

Data Sheet

Customer:

Product: Metal Film Leaded Precision Resistor—MFR Series

Sizes.: 0318/0623/0932/1145/1550

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VIKING TECH CORPORATION
光韻科技股份有限公司
No.70, Guangfu N. Rd.,
Hukou Township, Hsinchu County
303, Taiwan (R.O.C)

TEL:886-3-5972931
FAX:886-3-5972935•886-3-5973494
E-mail:sales@viking.com.tw

VIKING TECH CORPORATION KAOHSIUNG BRANCH
光韻科技股份有限公司高雄分公司
No.248-3, Sin-Sheng Rd., Cian-Jhen Dist., Kaohsiung,
806, Taiwan

TEL:886-7-8217999
FAX:886-7-8228229
E-mail:sales@viking.com.tw

WUXI TMTEC CO., LTD.
無錫泰銘電子有限公司
No.22 Xixia Road, Machinery & Industry Park,
National Hi-Tech Industrial Development Zone
of Wuxi, Wuxi, Jiangsu Province, China
Zip Code:214028
TEL:86-510-85203339
FAX:86-510-85203667•86-510-85203977
E-mail:china@viking.com.tw

| Produced by (QC) | Checked (QC) | Approved by (QC) | Prepared by (Sales) | Accepted by (Customer) |
|---------------------|------------------|---------------------|------------------------|---------------------------|
| 30-Jul-16 | 30-Jul-16 | 30-Jul-16 | 30-Jul-16 | |
| <i>Kris Chen</i> | <i>Ben Chang</i> | <i>Ben Chang</i> | | |

Metal Film Leaded Precision Resistor

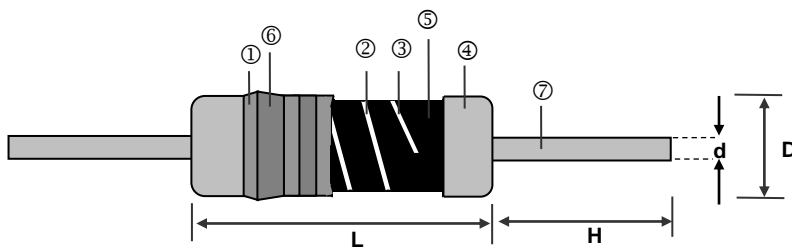
■ Features

- Excellent overall stability
- Very tight tolerance down to $\pm 0.05\%$
- Extremely low TCR down to ± 5 PPM/ $^{\circ}\text{C}$
- High power rating up to 3 Watts
- Excellent ohmic contact

■ Applications

- Telecommunication
- Medical Equipment

■ Construction



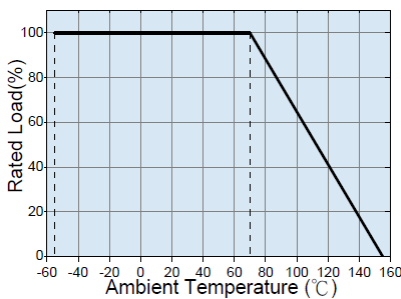
| | |
|----------------------|------------------|
| ① Insulation Coating | ⑤ Resistor Layer |
| ② Trimming Line | ⑥ Marking |
| ③ Ceramic Core | ⑦ Lead Wire |
| ④ Electrode Cap | |

