

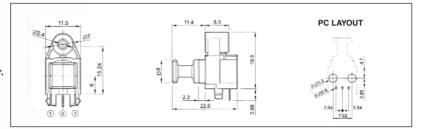
# **Optical Jacks**

The **CLIFF®** range of Optical Transmitter and Receiver jacks feature seven different models that conform to the EIAJ standard CP-1201 for Digital Audio Interfaces including Fibre-Optical interconnections. Optical Jacks are virtually unaffected by noise when transmitting and receiving signals between digital audio equipment, enabling high-quality audio recording and high speed signal receiving. It continues to be adopted as a virtual standard in portable audio equipment. Several models have a self-tapping hole for panel mounting and three models replace the plug-in cover with a convenient hinged shutter to protect against contamination.



OTJ-1/ORJ-1 Single Optical Transmitter and Receiver Jack. Right angle PCB mount with self tapping hole for panel mounting. Removable plug-in cover.

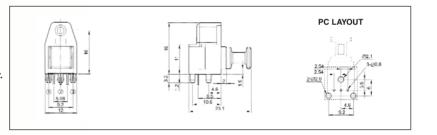
OTJ-1 (FC6842031T) ORJ-1 (FC6842031R)





OTJ-2/ORJ-2 Single Optical Transmitter and Receiver Jack. Right angle PCB mount with self tapping hole for panel mounting. Removable plug-in cover.

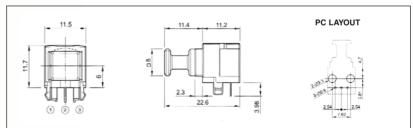
OTJ-2 (FC684202T) ORJ-2 (FC684202R)





OTJ-3/ORJ-3 Single Optical Transmitter and Receiver Jack. Right angle PCB mount. Removable plug-in cover.

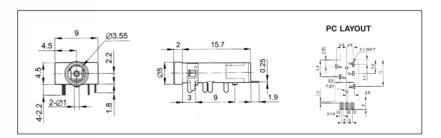
OTJ-3 (FC6842032T) ORJ-3 (FC6842032R)





OTJ-4/ORJ-4 Single Optical Transmitter and Receiver Jack. Low profile right angle PCB mount.

OTJ-4 (FC684204T) ORJ-4 (FC684204R)



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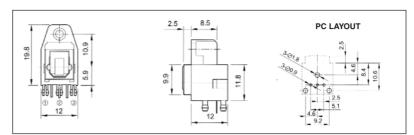


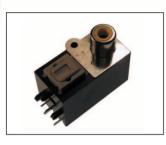
# **Optical Jacks**



OTJ-5/ORJ-5 Single Optical Transmitter and Receiver Jack, Right angle PCB mount with self tapping hole for panel mounting. Hinged shutter.

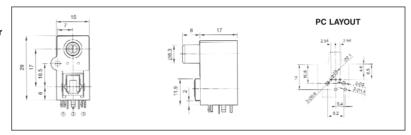
OTJ-5 (FC684205T) ORJ-5 (FC684205R)





OTJ-6/ORJ-6 Dual SPDIF **RCA** and Optical Transmitter and Receiver Jack, Right angle PCB mount with self tapping hole for panel mounting. Hinged shutter. Several different colored inserts available

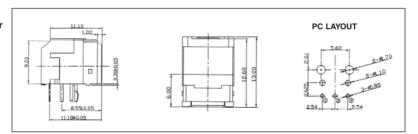
OTJ-6 (FC684206T) ORJ-6 (FC684206R)





OTJ-8/ORJ-8 Optical Transmitter and Receiver Jack. Right angle PCB mount. Hinged shutter.

OTJ-8 (FC684208T) ORJ-8 (FC684208R)



**Electrical Specifications:** 

Supply Voltage: -0.5 to 7.0V Maximum. Input Voltage: -0.5 to +0.5V Maximum.

Operating Temperature: -20 deg. C to +70 deg. C Maximum. Storage Temperature: -30 deg. C to +80 deg. C Maximum.

Soldering Temperature: 260 deg. C Maximum.

