



# RF Coax Products



**Tyco Electronics**  
Our commitment. Your advantage.

## Introduction

### Product Facts

- Listed under the Component Program of Underwriters Laboratories Inc., File No. E-81956 as indicated by Product Family 

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E-81956 as indicated by Product Family 

- Certified by Canadian Standards Association File No. LR 7189 as indicated by Product Family 

- Produced under a Quality Management System certified to ISO 9001

A copy of the certificate is available upon request



The Tyco Electronics RF Coaxial catalog combines the best products from industry leading brand names like M/A-COM and AMP. We have integrated these into one cohesive set of RF products focused specifically on wireless, wireline carrier, and enterprise networking sectors of the world telecom equipment market.

Tyco Electronic's broadest selection of RF connectors and coaxial cable assemblies provides you with a solution for every interconnection requirement.

Type N and 7/16 connectors are used where high power and rugged reliability are required, typically as antenna feeds, filter/combiner I/O's, and power amplifier outputs. SMA, SMB, and TNC connectors are the primary cable interface for inner cabinet routing and are available in panel mount, board mount, and cable terminations. Subminiature connectors

such as MCX, SMP, DIN, and BlindMate provide panel to board and backplane connections. Finally, our micro miniature SSMT, and MMCX series provide excellent board to board and card edge to board solutions.

All of these interfaces are supported with cable terminating tools and between series adapters to meet all your requirements for trouble free terminations at the lowest applied cost. The appendices hold a wealth of information including a Theory and Application tutorial, RG/U cable specification tables, Application notes on White Bronze plating and intermodulation distortion.

Whether you need rugged external RF power cables, panel mount, board to board, blindmate, or DIN, Tyco Electronics has the connection.

### How to Use This Catalog

Based on the communications gear that you are designing:

- Wireless Basestations
- Carrier Rack Equipment
- Chassis Set Top Box
- NIC Card

Typical equipment drawings on pages 306-309 guide you to the interconnect section(s) in this catalog.

Selection guides will direct you to products based on performance and mechanical requirements such as impedance, VSWR, max. frequency, power handling, etc.

There are other guides to help you find the right connection: A table of contents listed by interface type, a complete connector type selector describes each interface with typical applications, and a mini-selection guide shows key parameters to quickly pinpoint the right connector type.

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- Technical Documents
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NOTE: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

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- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above
- So whatever your questions when it comes to RoHS, we've got the answers at [www.tycoelectronics.com/leadfree](http://www.tycoelectronics.com/leadfree)

**RoHS**  
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## Connector Selection

### Connector Types

**7-16 Series** connectors are designed for medium to high power applications such as cellular base stations, control components, antenna and broadcast. The 7-16 Series minimizes intermodulation distortion by white bronze or silver plating the electrical path. Combined hex/knurl coupling nuts allow for manual or torque tightening, further reducing distortion by providing a strong butt joint.

**Lightning Protection** devices have an integral surge arrestor capsule which is designed to protect equipment from high current pulses. It is effective against very fast rise times as induced by electromagnetic pulses from nuclear explosions (NEMP) and the slower pulses arising from lightning strikes (LEMP).

**N Series** threaded connectors have an air dielectric interface and are low cost. These connectors operate to 11 GHz and are commonly used in cable-based local-area networks (LAN's) medium power transmitters, and base station antenna applications.

**TNC** connectors have an interface similar to BNC except for a threaded coupling nut. The tighter fit provided by this screw-on connection improves interface control allowing connectors to operate up to 11 GHz. TNC connectors are excellent for mobile units where top-notch performance is required under vibration.

**BNC** connectors offer easy engagement and disengagement using bayonet couplings and overlapping dielectrics. They are most useful for frequently coupled and uncoupled RF connections with frequencies below 4 GHz. BNC connectors find applications in flexible networks, instrumentation, and computer peripheral interconnections.

**F & G Series** connectors offer enhanced performance beyond 1 GHz. Designed to meet the rigorous requirements of Bellcore TA-NWT-001503 and SCTE specifications, the F & G series provides high current carrying capabilities in both sealed and un-sealed configurations. Plugs, jacks and adapters are available in threaded and push-on versions. These connectors meet the evolving needs of the communications industry for increased reliability and performance.

**SMA** threaded connectors are widely used in microwave communications. Connectors operate to at least 12.4 GHz on flexible coax cables, and up to 26.5 GHz on semi-rigid coax cables. Crimp-on SMA connectors that operate to 26.5 GHz are available.

**Blind Mate** connectors operate to 22 GHz for OSP connectors, 28 GHz for OSSP connectors, and 40 GHz for SMP style connectors. These connectors offer easy slide-on connection and require less alignment between the cable and the equipment than other connectors with comparable band width. Blind Mate connectors are widely used as coaxial interconnects between plug-in modules and motherboards when axial and radial misalignments are necessary.

**SMB** connectors feature a snap coupling for fast connection. A self centering outer spring and overlapping dielectric allows easy snap-on and excellent performance even in moderate vibration. The SMB is smaller in size than the SMA and excellent where engineers are concerned about circuit miniaturization. Typical application is inter- or intra-board connection of RF or digital signals. Commercial 50 ohm versions operate to 4 GHz, and 75 ohm versions reach 2 GHz.

**MCX** connectors offer a high reliability, space saving sub-miniature coaxial cable to cable and cable to board interconnection system. The MCX connectors impedance types are applicable up to 6 GHz.

**Surface Mount (SMT)** connectors. The RF solution to the communication and information age. Tyco Electronics' SSMT and SMT Quick Grip connectors are designed to meet the growing demand for surface mount RF connector technology. These connectors operate up to 6 GHz utilizing cable assembly design to terminate to SMT connectors. Surface mount connectors contribute to high density packaging and high volume manufacturing requirements.

**Multi Position** connectors. These connector series, including the 1.0/2.3 (CECC 22230), 1.6/5.6 (CECC 22240), Subminiature D (DIN 41652 and CECC 75 301-082), and Tyco Electronics' own SIEMAX multi coax connector series offer the customer a broad choice of options where density and performance are a major concern. The 1.0/2.3 series contacts are available in both 50 and 75 Ohm versions and are designed for use to 10 GHz. The different types of coupling mechanisms, such as screw on, slide-in and latching coupling provide for a variety of space-saving installations. The connector series 1.6/5.6 has been modified to incorporate improved technical advantages. A 75 Ohm design for use up to 8 GHz, it offers excellent screening effectiveness and is a most suitable component for those applications where the transmission of high bit rates is required. In Subminiature D type connectors these interfaces provide good electrical grounding and electromagnetic shielding in a small package size. These plug connectors address the increasing demands related to EMC (electromagnetic compatibility) and RFI (immunity to radiated noise), and are widely used as interface connectors in office and data systems, telecommunications equipment, and in measurement and control systems. Tyco Electronics' SIEMAX connectors combine the benefits of surface mount technology and modular design. This 75 Ohm connector series operates up to 2 GHz and offers a compact grid pitch of 10mm. Its uses include multiplex and high-density systems, and Base Station applications.

**Miscellaneous** connector types include multiple-circuit connectors that use coaxial contacts in a pin-and-socket configuration, crimp-on ferrules that offer fast, reliable connections for attaching one or more ground taps to shielded wire and braided shield terminations for connecting cable shields to pc boards. Also available are network/premises interconnect products for Ethernet/IEEE 802.3 systems and coaxial taps for simple, dependable connections from transceiver to LAN without cutting the cable.

## Connector Selection Guide

| Product                   | Nominal Impedance<br>Ohms | Maximum Frequency<br>GHz | Temperature Rating<br>C | Cable Retention                   |        | Coupling Mechanism | Maximum Peak Voltage | Durability Cycles | Connector Body Finish              | Page No. |
|---------------------------|---------------------------|--------------------------|-------------------------|-----------------------------------|--------|--------------------|----------------------|-------------------|------------------------------------|----------|
|                           |                           |                          |                         | lb                                | [N]    |                    |                      |                   |                                    |          |
| 7-16 Series               | 50                        | 7                        | -55° to +155°           | RG8A/U                            | —      | Threaded           | 4000                 | 500               | White Bronze                       | 7        |
| Lightning Protection      | 50                        | 2.5                      | -45° to +85°            | Adapter                           | —      | Threaded           | 650                  | 500               | White Bronze                       | 12       |
| N Series Commercial       | 50                        | 11                       | -65° to +85°            | 90 (RG-214/U)                     | 400.3  | Threaded           | 1000                 | 500               | Nickel                             | 20       |
| TNC Single Crimp          | 50                        | 7                        | -65° to +165°           | 60 (RG-58C/U)                     | 266.9  | Threaded           | 500                  | 500               | Silver                             | 29       |
| TNC Dual Crimp            | 50                        | 11                       | -65° to +165°           | 60 (RG-58C/U)                     | 266.9  | Threaded           | 500                  | 500               | Silver or Nickel                   | 29       |
| TNC Commercial            | 50                        | 7                        | -55° to +85°            | 60 (RG-58C/U)                     | 266.9  | Threaded           | 500                  | 500               | Nickel                             | 29       |
| TNC 75 Ohm                | 75                        | 2                        | -55° to +85°            | 60 (RG-59B/U)                     | 266.9  | Threaded           | 500                  | 500               | Nickel                             | 29       |
| BNC Single Crimp          | 50                        | 2.5                      | -65° to +165°           | 60 (RG-58C/U)                     | 266.9  | Bayonet            | 500                  | 500               | Silver or Nickel                   | 44       |
| BNC Dual Crimp            | 50                        | 4                        | -65° to +165°           | 60 (RG-58C/U)                     | 266.9  | Bayonet            | 500                  | 500               | Silver or Nickel                   | 44       |
| BNC Dual Crimp Commercial | 50                        | 4                        | -55° to +85°            | 60 (RG-58C/U)                     | 266.9  | Bayonet            | 500                  | 500               | Nickel                             | 44       |
| BNC Hex Crimp             | 50                        | 4                        | -55° to +85°            | 60 (RG-58C/U)                     | 266.9  | Bayonet            | 500                  | 500               | Nickel                             | 44       |
| BNC Field Serviceable     | 50                        | 4                        | -65° to +165°           | 40 (RG-142B/U)                    | 177.9  | Bayonet            | 500                  | 500               | Nickel                             | 44       |
| BNC 75 Ohm                | 75                        | 2                        | -65° to +85°            | 60 (RG-59B/U)                     | 266.9  | Bayonet            | 500                  | 500               | Nickel                             | 44       |
| Twin BNC                  | Non-constant              | —                        | -55° to +85°            | 25 (RG-108/U)                     | 111.2  | Bayonet            | 500                  | 200               | Silver or Nickel                   | 89       |
| F Series                  | 75                        | —                        | -55° to +85°            | 40 (Series 59, 6, 7 Single Braid) | —      | Threaded (F)       | 500                  | 200               | Nickel                             | 93       |
| G Series                  | 75                        | —                        | -55° to +85°            | 40 (Series 59, 6, 7 Single Braid) | —      | Push-On (G)        | 500                  | 200               | Nickel                             | 93       |
| SMA Semi-Rigid            | 50                        | 26.5                     | -65° to +105°           | 60 (RG-402/U)                     | 266.9  | Threaded           | 500                  | 500               | Gold or Passivated Stainless Steel | 100      |
| SMA Flexible              | 50                        | 12.4                     | -65° to +165°           | 40 (RG-58C/U)                     | 177.9  | Threaded           | 500                  | 500               | Gold or Passivated Stainless Steel | 100      |
| SMP                       | 50                        | 40                       | -65° to +165°           | 20 (RG-405/U)                     | 89     | Snap-On            | 500                  | 100               | Gold                               | 152      |
| OSP Semi-Rigid            | 50                        | 22                       | -65° to +125°           | 60 (RG-402/U)                     | 267.02 | Push-On            | 500                  | 5000              | Gold or Passivated Stainless Steel | 157      |
| OSP Flexible              | 50                        | 12.4                     | -65° to +125°           | 40 (RG-58/U)                      | 178    | Push-On            | 335                  | 5000              | Gold or Passivated Stainless Steel | 157      |
| OSSP Semi-Rigid           | 50                        | 28                       | -65° to +125°           | 20 (RG-405/U)                     | 89     | Push-On            | 335                  | 5000              | Gold or Passivated Stainless Steel | 169      |
| OSSP Flexible             | 50                        | —                        | -65° to +125°           | 20 (RG-316/U)                     | 89     | Push-On            | 250                  | 5000              | Gold or Passivated Stainless Steel | 169      |
| SMB                       | 50                        | 4                        | -65° to +85°            | 20 (RG-316/U)                     | 89     | Snap-On            | 335                  | 500               | Nickel                             | 176      |
| SMC                       | 50                        | 10                       | -65° to +85°            | 20 (RG-174/U)                     | 89     | Threaded           | 250                  | 500               | Gold                               | 193      |
| MCX Connectors            | 50                        | 6                        | -65° to +165°           | 20 (RG-316/U)                     | 32     | Snap-On            | 500                  | 500               | Nickel                             | 196      |
|                           | 75                        | 6                        | -65° to +165°           | 20 (RG-187/U)                     | 32     | Snap-On            | 500                  | 500               | Nickel                             | 196      |
| SMT Quick Grip            | 50                        | 3                        | -40° to +125°           | Omni-Flex                         | —      | Snap-On            | 250                  | 5                 | Gold                               | 207      |
| SSMT                      | 50                        | 6                        | -40° to +125°           | Omni-Flex                         | —      | Snap-On            | 250                  | 100               | Gold                               | 212      |
| MMCX                      | 50                        | 6                        | -55° to +155°           | 10 (RG-178/U)                     | 44.5   | Snap-On            | 500                  | 500               | Gold                               | 218      |
| Mini BNC                  | 75                        | 2                        | -40° to +85°            | 20 (735A)                         | —      | Bayonet            | 300                  | 500               | Nickel                             | 78       |
| QMA                       | 50                        | 6                        | -40° to +125°           | 20 (RG-316/U)                     | —      | Quick Lock         | 335                  | 100               | Nickel                             | 124      |
| Comp. Coax                | 50                        | 4                        | -40° to +125°           | N/A                               | —      | N/A                | 125                  | 25                | Gold                               | 204      |
| DIN 1.0/2.3               | 50                        | 10                       | -40° to +85°            | —                                 | —      | Thread/Snap/Slide  | 500                  | 500               | —                                  | 129      |
|                           | 75                        | 2                        | -40° to +85°            | —                                 | —      | Thread/Snap/Slide  | 500                  | 500               | —                                  | 129      |
| Switching Coax            | 50                        | 2.4                      | —                       | N/A                               | —      | N/A                | —                    | 30,000            | —                                  | 229      |

## Connector Selection (Continued)

### Method of Termination

Tyco Electronics provides connectors that can be terminated to coaxial cable, printed circuit boards or other connector interfaces.

Selection of the proper connector to terminate to an RG cable is simplified by using the format of this catalog. Experience has proven that certain connector types lend themselves to termination of particular coax cable sizes. For example, miniature cables such as RG 188 are most practically terminated to subminiature connectors such as SMB and SMC styles. Figure 3 illustrates the interface diameters of each connector type and the dielectric outside diameter (DOD) of popular RG cables. It is most economical to select a connector that terminates to a cable with a dielectric diameter close in size to the connector's interface diameter. The product information sections of this catalog have been organized so that all connector construction types are grouped together by cable size. This allows easy selection of the connector construction best suited for the application.

Tyco Electronics continually looks at new cable types and will release new part numbers based upon general market or specific customer needs. If you cannot find a Tyco Electronics part number for a specific cable type, please contact one of our sales locations or your local distributor to make an inquiry.

Tyco Electronics offers a wide range of connector configurations for terminating to printed circuit boards. Also available are connectors which allow the interconnection of one interface type to another.

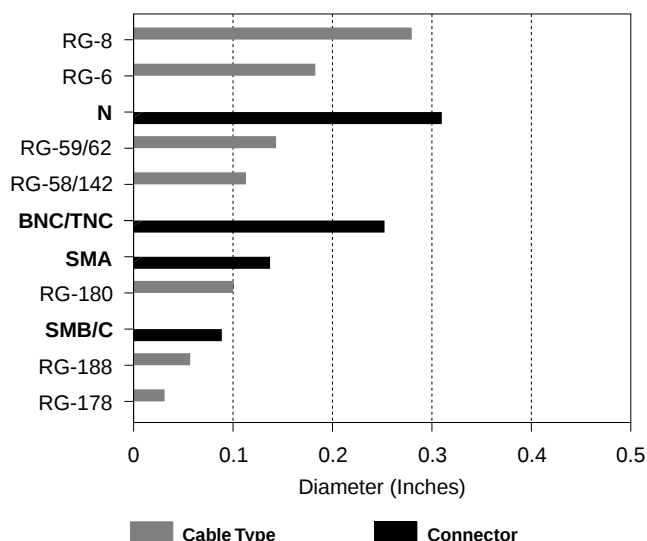


Figure 3

By reviewing this catalog, a connector can be found to match most any application. Since the RF connector is a part of a transmission line system, make sure when selecting a new connector design, that it is compatible with the overall system's performance.

### Construction

The construction of a connector will greatly affect the purchase price. The connector tables in this catalog include construction details that allow you to select connectors that meet your requirements at the lowest price. Commercial designs use lower cost materials, such as zinc diecast bodies, polypropylene insulators and silver-plated contacts. Specific details of connector construction are listed in each product section of this catalog.

The materials used affect both performance and cost. Common base metals include brass, beryllium copper and stainless steel. The most common plating used for the center contact is gold because of its low contact resistance, superior mating properties and corrosion resistance.

37 (polypropylene and polymethylpentene (TPX) are the most common connector dielectrics. 37 ( offers the lowest loss, the most stable electrical properties and high-est operating temperature. But since it cannot be injection molded, manufacturing is more costly than other materials. Be certain, when specifying connectors, that the temperature and voltage limitations are taken into consideration.

### Assembly

There are several methods of assembly or termination, but they can be categorized into two major areas: (1) Solder center conductor and clamp braid (Category A) and (2) Crimp center conductor and crimp braid. Other methods are derived from combinations of the above, (e.g., solder center conductor and crimp braid. Method (1) (Category A) is generally used where no specialized tools are available, such as with field installations. With the development of low cost assembly tools, method (2) is becoming more popular for field installation.

**Crimping** is preferred in most manufacturing environments where assembly tooling is available because terminations can be made in the least amount of time and with the greatest reliability. The design of crimp tools assures that every termination is made the same; this cannot be done with a clamp design without further testing or inspection. Figure 4 illustrates the difference between braid crimping using AMP "O" crimp and the industry-standard hex crimp. The AMP "O" crimp gives a more consistent pressure on the outer collar. In addition, the crimp of the center conductor provides superior VSWR as shown in Figure 5.

Benefits derived by using AMP "O" crimp:

- No soldering of center contact is required. This alleviates all prospective problems associated with the soldering process such as excess solder, cold solder joints and overheating the dielectric.
- Fewer parts resulting in less assembly errors
- Braid crimping which eliminates the need for the combing, screwing and torquing associated with the braid clamp.

TPX is a trademark of Mitsui Chemicals America, Inc.

## 7-16 Series Connectors

### Product Facts

- Designed for cellular base-stations, control component, antenna and broadcast applications
- Available in White Bronze plating
- Minimizes Intermodulation Distortion by the use of non-ferrous materials
- Hex knurl for wrench tightening
- Available for several popular RG cable sizes in solder-clamp and crimp-crimp attachment styles



Tyco Electronics offers a comprehensive range of 7-16 Connectors to suit today's challenging Wireless Infrastructure Market. This market demands reliable, intermodulation sensitive connectors that accommodate higher power.

Tyco Electronics 7-16 Coaxial Connector Series provides reliable, intermodulation-minimizing solutions that also provide a logical alternative to N Series connectors in high power applications where a more rugged interface design is required. Typical examples of this include transmitter to antenna links and channel switching networks.

The 7-16 Series conforms to CECC 22190 and IEC 169-4 specification standards and has a 2.7kV working voltage at the connector interface and maximum power handling capability of 4kW.

The series has been designed for these demanding environments and can withstand a minimum of 500 mating cycles. Popular RG cable sizes are covered in both solder/clamp and crimp attachment styles. Two piece combination connectors adapt to straight or right-angle configurations, minimizing the number of different part codes needed by the customer. Series N to 7-16 between series adapters facilitate the transition between system interfaces as well as providing a test interface.

The increased customer demand for greater channel capacity combined with increased sensitivity of receivers has exposed the IMD (Intermodulation Distortion) phenomenon. To address this problem 7-16 Connectors have been

designed to reduce IMD through the use of non-ferrous base materials and by silver plating of the electrical path. The proprietary White Bronze plating technique is standard, providing high corrosion resistance, low porosity, scratch resistance, low RF loss and a non-magnetic finish. Incorporation of hex-knurl coupling nuts allow for hand or wrench tightening of connectors, depending upon the application.

Tyco Electronics is a global ISO 9001 certified manufacturer and maintains a complete in-house Intermodulation Testing facility. Connector part numbers shown form just a small part of the extensive interconnect package that Tyco Electronics offers for the professional wireless and telecom markets.

### Related Product Data

**N Connectors** — Pages 20-25

### Application Notes —

White Bronze — Appendix B  
Intermodulation — Appendix C

### Between Series Adapters

For 7-16 Series Between Series Adapters, see pages 251-260.

## 7-16 Series Connectors (Continued)

### General Specifications

#### Materials

|                                   |                      |
|-----------------------------------|----------------------|
| Female Contacts (inner and outer) | Beryllium Copper     |
| Other Metal Parts                 | Brass                |
| Insulators                        | Fluorocarbon Polymer |
| Gaskets                           | Silicone Rubber      |
| Finishes                          |                      |
| Parts in the electrical path      | Silver over copper   |
| Other Metal Parts                 | White Bronze         |

#### Electrical

|                                         |                                                               |
|-----------------------------------------|---------------------------------------------------------------|
| Frequency Range                         | DC-7GHz                                                       |
| Impedance                               | 50 Ohms                                                       |
| Insulation Resistance                   | 10,000 Megohms Minimum<br>2.7kV (connector)                   |
| Maximum Working Voltage rms (sea level) | 1.4kV (versions for RG 213, 214 and 393)                      |
| Maximum Proof Voltage rms (sea level)   | 2.7kV (connector)<br>1.4kV (versions for RG 213, 214 and 393) |
| Center Contact Resistance               | 0.8 milliohm (max.) after conditioning                        |
| Insertion Loss                          | <1.5dB to 5 GHz                                               |
| VSWR                                    | 1.02 + 0.03f up to 7 GHz<br>where f is measured in GHz        |
| Intermodulation                         | Better than -150dBc                                           |

#### Mechanical

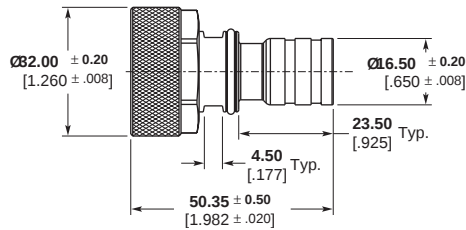
|                      |                    |
|----------------------|--------------------|
| Coupling Torque      | 18.5 – 22 ft.-lbs. |
| Proof Torque         | 25 ft.-lbs.        |
| Mechanical Endurance | 500 mating cycles  |

#### Environmental

|                    |                 |
|--------------------|-----------------|
| Temperature Rating | -55°C to +155°C |
|--------------------|-----------------|

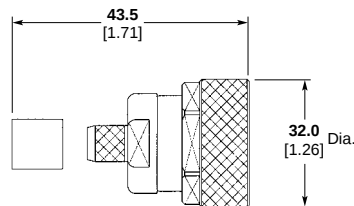
## 7-16 Series Connectors (Continued)

### Straight Cable Plug Solder/Solder



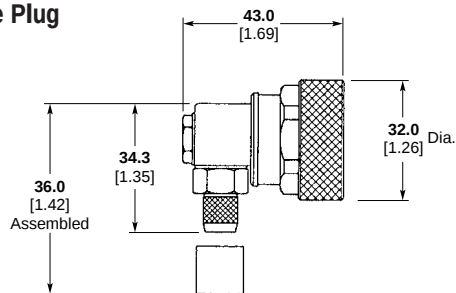
| Cable Type      | Body Plating          | Part No.         |
|-----------------|-----------------------|------------------|
| 1/2" Corrugated | White Bronze/<br>Gold | <b>1460159-1</b> |

### Straight Cable Plug Crimp/Crimp

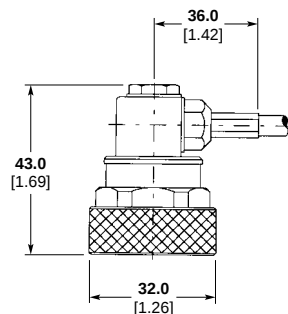


| Cable Type        | Body Plating | Part No.         |
|-------------------|--------------|------------------|
| RG 8A/U, RG 213/U | White Bronze | <b>6331959-1</b> |
| RG 9B/U, RG 214/U | White Bronze | <b>6362765-1</b> |

### Right-Angle Cable Plug Solder/Crimp



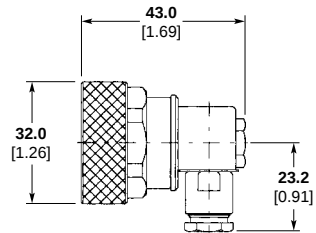
| Cable Type          | Body Plating | Part No.         |
|---------------------|--------------|------------------|
| RG 58C/U, RG 141A/U | White Bronze | <b>6408028-1</b> |
| RG 213/U            | White Bronze | <b>6408030-1</b> |
| RG 214/U            | White Bronze | <b>6312113-1</b> |



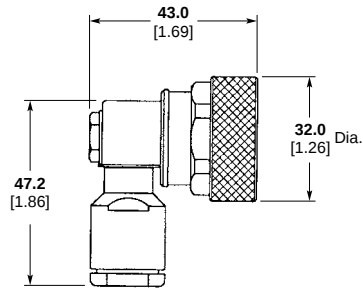
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## 7-16 Series Connectors (Continued)

### Right-Angle Cable Plug Solder/Clamp

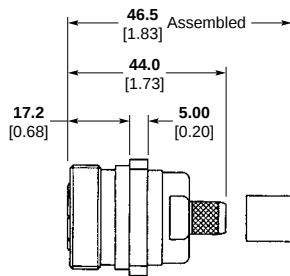


| Cable Type                                                         | Body Plating | Part No.         |
|--------------------------------------------------------------------|--------------|------------------|
| RG 55B/U, RG 58C/U,<br>RG 141A/U, RG 142B/U,<br>RG 223/U, RG 400/U | White Bronze | <b>6408026-1</b> |
| T-Flex 402                                                         | Silver       | <b>6328873-1</b> |

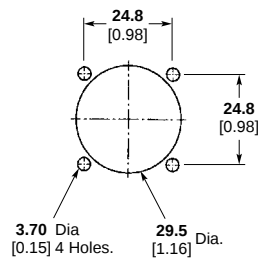


| Cable Type                              | Body Plating | Part No.         |
|-----------------------------------------|--------------|------------------|
| RG 213/U, RG 214/U,<br>RG 393/U         | White Bronze | <b>6408027-1</b> |
| RG 8A/U, RG 9B/U,<br>RG 213/U, RG 214/U | White Bronze | <b>6408038-1</b> |

### Straight Panel Mount Cable Jacks Crimp/Crimp



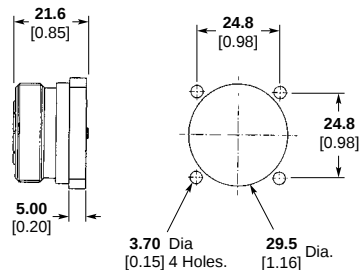
#### Mounting Detail



| Cable Type        | Body Plating | Part No.         |
|-------------------|--------------|------------------|
| RG 8A/U, RG 213/U | White Bronze | <b>6408032-1</b> |
| RG 9B/U, RG 214/U | White Bronze | <b>6408033-1</b> |

### Panel Socket Launcher

#### Mounting Detail

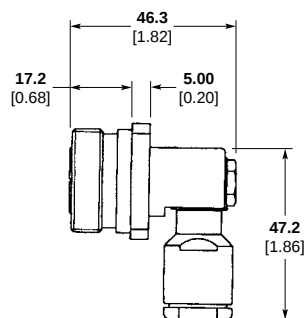


| Body Plating | Part No.         |
|--------------|------------------|
| White Bronze | <b>6311225-1</b> |
| White Bronze | <b>1460052-2</b> |

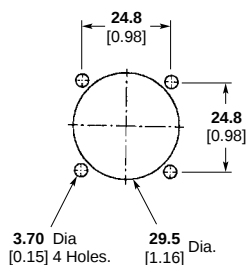
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## 7-16 Series Connectors (Continued)

### Right-Angle Panel Jack Solder/Clamp

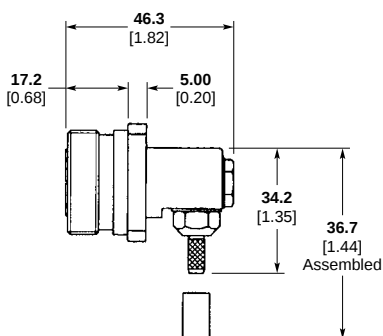


#### Mounting Detail

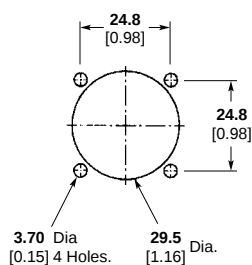


| Cable Type                                 | Body Plating | Part No.         |
|--------------------------------------------|--------------|------------------|
| RG 213/U, RG 214/U,<br>RG 393              | White Bronze | <b>6408036-1</b> |
| RG 58C/U, RG 142B/U,<br>RG 223/U, RG 400/U | White Bronze | <b>6363527-1</b> |

### Combination Panel Jack Solder/Crimp

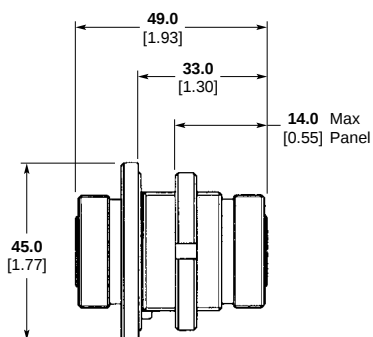


#### Mounting Detail



| Cable Type                                 | Body Plating | Part No.         |
|--------------------------------------------|--------------|------------------|
| RG 55B/U, RG 142B/U,<br>RG 233/U, RG 400/U | White Bronze | <b>6363524-1</b> |
| RG 8A/U, RG 213/U                          | White Bronze | <b>6363525-1</b> |
| RG 9B/U, RG 214/U                          | White Bronze | <b>6363526-1</b> |

### Bulkhead Adapter Jack/Jack



| Body Plating | Part No.         |
|--------------|------------------|
| White Bronze | <b>6408037-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Lightning and EMP Protection Devices

### Product Facts

- Cellular operator protection against EMP (electro-magnetic pulses) caused by lightning strikes
- Two different categories: Surge protectors and Quarter wave stub tuners
- For use in cellular infrastructure including GSM, DCS 1800, and PCS 1900 systems
- Incorporates Gas Discharge Tube (GDT) technology



Tyco Electronics has developed a unique series of Lightning and EMP protection devices for use in cellular infrastructure including GSM, DCS 1800, and PCS 1900 systems. These devices are designed to offer the cellular operator protection against EMP (electro-magnetic pulses) caused by lightning strikes. Direct or even near strikes produce fast rising electric fields within micro-seconds. These fields generate high voltage pulses through unprotected antennas and transmission lines which lead to the primary communication equipment. High voltage pulses can cause extensive damage leading to costly repairs as well as significant loss of service to

subscribers. These protective devices come in two different categories: surge protectors and quarter wave stub tuners.

To ensure that proper, low level contact resistance is established between the LP device and mounting wall, it is recommended that a minimum torque of 50 in/lbs / 5.65 n/m be applied to tighten the connector mounting nut. A recommended minimum torque of 35 in/lbs / 3.95 n/m should also be applied for installation of replacement surge protector capsules to ensure proper protection performance.

In order to ensure that resultant currents from lightning or EMP strikes do not

interfere with parallel transmission lines within protected electronic equipment, surge protector devices must be installed with proper orientation. The surge protector side of the device should be mounted in the unprotected side of the equipment while the mounting nut is positioned internally in the protected area.

It is important when planning lightning protection, that the user can estimate the potential number of direct strikes. This information may influence the type of device selected or the requirement for routine maintenance checks. Significant attention must be paid to the height of sup-

porting structure as this, when related to the typical number of thunderstorms in a particular region, allows us to estimate the probability of a direct strike taking place. To assist our customers in this, the following table and chart has been included in this note. This should enable lightning protection planners to establish the likelihood of direct strikes across a network anywhere in the world.

Detailed application notes are available for proper selection of lightning protection devices (surge protectors & stub tuners) as well as intermodulation and White Bronze plating.

### Selecting your RF Coaxial Lightning Protection Device

#### Between Series Adapters

For 7-16 Series and N Series Between Series Adapters, please see pages 251-260.

| Number of Thunderstorm Days per year | hmax/m 10% | hmax/m 20% | hmax/m 50% |
|--------------------------------------|------------|------------|------------|
| 05                                   | 28         | 39         | 61         |
| 10                                   | 18         | 26         | 40         |
| 15                                   | 14         | 20         | 31         |
| 20                                   | 12         | 17         | 26         |
| 30                                   | 9.4        | 13         | 20         |
| 40                                   | 7.9        | 11         | 17         |
| 50                                   | 6.9        | 9.5        | 15         |
| 70                                   | 5.6        | 8.0        | 12         |
| 90                                   | 4.8        | 7.0        | 10.6       |
| 130                                  | 3.9        | 5.5        | 8.5        |
| 150                                  | 3.5        | 5.0        | 7.7        |
| 180                                  | 3.1        | 4.4        | 6.9        |

**Table 1:** Maximum height of supporting building for a given number of thunderstorm days (when hmax is exceeded, probability of direct strike to supporting building within 15 years is greater than 10% for hmax values given in second column, 20% for hmax values given in third column and 50% for hmax values given in the fourth column).

## Surge Protectors

### Product Facts

- Excellent for Broadband Frequency Applications
- Field Replaceable Gas Discharge Tube
- Available Interfaces Facilitate Retrofit Capabilities
- Low VSWR up to 2.5GHz
- Specialized White Bronze Finish



### Selection of a Lightning Protection Device

At right are the basic advantages and limitations for both types of protection to use in the proper selection for your application.

#### Advantages

- Broadband
- Allows DC bias on the transmission line. (critical for applications using mast top electronics.)
- No harmonic passband
- Ease of retrofitting antenna sights
- GDT easily accessible for replacement

#### Limitations

- Routine maintenance recommended
- 3 GHZ maximum frequency
- Initial pass-through voltage

These devices incorporate Gas Discharge Tube (GDT) technology. A GDT is a hermetically sealed tube containing an inert gas. The tube is inserted in the side of the device through an easily accessible weather sealed port. During normal operation the tube is inactive. When an installation is struck by lightning, a high voltage impulse will appear on the coaxial line. As the impulse amplitude rises, a level is reached where the impulse surpasses the dynamic voltage threshold of the tube and the electrodes arc over to discharge the energy to ground. Prior to activation of the tube, there will be a short period of time where energy will be present on the line. This residual pulse is equal to the dynamic voltage threshold of the tube. The maximum impulse voltage a tube can handle without discharging is referred to as the impulse sparkover voltage. This capacity of the GDT is quoted as follows:

| Characteristic            | Symbol     | Definition                | Impulse      | Typical Value |
|---------------------------|------------|---------------------------|--------------|---------------|
| Impulse sparkover voltage | $U_{zdyn}$ | Dynamic voltage threshold | 1kV/ $\mu$ S | 650V          |

In the case of the referenced chart, the voltage will rise at one kilovolt per microsecond and the tube will fire after 650 nanoseconds. During activation a small percentage of voltage (called arc voltage) will still pass through. This will be approximately 30 volts. When the pulse subsides, the tube again becomes inactive leaving a small residual voltage on the line. A direct lightning strike results in an impulse current of high amplitude. The capability of a device to protect a system is defined as the impulse discharge current rating. This is defined as the peak current of an impulse which the device can withstand ten times (5 at each polarity at fixed intervals) without affecting the device. maximum impulse discharge current is the peak current of an impulse the device can withstand once.

Surge protectors are often used in applications requiring a standing DC line voltage. This is typical in applications with mast top electronics. The maximum voltage capacity of a surge protector prior to it surpassing the static voltage threshold and discharging it to ground is defined as its D.C.

## Surge Protectors (Continued)

sparkover voltage. This capacity is quoted as follows:

| Characteristic         | Symbol      | Definition               | Impulse | Typical Value |
|------------------------|-------------|--------------------------|---------|---------------|
| d.c. sparkover voltage | $U_{zstat}$ | Static voltage threshold | n/a     | 230V          |

In these applications it is important to select a device that will assure the tube can return to its inactive state after the passage of a surge. This feature of the Surge protector is known as the holdover voltage. If the device continues to conduct, the protected line will be short circuited and the tube will heat up (glow mode). If left in this state, the tube can overheat and

destruct. GDT's have a finite life span which is inversely proportional to the energy dissipated. At extremes it is possible to reach a level where the tube is unable to discharge all the energy and is destroyed. It is therefore necessary to schedule routine maintenance checks and periodically replace the tube within the surge protector.

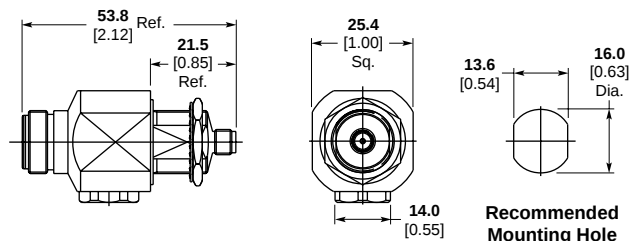
Surge protectors offer excellent lightning protection for broadband systems and are usable up to 3 GHz. Standard interfaces include 7-16, N, and SMA. Configurations include straight and bulkhead mounted adapters which allows for ease of assimilation into existing systems.

## Specifications

| Requirement                                               | Detail           |
|-----------------------------------------------------------|------------------|
| <b>Electrical</b>                                         |                  |
| Frequency Range                                           | DC to 3GHz       |
| Impedance                                                 | 50Ω              |
| VSWR Performance                                          | ≤ 1.33:1         |
| Insertion Loss (Typical)                                  | 0.45dB           |
| Impulse Discharge Current (8/20μs, multiple strike)       | 20kA             |
| Maximum Impulse Discharge Current (8/20μs, single strike) | 50kA             |
| Dynamic Sparkover Voltage, NEMP (1kV/μs)                  | 2,000V           |
| Dynamic Sparkover Voltage, LEMP (1kV/μs)                  | 800V             |
| Dynamic Sparkover Voltage, Static (<100V/μs)              | 90V*             |
| <b>Materials</b>                                          |                  |
| Body Parts                                                | Brass            |
| Gaskets                                                   | Silicone Rubber  |
| Female Contacts                                           | Beryllium Copper |
| Male Contacts                                             | Brass            |
| Insulators                                                | P.T.F.E.         |
| <b>Environmental</b>                                      |                  |
| Operating Temperature Range                               | -45° C to +85° C |
| Relative Humidity                                         | up to 100%       |

\* Determined by gas tube used, can be higher than value shown.

## N Series Jack to SMA Bulkhead Jack Adapter



**Recommended  
Mounting Hole**

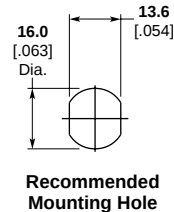
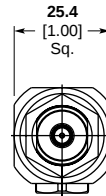
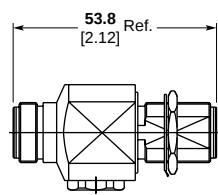
|                 |                        |
|-----------------|------------------------|
| Frequency Range | DC to 3GHz             |
| Contact Plating | Gold                   |
| Body Plating    | White Bronze           |
| Max Panel       | 10.00mm                |
| Compliant With  | CECC22210/<br>CEC22110 |
| Coupling Torque | 0.7-1.1Nm              |
| Proof Torque    | 1.7Nm both ends        |
| Endurance       | 500 Matings            |

**Part Number**  
**6312079-1**

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Surge Protectors (Continued)

### N Series Jack to N Series Bulkhead Jack Adapter

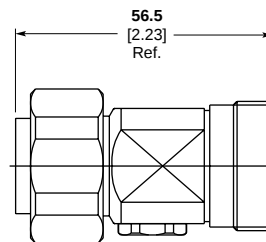
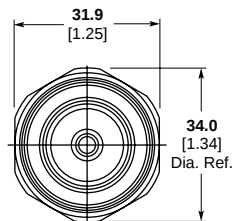


**Recommended  
Mounting Hole**

|                 |               |
|-----------------|---------------|
| Frequency Range | DC to 3.0 GHz |
| Contact Plating | Gold          |
| Body Plating    | White Bronze  |
| Max Panel       | 10.00mm       |
| Compliant With  | CECC22210     |
| Coupling Torque | 0.7-1.1 Nm    |
| Proof Torque    | 1.7 Nm        |
| Endurance       | 500 Matings   |

**Part Number**  
**6312138-1**

### 7-16 Plug to 7-16 Jack Adapter



|                 |               |
|-----------------|---------------|
| Frequency Range | DC to 3.0 GHz |
| Contact Plating | Silver        |
| Body Plating    | White Bronze  |
| Compliant With  | CECC22190     |
| Coupling Torque | 25 - 30 Nm    |
| Proof Torque    | 35Nm          |
| Endurance       | 500 Matings   |

**Part Number**  
**6312121-1**

### Gas Discharge Tube Replacement



**Part Number**  
**1402314-1**

|                                |                |
|--------------------------------|----------------|
| d.c. Sparkover Voltage:        | 230V ± 46V     |
| Impulse Sparkover Voltage:     | 700V typ.      |
| (1kV/mS)                       | (900V max)     |
| Glow Discharge Voltage:        | 72V            |
| Arc Discharge Voltage:         | 10V            |
| a.c. Discharge Current:        | 20A            |
| (1 sec, 50Hz)                  |                |
| Impulse Discharge Current:     | 20kA (50kA for |
| (8/20mS waveform)              | one strike)    |
| Insulation Resistance (@100V): | 10GW           |
| Capacitance:                   | 2pF            |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## $\lambda/4$ Stub Tuners

### Product Facts

- Ideal for use with GSM, PCS and DCS
- Maintenance Free Operation
- Low VSWR Within Specified Bandwidth
- Configurations include direct attachments to Cable variants
- Optional White Bronze Finish



### Advantages

- Low VSWR in pass-band
- Minimal maintenance
- Pass-through voltage eliminated
- No sparkover or residual voltage concerns
- Ease of retro-fitting antenna sights

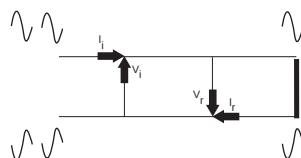
### Limitations

- Frequency specific
- Harmonic passband
- Does not allow DC bias on transmission line

These devices are three port coaxial connectors. The third port extending from the main through path is terminated in a short circuit at a pre-determined distance calculated to be exactly one quarter wavelength at the desired center frequency (see graph).

Unlike surge protectors, this design eliminates concerns about residual pulse, sparkover voltage and residual voltage ensuring greater protection for sensitive electronic equipment. As opposed to surge protectors, stub tuners will absorb lightning strikes without need for replacing components. These devices yield very low VSWR and feature high attenuation within a relatively narrow pass-band ( $\pm 70$  MHz) but are application specific. Stub tuners also pass energy in bands that are harmonically related to the fundamental center frequency. The graphs below show a typical test impulse and the response of a stub tuner.

### $\lambda/4$ Shorting Stub Basics

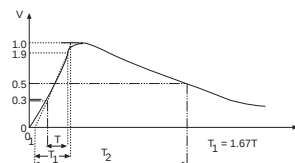


Stub tuners are classified into two broad categories—simple and broadband. The simple stub tuner exhibits a V-shaped response on the VSWR vs. frequency plot. The trough of the V is designed to occur at the required  $F_0$  and the bandwidth is restricted to approximately 8%. The broadband tuner employs extra RF techniques, similar to multiple cavity filtering, which increase the effective bandwidth by approximately 20%.

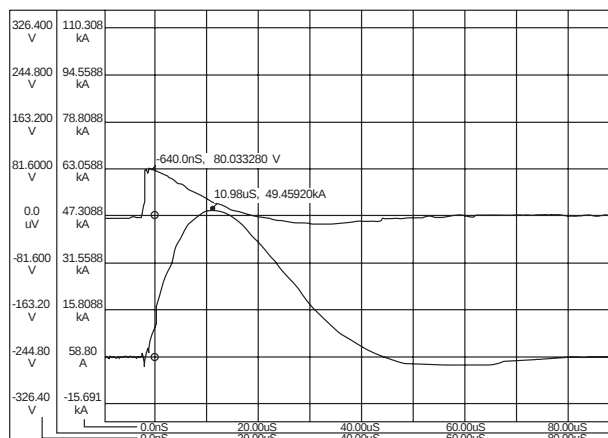
Tyco Electronics offers a wide variety of stub tuners for the most popular frequency bands to facilitate purchase without need for custom design and manufacturing. Designs exist for GSM, PCS 1900, DCS 1800

frequencies with standard industry interfaces including SMA, 7-16, and Type N. Configurations include cable assemblies, cabled connectors, and adapters for ease of assimilation into existing systems. Stub tuners are maintenance free since they incorporate no active components though it is recommended that a check of the stub tuner affixment be made following heavy discharges at an installation.

### Typical Test Impulse



### Typical $\lambda/4$ Test Response

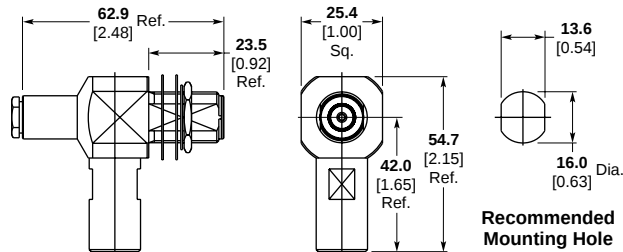


## $\lambda/4$ Stub Tuners (Continued)

| Requirement                                 | Detail (Type-N, 7-16) |
|---------------------------------------------|-----------------------|
| <b>Electrical</b>                           |                       |
| Impedance                                   | 50 $\Omega$           |
| VSWR Performance in Band                    | $\leq 1.2:1$          |
| Insertion Loss (Typical)                    | 0.2dB                 |
| DC Resistance (stub outer to inner)         | 1m $\Omega$           |
| Dynamic Voltage @ 250A/ms                   | $\leq 15$ V           |
| Residual Voltage @ 2500A, 8/20 $\mu$ s      | $\leq 15$ V           |
| Outer Conductor Contact Resistance          | 10m $\Omega$          |
| DC Resistance (through-path center contact) | 100m $\Omega$         |
| <b>Materials</b>                            |                       |
| Body parts                                  | Brass                 |
| Gasket                                      | Silicone Rubber       |
| Female contacts                             | Beryllium Copper      |
| Male Contacts                               | Brass                 |
| Insulators                                  | P.T.F.E.              |
| <b>Environmental</b>                        |                       |
| Operating temperature range                 | -45°C to +85°C        |
| Relative humidity (non-condensing)          | up to 100%            |

### DCS 1800

#### Type N Clamp Bulkhead Jack

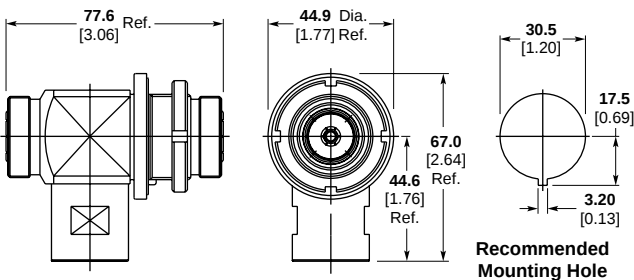


**Recommended  
Mounting Hole**

|                  |              |
|------------------|--------------|
| Bandwidth        | $\pm 70$ MHz |
| Center Frequency | 1795 MHz     |
| Contact Plating  | Silver       |
| Body Plating     | Silver       |
| Max Panel        | 10.00mm      |
| Compliant With   | CECC22210    |
| Coupling Torque  | 0.7-1.1Nm    |
| Proof Torque     | 1.7Nm        |
| Endurance        | 500 Matings  |

| Cable     | Part No.  |
|-----------|-----------|
| T-Flex402 | 6329818-1 |

### 7-16 Jack to 7-16 Bulkhead Jack Adapter



**Recommended  
Mounting Hole**

|                  |              |
|------------------|--------------|
| Bandwidth        | $\pm 70$ MHz |
| Center Frequency | 1795 MHz     |
| Contact Plating  | Silver       |
| Body Plating     | White Bronze |
| Max Panel        | 8.00mm       |
| Compliant With   | CECC22190    |
| Coupling Torque  | 25 - 30Nm    |
| Proof Torque     | 35Nm         |
| Endurance        | 500 Matings  |

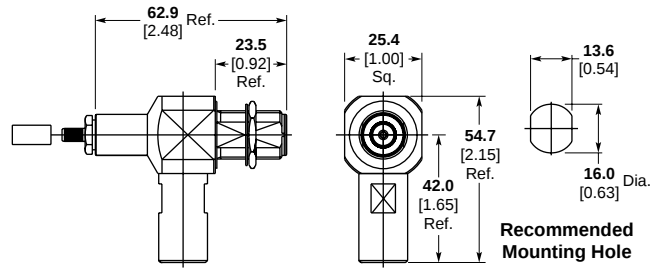
| Part Number |
|-------------|
| 6361137-1   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## $\lambda/4$ Stub Tuners (Continued)

### DCS 1800 (Continued)

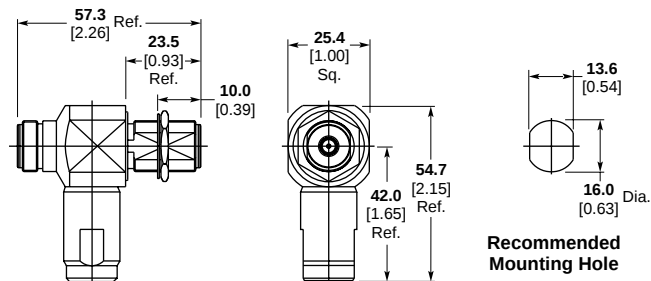
#### Type N Crimp Bulkhead Jack



|                  |             |
|------------------|-------------|
| Bandwidth        | ± 70 MHz    |
| Center Frequency | 1795 MHz    |
| Contact Plating  | Silver      |
| Body Plating     | Silver      |
| Max Panel        | 10.00mm     |
| Compliant With   | CECC22210   |
| Coupling Torque  | 0.7-1.1Nm   |
| Proof Torque     | 1.7Nm       |
| Endurance        | 500 Matings |

| Cable   | Part No.  |
|---------|-----------|
| RG58C/U | 1329819-1 |

#### Type N Jack to Type N Bulkhead Jack Adapter

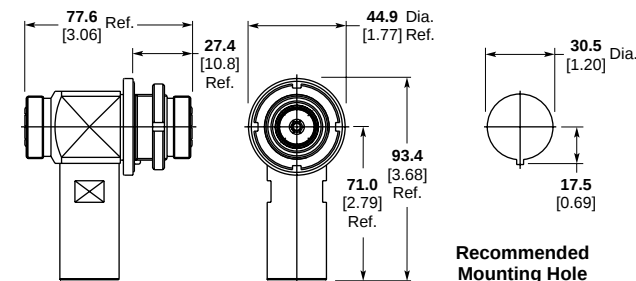


|                  |             |
|------------------|-------------|
| Bandwidth        | ± 70 MHz    |
| Center Frequency | 1795 MHz    |
| Contact Plating  | Silver      |
| Body Plating     | Silver      |
| Max Panel        | 10.00mm     |
| Compliant With   | CECC22210   |
| Coupling Torque  | 0.7-1.1Nm   |
| Proof Torque     | 1.7Nm       |
| Endurance        | 500 Matings |

| Part Number |
|-------------|
| 1361138-1   |

### GSM

#### 7-16 Bulkhead Jack to 7-16 Bulkhead Jack

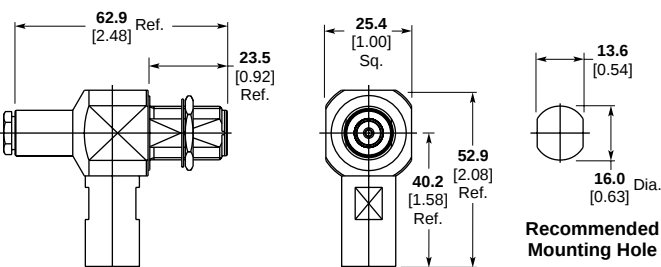


|                  |              |
|------------------|--------------|
| Bandwidth        | ± 70 MHz     |
| Center Frequency | 925 MHz      |
| Contact Plating  | Silver       |
| Body Plating     | White Bronze |
| Max Panel        | 8.00mm       |
| Compliant With   | CECC22190    |
| Coupling Torque  | 25 - 30Nm    |
| Proof Torque     | 35Nm         |
| Endurance        | 500 Matings  |

| Cable            | Part No.  |
|------------------|-----------|
| T-Flex 402 Cable | 6408399-1 |

### PCS 1900

#### Type N Clamp Bulkhead Jack



|                  |             |
|------------------|-------------|
| Bandwidth        | ± 70 MHz    |
| Center Frequency | 1920 MHz    |
| Contact Plating  | Silver      |
| Body Plating     | Silver      |
| Max Panel        | 10.00mm     |
| Compliant With   | CECC22210   |
| Coupling Torque  | 0.7-1.1Nm   |
| Proof Torque     | 1.7Nm       |
| Endurance        | 500 Matings |

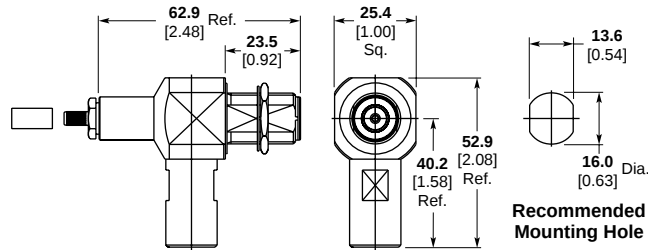
| Cable      | Part No.  |
|------------|-----------|
| T-Flex 402 | 1312137-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## $\lambda/4$ Stub Tuners (Continued)

### PCS 1900 (Continued)

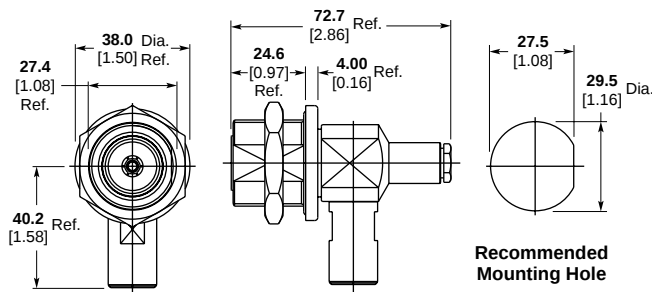
#### Type N Crimp Bulkhead Jack



|                  |             |
|------------------|-------------|
| Bandwidth        | ± 70 MHz    |
| Center Frequency | 1920 MHz    |
| Contact Plating  | Silver      |
| Body Plating     | Silver      |
| Max Panel        | 10.00mm     |
| Compliant With   | CECC22210   |
| Coupling Torque  | 0.7-1.1Nm   |
| Proof Torque     | 1.7Nm       |
| Endurance        | 500 Matings |

| Cable    | Part No.  |
|----------|-----------|
| RG58 C/U | 6312139-1 |

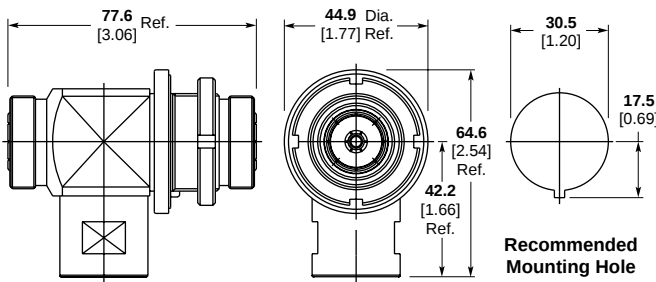
### 7-16 Clamp Bulkhead Jack



|                  |             |
|------------------|-------------|
| Bandwidth        | 1920 MHz    |
| Center Frequency | ± 70 MHz    |
| Contact Plating  | Silver      |
| Body Plating     | Silver      |
| Max Panel        | 8.00mm      |
| Compliant With   | CECC 22190  |
| Coupling Torque  | 25-30 Nm    |
| Proof Torque     | 35 Nm       |
| Endurance        | 500 Matings |

| Cable     | Part No.  |
|-----------|-----------|
| T-Flex402 | 6312123-1 |

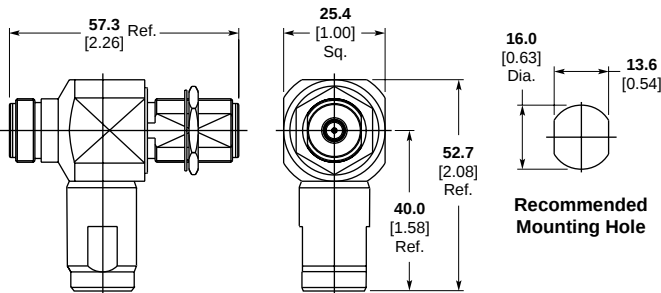
### 7-16 Bulkhead Jack to 7-16 Bulkhead Jack Adapter



|                  |              |
|------------------|--------------|
| Bandwidth        | 1920 MHz     |
| Center Frequency | ± 70 MHz     |
| Contact Plating  | Silver       |
| Body Plating     | White Bronze |
| Max Panel        | 8.00mm       |
| Compliant With   | CECC 22190   |
| Coupling Torque  | 25-30 Nm     |
| Proof Torque     | 35 Nm        |
| Endurance        | 500 Matings  |

| Part Number |
|-------------|
| 6312124-1   |

### Type N Bulkhead Jack to Type N Bulkhead Jack Adapter



|                  |             |
|------------------|-------------|
| Bandwidth        | ± 70 MHz    |
| Center Frequency | 1920 MHz    |
| Contact Plating  | Silver      |
| Body Plating     | Silver      |
| Max Panel        | 10.00mm     |
| Compliant With   | CECC22210   |
| Coupling Torque  | 0.7-1.1Nm   |
| Proof Torque     | 1.7Nm       |
| Endurance        | 500 Matings |

| Part Number |
|-------------|
| 6361139-1   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## N Series Connectors

### Product Facts

- Designated connectors are MIL-C-39012, Class II, Category B qualified
- Captive center contacts
- Completely crimpable application – one hand tool crimps all cables with single or double braided shields of a given size
- Impedance matching crimps
- Broad band performance – low VSWR
- Superior cable retention
-  dielectric
- Silver or nickel finish
- Fully intermateable with MIL-C-39012 connectors
- Listed under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- Certified by Canadian Standards Association File No. LR 7189 

The Tyco Electronics N Connector, featuring a 15.88 [5/8] - 24 threaded coupling for optimum stability, is highly suited for critical applications and environments. This medium sized connector can withstand shock and vibration to assure a low noise level and has a constant impedance of 50 ohms. It also features a captive center contact and provides excellent performance at frequencies up to 11 GHz, with voltages to 1000 volts rms.

This Tyco Electronics connector offers the added benefits of low overall applied cost with a labor-saving two-crimp assembly. The contact is simply crimped to the cable's center conductor, then both braid and cable support are simultaneously crimped to complete the termination.

N Series Connectors are available in standard plug, jack, panel jack, bulkhead jack and right-angle plug configurations. Those connectors with a military designation (M39012) are furnished in accordance with all requirements of specification MIL-C-39012, Class II, Category B.

### Materials

**Brass**—QQ-B-626  
**Beryllium Copper**—QQ-C-530  
**Dielectric**—37 (—MIL-P-19468)  
**Copper, Annealed**—QQ-C-576  
**Phosphor Bronze**—QQ-B-750  
**Silicone Rubber**—ZZ-R-765

### Plating

**Body**—  
 Silver per QQ-S-365  
 Nickel per QQ-N-290  
**Center Contact**—  
 Gold per MIL-B-45204



### Electrical Characteristics

**Nominal Impedance**—50 ohms  
**Working Voltage**—1000 volts, rms at sea level  
**Frequency Range**—0 to 11 GHz  
**Voltage Standing Wave Ratio (VSWR)**—  
 Straight Plug or Jack — 1.3:1 max.  
 Right-Angle Plug —  
 1.35 max. at 0 to 9.0 GHz  
 1.50 max. at 9.0 to 11.0 GHz  
**Contact Resistance**—  
 Outer Contact—0.2 milliohms  
 Center Contact—1.0 milliohms  
 Right-Angle—2.5 milliohms  
**Insulation Resistance**—5000 megohms min.  
**Dielectric Withstanding Voltage**—2500 Volts, rms at sea level  
**RF Leakage**—MIL Type, -90 dB min. at 2 to 3 GHz  
**RF Insertion Loss**—MIL Type, 0.15 dB max. at 10 GHz  
 Right-Angle Plug, 0.3 dB max. at 10 GHz  
**Corona Level**—MIL Type, 500 volts min. at 21 336 m [70,000 ft.]  
**Terminator**—  
 Resistance—50 ohms  $\pm$ 1%  
 Power Rating—1.0 watt max.

### Mechanical Characteristics

**Mating/Unmating**—Threaded coupling  
**Cable Attachment**—Crimp type - center contact and braid  
**Coupling Nut Retention**—445 N [100 lbs.] min.  
**Cable Retention**—400 N [90 lbs.] min. RG 214/U Cable  
**Durability**—500 cycles per MIL-C-39012  
**Captive Contact**—27 N [6 lbs.] min. axial retention, either direction

### Environmental Characteristics

**Temperature Range**—  
 MIL Type, -65°C to +165°C  
 Commercial, -55°C to +85°C  
**Vibration**—MIL-STD-202, Method 204, Test Cond. B  
**Shock**—MIL-STD-202, Method 213, Test Cond. I  
**Moisture Resistance**—MIL-STD-202 Method 106  
**Salt Spray**—MIL-STD-202, Method 101, Test Cond B  
**Temperature Cycling**—MIL-STD-202, Method 107, Test Cond. B (except high temperature is +85°C)  
**Note:** All data pertains to use with MIL-C-39012 specified cables only.

### Between Series Adapters

For N Series Between Series Adapters, see pages 251-260.

## N Series Connectors, 50 Ohm (Continued)

### Plugs

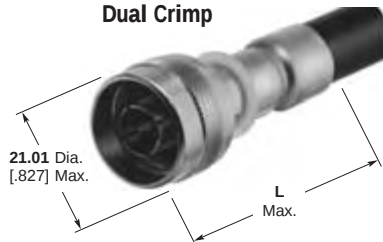
#### MIL Type Dual Crimp



#### Semi-Rigid Cable



#### Hex Dual Crimp



| RG/U<br>Cable                  | Termination<br>Type | Body<br>Plating | M39012/<br>Military No. and/<br>or Comments | Dim.<br>L      | Integral Die<br>Hand Tool | Hex Across Flats<br>Center | Braid         | Notes | Part No.    |
|--------------------------------|---------------------|-----------------|---------------------------------------------|----------------|---------------------------|----------------------------|---------------|-------|-------------|
| 58, 58A,<br>58B, 58C           | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220045-2                  | —                          | —             | 1     | 1-5225661-2 |
|                                | O Crimp             | Silver          | Knurl Collar                                | 42.85<br>1.687 | 220045-2                  | —                          | —             | 1     | 5225361-1   |
| 223,<br>55, 55A, 55B           | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220045-2                  | —                          | —             | 1     | 1-5225661-3 |
|                                | O Crimp             | Silver          | Knurl Collar                                | 42.85<br>1.687 | 220045-2                  | —                          | —             | 1     | 5225361-2   |
| 142, 142A<br>142B, 400         | O Crimp             | Silver          | Knurl Collar                                | 42.85<br>1.687 | 220045-2                  | —                          | —             | 1, 3  | 5225392-2   |
|                                |                     |                 | Knurl Collar                                | 42.85<br>1.687 | 220045-2                  | —                          | —             | 1     | 5225361-4   |
| 142, 142A<br>142B              | O Crimp             | Nickel          | Knurl Collar                                | 41.35<br>1.628 | 220045-2                  | —                          | —             | 3     | 5225699-1   |
|                                | Hex Crimp           | Nickel          | Knurl Collar                                | 39.40<br>1.550 | 58436-1                   | 1.73<br>.068               | 5.41<br>.213  | 2     | 5415232-4   |
| 115A,<br>BELDEN 89880,<br>9880 | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220015-1                  | —                          | —             | 3     | 5225092-8   |
| BELDEN 9880                    | Hex Crimp           | Nickel          | Knurl Collar                                | 39.40<br>1.550 | 58485-1                   | 2.54<br>.100               | 10.90<br>.429 | 2     | 1-415232-0  |
| 402 Semi Rigid<br>(.141)       | Solder              | Nickel          | Knurl Collar                                | 24.6<br>.970   | —                         | —                          | —             | —     | 6057088-1   |
| 405 Semi Rigid<br>(.085)       | Solder              | Nickel          | Knurl Collar                                | 24.6<br>.970   | —                         | —                          | —             | —     | 6057094-1   |
| 8, 8A, 213                     | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220015-1                  | —                          | —             | —     | 1-5227086-0 |
|                                | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220015-1                  | —                          | —             | —     | 5225661-2   |
|                                | O Crimp             | Silver          | 01B0007<br>Knurl Collar                     | 42.85<br>1.687 | 220015-1                  | —                          | —             | 3     | 51692-2     |
|                                | O Crimp             | Nickel          | Knurl Collar                                | 47.22<br>1.859 | 220015-1                  | —                          | —             | 3     | 5225662-2   |
| 11, 11A, 216                   | O Crimp             | Silver          | 01B0013<br>Knurl Collar                     | 42.85<br>1.687 | 220015-1                  | —                          | —             | 3     | 51692-4     |
| BELDEN 9292                    | O Crimp             | Nickel          | —                                           | 47.22<br>1.859 | 220015-1                  | —                          | —             | 3     | 1-5225662-8 |
| 393                            | Hex Crimp           | Nickel          | Hex Collar                                  | 39.40<br>1.550 | 58485-2                   | 3.25<br>.128               | 10.90<br>.429 | 2     | 5414160-5   |
| BELDEN 8214                    | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220015-1                  | —                          | —             | —     | 1-5225661-6 |
| 9, 9A, 9B,<br>214              | O Crimp             | Nickel          | Knurl Collar                                | 42.85<br>1.687 | 220015-1                  | —                          | —             | —     | 5225661-1   |
|                                | O Crimp             | Silver          | 01B0008<br>Knurl Collar                     | 42.85<br>1.687 | 220015-1                  | —                          | —             | 3     | 51692-1     |
| 9, 214                         | Hex Crimp           | Nickel          | Hex Collar                                  | 39.40<br>1.550 | 58485-1                   | 2.54<br>.100               | 10.90<br>.429 | 2     | 5415232-7   |
| LMR 240                        | Hex/Solder          | Silver          | Hex Collar                                  | 29.74<br>1.171 | —                         | —                          | 6.81<br>.268  | —     | 6274532-1   |

**Notes:** <sup>1</sup> Hand Tool 69710-1, with Die Insert 220062-1, is available to terminate these connectors. The 626 Pneumatic tool system can also be used.

<sup>2</sup> Die Set Crimp Tool — PRO-CRIMPER II Hand Tool, P/N 354940-1 or 626 Series Pneumatic Tool with 679304-1.

<sup>3</sup> Weatherproof.

BELDEN is a trademark of Belden Wire and Cable Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## N Series Connectors, 50 Ohm (Continued)

### Right-Angle Plugs, Crimp



| RG/U Cable         | Termination Type | Body Plating | M39012/<br>Military No. and/<br>or Comments | Dim.<br>L      | Integral Die<br>Hand Tool | Hex Across Flats |               | Notes | Part No.  |
|--------------------|------------------|--------------|---------------------------------------------|----------------|---------------------------|------------------|---------------|-------|-----------|
|                    |                  |              |                                             |                |                           | Center           | Braid         |       |           |
| 58A, 58C           | Hex Crimp        | Nickel       | Hex Collar                                  | 57.79<br>2.275 | 58436-1                   | 1.73<br>.068     | 5.41<br>.213  | 1     | 5415255-1 |
| 142, 142A,<br>142B | Hex Crimp        | Nickel       | Hex Collar                                  | 57.79<br>2.275 | 58436-1                   | 1.73<br>.068     | 5.41<br>.213  | 1     | 5415255-2 |
| 8, 8A, 213         | O Crimp          | Nickel       | Knurl Collar                                | 57.79<br>2.275 | 220015-1                  | —                | —             | —     | 5225669-2 |
|                    | O Crimp          | Silver       | 05B0002<br>Knurl Collar                     | 57.79<br>2.275 | 220015-1                  | —                | —             | —     | 225014-2  |
| 8, 213             | Hex Crimp        | Nickel       | Hex Collar                                  | 57.79<br>2.275 | 58485-1                   | 2.54<br>.100     | 10.90<br>.429 | 1     | 5415255-3 |
| 393                | O Crimp          | Silver       | Knurl Collar                                | 62.31<br>2.453 | 220015-1                  | —                | —             | 1,3   | 225389-6  |
| 9, 9A, 9B<br>214   | O Crimp          | Nickel       | Knurl Collar                                | 57.79<br>2.275 | 220015-1                  | —                | —             | —     | 5225669-1 |
|                    | O Crimp          | Silver       | 05B0003<br>Knurl Collar                     | 57.79<br>2.275 | 220015-1                  | —                | —             | —     | 225014-3  |
| 9, 214             | Hex Crimp        | Nickel       | Hex Collar                                  | 57.79<br>2.275 | 58485-1                   | 2.54<br>.100     | 10.90<br>.429 | 1     | 5415255-4 |

**Notes:** <sup>1</sup> Die Assembly compatible with Crimp Tool — PRO-CRIMPER III Hand Tool, P/N 354940-1, 626 Series Pneumatic Tool 1213855-1, SDE Battery Tool Kit 1725837-1, or SDE Electric Terminator 1490076-2.  
<sup>3</sup> Weatherproof.

### Jacks



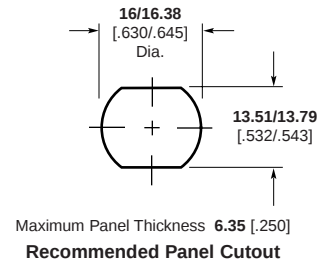
| RG/U Cable               | Termination Type | Body Plating | M39012/<br>Military No. and/<br>or Comments | Dim.<br>L      | Integral Die<br>Hand Tool | Hex Across Flats |               | Notes | Part No.    |
|--------------------------|------------------|--------------|---------------------------------------------|----------------|---------------------------|------------------|---------------|-------|-------------|
|                          |                  |              |                                             |                |                           | Center           | Braid         |       |             |
| 58A, 58C                 | O Crimp          | Nickel       | —                                           | 44.83<br>1.765 | 220045-2                  | —                | —             | 2, 3  | 1-5225664-2 |
| 142, 142A,<br>142B       | Hex Crimp        | Nickel       | —                                           | 41.28<br>1.625 | 58436-1                   | 1.73<br>.068     | 5.41<br>.213  | 2     | 5415242-2   |
| 8, 8A,<br>213            | O Crimp          | Silver       | 02B0008                                     | 49.20<br>1.937 | 220015-1                  | —                | —             | 3     | 225093-2    |
| 8, 213                   | O Crimp          | Nickel       | —                                           | 49.20<br>1.937 | 220015-1                  | —                | —             | 2, 3  | 5225664-2   |
| 9, 9A, 9B,<br>214        | O Crimp          | Silver       | 02B0009                                     | 49.20<br>1.937 | 220015-1                  | —                | —             | —     | 225093-1    |
| 9, 214                   | O Crimp          | Nickel       | —                                           | 49.20<br>1.937 | 220015-1                  | —                | —             | 2, 3  | 5225664-1   |
| 393                      | Hex Crimp        | Nickel       | —                                           | 41.28<br>1.625 | 58485-1                   | 2.54<br>.100     | 10.90<br>.429 | 2     | 5415242-6   |
| 402 Semi<br>Rigid (.141) | Solder           | Nickel       | —                                           | 26.70<br>1.051 | —                         | —                | —             | —     | 6057116-1   |

**Notes:** <sup>1</sup> Hand Tool 69710-1, with Die Insert 220062-1, is available to terminate these connectors. The 626 Pneumatic tool system can also be used.  
<sup>2</sup> Die Assembly compatible with Crimp Tool — PRO-CRIMPER III Hand Tool, P/N 354940-1, 626 Series Pneumatic Tool 1213855-1, SDE Battery Tool Kit 1725837-1, or SDE Electric Terminator 1490076-2.  
<sup>3</sup> Weatherproof.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## N Series Connectors, 50 Ohm (Continued)

### Bulkhead Jacks, Crimp



| RG/U Cable                                                                | Termination Type | Body Plating | Dim. L         | Integral Die Hand Tool | Hex Across Flats |              | Notes | Part No.    |
|---------------------------------------------------------------------------|------------------|--------------|----------------|------------------------|------------------|--------------|-------|-------------|
|                                                                           |                  |              |                |                        | Center           | Braid        |       |             |
| 58, 58A, 58B, 58C, LMR195                                                 | O Crimp          | Silver       | 49.61<br>1.953 | 220045-2               | —                | —            | 1     | 5225363-1   |
| 58A, 58C                                                                  | Hex Crimp        | Nickel       | 45.72<br>1.800 | 58436-1                | 1.73<br>.068     | 5.41<br>.213 | 2     | 5415248-1   |
| 142, 142A, 142B                                                           | Hex Crimp        | Nickel       | 45.72<br>1.800 | 58436-1                | 1.73<br>.068     | 5.41<br>.213 | 2     | 5415248-7   |
| 124, 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269, 89269 | O Crimp          | Nickel       | 49.61<br>1.953 | 220045-3               | —                | —            | —     | 1-5225667-6 |
| 8, 213                                                                    | O Crimp          | Silver       | 53.98<br>2.125 | 220015-1               | —                | —            | 2, 3  | 225094-2    |
| 393                                                                       | O Crimp          | Nickel       | 53.98<br>2.125 | 220015-1               | —                | —            | 2, 3  | 1-225668-1  |
| 9, 214                                                                    | O Crimp          | Silver       | 53.98<br>2.125 | 220015-1               | —                | —            | 2, 3  | 225094-1    |

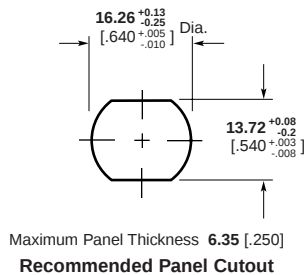
**Notes:** <sup>1</sup> Hand Tool 69710-1, with Die Insert 220062-1, is available to terminate these connectors. The 626 Pneumatic tool system can also be used.

<sup>2</sup> Die Assembly compatible with Crimp Tool — PRO-CRIMPER III Hand Tool, P/N 354940-1, 626 Series Pneumatic Tool 1213855-1, SDE Battery Tool Kit 1725837-1, or SDE Electric Terminator 1490076-2.

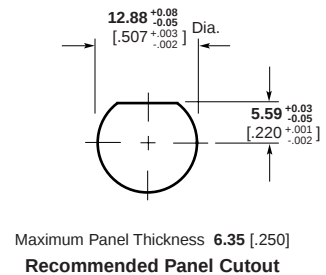
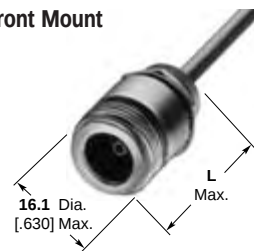
<sup>3</sup> Weatherproof.

### Bulkhead Jacks for Semi-Rigid Cable

#### Rear Mount



#### Front Mount



| RG/U Cable             | Termination Type | Body Plating | M39012/<br>Military No.<br>and/or<br>Comments | Dim. L         | Integral Die Hand Tool | Part No.  |
|------------------------|------------------|--------------|-----------------------------------------------|----------------|------------------------|-----------|
| 402<br>Semi-Rigid/.141 | Crimp            | Nickel       | Rear Mount                                    | 29.37<br>1.156 | *                      | 228658-1  |
|                        | Solder           | Pass. Gold   | Rear Mount                                    | —              | *                      | 6057159-1 |
|                        | Solder           | Nickel       | Rear Mount                                    | 25.4<br>1.00   | —                      | 6057176-1 |
| 405<br>Semi-Rigid/.085 | Solder           | Nickel       | Rear Mount                                    | 33.9<br>1.335  | —                      | 6057165-1 |

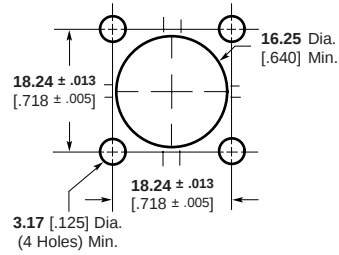
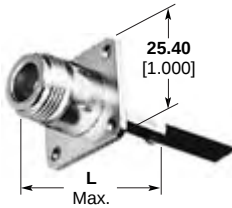
\*Tooling—Hand Tool No. 59980-1, Requires (2) Crimping Dies No. 312253-1 and (1) Locator No. 220220-2.

BELDEN is a trademark of Belden Wire and Cable Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## N Series Connectors, 50 Ohm (Continued)

### Jack, Panel Mount

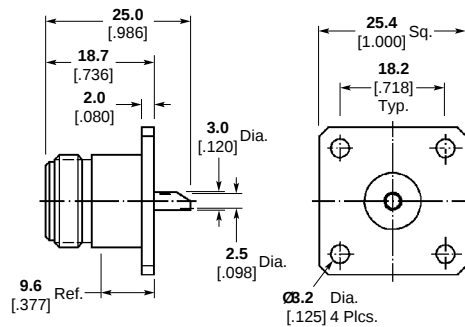


Recommended  
Panel Cutout

| RG/U<br>Cable      | Termination<br>Type | Body<br>Plating | Dim.<br>L      | Integral Die<br>Hand Tool | Hex Across Flats |               | Notes | Part No.  |
|--------------------|---------------------|-----------------|----------------|---------------------------|------------------|---------------|-------|-----------|
|                    |                     |                 |                |                           | Center           | Braid         |       |           |
| 58A, 58C           | Hex Crimp           | Nickel          | 41.28<br>1.625 | 58436-1                   | 1.73<br>.068     | 5.41<br>.213  | —     | 5415252-1 |
| 142, 142A,<br>142B | Hex Crimp           | Nickel          | 41.28<br>1.625 | 58436-1                   | 1.73<br>.068     | 5.41<br>.213  | —     | 5415252-2 |
| 8, 213             | Hex Crimp           | Nickel          | 41.28<br>1.625 | 58485-1                   | 2.54<br>.100     | 10.90<br>.429 | —     | 5415252-3 |
| 9, 214             | Hex Crimp           | Nickel          | 41.28<br>1.625 | 58485-1                   | 2.54<br>.100     | 10.90<br>.429 | —     | 5415252-4 |
| RG 225             | O Crimp             | Silver          | 49.20<br>1.937 | 220015-1                  | —                | —             | 3     | 5225089-4 |

Note: <sup>3</sup> Weatherproof.

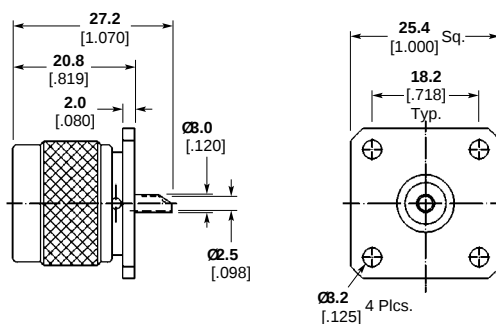
### Panel Jacks, Solder



| Body Plating | Part No.   |
|--------------|------------|
| Nickel       | 1057284-1  |
| Nickel       | 1057290-1* |

\*No solder cup — dielectric protrudes.

### Panel Plug, Solder



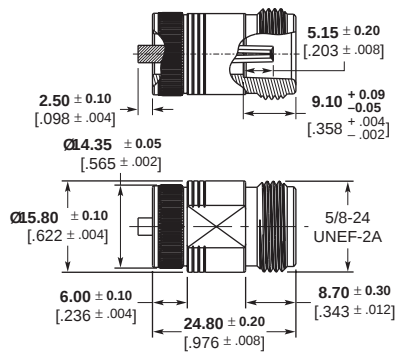
| Body Plating | Part No.   |
|--------------|------------|
| Nickel       | 1057275-1  |
| Nickel       | 1057279-1* |
| Nickel       | 1057277-1* |

\*No solder cup — dielectric protrudes.

Note: Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

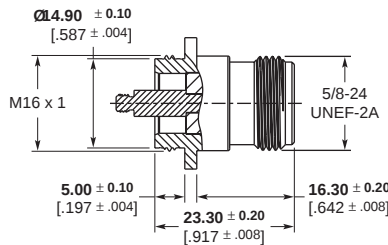
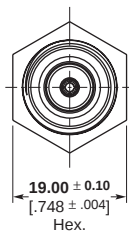
## N Series Connectors, 50 Ohm (Continued)

### Panel Mount Jack, Press-Fit



| Body Plating | Contact | Dielectric | Part No.  |
|--------------|---------|------------|-----------|
| White bronze | Gold    | PTFE       | 1460055-1 |

### Panel Mount Jack, Screw-In



| Body Plating | Contact | Dielectric | Part No.               |
|--------------|---------|------------|------------------------|
| White bronze | Gold    | PTFE       | 1460118-1 <sup>1</sup> |
| White bronze | Gold    | PTFE       | 1460118-2 <sup>2</sup> |
| White bronze | Gold    | PTFE       | 1460118-3 <sup>3</sup> |

**Notes:** 1. Without TUF-LOC Adhesive  
2. With TUF-LOC Adhesive around M3 thread  
3. With TUF-LOC Spot on M3 thread

### Feedthru Jack Adapter (Jack-Jack)

#### Plating

**Body** — Nickel

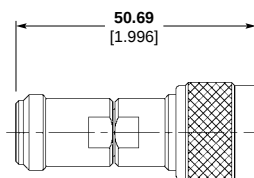
**Dielectric** — General purpose polypropylene

**Contact** — Gold plated



| Part Number |
|-------------|
| 227945-2    |

### Inter-Series Adapters



Jack-Plug

| Type      | Body Plating              | Contact | Dielectric | Part No.  |
|-----------|---------------------------|---------|------------|-----------|
| Jack-Plug | Stainless steel/passivate | Gold    |            | 1057374-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Quick Lock N (QLN) Series Connectors

### Product Facts

- Similar performance and applications to standard N Series
- Time saving and user friendly snap on/off mating
- Excellent performance to 6 GHz
- No torquing of connector required
- Free rotation of mated connection
- Higher packaging density can be achieved
- Fully compatible with Huber&Suhner and Radiall QN Series QLF® connectors\*



### Description

Snap-on version of the popular N Series connector

- Snap-on interface facilitates assembly
- Same dependable performance as standard N connector

### Applications

- Cellular & PCS Base Stations
- Broadcast equipment
- Telephony applications, WLAN
- Instrumentation and remote measuring equipment
- Mil Aero, SatCom, Radar

### Material and Finish

**Shell** — Brass, plated white bronze  
**Male Pin Center Contact** — Brass, plated gold  
**Female Socket Center Contact** — Beryllium copper, plated gold  
**Outer Contact** — Phosphor bronze, plated white bronze  
**Insulators** — PTFE or PFA

### Electrical Characteristics

**Characteristic Impedance** — 50 ohms  
**Frequency Range** — DC to 6 GHz  
**Voltage Standing Wave Ratio (VSWR)** — 1.12 max. DC to 3 GHz  
**Insertion Loss** — 0.15 dB max. DC to 3 GHz  
**Rated Voltage** — 1000 VAC rms, 50 Hz (at sea level)  
**Insulation Resistance** — 5000 megohms min.  
**Contact Resistance** — Center Contact — 1.5 milliohms max. Outer Contact — 1.5 milliohms max.

### Mechanical Characteristics

**Engagement Force** — 30 N typical  
**Disengagement Force** — 30 N typical  
**Interface Retention Force** — 450 N min.  
**Contact Captivation** — 28 N min.  
**Durability** — 100 cycles min.

### Environmental Characteristics

**Operating Temperature** — -40°C to +125°C (cable dependent)  
**Thermal Shock** — IEC 60169 para. 16.4  
**Corrosion** — MIL-STD-202, Method 101, Condition B  
**Vibration** — IEC-1169-1 para. 9.3.3 (10-500 Hz, 5g)  
**IP Rating for Interface** — IP68 (connector dependent)

### Related Product Data

**Internet** — <http://tycoelectronics.com/products/rfcoax>

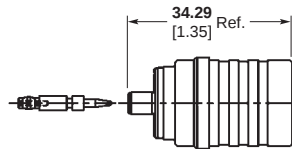
**Product Specification/Design Objectives** — 108-2281

\* QN and QLF are registered trademarks of Huber&Suhner, Inc. and Radiall S.A..  
 Huber&Suhner, Inc. and Radiall S.A. are not affiliated with the QLN product.

## Quick Lock N (QLN) Series Connectors (Continued)

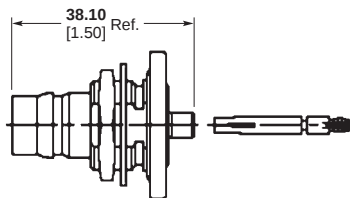
### Semi-Rigid Cable — Direct Solder Attachment

#### Straight Cable Plug



| Cable  | Part No.  |
|--------|-----------|
| RG 402 | 1274805-1 |

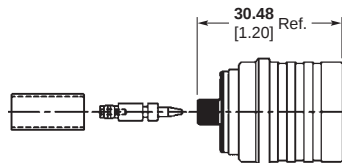
#### Bulkhead Cable Jack



| Cable  | Part No.  |
|--------|-----------|
| RG 402 | 1274806-1 |

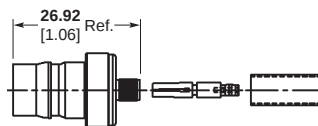
### Flexible Cable — Crimp Attachment

#### Straight Cable Plug



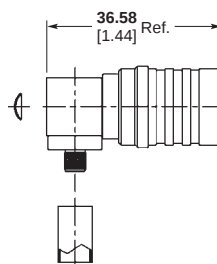
| Cable   | Part No.  |
|---------|-----------|
| RG 58   | 1274688-1 |
| RG 142  | 1274688-2 |
| LMR 240 | 1274688-3 |

#### Straight Cable Jack



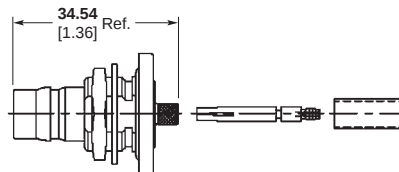
| Cable   | Part No.  |
|---------|-----------|
| RG 58   | 1274689-1 |
| RG 142  | 1274689-2 |
| LMR 240 | 1274689-3 |

#### Right-Angle Cable Plug



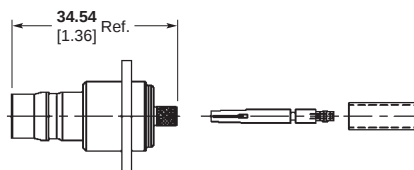
| Cable   | Part No.  |
|---------|-----------|
| RG 58   | 1274804-1 |
| RG 142  | 1274804-2 |
| LMR 240 | 1274804-3 |

#### Bulkhead Cable Jack



| Cable   | Part No.  |
|---------|-----------|
| RG 58   | 1274734-1 |
| RG 142  | 1274734-2 |
| LMR 240 | 1274734-3 |

#### 4-Hole Square Flange Cable Jack



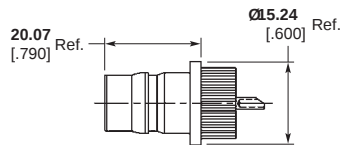
| Cable   | Part No.  |
|---------|-----------|
| RG 58   | 1274735-1 |
| RG 142  | 1274735-2 |
| LMR 240 | 1274735-3 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Quick Lock N (QLN) Series Connectors (Continued)

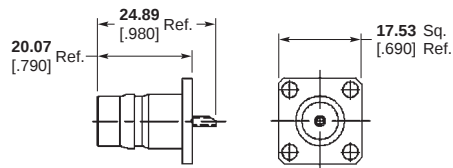
### Panel Mount Receptacles

#### Press-Fit Bulkhead Jack Receptacle — Solder Terminal



|             |
|-------------|
| Part Number |
| 1274807-1   |

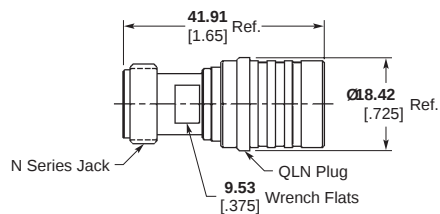
#### 4-Hole Flange Jack Receptacle — Solder Terminal



|             |
|-------------|
| Part Number |
| 1274662-1   |

### Adapters — Between Series

#### QLN Plug to N Series Jack



|             |
|-------------|
| Part Number |
| 1274808-1   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors

### Product Facts

#### Hex Crimp and O Crimp Connectors

- 50 and 75 ohm commercial versions available
- Provides excellent performance at frequencies up to 7 GHz
- Low cost commercial type available
- Commercial type is smaller and lighter weight
- Tarnish resistant nickel finish
- Choice of dielectric materials
- Standard and weatherproof versions available
- Plugs available for high temperature cable

#### Single Crimp Connectors

- Fast application—one crimping operation terminates inner conductor, outer braid and cable support
- Low application cost

#### Connectors for Semi-Rigid Cable

- Crimp and solder versions available
- Standard cable stripping dimensions
- Universal cable termination common to all configurations

Listed under the Component Program of Underwriters Laboratories Inc.,  
File No. E81956



PC Board connectors are recognized under the Component Program of Underwriters Laboratories Inc.,  
File No. E81956



Certified by Canadian Standards Association  
File No. LR 7189



### Between Series Adapters

For TNC Between Series Adapters, see pages 251-260.

The Tyco Electronics TNC RF connector family, with 7/16-28 threaded couplings, provides low noise levels and optimum stability, and can withstand the shock and vibration often present in hostile environments.

Available in both 50 and 75 ohm versions, these connectors feature numerous styles including cable plugs and jacks, adapters and printed circuit board connectors. These connectors accept a wide range of coaxial cables and are intermateable with industry standard connectors designed to MIL-C-39012 specifications.

Single crimp connectors provide reduced application time and lower applied costs. This is accomplished by using Tyco Electronics one-crimp operation tooling which simultaneously terminates the inner conductor, outer braid and cable support with one controlled stroke.

Tyco Electronics can also supply low-cost alternatives with a commercial type product line. These connectors are designed around the mil-specifications, offering comparable mechanical and electrical performance.



### Related Product Data

**Military Category** — All crimp connectors are Category B Type (Tyco Electronics Crimp Tooling), unless otherwise noted.

**Packaging** — All Mil-Type connectors are packaged individually and all Commercial connectors are bulk packaged unless otherwise noted.

## TNC Connectors (Continued)

### Specifications

| Characteristics                              | Single Crimp<br>(MIL Type)                     | Category B<br>O Crimp<br>(MIL Type)                 | Commercial<br>O Crimp<br>& Hex Crimp<br>50 & 75 Ohm | Commercial<br>PCB                               | Commercial<br>Solder<br>Jacks                   | Semi-Rigid                           | Solder<br>Clamp                      |
|----------------------------------------------|------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|-------------------------------------------------|--------------------------------------|--------------------------------------|
| <b>Electrical</b>                            |                                                |                                                     |                                                     |                                                 |                                                 |                                      |                                      |
| Impedance, Nom.<br>(Ohms)                    | 50                                             | 50                                                  | 50                                                  | 50                                              | 50                                              | 50                                   | 50                                   |
| Working Voltage<br>(Volts RMS)               | 500                                            | 500                                                 | 500                                                 | 500                                             | 500                                             | 335                                  | 500                                  |
| Contact Resistance<br>(Milliohms)            | Inner: 1.5<br>Outer: 3                         | Inner: 1.5<br>Outer: 0.2                            | Inner: 2.0<br>Outer: 0.3                            | Inner: 6.0<br>Outer: 3.0                        | Inner: 2.75<br>Outer: 1.0                       | Inner: 1.5<br>Outer: 0.2             | Inner: 1.5<br>Outer: 0.2             |
| Initial Insulation Resistance<br>(Megohms)   | 5000                                           | 5000                                                | 5000                                                | 5000                                            | 5000                                            | 5000                                 | 5000                                 |
| Dielectric Withstanding<br>Voltage (VAC)     | 1500                                           | 1500                                                | 1500                                                | 1500                                            | 1500                                            | 1500                                 | 1500                                 |
| Corona Level at 70,000 ft.<br>(Picocoulombs) | 5 max.<br>@ 375 VRMS                           | 5 max.<br>@ 375 VRMS                                | 5 max.<br>@ 375 VRMS                                | —                                               | —                                               | 5 max.<br>@ 375 VRMS                 | 5 max.<br>@ 375 VRMS                 |
| RF Leakage, Max.<br>(dB)                     | —                                              | 60 @<br>2-3 GHz                                     | 55 @<br>2-3 GHz                                     | —                                               | —                                               | 60 @<br>2-3 GHz                      | 55 @<br>2-3 GHz                      |
| RF Insertion Loss,<br>Max. (dB)              | —                                              | 0.18 @<br>9 GHz                                     | 0.2 @<br>3 GHz                                      | —                                               | —                                               | 0.06 @<br>3-6 GHz                    | 0.2 @<br>3 GHz                       |
| Frequency Range<br>(GHz)                     | 0-4                                            | 0-11                                                | 0-7                                                 | 0-4                                             | 0-4                                             | 0-15                                 | 0-11                                 |
| VSWR in Frequency<br>Range Max.              | 1.35                                           | 1.3                                                 | 1.40                                                | —                                               | —                                               | 1.35                                 | 1.30 @<br>4 GHz                      |
| <b>Mechanical</b>                            |                                                |                                                     |                                                     |                                                 |                                                 |                                      |                                      |
| Force to Engage/<br>Couple, lbs. [N]         | 10/2<br>[44.5/8.9]                             | 2/2<br>[8.9/8.9]                                    | 6/6<br>[26.7/26.7]                                  | —                                               | —                                               | 2<br>[.023]                          | 2<br>[.023]                          |
| Coupling Nut Retention,<br>Min. lbs. [N]     | 100<br>[444.8]                                 | 100<br>[444.8]                                      | 60<br>[266.9]                                       | —                                               | —                                               | 100<br>[444.8]                       | 100<br>[444.8]                       |
| Cable Retention,<br>lbs. [N]                 | 60 [266.9]<br>RG 58C/U                         | 60 [266.9]<br>RG 58C/U                              | 60 [266.9]<br>RG 58C/U                              | 60 [266.9]<br>(PCB Ret)                         | —                                               | 60<br>[266.9]                        | 40<br>[178.0]                        |
| Durability (Cycles)                          | 500                                            | 500                                                 | 500                                                 | 500                                             | 500                                             | 500                                  | 500                                  |
| Jam Nut Mounting Torque,<br>Max. lbs. [N•m]  | 25<br>[2.8]                                    | 25<br>[2.8]                                         | 25<br>[2.8]                                         | 25<br>[2.8]                                     | 25<br>[2.8]                                     | 25<br>[2.8]                          | 25<br>[2.8]                          |
| <b>Environmental</b>                         |                                                |                                                     |                                                     |                                                 |                                                 |                                      |                                      |
| Temperature Range,<br>Operating (C°)         | -65 to +85                                     | -65 to +165 <sup>1</sup><br>-55 to +85 <sup>2</sup> | -55 to +85                                          | -55 to +85                                      | -65 to +165                                     | -65 to +105                          | -65 to +165                          |
| Vibration                                    | MIL-STD-202<br>Method 204<br>Cond. B           | MIL-STD-202<br>Method 204<br>Cond. B                | MIL-STD-202<br>Method 204<br>Cond. B                | MIL-STD-202<br>Method 201A<br>Cond. A           | MIL-STD-202<br>Method 204<br>Cond. B            | MIL-STD-202<br>Method 202<br>Cond. B | MIL-STD-202<br>Method 202<br>Cond. B |
| Physical Shock                               | MIL-STD-202<br>Method 213<br>Cond. G, (50 G's) | MIL-STD-202<br>Method 213<br>Cond. I, (100 G's)     | MIL-STD-202<br>Method 213<br>Cond. I, (100 G's)     | MIL-STD-202<br>Method 213<br>Cond. I, (100 G's) | MIL-STD-202<br>Method 213<br>Cond. I, (100 G's) | MIL-STD-202<br>Method 213<br>Cond. I | MIL-STD-202<br>Method 213<br>Cond. I |
| Thermal Shock                                | MIL-STD-202<br>Method 107                      | MIL-STD-202<br>Method 107<br>Cond. B                | MIL-STD-202<br>Method 107<br>Cond. A                | MIL-STD-202<br>Method 107                       | MIL-STD-202<br>Method 107                       | MIL-STD-202<br>Method 107            | MIL-STD-202<br>Method 107            |
| Moisture<br>Resistance                       | MIL-STD-202<br>Method 106                      | MIL-STD-202<br>Method 106                           | MIL-STD-202<br>Method 106<br>Type II                | MIL-STD-202<br>Method 106                       | MIL-STD-202<br>Method 106                       | MIL-STD-202<br>Method 106            | MIL-STD-202<br>Method 106            |
| Salt Spray                                   | MIL-STD-202<br>Method 101<br>Cond. B           | MIL-STD-202<br>Method 101<br>Cond. B                | MIL-STD-202<br>Method 101<br>Cond. B                | MIL-STD-202<br>Method 101<br>Cond. B            | MIL-STD-202<br>Method 101<br>Cond. B            | MIL-STD-202<br>Method 101<br>Cond. B | MIL-STD-202<br>Method 101<br>Cond. B |
| Product<br>Specification                     | —                                              | 108-12001                                           | 108-12046                                           | —                                               | —                                               | 108-12032                            | —                                    |

<sup>1</sup>Assembled to cable with polytetrafluorethylene dielectric.

<sup>2</sup>Assembled to cable with polyethylene dielectric.

## TNC Connectors (Continued)

### Specifications (Continued)

| Characteristics                               | Single Crimp<br>(MIL Type)                            | Category B<br>O Crimp<br>(MIL Type)                   | Commercial<br>O Crimp<br>& Hex Crimp<br>50 & 75 Ohm              | Commercial<br>PCB                                                | Commercial<br>Solder<br>Jacks                                    | Semi-Rigid                  | Solder<br>Clamp             |
|-----------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------|-----------------------------|
| <b>Connector Material</b>                     |                                                       |                                                       |                                                                  |                                                                  |                                                                  |                             |                             |
| Collar                                        | Brass<br>QQ-B-626                                     | Brass<br>QQ-B-626                                     | Brass<br>QQ-B-626                                                | —                                                                | —                                                                | Brass<br>QQ-B-626           | Brass<br>QQ-B-626           |
| Outer Contact<br>(Plug)                       | Phos. Bronze<br>QQ-B-750<br>Beryl. Copper<br>QQ-C-530 | Phos. Bronze<br>QQ-B-750<br>Beryl. Copper<br>QQ-C-530 | Brass<br>MIL-C-21768                                             | —                                                                | —                                                                | Brass<br>QQ-B-626           | Brass<br>QQ-B-626           |
| Outer Contact<br>(Jack)                       | Brass<br>QQ-B-626                                     | Brass<br>QQ-B-626                                     | Zinc<br>QQ-Z-363                                                 | Zinc<br>QQ-Z-363                                                 | Zinc<br>QQ-Z-363                                                 | Brass<br>QQ-B-626           | Brass<br>QQ-B-626           |
| Dielectric                                    | MIL-P-19468                                           | MIL-P-19468                                           | Polyethylene<br>Polypropylene<br>Gen. Purpose                    | Polypropylene<br>Gen. Purpose <sup>1</sup>                       | MIL-P-19468<br>Polyester PBT<br>MIL-P-24519                      | MIL-P-19468                 | MIL-P-19468                 |
| Center Contact<br>(Plug)                      | Brass<br>QQ-B-626                                     | Brass<br>QQ-B-626                                     | Brass<br>QQ-B-626                                                | —                                                                | —                                                                | Brass<br>QQ-B-626           | Brass<br>QQ-B-626           |
| Center Contact<br>(Jack)                      | Beryl. Copper<br>ASTM-B-643,<br>QQ-C-530              | Beryl. Copper<br>ASTM-B-643,<br>QQ-C-530              | Beryl. Copper<br>QQ-C-530                                        | Phos. Bronze<br>QQ-B-570                                         | Phos. Bronze<br>QQ-B-570                                         | Beryl Copper<br>QQ-C-530    | Beryl Copper<br>QQ-C-530    |
| Gasket                                        | Silicon Rubber<br>QQ-R-765                            | Silicon Rubber<br>QQ-R-765                            | Silicon Rubber<br>QQ-R-765                                       | —                                                                | —                                                                | Silicone Rubber<br>QQ-R-765 | Silicone Rubber<br>QQ-R-765 |
| Ferrule                                       | Copper<br>QQ-C-576                                    | Copper<br>QQ-C-576                                    | Copper<br>QQ-C-576                                               | —                                                                | —                                                                | —                           | —                           |
| <b>Connector Primary Finishes<sup>2</sup></b> |                                                       |                                                       |                                                                  |                                                                  |                                                                  |                             |                             |
| Collar                                        | Silver<br>QQ-S-365                                    | Silver<br>QQ-S-365                                    | Bright Nickel<br>QQ-N-290                                        | —                                                                | —                                                                | Nickel<br>QQ-N-290          | Nickel<br>QQ-N-290          |
| Outer Contact<br>(Plug & Jack)                | Silver<br>QQ-S-365                                    | Bright Nickel<br>QQ-N-290                             | Bright or<br>Matte Nickel<br>QQ-N-290                            | Bright Nickel<br>QQ-N-290                                        | Bright Nickel<br>QQ-N-290                                        | Nickel<br>QQ-N-290          | Nickel<br>QQ-N-290          |
| Center Contact<br>(Plug & Jack)               | Gold<br>MIL-G-45204                                   | Silver<br>QQ-S-365                                    | Tin Lead,<br>ASTM-B-545<br>Silver, QQ-S-365<br>Gold, MIL-G-45204 | Tin Lead,<br>ASTM-B-545<br>Silver, QQ-S-365<br>Gold, MIL-G-45204 | Tin Lead,<br>ASTM-B-545<br>Silver, QQ-S-365<br>Gold, MIL-G-45204 | Gold<br>MIL-G-45204         | Gold<br>MIL-G-45204         |
| Ferrule                                       | Silver<br>QQ-S-365                                    | Gold<br>MIL-G-45204                                   | Tin Lead<br>ASTM-B-5                                             | —                                                                | —                                                                | —                           | —                           |

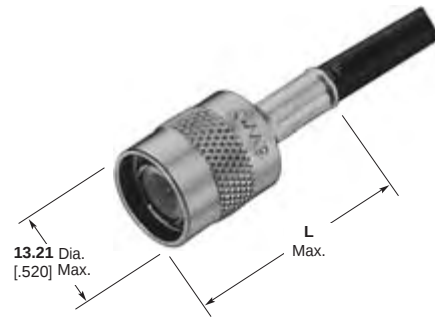
<sup>1</sup>Several pc board connectors have an outer polyester PBT insulator per MIL-P-24519.

<sup>2</sup>If several finishes are listed, refer to individual catalog page(s) or customer drawings for exact specifications.

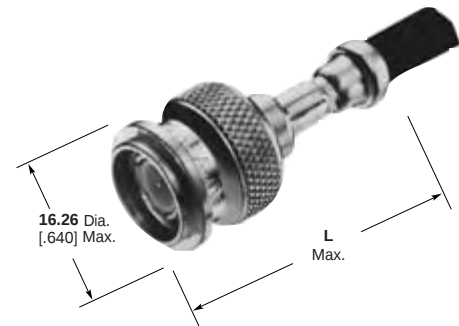
## TNC Connectors, 50 Ohm

### Plugs, Crimp

#### Hex Crimp and O Crimp



#### MIL Type O Crimp Weatherproof



| RG/U Cable                                   | Termination Type | Center Contact Plating | Body Plating | Dielectric    | Style      | Comments     | Dim. L                | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Part No.         |
|----------------------------------------------|------------------|------------------------|--------------|---------------|------------|--------------|-----------------------|-----------------------------------------|-----------------------------------------------------------------------------------------|------------------|
| 174, 188, 188A, 316                          | Hex Crimp        | Gold                   | Nickel       | Polypropylene | Commercial | —            | <b>31.24</b><br>1.230 | —                                       | 58436-3                                                                                 | <b>5222506-5</b> |
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221 | Hex Crimp        | Gold                   | Nickel       | Polypropylene | Commercial | —            | <b>31.24</b><br>1.230 | —                                       | 58436-3                                                                                 | <b>5222506-6</b> |
| 58, 58A, 58B, 58C                            | Hex Crimp        | Gold                   | Nickel       | Polypropylene | Commercial | —            | <b>31.25</b><br>1.230 | —                                       | 58436-11                                                                                | <b>5222506-1</b> |
|                                              | O Crimp          | Gold                   | Nickel       |               | MIL Type   | Weatherproof | <b>34.93</b><br>1.375 | 220045-2                                | —                                                                                       | <b>5225555-2</b> |
| 142, 142A, 142B, 400                         | O Crimp          | Gold                   | Nickel       |               | MIL Type   | Weatherproof | <b>34.93</b><br>1.375 | 220045-2                                | —                                                                                       | <b>5225555-6</b> |
| 8, 8A, 213                                   | O Crimp          | Gold                   | Nickel       |               | MIL Type   | Weatherproof | <b>50.8</b><br>2.000  | 220015-1                                | —                                                                                       | <b>5225555-7</b> |
| 9, 9A, 9B, 214                               | O Crimp          | Gold                   | Nickel       |               | MIL Type   | Weatherproof | <b>50.8</b><br>2.000  | 220015-1                                | —                                                                                       | <b>5225555-8</b> |

<sup>1</sup>Order Tyco Electronics PRO-CRIMPER Coaxial Hex Crimp Hand Tool assembly 58433-2, which includes dies 58436-1.

BELDEN is a trademark of Belden Wire and Cable Company.

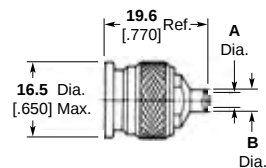
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

### Plugs for Semi Rigid-Cable



**Solder Type**



| RG/U Cable                      | Termination Type | Center Contact Plating | Body Plating | Dielectric | Style      | Comments      | Dim. A      | Dim. B      | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.  |
|---------------------------------|------------------|------------------------|--------------|------------|------------|---------------|-------------|-------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------|
| 405 Semi-Rigid/<br>2.18 [.086]  | Solder           | Gold                   | Passivate    | Solid PTFE | MIL Type   | —             | 2.3<br>.089 | 3.0<br>.120 | —                                                                                       | 3                                                                    | 1057635-1 |
| 402 Semi-Rigid/<br>3.66 [.141]  | Crimp            | Gold                   | Nickel       |            | Commercial | Weather proof | —           | —           | 1                                                                                       | 2                                                                    | 228179-3  |
| RG 402/U<br>.141<br>3.66 [.141] | Solder           | Gold                   | Gold         | Solid PTFE | MIL Type   | —             | 3.7<br>.144 | 4.6<br>.180 | —                                                                                       | 3                                                                    | 1057631-1 |

<sup>1</sup>Hand Tool 59980-1, Requires (2) Crimping Dies 312253-1 and (1) Locator 312644-1.

<sup>2</sup>Pneumatic Tool 58318-1, Requires (2) Crimping Dies 313720-1 and (1) Locator 312645-1.

<sup>3</sup>Refer to Recommended Assembly Tools in Tool Section.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

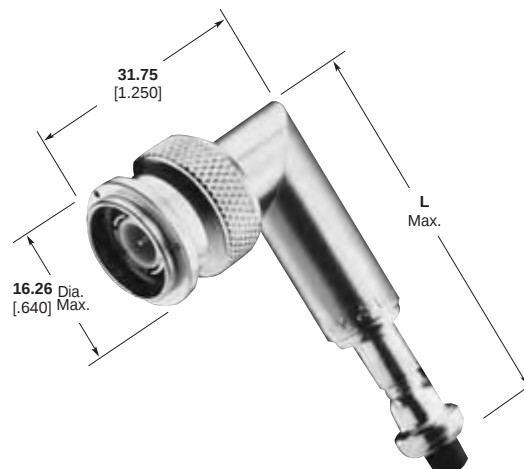
## TNC Connectors, 50 Ohm (Continued)

### Right-Angle Plugs, Crimp

#### O Crimp



#### MIL Type O Crimp Weatherproof



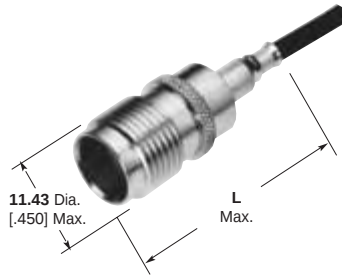
| RG/U<br>Cable               | Termination<br>Type | Center<br>Contact<br>Plating | Body<br>Plating | Dielectric             | Style      | Comments     | Dim.<br>L             | CERTI-CRIMP<br>Hand Tool<br>with<br>Integral Die | Interchangeable<br>Dies for<br>PRO-CRIMPER<br>Hand Tool<br>354940-1 or<br>PRO-CRIMPER<br>Adapter 679304-1 | Part No.           |
|-----------------------------|---------------------|------------------------------|-----------------|------------------------|------------|--------------|-----------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------|
| 174, 174A, 188<br>188A, 316 | O Crimp             | Gold                         | Nickel          | Polymethyl-<br>pentene | Commercial | —            | <b>38.23</b><br>1.505 | —                                                | 318450-2                                                                                                  | <b>5414173-3</b>   |
| 58, 58A, 58B<br>58C         | O Crimp             | Gold                         | Nickel          |                        | MIL Type   | Weatherproof | <b>47.63</b><br>1.875 | 220045-2                                         | —                                                                                                         | <b>5225559-2</b>   |
| 55, 55A, 55B<br>223         | O Crimp             | Gold                         | Nickel          | Polymethyl-<br>pentene | Commercial | —            | <b>38.23</b><br>1.505 | —                                                | 220189-1                                                                                                  | <b>5414173-6</b>   |
| 142, 142A, 142B<br>400      | O Crimp             | Gold                         | Silver          |                        | MIL Type   | Weatherproof | <b>47.63</b><br>1.875 | 220045-2                                         | —                                                                                                         | <b>5225554-6</b>   |
| 8, 8A, 213                  | O Crimp             | Gold                         | Nickel          |                        | MIL Type   | Weatherproof | <b>63.5</b><br>2.500  | 220015-1                                         | —                                                                                                         | <b>5225559-8</b>   |
| 393, 225                    | O Crimp             | Gold                         | Silver          |                        | MIL Type   | Weatherproof | <b>63.5</b><br>2.500  | 220015-1                                         | —                                                                                                         | <b>1-5225554-1</b> |
| 9, 9A, 9B, 214              | O Crimp             | Gold                         | Silver          |                        | MIL Type   | —            | <b>59.52</b><br>2.343 | 220015-1                                         | —                                                                                                         | <b>5225349-9</b>   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

### Jacks, Crimp

#### O Crimp



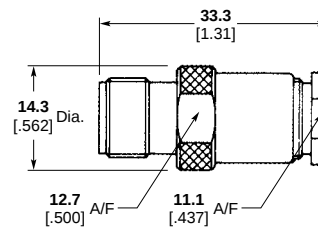
#### MIL Type O Crimp Weatherproof



| RG/U Cable                | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Comments     | Dim. L         | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Part No.  |
|---------------------------|------------------|------------------------|--------------|--------------------|------------|--------------|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------|-----------|
| 174, 174A, 188, 188A, 316 | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | 30.48<br>1.200 | —                                       | 318450-2                                                                                | 5414171-3 |
| 58, 58A, 58B, 58C         | O Crimp          | Gold                   | Silver       |                    | MIL Type   | Weatherproof | 35.72<br>1.406 | 220045-2*                               | —                                                                                       | 225551-2  |
| 141, 141A, 303            | O Crimp          | Gold                   | Silver       |                    | MIL Type   | Weatherproof | 35.72<br>1.406 | 220045-2*                               | —                                                                                       | 225551-5  |
| 55, 55A, 55B, 223         | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | 29.85<br>1.175 | —                                       | 220189-1                                                                                | 414171-6  |
| 142, 142A, 142B, 400      | O Crimp          | Gold                   | Silver       |                    | MIL Type   | Weatherproof | 35.72<br>1.406 | 220045-2*                               | —                                                                                       | 225551-6  |

\*Battery, Pneumatic

### Jacks, Solder/Clamp



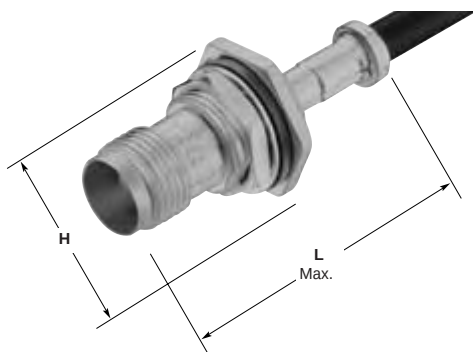
| RG/U Cable           | Termination Type | Center Contact Plating | Body Plating | Dielectric | Style    | Part No.  |
|----------------------|------------------|------------------------|--------------|------------|----------|-----------|
| RG 58C/U, RG 141 A/U | Solder/Clamp     | Gold                   | Silver       |            | MIL Type | 1312569-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

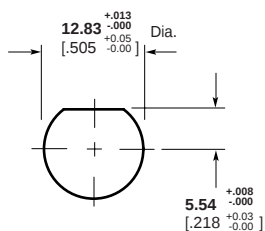
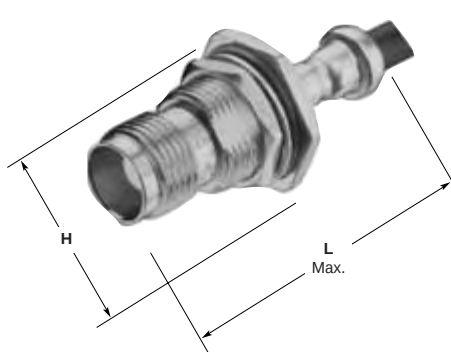
## TNC Connectors, 50 Ohm (Continued)

### Bulkhead Jacks, Crimp

Single Crimp



O Crimp



Maximum Panel Thickness Single Crimp **3.18** [.125];  
Dual Crimp **6.35** [.250]

#### Recommended Panel Cutout

H= **11/16** [.6875] max. across flats, **20.32** [.800] max. across points.

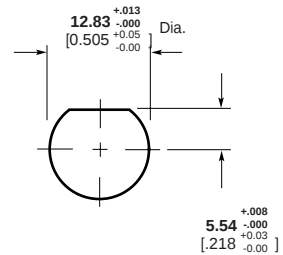
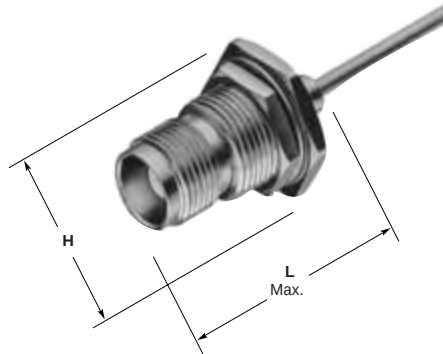
| RG/U Cable                                       | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Comments     | Dim. L                | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Part No.         |
|--------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|--------------|-----------------------|-----------------------------------------|-----------------------------------------------------------------------------------------|------------------|
| 174, 174A, 316<br>188, 188A                      | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | <b>34.93</b><br>1.375 | —                                       | 318450-2                                                                                | <b>5414168-3</b> |
| 179, 179A, 179B<br>161, 187, 187A<br>BELDEN 9221 | Single Crimp     | Gold                   | Nickel       |                    | MIL Type   | —            | <b>38.1</b><br>1.500  | —                                       | 91910-1                                                                                 | <b>5331238</b>   |
| RD 188, 316<br>Double Braid                      | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | <b>34.93</b><br>1.375 | —                                       | 58539-1                                                                                 | <b>5414168-4</b> |
| 58, 58A, 58B, 58C<br>141, 141A, 303              | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | <b>34.93</b><br>1.375 | —                                       | 220189-1                                                                                | <b>5414168-1</b> |
| 223<br>55, 55A, 55B                              | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | <b>34.93</b><br>1.375 | —                                       | 220189-1                                                                                | <b>5414168-6</b> |
| 142, 142A<br>142B, 400                           | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | —            | <b>34.93</b><br>1.375 | —                                       | 220189-1                                                                                | <b>5414168-5</b> |
|                                                  | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | Weatherproof | <b>38.1</b><br>1.500  | 220045-2                                | —                                                                                       | <b>5225557-6</b> |

BELDEN is a trademark of Belden Wire and Cable Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

### Bulkhead Jacks for Semi-Rigid Cable, Rear Mount



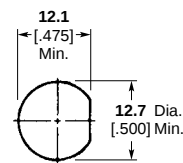
Maximum Panel Thickness **6.35** [.250]

#### Recommended Panel Cutout

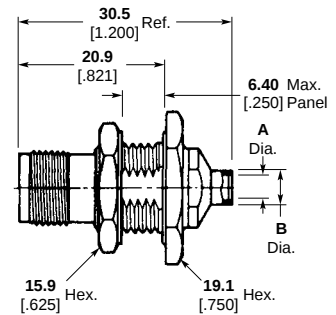
H= **17.45** [.687] max. across flats, **20.32** [.800] max. across points.

| RG/U Cable                             | Termination Type | Center Contact Plating | Body Plating | Dielectric | Style    | Dim. L               | Part No.        |
|----------------------------------------|------------------|------------------------|--------------|------------|----------|----------------------|-----------------|
| 402 Semi-Rigid/<br><b>3.66</b> [.141]* | Crimp            | Gold                   | Nickel       |            | MIL Type | <b>25.4</b><br>1.000 | <b>228502-1</b> |

\*Tooling—Hand Tool 59980-1, Requires (2) Crimping Dies 312253-1 and (1) Locator 220220-2.



#### Recommended Panel Cutout

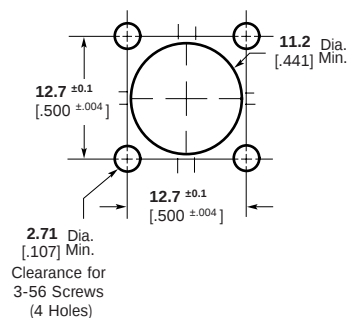
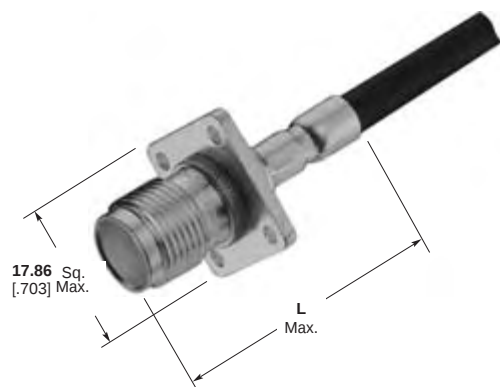


| RG/U Cable                     | Termination Type | Center Contact Plating | Body Plating          | Dielectric | Style    | Dim. A             | Dim. B             | Part No.         |
|--------------------------------|------------------|------------------------|-----------------------|------------|----------|--------------------|--------------------|------------------|
| RG 402/U<br><b>3.66</b> [.141] | Solder           | Gold                   | Pass. Stainless Steel | Solid PTFE | MIL Type | <b>3.7</b><br>.144 | <b>4.6</b><br>.180 | <b>1057676-1</b> |
| RG 405/U<br><b>2.16</b> [.085] | Solder           | Gold                   | Pass. Stainless Steel | Solid PTFE | MIL Type | <b>2.3</b><br>.089 | <b>3.0</b><br>.120 | <b>1057679-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

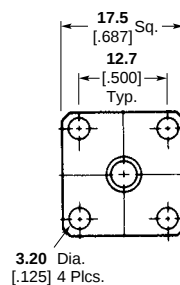
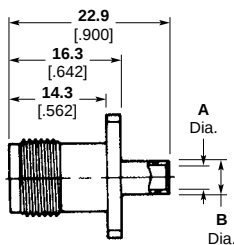
### Panel Jacks, Crimp



**Recommended  
Panel Cutout**

| RG/U Cable        | Termination Type | Center Contact Plating | Body Plating | Dielectric | Style    | Dim. L         | CERTI-CRIMP Hand Tool With Integral Die | Part No. |
|-------------------|------------------|------------------------|--------------|------------|----------|----------------|-----------------------------------------|----------|
| 58, 58A, 58B, 58C | Crimp            | Gold                   | Silver       |            | MIL Type | 34.93<br>1.375 | 220045-2                                | 225348-2 |

### Panel Jacks for Semi-Rigid Cable

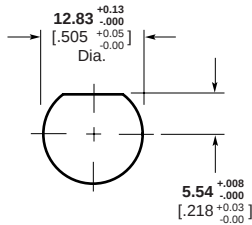


| RG/U Cable              | Termination Type | Center Contact Plating | Body Plating | Dielectric | Style    | Dim. A           | Dim. B      | Part No.  |
|-------------------------|------------------|------------------------|--------------|------------|----------|------------------|-------------|-----------|
| RG 402/U<br>3.66 [.141] | Solder           | Gold                   | Gold         | 3 7 ) (    | MIL Type | 3.7<br>.144 Min. | 4.6<br>.180 | 1057697-1 |
| RG 405/U<br>2.16 [.085] | Solder           | Gold                   | Gold         | 3 7 ) (    | MIL Type | 2.3<br>.089 Min. | 3.0<br>.120 | 1057699-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

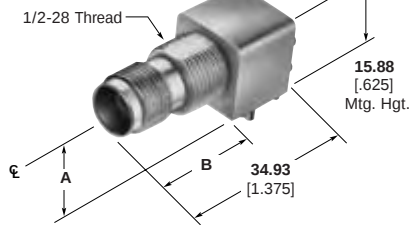
### Right-Angle PC Board/ Panel Mount Jacks



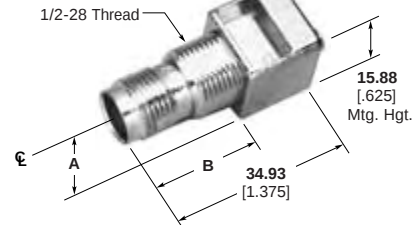
Maximum Panel Thickness 6.1 [0.240]

**Recommended  
Panel Cutout**

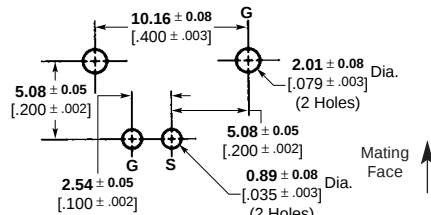
### VALOX Body



### Metal Body



| Body Material |    | Center Contact Plating | Dimensions   |               | Part Numbers |
|---------------|----|------------------------|--------------|---------------|--------------|
|               |    |                        | A            | B             |              |
| VALOX, White  | 50 | Gold                   | 8.56<br>.337 | 21.21<br>.835 | 5227818-1    |
| Metal         | 50 | Gold                   | 8.26<br>.325 | 20.83<br>.820 | 5227839-1    |



(Top View)

**Recommended PC Board Layout**

### Vertical PC Board/ Panel Mount Jacks

\*2-56 Self-Tapping Screws:  
For 1.57 [3/32] or greater panel thickness  
Part No. **221108-2**  
For less than 1.57 [3/32] panel thickness  
Part No. **221108-4**

### Lockwasher and Jam Nut

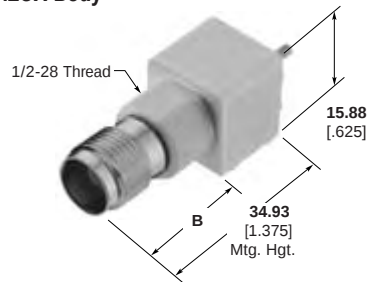


Part No.  
**1-329632-2**

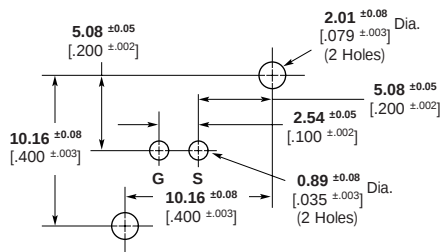


Part No.  
**1-329631-2**

### VALOX Body



| Body Material | Center Contact Plating | Dimension B   | Part Number |
|---------------|------------------------|---------------|-------------|
| VALOX, White  | Gold                   | 21.21<br>.835 | 5227820-1   |



(Top View)

**Recommended PC Board Layout**

VALOX is a trademark of General Electric Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

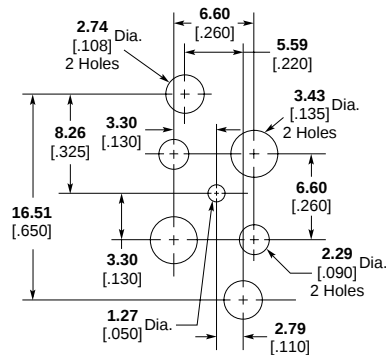
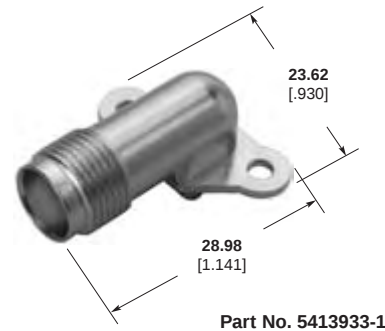
### Right-Angle PC Board/ Mount Jacks

#### Plating

Body — Nickel

Center Contact — Gold

Dielectric — 37 ) (



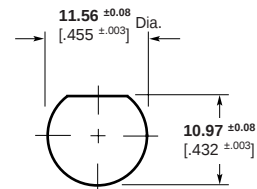
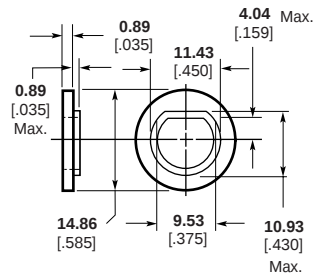
**Recommended PC Board Cutout**

### Bulkhead Solder Jacks

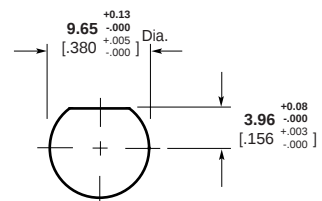
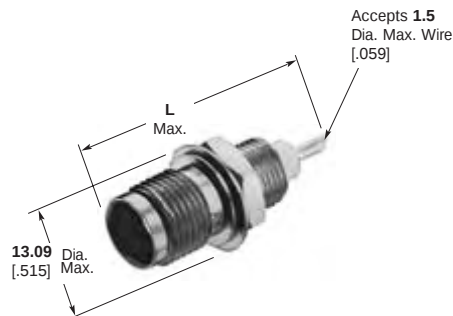
#### Insulation Bushing

Material — Nylon

Part No. 227223-1



**Recommended Panel Cutout  
(Bushing)**



**Recommended  
Panel Cutout  
(Jack)**

Panel Thickness Refer to chart below.

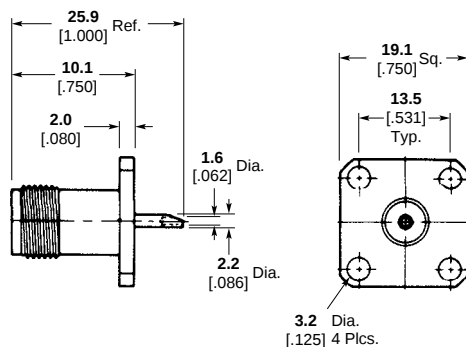
| Body Plating | Center Contact Plating | Dielectric | Dim. L         | Panel Thickness        | Part Number |
|--------------|------------------------|------------|----------------|------------------------|-------------|
| Nickel       | Gold                   | VALOX      | 33.33<br>1.312 | 1.17-6.35<br>.046-.250 | 5227764-2   |

VALOX is a trademark of General Electric Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 50 Ohm (Continued)

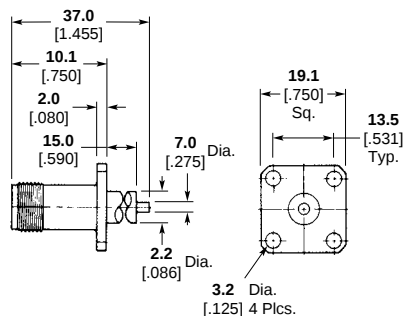
### Panel Mount Jack Receptacles



| Shell                     | Part No.               |
|---------------------------|------------------------|
| Nickel<br>Plated<br>Brass | 1057775-1 <sup>1</sup> |

<sup>1</sup>Captured Center Contact

### Flange Mount Receptacles



| Shell                     | Part No.               |
|---------------------------|------------------------|
| Nickel<br>Plated<br>Brass | 1057780-1 <sup>1</sup> |

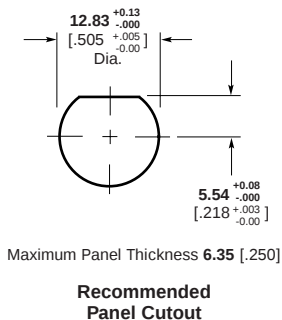
<sup>1</sup>Captured Center Contact

### Jack-Jack Adapter



| Center<br>Contact<br>Plating | Body<br>Plating | Dielectric    | Part No.  |
|------------------------------|-----------------|---------------|-----------|
| Gold                         | Nickel          | Polypropylene | 5221325-1 |

### Bulkhead Jack-Jack Adapter



| Center<br>Contact<br>Plating | Body<br>Plating | Dielectric | Part No. |
|------------------------------|-----------------|------------|----------|
| Gold                         | Nickel          | Acetal     | 221500-1 |

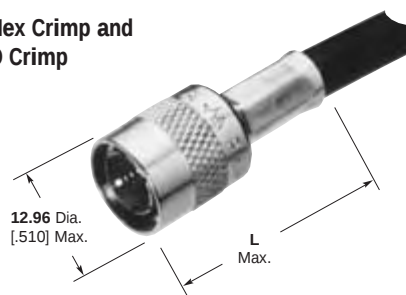
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 75 Ohm

### Plugs, Crimp

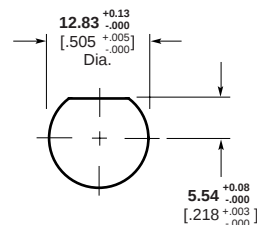
These connectors have been designed for optimum performance and have a true 75 ohm impedance the complete length of the connector. The crimp die tooling listed below is different from the equivalent 50 ohm connectors.

