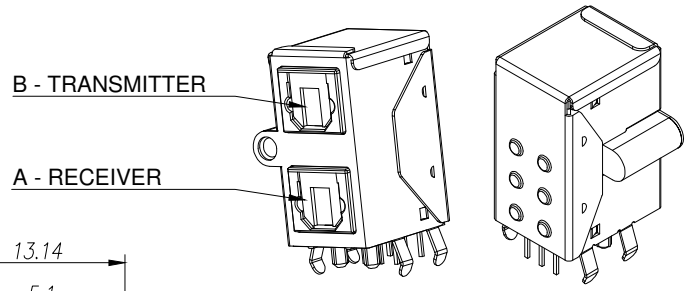
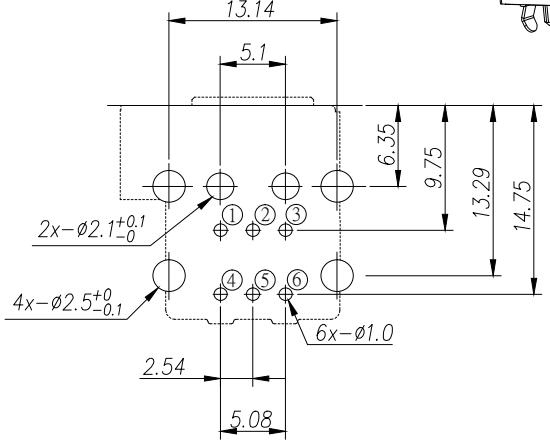
CLIFF

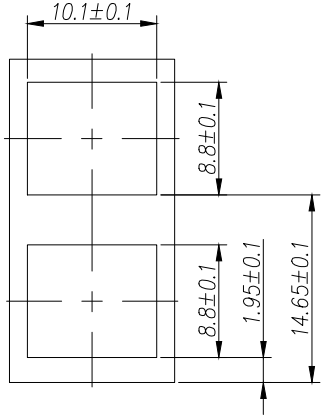
ISS.	AMEND	DATE
1	1st DRAWN	14/04/15



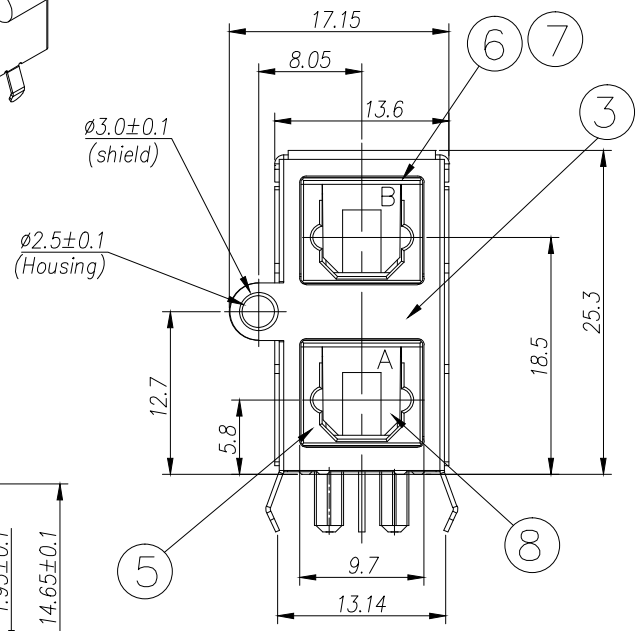
3D VIEW
(Reference)

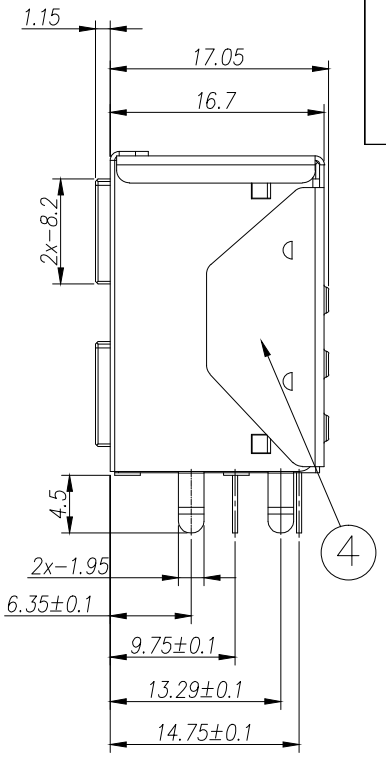


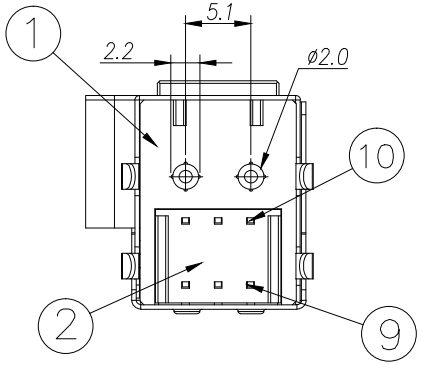
BOTTOM VIEW



Panel Layout
(Reference)