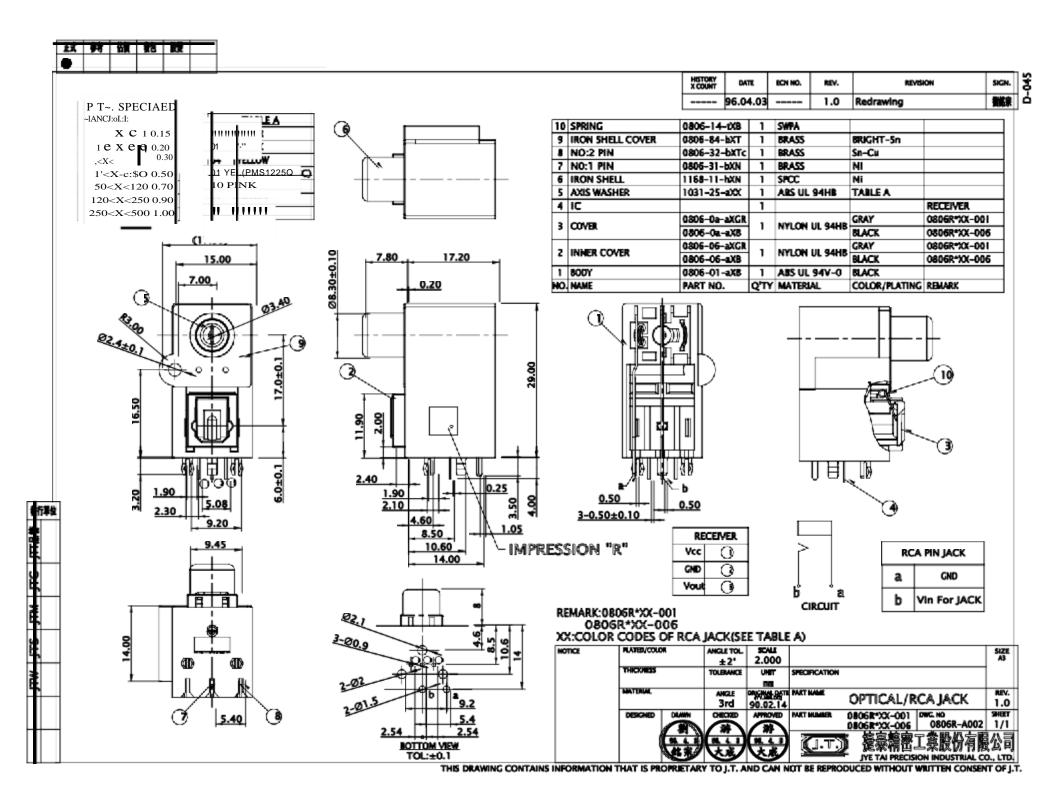
**Mechanical Specifications:** Insertion Force: 5.9N Minimum, 39.2N Maximum. Withdrawal Force: 5.9N Minimum, 39.2N Maximum.

**Materials:** 

Body: PBT +30G, ABS 94-V-0 (depends on model)

Shutter: Nylon PA66

Please refer to the individual technical data sheets available for each model for the recommended operating conditions, characteristics, PC layouts and technical information. We also manufacture molded optical lead assemblies for use with our optical jacks. Please contact our sales office for more details.



CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 1 OF 11 OPTICAL RECEIVING JACK OC08R-04-E FC684206R DATE: OCT.28.2003

Fiber optic receiving module for digital audio interface and navigation system.

### Features:

- (1) Conform to EIAJ standard CP-1201 (for Digital Audio interfaces Including Fiber Optical inter-connectors).
- (2) A self-tapping hole for easy attachment to Audio Equipments panels.
- (3) High speed signal receiving (12.5Mbps NRZ signal)

1.	Maximum Ratings	Symbol	Rating	(Ta <u></u> #25°C)
	Parameter	$T_{ m stg}$	-40 ~ 70 °C	
	Storage Temperature	$T_{ m opr}$	-20 ~ 70 °C	
,	Operating Temperature	Vcc	-0.5 ~ 6	V
	Supply Voltage	Іон	-1	mA
•	High Level Output Current	Iol	5	mA
	High Level Output Current	Tsol	260 (1) °C	

Soldering Temperature

Note (1): Soldering time  $\leq 10$  seconds (At a distance of 1mm from the package.)

