

**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 : FCR684215R

DATE : 23-10-2024

VERSION : 1.0

DEVICE NO. : ORJ-10 (OPTICAL RECEIVER JACK)



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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. FCR684215R has a maximum operating speed of 16 Mbps.

### Applications

- Amplifier
- Audio equipment
- Digital optical data link
- Sound Card

### Device Selection Guide

| Chip        |                    | Operating Voltage (Vcc) | Dissipation Current(mA) | Fiber Coupling Light Output (dBm) |      |       |
|-------------|--------------------|-------------------------|-------------------------|-----------------------------------|------|-------|
| IC Material | PD $\lambda$ p(nm) |                         |                         | Min.                              | Typ. | Max.  |
| Si          | 660                | +3~5V                   | 2.5                     | -24                               | -    | -14.5 |

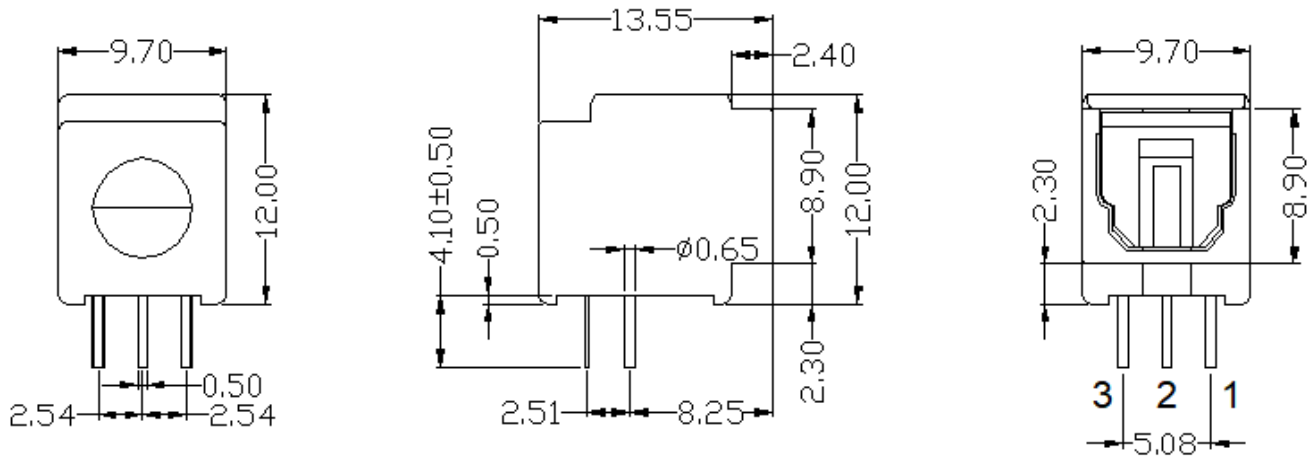
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### Package Dimensions



### Shutter Black

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

2.General Tolerance: $\pm 0.2$ mm

### Pin Function

1. Vout      2. GND      3. Vcc

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

| Parameter             | Symbol | Rating    | Unit |
|-----------------------|--------|-----------|------|
| Supply Voltage        | Vcc    | 0~5.5     | V    |
| Storage Temperature   | Tstg   | -30 to 80 | °C   |
| Operating Temperature | Topr   | -20 to 70 | °C   |
| Soldering Temperature | Tsol   | 260*      | °C   |

\* Soldering time  $\leq 5$ s / 2 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                | V <sub>cc</sub>  | -                 | 2.7  | -    | 5.5   | V    |
| Peak Detective Wavelength        | $\lambda_p$      | -                 | -    | 660  | -     | 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                | P <sub>i</sub>   | *1                | -24  | -    | -14.5 | dBm  |
| Dissipation Current              | I <sub>cc</sub>  | *2                | -    | 2.5  | 10    | mA   |
| High Level Output Voltage        | V <sub>OH</sub>  |                   | 2.4  | -    | -     | v    |
| Low Level Output Voltage         | V <sub>OL</sub>  |                   | -    | -    | 0.4   | v    |
| Rise Time                        | t <sub>r</sub>   | *3                | -    | -    | 25    | ns   |
| Fall Time                        | t <sub>f</sub>   | *3                | -    | -    | 25    | 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 time                      | $\Delta t_j$     | *3                | -    | 1.5  | 10    | ns   |

FCR684215R light receiving unit satisfies EIAJ CP-1201 digital audio interface standard.

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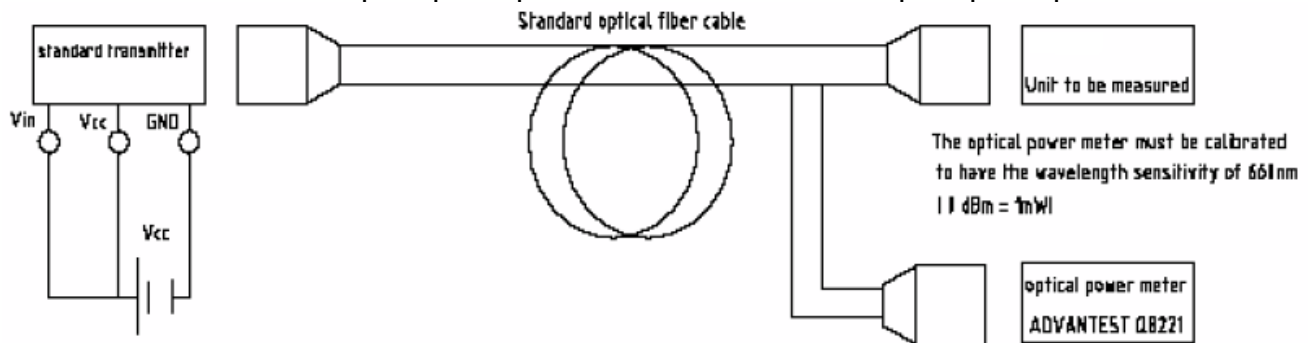
Tel: 01737-771375 Fax: 01737-766012 Website: [www.cliffuk.co.uk](http://www.cliffuk.co.uk)**Reliability Test Items**