■ Dimensions

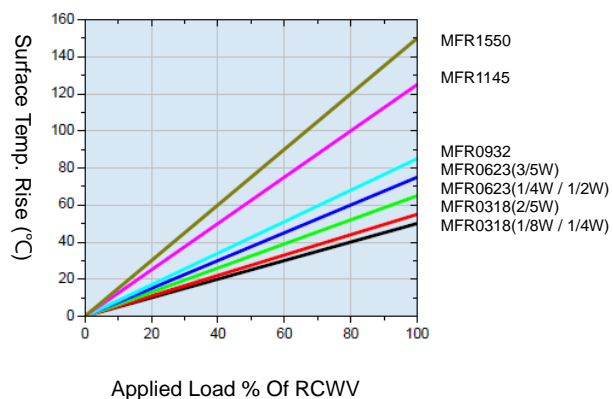
Unit: mm

| Type | L | D | H | d | Weight (g) (1000pcs) |
|---------|--------------|---------|--------|-----------|----------------------|
| MFR0318 | 3.3+0.7/-0.2 | 1.8±0.3 | 29±2.0 | 0.45±0.03 | 90 |
| MFR0623 | 6.3±0.5 | 2.3±0.3 | 28±2.0 | 0.55±0.03 | 150 |
| MFR0932 | 9.0±0.5 | 3.2±0.5 | 26±2.0 | 0.65±0.03 | 350 |
| MFR1145 | 11.5±1.0 | 4.5±0.5 | 35±2.0 | 0.78±0.03 | 770 |
| MFR1550 | 15.5±1.0 | 5.0±0.5 | 32±2.0 | 0.78±0.03 | 1040 |

■ Derating Curve



■ Hot-Spot Temperature



Part Numbering

| | | | | | | | |
|--------------|---|--|--------------------------------------|--|--|---|---|
| MFR | 0318 | B | T | N | W | 1001 | |
| Product Type | Dimensions (LxD) | Resistance Tolerance | Packaging Code | TCR (PPM/°C) | Power Rating | Resistance | Special |
| | 0318: 3.3x1.8 0623: 6.3x2.3 0932: 9.0x3.2 1145: 11.5x4.5 1550: 15.5x5.0 | A: ±0.05% B: ±0.1% C: ±0.25% D: ±0.5% F: ±1% | A: Ammo B: Bulk T: Taping Reel | S: ±5 B: ±10 N: ±15 C: ±25 D: ±50 E: ±100 | R: 3W S: 2W T: 1W F: 3/5W U: 1/2W G: 2/5W V: 1/4W W: 1/8W | R100: 0.1Ω 0010: 1Ω 1000: 100Ω 2201: 2200Ω 1001: 1KΩ 1004: 1MΩ | : Standard MA: MA-type MB: MB-type MC: MC-type FA: FA-type FB: FB-type FC: FC-type FD: FD-type |

Standard Electrical Specifications

| Item Type | Power Rating at 70°C | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Dielectric Withstanding Voltage | Resistance Range | | | | TCR (PPM/°C) |
|-----------|----------------------|-----------------------|------------------------|-----------------------|---------------------------------|------------------|---------|------------|-----------|--------------|
| | | | | | | ±0.05% | ±0.1% | ±0.25% | ±0.5% | |
| 0318 | 1/8W | -55 ~ +155°C | 150V | 300V | 300V | - | 10Ω-1MΩ | 10Ω-4.99MΩ | | ±15 |
| | | | | | | - | 10Ω-1MΩ | 10Ω-10MΩ | | ±25 ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 |
| 0623 | 1/4W | -55 ~ +155°C | 250V | 500V | 500V | 10Ω-1MΩ | | - | | ±5 |
| | | | | | | 10Ω-1MΩ | | | | ±10 |
| | | | | | | 10Ω-1MΩ | | 10Ω-10MΩ | | ±15 ±25 |
| | | | | | | - | 10Ω-1MΩ | 10Ω-10MΩ | | ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 |
| 0932 | 1/2W | -55 ~ +155°C | 350V | 500V | 500V | 10Ω-1MΩ | | - | | ±5 |
| | | | | | | 10Ω-1MΩ | | | | ±10 |
| | | | | | | 10Ω-1MΩ | | 10Ω-10MΩ | | ±15 ±25 |
| | | | | | | - | 10Ω-1MΩ | 10Ω-10MΩ | | ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 |
| 1145 | 1W | -55 ~ +155°C | 500V | 700V | 700V | - | 10Ω-1MΩ | 10Ω-4.99MΩ | | ±15 |
| | | | | | | - | 10Ω-1MΩ | 10Ω-10MΩ | | ±25 ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 |
| 1550 | 2W | -55 ~ +155°C | 500V | 1000V | 1000V | - | 10Ω-1MΩ | 10Ω-4.99MΩ | | ±15 |
| | | | | | | - | 10Ω-1MΩ | 10Ω-10MΩ | | ±25 ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 |

