

# **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**

PART No. : FCR684208T

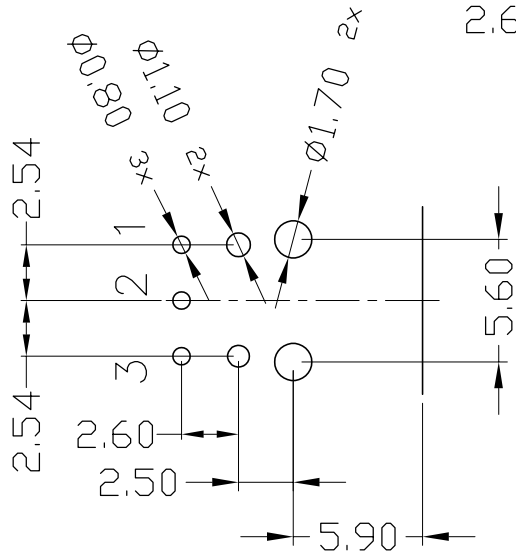
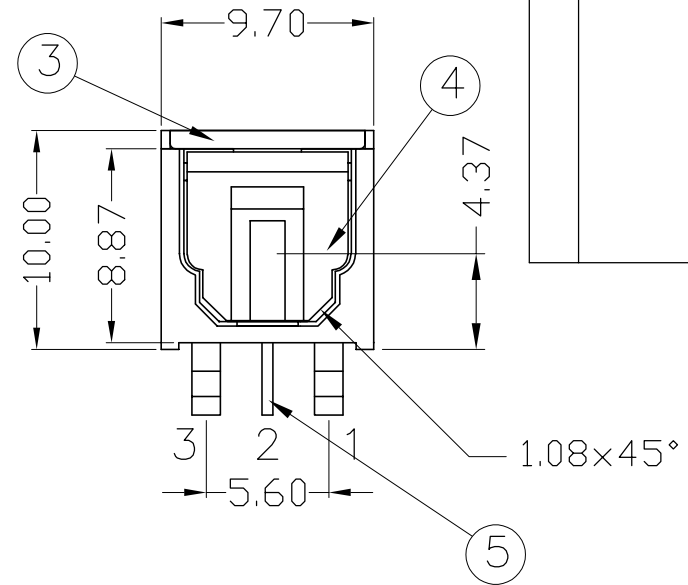
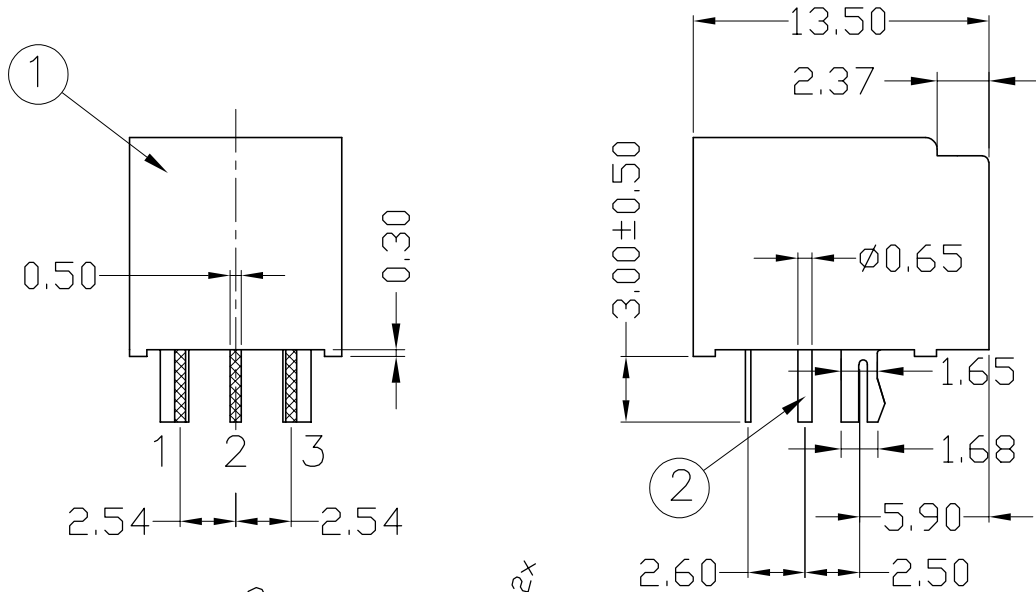
DATE : 2023-06-29