#### Hex Crimp and O Crimp



| RG/U Cable                                                                                 | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Dim. L         | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Part No.  |
|--------------------------------------------------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|----------------|-----------------------------------------------------------------------------------------|-----------|
| 179, 179A, 179B, 187, 187A, BELDEN 9221                                                    | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 27.79<br>1.094 | 318451-2                                                                                | 5221506-3 |
| AT&T 735A                                                                                  | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 29.46<br>1.160 | 58174-1                                                                                 | 5221506-5 |
| 302<br>BELDEN 88241<br>89269<br>Hi-Temp 62A<br>Times PL62,<br>BERK-TEK<br>BTDC-59, BTDC-62 | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 31.75<br>1.250 | 58425-1                                                                                 | 5413591-1 |
| BELDEN 8281<br>9141, 9231                                                                  | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 32.9<br>1.295  | 58538-1                                                                                 | 5221506-2 |

### Bulkhead Jack, Crimp



Maximum Panel Thickness 6.35 [0.250]

**Recommended Panel Cutout**

| RG/U Cable                                                      | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Dim. H                                                     | Tooling                                     | Part No. |
|-----------------------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|------------------------------------------------------------|---------------------------------------------|----------|
| 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9169, 89269 | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 11/16 across flats,<br>20.32<br>.800<br>max. across points | Use Hand Tool 354940-1 with Die Set 58536-1 | 221509-1 |

AT&T is a trademark of AT&T Corporation.

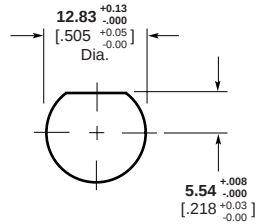
BELDEN is a trademark of Belden Wire and Cable Company.

BERK-TEK is a trademark of Nexans, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## TNC Connectors, 75 Ohm (Continued)

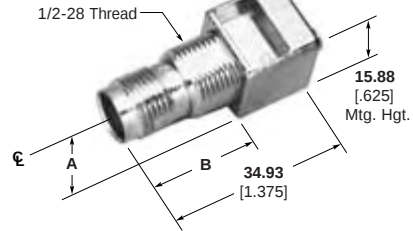
### Right-Angle PC Board/ Panel Mount Jacks



Maximum Panel Thickness 6.1 [.240]

#### Recommended Panel Cutout

#### Metal Body



| Body Material | □  | Center Contact Plating | Dimensions   |               | Part Numbers           |                     |
|---------------|----|------------------------|--------------|---------------|------------------------|---------------------|
|               |    |                        | A            | B             | Without Mounting Posts | With Mounting Posts |
| Metal         | 75 | Gold                   | 8.26<br>.325 | 20.83<br>.820 | —                      | 5413506-1           |

### Bulkhead Jack-Jack Adapter



| Center Contact Plating | Body Plating | Dielectric        | Part No. |
|------------------------|--------------|-------------------|----------|
| Gold                   | Nickel       | Polymethylpentene | 414396-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors (50 ohm/75 ohm)

### Product Facts

- Bayonet lock coupling for quick connect/disconnect
- Various connectors available in 50 and 75 ohm versions
- Fully intermateable with comparable BNC UG/U connectors
- Full range of Hex Crimp and O Crimp Products for common coaxial cables.
- Low VSWR
- Single crimp connectors offer one crimping operation for fast application
- Twist-on connectors require no special tooling for application to the cable
- Field serviceable (Category A) connectors qualified to MIL-C-39012
- Field replaceable (Category C) plugs with captivated center contact
- Field replaceable plugs can be terminated with industry standard tooling
- Tarnish resistant Nickel finish available
- Choice of different dielectrics
- Listed under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- PC Board soldered connectors are recognized under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- Certified by Canadian Standards Association File No. LR 7189 

### Between Series Adapters

For BNC Between Series Adapters, see pages 251-260.



The Tyco Electronics BNC RF connector family with bayonet locking coupling provides highly reliable, quick connect/disconnect coaxial connections. Exclusive single and O crimp terminations allow positive insulation grip and require no soldering, providing terminations at a very low overall applied cost.

Available in both 50 and 75 ohm versions, these con-

nectors feature numerous styles including cable plugs and jacks, adapters and printed circuit board connectors. In addition to a variety of crimp type terminations, connectors are furnished in field replaceable and twist-on styles. These connectors accept a wide range of coaxial cables and are intermateable with industry standard connectors designed to MIL-C-39012 specifications.

Tyco Electronics can also supply low cost alternatives with an extensive commercial type product line. A lower cost consumer series product offers the capability to supply center contacts in strip form and allow for automated center contact crimp technology. All connectors are designed around the mil-specifications, but utilize low-cost materials, offering comparable mechanical and electrical performance.

### Related Product Data

#### Product Specifications —

- 108-1275 — BNC Ohm Terminators
- 108-12020 — BNC O Crimp Connectors
- 108-12044 — BNC Commercial Hex Crimp
- 108-12047 — BNC Commercial and Hex Crimp Connectors
- 108-12074 — BNC Solder Jacks
- 108-12075 — BNC Connectors (Category A)
- 108-12078 — BNC Commercial PCB Panel-Mount Jacks

- 108-12002 — BNC Commercial T Adapter
- 108-12095 — BNC Commercial 75 Ohm Connectors
- 108-12096 — BNC Commercial Feed-Thru and Bulkhead Adapters
- 108-12079 — BNC Commercial 50 Ohm Solder Jacks
- 108-12103 — BNC Commercial PCB Press Fit Jacks

#### Application Specifications —

- 114-12001 — BNC Commercial PCB Jack Press Fit

#### Performance Specifications —

Page 45

#### Material Specifications — Page 46

Tooling — Pages 266-268

**Military Category** — All MIL type O crimp connectors are Category B Type (Tyco Electronics Crimp Tooling), unless otherwise noted.

**Packaging** — All MIL Type connectors are packaged individually, all O crimp connectors are bulk packaged and all Hex crimp connectors are individually packaged unless otherwise noted.

## BNC Connectors (50 ohm/75 ohm) Performance Specifications

| Characteristics                                            | Single Crimp<br>(MIL Type)                   | Category B<br>O Crimp<br>(MIL Type)                 | Straight<br>Solder<br>Clamp          | Right-Angle<br>Solder<br>Clamp       | Commercial<br>O Crimp<br>& Hex Crimp<br>50 Ohms | Commercial<br>O Crimp<br>& Hex Crimp<br>75 Ohms | Commercial PC<br>Board<br>50 & 75 Ohms            | Commercial<br>Solder<br>50 Ohm Jacks          |
|------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------------------|-------------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| <b>Electrical</b>                                          |                                              |                                                     |                                      |                                      |                                                 |                                                 |                                                   |                                               |
| Impedance, Nom.<br>(Ohms)                                  | 50                                           | 50                                                  | 50                                   | 50                                   | 50                                              | 75                                              | 50 & 75                                           | 50 & 75                                       |
| Working Voltage<br>(Volts RMS)                             | 500                                          | 500                                                 | 500                                  | 500                                  | 500                                             | 500                                             | 500                                               | 500                                           |
| Contact Resistance<br>(Milliohms)                          | Inner: 1.5<br>Outer: 0.3                     | Inner: 1.5<br>Outer: 0.2                            | Inner: 1.5<br>Outer: .20             | Inner: 1.5<br>Outer: .20             | Inner: 2.0<br>Outer: 1.0                        | Inner: 2.0<br>Outer: 2.0                        | Inner: 6/1.5<br>Outer: 3/0.2                      | Inner: 2.75<br>Outer: 1.0                     |
| Initial Insulation Resistance<br>(Megohms)                 | 5000                                         | 5000                                                | 5000                                 | 5000                                 | 5000                                            | 5000                                            | 5000                                              | 5000                                          |
| Dielectric Withstanding<br>Voltage (VAC)                   | 1500                                         | 1500                                                | 1500                                 | 1500                                 | 1500                                            | 1500                                            | 1500                                              | 1500                                          |
| Corona Level at 70,000 ft.<br>(Volts, RMS)                 | 375                                          | 375                                                 | 375                                  | 375                                  | 375                                             | 375                                             | —                                                 | 375                                           |
| RF Leakage, Max.<br>(dB)                                   | —                                            | -55 at<br>2-3 GHz                                   | -55 at<br>2-3 GHz                    | -55 at<br>2-3 GHz                    | -55 at<br>2-3 GHz                               | -55 at<br>1-2 GHz                               | —                                                 | —                                             |
| RF Insertion Loss,<br>Max. (dB)                            | —                                            | 0.2 at<br>3 GHz                                     | 0.2 at<br>3 GHz                      | 0.3 at<br>3 GHz                      | 0.2 at<br>3 GHz                                 | 0.15 at<br>2 GHz                                | —                                                 | —                                             |
| Frequency Range<br>(GHz)                                   | 0-2.5                                        | 0-4                                                 | 0-4                                  | 0-4                                  | 0-4                                             | 0-2                                             | 0-4 and<br>0-2                                    | 0-4                                           |
| VSWR in Frequency<br>Range Max.                            | 1.35                                         | 1.30                                                | 1.30                                 | 1.35                                 | 1.30                                            | 1.30                                            | —                                                 | —                                             |
| <b>Mechanical</b>                                          |                                              |                                                     |                                      |                                      |                                                 |                                                 |                                                   |                                               |
| Force to Engage (lbs. [N])/couple,<br>(in-lbs. [N•m]) max. | 13.3/11.12<br>[3/2.5]                        | 13.3/11.12<br>[3/2.5]                               | 13.3/.028<br>[3/2.5]                 | 13.3/.028<br>[3/2.5]                 | 26.7/26.69<br>[6/6.0]                           | 26.7/26.69<br>[6/6.0]                           | —                                                 | —                                             |
| Coupling Nut Retention,<br>Min. N [lbs.]                   | 444.8<br>[100]                               | 444.8<br>[100]                                      | 444.8<br>[100]                       | 444.8<br>[100]                       | 266.9<br>[60]                                   | 266.9<br>[60]                                   | —                                                 | —                                             |
| Cable Retention,<br>N [lbs.]                               | 266.9 [60]<br>(RG58C/U)                      | 266.9 [60]<br>(RG58C/U)                             | 177.9 [40]<br>(RG58C/U)              | 177.9 [40]<br>(RG58C/U)              | 266.9 [60]<br>(RG58C/U)                         | 266.9 [60]<br>(RG58C/U)                         | 266.9 [60]<br>(PCB Ret)                           | —                                             |
| Durability (Cycles)                                        | 500                                          | 500                                                 | 500                                  | 500                                  | 500                                             | 500                                             | 500                                               | 500                                           |
| Jam Nut Mounting Torque,<br>Max. [N•m] (in. lbs.)          | 25<br>[2.8]                                  | 25<br>[2.8]                                         | 25<br>[2.8]                          | —                                    | 25<br>[2.8]                                     | 25<br>[2.8]                                     | 25 <sup>3</sup> /12 <sup>4</sup><br>[2.8/1.4]     | 25<br>[2.8]                                   |
| <b>Environmental</b>                                       |                                              |                                                     |                                      |                                      |                                                 |                                                 |                                                   |                                               |
| Temperature Range,<br>Operating (C°)                       | -65 to +85                                   | -65 to +165 <sup>1</sup><br>-55 to +85 <sup>2</sup> | -65 to +165                          | -65 to +165                          | -55 to +85                                      | -55 to +85                                      | -55 to +85                                        | -65 to +165                                   |
| Vibration                                                  | MIL-STD-202<br>Method 204<br>Cond. B         | MIL-STD-202<br>Method 204<br>Cond. B                | MIL-STD-202<br>Method 204<br>Cond. B | MIL-STD-202<br>Method 204<br>Cond. B | MIL-STD-1344<br>Method 2005<br>Cond. III        | MIL-STD-202<br>Method 204<br>Cond. B            | MIL-STD-202<br>Method 201A                        | MIL-STD-202<br>Method 204<br>Cond. B          |
| Physical Shock                                             | MIL-STD-202<br>Method 213<br>Cond. G, 50 G's | MIL-STD-202<br>Method 213<br>Cond. G, 50 G's        | MIL-STD-202<br>Method 213<br>Cond. G | MIL-STD-202<br>Method 213<br>Cond. G | MIL-STD-1344<br>Method 2004<br>Cond. G, 100 G's | MIL-STD-202<br>Method 213<br>Cond. I, 100 G's   | MIL-STD-202<br>Method 213<br>Cond. I or A, 50 G's | MIL-STD-202<br>Method 213<br>Cond. I, 100 G's |
| Thermal Shock                                              | MIL-STD-202<br>Method 107                    | MIL-STD-202<br>Method 107                           | MIL-STD-202<br>Method 107            | MIL-STD-202<br>Method 107            | MIL-STD-1344<br>Method 1003<br>Cond. A          | MIL-STD-202<br>Method 107                       | MIL-STD-202<br>Method 107                         | MIL-STD-202<br>Method 107                     |
| Moisture<br>Resistance                                     | MIL-STD-202<br>Method 106                    | MIL-STD-202<br>Method 106                           | MIL-STD-202<br>Method 106            | MIL-STD-202<br>Method 106            | MIL-STD-1344<br>Method 1002<br>Type II          | MIL-STD-202<br>Method 106                       | MIL-STD-202<br>Method 106                         | MIL-STD-202<br>Method 106                     |
| Salt Spray                                                 | MIL-STD-202<br>Method 101<br>Cond. B         | MIL-STD-202<br>Method 101<br>Cond. B                | MIL-STD-202<br>Method 101<br>Cond. B | MIL-STD-202<br>Method 101<br>Cond. B | MIL-STD-1344<br>Method 1001<br>Cond. B          | MIL-STD-202<br>Method 101<br>Cond. B            | MIL-STD-202<br>Method 101<br>Cond. B              | MIL-STD-202<br>Method 101<br>Cond. B          |
| Product<br>Specification                                   | 108-12002                                    | 108-12020                                           | —                                    | —                                    | 108-12044<br>108-12047                          | 108-12095                                       | 108-12078                                         | 108-12079                                     |

<sup>1</sup>Assembled to cable with polytetrafluorethylene dielectric.

<sup>2</sup>Assembled to cable with polyethylene dielectric.

<sup>3</sup>For Metal Threads

<sup>4</sup>For Polyester Threads

## BNC Connectors (50 ohm/75 ohm) Performance Specifications (Continued)

| Connector Component                           | Single Crimp (MIL Type)                   | Category B & C O Crimp (MIL Type)         | Straight Solder Clamp    | Right-Angle Solder Clamp | Commercial O Crimp Hex Crimp & Terminators                      | Commercial PCB Solder                                        | Commercial PCB Press Fit | Commercial Solder Ohm Jacks                                  | Adapters                                        |
|-----------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------|--------------------------|-----------------------------------------------------------------|--------------------------------------------------------------|--------------------------|--------------------------------------------------------------|-------------------------------------------------|
| <b>Connector Material</b>                     |                                           |                                           |                          |                          |                                                                 |                                                              |                          |                                                              |                                                 |
| Collar                                        | Brass QQ-B-626                            | Brass QQ-B-626                            | Brass                    | Brass                    | Brass QQ-B-626<br>Zinc QQ-Z-363                                 | —                                                            | —                        | —                                                            | Brass QQ-B-626                                  |
| Outer Contact (Plug)                          | Brass QQ-B-626<br>Beryl. Copper QQ-C-530  | Phos. Bronze QQ-B-750                     | Brass                    | Brass                    | Brass MIL-C-21768                                               | —                                                            | —                        | —                                                            | Brass QQ-B-626<br>Beryl. Copper QQ-C-530        |
| Shell (Jack)                                  | Brass QQ-B-626                            | Brass QQ-B-626                            | Brass                    | —                        | Zinc QQ-Z-363                                                   | Zinc QQ-Z-363                                                | Zinc Zinc QQ-Z-363       | QQ-Z-363<br>Brass QQ-B-626                                   | Brass QQ-B-626                                  |
| Dielectric                                    | MIL-P-19468<br>Polypropylene Gen. Purpose | MIL-P-19468                               |                          |                          | Polyethylene<br>Polypropylene<br>Polymethylpentene Gen. Purpose | Polymethylpentene Gen. Purpose <sup>1</sup>                  | MIL-P-19468              | MIL-P-19468<br>Polyester PBT MIL-P-24519                     | MIL-P-19468<br>Polypropylene, Gen. Purpose      |
| Center Contact (Plug)                         | Brass QQ-B-626                            | Brass QQ-B-626                            | Brass                    | Brass                    | Brass QQ-B-626                                                  | —                                                            | —                        | —                                                            | Brass QQ-B-626<br>Beryl. Copper QQ-C-530        |
| Center Contact (Jack)                         | Beryl. Copper ASTM-B-643<br>QQ-C-530      | Beryl. Copper ASTM-B-643<br>QQ-C-530      | Beryl. Copper            | Beryl. Copper            | Beryl. Copper QQ-C-530                                          | Phos. Bronze QQ-B-750                                        | Beryl. Copper QQ-C-530   | Phos. Bronze QQ-B-570<br>Beryl. Copper QQ-C-530              | Phos. Bronze QQ-B-570<br>Beryl. Copper QQ-C-530 |
| Gasket                                        | Silicon Rubber QQ-R-765                   | Silicon Rubber QQ-R-765                   | Silicon Rubber           | Silicon Rubber           | Silicon Rubber QQ-R-765                                         | —                                                            | —                        | —                                                            | Silicon Rubber QQ-R-765                         |
| Ferrule                                       | Copper QQ-C-576                           | Copper QQ-C-576                           | —                        | —                        | Copper QQ-C-576                                                 | —                                                            | —                        | —                                                            | —                                               |
| <b>Connector Primary Finishes<sup>2</sup></b> |                                           |                                           |                          |                          |                                                                 |                                                              |                          |                                                              |                                                 |
| Collar                                        | Silver QQ-S-365<br>Bright Nickel QQ-N-290 | Silver QQ-S-365<br>Bright Nickel QQ-N-290 | Silver/<br>Bright Nickel | Silver/<br>Bright Nickel | Bright Nickel QQ-N-290                                          | —                                                            | —                        | —                                                            | Silver QQ-S-365<br>Bright Nickel QQ-N-290       |
| Outer Contacts (Plug & Jack)                  | QQ-S-365<br>Gold                          | Silver QQ-S-365<br>Bright Nickel QQ-N-290 | Silver/<br>Bright Nickel | Silver/<br>Bright Nickel | Bright or Matte Nickel QQ-N-290                                 | Bright Nickel QQ-N-290                                       | Bright Nickel QQ-N-290   | Bright Nickel QQ-N-290                                       | Silver QQ-S-365<br>Bright Nickel QQ-N-290       |
| Center Contacts (Plug & Jack)                 | MIL-G-45204<br>Silver                     | Gold MIL-G-45204                          | Gold                     | Gold                     | Tin Lead ASTM-B-545<br>Silver, QQ-S-365<br>Gold, MIL-G-45204    | Tin Lead ASTM-B-545<br>Silver, QQ-S-365<br>Gold, MIL-G-45204 | Gold MIL-B-45204         | Tin Lead ASTM-B-545<br>Silver, QQ-S-365<br>Gold, MIL-G-45204 | Silver QQ-S-365<br>Gold MIL-G-45204             |
| Ferrule <sup>3</sup>                          | QQ-S-365                                  | Silver QQ-S-365<br>Tin Lead ASTM-B-545    | —                        | —                        | Tin Lead ASTM-B-545                                             | —                                                            | —                        | —                                                            | —                                               |

<sup>1</sup>Several pc board connectors have an outer polyester PBT insulator per MIL-P-24519.

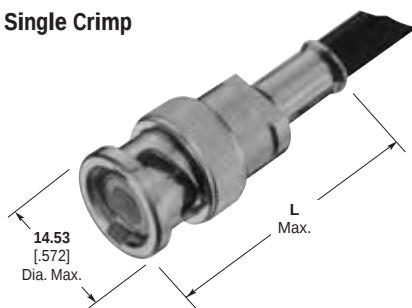
<sup>2</sup>If more than one finish is listed, refer to individual catalog page(s) or customer drawings for exact specification.

<sup>3</sup>Ferrules with tin-lead finish are used with nickel plated outer contacts.

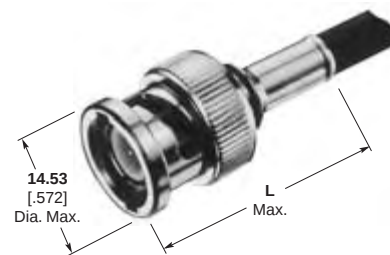
## BNC Connectors, 50 Ohm

### Plugs, Crimp

#### Single Crimp



#### Hex and O Crimp



| RG/U Cable                                   | Termination Type | Body Plating | Dielectric   | Style      | Dim. L         | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.                 |
|----------------------------------------------|------------------|--------------|--------------|------------|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------|
| 178, 178A, 178B, 196, 196A                   | Single Crimp     | Silver       |              | MIL Type   | 33.33<br>1.312 | 69245-4                                 | —                                                                                       | 69471                                                                | 5330876                  |
| 174, 188, 188A, 316                          | Hex Crimp        | Nickel       | Polyethylene | Commercial | 33.53<br>1.320 | —                                       | 58436-3                                                                                 | —                                                                    | 2-5221128-1              |
|                                              | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 220009-5                                | 318450-2                                                                                | 220217-3                                                             | 1-5227079-6              |
|                                              | O Crimp          | Nickel       |              | MIL Type   | 30.18<br>1.188 | —                                       | 1424050-1                                                                               | 220026-1                                                             | 5225395-7                |
|                                              | Single Crimp     | Silver       |              | MIL Type   | 33.33<br>1.312 | 69245-2                                 | —                                                                                       | 69422                                                                | 2-5330061-1              |
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221 | Hex Crimp        | Nickel       | Polyethylene | Commercial | 33.53<br>1.320 | —                                       | 58436-3                                                                                 | —                                                                    | 2-5221128-3              |
|                                              | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | —                                       | 1424050-1                                                                               | 220217-3                                                             | 2-5227079-2              |
|                                              | O Crimp          | Nickel       |              | MIL Type   | 30.18<br>1.188 | —                                       | —                                                                                       | 220026-1                                                             | 5225395-8                |
|                                              | Single Crimp     | Silver       |              | MIL Type   | 33.33<br>1.312 | —                                       | 91910-1                                                                                 | 69408                                                                | 2-5329446-1              |
| RD 316, 188, Double Braid                    | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 69477-4                                 | 58539-1                                                                                 | —                                                                    | 8-5227079-2              |
| BELDEN 8219                                  | Hex Crimp        | Nickel       | Polyethylene | Commercial | 33.53<br>1.320 | —                                       | 58436-1 <sup>2</sup>                                                                    | —                                                                    | 2-5221128-7              |
|                                              | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 6-5227079-7 <sup>3</sup> |
| BELDEN 9907, 89907 COMM/SCOPE 2104           | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 220187-1                                | 318452-2                                                                                | 220217-1                                                             | 6-5227079-8 <sup>4</sup> |
| BELDEN 8218                                  | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 69477-4                                 | 58539-1                                                                                 | 58376-1                                                              | 1-5227079-9              |
|                                              | O Crimp          | Nickel       |              | MIL Type   | 30.18<br>1.188 | —                                       | 91904-1                                                                                 | 69669-2                                                              | 1-5225395-0              |

<sup>1</sup>Order Tyco Electronics PRO-CRIMPER Coaxial "O" Crimp Hand Tool assembly 58433-1, which includes dies 58435-1.

<sup>2</sup>Order Tyco Electronics PRO-CRIMPER Coaxial Hex Crimp Hand Tool assembly 58433-2, which includes dies 58436-1.

<sup>3</sup>For use with BELDEN 9907 cable, COMM/SCOPE 3104 cable, and BELDEN 8219 cable only.

<sup>4</sup>For use with BELDEN 89907 cable, and COMM/SCOPE 2104 cable only.

BELDEN is a trademark of Belden Wire and Cable Company.

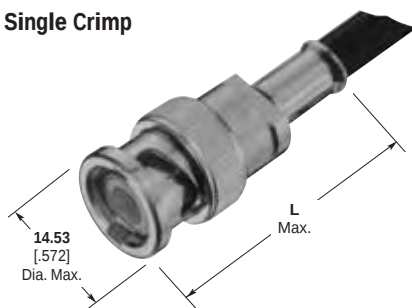
COMM/SCOPE is a trademark of Commscope, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

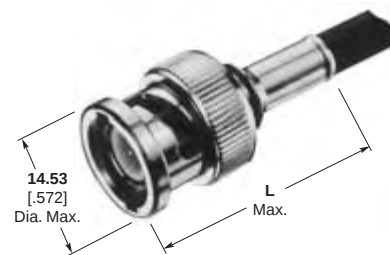
## BNC Connectors, 50 Ohm (Continued)

### Plugs, Crimp (Continued)

#### Single Crimp



#### Hex and O Crimp



| RG/U Cable                                      | Termination Type | Body Plating | Dielectric   | Style      | Dim. L         | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.               |
|-------------------------------------------------|------------------|--------------|--------------|------------|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------|
| 58, 58A, 58B, 58C                               | Hex Crimp        | Nickel       | Polyethylene | Commercial | 33.53<br>1.320 | —                                       | 58436-1 <sup>2</sup>                                                                    | —                                                                    | 5221128-1 <sup>3</sup> |
|                                                 | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 5227079-5              |
|                                                 | O Crimp          | Nickel       |              | MIL Type   | 33.74<br>1.328 | 69478-1                                 | 220189-3                                                                                | 69727                                                                | 5225395-1              |
|                                                 | Single Crimp     | Silver       |              | MIL Type   | 33.33<br>1.312 | —                                       | 91904-4                                                                                 | 69223-1                                                              | 2-5329444-1            |
| BELDEN 88240, BERK-TEK BTDC-58, COMM/SCOPE 2135 | Hex Crimp        | Nickel       | Polyethylene | Commercial | 33.53<br>1.320 | —                                       | 58436-1 <sup>2</sup>                                                                    | —                                                                    | 1-5221128-0            |
|                                                 | O Crimp          | Nickel       | Polyethylene | Commercial | 33.33<br>1.312 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 4-5227079-3            |
|                                                 | O Crimp          | Nickel       |              | MIL Type   | 33.33<br>1.312 | 69478-1                                 | 220189-3                                                                                | 69727                                                                | 4-5225395-2            |
| 223, 55, 55A, 55B                               | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.280 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 5227079-6              |
|                                                 | O Crimp          | Nickel       |              | MIL Type   | 43.64<br>1.718 | 69478-1                                 | 220189-3                                                                                | 69727                                                                | 5225395-3              |
|                                                 | Single Crimp     | Silver       |              | MIL Type   | 33.33<br>1.312 | —                                       | 91904-3                                                                                 | 69424                                                                | 2-5329444-2            |
| 142, 142A, 142B, 400                            | O Crimp          | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 6-5227079-1            |
|                                                 | O Crimp          | Nickel       |              | MIL Type   | 30.18<br>1.188 | 69478-1                                 | 220189-3                                                                                | 69727                                                                | 5225395-6              |
|                                                 | Single Crimp     | Silver       |              | MIL Type   | 33.33<br>1.312 | 69331-1                                 | —                                                                                       | 69429-1                                                              | 2-5330358-2            |

Consult Tyco Electronics for recommended crimp tooling.

<sup>1</sup>Order Tyco Electronics PRO-CRIMPER Coaxial "O" Crimp Hand Tool assembly 58433-1, which includes dies 58435-1.

<sup>2</sup>Order Tyco Electronics PRO-CRIMPER Coaxial Hex Crimp Hand Tool assembly 58433-2, which includes dies 58436-1.

<sup>3</sup>Bulk packaged.

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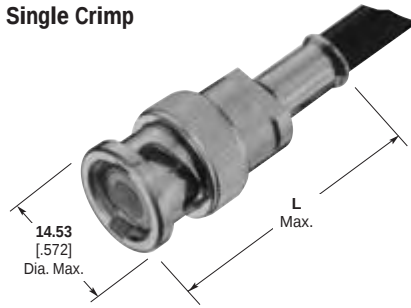
COMM/SCOPE is a trademark of Commscope, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

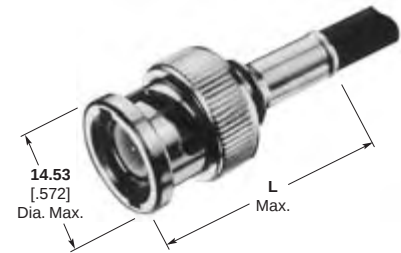
## BNC Connectors, 50 Ohm (Continued)

### Plugs, Crimp (Continued)

#### Single Crimp



#### Hex and O Crimp



| RG/U Cable                                                                    | Termination Type | Body Plating | Dielectric    | Style      | Dim. L         | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.    |
|-------------------------------------------------------------------------------|------------------|--------------|---------------|------------|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------|
| 124, 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269            | Hex Crimp        | Nickel       | Polyethylene  | Commercial | 33.53<br>1.320 | —                                       | 58436-1 <sup>2</sup>                                                                    | —                                                                    | 1-5221128-1 |
|                                                                               | O Crimp          | Nickel       | Polyethylene  | Commercial | 27.69<br>1.090 | 220187-2                                | 58435-1 <sup>1</sup>                                                                    | 220217-2                                                             | 5227079-7   |
|                                                                               | O Crimp          | Nickel       | Polyethylene  | Commercial | 27.69<br>1.090 | 220187-2                                | 58435-1 <sup>1</sup>                                                                    | 220217-2                                                             | 1-5227079-1 |
|                                                                               | O Crimp          | Nickel       |               | MIL Type   | 30.18<br>1.188 | —                                       | 58537-1                                                                                 | —                                                                    | 5225395-2   |
|                                                                               | Single Crimp     | Silver       |               | MIL Type   | 33.33<br>1.312 | 69141-1                                 | —                                                                                       | —                                                                    | 2-5329445-1 |
| 302, BELDEN 88241, 89269, Hi-Temp 62A, Times PL62, BERK-TEK, BTDC-59, BTDC-62 | Hex Crimp        | Nickel       | Polyethylene  | Commercial | 33.53<br>1.320 | —                                       | 58436-1 <sup>2</sup>                                                                    | —                                                                    | 1-5221128-1 |
|                                                                               | O Crimp          | Nickel       |               | MIL Type   | 34.14<br>1.344 | 69477-1                                 | 58537-1                                                                                 | 69669-1                                                              | 4-5225395-1 |
| Hi-Temp 59, Times PL59, PLF59 (20 AWG C.C.)                                   | O Crimp          | Nickel       | Polyethylene  | Commercial | 33.33<br>1.312 | —                                       | 58537-1                                                                                 | —                                                                    | 5-5227079-3 |
| BELDEN 9104, 9240, 9112, 9167, 9259, 9266, Times FM-59                        | Hex Crimp        | Nickel       | Polyethylene  | Commercial | 33.53<br>1.320 | —                                       | 58436-1 <sup>2</sup>                                                                    | —                                                                    | 1-5221128-7 |
|                                                                               | O Crimp          | Nickel       |               | MIL Type   | 30.94<br>1.218 | —                                       | 58537-1                                                                                 | 69669-1                                                              | 2-5225395-0 |
| BELDEN 8281, 9141, 9231, Western Electric 724, 728, 3049                      | Single Crimp     | Silver       | Polypropylene | MIL Type   | 41.50<br>1.634 | 69652                                   | —                                                                                       | 220000                                                               | 5330878     |
| 8, 8A, 213                                                                    | O Crimp          | Silver       |               | MIL Type   | 27.31<br>1.075 | 220015-1                                | —                                                                                       | —                                                                    | 5225886-1   |
| 11, 11A                                                                       | O Crimp          | Silver       |               | MIL Type   | 47.63<br>1.875 | 220015-1                                | —                                                                                       | —                                                                    | 5225886-4   |
| BELDEN 9914, Times FM-8                                                       | O Crimp          | Silver       |               | MIL Type   | 47.63<br>1.875 | 220015-1                                | —                                                                                       | —                                                                    | 5225886-7   |
| Alpha 9847, BELDEN 8213, 9292                                                 | O Crimp          | Silver       |               | MIL Type   | 47.63<br>1.875 | 220015-1                                | —                                                                                       | —                                                                    | 225886-5 □  |
| 9, 9A, 9B, 214                                                                | O Crimp          | Silver       |               | MIL Type   | 52.38<br>2.062 | 220015-1                                | —                                                                                       | —                                                                    | 5225886-1   |

<sup>1</sup>Order Tyco Electronics PRO-CRIMPER Coaxial "O" Crimp Hand Tool assembly 58433-1, which includes dies 58435-1.

<sup>2</sup>Order Tyco Electronics PRO-CRIMPER Coaxial Hex Crimp Hand Tool assembly 58433-2, which includes dies 58436-1. Tyco Electronics PRO-CRIMPER II Hand Tool Frame without dies Part No. 354940-1

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**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

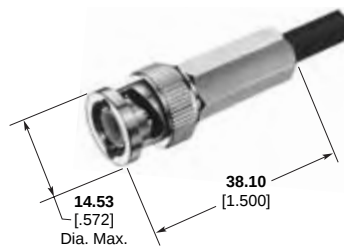
## BNC Connectors, 50 Ohm (Continued)

### Plugs, Twist-On

#### Related Product Data

Twist-On plugs must be used with cable that has a solid conductor. These plugs are not recommended for applications where the cable frequently moves or flexes.

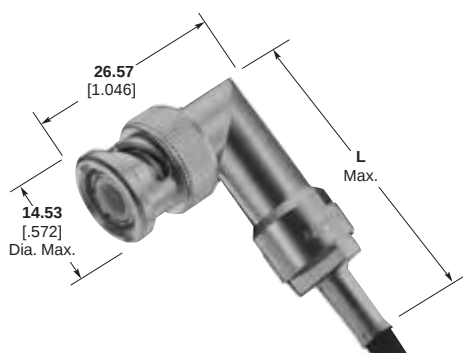
Mating Twist-On Jack — Page 52



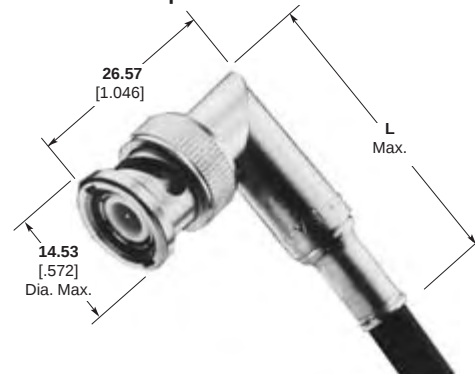
| RG/U Cable   | Contact Plating | Body Plating | Dielectric         | Style      | Part No.  |
|--------------|-----------------|--------------|--------------------|------------|-----------|
| 59, 59A, 59B | Gold            | Nickel       | Polymethyl-pentene | Commercial | 5414265-3 |

### Right-Angle Plugs, Crimp

#### Single Crimp



#### Hex and O Crimp



| RG/U Cable                                                         | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Dim. L         | CERT-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.  |
|--------------------------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|----------------|----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------|
| 174, 188, 188A, 316                                                | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 39.45<br>1.553 | —                                      | 58436-3                                                                                 | —                                                                    | 5413959-3 |
|                                                                    | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 44.45<br>1.750 | —                                      | 91910-1                                                                                 | 69422                                                                | 5331178   |
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221                       | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 39.45<br>1.553 | —                                      | 58436-3                                                                                 | —                                                                    | 5413959-4 |
| 180, 180A, 180B, 195, 195A                                         | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 39.45<br>1.553 | —                                      | 58436-3                                                                                 | —                                                                    | 5413959-5 |
| BELDEN 9907, 89907, 8219, COMM/SCOPE 2104, 3104                    | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 39.45<br>1.553 | —                                      | 58436-1                                                                                 | —                                                                    | 5413959-6 |
| 58, 58A, 58B, 58C                                                  | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 39.45<br>1.553 | —                                      | 58436-1                                                                                 | —                                                                    | 5413959-1 |
|                                                                    | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 37.29<br>1.468 | 69478-1                                | 220189-3                                                                                | 69727-1                                                              | 5225974-1 |
|                                                                    | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 44.45<br>1.750 | —                                      | 91904-1                                                                                 | 69223-1                                                              | 5331175   |
| 55, 55A, 55B, 223                                                  | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 37.29<br>1.468 | 69478-1                                | 220189-3                                                                                | 69727-1                                                              | 5225974-2 |
|                                                                    | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 44.45<br>1.750 | —                                      | 91904-3                                                                                 | 69429-1                                                              | 5331182   |
| 142, 142A, 142B, 400                                               | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 44.45<br>1.750 | 69331-1                                | —                                                                                       | 69429-1                                                              | 5331182   |
| 124, 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269 | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 37.29<br>1.468 | —                                      | 58537-1                                                                                 | 69669-1                                                              | 5225974-5 |

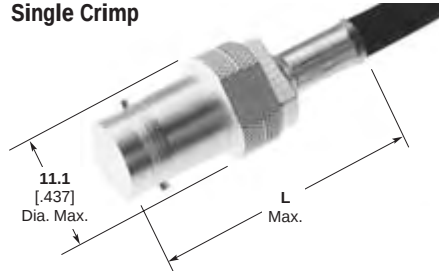
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**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

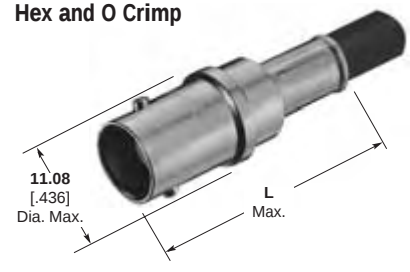
## BNC Connectors, 50 Ohm (Continued)

### Jacks, Crimp

#### Single Crimp



#### Hex and O Crimp



| RG/U Cable                                                         | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Dim. L         | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.    |
|--------------------------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------|
| 174, 188, 188A, 316                                                | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 33.02<br>1.300 | —                                       | 58436-3                                                                                 | —                                                                    | 5413779-3   |
|                                                                    | O Crimp          | Gold                   | Nickel       | Polypropylene      | Commercial | 30.48<br>1.200 | —                                       | 1424050-1                                                                               | 220217-3                                                             | 5228979-7   |
|                                                                    | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 30.48<br>1.200 | —                                       | 1424050-1                                                                               | 220026-1                                                             | 5225396-7   |
|                                                                    | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 33.33<br>1.312 | —                                       | —                                                                                       | 69422                                                                | 2-5330062-1 |
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221                       | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 33.02<br>1.300 | —                                       | 58436-3                                                                                 | —                                                                    | 2-5413779-4 |
| 58, 58A, 58B, 58C                                                  | O Crimp          | Gold                   | Nickel       | Polypropylene      | Commercial | 30.48<br>1.200 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 5228979-5   |
|                                                                    | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 30.48<br>1.200 | —                                       | 91901-1                                                                                 | 69727                                                                | 5225396-1   |
| 223, 55, 55A, 55B                                                  | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 33.33<br>1.312 | 69140-2                                 | 91904-3                                                                                 | 69424                                                                | 2-5329452-2 |
| 124, 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269 | O Crimp          | Gold                   | Nickel       | Polypropylene      | Commercial | 30.48<br>1.200 | 220187-2                                | 58435-1 <sup>1</sup>                                                                    | 220217-2                                                             | 5228979-6   |
|                                                                    | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 30.48<br>1.200 | —                                       | 58537-1                                                                                 | 69669-1                                                              | 5225396-2   |

<sup>1</sup>Order Tyco Electronics PRO-CRIMPER Coaxial "O" Crimp Hand Tool assembly 58433-1, which includes dies 58435-1.

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**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

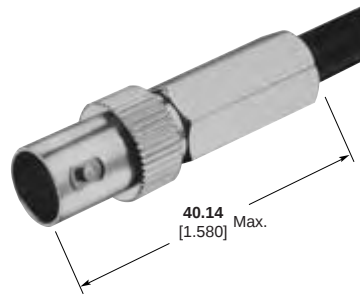
## BNC Connectors, 50 Ohm (Continued)

### Jacks, Twist-On

#### Related Product Data

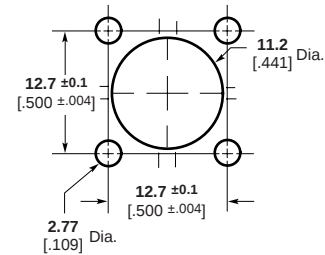
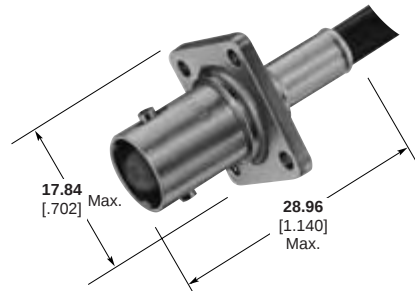
Twist-on jacks must be used with cable that has a solid conductor. These jacks are not recommended for applications where the cable frequently moves or flexes.

**Mating Twist-On Plug** — Page 50



| RG/U Cable   | Center Contact | Body Plating | Dielectric | Style      | Part No. |
|--------------|----------------|--------------|------------|------------|----------|
| 59, 59A, 59B | Gold           | Nickel       | Acetal     | Commercial | 222428-1 |

### Panel Jacks, Crimp



**Recommended Panel Cutout**

| RG/U Cable                                                                | Termination Type | Center Contact Plating | Body Plating | Dielectric | Style    | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.  |
|---------------------------------------------------------------------------|------------------|------------------------|--------------|------------|----------|-----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------|
| 174, 188, 188A, 316                                                       | O Crimp          | Gold                   | Nickel       |            | MIL Type | —                                       | 1424050-1                                                                               | 220026-1                                                             | 5225397-7 |
| 58, 58A, 58B, 58C                                                         | O Crimp          | Gold                   | Nickel       | 3 7 ) (    | MIL Type | 69478-1                                 | 91901-1                                                                                 | 69727                                                                | 5225397-1 |
| 124, 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269, 89269 | O Crimp          | Gold                   | Nickel       | 3 7 ) (    | MIL Type | 69477-1                                 | 58537-1                                                                                 | 69669-1                                                              | 5225397-2 |

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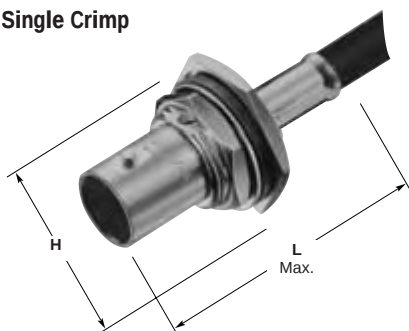
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

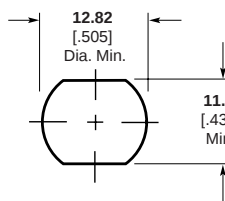
### Bulkhead Jacks, Crimp

**Note:** Panel Insulating Bushings — Page 54

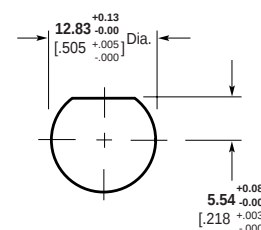
#### Single Crimp



**Recommended  
Panel Cutouts**  
Maximum Panel  
Thickness **3.18** [.125]



#### Hex and O Crimp



**H = 11/16"** across flats, **20.32** [.800] Max. across points

| RG/U<br>Cable                                         | Termination<br>Type | Center<br>Contact<br>Plating | Body<br>Plating | Dielectric             | Style      | Dim.<br>L             | CERTI-CRIMP<br>Hand Tool<br>with<br>Integral Die | Interchangeable Dies<br>for PRO-CRIMPER<br>Hand Tool 354940-1<br>or<br>PRO-CRIMPER<br>Adapter 679304-1 | Interchangeable<br>Dies for Hand<br>Tool 69710-1<br>& 626 Pneu.<br>Head 318161-1 | Part No.           |
|-------------------------------------------------------|---------------------|------------------------------|-----------------|------------------------|------------|-----------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------|
| 174, 188,<br>188A, 316                                | Hex Crimp           | Gold                         | Nickel          | Polymethyl-<br>pentene | Commercial | <b>36.83</b><br>1.450 | —                                                | 58436-3                                                                                                | —                                                                                | <b>5413771-3</b>   |
|                                                       | O Crimp             | Gold                         | Nickel          | Polypropylene          | Commercial | <b>34.93</b><br>1.375 | —                                                | —                                                                                                      | 220217-3                                                                         | <b>5228980-7</b>   |
|                                                       | O Crimp             | Gold                         | Nickel          |                        | MIL Type   | <b>35.71</b><br>1.406 | —                                                | —                                                                                                      | 220026-1                                                                         | <b>5225398-7</b>   |
|                                                       | Single Crimp        | Gold                         | Silver          |                        | MIL Type   | <b>32.13</b><br>1.265 | —                                                | —                                                                                                      | 69422                                                                            | <b>2-5330063-1</b> |
| 179, 179A,<br>179B, 161,<br>187, 187A,<br>BELDEN 9221 | O Crimp             | Gold                         | Nickel          |                        | MIL Type   | <b>35.71</b><br>1.406 | —                                                | 1424050-1                                                                                              | 220026-1                                                                         | <b>5225398-8</b>   |
|                                                       | Single Crimp        | Gold                         | Silver          |                        | MIL Type   | <b>32.13</b><br>1.265 | —                                                | 91910-1                                                                                                | 69408                                                                            | <b>2-5329458-1</b> |
| Times RD316                                           | O Crimp             | Gold                         | Nickel          |                        | MIL Type   | <b>35.71</b><br>1.406 | —                                                | 91904-1                                                                                                | 69669-2                                                                          | <b>1-5225398-5</b> |

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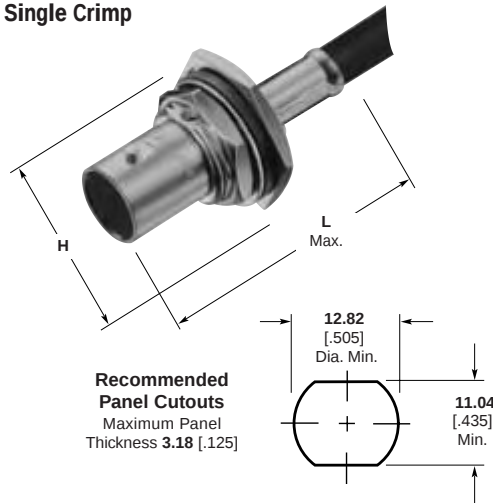
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

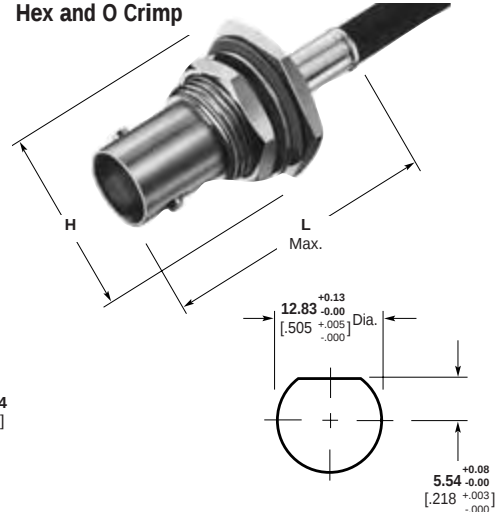
### Bulkhead Jacks, Crimp (Continued)

**Note:** Panel Insulating Bushings—  
at the bottom of this page

#### Single Crimp



#### Hex and O Crimp



H = 11/16" across flats, 20.32 [800] Max. across points

| RG/U Cable                                                         | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Dim. L      | CERTI-CRIMP Hand Tool with Integral Die | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.    |
|--------------------------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|-------------|-----------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------|
| 58, 58A, 58B, 58C, BELDEN 88240, BERK-TEK BTDC-58, COMM/SCOPE 2135 | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | 36.83 1.450 | —                                       | 58436-1                                                                                 | —                                                                    | 5413771-1   |
| 58, 58A, 58B, 58C                                                  | O Crimp          | Gold                   | Nickel       | Polypropylene      | Commercial | 34.93 1.375 | 220187-1                                | 58435-1 <sup>1</sup>                                                                    | 220217-1                                                             | 5228980-5   |
|                                                                    | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 41.28 1.625 | —                                       | 91901-1                                                                                 | 69727                                                                | 5225398-1   |
|                                                                    | Single Crimp     | Gold                   | Silver       |                    | MIL Type   | 32.13 1.265 | —                                       | 91904-4                                                                                 | 69223-1                                                              | 2-5329456-1 |
| 223, 55, 55A, 55B                                                  | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 35.71 1.406 | —                                       | 91901-1                                                                                 | 69727                                                                | 5225398-3   |
| 142, 142A, 142B, 400                                               | O Crimp          | Gold                   | Nickel       |                    | MIL Type   | 35.71 1.406 | —                                       | 91901-1                                                                                 | 69727                                                                | 5225398-6   |
| 124, 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269 | O Crimp          | Gold                   | Nickel       | Polypropylene      | Commercial | 34.93 1.375 | 220187-2                                | 58435-1 <sup>1</sup>                                                                    | 220217-2                                                             | 5228980-6   |

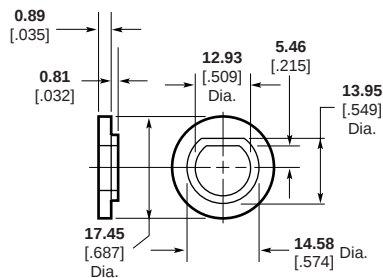
<sup>1</sup>Order Tyco Electronics PRO-CRIMPER Coaxial "O" Crimp Hand Tool assembly 58433-1, which includes dies 58435-1.

### Panel Insulating Bushings for Bulkhead Jacks

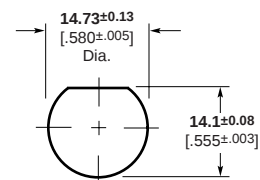
**Material** — Nylon

**Note:** Can not be used with single crimp bulkhead jacks.

BELDEN is a trademark of Belden Wire and Cable Company.  
BERK-TEK is a trademark of Nexans, Inc.  
COMM/SCOPE is a trademark of CommScope, Inc.



Part No. 330620 (2 Required)



Recommended Panel Cutout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

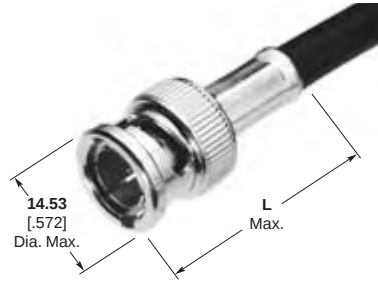
## BNC Connectors, 50 Ohm (Continued)

### Plugs, for JIS Cables, Crimp

#### Plating

Body — Nickel

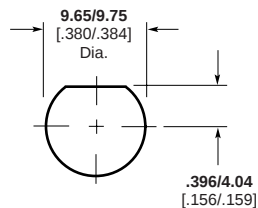
Center Contact — Gold



| JIS Cable | Termination Type | Dielectric   | Dim. L         | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Part No.    |
|-----------|------------------|--------------|----------------|-----------------------------------------------------------------------------------------|-------------|
| 3D-2V     | Hex Crimp        | Polyethylene | 33.53<br>1.320 | 58436-1                                                                                 | 3-5221128-1 |

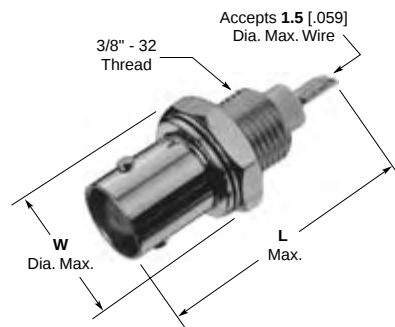
### Bulkhead Solder Jacks, Front Mount

Body Plating — Nickel

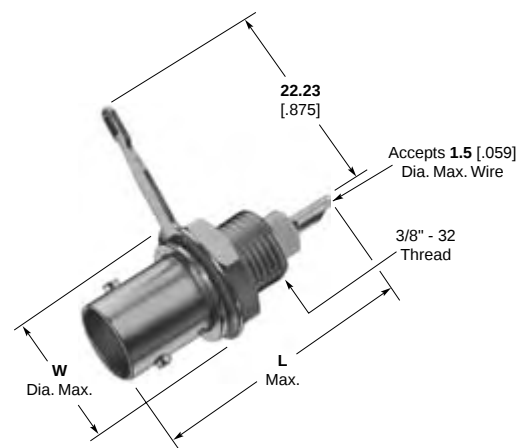


Recommended Panel Cutout

#### Without Solder Terminal



#### With Solder Terminal



| Contact Material | Dielectric | Dimensions     |               | Panel Thickness        | Insulating Bushing      | Part No.                 |                        |
|------------------|------------|----------------|---------------|------------------------|-------------------------|--------------------------|------------------------|
|                  |            | L              | W             |                        |                         | Without Solder Terminal* | With Solder Terminal** |
| Silver           | VALOX      | 26.93<br>1.060 | 13.09<br>.515 | 1.17-3.18<br>.046-.125 | 227223-1 or<br>221951-1 | 5227754-3                | 5227755-3              |
|                  |            | 33.33<br>1.312 | 13.09<br>.515 | 1.17-6.35<br>.046-.250 | 227223-1 or<br>221951-1 | —                        | 5227169-7              |
| Gold             | VALOX      | 26.93<br>1.060 | 13.09<br>.515 | 1.17-3.18<br>.046-.125 | 227223-1 or<br>221951-1 | 5227754-2                | 5227755-2              |
|                  |            | 33.33<br>1.312 | 13.09<br>.515 | 1.17-6.35<br>.046-.250 | 227223-1 or<br>221951-1 | 5227169-4                | 5227169-8              |
|                  | 3 7 ) (    | 26.93<br>1.060 | 13.09<br>.515 | 1.17-3.18<br>.046-.125 | 227223-1 or<br>221951-1 | 5227715-3                | 5227716-3              |
|                  |            | 33.33<br>1.312 | 13.09<br>.515 | 1.17-6.35<br>.046-.250 | 227223-1 or<br>221951-1 | —                        | 5227169-5              |
| Tin              | VALOX      | 26.93<br>1.060 | 13.09<br>.515 | 1.17-3.18<br>.046-.125 | 227223-1 or<br>221951-1 | 5227754-1                | 5227755-1              |

\*Includes lockwasher and jam nut.

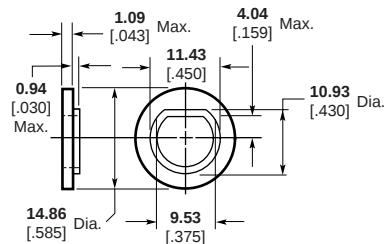
\*\*Includes solder terminal and jam nut.

VALOX is a trademark of General Electric Company.

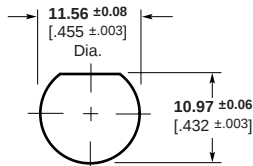
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

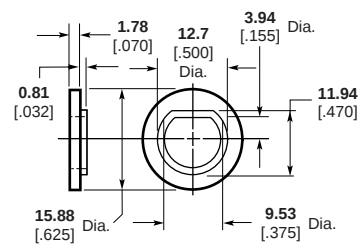
### Insulating Bushings



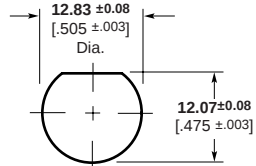
Part No. 227223-1



Recommended  
Panel Cutout



Part No. 221951-1



Recommended  
Panel Cutout

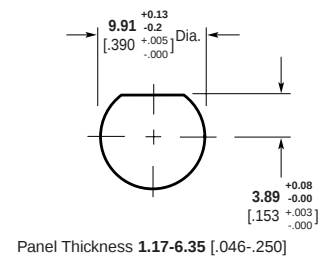
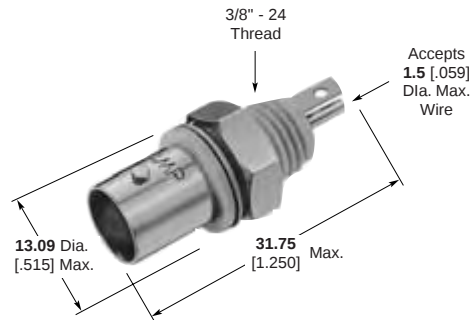
### Isolated Bulkhead Solder Jacks, Front Mount

#### Plating

Body — Nickel

Dielectric — White VALOX

| Center Contact Plating | Flange & Thread Material | Part No.  |
|------------------------|--------------------------|-----------|
| Tin                    | VALOX                    | 5227726-1 |
| Silver                 | VALOX                    | 5227726-2 |
| Gold                   | VALOX                    | 5227726-3 |



Recommended  
Panel Cutout

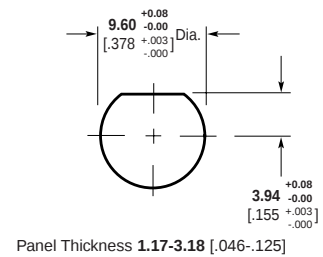
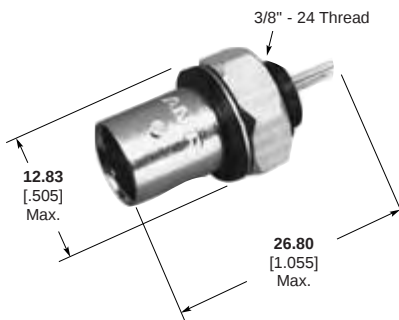
#### Plating

Body — Nickel

Center Contact — Silver

Dielectric — Black VALOX

Flange & Thread Material —  
Black VALOX



Recommended  
Panel Cutout

### Sealed Bulkhead Solder Jack, Rear Mount

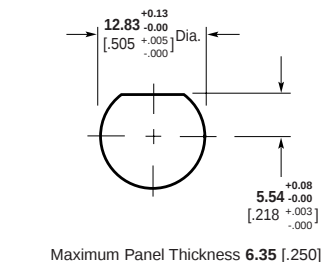
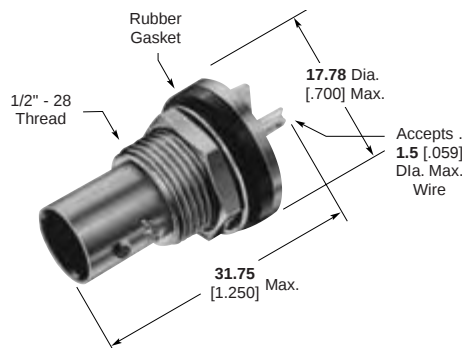
#### Plating

Body — Nickel

Center Contact — Gold

Dielectric — Polymethylpentene

This connector is designed to prevent moisture from entering the interface from the rear of the connector.



Recommended  
Panel Cutout

VALOX is a trademark of General Electric Company.

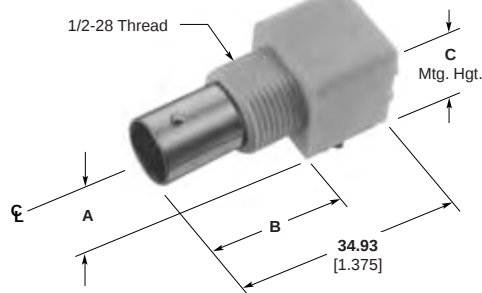
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

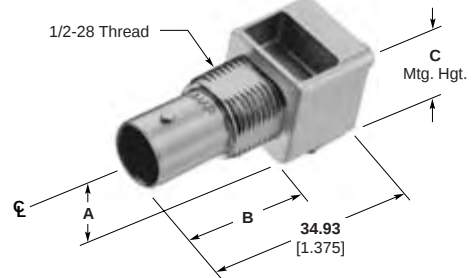
### Right-Angle Jacks PC Board/Panel Mount

**Body** — Nickel  
**Dielectric** — Polymethylpentene

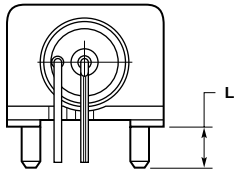
#### VALOX Body



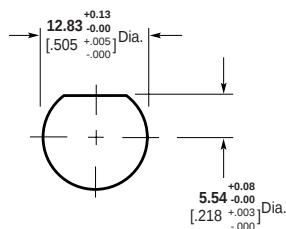
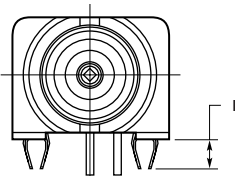
#### Metal Body



#### Mounting Post Style



#### Compliant Post



Maximum Panel Thickness 6.1 [240]

#### Recommended Panel Cutout

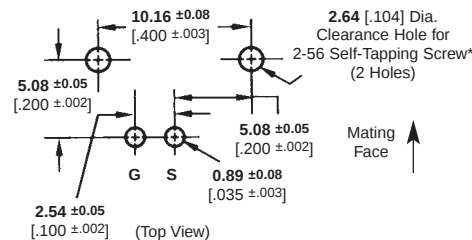
#### Lockwasher and Jam Nut



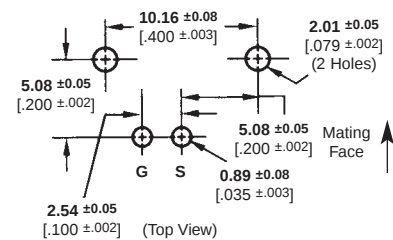
**Part No.**  
1-329632-2

**Part No.**  
1-329631-2

#### Without Mounting Posts



#### With Mounting Posts



#### Recommended PC Board Layouts

VALOX is a trademark of General Electric Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

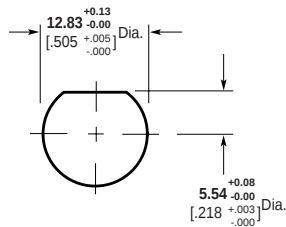
## BNC Connectors, 50 Ohm (Continued)

### Vertical Jacks PC Board/Panel Mount

#### Plating

Body — Nickel

Dielectric — Polymethylpentene



Maximum Panel Thickness 6.1 [.240]

#### Recommended Panel Cutout

### Lockwasher and Jam Nut

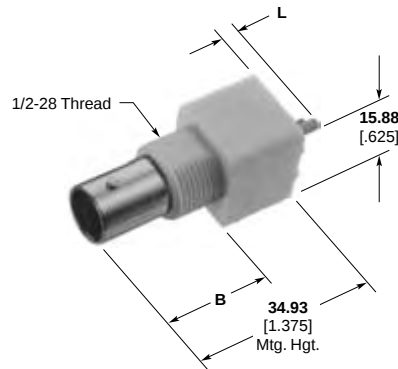


Part No.  
1-329632-2

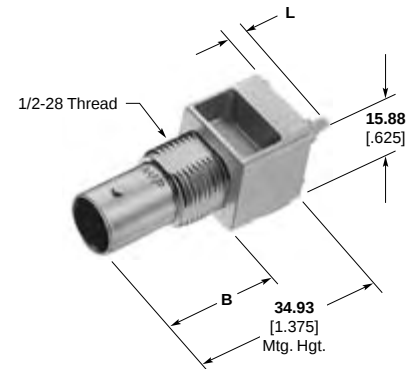


Part No.  
1-329631-2

### VALOX Body



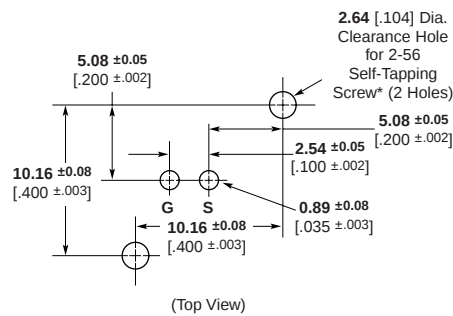
### Metal Body



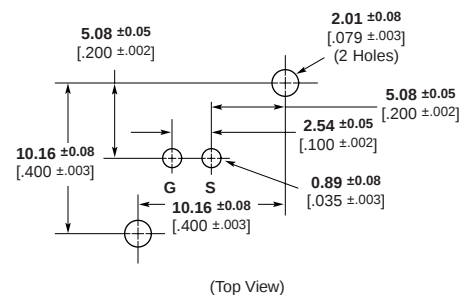
| Body Material | Center Contact Plating | Dim. B        | Dim. L       | Part No.               |                     |
|---------------|------------------------|---------------|--------------|------------------------|---------------------|
|               |                        |               |              | Without Mounting Posts | With Mounting Posts |
| VALOX, White  | Tin                    | 21.21<br>.835 | 3.48<br>.137 | 5226993-1              | 5227222-1           |
|               | Gold                   | 21.21<br>.835 | 3.48<br>.137 | 5226993-3              | 5227222-3           |
| VALOX, Black  | Tin                    | 21.21<br>.835 | 3.48<br>.137 | 5226993-2              | 5227222-2           |
|               | Gold                   | 21.21<br>.835 | 3.48<br>.137 | 5226993-6              | 5227222-6           |
| Metal         | Tin                    | 20.83<br>.820 | 3.48<br>.137 | —                      | 5227671-1           |
|               | Gold                   | 20.83<br>.820 | 3.48<br>.137 | —                      | 5227673-1           |

**Note:** If an Insulating Bushing is required see part number 330620 and Panel Cutout on page 54.

### Without Mounting Posts



### With Mounting Posts



### Recommended PC Board Layouts

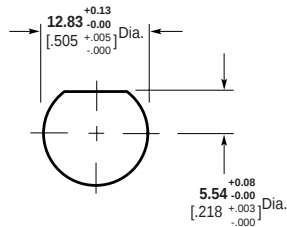
\* Screw for board thickness of 2.38 [.093] or greater **Part No. 221108-2.**  
Screw for thickness of less than 2.38 [.093] **Part No. 221108-4.**

VALOX is a trademark of General Electric Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

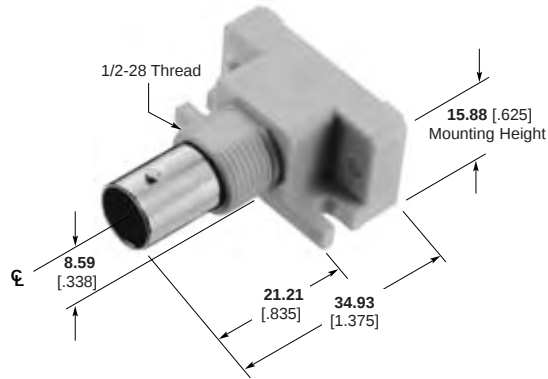
## BNC Connectors, 50 Ohm (Continued)

### Jacks with Mounting Flanges PC Board/Panel Mount



Maximum Panel Thickness 6.1 [0.240]

Recommended Panel Cutout



| Body Material | Center Contact Plating | Part No.  |
|---------------|------------------------|-----------|
| VALOX, White  | Tin                    | 5226978-1 |
|               | Gold                   | 5226978-3 |

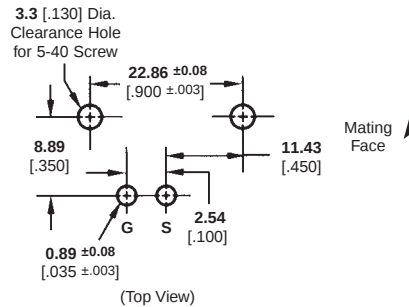
### Lockwasher and Jam Nut



Part No.  
1-329632-2



Part No.  
1-329631-2



Recommended PC Board Layout

VALOX is a trademark of General Electric Company.

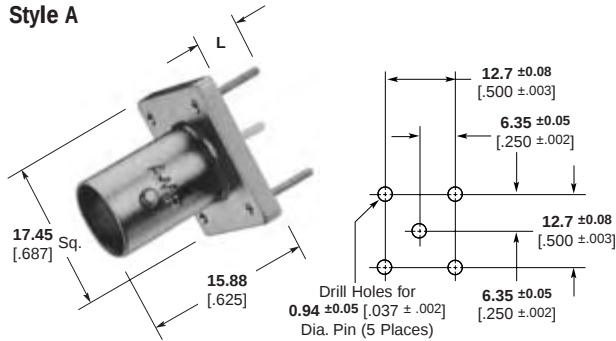
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

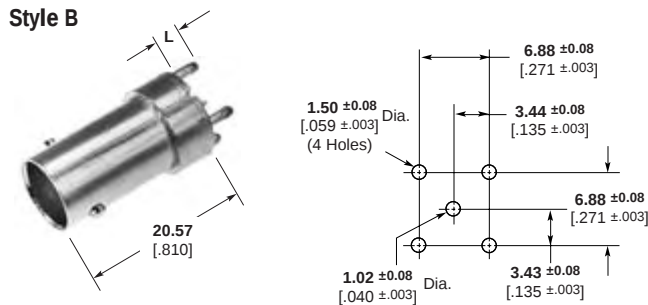
### Vertical Metalized Jacks PC Board Mount

#### Recommended PC Board Layouts

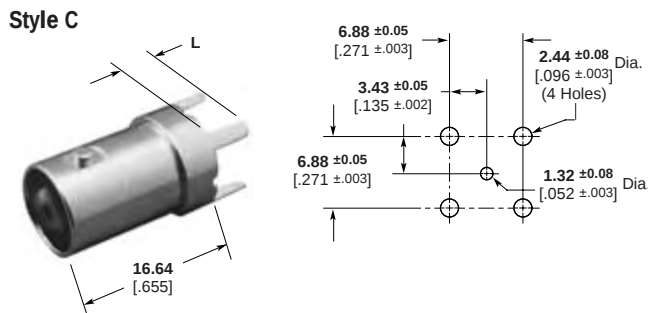
##### Style A



##### Style B



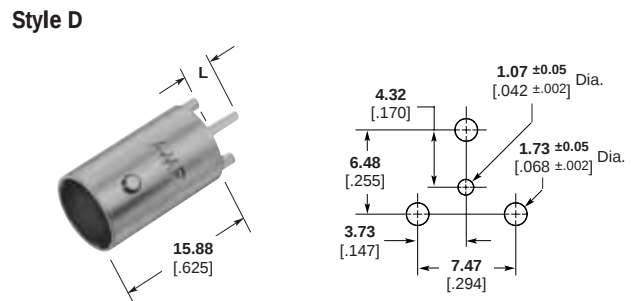
##### Style C



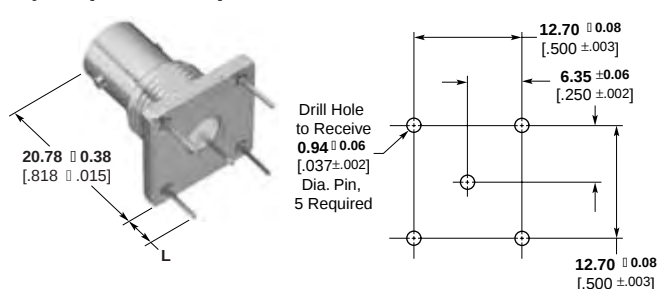
| Body Plating | Center Contact Plating | Dielectric | Style | Leg Length L | Part No.               |
|--------------|------------------------|------------|-------|--------------|------------------------|
| Nickel       | Silver                 | VALOX      | A     | 6.35 .250    | 5227699-1              |
|              | Gold                   | VALOX      | A     | 6.35 .250    | 5227699-2              |
|              | Tin                    | VALOX      | A     | 6.35 .250    | 5227699-3              |
|              | Gold                   | VALOX      | A     | 3.81 .150    | 5414460-1 <sup>1</sup> |
|              | Silver                 | VALOX      | C     | 4.45 .175    | 5222420-1              |
| Tin-Lead     | Gold                   | VALOX      | E     | 6.35 .250    | 5415189-1              |
|              | Gold                   |            | B     | 3.30 .130    | 5413969-2              |
|              | Silver                 | VALOX      | C     | 3.18 .125    | 5414305-1              |
|              | Gold                   | VALOX      | D     | 3.43 .135    | 5221123-2              |

<sup>1</sup>With .76 [0.30] standoffs on top of legs.

##### Style D



##### Style E (Panel Mount)

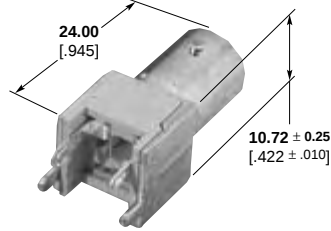


VALOX is a trademark of General Electric Company.

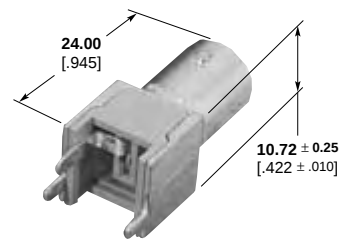
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

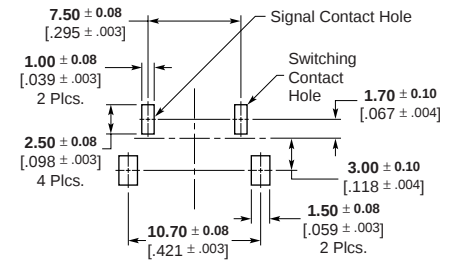
### Vertical Metalized Jacks, PC Board Mount



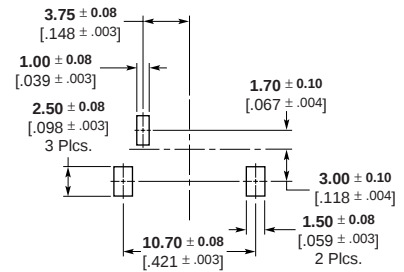
**Part No. 1274314-1**  
(Switching)



**Part No. 1274315-1**



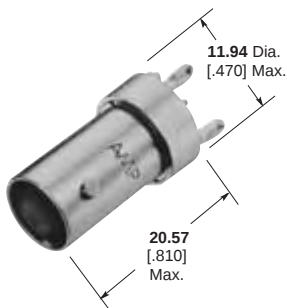
**Recommended  
PC Board Layout**



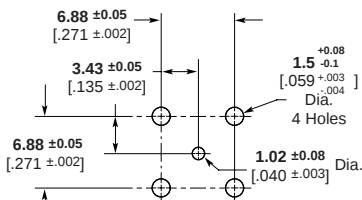
**Recommended  
PC Board Layout**

| Body Plating | Contact Plating | Dielectric    | Part No.  |
|--------------|-----------------|---------------|-----------|
| Tin          | Silver          | Polyphenylene | 6274314-1 |
| Tin          | Silver          | Polyphenylene | 6274315-1 |

### Press Fit Vertical Metalized Jack, PC Board Mount



**Part No. 5222006-1**

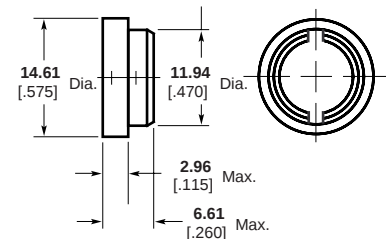


**Recommended PC Board Layout**  
PC Board Thickness Not Less Than 0.99 [0.093]

### Insulating Bushing

**Material** — Polypropylene  
**Part No. 222163-1**

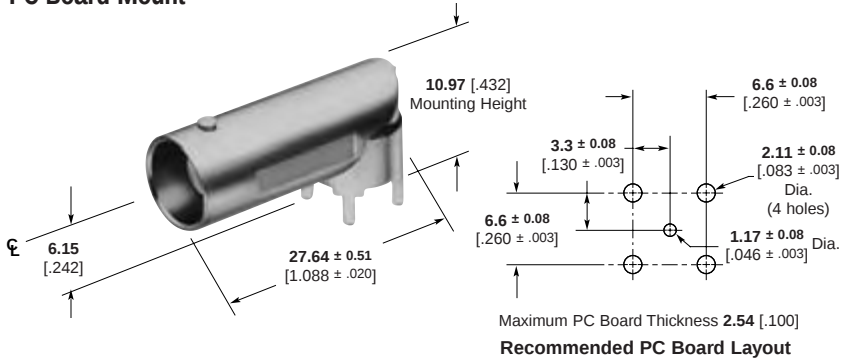
Only to be used on Part Nos. 5222006-1  
& 5222462-1



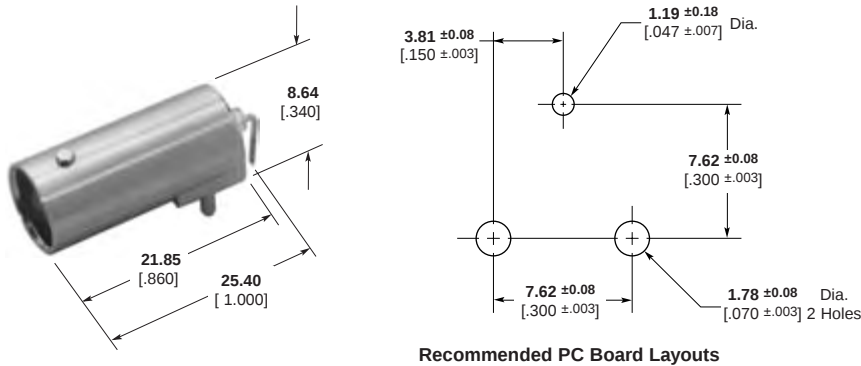
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

### Right-Angle Metalized Jacks, PC Board Mount

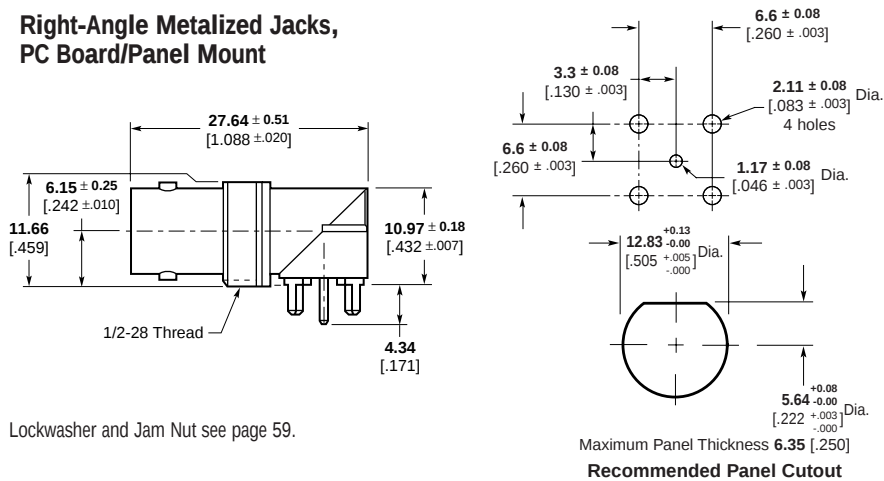


| Body Plating | Dielectric         | Center Contact Length | Part No.  |
|--------------|--------------------|-----------------------|-----------|
| Nickel       | Polymethyl-pentene | 4.34 .171             | 5413631-1 |
| Tin          |                    | 4.34 .171             | 5413631-2 |
| Nickel       | Polymethyl-pentene | 3.33 .131             | 5413631-3 |



| Body   | Dielectric | Contact | Part No.  |
|--------|------------|---------|-----------|
| Nickel | TPX        | Gold    | 5414373-1 |

### Right-Angle Metalized Jacks, PC Board/Panel Mount



| Body Plating | Dielectric | Part No.  |
|--------------|------------|-----------|
| Tin          |            | 5415025-2 |
| Tin          | TPX        | 5415025-1 |

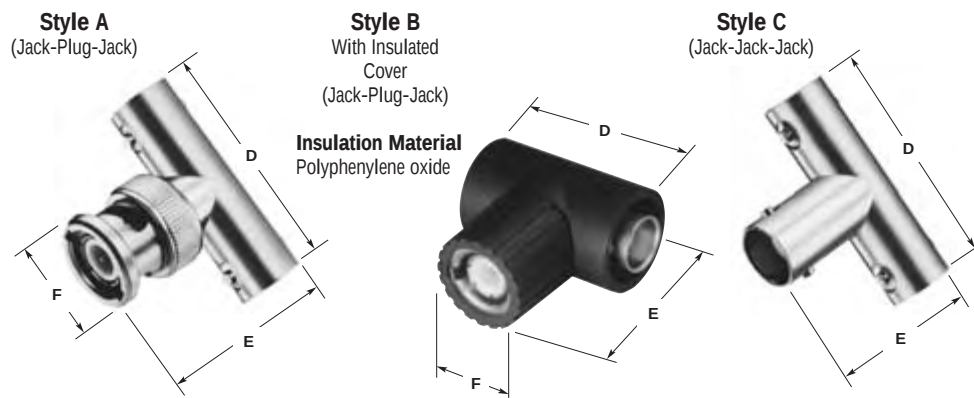
Lockwasher and Jam Nut see page 59.

TPX is a trademark of Mitsui Chemicals America, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

### Tee Adapters



| Style | Body Material and Plating | Center Contact Material and Plating | Dielectric | Dimensions     |                |               | Comparable UG/U Connector | Packaging No. Per Pkg.      | Part No.               |
|-------|---------------------------|-------------------------------------|------------|----------------|----------------|---------------|---------------------------|-----------------------------|------------------------|
|       |                           |                                     |            | D              | E              | F             |                           |                             |                        |
| A     | Brass, Nickel             | BE CU, Gold (30) <sup>2</sup>       |            | 32.54<br>1.281 | 26.19<br>1.031 | 14.27<br>.562 | 274A                      | Bulk (100)                  | 221543-2               |
|       |                           | PH BR, Gold (15) <sup>2</sup>       | Acetal     | 33.02<br>1.300 | 27.31<br>1.075 | 14.50<br>.571 | —                         | Bulk (100)                  | 5413592-2              |
|       | Zinc, Nickel              | BE CU, Gold (30) <sup>2</sup>       | Acetal     | 33.02<br>1.300 | 27.31<br>1.075 | 14.50<br>.571 | —                         | Bulk (100)                  | 5413592-6              |
|       |                           | PH BR, Gold (15) <sup>2</sup>       | Acetal     | 33.02<br>1.300 | 27.31<br>1.075 | 14.50<br>.571 | —                         | Individual (1) <sup>3</sup> | 5413592-9              |
|       |                           | BE CU, Silver (200) <sup>2</sup>    | Acetal     | 33.02<br>1.300 | 27.31<br>1.075 | 14.50<br>.571 | —                         | Individual (1)              | 1-5413592-1            |
| B     | Zinc, Nickel              | BE CU, Gold (30) <sup>2</sup>       | Acetal     | 32.54<br>1.281 | 31.12<br>1.225 | 17.15<br>.675 | —                         | Bulk (100)                  | 5413366-2 <sup>1</sup> |
| C     | Brass, Nickel             | BE CU, Silver (200) <sup>2</sup>    |            | 32.54<br>1.281 | 23.37<br>.920  | —             | —                         | Bulk (100)                  | 221988-1               |
|       | Zinc, Nickel              | PH BR, Gold (50) <sup>2</sup>       | Acetal     | 32.54<br>1.281 | 23.62<br>.930  | —             | —                         | Bulk (100)                  | 5414311-1              |

<sup>1</sup>Gray insulation cover

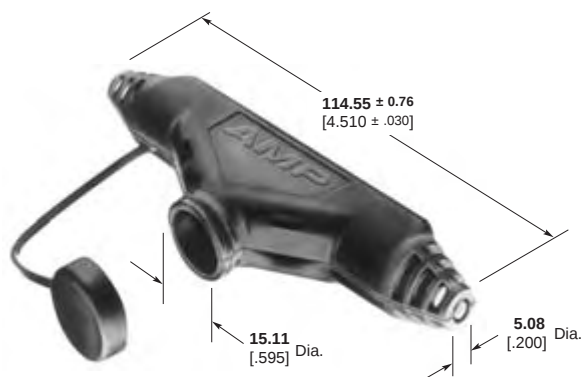
<sup>2</sup>(Microinches min thickness)

<sup>3</sup>(Special graphics)

### Tee Adapter Covers

**Material** — Polypropylene, general purpose

| Color | Part No. |
|-------|----------|
| Black | 221586-1 |
| Ivory | 221586-3 |

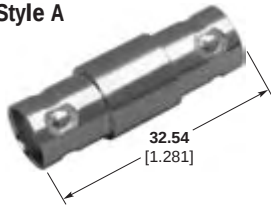


**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

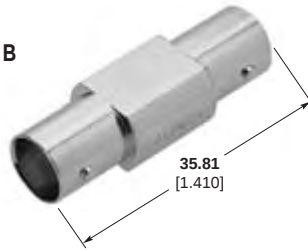
## BNC Connectors, 50 Ohm (Continued)

### Jack-Jack Adapters

#### Style A

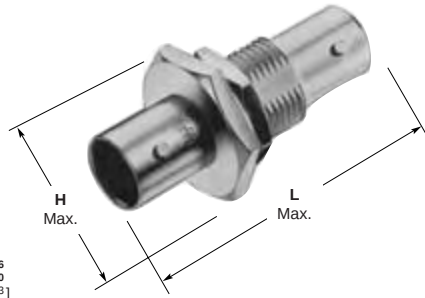
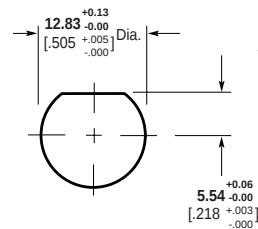


#### Style B



| Body Plating | Center Contact Plating | Dielectric        | Style | Part No.  |
|--------------|------------------------|-------------------|-------|-----------|
| Nickel       | Silver                 |                   | A     | 221551-1  |
| Nickel       | Gold                   |                   | A     | 221551-3  |
| Nickel       | Gold                   | Polymethylpentene | B     | 5414414-1 |

### Bulkhead Jack-Jack Adapters



| Body Plating | Center Contact Plating | Dimensions    |                | Dielectric   | Part No.  |
|--------------|------------------------|---------------|----------------|--------------|-----------|
|              |                        | H             | L              |              |           |
| Nickel       | Silver                 | 17.45<br>.687 | 38.10<br>1.500 |              | 330024    |
| Nickel       | Gold1                  | 17.78<br>.700 | 36.07<br>1.420 | Polyethylene | 5228226-1 |
| Nickel       | Gold2                  | 17.78<br>.700 | 36.07<br>1.420 | Polyethylene | 5228226-3 |

#### Plating:

Gold1—0.00127 [.000050] thick Gold2—0.00076 [.000015] thick

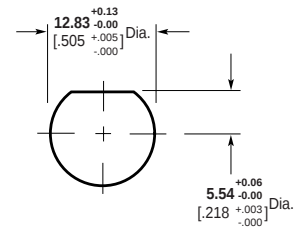
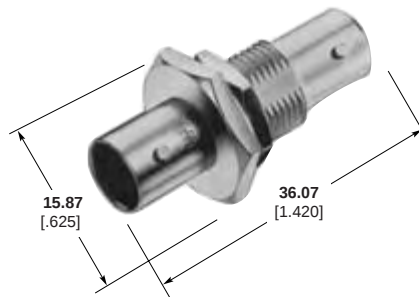
**Note:** If an Insulating Bushing is required see part number 330620 and Panel Cutout on page 54.

#### Recommended Panel Cutout

H= 11/16 across flats, 20.32 [.800] across points.

### Isolated Bulkhead Jack-Jack Adapter

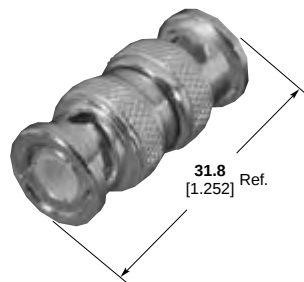
| Body Plating | Center Contact Plating | Dielectric        | Part No.  |
|--------------|------------------------|-------------------|-----------|
| Nickel       | Gold                   | Polymethylpentene | 5414105-1 |



#### Recommended Panel Cutout

H= 11/16 across flats, 20.32 [.800] across points.

### Plug-Plug Adapter

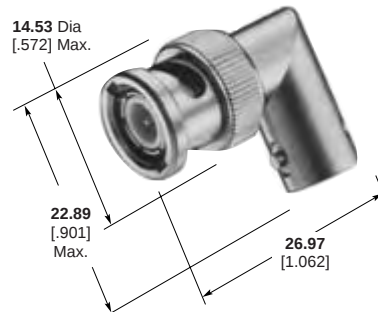


| Contact Plating | Body Plating | Part No. |
|-----------------|--------------|----------|
| Gold            | Nickel       | 415796-1 |

### Right-Angle Adapters

(Jack-Plug)

| Body Plating | Center Contact Plating | Dielectric        | Part No.  |
|--------------|------------------------|-------------------|-----------|
| Nickel       | Silver                 |                   | 5329517   |
| Nickel       | Gold                   |                   | 5222165-2 |
| Nickel       | Gold                   | Polymethylpentene | 5414666-1 |



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 50 Ohm (Continued)

### Terminator Plugs 50, 75, 93 Ohm

#### Plating

**Body** — Nickel  
**Center Contact** — Gold  
**Dielectric** — Polyethylene



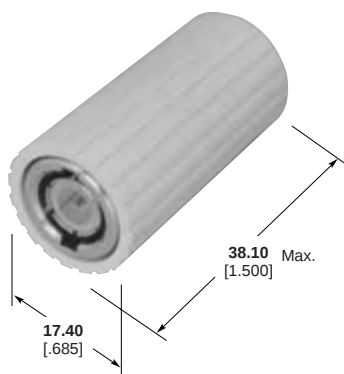
| Resistor Specification | Part No.                 |                |
|------------------------|--------------------------|----------------|
|                        | With Tether              | Without Tether |
| 1 Watt, 50 Ohm         | 5221629-1                | 5221629-4      |
| 1 Watt, 75 Ohm         | 5221629-2                | 5221629-5      |
| 1 Watt, 93 Ohm         | —                        | 5221629-6      |
| 0.5 Watt, 75 Ohm       | —                        | —              |
| 1 Watt, 50 Ohm         | 1-5221629-6 <sup>1</sup> | —              |

<sup>1</sup> Tether is conductive with #4 stud size

### Insulated Terminators

**Insulation Material**  
Polyphenylene oxide

#### Long Cover

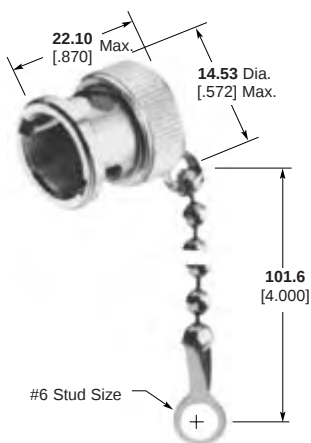


| Register Specification | Color | Cover Style | Part No.  |
|------------------------|-------|-------------|-----------|
| 1 Watt, 50 Ohm         | Gray  | Long        | 5413557-1 |
|                        |       | Short       | 5413364-2 |
|                        | Black | Long        | 5413557-2 |

\* The Short Cover is required when mating the Terminator with a Tee Adapter.

### Jack Covers

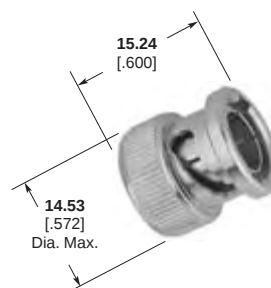
| Body Plating | Part No.   |
|--------------|------------|
| Silver       | 330022     |
| Nickel       | 1-330022-2 |



### Shorting Caps

#### Plating

**Body** — Nickel  
**Center Contact** — Gold



**Part No. 413453-1**

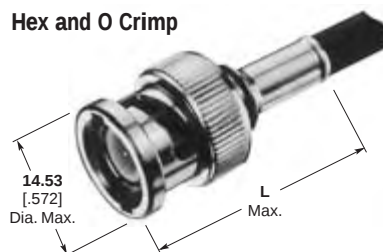
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm

### Plugs, Crimp

These connectors have been designed for optimum performance and have a true 75 ohm impedance the complete length of the connector. The crimp die tooling listed below is different from the equivalent 50 ohm connectors.

### Hex and O Crimp



### Plugs

| RG/U Cable                                                                                  | Termination Type | Center Contact Plating | Body Plating | Dielectric   | Style      | Dim. L         | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.    |
|---------------------------------------------------------------------------------------------|------------------|------------------------|--------------|--------------|------------|----------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------|
| 179, 179A, 179B, 187, 187A, 161, BELDEN 9221                                                | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-2                                                                                 | —                                                                    | 5413589-8   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 35.56<br>1.140 | 318451-2                                                                                | —                                                                    | 5221185-8   |
| AT&T 735A                                                                                   | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-2                                                                                 | —                                                                    | 1-5413589-0 |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 58174-1                                                                                 | 58248-3                                                              | 1-5221185-8 |
| BELDEN 8218                                                                                 | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-2                                                                                 | —                                                                    | 5413589-3   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 58174-1                                                                                 | 58248-3                                                              | 5221185-3   |
| 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269                               | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-1                                                                                 | —                                                                    | 5413589-2   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 58536-1                                                                                 | 58248-2                                                              | 5221185-2   |
| 302, BELDEN 89269, 88241, Hi-Temp 62A, Times PL-62, Berk Tek BTDC-59, BTDC-62               | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-1                                                                                 | —                                                                    | 5413589-1   |
| BELDEN 8212, 9104, 9112, 9167, 9240, 9259, 9266, Times FM-59, (RG 59 Type with 20 AWG C.C.) | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-1                                                                                 | —                                                                    | 5413589-9   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 58536-1                                                                                 | 58248-2                                                              | 5221185-9   |
| BELDEN 9145, AT&T 734A                                                                      | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-1                                                                                 | —                                                                    | 5413589-7   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 27.69<br>1.090 | 58536-1                                                                                 | —                                                                    | 1-5221185-0 |
| BELDEN 9248, 9114                                                                           | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 25.65<br>1.010 | 58536-1                                                                                 | —                                                                    | 5221185-1   |
| 6, 6A                                                                                       | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 37.85<br>1.490 | 58538-1                                                                                 | 58248-1                                                              | 5221185-7   |
| BELDEN 8281, 9141, 9231, Western Electric 724, 728, 3049                                    | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | 29.46<br>1.160 | 58425-3                                                                                 | —                                                                    | 5413589-5   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 28.45<br>1.120 | 58538-1                                                                                 | 58248-1                                                              | 5221185-5   |
| COMM/SCOPE S59 Hec                                                                          | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 28.96<br>1.140 | 58536-1                                                                                 | —                                                                    | 2-5221185-9 |
| COMM/SCOPE F59 Hec-z                                                                        | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | 28.96<br>1.140 | 58536-1                                                                                 | —                                                                    | 3-5221185-1 |

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COMM/SCOPE is a trademark of CommScope, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

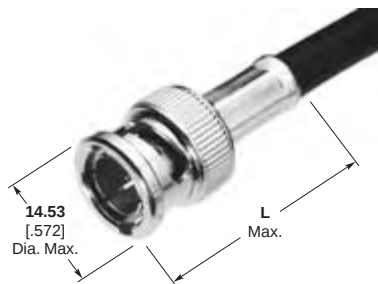
## BNC Connectors, 75 Ohm (Continued)

### Plugs for JIS Cables, Crimp

#### Plating

**Body** — Nickel

**Center Contact** — Gold



| JIS Cable | Termination Type | Dielectric        | Dim.<br>L      | Interchangeable Dies<br>for PRO-CRIMPER<br>Hand Tool 354940-1<br>or<br>PRO-CRIMPER<br>Adapter 679304-1 | Part No.    |
|-----------|------------------|-------------------|----------------|--------------------------------------------------------------------------------------------------------|-------------|
| 3C-2V     | Hex Crimp        | Polymethylpentene | 29.46<br>1.160 | 58425-1                                                                                                | 1-5413589-1 |
| 2.5C-2V   | Hex Crimp        | Polymethylpentene | 29.46<br>1.160 | 58425-2                                                                                                | 1-5413589-6 |

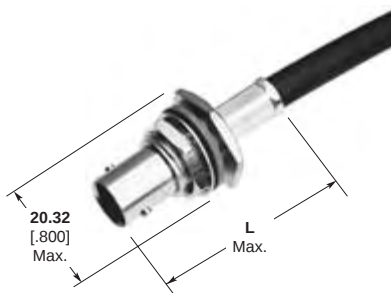
### Bulkhead Jacks for JIS Cables, Crimp

#### Plating

**Body** — Nickel

**Center Contact** — Gold

**Dielectric** — Polymethylpentene



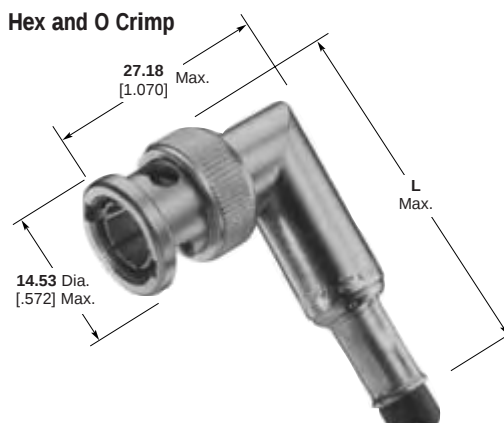
| JIS Cable | Termination Type | Dielectric | Dim.<br>L      | Interchangeable Dies<br>for PRO-CRIMPER<br>Hand Tool 354940-1<br>or<br>PRO-CRIMPER<br>Adapter 679304-1 | Part No.   |
|-----------|------------------|------------|----------------|--------------------------------------------------------------------------------------------------------|------------|
| 1.5C-2V   | Hex Crimp        | 75Ω        | 36.83<br>1.450 | 58425-2                                                                                                | 5413590-4* |

\*Packaged in 100 pieces per bag.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

### Right-Angle Plugs, Crimp



| RG/U Cable                                                                                  | Termination Type | Center Contact Plating | Body Plating | Dielectric         | Style      | Dim. L                | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.           |
|---------------------------------------------------------------------------------------------|------------------|------------------------|--------------|--------------------|------------|-----------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------|
| 179, 179A, 179B, 187, 187A, 161 BELDEN 9221                                                 | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.45</b><br>1.553 | 58425-2                                                                                 | —                                                                    | <b>5413588-8</b>   |
| AT&T 735A                                                                                   | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.45</b><br>1.553 | 58425-2                                                                                 | —                                                                    | <b>1-5413588-0</b> |
| AT&T KS 19224 L2, RD179 Double Braid                                                        | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.45</b><br>1.553 | 58425-2                                                                                 | —                                                                    | <b>5413588-4</b>   |
| 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269                               | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.45</b><br>1.553 | 58425-1                                                                                 | —                                                                    | <b>5413588-2</b>   |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.88</b><br>1.570 | 58536-1                                                                                 | 58248-2                                                              | <b>5221402-2</b>   |
| BELDEN 8212, 9104, 9112, 9240, 9167, 9259, 9266, Times FM-59, (RG 59 Type with 20 AWG C.C.) | Hex Crimp        | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.45</b><br>1.553 | 58425-1                                                                                 | —                                                                    | <b>5413588-9</b>   |
| BELDEN 9145, AT&T 734A                                                                      | O Crimp          | Gold                   | Nickel       | Polymethyl-pentene | Commercial | <b>39.88</b><br>1.570 | 58536-1                                                                                 | —                                                                    | <b>5221402-4</b>   |

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## BNC Connectors, 75 Ohm (Continued)

### Jacks, Crimp

### Hex and O Crimp



| RG/U Cable                                                                                  | Termination Type | Center Contact Plating | Body Plating | Dielectric   | Style      | Dim. L                | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.         |
|---------------------------------------------------------------------------------------------|------------------|------------------------|--------------|--------------|------------|-----------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------|
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221                                                | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>33.02</b><br>1.300 | 58425-2                                                                                 | —                                                                    | <b>5413760-8</b> |
|                                                                                             | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>30.48</b><br>1.200 | 318451-2                                                                                | —                                                                    | <b>5221199-5</b> |
| BELDEN 8218                                                                                 | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>33.02</b><br>1.300 | 58425-2                                                                                 | —                                                                    | <b>5413760-3</b> |
| 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269                               | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>30.48</b><br>1.200 | 58536-1                                                                                 | 58248-2                                                              | <b>5221199-2</b> |
| 302, BELDEN 88241, 89269, Hi-Temp 62A, Times PL-62, Berk Tek BTDC-59, BTDC-62               | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>33.02</b><br>1.300 | 58425-1                                                                                 | —                                                                    | <b>5413760-1</b> |
| BELDEN 8212, 9104, 9112, 9240, 9167, 9259, 9266, Times FM-59, (RG 59 Type with 20 AWG C.C.) | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>33.02</b><br>1.300 | 58425-1                                                                                 | —                                                                    | <b>5413760-9</b> |
| BELDEN 9248, 9114                                                                           | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>30.48</b><br>1.200 | 58536-1                                                                                 | —                                                                    | <b>5221199-1</b> |

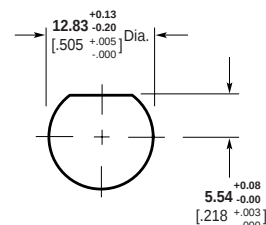
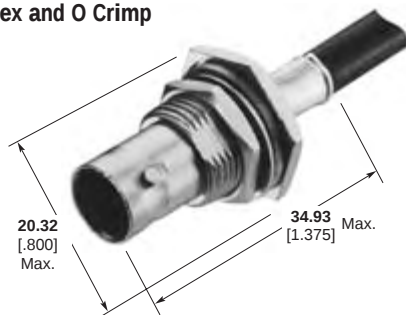
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**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

### Bulkhead Jacks, Crimp

### Hex and O Crimp



Maximum Panel Thickness 6.1 [.240]

**Recommended Panel Cutout**

| RG/U Cable                                                                                 | Termination Type | Center Contact Plating | Body Plating | Dielectric   | Style      | Dim. L                | Interchangeable Dies for PRO-CRIMPER Hand Tool 354940-1 or PRO-CRIMPER Adapter 679304-1 | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.         |
|--------------------------------------------------------------------------------------------|------------------|------------------------|--------------|--------------|------------|-----------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------|
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221                                               | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>36.83</b><br>1.450 | 58425-2                                                                                 | —                                                                    | <b>5413590-8</b> |
|                                                                                            | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>34.93</b><br>1.375 | 318451-2                                                                                | —                                                                    | <b>5221221-5</b> |
| AT&T KS 19224 L2, RD179 Double Braid                                                       | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>36.83</b><br>1.450 | 58425-2                                                                                 | —                                                                    | <b>5413590-4</b> |
| BELDEN 8218                                                                                | Hex Crimp        | Gold                   | Nickel       | Polyethylene | Commercial | <b>36.83</b><br>1.450 | 58425-2                                                                                 | —                                                                    | <b>5413590-3</b> |
| 140, 210, 62, 62A, 62B, 59, 59A, 59B, BELDEN 9291, 9209, 9269                              | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>34.93</b><br>1.375 | 58536-1                                                                                 | 58248-2                                                              | <b>5221221-2</b> |
| BELDEN 8212, 9104, 9112, 9240, 9167, 9259, 9266, Times FM-59 (RG 59 Type with 20 AWG C.C.) | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>34.93</b><br>1.375 | 58536-1                                                                                 | 58248-2                                                              | <b>5221221-7</b> |
| BELDEN 9114, 9248                                                                          | O Crimp          | Gold                   | Nickel       | Polyethylene | Commercial | <b>34.93</b><br>1.375 | 58536-1                                                                                 | —                                                                    | <b>5221221-1</b> |

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**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

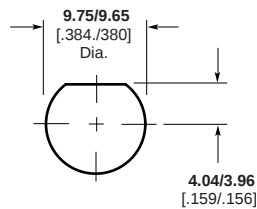
## BNC Connectors, 75 Ohm (Continued)

### Bulkhead Solder Jacks Front Mount

#### Plating

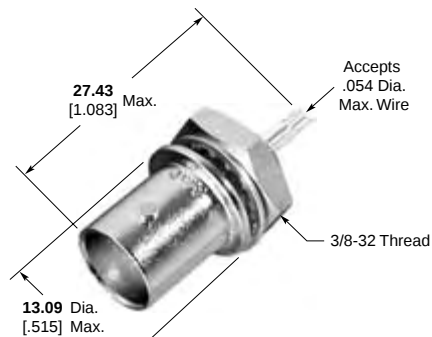
Body — Nickel

Center Contact — Silver



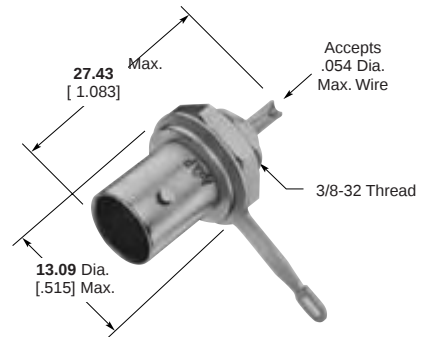
Maximum Panel Thickness 3.18 [.125]

#### Recommended Panel Cutout



**Part No. 5415187-1**  
(without Solder Terminal)

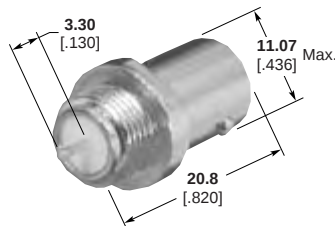
**Note:** If insulating bushing required use part no. 227223-1 or 221951-1 (for details, reference page 55).



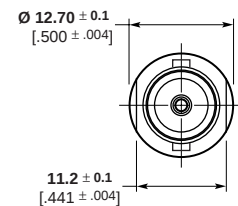
**Part No. 5221244-1**  
(with Solder Terminal)

**Note:** If insulating bushing required use part no. 227223-1 or 221951-1 (for details, reference page 55).

### Bulkhead Jack PC Board Mount



**Part No. 6274086-1**



### Bulkhead Solder Jack Rear Mount

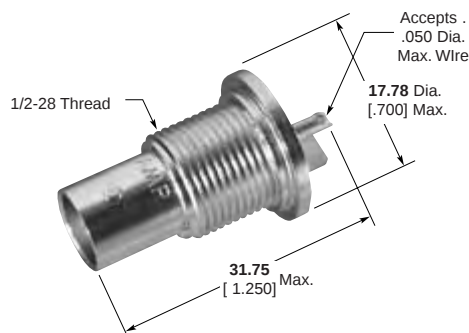
Lockwasher and Jam Nut see page 73.

#### Plating

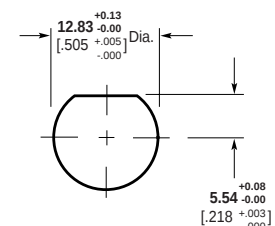
Body — Nickel

Center Contact — Gold

Dielectric — Polymethylpentene



**Part No. 5414217-1**



Maximum Panel Thickness 6.35 [.250]

#### Recommended Panel Cutout

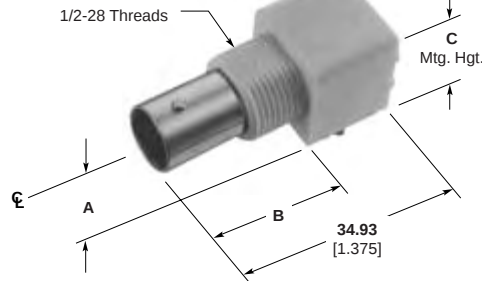
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

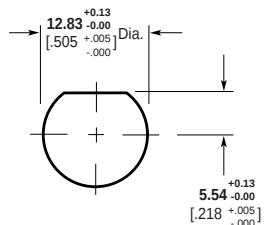
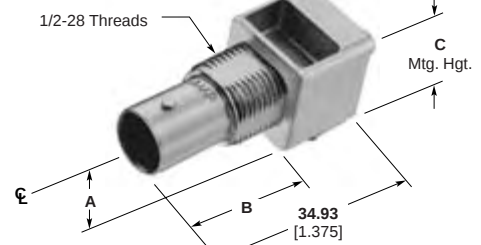
### Right-Angle Jacks PC Board/Panel Mount

**Outer Shell** — Nickel  
**Dielectric** — Polymethylpentene  
 Lockwasher and Jam Nut see page 73.

#### VALOX Body

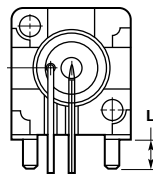


#### Metal Body



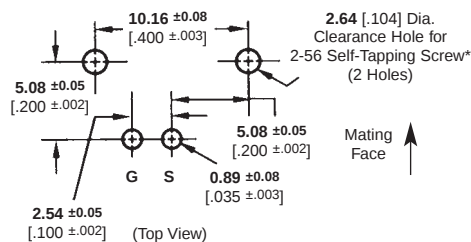
Maximum Panel Thickness **6.1** [.240]

#### Recommended Panel Cutout

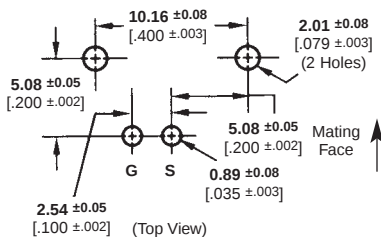


### Recommended PC Board Layouts

#### Without Mounting Posts



#### With Mounting Posts



\* Screw for panel thickness of **2.38** [3/32] or greater  
**Part No. 221108-2.**  
 Screw for panel thickness of less than **2.38** [3/32]  
**Part No. 221108-4.**

| Body Material                              | Center Contact Plating | Dimensions   |               |               |              | Part No.               |                     |
|--------------------------------------------|------------------------|--------------|---------------|---------------|--------------|------------------------|---------------------|
|                                            |                        | A            | B             | C             | L            | Without Mounting Posts | With Mounting Posts |
| VALOX, Black w/ Compliant Posts (Economy)* | Gold3                  | 6.17<br>.243 | 21.21<br>.835 | 11.68<br>.460 | 2.79<br>.110 | —                      | 5415105-2           |
| VALOX, Black (Economy)*                    | Gold3                  | 6.17<br>.243 | 21.21<br>.835 | 11.68<br>.460 | 4.01<br>.158 | —                      | 5415105-1           |
| VALOX, White                               | Gold1                  | 6.91<br>.272 | 21.21<br>.835 | 13.88<br>.519 | 3.48<br>.137 | —                      | 5413194-1           |
| VALOX, White (Economy)*                    | Gold1                  | 6.91<br>.272 | 21.21<br>.835 | 13.88<br>.519 | 3.48<br>.137 | —                      | 5415634-2           |
| VALOX, Black                               | Gold1                  | 6.91<br>.272 | 21.21<br>.835 | 13.88<br>.519 | 3.48<br>.137 | —                      | 5413194-2           |
| VALOX, Black (Economy)*                    | Gold1                  | 6.91<br>.272 | 21.21<br>.835 | 13.88<br>.519 | 3.48<br>.137 | —                      | 5415634-1           |
| VALOX, Black (Economy)*                    | Gold1                  | 8.59<br>.338 | 21.21<br>.835 | 15.88<br>.625 | 3.48<br>.137 | —                      | 5415633-1           |
| VALOX, White                               | Gold2                  | 8.59<br>.338 | 21.21<br>.835 | 15.88<br>.625 | 3.48<br>.137 | —                      | 5414459-1           |
| Metal                                      | Gold1                  | 8.25<br>.325 | 20.83<br>.820 | 15.88<br>.625 | 2.16<br>.085 | —                      | 5222092-1           |
| Metal                                      | Gold1                  | 8.25<br>.325 | 20.83<br>.820 | 15.88<br>.625 | —            | 5222093-1              | —                   |
| Metal (Economy)*                           | Gold1                  | 8.25<br>.325 | 20.83<br>.820 | 15.88<br>.625 | 3.48<br>.137 | —                      | 5414409-1           |
| Metal with Compliant Posts (Economy)*      | Gold1                  | 6.91<br>.272 | 20.83<br>.820 | 12.70<br>.500 | 3.48<br>.137 | —                      | 5415417-1           |
| Metal with Compliant Posts (Economy)*      | Tin                    | 8.56<br>.337 | 21.21<br>.835 | 15.88<br>.625 | 3.48<br>.137 | —                      | 5415419-1           |
| Metal                                      | Gold1                  | 8.25<br>.325 | 20.83<br>.820 | 15.88<br>.625 | 3.48<br>.137 | —                      | 5222092-3           |
| Metal                                      | Gold1                  | 6.91<br>.272 | 20.83<br>.820 | 12.70<br>.500 | 3.48<br>.137 | —                      | 5414907-1           |
| Metal                                      | Gold1                  | 6.91<br>.272 | 20.83<br>.820 | 12.70<br>.500 | —            | 6274072-1              | —                   |
| Metal (Economy)*                           | Gold1                  | 6.91<br>.272 | 20.83<br>.820 | 12.70<br>.500 | 3.48<br>.137 | —                      | 6274084-1           |

\*Economy connector uses 50  $\Omega$  part with smaller dielectric and stamped and formed contact, Phosphor Bronze contact material (Compare to regular connector which is 75  $\Omega$ , screw machined Beryllium Copper).

#### Plating:

Gold1 — 0.00076 [.000030] thick  
 Gold2 — 0.00127 [.000050] thick

**Note:** If an Insulating Bushing is required see part number 330620 and Panel Cutout on page 54.

VALOX is a trademark of General Electric Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

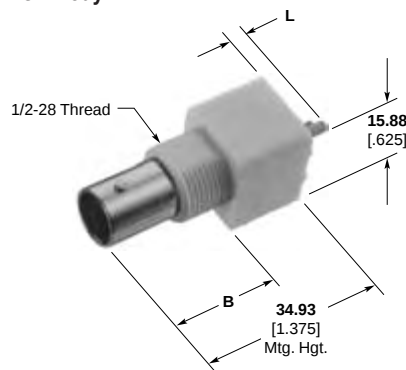
### Vertical Jacks PC Board/Panel Mount

#### Plating

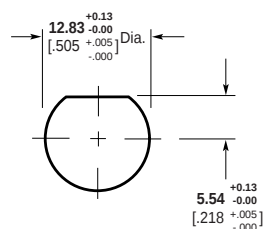
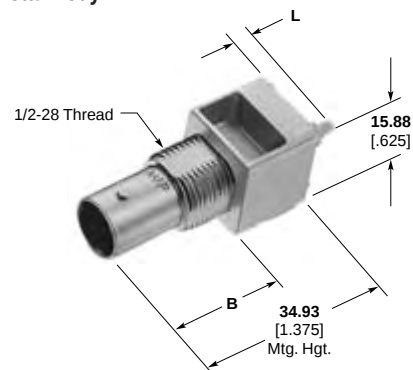
**Outer Shell**—Nickel

**Dielectric**—Polymethylpentene

#### VALOX Body



#### Metal Body



Maximum Panel Thickness 6.1 [.240]

#### Recommended Panel Cutout

| Body Material           | Contact Plating | Dim. B     | Dim. L    | Part No.  |
|-------------------------|-----------------|------------|-----------|-----------|
| VALOX, Black (Economy)* | Gold1           | 21.21 .835 | 3.48 .137 | 5415632-1 |
| VALOX, White (Economy)* | Gold1           | 21.21 .835 | 3.48 .137 | 5415632-2 |
| Metal                   | Gold1           | 20.83 .820 | 3.48 .137 | 5222132-1 |
| Metal (Economy)*        | Tin             | 21.21 .835 | 3.48 .137 | 5415520-1 |

\*Economy connector uses 50  $\Omega$  part with smaller dielectric and stamped and formed contact, Phosphor Bronze contact material (Compare to regular connector which is 75  $\Omega$ , screw machined Beryllium Copper).

#### Plating:

Gold1—0.00076 [.000030] thick

**Note:** If an Insulating Bushing is required see part number 330620 and Panel Cutout on page 54.

#### Lockwasher and Jam Nut



Part No.  
1-329632-2



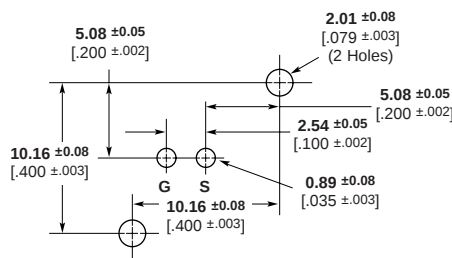
Part No.  
1-329631-2

\* Screw for panel thickness of 2.38 [3/32] or greater

Part No. 221108-2.

Screw for panel thickness of less than 2.38 [3/32]

Part No. 221108-4.



(Top View)

#### Recommended PC Board Layout

VALOX is a trademark of General Electric Company.

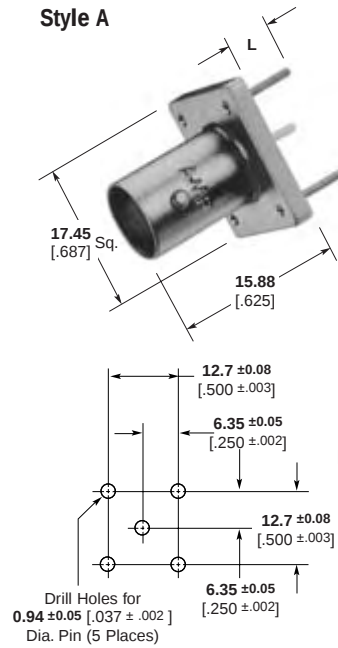
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

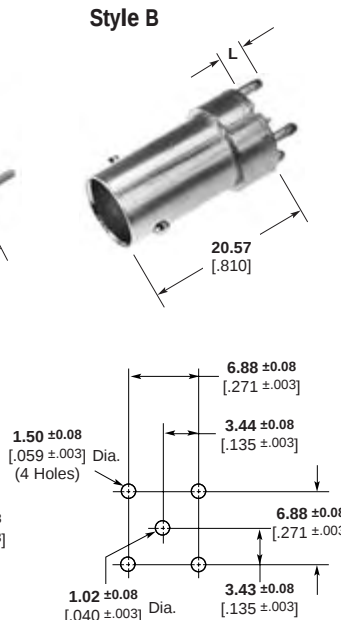
### Vertical Metalized Jacks PC Board Mount

Plating  
Dielectric — 37)(

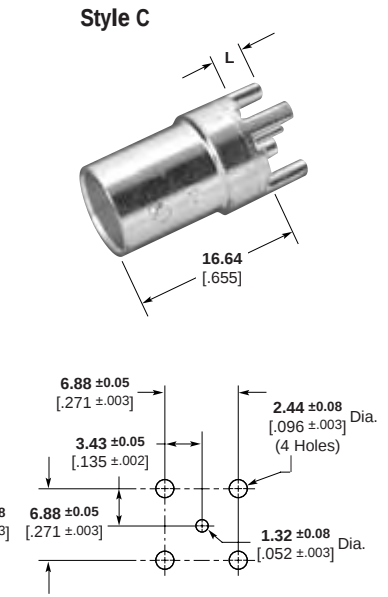
Style A



Style B

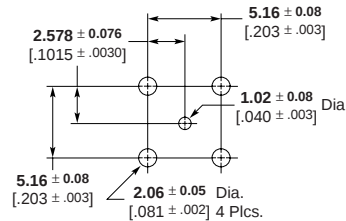
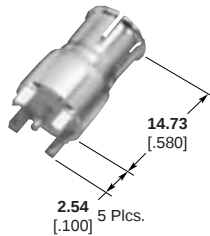


Style C



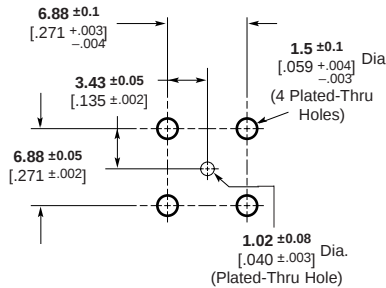
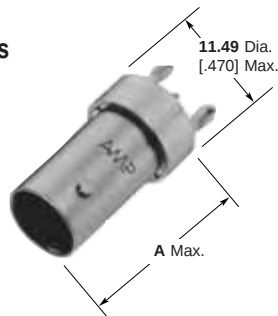
Recommended PC Board Layout

Style F (Push-On)



| Body Plating | Center Contact Plating | Style | Leg Length L | Part No.  |
|--------------|------------------------|-------|--------------|-----------|
| Nickel       | Gold                   | B     | 3.30 .130    | 6274291-2 |
| Tin          | Gold                   | B     | 3.30 .130    | 6274291-1 |
| Tin          | Gold                   | B     | 6.35 .250    | 6274359-1 |
| Tin          | Gold                   | C     | 4.44 .175    | 5414394-1 |
| Nickel       | Silver                 | A     | 6.35 .250    | 5413986-1 |
| Tin          | Gold                   | F     | 2.54 .100    | 6274360-1 |

### Press Fit Vertical Metalized Jacks PC Board Mount

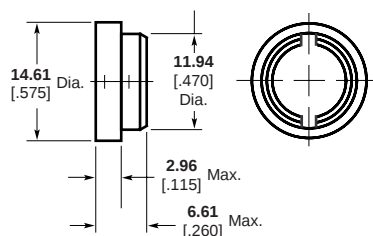


Recommended PC Board Layout

| Dim. A     | Part No.  |
|------------|-----------|
| 20.57 .810 | 5222462-1 |
| 16.26 .640 | 5414088-1 |

### Insulating Bushing

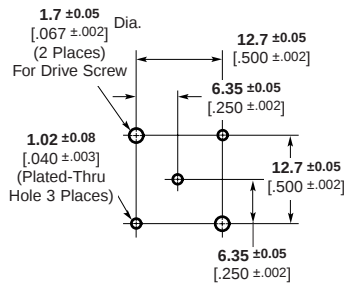
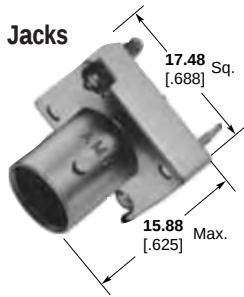
Material — Nylon  
Part No. 222163-1  
Only to be used on Part Nos.  
5222462-1 and 5222006-1



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

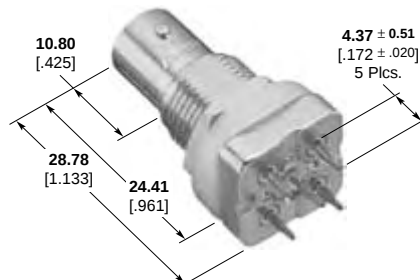
### Press Fit Vertical Metalized Jacks PC Board Mount (Continued)



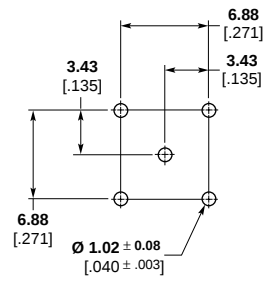
| PC Board Thickness (Min.) | Part No.  |
|---------------------------|-----------|
| 2.36<br>.093              | 5221336-3 |
| 3.17<br>.125              | 5221336-4 |

Recommended PC Board Layout

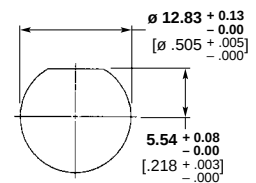
### Press Fit, Bulkhead Vertical Metalized Jack includes hardware



Part No. 6274124-2

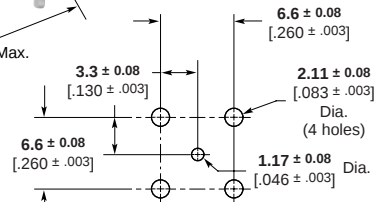
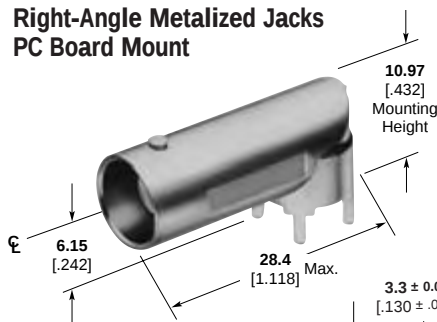


Holes Plated  
Through 5 Plcs.



Recommended  
PC Board Layout

### Right-Angle Metalized Jacks PC Board Mount

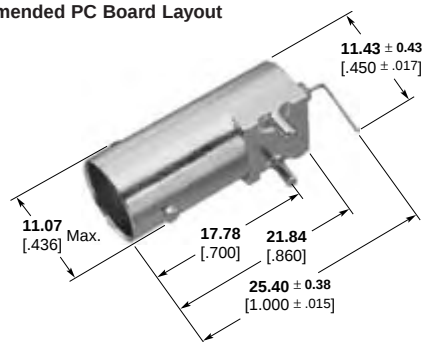


Maximum PC Board Thickness 2.54 [.100]

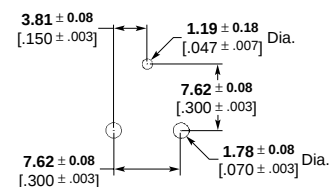
Recommended PC Board Layout

| Body Plating | Dielectric | Contact Plating | Center Contact Dimension | Part No.  |
|--------------|------------|-----------------|--------------------------|-----------|
| Nickel       | TPX        | Gold2           | .171 [.007]              | 5413558-1 |
| Tin          |            | Gold2           | .171 [.007]              | 5413558-2 |
| Nickel       | TPX        | Gold2           | .131 [.005]              | 5413558-3 |
| Nickel       | TPX        | Gold1           | .171 [.007]              | 5413558-5 |

Gold1—0.00076 [.000030] thick  
Gold2—0.00127 [.000050] thick



Part No. 6274127-1

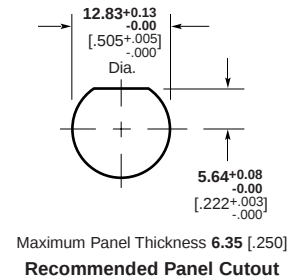
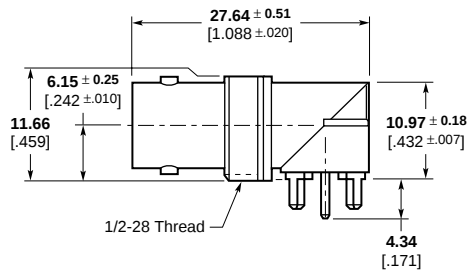


TPX is a trademark of Mitsui Chemicals America, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

### Right-Angle Metalized Jacks PC Board/Panel Mount

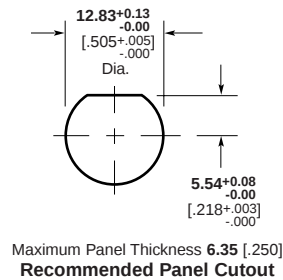
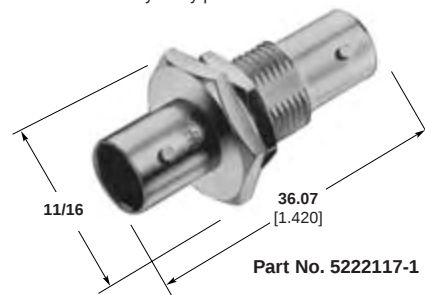


| Body Plating | Dielectric | Part No.  |
|--------------|------------|-----------|
| Tin          | 3 7 ) (    | 6274425-2 |

### Bulkhead Jack-Jack Adapter

#### Plating

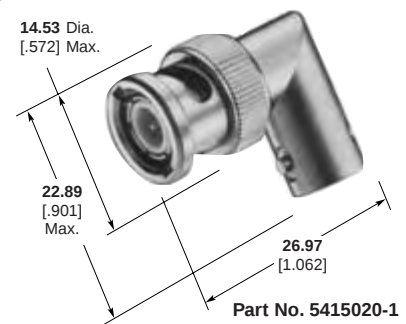
Body — Nickel  
Center Contact — Gold  
Dielectric — Polymethylpentene



### Right-Angle Adapter (Jack-Plug)

#### Plating

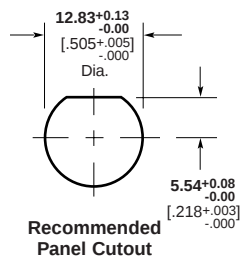
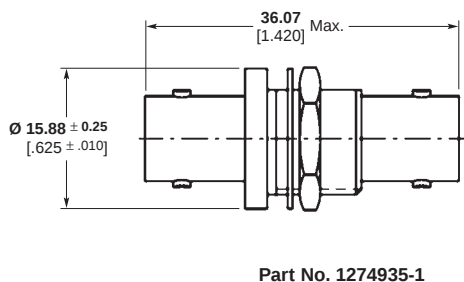
Body — Nickel  
Center Contact — Gold  
Dielectric — Polymethylpentene



### Bulkhead Jack-Jack Adapter

#### Plating

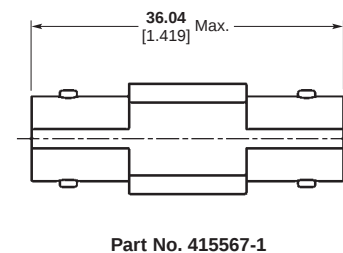
Body — Nickel  
Center Contact — Gold  
Dielectric — Polymethylpentene



### Jack-Jack Adapter

#### Plating

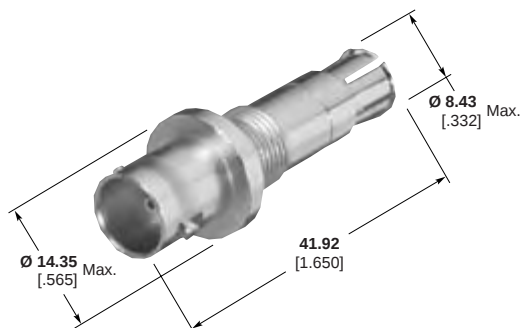
Body — Nickel  
Center Contact — Gold  
Dielectric — Polymethylpentene



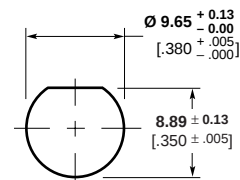
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## BNC Connectors, 75 Ohm (Continued)

### Bulkhead Jack-Push On Plug Adapter



Part No. 1274007-1



Recommended Panel Cutout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Mini BNC Connectors, 75 Ohm

### Product Facts

- Bayonet locking coupling mechanism
- 40% more interconnects in the same area
- Compatible with TROMPETER tooling
- Ideal for telecommunications and broadband applications



Tyco Electronics introduces the Mini BNC series of RF connectors to meet the growing demand for next generation telecommunications and broadband applications where higher connector densities are needed. Preserving the characteristics that have made the standard BNC so popular, the Mini BNC offers the same high performance currently found in standard Tyco Electronics BNC series, but offers 40% more interconnects in the same area.