High Power & Ultra High Power Rating Electrical Specifications

| Item Type | Power Rating at 70°C | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Dielectric Withstanding Voltage | Resistance Range | | | | TCR (PPM/°C) | |
|--------------|----------------------------|--------------------------|------------------------------|-----------------------------|---------------------------------------|------------------|---------|------------|------------|-----------------|------------|
| | | | | | | ±0.05% | ±0.1% | ±0.25% | ±0.5% | | ±1% |
| 0318 | 1/4W | -55 ~ +155°C | 200V | 400V | 300V | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | |
| | 2/5W | | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 | | | |
| | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 ±50 | | | |
| | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | | | | |
| 0623 | 1/2W | -55 ~ +155°C | 300V | 500V | 500V | 10Ω-1MΩ | | | | ±5 | |
| | | | | | | 10Ω-1MΩ | | | | ±10 | |
| | | | | | | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 | |
| | | | | | | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 | |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±50 |
| | 3/5W | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | | | | |
| | | | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 | | | |
| | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 | | | |
| | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | 1Ω-10MΩ | ±50 | | | |
| | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | | | | |
| 0932 | 1W | -55 ~ +155°C | 400V | 600V | 500V | 10Ω-1MΩ | | | | ±5 | |
| | | | | | | 10Ω-1MΩ | | | | ±10 | |
| | | | | | | 10Ω-1MΩ | | 10Ω-10MΩ | | ±15 ±25 | |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 |
| 1145 | 2W | -55 ~ +155°C | 500V | 700V | 700V | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 ±50 |
| 1550 | 3W | -55 ~ +155°C | 500V | 1000V | 1000V | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-10MΩ | | ±25 ±50 |
| | | | | | | - | 1Ω-1MΩ | 1Ω-10MΩ | 0.1Ω-10MΩ | ±100 | |
| | | | | | | - | 10Ω-1MΩ | | 10Ω-4.99MΩ | | ±15 |

Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.
 Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

Environmental Characteristics

| Item | Requirement | Test Method |
|---------------------------------|---|---|
| Short Time Overload | ±(0.25%+0.05Ω) | JIS-C-5201-1 5.5 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds |
| Insulation Resistance | > 10000MΩ | MIL-STD-202F Method 302 Apply 100V _{DC} for 1 minute |
| Endurance | ±(1.5%+0.05Ω) | MIL-STD-202F Method 108A 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Damp Heat with Load | ±(1.5%+0.05Ω) | MIL-STD-202F Method 103B 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Solderability | 95% min. Coverage | MIL-STD-202F Method 208H 260±5°C for 2±0.5 seconds |
| Dielectric Withstanding Voltage | By Type | MIL-STD-202F Method 301 Apply Max. Overload Voltage for 1 minute |
| Temperature Coefficient | By Type | Resistance value at room temperature and room Temperature+100°C |
| Pulse Overload | ±(0.75%+0.05Ω) | JIS-C-5201-1 5.8 4 times RCWV for 10000 cycles with 1sec "ON" and 25 sec "OFF" |
| Resistance To Solvent | No deterioration of coatings and markings | JIS-C-5201-1 6.9 Trichroethane for 1 min. with ultrasonic |
| Terminal Strength | Tensile: ≥ 2.5kg | Direct Load for 10 sec. In the direction off the terminal leads |
| Resistance to Soldering Heat | 0318: ±(0.75%+0.05Ω) 0623&0932: ±(0.5%+0.05Ω) 1145&1550: ±(0.25%+0.05Ω) | The solder iron heated to 260°C±5°C and applied to the termination for a duration of 10±1 seconds |
| Temperature Cycling | ±(0.75%+0.05Ω) | -40°C/85°C with 1000 cycles. (20min for both low and high temperature, transfer time less 30s) |

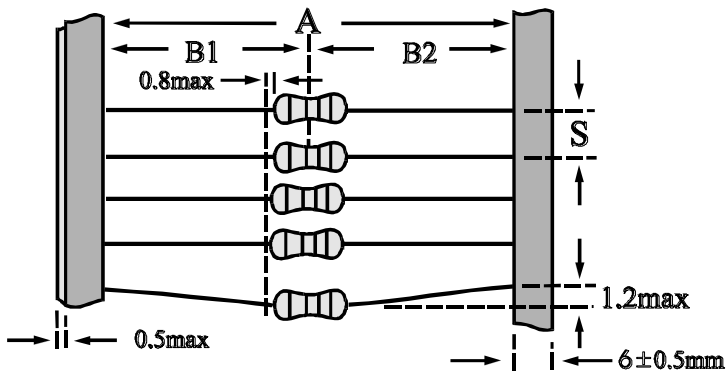
RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating voltage whichever is lower