DATA VERSION : 2.0

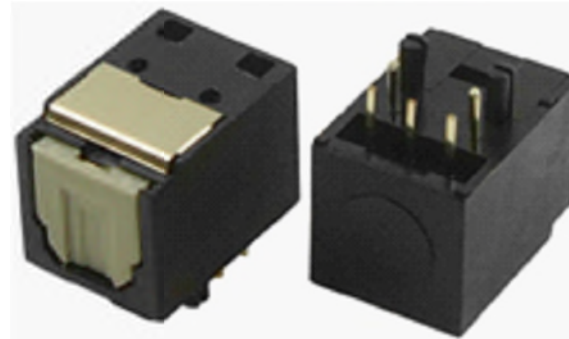
DESCRIPTION : OTJ-8 (OPTICAL TRANSMITTER JACK)

CUSTOMER	DESIGNER	CHECKER	APPROVER

ISS.	AMEND	DATE
1	ISSUED	20/09/16
2	UPDATE MATERIALS	29/06/23



Pin Function:  
 1. GND  
 2. Vcc  
 3. Vin



GENERAL TOLERANCE ±0.2

No.	DESCRIPTION	QTY	MATERIAL	FINISH
1	BODY	1	PA66 UL94 V-0	BLACK
2	PIN	2	COPPER ALLOY	TIN PLATE
3	SPRING	1	SUS304	-
4	SHUTTER	1	PA66 UL94 V-0	GREY
5	IR TRANSMITTER	1	PHOSPHOR BRONZE	TIN PLATE

**RoHS**  
**COMPLIANT**

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

DO NOT SCALE

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DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED. WORK TO DIMENSIONS. REMOVE ALL BURRS. IF IN DOUBT ASK.

ANGLE PROJECTION:

MATERIAL: SEE TABLE

TITLE: OPTICAL JACK TRANSMITTER OTJ-8

FINISH: CLEAN

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DRAWN: T.J.O.

APPROVED: D.P.J.

DRWG. No. **FCR684208T**

FORM: A4DRWGH

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## Features

- High speed signal transmission  
( 16 Mbps, NRZ signal )
- Input TTL compatible
- +3~+5V power source

## Descriptions

The light transmitting unit is a standard-package product with connector and opto-electric component packaged with LED and drive IC. The function of unit changes the electric signal into light signal and be transmitted by plastic fiber.

The unit is operated at single+3V~ +5V and the input signal is TTL compatible. FCR684208T has a maximum operating speed of 16 Mbps. The light signal is coupled into plastic fiber by connector. The unit has high performance at low dissipation current, steady light output and efficient light coupling.

## Applications

- Audio equipment
- DVD player
- PC, Notebook
- Sound card

## Device Selection Guide

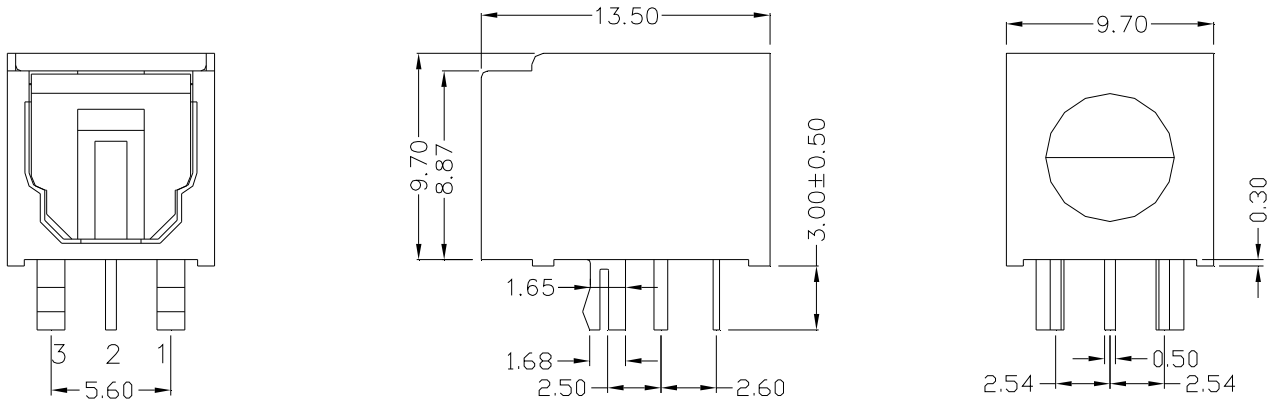
Chip		Operating Voltage (Vcc)	Dissipation Current(mA)	Fiber Coupling Light Output (dBm)		
IC Material	LED $\lambda$ p(nm)			Typ.	Min.	Typ.
Si	650	2.7~5.5	5.5	-21	-	-15

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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 GREY shutter.