The Mini BNC offering is an excellent fit for 75 Ohm systems, offering 500 mating cycles, electrical performance through 2 GHz, and is completely interchangeable with competitive miniature BNC offerings. Tyco Electronics' Mini BNC product offers the same advantage of the bayonet locking mechanism as our standard BNC, allowing quicker connect and disconnects than standard

threaded interfaces. It uses standard BNC installation tooling meaning there is no need for retraining of field telco installers, and it utilizes the same PCB footprint on the jack side, providing a drop in replacement for DS3 telco applications.

Mini BNC connector configurations currently available include PCB, panel mount, and flexible cable. Other options can be reviewed as well, including additional cable sizes, adapters, PCB surface mounting, and tape and reel packaging. Call your local sales office or authorized distributor for additional information or samples of the Mini BNC connector series.

Tyco Electronics is a leading supplier of RF and Microwave connectors and cable assemblies, and provides advanced technology products from well known and industry leading brands, including AMP and M/A-COM.

### Material and Finish

**Shells, Bodies, Mtg Nuts** — Brass, nickel plated

**Washers** — Stainless Steel, nickel plated

**Ferrule** — Copper or Brass, tin plated

**Center Contacts** — Phos Bronze and Brass, gold plated

**Dielectrics** — PTFE

### Electrical Characteristics

**Frequency** — DC – 2 GHz

**Nominal Impedance** — 75 ohms

**Voltage Rating** — 300 Volts (VRMS maximum) @ Sea Level

**VSWR** —

1.10 max to 500 MHz  
(Return Loss -26.4 dB)

1.16 max to 1 GHz  
(Return Loss -22.6 dB)

**Insulation Resistance** —  
1,000 megohms minimum

**Dielectric Withstanding Voltage** —  
1,000 Volts (VRMS maximum) @  
Sea Level

**Contact Resistance** —  
12 milliohms maximum

### Mechanical Characteristics

**Connector Durability** —  
500 mating cycles

**Force to Engage** —  
7 pounds maximum

**Force to Disengage** —  
1 pound minimum

**Center Contact Retention** —  
2 pounds minimum

**Cable Retention** —  
20 pounds minimum

**Vibration** — EIA-364-28,  
Test Condition VII, Condition D

**Shock** — EIA-364-27, Method H

### Environmental Characteristics

**Temperature Rating** —  
-40 to +85°C

**Moisture Resistance** — EIA-364-31,  
Method II, Condition C

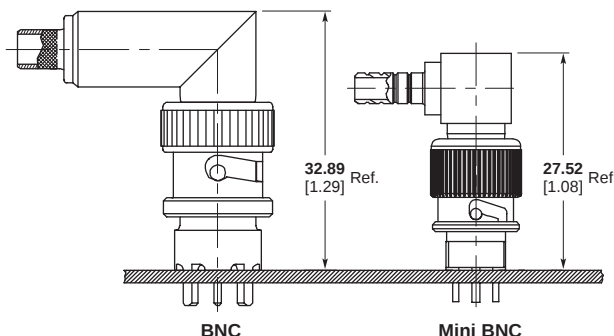
**Thermal Shock** — EIA-364-32

**Note:** Performance specifications are typical, but may not apply to all connector types.

### Related Product Data

**Product Specification** — 108-2159

**Sample Kit** — 1773042

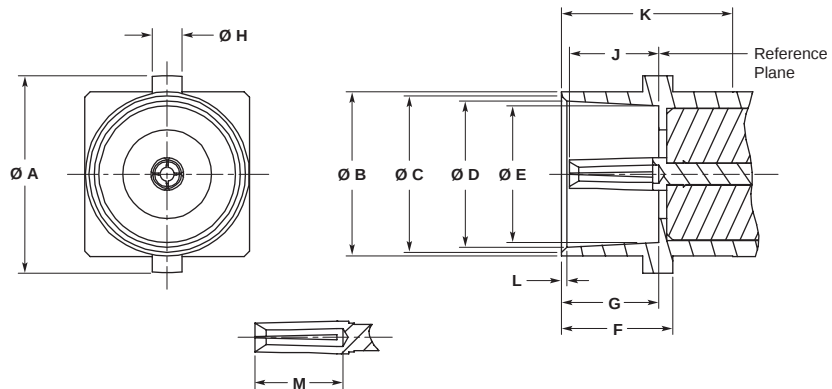


TROMPETER is a trademark of Trompeter Electronics, Inc.

## Mini BNC Connectors, 75 Ohm (Continued)

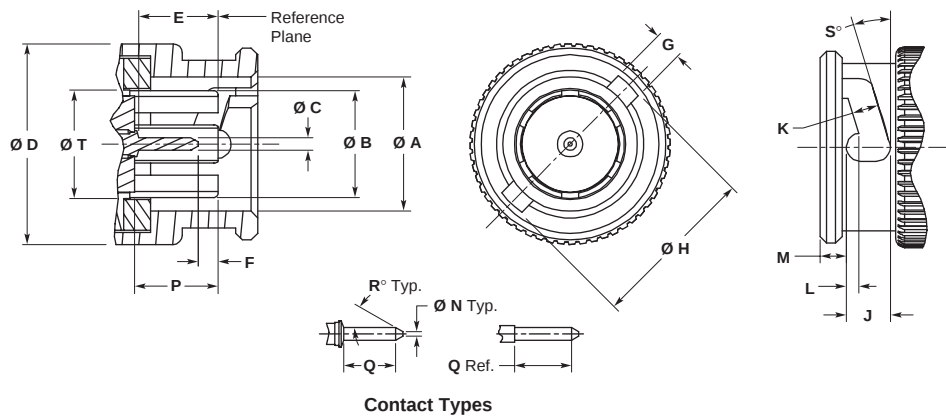
### Interface Dimensions

#### Mini BNC Jack



| Dimensions             |                        |                        |                        |                        |                        |                        |                        |                        |                   |                        |                   |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------|------------------------|-------------------|
| A                      | B                      | C                      | D                      | E                      | F                      | G                      | H                      | J                      | K                 | L                      | M                 |
| 8.89–9.14<br>.350–.360 | 7.37–7.62<br>.290–.300 | 7.11–7.21<br>.280–.284 | 6.63–6.73<br>.261–.265 | 6.20–6.30<br>.244–.248 | 5.03–5.13<br>.198–.202 | 4.39–4.50<br>.173–.177 | 1.32–1.42<br>.052–.056 | 3.86–4.27<br>.152–.168 | 7.70<br>.303 Min. | 0.18–0.30<br>.007–.012 | 4.01<br>.158 Min. |

#### Mini BNC Plug



Contact Types

| Dimensions             |   |                        |                          |                        |                        |                        |                        |                        |
|------------------------|---|------------------------|--------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| A                      | B | C                      | D                        | E                      | F                      | G                      | H                      | J                      |
| 7.70–7.80<br>.303–.307 | — | 0.71–0.76<br>.028–.030 | 11.43–11.68<br>.450–.460 | 4.27–4.93<br>.168–.194 | 0.94–1.35<br>.037–.053 | 1.57–1.68<br>.062–.066 | 9.60–9.70<br>.378–.382 | 2.50–2.59<br>.098–.102 |

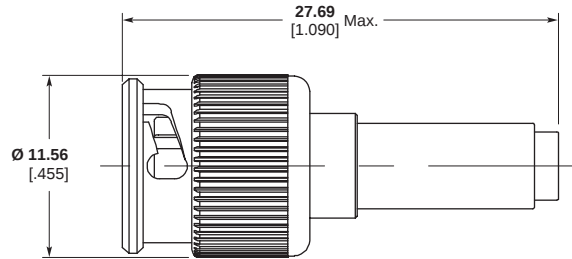
  

| Dimensions             |                        |                        |                        |                        |                        |         |         |                        |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------|---------|------------------------|
| K                      | L                      | M                      | N                      | P                      | Q                      | R       | S       | T                      |
| 1.57–1.68<br>.062–.066 | 0.64–0.74<br>.025–.029 | 1.47–1.57<br>.058–.062 | 0.20–0.30<br>.008–.012 | 4.62–4.93<br>.182–.194 | 2.84–3.38<br>.112–.133 | 29°–31° | 14°–16° | 6.20–6.30<br>.244–.248 |

## Mini BNC Connectors, 75 Ohm (Continued)

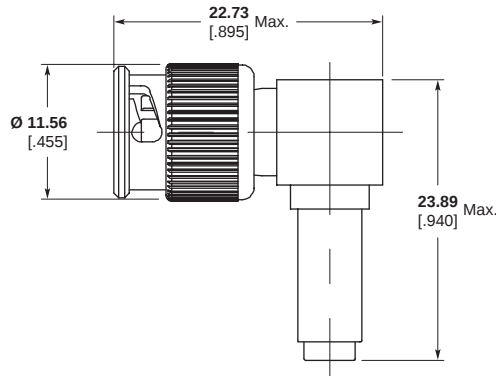
### Flexible Cable — Crimp Attachment

#### Straight Cable Plug



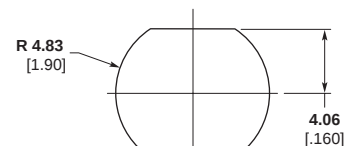
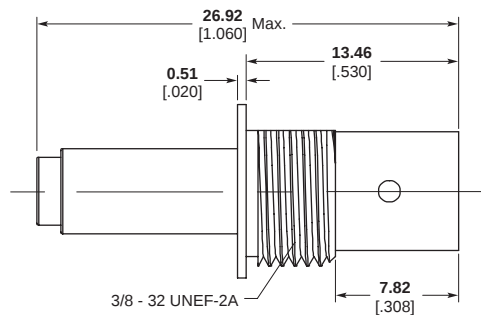
| Cable  | Part Number |
|--------|-------------|
| 735A   | 1274563-1   |
| 734A   | 1274563-2   |
| RG 179 | 1274563-3   |

#### Right-Angle Cable Plug



| Cable  | Part Number |
|--------|-------------|
| 735A   | 1274566-1   |
| 734A   | 1274566-2   |
| RG 179 | 1274566-3   |

#### Bulkhead Cable Jack



**Recommended Panel Cutout**  
Tolerance:  $\pm 0.08$  [.003]

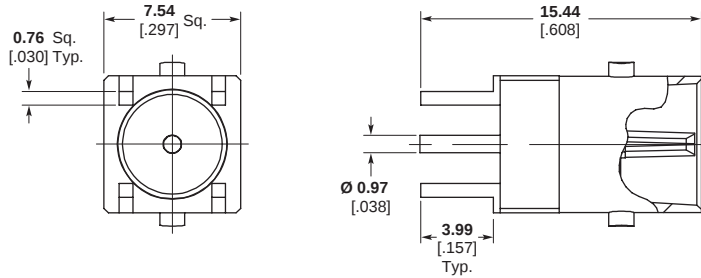
| Cable  | Part Number |
|--------|-------------|
| 735A   | 1274568-1   |
| 734A   | 1274568-2   |
| RG 179 | 1274568-3   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Mini BNC Connectors, 75 Ohm (Continued)

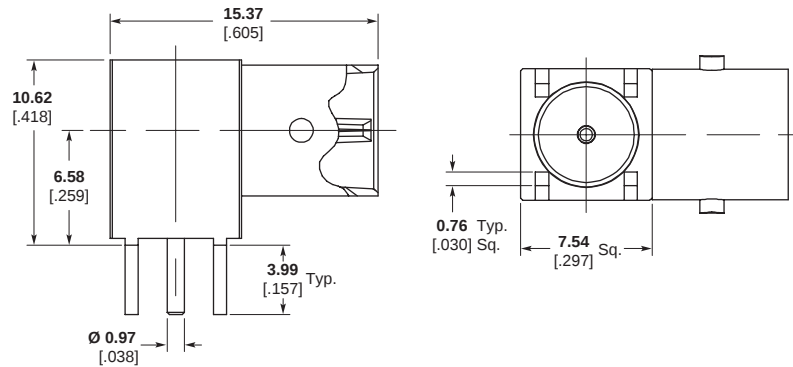
### Printed Circuit Board

#### Straight Jack Receptacle



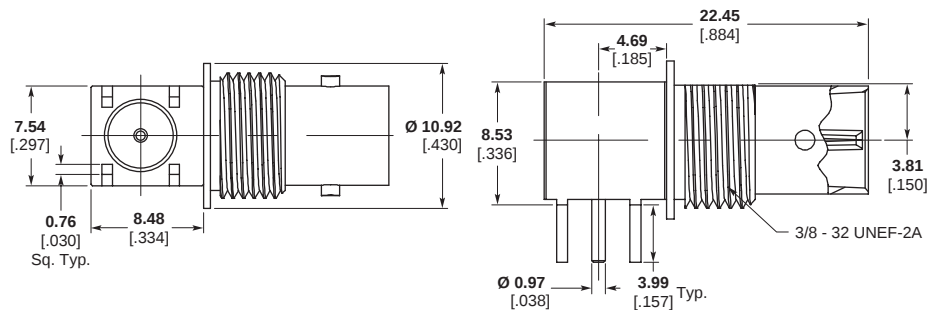
Part Number  
1274571-1

#### Right-Angle Jack Receptacle



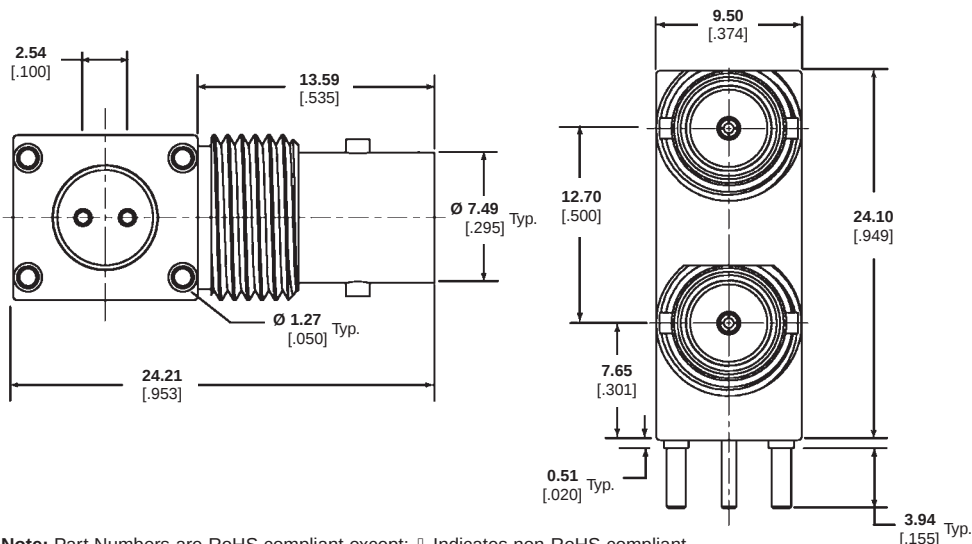
Part Number  
1274572-1

#### Right-Angle Bulkhead Jack Receptacle



Part Number  
1274584-1

#### 2 Position, Right-Angle, Bulkhead Jack Receptacle



| Description      | Part Number |
|------------------|-------------|
| With Hardware    | 1274663-2   |
| Without Hardware | 1274684-1   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Decoupled Connectors

### Product Facts

- Built-in chip capacitors filter high-frequency noise to panel ground
- PC board mounting with vertical and standard or low-profile right-angle configurations
- Cable mount bulkhead BNC version available
- Drop-in replacement for Tyco Electronics standard BNC printed circuit board connectors
- One-piece design and robotic capacity to reduce assembly time



Tyco Electronics capacitively decoupled connectors provide the fast, better way to reduce noise and reduce ground loops on coaxial interconnections. The high-frequency noise generated by fast rise times can cause both false triggering of circuits as well as emissions that can be radiated or conducted outside the equipment. Such emissions can interfere with nearby equipment. Ground loops are also a problem for networked systems. Ground loops are caused when two interconnected units are at different voltage potentials.

The typical way to handle such EMI and ground loop problems is to decouple the cable shield from the ground panel by soldering a ceramic disk capacitor between the cable shield and the panel. The capacitor shunts high-frequency noise to ground. While effective, this approach is time consuming and expensive.

The Capacitively Decoupled connector has built-in chip capacitors. These capacitors establish the electrical contact between the outer shield and a clip. This clip provides a short electrical

path between the capacitors and panel. As a result, high-frequency noise is effectively shunted to ground, while the DC path is blocked.

The connectors offer compatibility in design and manufacture. The same footprint and dimensional envelope make them a drop-in replacement for Tyco Electronics standard BNC or TNC printed circuit board connectors. In addition, they can be robotically picked and placed for high-speed automated assembly to pc boards.

### Product Specification

108-1263 — BNC Decoupled PCB Press-Fit Connection

108-1269 — BNC Decoupled PCB Connectors

108-1490 — BNC Decoupled Cable Mount

## Decoupled Connectors (Continued)

### PC Board/Panel Mount Jacks Decoupled to Panel

#### Style A Vertical BNC

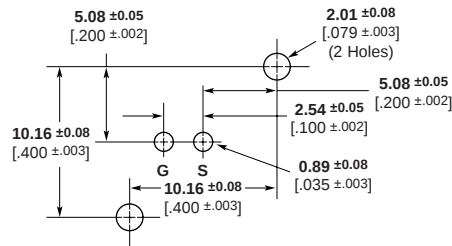
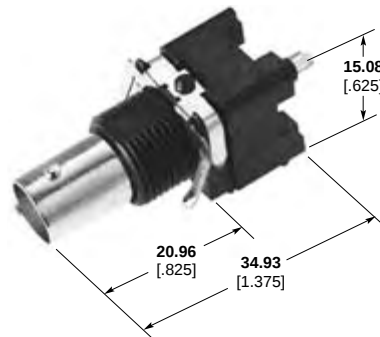
#### Material

**Body** — VALOX, black

**Dielectric** — Polymethylpentene

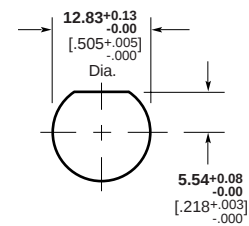
**Note:** Both styles are shown with a standard clip. See next page for other clip styles.

For height dimensions see chart on page 85.



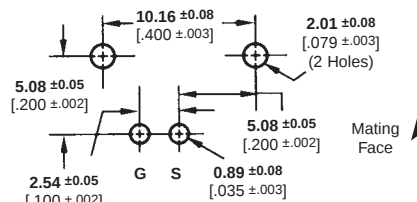
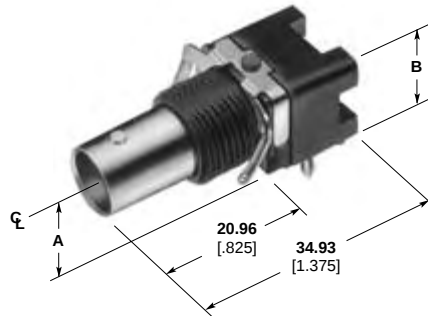
(Top View)

Recommended PC Board Layout



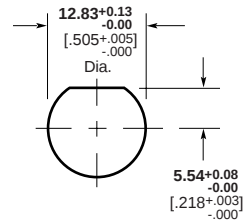
Maximum Panel Thickness 6.1 [0.240]  
Recommended Panel Cutout

#### Style B Right-Angle BNC



(Top View)

Recommended PC Board Layout

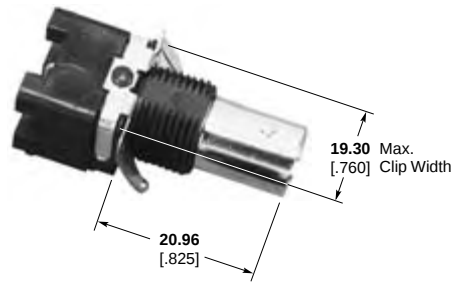


Maximum Panel Thickness 6.1 [0.240]  
Recommended Panel Cutout

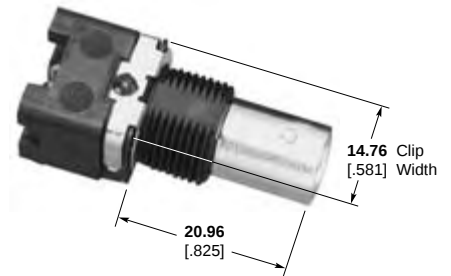
VALOX is a trademark of General Electric Company.

## Decoupled Connectors (Continued)

### Clip Styles

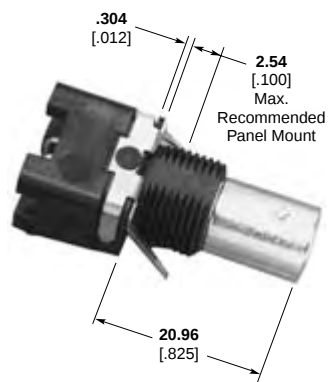


**Standard**



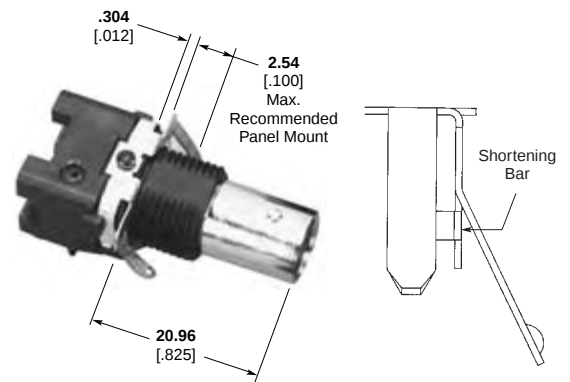
**Flush**

For closer centerline-to-centerline connector spacing



**Extended**

For use with or without a jam nut



**Short Electrical Path**

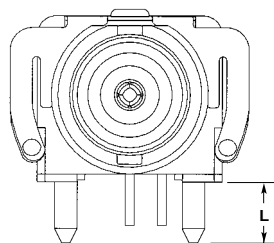
For reduced series inductance in ground path

## Decoupled Connectors (Continued)

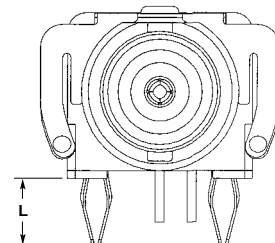
### PC Board/Panel Mount Jacks Decoupled to Panel

(Continued)

#### Mounting Post Styles



Standard



Compliant

### BNC

| Description                                                                      | Capacitance/<br>Voltage | Clip     | Mounting<br>Post | L<br>Mounting<br>Post Length | B*            | A*            | Style <sup>1</sup> | Part<br>No. |
|----------------------------------------------------------------------------------|-------------------------|----------|------------------|------------------------------|---------------|---------------|--------------------|-------------|
| Vertical<br>50 Ω                                                                 | 9400pF<br>1500VDC       | Standard | Standard         | 3.48<br>.137                 | —             | —             | A                  | 5413476-2   |
| Standard<br>Right-Angle<br>50 Ω                                                  | 9400pF<br>1500VDC       | Standard | Standard         | 4.01<br>.158                 | 15.88<br>.625 | 8.59<br>.338  | B                  | 5413524-2   |
|                                                                                  | 9400pF<br>1500VDC       | Standard | Compliant        | 2.79<br>.110                 | 15.88<br>.625 | 8.59<br>.338  | B                  | 5413524-5   |
| Standard Right-Angle<br>W/O Mounting Post 50 Ω <sup>2</sup>                      | 9400pF<br>1500VDC       | Standard | —                | —                            | 15.88<br>.625 | 8.59<br>.338  | B                  | 5414215-1   |
| Low Profile<br>Right-Angle<br>50 Ω                                               | 9400pF<br>1500VDC       | Standard | Standard         | 4.01<br>.158                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5413515-2   |
|                                                                                  | 20000pF<br>500VDC       | Standard | Standard         | 4.01<br>.158                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5413515-3   |
|                                                                                  | 7900pF<br>1600VDC       | Standard | Compliant        | 2.79<br>.110                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5413515-7   |
|                                                                                  | 9400pF<br>1500VDC       | Standard | Compliant        | 4.70<br>.185                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5413515-8   |
|                                                                                  | 9400pF<br>1500VDC       | Standard | Compliant        | 2.79<br>.110                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5413515-9   |
| Low Profile Right-<br>Angle W/Special Clip<br>& High Temperature<br>Housing 50 Ω | 9400pF<br>500VDC        | Extended | Compliant        | 2.79<br>.110                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5414284-2   |
| Low Profile<br>Right-Angle<br>W/High Temperature<br>Housing 50 Ω                 | 9400pF<br>500VDC        | Flush    | Compliant        | 4.70<br>.185                 | 13.18<br>.519 | 6.91<br>.272  | B                  | 5414352-1   |
| Low Profile<br>Right-Angle 75 Ω                                                  | 9400pF<br>1500VDC       | Standard | Standard         | 4.01<br>.158                 | 13.18<br>.519 | —             | B                  | 5414094-2   |
| Ultra Low Profile<br>Right-Angle<br>75 Ω                                         | 9400pF<br>1500VDC       | Standard | Standard         | 4.01<br>.158                 | 6.17<br>.243  | 11.68<br>.460 | —                  | 5415103-1   |
|                                                                                  | 9400pF<br>1500VDC       | Standard | Compliant        | 2.79<br>.110                 | 6.17<br>.243  | 11.68<br>.460 | —                  | 5415103-2   |

<sup>1</sup>See pages 83 and 84 for Connector Styles.

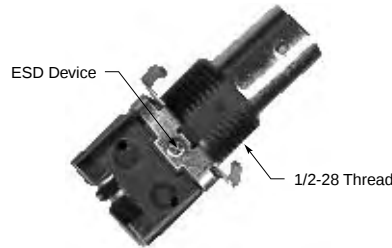
<sup>2</sup>See customer drawing for PC Board Layout.

\*See page 83 for dimension reference.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Decoupled Connectors (Continued)

### Right-Angle BNC Jack PC Board/Panel Mount Decoupled to Panel ESD Protected



See page 83 Style B for panel cutout and recommended PC board configuration.

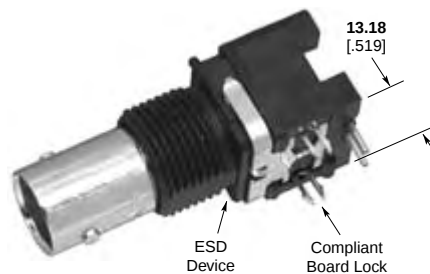
**Note:** See Tyco Electronics Customer drawing for voltage breakdown rating.

| Description                                     | Capacitance/<br>Voltage | Contact<br>Plating | Clip     | Mounting<br>Post | L<br>Mounting<br>Post Length | B*            | A*           | Part<br>No. |
|-------------------------------------------------|-------------------------|--------------------|----------|------------------|------------------------------|---------------|--------------|-------------|
| <b>50 Product</b>                               |                         |                    |          |                  |                              |               |              |             |
| Low Profile<br>Right-Angle<br>W/ ESD Protection | 7900pF<br>1500VDC       | Gold1              | Standard | Compliant        | 2.79<br>.110                 | 13.18<br>.519 | 6.91<br>.272 | 5414651-3   |
| <b>75 Product</b>                               |                         |                    |          |                  |                              |               |              |             |
| Standard<br>Right-Angle<br>W/ ESD Protection    | 9400pF<br>1500VDC       | Gold1              | Standard | Standard         | 4.01<br>.158                 | 15.88<br>.625 | 8.59<br>.338 | 5415085-1   |
| Low Profile<br>Right-Angle<br>ESD Protected     | 9400pF<br>1500VDC       | Gold1              | Flush    | Compliant        | 2.79<br>.110                 | 13.18<br>.519 | 6.91<br>.272 | 5415216-1   |

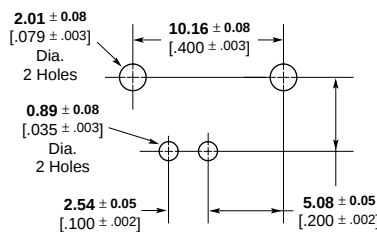
\*See page 83 for dimension reference.

### Right-Angle BNC Jack PC Board/Panel Mount Decoupled to Board ESD Protected

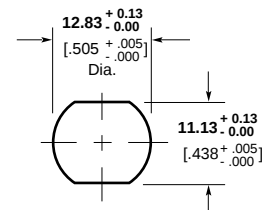
| Capacitance | Voltage |
|-------------|---------|
| 9400pF      | 1500VDC |



Part No. 5415205-1



Recommended PC Board Layout



Recommended Panel Cutout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Decoupled Connectors (Continued)

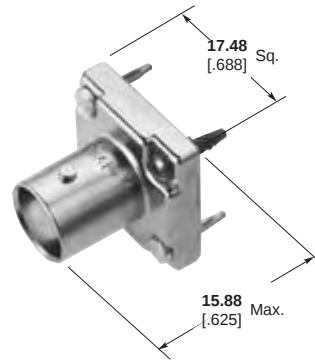
### Press-Fit, Vertical BNC Jacks, PC Board Mount Decoupled to Board

#### Material

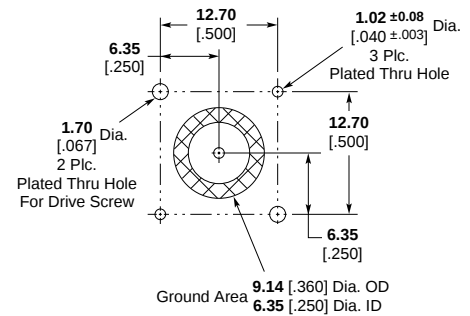
**Dielectric**— 37)  
**Isolation Pad**— Polyester

#### Plating

**Body**— Nickel  
**Ground Clip**— Nickel  
**Center Contact**— Gold  
**Action Pin Legs**— Gold

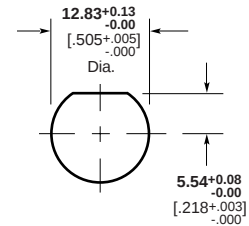
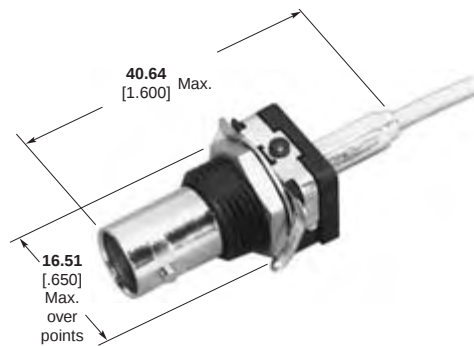


Part No. 5414553-1 50 Ohm  
Part No. 5414493-4 75 Ohm



Recommended PC Board Layout

### BNC Bulkhead Jacks, Crimp



Recommended Panel Cutout

| Description | RG/U Cable                   | Termination Type | Center Contact Plating | Body Plating | Dielectric        | Style      | Interchangeable Dies for Hand Tool 69710-1 & 626 Pneu. Head 318161-1 | Part No.         |
|-------------|------------------------------|------------------|------------------------|--------------|-------------------|------------|----------------------------------------------------------------------|------------------|
| 50 □        | RG 58, 58A, 58B, 58C         | Hex Crimp        | Gold                   | Nickel       | Polymethylpentene | Commercial | 58436-1                                                              | <b>5414758-1</b> |
| 50 □        | RG 174, 174A, 316, 188, 188A | Hex Crimp        | Gold                   | Nickel       | Polymethylpentene | Commercial | 58436-3                                                              | <b>5414758-2</b> |
| 50 □        | RG 174, 174A, 316, 188, 188A | Hex Crimp        | Gold                   | Nickel       | Polymethylpentene | Commercial | 58436-3                                                              | <b>5414758-3</b> |
| 75 □ ESD    | RG 179, 187                  | Hex Crimp        | Gold                   | Nickel       | Polymethylpentene | Commercial | 58425-2                                                              | <b>5415779-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Self-Terminating PC Board Connectors

### Product Facts

- Built-in chip resistor terminates the signal line to the proper characteristic impedance when in the unmated state
- Can be ordered with standard resistance values (50, 75 and 100 Ohms)
- Fits into printed circuit board footprint of standard BNC PCB connectors
- One-piece design is compatible with robotic insertion and wave soldering

Tyco Electronics Self-Terminating printed circuit board BNC connectors provide the capability to automatically terminate an input-output port to the system characteristic impedance. This feature eliminates the need for external terminators when an I/O port is not being used. The Self-Terminating BNC jack contains a chip resistor which bridges the signal and ground paths when the connector is not mated to a BNC plug. When mated, the resistor is switched out of the circuit for direct signal transmission to the board.

The footprint of this connector is compatible with standard BNC connectors, allowing it to be easily installed into existing circuit board designs and suitable for robotic insertion for high speed automated assembly onto the PC board.

The Self-Terminating BNC is available in standard resistance values for use in networking and video systems. Contact Tyco Electronics for new designs that include switching and capacitively decoupled versions.

### Material

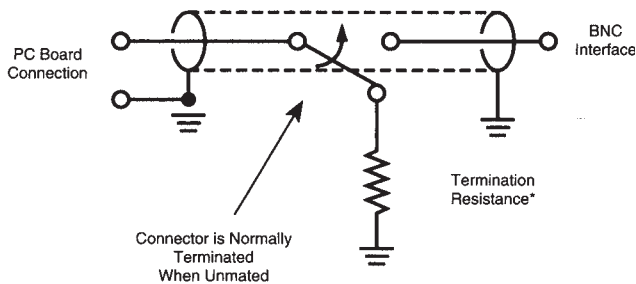
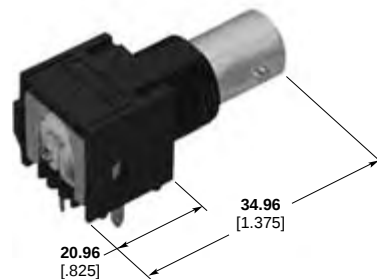
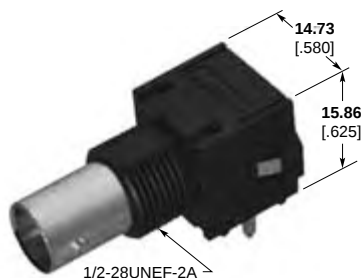
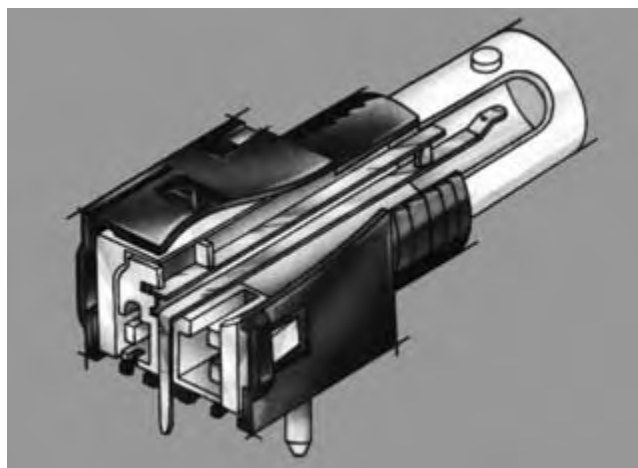
**Body**—Polyester, PBT, black

**Dielectric**—Polyester, PBT, natural

### Plating

**Shell**—Tin

**Center Contact**—Gold on mating end and Tin on solder tails



| Product                  | Termination Resistance | Part Number |
|--------------------------|------------------------|-------------|
| Self-Terminating BNC PCB | 75                     | 5414367-2   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Twin BNC Connectors

### Product Facts

- Crimp connectors require only one-stroke crimping of both conductors, plus braid and cable support
- Lower installed cost with one-stroke crimp
- Reduced noise levels because of Tyco Electronics solderless crimping techniques
- Captive inner contact stability
- No danger of heat damage to coaxial cable
- Ease of inspection
- Listed under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- PC Board soldered connectors are recognized under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- Certified by Canadian Standards Association File No. LR 7189 

The Twin BNC Connector is a quick connect/disconnect, weatherproof connector designed in accordance with MIL-C-39012 to meet the stringent requirements of MIL-STD-1553 Multiplex Data Bus.

These twin coaxial cable connectors are a unique development by Tyco Electronics which has resulted in the production of high level RF components. Termination of these connectors to twin conductor cable is made with Tyco Electronics exclusive one crimp method which simultaneously terminates inner conductors, outer braid and cable support with one stroke of the matching Tyco Electronics tool.

These rugged connectors accommodate today's most commonly used twin conductor cable sizes.

### Materials

**Brass** — QQ-B-626  
**Beryllium Copper** — QQ-C-530  
 37 ) ( — MIL-P-19468  
**Polypropylene** — General purpose  
**Copper, Annealed** — QQ-C-576  
**Phosphor Bronze** — QQ-B-750  
**Silicone Rubber** — ZZ-R-765

### Plating

**Silver** — QQ-S-365  
**Nickel** — QQ-N-290  
**Tin** — ASTM-B-545

**Packaging** — All connectors are packaged individually unless otherwise noted.



### Electrical Characteristics

**Nominal Impedance** — Non-constant  
**Working Voltage** — 500 volts rms sea level  
**Insulation Resistance** — 5000 megohms min.  
**Dielectric Withstanding Voltage** — 1500 volts rms sea level

### Mechanical Characteristics

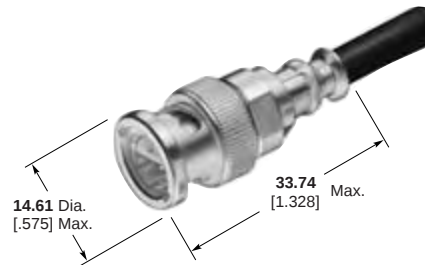
**Mating/Unmating** — Bayonet lock-quick connect/ disconnect  
**Cable Attachment** — Crimp type - Simultaneous center and braid  
**Coupling Nut Retention** — 100 lbs. [444 N] min.  
**Cable Retention** — 25 lbs. [111 N] min., RG 108A/U cable  
**Durability** — 200 cycles per MIL-C-39012

### Environmental Characteristics

**Temperature Range** — -55°C to +85°C  
**Vibration** — MIL-STD-202, Method 204, Condition B  
**Shock** — MIL-STD-202, Method 213, Condition I, 100 G's  
**Salt Spray** — MIL-STD-202, Method 101, Condition B  
**Temperature Cycling** — MIL-STD-202, Method 102, Condition C

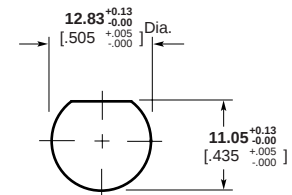
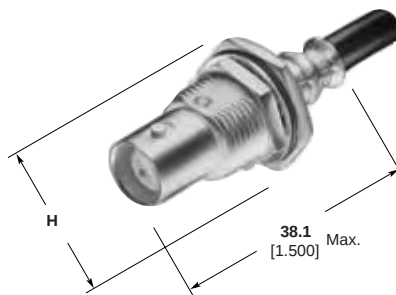
## Twin BNC Connectors (Continued)

### Plugs



| RG/U Cable                       | Center Contact Plating | Body Plating | Dielectric    | Integral Die Hand Tool | Part No.         |
|----------------------------------|------------------------|--------------|---------------|------------------------|------------------|
| 108, 108A                        | Silver                 | Silver       |               | 69667                  | <b>5332225</b>   |
| BELDEN 9272, 89272               | Silver                 | Nickel       | Polypropylene | 69667                  | <b>5332225-5</b> |
| TROMPETER TWC-124-2              | Silver                 | Silver       |               | 69667                  | <b>5332225-3</b> |
| ROLM 49D2401<br>RAYCHEM 7824D013 | Silver                 | Nickel       | Polypropylene | 69667                  | <b>5332225-6</b> |

### Bulkhead Jack



Maximum Panel Thickness **3.18** [.125]

**Recommended Panel Cutout**

**H = 17.45** [.687] Max. across flats, **20.32** [.800] Max. across points

| RG/U Cable                      | Center Contact Plating | Body Plating | Dielectric | CERTI-CRIMP Hand Tool with Integral Die | Integral Die Hand Tool | Die Insert for Tools: Hand Tool-69710-1, 626 Pneu. Head 318161-1 | Part No.       |
|---------------------------------|------------------------|--------------|------------|-----------------------------------------|------------------------|------------------------------------------------------------------|----------------|
| 108, 108A<br>BELDEN 9272, 89272 | Silver                 | Silver       |            | —                                       | 69667                  | 69708                                                            | <b>5332342</b> |

BELDEN is a trademark of Belden Wire and Cable Company.

ROLM is a trademark of the Rolm Corp.

TROMPETER is a trademark of Trompeter Electronics, Inc.

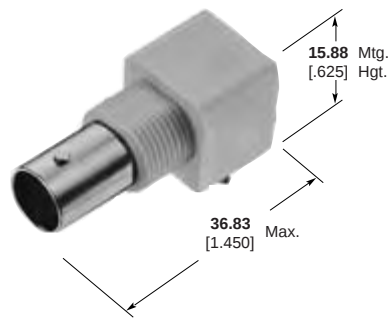
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Twin BNC Connectors (Continued)

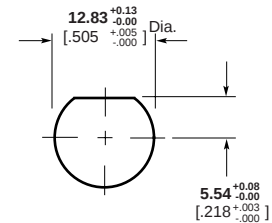
### Right-Angle PC Board/ Panel Mount Jacks

#### Material

**Body** — VALOX, White  
**Center Contacts** — Gold  
**Dielectric** — Polymethylpentene

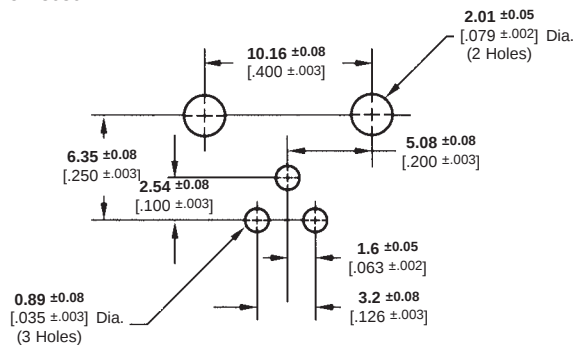


With Mounting Posts  
Part No. 5228686-1



Maximum Panel Thickness 6.1 [1.240]

Recommended Panel Cutout



Recommended PC Board Layout

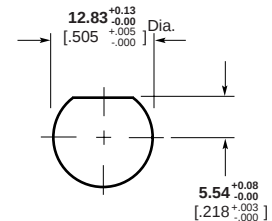
### Vertical PC Board/ Panel Mount Jacks

#### Material

**Body** — VALOX, White  
**Center Contacts** — Gold  
**Dielectric** — Polymethylpentene



With Mounting Posts  
Part No. 5221198-1



Maximum Panel Thickness 6.1 [1.240]

Recommended Panel Cutout

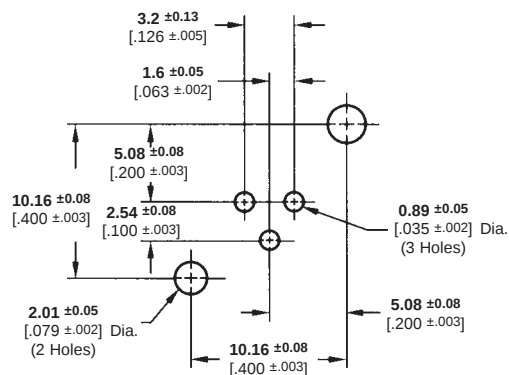
### Lockwasher and Jam Nut



Part No.  
1-329632-2



Part No.  
1-329631-2



Recommended PC Board Layout

VALOX is a trademark of General Electric Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Twin BNC Connectors (Continued)

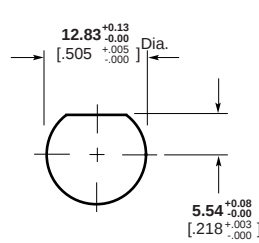
### Vertical PC Board Mount Jack

#### Plating

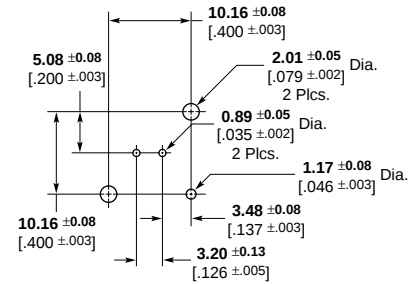
Body — Nickel

Center Contacts — Gold

Dielectric — Polymethylpentene



Part No. 5415832-1  
Recommended Panel Cutout



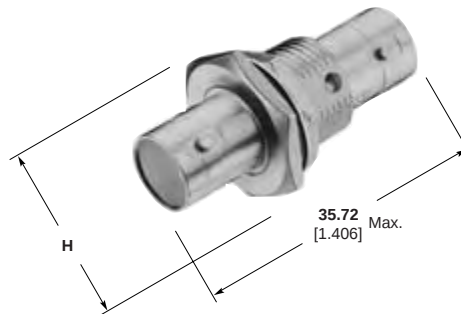
PCB Configuration

### Bulkhead Jack Adapter

#### Plating

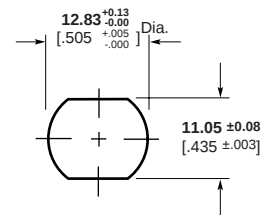
Body — Silver

Center Contacts — Silver



H = 17.45 [0.687] Max. across flats, 20.32 [0.800] Max. across points

Part No. 5332215



Maximum Panel Thickness 3.18 [0.125]

Recommended Panel Cutout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## F Series and G Series Connectors

### Product Facts

- Designs meet SCTE requirements where applicable
- Plugs, jacks and adapters available
- Board mount and cable mount available
- Surface mount connectors available
- Sealed product available
- High current carrying capabilities



Tyco Electronics F Series connectors offer performance, which is driven by evolving OEM requirements and expectations. Improved VSWR beyond 1 GHz, high current carrying capability, and pressure sealed products are now part of the standard product offering. Designs compliant with ANSI/SCTE, Bellcore, UL/CSA, and various other

industry and agency standards are also available.

Both cable applied and PCB terminated products are offered in a variety of styles. The cable connectors are designed for fast, accurate termination with tools common to the industry. Application cost reductions can be achieved using Tyco Electronics PCB terminated products; press-fit designs eliminate the

need for soldering. Center of gravity control and PCB retention designs prevent tipping and eliminate fixturing during soldering. Integral mechanical keys and "D flats" prevent rotation in panels.

These products provide the highly reliable, cost-effective solutions demanded by today's evolving marketplace.

### Product Specification

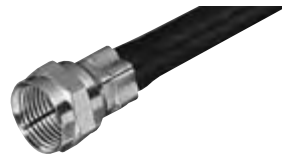
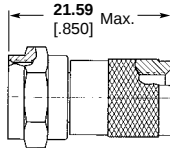
108-1518 — Connector Coaxial, F Series, RF, Single Crimp Plug  
 108-1643 — Connector Coaxial, F Series, RF, PCB Mounted  
 108-1755 — Connector Economy, F Series, RF Coaxial, PCB  
 108-1757 — Connector, 15 amp, G Series Jack, PCB  
 108-1758 — Connector, F Series Jack, PCB, Surface Mount  
 108-1629 — Feedthrough, Sealed F Port Jack

### Instruction Sheets

408-9221 — Coaxial Series F Plug Connectors  
 408-4402 — Series F & G Coaxial Cable Bulkhead Jack Connector  
 408-4291 — PRO-CRIMPER II Hand Tool Assembly 58622-1 and 58622-2

## F Series Connectors

### Plugs



**Crimp Style  
A**



**Screw-On Style  
B**



**Crimp Style, Hex  
C**

| RG/U Cable                  | Termination Type | Body Plating | Style | "B" Threads | PRO-CRIMPER† Hand Tool Assembly | Part No.        |
|-----------------------------|------------------|--------------|-------|-------------|---------------------------------|-----------------|
| 6                           | Crimp            | Nickel       | A     | —           | 58425-3, 58436-2, or 58621-2    | <b>221539-2</b> |
| 6                           | Screw-On         | Nickel       | B     | M7x1        | —                               | <b>221540-2</b> |
| 59<br>BELDEN 9104,<br>9100* | Crimp            | Nickel       | C     | —           | 58425-3, 58436-2, or 58621-2    | <b>414766-1</b> |
| 59                          | Crimp            | Nickel       | C     | —           | 58425-3, 58436-2, or 58621-2    | <b>414766-8</b> |

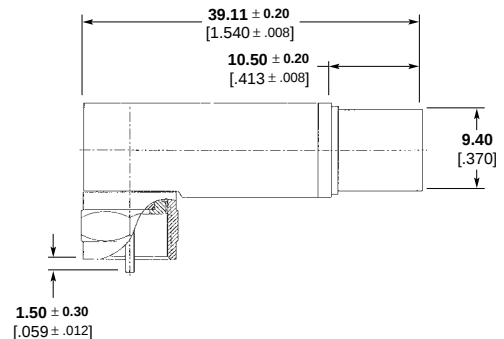
\*NID to inside cable.

† 8.23 [.324] Hex Crimp.



| RG/U Cable                    | Termination Type | Center Contact Plating | Body Plating | Termination Tooling                                                                                                    | Part No.         |
|-------------------------------|------------------|------------------------|--------------|------------------------------------------------------------------------------------------------------------------------|------------------|
| 179<br>Headend<br>Patch Panel | Crimp            | Tin                    | Nickel       | Braid: M 22520/5-01 w/ DANIELS Die Set Hx4-1637 (.128 Hex)<br>Contact: M 22520/2-01 w/ DANIELS Positioner K727, Pos. 2 | <b>5415226-1</b> |

### Right-Angle Plugs, Crimp



| RG/U Cable      | Termination Type | Center Contact Plating | Body Plating | Termination Tooling | Part No.        |
|-----------------|------------------|------------------------|--------------|---------------------|-----------------|
| 6<br>Std. Cable | Crimp            | Tin                    | Nickel       | use .324 inch Hex   | <b>887098-1</b> |

BELDEN is a trademark of Belden Wire and Cable Company.

DANIELS is a trademark of Daniels Manufacturing Corporation.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## F Series Connectors (Continued)

### Bulkhead Jacks, Crimp, Rear Mount



| RG/U Cable | Center Contact Plating | Body Plating | Die Set   | Part No.  |
|------------|------------------------|--------------|-----------|-----------|
| 179        | Bright Tin             | Nickel       | 220210-1* | 5415712-1 |

\*Use with hand tool 354940-1

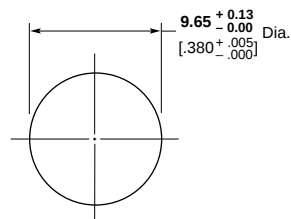
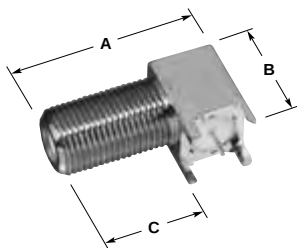
### Bulkhead Jacks, Crimp, Splash Resistant, Front Mount



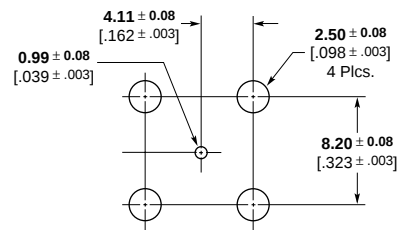
| RG/U Cable | Center Contact Plating | Body Plating | Die Set   | Part No.  |
|------------|------------------------|--------------|-----------|-----------|
| 179        | Bright Tin             | Nickel       | 220210-1* | 5415569-2 |

\*Use with hand tool 354940-1

### Right-Angle PC Board Mount Jacks

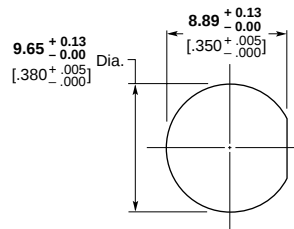
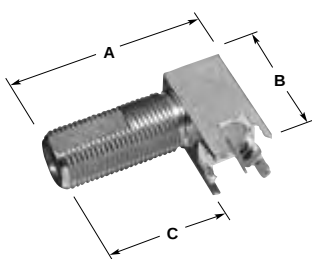


Recommended Panel Cutout

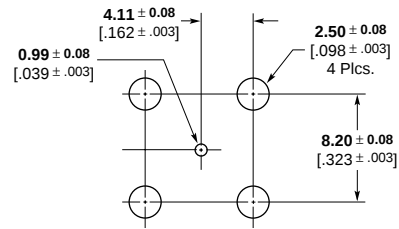


PC Board Layout

| Body Plating |      | Center Contact Plating | Dimensions     |               |               | Part No.  |
|--------------|------|------------------------|----------------|---------------|---------------|-----------|
| Barrel       | Base |                        | A              | B             | C             |           |
| Nickel       | Tin  | Tin                    | 25.40<br>1.00  | 14.48<br>.570 | 15.90<br>.626 | 5415302-1 |
| Nickel       | Tin  | Tin                    | 31.75<br>1.250 | 14.48<br>.570 | 22.25<br>.876 | 5415302-2 |



Recommended Panel Cutout



PC Board Layout

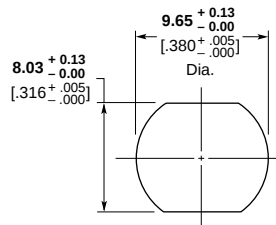
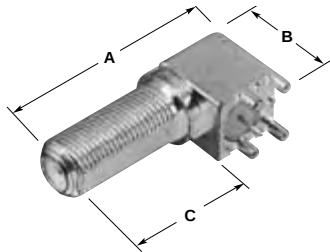
| Body Plating |      | Center Contact Plating | Dimensions     |               |               | Part No.  |
|--------------|------|------------------------|----------------|---------------|---------------|-----------|
| Barrel       | Base |                        | A              | B             | C             |           |
| Nickel       | Tin  | Tin                    | 29.97<br>1.180 | 17.53<br>.690 | 12.19<br>.480 | 5887078-1 |

\*Connectors will accept a center conductor, diameter of **0.51-1.19** [.020-.047]

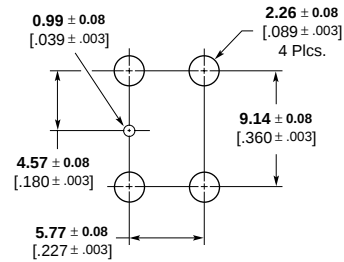
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## F Series Connectors (Continued)

### Right-Angle PC Board Mount Jacks (Continued)



Recommended Panel Cutout



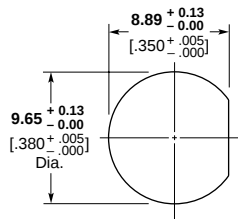
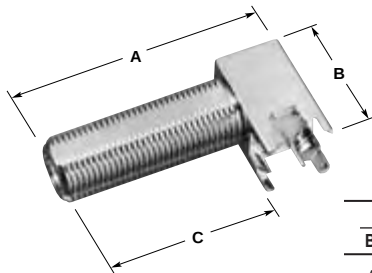
PC Board Layout

| Body Plating |      | Center Contact Plating | Dimensions     |               |               | Part No.   |
|--------------|------|------------------------|----------------|---------------|---------------|------------|
| Barrel       | Base |                        | A              | B             | C             |            |
| Nickel       | Tin  | Tin                    | 33.81<br>1.331 | 15.75<br>.620 | 19.86<br>.782 | 5415276-2* |

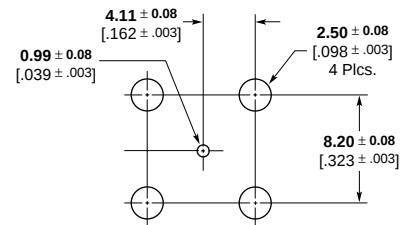
\*Connector will accept center conductor diameter range of 0.56-1.19 [0.022-.047].

### Right-Angle PC Board Mount Jack, High Temperature

\*High temperature versions use PTFE dielectric (see table)



Recommended Panel Cutout



PC Board Layout

| Dielectric |        |               | Solder Post Plating | Dimensions     |               |                | Part No.   |
|------------|--------|---------------|---------------------|----------------|---------------|----------------|------------|
| Bottom     | Middle | Front         |                     | A              | B             | C              |            |
| Acetal     | Acetal | Polypropylene | Nickel              | 35.61<br>1.402 | 16.89<br>.665 | 26.11<br>1.028 | 5415024-1  |
| Acetal     | Acetal | Polypropylene | Tin                 | 35.61<br>1.402 | 16.89<br>.665 | 26.11<br>1.028 | 5415024-3  |
| PTFE       | PTFE   | PTFE          | Tin                 | 25.40<br>1.00  | 17.91<br>.705 | 14.99<br>.590  | 5415214-1* |

\*Pin in paste reflow / high temperature processing.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

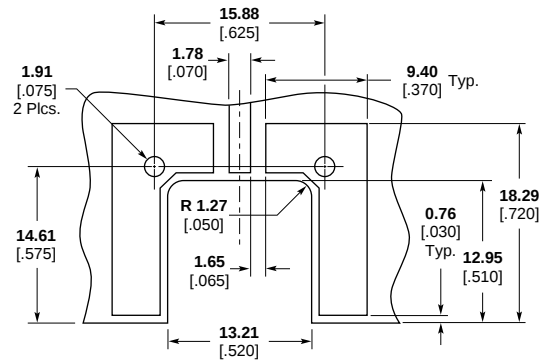
## F Series Connectors (Continued)

### Surface Mount, Straddle Jack

Contact will accept center conductor diameter range **0.56–1.19** [.022–.047]  
Center of gravity balanced for automated pick and place and anti-tipping during solder reflow process.



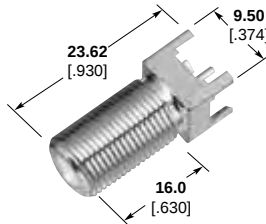
Part No. 5415322-2



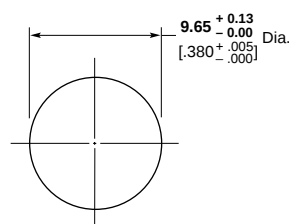
Recommended PC Board Layout

### Vertical PC Board Mount Jacks

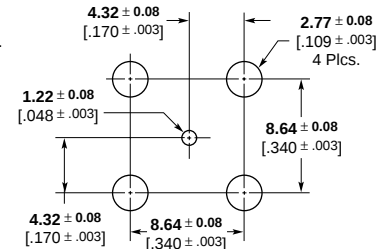
Connector will accept a center conductor diameter of **0.56–1.19** [.022–.047]



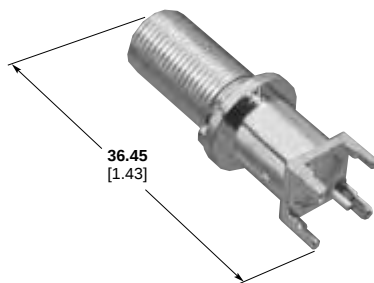
Part No. 5887046-1



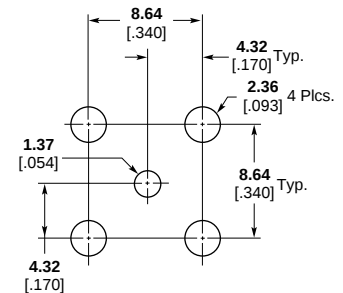
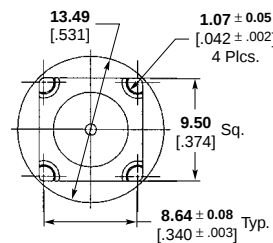
Recommended Panel Cutout



PC Board Layout



Part No. 6274020-1



PC Board Layout

### Adapters

#### Jack to Jack Feed through Adapter



Part No. 282938-2

#### Jack to Plug Right-Angle Adapter



Part No. 5887089-1

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## G Series Connectors

### Bulkhead Jack, Crimp



| RG/U Cable | Termination Type | Body Plating | Part No.  |
|------------|------------------|--------------|-----------|
| 179        | Crimp            | Nickel       | 5415683-1 |

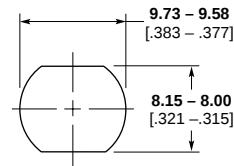
Termination Tooling: Use 220210-1 die set for Contact only.  
Use Certi-Crimp Hand Tool 220009-1 for ferrule.

### Bulkhead Jack, PC Board

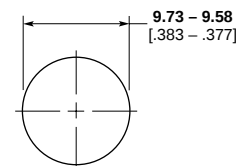
Connector will accept center conductor diameter range **0.97–1.65** [.038–.065] (415332-1 only)



Part No. 5415332-1 (15 Amp)  
Part No. 6274032-1



Recommended Panel Cutout  
for 5415332-1



Recommended Panel Cutout  
for 6274032-1

### Jack, Bulkhead PC Board

Connector will accept center conductor diameter range **0.97–1.07** [.038–.042]



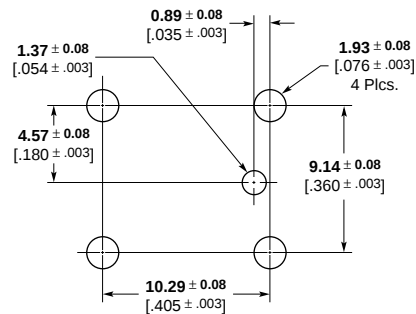
Part No. 5887000-1

### Right-Angle PC Board Mount Plug

Includes board retention feature to prevent tipping during solder process.



Part No. 5415406-2

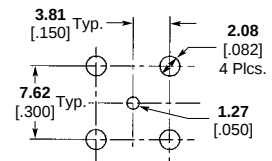
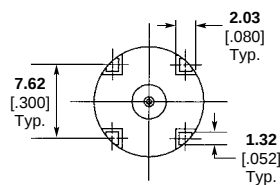


PC Board Layout

### Vertical PC Board Mount Plug



Part No. 6274045-1



PC Board Layout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

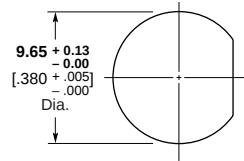
## G Series Connectors (Continued)

### Adapters

#### F Jack to G Jack Bulkhead Adapter



Part No. 415327-1



Recommended Panel Cutout

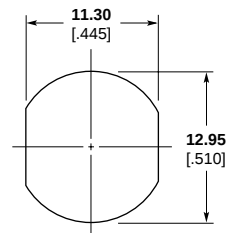
#### F Jack to G Plug Bulkhead Adapter

Connector will accept center conductor diameter range of **0.51–1.19** [.020–.047].

Panel nut 887003-3 available for float mounting.



Part No. 415523-1



Recommended Panel Cutout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMA Connectors

### Product Facts

- Performance to 12.4 GHz and beyond
- Available in various base metal options, including stainless steel, brass and zinc diecast
- Uses industry standard crimp tools and processes
- Available with corrosion resistant, non-magnetic White Bronze plating
- Meets all performance requirements for MIL-C-39012.



Tyco Electronics offers a complete line of SMA connectors designed for performance to 18 GHz to satisfy the growing demand for SMA connectors in the wireless communications industry. The SMA product line offers stainless steel bodies, as well as non-ferrous metals. Various plating options are available, including Gold and White Bronze. The SMA interface is fully compatible with Mil-C-39012.

While still offering various options on military (QPL) approved connectors, Tyco Electronics has developed a complete offering tailored to the commercial Communications industry. This includes 3 piece flexible cable products for popular RG 316, 142 and RD

316 cable utilizing industry standard HEX crimps.

The SMA series meets the performance, quality and application requirements of the commercial marketplace. This includes White Bronze plating, a unique finish developed by Tyco Electronics to address the performance needs of the telecommunications market. This plating is highly resistant to wear, and contains no ferrous metals, thus displaying excellent inter-modulation characteristics.

To satisfy the broad range of commercial applications, SMA connectors are available in a broad range of standard configurations including; straight and right-angle cable applied plugs, bulkhead cable jacks, two and four hole

flange mount panel jacks, straight and right-angle pcb mount jacks and various between and in series adapters. Numerous packaging and testing options are also available to meet specific system criteria as well.

Additionally, standard military approved (QPL) interfaces are offered as well. Including connectors for semi-rigid cable and micro strip applications.

The 3 Piece SMA offering is designed especially for applications in cellular infrastructure where InterModulation Products (IMP) must be minimized. By limiting non-linearities within the connectors, IMP is reduced and increased channel capacity can be offered.

### Between Series Adapters

For SMA Between Series Adapters, see pages 251-260.

## SMA Connectors (Continued)

### Specifications

| MIL-C-39012<br>Applicable Paragraph |       |                                                                                                                                                                                                                                                                             |
|-------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b>                      |       |                                                                                                                                                                                                                                                                             |
| Material                            | 3.3   | Steel corrosion resistant per ASTM-A-582 and ASTM-A-484, Type 303. Beryllium copper per ASTM-B-196. PTFE Fluorocarbon per ASTM-D-1710.                                                                                                                                      |
| Finish                              | 3.3.1 | Center contacts shall be gold plated to a min. thickness of .00127 [.00005] in accordance with MIL-G-45204, ASTM-B-488. All other metal parts shall be finished as to provide a connector which meets the corrosion requirements.                                           |
| Design                              | 3.4   | The design shall be such that the outline shown in this catalog and the interface dimensions of MIL-STD-348A are met.                                                                                                                                                       |
| <b>Electrical</b>                   |       |                                                                                                                                                                                                                                                                             |
| Insulation Resistance               | 3.11  | The insulation resistance shall not be less than 10,000 megohms.                                                                                                                                                                                                            |
| Corona Level                        | 3.22  | Refer to applicable military slash sheet, product drawing or spec.                                                                                                                                                                                                          |
| Dielectric Withstanding Voltage     | 3.17  | Refer to applicable military slash sheet, product drawing or spec.                                                                                                                                                                                                          |
| RF High Potential                   | 3.23  | Refer to applicable military slash sheet, product drawing or spec.                                                                                                                                                                                                          |
| Contact Resistance                  | 3.16  | Refer to applicable military slash sheet, product drawing or spec.                                                                                                                                                                                                          |
| VSWR                                | 3.14  | Refer to applicable military slash sheet, product drawing or spec. Frequency range dependent on cable used.                                                                                                                                                                 |
| RF Leakage                          | 3.26  | Refer to applicable military slash sheet, product drawing or spec.                                                                                                                                                                                                          |
| Insertion Loss                      | 3.27  | Refer to applicable military slash sheet, product drawing or spec. Frequency range dependent on cable used.                                                                                                                                                                 |
| <b>Mechanical</b>                   |       |                                                                                                                                                                                                                                                                             |
| Force to Engage                     | 3.5.1 | The torque required to engage and disengage shall not exceed 2 in.-lbs. The longitudinal force is not applicable.                                                                                                                                                           |
| Coupling Nut Retention              | 3.25  | 60 lbs. min. Applicable for plug connectors only.                                                                                                                                                                                                                           |
| Coupling Proof Torque               | 3.6   | 15 in.-lbs. min. Applicable for plug connectors only.                                                                                                                                                                                                                       |
| Cable Retention                     | 3.24  | Refer to applicable military slash sheet or consult factory.                                                                                                                                                                                                                |
| Mating Characteristics              | 3.7   | Applicable to jack connectors only. Reference MIL-STD-348A for dimensions; oversize test pin .953 [.0375] min. dia., .76 - 1.14 [.030-.045] deep, insertion force 3 lbs. max. with .940 [.0370] min. dia. pin, withdrawal force 1 oz. min. with .902 [.0355] max. dia. pin. |
| Connector Durability                | 3.15  | The connector to be tested and its mating connector shall be subjected to 500 insertion and withdrawal cycles at 12 cycles per minute max. The connector shall show no evidence of mechanical failure and shall meet the mating characteristic requirements.                |
| Recommended Mating Torque           | —     | 7 to 10 in.-lbs.                                                                                                                                                                                                                                                            |
| <b>Environmental</b>                |       |                                                                                                                                                                                                                                                                             |
| Vibration                           | 3.18  | Specification MIL-STD-202, method 204, test condition D                                                                                                                                                                                                                     |
| Shock                               | 3.19  | Specification MIL-STD-202, method 213, test condition I                                                                                                                                                                                                                     |
| Thermal Shock                       | 3.20  | Refer to applicable military slash sheet or consult factory.                                                                                                                                                                                                                |
| Corrosion (Salt Spray)              | 3.13  | Specification MIL-STD-202, method 101, test condition B.                                                                                                                                                                                                                    |
| Moisture Resistance                 | 3.21  | Specification MIL-STD-202, method 106. No measurements at high humidity. Insulation resistance shall be at least 200 megohms within 5 minutes of removal from humidity.                                                                                                     |

## SMA Connectors (Continued)

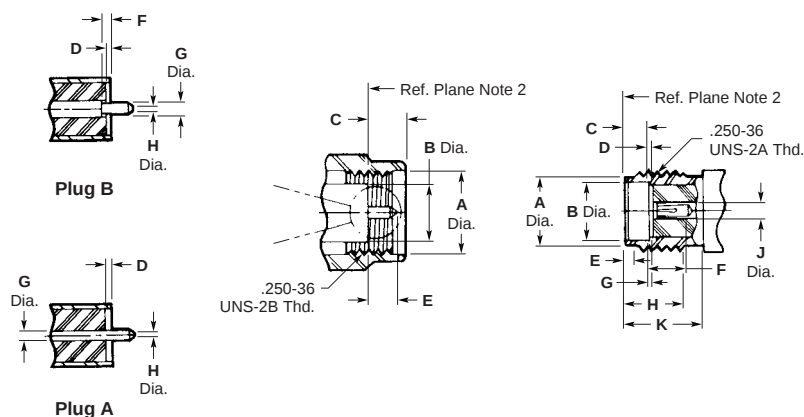
### Electrical

| Connector Type                                                  | Cable                                   | Frequency<br>Max.<br>(GHz) | VSWR<br>x (fGHz) | Contact Resistance<br>(milliohms max.) |                  | Insulation<br>Resistance<br>(megohms<br>min.) | Dielectric<br>Withstanding<br>Voltage<br>(Volts RMS) | Corona<br>Extinction<br>Voltage at<br>70,000 Ft.<br>(V RMS min.) | RF<br>Transmission<br>Loss | RF High<br>Potential<br>at 5 MHz<br>(V RMS) | RF<br>Leakage<br>(dB min.) |
|-----------------------------------------------------------------|-----------------------------------------|----------------------------|------------------|----------------------------------------|------------------|-----------------------------------------------|------------------------------------------------------|------------------------------------------------------------------|----------------------------|---------------------------------------------|----------------------------|
|                                                                 |                                         |                            |                  | Center<br>Contact                      | Outer<br>Contact |                                               |                                                      |                                                                  |                            |                                             |                            |
| Straight Cable Plug<br>without Contact                          | RG 402 (3.58 [.141])                    | Note 1                     | 1.02 + .005      | N/A                                    | 2.0              | 10,000                                        | N/A                                                  | 250                                                              | N/A                        | 670                                         | -(90-fGHz)                 |
| Straight Cable Plugs<br>& Jacks Solder<br>Attachment            | RG 405 (2.16 [.085])                    | 18.0                       | 1.05 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(90-fGHz)                 |
|                                                                 | RG 402 (3.58 [.141])                    | 18.0                       | 1.05 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .03 f(GHz)                 | 1000                                        | -(90-fGHz)                 |
|                                                                 | 3.58 [.141] Microporous                 | 18.0                       | 1.05 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .03 f(GHz)                 | 1000                                        | -(90-fGHz)                 |
|                                                                 | RG 401 (6.35 [.250])                    | 18.0                       | 1.07 + .007      | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .03 f(GHz)                 | 1000                                        | -(90-fGHz)                 |
|                                                                 | RG 174, 188, 316                        | Note 1                     | 1.15 + .01       | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | .06 f(GHz)                 | 500                                         | -(60-fGHz)                 |
| Straight Cable Plugs<br>& Jacks Solder<br>Clamp Attachment      | RG 55, 58, 141, 142,<br>223, 303, 400   | Note 1                     | 1.10 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .06 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | RG 405 (2.16 [.085])                    | 12.4                       | 1.10 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(90-fGHz)                 |
|                                                                 | RG 402 (3.58 [.141])                    | 12.4                       | 1.07 + .01       | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .03 f(GHz)                 | 1000                                        | -(90-fGHz)                 |
|                                                                 | RG 55, 58, 141, 142,<br>223, 400        | Note 1                     | 1.10 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .06 f(GHz)                 | 670                                         | -(60-fGHz)                 |
| Straight Cable Plugs<br>& Jacks Clamp<br>Attachment             | RG 174, 188, 316                        | Note 1                     | 1.15 + .01       | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | .06 f(GHz)                 | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 180, 195                             | Note 1                     | —                | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | —                          | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 55, 142, 223, 400                    | Note 1                     | 1.10 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .06 f(GHz)                 | 670                                         | -(60-fGHz)                 |
| Straight Cable Plugs<br>& Jacks Crimp<br>Attachment             | RG 58, 141, 303                         | Note 1                     | 1.10 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .06 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | RG 174, 188, 316                        | Note 1                     | 1.15 + .01       | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | .06 f(GHz)                 | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 180, 195                             | Note 1                     | —                | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | —                          | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 178, 196                             | Note 1                     | 1.2 + .02        | 2.0                                    | 2.0              | 10,000                                        | 500                                                  | 125                                                              | .06 f(GHz)                 | 335                                         | -(60-fGHz)                 |
|                                                                 | RG 401 (6.35 [.250])                    | 18.0                       | 1.07 + .01       | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .05 f(GHz)                 | 1000                                        | -70 dB min.                |
| Straight Cable Plugs<br>& Jacks Compression<br>Clamp Attachment | 6.35 [.250] Microporous                 | 18.0                       | 1.07 + .01       | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .05 f(GHz)                 | 1000                                        | -70 dB min.                |
|                                                                 | 6.35 [.250] 3 Spline                    | 18.0                       | 1.07 + .01       | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .05 f(GHz)                 | 1000                                        | -70 dB min.                |
|                                                                 | 6.35 [.250] 5 Spline                    | 18.0                       | 1.07 + .01       | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 375                                                              | .05 f(GHz)                 | 1000                                        | -70 dB min.                |
|                                                                 | RG 405 (2.16 [.085])                    | 12.4                       | 1.18 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .04 f(GHz)                 | 670                                         | -(90-fGHz)                 |
| Right-Angle Cable<br>Plugs Solder<br>Attachment                 | RG 405 (2.16 [.085])                    | 18.0                       | 1.18 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .04 f(GHz)                 | 670                                         | -(90-fGHz)                 |
|                                                                 | RG 402 (3.58 [.141])                    | 12.4                       | 1.15 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 325                                                              | .04 f(GHz)                 | 1000                                        | -(90-fGHz)                 |
|                                                                 | RG 402 (3.58 [.141])                    | 18.0                       | 1.10 + .010      | 2.0                                    | 2.0              | 10,000                                        | 1500                                                 | 250                                                              | .05 f(GHz)                 | 1000                                        | -(90-fGHz)                 |
|                                                                 | RG 55, 58, 141, 142,<br>223, 303, 400   | Note 1                     | 1.15 + .01       | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .07 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | RG 174, 188, 316                        | Note 1                     | 1.15 + .02       | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | .07 f(GHz)                 | 500                                         | -(60-fGHz)                 |
| Right-Angle Cable<br>Plugs Crimp<br>Attachment                  | RG 55, 142, 223, 400                    | Note 1                     | 1.15 + .02       | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .07 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | RG 58, 141, 303                         | Note 1                     | 1.15 + .02       | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .07 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | RG 174, 188, 316                        | Note 1                     | 1.18 + .02       | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | .07 f(GHz)                 | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 180, 195                             | Note 1                     | —                | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | —                          | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 178, 196                             | Note 1                     | 1.25 + .025      | 2.0                                    | 2.0              | 10,000                                        | 500                                                  | 125                                                              | .07 f(GHz)                 | 335                                         | -(60-fGHz)                 |
| Right-Angle Cable<br>Plugs Clamp<br>Attachment                  | RG 55, 58, 141, 142,<br>223, 303        | Note 1                     | 1.10 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .08 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | RG 174, 188, 316                        | Note 1                     | 1.15 + .01       | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | .08 f(GHz)                 | 500                                         | -(60-fGHz)                 |
|                                                                 | RG 180, 195                             | Note 1                     | —                | 2.0                                    | 2.0              | 10,000                                        | 750                                                  | 190                                                              | —                          | 500                                         | -(60-fGHz)                 |
| Flange Mount Plugs<br>& Jacks Panel or<br>Bulkhead Mount        | Non-Captured                            | 18.0                       | 1.03 + .004      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(100-fGHz)                |
|                                                                 | Epoxy Captured                          | 18.0                       | 1.05 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | Mechanical Capture                      | 18.0                       | 1.04 + .004      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(100-fGHz)                |
|                                                                 | Field Replaceable<br>Hermetic Launchers | 18.0                       | 1.04 + .006      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .04 f(GHz)                 | 670                                         | -(100-fGHz)                |
|                                                                 | Epoxy Captured                          | 18.0                       | 1.07 + .010      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .04 f(GHz)                 | 670                                         | -(60-fGHz)                 |
| Bulkhead<br>Feedthrough Jacks                                   | Mechanical Capture                      | 18.0                       | 1.07 + .010      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .04 f(GHz)                 | 670                                         | -(100-fGHz)                |
| Right-Angle Flange<br>Mount Jacks                               | N/A                                     | 18.0                       | 1.07 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .08 f(GHz)                 | 670                                         | -(90-fGHz)                 |
|                                                                 | N/A                                     | 12.4                       | 1.15 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .08 f(GHz)                 | 670                                         | -(90-fGHz)                 |
| Printed Circuit Board<br>Mount Straight Terminal                | N/A                                     | 18.0                       | N/A              | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | N/A                        | 670                                         | N/A                        |
| Right-Angle<br>Printed Circuit                                  | N/A                                     | 12.4                       | N/A              | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | N/A                        | 670                                         | N/A                        |
| End Launch<br>Stripline Circuit                                 | N/A                                     | 18.0                       | 1.05 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(60-fGHz)                 |
| Surface Launch<br>Stripline Circuit                             | N/A                                     | 18.0                       | 1.05 + .005      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .03 f(GHz)                 | 670                                         | -(60-fGHz)                 |
| Right-Angle Surface<br>Launch Stripline Circuit                 | N/A                                     | 12.4                       | 1.15 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .08 f(GHz)                 | 670                                         | -(60-fGHz)                 |
|                                                                 | N/A                                     | 18.0                       | 1.07 + .015      | 2.0                                    | 2.0              | 10,000                                        | 1000                                                 | 250                                                              | .08 f(GHz)                 | 670                                         | -(60-fGHz)                 |

1. Maximum operating frequency of cable per MIL-C-17.
2. Specifications do not apply to hermetic or compression crimp connectors.
3. For Brass SMA: Frequency Range DC-6GHz, Impedance 50 Ohms, Insulation Resistance.

## SMA Connectors (Continued)

### Interface Mating Dimensions



#### Plug

| Dimension | Minimum              | Maximum              |
|-----------|----------------------|----------------------|
| A         | <b>6.35</b><br>.250  | —                    |
| B         | —                    | <b>4.59</b><br>.1808 |
| C         | —                    | <b>3.43</b><br>.135  |
| D         | <b>0.00</b><br>.000  | <b>0.25</b><br>.010  |
| E         | —                    | <b>2.54</b><br>.100  |
| F         | <b>0.00</b><br>.000  | <b>0.25</b><br>.010  |
| G         | <b>0.90</b><br>.0355 | <b>0.94</b><br>.037  |
| H         | <b>0.00</b><br>.000  | <b>0.38</b><br>.015  |

#### Jack

| Dimension | Minimum             | Maximum             |
|-----------|---------------------|---------------------|
| A         | <b>5.28</b><br>.208 | <b>5.49</b><br>.216 |
| B         | <b>4.60</b><br>.181 | —                   |
| C         | <b>1.91</b><br>.075 | <b>1.98</b><br>.078 |
| D         | <b>0.00</b><br>.000 | <b>0.25</b><br>.010 |
| E         | <b>0.38</b><br>.015 | <b>1.43</b><br>.045 |
| F         | <b>2.92</b><br>.115 | —                   |
| G         | <b>0.00</b><br>.000 | <b>0.25</b><br>.010 |
| H         | <b>4.32</b><br>.170 | —                   |
| J         | <b>.124</b><br>.049 | <b>1.30</b><br>.051 |
| K         | <b>5.54</b><br>.218 | —                   |

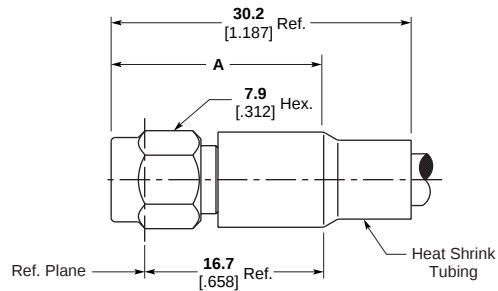
#### Notes:

1. ID to meet VSWR and contact resistance when mated with 0.51 +.025/-.013 [.036 +.0010/-.0005] Dia. Pin.
2. When fully engaged, the two reference planes must coincide with metal to metal contact.
3. Metric equivalents (to the nearest 0.01mm) are given for general information only.

## SMA Connectors (Continued)

### Flexible Cable

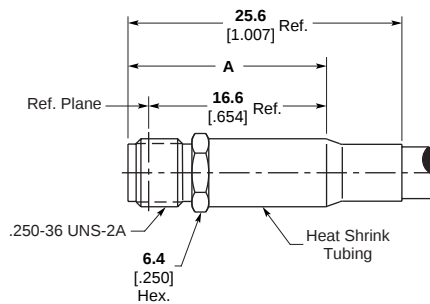
#### Straight Cable Plug, Solder



| Cable Type<br>RG/U                 | Body Material<br>& Finish    | Contact<br>Captivation | Contact<br>Attachment | Dimension<br>A      | Instruction<br>Sheet | Part<br>No.      |
|------------------------------------|------------------------------|------------------------|-----------------------|---------------------|----------------------|------------------|
| 55, 58, 141, 142,<br>223, 303, 400 | Stainless, Gold <sup>1</sup> | No                     | Solder                | <b>19.7</b><br>.775 | 408-4821             | <b>1051638-1</b> |
| 174, 188, 316                      | Stainless, Gold <sup>1</sup> | No                     | Solder                | <b>17.5</b><br>.690 | 408-4756             | <b>1051644-1</b> |

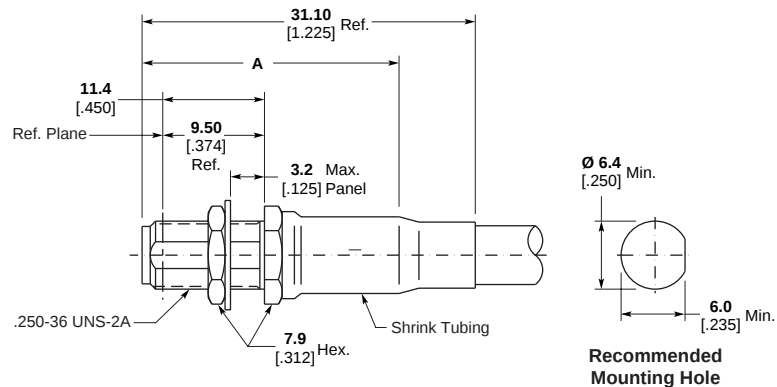
<sup>1</sup>Coupling nut is passivated stainless steel.

#### Straight Cable Jack, Solder



| Cable Type<br>RG/U                 | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Dimension<br>A      | Instruction<br>Sheet | Part<br>No.      |
|------------------------------------|---------------------------|------------------------|-----------------------|---------------------|----------------------|------------------|
| 55, 58, 141, 142,<br>223, 303, 400 | Stainless, Gold           | No                     | Solder                | <b>18.5</b><br>.730 | 408-4820             | <b>1051852-1</b> |

#### Bulkhead Cable Jack, Solder



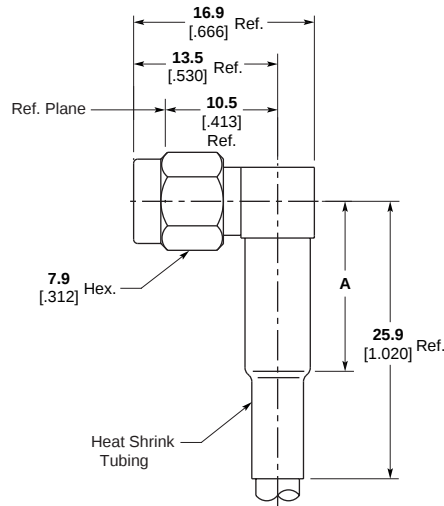
| Cable Type<br>RG/U          | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Dimension<br>A      | Instruction<br>Sheet | Part<br>No.      |
|-----------------------------|---------------------------|------------------------|-----------------------|---------------------|----------------------|------------------|
| RG 55, 58,<br>141, 142, 300 | Stainless, Gold           | No                     | Solder                | <b>24.0</b><br>.945 | 408-4817             | <b>1051861-1</b> |
| 174, 188, 316               | Stainless, Gold           | No                     | Solder                | <b>21.0</b><br>.825 | 408-4817             | <b>1051942-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

### Flexible Cable (Continued)

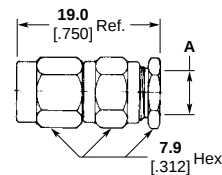
**Right-Angle Cable Plug, Solder**



| Cable Type<br>RG/U                 | Body Material<br>& Finish    | Contact<br>Captivation | Contact<br>Attachment | Dimension<br>A | Instruction<br>Sheet | Part<br>No. |
|------------------------------------|------------------------------|------------------------|-----------------------|----------------|----------------------|-------------|
| 55, 58, 141, 142,<br>223, 303, 400 | Stainless, Gold <sup>1</sup> | Yes                    | Solder                | 16.0<br>.630   | 408-4816             | 1052063-1   |
| 174, 188, 316                      | Stainless, Gold <sup>1</sup> | Yes                    | Solder                | 11.2<br>.440   | 408-4815             | 1052067-1   |

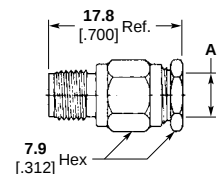
<sup>1</sup>Coupling nut is passivated stainless steel.

**Straight Cable Plug, Clamp**



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Dimension<br>A | Instruction<br>Sheet | Part<br>No. |
|--------------------|---------------------------|------------------------|-----------------------|----------------|----------------------|-------------|
| 174, 188, 316      | Stainless, Pass.          | Yes                    | Solder                | 2.9<br>.116    | 408-4906             | 1050721-1   |

**Straight Cable Jack, Clamp**



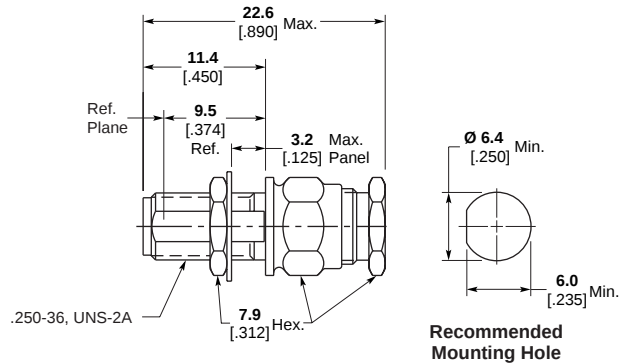
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Dimension<br>A | Instruction<br>Sheet | Part<br>No. |
|--------------------|---------------------------|------------------------|-----------------------|----------------|----------------------|-------------|
| 174, 188, 316      | Stainless, Pass.          | Yes                    | Solder                | 2.9<br>.116    | 408-4906             | 1050903-1   |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

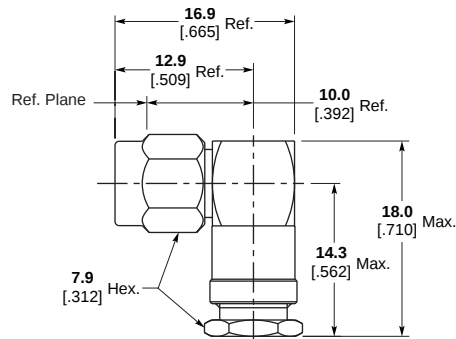
### Flexible Cable (Continued)

#### Bulkhead Feedthrough Cable Jack, Clamp



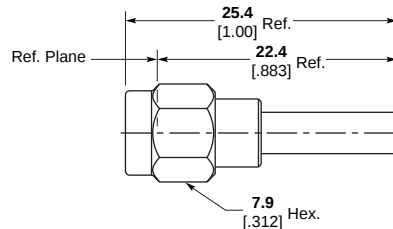
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Instruction<br>Sheet | Part<br>No. |
|--------------------|---------------------------|------------------------|-----------------------|----------------------|-------------|
| 174, 188, 316      | Stainless, Pass.          | Yes                    | Solder                | 408-4704             | 1050996-1   |

#### Right-Angle Cable Plug, Clamp



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Instruction<br>Sheet | Part<br>No. |
|--------------------|---------------------------|------------------------|-----------------------|----------------------|-------------|
| 174, 188, 316      | Stainless, Pass.          | Mechanical             | Solder                | 408-4965             | 1051140-1   |

#### Straight Cable Plug, Crimp



| Cable Type<br>RG/U         | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment     | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No. |
|----------------------------|---------------------------|------------------------|---------------------------|------------------------------|----------------------|-------------|
| 174, 179, 187,<br>188, 316 | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1                    | 408-4661             | 1056443-1   |
| RD316                      | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1 <sup>1</sup>       | 408-4661             | 1056436-1   |
| 55, 142, 223, 400          | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1                    | 408-4661             | 1056438-1   |
| 174, 179, 187,<br>188, 316 | Brass,<br>White Bronze    | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1                    | 408-4661             | 1082034-1   |

<sup>1</sup>Use die 1055270-1 to crimp RD316 ferrule.

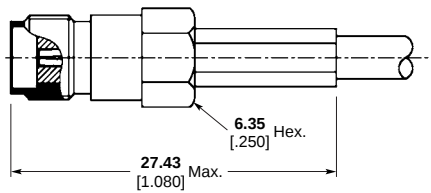
<sup>2</sup>Use die 1055880-1 to crimp center contact.

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

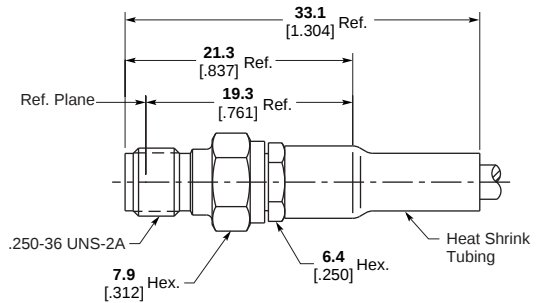
## SMA Connectors (Continued)

### Flexible Cable (Continued)

#### Straight Cable Jack, Crimp



Style A

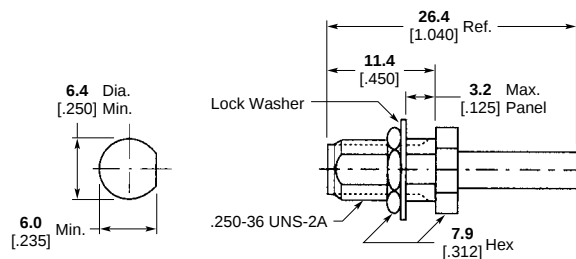


Style B

| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Style | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|-------|------------------|
| 174, 316           | Brass, Nickel             | Mechanical             | Solder                | 1                            | 408-4032             | A     | <b>5447648-3</b> |
| 58, 141, 303       | Stainless, Pass.          | Mechanical             | Solder                | 1055236-1                    | 408-4704             | B     | <b>1051867-1</b> |
| 174, 188, 316      | Stainless, Pass.          | Mechanical             | Solder                | 1055236-1                    | 408-4708             | B     | <b>1051855-1</b> |
| 178, 196           | Stainless, Pass.          | Mechanical             | Solder                | 1055236-1                    | 408-4806             | B     | <b>1051869-1</b> |

<sup>1</sup>Refer to Tyco Electronics Customer Print for tooling requirement. DANIELS Mil Tooling used for contact and ferrule crimp.

#### Bulkhead Feedthrough Cable Jack, Crimp



Recommended  
Mounting Hole

| Cable Type<br>RG/U         | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment     | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|----------------------------|---------------------------|------------------------|---------------------------|------------------------------|----------------------|------------------|
| 174, 179, 187,<br>188, 316 | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1                    | 408-4661             | <b>1056452-1</b> |
| RD316                      | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1 <sup>3</sup>       | 408-4661             | <b>1056445-1</b> |
| 58, 141, 303               | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1                    | 408-4661             | <b>1056450-1</b> |
| 55, 142,<br>223, 400       | Stainless, Pass.          | Mechanical             | Solder/Crimp <sup>2</sup> | 1055236-1                    | 408-4661             | <b>1056447-1</b> |
| 174, 188, 316              | Brass, Nickel             | Mechanical             | Crimp                     | 1                            | 408-4032             | <b>5448103-2</b> |

<sup>1</sup>Refer to Tyco Electronics Customer Print for tooling requirement. DANIELS Mil Tooling used for contact and ferrule crimp.

<sup>2</sup>Use die 1055880-1 to crimp center contact.

<sup>3</sup>Use die 1055270-1 to crimp RD316 ferrule.

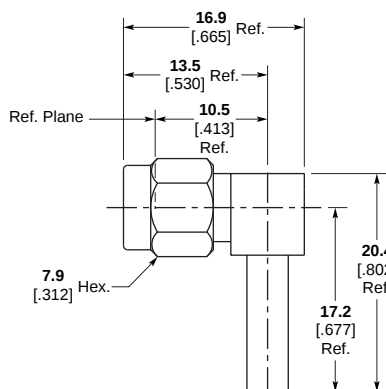
DANIELS is a trademark of Daniels Manufacturing Corporation.

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

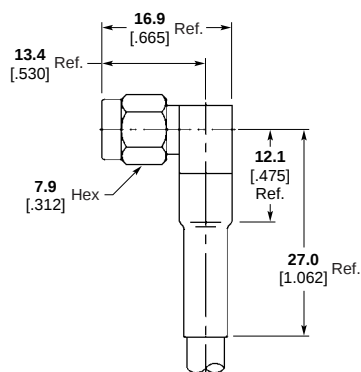
### Flexible Cable (Continued)

**Right-Angle Cable Plug, Crimp**



| Cable Type<br>RG/U         | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|----------------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|------------------|
| 174, 179, 187,<br>188, 316 | Stainless, Pass.          | Mechanical             | Solder                | 1055236-1                    | 408-4659             | <b>1056462-1</b> |
| 58, 141, 303               | Stainless, Pass.          | Mechanical             | Solder                | 1055236-1                    | 408-4659             | <b>1056456-1</b> |

**Right-Angle Cable Plug, Crimp**



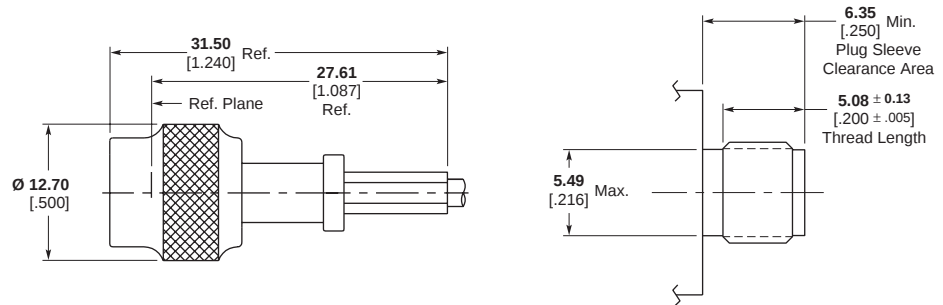
| Cable Type<br>RG/U   | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|----------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|------------------|
| 55, 142,<br>223, 400 | Stainless, Pass.          | Epoxy                  | Solder                | 1055236-1                    | 408-4681             | <b>1052072-1</b> |
| 174, 188, 316        | Stainless, Pass.          | Epoxy                  | Solder                | 1055236-1                    | 408-4683             | <b>1052076-1</b> |
| 178, 196             | Stainless, Pass.          | Epoxy                  | Solder                | 1055236-1                    | 408-4801             | <b>1052098-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

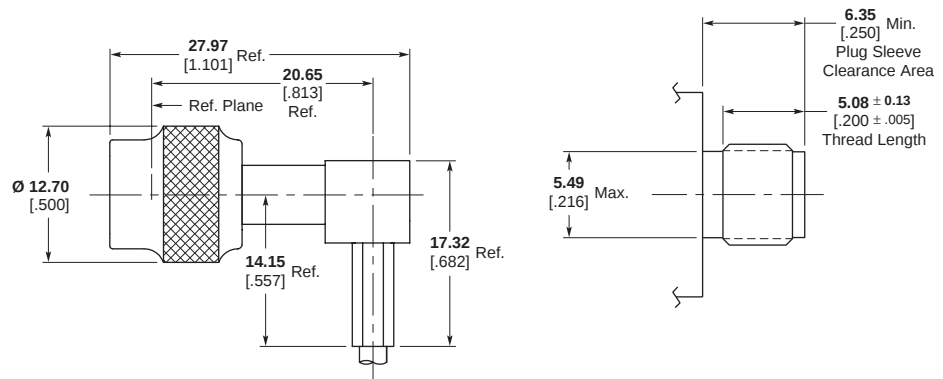
### Flexible Cable (Continued)

#### Straight Push-On



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------|
| 316                | Beryllium Copper, Gold    | Mechanical             | Crimp                 | <b>1408541-1</b> |

#### Right-Angle Push-On



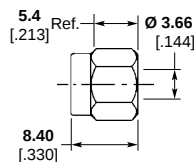
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------|
| 316                | Beryllium Copper, Gold    | Mechanical             | Solder/Crimp          | <b>1274694-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

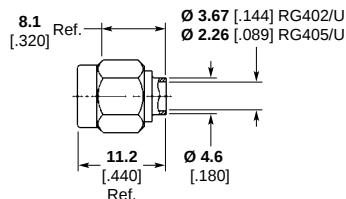
### Direct Solder Attachment, Semi-Rigid Cable

#### Straight Cable Plug



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captive   | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|----------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [0.141]) | Stainless, Pass.          | No Center<br>Contact | No Center<br>Contact  | 1055420-1                          | 408-4761             | <b>1050757-1</b> |

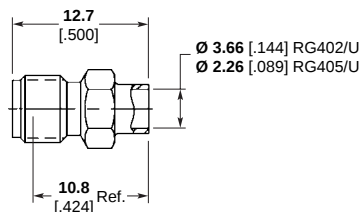
#### Straight Cable Plug



| Cable Type<br>RG/U | Body Material<br>& Finish    | Contact<br>Captive   | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|------------------------------|----------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [0.141]) | Stainless, Gold <sup>1</sup> | No                   | Solder                | 1055420-1                          | 408-4764             | <b>1050525-1</b> |
| 405 (2.16 [0.085]) | Stainless, Gold <sup>1</sup> | No                   | Solder                | 1055420-1                          | 408-4765             | <b>1050770-1</b> |
| 402 (3.58 [0.141]) | Stainless, Gold <sup>1</sup> | No Center<br>Contact | No Center<br>Contact  | N/A                                | —                    | <b>1050542-1</b> |
| 405 (2.16 [0.085]) | Stainless, Gold <sup>1</sup> | No                   | Solder                | 1055420-1                          | —                    | <b>1050548-1</b> |

<sup>1</sup>Coupling nut is passivated stainless steel.

#### Straight Cable Jack

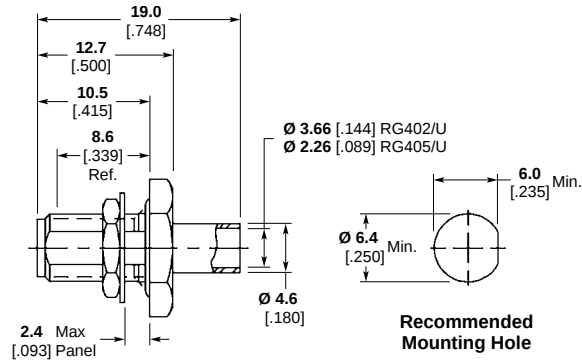


| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captive | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|--------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [0.141]) | Stainless, Gold           | No                 | Solder                | 1055420-1                          | 408-4767             | <b>1050854-1</b> |
| 405 (2.16 [0.085]) | Stainless, Gold           | No                 | Solder                | 1055420-1                          | 408-4833             | <b>1050859-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

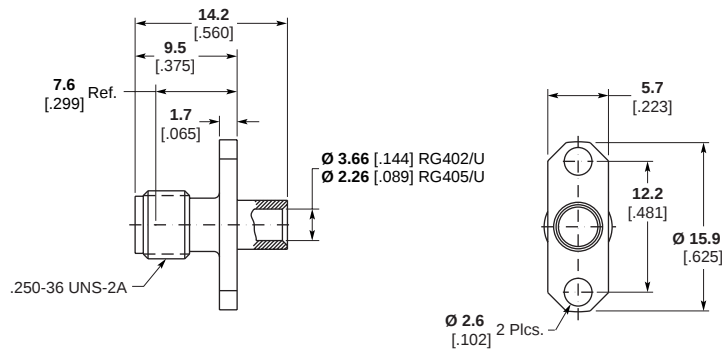
**SMA Connectors** (Continued)  
**Direct Solder Attachment, Semi-Rigid Cable** (Continued)

**Bulkhead Cable Jack**



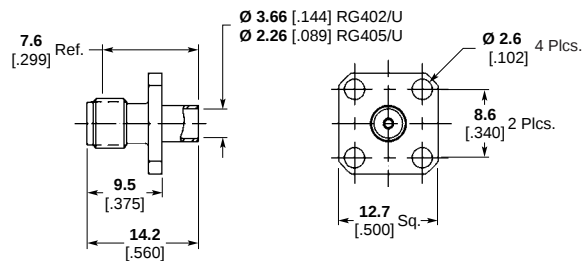
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [1.141]) | Brass, Gold               | No                     | Solder                | 1055420-1                          | 408-4768             | <b>1082029-1</b> |

**2 Hole Flange Mount  
Cable Jack**



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [1.141]) | Stainless, Gold           | No                     | Solder                | 1055420-1                          | 408-4767             | <b>1051052-1</b> |
| 405 (2.16 [1.085]) | Stainless, Gold           | No                     | Solder                | 1055420-1                          | 408-4883             | <b>1051046-1</b> |

**4 Hole Flange Mount  
Cable Jack**



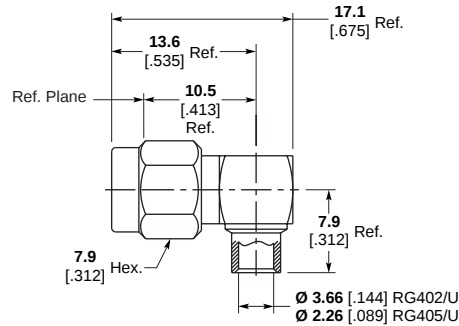
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [1.141]) | Stainless, Gold           | No                     | Solder                | 1055420-1                          | 408-4767             | <b>1051081-1</b> |
| 405 (2.16 [1.085]) | Stainless, Gold           | No                     | Solder                | 1055420-1                          | 408-4883             | <b>1051085-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

### Semi-Rigid Cable

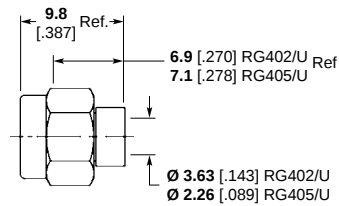
#### Right-Angle Cable Plug, Direct Solder Attachment



| Cable Type<br>RG/U | Body Material<br>& Finish    | Contact<br>Captivation | Contact<br>Attachment | Solder<br>Assembly Kit<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|------------------------------|------------------------|-----------------------|------------------------------------|----------------------|------------------|
| 402 (3.58 [0.141]) | Stainless, Gold <sup>1</sup> | Epoxy                  | Solder                | 1055420-1                          | 408-4831             | <b>1051151-1</b> |
| 405 (2.16 [0.085]) | Stainless, Gold <sup>1</sup> | Epoxy                  | Solder                | 1055420-1                          | 408-4831             | <b>1051157-1</b> |
| 405 (2.16 [0.085]) | Brass, Gold                  | Mechanical             | Solder                | 1055420-1                          | 408-4831             | <b>1088312-1</b> |

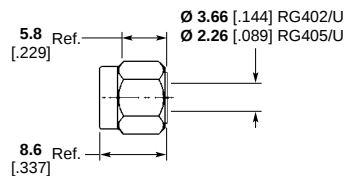
<sup>1</sup>Coupling nut is passivated stainless steel.

#### Straight Cable Plug, Crimp



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|------------------|
| 405 (2.16 [0.085]) | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4695             | <b>1050598-1</b> |
| 402 (3.58 [0.141]) | Stainless, Pass.          | No Center<br>Contact   | Solderless            | 1055835-1                    | 408-4690             | <b>1050740-1</b> |

#### Straight Cable Plug — Low Profile, Crimp



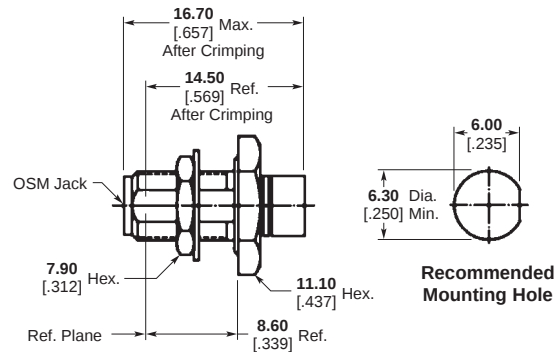
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|------------------|
| 402 (3.58 [0.141]) | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4696             | <b>1050602-1</b> |
| 405 (2.16 [0.085]) | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4697             | <b>1050611-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

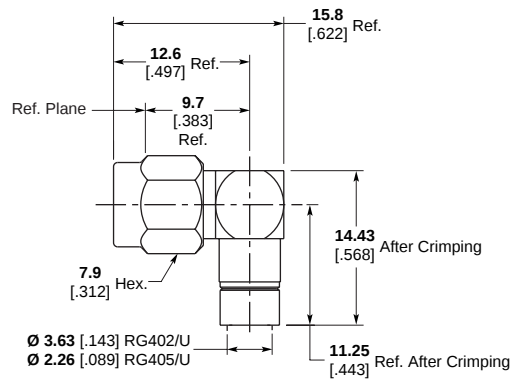
### Semi-Rigid Cable (Continued)

#### 2 Hole Flange, Crimp



| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|------------------|
| 402 (3.58 [.141])  | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4954             | <b>1051005-1</b> |
| 405 (2.16 [.085])  | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4689             | <b>1051007-1</b> |

#### Right-Angle Cable Plug, Crimp



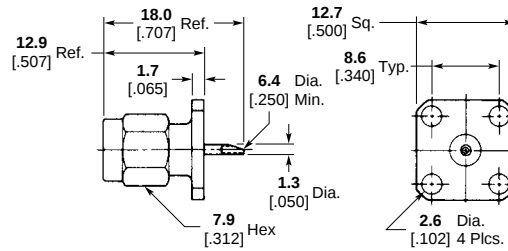
| Cable Type<br>RG/U | Body Material<br>& Finish | Contact<br>Captivation | Contact<br>Attachment | Crimp<br>Tooling<br>Part No. | Instruction<br>Sheet | Part<br>No.      |
|--------------------|---------------------------|------------------------|-----------------------|------------------------------|----------------------|------------------|
| 402 (3.58 [.141])  | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4691             | <b>1051145-1</b> |
| 405 (2.16 [.085])  | Stainless, Pass.          | Mechanical             | Solderless            | 1055835-1                    | 408-4692             | <b>1051147-1</b> |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

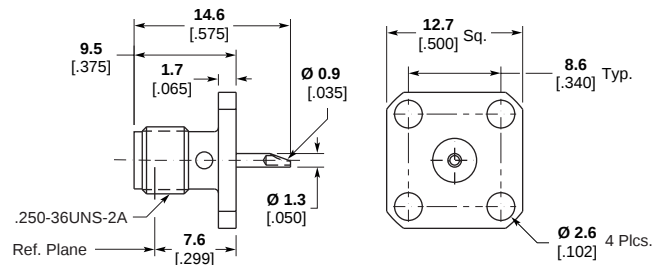
### Panel Mount, Solder Pot Terminal

#### 4 Hole Flange Mount Plug Receptacle



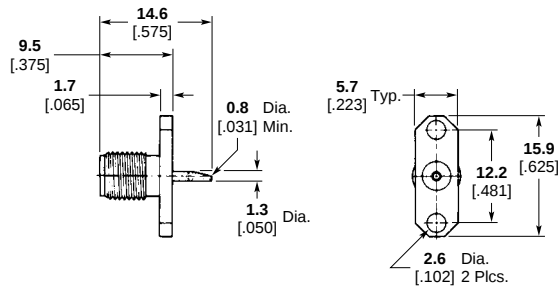
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | N/A                | -65 to 125° C     | 1052324-1 |

#### 4 Hole Flange Mount Jack Receptacle



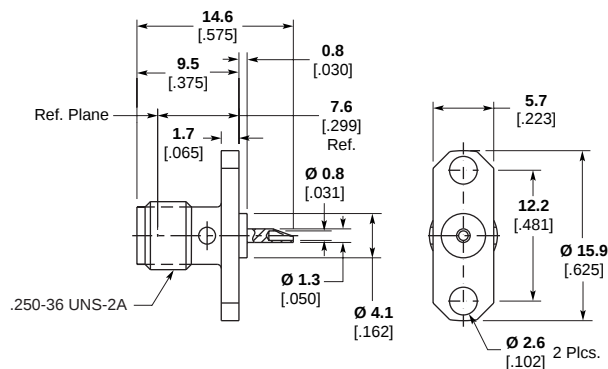
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052422-1 |

#### 2 Hole Flange Mount Jack Receptacle



| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052544-1 |

#### 2 Hole Flange Mount Jack Receptacle



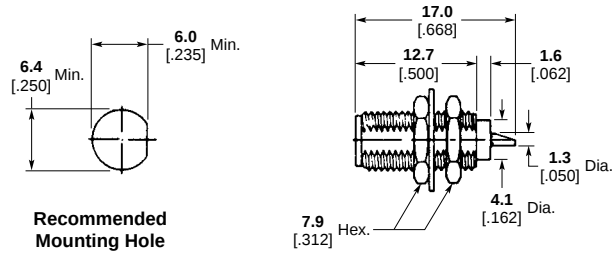
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052534-1 |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

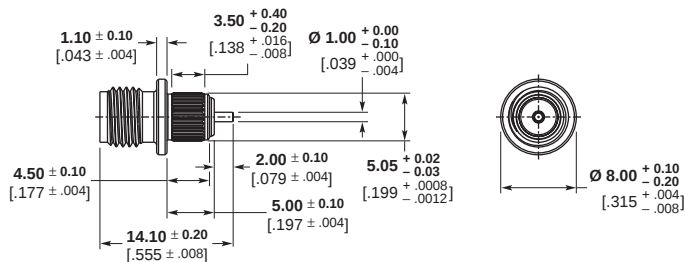
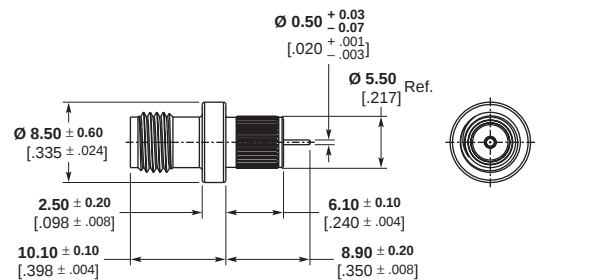
### Panel Mount

#### Bulkhead Feedthrough Jack Receptacle, Solder Pot Terminal



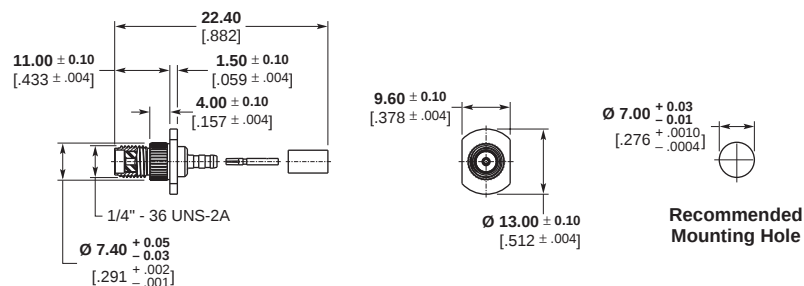
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | N/A                | -65 to 125° C     | 1053092-1 |

#### Press-In Jacks, Straight Terminal



| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Brass, White Bronze    | Mechanical          | N/A                | -65 to 125° C     | 1460468-1 |
| Brass, Gold            | Mechanical          | N/A                | -65 to 125° C     | 1460469-1 |

#### Press-In Cable, Jack Panel



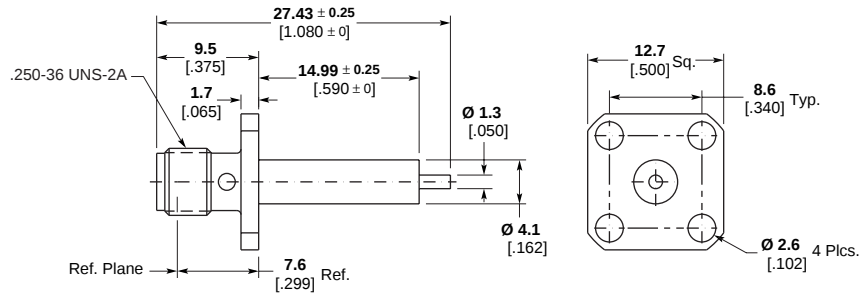
**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

| Cable Type RG/U | Body Material & Finish | Contact Captivation | Temperature Range | Part No. |
|-----------------|------------------------|---------------------|-------------------|----------|
| 316 D           | Brass, Gold            | Mechanical          | -65 to 125° C     | 619115-1 |

## SMA Connectors (Continued)

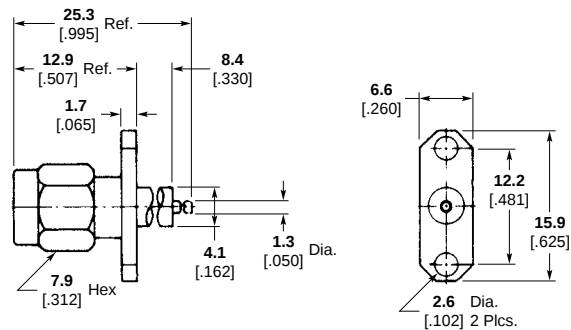
### Panel Mount, Straight Terminal

#### 4 Hole Flange Mount Jack Receptacle



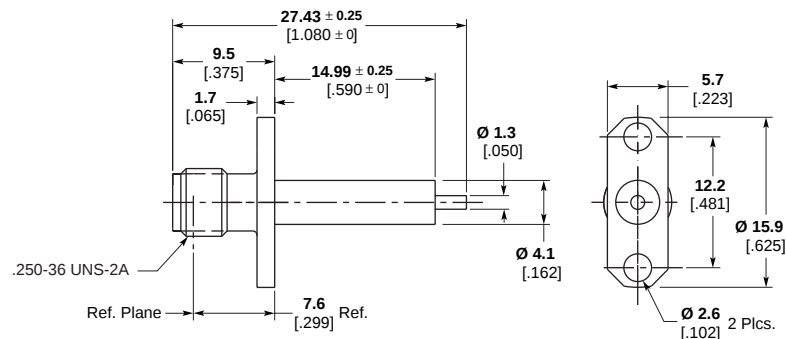
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | None                | -(100-fGHz)        | -65 to 165° C     | 1052518-1 |
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052523-1 |
| Stainless, Gold        | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052522-1 |

#### 2 Hole Flange Mount Plug Receptacle



| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052349-1 |

#### 2 Hole Flange Mount Jack Receptacle



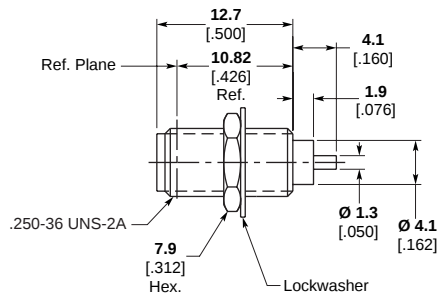
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052552-1 |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

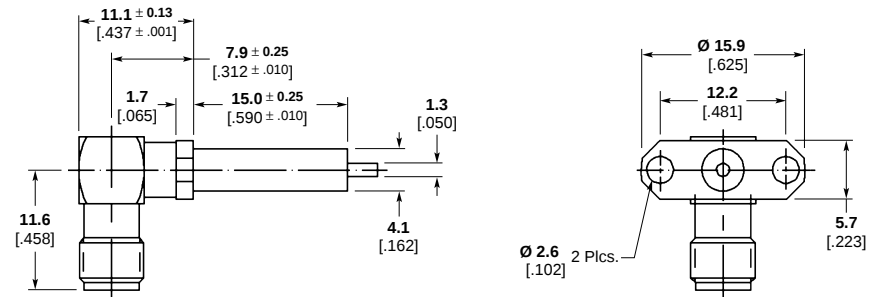
### Panel Mount, Straight Terminal (Continued)

#### Bulkhead Feedthrough Jack Receptacle



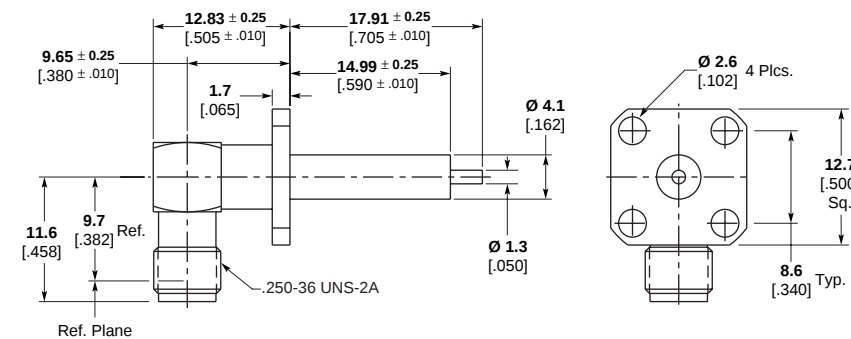
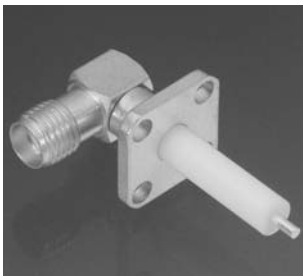
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1053222-1 |

#### 2 Hole Flange Mount Right-Angle Jack Receptacle



| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Mechanical          | -(90-fGHz)         | -65 to 165° C     | 1052986-1 |

#### 4 Hole Flange Mount Right-Angle Jack Receptacle



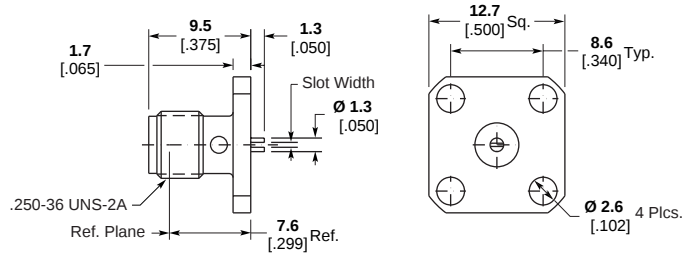
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Mechanical          | -(90-fGHz)         | -65 to 165° C     | 1052978-1 |
| Stainless, Passivated  | Mechanical          | -(90-fGHz)         | -65 to 165° C     | 1052982-1 |

**Note:** Part Numbers are RoHS compliant except: I Indicates non-RoHS compliant.

## SMA Connectors (Continued)

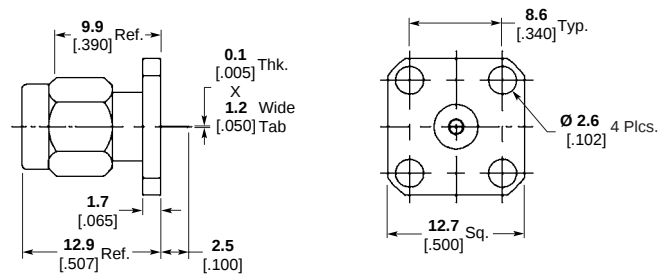
### Panel Mount

#### 4 Hole Flange Mount Jack Receptacle, Straight Terminal



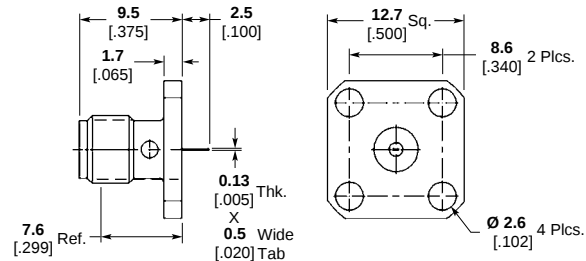
| Body Material & Finish | Contact Captivation | Slot Width<br>+.076/-0.025<br>[+.003/-0.001] | RF Leakage<br>db min. | Temperature<br>Range | Part<br>No. |
|------------------------|---------------------|----------------------------------------------|-----------------------|----------------------|-------------|
| Stainless, Passivated  | Epoxy               | 0.5 [018]                                    | -(60-fGHz)            | -65 to 125° C        | 1052563-1   |

#### 4 Hole Flange Mount Plug Receptacle, Tab Terminal



| Body Material & Finish | Contact Captivation | Tab Width | RF Leakage<br>db min. | Temperature<br>Range | Part<br>No. |
|------------------------|---------------------|-----------|-----------------------|----------------------|-------------|
| Stainless, Passivated  | Epoxy               | 1.3 [050] | -(60-fGHz)            | -65 to 125° C        | 1052360-1   |

#### 4 Hole Flange Mount Jack Receptacle, Tab Terminal

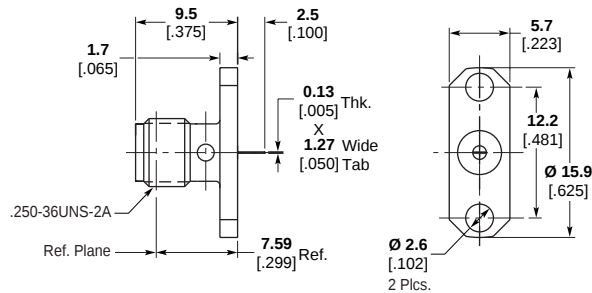


| Body Material & Finish | Contact Captivation | Tab Width | RF Leakage<br>db min. | Temperature<br>Range | Part<br>No. |
|------------------------|---------------------|-----------|-----------------------|----------------------|-------------|
| Stainless, Passivated  | Epoxy               | .51 [020] | -(60-fGHz)            | -65 to 125° C        | 1052898-1   |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

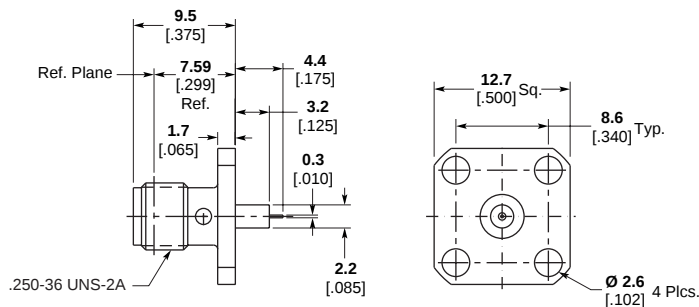
## SMA Connectors (Continued)

### 2 Hole Flange Mount Jack Receptacle, Panel Mount, Tab Terminal



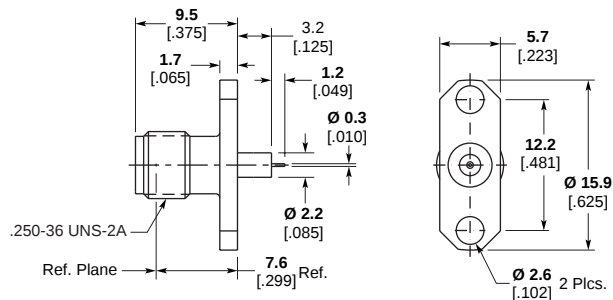
| Body Material & Finish | Contact Captivation | Horizontal Tab | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|----------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               |                | -(60-fGHz)         | -65 to 125° C     | 1052577-1 |

### 4 Hole Flange Mount Jack Receptacle, for Microstrip Transmission Line Circuits



| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052528-1 |

### 2 Hole Flange Mount Jack Receptacle, for Microstrip Transmission Line Circuits



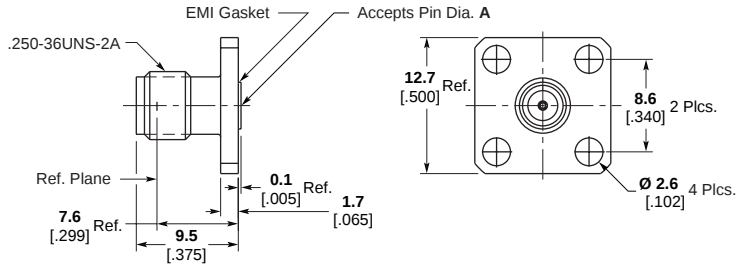
| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No.  |
|------------------------|---------------------|--------------------|-------------------|-----------|
| Stainless, Passivated  | Epoxy               | -(60-fGHz)         | -65 to 125° C     | 1052902-1 |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## SMA Connectors (Continued)

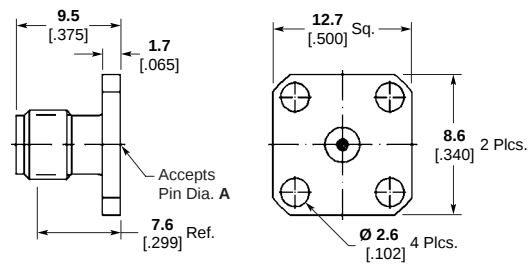
### Field Replaceable Hermetic Launchers (Continued)

#### 4 Hole Flange Mount Jack Receptacle with EMI/RFI Gasket



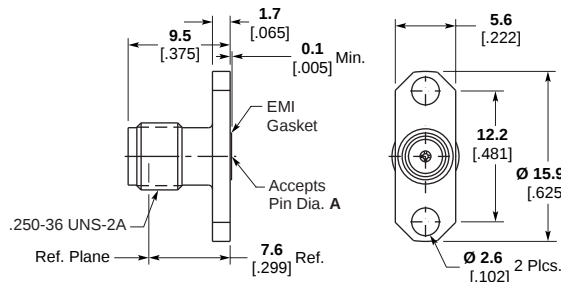
| Material & Finish     | Captivation | Pin Diameter A | Part No.  |
|-----------------------|-------------|----------------|-----------|
| Stainless, Passivated | Mechanical  | .38 [.015]     | 1052684-1 |

#### 4 Hole Flange Mount Jack Receptacle without EMI/RFI Gasket



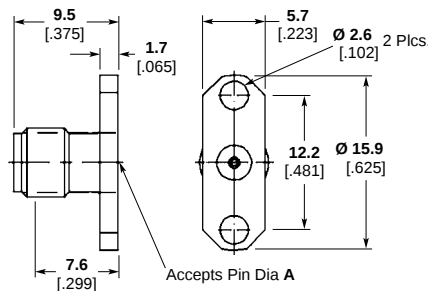
| Material & Finish     | Captivation | Pin Diameter A | Part No.  |
|-----------------------|-------------|----------------|-----------|
| Stainless, Passivated | Mechanical  | .91 [.036]     | 1052643-1 |

#### 2 Hole Flange Mount Jack Receptacle with EMI/RFI Gasket



| Material & Finish     | Captivation | Pin Diameter A | Part No.  |
|-----------------------|-------------|----------------|-----------|
| Stainless, Passivated | Mechanical  | .30 [.012]     | 1052628-1 |
| Stainless, Passivated | Mechanical  | .38 [.015]     | 1052689-1 |
| Stainless, Passivated | Mechanical  | .46 [.018]     | 1052634-1 |

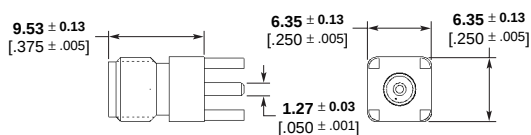
#### 2 Hole Flange Mount Jack Receptacle without EMI/RFI Gasket, Field Replaceable Hermetic Launchers



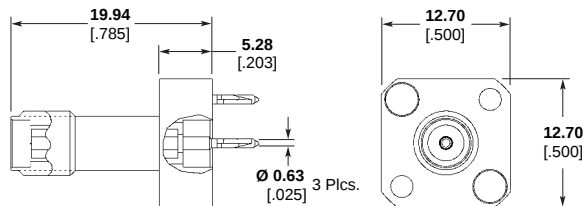
| Material & Finish     | Captivation | Pin Diameter A | Part No.  |
|-----------------------|-------------|----------------|-----------|
| Stainless, Passivated | Mechanical  | .51 [.020]     | 1052652-1 |
| Stainless, Passivated | Mechanical  | .91 [.036]     | 1052646-1 |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## PC Board Mount Vertical Jack



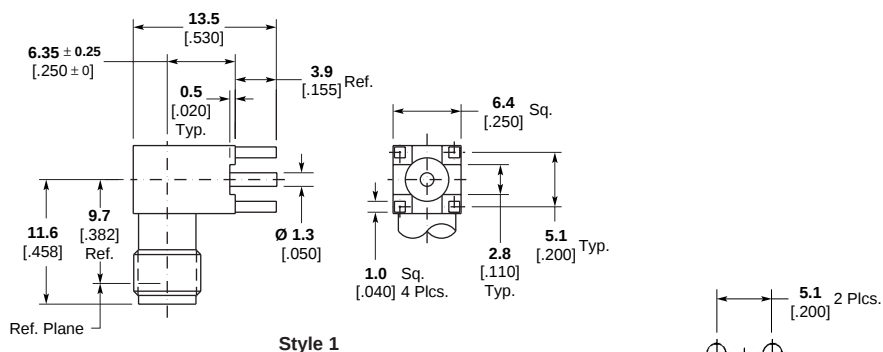
### Style 2



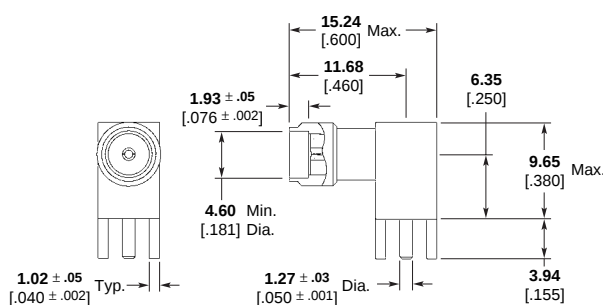
### Style 3

| Material & Finish   | Style No. | Part No.  |
|---------------------|-----------|-----------|
| Stainless, Gold     | 1         | 1053354-1 |
| Brass, Gold         | 2         | 221789-1  |
| Brass, Gold         | 2         | 221789-3  |
| Brass, Nickel Plate | 3         | 6274096-1 |

## PC Board Mount Right-Angle Jack



### Style 1



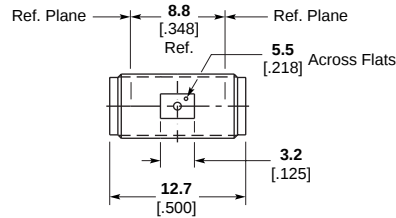
### Style 2

| Material & Finish | Style No. | Part No.  |
|-------------------|-----------|-----------|
| Stainless, Gold   | 1         | 1053378-1 |
| Stainless, Gold   | 2         | 221790-1  |

**Note:** Part Numbers are RoHS compliant except:      Indicates non-RoHS compliant.

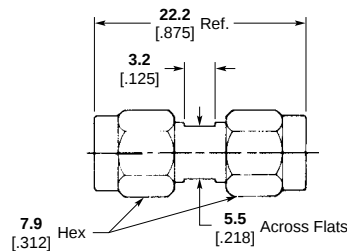
## SMA Connectors (Continued)

### In-Series Adapter, Jack to Jack



| Frequency  | Material & Finish | Captivation | Part No.  |
|------------|-------------------|-------------|-----------|
| DC-18.0GHz | Stainless, Gold   | Epoxy*      | 1053488-1 |

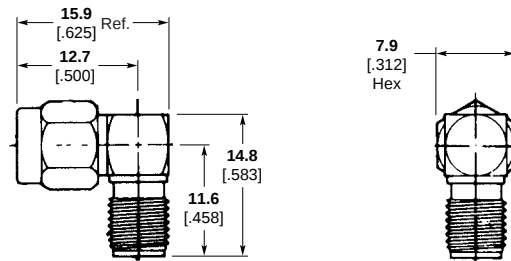
### In-Series Adapter, Plug to Plug



| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-18.0GHz | Stainless, Passivated | Epoxy*      | 1053635-1 |

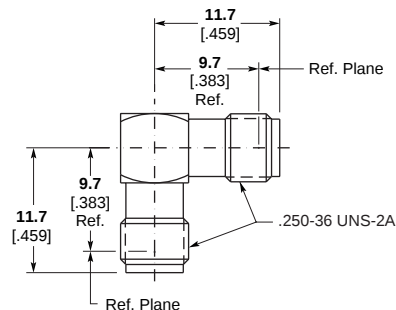
\*All adapters listed above employ epoxy captivation. Mechanically captivated versions are also available. Please consult Tyco Electronics.