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

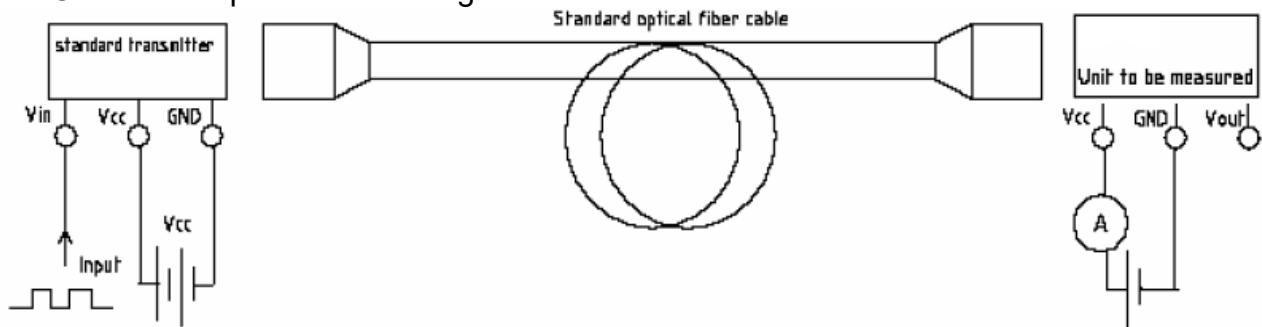
I<sub>cc</sub> (dissipation current): CURRENT ATTENUATE DIFFERENCE < 20%T<sub>PLH</sub> (propagation L → H delay time): DELAY TIME DIFFERENCE < 20%T<sub>PHL</sub> (propagation H → L delay time): DELAY TIME DIFFERENCE < 20%T<sub>r</sub> (rise time): TIME DIFFERENCE < 20%T<sub>f</sub> (fall time): TIME DIFFERENCE < 20%

## Measuring Method

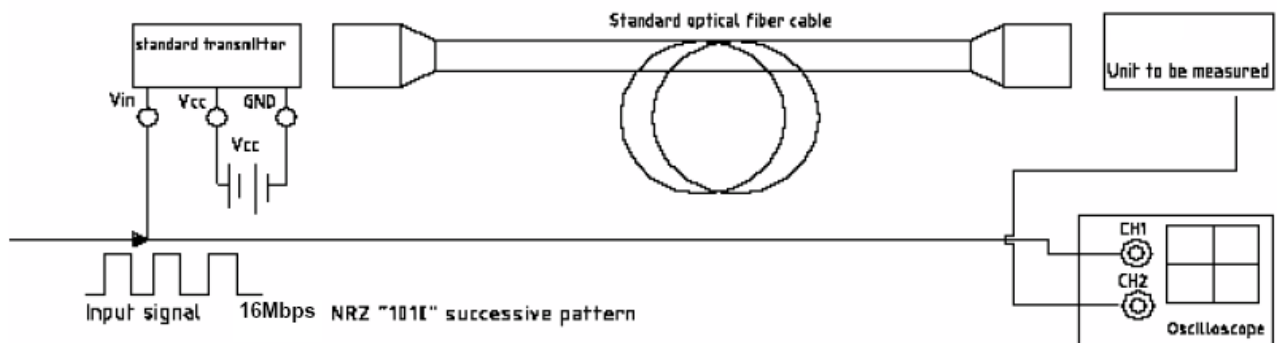
### \*1 Maximum receiver input optical power/Minimum receiver input optical power



### \*2 Current dissipation measuring method



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



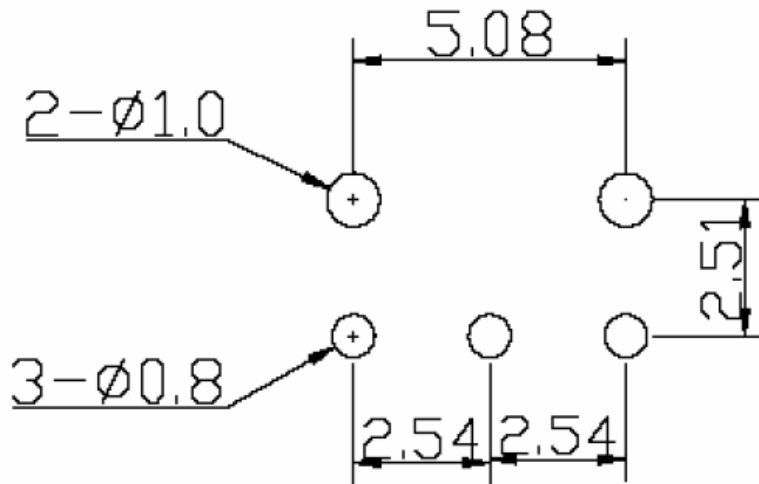
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### PCB Layout For Electrical Circuit



#### 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 FCR684215R 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.