B	Transmiter	BLACK	L=24.1
A	Receiver	BLACK	L=8.85
NO.	I.C.	COVER COLOR	REMARK

10	IC	1			See Table
9	IC	1			See Table
8	COVER	2	NYLON	See Table	
7	SPRING	1	SWPA	BLACK	ø=0.25
6	TOP COVER	2	NYLON	BLACK	
5	INNER CYLINDER	2	NYLON	BLACK	
4	BACK COVER−2	1	C2680R−H	BRIGHT Sn: 3~4μm	t=0.35
3	FRONT COVER−1	1	C2680R−H	BRIGHT Sn: 3~4μm	t=0.35
2	BACK COVER	1	P.B.T	BLACK	
1	BODY	1	P.B.T	BLACK	
NO.	PART NAME	QTY	MATERIAL	PLATED/COLOUR	REMARK

Receiver	
Vcc	①
GND	②
Vout	③

Transmitter	
Vin	④
Vcc	⑤
GND	⑥

GENERAL TOLERANCE ±0.3

RoHS COMPLIANT

TOLERANCE
NO DEC. PLACE ±
1 DEC. PLACE ±
2 DEC. PLACE ±
HOLE Ø ±
ANGLES ± 2°
UNLESS
OTHERWISE STATED

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DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED. WORK TO DIMENSIONS. REMOVE ALL BURRS. IF IN DOUBT ASK. | 3rd ANGLE PROJECTION: | DO NOT SCALE

MATERIAL: SEE TABLE
FINISH: CLEAN
DRAWN: T.J.O. | APPROVED: D.P.J.

TITLE: OPTICAL JACK TRANSCEIVER
DRWG. No. FC6842135TR
FORM: A4DRWGH

SPECIFICATIONS

CUSTOMER MODEL NO. / TITLE MINI DIN 4 POS WITH OPTICAL CONNECTOR	DATASHEET FOR FC6842135TR	PAGE： 1 OF 7 DATE：OCT,05,2005

1. Scope

This specification covers the requirements for I/O signal and video machine connecting with optical connector.

2. Adapted plug

Adapted plug as Fig.4.

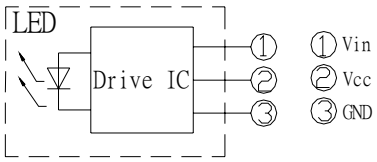
3. The outlook structure and dimension

The outlook and plated stripped with vision shall be capable of correct using and without loosing and breakdown.

4. Rated

4-1 Temperature and humidity range for using: -25~70℃, 85% RH max.
4-2 Temperature and humidity range for storage: -40~70℃, 85% RH max
4-3 Supply voltage:-0.5 to 7V
4-4 Input voltage:-0.5 to Vcc +0.5V
4-5 Operating voltage:2.75 to 5.25V
4-6 Signal transmission speed:16Mbps

Internal equivalent circuit



5. Status of testing

5-1 Standard condition

All measurement and tests shall be made at temperature of 15~35℃ and relative humidity of 25~80%, air pressure of 86~106kPa.
If the justification has problem, at temperature 20±2℃ and relative humidity of 60~70%, air pressure of 86~106kPa.

5-2 After testing

In test room at temperature of 15~35±1℃ and relative humidity of 75~77%, air pressure of 86~106kPa.