### In-Series Adapter, Jack to Plug, Right-Angle



| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-12.4GHz | Stainless, Passivated | Mechanical  | 1055065-1 |

### In-Series Adapter, Jack to Jack, Right-Angle

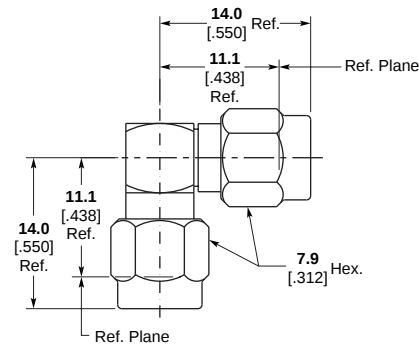


| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-12.4GHz | Stainless, Passivated | Mechanical  | 1055018-1 |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

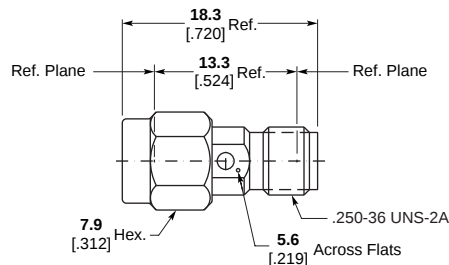
## SMA Connectors (Continued)

### In-Series Adapter, Plug to Plug, Right-Angle



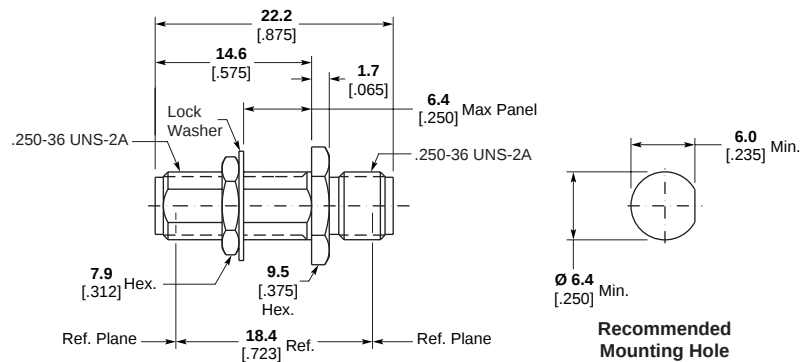
| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-18.0GHz | Stainless, Passivated | Mechanical  | 1055047-1 |

### In-Series Adapter, Jack to Plug, Connector Saver



| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-18.0GHz | Stainless, Passivated | Epoxy       | 1054426-1 |

### In-Series Adapter, Jack to Jack, Bulkhead Feedthrough

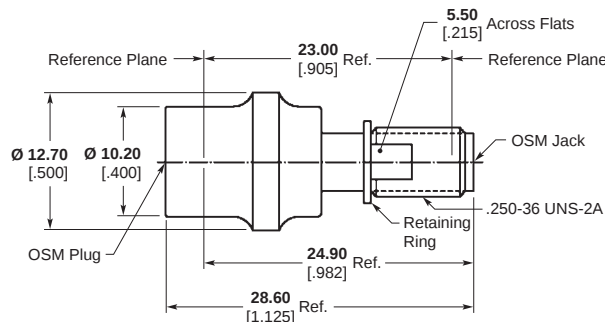


**Recommended  
Mounting Hole**

| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-18.0GHz | Stainless, Passivated | Epoxy*      | 1054869-1 |

\*Mechanically captivated version available. Please consult Tyco Electronics.

### Test Adapter, Plug to Jack, Quick Release



| Frequency  | Material & Finish     | Captivation | Part No.  |
|------------|-----------------------|-------------|-----------|
| DC-18.0GHz | Stainless, Passivated | Epoxy       | 1053780-1 |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## QMA Connectors

### Snap-On SMA Series of RF Connectors

#### Product Facts

- Positive snap-on interface facilitates assembly
- Intermateable with competitor product
- Excellent RF performance to 6 GHz
- Ideal for Communications and Industrial Applications



Tyco Electronics' next generation high performance RF products QMA (Snap-On SMA) connectors series offers the same high quality and performance currently found in the standard Tyco Electronics SMA series but does not require the coupling nut torque. By integrating a snap-on feature to the design, denser packaging can be achieved, and the overall applied cost is dramatically reduced. The QMA connector series is excellent for communications as well as industrial applications. The QMA offering is designed for 100 mating cycles, operates through 6 GHz, and is completely intermateable with competitive QMA offerings. This new QMA product is not intermateable with standard SMA interfaces.

QMA connectors are available in a broad range of standard configurations,

including PCB and panel mount, flexible and semi-rigid cable, and adapters. Other options can be reviewed as well, including additional cable sizes, PCB surface mounting, and tape and reel packaging.

The QMA connector series is a cost effective solution for the challenging demands of today's commercial marketplace, with applications including cellular base station, handsets, and test and measurement. Call your local sales office or authorized distributor for additional information or samples of the QMA connector series.

Tyco Electronics is a leading supplier of RF and Microwave connectors and cable assemblies, and provides advanced technology products from well known and industry leading brands, including AMP and M/A-COM.

#### Material and Finish

**Shells and Bodies** — Brass, nickel plated

**Collars** — Phosphor bronze, white bronze plated

**Outer Contacts** — Beryllium copper, nickel plated

**Center Contacts** — Beryllium copper, gold plated

**Dielectrics** — PTFE

#### Electrical Characteristics

**Frequency** — dc – 6 GHz

**Nominal Impedance** — 50 ohms

**Voltage Rating** — 335 Volts (VRMS max.) @ Sea Level

**VSWR** — 1.15 : 1 max. @ 6 GHz

**Insulation Resistance** — 5,000 megohms min.

**Insertion Loss** — .25 dB Max @ 6 GHz

**Dielectric Withstanding Voltage** — 1000 Volts (VRMS max.) @ Sea Level

**Contact Resistance** —

Center Contact — 5 milliohms max.

Outer Contact — 4 milliohms max.

#### Mechanical Characteristics

**Connector Durability** —

100 mating cycles

**Force to Engage** — 27 Newtons

**Force to Disengage** — 20 Newtons

**Retention Force (mated pair)** — 60 Newtons min.

**Cable Retention** — Dependent upon cable type

#### Environmental Characteristics

**Temperature Rating** —

-40 to +125°C

**Vibration** — EIA-364-28,

Test Condition VII, Condition D

**Shock** — EIA-364-27, Method H

**Moisture Resistance** — EIA-364-31, Method III

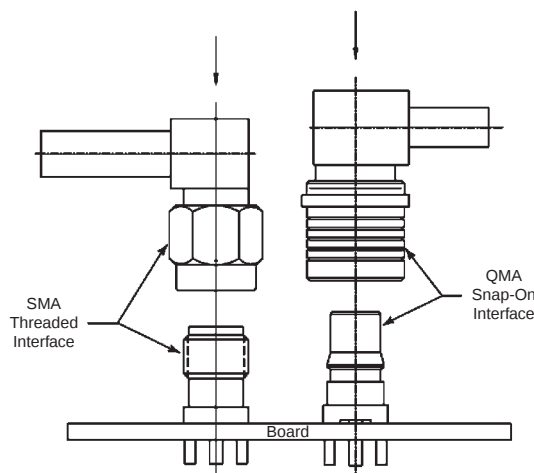
**Thermal Shock** — EIA-364-32

**Note:** Performance specifications are typical, but may not apply to all connector types.

#### Related Product Data

**Product Specification** — 108-2087

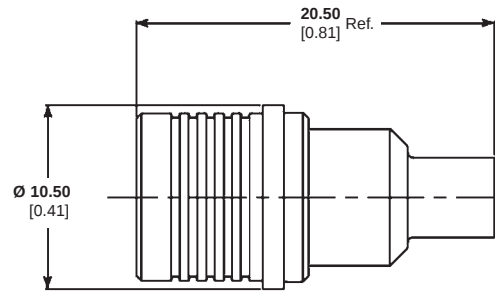
**Sample Kit** — 1654882



## QMA Connectors (Continued)

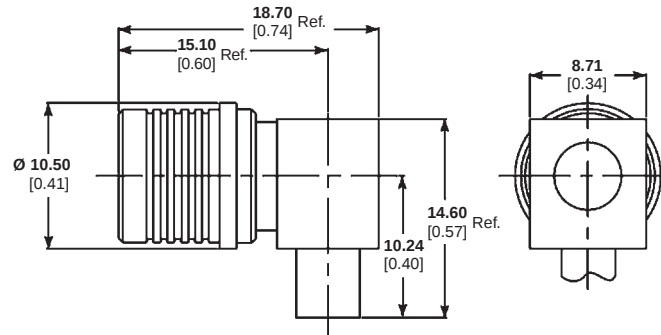
### Semi-Rigid Cable — Direct Solder Attachment

#### Straight Cable Plug



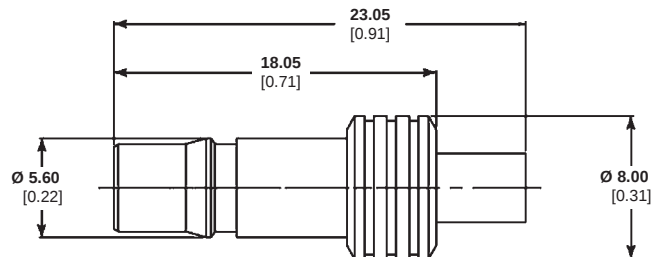
| Cable  | Part Number |
|--------|-------------|
| RG 402 | 1408346-1   |

#### Right-Angle Cable Plug



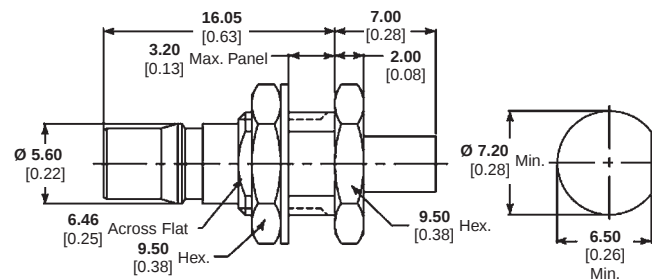
| Cable  | Part Number |
|--------|-------------|
| RG 402 | 1408347-1   |

#### Straight Cable Jack



| Cable  | Part Number |
|--------|-------------|
| RG 402 | 1408348-1   |

#### Bulkhead Cable Jack



#### Recommended Mounting Hole

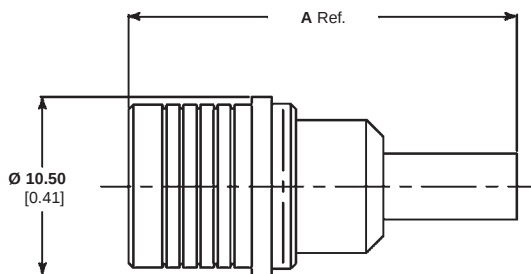
| Cable  | Part Number |
|--------|-------------|
| RG 402 | 1408349-1   |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## QMA Connectors (Continued)

### Flexible Cable — Crimp Attachment

#### Straight Cable Plug

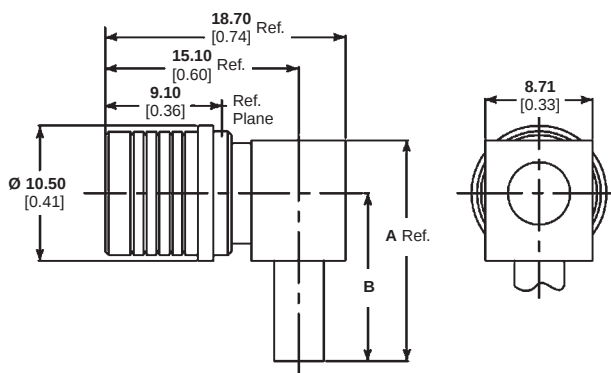


| Cable            | Dim. A        | Part Number |
|------------------|---------------|-------------|
| RG 174, 188, 316 | 22.90<br>0.90 | 1408333-1   |
| RD 316           | 22.90<br>0.90 | 1408333-3   |
| RG 400           | 25.20<br>0.99 | 1408333-5   |
| RG 58            | 25.20<br>0.99 | 1408333-7   |

#### Right-Angle Cable Plug



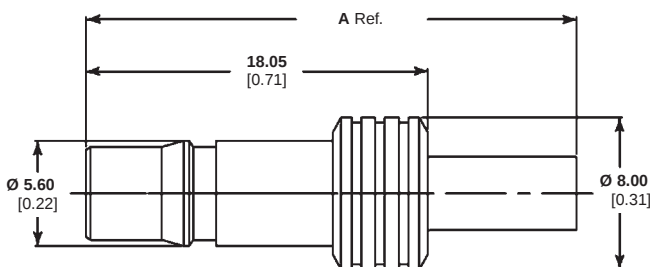
| Cable            | Dim. A        | Dim. B        | Part Number |
|------------------|---------------|---------------|-------------|
| RG 174, 188, 316 | 17.20<br>0.68 | 13.10<br>0.52 | 1408336-1   |
| RD 316           | 17.20<br>0.68 | 13.10<br>0.52 | 1408336-3   |
| RG 400           | 19.50<br>0.77 | 15.40<br>0.61 | 1408336-5   |
| RG 58            | 19.50<br>0.77 | 15.40<br>0.61 | 1408336-7   |



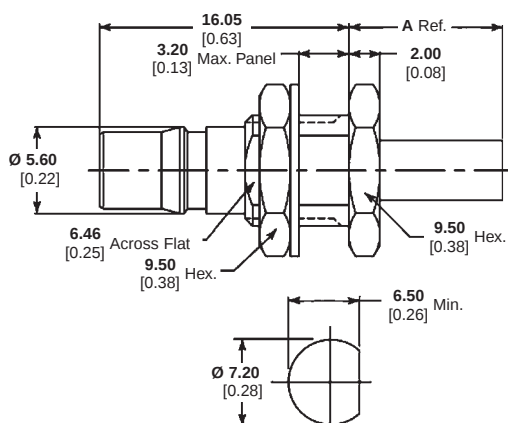
#### Straight Cable Jack



| Cable            | Dim. A        | Part Number |
|------------------|---------------|-------------|
| RG 174, 188, 316 | 25.90<br>1.02 | 1408338-1   |
| RD 316           | 25.90<br>1.02 | 1408338-3   |
| RG 400           | 28.20<br>1.11 | 1408338-5   |
| RG 58            | 28.20<br>1.11 | 1408338-7   |



#### Bulkhead Cable Jack



| Cable            | Dim. A        | Part Number |
|------------------|---------------|-------------|
| RG 174, 188, 316 | 9.90<br>0.39  | 1408339-1   |
| RD 316           | 9.90<br>0.39  | 1408339-3   |
| RG 400           | 12.20<br>0.48 | 1408339-5   |
| RG 58            | 12.20<br>0.48 | 1408339-7   |

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

#### Recommended Mounting Hole

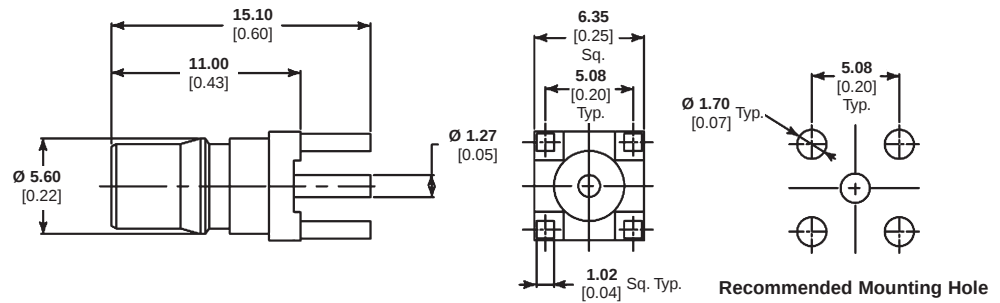
## QMA Connectors (Continued)

### Printed Circuit Board

#### Straight Jack Receptacle



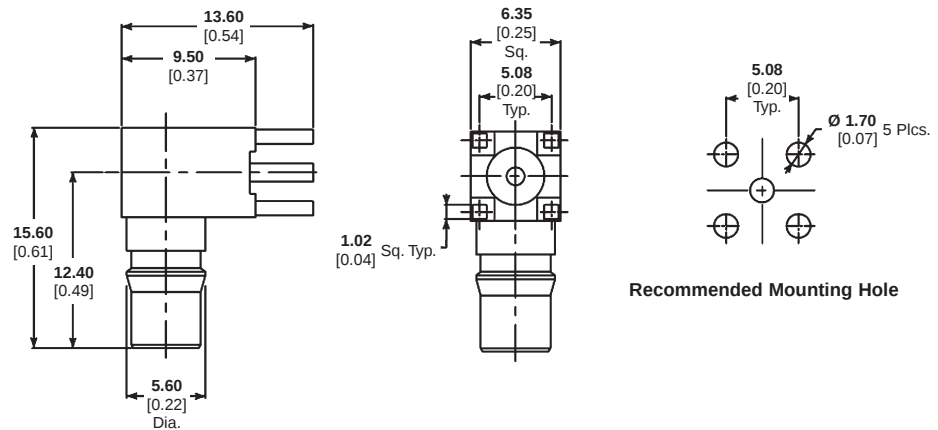
| Part Number |
|-------------|
| 1408332-1   |



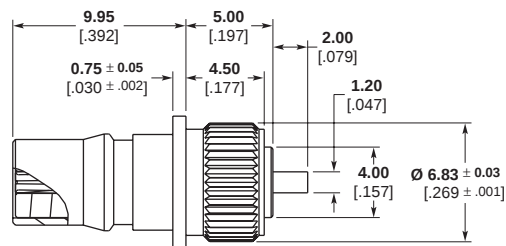
#### Right-Angle Jack Receptacle



| Part Number |
|-------------|
| 1408337-1   |



#### Straight Terminal Press-In Jack



| Body Material & Finish | Contact Captivation | RF Leakage db min. | Temperature Range | Part No. |
|------------------------|---------------------|--------------------|-------------------|----------|
| Brass, Gold            | Mechanical          | N/A                | -65 to 125° C     | 619215-1 |

**Note:** Part Numbers are RoHS compliant except: I Indicates non-RoHS compliant.

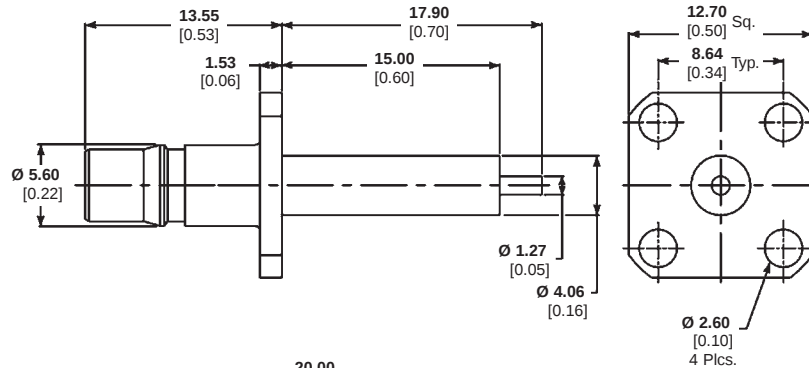
## QMA Connectors (Continued)

### Straight Terminal

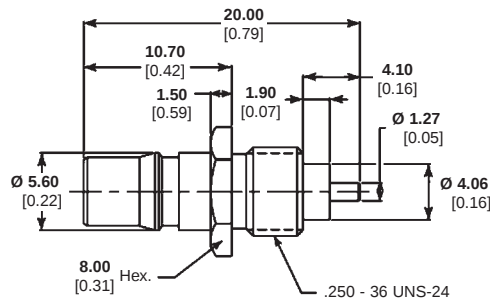
#### 4-Hole Flange Mount Jack Receptacle



Part Number  
**1408341-1**



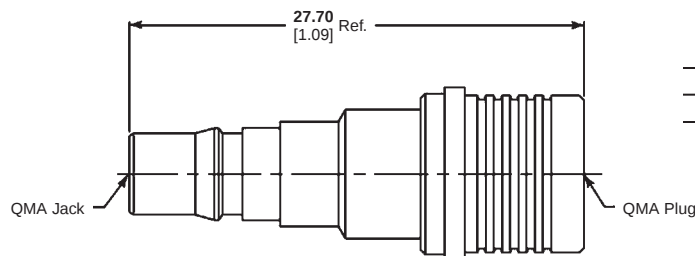
### Screw-In Front Mount Jack Receptacle



Part Number  
**1408340-1**

### Adapters — In Series

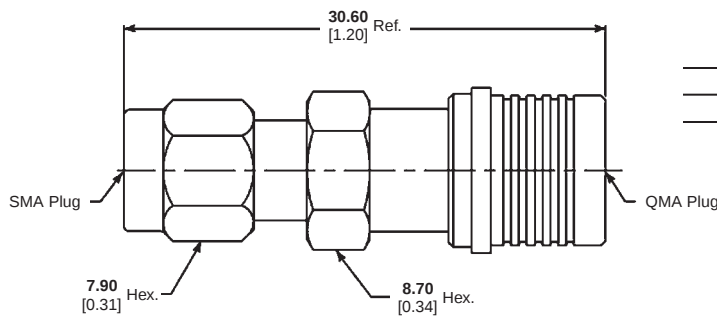
#### QMA Plug to QMA Jack



Part Number  
**1408342-1**

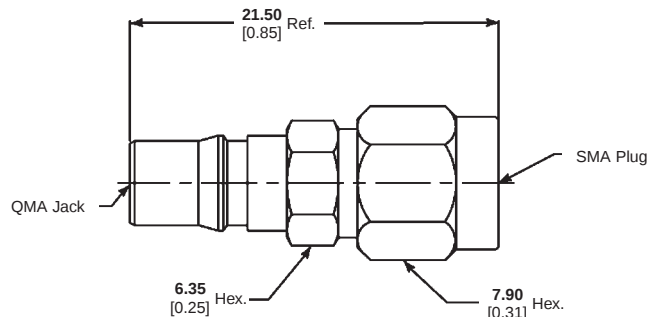
### Adapters — Between Series

#### QMA Plug to SMA Plug



Part Number  
**1408393-1**

#### QMA Jack to SMA Plug



Part Number  
**1408343-1**

**Note:** Part Numbers are RoHS compliant except: Indicates non-RoHS compliant.

## Series 1.0/2.3 (50 Ohm/75 Ohm)



Miniature coaxial connectors series 1.0/2.3 (CECC 22230 and IEC 61169-29) coaxial connectors are devised to meet the requirements of compact electronic instrumentation. All plugs and jacks with  $Z_0 = 50$  are designed for a number of different 50 and 75 cables. Owing to the large demand, the Series 1.0/2.3 has also been optimized as a 75 design into the GHz range. The different types of coupling mechanisms, such as screw on, slide-in and latching coupling permit space-saving installation. In addition, an extensive range of measurement

accessories, adapters as well as terminations is available. The quality-determining factors have been established on the basis of corresponding measurements and test procedures in accordance with national and international standards for RF connectors (IEC 61169-1, MIL-C-39012 etc.).

High-quality materials ensure high reliability even in industrial atmospheres. The contact principle is the pin-socket principle and the contacts are gold plated to ensure perfect contact mating. The inner conductor parts are held in PTFE (Polytetrafluoroethylene).

The reduced dimensions of all component parts of these connectors permit a compact hole spacing (installation pitch) of 6.8 [0.27] depending upon the corresponding cable diameters.

The cable is connected by crimping the cable braid to the plug or jack body, the inner conductor is soldered or crimped.

In most applications, the plug and jack belong to the same coupling type group. In special instances, such as for measurement purposes, different coupling types can be used together.

### Between Series Adapters

For Series 1.0/2.3 Adapters please see pages 251-260.

## Series 1.0/2.3 (50 Ohm/75 Ohm) (Continued)

### Technical Data

#### Electrical and mechanical characteristics in accordance with CECC 22230

**Characteristic impedance** —  
50 /75

**Frequency range** — up to 10 GHz/  
2 GHz

**Reflection factor, referred to 50 cable<sup>1</sup>** —

up to 1 GHz,  $r$  0.05

up to 4 GHz,  $r$  0.07

up to 10 GHz,  $r$  0.15

**Reflection factor, referred to 75 cable<sup>1</sup>** —

up to 2 GHz,  $r$  0.10

**Insulation resistance** —

initial value 1 G

after stressing 200 M

**Screening effectiveness<sup>2</sup>** —

90 dB

**Inner conductor contact resistance**

— after stressing 10 m

**Outer conductor continuity** —

after stressing 7.5 m

**Voltage proof<sup>3</sup>** —

flexible cables (RG 316)

— at sea level, 750 V, 50 Hz

— at 20 km altitude, 150 V, 50 Hz

**Working voltage<sup>3</sup>** —

flexible cables (RG 316)

— at sea level, 350 V, 50 Hz

— at 20 km altitude, 65 V, 50 Hz

**Service life** — 500 cycles

**Climatic category** — 40/85/21

#### Notes:

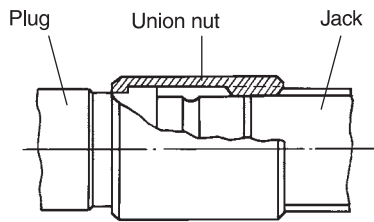
<sup>1</sup> Guide values, depending on cable type and connector style.

<sup>2</sup> Values apply to a straight screw and latching coupling with suitable cable.

<sup>3</sup> Some cables suitable for use with these connectors have lower characteristic values than specified here.

<sup>4</sup> For applicable cable types see page 151.

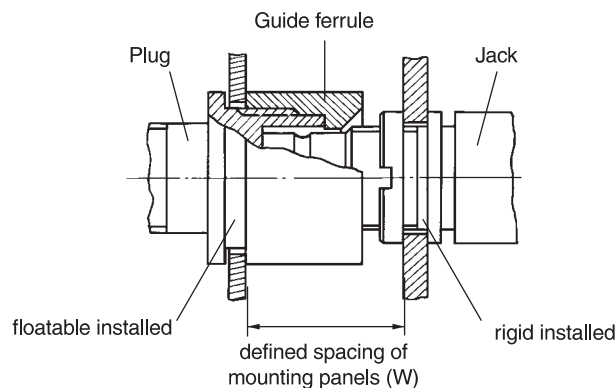
### Coupling Types



#### Type A

Screw coupling; version with union nut

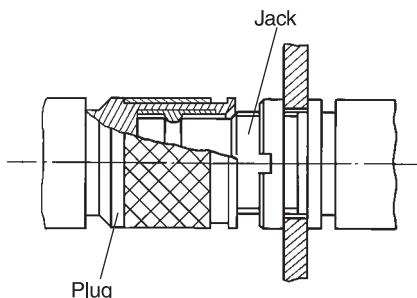
This type permits the plug and jack to be screwed together manually by means of a union nut secured to the plug. This is necessary for readily accessible locations, front panel test points and cable connections.



#### Type C

Slide-in coupling; version with centering ferrule

In this type of coupling, the plug features a guide ferrule with a conical entry surface. This ensures that the floatable bulkhead plugs with cable connection make a reliable electrical connection to the rigid installed jack. Examples of this are single and multi-contact connections of slide-in applications. "W" denotes the allowed spacing of the mounting panel for satisfactory contact when the connection is made.



#### Type F

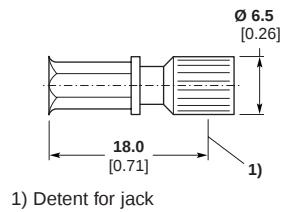
Latching coupling (Quick Lock)

In this version, the cable plugs bear a funnel ferrule with built-in spring which snaps into a groove on the jack, simultaneously locking the connection. The connec-

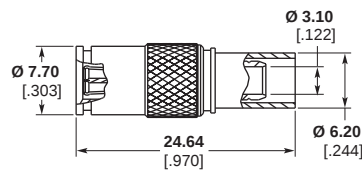
tion can be easily separated by lightly pulling the outer sleeve of the plug. This type of coupling can be used with a higher packing density, as the screw coupling.

## Series 1.0/2.3, 50 Ohm

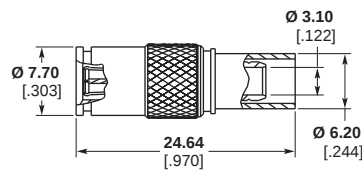
### Plugs, Solder/Crimp



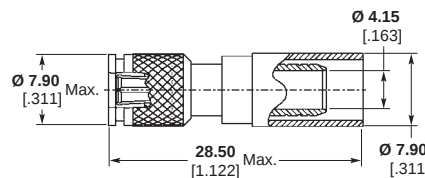
| Cable  | Coupling Type | Ø Max.        | Part No.  |
|--------|---------------|---------------|-----------|
| RG 316 | A             | 2.67<br>0.105 | 1393670-1 |



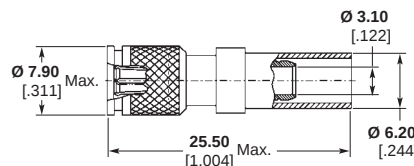
| Cable     | Coupling Type | Ø Max.        | Part No. |
|-----------|---------------|---------------|----------|
| WP93385L2 | F             | 2.67<br>0.105 | 619223-1 |



| Cable   | Coupling Type | Ø Max.        | Part No. |
|---------|---------------|---------------|----------|
| LMR 240 | F             | 2.67<br>0.105 | 619224-1 |



| Cable     | Coupling Type | Ø Max.       | Part No.  |
|-----------|---------------|--------------|-----------|
| LMR 240FR | F             | 6.3<br>0.248 | 1460010-1 |

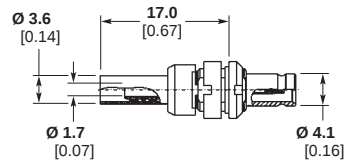


| Cable     | Coupling Type | Ø Max.       | Part No. |
|-----------|---------------|--------------|----------|
| WP93385L2 | F             | 6.3<br>0.248 | 619085-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

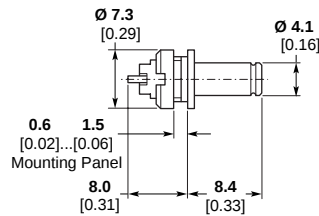
**Series 1.0/2.3, 50 Ohm** (Continued)

**Bulkhead Jack,  
Solder/Crimp**



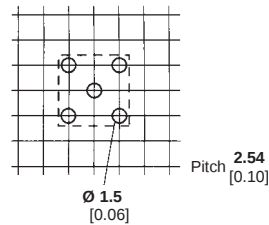
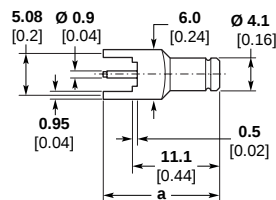
| Cable  | Coupling Type | Ø Max.      | Part No.    |
|--------|---------------|-------------|-------------|
| RG 316 | A, C, F       | 2.6<br>0.10 | 4-1393670-4 |

**Bulkhead Solder Jack**



| Coupling Type | Part No.  |
|---------------|-----------|
| C, F          | 1393670-8 |

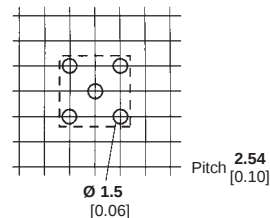
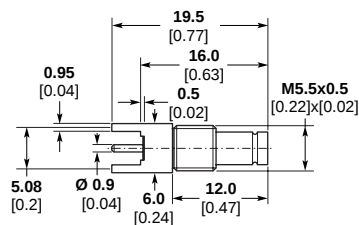
**Vertical PC Board  
Mount Jack**



| Coupling Type | Dim a        | Part No.    |
|---------------|--------------|-------------|
| C, F          | 14.6<br>0.57 | 3-1393670-4 |
| C, F          | 15.6<br>0.61 | 3-1393670-5 |

Recommended Mounting Holes

**Vertical PC Board Mount  
Bulkhead Jack**



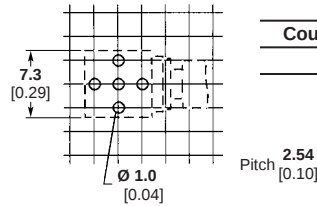
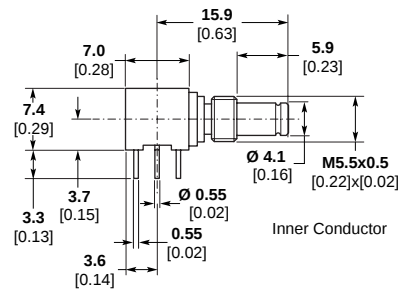
| Coupling Type | Part No.    |
|---------------|-------------|
| A, C, F       | 3-1393670-6 |

Recommended Mounting Holes

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**Series 1.0/2.3, 50 Ohm** (Continued)

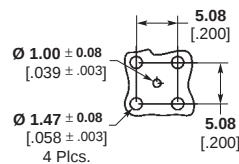
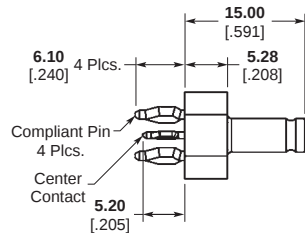
**Right-Angle PC Board  
Mount Bulkhead Jack**



**Recommended Mounting Holes**

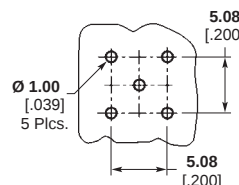
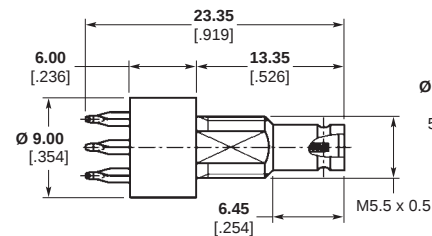
| Coupling Type | Part No.    |
|---------------|-------------|
| A, C, F       | 3-1393670-9 |

**Vertical PC Board Mount  
ACTION PIN Jack**



**Recommended Mounting Holes**

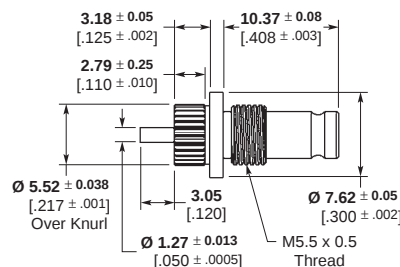
| Coupling Type | Part No.  |
|---------------|-----------|
| C, F          | 6274431-1 |



**Recommended Mounting Holes**

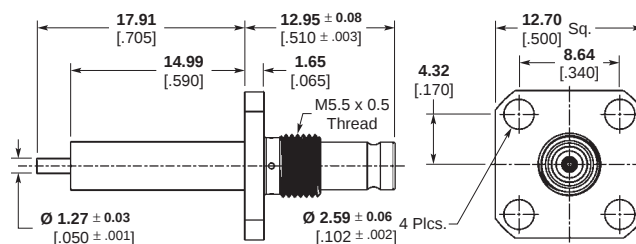
| Coupling Type | Part No. |
|---------------|----------|
| A, C, F       | 619107-1 |

**Panel Mount, Press-in,  
Launcher Jack**



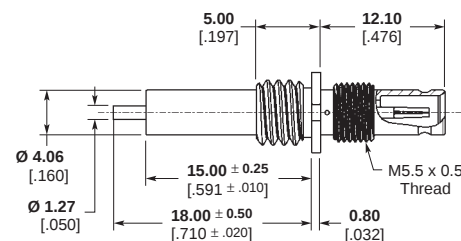
| Coupling Type | Part No.  |
|---------------|-----------|
| A, C, F       | 1274449-1 |

**Panel Mount, 4-Hole  
Flange, Launcher Jack**



| Coupling Type | Part No.  |
|---------------|-----------|
| A, C, F       | 1274520-1 |

**Front Mount,  
Bulkhead Jack**

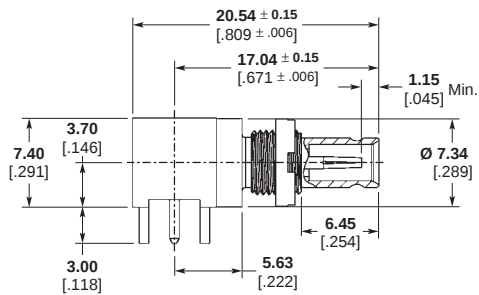


| Coupling Type | Part No.  |
|---------------|-----------|
| A, C, F       | 1274594-1 |

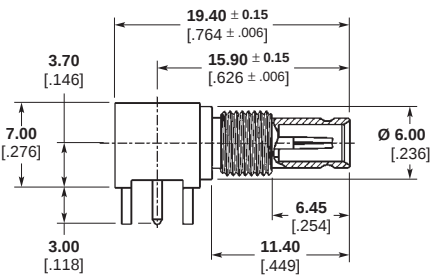
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Series 1.0/2.3, 50 Ohm (Continued)

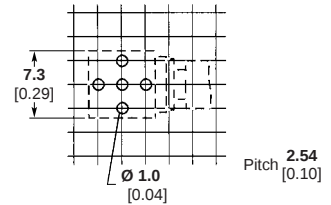
### Right-Angle PC Board Mount Bulkhead Jack



Part Number 1274544-1



Part Number 1460060-1



Recommended Mounting Holes

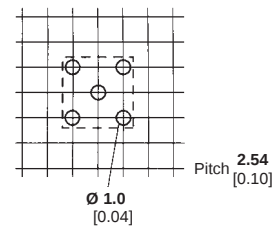
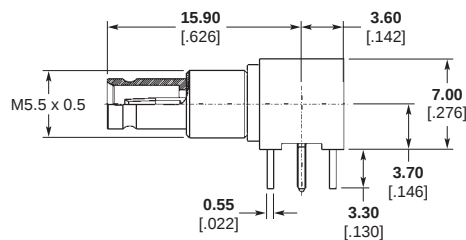
| Coupling Type | Part No.  |
|---------------|-----------|
| A, C, F       | 1274544-1 |
| A, C, F       | 1460060-1 |

### Plating

Outer Body — Silver

Outer and Center Conductor —  
Gold

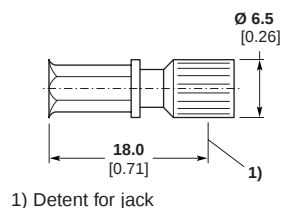
| Coupling Type | Part No.  |
|---------------|-----------|
| A, C, F       | 1460139-1 |



Recommended Mounting Holes

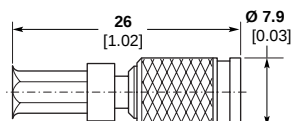
## Series 1.0/2.3, 75 Ohm

### Plugs, Solder/Crimp



1) Detent for jack

| Cable  | Coupling Type | Ø Max.        | Part No.    |
|--------|---------------|---------------|-------------|
| RG 179 | A             | 2.67<br>0.105 | 5-1393670-5 |

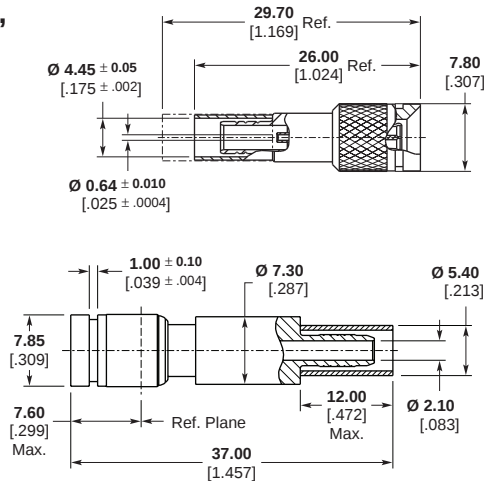


| Cable                | Coupling Type | Ø Max.        | Part No.    |
|----------------------|---------------|---------------|-------------|
| RG 179               | F             | 2.67<br>0.105 | 6-1393670-2 |
| ST 212               | F             | 3.2<br>0.13   | 6-1393670-5 |
| 02Y(S)CY<br>0.45/2.0 | F             | 3.6<br>0.14   | 6-1393670-4 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**Series 1.0/2.3, 75 Ohm** (Continued)

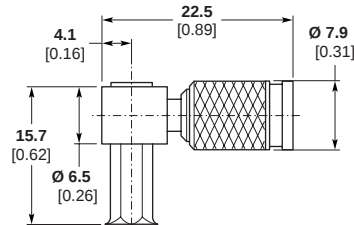
**Straight Plugs,  
Solder/Crimp**



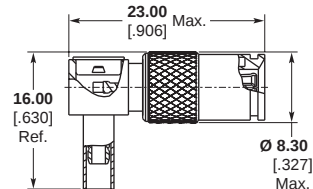
| Cable        | Coupling Type | $\varnothing$ Max. | Part No. |
|--------------|---------------|--------------------|----------|
| BELDEN 1855A | A, C, F       | 2.67<br>0.105      | 619226-1 |

| Cable   | Coupling Type | $\varnothing$ Max. | Part No.  |
|---------|---------------|--------------------|-----------|
| BT 3002 | A, C, F       | 2.67<br>0.105      | 1460815-1 |

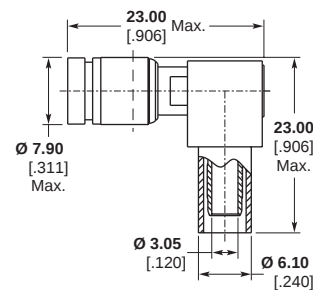
**Right-Angle Plug,  
Solder/Crimp**



| Cable              | Coupling Type | $\varnothing$ Max. | Part No.    |
|--------------------|---------------|--------------------|-------------|
| RG 179             | F             | 2.67<br>0.105      | 2-1393670-6 |
| 02Y(St)CY 0.45/2.0 | F             | 3.6<br>0.14        | 7-1393670-0 |

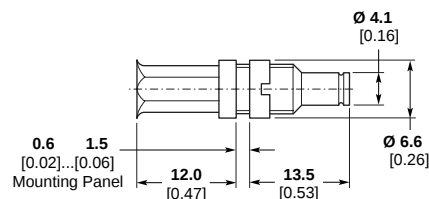


| Cable  | Coupling Type | $\varnothing$ Max. | Part No. |
|--------|---------------|--------------------|----------|
| RG 316 | F             | 2.8<br>0.110       | 619228-1 |



| Cable   | Coupling Type | $\varnothing$ Max. | Part No.  |
|---------|---------------|--------------------|-----------|
| RA 7000 | A, C, F       | 2.67<br>0.105      | 1460817-1 |

**Bulkhead Jack,  
Solder/Crimp**



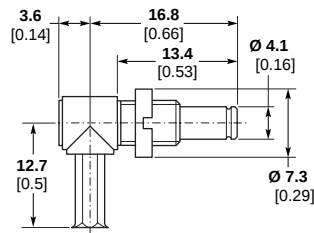
| Cable  | Coupling Type | $\varnothing$ Max. | Part No.    |
|--------|---------------|--------------------|-------------|
| RG 179 | A, C, F       | 2.67<br>0.105      | 8-1393670-0 |

BELDEN is a trademark of Belden Wire and Cable Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

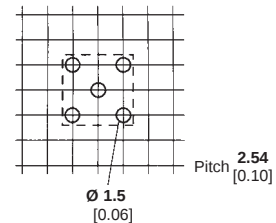
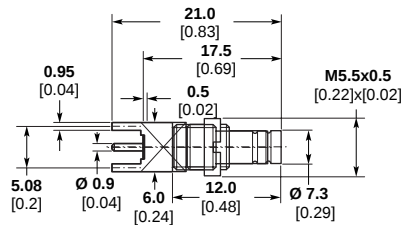
**Series 1.0/2.3, 75 Ohm (Continued)**

**Right-Angle Bulkhead Jack,  
Solder/Crimp**



| Cable       | Coupling Type | Ø Max.        | Part No.    |
|-------------|---------------|---------------|-------------|
| RG 179, 316 | A, C, F       | 2.67<br>0.105 | 3-1393670-2 |

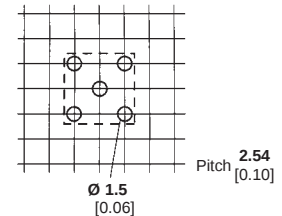
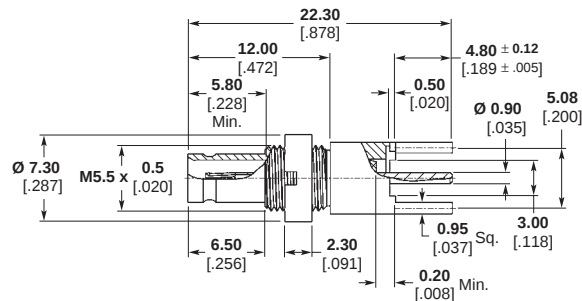
**Vertical PC Board Mount  
Bulkhead Jack**



Recommended Mounting Holes

| Coupling Type | Part No.    |
|---------------|-------------|
| A, C, F       | 8-1393670-3 |

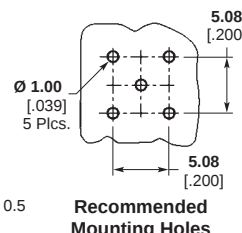
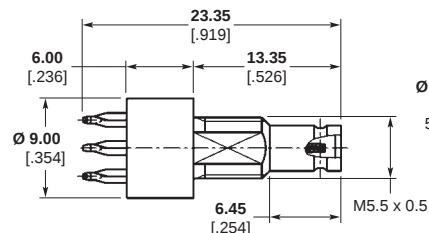
**PC Board Mount  
Bulkhead Jack**



Recommended Mounting Holes

| Coupling Type | Ø Max.                 | Part No. |
|---------------|------------------------|----------|
| A, C, F       | 1.00-2.30<br>.039-.091 | 619220-1 |

**Vertical PC Board Mount  
Bulkhead Jack**



Recommended Mounting Holes

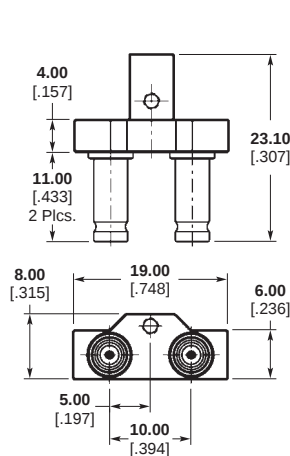
| Coupling Type | Part No. |
|---------------|----------|
| A, C, F       | 619106-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

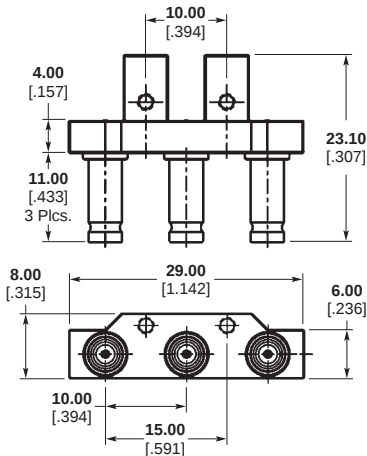
## Series 1.0/2.3, 75 Ohm (Continued)

### Straight PCB Jacks, Multi-Port

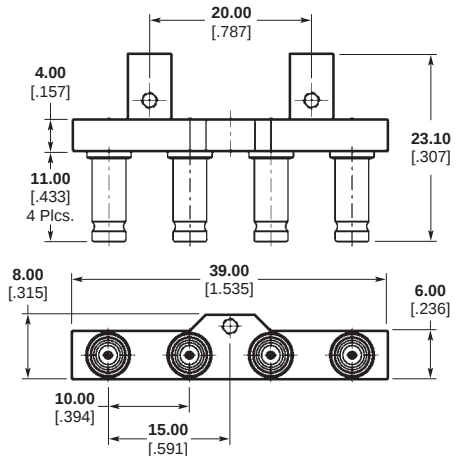
| No. of Ports | Coupling Type | Part No.  |
|--------------|---------------|-----------|
| 2            | A, C, F       | 1274714-3 |
| 3            | A, C, F       | 1274714-2 |
| 4            | A, C, F       | 1274714-1 |



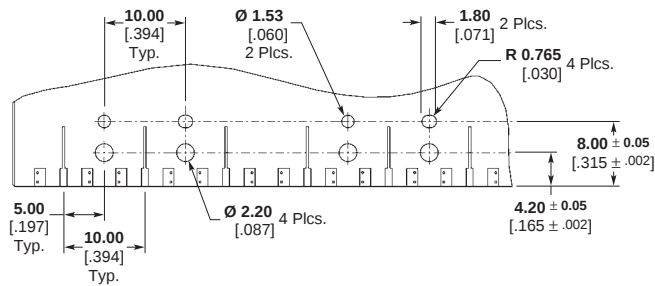
Part Number 1274714-3



Part Number 1274714-2

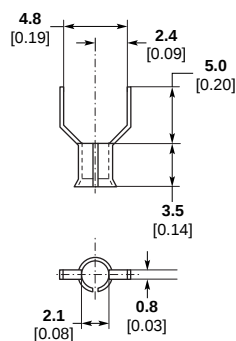


Part Number 1274714-1



Recommended PC Board Layout  
2 Positions Shown

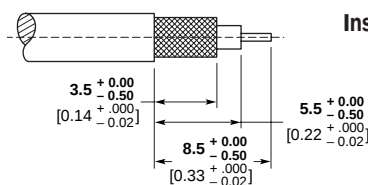
### Accessories for 50 Ohm and 75 Ohm



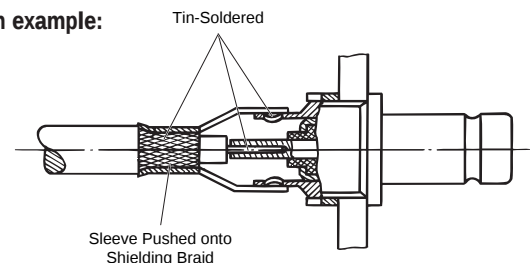
Soldering aid (sleeve) for jack 1393670-8 with solder connection.

| Part No.    |
|-------------|
| 2-1393562-2 |

For cable size similar to RG 179  
and RG 316



#### Installation example:



**Note:** For more accessories, see  
page 147.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Series 1.6/5.6 mS (75 Ohm)



### General

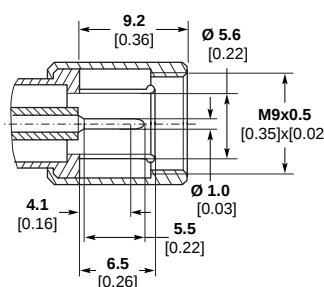
The Series 1.6/5.6 mS connectors have been modified to incorporate improved technical advantages. Transmission values have been greatly improved while maintaining the proven positive characteristics of the previous genera-

tions. All types of this new "third generation" Series 1.6/5.6 mS connectors are connection-compatible with their predecessor.

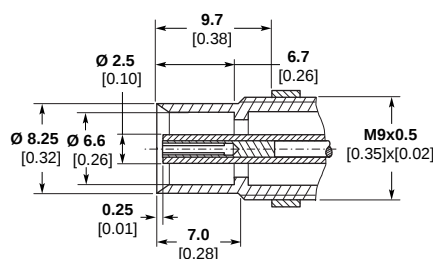
Today's PCM technology demands place the Series 1.6/5.6 mS connectors as a most suitable component for transmission of high bit rates.

Connectors are available in straight and angled versions as well as with different mechanisms for screw (type A), snap-on (type B), slide-in (type C), and latching (type F) coupling. All connectors of different coupling mechanisms are compatible with each other.

Plug



Jack



### Between Series Adapters

For Series 1.6/5.6 Adapters please see pages 253-262.

The connectors are designed according to the pin-socket principle. The contacts are partially gold-plated, ensuring long service life and stable contact resistance for a high number of intermateability cycles.

The inner conductor parts are secured so that they cannot be displaced. The insulating parts are made of PEEK (polyetheretherketone) or PC (polycarbonate).

The cable inner conductors are soldered on, while the outer conductors are screwed or crimped on. Also, cable clamp which is independent of the braid clamping secures the connection point against tensile stressing for both methods of connection.

In addition, assembly-friendly connectors with full crimp and IDC (Insulation Displacement Contact) connection are included within

the scope of delivery. The connectors are characterized by high mechanical strength and low space requirement.

Connection possibilities exist for a number of different cables, including highly-flexible cable types (with foam insulation) with low attenuation or small diameter. Terminations and adapters (see also measurement accessories) round out the spectrum.

## Series 1.6/5.6 mS (75 Ohm) (Continued)

### Technical data

#### Electrical and mechanical characteristics in accordance with CECC 22240

**Characteristic impedance** — 75

**Frequency range** — up to 8 GHz

**Reflection factor<sup>1</sup>, referred to —**

flexible cables, straight types —

up to 1 GHz,  $r$  0.02

up to 4 GHz,  $r$  0.06

up to 8 GHz,  $r$  0.10

flexible cables, angled types —

up to 1 GHz,  $r$  0.04

up to 2 GHz,  $r$  0.06

up to 4 GHz,  $r$  0.10

**Insulation resistance** —

initial value, 10 G

after stressing, 1 G

**Screening effectiveness** —

(straight screw connector at 1 GHz)

100 dB

**Inner conductor contact**

**resistance** — after stressing 8 m

**Outer conductor continuity** — after

stressing 4 m

**Voltage proof<sup>2</sup> —**

flexible cables (RG 59) —

at sea level, 1.5 kV, 50 Hz

at 20 km altitude, 300 V, 50 Hz

**Working voltage<sup>2</sup> —**

flexible cables (RG 59) —

at sea level, 500 V, 50 Hz

at 20 km altitude, 125 V, 50 Hz

**Service life** — 500 cycles

**Climactic category** — 40/85/21

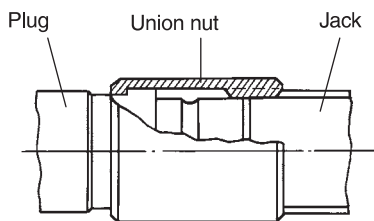
#### Notes:

<sup>1</sup> Guideline values, depending on cable type and connector style.

<sup>2</sup> Some cable types suitable for use with these connectors have lower characteristic values than specified here.

<sup>3</sup> For applicable cable types see page 151.

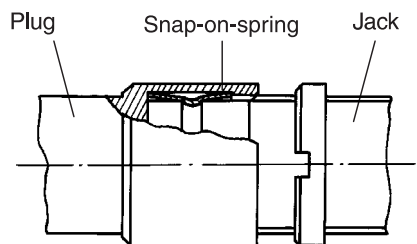
### Coupling Types



#### Type A

Screw coupling; version with union nut

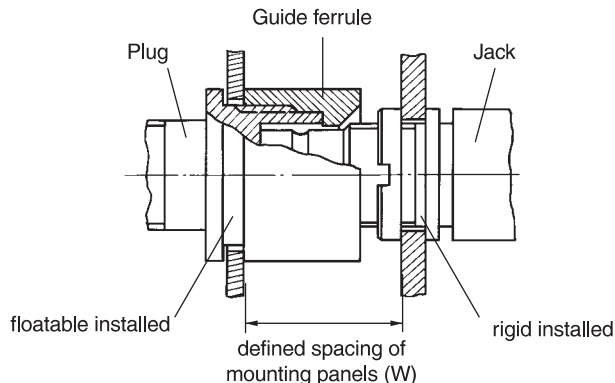
This type permits the plug and jack to be screwed together manually by means of a union nut secured to the plug manually, thus preventing the coupling from being pulled apart. This is necessary for readily accessible locations, front panel test points and cable connections.



#### Type B

Snap-on coupling (push-pull)

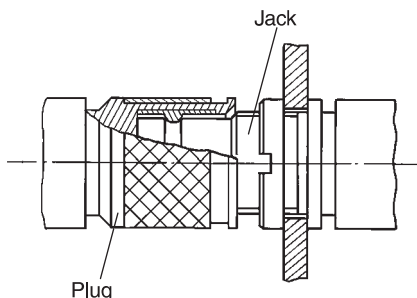
Connectors of this type offer fast make/break. They can be used for test and maintenance applications and also if there is lack of space and connectors with screw coupling cannot be used.



#### Type C

Slide-in coupling; version with centering ferrule

In this type of coupling, the plug features a guide ferrule with a conical entry surface. This ensures that the floatable bulkhead plugs with cable connection make a reliable electrical connection to the rigid installed jack. Examples of this are single and multi-contact connections of slide-in applications. "W" denotes the allowed spacing of the mounting panel for satisfactory contact when the connection is made.



#### Type F

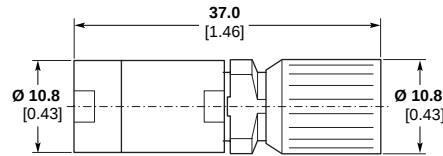
Latching coupling (Quick Lock)

In this version, the cable plugs bear a funnel ferrule with built-in spring which snaps into a groove on the jack, simultaneously locking the connection. The connec-

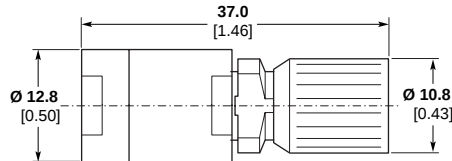
tion can be easily separated by lightly pulling the outer sleeve of the plug. This type of coupling provides the same amount of axial tensile strength as the screw coupling, but can be used with a higher packing density.

## Series 1.6/5.6 mS (75 Ohm) (Continued)

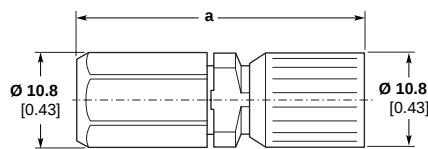
### Plugs, Solder/Clamp



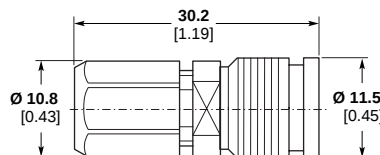
| Cable         | Coupling Type | Ø Max.      | Part No.  |
|---------------|---------------|-------------|-----------|
| 2YCCY 0.7/4.4 | A             | 7.8<br>0.31 | 1393682-1 |



| Cable                              | Coupling Type | Ø Max.      | Part No.  |
|------------------------------------|---------------|-------------|-----------|
| 2YCCY 1.0/6.5<br>2YC(mS)CY 1.0/6.5 | A             | 9.8<br>0.31 | 1393682-2 |

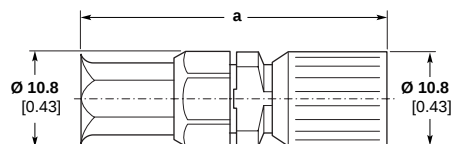


| Cable             | Coupling Type | Dim. a       | Ø Max.       | Part No.    |
|-------------------|---------------|--------------|--------------|-------------|
| 2YCY 0.4/2.5      | A             | 30.7<br>1.21 | 4.1<br>0.16  | 1-1393682-1 |
| 2YCCY 0.4/2.5     | A             | 30.7<br>1.21 | 4.8<br>0.19  | 1-1393682-2 |
| 2YC(mS)CY 0.4/2.5 | A             | 30.7<br>1.21 | 5.0<br>0.20  |             |
| 2YCY 0.7/4.4      | A             | 32.9<br>1.30 | 6.1<br>0.24  | 1-1393682-3 |
| RG 59             | A             | 32.9<br>1.30 | 6.25<br>0.25 |             |
| 2YC(mS)CY 0.5/3.0 | A             | 32.9<br>1.30 | 6.2<br>0.24  |             |



| Cable              | Coupling Type | Ø Max.      | Part No.  |
|--------------------|---------------|-------------|-----------|
| 02Y(St)CY 0.45/2.0 | F             | 3.6<br>0.14 | 1393681-8 |

### Plugs, Solder/Crimp



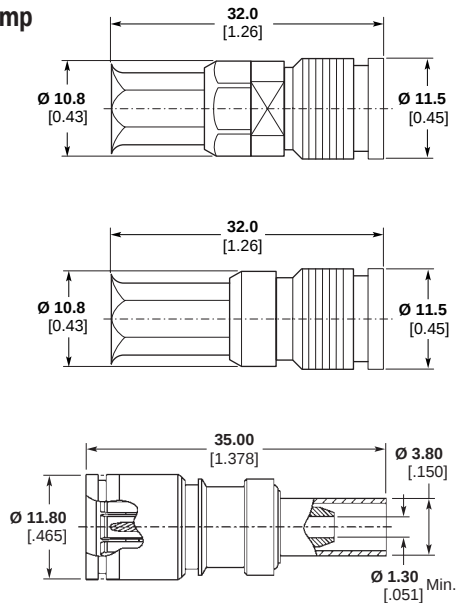
| Cable              | Coupling Type | Dim. a       | Ø Max.       | Part No.  |
|--------------------|---------------|--------------|--------------|-----------|
| RG 179             | A             | 32.5<br>1.28 | 2.6<br>0.105 | 1393680-2 |
| 2YCCY 0.4/2.5      | A             | 32.5<br>1.28 | 4.8<br>0.19  | 1393680-3 |
| 2YC(mS)CY 0.4/2.5  | A             | 35.5<br>1.40 | 5.0<br>0.20  |           |
| 2YC(mS)CY 0.5/3.0  | A             | 35.5<br>1.40 | 6.2<br>0.24  | 1393680-4 |
| 2YCY 0.7/4.4       | A             | 35.5<br>1.40 | 6.1<br>0.24  | 1393680-5 |
| 02Y(St)CY 0.45/2.0 | A             | 32.5<br>1.28 | 3.6<br>0.14  | 1393680-9 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Series 1.6/5.6 mS (75 Ohm)

### Plugs, Solder/Crimp

(Continued)



#### Version with Preassembled Insulation

| Cable              | Coupling Type | Ø Max.      | Part No.  |
|--------------------|---------------|-------------|-----------|
| 02Y(St)CY 0.45/2.0 | F             | 3.6<br>0.14 | 1393672-3 |

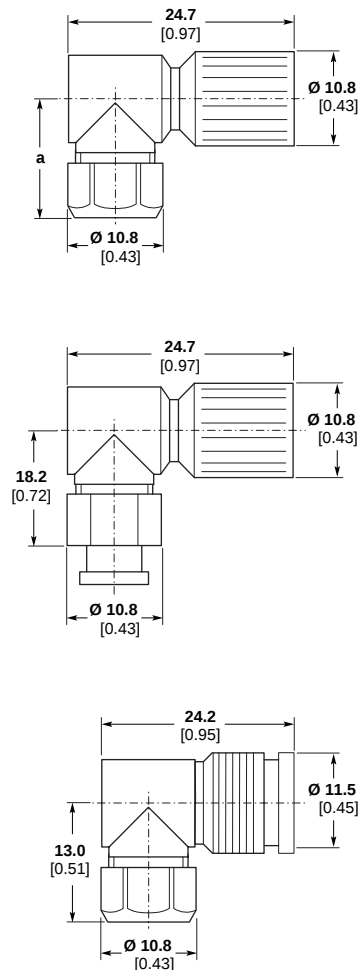
#### Preassembled Isolation Parts

| Cable              | Coupling Type | Ø Max.      | Part No.  |
|--------------------|---------------|-------------|-----------|
| 02Y(St)CY 0.45/2.0 | F             | 3.6<br>0.14 | 1393672-9 |

#### Preassembled Version

| Cable                | Coupling Type | Ø Max.      | Part No.  |
|----------------------|---------------|-------------|-----------|
| 02YS(St)CHH 0.25/1.2 | F             | 2.9<br>0.11 | 1460132-1 |

### Right-Angle Plugs, Solder/Crimp



| Cable             | Coupling Type | Dim. a       | Ø Max.       | Part No.    |
|-------------------|---------------|--------------|--------------|-------------|
| 2YCCY 0.4/2.5     | A             | 13.0<br>0.51 | 4.8<br>0.19  | 2-1393682-0 |
| 2YC(mS)CY 0.4/2.5 | A             | 13.0<br>0.51 | 5.0<br>0.20  |             |
| 2YCY 0.7/4.4      | A             | 15.8<br>0.62 | 6.1<br>0.24  | 2-1393682-2 |
| RG 59             | A             | 15.8<br>0.62 | 6.25<br>0.25 |             |
| 2YC(mS)CY 0.5/3.0 | A             | 15.8<br>0.62 | 6.2<br>0.24  |             |

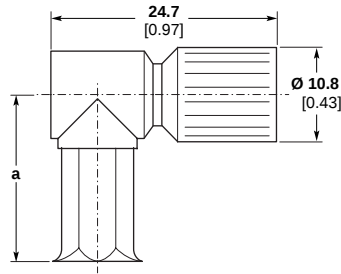
| Cable  | Coupling Type | Ø Max.        | Part No.    |
|--------|---------------|---------------|-------------|
| RG 179 | A             | 2.67<br>0.105 | 2-1393682-3 |

| Cable              | Coupling Type | Ø Max.      | Part No.    |
|--------------------|---------------|-------------|-------------|
| 02Y(St)CY 0.45/2.0 | F             | 3.6<br>0.14 | 1-1393681-0 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

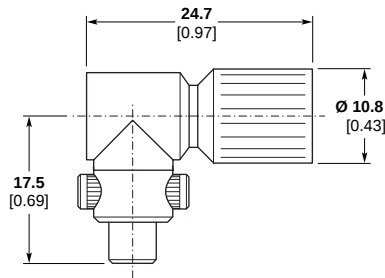
## Series 1.6/5.6 mS (75 Ohm) (Continued)

### Right-Angle Plugs, Solder/Crimp



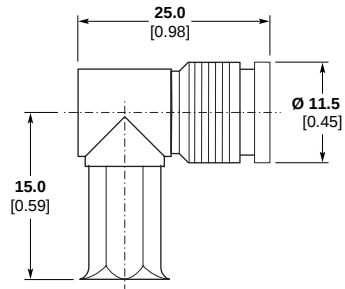
| Cable                   | Coupling Type | Dim. a       | Ø Max.      | Part No.    |
|-------------------------|---------------|--------------|-------------|-------------|
| 02Y12YC(mS)C6Y 0.45/2.0 | A             | 15.0<br>0.59 | 4.0<br>0.16 | 1-1393680-6 |
| 02Y(St)CY 0.45/2.0      | A             | 15.0<br>0.59 | 3.6<br>0.14 | 1-1393680-8 |

### Right-Angle Plugs, IDC Connection



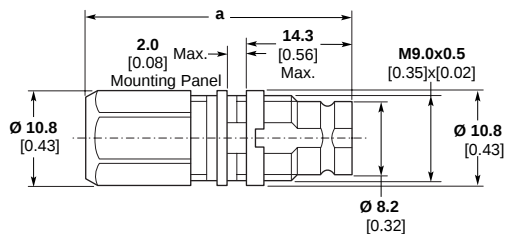
| Cable              | Coupling Type | Ø Max.      | Part No.  |
|--------------------|---------------|-------------|-----------|
| 02Y(St)CY 0.45/2.0 | A             | 3.6<br>0.14 | 1393757-9 |
| 2YCY 0.4/2.5       | A             | 4.1<br>0.16 | 1393757-8 |

### Right-Angle Plug, Solder/Crimp



| Cable              | Coupling Type | Ø Max.      | Part No.  |
|--------------------|---------------|-------------|-----------|
| 02Y(St)CY 0.45/2.0 | F             | 3.6<br>0.14 | 1393672-5 |

### Bulkhead Jacks, Solder/Clamp

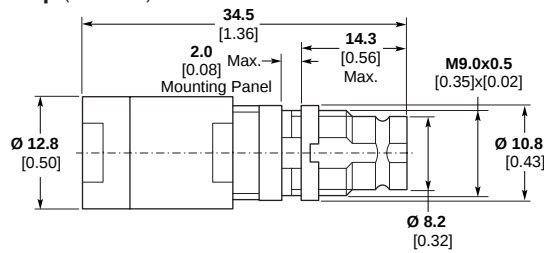


| Cable             | Coupling Type | Dim. a       | Ø Max.       | Part No.    |
|-------------------|---------------|--------------|--------------|-------------|
| 2YCY 0.4/2.5      | A, B, F       | 28.1<br>1.11 | 4.1<br>0.16  | 3-1393682-2 |
| 2YCCY 0.4/2.5     | A, B, F       | 28.1<br>1.11 | 4.8<br>0.19  | 3-1393682-3 |
| 2YC(mS)CY 0.4/2.5 | A, B, F       | 28.1<br>1.11 | 5.0<br>0.20  |             |
| 2YCY 0.7/4.4      | A, B, F       | 30.4<br>1.20 | 6.1<br>0.24  | 3-1393682-5 |
| RG 59             | A, B, F       | 30.4<br>1.20 | 6.25<br>0.25 |             |
| 2YC(mS)CY 0.5/3.0 | A, B, F       | 30.4<br>1.20 | 6.2<br>0.24  |             |

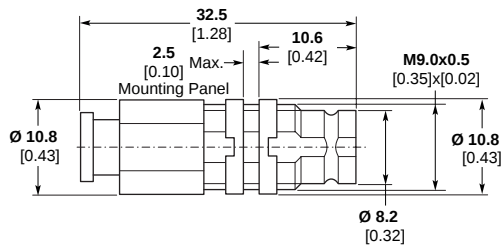
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**Series 1.6/5.6 mS (75 Ohm)** (Continued)

**Bulkhead Jacks,  
Solder/Clamp** (Continued)

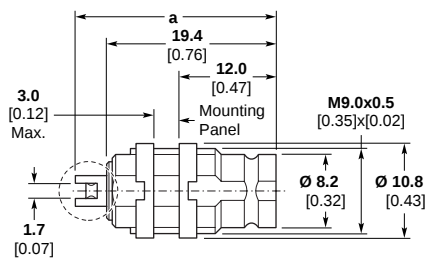


| Cable             | Coupling Type | Ø Max.      | Part No.  |
|-------------------|---------------|-------------|-----------|
| 2YCCY 1.0/6.5     | A, B, F       | 9.8<br>0.38 | 1393682-4 |
| 2YC(mS)CY 1.0/6.5 | A, B, F       | 9.8<br>0.38 |           |



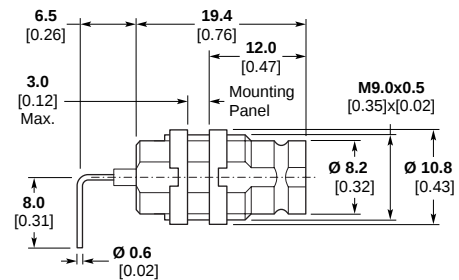
| Cable  | Coupling Type | Ø Max.        | Part No.    |
|--------|---------------|---------------|-------------|
| RG 179 | B, C, F       | 2.67<br>0.105 | 4-1393682-2 |

**Bulkhead Jacks, Solder**



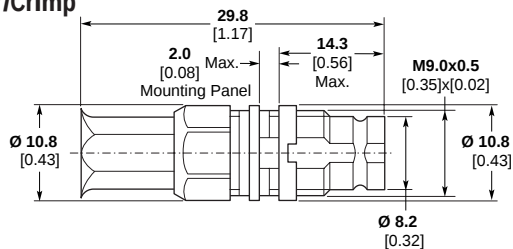
| Dim. a        | Ø Max.     | Part No.    |
|---------------|------------|-------------|
| 22.3*<br>0.88 | A, B, C, F | 1-1393681-1 |
| 23.5<br>0.93  | A, B, C, F | 1-1393681-9 |

\*Without soldering tags on outer conductor, dimension a up to inner conductor end.

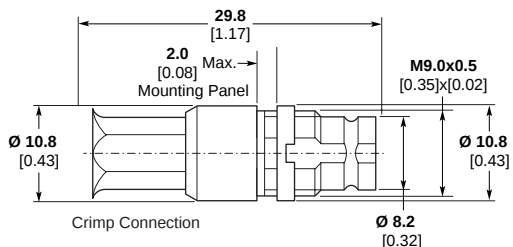


| Coupling Type | Part No.    |
|---------------|-------------|
| A, B, C, F    | 1-1393681-3 |

**Bulkhead Jacks,  
Solder/Crimp**



| Cable                   | Coupling Type | Ø Max.        | Part No.    |
|-------------------------|---------------|---------------|-------------|
| RG 179                  | A, B, F       | 2.67<br>0.105 | 2-1393680-2 |
| 02Y12YC(mS)C6Y 0.45/2.0 | A, B, F       | 4.0<br>0.16   | 2-1393680-4 |
| 06YCC(St)6Y 0.4/1.6     | A, B, F       | 3.3<br>0.13   | 2-1393680-5 |
| 02Y(St)CY 0.45/2.0      | A, B, F       | 3.6<br>0.14   | 1393672-6   |



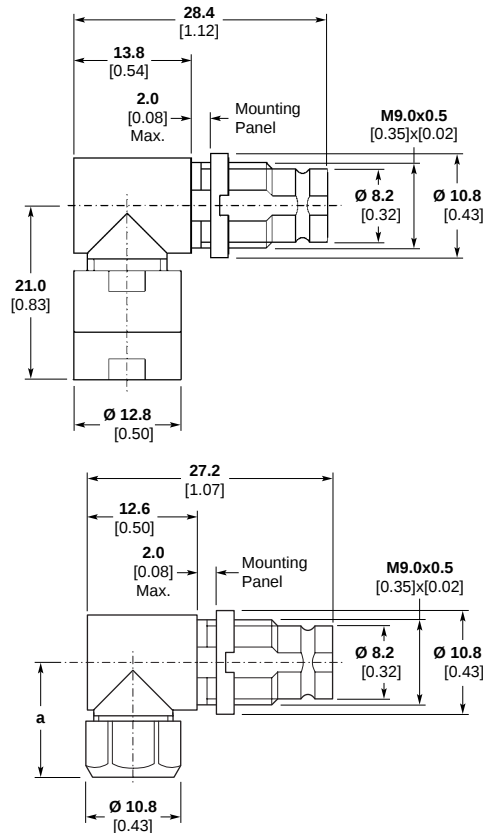
With preassembled insulation parts

| Cable              | Coupling Type | Ø Max.      | Part No.    |
|--------------------|---------------|-------------|-------------|
| 02Y(St)CY 0.45/2.0 | A, B, F       | 3.6<br>0.14 | 1-1393672-4 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**Series 1.6/5.6 mS (75 Ohm)** (Continued)

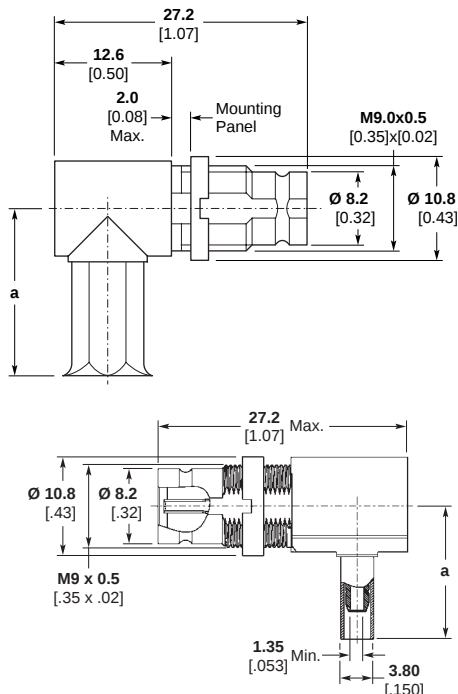
**Right-Angle Bulkhead Jack,  
Solder/Clamp**



| Cable             | Coupling Type | Ø Max.      | Part No.  |
|-------------------|---------------|-------------|-----------|
| 2YCCY 1.0/6.5     | A, B, F       | 9.8<br>0.39 | 1393682-8 |
| 2YC(mS)CY 1.0/6.5 | A, B, F       | 9.8<br>0.39 |           |

| Cable              | Coupling Type | Dim. a       | Ø Max.       | Part No.    |
|--------------------|---------------|--------------|--------------|-------------|
| 02Y(Si)CY 0.45/2.0 | A, B, F       | 13.0<br>0.51 | 3.6<br>0.14  | 4-1393682-9 |
| 2YCCY 0.4/2.5      | A, B, F       | 13.0<br>0.51 | 4.8<br>0.19  | 4-1393682-6 |
| 2YC(mS)CY 0.4/2.5  | A, B, F       | 13.0<br>0.51 | 5.0<br>0.20  |             |
| 2YCY 0.7/4.4       | A, B, F       | 15.8<br>0.62 | 6.1<br>0.24  | 4-1393682-8 |
| RG 59              | A, B, F       | 15.8<br>0.62 | 6.25<br>0.25 |             |
| 2YC(mS)CY 0.5/3.0  | A, B, F       | 15.8<br>0.62 | 6.2<br>0.24  |             |

**Right-Angle Bulkhead Jack,  
Solder/Crimp**



| Cable                   | Coupling Type | Dim. a       | Ø Max.        | Part No.    |
|-------------------------|---------------|--------------|---------------|-------------|
| RG 179                  | A, B, F       | 15.0<br>0.59 | 2.67<br>0.105 | 3-1393680-0 |
| 2YCCY 0.4/2.5           | A, B, F       | 15.0<br>0.59 | 4.8<br>0.19   | 3-1393680-2 |
| 2YC(mS)CY 0.4/2.5       | A, B, F       | 15.0<br>0.59 | 5.0<br>0.20   |             |
| 02Y12YC(mS)C6Y 0.45/2.0 | A, B, F       | 15.0<br>0.59 | 4.0<br>0.16   | 3-1393680-5 |
| 06YCC(Si)6Y 0.4/1.6     | A, B, F       | 15.0<br>0.59 | 3.3<br>0.13   | 4-1393682-3 |
| 02Y(Si)CY 0.45/2.0      | A, B, F       | 15.0<br>0.59 | 3.6<br>0.14   | 3-1393680-7 |

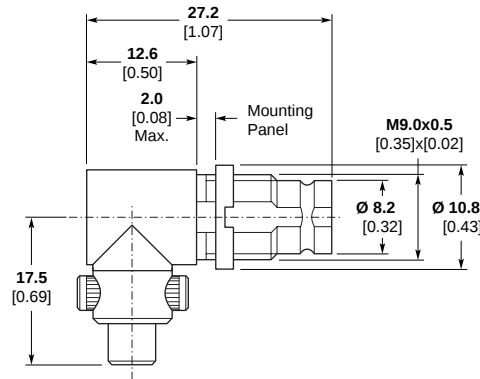
| Cable                | Coupling Type | Dim. a       | Ø Max.      | Part No.    |
|----------------------|---------------|--------------|-------------|-------------|
| 02YS(Si)CHH 0.25/1.2 | A, B, F       | 15.0<br>0.59 | 2.9<br>0.11 | 1460128-1*  |
| 02YS(Si)CHH 0.25/1.2 | A, B, F       | 15.0<br>0.59 | 2.9<br>0.11 | 1460169-1** |

\* Tray Packaging.  
\*\* Individual Packaging.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

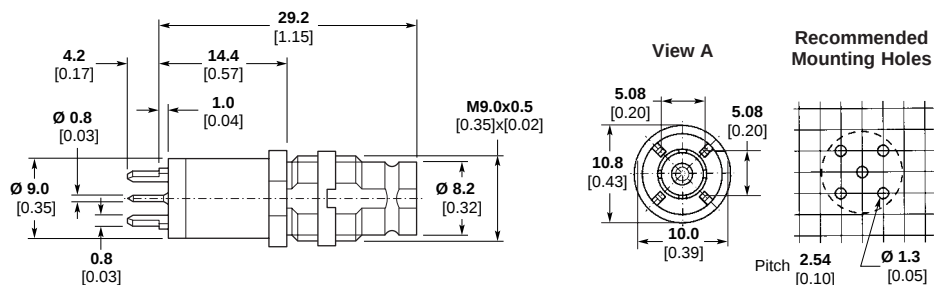
**Series 1.6/5.6 mS (75 Ohm)** (Continued)

**Right-Angle Bulkhead Jack,  
IDC Connection**

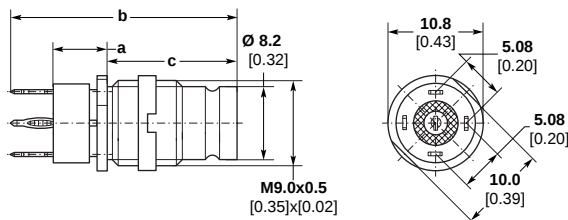


| Cable              | Coupling Type | Ø Max.      | Part No.    |
|--------------------|---------------|-------------|-------------|
| 02Y(St)CY 0.45/2.0 | A, B, F       | 3.6<br>0.14 | 1-1393757-6 |

**Vertical PC Board  
Mount Jack**



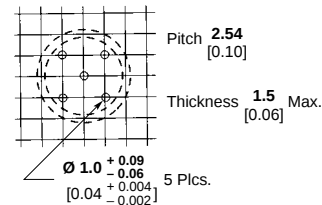
| Coupling Type | Part No.    |
|---------------|-------------|
| A, B, F       | 1-1393681-6 |



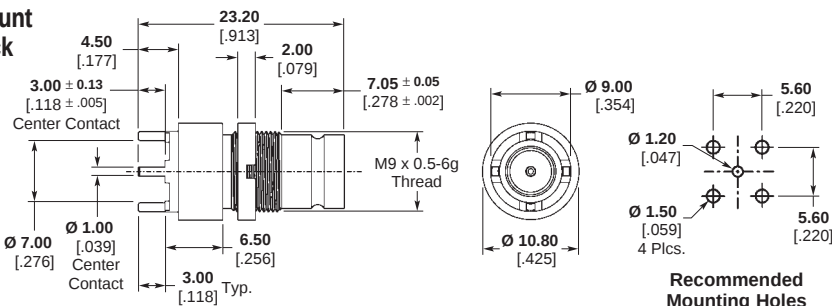
**Inner- and outer conductor, press-fit**

| Coupling Type | Dim. a      | Dim. b       | Dim. c       | Part No.    |
|---------------|-------------|--------------|--------------|-------------|
| A, B, F       | 6.0<br>0.24 | 27.2<br>1.07 | 16.4<br>0.65 | 2-1393757-0 |

**Recommended Mounting Holes**



**PC Board Mount  
Bulkhead Jack**

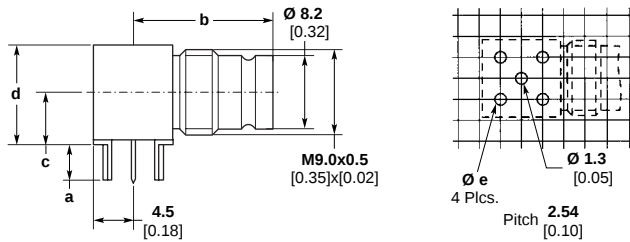


| Coupling Type | Part No.  |
|---------------|-----------|
| A, B, F       | 1274513-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**Series 1.6/5.6 mS (75 Ohm)** (Continued)

**Right-Angle PC Board  
Mount Bulkhead Jack**

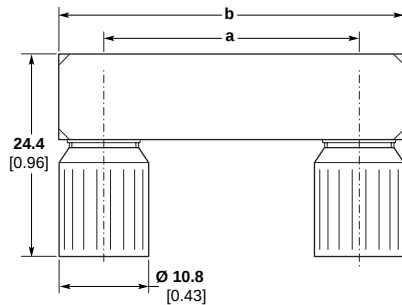


**Recommended  
Mounting Holes**

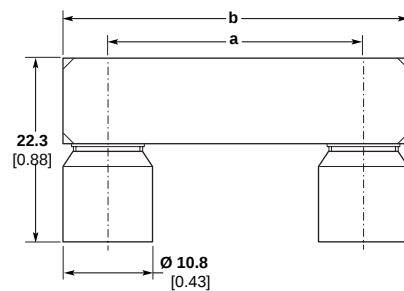
| Coupling Type | Dim. a      | Dim. b       | Dim. c       | Dim. d        | Dim. e      | Part No.     |
|---------------|-------------|--------------|--------------|---------------|-------------|--------------|
| A, B, F       | 4.0<br>0.16 | 16.0<br>0.63 | 6.0<br>0.24  | 10.75<br>0.42 | 1.3<br>0.05 | 2-1393681-1  |
| A, B, F       | 3.3<br>0.13 | 16.0<br>0.63 | 6.0<br>0.24  | 10.75<br>0.42 | 1.3<br>0.05 | 2-1393681-2  |
| A, B, F       | 3.7<br>0.15 | 22.9<br>0.90 | 6.45<br>0.25 | 11.25<br>0.44 | 1.8<br>0.07 | 2-1393681-3* |

\*With positioning and snap-on system onto PC board

**U-link Plug/Plug**



| Coupling Type | Dim. a<br>± 0.1 [0.004] | Dim. b<br>Max. | Part No.    |
|---------------|-------------------------|----------------|-------------|
| A             | 15.0<br>0.59            | 26.5<br>1.04   | 6-1460823-1 |



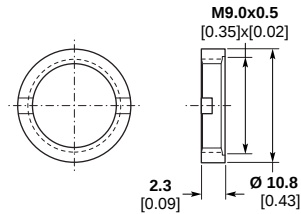
| Coupling Type | Dim. a<br>± 0.1 [0.004] | Dim. b<br>Max. | Part No.    |
|---------------|-------------------------|----------------|-------------|
| B             | 15.0<br>0.59            | 26.5<br>1.04   | 6-1460823-2 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Series 1.6/5.6 mS (75 Ohm) (Continued)

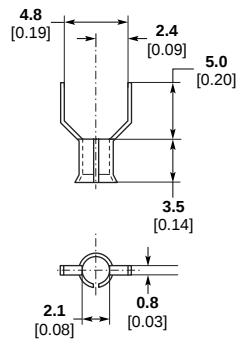
### Accessories

These components are provided when bulkhead jack part numbers are ordered, but can also be ordered separately.



#### Threaded ring for installation of bulkhead jacks

| Part No.    |
|-------------|
| 1-1393562-0 |



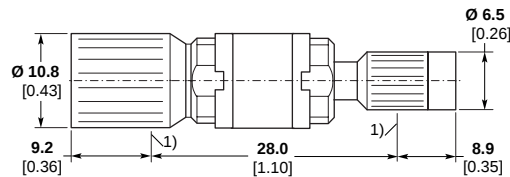
#### Soldering aid (sleeve) for jack (1-1393681-9) with solder termination

| Part No.    |
|-------------|
| 2-1393562-2 |

Cable stripping and installation example: see Part number 2-1393562-2 under "Series 1.0/2.3", page 137.

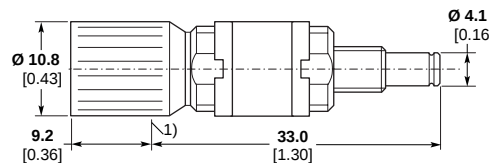
## Measurement Accessories

### Between Series Adapters (75 Ohm)



#### Plug 1.6/5.6 to Plug 1.0/2.3

| Coupling Type | Part No.    |
|---------------|-------------|
| A             | 6-1460821-1 |



#### Plug 1.6/5.6 to Jack 1.0/2.3

| Coupling Type     | Part No.      |
|-------------------|---------------|
| A, F <sup>2</sup> | 2-1393670-2 □ |
| A, F <sup>2</sup> | 6-1460821-2   |

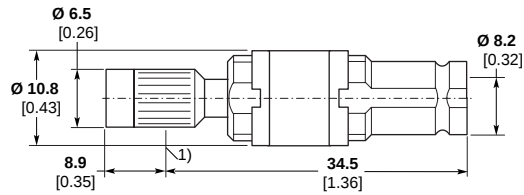
<sup>2</sup> Only jack side

1) Detent for jack

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Measurement Accessories (Continued)

### Between Series Adapters (75 Ohm) (Continued)

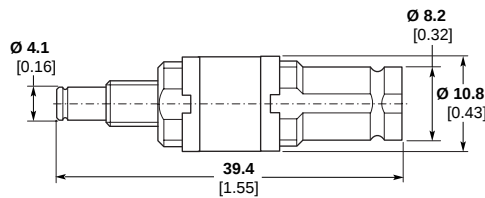


1) Detent for jack

#### Plug 1.0/2.3 to Jack 1.6/5.6

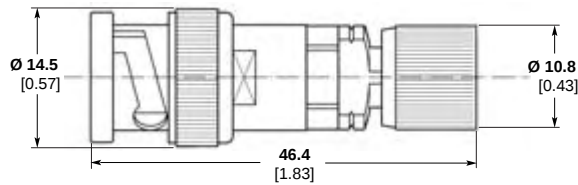
| Coupling Type                      | Part No.    |
|------------------------------------|-------------|
| A, B <sup>2</sup> , F <sup>2</sup> | 6-1460821-3 |

<sup>2</sup> Only jack side



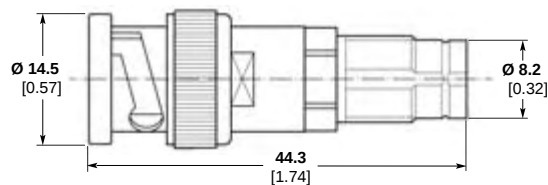
#### Jack 1.0/2.3 to Jack 1.6/5.6

| Coupling Type | Part No.    |
|---------------|-------------|
| A, B, F       | 6-1460821-4 |



#### BNC Plug to Plug 1.6/5.6

| Part No.    |
|-------------|
| 7-1393665-4 |



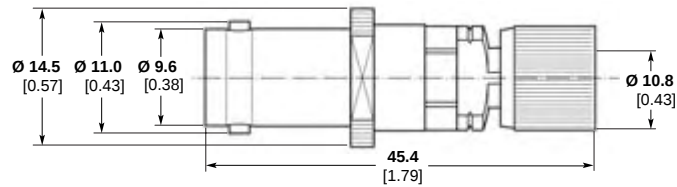
#### BNC Plug to Jack 1.6/5.6

| Part No.    |
|-------------|
| 7-1393665-6 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

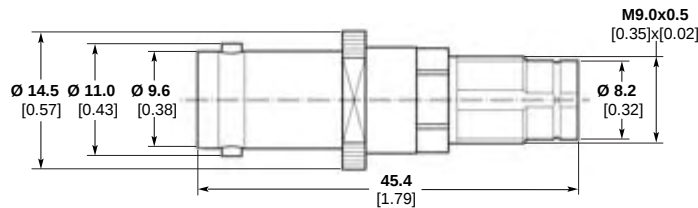
## Measurement Accessories (Continued)

### Between Series Adapters (75 Ohm) (Continued)



**BNC Jack to Plug 1.6/5.6**

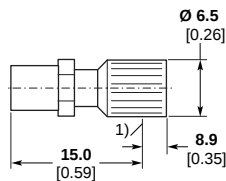
| Part No.    |
|-------------|
| 7-1393665-7 |



**BNC Jack to Jack 1.6/5.6**

| Part No.    |
|-------------|
| 7-1393665-5 |

### Termination (75 Ohm)

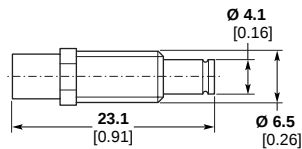


1) Detent for jack

### Standard Termination

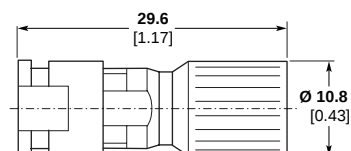
**Plug 1.0/2.3**

| Coupling Type | Power W | Part No.    |
|---------------|---------|-------------|
| A             | 0.6     | 7-1393665-2 |



**Jack 1.0/2.3**

| Coupling Type | Power W | Part No.    |
|---------------|---------|-------------|
| A, F          | 0.6     | 7-1393665-3 |



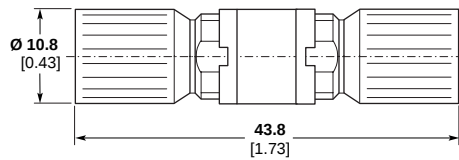
**Plug 1.6/5.6**

| Coupling Type | Power W | Part No.    |
|---------------|---------|-------------|
| A             | 1.0     | 6-1393665-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

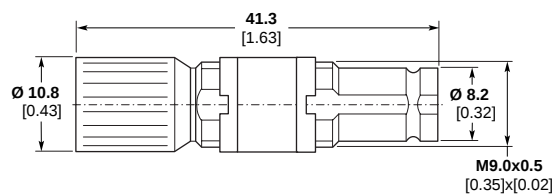
## Measurement Accessories (Continued)

### In-Series Adapter (75 Ohm)



#### Adapter 1.6/5.6, Plug/Plug

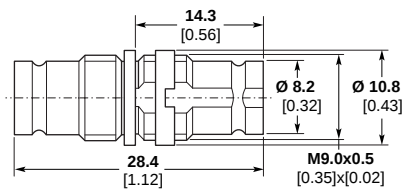
| Coupling Type | Part No.  |
|---------------|-----------|
| A             | 1393681-6 |



#### Adapter 1.6/5.6, Plug/Jack

| Coupling Type | Part No.    |
|---------------|-------------|
| A, B*, F*     | 1-1393681-7 |

\*Jack side only



#### Adapter 1.6/5.6, Jack/Jack

| Coupling Type | Part No.    |
|---------------|-------------|
| A, B, F       | 1-1393665-1 |

#### Note:

U-link connectors see "1.6/5.6" section, page 146.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Coaxial Cables

List of the coaxial cables that are listed in the various connector series of this section.

| Characteristic Impedance ( ) | Max. Cable Outer Diameter (mm) | Dielectric Diameter (mm)/ Material <sup>1)</sup> | Cable-Type Designation        |                                  |                        |
|------------------------------|--------------------------------|--------------------------------------------------|-------------------------------|----------------------------------|------------------------|
|                              |                                |                                                  | VDE Designation <sup>2)</sup> | US Designation Manufacturer des. | IEC Designation 96-IEC |
| 50                           | 1.9                            | 0.91max/PTFE                                     | 5YC5Ye 0.3/0.86               | RG 178                           | 50-1-1                 |
| 50                           | 2.1                            | 0.87/PTFE                                        | —                             | RG 196                           | 50-1-2                 |
| 50                           | 2.25                           | 1.71max/PTFE                                     | 5YK 0.51/1.68                 | RG 405                           | —                      |
| 50                           | 2.6                            | 1.60max/PTFE                                     | 5YC5Ye 0.5/1.5                | RG 316                           | 50-2-1                 |
| 50                           | 2.8                            | 1.60max/PE                                       | 2YCY 0.5/1.5                  | RG 174                           | —                      |
| 50                           | 3.0                            | 1.52/PTFE                                        | 5YCC5Y 0.5/1.5                | RD 316                           | —                      |
| 50                           | 3.6                            | 3.01max/PTFE                                     | 5YK 0.9/3.0                   | RG 402                           | —                      |
| 50                           | 6.4                            | 5.38max/PTFE                                     | 5YK 1.63/5.33                 | RG 401                           | —                      |
| 75                           | 2.67                           | 1.68max/PTFE                                     | 5YC6Y 0.3/1.6                 | RG 179                           | 75-2-1                 |
| 75                           | 3.0                            | 1.60max/PTFE                                     | —                             | RD 179                           | —                      |
| 75                           | 3.3                            | 1.68max/Cell-FEP                                 | 06YCC(St)6Y 0.4/1.6           | —                                | —                      |
| 75                           | 3.2                            | 2.1max                                           | —                             | ST 212                           | —                      |
| 75                           | 3.6                            | 2.0max/Cell-PE                                   | 02Y(St)CY 0.45/2.0            | —                                | —                      |
| 75                           | 4.0                            | 2.0maxE/Cell-PE                                  | 02Y12YC(mS)C6Y 0.45/2.0       | —                                | —                      |
| 75                           | 4.0                            | 2.54max/PE                                       | 2YCY 0.4/2.5                  | —                                | —                      |
| 75                           | 4.8                            | 2.54max/PE                                       | 2YCCY 0.4/2.5                 | —                                | —                      |
| 75                           | 5.0                            | 2.54max/PE                                       | 2YC(mS)CY 0.4/2.5             | —                                | —                      |
| 75                           | 6.1                            | 4.25max/PE                                       | 2YCY 0.7/4.4                  | —                                | —                      |
| 75                           | 6.2                            | 2.83max/PE                                       | 2YC(mS)CY 0.5/3.0             | —                                | —                      |
| 75                           | 6.25                           | 3.8max/PE                                        | 2YCY 0.58/3.7                 | RG 59                            | —                      |
| 75                           | 7.8                            | 4.43max/PE                                       | 2YCCY 0.7/4.4                 | —                                | —                      |
| 75                           | 9.8                            | 6.4/PE                                           | 2YCCY 1.0/6.5                 | —                                | —                      |
| 75                           | 9.8                            | 6.4/PE                                           | 2YC(mS)CY 1.0/6.5             | —                                | —                      |

### 1) Material label

|      |                            |
|------|----------------------------|
| PTFE | Polytetrafluorethylene     |
| PE   | Polyethylene               |
| FEP  | Perfluorethylene propylene |
| PFA  | Perfluoralkoxy copolymer   |

### 2) Mounting label of the VDE type numbers (from inside to outside)

Example:

### Explanation

Dielectric and Jacket

2Y = PE  
5Y = PTFE  
02Y = Cell PE  
06Y = Cell FEP  
6Y = FEP

Screen:

C = Cu braiding  
K = Cu tape

Intermediate layer:

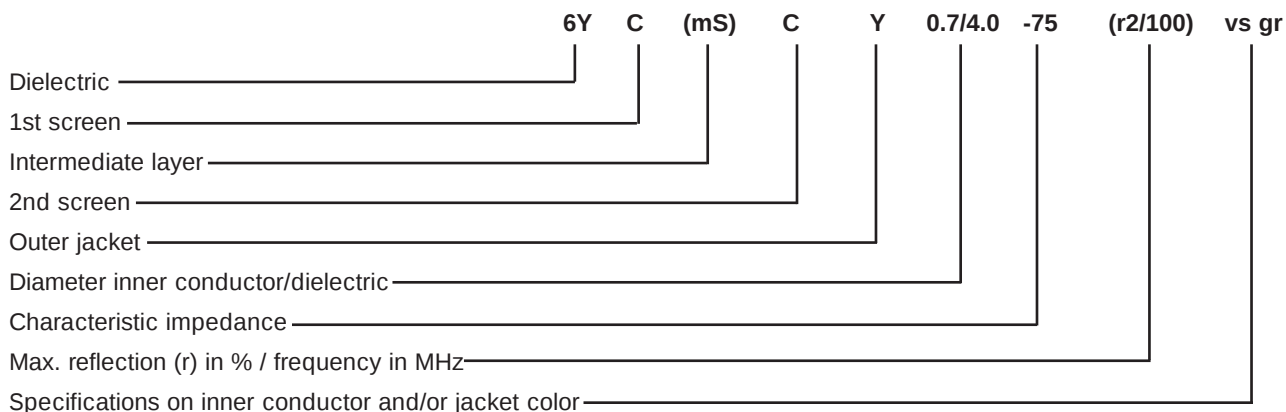
mS = magnetic screen  
St = static screen

Specifications on inner conductor:

vs = silver plated  
staku = Bare copper-clad steel wire conductor

Jacket color:

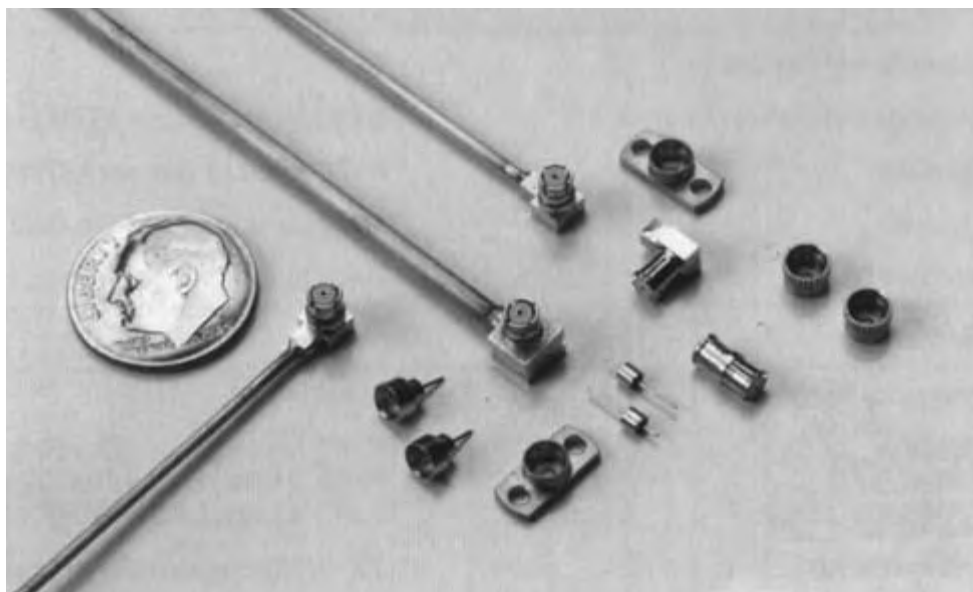
gn = green  
gr = grey  
rt = red  
ws = white



## SMP Microminiature Push-On Coaxial Connectors

### Product Facts

- Intermateable with Corning Gilbert GPO Series Connector
- DESC approved
- Enhanced performance features
- Simplified Assembly



SMP microminiature push-on coaxial connectors provide solutions for today's modular designs with denser packaging requirements. The extremely small size of the SMP offers a versatile solution for high density packaging allowing connector center-to-center spacing of 4.32 [0.17]. The push-on interface facilitates easier assembly and test with a positive snap-in feature to indicate a fully mated connection. The rugged SMP interface can withstand harsh environments of mechanical shock and vibration, typically found in military or aerospace related applications. This SMP connector interface is the standard used by Defense Electronics Supply Center (DESC) to generate the SMP push-on connector series.

SMP connectors can be your design solution for mechanical packaging and frequency response. The SMP interface provides 0.020" of radial misalignment for critical blindmate applications. Mating forces are strictly controlled to ensure reliable connections per mated pair or when simultaneously mating multiple connectors. Cable jacks include an anti-rocking ring to ensure reliable mechanical performance regardless of the operating environment. SMP connectors offer enhanced broadband VSWR performance of

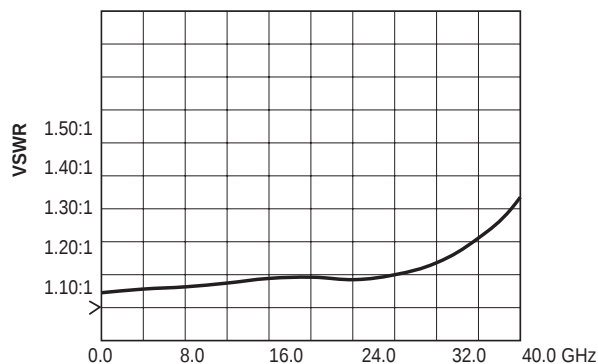
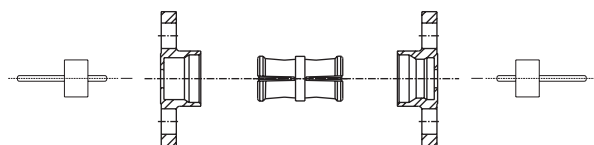
1.15:1 max thru 26GHz and 1.40:1 max thru 40GHz.

Standard design SMP configurations include cable connectors, straight and right-angle, for 0.047 and 0.085 semi-rigid cable, full detent, limited detent and smooth bore mating shrouds that can be bulkhead or flange mounted and glass feedthroughs for coax to circuit launchers. In-series adapters for module to module intermating and between series adapters for integrating or testing systems or components parameters.

### Between Series Adapters

For SMP Between Series Adapters, see pages 253-262.

SMP Shroud and Jack to Jack Adapter Assembly



Typical VSWR for SMP Jack to Jack Adapter  
Part Numbers 1056700-1 and 1056721-1

GPO is a trademark of Corning Gilbert, Inc.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMP Microminiature Push-On Coaxial Connectors (Continued)

### Specifications

#### General

Materials and Finishes

Housings and Center Contacts

Beryllium Copper per ASTM-B-196; gold plate over nickel plate

Dielectric

PTFE Fluorocarbon per ASTM-D-1457

Shrouds

Stainless steel per ASTM-A582 Type 303; passivate per ASTM-A380

Hermetic Seal

Glass bead

#### Electrical

Frequency Range

dc - 40.0 GHz

VSWR

1.10:1 Maximum dc - 23.0 GHz

1.15:1 Maximum 23.0 - 26.0 GHz

1.40:1 Maximum 26.0 - 40.0 GHz

Voltage Rating

335 Vrms maximum at sea level

Insertion Loss

0.10 dB (GHz) maximum

Insulation Resistance

5000 megohms minimum

Dielectric Withstanding Voltage

500 volts (VRMS minimum)

RF High Potential

325 volts (VRMS minimum) @ 5 MHz

Impedance

50 ohms nominal

RF Leakage

-80dB to 3 GHz, -65dB from 3 to 26.5 dB minimum

Contact Resistance

Initial center contact 6.0 milliohms maximum

Outer contact 2.0 milliohms maximum

#### Mechanical

Durability

100 mating cycles minimum

Radial Misalignment

±0.020 minimum

Axial Misalignment

.000/.010

Force to Engage

full detent

15.0 lbs. maximum

half detent

10.0 lbs. maximum

smooth bore

2.0 lbs. maximum

Force to Disengage

full detent

5.0 lbs. minimum

half detent

2.0 lbs. minimum

smooth bore

0.5 lbs. minimum

Center Contact Retention

1.5 lbs. minimum axial force

#### Environmental

Operating Temperature

-65°C to +165°C

Vibration

per mil-std-202, method 204, test condition D

Shock

per mil-std-202, method 213, test condition I

Thermal Shock

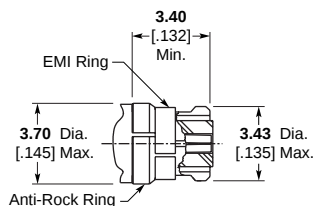
per mil-std-202, method 107, test condition B

Moisture Resistance

per MIL-STD-202 method 106, except step 7b shall be omitted. Resistance shall be 200 megohms within 5 minutes after removal from humidity.

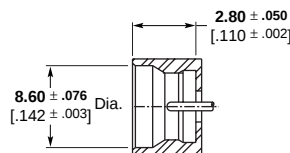
### Interface Dimensions

#### Jack

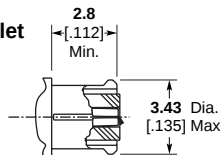


#### Shroud

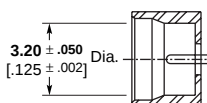
##### Full Detent



##### Bullet



##### Smooth Bore



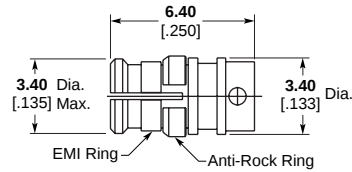
**Note:** The U.S. Government (DESC) has determined that the above specified interface dimensions are interchangeable and intermateable with Corning Gilbert GPO Series RF Connectors.<sup>1</sup>

GPO is a trademark of Corning Gilbert, Inc.

<sup>1</sup> Per DESC drawing numbers 94007 and 94008, series SMP.

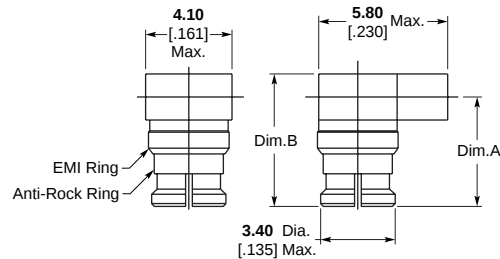
## SMP Microminiature Push-On Coaxial Connectors (Continued)

### Straight Cable Jack, Solder Attachment



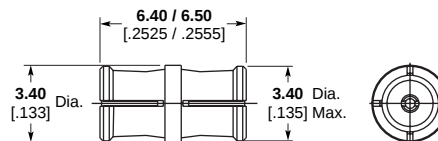
| Cable                    | Part No.         |
|--------------------------|------------------|
| .047 Semi-Rigid          | <b>1056526-1</b> |
| .085 Semi-Rigid (RG 405) | <b>1056527-1</b> |

### Right-Angle Cable Jack, Solder Attachment



| Cable                    | Dim. A             | Dim. B             | Part No.         |
|--------------------------|--------------------|--------------------|------------------|
| .047 Semi-Rigid          | <b>4.8</b><br>.190 | <b>5.8</b><br>.230 | <b>1056553-1</b> |
| .085 Semi-Rigid (RG 405) | <b>5.3</b><br>.209 | <b>6.7</b><br>.265 | <b>1056554-1</b> |

### Jack to Jack Adapter (Bullet)

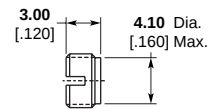


| Part No.         |
|------------------|
| <b>1056700-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

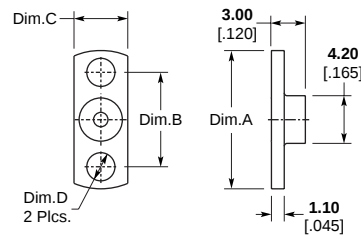
## SMP Microminiature Push-On Coaxial Connectors (Continued)

### Shroud — Threaded



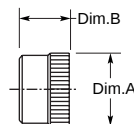
| Description    | Part No.  |
|----------------|-----------|
| Full Detent    | 1056745-1 |
| Limited Detent | 1056743-1 |
| Smooth Bore    | 1056744-1 |

### Shroud — 2 Hole Flange Surface Mount



| Description    | Dim. A       | Dim. B       | Dim. C      | Dim. D      | Part No.  |
|----------------|--------------|--------------|-------------|-------------|-----------|
| Full Detent    | 12.2<br>.480 | 8.3<br>.328  | 4.7<br>.187 | 2.5<br>.098 | 1056721-1 |
|                | 15.8<br>.625 | 12.2<br>.481 | 5.7<br>.223 | 2.6<br>.102 | 1056722-1 |
|                | 10.2<br>.400 | 7.2<br>.282  | 4.2<br>.165 | 1.9<br>.073 | 1056724-1 |
| Limited Detent | 12.2<br>.480 | 8.3<br>.328  | 4.7<br>.187 | 2.5<br>.098 | 1056729-1 |
|                | 10.2<br>.400 | 7.2<br>.282  | 4.2<br>.165 | 1.9<br>.073 | 1056731-1 |

### Shroud — Press Fit

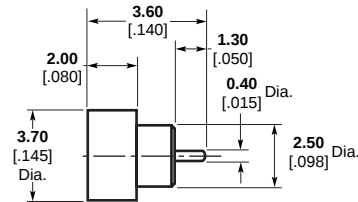


| Description    | Dim. A      | Dim. B      | Part No.  |
|----------------|-------------|-------------|-----------|
| Limited Detent | 3.9<br>.154 | 2.0<br>.080 | 1056736-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

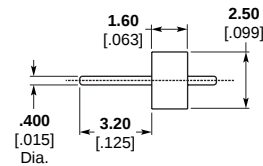
## SMP Microminiature Push-On Coaxial Connectors (Continued)

### Shroud — Solder-In Hermetic



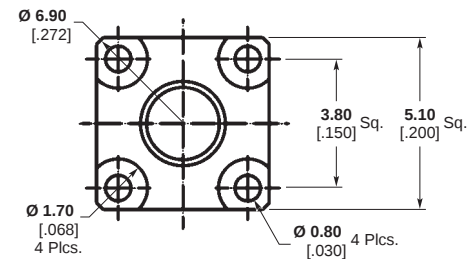
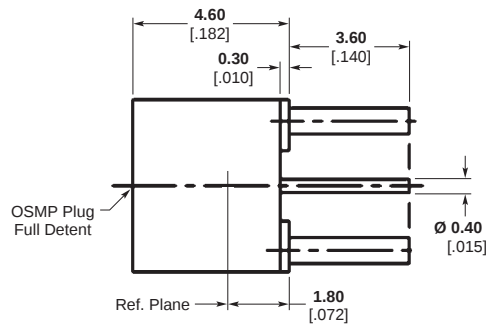
| Description    | Part No.  |
|----------------|-----------|
| Full Detent    | 1056750-1 |
| Limited Detent | 1056751-1 |
| Smooth Bore    | 1056752-1 |

### Glass Bead Assembly

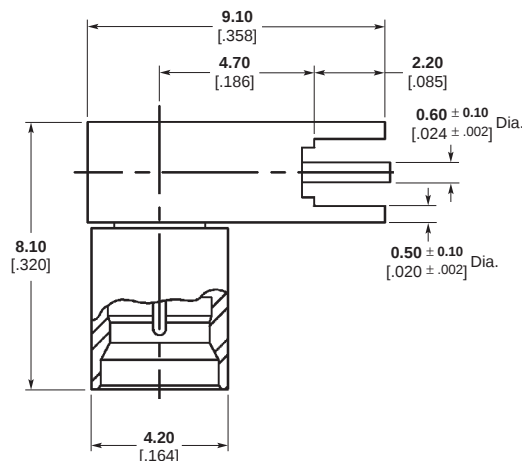


| Part No.  |
|-----------|
| 1056728-1 |

### Plug, Straight, Full Detent



### Plug, Right-Angle, Limited Detent



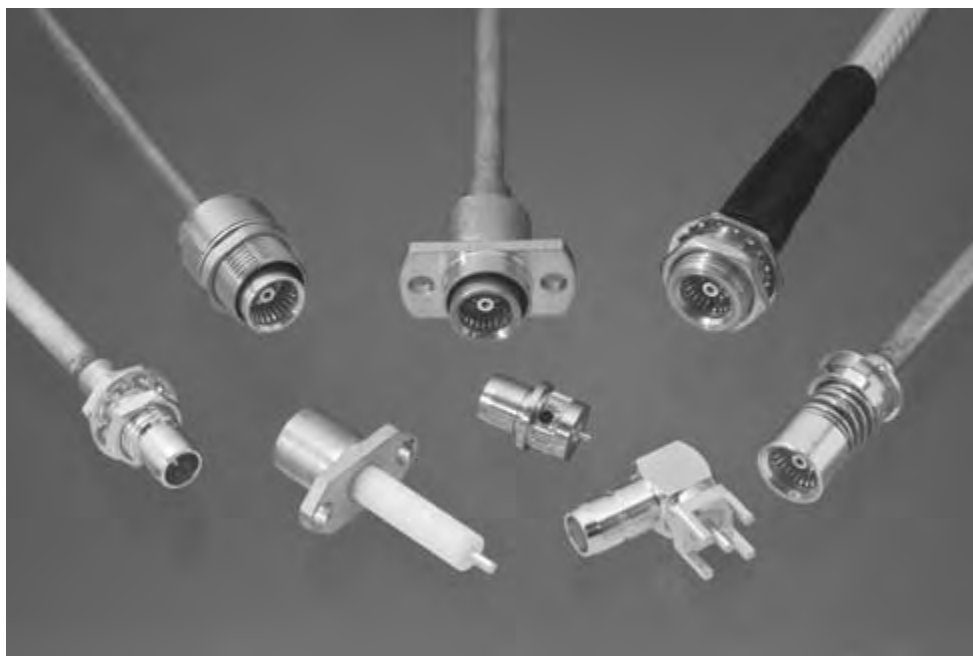
| M/A-COM<br>Model Number | Part<br>No. |
|-------------------------|-------------|
| 2965-5006-62            | 1061692-1   |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors

### Product Facts

- Interface designed for multiple interconnects
- For high performance microwave system requirements
- Module to module, module to motherboard, fixed and float mount
- Bulkhead or panel mount
- For flexible and semi-rigid cable



OSP miniature connectors for semi-rigid cable meet high performance requirements for microwave multiple interconnects. Standard units are available in bulkhead or panel mount designs for either direct solder or solderless compression crimp attachment. Complete tooling for both versions is located in the Tooling Section of this catalog.

Jack connectors are available in either float or rigid mount. Rigid mount units will function to specifications up to  $\pm .10$  [.004] radial misalignment with the mating plug connector. Applications requiring greater than  $\pm .10$  [.004] radial misalignment can use either the float design or floating connector plates with guide pins.

The solderless compression crimp attachment meets

high performance requirements for microwave system applications. The cable attachment is permanent and highly reliable.

Ease of assembly permits users unskilled in soldering techniques to rapidly produce cable assemblies with consistently excellent mechanical and electrical performance.

## OSP Miniature Modular Blind Mate Connectors (Continued)

The specifications given refer specifically to mated pair of Part Numbers 1059410-1 and 1059402-1 (RG 402) and 1059412-1 and 1059404-1 (RG 405). Specifications on other connectors are available on request.

The general electrical, mechanical and environmental specifications in the following table are recommended for procurement documents or drawings.

### Engineering Data

|                      |                |
|----------------------|----------------|
| Impedance —          | 50 ohms        |
| Frequency —          | dc to 22.0 GHz |
| Temperature Rating — | -65° to 125° C |

### Electrical

| VSWR —                                   | RG 402 (.141) Semi-Rigid                       | RG 405 (.085) Semi-Rigid         |
|------------------------------------------|------------------------------------------------|----------------------------------|
| dc - 18.0 GHz                            | 1.02 + .005f (GHz)                             | 1.05 + .005f (GHz)               |
| 18.0 - 22.0 GHz                          | 1.02 + .008f (GHz)                             | 1.05 + .009f (GHz)               |
| RF Transmission Loss —                   | .03 x $\sqrt{f}$ (GHz)                         | .03 x $\sqrt{f}$ (GHz)           |
| Insulation Resistance —                  | 5,000 megohms min.                             | 5,000 megohms min.               |
| Contact Resistance —                     |                                                |                                  |
| Center Contact                           | 2.0 milliohms max.                             | 2.0 milliohms max.               |
| Outer Contact                            | 2.0 milliohms max.                             | 2.0 milliohms max.               |
| Outer Contact to Cable                   | 0.5 milliohms max.                             | 0.5 milliohms max.               |
| Dielectric Withstanding Voltage —        | 1500 volts RMS                                 | 1000 volts RMS                   |
| Corona Extinction Voltage at 70,000 Ft.— | 375 volts min.                                 | 335 volts min.                   |
| RF High Potential at 5 MHz —             | 1,000 volts RMS                                | 670 volts RMS                    |
| RF Leakage Interface Only —              | -(90-fGHz) dB min. (fully mated)               | -(90-fGHz) dB min. (fully mated) |
| Power Handling —                         | 300W at 3 GHz (sea level) and room temperature |                                  |

### Environmental

|                       |                                              |
|-----------------------|----------------------------------------------|
| Corrosion —           | Method 101, Condition B, MIL-STD-202         |
| Vibration —           | Method 204, Condition D, 20G's, MIL-STD-202  |
| Shock —               | Method 213, Condition I, 100G's, MIL-STD-202 |
| Temperature Cycling — | Method 107, Condition B, MIL-STD-202         |
| Moisture Resistance — | Method 106, MIL-STD-202                      |

### Material

|                   |                                                                       |
|-------------------|-----------------------------------------------------------------------|
| Housing —         | Corrosion resistant steel Type 303 (stainless) per ASTM A484 and A582 |
| Center Contact —  | Beryllium copper per ASTM-B-196                                       |
| Dielectric —      | TFE fluorocarbon per ASTM-D-1457                                      |
| Gasket (O'Ring) — | MIL-P-25732                                                           |

### Mechanical

|                            |                 |
|----------------------------|-----------------|
| Force to Engage —          | 3 pounds max.   |
| Force to Disengage —       | 1.5 pounds max. |
| Center Contact Retention — | 6 pounds min.   |
| Durability —               | 5,000 Cycles    |
| Radial Misalignment —      |                 |
| Rigid Mount                | ±.10 [±.004]    |
| Float Mount                | ±.51 [±.020]    |

### Mating Characteristics

|                       |                                                                                         |                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Jack Connector —      |                                                                                         |                                                                                             |
| Center Contact Socket | Oversize test Pin —<br>Test Pin Finish —<br>Insertion Depth —<br>Number of Insertions — | .945 + .003 [.0372 + .0001] dia.<br>16 micro inch<br>.76/1.14 [.030/.045]<br>3              |
| Insertion Force       | Test Pin —<br>Test Pin Finish —<br>Insertion Depth —<br>Insertion Force —               | .940 + .003 [.0370 + .0001] dia.<br>16 micro inch<br>1.27/1.91 [.050/.075]<br>3 pounds max. |
| Withdrawal Force      | Test Pin —<br>Test Pin Finish —<br>Insertion Depth —<br>Withdrawal —                    | .90 + .003 [.0355 - .0001] dia.<br>16 micro inch<br>1.27/1.91 [.050/.075]<br>1 ounce min.   |

### Finish

|                  |                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------|
| Center Contact — | Gold plate per MIL-G-45204, Type II, Class 1 over copper plate per MIL-C-14550                                 |
| Housing —        | Gold plate per MIL-G-45204, Typ II, Class 0 over nickel plate per QQ-N-290, Class 2 or passivate per ASTM-A380 |

All dimensions shown are nominal.  
Contact the factory for specific tolerances.

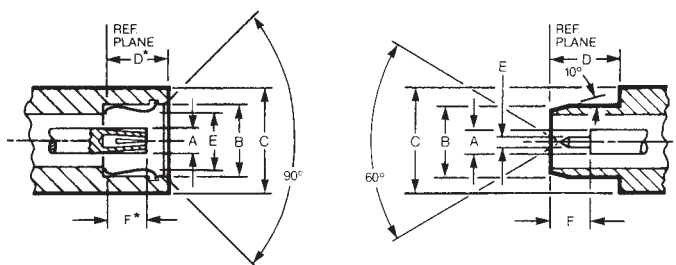
## OSP Miniature Modular Blind Mate Connectors (Continued)

### Interface Mating Dimensions

The connector interface, specifically designed for multiple interconnects, maintains reliable performance over the typical mechanical tolerance required in cost effective packaging.

The interface test data shows excellent performance is maintained with mating gaps up to 0.38 [.015].

Meets MIL-STD-348 Figure 321. Intermateable to BMA Connectors.



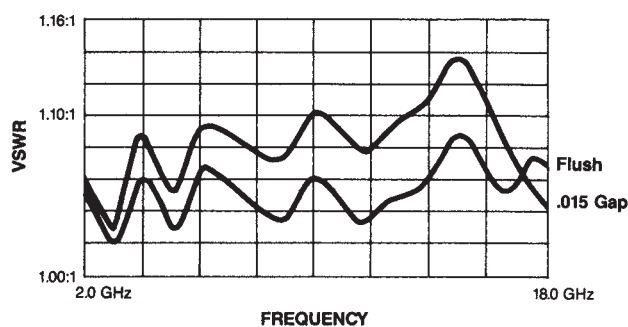
Jack

Plug

| Letter | Dimensions         |
|--------|--------------------|
| A      | 1.78<br>.070 Nom.  |
| B      | 5.72<br>.225 Min.  |
| C      | 7.62<br>.300 Ref.  |
| D      | 5.00<br>.197 Nom.* |
| E      | 5.08<br>.200 Max.  |
| F      | 3.23<br>.127 Max.* |

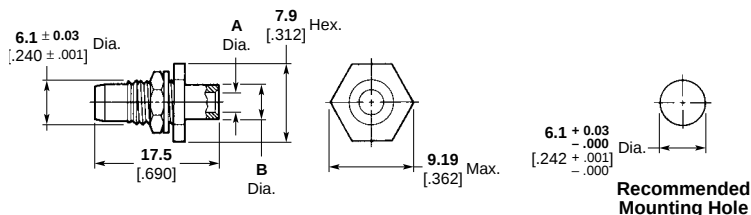
| Letter | Dimensions        |
|--------|-------------------|
| A      | 1.78<br>.070 Nom. |
| B      | 5.33<br>.210 Nom. |
| C      | 7.62<br>.300 Ref. |
| D      | 5.05<br>.199 Min. |
| E      | 0.91<br>.036 Nom. |
| F      | 3.25<br>.128 Min. |

\*With spring bottomed



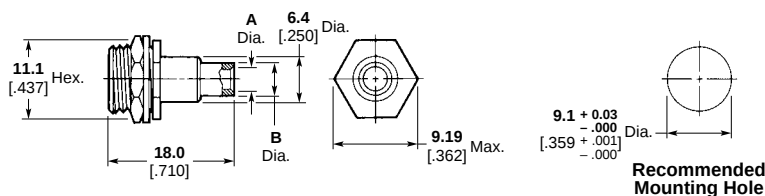
## OSP Miniature Modular Blind Mate Connectors (Continued) For Semi-Rigid Cable, Direct Solder Attachment

### Bulkhead Feedthrough Cable Plug Rear Mount



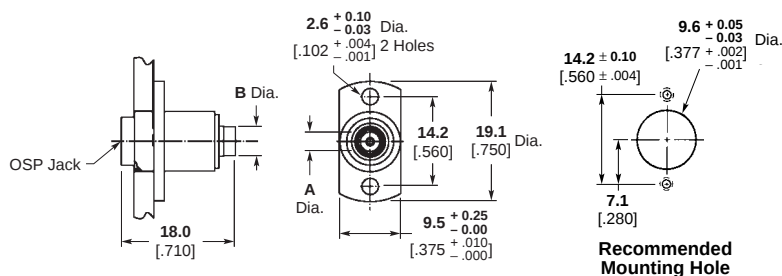
| Cable                    | Plating | Dimensions  |             | Part No.  |
|--------------------------|---------|-------------|-------------|-----------|
|                          |         | A           | B           |           |
| RG 402/U<br>3.58<br>.141 | Gold    | 3.7<br>.144 | 4.6<br>.180 | 1059402-1 |
| RG 405/U<br>2.16<br>.085 | Gold    | 2.3<br>.089 | 3.0<br>.120 | 1059404-1 |

### Bulkhead Feedthrough Cable Jack Rigid Rear Mount



| Cable                    | Plating | Dimensions  |             | Part No.  |
|--------------------------|---------|-------------|-------------|-----------|
|                          |         | A           | B           |           |
| RG 402/U<br>3.58<br>.141 | Gold    | 3.7<br>.144 | 4.6<br>.180 | 1059410-1 |
| RG 405/U<br>2.16<br>.085 | Gold    | 2.3<br>.089 | 3.0<br>.120 | 1059412-1 |

### Flange Mount Cable Jack Floating Rear Mount



| Cable                    | Dimensions  |             | Part No.  |
|--------------------------|-------------|-------------|-----------|
|                          | A           | B           |           |
| RG 402/U<br>3.58<br>.141 | 3.7<br>.144 | 4.6<br>.180 | 1059453-1 |
| RG 405/U<br>2.16<br>.085 | 2.3<br>.089 | 3.0<br>.120 | 1059456-1 |

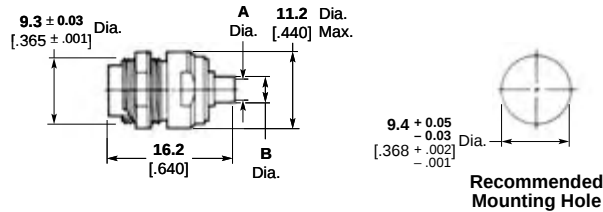
Finish: Inner housing that is soldered to cable is gold plated. Outer housing is passivated stainless steel.