## Pin Function

1. GND
2. Vcc
3. Vin

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

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	-0.5 to 7	V
DC Input Voltage	Vin	-0.5 to Vcc+0.5	V
Power Dissipation	P	120	mW
Storage Temperature	Tstg	-30 to 80	°C
Operating Temperature	Topr	-20 to 70	°C
Soldering Temperature	Tsol	260*	°C

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

\*Don't touch flux soldering and white Gas

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### Electro-Optical Characteristics

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V <sub>cc</sub>	-	2.7	-	5.5	V
Peak Emission Wavelength	$\lambda_p$	-	640	-	670	nm
Transmission Speed		NRZ signal	-	-	16	Mbps
Transmission Distance		Using APF*	0.2	-	20	m
Pulse Width Distortion	$\Delta tw$	16 Mbps NRZ Signal	-25	-	25	ns
Fiber Coupling Light Output	Pf	*1	-21	-17	-15	dBm
Dissipation Current	I <sub>cc</sub>	*2	-	5	10	mA
High Level Input Voltage	V <sub>IH</sub>		2	-	-	v
Low Level Input Voltage	V <sub>IL</sub>		-	-	0.8	v
Rise Time	t <sub>r</sub>	*3	-	30	40	ns
Fall Time	t <sub>f</sub>	*3	-	20	30	ns
Low → High propagation delay time	t <sub>PLH</sub>	*3	-	-	100	ns
High → Low propagation delay time	t <sub>PHL</sub>	*3	-	-	100	ns
Jitter	$\Delta t_j$	*3	-	1.5	15	ns

\*Light output after APF should satisfy Pf range.

The FCR684208T light transmitting 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 Overallamplitude:1.5 mm 2H./X,Y,Z direction		22	n=22, c=0

I<sub>cc</sub> (dissipation current): CURRENT ATTENUATE DIFFERENCE < 20%

P<sub>f</sub> (fiber coupling light output): BRIGHTNESS ATTENUATE DIFFERENCE < 20%

T<sub>PLH</sub> (propagation L → H delay time): DELAY TIME DIFFERENCE < 20%

T<sub>PHL</sub> (propagation H → L delay time): DELAY TIME DIFFERENCE < 20%

T<sub>r</sub> (rise time): TIME DIFFERENCE < 20%

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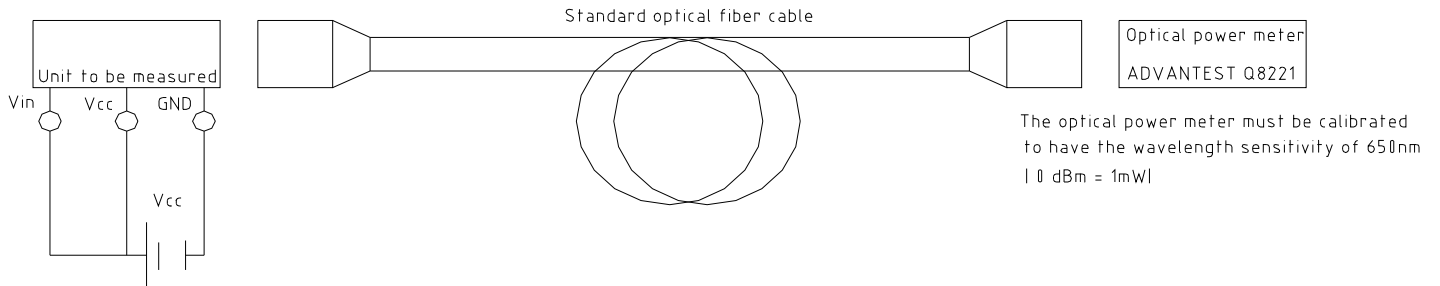
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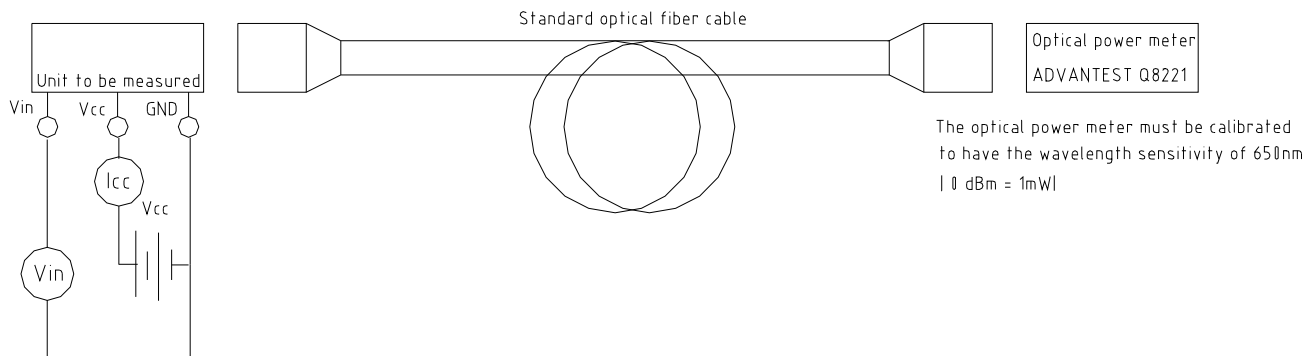
Tf (fall time): TIME DIFFERENCE < 20%

