

**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](http://www.cliffuk.co.uk)

# **FIBER OPTIC DATA LINK**

## **DATA SHEET**

MODEL NO : FCR684208R

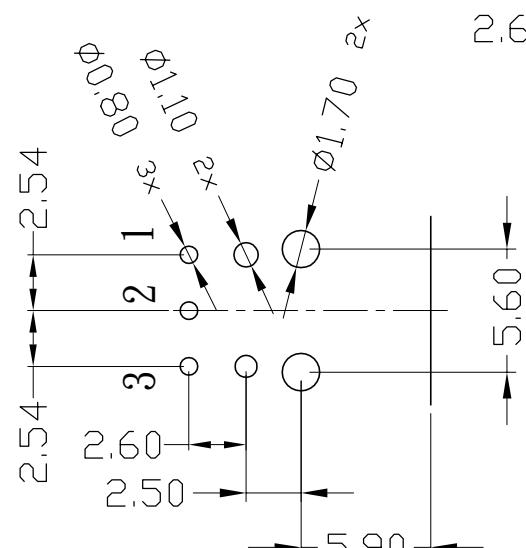
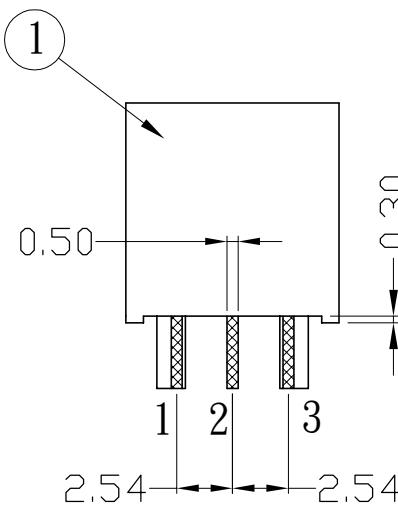
DATE : 2016-09-02

VERSION : 1.1

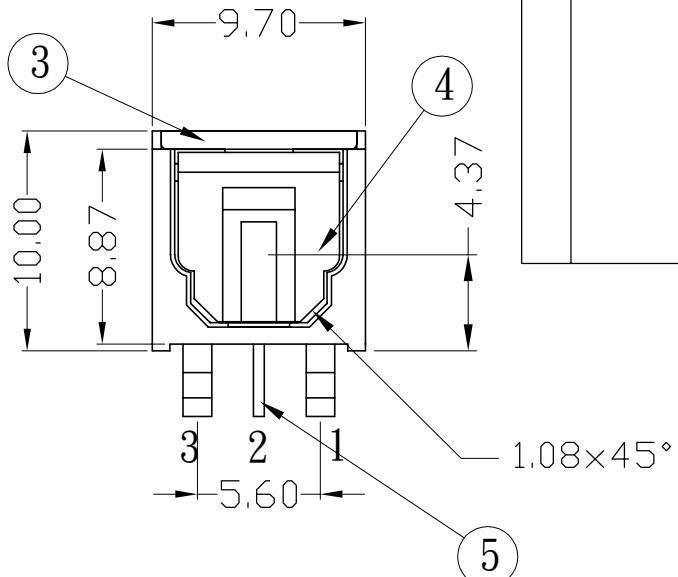
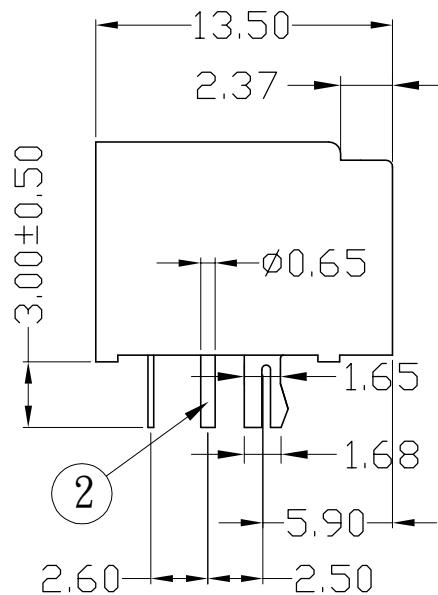
DEVICE NO. : ORJ-8 (OPTICAL RECEIVER JACK)