When using semi-rigid cable, it is recommended that a service loop be used to facilitate the float features of the connector.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors (Continued) For Semi-Rigid Cable, Direct Solder Attachment (Continued)

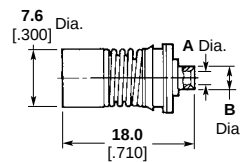
### Low Profile — Bulkhead Feedthrough Cable Jack — Floating Rear Mount



| Cable                    | Plating | Dimensions  |             | Part No.  |
|--------------------------|---------|-------------|-------------|-----------|
|                          |         | A           | B           |           |
| RG 402/U<br>3.58<br>.141 | Gold    | 3.7<br>.144 | 4.6<br>.180 | 1059505-1 |
| RG 405/U<br>2.16<br>.085 | Gold    | 2.3<br>.089 | 3.0<br>.120 | 1059506-1 |

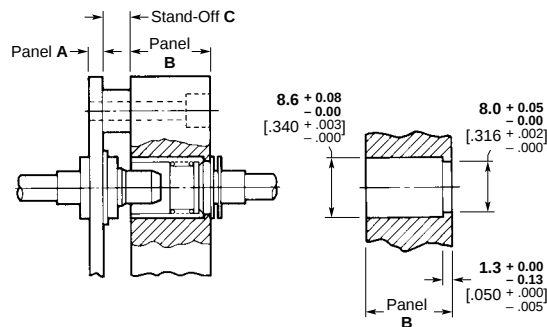
When using semi-rigid cable, it is recommended that a service loop be used to facilitate the float features of the connector.

### Low Profile — Panel Feedthrough Cable Jack — Floating Rear Mount



| Cable                    | Plating | Dimensions  |             | Part No.  |
|--------------------------|---------|-------------|-------------|-----------|
|                          |         | A           | B           |           |
| RG 402/U<br>3.58<br>.141 | Gold    | 3.7<br>.144 | 4.6<br>.180 | 1059465-1 |
| RG 405/U<br>2.16<br>.085 | Gold    | 2.3<br>.089 | 3.0<br>.120 | 1059467-1 |

Recommended removal tool part number 1059774-1 is described in the Tooling Section of this catalog.  
When using semi-rigid cable, it is recommended that a service loop be used to facilitate the float features of the connector.



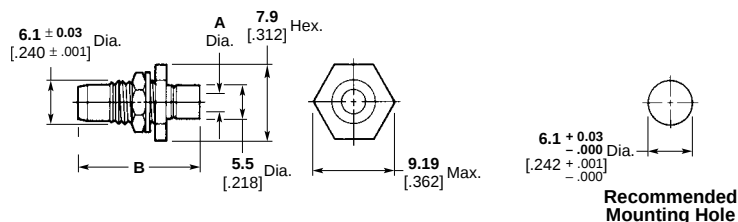
Recommended Mounting Detail

| Panel A ±.003 | Panel B ±.003 | Stand-Off Panel C +.050/-0.000 |
|---------------|---------------|--------------------------------|
| 2.3<br>.090   | 9.5<br>.375   | 7.2<br>.285                    |
| 2.3<br>.090   | 11.1<br>.438  | 5.6<br>.222                    |
| 2.3<br>.090   | 12.7<br>.500  | 4.1<br>.160                    |
| 3.2<br>.125   | 9.5<br>.375   | 6.4<br>.250                    |
| 3.2<br>.125   | 11.1<br>.438  | 4.7<br>.187                    |
| 3.2<br>.125   | 12.7<br>.500  | 3.2<br>.125                    |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors (Continued) For Semi-Rigid Cable, Solderless Compression Crimp Attachment

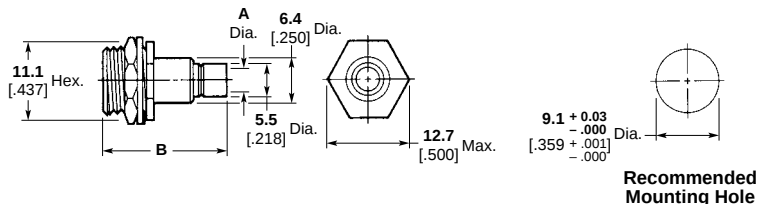
### Bulkhead Feedthrough Cable Plug Fixed Rear Mount



| Cable                    | Plating                          | Dim. A      | Dim. B          |                | Part No.  |
|--------------------------|----------------------------------|-------------|-----------------|----------------|-----------|
|                          |                                  |             | Before Crimping | After Crimping |           |
| RG 405/U<br>2.16<br>.085 | Passivated<br>Stainless<br>Steel | 2.2<br>.088 | 19.8<br>.782    | 17.2<br>.677   | 1059399-1 |

Outline drawing shows after crimp dimensions.

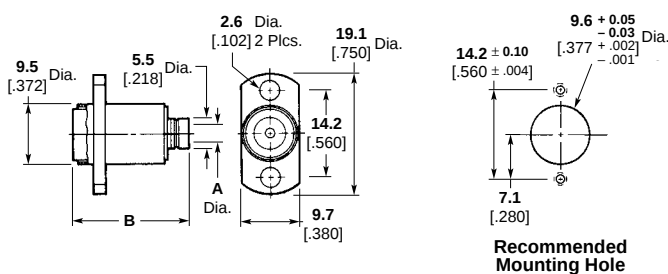
### Bulkhead Feedthrough Cable Jack Fixed Rear Mount



| Cable                    | Plating                          | Dim. A      | Dim. B          |                | Part No.  |
|--------------------------|----------------------------------|-------------|-----------------|----------------|-----------|
|                          |                                  |             | Before Crimping | After Crimping |           |
| RG 402/U<br>3.58<br>.141 | Passivated<br>Stainless<br>Steel | 3.6<br>.143 | 21.1<br>.830    | 18.2<br>.715   | 1059408-1 |

Outline drawing shows after crimp dimensions.

### Flange Mount Cable Jack Floating Rear Mount



| Cable                    | Plating                          | Dim. A      | Dim. B          |                | Part No.  |
|--------------------------|----------------------------------|-------------|-----------------|----------------|-----------|
|                          |                                  |             | Before Crimping | After Crimping |           |
| RG 402/U<br>3.58<br>.141 | Passivated<br>Stainless<br>Steel | 3.6<br>.143 | 22.6<br>.891    | 19.8<br>.780   | 1059451-1 |
| RG 405/U<br>2.16<br>.085 | Passivated<br>Stainless<br>Steel | 2.2<br>.088 | 22.6<br>.891    | 19.8<br>.780   | 1059452-1 |

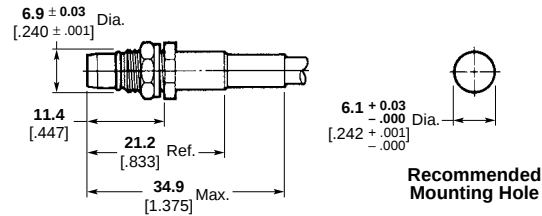
Outline drawing shows after crimp dimensions.

When using semi-rigid cable, it is recommended that a service loop be used to facilitate the float features of the connector.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

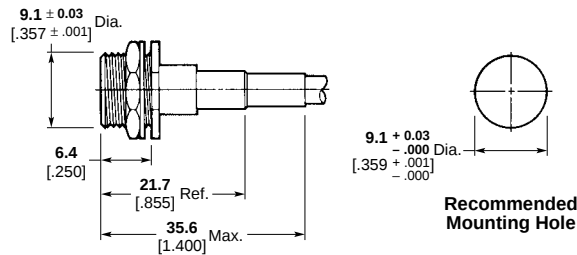
## OSP Miniature Modular Blind Mate Connectors (Continued) For Flexible Cable, Crimp Attachment

### Bulkhead Feedthrough Cable Plug Rear Mount



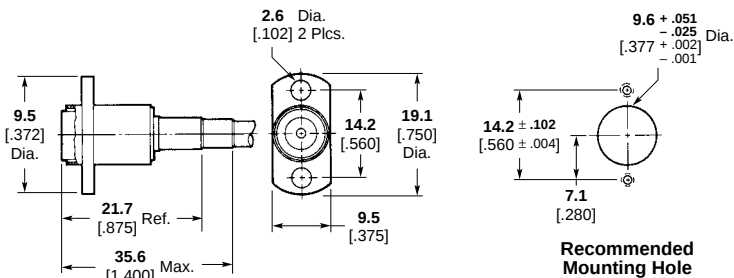
| Cable                           | Plating                    | Part No.         |
|---------------------------------|----------------------------|------------------|
| RG 174/U, 179,<br>187, 188, 316 | Passivated Stainless Steel | <b>1059523-1</b> |

### Bulkhead Feedthrough Cable Jack Rigid Rear Mount



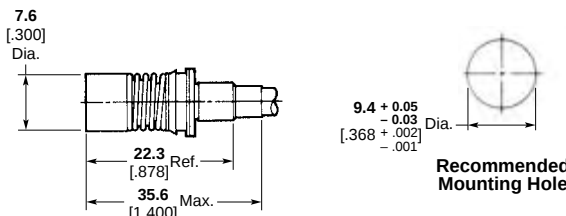
| Cable                     | Plating                    | Part No.         |
|---------------------------|----------------------------|------------------|
| RG 55/U,<br>142, 223, 400 | Passivated Stainless Steel | <b>1059525-1</b> |

### Flange Mount Cable Jack Floating Rear Mount



| Cable                           | Plating                    | Part No.         |
|---------------------------------|----------------------------|------------------|
| RG 55/U,<br>142, 223, 400       | Passivated Stainless Steel | <b>1059540-1</b> |
| RG 174/U, 179,<br>187, 188, 316 | Passivated Stainless Steel | <b>1059541-1</b> |
| RG 178,<br>Double Braid         | Passivated Stainless Steel | <b>1058572-1</b> |

### Low Profile — Panel Feedthrough Cable Jack — Rear Mount



| Cable                           | Plating                    | Part No.         |
|---------------------------------|----------------------------|------------------|
| RG 174/U, 179,<br>187, 188, 316 | Passivated Stainless Steel | <b>1059551-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

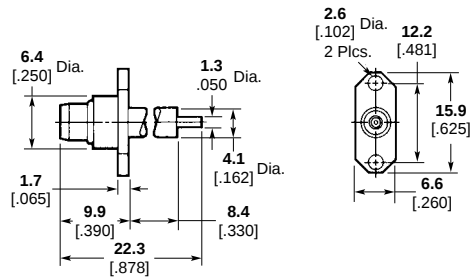
Refer to Recommended Mounting Hole Detail for Semi-Rigid Cable Low Profile Feedthrough Cable Jack.  
Recommended removal tool part number 1059774-1 as described in the Tooling Section of this catalog.

## OSP Miniature Modular Blind Mate Connectors (Continued)

### Panel Mount

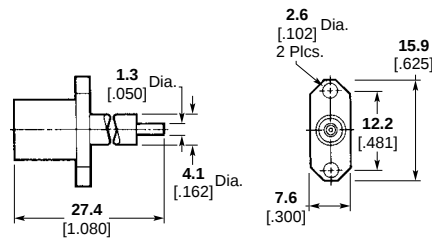
#### Straight Terminal

#### 2-Hole Flange Mount Plug Receptacle



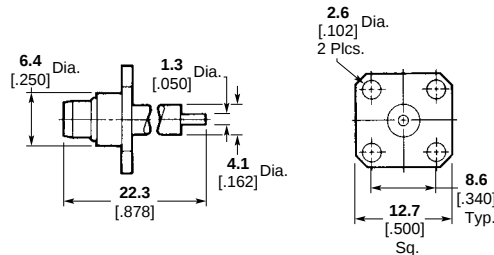
| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059566-1</b> |

#### 2-Hole Flange Mount Jack Receptacle



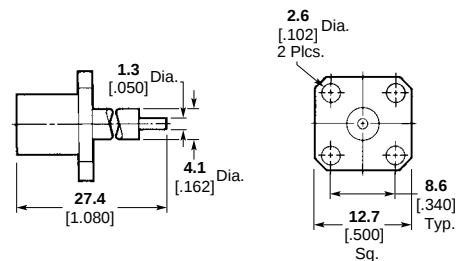
| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059596-1</b> |

#### 4-Hole Flange Mount Plug Receptacle



| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059563-1</b> |

#### 4-Hole Flange Mount Jack Receptacle



| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059594-1</b> |

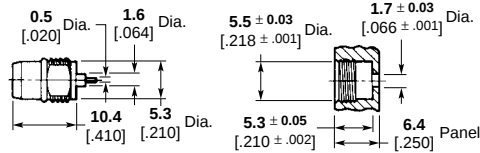
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors (Continued)

### Panel Mount (Continued)

#### Straight Terminal

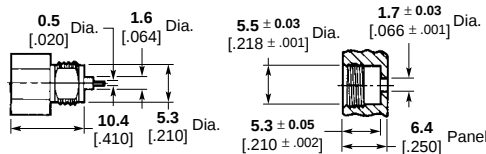
#### Threaded Installation — Panel Feedthrough Plug Receptacle



**Recommended  
Mounting Hole**

| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059617-1</b> |

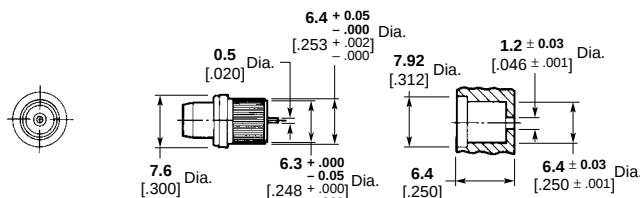
#### Threaded Installation — Panel Feedthrough Jack Receptacle



**Recommended  
Mounting Hole**

| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059657-1</b> |

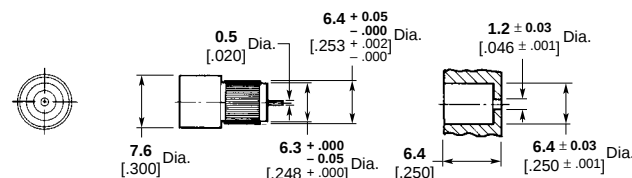
#### Press Fit Installation — Panel Feedthrough Plug Receptacle



**Recommended  
Mounting Hole**

| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059651-1</b> |

#### Press Fit Installation — Panel Feedthrough Jack Receptacle



**Recommended  
Mounting Hole**

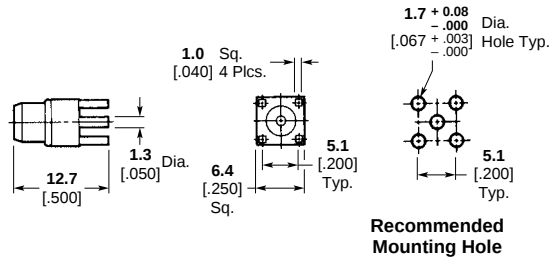
| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059654-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors (Continued)

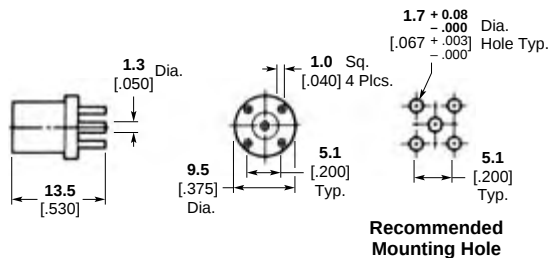
### Printed Circuit Board Mount

#### Straight Plug Receptacle — Captured Contact



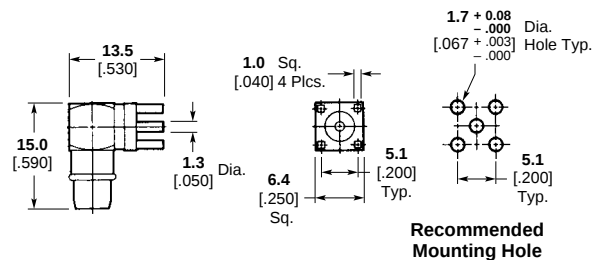
| Plating | Part No.  |
|---------|-----------|
| Gold    | 1059684-1 |

#### Straight Jack Receptacle — Captured Contact



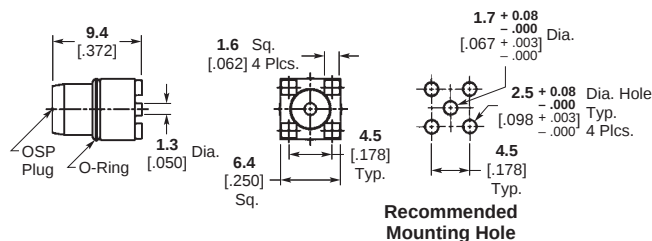
| Plating | Part No.  |
|---------|-----------|
| Gold    | 1059681-1 |

#### Right-Angle Plug Receptacle — Captured Contact



| Plating | Part No.  |
|---------|-----------|
| Gold    | 1059691-1 |

#### Surface Mount Vertical Plug with Small Leg



| Plating | Part No.  |
|---------|-----------|
| Gold    | 1253111-1 |

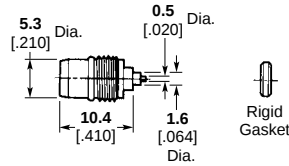
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors (Continued)

### Hermetically Sealed

#### Metal-To-Metal

#### Rigid Gasket Seal — Panel Feedthrough Plug Receptacle

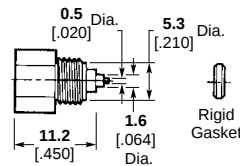


| VSWR (GHz)   | RF Leakage (dB) | Plating                    | Part No.         |
|--------------|-----------------|----------------------------|------------------|
| 1.04 + .009f | -(90-fGHz)      | Passivated stainless steel | <b>6059632-1</b> |

Installation Thermal Limit: 250°C.

Recommended Mounting Hole Detail A follows, pg 168.

#### Rigid Gasket Seal — Panel Feedthrough Jack Receptacle



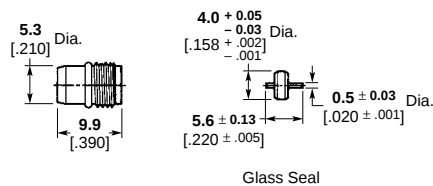
| VSWR (GHz)   | RF Leakage (dB) | Plating                    | Part No.         |
|--------------|-----------------|----------------------------|------------------|
| 1.04 + .009f | -(90-fGHz)      | Passivated stainless steel | <b>6059665-1</b> |

Installation Thermal Limit: 250°C.

Recommended Mounting Hole Detail A follows, pg 168.

#### Field Replaceable Solder and Braze-In

#### Panel Feedthrough Plug Receptacle



| VSWR (GHz)  | RF Leakage (dB) | Plating                    | Part No.         |
|-------------|-----------------|----------------------------|------------------|
| 1.06 + .01f | -(90-fGHz)      | Passivated stainless steel | <b>1059637-1</b> |

Recommended Mounting Detail B or E follows, pg 168.

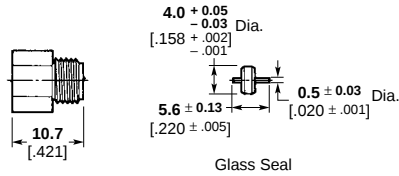
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSP Miniature Modular Blind Mate Connectors (Continued) Hermetically Sealed (Continued)

### Field Replaceable Solder and Braze-In

(Continued)

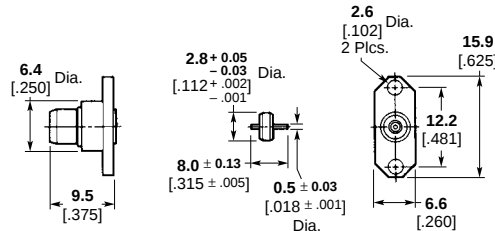
### Panel Feedthrough Jack Receptacle



| VSWR (GHz)  | RF Leakage (dB) | Plating                    | Part No.         |
|-------------|-----------------|----------------------------|------------------|
| 1.06 + .01f | -(90-fGHz)      | Passivated stainless steel | <b>1059671-1</b> |

Recommended Mounting Detail B or E follows at bottom of this page.

### 2-Hole Flange Mount Plug Receptacle With EMI/RFI Gasket — 0.5 [0.018] Dia. Contact

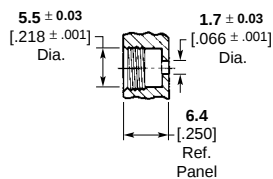


| VSWR (GHz)  | RF Leakage (dB) | Plating                    | Part No.         |
|-------------|-----------------|----------------------------|------------------|
| 1.06 + .01f | -(90-fGHz)      | Passivated stainless steel | <b>1059572-1</b> |

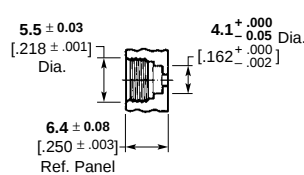
Recommended Mounting Detail D follows at bottom of this page.

### Recommended Mounting Hole Detail

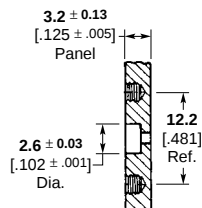
#### Detail A\*



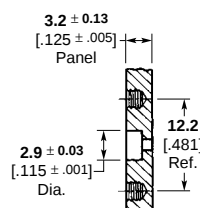
#### Detail B\* (6.35 [1.250] Panel Thickness)



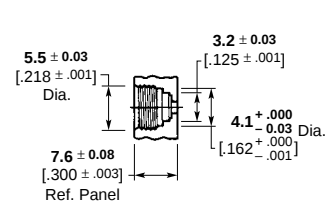
#### Detail C\*



#### Detail D\*



#### Detail E\*



\*Consult appropriate Instruction Sheet for complete mounting details.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSSP Subminiature Modular Blind Mate Connectors

### Product Facts

- Subminiature version of OSP Blind Mate Connectors
- For space savings
- Family of connectors and adapters



OSSP connectors are a subminiature version of the OSP blind mate series. Connectors in this series incorporate the design elements of the OSP interface including the float and mis-mate features. OSSP blind mates are about 40% smaller than OSP connectors and are designed to be

used in applications where space is at a premium.

A complete family of OSSP connectors and adapters is available including cable connectors, fixed and float mount panel connectors and hermetic connectors. Rigid mount units will function to specifications up to

$\pm .064$  [ $\pm .0025$ ] radial misalignment with the mating plug connector. Applications requiring greater than  $\pm .064$  [ $\pm .0025$ ] radial misalignment can use either the float design or floating connector plates with guide pins.

### Engineering Data

|                      |                |
|----------------------|----------------|
| Impedance —          | 50 ohms        |
| Frequency —          | dc to 28.0 GHz |
| Temperature Rating — | -65° to 125° C |

### Electrical

|                                          |                                                |
|------------------------------------------|------------------------------------------------|
| VSWR —                                   | 1.05 + .01f (GHz)                              |
| RF Transmission Loss —                   | .040 x $\sqrt{f}$ (GHz)                        |
| Insulation Resistance —                  | 5,000 megohms min.                             |
| Contact Resistance —                     |                                                |
| Center Contact                           | 6.0 milliohms max.                             |
| Outer Contact                            | 3.0 milliohms max.                             |
| Outer Contact to Cable                   | 0.5 milliohms max.                             |
| Dielectric Withstanding Voltage —        | 675 volts RMS                                  |
| Corona Extinction Voltage at 70,000 Ft.— | 250 volts min.                                 |
| RF High Potential at 5 MHz —             | 675 volts RMS                                  |
| RF Leakage Interface Only —              | -(90-fGHz) dB min. (fully mated)               |
| Power Handling —                         | 300W at 3 GHz (sea level) and room temperature |

### Environmental

|                       |                                              |
|-----------------------|----------------------------------------------|
| Corrosion —           | Method 101, Condition B, MIL-STD-202         |
| Vibration —           | Method 204, Condition D, 20G's, MIL-STD-202  |
| Shock —               | Method 213, Condition I, 100G's, MIL-STD-202 |
| Temperature Cycling — | Method 107, Condition B, MIL-STD-202         |
| Moisture Resistance — | Method 106, MIL-STD-202                      |

### Material

|                   |                                                                       |
|-------------------|-----------------------------------------------------------------------|
| Housing —         | Corrosion resistant steel Type 303 (stainless) per ASTM A484 and A582 |
| Center Contact —  | Beryllium copper per ASTM-B-196                                       |
| Dielectric —      | TFE fluorocarbon per ASTM-D-1457                                      |
| Gasket (O'Ring) — | MIL-P-25732                                                           |

### Mechanical

|                            |                           |
|----------------------------|---------------------------|
| Force to Engage —          | 3 pounds max.             |
| Force to Disengage —       | 1.5 pounds max.           |
| Center Contact Retention — | 4 pounds min.             |
| Durability —               | 1,000 Cycles              |
| Radial Misalignment —      |                           |
| Rigid Mount                | $\pm .06$ [ $\pm .0025$ ] |
| Float Mount                | $\pm .51$ [ $\pm .020$ ]  |

### Mating Characteristics

|                       |                        |                                    |  |
|-----------------------|------------------------|------------------------------------|--|
| Jack Connector —      |                        |                                    |  |
| Center Contact Socket | Oversize test Pin —    | $.533 + .003$ [.0210 + .0001] dia. |  |
|                       | Test Pin Finish —      | 16 micro inch max.                 |  |
|                       | Insertion Depth —      | $.76/1.14$ [.030/.045]             |  |
|                       | Number of Insertions — | 3                                  |  |
| Insertion Force       | Test Pin —             | $.528 + .003$ [.0208 + .0001] dia. |  |
|                       | Test Pin Finish —      | 16 micro inch                      |  |
|                       | Insertion Force —      | 3 pounds max.                      |  |
| Withdrawal Force      | Test Pin —             | $.495 + .003$ [.0195 - .0001] dia. |  |
|                       | Test Pin Finish —      | 16 micro inch max.                 |  |
|                       | Insertion Depth —      | $1.27/1.91$ [.050/.075]            |  |
|                       | Withdrawal —           | 1/2 ounce min.                     |  |

### Finish

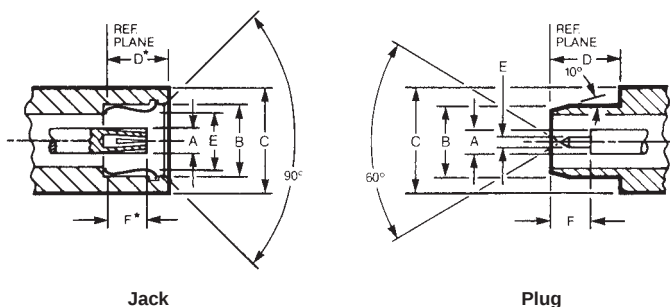
|                  |                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------|
| Center Contact — | Gold plate per MIL-G-45204, Type II, Class 0 over nickel plate per QQ-N-290, Class 2 or passivate per ASTM-A380 |
| Housing —        | Gold plate per MIL-G-45204, Type II, Class 0 over nickel plate per QQ-N-290, Class 2 or passivate per ASTM-A380 |

## OSSP Subminiature Modular Blind Mate Connectors (Continued)

### Interface Mating Dimensions

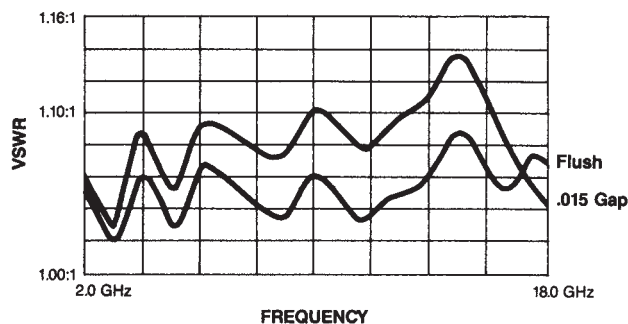
The connector interface, specifically designed for multiple interconnects, maintains reliable performance over the typical mechanical tolerance required in cost effective packaging.

The interface test data shows excellent performance is maintained with mating gaps up to .015 inch.



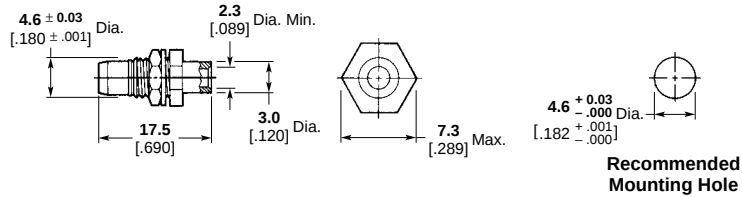
| Description | Dimensions           |                      |                      |                       |                      |                       |
|-------------|----------------------|----------------------|----------------------|-----------------------|----------------------|-----------------------|
|             | A                    | B                    | C                    | D                     | E                    | F                     |
| Jack        | 1.22<br>0.48<br>Nom. | 3.91<br>.154<br>Min. | 5.33<br>.210<br>Ref. | 5.00<br>.197<br>Nom.* | 3.35<br>.132<br>Max. | 3.23<br>.127<br>Max.* |
| Plug        | 1.22<br>0.48<br>Nom. | 3.56<br>.140<br>Nom. | 5.33<br>.210<br>Ref. | 5.00<br>.199<br>Min.  | 0.51<br>.020<br>Nom. | 3.25<br>.128<br>Min.  |

\*With spring bottomed.



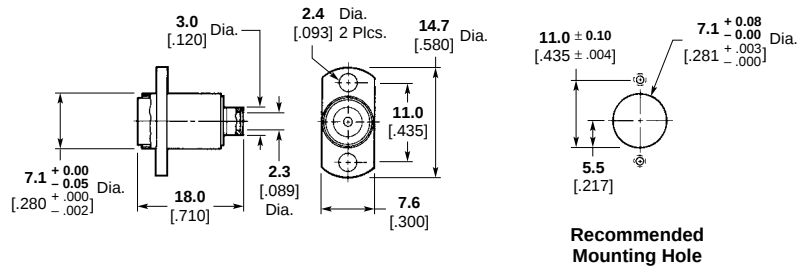
## OSSP Subminiature Modular Blind Mate Connectors (Continued) For Semi-Rigid Cable, Direct Solder Attachment

### Bulkhead Feedthrough Cable Plug — Rear Mount



| Cable                       | Plating | Part No.  |
|-----------------------------|---------|-----------|
| RG 405/U,<br>2.16<br>[.085] | Gold    | 1059857-1 |

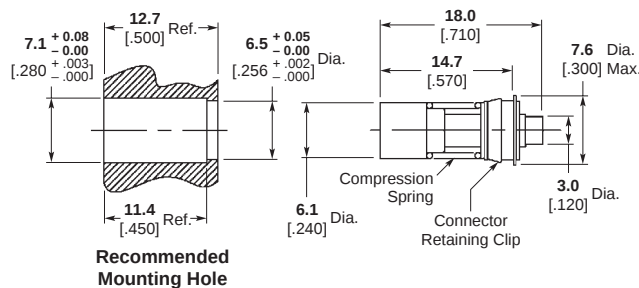
### Flange Mount Cable Jack — Floating Rear Mount



| Cable                       | Part No.  |
|-----------------------------|-----------|
| RG 405/U,<br>2.16<br>[.085] | 1059868-1 |

Finish: Inner housing that is soldered to cable is gold plated. Outer housing is passivated stainless steel.  
When using semi-rigid cable, it is recommended that a service loop be used to facilitate the float features of the connector.

### Feedthrough Snap-In

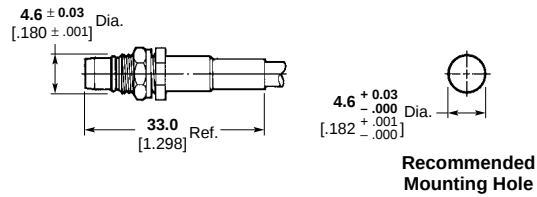


| Cable                       | Part No.  |
|-----------------------------|-----------|
| RG 405/U,<br>2.16<br>[.085] | 1059874-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

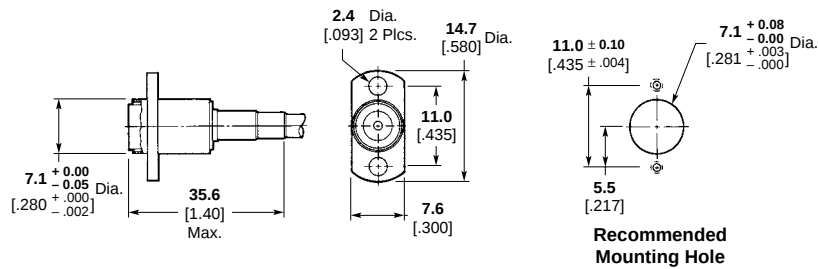
## OSSP Subminiature Modular Blind Mate Connectors (Continued) For Flexible Cable, Crimp Attachment

### Bulkhead Feedthrough Cable Plug — Rear Mount



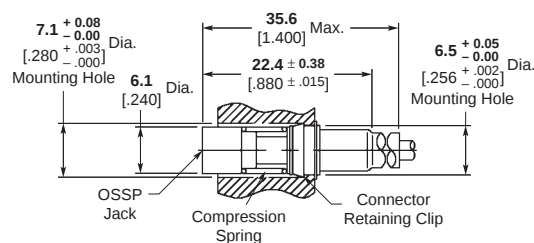
| Cable                                   | Plating                    | Part No.         |
|-----------------------------------------|----------------------------|------------------|
| RG 188/U,<br>316 Double<br>Braided Only | Passivated Stainless Steel | <b>1059884-1</b> |
| RG 174/U,<br>188/U, 316U                | Passivated Stainless Steel | <b>1059886-1</b> |

### Flange Mount Cable Jack — Floating Rear Mount



| Cable                                   | Plating                    | Part No.         |
|-----------------------------------------|----------------------------|------------------|
| RG 188/U,<br>316 Double<br>Braided Only | Passivated Stainless Steel | <b>1059888-1</b> |
| RG 174/U,<br>188/U, 316U                | Passivated Stainless Steel | <b>1059887-1</b> |

### Feedthrough Snap-In Cable Jack

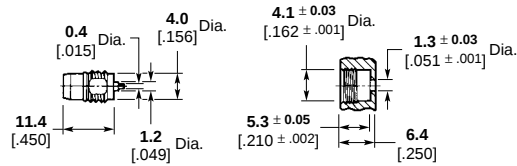


| Part No.         |
|------------------|
| <b>1059889-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSSP Subminiature Modular Blind Mate Connectors (Continued) For Panel Mount

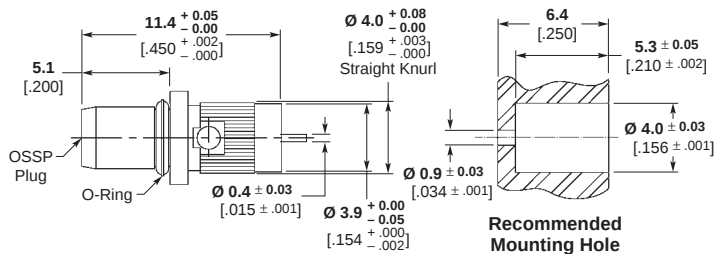
### Threaded Panel Feedthrough Plug Receptacle, Straight Terminal



**Recommended  
Mounting Hole**

| Plating                          | Part No.         |
|----------------------------------|------------------|
| Passivated<br>Stainless<br>Steel | <b>1059903-1</b> |

### Press-Fit Panel Feedthrough Plug Receptacle



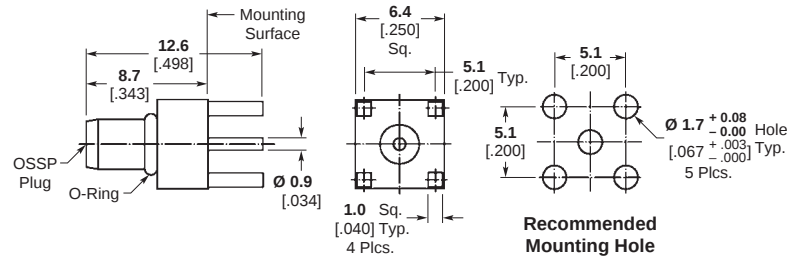
**Recommended  
Mounting Hole**

| Part No.         |
|------------------|
| <b>1059901-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSSP Subminiature Modular Blind Mate Connectors (Continued) For Printed Circuit Board Mount

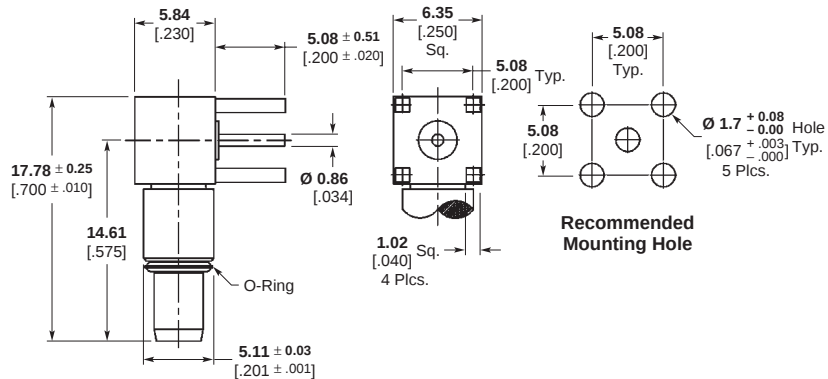
### Straight Plug Receptacle — Captured Contact



**Part No.**

**1059919-1**

### Right-Angle Plug Receptacle



**Part Number**

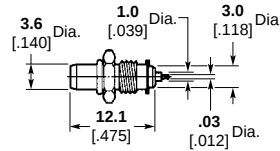
**1484546-1**

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## OSSP Subminiature Modular Blind Mate Connectors (Continued) Hermetically Sealed

### Metal to Metal

#### Formable Gasket — Panel Feedthrough Plug Receptacle

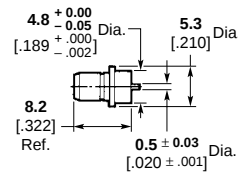


| VSWR (GHz)  | RF Leakage (dB) | Plating | Part No.  |
|-------------|-----------------|---------|-----------|
| 1.06 + .01f | -(85-fGHz)      | Gold    | 1059905-1 |

Recommended Mounting Hole Detail A at bottom of this page.

### Solder and Braze-In

#### Panel Feedthrough Plug Receptacle

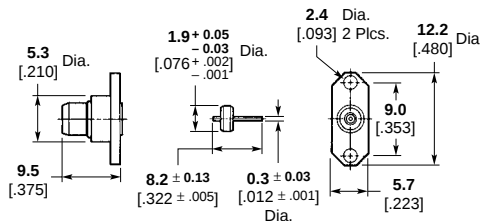


| VSWR (GHz)  | RF Leakage (dB) | Plating | Part No.  |
|-------------|-----------------|---------|-----------|
| 1.06 + .01f | -(85-fGHz)      | Gold    | 1059902-1 |

Recommended Mounting Hole Detail B at bottom of this page.

### Field Replaceable Solder and Braze-In

#### 2-Hole Flange Mount Plug Receptacle With EMI/RFI Gasket

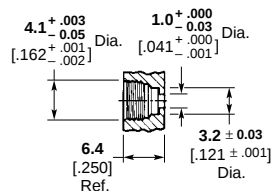


| VSWR (GHz)  | RF Leakage (dB) | Plating                    | Part No.  |
|-------------|-----------------|----------------------------|-----------|
| 1.06 + .01f | -(85-fGHz)      | Passivated Stainless Steel | 1059894-1 |

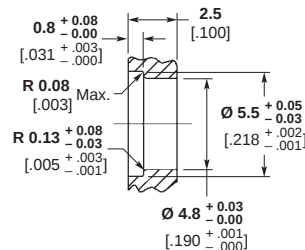
Recommended Mounting Hole Detail C at bottom of this page.

### Recommended Mounting Hole Detail for Hermetically Sealed

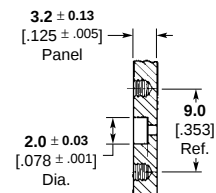
#### Detail A\*



#### Detail B\*



#### Detail C\*



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

\*Consult appropriate Instruction Sheet for complete mounting procedure.

## SMB Connectors

### Product Facts

- SMB offers snap-fit coupling for quick connect/disconnect
- Choice of Commercial or High Rel Connectors
- 50 and 75  $\Omega$  MIL-Type connectors available
- Straight plugs and jacks are completely crimp terminated
- Fast easy cable assembly
- Low VSWR
- Standard military, commercial or Tyco Electronics tooling
- Listed under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- PC Board soldered connectors are recognized under the Component Program of Underwriters Laboratories Inc., File No. E81956 
- Certified by Canadian Standards Association File No. LR 7189 

SMB Connectors are available in commercial and high rel versions. They are ideally suited for circuit miniaturization and are offered in a wide range of configurations including plugs, right-angle plugs, jacks, bulkhead jacks and adapters, as well as printed circuit board and solder jacks.

Termination costs are kept to a minimum using plugs and jacks with a crimp center contact and hex crimp outer braid. Both hand held tooling and pneumatic bench-mounted tooling is available. Easily assembled right-angle plugs have a hex crimp on the outer braid ferrule and bifurcated solder center contacts.

Tyco Electronics' 75 Ohm BT 43 SMB Connectors feature unique spring mating with snap-fit couplings for quick connect/disconnect. These connectors are designed to be intermateable with 75 Ohm SMB MIL-C-39012 connectors. They also feature reliable dual crimp cable terminations.



**Packaging** — All connectors are packaged individually unless otherwise noted under the "Military No. and/or Comments" column in the connector specifications chart.

### Between Series Adapters

For SMB Between Series Adapters, please see pages 251-260.

## SMB Connector Specifications

### Electrical Characteristics

**Impedance** — 50 ohms and 75 ohms, nominal

**Frequency Range** — 0 to 4.0 GHz

**Voltage Rating (VRMS)** —

|                                             |     |     |
|---------------------------------------------|-----|-----|
| 50 ohm connectors for RG 178/U series cable | 300 | 75  |
| 50 ohm connectors for RG 316/U series cable | 400 | 100 |
| 75 ohm connectors for RG 179/U series cable | 300 | 75  |
| 75 ohm connectors for RG 195/U series cable | 500 | 125 |

**Insulations Resistance** — 1000 megohms min.

**Contact Resistance** — (milliohms max.)

|                | Initial | After Environment |
|----------------|---------|-------------------|
| Center contact | 6.0     | 8.0               |
| Outer contact  | 1.0     | 1.5               |
| Braid to body  | 1.0     | N/A               |

**Contact Current Rating** — 1.5 amps DC max.

**Voltage Standing Wave Ratio (VSWR)** — to 4.0 GHz or 80% of upper cutoff frequency of the cable, whichever is lower.

| Cable           | Mating Engagement |             |
|-----------------|-------------------|-------------|
|                 | Straight          | Right-Angle |
| RG 178/U Series | 1.30 + .04F       | 1.45 + .06F |
| RG 316/U Series | 1.25 + .04F       | 1.35 + .04F |

F=GHz, does not apply to 75 ohm connectors.

### RF High Potential Withstanding Voltage

**Frequency** — 5 MHz

**Leakage Current** — N/A

|                                             |           |
|---------------------------------------------|-----------|
| 50 ohm connectors for RG 178/U series cable | 675 VRMS  |
| 50 ohm connectors for RG 316/U series cable | 950 VRMS  |
| 75 ohm connectors for RG 179/U series cable | 950 VRMS  |
| 75 ohm connectors for RG 195/U series cable | 1225 VRMS |

**RF Leakage** — -55 dB min. at 2-3 GHz

**Insertion Loss** — .30dB max. at 3 GHz

### Mechanical Characteristics

**Engagement Forces** — 14 lbs. [62.3 N] maximum engagement initially.

After 500 matings, 14 lbs. [62.3 N] maximum engagement and 2 lbs. [8.8 N] minimum disengagement for all of SMBs.

**Cable Attachment** —

**Straight Connectors** — Crimp, both center contact and braid

**Right-Angle Connectors** — Crimp on braid and bifurcated solder center contact

**Durability** — 500 cycles per MIL-C-39012

**Contact Captivation** — When captivated, the contacts will withstand 4.0 lbs. minimum axial force.

**Cable Retention** — When properly assembled to the compatible braided coaxial cable, the retention is equal to the breaking strength of the cable.

**Marking** — Per MIL-STD-130

### Environmental Characteristics

**Temperature Rating** — -65°C to +165°C

**Corrosion (salt spray)** — MIL-STD-202, Method 101, test condition B, 5% salt solution

**Vibration High Frequency** — MIL-STD-202, Method 204, test condition B (15 G's)

**Shock** — MIL-STD-202, Method 213, test condition B, 75 G's at 6 milliseconds, 1/2 sine

**Thermal Shock** — MIL-STD-202, Method 107, test condition B, except high temperature shall be +85°C. High temperature shall be +200°C for connectors using 200°C cables.

**Moisture Resistance** — MIL-STD-202, Method 106, when interface gasket is used. No measurements of high humidity. Insulation resistance shall be 200 megohms minimum within five minutes after removal from humidity.

**Durability Test** — Conducted per MIL-C-39012 Reg. Para. 3.15, Method Para. 4.6.12

### Materials

**Body, Body Components and Male Contacts** — Brass, half hard, per QQ-B-626, Alloy 360, Zinc per QQ-Z-363

**Female Contacts** — Beryllium copper per QQ-C-530, heat treated per MIL-H-7199

**Insulators** — TFE fluorocarbon per ASTM D 1710, Type 1, Grade 1

**Lockwashers** — Phosphor bronze per QQ-B-750

**Crimp Ferrule** — Annealed copper alloy per WW-T-799

**Gaskets** — Silicone rubber per ZZ-R-765, Class 11B, Grade 65-75

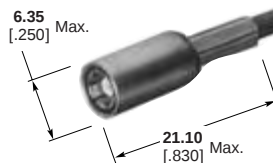
### Plating

**Center Contacts** — 0.00127 [0.00050] min. Gold per MIL-G-452048 Type 1, Grade C, Class 1, over 0.00254 [0.000100] min. nickel per QQ-N-290

**Other Metal Parts** — Gold, Nickel or Solder plated to meet the Finish and Corrosion requirements of MIL-C-39012

## SMB Connectors, 50 Ohm

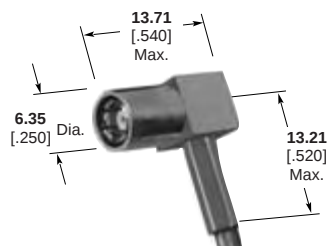
### Straight Plugs



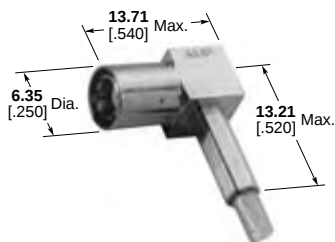
| RG/U Cable                                   | Center Contact Plating | Outer Contact Plating | Other Metal Parts Plating | Dielectric | Style    | Part No.          |
|----------------------------------------------|------------------------|-----------------------|---------------------------|------------|----------|-------------------|
| 178, 178A, 178B, 196, 196A                   | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>413985-6</b>   |
|                                              | Gold                   | Gold                  | Gold                      |            | MIL Type | <b>413985-1</b>   |
|                                              | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>413985-3</b>   |
| 174, 316, 188, 188A                          | Gold                   | Nickel                | Nickel                    |            | MIL Type | <b>413985-7</b>   |
|                                              | Gold                   | Gold                  | Nickel                    |            | Die Cast | <b>414946-1</b>   |
|                                              | Gold                   | Nickel                | Nickel                    |            | Die Cast | <b>5414946-2</b>  |
| 179, 179A, 179B, 161, 187, 187A, BELDEN 9221 | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>1-413985-1</b> |
|                                              | Gold                   | Gold                  | Nickel                    |            | Die Cast | <b>5414946-5</b>  |
|                                              | Gold                   | Nickel                | Nickel                    |            | Die Cast | <b>5414946-6</b>  |
| RG 316, 188 Double Braid                     | Gold                   | Gold                  | Gold                      |            | MIL Type | <b>413985-2</b>   |
|                                              | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>413985-4</b>   |
|                                              | Gold                   | Gold                  | Nickel                    |            | Die Cast | <b>5414946-3</b>  |
|                                              | Gold                   | Nickel                | Nickel                    |            | MIL Type | <b>413985-8</b>   |

### Right-Angle Plugs

#### MIL Type



#### Die Cast



| RG/U Cable                                                        | Center Contact Plating | Outer Contact Plating | Other Metal Parts Plating | Dielectric | Style    | Part No.         |
|-------------------------------------------------------------------|------------------------|-----------------------|---------------------------|------------|----------|------------------|
| 178, 178A, 178B, 196, 196A                                        | Gold                   | Gold                  | Gold                      |            | MIL Type | <b>414002-7</b>  |
|                                                                   | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>414002-8</b>  |
|                                                                   | Gold                   | Gold                  | Nickel                    |            | Die Cast | <b>5414363-8</b> |
|                                                                   | Gold                   | Gold                  | Gold                      |            | MIL Type | <b>414002-1</b>  |
| 174, 316, 188, 188A, 179, 179A, 179B, 161, 187, 187A, BELDEN 9221 | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>414002-3</b>  |
|                                                                   | Gold                   | Nickel                | Nickel                    |            | MIL Type | <b>414002-5</b>  |
|                                                                   | Gold                   | Gold                  | Nickel                    |            | Die Cast | <b>5414363-3</b> |
|                                                                   | Gold                   | Nickel                | Nickel                    |            | Die Cast | <b>5414363-5</b> |
| RG 316, 188 Double Braid                                          | Gold                   | Gold                  | Gold                      |            | MIL Type | <b>414002-2</b>  |
|                                                                   | Gold                   | Gold                  | Nickel                    |            | MIL Type | <b>414002-4</b>  |
|                                                                   | Gold                   | Gold                  | Nickel                    |            | Die Cast | <b>5414363-4</b> |

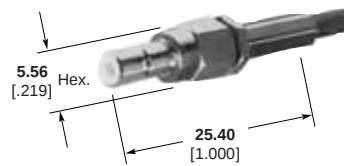
BELDEN is a trademark of Belden Wire and Cable Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connectors, 50 Ohm (Continued)

### Straight Jacks

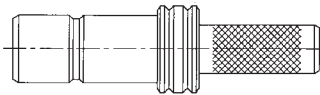
#### Commercial Jack



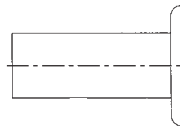
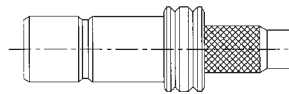
#### MIL Type Jack



#### Die Cast

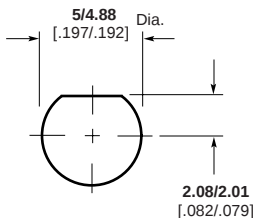


#### Brass

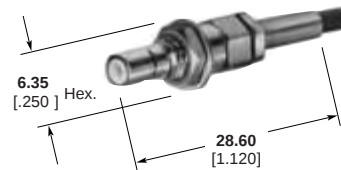


| RG/U Cable                 | Center Contact Plating | Body Plating | Dielectric | Style      | Jack Part No.    |
|----------------------------|------------------------|--------------|------------|------------|------------------|
| 178, 178A, 178B, 196, 196A | Gold                   | Nickel       |            | MIL Type   | <b>5414170-2</b> |
| 174, 316, 188, 188A        | Gold                   | Nickel       |            | MIL Type   | <b>5414170-1</b> |
|                            | Gold                   | Nickel       |            | Die Cast   | <b>414948-1</b>  |
| RD 316, 188 Double Braid   | Gold                   | Nickel       |            | Commercial | <b>414948-3</b>  |

### Bulkhead Jacks

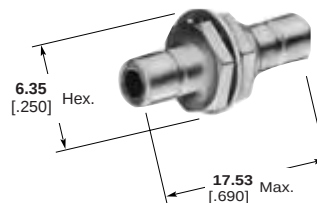


Maximum Panel Thickness **2.36** [.093]  
**Recommended Panel Cutout for Bulkhead Jack and Adapter**



| RG/U Cable               | Center Contact Plating | Body Plating | Dielectric | Style      | Bulkhead Jack Part No. |
|--------------------------|------------------------|--------------|------------|------------|------------------------|
| 174, 316, 188, 188A      | Gold                   | Nickel       |            | Commercial | <b>5415006-1</b>       |
|                          | Gold                   | Nickel       |            | Commercial | <b>5228217-1</b>       |
| RD 316, 188 Double Braid | Gold                   | Nickel       |            | Commercial | <b>5415006-2</b>       |

### Bulkhead Jack Adapter (Jack-Jack)

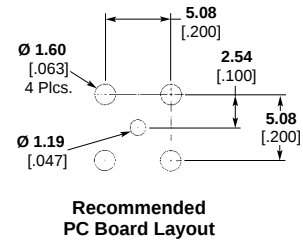
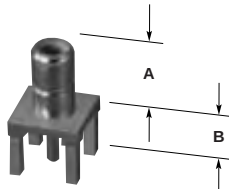


| Type         | Center Contact Plating | Body Plating | Dielectric | Style    | Part No.        |
|--------------|------------------------|--------------|------------|----------|-----------------|
| Jack-To-Jack | Gold                   | Nickel       |            | MIL Type | <b>228553-1</b> |
|              | Gold                   | Gold         |            | MIL Type | <b>228553-2</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connectors, 50 Ohm (Continued)

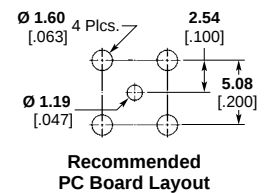
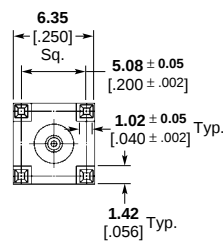
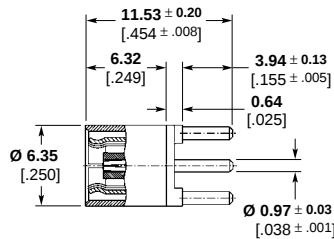
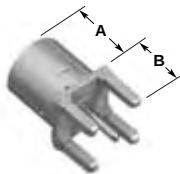
### PC Board Vertical Jacks



### Jacks

| Type | Center<br>Contact<br>Plating | Body<br>Plating | Dim.<br>A     | Dim.<br>B    | Dielectric   | Style             | Part<br>No. |
|------|------------------------------|-----------------|---------------|--------------|--------------|-------------------|-------------|
| —    | Gold                         | Gold            | 7.62<br>.300  | 3.94<br>.155 |              | MIL Type          | 413990-1    |
| —    | Gold                         | Nickel          | 7.62<br>.300  | 3.94<br>.155 |              | MIL Type          | 413990-2    |
| —    | Gold                         | Nickel          | 10.16<br>.400 | 2.54<br>.100 |              | MIL Type          | 414612-2    |
| —    | Gold                         | Tin             | 3.94<br>.155  | 8.25<br>.325 | Max. 3 7 ) ( | Brass,<br>Stamped | 5221111-1   |

### PC Board Vertical Plugs



### Plugs

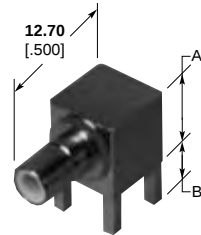
| Type                             | Center<br>Contact<br>Plating | Body<br>Plating | Dim.<br>A    | Dim.<br>B    | Dielectric | Recommended<br>PC Board<br>Layout | Style    | Part<br>No. |
|----------------------------------|------------------------------|-----------------|--------------|--------------|------------|-----------------------------------|----------|-------------|
| Low Profile (Plug)<br>Mated Pair | Gold                         | Nickel          | 3.94<br>.155 | 7.62<br>.300 | 3 7 ) (    | B                                 | MIL Type | 415774-1    |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

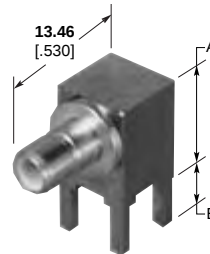
## SMB Connectors, 50 Ohm (Continued)

### PC Board, Right-Angle Jacks

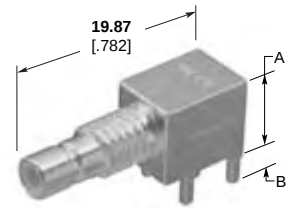
#### Jack Low Profile



#### Jack with Standoff Pads



#### Bulkhead Jack

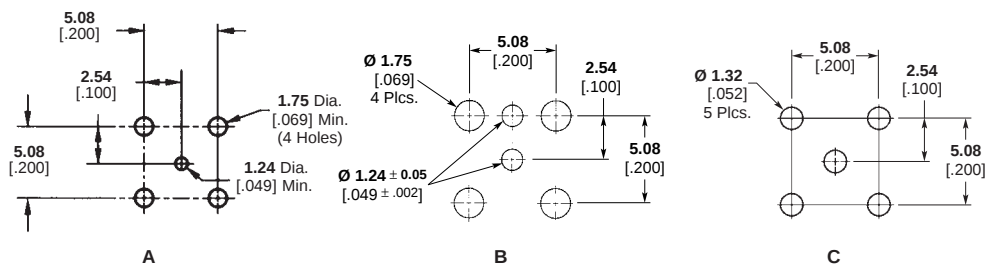
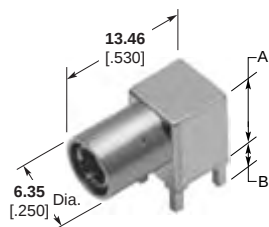


#### Jacks

| Type               | Center Contact Plating | Interface Body Plating | PCB Leg Plating | Dielectric    | Dim. A       | Dim. B       | Style          | Recommended PC Board Layout | Part No.   |
|--------------------|------------------------|------------------------|-----------------|---------------|--------------|--------------|----------------|-----------------------------|------------|
| Low Profile        | Gold                   | Gold                   | Gold            | 3 7 ) (       | 7.11<br>.280 | 3.94<br>.155 | MIL Type       | A                           | 413996-2   |
|                    | Gold                   | Nickel                 | Nickel          | 3 7 ) (       | 7.11<br>.280 | 3.94<br>.155 | MIL Type       | A                           | 413996-4   |
|                    | Gold                   | Gold                   | Gold            | 3 7 ) (       | 7.11<br>.280 | 2.79<br>.110 | Die Cast       | A                           | 415340-1   |
|                    | Gold                   | Gold                   | Gold            | 3 7 ) (       | 8.76<br>.345 | 2.79<br>.110 | Die Cast       | A                           | 415672-1   |
| With Standoff Pads | Gold                   | Gold                   | Gold            | 3 7 ) (       | 8.51<br>.335 | 3.94<br>.155 | MIL Type       | A                           | 414026-2   |
|                    | Gold                   | Nickel                 | Nickel          | 3 7 ) (       | 8.76<br>.345 | 3.94<br>.155 | MIL Type       | A                           | 414026-3   |
|                    | Gold                   | Nickel                 | Tin-Lead        | 3 7 ) (       | 8.76<br>.345 | 3.94<br>.155 | Die Cast       | A                           | 5414337-1  |
|                    | Gold                   | Nickel                 | Nickel          | 3 7 ) (       | 8.76<br>.345 | 2.79<br>.110 | Die Cast       | B                           | 5415379-1* |
|                    | Gold                   | Nickel                 | Nickel          | 3 7 ) (       | 8.51<br>.335 | 3.94<br>.155 | Die Cast       | A                           | 415381-1 □ |
| Bulkhead           | Gold                   | Gold                   | Gold            | 3 7 ) (       | 7.67<br>.302 | 2.79<br>.110 | Die Cast       | A                           | 414963-1   |
| Commercial         | Gold                   | Nickel                 | Tin             | Polypropylene | 9.78<br>.385 | 3.94<br>.155 | Brass, Stamped | C                           | 5228435-1  |
| Bulkhead           | Gold                   | Gold                   | Gold            | 3 7 ) (       | 7.67<br>.302 | 2.79<br>.110 | Die Cast       | A                           | 1274330-1  |

\* 5 leg design

### PC Board, Right-Angle Plug



#### Recommended PC Board Layouts

#### Plugs

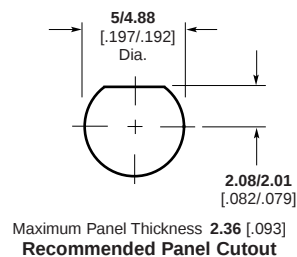
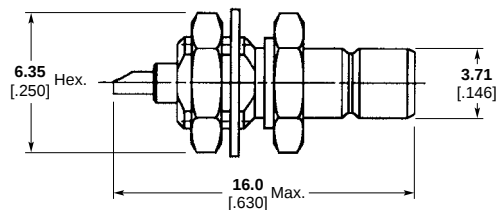
| Center Contact Plating | Interface Body Plating | PCB Leg Plating | Dielectric | Dim. A       | Dim. B       | Style    | Recommended PC Board Layout | Part No.  |
|------------------------|------------------------|-----------------|------------|--------------|--------------|----------|-----------------------------|-----------|
| Gold                   | Nickel                 | Nickel          |            | 8.76<br>.345 | 2.79<br>.110 | Die Cast | B                           | 415380-1* |
| Gold                   | Nickel                 | Tin             |            | 8.76<br>.345 | 3.94<br>.155 | Die Cast | A                           | 5414338-1 |

\* 5 leg design

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connectors, 50 Ohm (Continued)

### Bulkhead PC Board Jack, Solder Receptacle Kits



### Kit Includes Lockwasher and Jam Nut

#### Lockwasher and Jam Nut



Part No.  
415001-2

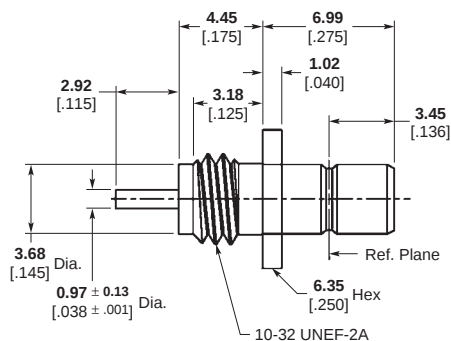


Part No.  
414969-2

| Type        | Center Contact Plating | Body Plating | Dielectric | Style    | Kit Part No.     |
|-------------|------------------------|--------------|------------|----------|------------------|
| Front Mount | Gold                   | Nickel       |            | MIL Type | <b>228216-1*</b> |
| Rear Mount  | Gold                   | Nickel       |            | MIL Type | <b>228215-1*</b> |

\*includes Jam Nut and Lockwasher

### SMB Receptacle Jack



| Type        | Center Contact Plating | Body Plating | Dielectric | Style    | Part No.        |
|-------------|------------------------|--------------|------------|----------|-----------------|
| Front Mount | Gold                   | Nickel       |            | MIL Type | <b>414895-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connectors, Mini 75 Ohm

### Product Facts

- Industry standard for miniature 75 ohm SMB
- SMB offers snap-fit coupling for quick connect/disconnect
- Suitable for high density applications
- Fast easy cable assembly
- Low VSWR
- Connectors offer consistent mating and unmating forces
- Straight plugs and jacks are completely crimp terminated
- Low cost

Mini 75 ohm SMB connectors are ideally suited for circuit miniaturization in communication, broadband and switching equipment as well as a variety of other applications.

They offer the same low consistent mating/unmating force as Tyco Electronics standard SMB products and therefore, outer contact resistance values are maintained from connector to connector.

Standard military, commercial or Tyco Electronics tooling can be used to terminate these products. Cost effective assembly of the straight plugs is completed with a crimp center contact and hex crimp on the outer braid. Right-angle plugs have a hex crimp on the outer braid ferrule and bifurcated solder center contacts.



### Electrical Characteristics

**Impedance** — 75 ohms

**Frequency Range** — 0 to 4.0 GHz

**Insulation Resistance** — 1000 megohms

**Contact Current Rating** — 1.5 amps DC max.

### Mechanical Characteristics

**Engagement Forces** — Initial—14.0 lbs. [62.3 N] maximum engagement.

After 500 matings, 14.0 lbs. [62.3 N] maximum engagement.

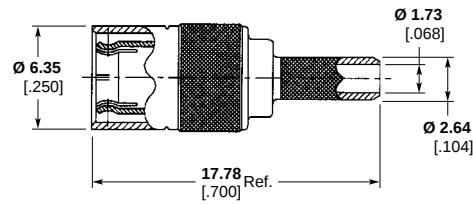
Durability—500 cycles

### Environmental Characteristics

**Temperature Rating** — -65°C to +165°C

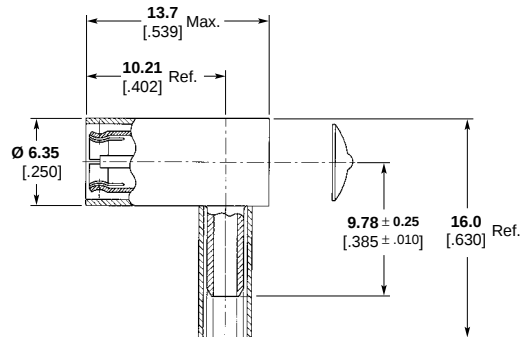
## SMB Connectors, Mini 75 Ohm (Continued)

### Straight Plug



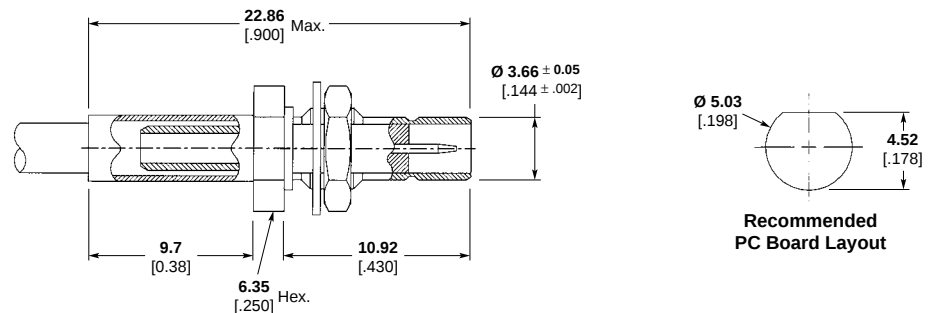
| RG Cable | Center Contact Plating | Outer Contact Plating | Body Plating | Part No.  |
|----------|------------------------|-----------------------|--------------|-----------|
| 179, 187 | Gold                   | Gold                  | Nickel       | 5415487-1 |
| 179, 187 | Gold                   | Nickel                | Nickel       | 5415487-2 |
| RD 179   | Gold                   | Nickel                | Nickel       | 5415487-3 |

### Right-Angle Plug



| RG Cable | Center Contact Plating | Outer Contact Plating | Body Plating | Part No.  |
|----------|------------------------|-----------------------|--------------|-----------|
| 179, 187 | Gold                   | Nickel                | Nickel       | 5415484-1 |
| 179, 187 | Gold                   | Gold                  | Nickel       | 5415484-2 |
| RD 179   | Gold                   | Gold                  | Nickel       | 5415484-3 |

### Bulkhead Jack

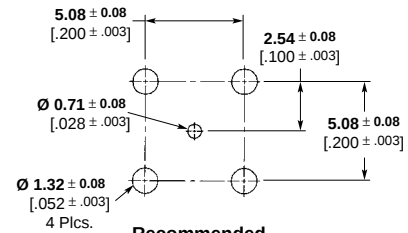
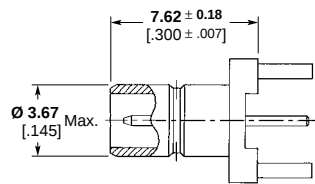


| RG Cable | Center Contact Plating | Body Plating | Part No. |
|----------|------------------------|--------------|----------|
| 179, 187 | Gold                   | Nickel       | 415500-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connectors, Mini 75 Ohm (Continued)

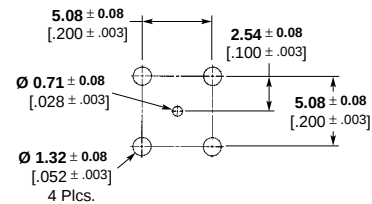
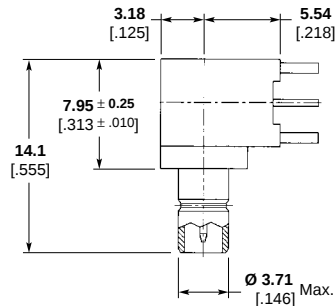
### Vertical PC Board Jacks



**Recommended  
PC Board Layout**

| Leg Length   | Center Contact Plating | Body Plating | Part No. |
|--------------|------------------------|--------------|----------|
| 2.11<br>.083 | Gold                   | Gold Flash   | 415504-2 |
| 3.05<br>.120 | Gold                   | Gold         | 415504-3 |
| 3.05<br>.120 | Gold                   | Gold Flash   | 415504-4 |

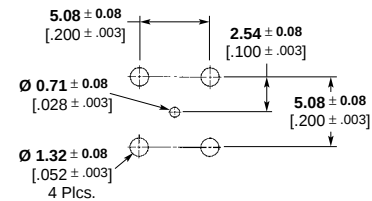
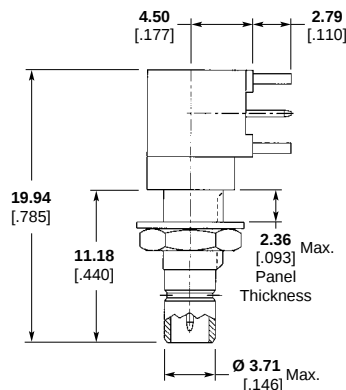
### Right-Angle PC Board Jacks



**Recommended  
PC Board Layout**

| Leg Length   | Center Contact Plating | Body Plating | Part No. |
|--------------|------------------------|--------------|----------|
| 2.79<br>.110 | Gold                   | Gold         | 415490-1 |
| 2.79<br>.110 | Gold                   | Nickel       | 415490-2 |
| 2.11<br>.083 | Gold                   | Gold         | 415490-3 |
| 2.11<br>.083 | Gold                   | Nickel       | 415490-4 |

### Right-Angle PC Board Bulkhead Jacks



**Recommended  
PC Board Layout**

| Leg Length   | Center Contact Plating | Body Plating | Part No.  |
|--------------|------------------------|--------------|-----------|
| 2.79<br>.110 | Gold                   | Nickel       | 415377-1  |
| 2.79<br>.110 | Gold                   | Gold         | 415377-2  |
| 2.79<br>.110 | Gold                   | Gold         | 415377-5* |

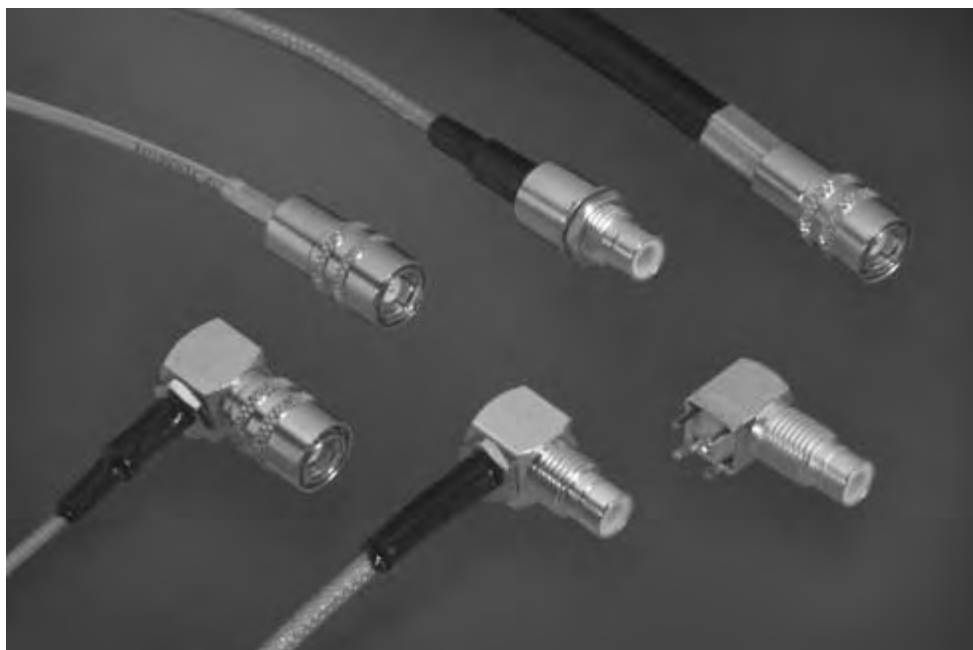
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

\*Isolated.

## SMB Connectors, 75 Ohm BT 43 (SMZ)

### Product Facts

- Widely used in data transmission and telecommunication applications
- BT 43 connector developed from the SMB range and feature snap-on and latching variant
- Most BT 43 connectors are available as fully crimped connectors.
- BT 43 and 75  $\Omega$  connectors available in solder and crimp versions



The Tyco Electronics range of 75 ohm SMB (SMZ) connectors are designed to meet the increasing demands of the Telecommunications market, and are designed in accordance with BS9210 F0022.

### Specifications

**Max working voltage (dc)** — 500 V

**Max proof voltage (dc)** — 1.5 kV

**Contact resistance (inner)** —  
5 milliohm

**Contact resistance (outer)** —  
1 milliohm

**Bodies and other parts** — Brass

### Female center contacts —

Copper Alloy

### Male center contacts —

Copper Alloy

**Outer contacts** — BeCu

### Plating —

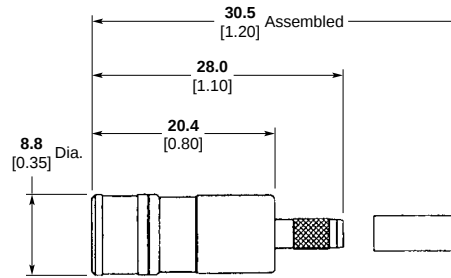
Contacts and critical surfaces — Gold

Other parts — Nickel

**Insulators** — P.T.F.E.

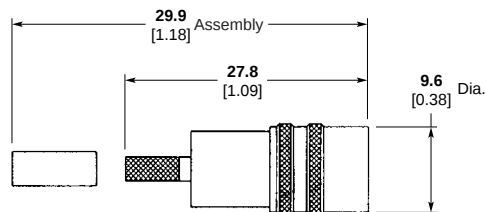
## SMB Connectors, 75 Ohm BT 43 (SMZ) (Continued)

### Straight Plugs, Snap-On



| Cable Type | Termination Method |       | Body Plating   | Part No.         |
|------------|--------------------|-------|----------------|------------------|
|            | Inner              | Outer |                |                  |
| RG 179B/U  | Crimp              | Crimp | Selective Gold | <b>1311097-1</b> |
| BT2002     | Crimp              | Crimp | Selective Gold | <b>1311098-1</b> |

### Straight Plugs, Latching, Crimp/Crimp

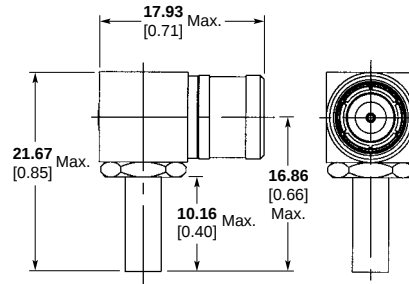


| Cable Type                   | Body Plating   | Part No          |
|------------------------------|----------------|------------------|
| RG 179B/U                    | Selective Gold | <b>1311099-1</b> |
| BT2003                       | Selective Gold | <b>1311100-1</b> |
| BT2002                       | Selective Gold | <b>1311101-1</b> |
| BT2001                       | Selective Gold | <b>1311696-1</b> |
| BT3002, TZC75024             | Selective Gold | <b>1311102-1</b> |
| RG 59B/U,<br>RG 140/U, URM90 | Selective Gold | <b>1313507-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

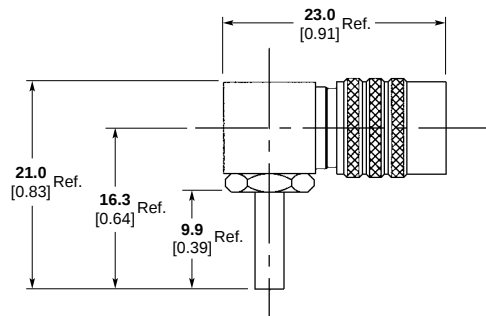
## SMB Connectors, 75 Ohm BT 43 (SMZ) (Continued)

### Right-Angle Socket, Snap-On, Solder/Crimp



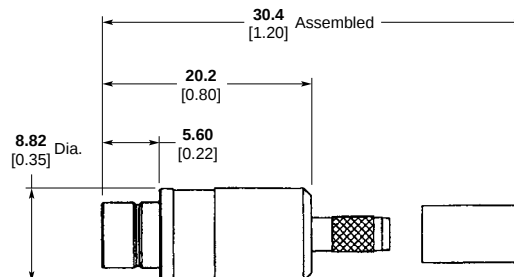
| Cable Type       | Body Plating   | Part No          |
|------------------|----------------|------------------|
| RG 179B/U        | Selective Gold | <b>1311103-1</b> |
| BT3002, TZC75024 | Selective Gold | <b>1311104-1</b> |

### Right-Angle Socket, Latching, Solder/Crimp



| Cable Type         | Body Plating   | Part No          |
|--------------------|----------------|------------------|
| RG 179B/U          | Selective Gold | <b>1311106-1</b> |
| BT2003             | Selective Gold | <b>1311698-1</b> |
| BT3002, TZC75024   | Selective Gold | <b>1311111-1</b> |
| RG 59B/U, RG 140/U | Selective Gold | <b>1313508-1</b> |

### Straight Free Plug, Crimp/Crimp

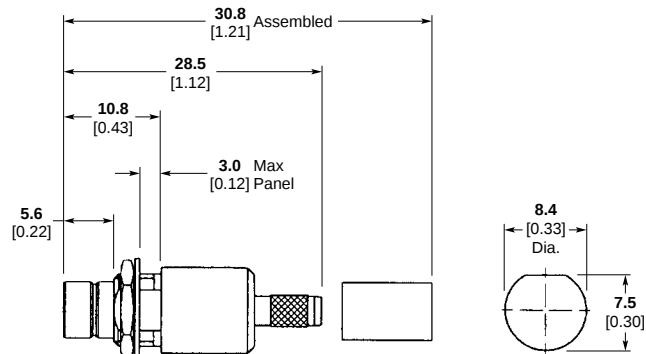


| Cable Type | Body Plating   | Part No          |
|------------|----------------|------------------|
| RG 179B/U  | Selective Gold | <b>1408041-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

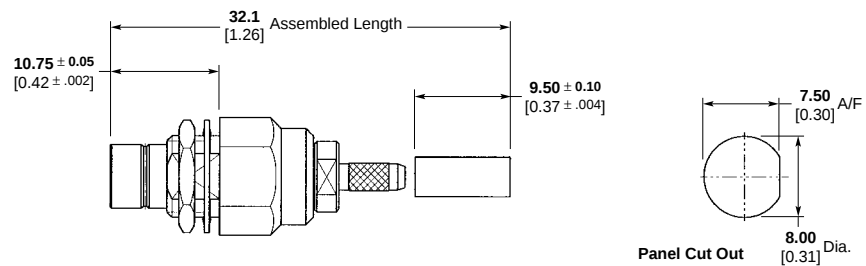
## SMB Connectors, 75 Ohm BT 43 (SMZ) (Continued)

### Straight Bulkhead Plug



Mounting Detail

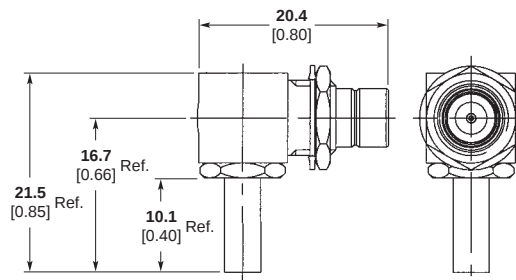
| Cable Type              | Termination Method |       | Body Plating   | Part No.  |
|-------------------------|--------------------|-------|----------------|-----------|
|                         | Inner              | Outer |                |           |
| RG 179B/U               | Crimp              | Crimp | Selective Gold | 1311120-1 |
| BT500B, BT2003, BT2003A | Crimp              | Crimp | Selective Gold | 1311701-1 |
| BT3002, TZC75024        | Crimp              | Crimp | Selective Gold | 1311122-1 |



Panel Cut Out

| Cable Type                       | Termination Method |       | Body Plating   | Part No.  |
|----------------------------------|--------------------|-------|----------------|-----------|
|                                  | Inner              | Outer |                |           |
| 3M: 043, 031C, CS4456, Gore: GCX | Crimp              | Crimp | Selective Gold | 1313511-1 |

### Right-Angle Bulkhead Plug, Solder/Crimp

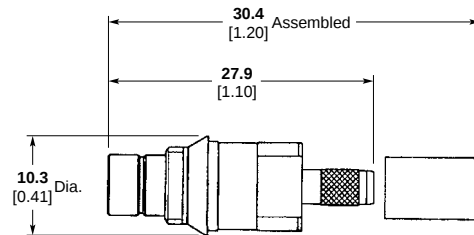


| Cable Type | Body Plating   | Part No   |
|------------|----------------|-----------|
| RG 179B/U  | Selective Gold | 1311115-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

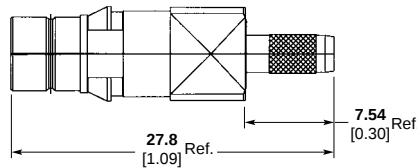
## SMB Connectors, 75 Ohm BT 43 (SMZ) (Continued)

### DDF Plug, Crimp/Crimp



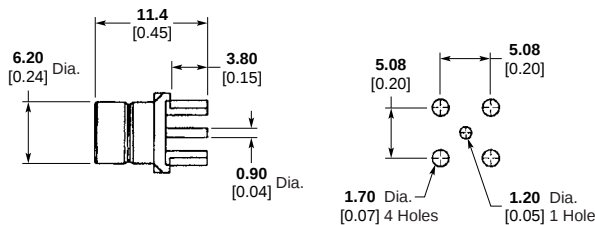
| Cable Type                | Body Plating   | Part No          |
|---------------------------|----------------|------------------|
| RG 179B/U                 | Selective Gold | <b>1327083-1</b> |
| BT2003                    | Selective Gold | <b>1311117-1</b> |
| BT2002                    | Selective Gold | <b>1311700-1</b> |
| B2001                     | Selective Gold | <b>1313883-1</b> |
| BT3002, TZC75024          | Selective Gold | <b>1311118-1</b> |
| RG 59B/U, RG 140/U, URM90 | Selective Gold | <b>1313887-1</b> |

### DDF Plug, Crimp/Crimp



| Cable Type                                                           | Body Plating   | Part No          |
|----------------------------------------------------------------------|----------------|------------------|
| RD179, 124431 (Filotex), 1366 (Orebro), K02253D-1, K02253-2 (Shuner) | Selective Gold | <b>1314422-1</b> |

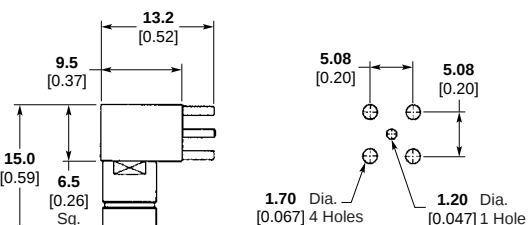
### PC Board Plug 43/1D



Mounting Detail

| Body Plating   | Part No.         |
|----------------|------------------|
| Selective Gold | <b>1311125-1</b> |

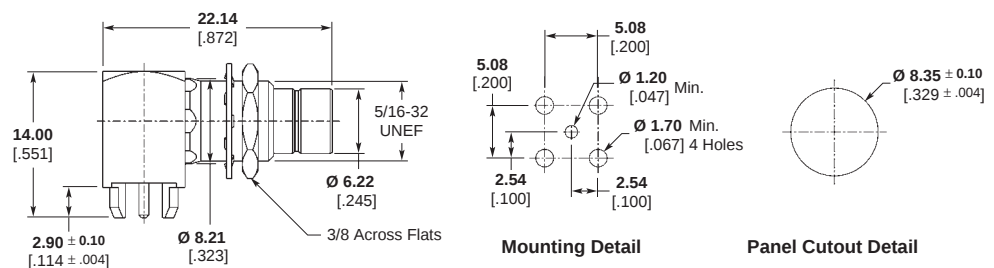
### PC Board Plug 43/1E



Mounting Detail

| Body Plating   | Part No.         |
|----------------|------------------|
| Selective Gold | <b>1314103-1</b> |

### Right-Angle PC Board Plug



Mounting Detail

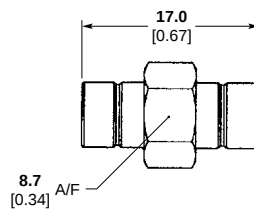
Panel Cutout Detail

Part No. 1314102-1

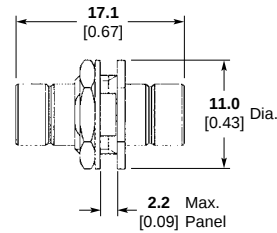
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connectors, 75 Ohm BT 43 (SMZ) (Continued)

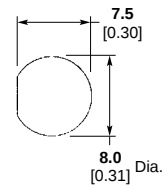
### Straight Adapter Plug-Plug



Part No. 1313364-1



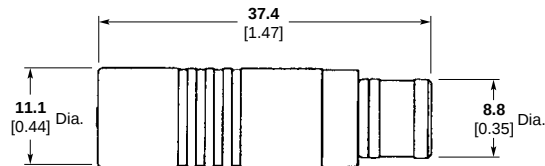
Part No. 1311127-1



Mounting Detail

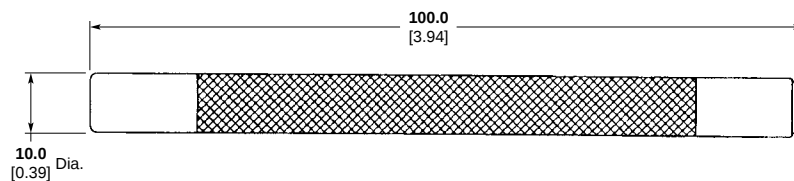
| Body Plating   | Part No.  |
|----------------|-----------|
| Selective Gold | 1313364-1 |
| Selective Gold | 1311127-1 |

### Tester 430A



| Body Plating      | Part No.    |
|-------------------|-------------|
| Selective Plating | 6-1311703-1 |

### Extraction Tool 65A



| Part No.    |
|-------------|
| 1311164-1 □ |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMB Connector Crimp Tooling

### 50 Ω/75 Ω

| RG/U Cable                                  | Commercial Connector Tooling                           |                                           |          |                                                        |          |                                              | MIL Type Connector Tooling   |                            |                   |                                                        |          |                   |                      |
|---------------------------------------------|--------------------------------------------------------|-------------------------------------------|----------|--------------------------------------------------------|----------|----------------------------------------------|------------------------------|----------------------------|-------------------|--------------------------------------------------------|----------|-------------------|----------------------|
|                                             | Center Contact Crimp Tooling                           |                                           |          | Braid Crimp Tooling                                    |          |                                              | Center Contact Crimp Tooling |                            |                   | Braid Crimp Tooling                                    |          |                   |                      |
|                                             | Dies for Tyco Electronics PRO-CRIMPER Hand Tool Number | MIL-C-22520/2-01 Tool DANIELS* Positioner | Position | Dies for Tyco Electronics PRO-CRIMPER Hand Tool Number | Position | MIL-C-22520/5-01 Tool DANIELS* Hex Crimp Die | DANIELS* Hand Tool           | DANIELS* Positioner Number | Selector Position | Dies for Tyco Electronics PRO-CRIMPER Hand Tool Number | Position | DANIELS Hand Tool | Hex Die Across Flats |
|                                             |                                                        |                                           |          |                                                        |          |                                              |                              |                            |                   |                                                        |          |                   |                      |
| 178, 178A, 178B, 196, 196A                  | 58489-1                                                | Female-K699 Male-K727                     | 4        | 58489-1                                                | A&B      | Y624                                         | AFM8                         | Female-K699 Male-K727      | 4                 | 58483-1                                                | A        | HX4-1637          | 2.67 .105            |
| Double Braid 178, 196                       | —                                                      | —                                         | —        | —                                                      | —        | —                                            | AFM8                         | Female-K699 Male-K727      | 4                 | 58483-1                                                | B        | HX4-1637          | 3.25 .128            |
| 174, 316 188, 188A                          | 58489-1                                                | Female-K699 Male-K727                     | 4        | 58489-1                                                | A        | Y444                                         | AFM8                         | Female-K699 Male-K727      | 4                 | 58483-1                                                | B        | HX4-1637          | 3.25 .128            |
| Double Braid 174, 316, 188                  | 58489-1                                                | Female-K699                               | 4        | 58489-1                                                | C        | Y196 Location A                              | AFM8                         | Female-K699                | 4                 | 58483-1                                                | C        | HX4-1637          | 3.84 .151            |
| Double Braid 174, 316, 188                  | 58489-1                                                | Male-K727                                 | 4        | 58489-1                                                | C        | Y196 Location A                              | AFM8                         | Solder                     | —                 | 58483-1                                                | B        | HX4-1637          | 3.25 .128            |
| 179, 179A 179B, 161, 187, 187A, BELDEN 9221 | 58489-1                                                | Female-K699                               | 4        | 58489-1                                                | A        | Y444                                         | AFM8                         | Female-K699                | 4                 | 58483-1                                                | B        | HX4-1637          | 3.25 .128            |
| 179, 179A 179B, 161, 187, 187A, BELDEN 9221 | 58489-1                                                | Male-K727                                 | 4        | 58489-1                                                | A        | Y444                                         | —                            | Solder                     | —                 | 58483-1                                                | B        | HX4-1637          | 3.25 .128            |
| 180, 180A 180B                              | —                                                      | —                                         | —        | —                                                      | —        | —                                            | —                            | Solder                     | —                 | 58483-1                                                | C        | HX4-1637          | 3.84 .151            |
| <b>Mini SMB 75 ohm</b>                      |                                                        |                                           |          |                                                        |          |                                              |                              |                            |                   |                                                        |          |                   |                      |
| 179, 187                                    | —                                                      | Female-K699                               | —        | 58483-1                                                | B        | HX4-1637                                     | —                            | —                          | —                 | —                                                      | —        | —                 | —                    |
| 179, 187                                    | —                                                      | Solder Center Contact                     | —        | 58483-1                                                | B        | HX4-1637                                     | —                            | —                          | —                 | —                                                      | —        | —                 | —                    |

**Note:** All 75 ohm SMB connectors have a solder center contact.

\* DANIELS Manufacturing Corporation Telephone: 407-855-6161  
6103 Anno Avenue FAX: 407-855-6884  
Orlando, Florida 32809

**Note:** Equivalent military tool part numbers—  
M22520/5-01 – DANIELS Hand Tool HX4  
M22520/5-33 – DANIELS Die Set Y136

M22520/5-37 – DANIELS Die Set Y138  
M22520/5-41 – DANIELS Die Set Y140  
M22520/5-03 – DANIELS Die Set Y196  
M22520/2-01 – DANIELS Hand Tool AFM8

BELDEN is a trademark of Belden Wire and Cable Company.

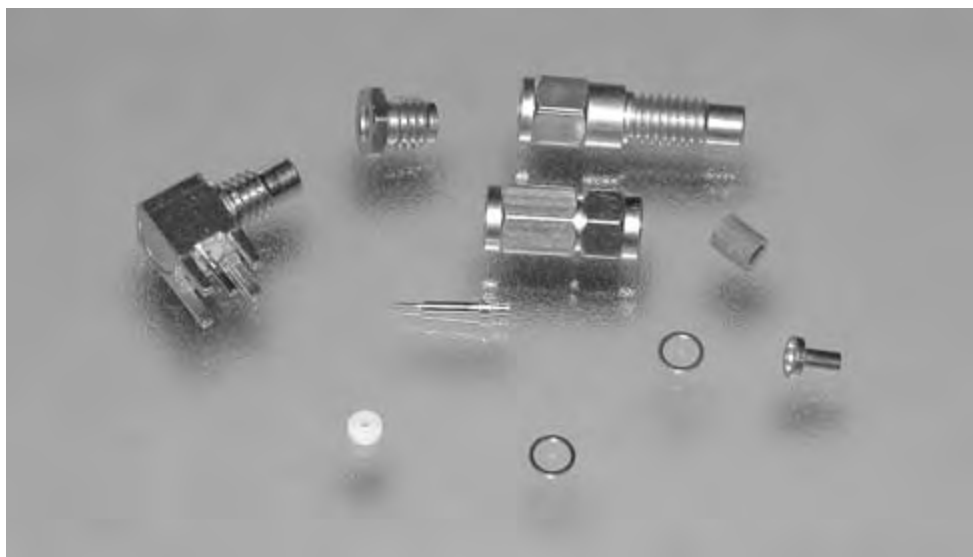
DANIELS is a trademark of Daniels Manufacturing Corporation.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMC Connectors

### Product Facts

- Three-piece designs
- Fast, clean cable assembly
- Connector bodies preassembled
- Solderless termination —no danger of heat damage
- Center conductor and braid terminated with same tool
- Low noise level
- Miniature screw-on coupling
- ✓  dielectric



The SMC Connector is miniature and light-weight, especially designed for use in critical applications where limited space and vibration are of major concern.

This connector is designed in accordance with the requirements of Specification MIL-C-39012, Class II, Category B to assure the highest standards of electrical and mechanical performance. It has a constant impedance of 50 ohms, a voltage rating of 350 volts and provides excellent operation at frequencies up to 10 GHz. It also has a threaded coupling and can be used with a wide range of miniature coaxial cable sizes including RG 174, 197, 187, 188 and 316.

### Materials

**Brass** — QQ-B-626  
**Beryllium Copper** — QQ-C-530  
**Copper** — QQ-C-576  
 3 7 ) ( **Insulation** — MIL-P-19468

### Plating

**Gold** — MIL-G-45204

### Electrical Characteristics

**Nominal Impedance** — 50 ohms  
**Working Voltage** — 335 volts rms  
**Frequency Range** — 0 to 10 GHz  
**Insulation Resistance** — 1000 megohms min.

### Contact Resistance —

Outer Contact — 1 milliohms  
 Center Contact —  
     Straight Connectors — 6 milliohms  
     Right-Angle Connectors —  
     12 milliohms

**Dielectric Withstanding Voltage** —  
 1000 volts rms

**RF Leakage** — -60 dB min., between  
 2 and 3 GHz

### RF Insertion Loss —

Straight Connectors — 0.25 dB max.  
 at 4 GHz  
 Right-Angle Connectors — 0.50 dB  
 max. at 4 GHz

**Corona Level** — 250 volts min. at  
 70,000 ft [21 336 m]

### Mechanical Characteristics

**Mating/Unmating** — 10-32 threaded  
 coupling

**Cable Attachment** — Crimp type,  
 both center contact and braid

**Coupling Nut Retention** —  
 35 lb [156 N] min.

**Cable Retention** — 20 lb [89 N] min.,  
 GR-174 cable

**Durability** — 500 cycles per  
 MIL-C-39012

### Environmental Characteristics

**Temperature Range** —  
 -65°C to +85°C

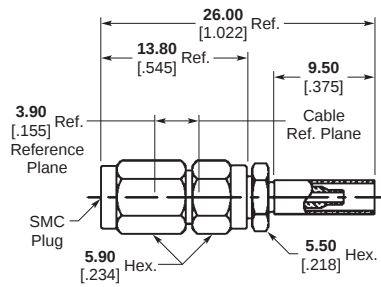
**Vibration** — MIL-STD-1344, Method  
 2005, Condition IV

**Salt Spray** — MIL-STD-1344, Method  
 1001, Condition B

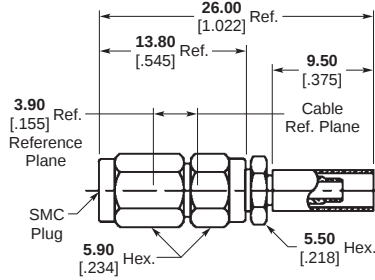
**Temperature Cycling** —  
 MIL-STD-1344, Method 1003,  
 Condition A (except low temperature  
 is -65°C)

## SMC Connectors (Continued)

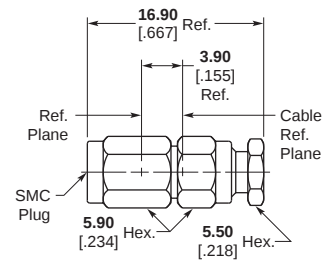
### Straight Plugs



**Part No. 1060220-1**  
**Crimp**



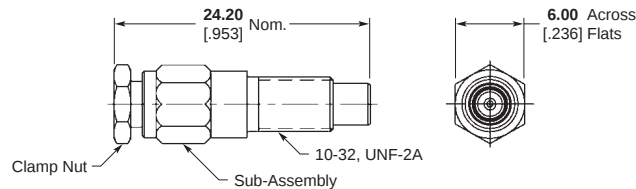
**Part No. 1060221-1**  
**Crimp**



**Part No. 1060163-1**  
**Clamp**

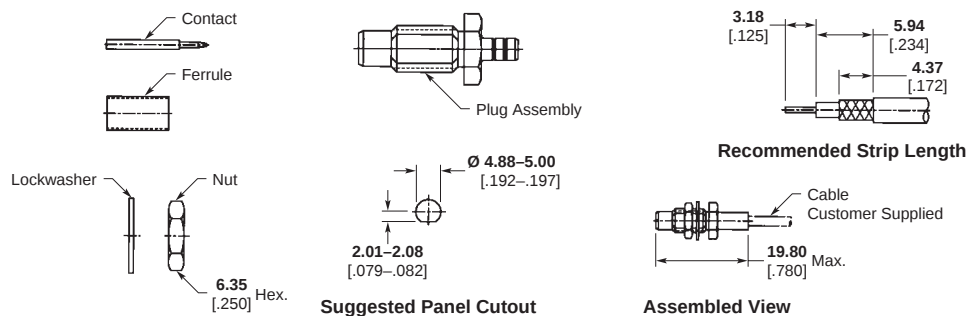
| Cable Attachment | RG/U Cable                   | Part No.         |
|------------------|------------------------------|------------------|
| Crimp            | 178, 178A, 178B<br>196, 196A | <b>1060220-1</b> |
| Crimp            | 174, 316<br>188, 188A        | <b>1060221-1</b> |
| Clamp            | 174, 316<br>188, 188A        | <b>1060163-1</b> |

### Straight Jacks



| Cable Attachment | RG/U Cable            | Part No.         |
|------------------|-----------------------|------------------|
| Clamp            | 174, 316<br>188, 188A | <b>1311638-1</b> |

### Bulkhead Feedthrough Cable Jacks

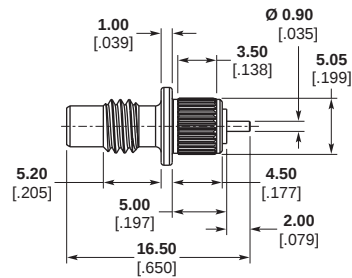


| Cable Attachment | RG/U Cable            | Part No.       |
|------------------|-----------------------|----------------|
| Crimp            | 174, 316<br>188, 188A | <b>51751-1</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

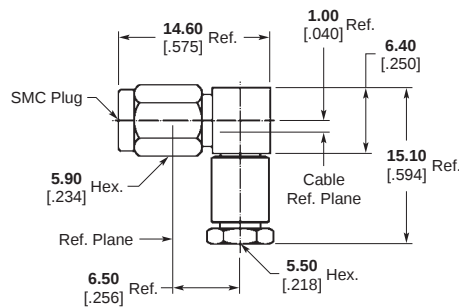
## SMC Connectors (Continued)

### Press-In Panel Jacks, Straight Terminal



Part No. 1460470-1

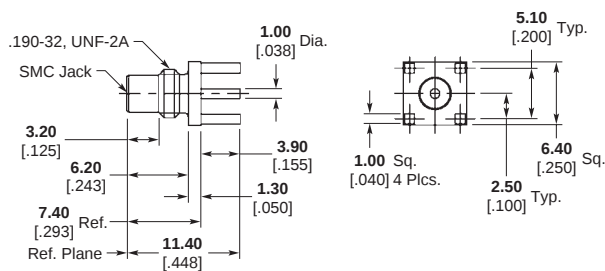
### Right-Angle Cable Plug



| Cable Attachment | RG/U Cable            | Part No.  |
|------------------|-----------------------|-----------|
| Clamp            | 174, 316<br>188, 188A | 1060183-1 |

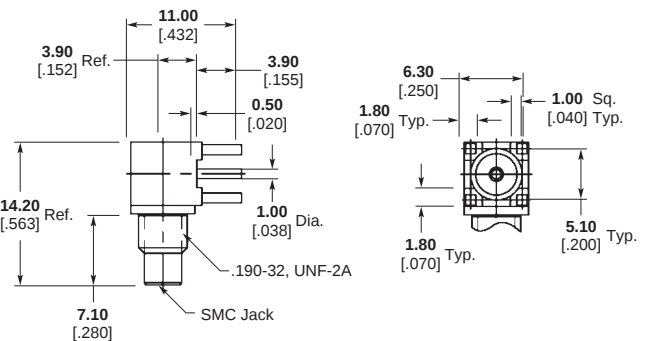
### PC Board Jack Receptacles

#### Straight

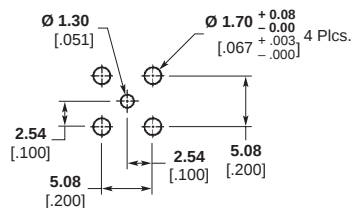


Part No. 1060256-1

#### Right-Angle



Part No. 1060259-1



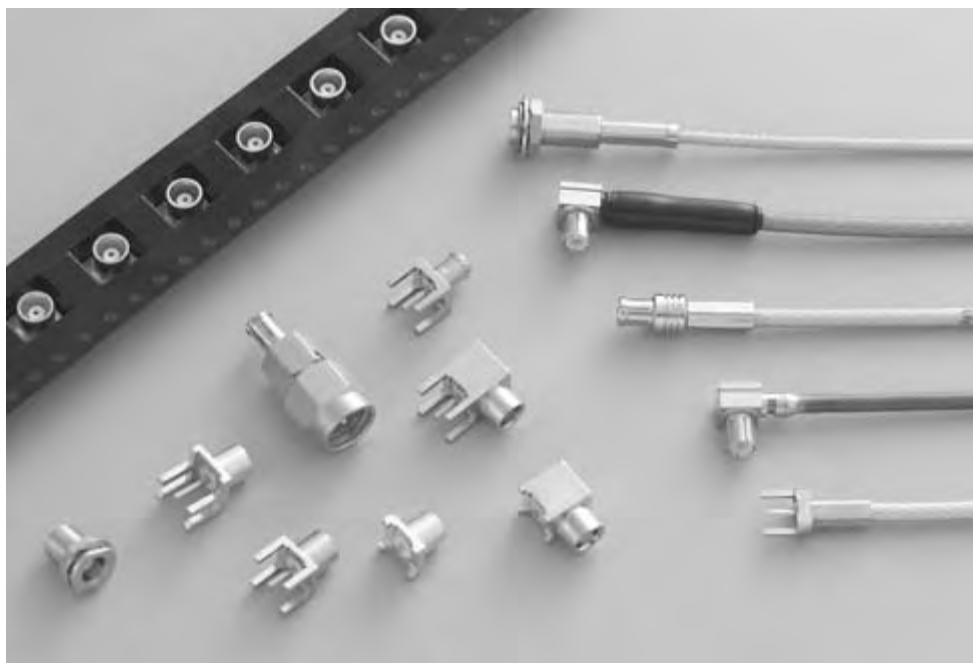
Recommended PC Board Layout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## MCX Connectors

### Product Facts

- Snap-on interface facilitates assembly
- Conforms to CECC interface specifications for MCX
- 30% smaller than SMB connectors
- Surface mount tape and reel for high volume
- 50 and 75 ohm versions available



### Between Series Adapters

For MCX Between Series Adapters, see pages 251-260.

Tyco Electronics MCX microminiature snap-on connectors offer an excellent blend of size, durability and performance for emerging applications in GPS, automotive and wireless communications. MCX connectors are 30% smaller than traditional snap-on SMB connectors, offering greater packaging density and weight reduction. MCX connectors are mechanically robust with beryllium copper spring fingers rated at a minimum of 500 mating cycles. The snap-on interface facilitates assembly, eliminating the need for a threaded connection, and

ensuring full engagement. The forces to engage and disengage have been optimized to ensure ease of mating as well as to prevent damage to PCB solder connections. MCX connectors are designed for broad band performance, DC-6 GHz, and can be utilized for future system upgrades without concerns for performance degradation. Tyco Electronics MCX connectors are fully mateable with standard MCX connectors and conform to the CECC interface specifications.

MCX connectors are available in a broad range of

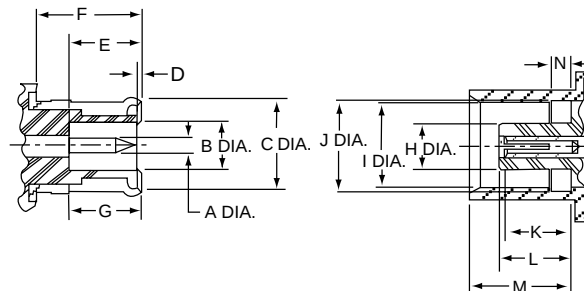
standard configurations for commercial applications. Tape and reel packaging for MCX surface mount straight and right-angle PCB receptacles is available to facilitate high volume pick and place manufacturing. MCX surface mount connectors are designed to withstand infrared reflow, convection and vapor phase soldering and provide a .254 [.010] standoff for optimal board cleaning. MCX plug and jack PCB receptacles also offer a direct board to board solution providing a nominal 7.11 [0.28] separation.

## MCX Connectors (Continued)

### Specifications

| General                         |        |                  | CECC 22220 PARA                                                                                                                          |
|---------------------------------|--------|------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Materials                       | —      |                  | Brass alloys UNS C36000 (ASTM-B16) or C38500 per QQ-B626, Beryllium copper per ASTM B-196, PTFE fluorocarbon per ASTM-D-1710             |
| Finish                          | —      | Center Contacts: | Gold plated (ASTM-B488) over nickel plate (QQ-N-290)                                                                                     |
|                                 | —      | Outer Contacts:  | Gold plated (ASTM-B488) over nickel plate (OO-N-290)                                                                                     |
|                                 | —      | Housings:        | Nickel plated (QQ-N-290), tin (ASTM-B488) or Gold plated (ASTM-B488)                                                                     |
|                                 | —      |                  | All other metal parts shall be furnished so as to provide a connector which meets corrosion requirements of CECC 22220 PARA 4.6.10       |
| Design                          | —      |                  | The design shall be such that the outline and interface dimensions shown in this catalog and the requirements of CECC 22220 PARA are met |
| Electrical                      |        |                  | CECC 22220 PARA (General requirements performance may vary by cable)                                                                     |
| Frequency                       | —      |                  | dc - 6 GHz                                                                                                                               |
| Nominal Impedance               | —      |                  | 50 ohms                                                                                                                                  |
| Voltage Rating                  | —      |                  | 335 Volts (VRMS Maximum) @ Sea Level                                                                                                     |
| VSWR                            | 4.4.1  |                  | 1.25:1 Maximum @ 4 GHz                                                                                                                   |
|                                 | —      |                  | 1.35:1 Maximum @ 6 GHz                                                                                                                   |
| Insulation Resistance           | 4.4.4  |                  | 10,000 Megohms Minimum                                                                                                                   |
| Insertion Loss                  | —      |                  | .1dB Maximum/1000 MHz                                                                                                                    |
| Dielectric Withstanding Voltage | 4.4.5  |                  | 1000 Volts (VRMS Minimum) @ Sea Level                                                                                                    |
| Contact Resistance              |        |                  |                                                                                                                                          |
| Center Contact                  | 4.4.2  |                  | 5.0 Milliohms Maximum                                                                                                                    |
| Outer Contact                   | 4.4.3  |                  | 1.0 Milliohms Maximum                                                                                                                    |
| Corona 70,000 ft.               | —      |                  | 250 Volts (VRMS Minimum) @ MHz                                                                                                           |
| RF High Potential @ Sea Level   | —      |                  | 670 Volts (VRMS Minimum) @ MHz                                                                                                           |
| Contact Current                 | —      |                  | 1.5 ADC Max                                                                                                                              |
| Mechanical                      |        |                  | CECC 22220 PARA                                                                                                                          |
| Force to Engage                 | 4.5.4  |                  | 15.5 N [3.4 lbs.] Maximum                                                                                                                |
| Force to Disengage              | —      |                  | 8 – 20 N [1.8 – 4.5 lbs.]                                                                                                                |
| Contact Captivation             | 4.5.2  |                  | Designed to maintain MCX interface when mating 10 N [2.2 lbs.] axial                                                                     |
| Connector Durability            | 4.7.1  |                  | 500 insertion and withdrawal cycles                                                                                                      |
| Environmental                   |        |                  | CECC 22220 PARA                                                                                                                          |
| Temperature Rating              | —      |                  | –65°C + 165°C                                                                                                                            |
| Vibration                       | 4.6.3  |                  | See CECC 22220                                                                                                                           |
| Moisture Resistance             | 4.6.4  |                  | See CECC 22220                                                                                                                           |
| Corrosion                       | 4.6.10 |                  | See CECC 22220                                                                                                                           |
| Thermal Shock                   | 4.6.7  |                  | See CECC 22220                                                                                                                           |

Meets or exceeds requirements of CECC 22220. Tyco Electronics has design control and all data contained herein is subject to change without notice. Contact Tyco Electronics for specifications on other connector types.



Plug

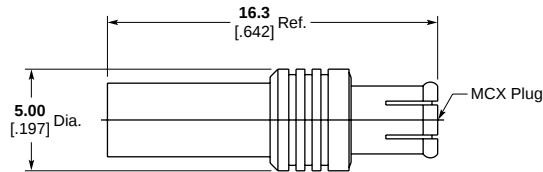
| Letter | Minimum      | Maximum      |
|--------|--------------|--------------|
| A      | 0.48 [.0189] | 0.53 [.0208] |
| B      | 2.00 [.0788] | —            |
| C      | —            | 3.8 [.148]   |
| D      | 0.00 [.000]  | 0.30 [.0118] |
| E      | 2.80 [.111]  | 3.20 [.125]  |
| F      | 4.15 [.164]  | —            |
| G      | 2.80 [.111]  | —            |

Jack

| Letter | Minimum      | Maximum      |
|--------|--------------|--------------|
| H      | —            | 1.98 [.077]  |
| I      | 3.42 [.135]  | 3.48 [.137]  |
| J      | 3.60 [.142]  | 3.75 [.147]  |
| K      | 2.30 [.091]  | 2.80 [.110]  |
| L      | 2.60 [.103]  | 2.80 [.110]  |
| M      | 4.00 [.158]  | 4.12 [.162]  |
| N      | 0.75 [.0296] | 0.85 [.0334] |

## MCX Connectors (Continued)

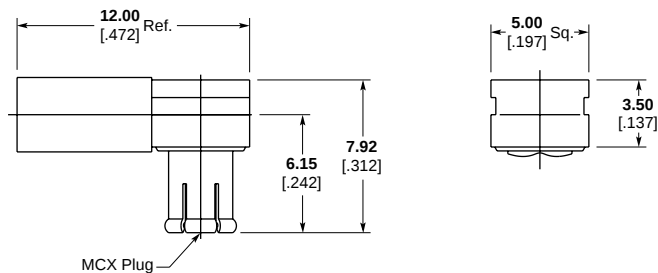
### Straight Cable Plug, Crimp



| Cable                  | Plating | Part No.         |
|------------------------|---------|------------------|
| RG 178/U, 196/U        | Nickel  | <b>1060869-1</b> |
| RG 174/U, 188/U, 316/U | Nickel  | <b>1060872-1</b> |
|                        | Gold    | <b>1060871-1</b> |
| RD-316                 | Nickel  | <b>1060875-1</b> |
|                        | Gold    | <b>1060875-2</b> |

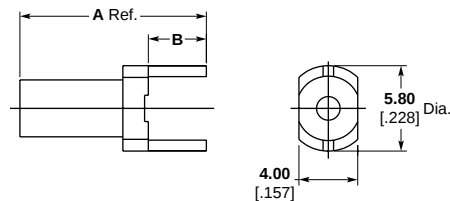
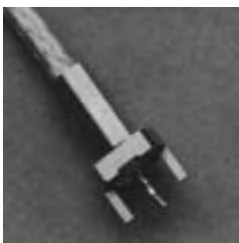
**Note:** For full crimp attachment consult Tyco Electronics at the numbers listed below.

### Right-Angle Cable Plug, Crimp



| Cable                                 | Plating | Part No.         |
|---------------------------------------|---------|------------------|
| RG 178/U, 196/U                       | Nickel  | <b>1329293-1</b> |
| RG 188/U, 316/U<br>RG 179/U, RG 187/U | Nickel  | <b>1330723-1</b> |
| RD-316                                | Nickel  | <b>1363301-1</b> |
|                                       | Gold    | <b>1363301-2</b> |

### Straight Cable Terminal, PC Board, Without Center Contact

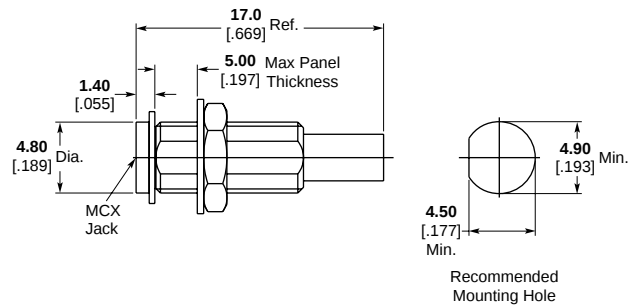


| Cable                     | Dim. A               | Dim. B              | Plating | Part No.         |
|---------------------------|----------------------|---------------------|---------|------------------|
| RG 174/U,<br>188/U, 316/U | <b>11.76</b><br>.463 | <b>3.94</b><br>.155 | Nickel  | <b>1060811-1</b> |
|                           | <b>10.74</b><br>.423 | <b>2.92</b><br>.115 | Gold    | <b>1060811-2</b> |
|                           |                      |                     | Gold    | <b>1060813-2</b> |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

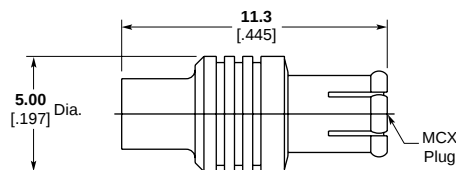
## MCX Connectors (Continued)

### Bulkhead Cable Jack



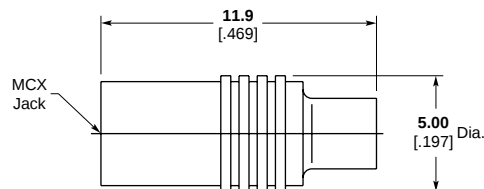
| Cable              | Plating | Part No.  |
|--------------------|---------|-----------|
| RG 188/U, RG 316/U | Nickel  | 1060883-1 |

### Straight Cable Plug, Direct Solder Attachment For Semi-Rigid Cable



| Cable           | Plating | Part No.  |
|-----------------|---------|-----------|
| RG 405/U [.085] | Gold    | 1060772-1 |
| .047            | Gold    | 1060772-2 |

### Straight Cable Jack, Direct Solder Attachment For Semi-Rigid Cable

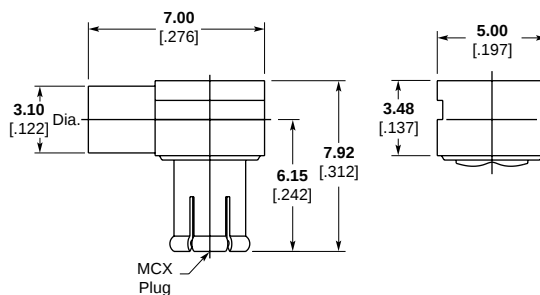


| Cable           | Plating | Part No.  |
|-----------------|---------|-----------|
| RG 405/U [.085] | Gold    | 1060774-1 |
| .047            | Gold    | 1060774-2 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

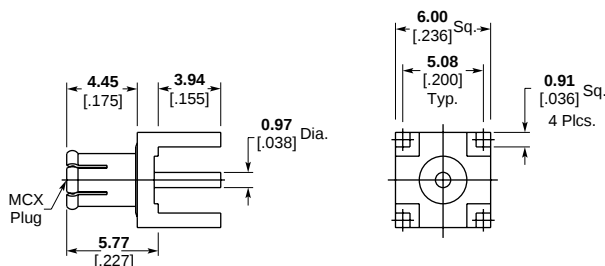
## MCX Connectors (Continued)

### Right-Angle Plug Receptacle, Direct Solder Attachment For Semi-Rigid Cable



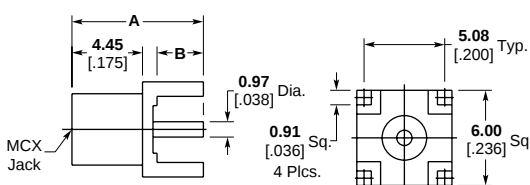
| Cable    | Plating | Part No.  |
|----------|---------|-----------|
| RG 405/U | Gold    | 1060787-1 |

### Vertical Plug Receptacle, PC Board



| Plating | Part No.  |
|---------|-----------|
| Nickel  | 1061015-1 |
| Gold    | 1085221-1 |

### Vertical Jack Receptacle, PC Board

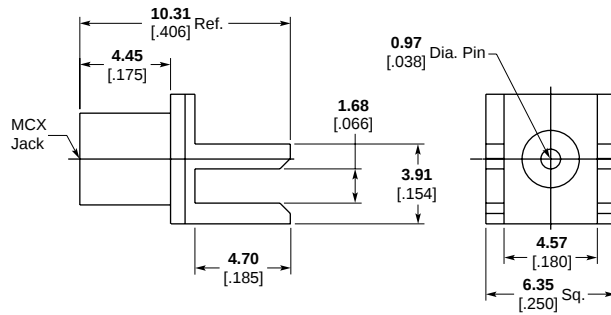


| Dim. A       | Dim. B       | Plating | Part No.  |
|--------------|--------------|---------|-----------|
| 8.28<br>.326 | 2.92<br>.115 | Nickel  | 1060985-1 |
|              |              | Gold    | 1060984-1 |
| 9.30<br>.366 | 3.94<br>.155 | Nickel  | 1060989-1 |
|              |              | Gold    | 1330126-1 |
| 7.09<br>.279 | 1.73<br>.068 | Nickel  | 1060996-1 |
|              |              | Gold    | 1060995-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

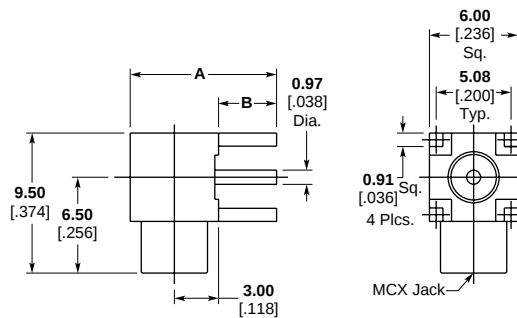
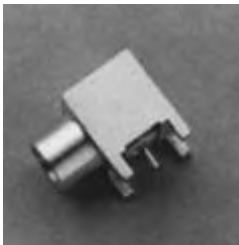
## MCX Connectors (Continued)

### Vertical End Launch, PC Board



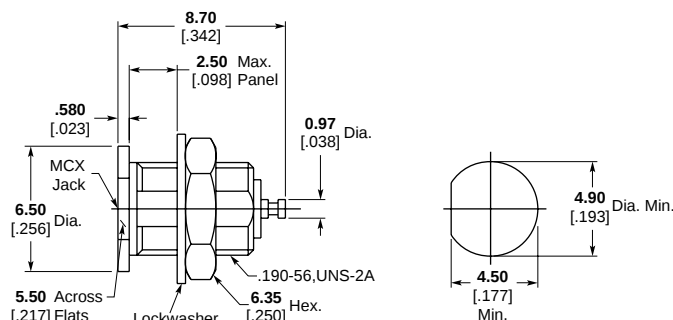
| Plating | Part No.  |
|---------|-----------|
| Tin     | 1061007-1 |

### Right-Angle Jack Receptacle, PC Board



| Dim. A      | Dim. B       | Plating | Part No.  |
|-------------|--------------|---------|-----------|
| 9.93 [3.91] | 3.94 [1.55]  | Nickel  | 1061023-1 |
|             |              | Gold    | 1061022-1 |
| 7.72 [3.04] | 1.73 [0.068] | Nickel  | 1061027-1 |
|             |              | Gold    | 1061026-1 |
| 8.92 [3.51] | 2.92 [1.15]  | Nickel  | 1061030-1 |
|             |              | Gold    | 1061029-1 |

### Jack Receptacle, Bulkhead Feedthrough



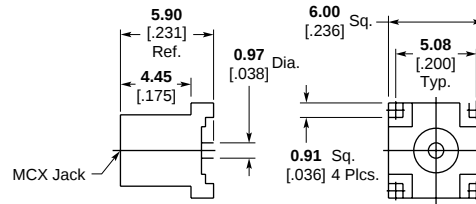
#### Recommended Mounting Hole

| Plating | Part No.  |
|---------|-----------|
| Nickel  | 1060960-1 |
| Gold    | 1060959-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## MCX Connectors (Continued)

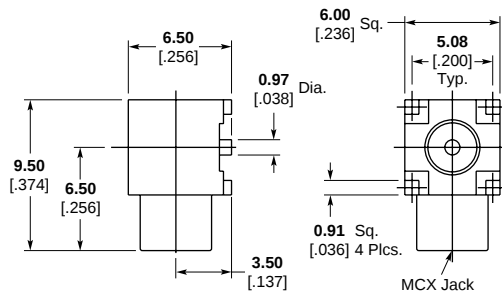
### Vertical Jack Receptacle, Surface Mount



| Plating | Part No.                     |
|---------|------------------------------|
| Tin     | <b>6061002-1</b>             |
|         | <b>6061092-1<sup>1</sup></b> |

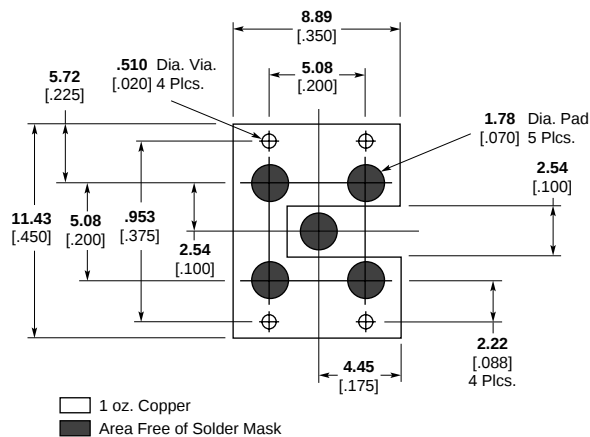
<sup>1</sup>Tape and Reel packaging. 900 connectors per reel (carrier width 16mm, carrier pitch 12mm).

### Right-Angle Jack Receptacle, Surface Mount



| Plating | Part No.                     |
|---------|------------------------------|
| Tin     | <b>6061035-1</b>             |
| Tin     | <b>6061094-1<sup>1</sup></b> |

<sup>1</sup>Tape and reel packaging. 750 connectors per reel (carrier width 24mm carrier pitch 12mm).



Recommended Mounting Pattern for Microstrip Line

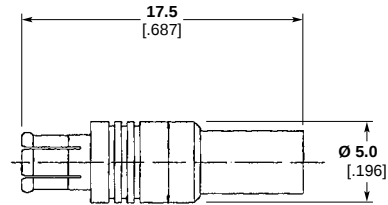
#### Notes:

1. Printed circuit board material: glass epoxy FR-4 or similar; relative permittivity: 4.8, 1 oz. copper clad both sides.
2. These dimensions valid for 1.58 [.062] board thickness.
3. Decimal inch equivalents are shown in parentheses for general information only.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

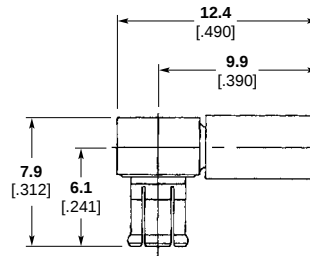
## MCX Connectors (Continued)

### Straight Cable Plug, Crimp, 75 Ohm



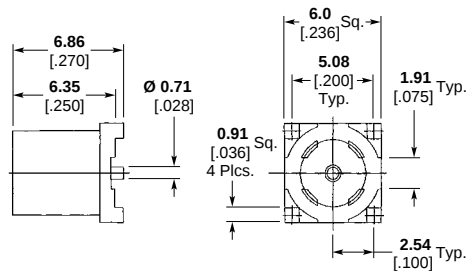
| Cable    | Plating | Part No.  |
|----------|---------|-----------|
| RG 179/U | Nickel  | 1362990-1 |

### Right-Angle Cable Plug, Crimp, 75 Ohm



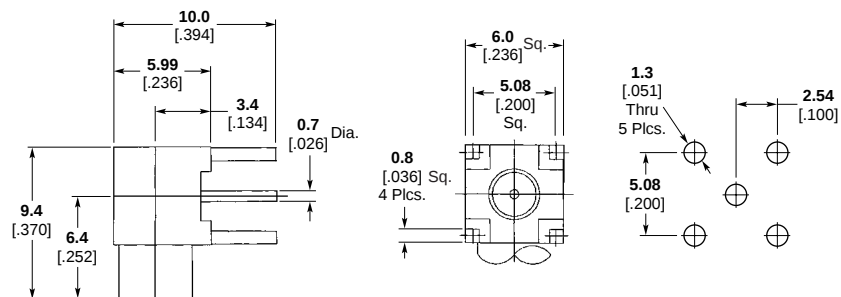
| Cable    | Plating | Part No.  |
|----------|---------|-----------|
| RG 179/U | Nickel  | 1362991-1 |

### Vertical Plug, PC Board, 75 Ohm



| Plating | Part No.  |
|---------|-----------|
| Nickel  | 1361169-1 |

### Vertical Jack, PC Board, 75 Ohm



| Plating | Part No.  |
|---------|-----------|
| Gold    | 1363106-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Compression Coax Board-to-Board Connectors

### Board-to-Board RF Connector Series

- Single connector product
- Surface mount technology
- Excellent price-to-performance ratio

### Product Facts

- Single connector design — no mating connectors needed
- Available in four sizes for varied board spacing: 14mm, 10mm, 6.65mm and 4mm
- Large radial and axial misalignment: For positioning both boards and for gap between boards
- Surface Mount Device for standard pick & place compatibility
- Gold plated phosphor bronze and brass contacts, stainless steel springs
- Mating directly on target board
- Easy connection without risk of breaking soldering or connector when mating or unmating
- Low applied material and assembly costs

### Applications

- Modular parallel board-to-board blindmate applications
- Base Station / Sub Station systems
- PDA / PCS / Cellular Handset applications
- Wireless Communications systems (GSM, PCS, WCDMA, UMTS)



### Specifications

**Characteristic Impedance** — 50 Ohms

**Frequency Range** — Up to 6 GHz

**Return Loss** — -20dB min.; up to 2.2 GHz (all misalignments)

**Shielding Effectiveness** — -60 dB min.; up to 2.2 GHz

**Working Voltage** — 125 VAC, 50 Hz (at sea level)

**Dielectric Withstanding Voltage** — 500 VAC, 50 Hz (at sea level)

**Insulation Resistance** — 100 Megohms

**Operating Temperature** — -40 to +125°C

**Mating Force** — 10 N

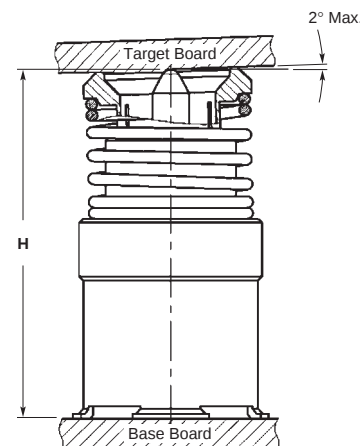
**Durability** — 25 cycles

**Angle Between Boards** —  $\pm 2^\circ$  max.

**Axial Misalignment** —  $\pm 1.0$ mm from nominal boards stacking height;  $\pm 0.4$ mm,  $\pm 0.3$ mm for shortest models (Part Numbers 619135 and 1658260)

**Radial Misalignment** —  $\pm 0.8$ mm from center line in any direction

**Vibration** — 20 g between 58-500 Hz (Const. amplitude of 1.5 mm between 10-58 Hz)



| Part Number | Height "H"       |
|-------------|------------------|
| 619127-1    | 14 $\pm$ 1.0mm   |
| 619134-1    | 10 $\pm$ 1.0mm   |
| 619135-1    | 6.65 $\pm$ 0.4mm |
| 1658260-1   | 4 $\pm$ 0.3mm    |

### Related Product Data

**Internet** — <http://tycoelectronics.com/products/rfcoax>

**Product Specification/Design Objectives** — 108-71060

**Test Report** — 501-90021

**Sample Kit** — 1-1773441-3

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## STAX Coax Connectors

### Product Facts

- Low cost, low height and high performance
- Low insertion loss  
0 to -0.5 dB from 0 to 6 GHz
- VSWR < 1.07 from 0 to 6 GHz
- Wide working range of deflection
- Long term reliability and durability
- Surface mount/pick and place
- Low board separation  
2.5 mm
- Technology can support board separations 1.5 mm
- Easily modified free height
- No tooling required for height modifications
- Modified prototype samples within 2 weeks



Tyco Electronics' STAX coax RF connector is the first surface mount RF board-to-board connector on the market that uses elastomeric connector technology to provide an economical means to achieve low board separation while maintaining excellent RF signal integrity between PCBs.