				APVD		CHKD		CHKD		WRTN	
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REV.	NAME	DATE	REMARK								

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6. Electrical efficiency

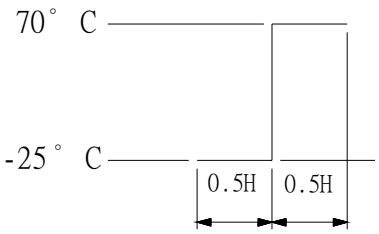
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit.
Peak emission wavelength	λp		630	660	690	nm
Optical power output coupling with fiber	Pc	Refer to Fig.1	-21	-18	-15	dBm
Dissipation current	Icc	Refer to Fig.2	3	-	10	mA
High level input voltage	V_{iH}	Refer to Fig.2	2	-	-	V
Low level input voltage	V_{iL}	Refer to Fig.2	-	-	0.8	V
Low → High delay time	t_{pLH}	Refer to Fig.3	-	-	120	ns
High → Low delay time	t_{pHL}	Refer to Fig.3	-	-	120	ns
Pulse width distortion	Δtw	Refer to Fig.3	-25	-	25	ns
Jitter	Δtj	Refer to Fig.3	-	-	20	ns

7. Mechanical efficiency

No.	Item		Test method	Character
7-1	Mating force	OPTO conn.	As Fig.4, use adapted gauge plug for testing.	39.2N max
7-2	Withdrawal force	OPTO conn.	As Fig.4, use adapted gauge plug for testing.	5.9N to 39.2N
7-3	Durability	OPTO conn.	As Fig.1, use adapted gauge plug for testing, 500cycles insertion and withdrawal.	Satisfy with 7-1,7-2 and the outlook without breakdown or unnormal.
7-4	Chape test		After inserting a plug (as Fig.4) for the test. It gains 5 second of upper and lower either side torque of 1N five times.	To be mated without mechanical abnormality.
7-5	Vibration resistance		The test sample is soldered on the P.W.B.. And then the simple vibration which change from 10 to 55 H2, amplitude 0.75mm per minutes. Shall be applied to each of the X,Y and Z axis for 2h (a total of 6 hours)	Plug and receptacle shall not be come off during test.

SPECIFICATIONS

8. Environmental test

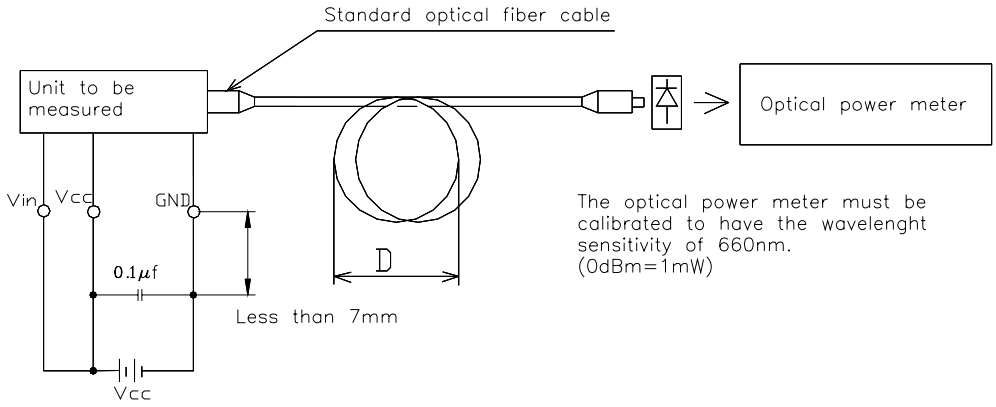
No.	Item	Test method	Character
8-1	Humidity test	The jack shall be subjected to temperature 40±2℃ and relative humidity of 90~95% for 240 h. Upon completion of the exposure, dewdrops shall be blown out and removed from the jack, after which the jack shall be conditioned at room ambient conditions for 1.5~2hours.	Satisfy with 7-1,7-2 the outlook without unnormal. (OPTO)
8-2	Temperature cycling test	Take forth and back cycles 5 times form the adapted plug and jack. Upon completion of above process for 1.5~2 hours. Execute the temperature testing as following. 	
8-3	Dry heat	The test sample shall be left at a temperature of 70±2℃ for 240h. And then it shall be kept under standard atmospherics condition for 1h, after which measurement shall be made. (Refer to JIS C 0021)	Satisfy with 7-1,7-2 the outlook without unnormal. (OPTO)
8-4	Cold	The test sample shall be left at a temperature of -25±3℃ of 240h. And then it shall be kept under standard atmospheric condition for 1h, after which measurement shall be made.	