2.	Recommended Operating Cond	Symbol	MIN.	TYP.	MAX.	Unit
	ParameterSupply Voltage	Vcc	4.75	5.0	5.25	V

	Α	С	С	W
	Р	Н	Н	R
	V	K	K	Т
REV. NAME DATE REMARK	D	D	D	N

CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 2 OF 11 OPTICAL RECEIVING JACK FC684206R DATE: OCT 28 2003

3. Optical-electro Characteristics (Ta = 25°C, Vcc = 5V)

Parameter	Symbol	Conditions	MIN.	TYP. 1	MAX.	Unit.
Data Rate		NRZ Code (2)	0.1	-	12.5	Mb/s
Transmission Distance		Using APF (3), Using OC-0806T	0.2	-	5 -	М
Pulse Width Distortion (4)	∆tw	Pulse Width = 147ns Pulse Cycle = 294ns C <sub>L</sub> = 10pF Using OC-0806T	-15		15	ns
Maximum Receivable Power	Рмах	12.5Mb/s,UsingAPF	-		-14.5	dBm
Minimum Receivable Power	Рмім	12.5Mb/s,UsingAPF	-24 -			dBm
Current Consumption	Icc		-	15	40	mA
High Level Output Voltage	Voh		2.4	4.8		
Low Level Output Voltage	$\mathbf{V}_{\mathrm{OL}}$		-	0.2	0.4	V
Rise time	<b>t</b> r	Refer to "Test Circuit"	-	10	20	ns
Fall time	<b>t</b> f	Refer to "Test Circuit"	-	10	20	ns
Low→High delay time	tpLH	Refer to "Test Circuit"	-	100	180	ns
High→Low delay time	tpHL	Refer to "Test Circuit"	-	100	180	ns

Note (1): When non-modulated signal (optical all high or all low level signal) is inputted, output signal is not stable.

When modulated optical high level signal is received, output signal is high.

When modulated optical low level signal is received, output signal is low.

The duty factor must be maintained between 25 to 75%.

Note (2): All Plastic Fiber (970 / 1000µm).

Note (3): Between input of transmitting module and output of OC-0806T.

4. Mechanical Characteristics (Ta= 25°C)

т,	icentaliteal Characteristics	(1a-25 G)				
	Parameter	Condition	MIN.	TYP	MAX	UNIT
	Insertion Force.	Using JYE TAI OC-0801P,	-	1		N
	Withdrawal Force.	Initial value	4	-		N
	Torque for Self-Tap	Using self-tapping Screw (TP3×8)	58.8	-	78.4	N. cm
		A C		С		W

P H H R V K K T REV. NAME DATE REMARK D D N

SPECIFICATION NO. PAGE: CUSTOMER MODEL NO. / TITLE 3 OF 11 DATE: OCT.28.2003 OPTICAL RECEIVING JACK FC684206R Test Circuit Fiber optic cable Standard transmitter Receiver GNOO 44⊢ D Oscilloscope CH1 Input (O) CH2  $\langle \bigcirc \rangle$ 13.2Mbps NRZ, Duty 50% Test item Test item Symbol Standard transmitter Low High pulse delay time t <sub>PLH</sub> Input signal High Low pulse delay time (CH1)  $t_{ ext{PHL}}$ Rise time  $t_r$ Fall time  $t_f$ Output signal Pulse width distortion (CH2)  $\triangle$   $\mathbf{tw} = \mathbf{t}_{PHL} \mathbf{t}_{LH}$ tw High level output voltage  $V_{OH}$ Low level output voltage  $V_{OL}$ Notes: 1) Vcc: 5V (State of operation) 2) To bundle up the standard fiber optic cable. Mark it into a loop with the diameter D=10cm. Α C C W Ρ Н Η Т K D D REV. NAME DATE REMARK

SPECIFICATION NO. PAGE: 4 OF 11 CUSTOMER MODEL NO. / TITLE DATE: OCT.28.2003 OPTICAL RECEIVING JACK FC684206R 5. Application Circuit Fiber optic connector insertion side Fiber Optic Receiving Module Less than 7 mm ΙΙ 0.1μF GND Vout Vcc (Bottom View) 6. Required Optical Fiber with Fiber Optic Connectors OC-0801P) Α C C W Ρ Н Т K K REV. NAME DATE REMARK CLIFF ELECTRONIC COMPONENTS LTD