CUSTOMER	DESIGNER	CHECKER	APPROVER

ISS.	AMEND	DATE
1	ISSUED	20/09/16



PCB LAYOUT<ToL,±0.3>  
COMPONENT (TOP) SIDE



## Pin Function:

1. Vout
  2. GND
  3. Vcc

GENERAL TOLERANCE  $\pm 0.2$

No.	PART NAME	QTY	MATERIAL	RoHS COMPLIANT
1	BODY	1	PA66 BLACK	TOLERANCE NO DEC. PLACE ± 1 DEC. PLACE ± 2 DEC. PLACE ± HOLE Ø ± ANGLES ± UNLESS OTHERWISE STATED
2	PIN	2	COPPER ALLOY	
3	SPRING	1	SUS304	
4	SHUTTER	1	PA66 BLACK	
5	IR	1	RECEIVER	

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FINISH:	CLLAN					
DRAWN:	T.J.O.	APPROVED:	D.P.J.	DRWG. No.	FCR684208R	FORM: A4DRWGH

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## **Features**

- High PD sensitivity for red light
- High speed up to 16 Mbps
- Low power consumption and current dissipation
- +3~+5V power source

## **Descriptions**

The light receiving unit is a standard-package product with connector and opto-electric component packaged with PD and I/V amplifier IC. The function of unit changes the light signal into electric signal.

The unit is operated at +3~+5V and the input signal is TTL compatible. FCR684208R has a maximum operating speed of 16 Mbps.

## **Applications**

- Audio equipment
- Digital optical data link
- MD
- Sound card

## **Device Selection Guide**

Chip		Operating Voltage (Vcc)	Dissipation Current(mA)	Fiber Coupling Light Output (dBm)		
IC Material	LED $\lambda$ p(nm)			Typ.	Min.	Typ.
Si	650	2.7~5.5	6.5	-24	-	-14.5

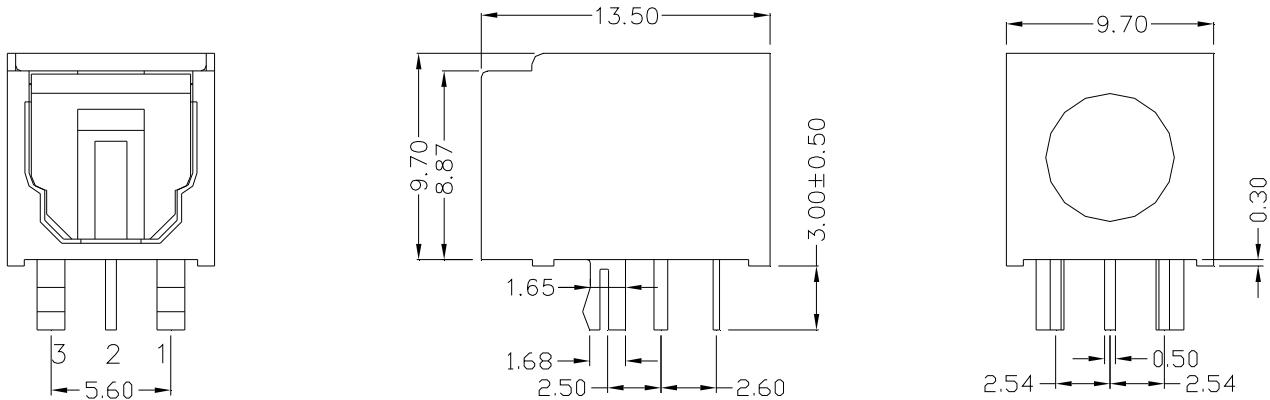
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## Package Dimensions



**Notes:** 1. All dimensions are in millimeters.

2. General Tolerance:  $\pm 0.2\text{mm}$

3. Material: HTN (High Temperature Nylon)

4. Supplied with black shutter.

## Pin Function

1. Vout

2. GND

3. Vcc

## Absolute Maximum Ratings( Ta = 25°C )

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	5.5	V
Storage Temperature	Tstg	-30 to 80	°C
Operating Temperature	Topr	-20 to 70	°C
Soldering Temperature	Tsol	260*	°C

\* Soldering time  $\leq 5\text{s} / 2 \text{ times.}$

\*Don't touch flux soldering and white Gas

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Tel: 01737-771375 Fax: 01737-766012 Website: [www.cliffuk.co.uk](http://www.cliffuk.co.uk)**Electro-Optical Characteristics**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	Vcc	-	2.7	-	5.5	V
Peak Detective Wavelength	$\lambda_p$	-	-	650	-	nm
Transfer Speed		NRZ signal	0.1	-	16	Mbps
Receiving Distance		Using APF	0.2	-	20	m
Pulse Width Distortion	$\Delta_{tw}$	16Mbps NRZ Signal	-20	-	20	ns
Input Light power	Pi	*1	-24	-	-14.5	dBm
Dissipation Current	Icc	*2	-	6	10	mA
High Level Output Voltage	VOH		2.4	-	-	v
Low Level Output Voltage	VOL		-	-	0.4	v
Rise Time	$t_r$	*3	-	-	25	ns
Fall Time	$t_f$	*3	-	-	25	ns
Low → High propagation delay time	tPLH	*3	-	-	100	ns
High → Low propagation delay time	tPHL	*3	-	-	100	ns
Jitter time	$\Delta t_j$	*3	-	1.5	15	ns

FCR684208R light receiving unit satisfies EIAJ CP-1201 digital audio interface standard.