SPECIFICATIONS

No.	Item	Test method	Character
8-5	Solder ability test	JIS C0053 rule applied use rosin liquid 25% for 3seconds. Temperature of solder：235±3℃ Time of dip：5sec Length of dip：4±0.5mm.	A new uniform coating of solder shall be cover more than 95% of the surface being immersed.
8-6	Resistance to soldering heat	Solder bath method Solder temperature：260 ±3℃ Immersion time ：5 $\pm^{1}_{0}$ sec 、2times Immersion depth: Up to the surface of the board. Thickness of printed wiring board: 1.6mm Material： Dimensions of component holes in the printed wiring board shall be in accordance with those specified in this specification. Soldering iron method Bit temperature ：380 ±10℃ Application of soldering iron：3 $\pm^{1}_{0}$ sec However, excessive pressure shall not be applied to the terminal.	Satisfy with 7-1,7-2 the outlook without unnormal. (OPTO)

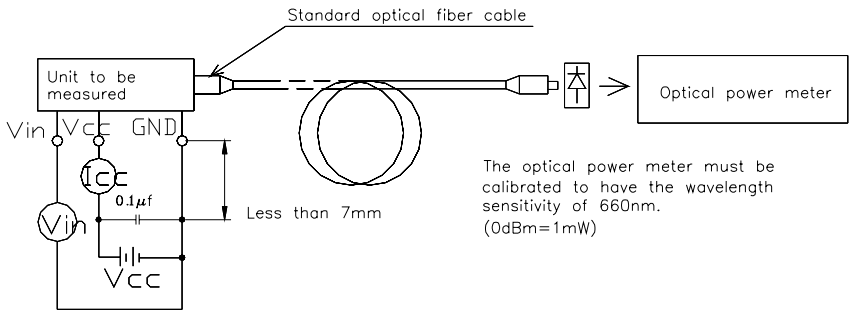
Remark: If the jack with “switch,,, the out connector plug test is also used.

Fig.1 Measuring Method of Optical Output Coupling with Fiber.



Notes: (1) OC-08 Vcc=3.0V (State of operating).
(2) To bundle up the standard fiber optic cable, make it into a loop with the diameter D=10cm or more. (The standard fiber optic cable will be specified elsewhere.)

Fig.2 Measuring Method of Input Voltage and Supply Current.

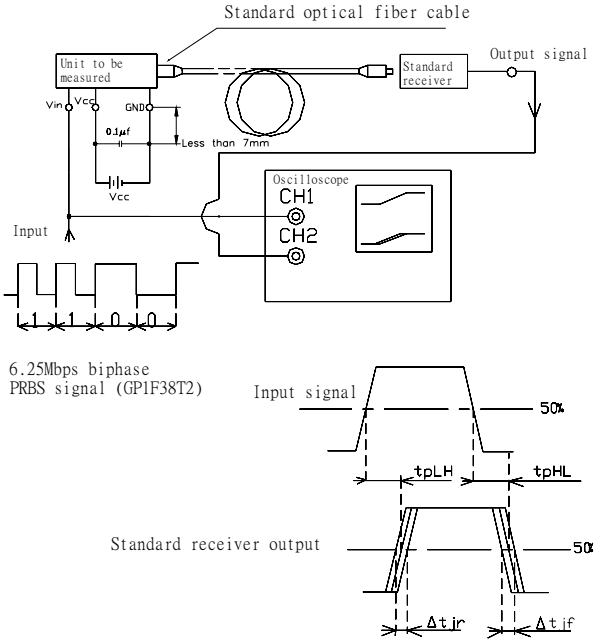


Input conditions and judgment method.

Condition	Judgment method
V_{in}=2.1V or more.	-21≦Pc≦-15dBm, Icc=13mA or less.
V_{in}=0.8V or less.	Pc≦-36dBm, Icc=13mA or less.

Note) Vcc=3.0V (State of operating).

Fig.3 Measuring Method of Pulse Response and Jitter.