CUSTOMER MODEL NO. / TITLE OPTICAL RECEIVING JACK

SPECIFICATION NO. PAGE: 5 OF 11 FC684206R

DATE: OCT.28.2003

#### 7. Precautions on Use

### (1) Maximum rating

The maximum ratings are the limit values which must not be exceeded during operation of device. None of these rating value must be exceeded. If the maximum rating value is exceeded, the characteristics of devices may never be restored properly. In extreme cases, the device may be permanently damaged.

### (2) Soldering

Optical modules are comprised of internal semiconductor devices. However, in principle, optical modules are optical components. During soldering, ensure that flux does not contact with the emitting surface or the detecting surface. Also ensure that proper flux removal is conducted after soldering.

Some optical modules come with a protective cap. The protective cap is used to avoid malfunction when the optical module is not in use. Note that it is not dust or waterproof.

As mentioned before, optical modules are optical components. Thus, in principle, soldering where there may be flux residue and flux removal after soldering is not recommended. CLIFF recommend that soldering be performed without the optical module mounted on the board.

Then, after the board has been cleaned, the optical module should be soldered on to the board manually.

If the optical module cannot be soldered manually, use non-halogen (chlorine-free) flux and make sure, with cleaning, there is no residue such as chlorine. This is one of the ways to eliminate the effects of flux.

In such a cases, be sure to check the devices' reliability.

### (3) Noise resistance

It is believed that the use of optical transfer devices improve noise resistance. In theory, optical fiber is not affected by noise at all. However, receiving modules which handle signals whose level is extremely small, are susceptible to noise.

IF The optical module is to be used in an area which is susceptible to radiated noise, increase the shielding by covering the optical module and the power line filter with a metallic cover.

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	Р	Н	Н	W
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				N

CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 6 OF 11
OPTICAL RECEIVING JACK OC806R FC684206R DATE: OCT.28.2003

### (4) Vibration and shock

This module is plastic sealed and has its wire fixed by resin. This structure is relatively resistant to vibration and shock. In actual equipment, there are sometime cases in which vibration, shock, or stress is applied to soldered parts or connected parts, resulting in lines cut.

A care must be taken in the design of equipment which will be subject to high levels of vibration.

### (5) Support pins

The OC-0806R has support pins in order to fix itself to the PCB temporary. Please make the hole for these pins in the PCB under the condition described in board layout hole pattern.

#### (6) Panel attachment

OC-0806R has hole for panel attachment. Please be sure to attach it to panel with self-tapping screw.

#### (7) Solvent

When using solvent for flux removal, do not use a high acid or high alkali solvent. Be careful not to pour solvent in to the optical connector ports. If solvent is inadvertently poured in to them, clean it off using cotton tips.

## (8) Supply voltage

Use the supply voltage within the recommended operating condition ( $Vcc = 5\pm0.25V$ ). Make sure that supply voltage does not exceed the maximum rating value of 7V, even for an instant.

#### (9) Interface

The OC-0806R has a TTL interface. It can be interfaced with any TTL-compatible C-MOS IC.

### (10) Output

If the receiver output is at low and is connected to the power supply, or if the output is high and is connected to GND, the internal IC may be destroyed.

#### (11) Soldering condition

Solder at 260°C or less for no more than ten seconds.

#### (12) Repeated operation:

Inserting and withdrawing shall be made at a speed of 20 times or less/min using mating plug (Refer to clause 4). 500 times.

	Α	С	С	W
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	V	K	K	T
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CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 7 OF 11 OPTICAL RECEIVING JACK FC684206R DATE: OCT.28.2003

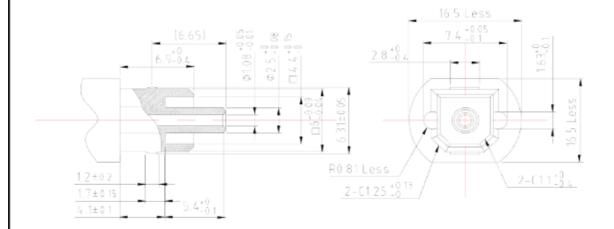
- (13) Precautions when disposing of devices and packing materials.