Storage Temperature: 15~28°C; Humidity < 80%RH

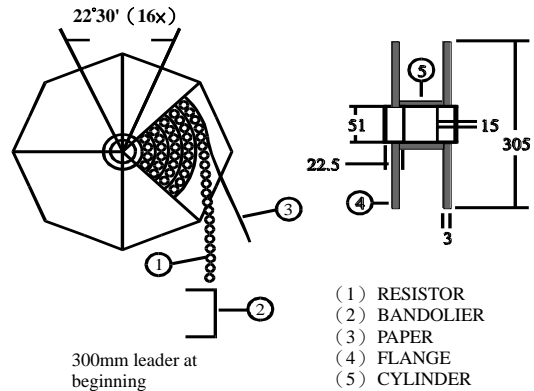
Taping/Packing Specifications

1. Standard Type (Reel & Ammo)

Packing Methods



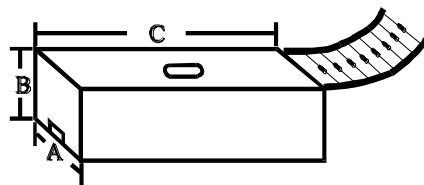
Reel Packing



Unit: mm

| Packaging Type | Packing Methods | | | Reel Packing | |
|----------------|-----------------|-----------|----|-------------------|-------|
| | A | B1-B2 Max | S | Across Flange (A) | Qty |
| 0318 | 52+1/-0 | 1.2 | 5 | 72 | 5,000 |
| | 26+1/-0 | 1.0 | | | |
| 0623 | 52+1/-0 | 1.2 | 5 | 72 | 5,000 |
| | 26+1/-0 | 1.0 | | | |
| 0932 | 52+1/-0 | 1.2 | 5 | 72 | 2,500 |
| 1145 | 52+1/-0 | 1.5 | 5 | 95 | 2,000 |
| | 73+1/-0 | | | | |
| 1550 | 52+1/-0 | 1.5 | 10 | 95 | 1,000 |
| | 73+1/-0 | | | | |

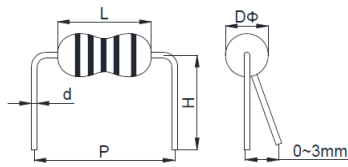
Ammo Packing



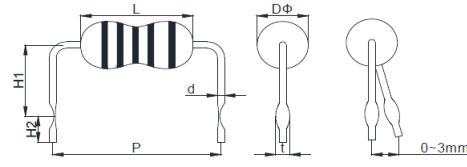
Unit: mm

| Packaging Type | Packing Methods | | | Ammo Packing | | | |
|----------------|-----------------|-----------|----|--------------|-----|-----|-------|
| | A | B1-B2 Max | S | A | B | C | Qty |
| 0318 | 52+1/-0 | 1.2 | 5 | 80 | 75 | 264 | 5,000 |
| | 26+1/-0 | 1.0 | | | | | |
| 0623 | 52+1/-0 | 1.2 | 5 | 80 | 105 | 264 | 5,000 |
| | 26+1/-0 | 1.0 | | | | | |
| 0932 | 52+1/-0 | 1.2 | 5 | 80 | 46 | 264 | 1,000 |
| 1145 | 52+1/-0 | 1.5 | 5 | 103 | 82 | 265 | 1,000 |
| | 73+1/-0 | | | | | | |
| 1550 | 52+1/-0 | 1.5 | 10 | 103 | 96 | 265 | 1,000 |
| | 73+1/-0 | | | | | | |

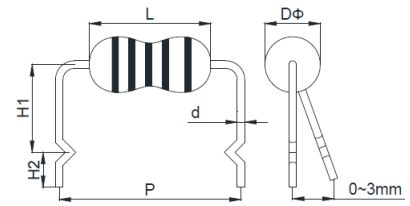
2. Special Type (Bulk)