Test item

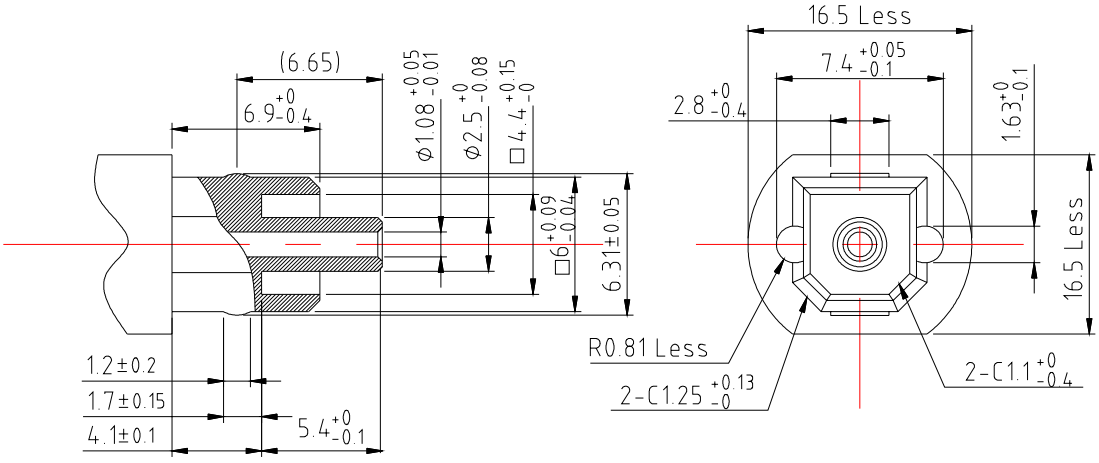
Test item	Symbol	Test condition
Low → High pulse delay time	t_{PLH}	Refer o the above prescriptions
High → Low pulse delay time	t_{PHL}	Refer to the above prescriptions
Pulse width distortion	Δtw	$\Delta tw=t_{PHL}-t_{PLH}$
Low → High Jitter	Δtjr	Set the trigger on the rise of input signal to measure the jitter of the rise of output
High → Low Jitter	Δtjf	Set the trigger on the fall of input signal to measure the jitter of the rise of output

Notes: (1) The waveform write time shall be 4 seconds. But do not allow the waveform to be distorted by increasing the brightness too much.
(2) Vcc=3.0V (State of operating)
(3) The probe for the oscilloscope must be more than 1MΩ and less than 10pF.

SPECIFICATIONS

CUSTOMER MODEL NO. / TITLE MINI DIN 4 POS WITH OPTICAL CONNECTOR	DATASHEET FOR FC6842135TR	PAGE： 7 OF 7 DATE：OCT,05,2005

Fig.4 Adapted plug



Unit:mm

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SPECIFICATIONS

CUSTOMER MODEL NO. / TITLE OPTICAL RECEIVING JACK	DATASHEET FOR FC6842135TR	PAGE： 1 OF 7 DATE： APR,0,2003

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 (Ta=25℃)

Parameter	Symbol	Rating	Unit
Storage Temperature	T_{stg}	-40 ~ 70	℃
Operating Temperature	T_{opr}	-20 ~ 70	℃
Supply Voltage	Vcc	-0.5 ~ 6	V
High Level Output Current	I_{OH}	-1	mA
High Level Output Current	I_{OL}	5	mA
Soldering Temperature	Tsol	260 (1)	℃

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

2. Recommended Operating Conditions

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	Vcc	4.75	5.0	5.25	V

REV.	NAME	DATE	REMARK	APVD	CHKD	CHKD	WRTN
				陳 92.4.9 文昌		李 92.4.7 宗暉	張 92.4.4 榆珮

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

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit.
Data Rate		NRZ Code (2)	0.1	-	12.5	Mb/s
Transmission Distance		Using APF (3)	0.2	-	5	M
Pulse Width Distortion (4)	Δtw	Pulse Width = 147ns Pulse Cycle = 294ns C_L = 10pF	-15	-	15	ns
Maximum Receivable Power	P_{MAX}	12.5Mb/s, Using APF	-	-	-14.5	dBm
Minimum Receivable Power	P_{MIN}	12.5Mb/s, Using APF	-24	-	-	dBm
Current Consumption	I_{CC}		-	15	40	mA
High Level Output Voltage	V_{OH}		2.4	4.8	Vcc	V
Low Level Output Voltage	V_{OL}		-	0.2	0.4	V
Rise time	t_r	Refer to "Test Circuit,,	-	10	20	ns
Fall time	t_f	Refer to "Test Circuit,,	-	10	20	ns
Low→High delay time	t_pLH	Refer to "Test Circuit,,	-	100	180	ns
High→Low delay time	t_pHL	Refer to "Test Circuit,,	-	100	180	ns

Note (2): 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 (3): All Plastic Fiber (970 / 1000μm).