  When disposing devices and packing materials, follow the procedures stipulated by local regulations in order to protect the environment against contamination.
- (14) Precautions during use

R

CLIFF TW is continually working to improve the quality and the reliability of their products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and their vulnerability to physical stress. It is the responsibility of the buyer, when utilizing CLIFF TW products, to observe standards of safety, and to avoid situations in which the malfunction or failure of a CLIFF TW product could cause loss of human life, bodily injury or damage to property.

# Mating plug



Unit:mm

	Α	С	С	W
	Р	Н	Н	R
	V	K	K	T
EV. NAME DATE REMARK	D	D	D	N

CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 8 OF 11 OPTICAL RECEIVING JACK FC684206R DATE: OCT.28.2003

### **RCA**

### 1. Scope

This specification covers the requirements for "PIN JACK".

#### 2. Rated

- A) Rated voltage DC/AC 34V
- B) Rated current DC/AC 2A
- C) Temperature range -25~70°C
- D) Humidity range 85% RH MAX.
- E) Test condition

Unless otherwise specified herein, all measurements and tests shall be made at temperature of 5°C~35°C and relative humidity of 45%~85%.

3. Electrical efficiency

Item	Condition	Result/Value
3A) Dielectric strength	500V AC applied between mutual insulated metal parts for one minute.	Not breaking insulation
	(500V DC applied between mutual insulated metal parts.) Initial	≧ 100 MΩ
After heat test After cold test After resistance to soldering test After life test After temperature cycling test After humidity test		≧ 50 MΩ
3C) Contact resistance	(Measure at a current of less than 100mA 1KHz. The Gauge plug used shall be cleaned and free from oxidation film of the surface.) Initial After humidity test After heat test After cold test After resistance to soldering test After life test After temperature cycling test	≦ 30 mΩ

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V K K T
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CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 9 OF 11 OPTICAL RECEIVING JACK FC684206R DATE: OCT.28.2003

4. Mechanical efficiency

Item	Condition	Insertion force	Withdrawal force
4A)Insertion force and Withdrawal force	(With the gauge plug as show in 8) Initial After humidity test After heat test After cold test After resistance to soldering test After life test After temperature cycling test		gf~4.0kgf N~39.4N)

## 4B)Terminal strength

Every terminal shall be capable of withstand a force of 3kgf on 0.5 seconds without becoming loose and breakdown, but deformation of terminal is allowed.

The jack fixed on PCB, then shall be capable of inserted the gauge plug at 150 times, without loosening and breakdown, but force of inserted the gauge plug shall be less than 3kgf.

# 4C)Strength of tapping part

The tapping part shall be capable of a torque of 8kgf-cm for 5 seconds by M3×8 tapping tight screw and panel (t=1), the jack shall not be broken.

### 5. Construction

### 5A) Mating limit

Mating limit or range of between the plug and spring of jack shall be not regulated.

# 5B)Connection timing

The jack shall be permitted with connection timing whether shorting or not between the mutually separated terminals or spring of the pin jack, during the plug inserting and extracting action.

### 5C)Creepage distance and spacing

Creepage distance and spacing between mutually insulated parts be 0.2mm minimum, these distances and spacing shall be maintained with or without the gauge plug inserted.

	A	C	C	$\mathbf{W}$
	P	Н	H	R
	${f V}$	K	K	T
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# CUSTOMER MODEL NO. / TITLE SPECIFICATION NO. PAGE: 10 OF 11 OPTICAL RECEIVING JACK FC684206R DATE: OCT.28.2003

#### 6. Environmental test

### 6A) Life test

The life test shall consist of 150 cycles of insertion and withdrawal with gauge plug covered with a thin coat of grease in order to prevent from heating or wearing, at a rate of 20 to 30 cycles per minute under no load. At the conclusion of this test, the jack shall comply with Paragraphs 3 & 4, and be in operating condition.

# 6B) Humidity test

The jack shall be subjected to temperature of  $40\pm2^{\circ}\text{C}$  and relative humidity of 90% to 95% for a period of 96 hours. Upon completion of the exposure, dewdrops shall be blown out and removed from the jack, after which the jack shall be conditioned at room ambient conditions for 30 minutes. At the conclusion of this test, the jack shall comply with paragraphs 3 & 4.