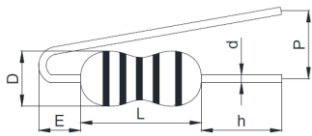
MA Type



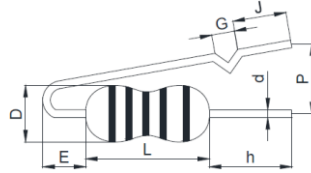
MB Type



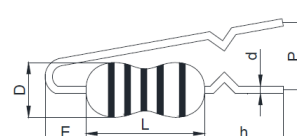
MC Type



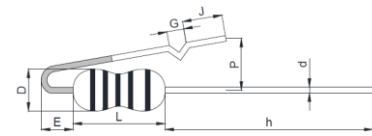
FA Type



FB Type



FC Type



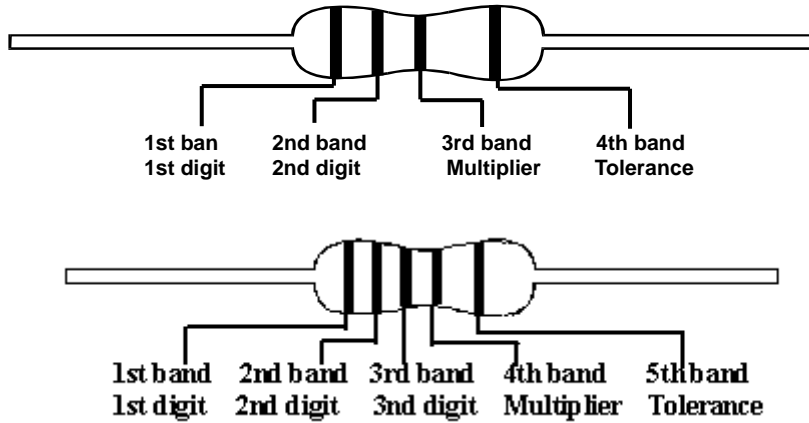
FD Type

Unit: mm

| Codes | Type | P | H /H1/h | H2/G | J | t | D | L | d | E |
|-------|------|--------|---------|---------|-----|---|---------|----------|-----------|-----|
| 0623 | MA | 10±1 | 10.0±1 | - | - | - | 2.3±0.3 | 6.3±0.5 | 0.55±0.03 | - |
| | MC | 10±1 | 5.0±1 | 6.0±2 | - | - | 2.3±0.3 | 6.3±0.5 | 0.55±0.03 | - |
| | FA | 5~15 | 5.0±2 | - | - | - | 2.3±0.3 | 6.3±0.5 | 0.55±0.03 | 3±1 |
| | FB | 5~15 | 4.0±2 | 3.0±0.5 | 3±1 | - | 2.3±0.3 | 6.3±0.5 | 0.55±0.03 | 3±1 |
| | FD | 5~15 | 27.0±2 | 3.0±0.5 | 3±1 | - | 2.3±0.3 | 6.3±0.5 | 0.55±0.03 | 3±1 |
| 0932 | MA | 12.5±1 | 10.0±1 | - | - | - | 3.2±0.5 | 9.0±0.5 | 0.65±0.03 | - |
| | MC | 12.5±1 | 5.0±1 | 4.0±2 | - | - | 3.2±0.5 | 9.0±0.5 | 0.65±0.03 | - |
| | FA | 5~15 | 5.0±2 | - | - | - | 3.2±0.5 | 9.0±0.5 | 0.65±0.03 | 3±1 |
| | FB | 5~15 | 4.0±2 | 3.0±0.5 | 3±1 | - | 3.2±0.5 | 9.0±0.5 | 0.65±0.03 | 3±1 |
| | FC | 5~15 | 10.0±3 | - | - | - | 3.2±0.5 | 9.0±0.5 | 0.65±0.03 | - |
| 1145 | MA | 15±1 | 12.5±1 | - | - | - | 4.5±0.5 | 11.5±1.0 | 0.78±0.03 | - |
| | MC | 15±1 | 8.0±1 | 6.0±1.0 | - | - | 4.5±0.5 | 11.5±1.0 | 0.78±0.03 | - |
| | FA | 5~15 | 5.0±2 | - | - | - | 4.5±0.5 | 11.5±1.0 | 0.78±0.03 | 3±1 |
| | FB | 5~15 | 4.0±2 | 3.0±0.5 | 3±1 | - | 4.5±0.5 | 11.5±1.0 | 0.78±0.03 | 3±1 |
| | FC | 5~15 | 10.0±3 | - | - | - | 4.5±0.5 | 11.5±1.0 | 0.78±0.03 | - |
| 1550 | MA | 20±1 | 15.0±1 | - | - | - | 5.0±0.5 | 15.5±1.0 | 0.78±0.03 | - |
| | MC | 20±1 | 12.0±1 | 5.0±1.0 | - | - | 5.0±0.5 | 15.5±1.0 | 0.78±0.03 | - |
| | FA | 5~15 | 5.0±2 | - | - | - | 5.0±0.5 | 15.5±1.0 | 0.78±0.03 | 3±1 |
| | FB | 5~15 | 4.0±2 | 3.0±0.5 | 3±1 | - | 5.0±0.5 | 15.5±1.0 | 0.78±0.03 | 3±1 |
| | FC | 5~15 | 10.0±3 | - | - | - | 5.0±0.5 | 15.5±1.0 | 0.78±0.03 | - |