Note (4): Between input of transmitting module and output

4. Mechanical Characteristics (Ta= 25℃)

4-1

Parameter	Condition	MIN.	TYP.	MAX.	Unit
Insertion Force.	Initial value	-	-	40	N
Withdrawal Force.		4	-	40	N
Torque for Self-Tap	Using self-tapping Screw (TP3×8)	58.8	-	78.4	N · cm

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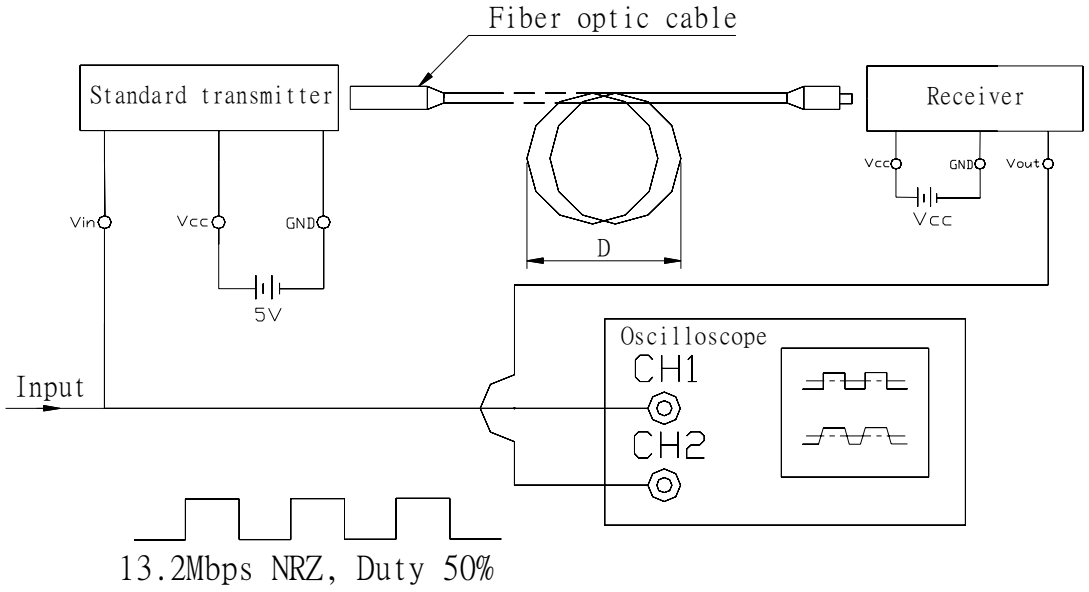
SPECIFICATIONS

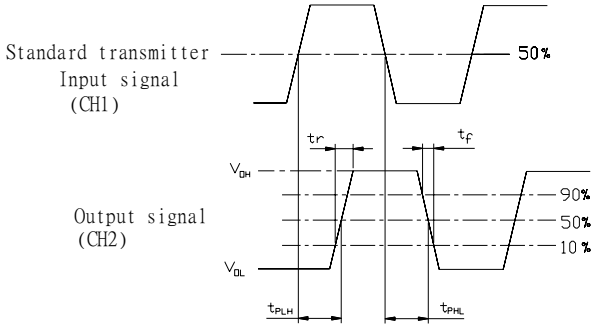
CUSTOMER MODEL NO. / TITLE OPTICAL RECEIVING JACK	DATASHEET FOR FC6842135TR	PAGE : 3 OF 7 DATE : APR,0,2003

TEST CIRCUIT



Test item

Test item	Symbol
Low → High pulse delay time	t_{PLH}
High → Low pulse delay time	t_{PHL}
Rise time	t_r
Fall time	t_f
Pulse width distortion △ tw = t_{PHL} - t_{PLH}	△ 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.

REV.	NAME	DATE	REMARK	APVD	CHKD	CHKD	WRTN
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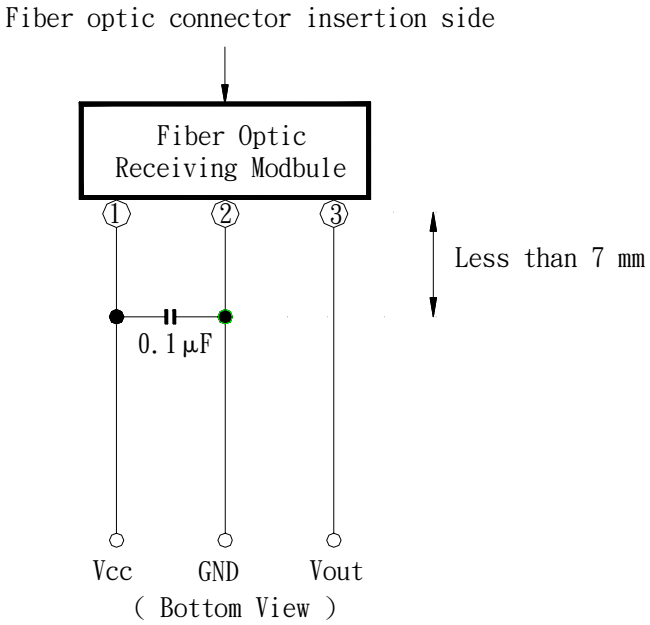
SPECIFICATIONS

5. Application Circuit



6. Required Optical Fiber with Fiber Optic Connectors

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SPECIFICATIONS

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 not 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 damages.