### 6C) Heat test

The jack shall be subjected to temperature of  $70\pm2^{\circ}\text{C}$  for a period of 96 hours, then shall be allowed to remain in room ambient conditions for 30 minutes. At the conclusion of this test, the jack shall comply with Paragraph 3 & 4.

### 6D) Cold test

The jack shall be subjected to temperature of  $-40\pm3^{\circ}$ C for a period of 96 hours, then shall be allowed to remain in room ambient conditions for 30 minutes. At the conclusion of this test, the jack shall comply with Paragraph 3 & 4.

# 6E) Resistance to soldering heat test

The jack terminal shall be dipped in solder under the condition as specified below. At the conclusion of this test, the jack shall comply with Paragraph 3 & 4, and not show remarkable failure.

### 6E1. The terminal for a printed circuit board.

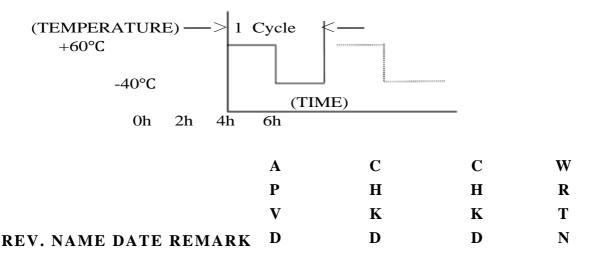
Temperature of solder:  $260\pm5$ °C; Dip time:  $5\pm1$  seconds.

# 6E2. The terminal for a lead wire

Temperature of solder:  $350\pm10^{\circ}$ C; Dip time:  $3\pm0.5$  seconds.

#### 6F. Temperature cycling test

The jack shall be subjected to the conditions as shown in fig as follows. And then shall be returned and allowed to remain in room ambient condition for 30 minutes. At the conclusion of this test, the jack shall comply with Paragraph 3 & 4.



CUSTOMER MODEL NO. / TITLE OPTICAL RECEIVING JACK

SPECIFICATION NO. PAGE: 11 OF 11 FC684206R

DATE: OCT.28.2003

# 6G) Soldering test

Area of soldering shall be capable of 95% or more of dip terminal area. Condition: Terminal of solder: 235±5°C; Time of dip:5±0.5 sec. Length of dip: 2±0.5mm (from top of terminal)

#### 7. Others

When the amendment of this specification comes into necessity, it shall be made by the mutual consultation and agreement between manufacturer and customer.

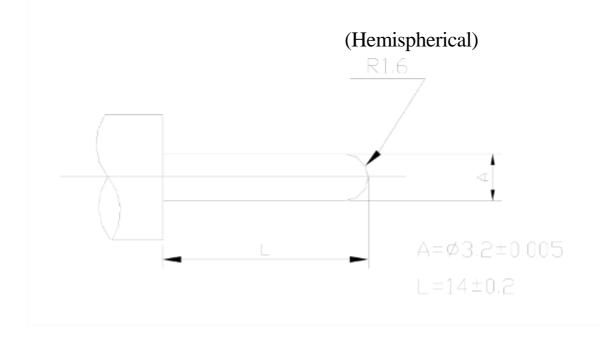
### 8. Mated plug

Surface roughness: Peak-to-valley height of 0.8 micron MAX.

For insertion and drawing force. Material: Stainless steel;

Finish: Chromium plated.

For contact resistance. Material: Brass; Finish: Silver plated.



	A	C	C	$\mathbf{W}$
	P	H	H	R
	$\mathbf{V}$	K	K	T
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Document No.	Document name	Rev.	DATE	
01-E	Management standards for "Environment-related	1.6	OCT,26,2006	
	substances to be controlled"	1.0		

- 1. This part should not contain any substances which are specified in follow .(Except cadmium is less than 5ppm, Lead is under 90ppm)
- 2. In this case, pre-processing methods and measurement methods shall conform to ROHS.