## Measuring Method

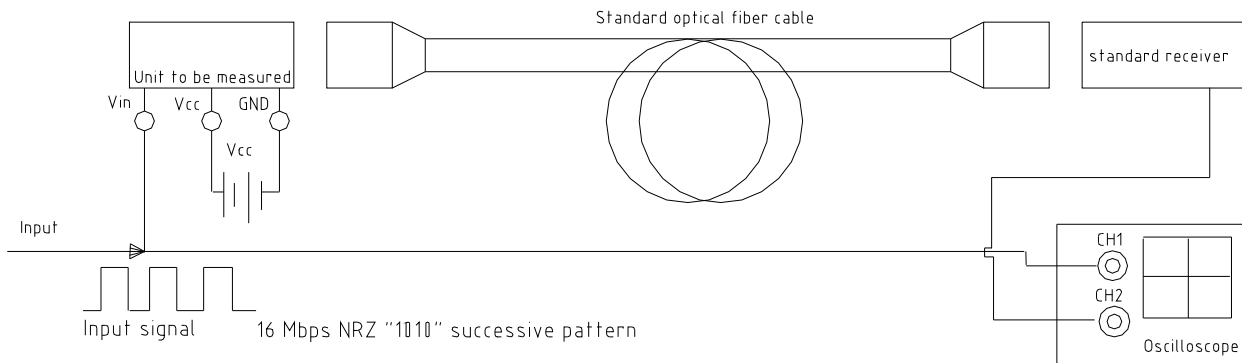
### \*1 Measuring method of optical output coupling fiber



### \*2 Input voltage/power dissipation measuring method



### \*3 Pulse response and jitter measuring method



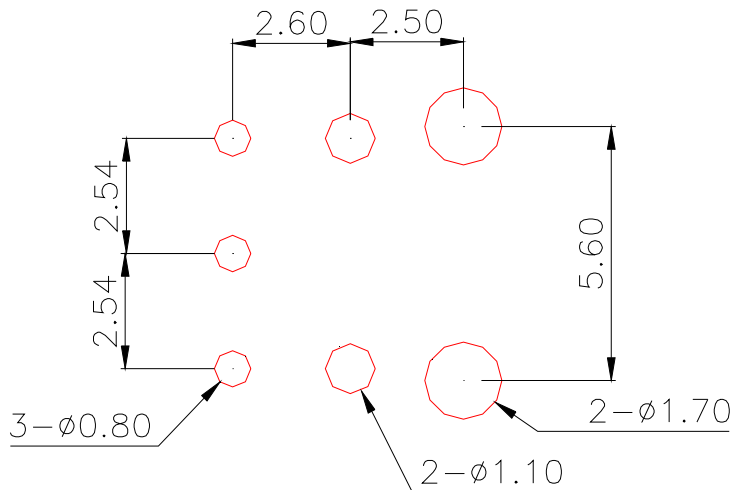
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## PCB Layout For Electrical Circuit



### Notes:

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

### Precautions for Using Method

1. Connect a by-pass capacitor (0.1  $\mu$ F) close to the FCR684208T within 7 mm of the unit lead frame.
2. Take proper electrostatic-discharge (ESD) precautions while handling these devices.  
These devices are sensitive to ESD.
4. Please follow the conditions described in the diagram below.



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7 V must not be exceeded