(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, without 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.

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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(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 tress 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 jack 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

jack 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±0.25V). Make sure that supply voltage does not exceed the maximum rating value of 7V, even for an instant.

(9) Interface

The jack 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℃ 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.

(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.

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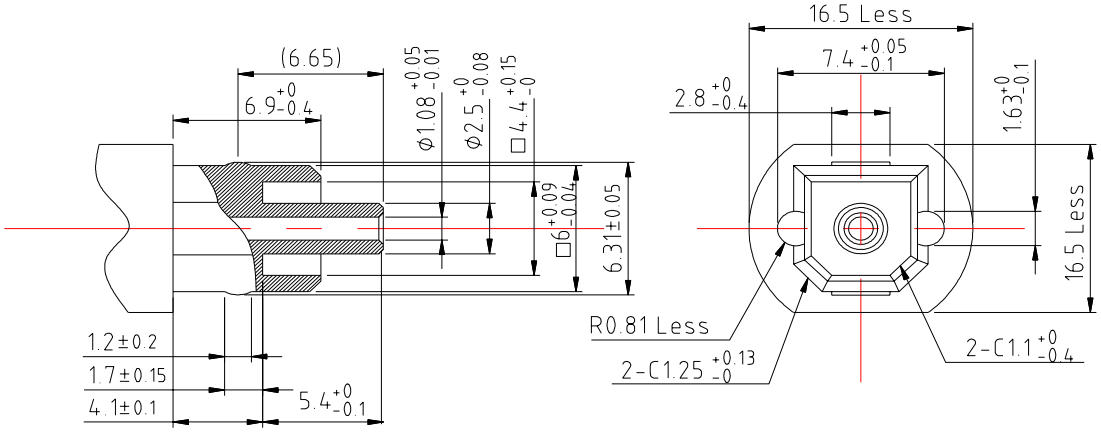
SPECIFICATIONS

CUSTOMER MODEL NO. / TITLE OPTICAL RECEIVING JACK	DATASHEET FOR FC6842135TR	PAGE： 7 OF 7 DATE： APR,0,2003

(14) Precautions during use

CLIFF 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** products, to observe standards of safety, and to avoid situations in which the malfunction or failure of a **CLIFF** product could cause loss of human life, bodily injury or damage to property.

Mating plug



Unit:mm

REV.	NAME	DATE	REMARK	APVD	CHKD	CHKD	WRTN
				陳 92.4.9 文昌		李 92.4.7 宗暉	張 92.4.4 榆珮

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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')"

Substances		Allowable concentration
Heavy metals	Cadmium and cadmium compounds	Less 5ppm
	Lead and lead compounds	Less 90ppm
	Lead in the plastic,rubber,paints,ink	Less 50ppm
	Mercury and mercury compounds	
	Hexavalent chromium compounds	
	Nickel and Nickel compounds (at present only ASUS and Silitek)	
Chlorinated organic compounds	Polychlorinated biphenyls (PCB)	
	Polychlorinated naphthalenes (PCN)	
	Short-chain chlorinated paraffins (SCCP)	
	Polychlorinated terphenyls (PCT)	
	Other chlorinated organic compounds	
Brominated organic compounds	Polybrominated biphenyls (PBB)	
	Polybrominated diphenylethers (PBDE)(including decabromodiphenyl ether [DecaBDE])	
	Other brominated organic compounds	
Organic tin compounds (tributy tin compounds, Triphenyl tin compounds)		
Asbestos		
Specific azo compounds		
Formaldehyde		
Polyvinyl chloride (PVC) and PVC blends		
Foaming cushion material (EPS、EPE、EPP)		

				APVD	邱 2009.4.20 信榮	CHKD		CHKD	林 2009.4.20 美曲	WRTN	簡 2009.4.20 秀陵
REV.	NAME	DATE	REMARK								

Cliff Electronic Components Ltd.

76 Holmethorpe Avenue, Holmethorpe Industrial Estate,
Redhill, Surrey, RH1 2PF, England, UK
Tel: 01737-771375 Fax: 01737-766012 Website: www.cliffuk.co.uk

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

Substances
Beryllium oxide
Specific phthalates (DEHP、DBP、BBP、DINP、DIDP、DNOP、DNHP)
Hydrofluorocarbon (HFC)、Perfluorocarbon (PFC)
Phosphorus certificate
Perfluorooctane sulfonates (PFOS)
Specific benzotriazole
Cobalt dichloride
Ozone depleting substance (ODS)

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.