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## **Reliability Test Items**

No.	Item	Test Condition	Test Hour/Cycle	Samples	Number (n) Failure (c)
1	Soldering Heat	260°C±5°C	5 sec./2times	22	n=22, c=0
2	High temp. & Hum. storage	Ta=40°C, 90%RH	500	22	n=22, c=0
3	High temp. storage	Ta=80°C	500	22	n=22, c=0
4	Low Temp. storage	Ta=-30°C	500	22	n=22, c=0
5	Temp. cycling	-30°C ~ 80°C (30min) (5min) (30min)	20	22	n=22, c=0
6	High Temp. Operation life	Ta=60°C, Vcc=5V ON	500	22	n=22, c=0
7	Repeated operation	500 times	Coupling force < 2 kg 0.4kg<Detaching force <2kg	22	n=22, c=0
8	Terminal Strength(tension)	Weight: 500 g 30 sec./each terminal		22	n=22, c=0
9	Terminal Strength(bending)	Weight: 500 g 2 times/each terminal		22	n=22, c=0
10	Mechanical Shock	Acceleration: 1000m/s <sup>2</sup> Pulse width: 6 ms 3 times/ X,Y,Z direction		22	n=22, c=0
11	Vibration	Frequency range: 10~55 Hz /sweep 1 min Overall amplitude:1.5 mm 2H./X,Y,Z direction		22	n=22, c=0

Icc (dissipation current): CURRENT ATTENUATE DIFFERENCE < 20%

TPLH (propagation L→ H delay time): DELAY TIME DIFFERENCE < 20%

TPHL (propagation H→ L delay time): DELAY TIME DIFFERENCE < 20%

Tr (rise time): TIME DIFFERENCE < 20%

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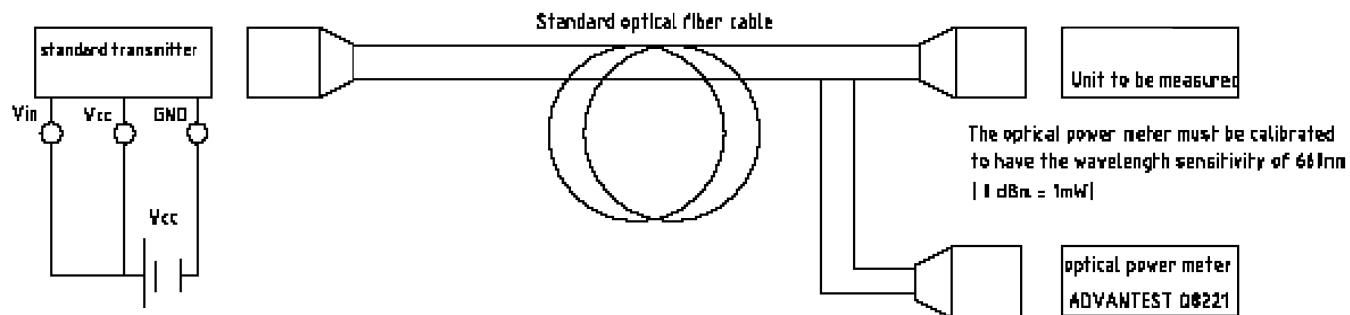
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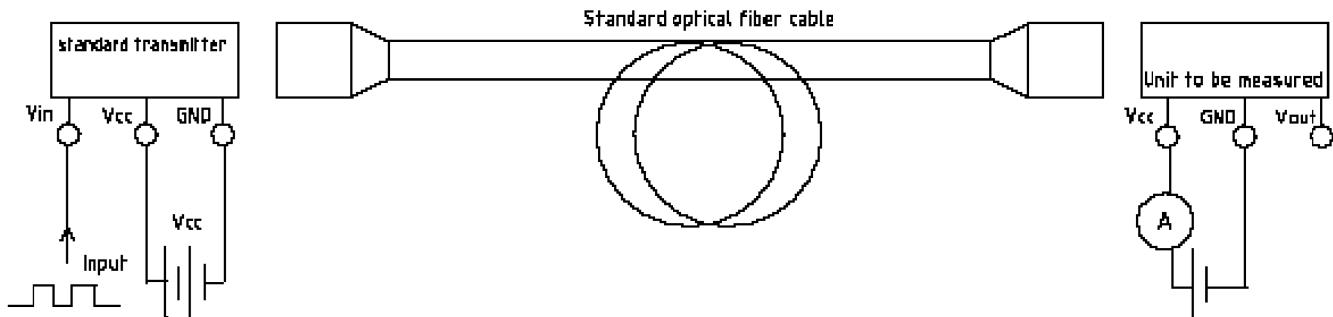
T<sub>f</sub> (fall time): TIME DIFFERENCE < 20%