The connector uses laminated sections of conductive and non-conductive silicone that are tuned to provide a 50 ohm

impedance line between mated substrates. The single piece construction of the STAX coax RF connector eliminates some of the signal anomalies normally associated with mated pairs of metal contact coax connectors. The dimensional relationship of the inner and outer conductor is consistently maintained throughout the connector.

With its metal holder, the STAX coax RF connector can be surface mount

soldered to the PCB. An additional metal SMT holder aligns the connector to the mating PCB. If adequate PCB alignment is already maintained by other means, the STAX RF connector may not need the additional mating receptacle and can become a blindmating connector. This has an additional advantage in space constrained mobile applications where very fine-pitch board-to-board connectors are also used.

### Related Product Data

**Internet** — [www.elastomerictech.com](http://www.elastomerictech.com)  
[www.tycoelectronics.com](http://www.tycoelectronics.com)

### Elastomeric Technologies Applications Engineering —

Phone: 1-800-989-STAX ext. 4453

Fax: 1-215-784-4522

E-mail: [ETIapplicationseng@tycoelectronics.com](mailto:ETIapplicationseng@tycoelectronics.com)

### Technical Documents —

Qualification Test Report — T R 368

RF Performance Report — 00266

### Electrical Characteristics

**Contact Resistance** — < 50 m

**Insulation Resistance** —  $10^{12}$  min.

**Dielectric Withstanding Voltage (without breakdown or arcing)** — 1000 Volt

### Physical Characteristics

**Board Separation** — 2.5 mm  $\pm$  0.2 (std. part)

**PCB Board Area** — 4.0 mm dia.

**Typical Clamping Force** — See chart

### Environmental Characteristics

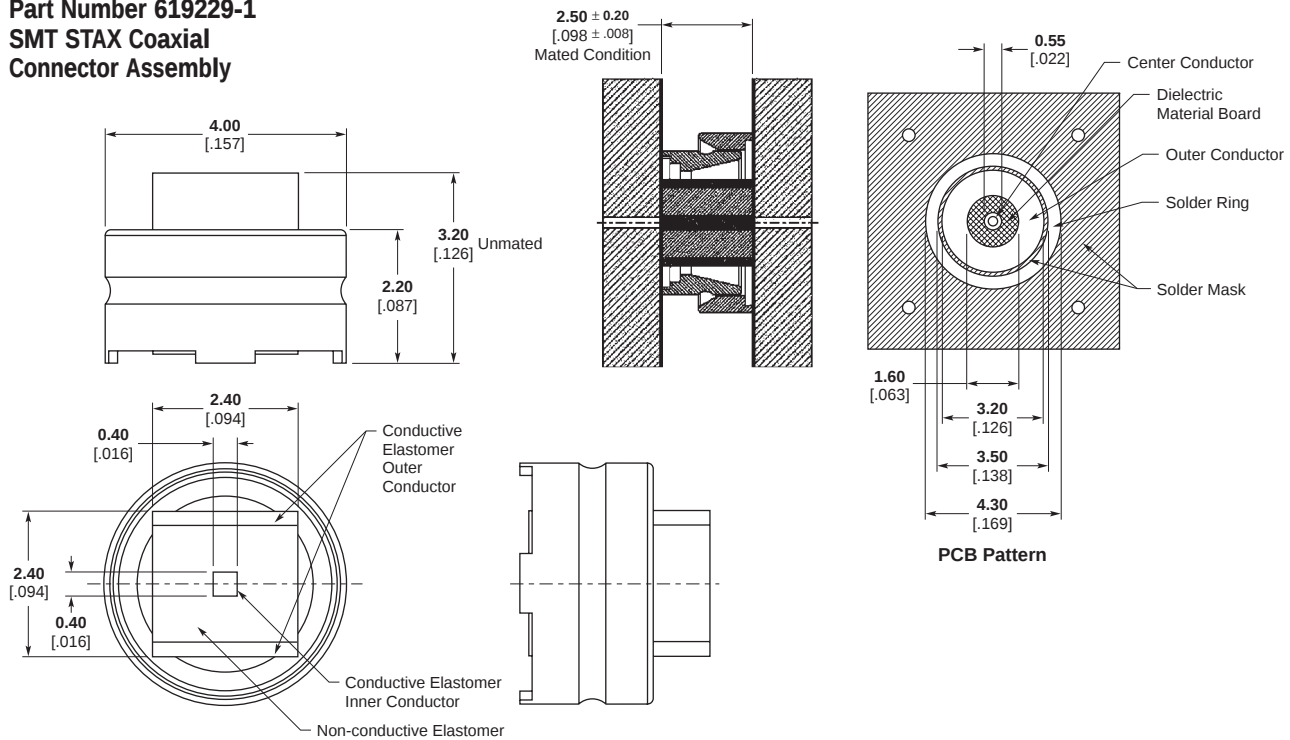
**Operating Temperature** — -40°C to +125°C

**Moisture** — 0 to 100% RH

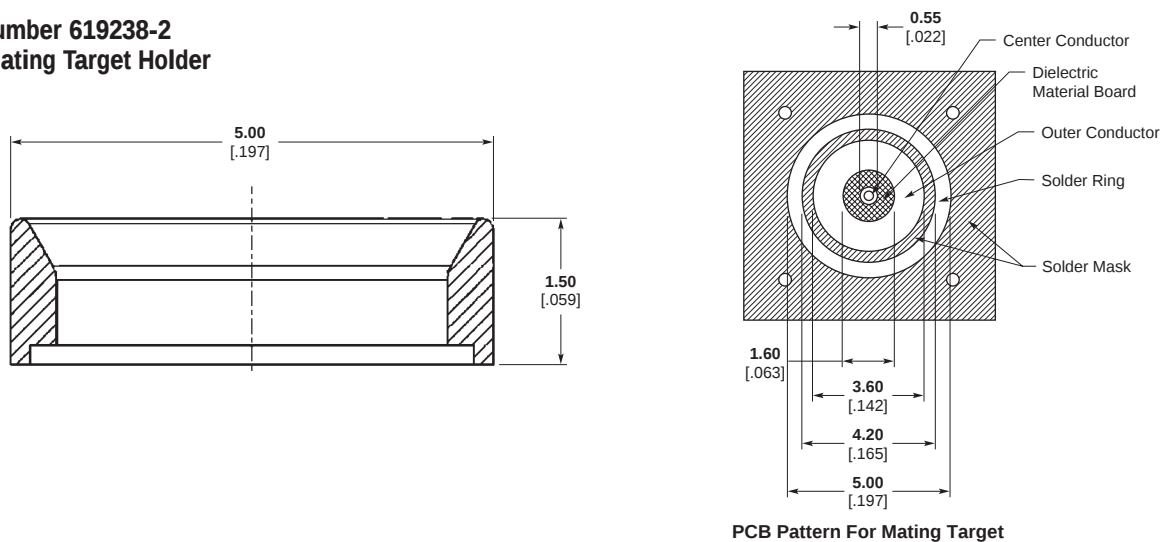
## STAX Coax Connectors (Continued)

| Description                                                                              | Part Number |
|------------------------------------------------------------------------------------------|-------------|
| STAX SMT Coax Connector Assembly:<br>Consists of STAX Coax elastomer in round SMT holder | 619229-1    |
| Mating SMT Target Holder:<br>Controls alignment between PCBs                             | 619238-2    |
| STAX Coax RF Elastomer only:<br>Used with customer furnished holder                      | 1442004-1   |

### Part Number 619229-1 SMT STAX Coaxial Connector Assembly



### Part Number 619238-2 SMT Mating Target Holder



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMT/QuickGrip Connectors

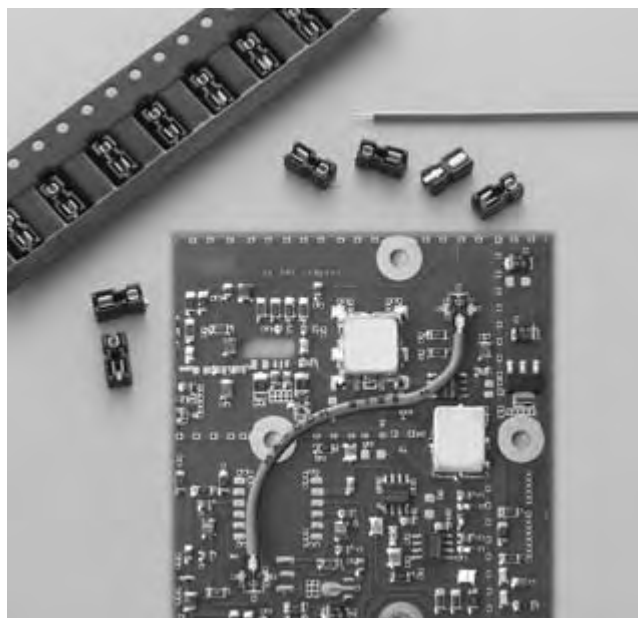
### Product Facts

- Solderless Cable Termination
- 3.0 [.118] Mated Height
- Excellent Cable Retention
- Usable With Flexible and Semi-Rigid Micro-Coaxial Cables
- Tape and Reel Packaging

Tyco Electronics revolutionary SMT/QuickGrip product line is designed to meet the growing demand for a reliable, low cost system for direct termination of coax to a printed circuit board (PCB). SMT/QuickGrip technology eliminates the requirement to connectorize the coaxial cable, reducing assembly times and, therefore, cost. The SMT/QuickGrip surface mount device occupies less PCB area than conventional through hole coaxial connectors. An innovative microstrip mounting pattern and cable receptacle design ensures excellent grounding and PCB retention. The SMT/QuickGrip cable termination system stands a mere 3.0 [.118] off the board when mated, allowing for closer pitch/spacing when designing a

system. The SMT/QuickGrip design provides optimal cable retention for applications where shock, vibration, and/or cable flexure may be encountered. This unique RF design accepts both flexible and semi-rigid micro-coaxial cables while delivering exceptional RF performance up to 3GHz.

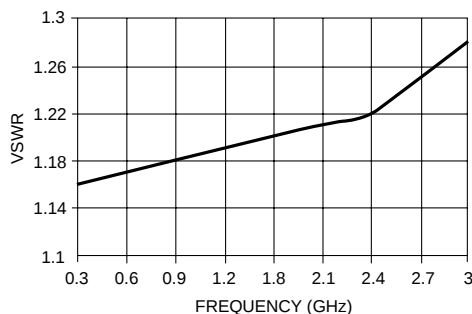
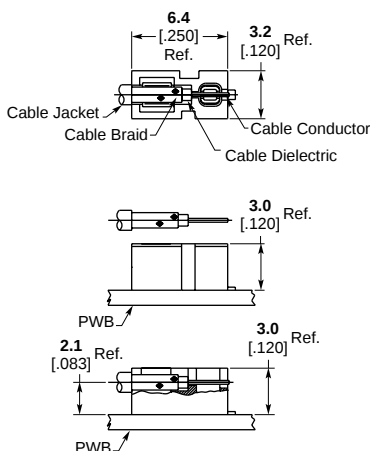
These features make this system extremely versatile for design engineers and offer a reliable, cost effective alternative to direct soldering of cable to the PCB. The cable is inserted into the device by means of a simple self-aligning hand tool, eliminating the requirement for skilled personnel. This system removes the possibility of damaged PCBs and cables which are common quality issues associated with direct solder, while providing superior RF performance. The SMT/QuickGrip accommodates multiple cable insertions allowing easy replacement of cables for repairs. This receptacle is designed for high volume assembly using surface mount technology and is available in tape and reel packaging for pick and place board assembly. Pre-stripped cables and inter-



series cable pigtails are available as turnkey solutions for your application needs (i.e.: for use in multi-board applications, for connecting antennas to the PCB, or point to point transmission on the same PCB).

The SMT/QuickGrip cable termination system is ideal for wireless surface mount applications in handsets, pagers and personal digital assistants (PDA). The SMT/QuickGrip

mechanical and electrical performance, coupled with its ease of use, ensure it to be a high quality, reliable solution for current and future interconnect needs. Tyco Electronics is an ISO9001 certified manufacturer and maintains an SPC controlled manufacturing environment. Please call your local Sales or Distribution office for additional information and qualification samples today.



Typical VSWR using SMT/QuickGrip with Omni-Flex 200 Cable

Omni-Flex 200 cable is a Tyco Electronics specified cable.

## SMT/QuickGrip Connectors (Continued)

### Specifications

#### General

##### Materials

Housing: Polyphenylene Sulfide (PPS)

Contacts: Copper Alloy

##### Finishes

Contacts: Gold Plate over Nickel

#### Electrical

Frequency Range: DC - 3GHz

Impedance: Usable with 50 &amp; 75 Ohm systems

Insertion Loss: .08 /GHz

DWV: 750 VRMs

VSWR: 1.3:1 @ 3GHz (Omni-Flex 200 and .047 [.002] Semi-Rigid)  
1.4:1 @ 3GHz (.034 [.001] Semi-Rigid)

#### Mechanical

Connector Durability: 5 mating cycles min. (receptacle only)

Tape and Reel Packaging: 16 [.629] per EIA-481

Force to Disengage by  
Cam-Out (grams):

Omni-Flex 200 Cable - 543 typical

.034 [.001] Semi-Rigid - 852 typical

.047 [.002] Semi-Rigid - 1066 typical

#### Environmental

Temperature Rating: -40°C(-40°F) to 125°C(257°F) when mated with Omni-Flex 200 Cable

Resistance to Solder Heat: Infrared, convection, and vapor phase solderable (receptacle only).  
Maximum reflow time/temperature not to exceed 260°C for 3 minutes.

#### Cable Information

Materials: Omni-Flex 200 Cable

Jacket: FEP Flexible Cable (200°C)

Shield: Fluorinated Ethylene Propylene

Silver plated copper wire,  
44 AWG, 90% min. coverage

Dielectric: PTFE (Polytetrafluoroethylene)

Center Conductor: Silver Plated Copper Clad Steel, 30 AWG

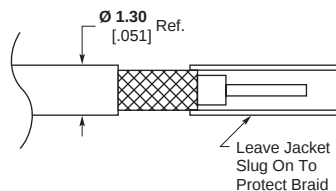
Minimum Bend Radius: 6.35 [.250]

Insertion Loss (PVC and FEP cable only): 1.3dB/m, 0.4 dB/ft. @ 500 MHz  
2.0dB/m, 0.5 dB/ft. @ 1 GHz  
3.0dB/m, 0.9 dB/ft. @ 2 GHz

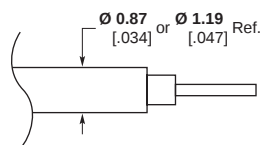
Center Conductor Resistance: .26 Ohms per foot average

### Strip Dimensions

#### Tyco Electronics Omni-Flex 200 Cable Part Number 1407578-1



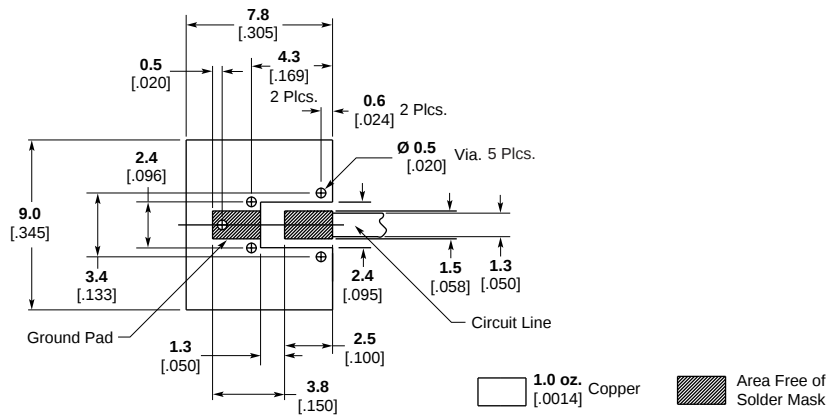
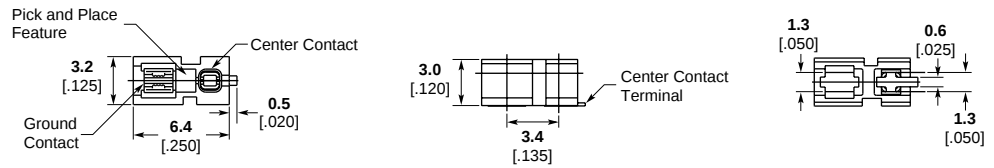
#### Semi-Rigid Cable (.034 and .047)


Omni-Flex 200 cable is a  
Tyco Electronics specified cable.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMT/QuickGrip Connectors (Continued)

### PC Board Mount Receptacle



Recommended Mounting Pattern for Microstrip Line

| Description           | Part No.  |
|-----------------------|-----------|
| Bulk Packaged 100/bag | 1085456-1 |
| 700 Piece Reel        | 1086008-1 |
| 2000 Piece Reel       | 1086009-1 |

1. Printed wiring board material: glass epoxy FR-4 or similar, relative permittivity: 4.8, 1 oz. copper clad both sides.
2. These dimensions valid for 1.6 [.062] board thickness.

### Cable Insertion Tool



Part No.  
1088313-1

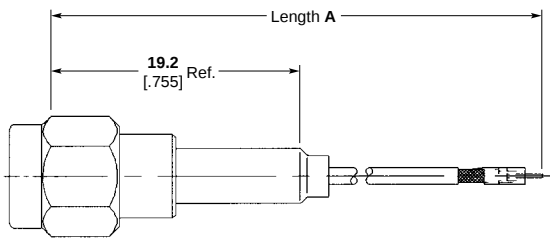
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMT/QuickGrip Connectors (Continued)

### Inter-Series Cable Assemblies



#### SMA Straight Plug

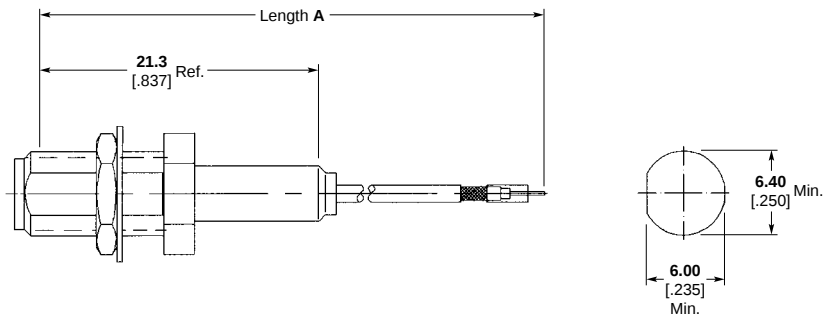


| Cable         | Assembly Length (A) | Part No.         |
|---------------|---------------------|------------------|
| Omni-Flex 200 | 100 [4]             | <b>1329174-1</b> |
|               | 200 [8]             | <b>1329174-2</b> |
|               | 305 [12]            | <b>1310432-1</b> |

**Note:**

1. Cable length tolerances: Length 'A' mm [In], Tolerance mm [In],  
50 to 100 [3.94],  $\pm 3$  [ $\pm .12$ ], 101 to 500 [3.98 to 19.69],  $\pm 5$  [ $\pm .20$ ],  
Over 500 [19.69],  $\pm 10$  [ $\pm .39$ ]

#### SMA Bulkhead Jack



**Recommended  
Mounting Hole**

| Cable         | Assembly Length (A) | Part No.         |
|---------------|---------------------|------------------|
| Omni-Flex 200 | 100 [4]             | <b>1329175-1</b> |
|               | 200 [8]             | <b>1329175-2</b> |
|               | 305 [12]            | <b>1329175-3</b> |

**Note:**

1. Cable length tolerances: Length 'A' mm [In], Tolerance mm [In],  
50 to 100 [3.94],  $\pm 3$  [ $\pm .12$ ], 101 to 500 [3.98 to 19.69],  $\pm 5$  [ $\pm .20$ ],  
Over 500 [19.69],  $\pm 10$  [ $\pm .39$ ]

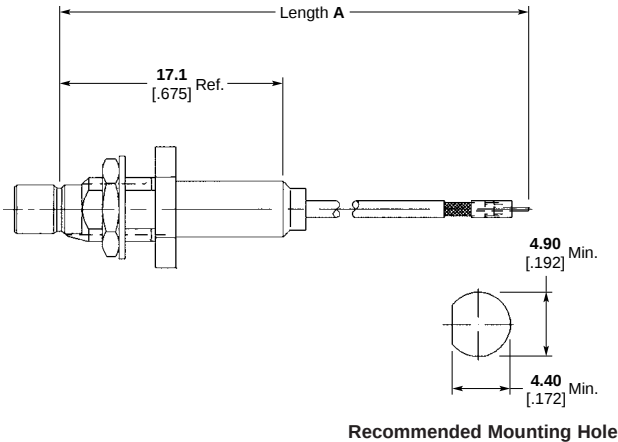
Omni-Flex 200 cable is a  
Tyco Electronics specified cable.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SMT/QuickGrip Connectors (Continued)

### Inter-Series Cable Assemblies (Continued)

#### SMB Bulkhead Jack

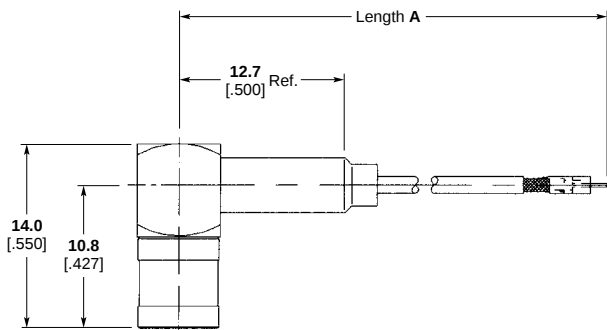


| Cable         | Assembly Length (A) | Part No.  |
|---------------|---------------------|-----------|
| Omni-Flex 200 | 100 [4]             | 1408050-4 |
|               | 200 [8]             | 1408050-5 |
|               | 305 [12]            | 1408050-6 |

#### Note:

- Cable length tolerances: Length 'A' mm [in], Tolerance mm [in],  
50 to 100 [3.94],  $\pm 3$  [ $\pm .12$ ], 101 to 500 [3.98 to 19.69],  $\pm 5$  [ $\pm .20$ ],  
Over 500 [19.69],  $\pm 10$  [ $\pm .39$ ]

#### SMB Right-Angle Plug

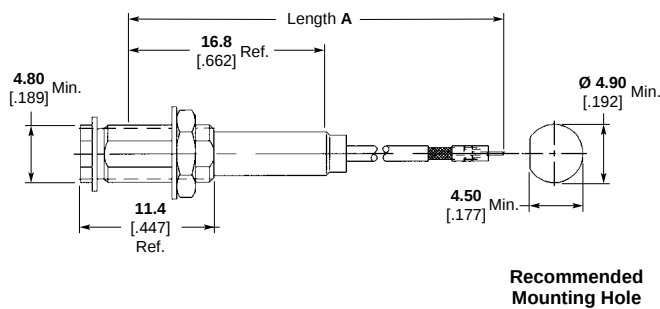


| Cable         | Assembly Length (A) | Part No.  |
|---------------|---------------------|-----------|
| Omni-Flex 200 | 100 [4]             | 1255378-4 |
|               | 200 [8]             | 1255378-5 |
|               | 305 [12]            | 1255378-6 |

#### Note:

- Cable length tolerances: Length 'A' mm [in], Tolerance mm [in],  
50 to 100 [3.94],  $\pm 3$  [ $\pm .12$ ], 101 to 500 [3.98 to 19.69],  $\pm 5$  [ $\pm .20$ ],  
Over 500 [19.69],  $\pm 10$  [ $\pm .39$ ]

#### MCX Bulkhead Jack

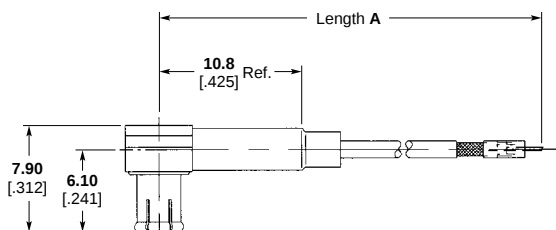


| Cable         | Assembly Length (A) | Part No.  |
|---------------|---------------------|-----------|
| Omni-Flex 200 | 100 [4]             | 1408051-4 |
|               | 200 [8]             | 1408051-5 |
|               | 305 [12]            | 1408051-6 |

#### Note:

- Cable length tolerances: Length 'A' mm [in], Tolerance mm [in],  
50 to 100 [3.94],  $\pm 3$  [ $\pm .12$ ], 101 to 500 [3.98 to 19.69],  $\pm 5$  [ $\pm .20$ ],  
Over 500 [19.69],  $\pm 10$  [ $\pm .39$ ]

#### MCX Right-Angle Plug



| Cable         | Assembly Length (A) | Part No.  |
|---------------|---------------------|-----------|
| Omni-Flex 200 | 100 [4]             | 1330401-4 |
|               | 200 [8]             | 1330401-5 |
|               | 305 [12]            | 1330401-6 |

#### Note:

- Cable length tolerances: Length 'A' mm [in], Tolerance mm [in],  
50 to 100 [3.94],  $\pm 3$  [ $\pm .12$ ], 101 to 500 [3.98 to 19.69],  $\pm 5$  [ $\pm .20$ ],  
Over 500 [19.69],  $\pm 10$  [ $\pm .39$ ]

Omni-Flex 200 cable is a Tyco Electronics specified cable.

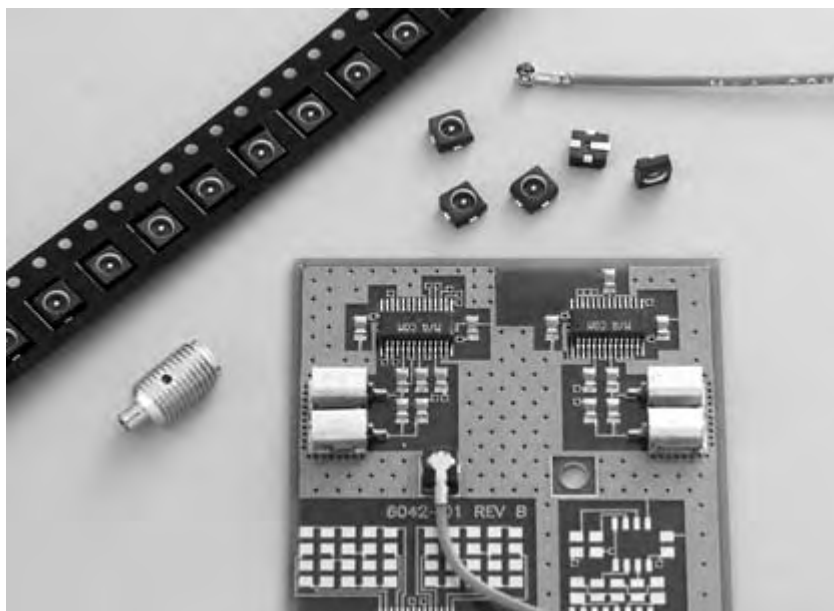
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SSMT Surface Mount Interconnect System

### Microminiature Surface Mount RF Connectors

#### Product Facts

- 3.0 [.118] mated height
- Excellent interface retention
- Flexible micro-coax cable
- 360 degree mated rotation
- Tape and Reel packaging available



The Tyco Electronics SSMT surface mount Interconnect System is designed to provide superior electrical and mechanical performance for wireless communication applications. The SSMT system occupies less printed circuit board (PCB) real estate than conventional through hole coaxial connectors. An innovative microstrip mounting pattern and plug receptacle design ensure reliable grounding and PCB retention characteristics. The SSMT Interconnect System allows closer pitch/spacing, standing 3.0 [.118] (fully mated height) off the board. The mated SSMT interface allows 360 degrees of rotation providing maximum PCB design flexibility. It has been designed to provide optimal retention for

applications where shock, vibration or cable flexure may be encountered. Force to disengage by cable load (cam-out) exceeds 300 grams.

The SSMT system is designed to provide the performance of much larger industry standard connectors. The SSMT Interconnect System consistently achieves broad band electrical performance through 6 GHz with a maximum VSWR of 1.20:1 at 2 GHz. This broad band performance establishes a reliable interface that can be utilized for future system upgrades without concern for performance degradation.

The SSMT utilizes a common plug receptacle, part number 1251802-1, which is designed for high volume

assembly using surface mount technology and is available in tape and reel packaging for automatic pick and place board assembly. The mating cable jack is available terminated to a highly flexible micro-coax cable as either a pigtail, jumper or standard interseries connector assembly to meet your needs.

The SSMT Interconnect System can be manually mated, facilitating high volume assembly and eliminating the need for special engagement tooling. The SSMT interface design aligns the center contacts prior to full mating to ensure a robust mechanical engagement. Interface durability is rated at 100 mating cycles.

## SSMT Surface Mount Interconnect System (Continued)

### Specifications

#### General

##### Materials

|                 |                                                              |                                                           |
|-----------------|--------------------------------------------------------------|-----------------------------------------------------------|
| SMT Plug        | Housing:<br>Contacts:                                        | Polyphenylene Sulfide (PPS)<br>Copper Alloy               |
| SSMT Cable Jack | Outer Contact:<br>Inner Contact:<br>Dielectric:              | Beryllium Copper<br>Beryllium Copper<br>Polypropylene, GF |
| Finish          | Plug and cable jack - Contacts: Gold plate over nickel plate |                                                           |

#### Electrical

|                                      |                                                  |
|--------------------------------------|--------------------------------------------------|
| Frequency                            | dc - 6 GHz                                       |
| Nominal Impedance                    | 50 Ohms                                          |
| Voltage Rating                       | 250 Volts (VRMS Maximum) @ Sea Level             |
| VSWR (Mated Pair)                    | 1.20:1 Maximum @ 2 GHz<br>1.40:1 Maximum @ 6 GHz |
| Insulation Resistance                | 5000 Megohms Minimum                             |
| Dielectric Withstanding Voltage      | 500 Volts (VRMS Minimum) @ Sea Level             |
| Contact Resistance (Connectors Only) |                                                  |
| Center Contact                       | 15 milliohms Maximum                             |
| Outer Contact                        | 10 milliohms Maximum                             |
| Insertion Loss (Connectors Only)     | .15dB Max. @ 6 GHz                               |

#### Mechanical

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Connector Durability                      | 100 mating cycles                             |
| Tape/Reel Packaging (Plug)                | 12mm per EIA-481                              |
| Force to Engage                           | 5.5 lbs. Max. (3.5 lbs. typ.)                 |
| Force to Disengage                        | (2.0 lbs. typ.) 4.0 lbs. Max. (2.0 lbs. typ.) |
| Force to Disengage by Cable Load (camout) | 300 Grams Min. (800 Grams typ. initial mate)  |

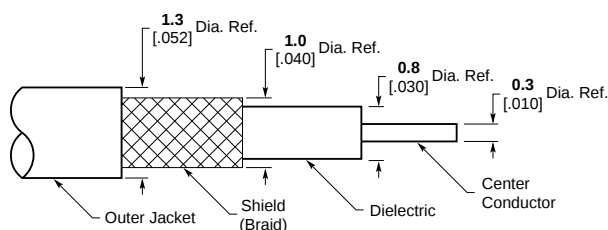
#### Environmental

|                                 |                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Rating (Mated Pair) | -40°C (-40°F) to +125°C (257°F)                                                                                                    |
| Resistance to Solder Heat       | Infrared, convection and vapor phase solderable (plug only).<br>Maximum reflow time/temperature not to exceed 260°C for 3 minutes. |

#### Cable Specifications

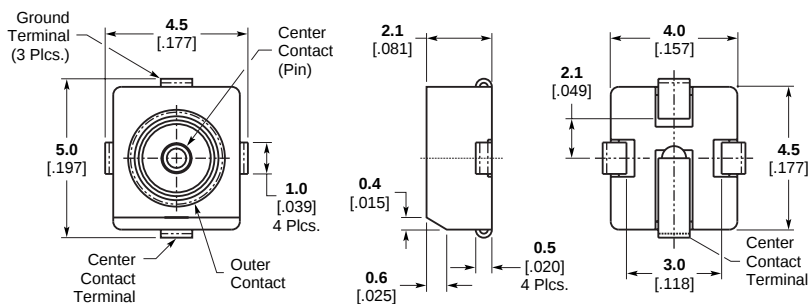
##### Materials

|                             |                                                                              |
|-----------------------------|------------------------------------------------------------------------------|
| Jacket:                     | FEP (polytetrafluoroethylene)                                                |
| Shield:                     | Silver plated copper wire, 44 AWG, 90% min. coverage                         |
| Dielectric:                 | PTFE (polytetrafluoroethylene)                                               |
| Center Conductor:           | Silver plated copper clad steel, 30 AWG                                      |
| Minimum Bend Radius         | 6.35mm (.250 inch)                                                           |
| Insertion Loss (Cable Only) | 0.5 dB/ft., 2.0 dB/m @ 1 GHz<br>0.9 dB/ft., 3.0 dB/m @ 2 GHz                 |
| Center Conductor Resistance | .25 Ohms per foot average.<br>819 milliohm/meter Nom.; 250 milliohm/Ft. Nom. |

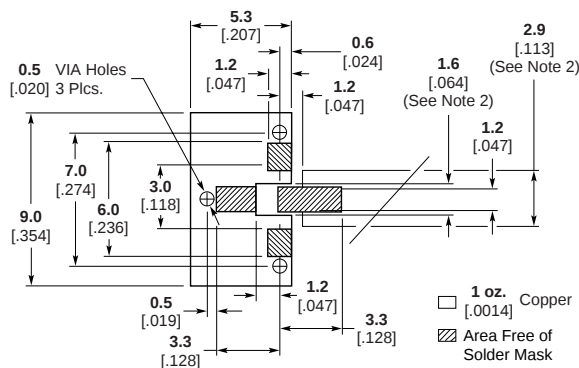


## SSMT Surface Mount Interconnect System (Continued)

### Straight SMT PCB Mount Plug Receptacle



| Packaging               | Quantity        | Part No.  |
|-------------------------|-----------------|-----------|
| Bulk                    | Multiple of 100 | 1251802-1 |
| 178<br>7.0 Dia. Taping  | 800 pcs/reel    | 1083946-1 |
| 330<br>13.3 Dia. Taping | 3000 pcs/reel   | 1055689-1 |



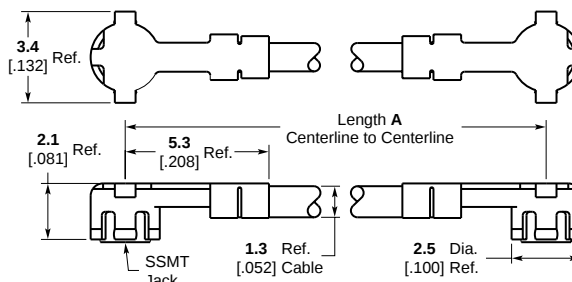
#### Notes:

- Printed wiring board material: glass epoxy. FR-4 or similar, relative permittivity: 4.8, 1 oz. copper clad both sides.
- These dimensions valid for 1.6 [0.062] board thickness.

#### Recommended Mounting Pattern for Microstrip Line

### Right-Angle Jack to Jack Cable Assembly

| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064524-1 |
| 200 [8.0]           | 1064530-1 |
| 305 [12.0]          | 1064533-1 |



#### Notes:

- Consult Tyco Electronics for non-standard cable lengths.  
Length A Tolerances:  

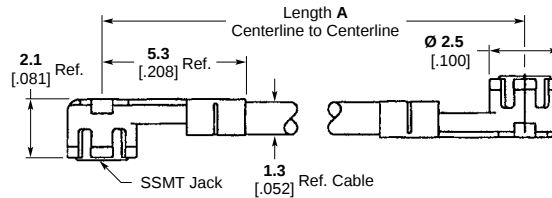
| Length A                   | Tolerance    |
|----------------------------|--------------|
| 50 To 100 [3.94]           | ± 3 [± .12]  |
| 101 To 500 [3.98 to 19.69] | ± 5 [± .20]  |
| Over 500 [19.69]           | ± 10 [± .39] |
- Connector centerlines align ± 30° as shown for lengths of 165 [6.5] or less. Cable assemblies over 165 [6.5] have randomly aligned connectors.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SSMT Surface Mount Interconnect System (Continued)

### Right-Angle Jack to Jack Cable Assembly (180° Offset)

| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1082845-1 |



**Notes:**

- Consult Tyco Electronics for non-standard cable lengths.  
Cable length tolerance:

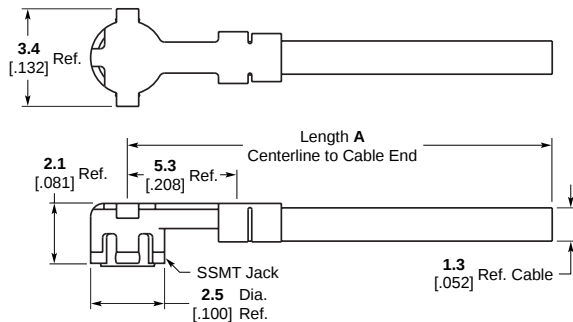
Length A Tolerances.

| Length A                   | Tolerance    |
|----------------------------|--------------|
| 50 To 100 [3.94]           | ± 3 [± .12]  |
| 101 To 500 [3.98 to 19.69] | ± 5 [± .20]  |
| Over 500 [19.69]           | ± 10 [± .39] |

- To avoid damaging the cable, minimize time at temperature while soldering and/or applying heat to unterminated end of cable.

### Right-Angle Jack Cable Pigtail

| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064535-1 |
| 200 [8.0]           | 1064538-1 |
| 305 [12.0]          | 1064540-1 |
| 510 [20.0]          | 1064542-1 |



**Notes:**

- Consult Tyco Electronics for non-standard cable lengths.  
Cable length tolerance:

Length A Tolerances.

| Length A                   | Tolerance    |
|----------------------------|--------------|
| 50 To 100 [3.94]           | ± 3 [± .12]  |
| 101 To 500 [3.98 to 19.69] | ± 5 [± .20]  |
| Over 500 [19.69]           | ± 10 [± .39] |

- To avoid damaging the cable, minimize time at temperature while soldering and/or applying heat to unterminated end of cable.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SSMT Surface Mount Interconnect System (Continued)

### Inter-Series Cable Assemblies



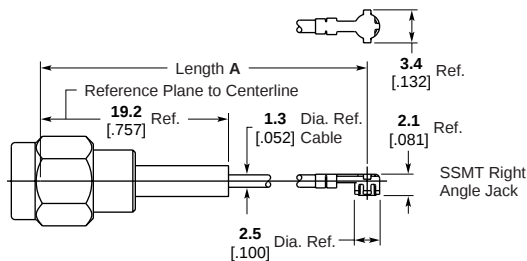
**Notes:**

1. Consult Tyco Electronics for non-standard cable lengths:  
Length A Tolerances.

| Length A                   | Tolerance    |
|----------------------------|--------------|
| 50 To 100 (3.94)           | ± 3 (± .12)  |
| 101 To 500 (3.98 to 19.69) | ± 5 (± .20)  |
| Over 500 (19.69)           | ± 10 (± .39) |

2. Connectors are randomly aligned unless otherwise noted.

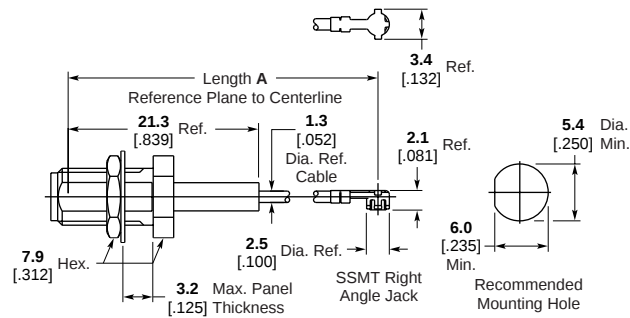
### SMA Straight Plug



| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064543-1 |
| 200 [8.0]           | 1064552-1 |
| 305 [12.0]          | 1064560-1 |

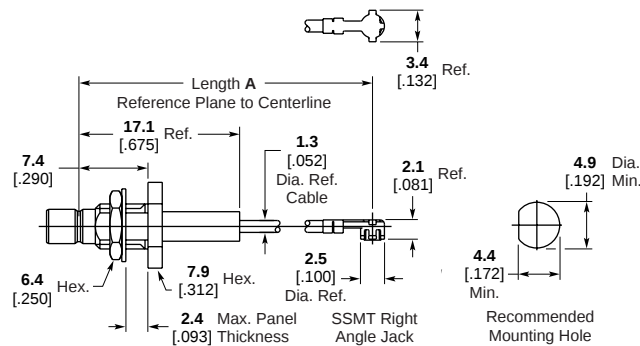
Note:  
1064552-1 recommended for customer system verification.

### SMA Bulkhead Jack



| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064544-1 |
| 200 [8.0]           | 1064553-1 |
| 305 [12.0]          | 1064561-1 |

### SMB Bulkhead Jack



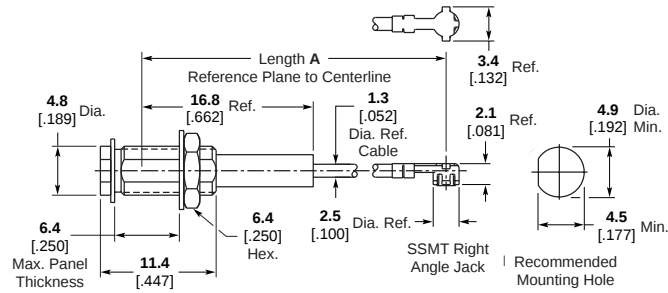
| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064546-1 |
| 200 [8.0]           | 1064555-1 |
| 305 [12.0]          | 1064563-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SSMT Surface Mount Interconnect System (Continued)

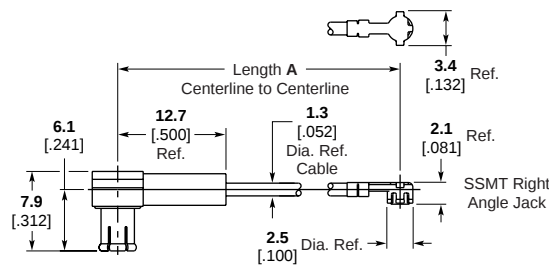
### Inter-Series Cable Assemblies (Continued)

#### MCX Bulkhead Jack



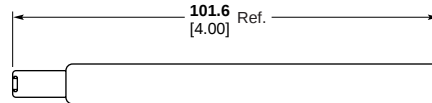
| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064549-1 |
| 200 [8.0]           | 1064558-1 |
| 305 [12.0]          | 1064566-1 |

#### MCX Right-Angle Plug

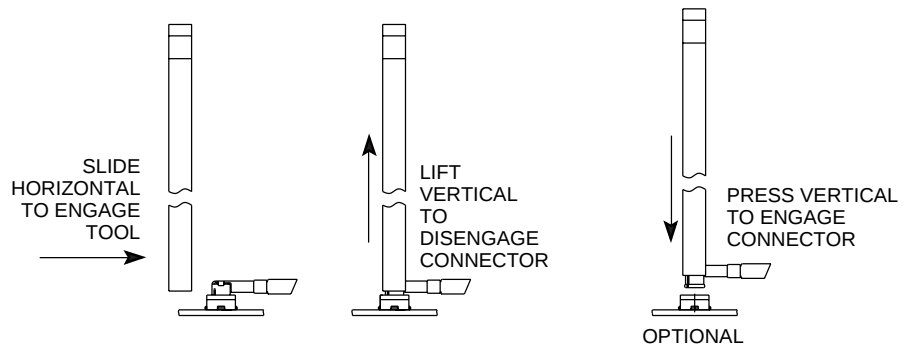


| Assembly Length (A) | Part No.  |
|---------------------|-----------|
| 100 [4.0]           | 1064550-1 |
| 200 [8.0]           | 1064559-1 |
| 305 [12.0]          | 1064567-1 |

#### SSMT Disengagement Tool



| Part No.  |
|-----------|
| 1221286-1 |

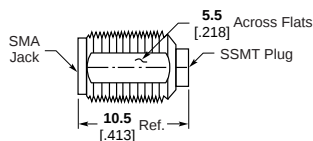


#### Use of Engagement/Disengagement Tool

Note: The SSMT disengagement tool can be utilized as an optional engagement tool versus manual hand installation.

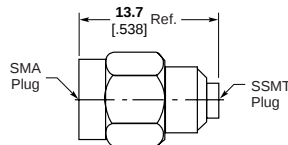
### SSMT to SMA Between Series Adapters

#### SSMT Plug to SMA Jack Adapter



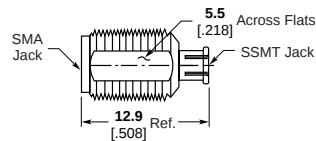
Part No. 1055696-1

#### SSMT Plug to SMA Plug Adapter



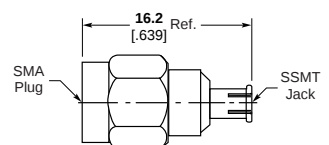
Part No. 1055695-1

#### SSMT Jack to SMA Jack Adapter



Part No. 1055694-1

#### SSMT Jack to SMA Plug



Part No. 1055697-1

Note: Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## MMCX Microminiature Snap-On Connector Series

### Product Facts

- Snap-on interface facilitates assembly
- 35% smaller than MCX Series
- Designed for space saving applications up to 6 GHz
- Conforms to CECC Specifications
- Surface mount tape and reel for high volume



Tyco Electronics' micro-miniature snap-on connectors offer an excellent blend of size, durability and performance for emerging applications in GPS, PCS, automotive and wireless communications. An extension of the popular MCX series, MMCX connectors are 35% smaller, offering even greater packaging density and weight reduction. MMCX connectors are rated to 500 mating cycles. The snap-on interface facilitates assembly, eliminating the need for a threaded connection, and ensuring full engagement. The forces to engage and disengage have been optimized to ensure ease of mating as

well as to prevent damage to PCB solder connections. MMCX connectors are designed for broadband performance, DC-6 GHz, and can be utilized for future system upgrades without concerns for performance degradation. The non-slotted outer contact provides for minimal RF leakage. MMCX surface mount connectors are designed to withstand infrared reflow, convection and vapor phase soldering.

Tyco Electronics MMCX connectors are fully mateable with competitive MMCX product and conforms to the CECC interface specifications. They are available in a broad range of standard

configurations, including PCB and panel mount, flexible and semi-rigid cable. Tape and reel packaging is available on surface mount product to facilitate high volume manufacturing. Other options can be reviewed as well, including additional cable sizes, and adapters.

The MMCX connector series is a cost effective solution for the challenging demands of today's commercial marketplace. It offers one of the smallest conventional crimp terminations without special tooling. Call your local sales office or authorized distributor for additional information or samples of the MMCX connector series.

### Material and Finish

**Shells** — Brass

**Bodies** — Brass, plated gold

**Center Contacts** —

(Male) — Brass, plated gold

(Female) — Beryllium Copper, plated gold

**Dielectrics** — PTFE

### Electrical Characteristics in accordance with CECC 22000

**Frequency** — dc – 6 GHz

**Nominal Impedance** — 50 ohms

**Voltage Rating** — 170 Volts (VRMS Max.) @ Sea Level

**VSWR** — 1.25 : 1 Max. @ 6 GHz

**Insulation Resistance** — 1,000 Megohms Min.

**Dielectric Withstanding Voltage** — 500 Volts (VRMS Max.) @ Sea Level

**RF Leakage** — -60 dB Min. @ 2.5 GHz

**Contact Resistance** —

Center Contact — 5 milliohms max.

Outer Contact — 1 milliohm max.

### Mechanical Characteristics in accordance with CECC 22000

**Connector Durability** — 500 mating cycles

**Force to Engage** — 18 Newtons Max.

**Force to Disengage** — 6 Newtons Max.

**Center Contact Retention** — 10 Newtons Min.

**Cable Retention** —

Axial — 45 Newtons Min.

Rotational — 0.05 N-m Min.

### Environmental Characteristics in accordance with CECC 22000, Equivalent Test Conditions

**Temperature Rating** — -55 to +155°C

**Vibration** — MIL-STD-202, Method 204, Condition B

**Shock** — MIL-STD-202, Method 213, Condition A

**Moisture Resistance** — MIL-STD-202, Method 106

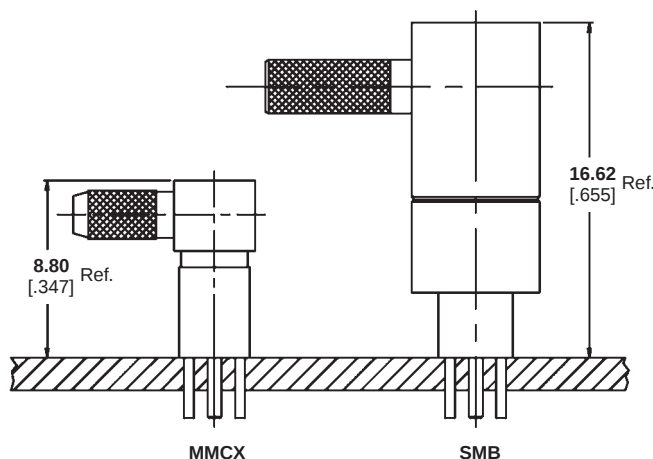
**Thermal Shock** — MIL-STD-202, Method 107, Condition B

**Note:** Performance specifications are typical, but may not apply to all connector types.

### Related Product Data

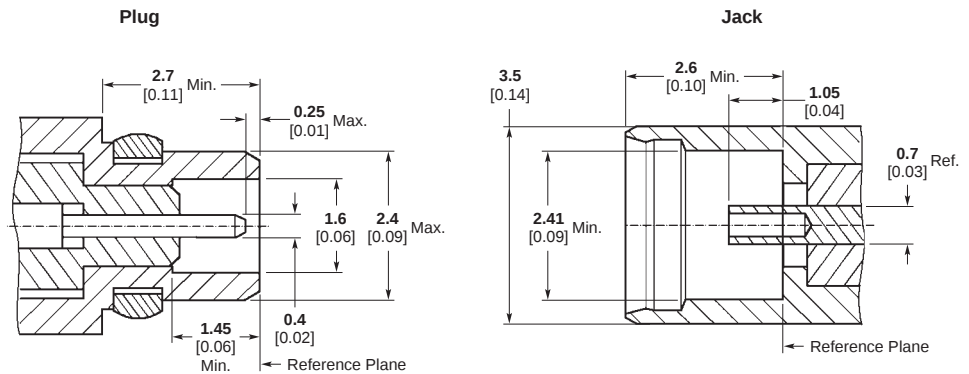
**Product Specification** — 108-2084

**Sample Kit** — 1654779

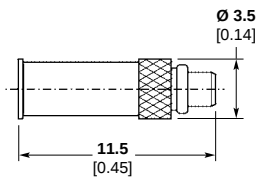


## MMCX Microminiature Snap-On Connector Series (Continued)

### MMCX Interface Dimensions

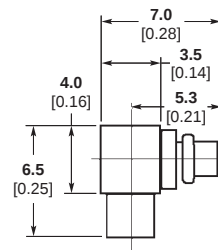


### Semi-Rigid Cable – Direct Solder Attachment Straight Cable Plug



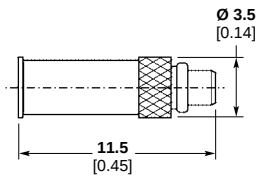
| Cable  | Part No.  |
|--------|-----------|
| RG 405 | 1408313-1 |

### Right-Angle Cable Plug



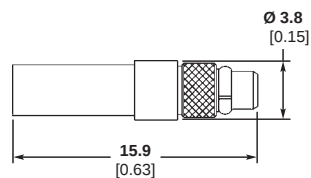
| Cable  | Part No.  |
|--------|-----------|
| RG 405 | 1408314-1 |

### Flexible Cable – Crimp Attachment Straight Cable Plugs



| Cable       | Part No.  |
|-------------|-----------|
| RG 178, 196 | 1408148-1 |

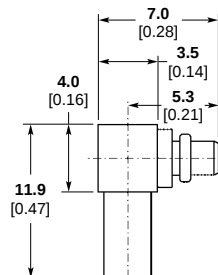
Captured Center Contact



| Cable            | Part No.  |
|------------------|-----------|
| RG 174, 188, 316 | 1408312-1 |
| RD 316           | 1408312-2 |

Captured Center Contact

### Right-Angle Cable Plug



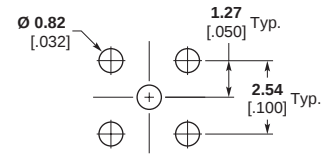
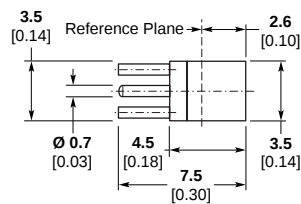
| Cable            | Part No.  |
|------------------|-----------|
| RG 178, 196      | 1408149-1 |
| RG 174, 188, 316 | 1408149-2 |
| RD 316           | 1408149-3 |

Captured Center Contact

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## MMCX Microminiature Snap-On Connector Series (Continued)

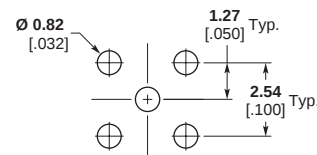
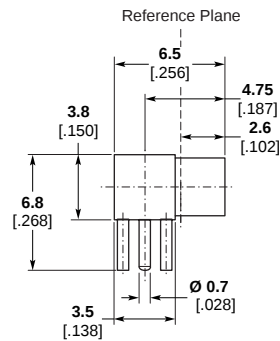
### Printed Circuit Board Straight Jack Receptacle



Recommended Mounting Holes

Part No.  
1408150-1

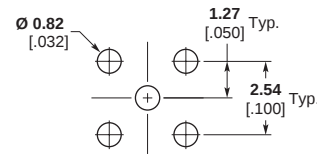
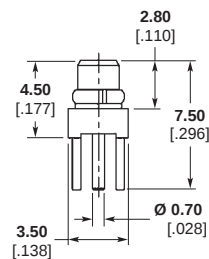
### Right-Angle Jack Receptacle



Recommended Mounting Holes

Part No.  
1408151-1

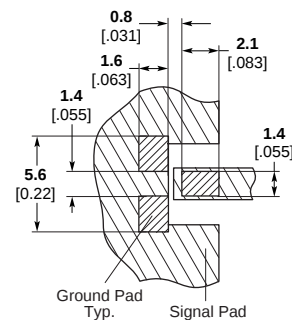
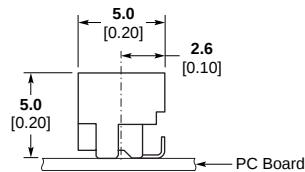
### Straight Plug Receptacle



Recommended Mounting Holes

Part No.  
1408496-1

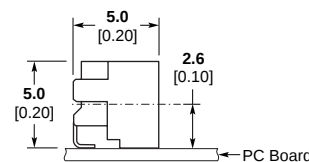
### Surface Mount Straight Jack Receptacle



Recommended Mounting Pattern

Part No.  
1393757-6

### Right-Angle Jack Receptacle



Ground Pad Typ. Signal Pad

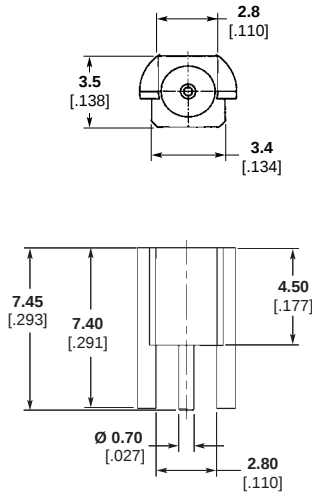
Part No.  
1393757-7

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

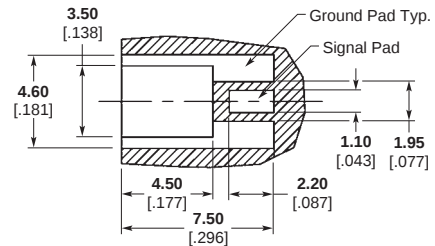
## MMCX Microminiature Snap-On Connector Series (Continued)

### Edge Mount

#### Straight Jack Receptacle

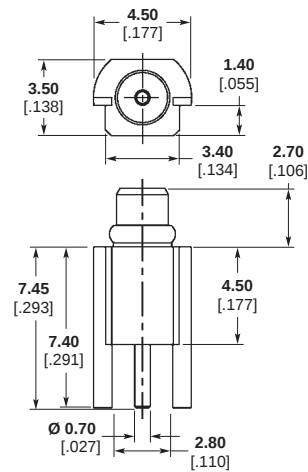


| Part No.  |
|-----------|
| 1408152-1 |

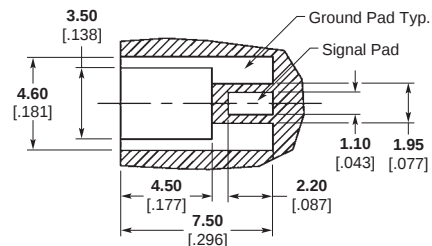


Solder Pad Configuration Only

#### Straight Plug Receptacle



| Part No.  |
|-----------|
| 1408120-1 |



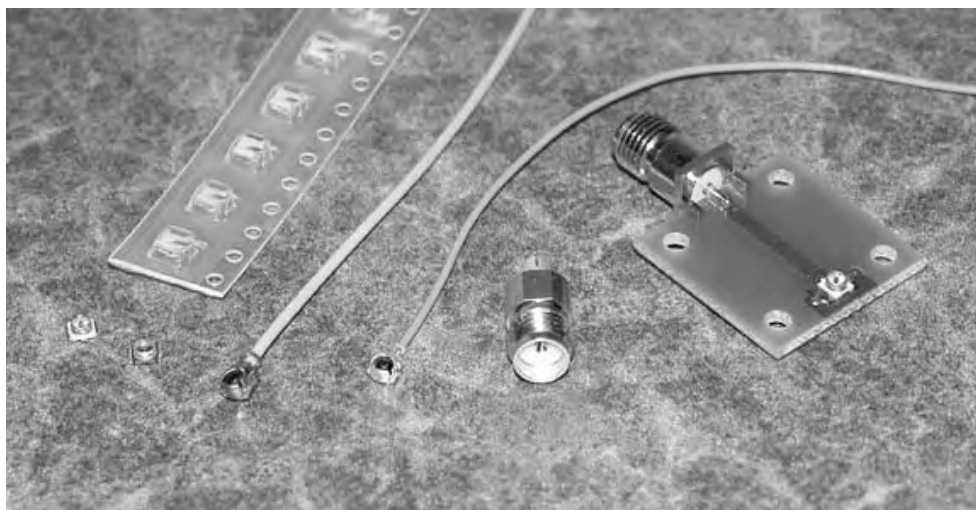
Solder Pad Configuration Only

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## UMCC — Ultraminiature Coax Connector and Cable Assembly Series

### Product Facts

- Ultra low profile (2.0 mm or 2.5 mm maximum mated height)
- Easy snap on/off mating
- Small footprint on PCB (3 mm x 3 mm)
- Excellent performance to 6 GHz
- Surface mount and reflow solderable
- Available on 0.80 mm and 1.37 mm dia. single shield, and 1.32 mm dia. double shield cable
- Style A receptacles mate with HIROSE U.FL/U.FL(v) Series connectors
- Style B receptacles mate with MURATA GSC Series connectors



### Description

- Extremely low profile
- Surface mount technology
- 360° mated rotation
- Excellent price-to-performance ratio

### Applications

- Wireless LAN, Mini PCI
- Mobile Antenna/GPS/Radio Systems
- PDA/PCS/Cellular Handset applications
- Wireless Communications systems (LAN, GSM, PCS, WCDMA, UMTS)
- Remote measuring equipment

### Electrical Characteristics

- Characteristic Impedance** — 50 Ohms
- Frequency Range** — DC to 6 GHz
- VSWR (mated pair)** — 1.30 max. DC to 3 GHz  
1.40 max. 3 to 6 GHz (cable dependent)
- Insertion Loss (connectors only)** — 0.24 dB max. DC to 6 GHz
- Rated Voltage** — 60 VAC (rms) — standard receptacle (Styles A, B)
- Dielectric Withstanding Voltage** — 200 VAC, 50 Hz for 1 min. @ sea level
- Insulation Resistance** — 500 Megohms min.
- Contact Resistance (connectors only)** — 20 milliohms max. (Center)  
10 milliohms max. (Outer, Plug)  
10 milliohms max. (Outer, Receptacle)

### Mechanical and Environmental Characteristics

- Durability** — 30 cycles — standard receptacle (Styles A, B)
- Disengagement Force** — 2N min. perpendicular  
4N min. orthogonal
- Center Contact Retention Force** — 0.15N min.
- Tape/Reel Packaging (receptacle)** — 12 mm carrier per EIA-481
- Operating Temperature** — -40°C to +90°C

### Material and Finish

- Shell** — Phosphor bronze, plated gold or silver
- Male Center Contact** — Brass or phosphor bronze, plated gold
- Female Center Contact** — Brass or phosphor bronze, plated gold
- Insulator (Plug)** — PBT (15% G.F.), black, UL94V-0
- Insulator (Receptacle)** — LCP, beige or black, UL94V-0

### Related Product Data

- Product Specification** — 108-2231
- Sample Kit** — 1-1773441-6

HIROSE is a trademark of Hirose Electric.  
MURATA is a trademark of Murata Electronics, Inc.

## UMCC — Ultraminiature Coax Connector and Cable Assembly Series (Continued)

### Cable Information

#### Material and Finish

##### Center Conductor —

0.8 mm Dia. — Silver plated copper  
1.32 mm Dia. — Silver plated copper  
1.37 mm Dia. — Silver plated copper

##### Center Conductor Size —

0.8 mm Dia. — Stranded 7/0.05 mm  
1.32 mm Dia. — Stranded 7/0.08 mm  
1.37 mm Dia. — Stranded 7/0.10 mm

##### Dielectric —

0.8 mm Dia. — FEP or PFA  
1.32 mm Dia. — FEP  
1.37 mm Dia. — FEP

##### Dielectric Size —

0.8 mm Dia. — 0.4 mm OD  
1.32 mm Dia. — 0.66 mm OD  
1.37 mm Dia. — 0.83 mm OD

##### Shield —

0.8 mm Dia. — Silver plated copper braid  
1.32 mm Dia. — Double SPL braid  
1.37 mm Dia. — Silver plated copper braid

#### Shield Coverage —

0.8 mm Dia. — > 90%  
1.32 mm Dia. — > 90% (each braid layer)  
1.37 mm Dia. — > 90%

#### Jacket —

0.8 mm Dia. — FEP or PFA  
1.32 mm Dia. — FEP  
1.37 mm Dia. — FEP

#### Jacket Size —

0.8 mm Dia. — 0.80 mm OD  
1.32 mm Dia. — 1.32 mm OD  
1.37 mm Dia. — 1.37 mm OD

#### Mechanical Characteristics

##### Minimum Bend Radius —

0.8 mm Dia. — 5 mm single bend,  
30 mm continuous flexing  
1.32 mm Dia. — 5 mm single bend,  
30 mm continuous flexing  
1.37 mm Dia. — 5 mm single bend,  
30 mm continuous flexing

#### Electrical Characteristics

##### Impedance (Ohms) —

0.8 mm Dia. —  $50 \pm 2$   
1.32 mm Dia. —  $50 \pm 2$   
1.37 mm Dia. —  $50 \pm 2$

##### Velocity of Propagation —

0.8 mm Dia. — 70%  
1.32 mm Dia. — 70%  
1.37 mm Dia. — 70%

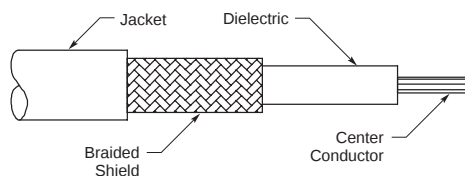
##### CC Resistance (Ohms/KM) —

0.8 mm Dia. — 1450  
1.32 mm Dia. — 560  
1.37 mm Dia. — 354

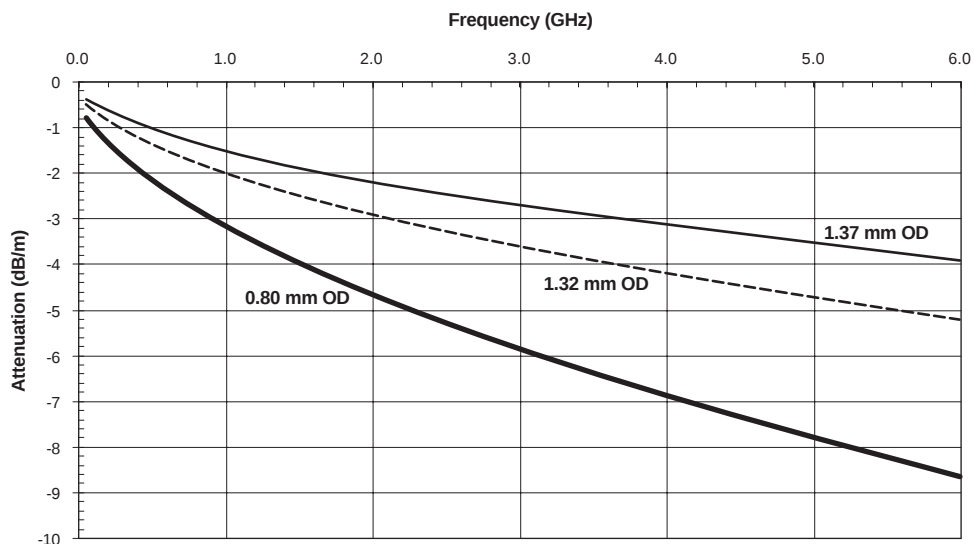
##### Voltage Rating —

0.8 mm Dia. — 60 VAC  
1.32 mm Dia. — 60 VAC  
1.37 mm Dia. — 60 VAC

##### Attenuation — See chart

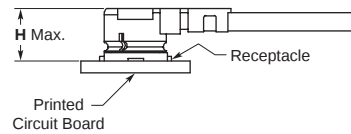


### UMCC Cable Attenuation



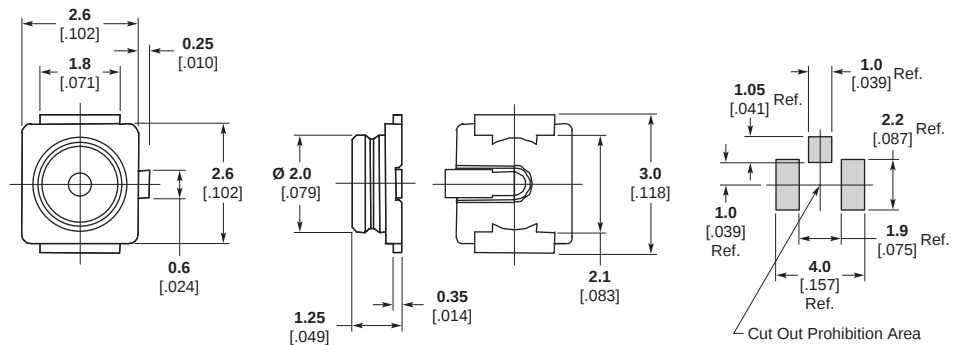
## UMCC — Ultraminiature Coax Connector and Cable Assembly Series (Continued)

### PCB Receptacles — Style A



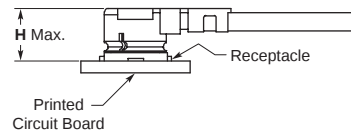
| Style | Mates with UMCC Connector Type | Mated Height (H)       | Description                       | Part Number |
|-------|--------------------------------|------------------------|-----------------------------------|-------------|
| A     | II / III                       | 2.00–2.50<br>.079–.098 | UMCC PCB Receptacle, 2500 Pc Reel | 1566230-1   |
| A     | II / III                       | 2.00–2.50<br>.079–.098 | UMCC PCB Receptacle, 500 Pc Bag   | 1566230-2   |

### UMCC PCB Receptacle



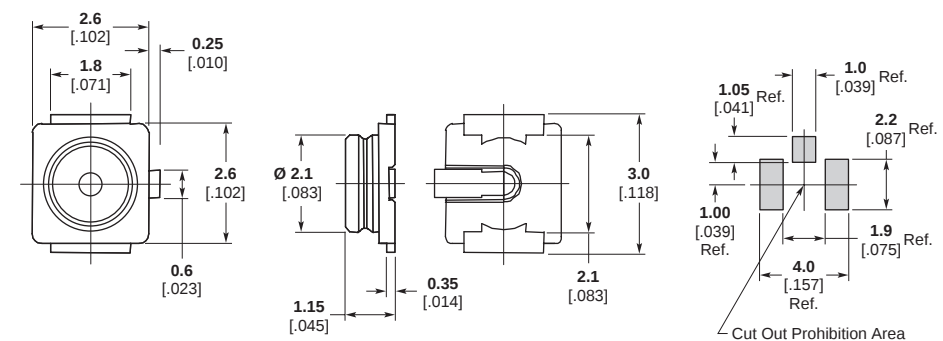
Recommended PC Board Layout

### PCB Receptacles — Style B



| Style | Mates with UMCC Connector Type | Mated Height (H) | Description                       | Part Number |
|-------|--------------------------------|------------------|-----------------------------------|-------------|
| B     | I                              | 2.00<br>.079     | UMCC PCB Receptacle, 2500 Pc Reel | 1775146-1   |
| B     | I                              | 2.00<br>.079     | UMCC PCB Receptacle, 500 Pc Bag   | 1775146-2   |

### UMCC PCB Receptacle

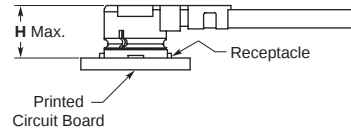


Recommended PC Board Layout

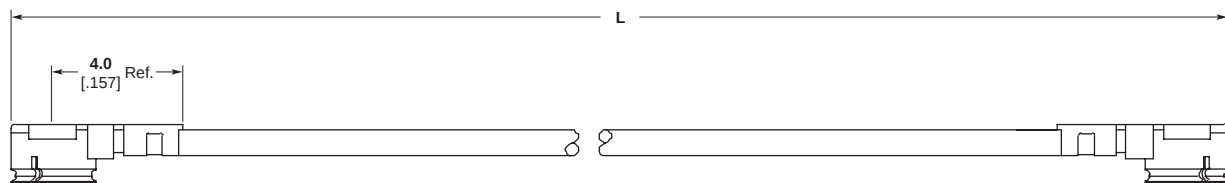
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## UMCC — Ultraminiature Coax Connector and Cable Assembly Series (Continued)

### Standard Double Ended Cable Assemblies



| UMCC Connector Type | Mated Height (H) | Cable Dia.   | Length L        | Mates with PCB Rcpt. | Part Number |
|---------------------|------------------|--------------|-----------------|----------------------|-------------|
| I                   | 2.00<br>.079     | 0.80<br>.031 | 100.00<br>3.937 | Style B              | 1750109-1   |
|                     | 2.00<br>.079     | 0.80<br>.031 | 200.00<br>7.874 | Style B              | 1750109-2   |
| II                  | 2.00<br>.079     | 0.80<br>.031 | 100.00<br>3.937 | Style A              | 1750108-1   |
|                     | 2.00<br>.079     | 0.80<br>.031 | 200.00<br>7.874 | Style A              | 1750108-2   |
| III                 | 2.50<br>.098     | 0.80<br>.031 | 100.00<br>3.937 | Style A              | 1750107-1   |
|                     | 2.50<br>.098     | 0.80<br>.031 | 200.00<br>7.874 | Style A              | 1750107-2   |
|                     | 2.50<br>.098     | 1.32<br>.052 | 100.00<br>3.937 | Style A              | 1750107-3   |
|                     | 2.50<br>.098     | 1.32<br>.052 | 200.00<br>7.874 | Style A              | 1750107-4   |
|                     | 2.50<br>.098     | 1.37<br>.054 | 100.00<br>3.937 | Style A              | 1750107-5   |
|                     | 2.50<br>.098     | 1.37<br>.054 | 200.00<br>7.874 | Style A              | 1750107-6   |



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

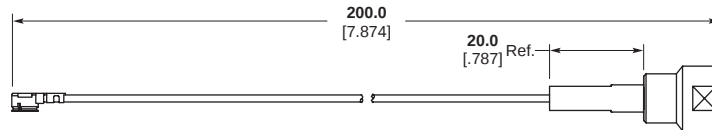
## UMCC — Ultraminiature Coax Connector and Cable Assembly Series (Continued)

### Interseries Cable Assemblies

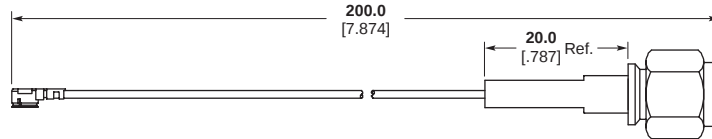


| UMCC Connector Type | Mated Height (H) | Cable Dia.   | Length          | Description                        | Part Number |
|---------------------|------------------|--------------|-----------------|------------------------------------|-------------|
| III                 | 2.50<br>.098     | 1.37<br>.054 | 200.00<br>7.874 | UMCC Plug to FME Plug              | 1750110-2   |
|                     | 2.50<br>.098     | 1.37<br>.054 | 200.00<br>7.874 | UMCC Plug to SMA Plug              | 1750110-4   |
|                     | 2.50<br>.098     | 1.37<br>.054 | 200.00<br>7.874 | UMCC Plug to SMA Bulkhead Jack     | 1750110-6   |
|                     | 2.50<br>.098     | 1.37<br>.054 | 200.00<br>7.874 | UMCC Plug to MCX Right-Angle Plug  | 1750110-8   |
|                     | 2.50<br>.098     | 1.37<br>.054 | 200.00<br>7.874 | UMCC Plug to MMCX Right-Angle Plug | 1-1750110-0 |
| II                  | 2.00<br>.079     | 0.80<br>.031 | 200.00<br>7.874 | UMCC Plug to MCX Right-Angle Plug  | 1750110-7   |
|                     | 2.00<br>.079     | 0.80<br>.031 | 200.00<br>7.874 | UMCC Plug to MMCX Right-Angle Plug | 1750110-9   |

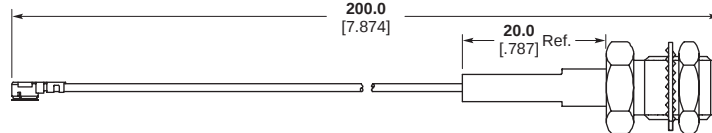
### UMCC to FME Plug



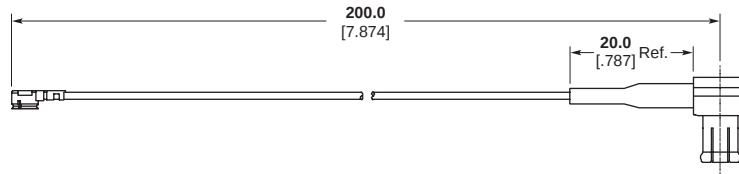
### UMCC to SMA Plug



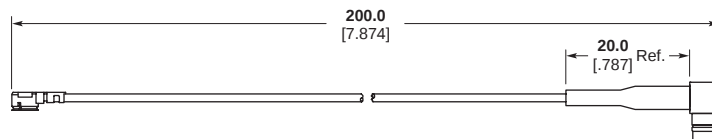
### UMCC to SMA Bulkhead Jack



### UMCC to MCX Right-Angle Plug



### UMCC to MMCX Right-Angle Plug



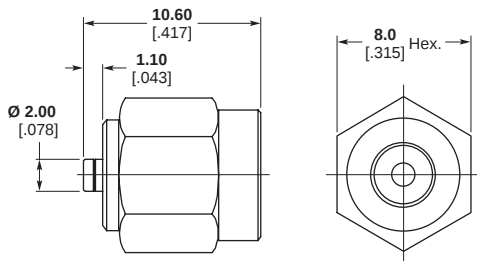
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## UMCC — Ultraminiature Coax Connector and Cable Assembly Series (Continued)

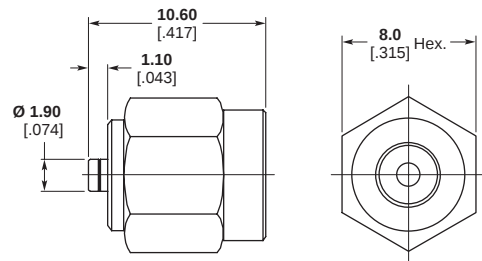
### Adapters



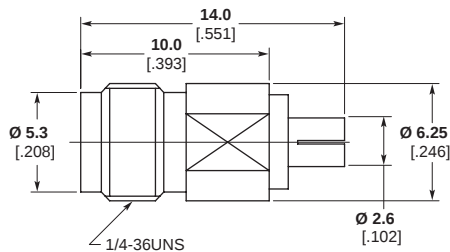
| UMCC Connector Type | Description                      | Part Number |
|---------------------|----------------------------------|-------------|
| I                   | UMCC Jack Receptacle to SMA Plug | 1775228-1   |
|                     | UMCC Plug to SMA Jack            | 1775229-1   |
| II / III            | UMCC Jack Receptacle to SMA Plug | 1775227-1   |
|                     | UMCC Plug to SMA Jack            | 1775230-1   |



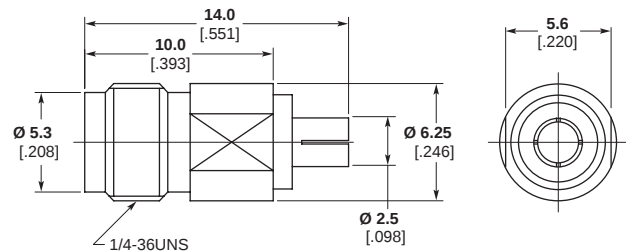
Part Number 1775228-1



Part Number 1775227-1

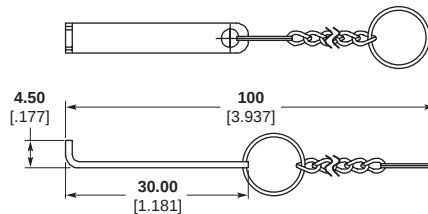


Part Number 1775229-1



Part Number 1775230-1

### Extraction Tool Part Number 1775231-1

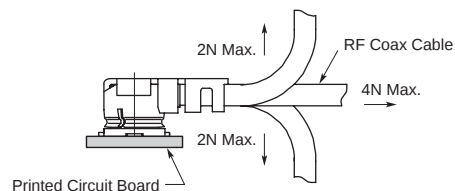
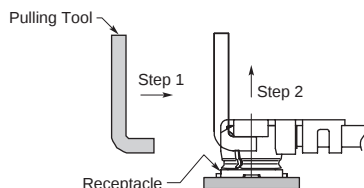


**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## UMCC — Ultraminiature Coax Connector and Cable Assembly Series (Continued)

### Application Notes

#### Mating/Unmating — Cable Plugs



#### Mating/Unmating

1. To mate the connectors, insert the cable plug into the SMT receptacle, making sure the cable plug is as vertical as possible and the mating axis of both connectors are aligned. Do not insert on an extreme angle.

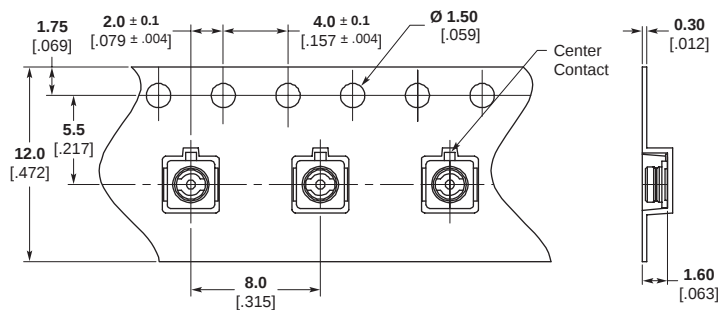
2. To unmate the connectors, insert the end portion of the extraction tool under the SMT receptacle connector flanges and pull off vertically in the direction of the mating axis.

#### Permissible Load

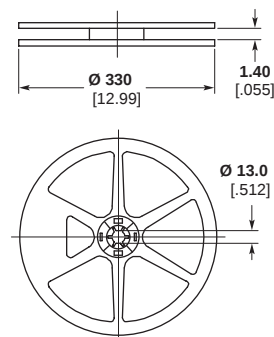
Do not apply excessive load to the cable after the connectors are mated. Please refer to the permissible loads indicated in the figure to the right.

### Tape and Reel Packaging Specifications

#### Standard Receptacles



Dimensions of Taping



Dimensions Reel (2500 Pieces/Reel)

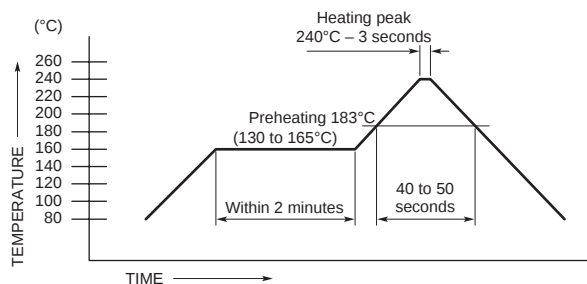
### Soldering Profile — SMT Receptacle

#### Recommended Temperature Profile (Reference)

1. The preferred technique for mounting the SMT Receptacle package is to reflow solder the device onto a PCB (Printed Circuit Board).
2. The maximum temperature for the lead of PCB surface does not exceed 240°C.
3. The right reflow soldering profile is for reference and will modify under individual different conditions.

#### Hand Soldering (Reference only)

1. Soldering iron: The maximum temperature is 240°C.
2. Soldering period: within 5 seconds.



## COAXICON Series Mobile Phone Switching Coax Connectors

### Product Facts

- Able to switch RF signal from internal to external antenna
- SMD component for standard pick & place
- Up to 2.4 GHz
- Up to 30,000 life cycles
- High radial and axial tolerance capture
- Low insertion loss
- Right-angle cable plug with floating for alignment tolerance capture
- Application in handsets

### Product Specification

108-71000

#### Technical Features

**Impedance** — 50 Ohms

**Operating Temperature** —  
-40°C to +85°C

**Radial Tolerance Capture** —  
±1.0 [.039] (except for 3.5 [.138] height)

**Axial Tolerance Capture** — 0.6 [.024]

**Plating** — Outer shell and center contact are gold plated

**Short Stamped Contact** —  
Selective gold plating

**Long Stamp Contact (switch)** —  
Full gold plating with ink barrier

**Insertion Loss** — 0.30 dB max.  
at 2 GHz

**Isolation** — 26 dB min. at 2 GHz

**VSWR** — 1.15:1 at 1 GHz, below  
1.20:1 at 2 GHz

**Mated Insertion Loss (after life cycle testing)** — Below 0.30 dB at 1 GHz, below 0.45 dB at 2 GHz

**Unmated Insertion Loss (after life cycle testing)** — Below 0.20 dB at 1 GHz, below 0.35 dB at 2 GHz

Packaging on reels for SMD.

For more details, refer to the product specification.

The Tyco Electronics SMD mobile phone connector system offers a low-cost and effective solution to passive switching between an internal and external phone antenna. When implemented in a cradle kit, the connector helps to make possible hands-free operation of the mobile

phone within a vehicle, enhancing safety and permitting compliance with a growing body of legislation. Connection to the external antenna also enhances signal gain and clarity.

The connector design accommodates gross misalignment between the

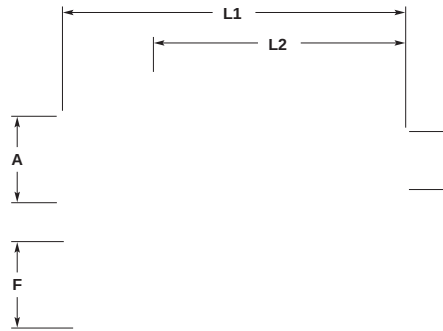
phone and cradle, which is extremely important when blindmating is necessary. The Tyco Electronics switching coax connector system meets all performance objectives, including up to 30,000 connect/disconnect and switching cycles over the connector's life.

Figure 1 — System Configuration

Figure 2 — System Configuration

## COAXICON Series Mobile Phone Switching Coax Connectors (Continued)

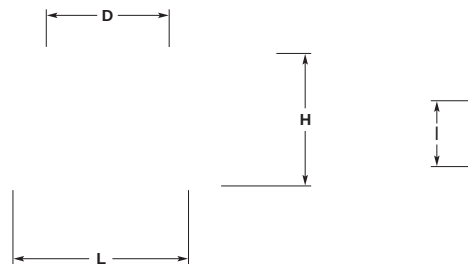
### Right-Angle Cable Plugs



Note: Hex Crimp Dim. 3.25 [.128]

| RG/U Cable | Dimensions  |             |             |              |              | Single Packed Part No. | Bulk Packed Part No. |
|------------|-------------|-------------|-------------|--------------|--------------|------------------------|----------------------|
|            | A           | D           | F           | L1           | L2           |                        |                      |
| RG 174     | 5x5 Square  | 3.4<br>.134 | 6.9<br>.272 | 15.6<br>.614 | 10.9<br>.429 | 619028-2               | 5-619028-2           |
|            | 5x5 Square  | 3.4<br>.134 | 9.6<br>.378 | 15.6<br>.614 | 10.9<br>.429 | 619028-4               | 5-619028-4           |
|            | 6.0<br>.236 | 3.4<br>.134 | 6.9<br>.272 | 15.8<br>.622 | 10.9<br>.429 | 619041-2               | 5-619041-2           |
|            | 6.0<br>.236 | 3.4<br>.134 | 9.6<br>.378 | 15.8<br>.622 | 10.9<br>.429 | 619041-4               | 5-619041-4           |
|            | 6.0<br>.236 | 3.4<br>.134 | 6.9<br>.272 | 20.3<br>.799 | 11.0<br>.433 | 619078-1               | 5-619078-3           |
|            | 6.0<br>.236 | 3.4<br>.134 | 9.6<br>.378 | 20.3<br>.799 | 11.0<br>.433 | 619078-2               | 5-619078-4           |

### SMD Switching Jacks



| Dimensions  |             |             | Diameter D  | Part No. |
|-------------|-------------|-------------|-------------|----------|
| H           | L           | I           |             |          |
| 6.0<br>.236 | 8.0<br>.315 | 3.2<br>.126 | 5.4<br>.213 | 619061-1 |
| 4.5<br>.177 | 8.0<br>.315 | 3.2<br>.126 | 5.4<br>.213 | 619062-1 |
| 3.5<br>.137 | 8.0<br>.315 | 3.2<br>.126 | 5.4<br>.213 | 619072-1 |

Other models upon request.

For all dimensions, stencil and PCB recommended layout, see customer drawing.

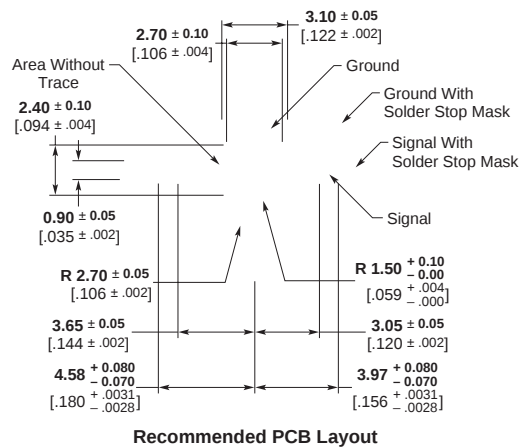
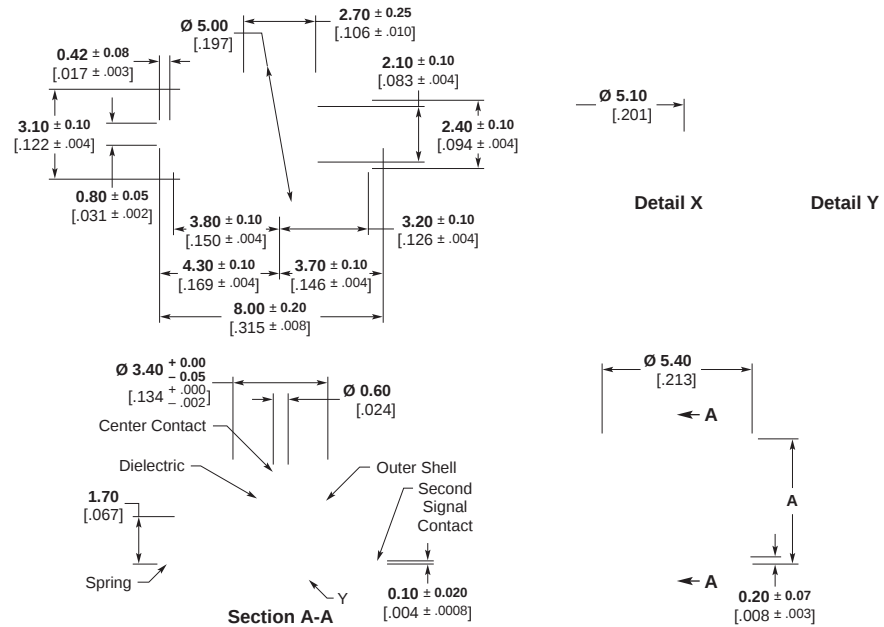
\*Dim. I is the width of the connector on the PCB.

Note: Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## COAXICON Series Mobile Phone Switching Coax Connectors (Continued)

### Switching SMD Jack Low Profile

Part Number 619061-1,  
Part Number 619062-1, and  
Part Number 619072-1



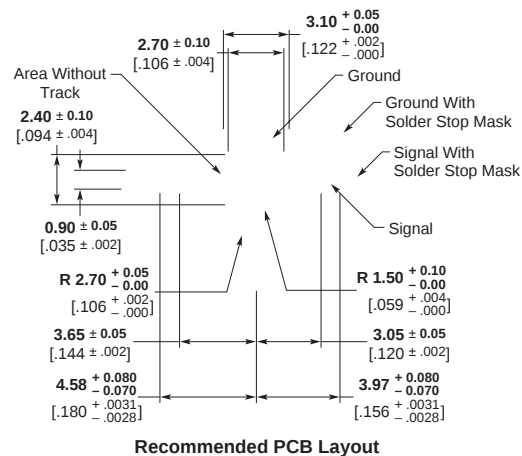
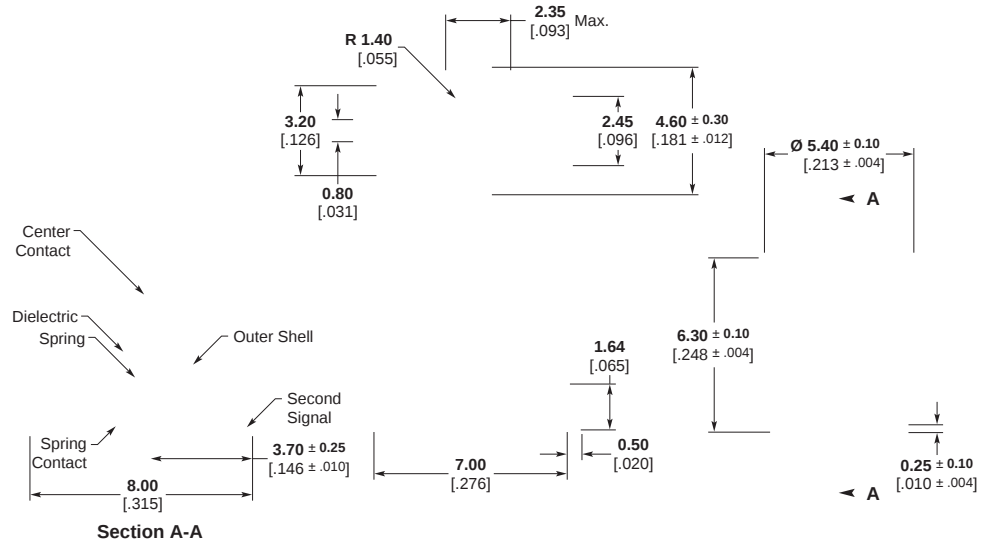
| Plating | Dim. A                         | Part No. |
|---------|--------------------------------|----------|
| Gold    | $6.00 \pm 0.10$<br>.236 ± .004 | 619061-1 |
| Gold    | $4.50 \pm 0.10$<br>.177 ± .004 | 619062-1 |
| Gold    | $3.50 \pm 0.10$<br>.138 ± .004 | 619072-1 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**COAXICON Series Mobile Phone Switching Coax Connectors (Continued)**

**Switching SMD Jack**  
**ESD Protected**  
**Part Number 619133-3**

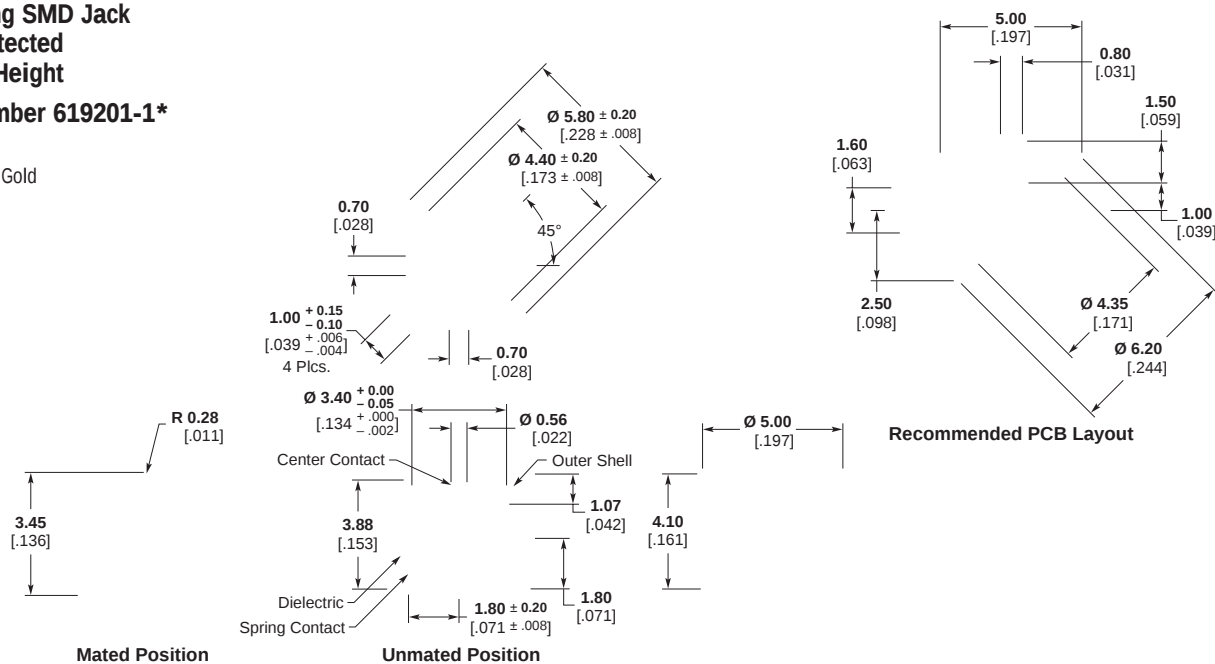
**Plating — Gold**



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

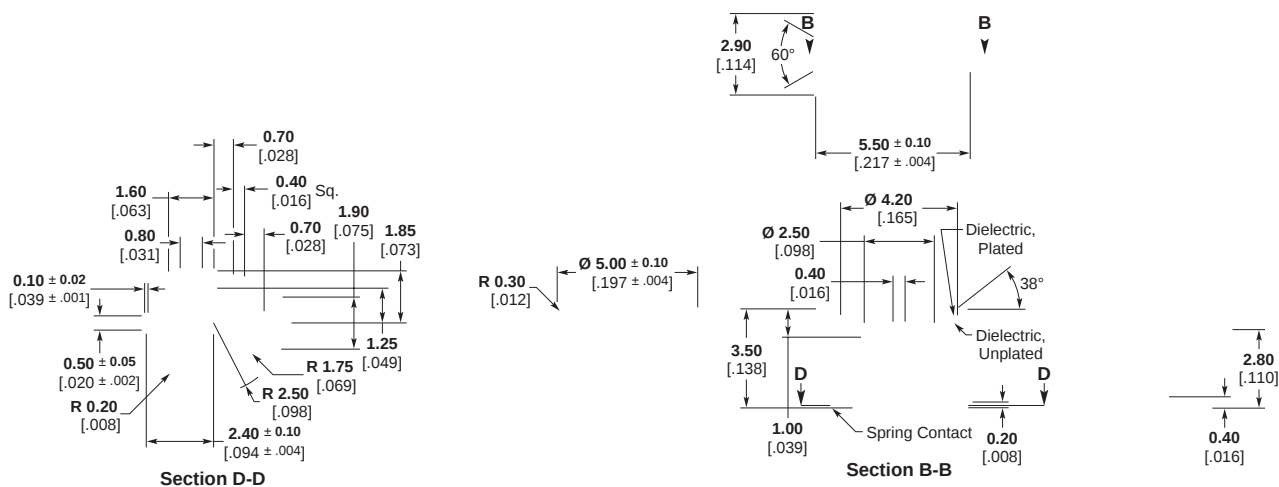
**Switching SMD Jack**  
**ESD Protected**  
**4.1mm Height**  
**Part Number 619201-1\***

### Plating — Gold



**\*Mirrored Version of Part Number 619201-1 Also Available Under Part Number 619231-1**

### Plating — Gold



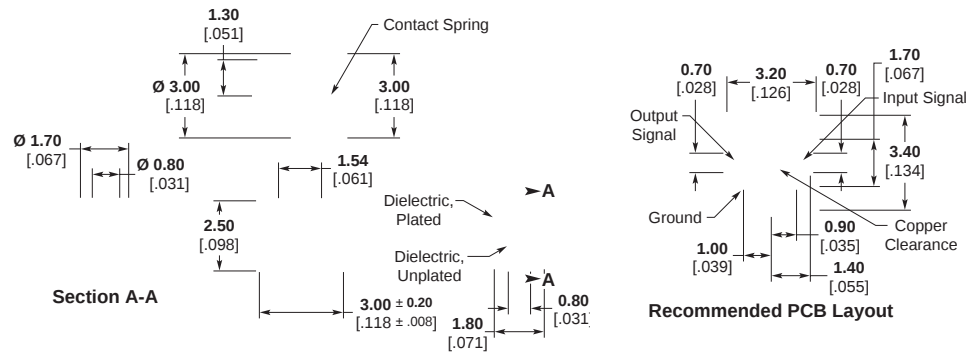
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## COAXICON Series Mobile Phone Switching Coax Connectors (Continued)

### Micro Switching Coax Connector

Part Number 619196-1

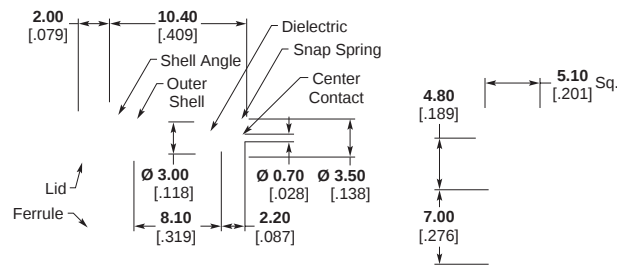
Plating — Gold



### Right-Angle Cable Plug For Micro Switching Coax Connector Cable RG 316/ RG 174

Part Number 619211-2

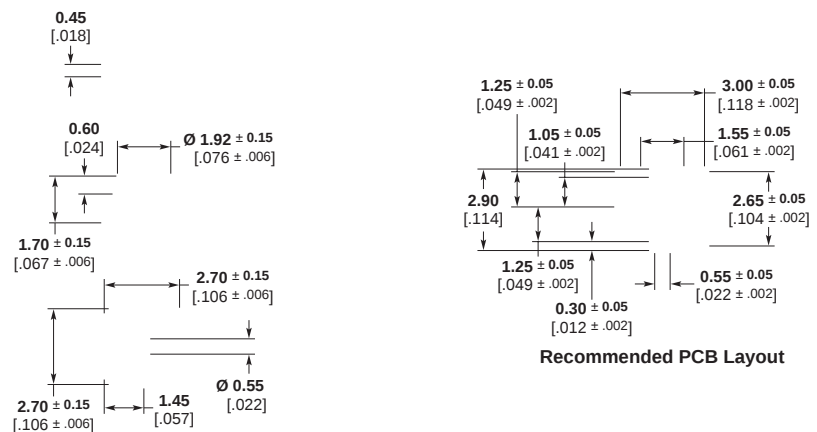
Plating — Gold



### Nano Switching Coax

Part Number 619213-1

Plating — Gold

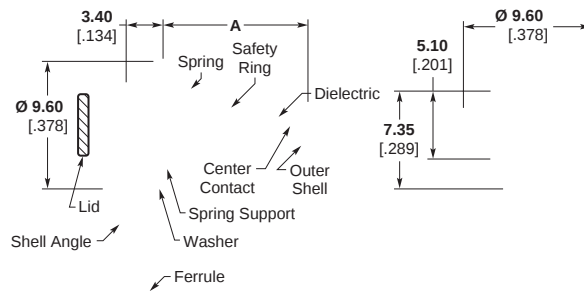


**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## COAXICON Series Mobile Phone Switching Coax Connectors (Continued)

### Protected Front Contact Cable Plug

Part Number 5-619028-1,  
Part Number 5-619078-1,  
and Part Number 5-619137-1



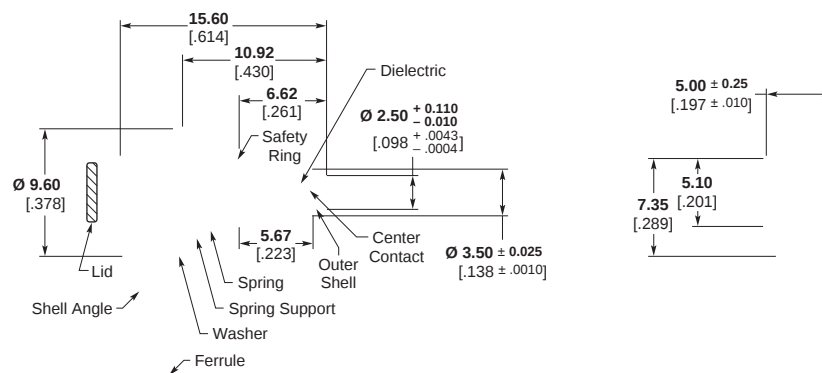
| Plating | Dim. A        | Part No.    |
|---------|---------------|-------------|
| Gold    | 10.92<br>.430 | 5-619028-1  |
| Gold    | 14.90<br>.587 | 5-619078-1  |
| Gold    | 10.92<br>.430 | 5-619137-1* |

Bulk packaging.  
\*Outer conductor without slot.

### Protected Front Contact Cable Plug With Cylindrical Interface

Part Number 5-619076-2

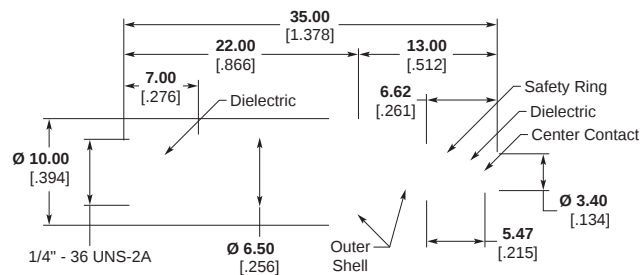
Plating — Gold  
Bulk packaging.



### Cable Plug/ SMA Jack Adapter

Part Number 619052-1

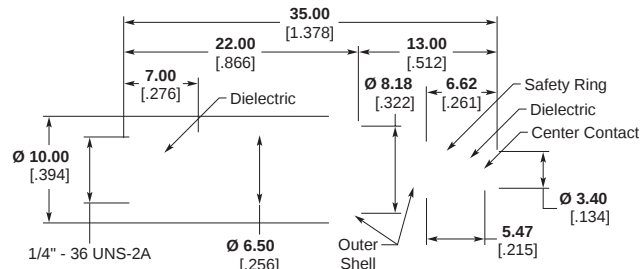
Plating — Gold



### Cable Plug/ SMA Jack Adapter With Conical Flange

Part Number 619068-1

Plating — Gold

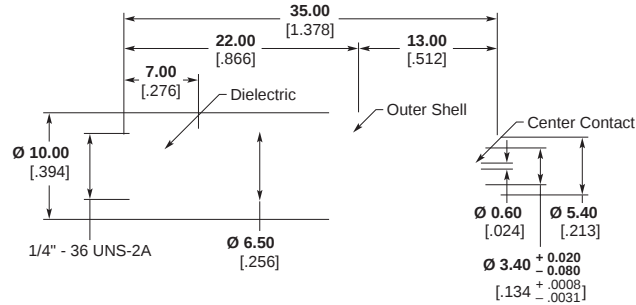


**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

**COAXICON Series Mobile Phone Switching Coax Connectors (Continued)**

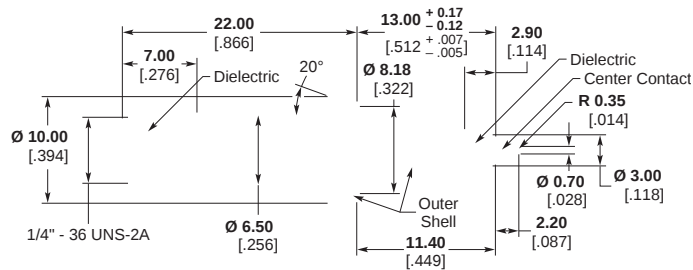
**Switching SMD Jack/  
SMA Jack Adapter  
Part Number 619053-1**

Plating — Gold



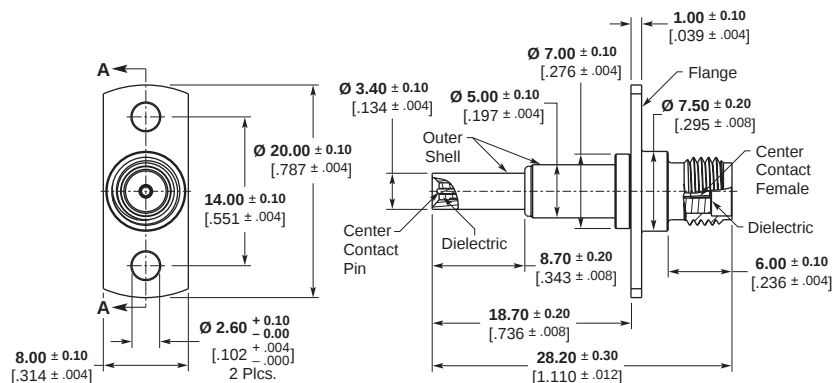
**Adapter SMA Jack —  
MSC Test Plug  
With Conical Flange  
Part Number 619210-1**

Plating — Gold



**Adapter SMA Jack —  
NSC Test Plug With  
Two-Hole Flange  
Part Number 619214-1**

Plating — Gold



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

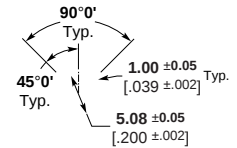
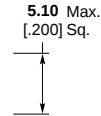
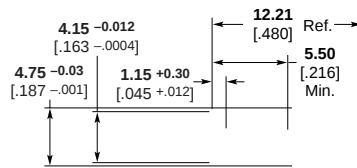




## DIN Inserts (Continued)

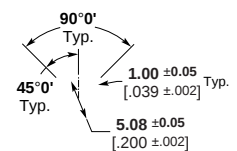
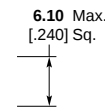
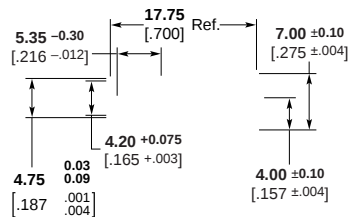
### Coaxial Inserts, 50 Ohm Z-PACK 2mm HM Connectors

#### Vertical PC Board Mount, Compliant



Recommended  
PC Board Layout

#### Right-Angle PC Board Mount, Compliant

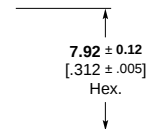
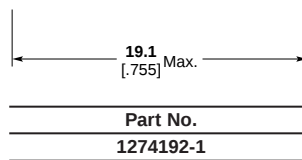


Recommended  
PC Board Layout

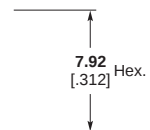
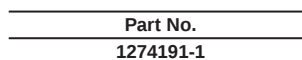
| Type                           | Housing Type         | Application Tooling                | Part No.  |
|--------------------------------|----------------------|------------------------------------|-----------|
| Vertical PCB Socket, Compliant | Z-PACK 2mm HM Male   | 904800-1                           | 5148385-1 |
| Rt. Angle PCB Pin, Compliant   | Z-PACK 2mm HM Female | 904805-1<br>904804-1 Support Anvil | 5148386-1 |

### Coaxial Inserts to SMA Adapters

#### Coaxial Insert Plug to SMA Jack



#### Coaxial Insert Socket to SMA Jack

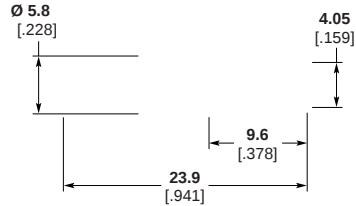


**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## DIN Inserts (Continued)

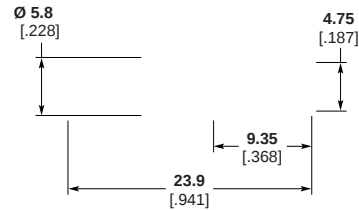
### Coaxial Inserts (50 /75 )

#### Bulkhead Cable Jack for male connectors



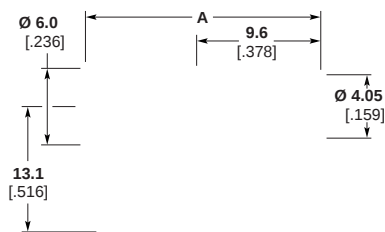
| Ø Max.       | Cable Type   | Width Across Flats of Hex Profile | Part No.    |
|--------------|--------------|-----------------------------------|-------------|
| 2.6<br>.102  | RG 316 (50 ) | 3.2<br>.126                       | 1392020-1   |
| 2.67<br>.105 | RG 179 (75 ) | 3.2<br>.126                       | 3-1393668-4 |

#### Bulkhead Cable Jack for female connectors



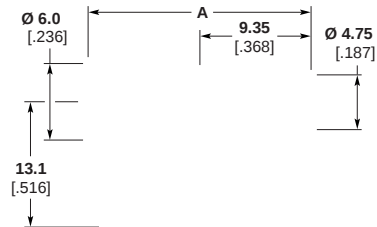
| Ø Max.       | Cable Type   | Width Across Flats of Hex Profile | Part No.    |
|--------------|--------------|-----------------------------------|-------------|
| 2.6<br>.102  | RG 316 (50 ) | 3.2<br>.126                       | 1392019-1   |
| 2.67<br>.105 | RG 179 (75 ) | 3.2<br>.126                       | 3-1393668-0 |

#### Right-Angle Bulkhead Jack for male connectors



| Dim A        | Ø Max.       | Cable Type   | Width Across Flats of Hex Profile | Part No.    |
|--------------|--------------|--------------|-----------------------------------|-------------|
| 19<br>.748   | 2.6<br>.102  | RG 316 (50 ) | 3.2<br>.126                       | 1-1393668-2 |
|              | 2.67<br>.105 | RG 179 (75 ) |                                   |             |
| 22.4<br>.882 | 2.67<br>.105 | RG 179 (75 ) | 3.2<br>.126                       | 2-1393668-8 |
| 24.0<br>.945 | 2.67<br>.105 | RG 179 (75 ) | 3.2<br>.126                       | 3-1393668-6 |

#### Right-Angle Bulkhead Plug for female connectors



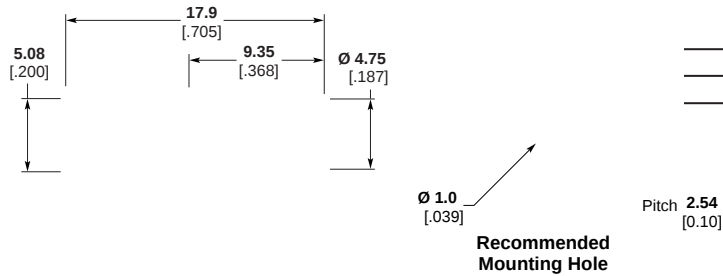
| Dim A        | Ø Max.       | Cable Type   | Width Across Flats of Hex Profile | Part No.    |
|--------------|--------------|--------------|-----------------------------------|-------------|
| 18.7<br>.736 | 2.6<br>.102  | RG 316 (50 ) | 3.2<br>.126                       | 1393668-4   |
| 22.3<br>.878 | 2.6<br>.102  | RG 316 (50 ) | 3.2<br>.126                       | 1393668-8   |
| 18.7<br>.736 | 3.0<br>.118  | RD 316 (50 ) | 3.6<br>.142                       | 1393668-7   |
| 18.7<br>.736 | 2.67<br>.105 | RG 179 (75 ) | 3.2<br>.126                       | 2-1393668-4 |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

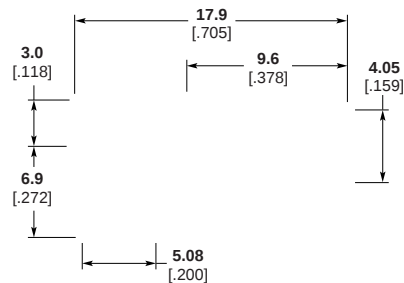
## DIN Inserts (Continued)

### Coaxial Inserts (50 /75 ) (Continued)

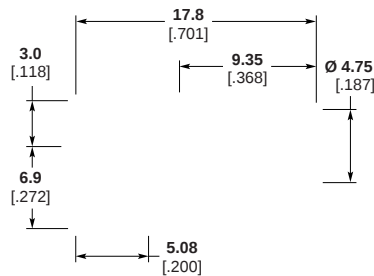
**Bulkhead Plug, PC Board  
connection for DIN 41612 M  
female connectors**



**Right-Angle Bulkhead Jack,  
PC Board for DIN 41612 M  
male connectors**



**Right-Angle Bulkhead Plug,  
PC Board for SIEDECON  
female connectors**



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Size 8 Contacts

### Performance Characteristics

**Frequency Range** — 0 to 500 MHz

**Operating Voltage, Max.** —  
275 vac rms @ sea level

**Termination Resistance, Max.** —  
Center Contact — 6.0 milliohms  
Outer Contact — 3.0 milliohms

**Insulation Resistance, Min.** —  
5,000 megohms @ 500 vdc

**Dielectric Withstanding Voltage** —  
Sea Level — 800 Volts rms  
30,000 ft [9,144 m] — 525 volts rms  
70,000 ft [21,336m] — 275 volts rms

**VSWR to 500MHz, Max.**

| Pin/Socket              | VSWR |
|-------------------------|------|
| Straight/Straight       | 1.30 |
| Right-Angle/Straight    | 1.35 |
| Right-Angle/Right-Angle | 1.40 |

**RF Crosstalk** — 90dB @ 5-500 MHz

**Mating Force, Max.** — 4.0 lb  
[17.8 N]

**Unmating Force, Min.** — 2.0 oz  
[0.556 N]

**Contact Retention** — 20 lb [89 N]

**Contact Durability** — 500 cycles

| Cable<br>RG/U                     | Force |       |
|-----------------------------------|-------|-------|
|                                   | lb    | [N]   |
| 316, 188, 174,<br>179, 179A, 179B | 20    | 89    |
| 188-type<br>Double-Braid          | 35    | 155.8 |
| 142, 142A, 142B                   | 50    | 222.5 |

**Operating Temperature** —  
55°C to +125°C

**Thermal Shock** — 55°C to +125°C per  
MIL-STD-1344, Method 1003, Cond. A

**Physical Shock** — 50 G's per MIL-  
STD-1344, Method 2004, Cond. A

**Vibration** — MIL-STD-1344, Method  
2005, Cond. II

**Moisture Resistance** — 240 hours  
per MIL-STD-1344, Method 1002,  
Cond. II

**Salt Fog** — 48 hours per MIL-STD-  
1344, Method 1001, Cond. B

### Extraction Tool Numbers

**Subminiature D Housings** —  
58095-1 (AMPLIMITE)

**AMP-HDI Housings** — 58095-2

### Material

**Brass** — per QQ-B-626 and MIL-C-50

**Phosphor Bronze** — per QQ-B-750

**Beryllium Copper** — per QQ-C-530  
3 7 ) (—per MIL-P-19468

**Nylon** — per MIL-M-20693

### Finish

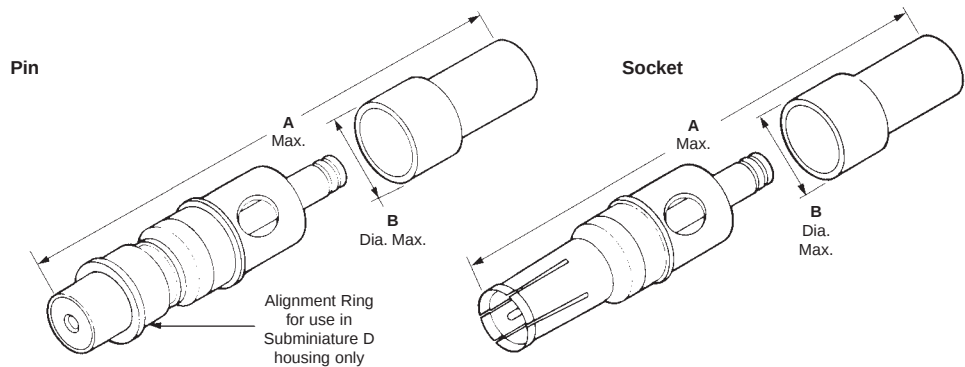
**Bright Tin Plating** — per ASTM-B-571

**Copper Plating** — per MIL-C-14550

**Gold Plating** — per MIL-G-45204

**Nickel Plating** — per QQ-N-290

### Straight Contacts



| RG/Cable                                              | Shell<br>Type | Dimensions    |              | Die<br>Insert* | 50 Ohm    |           | Non-Impedance Matched |           |
|-------------------------------------------------------|---------------|---------------|--------------|----------------|-----------|-----------|-----------------------|-----------|
|                                                       |               | A             | B            |                | Pin       | Socket    | Pin                   | Socket    |
| 178, 178A<br>178B, 196, 196A                          | Brass         | 24.13<br>.950 | 5.94<br>.234 | 59993-1        | —         | —         | 5228618-5             | 5228596-5 |
| 174, 316,<br>188, 188A                                | Brass         | 24.28<br>.956 | 5.94<br>.234 | 59993-1        | 5221980-1 | —         | 5228618-1             | 5228596-1 |
| 179, 179A,<br>179B, 187,<br>187A, 161,<br>BELDEN 9221 | Brass         | 24.28<br>.956 | 5.94<br>.234 | 59993-1        | —         | —         | 5228618-2             | 5228596-2 |
| 174, 316, 188,<br>Double Braid                        | Brass         | 24.28<br>.956 | 5.94<br>.234 | 59993-1        | —         | —         | 5228618-3             | 5228596-3 |
| 142, 142A, 142B,<br>400, BELDEN 9246                  | Brass         | 27.43<br>1.08 | 6.48<br>.255 | 58212-1        | —         | 5221981-2 | 5228618-4             | 5228596-4 |

\*For hand tool 69710-1 or pneumatic tool 69365-8.

**Note:** Non-Impedance Matched and 50 Ohm are not interchangeable.

BELDEN is a trademark of Belden Wire  
and Cable Company.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

### PC Board Mount Contacts

### Right-Angle Socket Contact

|             |              |
|-------------|--------------|
| <b>6.50</b> | <b>11.33</b> |
| [.256]      | [.446]       |

**5.08 ±0.08**  
[.200 ±.003]

$$2.54 \pm 0.08$$

$$[.100 \pm .003]$$
$$5.08 \pm 0.08$$

$$[.200 \pm .003]$$
$$2.54 \pm 0.08$$

$$[.100 \pm .003]$$

## Recommended PC Board Layout

| Type                       | Contact Part No.      |
|----------------------------|-----------------------|
|                            | Non-Impedance Matched |
| Right-Angle Socket Contact | <b>5221162-1</b>      |

243



## Miniature Contacts

### Performance Characteristics

**Insulation Resistance** — 5000 megohms min

**Dielectric Withstanding Voltage** — 1,000 volts rms for 1 minute

**Contact Resistance** — 2.0 milliohms @ 1 ampere

**Low-Level Conductivity** — 10 milli-volts DC min.

**VSWR** — 1.3 to 1.0 @ 1,000 MHz max.

### Cable Retention —

| RG/U Cable | Retention lbs [N] |
|------------|-------------------|
| 58C        | 50 [222]          |
| 188A       | 30 [133]          |
| 180B       | 28 [125]          |
| 195A       | 16 [71]           |

**Durability** — 500 cycles @ 10 cycles per minute max.

**Vibration** — 2 hrs. per MIL-STD-202, Method 201

**Shock** — 50 G's per MIL-Std-202, Method 213, Cond. G

**Temperature Cycling** — 5 cycles per MIL-STD-202, Method 102, Cond C.

**Temperature Range** — -55°C to +125°C

**Test Method for Electronic and Electrical Component Parts** — MIL-STD-202

### Material

**Outer Shell** — Brass per MIL-C-50

**Center Conductor** — Brass per QQ-B-626, or Beryllium copper per QQ-C-533

### Note:

A ferrule and retention spring (201142-2) are required for each pin and socket.  
Extraction Tool No. 305183-8

**Inner Dielectric** — Polypropylene, nylon, or polymethylpentene, general purpose

**Retention Spring** — Stainless steel per QQ-S-766

**Ferrule** — Copper per QQ-C-576

### Finish

**Outer Shell, Center Conductor** — 0.00076 [.000030] gold over 0.00076 [.000030] nickel

**Retention Spring** — Nickel per QQ-N-290

**Ferrule** — Bright tin per MIL-T-10727

### Retention Springs Part No. 201142-2

### Ferrules

### Pin

### Socket

| RG/U Cable                                                            | Ferrule No. | Integral Die Hand Tool | PRO-CRIMPER | Die Insert for Tools:<br>Hand Tool 69710-1<br>Pneu. 69365-2,<br>69365-3 <sup>2</sup> | Part Numbers     |                  |
|-----------------------------------------------------------------------|-------------|------------------------|-------------|--------------------------------------------------------------------------------------|------------------|------------------|
|                                                                       |             |                        |             |                                                                                      | Pin              | Socket           |
| 316, 188, 188A<br>174                                                 | 328666      | —                      | —           | 69227-2                                                                              | <b>201143-5</b>  | <b>201144-5</b>  |
| 179, 179A, 179B<br>161, 187, 187A<br>Belden 9221                      | 328666      | —                      | —           | 69227-2                                                                              | <b>201143-1</b>  | <b>201144-1</b>  |
| 188 Double Braid<br>316 Double Braid                                  | 221848-3    | 58290-1                | —           | 69227-2                                                                              | <b>201143-5</b>  | <b>201144-5</b>  |
| 122                                                                   | 328664      | 45639-2                | 91912-3     | 69222-2                                                                              | <b>201145-1</b>  | —                |
| 180, 180A, 180B<br>195, 195A,<br>21-597                               | 328664      | 45639-2                | 91912-3     | 69222-2                                                                              | <b>201145-2</b>  | <b>201146-2</b>  |
| Belden 8218                                                           | 328664      | 45639-2                | 91912-3     | 69222-2                                                                              | <b>201145-2</b>  | <b>201146-2</b>  |
| 58, 58A, 58B, 58C                                                     | 328663      | 45740-2                | —           | 69220-2                                                                              | <b>201145-4</b>  | <b>201146-4</b>  |
| 141<br>55, 55A, 55B, 223                                              | 330478      | 69248-4                | —           | 69315-4                                                                              | <b>201145-4</b>  | <b>201146-4</b>  |
| 124, 140, 210<br>62, 62A, 62B<br>59, 59A, 59B                         | 329006      | —                      | —           | 69675-1                                                                              | <b>201097-1*</b> | <b>201098-1*</b> |
| <b>Twisted Pair</b>                                                   |             |                        |             |                                                                                      |                  |                  |
| 24-22 AWG [0.2-0.4 mm <sup>2</sup> ]<br>(Stranded) <sup>1</sup>       | 328666      | 91912-4                | —           | 69672                                                                                | <b>201143-5</b>  | <b>201144-5</b>  |
| Shielded Wire<br>22, NAS-702, Class B                                 | 328663      | 45740-2                | —           | 69220-2                                                                              | <b>201145-4</b>  | <b>201146-4</b>  |
| Brand Rex T5788A<br>26 AWG [0.12-0.155 mm <sup>2</sup> ] <sup>3</sup> | 328664      | 45639-2                | 91912-3     | 69222-2                                                                              | <b>201145-2</b>  | <b>201146-2</b>  |

\*These contacts are for use in the 4-position G Series connector modules only.

<sup>1</sup>Maximum insulation diameter—**2.92** [.115] (two wires combined).

<sup>2</sup>Includes bench mount and foot control; requires Manual Take-Up Attachment No. 69689.

<sup>3</sup>Dielectric O.D.—**2.69** [.106] max.; Cable O.D.—**4.06** [.160].

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Miniature PC Board Sockets

### Material

**Shell and Center Contact** — Brass  
per MIL-C-50 and QQ-B-626

**Dielectric** — Polypropylene, or  
Polymethylpentene, general purpose

Shell

### Finish

**Center Contact** — 0.00076 [.000030]  
gold over copper

**Shell** — Gold plated per MIL-G-45204

Spring Latch

### Performance Characteristics

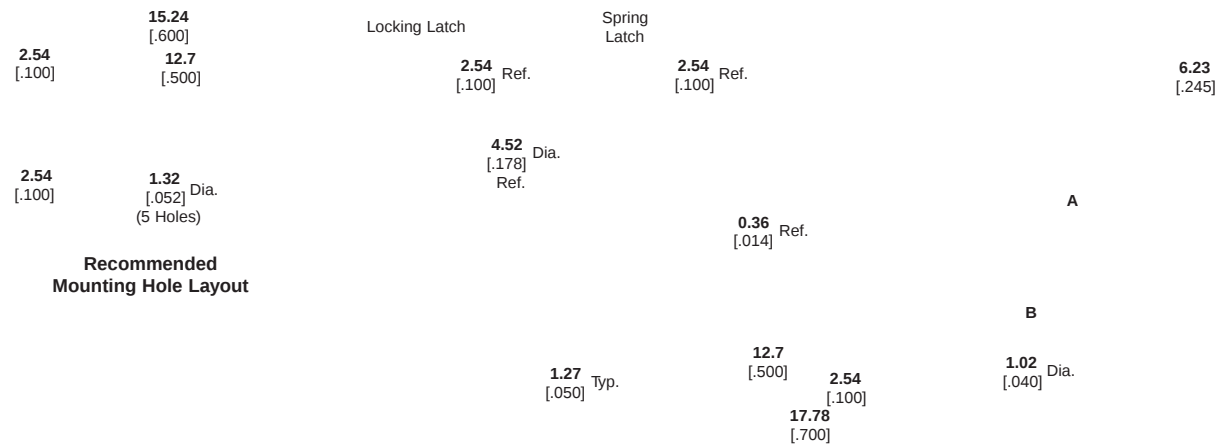
**Dielectric Withstanding Voltage** —  
1,000 volts, rms

**Impedance** — Non-constant

**Operating Temperature Range** —  
-55°C to +85°C

Locking Latch

Center Conductor



| Type          | PC Board Thickness  | Retention |      | Dimensions          |                     | Part No.       |
|---------------|---------------------|-----------|------|---------------------|---------------------|----------------|
|               |                     | lb.       | [N]  | A                   | B                   |                |
| Spring Latch  | <b>1.57</b><br>.062 | 1.25      | 5.56 | <b>9.07</b><br>.357 | <b>3.18</b><br>.125 | <b>50084-1</b> |
| Spring Latch  | <b>3.18</b><br>.125 | 1.25      | 5.56 | <b>7.49</b><br>.295 | <b>4.75</b><br>.187 | <b>50095-1</b> |
| Locking Latch | <b>3.18</b><br>.125 | 7         | 31.1 | <b>7.49</b><br>.295 | <b>4.75</b><br>.187 | <b>50105-1</b> |
| Locking Latch | <b>1.57</b><br>.062 | 7         | 31.1 | <b>9.07</b><br>.357 | <b>3.18</b><br>.125 | <b>50107-1</b> |

**Note:** For mateable Miniature Contacts, see page 245.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Subminiature PC Board Sockets

### Material

**Shell and Center Contact** — Brass  
per MIL-C-50 and QQ-B-626

Shell

**Dielectric** — Polypropylene, or  
polymethylpentene, general purpose

Locking Latch

### Finish

**Center Contact** — 0.00076[.000030]  
gold per MIL-G-45204 over copper per  
MIL-C-14550

**Shell** — Gold

Spring Latch

Center Conductor

### Performance Characteristics

**Dielectric Withstanding Voltage** —  
600 volts, rms

**Operating Temperature Range** —  
-55°C to +85°C

22.23  
[.875] Max.

3.05 ±0.2  
[.120 ±.008]

1.09 Dia.  
[.043]  
#57 Drill  
(3 Holes)

1.47 [.058]

4.52  
[.178]

Locking  
Latch

A

0.84±0.2  
[.033±.008]

10.16  
[.400]

0.84 Dia.  
[.033]

10.16  
[.400]

15.24  
[.600]

15.24  
[.600]

### Recommended Mounting Hole Layout

| Type          | PC Board Thickness | Dim. L       | Part No. |
|---------------|--------------------|--------------|----------|
| Spring Latch  | 1.57<br>.062       | 2.54<br>.100 | 226023-1 |
| Locking Latch | 1.57<br>.062       | 2.54<br>.100 | 226060-1 |

### Mating Subminiature COAXICON Pins

These short Subminiature COAXICON Pins are recommended for use with any of the sockets listed above.