3. List of "Environment-related Substances to be Controlled ('The Controlled Substances')"

3. List of "Environment-related Substances to be Controlled ("The Controlled Substances")"						
	Allowable concentration					
	Cadmium and cadmium compounds	Less 5ppm				
	Lead and lead compounds	Less 90ppm				
Heavy metals	Lead in the plastic,rubber,paints,ink	Less 50ppm				
	Mercury and mercury compounds					
	Hexavalent chromium compounds					
	Polychlorinated biphenyls (PCB)					
	Polychlorinated naphthalenes (PCN)					
Chlorinated organic compounds	Chlorinated paraffins (CP)					
	Mirex (Perchlordecone)					
	Other chlorinated organic compounds					
	Polybrominated biphenyls (PBB)					
Brominated organic	Polybrominated diphenylethers (PBDE)					
compounds	Tetrabromobisphenol-A-bis- (2, 3-dibromopropylether) (TBBP-A-bis)					
	Other brominated organic compounds					
Organic tin compound	ls (tributy tin compounds, Triphenyl tin compounds)					
Asbestos						
Azo compounds						
Formaldehyde						
Polyvinyl chloride (PV	VC) and PVC blends					

### 4. Allowable concentrations:

Less than 90ppm is determined as an allowable total-concentration of four heavy metals (mercury, cadmium, hexavalent chromium, and lead). Less than 5ppm is determined as an allowable cadmium-concentration in a plastic (including rubber) part.

Α	С	С	W
Р	Н	Н	W R T N
V	K	K	Т
D	D	D	N

#### **CHI MEI CORPORATION**

59-1 SAN CHIA JEN TE TAINAN HSIEN TAIWAN

Material Designation: PA-765A (+)

Product Description: Acrylonitrile Butadiene Styrene (ABS), designated "Polylac" furnished as pellets.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec F	RTI Imp F	RTI Str IE	C GWIT	IEC GWFI
ALL	1.5	V-1	-	-	85	80	85	-	-
	2.1	V-0, 5V-B	3	0	85	80	85	-	-
	2.5	5VA	-	0	85	80	85	-	-
	3.0	V-0	0	0	85	80	85	-	-
	<b>CTI:</b> 0		нут	<b>R:</b> 0	D49	<b>5:</b> 7	IEC	BP: -	

(+) Optional prefix or suffix may be used to denote 0-0.5% acid scavengers.

Report Date: 06/23/1983 Underwriters Laboratories Inc® 267295002

UL94 small-scale test data does not pertain to building materials, furnishings and related contents. UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.

#### **CHI MEI CORPORATION**

59-1 SAN CHIA JEN TE TAINAN HSIEN TAIWAN

Material Designation: PA-777D

Product Description: Acrylonitrile Butadiene Styrene/Phenyl Maleimide (ABS/PMI), designated "Polylac" furnished as pellets.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec F	RTI Imp F	RTI Str IE	CGWIT	IEC GWFI
ALL	1.5	НВ	4	0	50	50	50	-	-
<b>CTI</b> : 1		<b>HVTR:</b> 0 <b>D495:</b> 7			<b>5:</b> 7	IEC	BP: -		
Report Date: 03/10/1993				Underwriters Laboratories Inc®					267295002

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flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.

#### **E I DUPONT DE NEMOURS & CO INC**

ENGINEERING POLYMERS CHESTNUT RUN PLAZA PO BOX 80713 WILMINGTON DE 19880

Material Designation: **70G33L(+)** 

Product Description: Polyamide 66 (PA66), glass reinforced, designated "Zytel" furnished as pellets.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI F	RTI Elec R	RTI Imp R	TI Str IEC	GWIT	IEC GWFI
ALL	0.71	НВ	4	0	130	120	130	-	-
	1.5	НВ	4	0	130	120	130	_	-
	3.0	НВ	4	0	130	120	130		-
	<b>CTI:</b> 0		HVT	<b>R:</b> 1	D49	<b>5:</b> 5	IEC	BP: -	

(+) Virgin and Regrind up to 50% by weight inclusive, have the same basic material characteristics.

NOTE (1) Material designations that are color pigmented may be followed by suffix letters and numbers. (2) Material designations may be prefixed by "ZYT" or "MIN".

Report Date: 08/06/1996 Underwriters Laboratories Inc® 324299147

UL94 small-scale test data does not pertain to building materials, furnishings and related contents. UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.