Metal Film Leaded Precision Resistor

■ Marking & Resistance Tolerance



| Cold | Digit | Multiplier | Tolerance | |
|---------|-------|------------------|-----------|---|
| Without | - | - | ±20% | M |
| Silver | - | 10 ⁻² | ±10% | K |
| Gold | - | 10 ⁻¹ | ±5.0% | J |
| Black | 0 | 10 ⁰ | - | - |
| Brown | 1 | 10 ¹ | ±1.0% | F |
| Red | 2 | 10 ² | ±2.0% | G |
| Orange | 3 | 10 ³ | - | - |
| Yellow | 4 | 10 ⁴ | - | - |
| Green | 5 | 10 ⁵ | ±0.50% | D |
| Blue | 6 | 10 ⁶ | ±0.25% | C |
| Violet | 7 | 10 ⁷ | ±0.10% | B |
| Grey | 8 | 10 ⁸ | ±0.05% | A |
| White | 9 | 10 ⁹ | - | - |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ±10% | E-6 | 1.0 | - | - | - | 1.5 | - | - | - | 2.2 | - | - | - | 3.3 | - | - | - | 4.7 | - | - | - | 6.8 | - | - | - |
| ±5.0% | E-12 | 1.0 | - | 1.2 | - | 1.5 | - | 1.8 | - | 2.2 | - | 2.7 | - | 3.3 | - | 3.9 | - | 4.7 | - | 5.6 | - | 6.8 | - | 8.2 | - |
| ±2.0% | E-24 | 1.0 | 1.1 | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.7 | 3.0 | 3.3 | 3.6 | 3.9 | 4.3 | 4.7 | 5.1 | 5.6 | 6.2 | 6.8 | 7.5 | 8.2 | 9.1 |
| ±2.0% | E-48 | 1.00 | 1.05 | 1.10 | 1.15 | 1.21 | 1.27 | 1.33 | 1.40 | 1.47 | 1.54 | 1.62 | 1.69 | 1.78 | 1.87 | 1.96 | 2.05 | 2.15 | 2.26 | 2.37 | 2.37 | 2.61 | 2.74 | 2.87 | 3.01 |
| | | 3.16 | 3.32 | 3.48 | 3.65 | 3.83 | 4.02 | 4.22 | 4.22 | 4.64 | 4.87 | 5.11 | 5.36 | 5.62 | 5.90 | 6.19 | 6.49 | 6.81 | 7.15 | 7.50 | 7.87 | 8.25 | 8.66 | 9.09 | 9.53 |
| | E-96 | 1.00 | 1.02 | 1.05 | 1.07 | 1.10 | 1.13 | 1.15 | 1.18 | 1.21 | 1.24 | 1.27 | 1.30 | 1.33 | 1.37 | 1.40 | 1.43 | 1.47 | 1.50 | 1.54 | 1.58 | 1.62 | 1.65 | 1.69 | 1.74 |
| | | 1.78 | 1.82 | 1.87 | 1.91 | 1.96 | 2.00 | 2.05 | 2.10 | 2.15 | 2.21 | 2.26 | 2.32 | 2.37 | 2.43 | 2.49 | 2.55 | 2.61 | 2.67 | 2.74 | 2.80 | 2.87 | 2.94 | 3.01 | 3.09 |