**Note:** Alignment springs are not required for this application and are not included with the pin assemblies.

| RG/U Cable                   | Ferrule No. | Integral Die Hand Tool | Die Insert for Tools:<br>Hand Tool 69710-1<br>Pneu. 69365-2,<br>69365-3 | Part No. |
|------------------------------|-------------|------------------------|-------------------------------------------------------------------------|----------|
| 174<br>316, 188, 188A        | 1-332056-0  | 91911-3                | 69690                                                                   | 51563-8  |
| 179, 179A, 179B<br>187, 187A | 1-332056-0  | 91911-4                | 69690-1                                                                 | 51563-8  |
| 161                          | 1-332056-0  | 69656-5                | —                                                                       | 51563-8  |

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Subminiature Contacts

### Material

**Outer Shell** — Brass per MIL-C-50

**Center Conductor** — Beryllium copper per QQ-C-533 (Pin); Brass per QQ-B-626 (Socket)

**Inner Dielectric** — Polypropylene, nylon, or polymethylpentene, general purpose

**Retention Spring** — Stainless steel per QQ-S-766

**Ferrule** — Copper per QQ-C-576

### Finish

**Outer Shell and Socket**

**Center Conductor** — 0.00076 [.000030] gold over 0.00127 [.000050] nickel

**Pin Center Conductor** — 0.00076 [.000030] gold over 0.00254 [.000100] copper

**Ferrule** — Bright tin per MIL-T-10727

| Pin                                                                             | A | Ferrule              | Socket |
|---------------------------------------------------------------------------------|---|----------------------|--------|
|                                                                                 |   |                      |        |
|                                                                                 |   | 16.51<br>[.650] Max. |        |
| <p>A = Multimate Pin <b>25.65</b> [1.010]<br/>Short Pin <b>22.66</b> [.892]</p> |   |                      |        |

### Selection Chart for Coaxial Cable

| RG/U Cable                                  | Integral Die Hand Tool | PRO-CRIMPER | Die Insert for Tools:<br>Hand Tool 69710-1<br>Pneu. Tool 69365-2,<br>69365-3* | Contact Part Numbers |           |                |            |
|---------------------------------------------|------------------------|-------------|-------------------------------------------------------------------------------|----------------------|-----------|----------------|------------|
|                                             |                        |             |                                                                               | Multimate Pin        | Short Pin | Socket         | Ferrule    |
| 178, 178A, 178B<br>196, 196A                | 69656-2                |             | 69690-2                                                                       | <b>226537-2</b>      | —         | <b>51565-2</b> | 1-332057-0 |
| 196<br>(Double Braid)                       | 69656-9                |             | —                                                                             | <b>226537-2</b>      | —         | <b>51565-2</b> | 225088-1   |
| 174, 316<br>188, 188A                       | —                      | 91911-3     | 69690                                                                         | <b>226537-1</b>      | —         | <b>51565-1</b> | 1-332056-0 |
| 179, 179A, 179B<br>187, 187A<br>Belden 9221 | —                      | 911911-4    | 69690-1                                                                       | <b>226537-1</b>      | —         | <b>51565-1</b> | 1-332056-0 |
| RD-316                                      | 69656-7                |             | —                                                                             | <b>226537-1</b>      | —         | <b>51565-1</b> | 225088-3   |
| 187<br>(Double Braid)                       | 69656-8                |             | —                                                                             | <b>226537-1</b>      | —         | <b>51565-1</b> | 225088-1   |
| 161                                         | 69656-5                |             | —                                                                             | <b>226537-1</b>      | —         | <b>51565-1</b> | 1-332056-0 |

### Selection Chart for Twisted Pairs and Shielded Wire

| Wire Size                                                                |                    | Integral Die Hand Tool | PRO-CRIMPER | Die Insert for Tools:<br>Hand Tool 69710-1<br>Pneu. Tool 69365-2,<br>69365-3* | Contact Part Numbers |                |                |            |
|--------------------------------------------------------------------------|--------------------|------------------------|-------------|-------------------------------------------------------------------------------|----------------------|----------------|----------------|------------|
| AWG                                                                      | [mm <sup>2</sup> ] |                        |             |                                                                               | Multimate Pin        | Short Pin      | Socket         | Ferrule    |
| 30<br>(Twisted Pair, Solid)                                              | 0.05               | 69656-2                | —           | 69690-2                                                                       | <b>226537-3</b>      | <b>51563-3</b> | <b>51565-3</b> | 1-332057-0 |
| 28<br>(Twisted Pair, Solid)                                              | 0.08-0.09          | —                      | 91911-3     | 69690                                                                         | <b>226537-3</b>      | <b>51563-3</b> | <b>51565-3</b> | 1-332057-0 |
| 28<br>(Twisted Pair, Stranded;<br>7 str., .005 [0.13] Dia.)              | 0.08-0.09          | —                      | 91911-4     | 69690-1<br>or<br>69690-2                                                      | <b>226537-3</b>      | <b>51563-3</b> | <b>51565-3</b> | 1-332057-0 |
| 26<br>(Twisted Pair,<br>Solid or Stranded;<br>7 str., .0063 [0.16] Dia.) | 0.12-0.15          | —                      | 91911-3     | 69690                                                                         | <b>226537-3</b>      | <b>51563-3</b> | <b>51565-3</b> | 1-332057-0 |
| 26<br>(Shielded, 0.75 [1.91]<br>Max. O.D.)                               | 0.12-0.15          | 69656-3                | —           | 69690-3                                                                       | <b>226537-1</b>      | —              | <b>51565-1</b> | 1-332057-0 |

\*Includes bench mount and foot control.

Extraction Tool 305183

**Note:** A ferrule is required for each pin and socket.

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## SIEMAX Connectors

### Applications

- Multiplex Systems
- Base Stations
- High Density Systems

### Product Facts

- Multi Coax Surface Mount
- Maximum packaging density
- Component placement on both sides of PCB
- Fully automated assembly (pick-and-place)
- Modular design

### Technical Data

- Interface: Series 1.0/2.3
- Impedance: 75
- International specifications: IEC 169-29 and CECC 22 230
- Frequency range up to 2 GHz
- Compact grid pitch 10 [0.39]
- Guaranteed coplanarity of max. 0.1 [0.004]
- Integrated positioning pins for manual placement
- Optional mechanical securing

SIEMAX connectors combine the benefits of surface mount technology and modular design. This multi coax connector is packaged in tape-and-reel for automatic placement, has optimum solder joints and 100% reflow suitability. This con-

necter is ideal for systems requiring superior packaging density because it can be placed on both sides of the printed circuit board.

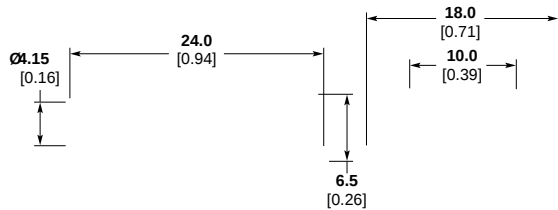
The modular design provides flexibility in terms of the number of poles offered (two- or three-poles). It can

be stacked, enabling any required configuration to be produced. The SIEMAX connector also allows the use of any other connector series, e.g. SMB, is resistant to high temperatures, and is robust, with reliably sustained coplanarity.

For General Information  
on Series 1.0/2.3 Connectors, see  
Page 129.

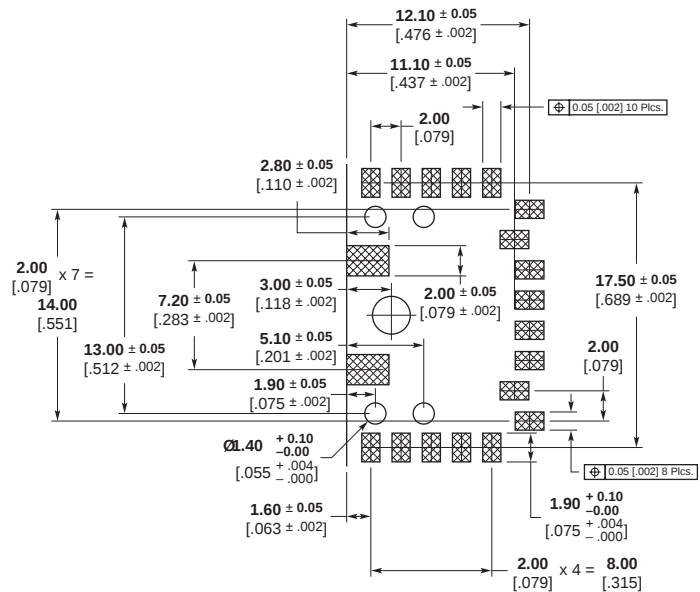
## SIEMAX Connectors, Series 1.0/2.3 (75 Ohm)

### SIEMAX Connector, SMT Right-Angle Jack, 2 Poles



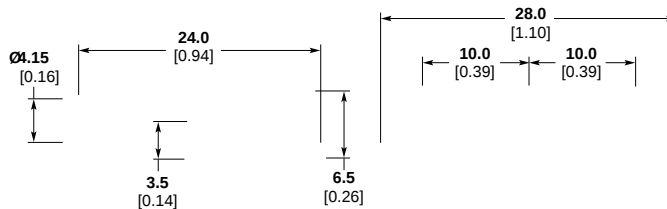
| Coupling type* | Part No.    |
|----------------|-------------|
| C, F           | 6-1393696-2 |

\*For coupling type see DIN 1.0/2.3 Section.



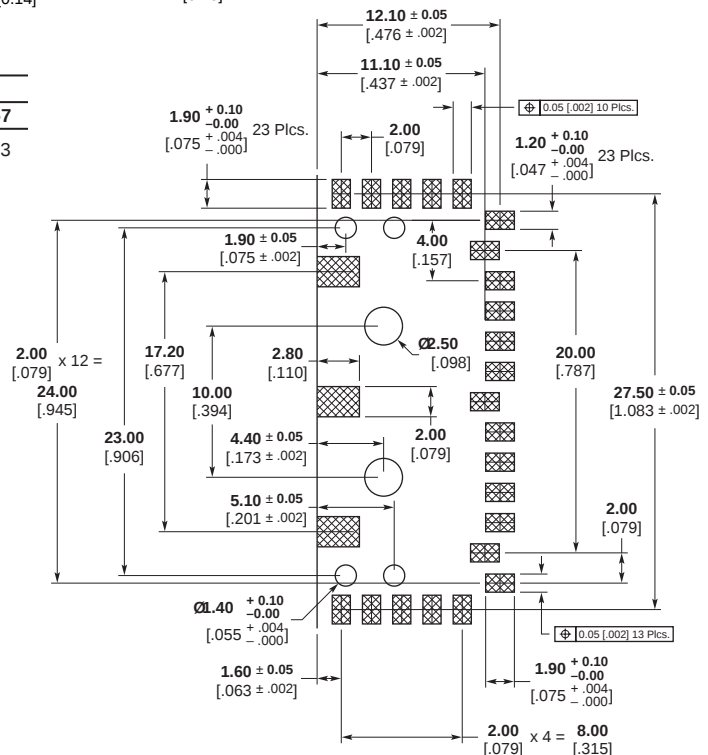
PC Board Layout

### SIEMAX Connector, SMT Right-Angle Jack, 3 Poles



| Coupling type* | Part No.    |
|----------------|-------------|
| C, F           | 6-1393696-7 |

\*For coupling type see DIN 1.0/2.3 Section.



PC Board Layout

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters

Between Series Coaxial Transmission Line Adapters provide convenient transitions between popular series coaxial connectors. The adapter design provides a minimum length consistent with good electrical performance. The small size, low VSWR, and broad frequency coverage permits a wide range of applications in both measurement and systems use.

### Design and Construction

The standard units are constructed of stainless steel with passivated finish, nickel plated brass, and gold plated brass. The material and plating is to be consistent with the basic connector series. All dielectrics are TFE fluoro-carbon. The center contacts are made of beryllium copper, gold plated.

### Types

The straight in-line adapters are available in many combinations of plug and jack (male and female) configurations. Also, popular panel mount versions are cataloged. For special modifications and hermetic seal version, consult Tyco Electronics.

### Application

The major application is the requirement for a low VSWR, compact transition in both test system and operating systems. Many panel mount and bulkhead mount versions are available so the designer can use small size connectors for internal design, but adapt to a larger rugged version for external connection.

Selection charts follow to help you find the correct adapter for your application.

### Plug-Plug

|                | N Series | OSP      | OSP Bulkhead | BNC      | 7-16     | SMB      | SMA      | SMP      | SSMT     | Series 1.0/2.3 | QMA      |
|----------------|----------|----------|--------------|----------|----------|----------|----------|----------|----------|----------------|----------|
| MCX            |          |          |              |          |          |          | Page 253 |          |          |                |          |
| N Series       |          |          |              |          | Page 253 |          |          |          |          |                |          |
| BNC            |          |          |              |          |          | Page 253 |          |          |          |                |          |
| Series 1.6/5.6 |          |          |              | Page 253 |          |          |          |          |          | Page 253       |          |
| SMA/SMA 18 GHz | Page 253 | Page 253 | Page 253     |          |          | Page 253 |          | Page 253 | Page 253 |                | Page 253 |

### Jack-Jack

|                             | MCX      | N Series N Series Flange Mount N Series Bulkhead | OSP OSP Bulkhead OSP Floating Rear Mount | BNC Bulkhead | TNC TNC Flange Mount TNC Bulkhead | 7-16     | SMB 75 OHM SMB | SMP      | SSMT     | Series 1.0/2.3 | Series 1.6/5.6 |
|-----------------------------|----------|--------------------------------------------------|------------------------------------------|--------------|-----------------------------------|----------|----------------|----------|----------|----------------|----------------|
| N Series                    |          |                                                  |                                          |              |                                   | Page 254 |                |          |          |                |                |
| BNC                         |          |                                                  |                                          |              |                                   |          | Page 254       |          |          |                | Page 256       |
| TNC                         |          | Page 254                                         |                                          | Page 254     |                                   |          |                |          |          |                |                |
| SMA SMA Bulkhead SMA 18 GHz | Page 254 | Page 254 and 255                                 | Page 255 and 256                         | Page 254     | Page 254 and 255                  |          | Page 255       | Page 255 | Page 255 |                |                |
| Series 1.0/2.3              |          |                                                  |                                          |              |                                   |          |                |          |          |                | Page 256       |

## Between Series Adapters (Continued)

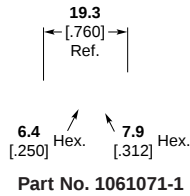
### Jack-Plug

|                                       | 7 mm     | 7 mm best VSWR | MCX      | N Series<br>N Series Flange Mount | OSP<br>OSP Bulkhead | BNC      | TNC      | SMB      | SMA<br>SMA Flange Mount<br>SMA 18 GHz | SMP      | SSMT     | DIN-Series 1.0/2.3 | DIN-Series 1.6/5.6 | UMCC     |
|---------------------------------------|----------|----------------|----------|-----------------------------------|---------------------|----------|----------|----------|---------------------------------------|----------|----------|--------------------|--------------------|----------|
| 7 mm                                  |          |                |          | Page 256                          | Page 256            |          | Page 256 |          | Page 256                              |          |          |                    |                    |          |
| 7 mm best VSWR                        |          |                |          | Page 256                          |                     |          | Page 256 |          |                                       |          |          |                    |                    |          |
| MCX                                   |          |                |          |                                   |                     |          |          |          | Page 256                              |          |          |                    |                    |          |
| N Series<br>N Series Flange Mount     | Page 256 | Page 257       |          |                                   |                     | Page 257 | Page 257 |          | Page 257                              |          |          |                    |                    |          |
| OSP<br>OSP Bulkhead                   | Page 257 |                |          |                                   |                     |          |          |          | Page 257                              |          |          |                    |                    |          |
| BNC                                   |          |                |          | Page 257                          |                     |          |          | Page 257 | Page 257                              |          |          |                    | Page 259           |          |
| TNC<br>TNC Flange Mount               | Page 258 | Page 258       |          | Page 258                          |                     |          |          |          | Page 258                              |          |          |                    |                    |          |
| SMB<br>75 OHM SMB                     |          |                |          | Page 259                          |                     |          |          |          | Page 258                              |          |          |                    |                    |          |
| SMA<br>SMA Flange Mount<br>SMA 18 GHz | Page 259 |                | Page 258 | Page 258<br>and 259               | Page 260            | Page 258 | Page 259 | Page 259 |                                       | Page 259 | Page 259 |                    |                    | Page 259 |
| SMP                                   |          |                |          |                                   |                     |          |          |          | Page 260                              |          |          |                    |                    |          |
| SSMT                                  |          |                |          |                                   |                     |          |          |          | Page 260                              |          |          |                    |                    |          |
| DIN-Series 1.0/2.3                    |          |                |          |                                   |                     |          |          |          |                                       |          |          |                    | Page 260           |          |
| DIN-Series 1.6/5.6                    |          |                |          |                                   |                     | Page 259 |          |          |                                       |          |          | Page 260           |                    |          |
| QMA                                   |          |                |          |                                   |                     |          |          |          | Page 260                              |          |          |                    |                    |          |
| UMCC                                  |          |                |          |                                   |                     |          |          |          | Page 260                              |          |          |                    |                    |          |

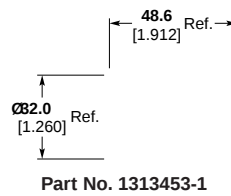
## Between Series Adapters (Continued)

### Plug-Plug

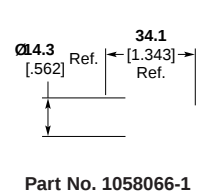
#### MCX Plug – SMA Plug



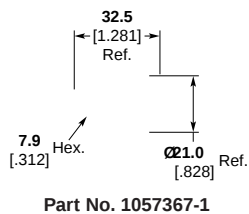
#### 7-16 Plug – N Series Plug



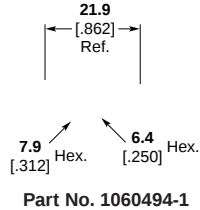
#### BNC Plug – SMB Plug



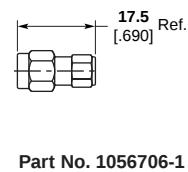
#### SMA 18 GHz Plug – N Series Plug



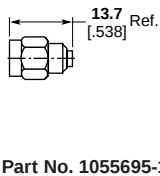
#### SMA Plug – SMB Plug



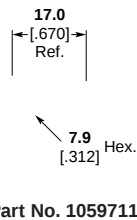
#### SMA Plug – SMP Plug



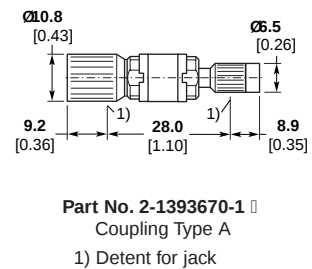
#### SMA Plug – SSMT Plug



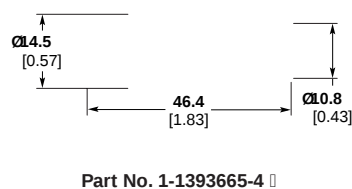
#### SMA Plug – OSP Plug



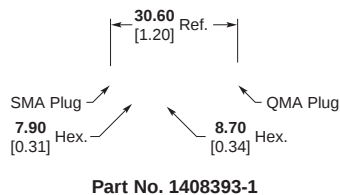
#### Series 1.6/5.6 Plug – Series 1.0/2.3 Plug



#### BNC Plug – Series 1.6/5.6 Plug



#### QMA Plug – SMA Plug

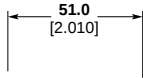


**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters (Continued)

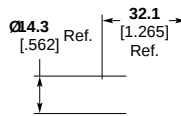
### Jack-Jack

**7-16 Jack – N Series Jack**



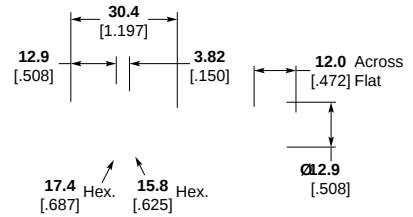
Part No. 1311206-1

**BNC Jack – SMB Jack**



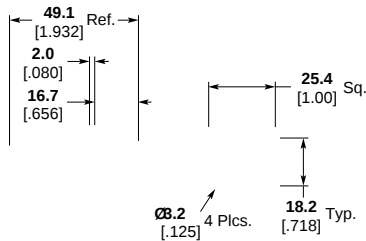
Part No. 1058056-1

**BNC Jack – 75 ohm SMB Jack**



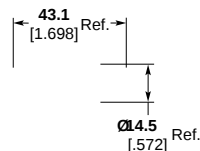
Part No. 1311209-1

**TNC Jack – N Series Flange Mount Jack**



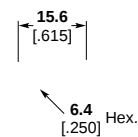
Part No. 1057843-1

**TNC Jack – BNC Jack**



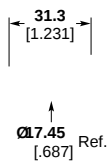
Part No. 1057845-1

**MCX Jack – SMA Jack**



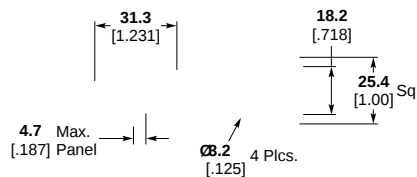
Part No. 1061070-1

**SMA Jack – N Series Jack**



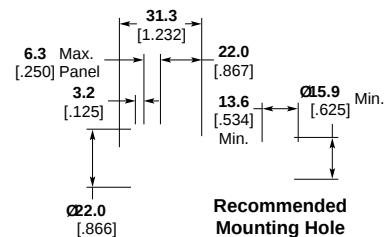
Part No. 1057341-1

**SMA Jack – N Series Flange Mount**



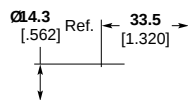
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**SMA Jack – N Series Bulkhead Jack**



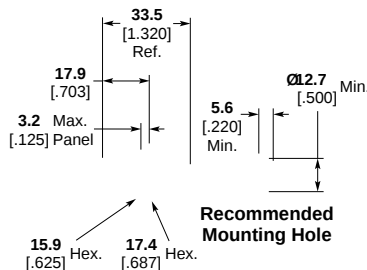
Part No. 1057463-1

**SMA Jack – BNC Jack**



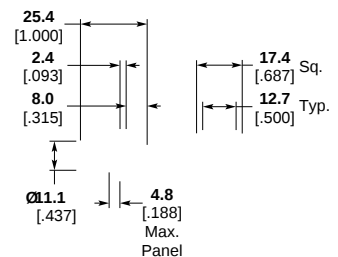
Part No. 1058058-1

**BNC Bulkhead Jack – SMA Jack**



Part No. 1058117-1

**TNC Flange Mount Jack – SMA Jack**

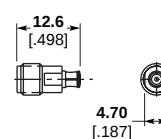


Part No. 1057841-1

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

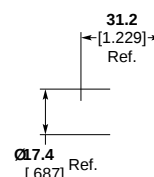
## Jack-Jack (Continued)

### SMA Jack – SMP Jack



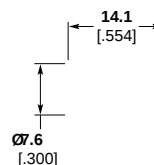
Part No. 1056702-1

### SMA 18 GHz Jack – N Series Jack



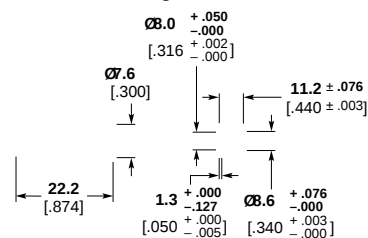
Part No. 1058651-1

### OSP Jack – SMA Jack



Part No. 1059707-1

### SMA Jack – OSP Floating Rear Mount Jack



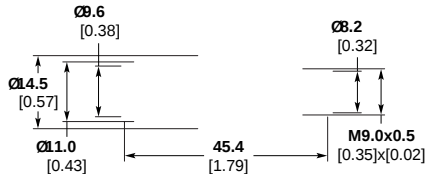
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**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters (Continued)

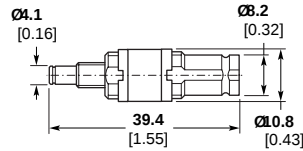
### Jack-Jack (Continued)

**BNC Jack –  
Series 1.6/5.6 Jack**



Part No. 1-1393665-5 □

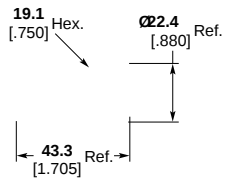
**Series 1.0/2.3 Jack –  
Series 1.6/5.6 Jack**



Part No. 2-1393670-4 □  
Coupling Type A, B, F

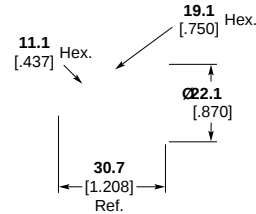
### Jack-Plug

**N Series Plug to 7 mm Jack**



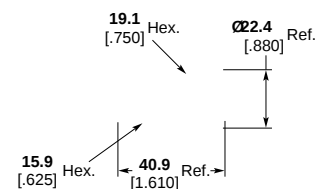
Part No. 1061742-1

**OSP Plug to 7 mm Jack**



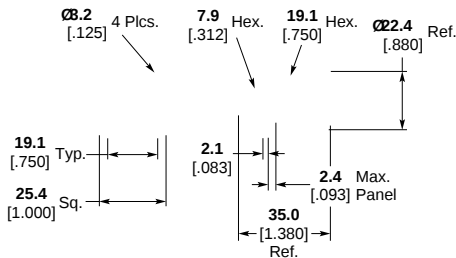
Part No. 1059713-1

**TNC Plug to 7 mm Jack**



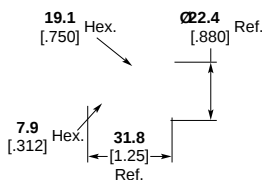
Part No. 1061739-1

**SMA Flange Mount Plug to 7 mm Jack**



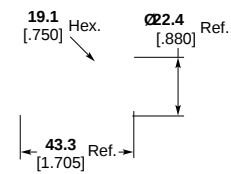
Part No. 1061751-1

**SMA Plug to 7 mm Jack**



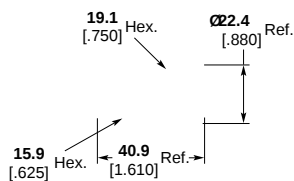
Part No. 1053646-1

**N Series Plug to 7 mm Best VSWR Jack**



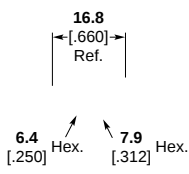
Part No. 1061738-1

**TNC Plug to 7 mm Best VSWR Jack**



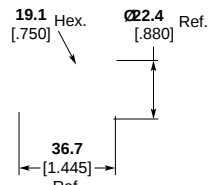
Part No. 1061744-1

**MCX Jack – SMA Plug**



Part No. 1061073-1

**N Series Jack – 7 mm Plug**



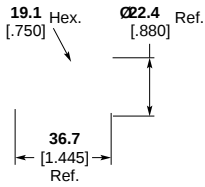
Part No. 1061757-1

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters (Continued)

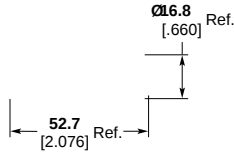
### Jack-Plug (Continued)

#### N Series Jack – 7 mm Best VSWR Plug



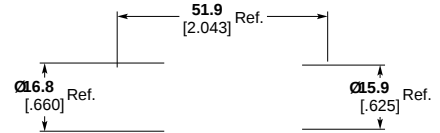
Part No. 1061752-1

#### BNC Plug – N Series Jack



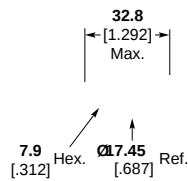
Part No. 1057392-1

#### N Series Jack – TNC Plug



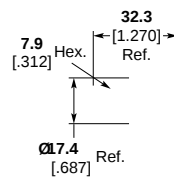
Part No. 1057388-1

#### SMA Plug – N Series Jack



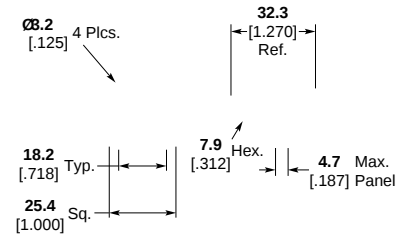
Part No. 1057381-1

#### SMA 18 GHz Plug – N Series Jack



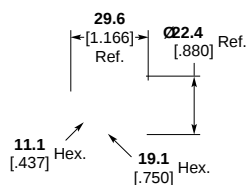
Part No. 1058664-1

#### SMA Plug – N Series Flange Mount Jack



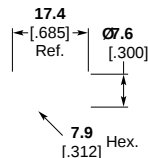
Part No. 1057385-1

#### OSP Jack – 7 mm Plug



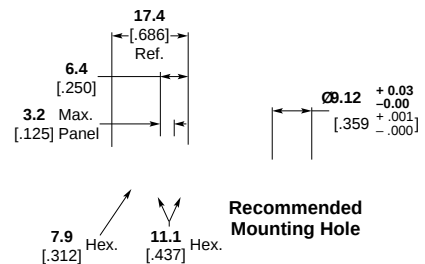
Part No. 1059720-1

#### SMA Plug – OSP Jack



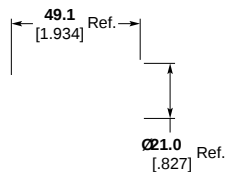
Part No. 1059718-1

#### SMA Plug – OSP Bulkhead Jack



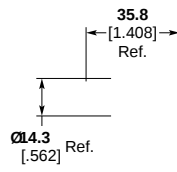
Part No. 1059758-1

#### BNC Jack – N Series Plug



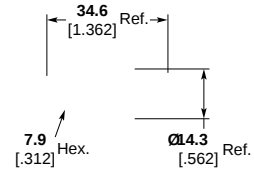
Part No. 1057390-1

#### BNC Jack – SMB Plug



Part No. 1058077-1

#### SMA Plug – BNC Jack



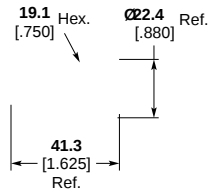
Part No. 1058083-1

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters (Continued)

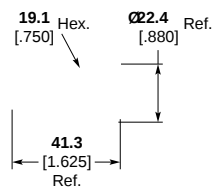
### Jack-Plug (Continued)

**TNC Jack – 7 mm Plug**



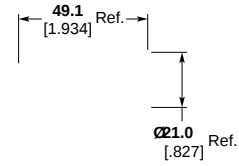
Part No. 1061753-1

**TNC Jack – 7 mm Best VSWR Plug**



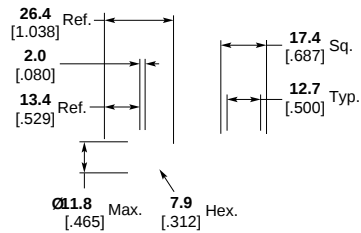
Part No. 1061758-1

**TNC Jack – N Series Plug**



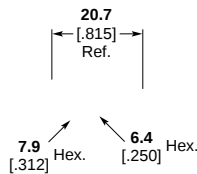
Part No. 1057387-1

**TNC Flange Mount Jack – SMA Plug**



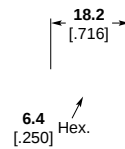
Part No. 1057857-1

**SMA Plug – SMB Jack**



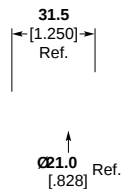
Part No. 1060500-1

**SMA Jack – MCX Plug**



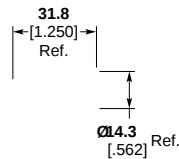
Part No. 1061072-1

**SMA 18 GHz Jack – N Series Plug**



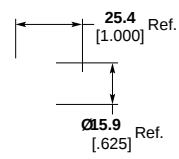
Part No. 1057377-1

**SMA Jack – BNC Plug**



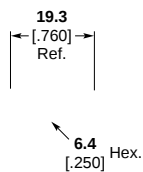
Part No. 1058081-1

**TNC Plug – SMA Jack**



Part No. 1057853-1

**SMA Jack – SMB Plug**



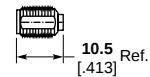
Part No. 1060498-1

**SMA Jack – SMP Plug**



Part No. 1056707-1

**SMA Jack – SSMT Plug**



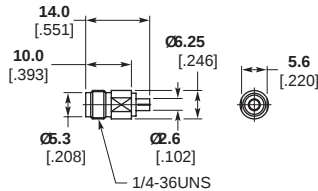
Part No. 1055696-1

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters (Continued)

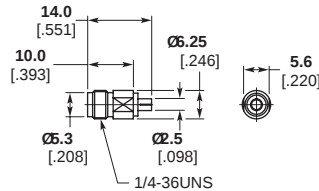
### Jack-Plug (Continued)

**SMA Jack – UMCC Plug**



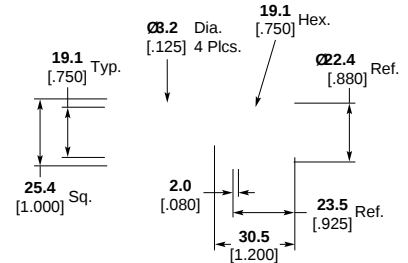
Part No. 1775229-1

**SMA Jack – UMCC Plug**



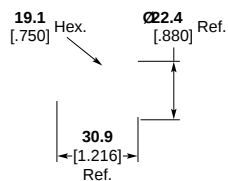
Part No. 1775230-1

**SMA Flange Mount Jack – 7 mm Plug**



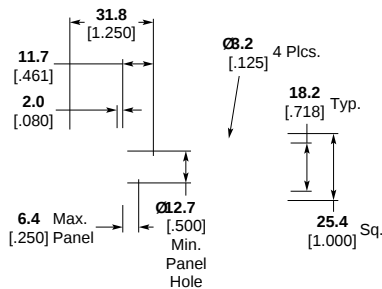
Part No. 1061750-1

**SMA 18 GHz Jack – 7 mm Plug**



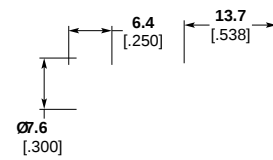
Part No. 1053788-1

**N Series Flange Mount Plug – SMA 18 GHz Jack**



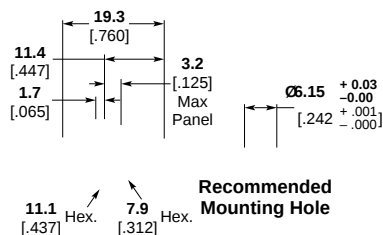
Part No. 1058666-1

**OSP Plug – SMA Jack**



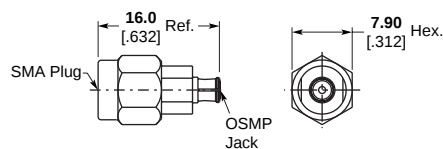
Part No. 1059716-1

**SMA 18 GHz Jack – OSP Bulkhead Plug**



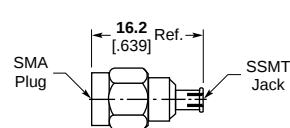
Part No. 1059756-1

**SMP Jack – SMA Plug**



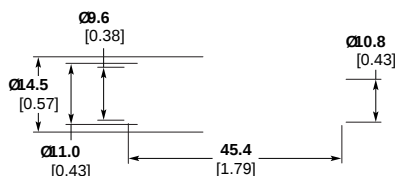
Part No. 1056708-1

**SSMT Jack – SMA Plug**



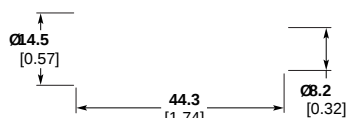
Part No. 1055697-1

**BNC Jack – Series 1.6/5.6 Plug**



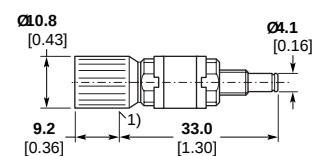
Part No. 1-1393665-7 □

**BNC Plug – Series 1.6/5.6 Jack**



Part No. 1-1393665-6 □

**Series 1.6/5.6 Plug – Series 1.0/2.3 Jack**



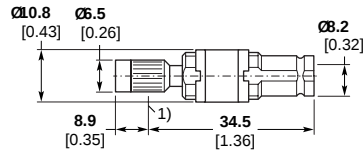
Part No. 2-1393670-2 □  
Coupling Type A, B<sup>2</sup>, F<sup>2</sup>

**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Between Series Adapters (Continued)

### Jack-Plug (Continued)

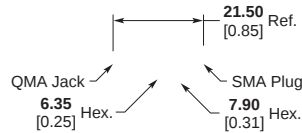
#### Series Plug 1.0/2.3 – Series 1.6/5.6 Jack



**Part No. 2-1393670-3** □  
Coupling Type A, B<sup>2</sup>, F<sup>2</sup>

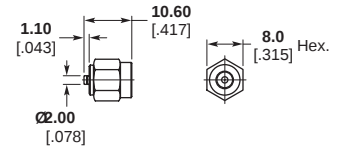
- 1) Detent for jack  
2 Only jackside

#### QMA Jack – SMA Plug



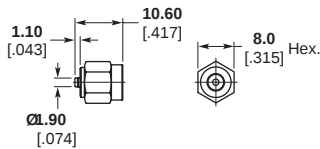
**Part No. 1408343-1**

#### UMCC Jack – SMA Plug



**Part No. 1775228-1**

#### UMCC Jack – SMA Plug



**Part No. 1775227-1**

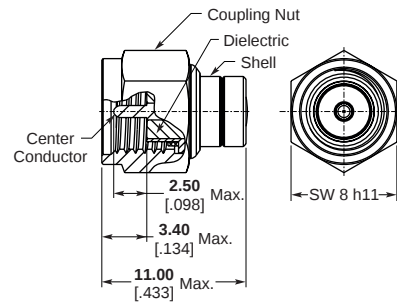
**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.

## Coaxial Terminations

### SMA Plug Terminator Part Number 1460802

Plating — Gold

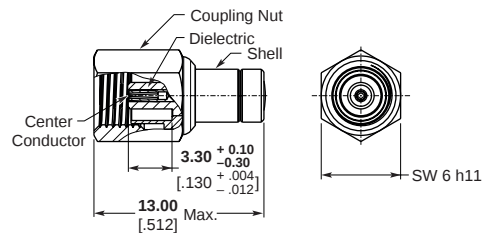
Frequency — 6 GHz



### SMC Plug Terminator Part Number 1460803

Plating — Gold

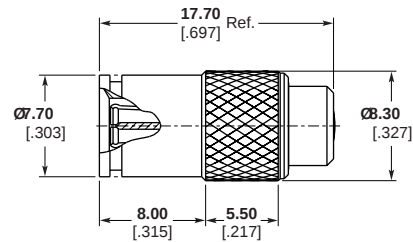
Frequency — 6 GHz



### Push Pull Plug Terminator Part Number 619219

Plating — Gold

Frequency — 6 GHz



### QMA Plug Terminator Part Number 619271-1

Single Packaging

Plating — Standard Gold

### Part Number 5-619271-1

1000 Pieces per Pack

Plating — Standard Gold

### Part Number 619271-2

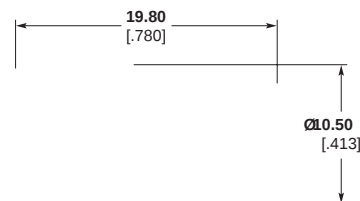
Single Packaging

Plating — Higher Gold

### Part Number 5-619271-2

1000 Pieces per Pack

Plating — Higher Gold



**Note:** Part Numbers are RoHS compliant except: □ Indicates non-RoHS compliant.



## Application Tooling (Continued)

### Solder Assembly Kit Brass SMA Connectors Kit Part Number 1055420-1

S-0-1

|                        |               | Item Description          | Part No.  |
|------------------------|---------------|---------------------------|-----------|
| Inserts                | Locator Tools | Center Contact Holder     | 1055454-1 |
|                        |               | Dielectric Insert Tool    | 1055448-1 |
|                        |               | Dielectric Recess Tool    | 1055447-1 |
|                        |               | Fixture Sub-Assembly      | 1055450-1 |
|                        |               | Inserts — 2.16 [.085] (2) | 1055441-1 |
|                        |               | Inserts — 3.58 [.141] (2) | 1055440-1 |
|                        |               |                           | 1055442-1 |
|                        |               | Locator Tool              | 1055443-1 |
|                        |               |                           | 1055446-1 |
|                        |               |                           | 1055451-1 |
| Dielectric Insert Tool | Solder Gage   | Retainer Ring Pliers      | 1055449-1 |
|                        |               | Solder Gauge 0.25 [.010]  | 1055500-1 |
|                        |               | Solder Gauge 0.38 [.015]  | 1055445-1 |
|                        |               | Solder Gauge 0.46 [.018]  | 1055444-1 |
| Retainer Ring Pliers   |               | Dielectric Recess Tool    |           |
| Fixture Sub-Assembly   |               | Center Contact Holder     |           |

### Universal Compression Crimp Tool

#### Kit Part Number 1055835-1

Tyco Electronics Universal Compression Crimp Tool offers the ability to rapidly produce cable assemblies using solderless compression crimp connectors with semi-rigid cables. This universal assembly tool kit will attach SMA, OSP, N and TNC series connectors to 3.58 [.141], 2.16 [.085] and 6.35 [.250] cable quickly and consistently with excellent mechanical and electrical results.

The tool kit permits single hand assembly. Anvils and cable supports can be quickly changed. Crimp lengths can be adjusted from .025 [.001] to 25.4 [1.000] in increments of .025 [.001]. Sharp radius bends in cables are easily accommodated. The kit contains:

| Cable Supports            |           | Anvil       | Gauge |
|---------------------------|-----------|-------------|-------|
|                           |           | Crimp Frame |       |
| Description               | Part No.  |             |       |
| Crimp Frame               | 1055831-1 |             |       |
| Calibration Gauge         | 1055832-1 |             |       |
| 3.58 [.141] Cable Support | 1055833-1 |             |       |
| 2.16 [.085] Cable Support | 1055834-1 |             |       |
| SMA Plug Anvil            | 1055836-1 |             |       |
| SMA Jack Anvil            | 1055837-1 |             |       |
| Type N Plug Anvil         | 1055838-1 |             |       |
| Type N Jack Anvil         | 1055839-1 |             |       |
| TNC Plug Anvil            | 1055840-1 |             |       |
| TNC Jack Anvil            | 1055841-1 |             |       |
| OSP Plug Anvil            | 1055842-1 |             |       |
| OSP Jack Anvil            | 1055843-1 |             |       |

All tools may be purchased separately.

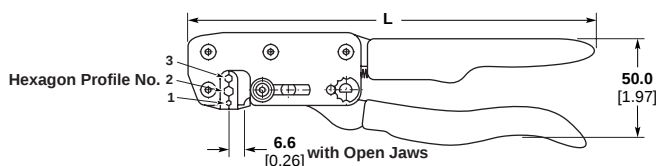
## Application Tooling (Continued)

### Crimping Tools

Crimping tools are used for assembling coaxial connectors on coaxial cables. They can be applied particularly economically for small batch sizes.

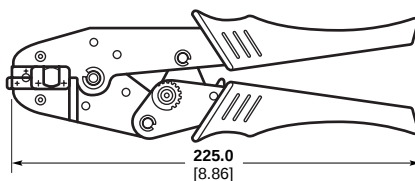
The crimping dies are a fixed part of the crimping tools. Each tool is equipped with 2 or 3 different profiles. A total of 6 widths across flats are possible with 2 tools, whose hand lengths are adapted to the dimensions of the hexagon profiles. The tools can be distinguished at a glance by different colored handles.

| Item          | Width Across Flats of the Profile |             |             | Dim.<br>L      | Color of<br>handles | Part No.  |
|---------------|-----------------------------------|-------------|-------------|----------------|---------------------|-----------|
|               | 1                                 | 2           | 3           |                |                     |           |
| Crimping Tool | 2.8<br>0.11                       | 3.2<br>0.13 | 3.6<br>0.14 | 214.0<br>8.43  | Green               | 1393524-4 |
| Crimping Tool | 2.8<br>0.11                       | 5.4<br>0.21 | 4.5<br>0.18 | 260.0<br>10.24 | Yellow              | 1393524-5 |



### IDC Tool

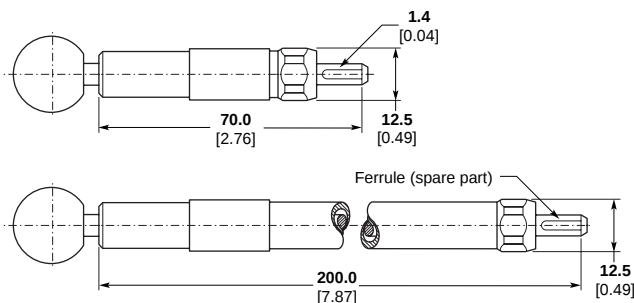
For assembling IDC coaxial connectors Series 1.6/5.6 mS on coaxial cables.



| Part No.    |
|-------------|
| 1-1393524-1 |

### Removal Tool

For replacing the special contacts on connectors DIN 41612 M and SIEDECON.



| Item                                                  | Part No.                   |
|-------------------------------------------------------|----------------------------|
| Removal tool<br>length 70 [2.76]<br>length 200 [7.87] | 2-1393524-4<br>2-1393524-6 |
| Spare part<br>Ferrule                                 | 2-1393524-7                |

## Application Tooling (Continued)

### Setting Gauge

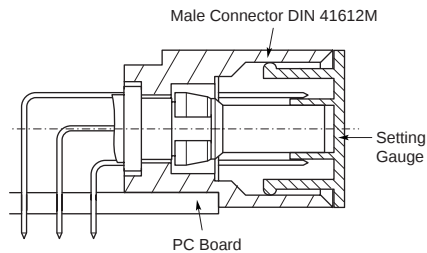
#### Protective Caps/Setting Gauges

The setting gauges are used to position coaxial jacks and pre-mating high-current plugs on male connectors DIN 41612 M if the pins are flow-soldered into PC boards.

The gauges are held by clamping in connector body and protect the blade contacts.

The gauges provide protection

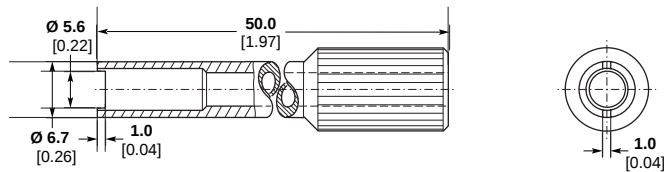
- during transport (if the male connectors have already been removed from the packaging),
- during assembly,
- against soiling,
- during soldering.



| Item                      | Part No.           |
|---------------------------|--------------------|
| Setting gauge for types M | <b>1393494-9</b>   |
| M/2                       | <b>1-1393494-0</b> |
| M/3                       | <b>1-1393494-1</b> |

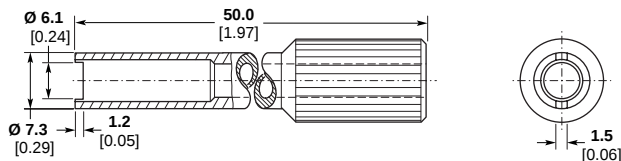
**Note:** These gauges can also be used to protect types C, C/2, C/3 and D.

### Wrench



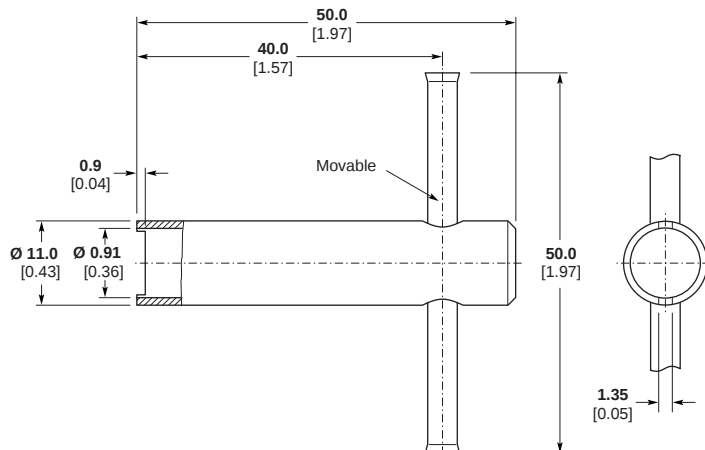
Used to tighten the threaded ring on bulkhead jacks Series 1.0/2.3

| Item   | Part No.         |
|--------|------------------|
| Wrench | <b>1393488-3</b> |



Used to tighten the threaded ring on bulkhead jack 1393670-8.

| Item   | Part No.         |
|--------|------------------|
| Wrench | <b>1393488-4</b> |



Used to tighten the threaded rings 1-1393562-0 on bulkhead jacks Series 1.6/5.6.

| Item   | Part No.         |
|--------|------------------|
| Wrench | <b>1393524-1</b> |

## Application Tooling (Continued)

### Hand Tools

Tyco Electronics PRO-CRIMPER II Hand Tools are economy versions of our Tyco Electronics CERTI-CRIMP Hand Tools, featuring ratcheted crimp control to provide full die closure and help eliminate partial crimps. With an all new design, the PRO-CRIMPER II hand tools require dramatically less hand force to produce the same connection as comparable tools. Dies are interchangeable. It's the most versatile and reliable crimping tool in the mid-price class. Recommended for networking installations, and commercial, industrial and institutional maintenance work. See Catalog 82276 for further information.

#### Typical PRO-CRIMPER III Hand Tool

**No. 58433-1**  
for 50 Ohm BNC Dual  
OOO Crimp Commercial  
Connectors

Tyco Electronics CERTI-CRIMP Hand Tools are our top-of-the-line crimping tools featuring the original ratcheted crimp control. All tools are designed to exacting specifications, and manufactured using the highest quality materials to provide long service life. Recommended for low production runs, repairs and prototype work, and applications requiring consistent, highly-reliable terminations. See Catalog 65780 for further information.

#### Typical CERTI-CRIMP Hand Tools with Integral (Non-Interchangeable) Dies

**No. 69477-1**  
for 50 Ohm BNC  
Dual Crimp MIL Type  
Connectors

**No. 220015-1**  
for 50 Ohm N  
Connectors

#### CERTI-CRIMP Hand Tool with Interchangeable Dies

**No. 69710**

### Pneumatic Tools

The 626 Pneumatic Tool System, as the name implies, will apply a broad range of products in the 6-26 AWG [13-0.12 mm<sup>2</sup>] wire range. A basic 626 Pneumatic Tool System requires a power unit, a tool holder, a crimp head assembly and a die set when applicable. This premium system is well suited for low- to medium- volume production and harness assembly operations. Since the crimp head can be rotated to any angle, the operator can also work on more difficult terminations in confined equipment cabinets or enclosures.

Interchangeable tool holder assemblies and crimping heads are available to crimp a variety of products. Crimping heads for the earlier Model 2614 pneumatic power unit can be used with the 626 Pneumatic Tool System. If you are already using Tyco Electronics hand tools, many crimp heads and die sets can be removed, attached to an adapter with quick pins and used with the 626 Pneumatic Tool System. An adapter is even available to accept lower cost die sets of the PRO-CRIMPER II hand tool. For more information, order catalog 124208.

**No. 189721-1**

#### Bench Mount Assembly for Pneumatic Tool System (Optional)

Fully adjustable stand allows operator free use of both hands — recommended for maximum productivity.

**No. 856402-1**

### Battery Powered Crimp Tool

Take automatic crimping away from the bench to the product, with this convenient, portable, battery-operated tool. It's at home in the factory or in the field.

- Completely portable—performs about 100 crimps per charge
- Terminates wires to 10 AWG [6 mm<sup>2</sup>]
- Weighs only 1.57 kg [3.46 lb] including battery; 360 mm [14.2 in] long
- Pressure-sensitive cycle control
- Kit includes tool, 2 batteries, and charger

**Part Number 1725837-1**  
**Part Number 1213890-1**  
(Open Barrel)

## Application Tooling (Continued)

### Bench-Mounted Machines

AMP-O-ELECTRIC bench-mounted, semi-automatic terminating machines may be used to apply RF products such as Commercial BNC and TNC Connectors, Miniature and Standard UHF Connectors, and Braid-Pic Contacts and Terminals. The Model G unit features interchangeable applicators, and is used to apply strip-form contacts. The "Coax" unit is used to apply loose-piece contacts and ferrules with dies that are mounted onto the machine. See Catalog 65828 and Customer Manual 409-2627 for further information.

**AMP-O-ELECTRIC Model G,  
No. 354500 Series with  
Tyco Electronics Crimp  
Quality Monitor**

### Stripping Tools

The hand-operated Tyco Electronics Coaxial Cable Stripper features interchangeable, color-coded blade cassettes and V-blocks to accommodate 2- or 3-step stripping for cable diameters ranging from 2.54 [.10] through 7.62 [.30]. You strip cable by simply clamping and rotating the tool around the cable. See Instruction Sheet IS 2766 for further information.

| For Use With<br>Connector Type      | Tool No. |
|-------------------------------------|----------|
| BNC Single Crimp                    | 603995-1 |
| BNC Commercial and<br>UHF Miniature | 603995-2 |
| UHF Standard                        | 603995-3 |
| BNC MIL Type Dual Crimp             | 603995-5 |
| BNC Commercial Dual Crimp           | 603995-6 |

### Semi-Rigid Cable Tooling

The tools listed here are designed specifically to strip and terminate semi-rigid cable. These tools operate basically the same as the flexible cable tools, in that they produce uniform terminations time after time, without heat damage from soldering.

**Hand Tool for BNC and TNC  
Semi-Rigid Cable Connectors**

**No. 59980-1 Frame only—  
does not include dies and locator**

## Application Tooling (Continued)

### Hand Tool Kit for SMA and Blindmate Connectors

No. 59981-1

### Pneumatic Tool for Terminating BNC, TNC, SMA and Blindmate Connectors

(for RG 402/U and RG 405/U Cable)

No. 58318-1\*

This pneumatic tool is a bench-mounted, semi-automatic power tool designed for easy operation. The operator needs only to depress the trigger to complete a termination. It is used with the cable preparation machine to produce finished terminations.

\*Includes Locators 220241-1 and 308075-2. Dies are not included.

| Item Description                                           | Part Numbers     |                    |
|------------------------------------------------------------|------------------|--------------------|
|                                                            | Tyco Electronics | Military (M22520/) |
| Hand Tool                                                  | 59980-1          | 36-01              |
| Plug Locator<br>(without Center Contact)                   | 220220-2         | 36-06              |
| Plug Locator<br>(with Center Contact)                      | 220221-2         | 36-04              |
| Jack Locator                                               | 220222-2         | 36-05              |
| Die Set for RG 402/U Cable<br>(3.58 [.141] O.D.)           | 312253-1         | 36-03              |
| Die Set for RG 405/U Cable<br>(2.18 [.086] O.D.)           | 312253-2         | 36-02              |
| Cutoff Fixture                                             | 311395-1         | 36-09              |
| Cable Dressing Fixture                                     | 311396-1         | 36-07              |
| Trimmer Tool                                               | 312317-1         | 36-08              |
| Cable Bend Fixture Assembly<br>Includes following 6 items: | 220224-1         | 36-10              |
| Bend Segment, RG 402/U<br>(3.18 [.125] Radius)             | 311386-1         | 36-11              |
| Bend Segment, RG 402/U<br>(6.35 [.250] Radius)             | 311386-2         | 36-12              |
| Bend Segment, RG 405/U                                     | 311386-3         | 36-13              |
| Tool Holder                                                | 311392-1         | —                  |
| Limiting Pin                                               | 307581-1         | —                  |
| Conforming Block                                           | 312067-1         | —                  |
| Hex Wrench                                                 | 21027-6          | —                  |
| Carrying Case                                              | 13126-1          | —                  |
| Insert, Case                                               | 13127-1          | —                  |



## Cable Assembly Capabilities (Continued)

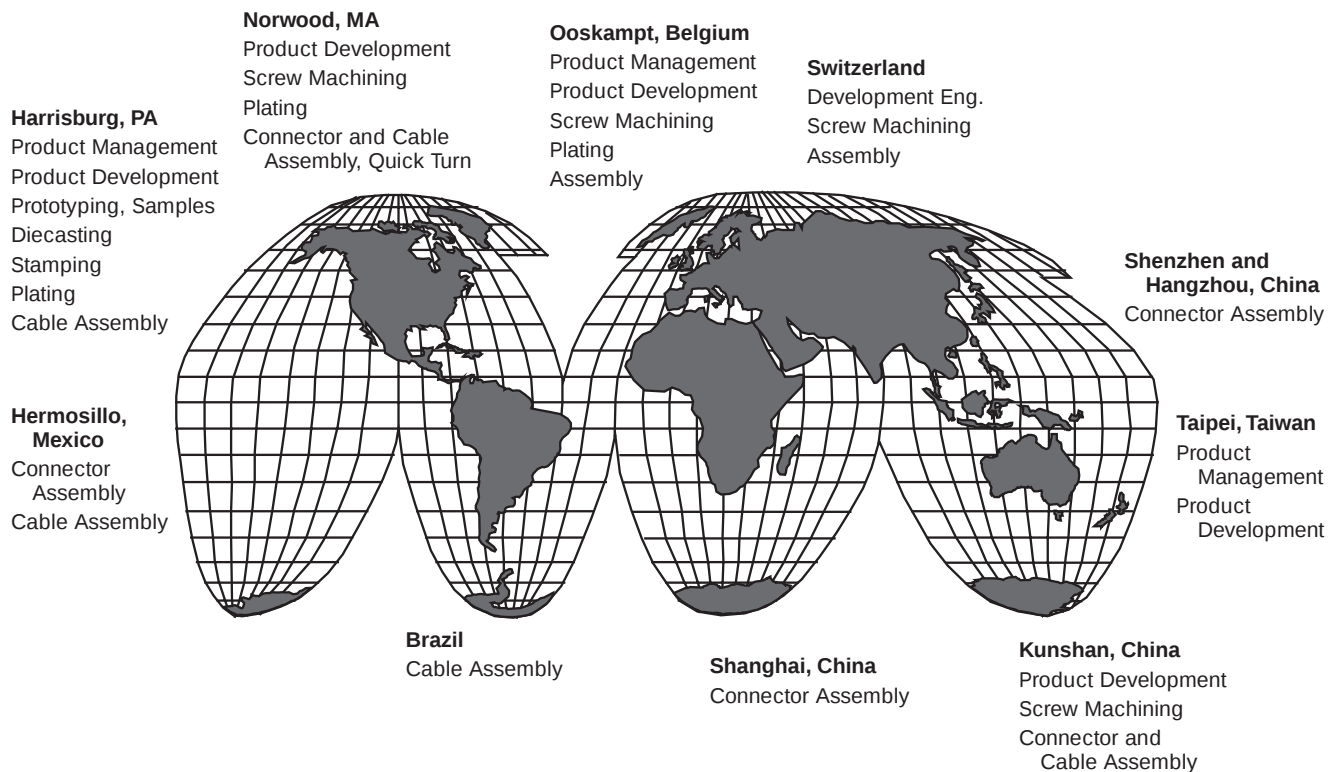


Utilizing network analyzers, TDR, and intermodulation test equipment to mention a few, our testing capability allows extensive electrical and environmental characterization of your assembly. We offer full test capabilities right in our manufacturing facilities. Tests such as those listed below can be

an integral part of the manufacturing process:

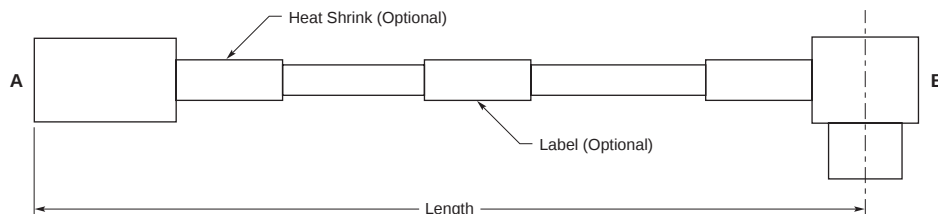
- VSWR,
- Return Loss,
- Insertion Loss,
- Phase matching,
- Propagation Delay,
- Impedance,
- Passive Intermodulation.

Our cable manufacturing centers are designed to meet your production requirements and delivery needs. Our global locations, combined with Tyco Electronics logistic strengths assures you will get the product where and when you need it.



## Coaxial Cable Assembly Specification Guide

Please use this handy reference guide when specifying or building your new cable assembly.



| CONNECTOR A                                                                              | CONNECTOR B                                                                            |
|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| INTERFACE _____<br>example: BNC, MCX, SMA, etc.                                          | INTERFACE _____<br>example: BNC, MCX, SMA, etc.                                        |
| STYLE _____<br>example: Straight Plug, Right-Angle Plug, Bulkhead Jack, etc.             | STYLE _____<br>example: Straight Plug, Right-Angle Plug, Bulkhead Jack, etc.           |
| <b>HEAT SHRINK</b>                                                                       | <b>HEAT SHRINK</b>                                                                     |
| MARKING _____                                                                            | MARKING _____                                                                          |
| CABLE                                                                                    | LABEL                                                                                  |
| LENGTH _____ (inch/mm)                                                                   | <div style="border: 2px solid black; padding: 5px; min-height: 100px;"> MARKING </div> |
| RG TYPE _____<br>OR                                                                      |                                                                                        |
| CABLE MFG. _____                                                                         |                                                                                        |
| MFG. PART NO. _____<br>OR                                                                |                                                                                        |
| FREQUENCY RANGE _____ (MHz/GHz)                                                          | <b>ELECTRICAL SPECIFICATIONS</b>                                                       |
| IMPEDANCE _____ Ohms                                                                     | VSWR _____<br>OR                                                                       |
| INSERTION LOSS _____ dB                                                                  | RETURN LOSS _____                                                                      |
| SHIELDING EFFECTIVENESS _____ dB                                                         | INSERTION LOSS _____                                                                   |
| TEMP. RANGE _____ (°C/°F)                                                                | DELAY _____                                                                            |
| MAX. AVG. POWER HANDLING* _____ Watt<br>* 25°C at sea level and max. specified frequency | INSERTION PHASE _____                                                                  |
|                                                                                          | INTERMODULATION _____                                                                  |
| OTHER SPECIFICATIONS _____                                                               |                                                                                        |
|                                                                                          |                                                                                        |
|                                                                                          |                                                                                        |



## Appendix A - Theory and Application (Continued)

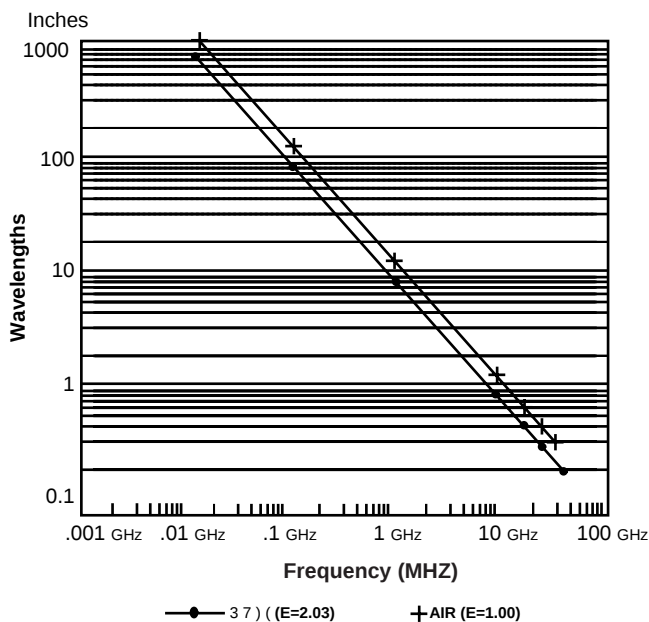


Figure 9

Table 1.  
Properties of Insulating Materials

| Dielectric Material | Dielectric Constant | Operating Temperature Range |
|---------------------|---------------------|-----------------------------|
| TFE                 | 2.03                | -70 +250°C                  |
| Polyethylene        | 2.3                 | -60 +80°C                   |
| Nylon               | 4.6-4.0             | -40 +120°C                  |
| TPX                 | 2.12                | -65 +85°C                   |
| Polypropylene       | 2.25                | -40 +105°C                  |
| Acetal              | 3.7                 | -65 +85°C                   |

### Pulses

The sine wave is most often used for communication purposes where intelligence is imposed on the wave by a variation in amplitude (amplitude modulation, AM) or by a variation in frequency (frequency modulation, FM).

Pulses, on the other hand, are primarily used in computers and digital instrumentation. Since pulses are generally used for triggering purposes, the pulse rise/fall time, amplitude and width are the most important. Figure 10 shows a pulse and identifies these characteristics.

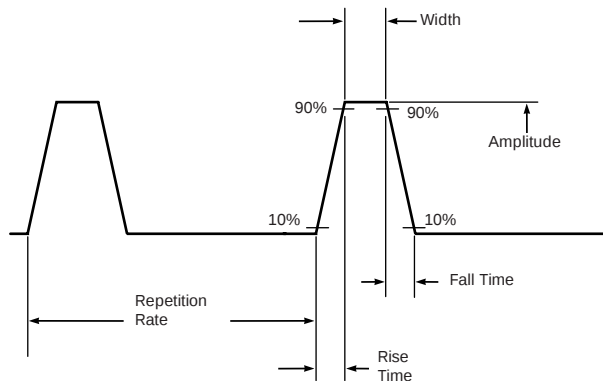


Figure 10

Pulse Characteristics

Notice that rise time is the time required for the pulse to rise from 10% to 90% of its amplitude - not from zero to maximum. Rise and fall time is perhaps the single most important characteristic of a pulse in today's high-speed digital equipment. Figure 11 shows that the faster the rise and fall time, the more pulses will fit in a given time frame.

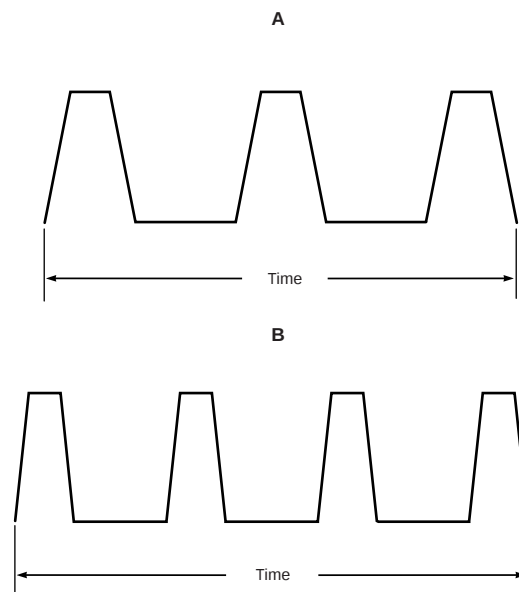


Figure 11

Pulse Rise and Fall Time

The bit rate for a system is the maximum rate of pulses per second that a system can process without causing data errors. The maximum performance can also be specified in terms of baud rate. The baud rate is defined as the number of characters (bytes) that are transmitted per second. Generally a character represents 10 bits (7 bits for the information, one parity bit, and two for start and stop, totalling 10).

Now that we know why fast pulses are required, the next problem is how to obtain faster rise times. A pulse is made up of a great number of different frequencies, and the more high frequencies a pulse contains, the faster will be its rise time and the flatter will be its peak. To better understand this, refer to Figure 12. At A, you will see a fundamental frequency (1), its third harmonic (3), and the resultant waveform (S3), which is a combination of 1 and 3. Although this does not yet resemble a square wave, you will note that the rise time is decreased, and a dip appears at the peak. At B of Figure 12, we have added the fifth harmonic. Rise time is further decreased, and the peak is beginning to flatten out. At C the seventh harmonic has been included, and the resultant wave S7 begins to resemble a square wave. As more high frequency harmonics are added to the waveform, it will more closely resemble a square wave, and the squarer it becomes, the faster will be the rise time.

TPX is a trademark of Mitsui Chemicals America, Inc.

## Appendix A - Theory and Application (Continued)

Fast rise times and short pulse widths require high frequency components.

Two frequent causes of digital signal degradation can be (1) high capacitance of the transmission line and (2) impedance mismatches of connector transmission line or I/O devices. Selection of an impedance-matched connector on a digital line, especially if short cable assemblies are used, can be as important as connector selection for an RF modulated line. **Reflected pulses out of phase with the original pulse can cause false signals or high error rates in a digital system.**

Since pulses with fast rise times are necessary in high-speed computers, any circuit element which could reduce or attenuate high frequency response is undesirable.

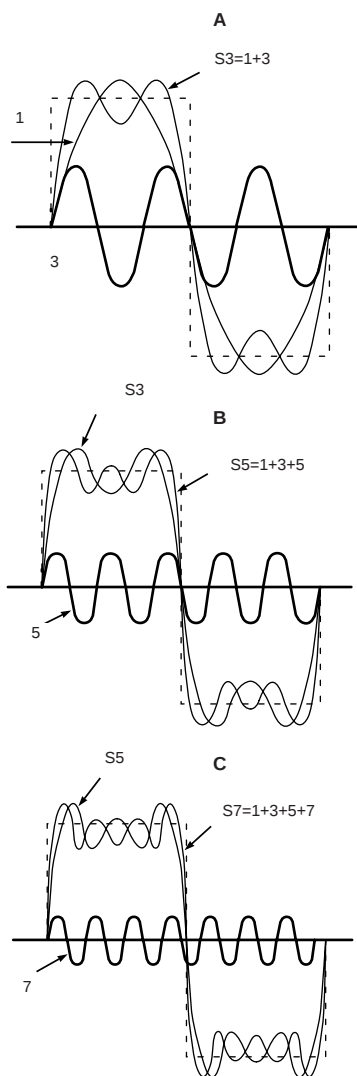


Figure 12

Development of a Square Wave

### Signal Integrity and Propagation

To explain how to maintain signal integrity, it is necessary to review how the signal is configured in a cable and how it propagates. Ignoring digital signals for this discussion we will identify the issues that deal with the integrity of a sine wave. Consider a coaxial cable consisting of an inner conductor surrounded by a dielectric material and then an outer conductor (See Figure 13). The outer conductor may be a braid, a foil, or a solid metal.

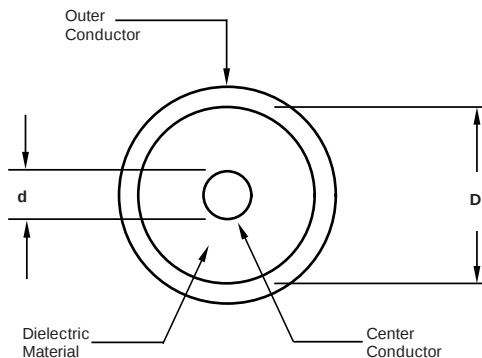


Figure 13

Diagram of a Cable

An electromagnetic wave traveling in a coaxial cable produces an electric and a magnetic field between the inner conductor and the outer conductor (Figure 14). The electric (E field) is radial and varies in time. An alternating current flows along the inner conductor and the outer conductor. An oscillating magnetic field (H field) circles the inner conductor.

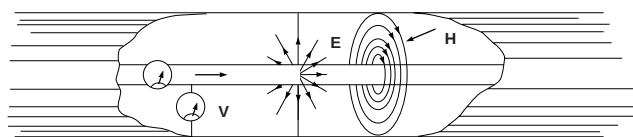


Figure 14

Electric field (E) and magnetic field (H)  
belonging to the principal mode in a coaxial line.

The alternating current on a conductor is not spread throughout the conductor but is strongest at the surface and decays exponentially at points further into the conductor. This is called the skin effect. At a frequency of 1MHz, three skin depths is 0.0078" (95% of the current is within three skin depths of the surface) and at 10GHz three skin depths is 0.00078". As a result, the current is on the outer surface of the inner conductor and the inner surface of the outer conductor over the entire range of interest for most RF systems. The dimensions and material beyond several skin depths have no effect on the wave; gold plated plastic will propagate as well as gold plated copper at sufficiently high frequencies.

## Appendix A - Theory and Application (Continued)

### Attenuation

A wave loses energy (attenuates) in several ways: (1) The resistance of the inner and outer conductors is small but can be significant over long lengths and will produce some heat. (2) The dielectric may be lossy; its resistance is high but not infinite, and some energy is lost. (3) Electromagnetic energy radiates at high frequencies; significant energy losses are caused by radiation of electromagnetic energy (the cable acts like an antenna). (4) Energy is reflected due to impedance mismatches. The combination of these four types of losses are referred to as the **insertion loss** of a transmission line system. Connectors have similar losses.

### Characteristic Impedance

A parameter which defines the behavior of a cable, connector, or any propagating system is **Characteristic Impedance**,  $Z_0$ . The characteristic impedance of a lossless cable is related to the inductance per unit length,  $L$ , and the capacitance per unit length,  $C$ , as follows:

$$Z_0 = \sqrt{L/C} \text{ in ohms}$$

The equivalent circuit of a transmission line is shown in Figure 15.  $R$  represents the conductor resistance for a unit length. For a coaxial cable the characteristic impedance is given by:

$$Z_0 = \frac{138}{\sqrt{\epsilon}} \times \log_{10} \frac{D}{d} \text{ in ohms}$$

where  $D$  is the inner diameter of the outer conductor and  $d$  is the outer diameter of the inner conductor, respectively. Similar equations apply for other geometries such as two parallel wires.

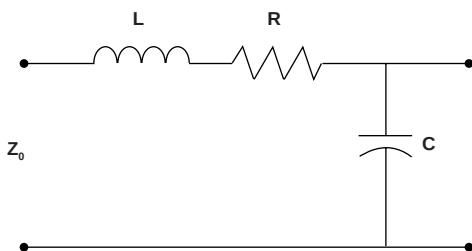


Figure 15

Typical Transmission Line Schematic

The maximum power is transferred between two systems if they have the same impedance. This is called impedance matching. However, impedance variations that are short compared to a wavelength can have a negligible effect on signal loss.

Standard impedances are 50 ohm, 75 ohm and 93-125 ohm. Most systems use 50 ohm because it is a compromise between maximum power transmission and minimum line loss. The telephone industry and the broadcast industry use 75 ohm for minimum line attenuation. The need for low capacitance instrumentation cable has produced the 93-125 ohm systems. The higher impedances are generally achieved by changing the conductor diameters and by modifying the dielectric material to add air.

### Reflections

When the characteristic impedance changes in a transmission line system, part of an incident wave is reflected. The reflection coefficient can be calculated as:

$$\text{Reflection Coefficient} = \frac{V_i}{V_R} = \frac{Z_R - Z_0}{Z_R + Z_0}$$

Where  $V_i$  and  $Z_0$  are the incident voltage and impedance of the first media.  $V_R$  and  $Z_R$  represent the reflected voltage and impedance of the media that caused the reflection. The decibel loss due to reflection is given by:

$$\text{Return Loss} = 10 \log_{10} \left( \frac{1}{1 - \Gamma^2} \right) \text{ dB}$$

### VSWR

The traditional way to determine the reflection coefficient is to measure the standing wave caused by the superposition of the incident wave and the reflected wave. Traditionally the voltage is measured at a series of points using a slotted line. The ratio of the maximum divided by the minimum is the Voltage Standing Wave Ratio (VSWR). The VSWR is infinite for total reflections because the minimum voltage is zero. If no reflection occurs the VSWR is 1.0. VSWR and reflection coefficient are related as follows:

$$\text{VSWR} = (1 + |\Gamma|) / (1 - |\Gamma|)$$

Most present instrumentation measures the reflection coefficient and calculates the VSWR.

Figure 16 represents the direct relationship between VSWR and its equivalent in return loss (expressed in dB).

Figure 16

VSWR vs. Return Loss

### Multiple Reflections

If there is a series of impedance changes, each one will have a reflection coefficient. The total reflection coefficient is the vector addition of each of the individual coefficients accounting for the distance between reflections and the reflection of any reflected waves. Even though the calculations are difficult, a total VSWR can still be measured.

Multiple reflections can produce a resonance phenomenon that is unique to wave theory. Properly understood some serious difficulties can be avoided. An example will make the point clear. Consider an electromagnetic wave with a

## Appendix A - Theory and Application (Continued)

wavelength of 4 inches traveling on a cable that changes from 50 ohms to 25 ohms. The reflection coefficient is -.33, which means that one third of the incident voltage is reflected toward the source. Assume that one inch (one quarter wavelength) down the cable the impedance changes back to 50 ohm. Again, one third of the wave is reflected, but without any phase shift. It travels back to the first interface where one third of this reflected wave is reflected back toward the second interface. Two thirds of the wave is transmitted through the interface and travels back to the source. Since the first (reflected) wave is shifted 180 degrees at the reflection, and the second (transmitted-reflected-transmitted) wave is shifted 180 degrees because it traveled the one inch separation twice, the two waves are in phase. The net result is that the VSWR is much larger because the length of the 25 ohm section was just the right length to cause a resonance. If the length of the 25 ohm section had been one half wavelength, the two waves would have interfered and the VSWR would be at a minimum.

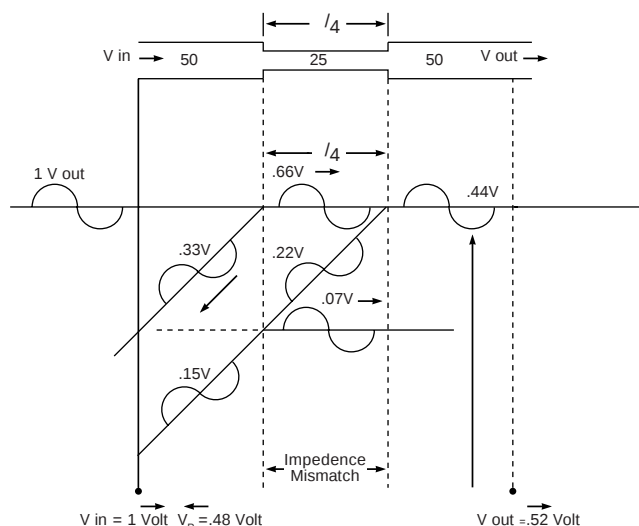


Figure 17

**Multiple Wave Reflections**  
(Caused by Impedance Mismatch)

In summary, avoid cable lengths, printed circuit board paths, or connectors that are multiple of one quarter ( $1/4$ ,  $3/4$ , etc.) of the intended signal transmission wavelength. Coaxial cables, when manufactured, also have periodic variations in diameter that result in periodic changes in impedance ( $Z_0$ ), that can cause significant levels of reflected signal (high return loss) at specific frequencies.

### Reflections of Digital Signals

The previous discussions dealing with attenuation, reflections and standing waves can apply to digital signals with some extra thought.

A single pulse can be thought of as a combination of high frequency sine waves. The maximum frequency component in a square wave pulse can be calculated by this equation:

$$f = 0.35/\text{rise time}$$

where

$$f = \text{GHz when "t" is in nanoseconds}$$

Attenuation of the frequencies necessary to support the short risetime will produce a slower rise and possibly prohibit the pulse from ever reaching the detector. This 'slurring' of the pulse is similar to the behavior of an RC circuit and the attenuation is sometimes called capacitive attenuation.

A series of pulses can demonstrate resonance. If a portion of a pulse is reflected at each interface, it is possible for them to come together and add up to form a new phantom pulse.

The critical frequency here is the bit rate. Think of a sine wave with a frequency the same as the bit rate; if it will resonate in the cable, the pulses will also. Extra pulses caused by resonance might easily result in an error signal from the receiving system requesting a retransmittal. The final result would be a communication system that is much slower than intended.

### Cut-off Frequency

The cut-off frequency of a coaxial transmission line is the frequency at which modes of energy transmission, other than the "TEM" mode, can be generated.

$$f_{co} = \frac{7.5}{\sqrt{(D+d)}} \text{ (in GHz)}$$

(D and d are measured in inches)

### Types of Transmission Lines

**Twin Lead transmission cable** is generally used where impedance matching alone is important, since it provides only minimal shielding. Impedance values of 300 ohms and 600 ohms are common. Lower impedance values require closer spacing of the conductors and are not normally available in this type of cable. A typical application for twin lead cable is in antenna lead wire for television sets.

**Twisted Pair** is a variation of the twin lead type. It consists of two lengths of ordinary hookup wire twisted together. A twisted pair provides relatively constant impedance plus better magnetic shielding than twin lead cables. It is flexible, inexpensive, easy to terminate and is used extensively by the computer industry. However, it should not be used when maximum shielding is required.

## Appendix A - Theory and Application (Continued)

**Shielded Twisted Pair Cable** is used to eliminate inductive and capacitive coupling. Twisting cancels out inductive coupling, while the shield eliminates capacitive coupling. Most applications for this cable are between equipment, racks and buildings.

**Flexible (Braided) Coaxial Cable** is by far the most common type of closed transmission line because of its flexibility. It is a coaxial cable, meaning that both the signal and the ground conductors are on the same center axis. The outer conductor is made from fine braided wire, hence the name "braided coaxial cable". This type of cable is used in practically all applications requiring complete shielding of the center conductor. The effectiveness of the shielding depends upon the weave of the braid and the number of braid layers. Tyco Electronics manufactures connectors for cable sizes ranging from less than 1/8 in. diameter, for low power applications of around 50 watts, to over 1/2 in. diameter for power of 850 watts at 100 MHz and voltages up to 5000. In addition to power handling capabilities, cables are available for high frequency applications, high and low temperature applications, severe environmental applications and many other specialized uses.

**Triaxial Cable** is used when higher "shielding" efficiency characteristics are required in applications similar to those using shielded twisted pair cable.

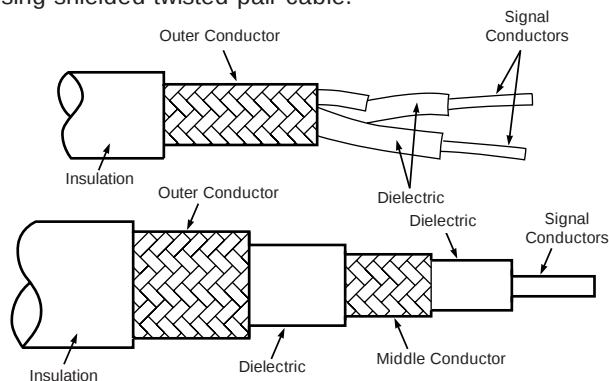


Figure 18

Twin Conductor and Triaxial Cable

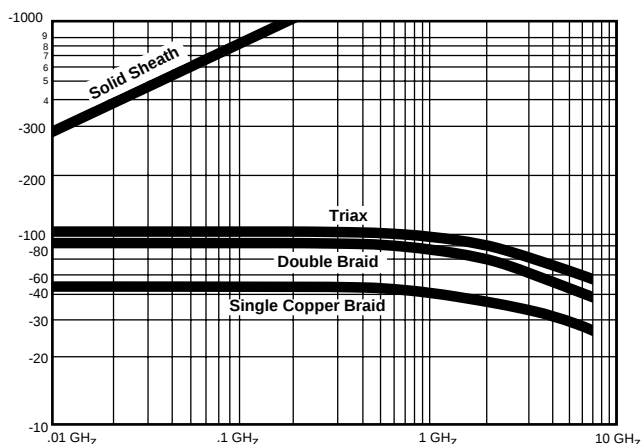


Figure 19

Shielding Efficiencies

Often you will hear the term "shielded cable". This is very similar to coaxial cable except the spacing between center conductor and shield is not carefully controlled during manufacture, resulting in non-constant impedance.

**Semirigid Coaxial Cable** uses a solid tubular outer conductor rather than the braided type, so that all the RF energy is contained within the cable. One of the drawbacks of braided cable is that the shielding is not 100% effective, especially at higher frequencies. This is because the braided construction can permit small amounts of short wavelength (high frequency) energy to radiate. Normally this does not present a problem; however, if a higher degree of shielding is required, semirigid coaxial cable is recommended. For applications using frequencies higher than 30 GHz a miniature semirigid cable is recommended. Various connectors are available from Tyco Electronics to terminate these cables.

**Ribbon Coaxial Cable** is a relatively recent Tyco Electronics innovation which combines the advantages of both ribbon cable and coaxial cable. Tyco Electronics currently provides both the cable and the insulation displacing coaxial connector to terminate the cable. Each individual coaxial cable consists of the signal conductor, dielectric, a foil shield and a drain wire which is in continuous contact with the foil. The entire assembly is then covered with an outer insulating jacket. The unique manufacturing feature of this cable is the precise placement of the drain wires to permit gang stripping of the outer jacket and foil. The major advantage of this cable is the speed and ease with which it can be mass terminated with the Tyco Electronics insulation displacement technique. They can also be separated into individual coaxial lines and terminated with standard coaxial connectors as required.

---

**Appendix B - White Bronze**

---

**High Quality Surface  
Plating & Excellent  
Intermodulation  
Performance for RF  
Connectors****Product Facts**

- Low intermodulation
- High corrosion resistance
- Low porosity
- Low RF losses
- Wear and scratch resistance

Tyco Electronics' industrial electroplating facilities is one of the most advanced in the world.

The Tyco Electronics White Bronze surface finish represents a dramatic improvement upon the wear characteristics and life expectancy of silver plating, at the same time offering a far better electrical performance than nickel. White Bronze plated connectors exhibit intermodulation characteristics significantly better than stainless steel or nickel plated products. Silver has always been the preferred finish from an electrical standpoint but its corrosion and wear characteristics especially in harsh conditions are often unacceptable. While nickel is an extremely rugged finish it

has properties undesirable in many RF applications; including, high RF and insertion losses, poor intermodulation performance, high permeability and poor screening effectiveness.

The Tyco Electronics White Bronze is composed of copper, tin and zinc which are applied simultaneously to produce a finished color similar to stainless steel. With one of the most advanced industrial electroplating facilities in the world Tyco Electronics can achieve the levels of control over the complex galvanic process necessary in the application of this alloy.

The Tyco Electronics White Bronze is similar in composition and performance to other copper/tin/zinc alloys developed in the industry such as Sucoplate® and BBR.

Comprehensive conditioning tests have been performed to provide a thorough evaluation of The Tyco Electronics White Bronze plated connector bodies. The tests were performed to the specifications of the European and International RF connector standards — CECC 22000/IEC 68-2-14/IEC 169-1. The results are summarized on page 280.

**Need more information?**

Call Technical Support Center at 1-800-522-6752 for product and tooling information.

The Technical Support Center is staffed with specialists well versed in all Tyco Electronics products. The Center can provide you with:

- Engineering Support
- Catalogs
- Technical Documents
- Product Samples
- Tyco Electronics Authorized Distributor Locations
- Tyco Electronics Internet Home Page:  
**[www.tycoelectronics.com](http://www.tycoelectronics.com)**

**Deposit Characteristics**

**Composition** — Copper (55-60%), Tin (20-25%), Zinc (15-20%)

**Density** — 7.9-8.1 g/cm<sup>3</sup>

**Hardness** — 300-380 HV

**Passivation** — Immersion Chrome

Sucoplate® is a plating trademark for Huber & Suhner.  
BBR is a plating trademark for Radiall.

## Appendix B - White Bronze (Continued)

### Low Intermodulation Products

Dissimilar metals, finishes and discontinuities within a coaxial line structure give rise to Intermodulation Products (IMP). This is of particular concern in applications requiring low levels of intermodulation, such as cellular base stations and antennas. White Bronze plated connectors offer better IMP performance and lifetime characteristics than nickel. Due to the similarity of electrolytic potentials and the non magnetic properties of the finish, levels of intermodulation are commensurate with silver and far in excess of stainless steel/nickel connectors. At the same time the excellent wear characteristics and durability of the finish ensure that the intermodulation life of the connector is greater than silver. The life is also improved as a direct result of the excellent corrosion resistance properties of White Bronze; thereby minimizing metal/metal oxide junctions.

### Highly Corrosion Resistant

Even under continuous exposure to harsh environments White Bronze retains its aesthetic appearance. Unlike silver it does not discolor when exposed to sulphur, potassium sul-

phides etc., neither is there any build up in oxide layers as is the case with nickel. Furthermore, White Bronze parts have successfully passed all international salt spray tests (MIL, BS, CECC, IEC).

In conditions of continuously high temperatures (>100°C) and/or excessive humidity (>100%) there is no build up of foreign layers which may affect contact resistance.

### Low Porosity and No Reaction with Contact Surfaces

Less than 2µm of White Bronze is needed to create a completely nonporous, corrosion resistant surface. Tyco Electronics applies White Bronze to a thickness of between 2µm and 3µm. This compares favorably with the typical plating thickness of nickel (>10µm) and consequently, variations in plating depth are significantly less.

White Bronze does not alloy with brass and since its coefficient of expansion is virtually identical to that of brass, rapid temperature shocks (-50°C/200°C) do not cause blistering or cracking of the plating.

The electrolytic potential of White Bronze is approximately that of brass. Consequently, any White

Bronze plated connectors in contact with stainless steel, silver, nickel or nickel containing finishes carry no risk of corrosion as a result of any chemical potential difference.

### Low RF Losses

The relative permeability (µr) of the Tyco Electronics White Bronze is 1 giving rise to low RF losses even at high frequencies. As a direct result of the good conductivity of the finish, skin depth is minimized further reducing insertion loss and ensuring a better impedance match across the frequency range of the connectors.

### Non Magnetic Finish

The Tyco Electronics White Bronze contains no ferrous materials and so has no magnetic properties. This is particularly desirable in many RF applications.

### Wear and Scratch Resistant

The hardness of the Tyco Electronics White Bronze at 300-380HV is more than double that of silver and marginally harder than platings containing nickel. This gives a scratch resistance which is rarely surpassed and makes it ideal for high mating applications.

## Appendix B - White Bronze (Continued)

White Bronze is available on all products, including 7-16, N, TNC, OSP and SMA.

### Low Coefficient of Friction

The coefficient of friction is approximately 70% that of silver to give lower insertion forces and smoother coupling. These properties combine to produce a harder wearing, longer lasting finish which prolongs connector life and reduces the ongoing cost of ownership.

### Tyco Electronics' White Bronze

#### Environmental Test

Four groups of conditioning tests were performed to provide a comprehensive evaluation of the Tyco Electronics White Bronze plated connector bodies. The tests were performed to the specifications of the European and International RF connector standards - CECC 22000/ IEC 68-2-14/IEC 169-1. Full details and relevant data are available from Tyco Electronics and results are summarized below.

#### Test 1 - Industrial Atmosphere & Temperature

##### Endurance

1.1 Industrial Atmosphere Exposure to Sulphur Dioxide Atmosphere (as specified in IEC 68-2-42 Test Kc) for 21 days of mated connectors, previously subjected to 500 matings, to determine the influence of sulphur dioxide on the corrosion resistance properties of White Bronze

Plating. Contact resistance measured after matings and sulphur dioxide exposure was less than 5% (0.23mohm) of the permissible specification.

1.2 High Temperature Endurance Exposure to temperatures of 85°C ±5°C for 250 hours, to determine the impact of prolonged high temperatures on plating adhesion. Prior to testing the connectors were subject to 500 matings. Results showed no visual deterioration in plating finish (blistering, cracking etc.) and the results of outer conductivity performance were comparable to Test 1 (above).

#### Test 2 - Rapid Temperature Change & Damp Heat

##### Steady State

2.1 Rapid Temperature Change Exposure to -55°C and +85°C for 15 minutes, transition time 2-3 minutes, 50 cycles. To determine possible plating deterioration caused by prolonged and rapid temperature change. No visual deterioration, outer conductivity performance were comparable with Test 1 (above).

2.2 Damp Heat Steady State Exposure to 93% relative humidity (at 40°C) for 10 days. To determine plating adhesion. No visual deterioration, outer conductivity performance were comparable with Test 1 (above).

### Test 3 - Soldering Heat

3.1 Resistance to Soldering Heat Exposure to concentrated soldering heat (250°C) for 10 seconds to evaluate any possible deterioration in plating finish. No deterioration detected.

### Test 4 - Salt Mist & Mechanical Endurance

#### 4.1 Salt Mist

Exposure to salt mist spray (as defined in BS 2011 Pt. 2.1 Ka) for 48 hours to evaluate the uniformity of protective coatings, any visual deterioration, or impact on electrical performance. No visual deterioration, outer conductivity performance were comparable with Test 1 (above).

4.2 Mechanical Endurance Electrical and visual evaluation of the connectors after 500 matings to determine any electrical or visual deterioration. No visual deterioration, outer conductivity performance were comparable with Test 1 (above).

### Availability and Ordering

Tyco Electronics offers White Bronze on all products including 7-16, N, TNC, SMA and OSP. For more information on White Bronze contact your local Tyco Electronics Sales Office.

## Appendix C - Intermodulation in RF Coaxial Connectors

### Product Facts

- High quality plating to 6µm for IM-sensitive products
- Restrict materials to copper and its alloys
- Avoid the use of stainless steel, nickel, ferrites, etc. in the signal path
- Quality machining
- Ensure, by design, a properly defined contact interface at connector, panel and contact interfaces
- Avoidance of crimps

The increased demand from the mobile communication industry to provide greater channel capacity coupled with the increased sensitivity of receivers has exposed a condition within RF Coaxial Connectors referred to as Intermodulation Distortion (IMD). This condition occurs when non-linearities within the connectors act as imperfect diodes to generate other frequencies known as Intermodulation Products (IMP). Some of these frequencies appear within the receive band and effectively block the channel. The purpose of this application note is to outline the basic causes of Intermodulation and the techniques Tyco Electronics has undertaken to minimize this condition.

### IM Basics

Modern developments in base stations for GSM, DCS 1800 and PCS 1900 have necessitated the use of "7-16", "4.1/9.5" and "N" connectors due to the increased power requirements. The requirements for performance are typically in the order of -

160 dBc to -163dBc (when working in dBc) or -120dBm (when working in dBm), both with 2 x (+43dBm) tones. The requirement is so stringent because the connectors are used in post-filtering sections of the transmit path (between the diplexer and the antenna) and also because the system is a full duplex system where the multiple-carrier transmit path is also the receive path. In a truly linear system, the output is directly proportional to the input, following the form of  $y=mx+c$  (see fig. 2). Coaxial connectors have traditionally been viewed as following this pattern. In reality, there have always been non-linearities present in coaxial connectors. These were not readily apparent as the resultant IM products were significantly below the noise floor of the system due to relatively weak carrier signals. This situation becomes apparent when the incident power is raised above 30 dBm.

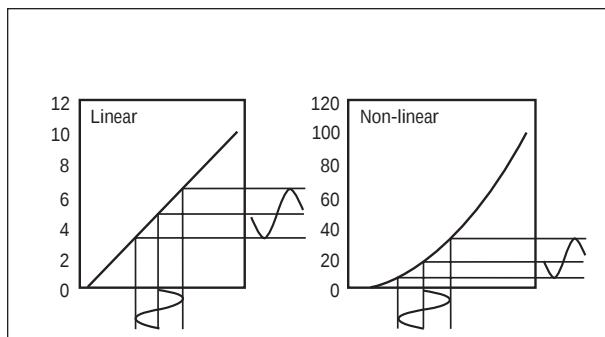
The small non-linearities have a characteristic similar to a square-law (see Fig 3). The distortion to the waveform is evident, the

### Need more information?

Call Technical Support at the numbers listed below.

Technical Support is staffed with specialists well versed in all Tyco Electronics products. They can provide you with:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- Tyco Electronics Authorized Distributor Locations

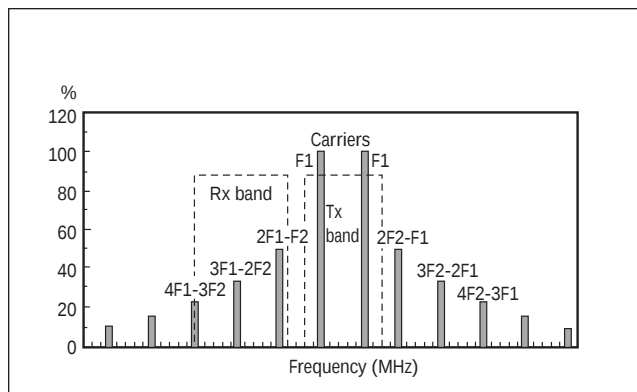


## Appendix C - Intermodulation in RF Coaxial Connectors (Continued)

### IM Basics (Continued)

positive 1/2 cycle being significantly greater in amplitude than the negative 1/2-cycle. When converted to the frequency domain, this waveform consists of the desired fundamental plus a decaying series of related harmonics that, in themselves, interact with other carriers present on the transmission line.

The effect of this interaction produces additional frequencies, some of which occur where they are least wanted (see fig. 4). The  $2F_1-F_2$  (3rd order IMP),  $3F_1-2F_2$  (5th order IMP) and  $4F_1-3F_2$  (7th order IMP) products can all manifest in the receive band and, if sufficiently large, effectively block a channel by making the base station receiver think that a carrier is present when one is not.



### Potential causes of IM in Coaxial Connectors

There are numerous factors which can affect intermodulation performance in RF coaxial connectors. Identified below are the most likely sources of concern:

- Contaminated plating solution
- Insufficient plating thickness
- Corrosion
- Dissimilar metals in intimate contact

- Magnetic materials in the signal path
- Low contact pressure
- Less than 360-degree contact
- Poor surface finish
- Debris and dust within the connector
- Convoluted signal path

### Remedies for IM in RF Coaxial Connectors

To combat the above identified IM sources, Tyco Electronics undertakes precautions during the design and manufacture of the product, as summarized below:

- High quality plating to 6μm for IM-sensitive products

The plating must also be free from contaminants and properly passivated with a chromate passivate. Silver has been the preferred plating material as it possesses the lowest practical resistivity thereby minimizing interface contact resistances. Tyco Electronics also offers a unique White Bronze plating finish which provides excellent durability, tarnish resistance and non-magnetic properties ideal for low intermodulation. During testing with a system noise floor of -145 dBm, the difference in performance between the Tyco Electronics silver-plating and the Tyco Electronics White Bronze finish is not discernible (refer to White Bronze Application Note 1307057).

- Restrict materials to copper and its alloys.

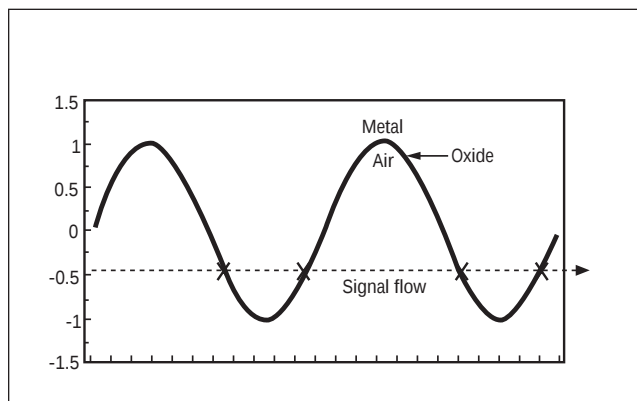
This ensures maximum plating adhesion and minimum electrochemical potential difference between the base materials and their over-platings.

- Avoid the use of stainless steel, nickel, ferrites, etc. in the signal path

Magnetic and para-magnetic materials will only compound non-linearities and give poorer interface contact resistances. During experimentation, Tyco Electronics discovered a degradation in performance of 20dB when nickel plate was used. The presence of magnetic or para-magnetic materials will also cause the forward IMP figure to differ from the reverse IMP.

- Quality machining

Surface finish is paramount. The signal propagates within a "skin" if this skin is too rough, the signal will repeatedly transition through metal and surface oxide layers, thereby creating the



same effect as a poor panel contact (see fig. 5). For IM-sensitive designs Tyco Electronics ensures 0.4μm is the maximum.

- Contact design

This primarily affects the connector interface. Repeated matings can generate small amounts of plating from the individual parts. These oxidize and interfere with the mechanical (and therefore electrical) mating of connectors. The oxidized debris gives further rise to metal and surface oxide junctions and consequently, higher IM products.

- Ensure, by design, a properly defined contact interface at connector, panel and contact interfaces

Insufficient contact force will give rise to metal to oxide junctions. The classic rectifiers were metal oxide by composition.

Axial maximum material condition at the connector interface is critical in order to ensure minimum mismatch and maximum

## Appendix C - Intermodulation in RF Coaxial Connectors (Continued)

### Remedies for IM in RF Coaxial Connectors (Continued)

potential of a butt-contact. Panel interfaces generally concern the physical contact of the connector body to the panel. In this case, it has been determined that a protruding feature as close as possible to the body bore will give the best IM performance. The applied mounting force is concentrated in the surface area of the protrusion which, on engagement with the panel, punctures the existing oxide layer to give a metal-to-metal, gas-tight junction.

### Improving IM Connector Design

Tyco Electronics continues to pursue design techniques which improve intermodulation performance to address emerging telecommunication market needs. A state of the art intermodulation test facility and participation on the international (IEC SC46D WG5) committee to develop standard test practices

#### ■ Avoidance of crimps

Crimps, by nature, can only give multiple point-contact rather than 360-degree contact and also cause a variability in the position of electrical contact during dynamic testing. IM products will therefore be greater. It has been found that soldered center contacts and clamp/solder outer contacts give the best static and dynamic IM performance.

ensures our commitment to the understanding of intermodulation characteristics. This applied technology base is instrumental in developing innovative low intermodulation products for 7-16, Type N, SMA and OSP interfaces.

### Most commonly asked questions regarding Intermodulation

#### 1 Why is intermodulation such a concern for cellular infrastructure equipment?

The primary concerns for cellular service providers today are channel efficiency and clarity of transmission. Growth in demand for mobile communications has created a need to operate equipment at greater capacities and reliability to service the competitive market. Intermodulation degrades or limits the ability of the service provider to operate at optimal levels of performance and may ultimately cause subscribers to experience poor call quality. Intermodulation has become an important factor in system selection to ensure the best possible network service.

#### 2 Where is intermodulation most likely to occur in cellular infrastructure equipment?

Intermodulation is typically of greatest concern between the filtering elements of the system and the antenna. The introduction of higher power levels for the transmit side of the equipment creates greater potential for intermodulation to occur. This is why the majority of focus for intermodulation concerns 7-16, Type N, SMA and 4.1/9.5 connector interfaces.

#### 3 Is intermodulation a recent development?

Intermodulation has always been inherently present in RF coaxial connectors but may be relatively imperceptible in some devices for a variety of reasons. The amount of power applied to an RF connector determines the relative IM threshold which can be observed. Intermodulation is therefore more likely to cause concern in a higher power system, for example, utilizing a 7-16 connector interface rather than an equivalent low power OSX solution. The trend toward higher power digital cellular systems creates the need for greater intermodulation sensitivity.

#### 4 What is the best method of cable attachment for IM sensitive cable assembly applications?

Soldering and clamping are preferred methods due to the 360-degree point of contact created at the cable to connector interface. Such intimate contact improves the overall contact resistance leading to improved IM characteristics. In addition, it is also better to solder the center conductor of the connector to the cable versus crimping due to the improved contact resistance path and elimination of voids.

#### 5 Are there ways to test for intermodulation in an RF coaxial connector?

Yes, very sophisticated methods are needed to test for intermodulation in RF connectors. The test system must utilize extremely sensitive filtering or clean amplification so that the equipment itself has a very low intermodulation noise floor. There is not yet a standardized approach to testing, although an international committee has been formed in the connector industry to address the situation. Tyco Electronics has a state of the art test facility where our designs are optimized for low intermod performance and where further analysis on the effects of this phenomena can be studied.

#### 6 Is intermodulation in coaxial connectors frequency dependent?

No. Because coaxial connectors are broadband devices there is no frequency dependency. Some apparent variability can be detected during testing but this is not due to the connector. The impedance matches of the output diplexer/triplexer and terminations are the causes of the variations and should not be incorrectly attributed to the connector/assembly. Tyco Electronics Interconnect Business Unit has demonstrated that by varying the impedance match of the test station termination, a DUT can show 15dB better  $IMP_3$  than exists in reality.

#### 7 $IMP_3$ in mixers follows a 3dB/dB relationship. What is it for connectors?

The relationship is identical. Taking the 3rd order (2F1-F2): varying the power of F2 gives an  $IMP_3$  relationship of 1dB/dB whereas varying the power of F1 gives a relationship of 2dB/dB as the  $IMP$  is derived from the 2nd harmonic of F1. This gives a total of 3dB/dB when symmetrically varying both carrier powers.

#### 8 I am buying a complete cable assembly from Tyco Electronics. How do I interpret the $IMP$ result now?

With caution! It is the Tyco Electronics policy when testing devices to move away from the normal static test to a dynamic test where the cable termination interfaces are mechanically exercised during live IM conditions. It is also a good indicator to customers of the build quality of the assemblies. A dynamic evaluation has shown 15dB degradation in  $IMP$  performance for poor assemblies and even as much as 50dB for bad ones. It is therefore strongly advisable that IM performance figures are stated in the context of a dynamic measurement.

## Appendix D - Typical Coaxial Cable Specifications

### Abbreviations

#### Dielectric

PE .....Solid polyethylene  
PTEE .....Solid polytetrafluoroethylene  
PIB .....Polyisobutylene, Type B, per MIL-C-17  
Rubber .....Per MIL-C-17D  
Sil .....Silicone rubber  
PS .....Polystyrene

#### Conductors and Braid Materials

AL .....Aluminum  
SCAAI .....Silver covered copper covered aluminum  
BC .....Bare copper  
SC .....Silver covered copper  
CCS .....Copper covered steel  
TC .....Tinned copper  
SCCS .....Silver covered copper covered steel

SCCad Br .....Silver covered cadmium bronze  
GS .....Galvanized steel  
TCCS .....Tin copper covered steel  
SSC .....Silver covered strip  
HR .....High resistance wire  
SA .....Silver covered alloy

#### Jacket Material

PVC-I .....Black polyvinylchloride, contaminating, Type I, per MIL-C-17D  
PVC-II .....Gray polyvinylchloride, noncontaminating, Type II, per MIL-C-17D  
PVC-IIA .....Black polyvinylchloride, noncontaminating, Type IIA, per MIL-C-17D  
PE-III .....Clear polyethylene  
PE-IIIA .....High molecular weight, black polyethylene, Type IIIA, per MIL-C-17D  
FG Braid V .....Fiberglass, impregnated, Type V, per MIL-C-17D  
FEP-IX .....Fluorinated ethylene propylene, Type IX, per MIL-C-17D  
PUR .....Polyurathane, black specific compounds  
SIL/DAC-VI .....Dacron braid over silicone rubber, Type VI, per MIL-C-17D  
Rubber .....Per MIL-C-17D