## Measuring Method

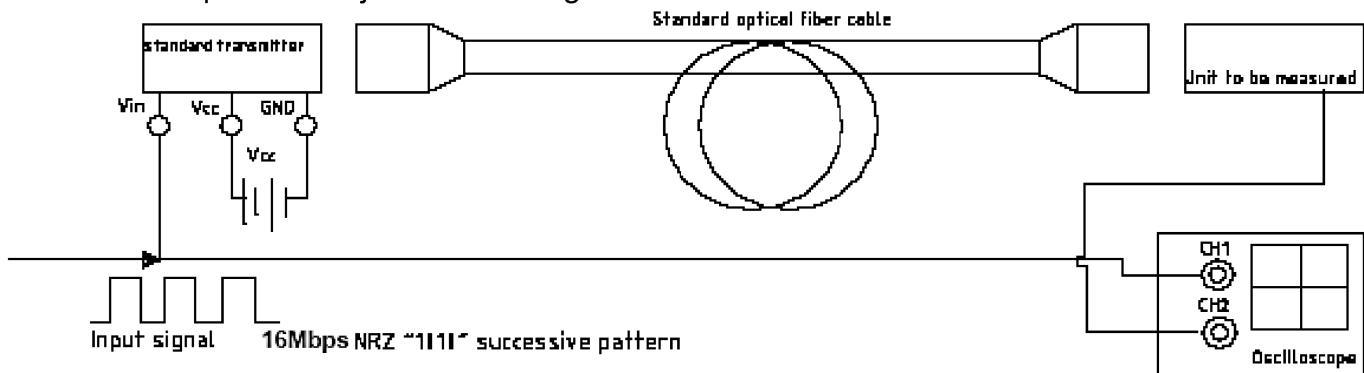
- \*1 Maximum receiver input optical power/Minimum receiver input optical power



- \*2 Current dissipation measuring method



- \*3 Pulse response and jitter measuring method



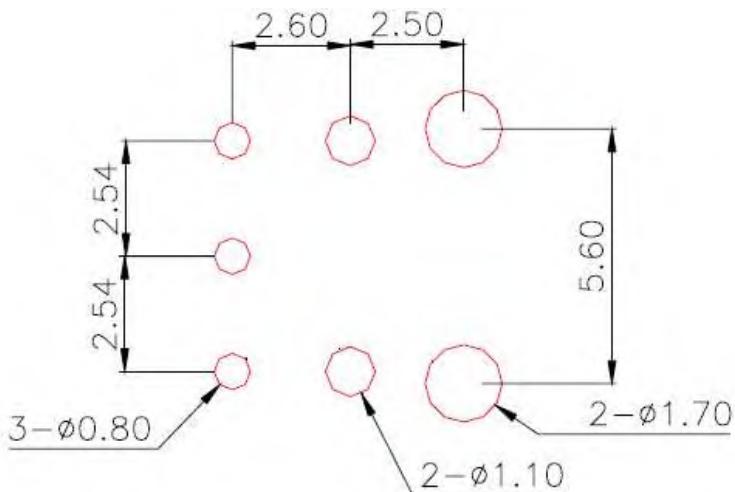
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## **PCB Layout For Electrical Circuit**



### **Notes:**

1. Unit: mm
2. Unspecified tolerance:  $\pm 0.3\text{mm}$
3. Substrate Thickness: 1.6mm

## **Precautions for Using Method**

1. Connect a by-pass capacitor (0.1uF) close to the FCR684208R within 7 mm of the unit lead frame.
2. Connect a by-pass capacitor(30pF) between GND and Vout avoid loading effect.
3. Take proper electrostatic-discharge (ESD) precautions while handling these devices.  
These devices are sensitive to ESD.