Component - Plastics **E130155**

NAN YA PLASTICS CORP PLASTICS 4TH DIV

3RD FL, 201 TUNG HWA NORTH RD, TAIPEI TW

1403G6

Polybutylene Terephthalate (PBT), furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.75	V-0	3	0	130	130	140
	1.5	V-0	2	0	130	130	140
	3.0	V-0	2	0	130	130	140

Comparative Tracking Index (CTI): **2**

Dimensional Stability (%): **0**

High-Voltage Arc Tracking Rate (HVTR): **1**

High Volt, Low Current Arc Resis (D495): **6**

Dielectric Strength (kV/mm): **33**

Volume Resistivity (10^x ohm-cm) : **14**

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

Report Date:1991-01-11
Last Revised:2003-10-24

Underwriters Laboratories Inc®

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.75	V-0 (ALL)
			1.5	V-0 (ALL)
			3.0	V-0 (ALL)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m^2	-	-

Underwriters Laboratories Inc®

Component - Plastics **E41938**

E I DUPONT DE NEMOURS & CO INC

ENGINEERING POLYMERS, CHESTNUT RUN PLAZA, PO BOX 80713, WILMINGTON DE 19880

101(+)(f1), 101F(+)(f1), 101L(+)(f1), E101(+)(f1), E101L(f1), 132F(+)(f1), 135F(+)(f1)

Polyamide 66 (PA66), "Zytel", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.71	V-2	4	0	130	75	85
	1.5	V-2	3	0	130	75	85
	3.0	V-2	2	0	130	75	85
	6.0	V-2	2	0	130	75	85

Comparative Tracking Index (CTI): **0**

High-Voltage Arc Tracking Rate (HVTR): **0**

Dielectric Strength (kV/mm): **13**

Dimensional Stability (%): **-**

High Volt, Low Current Arc Resis (D495): **6**

Volume Resistivity (10^x ohm-cm) : **14**

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

(f1) - Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.

NOTE - (1) Material designations that are color pigmented may be followed by suffix letters and numbers. (2) Material designations may be prefixed by "ZYT" for Zytel or "MIN" for Minlon or "ZEN" for Zenite or "DEL" for Delrin or "CRA" for Crastin or "RYN" for Rynite or "THX" for Thermx or "ETPV" for ETPV grades.

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

Report Date:1996-07-29
Last Revised:2004-09-15

Underwriters Laboratories Inc®

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.71	V-2 (ALL)
			1.5	V-2 (ALL)
			3.0	V-2 (ALL)
			6.0	V-2 (ALL)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	0.71	960
			1.5	960
			3.0	960
			6.0	960
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	0.71	725
			1.5	750
			3.0	800
			6.0	800
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m^2	-	-

Underwriters Laboratories Inc®

Component - Plastics **E41938**

E I DUPONT DE NEMOURS & CO INC

ENGINEERING POLYMERS, CHESTNUT RUN PLAZA, PO BOX 80713, WILMINGTON DE 19880

70G13L

Polyamide 66 (PA66), glass reinforced, "Zytel", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.71	HB	4	0	125	120	125
	1.5	HB	4	0	125	120	125
	3.0	HB	4	0	125	120	125

Comparative Tracking Index (CTI): **0**

Dimensional Stability (%): **0.3**

High-Voltage Arc Tracking Rate (HVTR): **1**

High Volt, Low Current Arc Resis (D495): **5**

Dielectric Strength (kV/mm): **22**

Volume Resistivity (10^x ohm-cm) : **16**

NOTE - (1) Material designations that are color pigmented may be followed by suffix letters and numbers. (2) Material designations may be prefixed by "ZYT" for Zytel or "MIN" for Minlon or "ZEN" for Zenite or "DEL" for Delrin or "CRA" for Crastin or "RYN" for Rynite or "THX" for Thermx or "ETPV" for ETPV grades.

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

Report Date:1996-08-06
Last Revised:2003-10-24

Underwriters Laboratories Inc®

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.71	HB75 (ALL)
			1.5	HB75 (ALL)
			3.0	HB40 (ALL)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	0.71	650
			1.5	650
			3.0	800
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	0.71	675
			1.5	675
			3.0	675
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m^2	-	-

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