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                | Dielectric<br>Material | DOD                 | Number/Type<br>of Shielding<br>Braids | Jacket<br>Material | O.D.                 | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                      |
|-----------------------|---------------------------------------------------|------------------------|---------------------|---------------------------------------|--------------------|----------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|-------------------------------|
| 4                     | <b>0.81</b> BC<br>.0320                           | PE                     | <b>.295</b><br>.116 | 2/BC                                  | PVC-1              | <b>5.74</b><br>.226  | .025              | 50                       | 30.8                 | 40 80                           | 1900                                        | Use RG 58C                    |
| 5                     | <b>1.29</b> BC<br>.0508                           | PE                     | <b>4.7</b><br>.185  | 2/BC                                  | PVC-1              | <b>8.43</b><br>.332  | .088              | 52.5                     | 28.5                 | 40 80                           | 3000                                        | Use up to<br>100 MHz          |
| 5A                    | <b>1.29</b> SC<br>.0508                           | PE                     | <b>4.6</b><br>.181  | 2/SC                                  | PVC-II             | <b>8.33</b><br>.328  | .088              | 50                       | 30.8                 | 40 80                           | 3000                                        | Use RG 212                    |
| 5B                    | <b>1.29</b> SC<br>.0508                           | PE                     | <b>4.6</b><br>.181  | 2/SC                                  | PVC-IIA            | <b>8.33</b><br>.328  | .087              | 50                       | 30.8                 | 40 80                           | 3000                                        | Use RG 212                    |
| 6                     | <b>0.72</b> CCS<br>.0285                          | PE                     | <b>4.7</b><br>.185  | 2/Inner SC<br>Outer BC                | PVC-II             | <b>8.43</b><br>.332  | .081              | 76                       | 20.0                 | 40 80                           | 2700                                        | Use RG 6A                     |
| 6A                    | <b>0.72</b> CCS<br>.0285                          | PE                     | <b>4.7</b><br>.185  | 2/Inner SC<br>Outer BC                | PVC-IIA            | <b>8.43</b><br>.332  | .082              | 75                       | 20.6                 | 40 80                           | 2700                                        | Good Attenuation<br>Stability |
| 7                     | <b>0.91</b> BC<br>.0359                           | Air-Space<br>PE        | <b>6.35</b><br>.250 | 1/BC                                  | PVC-I              | <b>9.4</b><br>.370   | .080              | 95                       | 12.5                 | 40 80                           | 1000                                        | Use RG 63B                    |
| 8                     | <b>2.17</b><br>.0855<br><b>7/0.72</b> BC<br>.0285 | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-I              | <b>10.29</b><br>.405 | .106              | 52                       | 29.5                 | 40 80                           | 4000                                        | Use RG 213                    |
| 8A                    | <b>2.17</b><br>.0855<br><b>7/0.72</b> BC<br>.0285 | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-IIA            | <b>10.29</b><br>.405 | .106              | 52                       | 29.5                 | 40 80                           | 5000                                        | Use RG 213                    |
| 9                     | <b>2.17</b><br>.0855<br><b>7/0.72</b> SC<br>.0285 | PE                     | <b>7.11</b><br>.280 | 2/Inner SC<br>Outer BC                | PVC-II             | <b>10.67</b><br>.420 | .140              | 51                       | 30.0                 | 40 80                           | 4000                                        | Use RG 214                    |
| 9A                    | <b>2.17</b><br>.0855<br><b>7/0.72</b> SC<br>.0285 | PE                     | <b>7.11</b><br>.280 | 2/SC                                  | PVC-II             | <b>10.67</b><br>.420 | .140              | 51                       | 30.0                 | 40 80                           | 4000                                        | Use RG 214                    |
| 9B                    | <b>2.17</b><br>.0855<br><b>7/0.72</b> SC<br>.0285 | PE                     | <b>7.11</b><br>.280 | 2/SC                                  | PVC-IIA            | <b>10.67</b><br>.420 | .150              | 50                       | 30.8                 | 40 80                           | 5000                                        | Use RG 214                    |
| 10                    | <b>2.17</b><br>.0855<br><b>7/0.72</b> BC<br>.0285 | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-II<br>w/Armor  | <b>11.76</b><br>.463 | .146              | 52                       | 29.5                 | 40 80                           | 4000                                        | Use RG 215                    |
| 10A                   | <b>2.17</b><br>.0855<br><b>7/0.72</b> BC<br>.0285 | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-IIA<br>w/Armor | <b>11.76</b><br>.463 | .146              | 52                       | 29.5                 | 40 80                           | 5000                                        | Use RG 215                    |
| 11                    | <b>1.21</b><br>.0477<br><b>7/0.4</b> TC<br>.0159  | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-I              | <b>10.29</b><br>.405 | .096              | 75                       | 20.6                 | 40 80                           | 4000                                        | Use up to<br>100 MHz          |
| 11A                   | <b>1.21</b><br>.0477<br><b>7/0.4</b> TC<br>.0159  | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-IIA            | <b>10.29</b><br>.405 | .096              | 75                       | 20.6                 | 40 80                           | 5000                                        | Use up to<br>1000 Mhz         |
| 12                    | <b>1.21</b><br>.0477<br><b>7/0.4</b> TC<br>.0159  | PE                     | <b>7.24</b><br>.285 | 1/BC                                  | PVC-II<br>w/Armor  | <b>11.76</b><br>.463 | .141              | 75                       | 20.6                 | 40 80                           | 4000                                        | Use RG 12A                    |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                 | Dielectric<br>Material | DOD                  | Number/Type<br>of Shielding<br>Braids       | Jacket<br>Material | O.D.                                             | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                         |
|-----------------------|----------------------------------------------------|------------------------|----------------------|---------------------------------------------|--------------------|--------------------------------------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|----------------------------------|
| 12A                   | <b>1.21</b><br>.0477<br>7/0.4 TC<br>.0159          | PE                     | <b>7.24</b><br>.285  | 1/BC                                        | PVC-IIA<br>w/Armor | <b>11.76</b><br>.463                             | .141              | 75                       | 20.6                 | 40 80                           | 5000                                        | Use up to<br>1000 MHz            |
| 13                    | <b>1.21</b><br>.0477<br>7/0.4 TC<br>.0159          | PE                     | <b>7.11</b><br>.280  | 2/BC                                        | PVC-I              | <b>10.67</b><br>.420                             | .126              | 74                       | 20.8                 | 40 80                           | 4000                                        | Use RG 216                       |
| 13A                   | <b>1.21</b><br>.0477<br>7/0.4 TC<br>.0159          | PE                     | <b>7.11</b><br>.280  | 2/BC                                        | PVC-IIA            | <b>10.67</b><br>.420                             | .126              | 52                       | 20.8                 | 40 80                           | 4000                                        | Use RG 216                       |
| 14                    | <b>2.59</b> BC<br>.1020                            | PE                     | <b>9.4</b><br>.370   | 2/BC                                        | PVC-II             | <b>13.84</b><br>.545                             | .216              | 52                       | 29.5                 | 40 80                           | 5500                                        | Use RG 217                       |
| 14A                   | <b>2.59</b> BC<br>.1020                            | PE                     | <b>9.4</b><br>.370   | 2/BC                                        | PVC-IIA            | <b>13.84</b><br>.545                             | .216              | 76                       | 29.5                 | 40 80                           | 7000                                        | Use RG 217                       |
| 15                    | <b>1.45</b> CCS<br>.0571                           | PE                     | <b>9.4</b><br>.370   | 2/BC                                        | PVC-I              | <b>13.84</b><br>.545                             | .197              | 52                       | 20.0                 | 40 80                           | 5000                                        | Use up to<br>1000 MHz            |
| 16                    | <b>2.59</b> BC<br>.1250<br>Tube                    | PE                     | <b>11.68</b><br>.460 | 1/BC                                        | PVC-I              | <b>16</b><br>.630                                | .254              | 52                       | 29.5                 | 40 80                           | 6000                                        | Use up to<br>1000 MHz            |
| 17                    | <b>4.78</b> BC<br>.1880                            | PE                     | <b>17.27</b><br>.680 | 1/BC                                        | PVC-II             | <b>22.1</b><br>.870                              | .460              | 52                       | 29.5                 | 40 80                           | 11,000                                      | Use up to<br>1000 MHz            |
| 17A                   | <b>4.78</b> BC<br>.1880                            | PE                     | <b>17.27</b><br>.680 | 1/BC                                        | PVC-IIA            | <b>22.1</b><br>.870                              | .460              | 52                       | 29.5                 | 40 80                           | 11,000                                      | Use RG 218                       |
| 17B                   | Cancelled, Reassigned New Nomenclature, RG 177     |                        |                      |                                             |                    |                                                  |                   |                          |                      |                                 |                                             |                                  |
| 18                    | <b>4.78</b> BC<br>.1880                            | PE                     | <b>17.27</b><br>.680 | 1/BC                                        | PVC-II<br>w/Armor  | <b>23.50</b><br>.925                             | .585              | 52                       | 29.5                 | 40 80                           | 11,000                                      | Use RG 219                       |
| 18A                   | <b>4.78</b> BC<br>.1880                            | PE                     | <b>17.27</b><br>.680 | 1/BC                                        | PVC-IIA<br>w/Armor | <b>23.57</b><br>.928                             | .585              | 52                       | 29.5                 | 40 80                           | 11,000                                      | Use RG 219                       |
| 19                    | <b>6.35</b> BC<br>.2500                            | PE                     | <b>23.11</b><br>.910 | 1/BC                                        | PVC-II             | <b>28.45</b><br>1.120                            | .740              | 52                       | 29.5                 | 40 80                           | 14,000                                      | Use RG 220                       |
| 19A                   | <b>6.35</b> BC<br>.2500                            | PE                     | <b>23.11</b><br>.910 | 1/BC                                        | PVC-IIA            | <b>28.45</b><br>1.120                            | .740              | 52                       | 29.5                 | 40 80                           | 14,000                                      | Use RG 220                       |
| 20                    | <b>6.35</b> BC<br>.2500                            | PE                     | <b>23.11</b><br>.910 | 1/BC                                        | PVC-II<br>w/Armor  | <b>29.92</b><br>1.178                            | .925              | 52                       | 29.5                 | 40 80                           | 14,000                                      | Use RG 221                       |
| 20A                   | <b>6.35</b> BC<br>.2500                            | PE                     | <b>23.11</b><br>.910 | 1/BC                                        | PVC-IIA<br>w/Armor | <b>29.92</b><br>1.178                            | .925              | 53                       | 29.5                 | 40 80                           | 14,000                                      | Use RG 221                       |
| 21                    | <b>1.29</b><br>0508<br>High Res. Wire              | PE                     | <b>4.7</b><br>.185   | 2/SC                                        | PVC-II             | <b>8.43</b><br>.332                              | .087              | 53                       | 29.0                 | 40 80                           | 2700                                        | Use RG 222                       |
| 21A                   | <b>1.29</b><br>.0508<br>High Res. Wire             | PE                     | <b>4.7</b><br>.185   | 2/SC                                        | PVC-IIA            | <b>8.43</b><br>.332                              | .087              | 95                       | 29.0                 | 40 80                           | 2700                                        | Use RG 222                       |
| 22                    | 2 Cond. <b>1.16</b><br>.0456<br>7/0.39 BC<br>.0152 | PE                     | <b>7.24</b><br>.285  | 1/TC                                        | PVC-I              | <b>10.29</b><br>.405                             | .105              | 95                       | 16.0                 | 40 80                           | 1000                                        | Balanced Line<br>w/Twisted Cond. |
| 22A                   | 2 Cond. <b>1.16</b><br>.0456<br>7/0.39 BC<br>.0152 | PE                     | <b>7.24</b><br>.285  | 2/TC                                        | PVC-II             | <b>10.67</b><br>.420                             | .151              | 95                       | 16.0                 | 40 80                           | 1000                                        | Balanced Line<br>w/Twisted Cond. |
| 22B                   | 2 Cond. <b>1.16</b><br>.0456<br>7/0.39 BC<br>.0152 | PE                     | <b>7.24</b><br>.285  | 2/TC                                        | PVC-IIA            | <b>10.67</b><br>.420                             | .151              | 125                      | 16.0                 | 40 80                           | 1000                                        | Balanced Line<br>w/Twisted Cond. |
| 23                    | 2 Cond. <b>2.17</b><br>.0855<br>7/0.72 BC<br>.0285 | PE, 2 Cores            | <b>9.65</b><br>.380  | 2/Individual<br>Inner<br>Common<br>Outer BC | PVC-I              | <b>16.51 x .490</b><br>.650<br><b>24</b><br>.945 | .490              | 125                      | 12.0                 | 40 80                           | 3000                                        | Use RG 23A                       |
| 23A                   | 2 Cond. <b>2.17</b><br>.0855<br>7/0.72 BC<br>.0285 | PE, 2 Cores            | <b>9.65</b><br>.380  | 2/Individual<br>Inner<br>Common<br>Outer BC | PVC-IIA            | <b>16.51 x .490</b><br>.650<br><b>24</b><br>.945 | .490              | 125                      | 12.0                 | 40 80                           | 3000                                        | Dual Coaxial<br>Balanced Line    |
| 24                    | 2 Cond. <b>2.17</b><br>.0855<br>7/0.72 BC<br>.0285 | PE, 2 Cores            | <b>9.65</b><br>.380  | 2/Individual<br>Inner<br>Common<br>Outer BC | PVC-I<br>w/Armor   | <b>25.48</b><br>1.003<br><b>19.81</b><br>.780    | .670              | .670                     | 12.0                 | 2/Individual<br>40 80           | 3000                                        | Use RG 24A                       |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U Type Cable | Inner Conductor                                            | Dielectric Material | DOD                  | Number/Type of Shielding Braids    | Jacket Material   | O.D.                                          | Weight (lb/ft) | Nom. Imped. (Ohms) | Nom. Cap pf/ft | Max. Operating Temp. (C°) | Max. Operating Voltage (Volts RMS) | Comments              |
|-----------------|------------------------------------------------------------|---------------------|----------------------|------------------------------------|-------------------|-----------------------------------------------|----------------|--------------------|----------------|---------------------------|------------------------------------|-----------------------|
| 24A             | 2 Cond. <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285 | PE, 2 Cores         | <b>9.65</b><br>.380  | 2/Individual Inner Common Outer BC | PVC-IIA w/Armor   | <b>25.48</b><br>1.003<br><b>19.81</b><br>.780 | .670           | 125                | 12.0           | 40 80                     | 3000                               | Use RG 23A            |
| 25A             | <b>1.49</b><br>.0585<br>19/ <b>0.3</b> TC<br>.0117         | Rubber-E            | <b>7.32</b><br>.288  | 2/TC                               | Rubber-IV         | <b>12.83</b><br>.505                          | .205           | 48                 | 50.0           | 40 80                     | 10,000                             | —                     |
| 26A             | <b>1.49</b><br>.0585<br>19/ <b>0.3</b> TC<br>.0117         | Rubber-E            | <b>7.32</b><br>.288  | 1/TC                               | Rubber-IV w/Armor | <b>12.27</b><br>.483                          | .189           | 48                 | 50.0           | 40 80                     | 10,000                             | —                     |
| 27A             | <b>2.35</b><br>.0925<br>19/ <b>0.47</b> TC<br>.0185        | Rubber-D            | <b>11.56</b><br>.455 | 1/TC                               | Rubber-IV w/Armor | <b>16.59</b><br>.653                          | .304           | 48                 | 50.0           | 40 80                     | 15,000                             | —                     |
| 28B             | <b>2.35</b><br>.0925<br>19/ <b>0.47</b> TC<br>.0185        | Rubber-D            | <b>11.56</b><br>.455 | 2/TC, GS                           | Rubber-IV w/Armor | <b>19.05</b><br>.750                          | .370           | 48                 | 50.0           | 40 80                     | 15,000                             | —                     |
| 29              | <b>0.81</b> BC<br>.0320<br><b>1.21</b><br>.0477            | PE                  | <b>2.95</b><br>.116  | 1/TC                               | PE-111            | <b>4.67</b><br>.184                           | 0.21           | 53.5               | 28.5           | 55 80                     | 1900                               | Use RG 58             |
| 30              | 7/ <b>0.4</b> BC<br>.0159                                  | PIB                 | <b>4.7</b><br>.185   | 1/BC                               | PVC-I             | <b>6.35</b><br>.250                           | .044           | 50                 | 27.0           | 40 80                     | 1500                               | Use RG 58             |
| 31              | <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285         | PIB                 | <b>7.24</b><br>.285  | 1/BC                               | PVC-I             | <b>10.29</b><br>.405                          | .106           | 51                 | 31.0           | 40 80                     | 2000                               | Use RG 213            |
| 32              | <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285         | PIB                 | <b>7.24</b><br>.285  | 1/BC                               | PVC-I w/Armor     | <b>11.81</b><br>.465                          | .141           | 51                 | 29.0           | 40 80                     | 2000                               | Use RG 215            |
| 33              | <b>2.59</b> BC<br>.1019                                    | PE                  | <b>9.4</b><br>3.70   | None                               | Lead              | <b>11.94</b><br>.470                          | .390           | 51                 | 30.0           | 55 80                     | 6000                               | —                     |
| 34              | <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285         | PE                  | <b>11.56</b><br>.455 | 1/BC                               | PVC-I             | <b>15.88</b><br>.625                          | .224           | 71                 | 21.5           | 40 80                     | 5200                               | Use RG 31B            |
| 34A             | <b>1.9</b><br>.0747<br>7/ <b>0.63</b> BC<br>.0249          | PE                  | <b>11.68</b><br>.460 | 1/BC                               | PVC-IIA           | <b>16</b><br>.630                             | .224           | 75                 | 20.6           | 40 80                     | 6500                               | Use RG 34B            |
| 34B             | <b>1.9</b><br>.0747<br>7/ <b>0.63</b> BC<br>.0249          | PE                  | <b>11.68</b><br>.460 | 1/BC                               | PVC-IIA           | <b>16</b><br>.630                             | .224           | 75                 | 20.6           | 40 80                     | 6500                               | Use up to 1000 MHz    |
| 35              | <b>2.91</b> BC<br>.1144<br><b>1.6</b><br>0.63              | PE                  | <b>11.68</b><br>.460 | 1/BC                               | PVC-II w/Armor    | <b>23.57</b><br>.928                          | .525           | 71                 | 21.5           | 40 80                     | 10,000                             | Use RG 35B            |
| 35A             | <b>2.65</b> BC<br>.1045                                    | PE                  | <b>11.68</b><br>.460 | 1/BC                               | PVC-IIA w/Armor   | <b>23.57</b><br>.928                          | .525           | 75                 | 20.6           | 40 80                     | 10,000                             | Use RG 35B            |
| 35B             | <b>2.65</b> BC<br>.1045                                    | PE                  | <b>11.68</b><br>.460 | 1/BC                               | PVC-IIA           | <b>23.57</b><br>.928                          | .525           | 75                 | 20.6           | 40 80                     | 10,000                             | Unarmored: see RG 164 |
| 36              | <b>4.11</b> BC<br>.1620                                    | PE                  | <b>23.11</b><br>.910 | 1/BC                               | PVC-I             | <b>29.97</b><br>1.180                         | .805           | 69                 | 22.0           | 40 80                     | 13,000                             | Use up to 1000 MHz    |
| 37              | <b>0.81</b> TC<br>.0320                                    | Rubber-C            | <b>3.56</b><br>.140  | 1/TC                               | PE-III            | <b>5.33</b><br>.210                           | .040           | 52.5               | 38.0           | 55 80                     | 750                                | —                     |
| 38              | <b>1.15</b> TC<br>.0453                                    | Rubber-C            | <b>4.98</b><br>.196  | 2/TC                               | PE-III            | <b>7.92</b><br>.312                           | .110           | 52.5               | 38.0           | 55 80                     | 1000                               | —                     |
| 39              | <b>0.64</b> CCS<br>.0253                                   | Rubber-C            | <b>4.98</b><br>.196  | 2/TC                               | PE-III            | <b>7.92</b><br>.312                           | .100           | 72.5               | 28.6           | 55 80                     | 1000                               | —                     |
| 40              | <b>0.64</b> CCS<br>.0253                                   | Rubber-C            | <b>4.98</b><br>.196  | 2/TC                               | Rubber IV         | <b>10.67</b><br>.420                          | .150           | 72.5               | 28.0           | 40 80                     | 1000                               | —                     |
| 41              | <b>1.24</b><br>.0490<br>16/ <b>0.25</b> TC<br>.0100        | Rubber-IV           | <b>6.35</b><br>.250  | 1/TC                               | Rubber-IV         | <b>10.8</b><br>.425                           | .150           | 67.5               | 27.6           | 40 80                     | 3000                               | —                     |
| 42              | <b>0.72</b><br>.0285<br>Res. Wire                          | PE                  | <b>4.98</b><br>.196  | 2/SC                               | PVC-II            | <b>8.69</b><br>.342                           | .050           | 78                 | 20.0           | 40 80                     | 2700                               | Use RG 222            |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                                  | Dielectric<br>Material | DOD                                        | Number/Type<br>of Shielding<br>Braids | Jacket<br>Material | O.D.                                         | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                           |
|-----------------------|---------------------------------------------------------------------|------------------------|--------------------------------------------|---------------------------------------|--------------------|----------------------------------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|------------------------------------|
| 43                    | 2 Cond. <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285          | Rubber-B               | <b>11.99</b><br>.427                       | 1/BC                                  | PVC-I              | <b>15.67</b><br>.617                         | —                 | 95                       | 17.6                 | 40 80                           | 1500                                        | Use RG 57                          |
| 54                    | <b>1.21</b><br>.0477<br>7/ <b>0.4</b> BC<br>.0159                   | PE                     | <b>4.7</b><br>.185                         | 1/BC                                  | PVC-I              | <b>6.99</b><br>.275                          | .045              | 58                       | 27.0                 | 40 80                           | 2500                                        | Use RG 54A                         |
| 54A                   | <b>1.16</b><br>.0456<br>7/ <b>0.39</b> BC<br>.0152                  | PE                     | <b>4.52</b><br>.178                        | 1/TC                                  | PE-III             | <b>6.22</b><br>2.45                          | .041              | 58                       | 26.5                 | 55 80                           | 3000                                        | Use up to<br>1000 MHz              |
| 55                    | <b>0.81</b> BC<br>.0320                                             | PE                     | <b>2.95</b><br>.116                        | 2/TC                                  | PE-III             | <b>5.08</b><br>.200                          | .032              | 53.5                     | 28.5                 | 55 80                           | 1900                                        | Use RG 55B                         |
| 55A                   | <b>0.89</b> SC<br>.0350                                             | PE                     | <b>2.95</b><br>.116                        | 2/SC                                  | PVC-IIA            | <b>5.08</b><br>.200                          | .034              | 50                       | 30.8                 | 40 80                           | 1900                                        | Use RG 223                         |
| 55B                   | <b>0.81</b> SC<br>.0320                                             | PE                     | <b>2.95</b><br>.116                        | 2/TC                                  | PE-IIIA            | <b>5.08</b><br>.200                          | .033              | 53.5                     | 28.5                 | 55 80                           | 1900                                        | Use up to<br>1000 MHz              |
| 56                    | <b>1.49</b><br>.0585<br>19/ <b>0.3</b> BC<br>.0117                  | Rubber-D               | <b>7.82</b><br>.308                        | 2/BC                                  | PVC-I              | <b>13.59</b><br>.535                         | .243              | 48                       | 50.0                 | 40 80                           | 8000                                        | —                                  |
| 57                    | 2 Cond. <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285          | PE                     | <b>11.99</b><br>.472                       | 1/TC                                  | PVC-I              | <b>15.88</b><br>.625                         | .225              | 95                       | 17.0                 | 40 80                           | 3000                                        | Balanced Line<br>Parallel          |
| 57A                   | 2 Cond. <b>2.17</b><br>.0855<br>7/ <b>0.72</b> BC<br>.0285          | PE                     | <b>11.99</b><br>.472                       | 1/TC                                  | PVC-IIA            | <b>15.88</b><br>.625                         | .225              | 95                       | 17.0                 | 40 80                           | 3000                                        | Balanced Line<br>Parallel          |
| 58                    | <b>0.81</b> BC<br>.0320                                             | PE                     | <b>2.95</b><br>.116                        | 1/TC                                  | PVC-I              | <b>4.95</b><br>.195                          | .029              | 53.5                     | 28.5                 | 40 80                           | 1900                                        | Use RG 58B                         |
| 58A                   | <b>0.9</b><br>.0355                                                 | PE                     | <b>2.95</b><br>.116                        | 1/TC                                  | PVC-I              | <b>4.95</b><br>.195                          | .029              | 52                       | 28.5                 | 40 80                           | 1900                                        | Use RG 58C                         |
| 58B                   | <b>0.81</b> BC<br>.0320                                             | PE                     | <b>2.95</b><br>.116                        | 1/TC                                  | PVC-IIA            | <b>4.95</b><br>.195                          | .029              | 53.5                     | 28.5                 | 40 80                           | 1900                                        | Use up to<br>1000 MHz              |
| 58C                   | <b>0.9</b><br>.0355<br>19/ <b>0.8</b> TC<br>.0071                   | PE                     | <b>2.95</b><br>.116                        | 1/TC                                  | PVC-IIA            | <b>4.95</b><br>.195                          | .029              | 50                       | 30.8                 | 40 80                           | 1900                                        | Extra Flexible<br>Version RG 58B   |
| 59                    | <b>0.64</b> CCS<br>.0253                                            | PE                     | <b>3.71</b><br>.146                        | 1/BC                                  | PVC-I              | <b>6.15</b><br>.242                          | .032              | 73                       | 21.0                 | 40 80                           | 2300                                        | Use RG 59B                         |
| 59A                   | <b>0.64</b> CCS<br>.0253                                            | PE                     | <b>3.71</b><br>.146                        | 1/BC                                  | PVC-IIA            | <b>6.15</b><br>.242                          | .032              | 73                       | 21.0                 | 40 80                           | 2300                                        | Use RG 59B                         |
| 59B                   | <b>0.58</b> CCS<br>.0230                                            | PE                     | <b>3.71</b><br>.146                        | 1/BC                                  | PVC-IIA            | <b>6.15</b><br>.242                          | .032              | 75                       | 20.6                 | 40 80                           | 2300                                        | Use up to<br>1000 MHz              |
| 60                    | <b>1.29</b> Str. C<br>.0508                                         | Rubber-C               | <b>6.35</b><br>.250                        | 1/BC                                  | Rubber-IV          | <b>10.8</b><br>.425                          | .150              | 50                       | 39.0                 | 40 80                           | 1100                                        | —                                  |
| 62                    | <b>0.64</b> CCS<br>.0253                                            | Air-space<br>PE        | <b>3.71</b><br>.146                        | 1/BC                                  | PVC-I              | <b>6.15</b><br>.242                          | .038              | 93                       | 13.5                 | 40 80                           | 750                                         | Use RG 62A<br>Low                  |
| 62A                   | <b>0.64</b> CCS<br>.0253                                            | Air-space<br>PE        | <b>3.71</b><br>.146                        | 1/BC                                  | PVC-IIA            | <b>6.15</b><br>.242                          | .038              | 93                       | 13.5                 | 40 80                           | 750                                         | Capacitance                        |
| 62B                   | <b>0.61</b><br>.0240<br>7/ <b>0.2</b> CCS<br>.0080                  | Air-space<br>PE        | <b>3.71</b><br>.146                        | 1/BC                                  | PVC-IIA            | <b>6.15</b><br>.242                          | .038              | 93                       | 13.5                 | 40 80                           | 750                                         | Extra Flexible<br>RG 62A           |
| 63                    | <b>0.64</b> CCS<br>.0253                                            | Air-space<br>PE        | <b>7.24</b><br>.285                        | 1/BC                                  | PVC-I              | <b>10.29</b><br>.405                         | .083              | 125                      | 10.0                 | 40 80                           | 1000                                        | Use RG 63B                         |
| 63A                   | <b>0.64</b> BC<br>.0253                                             | Air-space<br>PE        | <b>7.24</b><br>.285                        | 1/BC                                  | PVC-I              | <b>10.29</b><br>.405                         | .083              | 125                      | 10.0                 | 40 80                           | 1000                                        | Use RG 63B                         |
| 63B                   | <b>0.64</b> CCS<br>.0253                                            | Air-space<br>PE        | <b>7.24</b><br>.285                        | 1/BC                                  | PVC-IIA            | <b>10.29</b><br>.405                         | .083              | 125                      | 10.0                 | 40 80                           | 1000                                        | Low<br>Capacitance                 |
| 64                    | <b>1.49</b><br>.0585<br>19/ <b>0.3</b> TC<br>.0117                  | Rubber-D               | <b>7.82</b><br>.308<br><b>7.24</b><br>.285 | 2/TC                                  | Rubber-IV          | <b>12.57</b><br>.495<br><b>10.29</b><br>.405 | .225              | 48                       | 60.0                 | 40 80                           | 10,000                                      | —<br>Capacitance                   |
| 64A                   | <b>1.49</b><br>.0585<br>19/ <b>0.3</b> TC<br>.0117                  | Rubber-E               | <b>7.32</b><br>.288                        | 2/TC                                  | Rubber-IV          | <b>11.68</b><br>.460                         | .205              | 48                       | 50.0                 | 40 80                           | 10,000                                      | —                                  |
| 65                    | <b>0.2</b> [.0080]<br>Formex-F<br><b>3.25</b> [.1280]<br>Dia. Helix | PE                     | <b>7.24</b><br>.285                        | 1/BC                                  | PVC-I              | <b>10.29</b><br>.405                         | .096              | 950                      | 44.0                 | 40 80                           | 1000                                        | High Impedance<br>Video Delay Line |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                    | Dielectric<br>Material | DOD                   | Number/Type<br>of Shielding<br>Braids | Jacket<br>Material       | O.D.                  | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pf/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                           |
|-----------------------|-------------------------------------------------------|------------------------|-----------------------|---------------------------------------|--------------------------|-----------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|------------------------------------|
| 65A                   | .02 [.0080]<br>Formex-F<br>3.25 [.1280]<br>Dia. Helix | PE                     | 7.24<br>.285          | 1/BC                                  | PVC-IIA                  | 10.29<br>.405         | .096              | 950                      | 44.0                 | 40 80                           | 1000                                        | High Impedance<br>Video Delay Line |
| 71                    | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 3.71<br>.146          | 2/TC                                  | PVC-I                    | 6.22<br>.245          | .046              | 93                       | 13.5                 | 40 80                           | 750                                         | Use RG 71B                         |
| 71A                   | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 3.71<br>.146          | 2/TC                                  | PE-III                   | 6.22<br>.245          | .046              | 93                       | 13.5                 | 55 80                           | 750                                         | Use RG 71B                         |
| 71B                   | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 3.71<br>.146          | 2/TC                                  | PE-IIIA                  | 6.22<br>.245          | .046              | 93                       | 13.5                 | 55 80                           | 750                                         | Low<br>Capacitance                 |
| 72                    | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 11.68<br>.460         | 1/BC                                  | PVC-I                    | 16<br>.630            | .169              | 150                      | 7.8                  | 40 80                           | 750                                         | Low<br>Capacitance                 |
| 73                    | 1.65 BC<br>.0650                                      | PE                     | 2.95<br>.116          | 2/BC                                  | Copper<br>Braid          | 4.45<br>.175          | .031              | 25                       | 61.8                 | 55 80                           | 1000                                        | Low<br>Impedance                   |
| 74                    | 2.59 BC<br>.1020                                      | PE                     | 9.4<br>.370           | 2/BC                                  | PVC-II<br>w/Armor        | 15.32<br>.603         | .310              | 52                       | 29.5                 | 40 80                           | 5500                                        | Use RG 224                         |
| 74A                   | 2.59 BC<br>.1020                                      | PE                     | 9.4<br>.370           | 2/BC                                  | PVC-IIA<br>w/Armor       | 15.32<br>.603         | .310              | 52                       | 29.5                 | 40 80                           | 5500                                        | Use RG 224                         |
| 77A                   | 1.49<br>.0585<br>19/0.3 TC<br>.0117                   | Rubber-E               | 7.32<br>.288          | 2/TC                                  | PVC-IIA                  | 11.43<br>.450         | .195              | 48                       | 50.0                 | 40 80                           | 8000<br>Peak                                | —                                  |
| 78A                   | 1.49<br>.0585<br>19/0.3 TC<br>.0117                   | Rubber-E               | 7.32<br>.288          | 1/TC                                  | PVC-IIA                  | 10.67<br>.420         | .149              | 48                       | 50.0                 | 40 80                           | 8000<br>Peak                                | —                                  |
| 79                    | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 7.24<br>.285          | 1/BC                                  | PVC-I<br>w/Armor         | 11.76<br>.463         | .136              | —                        | 10.0                 | 40 80                           | 1000                                        | Low<br>Capacitance                 |
| 79A                   | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 7.24<br>.285          | 1/BC                                  | PVC-I<br>w/Armor         | 11.76<br>.463         | .130              | .125                     | 10.0                 | 40 80                           | 1000                                        | Low<br>Capacitance                 |
| 79B                   | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 7.24<br>.285          | 1/BC                                  | PVC-IIA<br>w/Armor       | 11.76<br>.463         | .136              | .125                     | 10.0                 | 40 80                           | 1000                                        | Low<br>Capacitance                 |
| 81                    | 1.59 BC<br>.0625                                      | Magnesium<br>Oxide G   | 8.15<br>.321          | None                                  | Copper<br>Tube           | 8.26<br>.325          | .172              | 50                       | 37.0                 | 250                             | 3000                                        | —                                  |
| 82                    | 3.18 BC<br>.1250                                      | Magnesium<br>Oxide G   | 16.51<br>.650         | None                                  | Copper<br>Tube           | 19.05<br>.750         | .698              | 50                       | 36.0                 | 250                             | 5000                                        | —                                  |
| 83                    | 2.59 BC<br>.1020                                      | PE                     | 6.1<br>.240           | 1/BC                                  | PVC-I                    | 10.29<br>.405         | .120              | 35                       | 44.0                 | 40 80                           | 2000                                        | Low<br>Impedance                   |
| 84A                   | 2.65 BC<br>.1045                                      | PE                     | 17.27<br>.680         | 1/BC                                  | PVC-IIA<br>w/Lead Sheath | 25.4<br>1.000         | 1.325             | 75                       | 20.6                 | 40 80                           | 10,000                                      | RG 35B with<br>Special Armor       |
| 85A                   | 2.65 BC<br>.1045                                      | PE                     | 17.27<br>.680         | 1/BC                                  | PVC-IIA<br>w/Lead Armor  | 39.75<br>1.565        | 2.910             | 75                       | 20.6                 | 40 80                           | 10,000                                      | RG 84A with<br>Special Armor       |
| 86                    | 2 Cond. 2.17<br>.0855<br>7/0.72 BC<br>.0285           | PE                     | 7.62<br>16.51<br>.650 | None                                  | None                     | 7.62<br>16.51<br>.650 | .100              | 200                      | 7.8                  | 55 80                           | 10,000                                      | Twin Lead                          |
| 87A                   | 2.44<br>.0960<br>7/0.81 SC<br>.0320                   | PTFE                   | 7.11<br>.280          | 2/SC                                  | FG<br>Braid-V            | 10.8<br>.425          | .180              | 50                       | 29.4                 | 55 250                          | 5000                                        | Use RG 225                         |
| 88                    | 1.49<br>.0585<br>19/0.3 TC<br>.0117                   | Rubber-E               | 7.32<br>.288          | 4/TC                                  | PVC-I                    | 13.08<br>.515         | .211              | 48                       | 50.0                 | 40 80                           | 10,000                                      | —                                  |
| 88A                   | 1.49<br>.0585<br>19/0.3 TC<br>.0117                   | Rubber-E               | 7.32<br>.288          | 4/TC                                  | PVC-IIA                  | 13.08<br>.515         | .211              | 48                       | 50.0                 | 40 80                           | 10,000                                      | —                                  |
| 88B                   | 1.49<br>.0585<br>19/0.3 TC<br>.0117                   | Rubber-E               | 7.32<br>.288          | 4/TC                                  | Rubber-IV                | 14.35<br>.565         | .238              | 48                       | 50.0                 | 40 80                           | 10,000                                      | —                                  |
| 89                    | 0.64 CCS<br>.0253                                     | Air-space<br>PE        | 7.24<br>.285          | 1/BC                                  | PVC-I                    | 16.05<br>.632         | .195              | 125                      | 10.0                 | 40 80                           | 1000                                        | Low<br>Capacitance                 |
| 90                    | 1.53<br>.0603<br>7/0.51 SC<br>.0201                   | PE                     | 4.95<br>.195          | 3/SC, GS, SC                          | PVC-IIA                  | 10.8<br>.425          | —                 | 50                       | 30.8                 | 40 80                           | 3000                                        | Excellent<br>Shielding             |
| 93                    | 5.08<br>.2000<br>19/1.02 BC<br>.0400                  | Taped<br>PTFE          | 14.55<br>.573         | 1/BC                                  | FG<br>Braid-V            | 18.03<br>.710         | .475              | 50                       | 29.4                 | 55 250                          | 10,000                                      | Use RG 211A                        |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                         | Dielectric<br>Material | DOD                         | Number/Type<br>of Shielding<br>Braids | Jacket<br>Material    | O.D.                  | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                 |
|-----------------------|------------------------------------------------------------|------------------------|-----------------------------|---------------------------------------|-----------------------|-----------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|--------------------------|
| 94                    | <b>2.86</b><br>.1125<br>19/ <b>0.57</b> SC<br>.0225        | Taped<br>PTFE          | <b>7.42</b><br>.292         | 2/BC                                  | FG<br>Braid-V         | <b>11.3</b><br>.445   | .270              | 50                       | 29.4                 | 55 250                          | 7000                                        | Use RG 226               |
| 94A                   | <b>3.23</b><br>.1270<br>19/ <b>0.65</b> SC<br>.0254        | Taped<br>PTFE          | <b>9.4</b><br>.370          | 2/BC                                  | FG<br>Braid-V         | <b>12.7</b><br>.500   | .445              | 50                       | 29.4                 | 55 250                          | 7000                                        | Use RG 226               |
| 100                   | <b>1.87</b><br>.0735<br>19/ <b>0.37</b> BC<br>.0147        | PE                     | <b>3.71</b><br>.146         | 1/BC                                  | PVC-I                 | <b>6.15</b><br>.242   | .046              | 35                       | 44.0                 | 40 80                           | 2000                                        | Use up to<br>1000 MHz    |
| 101                   | <b>1.63</b> BC<br>.0641                                    | Rubber                 | —                           | 1/TC                                  | —                     | <b>14.94</b><br>.588  | —                 | 75                       | —                    | —                               | —                                           | —                        |
| 102                   | 2 Cond.<br><b>2.05</b> BC<br>.0808                         | Rubber                 | —                           | 1/TC                                  | —                     | <b>27.64</b><br>1.088 | —                 | 140                      | —                    | —                               | —                                           | —                        |
| 108                   | 2 Cond. <b>0.96</b><br>.0378<br>7/ <b>0.32</b> TC<br>.0126 | PE                     | <b>2.01</b><br>.079<br>Each | 1/TC                                  | PVC-II                | <b>5.97</b><br>.235   | .032              | 78                       | 19.6                 | 40 80                           | 1000                                        | Use RG 108A              |
| 108A                  | 2 Cond. <b>0.96</b><br>.0378<br>7/ <b>0.32</b> TC<br>.0126 | PE                     | <b>2.01</b><br>.079<br>Each | 1/TC                                  | PVC-IIA               | <b>5.97</b><br>.235   | .032              | 78                       | 19.6                 | 40 80                           | 1000                                        | Balanced Line            |
| 111                   | 2 Cond. <b>1.16</b><br>.0456<br>7/ <b>0.39</b> BC<br>.0152 | PE                     | <b>7.24</b><br>.285         | 2/TC                                  | PVC-II<br>w/Armor     | <b>12.14</b><br>.478  | .146              | 95                       | 16.0                 | 40 80                           | 1000                                        | Use RG 111A              |
| 111A                  | 2 Cond. <b>1.16</b><br>.0456<br>7/ <b>0.39</b> BC<br>.0152 | PE                     | <b>7.24</b><br>.285         | 2/TC                                  | PVC-IIA<br>w/Armor    | <b>12.14</b><br>.478  | .146              | 95                       | 16.0                 | 40 80                           | 1000                                        | Use RG 22B<br>w/Armor    |
| 114                   | <b>0.18</b> CCS<br>.0070                                   | Air-space<br>PE        | <b>7.24</b><br>.285         | 1/BC                                  | PVC-I                 | <b>10.29</b><br>.405  | .087              | 185                      | 6.5                  | 40 80                           | 1000                                        | Use RG 114A              |
| 114A                  | <b>0.18</b> CCS<br>.0070                                   | Air-space<br>PE        | <b>7.24</b><br>.285         | 1/BC                                  | PVC-IIA               | <b>10.29</b><br>.405  | .087              | 185                      | 6.5                  | 40 80                           | 1000                                        | Low<br>Capacitance       |
| 115                   | <b>2.13</b><br>.0840<br>7/ <b>0.71</b> SC<br>.0280         | Taped<br>PTFE          | <b>6.35</b><br>.250         | 2/BC                                  | FG<br>Braid-V         | <b>9.53</b><br>.375   | .148              | 50                       | 29.4                 | 55 250                          | 5000                                        | Use RG 115A              |
| 115A                  | <b>2.13</b><br>.0840<br>7/ <b>0.71</b> SC<br>.0280         | Taped<br>PTFE          | <b>6.48</b><br>.255         | 2/BC                                  | FG<br>Braid-V         | <b>10.54</b><br>.415  | .180              | 50                       | 29.4                 | 55 250                          | 5000                                        | Extra Flexible<br>RG 225 |
| 116                   | <b>2.44</b><br>.0960<br>7/ <b>0.81</b> SC<br>.0320         | PTFE                   | <b>7.11</b><br>.280         | 2/SC                                  | FG Braid-V<br>w/Armor | <b>12.7</b><br>.475   | .198              | 50                       | 29.4                 | 55 250                          | 5000                                        | Use RG 227               |
| 117                   | <b>4.78</b> BC<br>.1880                                    | PTFE                   | <b>15.75</b><br>.620        | 1/BC                                  | FG<br>Braid-V         | <b>18.54</b><br>.730  | .641              | 50                       | 29.4                 | 55 250                          | 7000                                        | Use RG 211A              |
| 117A                  | <b>4.78</b> BC<br>.1880                                    | PTFE                   | <b>15.75</b><br>.620        | 1/BC                                  | FG<br>Braid-V         | <b>18.54</b><br>.730  | .641              | 50                       | 29.4                 | 55 250                          | 7000                                        | Use RG 211A              |
| 118                   | <b>4.78</b> BC<br>.1880                                    | PTFE                   | <b>15.75</b><br>.620        | 1/BC                                  | FG Braid-V<br>w/Armor | <b>19.81</b><br>.780  | .682              | 50                       | 29.4                 | 55 250                          | 7000                                        | Use RG 228A              |
| 118A                  | <b>4.78</b> BC<br>.1880                                    | PTFE                   | <b>15.75</b><br>.620        | 1/BC                                  | FG Braid-V<br>w/Armor | <b>19.81</b><br>.780  | .682              | 50                       | 29.4                 | 55 250                          | 7000                                        | Use RG 228A              |
| 119                   | <b>2.59</b> BC<br>.1020                                    | PTFE                   | <b>8.43</b><br>.332         | 2/BC                                  | FG<br>Braid-V         | <b>11.81</b><br>.465  | .225              | 50                       | 29.4                 | 55 250                          | 6000                                        | Use up to<br>1000 MHz    |
| 120                   | <b>2.59</b> BC<br>.1020                                    | PTFE                   | <b>8.43</b><br>.332         | 2/BC                                  | FG<br>Braid-V         | <b>13.28</b><br>.523  | .282              | 50                       | 29.4                 | 55 250                          | 6000                                        | RG 119<br>w/Armor        |
| 122                   | <b>0.76</b><br>.0300<br>7/ <b>0.13</b> TC<br>.0050         | PE                     | <b>2.44</b><br>.096         | 1/TC                                  | PVC-IIA               | <b>4.06</b><br>.160   | .016              | 50                       | 29.4                 | 40 80                           | 1900                                        | Use up to<br>1000 MHz    |
| 124                   | <b>0.64</b> TCCS<br>.0253                                  | Taped<br>PTFE          | <b>3.43</b><br>.135         | 1/TC                                  | FG<br>Braid-V         | <b>6.1</b><br>.240    | .210              | 73                       | 20.3                 | 55 250                          | 2300                                        | Use RG 140               |
| 125                   | <b>0.4</b> CCS<br>.0159                                    | Air-space<br>PE        | <b>11.68</b><br>.460        | 1/BC                                  | PVC-IIA               | <b>15.24</b><br>.600  | .180              | 150                      | 7.8                  | 40 80                           | 2000                                        | Low<br>Capacitance       |
| 126                   | <b>1.55</b><br>.0609<br>7/ <b>0.52</b> HR<br>.0203         | PTFE                   | <b>4.7</b><br>.185          | 1/HR                                  | FG<br>Braid-V         | <b>7.11</b><br>.280   | .070              | 50                       | 29.4                 | 55 250                          | 3000                                        | High<br>Loss Cable       |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U Type Cable | Inner Conductor                                         | Dielectric Material | DOD                  | Number/Type of Shielding Braids | Jacket Material    | O.D.                 | Weight (lb/ft) | Nom. Imped. (Ohms) | Nom. Cap pF/ft | Max. Operating Temp. (C°) | Max. Operating Voltage (Volts RMS) | Comments                           |
|-----------------|---------------------------------------------------------|---------------------|----------------------|---------------------------------|--------------------|----------------------|----------------|--------------------|----------------|---------------------------|------------------------------------|------------------------------------|
| 130             | 2 Cond. <b>2.17</b><br>.0855<br>7/0.72 BC<br>.0285      | PE                  | <b>11.99</b><br>.472 | 1/TC                            | PVC-I              | <b>15.88</b><br>.625 | .220           | 95                 | 17.0           | 40 80                     | 3000                               | RG 57 w/<br>Twisted Cond.          |
| 131             | 2 Cond. <b>2.17</b><br>.0855<br>7/0.72 BC<br>.0285      | PE                  | <b>11.99</b><br>.472 | 1/TC                            | PVC-I<br>w/Armor   | <b>17.35</b><br>.683 | .290           | 95                 | 17.0           | 40 80                     | 3000                               | Armored<br>RG 130                  |
| 133             | <b>0.72</b> BC<br>.0285                                 | PE                  | <b>7.24</b><br>.285  | 1/BC                            | PVC-I              | <b>10.29</b><br>.405 | .094           | 95                 | 16.2           | 40 80                     | 4000                               | Use RG 133A                        |
| 133A            | <b>0.64</b> BC<br>.0253                                 | PE                  | <b>7.24</b><br>.285  | 1/BC                            | PVC-IIA            | <b>10.29</b><br>.405 | .094           | 95                 | 16.2           | 40 80                     | 4000                               | 95 Ohm Version<br>RG 8             |
| 140             | <b>0.64</b> SCCS<br>.0250                               | PTFE                | <b>3.71</b><br>1.46  | 1/SC                            | FG Braid-V         | <b>5.92</b><br>.233  | .056           | 75                 | 19.5           | 55 250                    | 2300                               | See RG 302 for<br>FEP Jacket       |
| 141             | <b>0.91</b> SCCS<br>.0359                               | PTFE                | <b>2.95</b><br>.116  | 1/SC                            | FG Braid-V         | <b>4.83</b><br>.190  | .036           | 50                 | 29.4           | 55 250                    | 1900                               | Use RG 141A                        |
| 141A            | <b>0.99</b> SCCS<br>.0390                               | PTFE                | <b>2.95</b><br>.116  | 1/SC                            | FG Braid-V         | <b>4.83</b><br>.190  | .036           | 50                 | 29.4           | 55 250                    | 1900                               | See RG 303 for<br>FEP Jacket       |
| 142             | <b>0.91</b> SCCS<br>.0359                               | PTFE                | <b>2.95</b><br>.116  | 2/SC                            | FG Braid-V         | <b>4.95</b><br>.195  | .047           | 50                 | 29.4           | 55 250                    | 1900                               | Use RG 142A                        |
| 142A            | <b>0.99</b> SCCS<br>.0390                               | PTFE                | <b>2.95</b><br>.116  | 2/SC                            | FG                 | <b>4.95</b><br>.195  | .047           | 50                 | 29.4           | 50 250                    | 1900                               | See RG 142B for<br>FEP Jacket      |
| 142B            | <b>0.99</b> SCCS<br>.0390                               | PTFE                | <b>2.95</b><br>.116  | 2/SC                            | FEP                | <b>4.95</b><br>.195  | .047           | 50                 | 29.4           | 55 250                    | 1900                               | Standard Center<br>Cond. Available |
| 143             | <b>1.45</b> SCCS<br>.0570                               | PTFE                | <b>4.7</b><br>.185   | 2/SC                            | FG Braid-V         | <b>8.26</b><br>.325  | .114           | 50                 | 29.4           | 55 250                    | 3000                               | Use RG 143A                        |
| 143A            | <b>1.5</b> SCCS<br>.0590                                | PTFE                | <b>4.7</b><br>.185   | 1/SC                            | FG Braid-V         | <b>8.26</b><br>.325  | .109           | 50                 | 29.4           | 55 250                    | 3000                               | See RG 304 for<br>FEP Jacket       |
| 144             | <b>1.36</b><br>.0537<br>7/0.45 SCCS<br>.0179            | Air-space<br>PE     | <b>7.24</b><br>.285  | Copper Tube                     | FG Braid-V         | <b>10.41</b><br>.410 | .137           | 75                 | 19.5           | 55 250                    | 5000                               | High Temp.<br>RG 11A               |
| 145             | 2 Cond. <b>1.83</b> BC<br>.0720                         | Air-space<br>PTFE   | —                    | 1/BC                            | Lead/Tar           | —                    | —              | 75                 | 14.6           | —                         | —                                  | —                                  |
| 146             | <b>0.18</b> CCS<br>.0070                                | PE                  | <b>7.24</b><br>.285  | 1/BC                            | FG Braid-V         | <b>9.53</b><br>.375  | .108           | 190                | 6.0            | 55 200                    | 1000                               | Low<br>Capacitance                 |
| 147             | <b>6.35</b> BC<br>.2500                                 | PE                  | <b>23.11</b><br>.910 | 1/BC                            | PVC-I<br>w/Armor   | <b>49.2</b><br>1.937 | —              | 52                 | 29.5           | 40 80                     | 14,000                             | RG 19U<br>w/Armor                  |
| 148             | <b>2.17</b><br>.0855<br>7/0.72 BC<br>.0285              | PTFE                | <b>7.24</b><br>.285  | 1/SC                            | PVC-I<br>w/Armor   | <b>20.32</b><br>.800 | —              | 52                 | 29.5           | 40 80                     | 4000                               | —                                  |
| 149             | <b>1.22</b><br>.048<br>7/0.4 TC<br>.0159                | PE                  | <b>7.24</b><br>.285  | 1/BC                            | PVC-IIA            | <b>10.29</b><br>.405 | .105           | 75                 | 20.6           | 40 80                     | 5000                               | Use RG 391                         |
| 150             | <b>1.22</b><br>.048<br>7/0.4 TC<br>.0159                | PE                  | <b>7.24</b><br>.285  | 1/BC                            | PVC-IIA<br>w/Armor | <b>11.76</b><br>.463 | .112           | 75                 | 20.6           | 40 80                     | 5000                               | Use RG 392                         |
| 156             | <b>2.17</b><br>.0855<br>7/0.72 TC<br>.0285              | PE and<br>Cond. PE  | <b>7.24</b><br>.285  | 3/TC, GS, TC                    | PVC-IIA            | <b>13.72</b><br>.540 | .211           | 50                 | 32.0           | 40 80                     | 10,000                             | Triaxial Pulse<br>Cable            |
| 157             | <b>2.55</b><br>.1005<br>19/0.51 TC<br>.0201             | PE and<br>Cond. PE  | <b>11.56</b><br>.455 | 3/TC, GS, TC                    | PVC-IIA            | <b>18.42</b><br>.725 | .317           | 50                 | 38.0           | 40 80                     | 15,000                             | Triaxial Pulse<br>Cable            |
| 158             | <b>5.05</b><br>.1988<br>37/0.72 TC<br>.0284             | PE and<br>Cond. PE  | <b>11.56</b><br>.455 | 3/TC, GS, TC                    | PVC-IIA            | <b>18.42</b><br>.725 | .380           | 25                 | 78.0           | 40 80                     | 15,000                             | Triaxial Pulse<br>Cable            |
| 159             | <b>0.81</b> SC<br>.0320                                 | Taped<br>PTFE       | <b>2.95</b><br>.116  | 1/SC                            | FG Braid-V         | <b>4.95</b><br>.195  | .035           | 50                 | 29.4           | 55 250                    | 1900                               | Use RG 141                         |
| 160             | 4 Cond. <b>1.8</b><br>.071<br>19/0.36 2TC, 2BC<br>.0142 | PE                  | <b>8.18</b><br>.322  | 1/BC                            | PVC-I              | <b>26.8</b><br>1.055 | —              | 125                | 12.0           | 40 80                     | 3000                               | 4 Cond.<br>Balanced Line           |
| 161             | <b>0.3</b><br>.012<br>7/0.1 S Cad. BR<br>.004           | PTFE                | <b>1.45</b><br>.057  | 1/SC                            | Nylon              | <b>2.08</b><br>.082  | .015           | 70                 | 20.0           | 60 120                    | 1000                               | Miniature                          |
| 164             | <b>2.65</b> BC<br>.1045                                 | PE                  | <b>17.27</b><br>.680 | 1/BC                            | PVC-IIA            | <b>22.1</b><br>.870  | .490           | 75                 | 20.6           | 40 80                     | 10,000                             | RG 35B without<br>Armor            |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                   | Dielectric<br>Material | DOD                                            | Number/Type<br>of Shielding<br>Braids       | Jacket<br>Material            | O.D.                 | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                         |
|-----------------------|------------------------------------------------------|------------------------|------------------------------------------------|---------------------------------------------|-------------------------------|----------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|----------------------------------|
| 165                   | <b>2.44</b><br>.0960<br>7/0.81 SC<br>.0320           | PTFE                   | <b>7.24</b><br>.285                            | 1/SC                                        | FG<br>Braid-V                 | <b>10.41</b><br>.410 | .121              | 50                       | 29.4                 | 55 250                          | 5000                                        | RG 225 w/One<br>Braid            |
| 166                   | <b>2.44</b><br>.0960<br>7/0.81 SC<br>.0320           | PTFE                   | <b>7.24</b><br>.285                            | 1/SC                                        | FG Braid-V<br>w/Armor         | <b>11.68</b><br>.460 | .144              | 50                       | 29.4                 | 55 250                          | 5000                                        | RG 165<br>w/ Armor               |
| 174                   | <b>0.48</b><br>.0189<br>7/0.16 CCS<br>.0063          | PE                     | <b>1.52</b><br>.060                            | 1/TC                                        | PVC                           | <b>2.54</b><br>.100  | .008              | 50                       | 30.8                 | 40 80                           | 1500                                        | Miniature Data<br>Transmission   |
| 174A                  | <b>0.48</b><br>.0189<br>7/0.16 CCS<br>.0063          | PE                     | <b>1.52</b><br>.060                            | 1/TC                                        | PVC-IIA                       | <b>2.54</b><br>.100  | .008              | 50                       | 30.8                 | 40 80                           | 1500                                        | Miniature Data<br>Transmission   |
| 176                   | <b>3.43</b><br>.135 Helix over<br>Magnetic Core      | PE                     | <b>7.24</b><br>.285                            | 1/Magnet Wire                               | PVC-I                         | <b>10.29</b><br>.405 | .120              | 2240                     | 49.0                 | 40 80                           | 5000                                        | —                                |
| 177                   | <b>4.95</b> BC<br>.195                               | PE                     | <b>17.27</b><br>.680                           | 2/SC                                        | PVC-IIA                       | <b>22.73</b><br>.895 | .470              | 50                       | 30.8                 | 40 80                           | 11,000                                      | High Frequency<br>RG 218         |
| 178                   | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>0.91</b><br>.036                            | 1/SC                                        | KEL-F                         | <b>1.83</b><br>.072  | .0054             | 50                       | 29.4                 | 40 150                          | 1000                                        | Use RG 178B                      |
| 178A                  | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>0.86</b><br>.034                            | 1/SC                                        | KEL-F                         | <b>1.83</b><br>.072  | .005              | 50                       | 29.4                 | 40 150                          | 1000                                        | Use RG 178B                      |
| 178B                  | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>0.86</b><br>.034                            | 1/SC                                        | FEP-IX                        | <b>1.83</b><br>.072  | .0054             | 50                       | 29.4                 | 55 200                          | 1000                                        | High Strength<br>Cond. Available |
| 179                   | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>1.45</b><br>.057                            | 1/SC                                        | KEL-F                         | <b>2.54</b><br>.100  | .010              | 70                       | 20.4                 | 55 150                          | 1200                                        | Use RG 179B                      |
| 179A                  | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>1.6</b><br>.063                             | 1/SC                                        | KEL-F                         | <b>2.54</b><br>.100  | .010              | 75                       | 19.5                 | 40 150                          | 1200                                        | Use RG 179B                      |
| 179B                  | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>1.6</b><br>.063                             | 1/SC                                        | FEP-IX                        | <b>2.54</b><br>.100  | .010              | 75                       | 19.5                 | 55 200                          | 1200                                        | High Strength<br>Cond. Available |
| 180                   | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>2.62</b><br>.103                            | 1/SC                                        | KEL-F                         | <b>3.56</b><br>.140  | .019              | 93                       | 15.4                 | 40 150                          | 1500                                        | Use RG 180B                      |
| 180A                  | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>2.59</b><br>.102                            | 1/SC                                        | KEL-F                         | <b>3.56</b><br>.140  | .019              | 95                       | 15.4                 | 40 150                          | 1500                                        | Use RG 180B                      |
| 180B                  | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040           | PTFE                   | <b>2.59</b><br>.102                            | 1/SC                                        | KEP-IX                        | <b>3.56</b><br>.140  | .019              | 95                       | 15.4                 | 55 200                          | 1500                                        | High Strength<br>Cond. Available |
| 181                   | 2 Cond. <b>1.21</b><br>.0477<br>7/0.4 BC<br>.0159    | PE                     | <b>5.33</b><br>.210                            | 2/Individual<br>Inner<br>Common<br>Outer BC | PVS-IIA                       | <b>16.25</b><br>.640 | .198              | 125                      | 12.0                 | 40 80                           | 3500                                        | Balanced<br>Line                 |
| 182                   | 2 of 19/0.36 BC<br>.0142<br>2 of 19/0.17 TC<br>.0066 | 4 Cores<br>PE          | <b>2/8.43</b><br>.332<br><b>2/3.71</b><br>.146 | Each Core<br>1/BC<br>Overall Shield<br>1/BC | PVC-IIA each<br>PVC-I overall | <b>26.8</b><br>1.055 | —                 | 125<br>each              | 12.0<br>each         | 40 80                           | 2300<br>3000                                | Special 4<br>Coaxial             |
| 183                   | <b>6.38</b> BC<br>.2510                              | PS Helix               | <b>16.05</b><br>.632                           | Al. Tube                                    | None                          | <b>19.05</b><br>.750 | .380              | 50                       | 23.0                 | 40 80                           | 1800                                        | See Times<br>AM-5034S            |
| 185                   | <b>0.08</b> [.0031]<br>Mag. Wire Helix<br>on PE Core | Air-Space<br>PE        | <b>4.78</b><br>.188                            | 1/Magnet Wire                               | PVC-IIA                       | <b>7.16</b><br>.282  | —                 | 2000                     | —                    | 40 80                           | —                                           | Delay Line<br>Cable              |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U Type Cable | Inner Conductor                                             | Dielectric Material | DOD                   | Number/Type of Shielding Braids     | Jacket Material     | O.D.                  | Weight (lb/ft) | Nom. Imped. (Ohms) | Nom. Cap pf/ft | Max. Operating Temp. (C°) | Max. Operating Voltage (Volts RMS) | Comments                      |
|-----------------|-------------------------------------------------------------|---------------------|-----------------------|-------------------------------------|---------------------|-----------------------|----------------|--------------------|----------------|---------------------------|------------------------------------|-------------------------------|
| 187             | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040                  | PTFE                | <b>1.52</b><br>.060   | 1/SC                                | PTFE                | <b>2.67</b><br>.105   | .010           | 75                 | 19.5           | 55 250                    | 1200                               | Use RG 179B                   |
| 187A            | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.0040                  | PTFE                | <b>1.52</b><br>.060   | 1/SC                                | PTFE                | <b>2.67</b><br>.105   | .010           | 75                 | 19.5           | 55 250                    | 1200                               | Use RG 179B                   |
| 188             | <b>0.51</b><br>.0201<br>7/0.17 SCCS<br>.0067                | PTFE                | <b>1.52</b><br>.060   | 1/SC                                | PTFE                | <b>2.67</b><br>.105   | .011           | 50                 | 29.4           | 55 250                    | 1200                               | Use RG 316                    |
| 188A            | <b>0.51</b><br>.0201<br>7/0.17 SCCS<br>.0067                | PTFE                | <b>1.52</b><br>.060   | 1/SC                                | PTFE                | <b>2.67</b><br>.105   | .011           | 50                 | 29.4           | 55 250                    | 1200                               | Use RG 316                    |
| 189             | <b>6.38</b> BC<br>.2510                                     | PS Helix            | <b>16.05</b><br>.632  | 2/SC                                | PE-III A            | <b>22.23</b><br>.875  | .570           | 50                 | 23.0           | 55 80                     | 3500                               | Use RG 389                    |
| 190             | <b>1.49</b><br>.0585<br>7/0.3 TC<br>.0117                   | Rubber H, J         | <b>9.65</b><br>.380   | 3/TC, GS, TC                        | Neoprene VIII       | <b>17.78</b><br>.700  | .353           | 50                 | 50.0           | 55 80                     | 15,000                             | —                             |
| 191             | <b>12.32</b> TC Braid<br>.485                               | Rubber H, J, H      | <b>27.05</b><br>1.065 | 3/TC, GS, GS                        | Neoprene VIII       | <b>37.08</b><br>1.460 | 1.469          | 25                 | 85.0           | 55 80                     | 15,000                             | —                             |
| 192             | <b>26.8</b> GS Tube<br>1.055 TC Braid                       | Butyl Rubber        | —                     | 3/TC, GS, GS                        | Rubber              | <b>55.88</b><br>2.200 | —              | 12.5               | 175.0          | 55 80                     | 15,000 Peak                        | —                             |
| 193             | <b>26.8</b> GS Tube<br>1.055 TC Braid                       | Silicone Rubber     | —                     | 3/TC, GS, GS                        | Rubber              | <b>53.34</b><br>2.100 | —              | 12.5               | 159.0          | 55 80                     | 30,000 Peak                        | —                             |
| 194             | <b>26.8</b> GS Tube<br>1.055 TC Braid                       | Silicone Rubber     | —                     | 3/TC, GS, GS                        | Rubber w/ Al. Armor | <b>49.4</b><br>1.945  | —              | 12.5               | 159.0          | 55 80                     | 30,000 Peak                        | —                             |
| 195             | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.004                   | PTFE                | <b>2.59</b><br>.102   | 1/SC                                | PTFE                | <b>3.68</b><br>.145   | .020           | 95                 | 15.4           | 55 250                    | 1500                               | Use RG 180B                   |
| 195A            | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.004                   | PTFE                | <b>2.59</b><br>.102   | 1/SC                                | PTFE                | <b>3.68</b><br>.145   | .020           | 95                 | 15.4           | 55 250                    | 1500                               | Use RG 180B                   |
| 196             | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.004                   | PTFE                | <b>0.86</b><br>.034   | 1/SC                                | PTFE                | <b>1.83</b><br>.072   | .006           | 50                 | 29.4           | 55 250                    | 1000                               | Use RG 178B                   |
| 196A            | <b>0.3</b><br>.0120<br>7/0.1 SCCS<br>.004                   | PTFE                | <b>0.86</b><br>.034   | 1/SC                                | PTFE                | <b>1.83</b><br>.072   | .006           | 50                 | 29.4           | 55 250                    | 1000                               | Use RG 178B                   |
| 197             | <b>7.62</b> BC<br>.300                                      | PS Helix            | <b>19.25</b><br>.758  | <b>22.23</b> [.875]<br>OD Al. Tube  | None                | <b>22.23</b><br>.875  | .500           | 50                 | 22.0           | 55 80                     | 2400 Peak                          | —                             |
| 198             | <b>2.9</b> BC<br>.1140                                      | PS Helix            | <b>10.69</b><br>.421  | <b>12.7</b> [.500]<br>OD Al. Tube   | PE                  | <b>15.24</b><br>.600  | .155           | 70                 | 16.0           | 55 80                     | 1300 Peak                          | —                             |
| 199             | <b>5.31</b> BC<br>.209                                      | PS Helix            | <b>19.25</b><br>.758  | <b>22.23</b> [.875]<br>OD Al. Tube  | PE                  | <b>25.78</b><br>1.015 | .435           | 70                 | 16.0           | 55 80                     | 2400 Peak                          | —                             |
| 200             | OD- <b>10.29</b><br>.405<br>ID- <b>7.65</b> BC Tube<br>.301 | PS Helix            | <b>37.39</b><br>1.472 | <b>41.28</b> [1.625]<br>OD Al. Tube | PE                  | <b>44.83</b><br>1.765 | .900           | 70                 | 16.0           | 55 80                     | 4600 Peak                          | —                             |
| 209             | <b>4.8</b><br>.189<br>19/0.96 SC<br>.0378                   | Air-Space<br>PTFE   | <b>12.7</b><br>.500   | 2/SC                                | SR and Polyester-IV | <b>18.42</b><br>.725  | .432           | 50                 | 25.0           | 55 150                    | 3200                               | Low Loss<br>RG 211A           |
| 210             | <b>0.64</b> SCCS<br>.0253                                   | Air-Space<br>PTFE   | <b>3.71</b><br>.146   | 1/SC                                | FG Braid-V          | <b>6.15</b><br>.242   | .040           | 93                 | 13.5           | 55 250                    | 750                                | High Temp.<br>Low Capacitance |
| 211             | <b>4.83</b> BC<br>.1900                                     | PTFE                | <b>15.75</b><br>.620  | 1/BC                                | FG Braid-V          | <b>18.54</b><br>.730  | .641           | 50                 | 29.4           | 55 250                    | 7000                               | High Temp.<br>High Power      |
| 211A            | <b>4.83</b> BC<br>.1900                                     | PTFE                | <b>15.75</b><br>.620  | 1/BC                                | FG Braid-V          | <b>18.54</b><br>.730  | .641           | 50                 | 29.4           | 55 250                    | 7000                               | High Temp.<br>High Power      |
| 212             | <b>1.44</b> SC<br>.0556                                     | PE                  | <b>4.7</b><br>.185    | 2/SC                                | PVC-II A            | <b>8.43</b><br>.332   | .083           | 50                 | 29.4           | 40 80                     | 3000                               | Use up to<br>10,000 MHz       |
| 213             | <b>2.26</b><br>.0888<br>7/0.75 BC<br>.0296                  | PE                  | <b>7.24</b><br>.285   | 1/BC                                | PVC-II A            | <b>10.29</b><br>.405  | .099           | 50                 | 30.8           | 40 80                     | 5000                               | Use up to<br>1000 MHz         |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                        | Dielectric<br>Material | DOD                   | Number/Type<br>of Shielding<br>Braids | Jacket<br>Material    | O.D.                  | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                     |
|-----------------------|-----------------------------------------------------------|------------------------|-----------------------|---------------------------------------|-----------------------|-----------------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|------------------------------|
| 214                   | <b>2.26</b><br>.0888<br>7/0.75 SC<br>.0296                | PE                     | <b>7.24</b><br>.285   | 2/SC                                  | PVC-IIA               | <b>10.0</b><br>.425   | .126              | 50                       | 30.8                 | 40 80                           | 5000                                        | Use up to<br>10,000 MHz      |
| 215                   | <b>2.26</b><br>.0888<br>7/0.75<br>.0296                   | PE                     | <b>7.24</b><br>.285   | 1/BC                                  | PVC-IIA<br>w/Armor    | <b>11.76</b><br>.463  | .121              | 50                       | 30.8                 | 40 80                           | 5000                                        | Armored<br>RG 213            |
| 216                   | <b>1.21</b><br>.0477<br>7/0.75 BC<br>.0159                | PE                     | <b>7.24</b><br>.285   | 2/BC                                  | PVC-IIA               | <b>10.8</b><br>.425   | .114              | 75                       | 20.6                 | 40 80                           | 5000                                        | Use up to<br>1000 MHz        |
| 217                   | <b>2.7</b> BC<br>.106                                     | PE                     | <b>9.4</b><br>.370    | 2/BC                                  | PVC-IIA               | <b>13.84</b><br>.545  | .201              | 50                       | 30.8                 | 40 80                           | 7000                                        | Use up to<br>1000 MHz        |
| 218                   | <b>4.95</b> BC<br>.195                                    | PE                     | <b>17.27</b><br>.680  | 1/BC                                  | PVC-IIA               | <b>22.1</b><br>.870   | .460              | 50                       | 30.8                 | 40 80                           | 11,000                                      | Use up to<br>1000 MHz        |
| 219                   | <b>4.95</b> BC<br>.195                                    | PE                     | <b>17.27</b><br>.680  | 1/BC                                  | PVC-IIA<br>w/Armor    | <b>23.57</b><br>.928  | .585              | 50                       | 30.8                 | 40 80                           | 11,000                                      | Armored<br>RG 218            |
| 220                   | <b>6.6</b> BC<br>.260                                     | PE                     | <b>23.11</b><br>.910  | 1/BC                                  | PVC-IIA               | <b>28.45</b><br>1.120 | .740              | 50                       | 30.8                 | 40 80                           | 14,000                                      | Use up to<br>1000 MHz        |
| 221                   | <b>6.6</b> BC<br>.260                                     | PE                     | <b>23.11</b><br>.910  | 1/BC                                  | PVC-IIA<br>w/Armor    | <b>29.92</b><br>1.178 | .925              | 50                       | 30.8                 | 40 80                           | 14,000                                      | Armored<br>RG 220            |
| 222                   | <b>1.41</b><br>.0556<br>High Res. Wire                    | PE                     | <b>4.7</b><br>.185    | 2/SC                                  | PVC-IIA               | <b>8.43</b><br>.332   | .087              | 50                       | 30.8                 | 40 80                           | 3000                                        | High<br>Attenuation          |
| 223                   | <b>0.89</b> SC<br>.035                                    | PE                     | <b>2.95</b><br>.116   | 2/SC                                  | PVC-IIA               | <b>5.36</b><br>.211   | .034              | 50                       | 30.8                 | 40 80                           | 1900                                        | Use up to<br>10,000 MHz      |
| 224                   | <b>2.609</b> BC<br>.106                                   | PE                     | <b>9.4</b><br>.370    | 2/BC                                  | PVC-IIA<br>w/Armor    | <b>15.32</b><br>.603  | .310              | 50                       | 30.8                 | 40 80                           | 7000                                        | Armored<br>RG 217            |
| 225                   | <b>2.38</b><br>.0936<br>7/0.79 SC<br>.0312                | PTFE                   | <b>7.24</b><br>.285   | 2/SC                                  | FG Braid-V            | <b>10.92</b><br>.430  | .180              | 50                       | 29.4                 | 55 250                          | 5000                                        | See RG 393 for<br>FEP Jacket |
| 226                   | <b>3.23</b><br>.1270<br>19/0.65 SC<br>.0254               | Taped<br>PTFE          | <b>9.4</b><br>.370    | 2/SC                                  | FG Braid-V            | <b>12.7</b><br>.500   | .445              | 50                       | 29.4                 | 55 250                          | 7000                                        | —                            |
| 227                   | <b>2.38</b><br>.0936<br>7/0.79 SC<br>.0312                | PTFE                   | <b>7.24</b><br>.285   | 2/SC                                  | FG Braid-V<br>w/Armor | <b>12.40</b><br>.488  | .198              | 50                       | 29.4                 | 55 250                          | 5000                                        | Armored<br>RG 225            |
| 228                   | <b>4.83</b> BC<br>.1900                                   | PTFE                   | <b>15.75</b><br>.620  | 1/BC                                  | FG Braid-V<br>w/Armor | <b>20.02</b><br>.788  | .682              | 50                       | 29.4                 | 55 250                          | 7000                                        | Armored<br>RG 211            |
| 228A                  | <b>4.83</b> BC<br>.1900                                   | PTFE                   | <b>15.75</b><br>.620  | 1/BC                                  | FG Braid-V<br>w/Armor | <b>20.02</b><br>.788  | .682              | 50                       | 29.4                 | 55 250                          | 7000                                        | Armored<br>RG 211A           |
| 229                   | <b>2.44</b><br>.0960<br>7/0.81 SC<br>.032                 | PTFE                   | <b>7.24</b><br>.285   | 1/SC                                  | FG Braid-V<br>w/Armor | <b>11.68</b><br>.460  | .144              | 50                       | 29.4                 | 55 250                          | 5000                                        | Use RG 166                   |
| 230                   | <b>5.05</b><br>.1988<br>37/0.72 TC<br>.0284               | Rubber-D               | <b>11.56</b><br>.455  | 3/TC,<br>GS, GS                       | Rubber-IV             | <b>18.8</b><br>.740   | —                 | 25                       | 100.0                | 40 80                           | 15,000                                      | —                            |
| 231                   | OD- <b>4.11</b><br>.162<br>ID- <b>2.84</b> BC<br>.112     | Foam PE                | <b>11.43</b><br>.450  | <b>12.7</b><br>.500<br>OD Al. Tube    | None                  | <b>12.7</b><br>.500   | .118              | 50                       | 25.0                 | 55 80                           | 5000<br>Peak                                | RG 331 for<br>Jacketed Cable |
| 232                   | <b>7.62</b> BC<br>.300                                    | PE Helix               | <b>19.25</b><br>.758  | <b>22.23</b><br>.875<br>OD Al. Tube   | PE-III A              | <b>28.07</b><br>1.015 | .570              | 50                       | 22.0                 | 50 80                           | 2400<br>Peak                                | —                            |
| 233                   | OD- <b>15.01</b> BC<br>.591<br>ID- <b>12.22</b><br>.481   | PS Helix               | <b>37.39</b><br>1.472 | <b>41.28</b><br>1.625<br>OD Al. Tube  | PE-III A              | <b>44.83</b><br>1.765 | 1.050             | 50                       | 22.0                 | 55 80                           | 4700<br>Peak                                | —                            |
| 234                   | OD- <b>29.39</b> BC<br>1.570<br>ID- <b>25.78</b><br>1.015 | PS Helix               | <b>70.49</b><br>2.775 | <b>79.38</b><br>3.125<br>OD Al. Tube  | PE-III A              | <b>83.69</b><br>3.295 | 3.110             | 50                       | 22.0                 | 55 80                           | 8700<br>Peak                                | —                            |
| 235                   | <b>2.16</b><br>.0852<br>7/0.72<br>.0284                   | Taped<br>PTFE          | <b>5.72</b><br>.255   | 2/SC                                  | SIL/DAC VI            | <b>11.43</b><br>.450  | .160              | 50                       | 29.5                 | 55 250                          | 5000                                        | RG 115A 235<br>w/VI Jacket   |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                            | Dielectric<br>Material | DOD                    | Number/Type<br>of Shielding<br>Braids | Jacket<br>Material | O.D.           | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments     |
|-----------------------|-----------------------------------------------|------------------------|------------------------|---------------------------------------|--------------------|----------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|--------------|
| 236                   | 4.11 BC<br>.1620                              | PS Helix               | 10.69<br>.421          | 12.7 [.500]<br>OD Al. Tube            | None               | 12.7<br>.500   | .165              | 50                       | 24.0                 | 55 80                           | 1300<br>Peak                                | —            |
| 237                   | 4.11 BC<br>.1620                              | PS Helix               | 10.69<br>.421          | 12.7 [.500]<br>OD Al. Tube            | PE-III A           | 15.24<br>.600  | .195              | 50                       | 24.0                 | 55 80                           | 1300<br>Peak                                | —            |
| 238                   | —                                             | —                      | —                      | —                                     | —                  | —              | —                 | —                        | —                    | —                               | —                                           | Use RG 197/U |
| 239                   | —                                             | —                      | —                      | —                                     | —                  | —              | —                 | —                        | —                    | —                               | —                                           | Use RG 232/U |
| 240                   | OD-15.01 BC<br>.591<br>ID-12.22 BC<br>.481    | PS Helix               | 36.07<br>1.420         | 41.28<br>1.625<br>OD Al. Tube         | None               | 41.28<br>1.625 | .930              | 50                       | 22.0                 | 55 80                           | 4700                                        | —            |
| 241                   | —                                             | —                      | —                      | —                                     | —                  | —              | —                 | —                        | —                    | —                               | —                                           | Use RG 233   |
| 242                   | OD-29.39<br>1.157<br>ID-25.78<br>1.0150       | PS Helix               | 72.39<br>2.850         | 79.38<br>3.125<br>OD Al. Tube         | None               | 79.3<br>3.125  | 2.700             | 50                       | 22.0                 | 55 80                           | 8700<br>Peak                                | —            |
| 243                   | —                                             | —                      | —                      | —                                     | —                  | —              | —                 | —                        | —                    | —                               | —                                           | Use RG 234   |
| 244                   | 2.59 BC<br>.102                               | PS Helix               | 10.69<br>.421          | 12.7 [.500]<br>OD Al. Tube            | None               | 12.7<br>.500   | .118              | 75                       | 15.5                 | 55 80                           | 1200<br>Peak                                | —            |
| 245                   | 2.59 BC<br>.102                               | PS Helix               | 10.69<br>.421          | 12.7 [.500]<br>OD Al. Tube            | PE-III A           | 15.24<br>.600  | .148              | 75                       | 15.5                 | 55 80                           | 1200<br>Peak                                | —            |
| 246                   | 4.78 BC<br>.1880                              | PS Helix               | 19.25<br>.758          | 22.23 [.875]<br>OD Al. Tube           | None               | 22.23<br>.875  | .348              | 75                       | 15.2                 | 55 80                           | 2200<br>Peak                                | —            |
| 247                   | 4.78 BC<br>.1880                              | PS Helix               | 19.25<br>.758          | 22.23 [.875]<br>OD Al. Tube           | PE-III A           | 25.78<br>1.015 | .418              | 75                       | 15.2                 | 55 80                           | 2200<br>Peak                                | —            |
| 248                   | OD-9.5 BC<br>.3740<br>ID-6.96<br>27.40        | PS Helix               | 37.39<br>1.472         | 41.28<br>1.625<br>OD Al. Tube         | None               | 41.28<br>1.625 | .948              | 75                       | 15.0                 | 55 80                           | 4300<br>Peak                                | —            |
| 249                   | OD-9.5 BC<br>.3740<br>ID-6.96<br>27.40        | PS Helix               | 37.39<br>1.472         | 41.28<br>1.625                        | PE-III A           | 44.83<br>1.765 | 1.068             | 75                       | 15.0                 | 55 80                           | 4300<br>Peak                                | —            |
| 250                   | 18.59 BC<br>.732<br>16.05<br>.632             | PS Helix               | 72.39<br>2.850         | 79.38<br>3.125<br>OD Al. Tube         | None               | 79.38<br>3.125 | 2.395             | 75                       | 15.0                 | 55 80                           | 8500<br>Peak                                | —            |
| 251                   | 18.59 BC<br>.732<br>16.05<br>.632             | PS Helix               | 72.39<br>2.850         | 79.38<br>3.125<br>OD Al. Tube         | PE-III A           | 32.95<br>2.805 | .175              | 75                       | 15.0                 | 55 80                           | 8500<br>Peak                                | —            |
| 252                   | 4.24 BC<br>.1670                              | PE Tubes               | 11.58<br>.456          | 13.46 [.530]<br>OD Al. Tube           | None               | 13.46<br>.530  | .225              | 50                       | 24.0                 | 55 80                           | 1000                                        | —            |
| 253                   | 4.24 BC<br>.1670                              | PE Tubes               | 11.58<br>.456          | 13.46 [.530]<br>OD Al. Tube           | PE                 | 16.64<br>.655  | .655              | 50                       | 24.0                 | 55 80                           | 1000                                        | —            |
| 254                   | 7.9 BC<br>.3110                               | PE Tubes               | 21.16<br>.833          | 24.21 [.953]<br>OD Al. Tube           | PE                 | 27.94<br>1.100 | .555              | 50                       | 24.0                 | 55 80                           | 1860                                        | —            |
| 255                   | 7.9 BC<br>.3110                               | PE Tubes               | 21.16<br>.833          | 24.21 [.953]<br>OD Al. Tube           | None               | 24.21<br>.953  | .550              | 50                       | 24.0                 | 55 80                           | 1860                                        | —            |
| 256                   | OD-7.9 SC<br>.3110<br>ID-6.48<br>.2550        | PTFE Tubes             | 21.16<br>.833          | 24.21<br>.953<br>OD Al. Tube          | None               | 24.21<br>.953  | 1.200             | 50                       | 24.0                 | 55 80                           | 1860                                        | —            |
| 257                   | OD-15.39<br>.6060<br>ID-1.23 BC<br>.4860      | PS Tubes               | 41.2<br>1.622          | 45.36<br>1.786<br>OD Al. Tube         | None               | 45.36<br>1.786 | 1.380             | 50                       | 24.0                 | 55 80                           | 3640                                        | —            |
| 258                   | OD-15.39<br>.6060<br>ID-1.23 BC Tube<br>.4860 | PS Tubes               | 41.2<br>1.622          | 45.36<br>1.786<br>OD Al. Tube         | PE                 | 48.92<br>1.926 | .100              | 50                       | 24.0                 | 55 80                           | 3640                                        | —            |
| 259                   | 2.92 BC Tube<br>.1150                         | PTFE Tubes             | 8.08<br>.318           | 9.91 [.390]<br>OD Al. Tube            | None               | 9.91<br>.390   | .140              | 50                       | 24.0                 | 55 80                           | 697                                         | —            |
| 260                   | 2.92 BC Tube<br>.1150                         | PE Tubes               | 8.08<br>.318           | 9.91 [.390]<br>OD Al. Tube            | PE-III A           | 11.43<br>.450  | .170              | 50                       | 24.0                 | 55 80                           | 697                                         | —            |
| 263                   | 4.37 BC<br>.1720                              | Air-Space<br>PTFE      | 10.69<br>.421          | Al. Tube                              | None               | 12.7<br>.500   | .336              | 50                       | 21.5                 | 40 250                          | 1300<br>Peak                                | —            |
| 264                   | 4 Cond. 19/.036<br>.0142<br>2 TC, 2 BC        | PE                     | 4.47<br>.176<br>e/core | 2 TC, 2 BC<br>BC Overall              | PVC-II A           | 19.05<br>.750  | .327              | 36.8                     | 41.0                 | 40 80                           | 2000                                        | Use RG 264C  |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U<br>Type<br>Cable | Inner<br>Conductor                                 | Dielectric<br>Material | DOD                    | Number/Type<br>of Shielding<br>Braids                  | Jacket<br>Material       | O.D.           | Weight<br>(lb/ft) | Nom.<br>Imped.<br>(Ohms) | Nom.<br>Cap<br>pF/ft | Max.<br>Operating<br>Temp. (C°) | Max.<br>Operating<br>Voltage<br>(Volts RMS) | Comments                        |
|-----------------------|----------------------------------------------------|------------------------|------------------------|--------------------------------------------------------|--------------------------|----------------|-------------------|--------------------------|----------------------|---------------------------------|---------------------------------------------|---------------------------------|
| 264A                  | 4 Cond. 19/0.36<br>.0142<br>2 TC, 2 BC             | PE                     | 4.47<br>.176<br>e/core | 2 TC, 2 BC<br>BC Overall                               | PUR                      | 19.05<br>.750  | .327              | 36.8                     | 41.0                 | 40 80                           | 2000                                        | Use RG 264C                     |
| 264C                  | 4 Cond. 1.73<br>.068<br>2 BC, 2 TC                 | PE                     | 4.72<br>.186<br>e/core | 2 TC, 2 BC<br>BC Overall                               | PUR                      | 19.43<br>.765  | —                 | 40                       | 38.4                 | 40 80                           | 2000                                        | Watertight<br>4 Coax.           |
| 265                   | 17.2 BC Tube<br>.6770                              | PE Helix               | 40.08<br>1.578         | Copper Clad<br>Mild Steel Tube                         | PE-III A                 | 52.58<br>2.070 | .120              | 50                       | 22.3                 | 40 80                           | 145 KW<br>Peak                              | —                               |
| 266                   | 0.29 Cond. Over<br>.0113<br>3.66 Mag. Core<br>.144 | PE                     | 7.24<br>.285           | 75 Spiral<br>Wound Cond.<br>68 BC & 7<br>are Insulated | PVC-I                    | 10.16<br>.400  | —                 | 1530                     | 53.0                 | 40 80                           | 5000 DC                                     | Delay Line Cable<br>50 ns/ft    |
| 267                   | 9.02 BC Tube<br>.3550                              | PS Helix               | —                      | Copper Clad<br>Mild Steel<br>Cor. Tubing               | PE-III A                 | 30.23<br>1.190 | .234              | 50                       | 22.2                 | 40 80                           | 44 KW<br>Peak                               | —                               |
| 268                   | 4.09 BC<br>.1610                                   | PE Helix               | 8.89<br>.350           | Corrugated<br>BC Tube                                  | None                     | 12.65<br>.498  | .430              | 50                       | 23.0                 | 55 80                           | 10 KW<br>Peak                               | —                               |
| 269                   | ID-7.29<br>.2870<br>OD-9.09 BC<br>.3580 Tube       | PE Helix               | 20.19<br>.795          | Corrugated<br>BC Tube                                  | None                     | 23.53<br>1.005 | .430              | 50                       | 22.2                 | 55 80                           | 44 KW<br>Peak                               | —                               |
| 269A                  | OD-7.29<br>.2870<br>ID-9.09 BC<br>.3580 Tube       | PE Helix               | 20.19<br>.795          | Corrugated<br>BC Tube                                  | None                     | 23.53<br>1.005 | .875              | 50                       | 22.2                 | 55 80                           | 44 KW<br>Peak                               | —                               |
| 270                   | ID-14.94<br>.5880<br>OD-17.48 BC<br>.6880 Tube     | PE Helix               | 40.08<br>1.578         | Corrugated<br>BC Tube                                  | None                     | 46.48<br>1.830 | .875              | 50                       | 22.3                 | 55 80                           | 145 KW<br>Peak                              | —                               |
| 270A                  | ID-14.94<br>.5880<br>OD-17.48 BC<br>.6880 Tube     | PE Helix               | 40.08<br>1.578         | Corrugated<br>BC Tube                                  | None                     | 46.48<br>1.830 | .125              | 50                       | 22.3                 | 55 80                           | 145 KW<br>Peak                              | —                               |
| 279                   | 0.64<br>.0250<br>19/0.13 SCCS<br>.0050             | Air-space<br>PTFE      | 2.79<br>.110           | 1/SC                                                   | FG Braid-V               | 3.68<br>.145   | .200              | 75                       | 19.5                 | 55 250                          | Extra Flex.<br>High Temp.<br>Cable          | Extra Flex.<br>High Temp. Cable |
| 280                   | 2.91 BC<br>.1144                                   | Taped<br>PTFE          | 8.31<br>.327           | 2/SC                                                   | FEP-IX                   | 11.89<br>.468  | .400              | 50                       | 25.4                 | 55 200                          | 3000                                        | Low Loss<br>High Frequency      |
| 281                   | 4.8<br>.1890<br>19/0.96 SC<br>.0378                | Taped<br>PTFE          | 12.7<br>.500           | 2/SC                                                   | Sil./DAC-VI              | 19.05<br>.750  | .031              | 50                       | 25.4                 | 55 150                          | 4000                                        | Low Loss<br>High Power          |
| 282                   | 0.64 SC<br>.0253                                   | Irradiated<br>PE       | 2.51<br>.099           | 2/SC                                                   | FEP                      | 5.08<br>.200   | .145              | 54.5                     | 28.2                 | 40 150                          | 4500                                        | —                               |
| 283                   | 1.49<br>.0585<br>19/0.3 SC<br>.0117                | Rubber-D               | 7.31<br>.288           | 2/SC                                                   | Sil.                     | 12.07<br>.475  | .410              | 46                       | 50.0                 | 55 150                          | 8000                                        | —                               |
| 284A                  | 5.59 BC<br>.220                                    | PE Helix               | 20.19<br>.795          | Corrugated<br>BC Tube                                  | None                     | 25.53<br>1.005 | .430              | 75                       | 15.0                 | 55 80                           | 29 KW                                       | —                               |
| 285A                  | 2.9 BC<br>.1140                                    | PTFE<br>Helix          | 20.19<br>.795          | Corrugated<br>BC Tube                                  | None                     | 25.53<br>1.005 | .720              | 100                      | 13.0                 | 55 200                          | 22 KW<br>Peak                               | —                               |
| 286                   | OD-10.92<br>.4300<br>ID-9.14 BC<br>.3600 Tube      | PE Helix               | 39.88<br>1.570         | Corrugated<br>BC Tube                                  | None                     | 46.48<br>1.830 | .750              | 75                       | 15.1                 | 55 80                           | 100 KW<br>Peak                              | —                               |
| 287                   | 5 BC<br>.1970                                      | PE Helix               | 39.88<br>1.570         | Corrugated<br>BC Tube                                  | None                     | 46.48<br>1.830 | 3.000             | 100                      | 13.5                 | 55 80                           | 73 KW<br>Peak                               | —                               |
| 288                   | OD-8.46<br>.3330<br>ID-5.64 BC<br>.2221 Tube       | PE Helix               | 75.18<br>2.960         | 95.25 CCS<br>3.750                                     | None                     | 95.25<br>3.750 | 3.000             | 50                       | 21.6                 | 40 80                           | 440 KW<br>Peak                              | —                               |
| 289                   | OD-20.83<br>.8200<br>ID-18.8 CCS<br>.7400 Tube     | PE Helix               | 75.18<br>2.960         | 95.25 CCS<br>3.750                                     | None                     | 95.25<br>3.750 | 1.040             | 75                       | 14.7                 | 40 80                           | 290 KW<br>Peak                              | —                               |
| 292                   | 10.92 BC Tube<br>.4300                             | PE Helix               | 39.88<br>1.570         | 46.48 [1.8300]<br>Corr. BC Tube                        | PE and<br>Flooding Comp. | 50.8<br>2.000  | .160              | 75                       | 15.1                 | 55 80                           | 100 KW<br>Peak                              | —                               |
| 293                   | 2.69 BC<br>.106                                    | PE                     | 9.53<br>.375           | 1/SC                                                   | PE-III A                 | 13.84<br>.545  | .160              | 50                       | 30.8                 | 55 80                           | 7000                                        | Use RG 293A                     |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U Type Cable | Inner Conductor                       | Dielectric Material | DOD         | Number/Type of Shielding Braids | Jacket Material  | O.D.        | Weight (lb/ft) | Nom. Imped. (Ohms) | Nom. Cap pf/ft | Max. Operating Temp. (C°) | Max. Operating Voltage (Volts RMS) | Comments                |
|-----------------|---------------------------------------|---------------------|-------------|---------------------------------|------------------|-------------|----------------|--------------------|----------------|---------------------------|------------------------------------|-------------------------|
| 293A            | 2.69 BC .106                          | PE                  | 9.4 .370    | 1/SC                            | PE-III A         | 13.84 .545  | .205           | 50                 | 30.8           | 55 80                     | 7000                               | Watertight RG 217       |
| 294             | 2 Cond. 2.05 .0808 1 BC, 1 TC         | PE                  | 11.99 .472  | 1/TC                            | PE-III A         | 16 .630     | .205           | 95                 | 16.3           | 55 80                     | 3000                               | Use RG 294A             |
| 294A            | 2 Cond. 2.05 .0808 1 BC, 1 TC         | PE                  | 11.99 .472  | 1/SC                            | PE-III A         | 16 .630     | .420           | 95                 | 16.3           | 55 80                     | 3000                               | Watertight RG 130       |
| 295             | 4.95 BC .1950                         | PE                  | 17.27 .680  | 1/SC                            | PE-III A         | 22.73 .895  | —              | 50                 | 30.8           | 55 80                     | 11,000                             | Watertight RG 218       |
| 296             | 5.97 .2352 37/0.85 SC .0336           | Silicone Rubber     | 23.01 .906  | 1/SC                            | Neoprene         | 30.23 1.190 | —              | 50                 | 36.4           | 55 80                     | 13,800                             | —                       |
| 297             | OD-9.02 .3550 ID-7.29 BC .2870 Tube   | PTFE Helix          | 20.19 .795  | Corrugated BC Tube              | None             | 25.53 1.005 | .090           | 50                 | 21.4           | 55 200                    | 44 KW Peak                         | —                       |
| 298             | 15.32 .6030 7/0.51 CCS .0201          | PE                  | 2.92 .115   | None                            | Foam PE          | 16.51 .650  | .056           | —                  | —              | 55 80                     | —                                  | Buoyant Per MIL-C-22667 |
| 301             | 1.55 .0609 7/0.52 HR .0203            | PTFE                | 4.7 .185    | 1/HR                            | FEP-IX           | 6.23 .245   | .031           | 50                 | 29.4           | 55 200                    | 3000                               | FEP Jacketed RG 126     |
| 302             | 0.64 SCCS .0250                       | PTFE                | 3.71 .146   | 1/SC                            | FEP-IX           | 5.11 .201   | .030           | 75                 | 19.5           | 55 200                    | 2300                               | FEP Jacketed RG 140     |
| 303             | 0.99 SCCS .0390                       | PTFE                | 2.95 .116   | 1/SC                            | FEP-IX           | 4.32 .170   | .088           | 50                 | 29.4           | 55 200                    | 1900                               | FEP Jacketed RG 141A    |
| 304             | 1.5 SCCS .0590                        | PTFE                | 4.7 .185    | 2/SC                            | FEP-IX           | 7.11 .280   | —              | 50                 | 29.4           | 55 200                    | 300                                | FEP Jacketed RG 143A    |
| 305             | OD-10.92 .4300 ID-9.14 .3600 Tube     | FEP                 | 39.88 1.570 | 46.48 BC Tube 1.830             | PE-III A         | 50.55 1.990 | .545           | 75                 | 14.4           | 55 80                     | 2720                               | —                       |
| 306A            | 4.39 BC .1730                         | Foam PE             | 20.35 .801  | 22.23 Al. Tube .8750            | PE-III A         | 25.78 1.015 | .070           | 75                 | 16.5           | 55 80                     | 5700                               | Per MIL-C-23806         |
| 307             | 0.74 .0290 19/0.15 SC .0058           | Foam PE             | 3.71 .146   | 2/SC PUR Interlayer             | PE-III A         | 6.86 .270   | .070           | 75                 | 16.7           | 55 80                     | 1000                               | Triax Use to 100 MHz    |
| 307A            | 0.74 .0290 19/0.15 SC .0058           | Foam PE             | 3.71 .146   | 2/SC PUR Interlayer             | PE-III A         | 6.86 .270   | .060           | 75                 | 16.7           | 55 80                     | 1000                               | Triax Use to 100 MHz    |
| 316             | 0.51 .0201 7/0.17 SCCS .0067          | PTFE                | 1.52 .060   | 1/SC                            | FEDP-IX          | 2.59 .102   | .012           | 50                 | 29.4           | 55 200                    | 1200                               | FEP Jacketed RG 188A    |
| 317             | 2 Cond. 2.21 .0870 7/0.74 BC .0290    | FEP                 | 11.33 .446  | 1/TC                            | Neoprene         | 18.03 .710  | —              | 95                 | 15.4           | 55 80                     | 10,000                             | Water Blocked           |
| 318             | OD-9.09 BC .3580 Tube ID-7.29 .2870   | PE Helix            | 20.19 .795  | 25.53 1.005 Corr. BC Tube       | PE-III A         | 28.58 1.125 | .530           | 50                 | 22.0           | 55 80                     | 44 KW Peak                         | —                       |
| 319             | OD-17.48 BC .6880 Tube ID-14.94 .5580 | PE Helix            | 39.88 1.570 | 46.48 1.830 Corr. BC Tube       | PE-III A         | 50.8 2.000  | 1.040          | 50                 | 22.0           | 55 80                     | 145 KW Peak                        | —                       |
| 321             | OD-28.96 1.1400 Corr. BC Tube         | PE Helix            | —           | 79.39 2.850 Corr. BC Tube       | None             | 72.39 2.850 | 1.210          | 50                 | 21.7           | 55 80                     | 320 KW Peak                        | —                       |
| 322             | OD-28.96 1.1400 Corr. BC Tube         | PE Helix            | —           | 79.39 2.850 Corr. BC Tube       | PE & Flood Comp. | 77.22 3.040 | 1.780          | 50                 | 21.7           | 55 80                     | 320 KW Peak                        | —                       |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U Type Cable | Inner Conductor                      | Dielectric Material | DOD         | Number/Type of Shielding Braids | Jacket Material  | O.D.          | Weight (lb/ft) | Nom. Imped. (Ohms) | Nom. Cap pf/ft | Max. Operating Temp. (C°) | Max. Operating Voltage (Volts RMS) | Comments                     |
|-----------------|--------------------------------------|---------------------|-------------|---------------------------------|------------------|---------------|----------------|--------------------|----------------|---------------------------|------------------------------------|------------------------------|
| 323             | 7.92 BC Tube .312                    | Foam PE             | —           | 24.89 .980<br>Corr. BC Tube     | PE & Flood Comp. | 26.92 1.060   | .420           | 50                 | 25.6           | 55 80                     | 1480                               | —                            |
| 324             | 7.92 BC Tube .312                    | Foam PE             | —           | 24.89 .980<br>Corr. BC Tube     | None             | 24.89 .980    | .320           | 50                 | 25.6           | 55 80                     | 1480                               | —                            |
| 325             | 2.54 .1000<br>19/0.51 SC Al. .0200   | PE Spline           | 6.6 .260    | 2/SC Strip Braids               | PUR              | 8.89 .350     | .10            | 50                 | 26.3           | 55 80                     | 750                                | Low Loss                     |
| 326             | 5.08 .2000<br>19/1.02 SC Al. .0400   | PE Spline           | 13.97 .550  | 2/SC Strip Braids               | PUR              | 17.7 .697     | .24            | 50                 | 26.3           | 55 80                     | 1700                               | Low Loss                     |
| 327             | 8.13 .3200<br>19/1.63 SC Al. .0640   | PE Spline           | 21.34 .840  | 2/SC Strip Braids               | PUR              | 25.65 1.010   | .55            | 50                 | 26.3           | 55 80                     | 2500                               | Low Loss                     |
| 328             | 12.32 TC Braid .4850                 | Rubber H.J.H.       | 27.05 1.065 | 3/TC, GS, TC                    | Neoprene         | 37.08 1.460   | 1.469          | 25                 | 85.0           | 55 80                     | 20,000                             | —                            |
| 329             | 1.49 .0585<br>19/0.3 TC .0117        | Rubber H.J.H.       | 9.65 .380   | 3/TC, GS, TC                    | Neoprene         | 17.78 .700    | .353           | 50                 | 50.0           | 55 80                     | 15,000                             | —                            |
| 330             | SC                                   | Foam PE             | —           | 1/SC                            | —                | 6.15 .242     | —              | 50                 | 25.0           | —                         | —                                  | —                            |
| 331             | 4.11 BC .1620                        | Foam PE             | 11.43 .450  | 12.7 Al. Tube .500              | PE-III A         | 15.24 .600    | .187           | 50                 | 25.0           | 55 80                     | 2500                               | Jacketed 231 Solid Conductor |
| 332             | 7.11 BC .2800                        | Foam PE             | 20.35 .801  | 22.23 Al. Tube .8750            | None             | 22.23 .875    | .466           | 50                 | 25.0           | 55 80                     | 4500                               | Per MIL-C-23806              |
| 333             | 7.11 BC .2800                        | Foam PE             | 20.35 .801  | 22.23 Al. Tube .8750            | PE-III A         | 25.78 1.015   | .548           | 50                 | 25.0           | 55 80                     | 4500                               | Jacketed RG 332              |
| 334             | 2.49 BC .0980                        | Foam PE             | 11.43 .450  | 12.7 Al. Tube .500              | None             | 12.7 .500     | .109           | 75                 | 17.0           | 55 80                     | 2500                               | Per MIL-C-23806              |
| 335             | 2.49 BC .0980                        | Foam PE             | 11.43 .450  | 12.7 Al. Tube .500              | PE-III A         | 15.88 .625    | .143           | 75                 | 17.0           | 55 80                     | 2500                               | Jacketed RG 334              |
| 336             | 4.39 BC .1730                        | Foam PE             | 20.35 .801  | 22.23 Al. Tube .8750            | None             | 22.23 .875    | .315           | 75                 | 17.0           | 55 80                     | 4000                               | Per MIL-C-23806              |
| 360             | 6.17 BC .2430                        | Foam PE             | 17.17 .676  | 19.05 Al. Tube .7500            | PE-III A         | 20.95 .825    | .397           | 50                 | 25.0           | 55 80                     | 4000                               | Per MIL-C-23806              |
| 366             | 4.06 .1600                           | Foam PE             | —           | 13.72 .540<br>Corr. BC Tube     | PE-III A         | 15.75 .620    | —              | 50                 | 62.6           | 55 80                     | 4000                               | —                            |
| 367             | Corrugated BC Tube                   | PE Helix            | —           | 12.7 .5000<br>Corr. BC Tube     | PE-III A         | 132.08 5.2000 | 4.590          | 50                 | 21.7           | 55 80                     | 830 KW Peak                        | —                            |
| 369             | 2.97 BC .1170                        | PE Tubes            | 8.08 .318   | 9.91 Al. Tube .390              | PE-III A         | 11.94 .470    | .140           | 50                 | 24.0           | 55 80                     | 700                                | —                            |
| 370             | 2.97 BC .1170                        | PE Tubes            | 8.08 .318   | 9.91 Al. Tube .390              | None             | 9.91 .390     | .100           | 50                 | 24.0           | 40 80                     | 700                                | —                            |
| 374             | 0.72 BC .0285                        | PE                  | 4.06 .160   | None                            | Foam PE          | 16.51 .650    | .097           | —                  | —              | 55 80                     | —                                  | Buoyant Antenna              |
| 376             | 7.92 BC Tube .3120                   | Foam PE             | —           | Corr. Al. Tube                  | PE-III A         | 26.92 1.060   | .390           | 50                 | 26.0           | 55 80                     | 6000                               | —                            |
| 377             | 4.19 SC Tube .1650                   | PTFE Tubes          | —           | 13.46 Al. Tube .5300            | None             | 13.36 .530    | .170           | 50                 | 24.0           | 55 250                    | 1000                               | —                            |
| 378             | 18.11 BC Tube .7130                  | PE Helix            | —           | 46.48 1.830<br>Corr. Al. Tube   | PE-III A         | 50.8 2.000    | .620           | 50                 | 22.1           | 55 80                     | 145 KW Peak                        | —                            |
| 383             | 2 Cond. 1.02 .0403<br>2000 lb. Break | PE                  | —           | None                            | Foam PE          | 16.51 .650    | —              | 100                | —              | 55 80                     | —                                  | Exper. Buoyant Twisted Pair  |
| 384             | 1.29 BC .0508                        | PE                  | —           | 1/Flat BC Braid Waterproofed    | Foam PE          | 16.51 .650    | —              | 50                 | 30.8           | 55 80                     | —                                  | Buoyant Antenna 600 psig.    |
| 385             | 3.89 SC .1530                        | Semi-Solid PTFE     | 10.8 .425   | 12.7 Corr. Al. .500             | Optional         | 16.76 .660    | .178           | 50                 | 25.0           | 55 250                    | 1500                               | Low Loss No Press. Req.      |

## Appendix D - Typical Coaxial Cable Specifications (Continued)

| RG/U Type Cable | Inner Conductor                                     | Dielectric Material    | DOD                  | Number/Type of Shielding Braids       | Jacket Material     | O.D.                 | Weight (lb/ft) | Nom. Imped. (Ohms) | Nom. Cap pf/ft | Max. Operating Temp. (C°) | Max. Operating Voltage (Volts RMS) | Comments                          |
|-----------------|-----------------------------------------------------|------------------------|----------------------|---------------------------------------|---------------------|----------------------|----------------|--------------------|----------------|---------------------------|------------------------------------|-----------------------------------|
| 386             | <b>1.29</b> CCS<br>.0508                            | PE                     | —                    | None<br>Non-hosing                    | Foam PE             | <b>16.51</b><br>.650 | —              | —                  | —              | 55 80                     | —                                  | Buoyant Antennna<br>400 lb. Break |
| 388             | CS                                                  | PE                     | —                    | <b>11.28</b><br>.444 Max. SC          | PE-III A            | <b>13.84</b><br>.545 | —              | 50                 | 30.8           | 55 80                     | —                                  | Watertight<br>See RG 14A          |
| 389             | <b>6.35</b> BC Al.<br>.2500                         | PE Spline              | <b>16.13</b><br>.635 | 2/SC                                  | PE-III A            | <b>22.23</b><br>.875 | .336           | 50                 | 22.8           | 55 80                     | 2000                               | Low Loss<br>Replaces RG 189       |
| 391             | <b>1.22</b><br>.048<br>7/ <b>0.4</b> TC<br>.0159    | Cond. PE<br>and PE     | <b>7.24</b><br>.285  | 1/TC                                  | PVC-II A            | <b>10.29</b><br>.405 | .092           | 72                 | —              | 55 80                     | 5000                               | Low Noise<br>Cable                |
| 392             | <b>1.22</b><br>.048<br>7/ <b>0.4</b> TC<br>.0159    | Cond. PE<br>and PE     | <b>7.24</b><br>.285  | 1/TC                                  | PVC-II A<br>w/Armor | <b>12.07</b><br>.475 | .114           | 72                 | —              | 55 80                     | 5000                               | Armored<br>RG 391                 |
| 393             | <b>2.38</b><br>.0936<br>7/ <b>0.79</b> SC<br>.0312  | PTFE                   | <b>7.24</b><br>.285  | 2/SC                                  | FEP-IX              | <b>9.91</b><br>.390  | .165           | 50                 | 29.4           | 55 200                    | 5000                               | Moistureproof<br>RG 225           |
| 397             | <b>2.44</b><br>.096<br>7/ <b>0.81</b> SC<br>.032    | Air-space<br>PTFE      | <b>6.86</b><br>.270  | 2/SC                                  | FEP-IX              | <b>8.89</b><br>.350  | .125           | 50                 | 28.0           | 55 200                    | 2000                               | Low Loss<br>RG 393                |
| 400             | <b>0.98</b><br>.0385<br>19/ <b>0.2</b> SPC<br>.0077 | PTFE                   | <b>2.95</b><br>.116  | 2/SC                                  | FEP-IX              | <b>4.95</b><br>.195  | .050           | 50                 | 29.3           | 55 200                    | 1900                               | —                                 |
| 401             | <b>1.64</b> SPC<br>.0645                            | PTFE                   | <b>5.46</b><br>.215  | <b>6.35</b> OD<br>.250<br>Copper Tube | None                | <b>6.35</b><br>.250  | .081           | 50                 | 29.3           | 40 125                    | 3000                               | Semirigid                         |
| 402             | <b>0.91</b> SCCS<br>.0360                           | PTFE                   | <b>3.02</b><br>.119  | <b>3.58</b> OD<br>.141<br>Copper Tube | None                | <b>3.58</b><br>.141  | .032           | 50                 | 29.3           | 40 125                    | 2500                               | Semirigid                         |
| 403             | <b>0.3</b> SCCS<br>.012<br>7/ <b>0.1</b><br>.004    | PTFE                   | <b>0.86</b><br>.034  | 2/SC<br>FEP Interlayer                | FEP-IX              | <b>2.95</b><br>.116  | .0075          | 50                 | 29.3           | 55 200                    | 2500                               | Triaxial<br>RG 178B               |
| 404             | <b>0.3</b> SCCS<br>.012<br>7/ <b>0.1</b><br>.004    | PTFE and<br>Cond. PTFE | <b>0.86</b><br>.034  | 1/SC                                  | FEP-IX              | <b>1.83</b><br>.072  | .0054          | 50                 | 31.5<br>Max.   | 55 200                    | 2000                               | Low Loss<br>RG 178B               |
| 405             | <b>0.51</b> SCCS<br>.0201                           | PTFE                   | <b>1.68</b><br>.066  | <b>2.18</b> OD<br>.086<br>Copper Tube | None                | <b>2.19</b><br>.0865 | .015           | 50                 | 29.4           | 40 125                    | 1500                               | Semirigid                         |

## Appendix E - Maximum Power Handling Capabilities for Cables

(Average Input Power in Watts)

| RG/U<br>Type Cable                            | Frequency in MHz |       |       |       |       |       |       |       |        |
|-----------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|--------|
|                                               | 10               | 50    | 100   | 200   | 400   | 1,000 | 3,000 | 5,000 | 10,000 |
| 5, 5A, 5B                                     | 2,000            | 800   | 550   | 350   | 230   | 125   | 60    | 40    | 22     |
| 8, 8A, 10A, 213, 215                          | 3,700            | 1,300 | 850   | 540   | 350   | 190   | 95    | 65    | 37     |
| 9, 9A, 9B, 214                                | 3,700            | 1,300 | 850   | 540   | 350   | 190   | 95    | 65    | 37     |
| 11, 11A, 12, 12A, 13, 13A, 216                | 2,500            | 1,000 | 650   | 400   | 260   | 150   | 70    | 50    | 26     |
| 217                                           | 6,000            | 2,000 | 1,200 | 800   | 480   | 260   | 120   | 85    | 50     |
| 22, 22B                                       | 1,700            | 650   | 430   | 280   | 190   | 110   | 50    | 38    | 20     |
| 55, 55A, 55B, 223                             | 800              | 310   | 205   | 137   | 90    | 53    | 28    | 20    | 10     |
| 58, 58B                                       | 730              | 280   | 180   | 125   | 85    | 50    | 25    | 17    | —      |
| 58A, 58C                                      | 650              | 225   | 170   | 110   | 75    | 44    | 22    | 15    | —      |
| 59, 59A, 59B                                  | 1,300            | 480   | 310   | 200   | 135   | 77    | 40    | 27    | 15     |
| 62, 62A, 71, 71A, 71B                         | 1,300            | 480   | 310   | 200   | 135   | 77    | 40    | 27    | 15     |
| 62B                                           | 1,150            | 420   | 280   | 180   | 120   | 69    | 35    | 25    | 14     |
| 115, 115A, 165, 225, 393                      | 25,000           | 9,500 | 6,300 | 4,300 | 2,800 | 1,700 | 880   | 620   | 350    |
| 108, 108A                                     | 340              | 145   | 100   | 70    | 50    | 30    | 15    | —     | —      |
| 122                                           | 540              | 205   | 140   | 90    | 60    | 35    | 18    | 12    | —      |
| 140, 141, 141A, 142, 142B, 302, 303, 400, 402 | 9,000            | 3,500 | 2,400 | 1,600 | 1,100 | 650   | 350   | 245   | 140    |
| 143, 143A                                     | 11,500           | 4,600 | 3,200 | 2,100 | 1,450 | 850   | 460   | 330   | 190    |
| 144                                           | 25,000           | 9,500 | 6,300 | 4,300 | 2,800 | 1,700 | 880   | 620   | 350    |
| 161, 179, 179A, 179B, 187, 187A               | 1,600            | 780   | 570   | 420   | 310   | 200   | 110   | 76    | 41     |
| 174, 174A                                     | 170              | 72    | 50    | 36    | 25    | 16    | —     | —     | —      |
| 178, 178A, 178B, 196, 196A                    | 710              | 340   | 240   | 170   | 123   | 78    | 41    | 28    | 14     |
| 180, 180A, 180B, 195, 195A                    | 2,500            | 1,100 | 800   | 570   | 400   | 250   | 135   | 93    | 50     |
| 188, 188A, 316                                | 1,250            | 600   | 450   | 330   | 240   | 160   | 80    | 57    | 30     |
| 210                                           | 8,500            | 3,300 | 2,300 | 1,600 | 1,100 | 620   | 310   | 220   | 140    |

**Note:** Values above 3 GHz vary considerably depending on construction.

### Conditions

Ambient: 40°C

Altitude: Sea level

Center Conductor Temperature:

80°C for polyethylene

200°C for PTFE

## Appendix F - Nominal Loss Characteristics for Cables

(Decibels per Hundred Feet)

| RG/U<br>Type Cable                            | Frequency in MHz |       |       |       |       |       |       |        |        |
|-----------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|--------|--------|
|                                               | 10               | 50    | 100   | 200   | 400   | 1,000 | 3,000 | 5,000  | 10,000 |
| 5, 5A, 5B                                     | .80              | 1.40  | 2.90  | 4.30  | 6.40  | 11.00 | 22.00 | 30.00  | 52.00  |
| 8, 8A, 10A, 213, 215                          | .66              | 1.50  | 2.20  | 3.20  | 4.60  | 9.00  | 19.00 | 28.00  | 47.00  |
| 9, 9A, 9B, 214                                | .66              | 1.50  | 2.20  | 3.20  | 4.60  | 9.00  | 19.00 | 28.00  | 47.00  |
| 11, 11A, 12, 12A, 13, 13A, 216                | .66              | 1.50  | 2.20  | 3.20  | 4.60  | 9.00  | 19.00 | 28.00  | —      |
| 217                                           | .41              | 1.00  | 1.40  | 2.10  | 3.10  | 5.80  | 13.00 | 19.00  | 31.00  |
| 22, 22B                                       | 1.20             | 2.80  | 4.20  | 6.30  | 9.50  | —     | —     | —      | —      |
| 55, 55A, 55B, 223                             | 1.35             | 3.00  | 4.30  | 6.00  | 8.80  | 16.50 | 36.00 | 51.00  | 85.00  |
| 58, 58B                                       | 1.20             | 3.10  | 4.60  | 7.00  | 10.00 | 17.50 | 38.00 | —      | —      |
| 58A, 58C                                      | 1.40             | 3.30  | 4.90  | 7.30  | 11.00 | 20.00 | 41.00 | —      | —      |
| 59, 59A, 59B                                  | 1.10             | 2.30  | 3.30  | 4.70  | 6.70  | 11.50 | 25.50 | 41.00  | —      |
| 62, 62A, 71, 71A, 71B                         | .90              | 1.90  | 2.80  | 3.70  | 5.20  | 8.50  | 18.40 | 29.50  | —      |
| 62B                                           | .90              | 2.10  | 3.00  | 4.30  | 6.10  | 10.50 | 23.50 | 36.00  | —      |
| 115, 115A, 165, 225, 393                      | .60              | 1.40  | 2.10  | 3.10  | 4.50  | 7.50  | 14.00 | 21.00  | 35.00  |
| 108, 108A                                     | 2.30             | 5.20  | 7.50  | 11.00 | 16.00 | 26.20 | 54.00 | —      | —      |
| 122                                           | 1.60             | 4.40  | 6.90  | 11.00 | 16.60 | 29.20 | 57.20 | 89.00  | —      |
| 140, 141, 141A, 142, 142B, 302, 303, 400, 402 | 1.20             | 2.70  | 3.90  | 5.50  | 8.00  | 13.00 | 26.00 | 36.00  | 62.00  |
| 143, 143A                                     | .85              | 1.80  | 2.50  | 3.80  | 5.70  | 9.70  | 18.10 | 26.10  | 40.70  |
| 144                                           | .38              | 1.00  | 1.60  | 2.30  | 3.80  | 7.00  | 15.10 | —      | —      |
| 161, 179, 179A, 179B, 187, 187A               | 5.00             | 7.90  | 9.80  | 12.70 | 15.80 | 25.00 | 43.00 | 62.50  | 135.00 |
| 174, 174A                                     | 3.80             | 6.50  | 8.90  | 12.00 | 17.50 | 31.00 | 64.30 | 97.00  | 185.00 |
| 178, 178A, 178B, 196, 196A                    | 5.30             | 10.00 | 13.30 | 20.00 | 27.50 | 45.00 | 78.00 | 115.00 | 172.00 |
| 180, 180A, 180B, 195, 195A                    | 3.10             | 4.20  | 5.10  | 7.30  | 10.40 | 16.50 | 36.00 | 49.50  | 89.00  |
| 188, 188A, 316                                | 3.80             | 7.90  | 11.50 | 15.00 | 20.00 | 30.00 | 58.00 | 79.00  | 133.00 |
| 210                                           | .23              | .58   | .85   | 1.30  | 1.90  | 3.10  | 6.50  | 9.00   | 15.00  |

**Note:** Values above 3 GHz vary considerably depending on construction.

### Conditions

Ambient: 20°C

## Appendix G - Glossary of Terms

### A

**ambient** The atmospheric conditions surrounding a given item. Normally in terms of factors which influence or modify, such as temperature, humidity, etc.

**amplitude** The magnitude of variation in a changing quantity from its zero value. The word requires modification - as with adjectives such as peak, maximum, rms, etc. - to designate the specific amplitude in question.

**arc voltage** voltage that continues to pass through a surge protector during activation of GDT(approx. 20 volts )

**attenuation** A reduction in power. It occurs naturally during wave travel through lines, waveguides, space or a medium such as water. It may be produced intentionally by placing an attenuator in a circuit. The amount of attenuation is generally expressed in decibels per unit of length.

### B

**back mounted** A connector attached to the inside of a panel or box with its mounting flanges inside the equipment.

**bayonet coupling** A quick coupling device for plug and receptacle connectors. Pins projecting from the outside of the cylindrical receptacle engage with corresponding cam slots in the bayonet plug.

**bellmouth** Flared at the mouth. The rear of a properly crimped wire barrel will have a slight flare (bellmouth) to relieve the strain on the wire strands as they leave the area of high compression and take their natural "lay". A bellmouth condition may also be present in front of the wire barrel.

**black box** A term used to refer to any assembly or subassembly, usually electronic, that can readily be installed or removed from a larger system.

**BNC Connector** A radio frequency connector covered by Military Specification. It has an impedance of 50 or 75 ohms, and is designed to operate in the 0 to 4 GHz frequency range. It features quick connect/disconnect by pin and cam bayonet coupling.

**body** Main or largest portion of a connector to which other portions are attached.

**braid** A weave of metal fibers used as a shield covering for an insulated conductor or group of insulated conductors. When flattened it may be used as a grounding strap.

**broad-band E** Interference generated over a wide range of frequencies (e.g., automotive ignition noise).

**bulkhead** A term used to define a mounting style of connectors. Bulkhead connectors are designed to be inserted into a panel cutout from the rear (component side) of the panel.

### C

**cable** Either a standard conductor, with or without insulation and other coverings, or a combination of conductors insulated from each other.

**cable assembly** A completed cable and its associated hardware.

**capacitance** The property of an electrical conductor (dielectric in a capacitor) that permits the storage of energy as a result of electrical displacement. The basic unit of capacitance is the farad, however, measurement is more commonly in microfarads or picofarads.

**cavity** A metallic enclosure in some types of tubes and circuits within which resonant fields may be excited at the microwave frequency to which the cavity is tuned. Usually referred to as resonant cavity. See also: contact cavity.

**characteristic impedance** The ratio of voltage to current at any point along a transmission line on which there are no standing waves.

**circular mil area (CMA)** A unit of area equal to the area of a circle whose diameter is 1 mil (0.001 inch). Used chiefly in specifying cross-sectional areas of conductors. (See Tyco Electronics Brochure No. 4402-8, Computing Circular Mil Area for Tyco Electronics Terminals and Splices).

**closed entry contact** A female contact designed to prevent the entry of a pin or probing device having a cross-sectional dimension (diameter) greater than the mating pin.

**coaxial cable** A transmission line consisting of two conductors concentric with and insulated from each other. In its flexible form it consists of either a solid or stranded center conductor surrounded by a dielectric. A braid is then woven over the dielectric to form an outer conductor. A weatherproof plastic covering, usually vinyl, is placed on top of the braid.

**connector** A coupling device employed to connect conductors to one circuit with those of another circuit. Used to provide rapid connect/disconnect mating with pc boards, posts or another connector.

**connector assembly** Includes housing and contact plus additional components such as hardware used to hold the assembly together and/or make the assembly a functional connector.

**contact** An electrically conductive component designed for use in a multi-circuit connector.

**contact cavity** A defined hole in the connector insert or housing into which the contact must fit. See also: cavity.

**contact durability** The number of insertion and withdrawal cycles that a connector must be capable of withstanding while remaining within the performance levels of the applicable specification.

**contact engaging and separating force** Force required to either engage or separate contacts. Values are generally established for maximum and minimum forces.

**contact inspection hole** A hole, perpendicular to the cylindrical rear portion of screw machined contacts, used to check the depth to which wire has been inserted into the barrel.

**contact resistance** Measurement of electrical resistance of mated contacts when assembled in a connector under typical service use. Electrical resistance is determined by measuring from the rear of the electrical area of one contact to the rear of the contact area of the mating contact (excluding both crimps) while carrying a specified test current.

**contact shoulder** The flanged or enlarged portion of a contact that prevents it from being over-inserted into the appropriate contact cavity. The shoulder may also contribute to proper orientation and stability with the connector housing.

**contact, two-piece** A contact made of two separate parts joined by swedging, brazing or other means of fastening to form a single contact. While this provides the mechanical advantages of two metals, it also has the inherent electrical disadvantage of difference in conductivity.

**corona** A discharge of electricity appearing as a bluish-purple glow on the surface of, and adjacent to, a conductor when the voltage gradient exceeds a certain critical value. It is caused by the ionization of surrounding air by high voltage.

**crimp** The final configuration of a terminal barrel after the necessary compression forces have been applied to cause a functional union between the terminal barrel and the wire.

**crimp height** A top to bottom measurement of the crimped barrel, using a crimp height comparator in the prescribed manner. (Refer to Tyco Electronics Instruction Sheet 7424).

**crimping dies** A term used to identify the shaping tools that, when moved toward each other, produce a certain desirable shape to the barrel of the terminal or contact that has been placed between them. Crimping dies are often referred to as die sets or as die inserts.

## Appendix G - Glossary of Terms (Continued)

**crimping head** Tooling containing jaws and linkage for use in pneumatic or hydraulic powered units to crimp loose-piece contacts/terminals that may be too large for hand tool applications.

**crimping tool** A term commonly used to identify a hand held mechanical device that is used to crimp a contact, terminal or splice.

**crosstalk** A magnetic or electrostatic coupling which causes the unwanted transfer of energy from one circuit (disturbing circuit) to another circuit (disturbed circuit)

**current rating** The maximum continuous electrical flow of current recommended for a given situation. It is expressed in amperes.

**cycle** One complete sequence of values of an alternating quantity, including a rise to maximum in one direction and return to zero; a rise to maximum in the opposite direction and return to zero. The number of cycles occurring in one second is called the frequency.

### D

**daisy chain** A cable assembly with common wires jumpering three or more connections/connectors. The term is also used as a verb, implying to connect in jumper manner.

**dB** Abbreviation — see decibel.

**D.C. sparkover voltage** defined as the maximum voltage across a device before it discharges the energy to ground when subjected to a slowly rising voltage ramp. A rate of rise of 100V/s is usually chosen for testing purposes.

**decibel** A unit expressing the ratio of two voltages, currents or powers. It is equal to 20 times the common logarithm of the ratio of two voltages across or two currents through equal loads, or 10 times the common logarithm of the two powers. One decibel is approximately the smallest change in audible power that can be recognized by the human ear.

**die closure** Term used to designate a crimping area (crimping chamber) when the dies are fully closed or bottomed. Die closure is checked with go/no go plug gage to insure that the crimp produced by the tooling satisfies the crimp height specification.

**dielectric** A material that serves as an insulator. The amount of resistance to voltage in a given insulation.

**dielectric withstanding voltage** The maximum potential gradient that a dielectric material can withstand without failure.

**discontinuity** Rated interconnection: a broken connection (open circuit) or the loss of a specified connection characteristic. Transient phenomena: Short term (temporary) interruption or unacceptable variation in current or voltage.

**dissipation** Unusable or lost energy, such as the production of unused heat in a circuit.

**distortion** An unwanted change or addition to a signal or waveform when it is amplified. This definition excludes noise which is an extraneous signal superimposed on the desired signal.

**dummy load** A dissipative device used at the end of a transmission line or waveguide to convert transmitted energy into heat, so essentially no energy is radiated outward or reflected back to its source.

**dust cap** A device attached to a connector to provide protection against dust and foreign debris.

### E

**electromagnetic compatibility (EMC)** The ability of an electronic device to operate in its intended environment without its performance being affected by EMI and without generating EMI that will affect other equipment.

**electromagnetic interference (EMI)** Unwanted electrical or electromagnetic energy that causes undesirable responses, degrading performance or complete malfunctions in electronic equipment. See also: noise.

**electromotive force (emf)** See voltage.

**environmentally sealed** A unit is provided with gaskets, seals, grommets, potting or other means to keep out moisture, dust, air or dirt which might reduce or impair its performance.

### F

**feedthrough** A connector or terminal block, usually having double-ended terminals, which permits distribution and bussing of electrical circuits. Also used to describe a bushing in a wall or bulkhead, separating compartments at different pressure levels, with terminations on both sides.

**ferrule** A short tube used to make solderless connections to shielded or coaxial cable. Also molded into the plastic inserts of multiple contact connectors to provide strong, wear-resistant shoulders on which contact retaining springs can bear.

**flange** A projection extending from or around the periphery of a connector and having holes that provide for mounting the connector to a panel or to a mating connector.

**frequency modulation (fm)** A scheme for modulating a carrier frequency in which the amplitude remains constant but the carrier frequency is displaced in frequency proportionally to the amplitude of the modulating signal. An fm broadcast is practically immune to atmospheric and man-made interference.

**fretting corrosion** A form of accelerated oxidation that appears at the interface of contacting materials undergoing slight cyclic relative motion. All non-nobel metals (tin) are susceptible to some degree of fretting corrosion and will suffer contact resistance increases.

**front mounted** A connector is said to be front mounted when it is attached to the outside of the mating side of a panel. A front mounted connector can only be installed or removed from the outside of the equipment.

### G

**gas discharge tube (GDT)** hermetically sealed device containing an inert gas.

**GHz** See gigahertz.

**giga** A prefix meaning one billion ( $10^9$ ).

**gigahertz (GHz)** One billion cycles per second ( $10^9$  cps).

**glow mode** condition in which the GDT continues to conduct after an impulse passed. Characterized by a visible glow in the device caused by over-heating.

**ground** A connection, intentional or accidental, between an electrical circuit and the earth or some conducting body (e.g. chassis) serving in place of earth.

### H

**heat-shrinkable** A type of plastic material that has been cross-linked. A term describing tubes, sleeves, caps, boots, films or other forms of plastic which shrink to encapsulate, protect or insulate connections, splices, terminations and other configurations.

**hermetic** Airtight, impervious to external influence, as in a hermetic package. Often used to describe metal-to-metal solder or weld-sealed packages.

## Appendix G - Glossary of Terms (Continued)

**hermetic seal** Hermetically sealed connectors are usually multiple contact connectors where the contacts are bonded to the connector by glass or other materials and permits maximum leakage rate of gas through the connector of 1.0 micron ft./hr. at one atmosphere pressure for special applications.

**hertz (Hz)** International standard term for cycles per second. Named after the German physicist Heinrich R. Hertz (e.g., 60 cycles per second is equal to 60 hertz or 60 Hz).

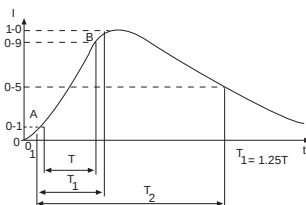
### I

**impedance (Z)** The total opposition offered by a component or circuit to the flow of alternating or varying current. Impedance is expressed in ohms and is similar to the actual resistance in a direct current circuit. In computations, impedance is handled as a complex ratio of voltage to current.

**impedance match** A condition in which the impedance of a component or circuit is equal to the internal impedance of the source, or the surge impedance of a transmission line. This gives maximum transfer of energy from the source to the load, as well as minimum reflection and distortion.

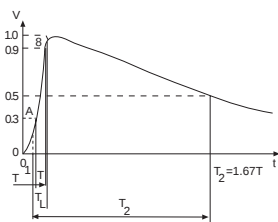
#### impulse discharge current

is defined as the peak current of an impulse which the device can withstand ten times (5 of each polarity at fixed time intervals) without substantially affecting device performance. The test normally used to determine this capacity uses the 8/20ms waveform as depicted below where  $T_1=8\text{ms}$  and  $T_2=20\text{ms}$ .



#### impulse sparkover voltage

defined as the maximum level of voltage across a device before it discharges the energy to ground when subjected to a voltage impulse. The three common waveform profiles used to determine this capacity are:



**inductance** One cause of reactance. An electromagnetic phenomenon in which the expanding and collapsing of a magnetic field surrounding a conductor or device tends to impede changes in current. The effects of inductance become greater as frequencies increase. The basic unit for inductance is the henry.

**input impedance** The impedance that exists between the input terminals of an amplifier or transmission line when the source is disconnected. The circuit, signal level and frequency must be specified.

**insertion loss** The loss in load power due to the insertion of a component, connector or device at some point in a transmission system. Generally expressed in decibels as the ratio of the power received at the load before insertion of the apparatus, to the power received at the load after insertion.

**insulation crimp** The area of a terminal splice or contact that has been formed around the insulation of a wire.

**insulation grip** The ability of certain crimped terminals to hold firmly in place both the conductor and a small portion of insulation. This prevents the conductor from being exposed due to insulation receding away from the terminal.

**insulation resistance** The electrical resistance between two conductors separated by an insulating material.

**interface** The two surfaces of a multiple-contact connector that face each other when the connector is assembled.

**interference** An electrical or electromagnetic disturbance that causes undesirable response in electronic equipment.

### J

**jack** A connecting device into which a plug can be inserted to make circuit connections. The jack may also have contacts which open or close to perform switching functions when the plug is inserted or removed. See also: receptacle.

### L

**line impedance** Impedance as measured across the terminals of a transmission line; frequently the characteristic impedance of the line.

### M

**matched impedance** The coupling of two circuits in such a way that the impedance of one circuit equals the impedance of the other.

**mate** To join two connectors in a normal engaging mode.

**maximum discharge current** defined as the peak current of an impulse which the device can withstand once without substantially affecting device performance.

**mega (M)** A prefix meaning one million ( $10^6$ ).

**microwave** That portion of the electromagnetic spectrum lying between the far infrared and conventional radio frequency range. The microwave frequency range extends from 1 GHz to 300 GHz. Microwaves are usually used in point-to-point communications because they are easily concentrated into a beam.

**Military Specification** Military requirements. The demand imposed upon a system to meet a military operational need.

**mismatch** The condition in which the impedance of a source does not match or equal the impedance of the connected load. This reduces power transfer by causing reflection.

### N

**narrow-band** EMI generated from a device operating at a specific and limited range of frequencies. See also: electromagnetic interference (EMI).

**N Connector** A large radio frequency connector covered by Military Specification. It has an impedance of 50 ohms and is designed to operate in the 0 to 11 GHz frequency range. It has a threaded coupling and is physically larger than a TNC connector.

**noise** An extraneous signal in an electrical circuit, capable of interfering with the desired signal. Classes of noise include burst of popcorn noise, intermediate frequency noise at low audio frequencies, white (thermal) noise, etc. Signals from power supply or ground line coupled into an amplifier output may be considered noise.

### O

**"O" crimp** An insulation support crimp for open barrel terminals and contacts. In its crimped form it resembles an "O" and conforms to the shape of the round wire insulation. "O" crimp is also used to describe the circumferential crimps used on COAXICON ferrules.

## Appendix G - Glossary of Terms (Continued)

**ohm** The unit of measurement for electrical resistance. A circuit is said to have a resistance of one ohm when an applied emf of one volt causes a current of one ampere to flow.

### P

**panel mount** A method of fixing a connector to a board, panel or frame. The mounted connector is usually the receptacle or female connector. The plug or male connector is usually the removable portion.

**pcb** Abbreviation: see printed circuit board.

**permeability (chemical)** The passage or diffusion (or rate of passage) of a gas, vapor, liquid or solid through a barrier without physically or chemically affecting it.

**permeability (magnetic)** The measure of how much better a material is than air as a path for magnetic lines of force. Air is assumed to have a permeability of 1.

**plug** In coaxial RF connectors the plug is usually the movable portion, and is usually attached to a cable or removable assembly. Plugs mate with receptacles, jacks, outlets, etc.

**printed circuit board** An insulating board serving as a base for a printed circuit. When the printing process is completed, the board may include printed components, as well as printed wiring.

**propagation delay** Time required for an electronic digital device, or transmission network to transfer information from its input to its output.

**propagation delay time** The time between the application of a digital input waveform and the corresponding change in input waveform. It is measured between reference points on the waveforms. The time is generally different for positive-going and negative-going waveforms.

**prototype** A model suitable for use in the complete evaluation of form, design and performance.

**pulse** A change in the level, over a relatively short period of time, of a signal whose value is normally constant.

**pulse width** The length of time that the pulse voltage is at the transient level. Electronic pulse widths are usually in the millisecond ( $10^{-3}$ ), microsecond ( $10^{-6}$ ) or nanosecond ( $10^{-9}$ ) range.

### R

**receptacle** In coaxial RF connectors, the receptacle is usually the fixed or stationary portion that is mounted to the panel. In shell-type, multiple-contact connectors the receptacle usually contains the pin contacts and is mounted on the "cold" side of a circuit such as in a drawer or black box. Receptacles mate with plugs. See also: jack.

**residual impulse** defined as the voltage that will pass through the device prior to activation of the GDT.

**residual voltage** defined as the small amount of voltage left on the line after an impulse passes.

**resonance** A frequency at which capacitive reactance and inductive reactance are equal and therefore cancel one another's effects.

**RF** Abbreviation for radio frequency.

**RG/U** Symbol used to designate coaxial cables that are made to Government Specification (e.g., RG 58U; in this designation the "R" means radio frequency, the "G" means Government, the "58" is the number assigned to the government approval, and the "U" means it is a universal specification).

**rise time** The time required for a component or logic circuit to change from the quiescent to the transient state when an input is applied. (i.e. elapsed time between application of input and attainment of full output level).

**rms** Abbreviation for root mean square.

**root mean square** The effective value of an alternating current, corresponding to the direct current value that will produce the same heating effect.

### S

**screw machine contact** A contact which is machined from solid bar stock.

**semi-rigid** A cable containing a flexible inner core and a relatively inflexible sheathing.

**sheath** The outer covering of a jacket over the insulated conductors to provide mechanical protection for the conductors. Also known as the external conduction surface of a shielded transmission line.

**shield/shielding (cable)** A conducting envelope, composed of metal strands, which enclose a wire, group of wires or cable so constructed that substantially every point on the surface of the underlying insulation is at ground potential or at some predetermined potential with respect to ground.

**shield/shielding (circuit)** The metal sleeving surrounding one or more of the conductors in a wire circuit to prevent interference, interaction or current leakage. Shielding protects a circuit against crosstalk.

**shock (mechanical)** (1) An abrupt impact applied to a stationary object. (2) An abrupt or nonperiodic change in position, characterized by suddenness, and by the development of substantial internal forces.

**SHV** Abbreviation for standard high voltage.

**sine wave** A wave which can be expressed as the sine of a linear function of time, space or both. A waveform, often viewed on an oscilloscope, of a pure alternating current or voltage.

**skin effect** The tendency of alternating currents to flow near the surface of the conductor, thus being restricted to a small part of the total cross-sectional area. This effect increases the resistance and becomes more marked as the frequency rises.

**sleeve** The insulated or metallic covering over the barrel of a terminal.

**solder contact** A contact or terminal having a cup, hollow cylinder, eyelet or hook to accept a wire for a conventional soldered termination.

**standard high voltage (SHV)** A quick connect/disconnect connector series employing a bayonet lock coupling and designated to operate safely up to 5000 volts AC. It is the industry standard connector specified by the National Bureau of Standards (NBS) for high voltage use by the Atomic Energy Commission (AEC).

**standing-wave** Distribution of current and voltage on a transmission line, resulting from two sets of waves traveling in opposite directions.

**standing wave ratio** The ratio between maximum and minimum current or voltage along a line. It is a measure of the mismatch between the load and the line. It is equal to 1 when the line impedance is perfectly matched to the load. (In which case the maximum and minimum are the same, as current and voltage do not vary along the line). The perfect match would be a 1 to 1 ratio.

**super high frequency (shf)** The Federal Communications Commission designation for the band from 3,000 to 30,000 MHz in the radio spectrum.

### T

**tensile** The amount of axial load (longitudinal stress) required to break or pull the wire from the crimped barrel of the terminal, splice or contact.

## Appendix G - Glossary of Terms (Continued)

**tensile strength** The greatest longitudinal stress that a substance or union can bear without tearing or pulling apart. In crimped terminations, it is the greatest longitudinal stress that a terminal can bear without the wire separating from the terminal.

**thermal shock** The effect of heat or cold applied at such a rate that nonuniform thermal expansion or contraction occurs within a given material or combination materials. The effect can cause inserts and other insulation materials to pull away from metal parts.

**time-delay** A circuit that delays the transmission of an impulse for a definite and desired period of time.

**TNC Connector** A radio frequency connector covered by Military Specification. It has an impedance of 50 ohms and is designed to operate in a 0 to 11 GHz frequency range. Reliability is assured by a threaded coupling that can be safely wired to prevent accidental disconnect.

### U

**UG** Symbol used to describe coaxial connectors that were made to a Government specification. This specification is now obsolete.

**ultra-high frequency (uhf)** A Federal Communications Commission designation for the band from 300 to 3000 MHz on the radio spectrum. In television - channels 14 to 83 or 470 to 890 MHz.

### V

**very high frequency (vhf)** A Federal Communications Commission designation for the band from 30 to 300 MHz on the radio spectrum.

**voice-frequency (vf)** Any frequency within that part of the radio frequency range essential to speech transmission of a commercial quality (i.e., 300 to 3400 Hz). Also referred to as telephone frequency.

**volt (V)** The unit of measurement for electromotive force (emf). It is equivalent to the force required to produce 1 ampere through a resistance of 1 ohm.

**voltage (E)** The term most often used to designate electrical pressure that exists between two points and is capable of producing a flow of current when a closed circuit is connected between the two points. Voltage is measured in volts, millivolts, microvolts and kilovolts. The terms electromotive force (emf), potential, potential difference and voltage drop are often referred to as voltage.

**voltage drop** The voltage developed across a component or conductor by the flow of current through the resistance or impedance of that component or conductor.

**voltage hold over** refers to the maximum line voltage at which recovery of the GDT to its inactive state will take place within a specified period of time (normally 150ms) after an induced lightning pulse (normally 10/1000ms) has been applied.

**VSWR** Abbreviation for voltage standing wave ratio. Also see: standing wave ratio.

### W

**wavelength** The distance between two points which are in phase on adjacent waves. It is the distance traveled by the wave in the same span of one cycle. Electromagnetic waves (both light and radio) have a speed in space of about 300,000,000 meters (186,000 miles) per second. Thus wavelength in meters is equal to 300,000,000 divided by frequency.

### Z

**Z** Letter symbol used to represent impedance in ohms.

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**RF Coaxial Solutions for Communications Equipment**

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**Wireless  
Base Station**

**Carrier Rack  
Equipment**

**Chassis**

**Set Top Box**

**NIC Card**

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**Wireless Base Station**

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Radio base station cabinets demand packaging that combines high power r.f. signals, high speed digital data, and analog signals. Cabinet input/output connections are provided by N Series and 7/16 connectors. Plug-in r.f. modules require Blindmate, DIN inserts, and

panel mount connectors. Transceiver modules utilize MCX, and SSMT board and cable connectors for board to board and panel to board applications. Finally, both semi-rigid and flexible RG cable assemblies route signals throughout the entire cabinet.

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## Carrier Rack Equipment

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For today's fast paced Carrier Equipment market, Tyco Electronics offers a broad line of RF interconnect products that meet demanding customer requirements for CATV, telecom and data transmission applications. Connectors, cable assemblies, and applicator tooling are available for applications ranging from central office to customer premise environ-

ments, 50 or 75 ohms, from rack based equipment to set top boxes. Styles range from standard miniature RF connectors such as F series, BNC and TNC to subminiature RF connectors such as SMA, SMB, SMC and Blindmate connectors, to Micro miniature MMCX, SSMT and SMT/QuickGrip products. SIEMAX connectors provide multi-positional surface mount technology

RF connection for pcb and panel applications, and offer superior packaging density. Between Series adapters are available, along with connectors meeting international DIN and IEC standard interfaces. High performance GHz range BNC connectors meet the needs for faster signaling.

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**BNC Connectors,  
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## Chassis, NIC Card and Set Top Box

Coaxial interconnects have evolved in the enterprise market place over the years. The BNC interfaces that once dominated the Ethernet premise installations to coax products that provide high speed access to the carrier infrastructure.

In today's environment, Network Interface Cards (NIC) still feature Capacitively Decoupled BNC connectors with built-in chip capacitors to reduce

noise and ground loop currents.

For the infrastructure, the standard coaxial interfaces to the infrastructure include both 50 and 75 ohm BNC connectors. The BNC family features numerous styles including cable plugs and jacks, adapters and printed circuit board connectors. To address manufacturability, we offer the board mount in SMT, wave solder, and press fit. More recently, the

SMB interface is the one of choice for improved density and is available in both commercial and MIL-type. Again, our portfolio has a wide variety of configurations to address your system requirements.

Lastly, as broadband CATV becomes more prevalent for internet access in cable modems, our family of F connectors offer a high performance solution.

### Chassis

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### Set Top Box

### NIC Card



## Non-RoHS to RoHS Compliant Part Number Cross Reference (Continued)

| Non-RoHS Part No. | RoHS Compliant Part No. | Non-RoHS Part No. | RoHS Compliant Part No. | Non-RoHS Part No. | RoHS Compliant Part No. | Non-RoHS Part No. | RoHS Compliant Part No. |
|-------------------|-------------------------|-------------------|-------------------------|-------------------|-------------------------|-------------------|-------------------------|
| 413194-2          | 5413194-2               | 413969-2          | 5413969-2               | 415189-1          | 5415189-1               | 1055441-1         | Exempt                  |
| 413311-1          | 5414311-1               | 413986-1          | 5413986-1               | 415205-1          | 5415205-1               | 1055442-1         | Exempt                  |
| 413364-2          | 5413364-2               | 414088-1          | 5414088-1               | 415214-1          | 5415214-1               | 1055443-1         | Exempt                  |
| 413366-2          | 5413366-2               | 414094-2          | 5414094-2               | 415216-1          | 5415216-1               | 1055444-1         | Exempt                  |
| 413476-2          | 5413476-2               | 414105-1          | 5414105-1               | 415218-5          | 5415218-5               | 1055445-1         | Exempt                  |
| 413506-1          | 5413506-1               | 414160-5          | 5414160-5               | 415226-1          | 5415226-1               | 1055446-1         | Exempt                  |
| 413515-2          | 5413515-2               | 414168-1          | 5414168-1               | 415232-4          | 5415232-4               | 1055447-1         | Exempt                  |
| 413515-3          | 5413515-3               | 414168-3          | 5414168-3               | 415232-7          | 5415232-7               | 1055448-1         | Exempt                  |
| 413515-7          | 5413515-7               | 414168-4          | 5414168-4               | 415242-2          | 5415242-2               | 1055449-1         | Exempt                  |
| 413515-8          | 5413515-8               | 414168-5          | 5414168-5               | 415242-6          | 5415242-6               | 1055450-1         | Exempt                  |
| 413515-9          | 5413515-9               | 414168-6          | 5414168-6               | 415248-1          | 5415248-1               | 1055451-1         | Exempt                  |
| 413524-2          | 5413524-2               | 414170-1          | 5414170-1               | 415248-7          | 5415248-7               | 1055454-1         | Exempt                  |
| 413524-5          | 5413524-5               | 414170-2          | 5414170-2               | 415252-1          | 5415252-1               | 1055474-1         | Exempt                  |
| 413557-1          | 5413557-1               | 414171-3          | 5414171-3               | 415252-2          | 5415252-2               | 1055475-1         | Exempt                  |
| 413557-2          | 5413557-2               | 414173-3          | 5414173-3               | 415252-3          | 5415252-3               | 1055476-1         | Exempt                  |
| 413558-1          | 5413558-1               | 414194-1          | 5414194-1               | 415252-4          | 5415252-4               | 1055477-1         | Exempt                  |
| 413558-2          | 5413558-2               | 414215-1          | 5414215-1               | 415255-1          | 5415255-1               | 1055500-1         | Exempt                  |
| 413558-3          | 5413558-3               | 414217-1          | 5414217-1               | 415255-2          | 5415255-2               | 1055831-1         | Exempt                  |
| 413558-5          | 5413558-5               | 414265-3          | 5414265-3               | 415255-3          | 5415255-3               | 1055832-1         | Exempt                  |
| 413588-2          | 5413588-2               | 414284-2          | 5414284-2               | 415255-4          | 5415255-4               | 1055833-1         | Exempt                  |
| 413588-4          | 5413588-4               | 414305-1          | 5414305-1               | 415276-2          | 5415276-2               | 1055834-1         | Exempt                  |
| 413588-8          | 5413588-8               | 414337-1          | 5414337-1               | 415302-1          | 5415302-1               | 1055836-1         | Exempt                  |
| 413588-9          | 5413588-9               | 414338-1          | 5414338-1               | 415302-2          | 5415302-2               | 1055837-1         | Exempt                  |
| 1-413588-0        | 1-5413588-0             | 414352-1          | 5414352-1               | 415322-2          | 5415322-2               | 1055838-1         | Exempt                  |
| 413589-1          | 5413589-1               | 414363-3          | 5414363-3               | 415332-1          | 5415332-1               | 1055839-1         | Exempt                  |
| 413589-2          | 5413589-2               | 414363-4          | 5414363-4               | 415379-1          | 5415379-1               | 1055840-1         | Exempt                  |
| 413589-3          | 5413589-3               | 414363-5          | 5414363-5               | 415381-1          | 5415381-1               | 1055841-1         | Exempt                  |
| 413589-5          | 5413589-5               | 414363-8          | 5414363-8               | 415406-2          | 5415406-2               | 1055842-1         | Exempt                  |
| 413589-7          | 5413589-7               | 414367-2          | 5414367-2               | 415417-1          | 5415417-1               | 1055843-1         | Exempt                  |
| 413589-8          | 5413589-8               | 414373-1          | 5414373-1               | 415419-1          | 5415419-1               | 1057088-1         | 6057088-1               |
| 413589-9          | 5413589-9               | 414394-1          | 5414394-1               | 415485-1          | 5415485-1               | 1057094-1         | 6057094-1               |
| 1-413589-0        | 1-5413589-0             | 414409-1          | 5414409-1               | 415485-2          | 5415485-2               | 1057116-1         | 6057116-1               |
| 1-413589-1        | 1-5413589-1             | 414414-1          | 5414414-1               | 415485-3          | 5415485-3               | 1057159-1         | 6057159-1               |
| 1-413589-6        | 1-5413589-6             | 414459-1          | 5414459-1               | 415487-1          | 5415487-1               | 1057165-1         | 6057165-1               |
| 413590-3          | 5413590-3               | 414460-1          | 5414460-1               | 415487-2          | 5415487-2               | 1057176-1         | 6057176-1               |
| 413590-4          | 5413590-4               | 414493-4          | 5414493-4               | 415487-3          | 5415487-3               | 1059632-1         | 6059632-1               |
| 413590-8          | 5413590-8               | 414553-1          | 5414553-1               | 415520-1          | 5415520-1               | 1059665-1         | 6059665-1               |
| 413591-1          | 5413591-1               | 414651-3          | 5414651-3               | 415569-2          | 5415569-2               | 1061002-1         | 6061002-1               |
| 413592-2          | 5413592-2               | 414666-1          | 5414666-1               | 415632-1          | 5415632-1               | 1061035-1         | 6061035-1               |
| 413592-6          | 5413592-6               | 414758-1          | 5414758-1               | 415632-2          | 5415632-2               | 1061092-1         | 6061092-1               |
| 413592-9          | 5413592-9               | 414758-2          | 5414758-2               | 415633-1          | 5415633-1               | 1061094-1         | 6061094-1               |
| 1-413592-1        | 1-5413592-1             | 414758-3          | 5414758-3               | 415634-1          | 5415634-1               | 1213890-1         | Exempt                  |
| 413631-1          | 5413631-1               | 414907-1          | 5414907-1               | 415634-2          | 5415634-2               | 1274020-1         | 6274020-1               |
| 413631-2          | 5413631-2               | 414946-2          | 5414946-2               | 415683-1          | 5415683-1               | 1274032-1         | 6274032-1               |
| 413631-3          | 5413631-3               | 414946-3          | 5414946-3               | 415712-1          | 5415712-1               | 1274045-1         | 6274045-1               |
| 413760-1          | 5413760-1               | 414946-5          | 5414946-5               | 415779-1          | 5415779-1               | 1274072-1         | 6274072-1               |
| 413760-3          | 5413760-3               | 414946-6          | 5414946-6               | 415832-1          | 5415832-1               | 1274084-1         | 6274084-1               |
| 413760-8          | 5413760-8               | 415006-1          | 5415006-1               | 447648-3          | 5447648-3               | 1274086-1         | 6274086-1               |
| 413760-9          | 5413760-9               | 415006-2          | 5415006-2               | 448103-2          | 5448103-2               | 1274096-1         | 6274096-1               |
| 413771-1          | 5413771-1               | 415020-1          | 5415020-1               | 603995-1          | Exempt                  | 1274124-2         | 6274124-2               |
| 413771-3          | 5413771-3               | 415024-1          | 5415024-1               | 603995-2          | Exempt                  | 1274127-1         | 6274127-1               |
| 413779-3          | 5413779-3               | 415024-3          | 5415024-3               | 603995-3          | Exempt                  | 1274220-1         | 6274220-1               |
| 2-413779-4        | 2-5413779-4             | 415025-1          | 5415025-1               | 603995-5          | Exempt                  | 1274291-1         | 6274291-1               |
| 413879-1          | 5413879-1               | 415025-2          | 5415025-2               | 603995-6          | Exempt                  | 1274291-2         | 6274291-2               |
| 413879-2          | 5413879-2               | 415046-1          | 5415046-1               | 856402-1          | Exempt                  | 1274314-1         | 6274314-1               |
| 413933-1          | 5413933-1               | 415085-1          | 5415085-1               | 887000-1          | 5887000-1               | 1274315-1         | 6274315-1               |
| 413959-1          | 5413959-1               | 415103-1          | 5415103-1               | 887046-1          | 5887046-1               | 1274359-1         | 6274359-1               |
| 413959-3          | 5413959-3               | 415103-2          | 5415103-2               | 887078-1          | 5887078-1               | 1274360-1         | 6274360-1               |
| 413959-4          | 5413959-4               | 415105-1          | 5415105-1               | 887089-1          | 5887089-1               | 1274425-2         | 6274425-2               |
| 413959-5          | 5413959-5               | 415105-2          | 5415105-2               | 1055439-1         | Exempt                  | 1274431-1         | 6274431-1               |
| 413959-6          | 5413959-6               | 415187-1          | 5415187-1               | 1055440-1         | Exempt                  | 1274532-1         | 6274532-1               |

## Non-RoHS to RoHS Compliant Part Number Cross Reference (Continued)

| Non-RoHS Part No. | RoHS Compliant Part No. | Non-RoHS Part No. | RoHS Compliant Part No. | Non-RoHS Part No. | RoHS Compliant Part No. | Non-RoHS Part No. | RoHS Compliant Part No. |
|-------------------|-------------------------|-------------------|-------------------------|-------------------|-------------------------|-------------------|-------------------------|
| 1311164-1         | Exempt                  | 1361137-1         | 6361137-1               | 1-1393524-1       | Exempt                  | 1393696-2         | 6-1393696-2             |
| 1312079-1         | 6312079-1               | 1361138-1         | 1361138-1               | 2-1393524-4       | Exempt                  | 1393696-7         | 6-1393696-7             |
| 1312113-1         | 6312113-1               | 1361139-1         | 6361139-1               | 2-1393524-6       | Exempt                  | 1402314-1         | 1402314-1               |
| 1312121-1         | 6312121-1               | 1362765-1         | 6362765-1               | 2-1393524-7       | Exempt                  | 1408026-1         | 6408026-1               |
| 1312123-1         | 6312123-1               | 1363524-1         | 6363524-1               | 1393665-1         | 6-1393665-1             | 1408027-1         | 6408027-1               |
| 1312124-1         | 6312124-1               | 1363525-1         | 6363525-1               | 1-1393665-4       | —                       | 1408028-1         | 6408028-1               |
| 1312137-1         | 1312137-1               | 1363526-1         | 6363526-1               | 1-1393665-5       | —                       | 1408030-1         | 6408030-1               |
| 1312138-1         | 6312138-1               | 1363527-1         | 6363527-1               | 1-1393665-6       | —                       | 1408032-1         | 6408032-1               |
| 1312139-1         | 6312139-1               | 1393488-3         | Exempt                  | 1-1393665-7       | —                       | 1408033-1         | 6408033-1               |
| 1328873-1         | 6328873-1               | 1393488-4         | Exempt                  | 2-1393670-1       | —                       | 1408036-1         | 6408036-1               |
| 1329818-1         | 6329818-1               | 1393524-1         | Exempt                  | 2-1393670-2       | —                       | 1408037-1         | 6408037-1               |
| 1329819-1         | 1329819-1               | 1393524-4         | Exempt                  | 2-1393670-3       | —                       | 1408038-1         | 6408038-1               |
| 1331959-1         | 6331959-1               | 1393524-5         | Exempt                  | 2-1393670-4       | —                       | 1725637-1         | Exempt                  |



## M/A-COM to Tyco Electronics Part Number Cross Reference (Continued)

| M/A-COM Part No. | Tyco Electronics Part No. | M/A-COM Part No. | Tyco Electronics Part No. | M/A-COM Part No. | Tyco Electronics Part No. | M/A-COM Part No. | Tyco Electronics Part No. |
|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| 4581 2241 02     | 1059711-1                 | 5837 5025 10     | 1330723-1                 | 9960 3100 24     | 1082845-1                 | B67B44TA25X      | 1313508-1                 |
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