| ±1.0% | E-96 | 3.16 | 3.24 | 3.32 | 3.40 | 3.48 | 3.57 | 3.65 | 3.74 | 3.83 | 3.92 | 4.02 | 4.12 | 4.22 | 4.32 | 4.42 | 4.53 | 4.64 | 4.75 | 4.87 | 4.99 | 5.11 | 5.23 | 5.36 | 5.49 |
| 5.62 | | 5.76 | 5.90 | 6.04 | 6.19 | 6.34 | 6.49 | 6.65 | 6.81 | 6.98 | 7.15 | 7.32 | 7.50 | 7.68 | 7.87 | 8.06 | 8.25 | 8.45 | 8.66 | 8.87 | 9.09 | 9.31 | 9.53 | 9.76 | |
| ±1.00% | E-192 | 10.0 | 10.1 | 10.2 | 10.4 | 10.5 | 10.6 | 10.7 | 10.9 | 11.0 | 11.1 | 11.3 | 11.4 | 11.5 | 11.7 | 11.8 | 12.0 | 12.1 | 12.3 | 12.4 | 12.6 | 12.7 | 12.9 | 13.0 | 13.2 |
| | | 13.3 | 13.5 | 13.7 | 13.8 | 14.0 | 14.2 | 14.3 | 14.5 | 14.7 | 14.9 | 15.0 | 15.2 | 15.4 | 15.6 | 15.8 | 16.0 | 16.2 | 16.4 | 16.5 | 16.7 | 16.9 | 17.2 | 17.4 | 17.6 |
| | | 17.8 | 18.0 | 18.2 | 18.4 | 18.7 | 18.9 | 19.1 | 19.3 | 19.6 | 19.8 | 20.0 | 20.3 | 20.5 | 20.8 | 21.0 | 21.3 | 21.5 | 21.8 | 22.1 | 22.3 | 22.6 | 22.9 | 23.2 | 23.4 |
| | | 23.7 | 24.0 | 24.3 | 24.6 | 24.9 | 25.2 | 25.5 | 25.8 | 26.1 | 26.4 | 26.7 | 27.1 | 27.4 | 27.7 | 28.0 | 28.4 | 28.7 | 29.1 | 29.4 | 29.8 | 30.1 | 30.5 | 30.9 | 31.2 |
| | | 31.6 | 32.0 | 32.4 | 32.8 | 33.2 | 33.6 | 34.0 | 34.4 | 34.8 | 35.2 | 35.7 | 36.1 | 36.5 | 37.0 | 37.4 | 37.9 | 38.3 | 38.8 | 39.2 | 39.7 | 40.2 | 40.7 | 41.2 | 41.7 |
| | | 42.2 | 42.7 | 43.2 | 43.7 | 44.2 | 44.8 | 45.3 | 45.9 | 46.4 | 47.0 | 47.5 | 48.1 | 48.7 | 49.3 | 49.9 | 50.5 | 51.1 | 51.7 | 52.3 | 53.0 | 53.6 | 54.2 | 54.9 | 55.6 |
| | | 56.2 | 56.9 | 57.6 | 58.3 | 59.0 | 59.7 | 60.4 | 61.2 | 61.9 | 62.6 | 63.4 | 64.2 | 64.9 | 65.7 | 66.5 | 67.3 | 68.1 | 69.0 | 69.8 | 70.6 | 71.5 | 72.3 | 73.2 | 74.1 |
| ±0.50% | E-192 | 75.0 | 75.9 | 76.8 | 77.7 | 78.7 | 79.6 | 80.6 | 81.6 | 82.5 | 83.5 | 84.5 | 85.6 | 86.6 | 87.6 | 88.7 | 89.8 | 90.9 | 92.0 | 93.1 | 94.2 | 95.3 | 96.5 | 97.6 | 98.8 |
| ±0.25% | | ±0.10% | | | | | | | | | | | | | | | | | | | | | | | |