



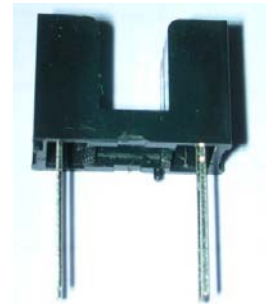
# Technical Data Sheet

## Opto Interrupter

### ITR9606

#### ■ Features

- Fast response time
- High analytic
- Cut-off visible wavelength  $\lambda_p=940\text{nm}$
- High sensitivity
- Pb free
- The product itself will remain within RoHS compliant version.



#### ■ Descriptions

The **ITR9606** consist of an infrared emitting diode and an NPN silicon phototransistor, encased side-by-side on converging optical axis in a black Thermoplastic

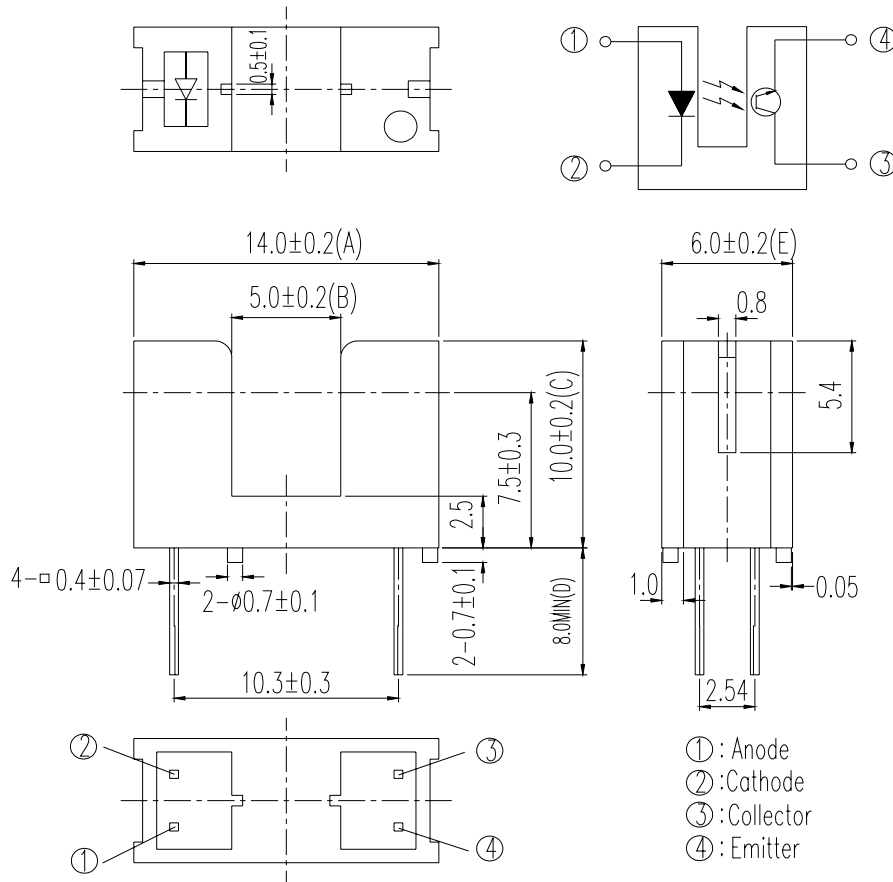
Housing The phototransistor receives radiation from the IRED only .This is the normal Situation. But when an object is in between , phototransistor could not receives the radiation. For additional component information , please refer to IR928-6C and PT928-6C

#### ■ Applications

- Mouse Copier
- Switch Scanner
- Floppy disk driver
- Non-contact Switching
- For Direct Board

#### ■ Device Selection Guide

| Device No. | Chip Material | LENS COLOR  |
|------------|---------------|-------------|
| IR928-6C   | GaAlAs        | Water clear |
| PT928-6C   | Silicon       | Water clear |

**Package Dimensions**

**Notes:**

1. All dimensions are in millimeters
2. Tolerances unless dimensions  $\pm 0.2$  mm
3. Lead spacing is measured where the lead emerge from the package
4. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification
5. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT's consent
6. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.

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

| Parameter  |  | Symbol             | Ratings | Unit |
|--|--|--------------------|---------|------|
| Input  | Power Dissipation at(or below) 25°C Free Air Temperature         | Pd                 | 100     | mW   |
|  | Reverse Voltage  | V <sub>R</sub>     | 5       | V    |
|  | Forward Current  | I <sub>F</sub>     | 50      | mA   |
|  | Peak Forward Current (*1)<br>Pulse width ≤ 100 μs, Duty cycle=1% | I <sub>FP</sub>    | 1       | A    |
|  | Collector Power Dissipation                                      | P <sub>C</sub>     | 75      | mW   |
| Output   | Collector Current  | I <sub>C</sub>     | 50      | mA   |
|  | Collector-Emitter Voltage  | B V <sub>CEO</sub> | 30      | V    |
|  | Emitter-Collector Voltage  | B V <sub>ECO</sub> | 5       | V    |
|  | Operating Temperature  | Topr               | -25~+85 | °C   |
| Storage Temperature  |  | Tstg               | -40~+85 | °C   |
| Lead Soldering Temperature (*2)<br>(1/16 inch form body for 5 seconds) |  | Tsol               | 260     | °C   |

(\*1)  $t_w=100 \mu \text{sec.}$ ,  $T=10 \text{msec.}$  (\*2)  $t=5 \text{Sec}$

**Electro-Optical Characteristics (Ta=25°C)**

| Parameter                |                        | Symbol               | Min. | Typ. | Max. | Unit | Conditions                                   |
|--------------------------|------------------------|----------------------|------|------|------|------|--|
| Input                    | Forward Voltage        | V <sub>F1</sub>      | ---  | 1.2  | 1.6  | V    | I <sub>F</sub> =20mA                         |
|                          |                        | V <sub>F2</sub>      | ---  | 1.4  | 1.85 |      | I <sub>F</sub> =100mA, tp=100 μs, tp/T=0.01  |
|                          |                        | V <sub>F3</sub>      | ---  | 2.6  | 4.0  |      | I <sub>F</sub> =1A, tp=100 μs, tp/T=0.01     |
|                          | Reverse Current        | I <sub>R</sub>       | ---  | ---  | 10   | μA   | V <sub>R</sub> =5V                           |
|                          | Peak Wavelength        | λ <sub>p</sub>       | ---  | 940  | ---  | nm   | I <sub>F</sub> =20mA                         |
|                          | View Angle             | 2θ1/2                | ---  | 60   | ---  | Deg  | I <sub>F</sub> =20mA                         |
| Output                   | Dark Current           | I <sub>CEO</sub>     | ---  | ---  | 100  | nA   | V <sub>CE</sub> =20V, Ee=0mW/cm <sup>2</sup> |
|                          | C-E Saturation Voltage | V <sub>CE(sat)</sub> | ---  | ---  | 0.4  | V    | I <sub>C</sub> =2mA, Ee=1mW/cm <sup>2</sup>  |
| Transfer Characteristics | Collect Current        | I <sub>C(ON)</sub>   | 0.5  | ---  | 10   | mA   | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA    |
|                          | Rise time              | t <sub>r</sub>       | ---  | 15   | ---  | μsec | V <sub>CE</sub> =5V                          |
|                          | Fall time              | t <sub>f</sub>       | ---  | 15   | ---  | μsec | I <sub>C</sub> =1mA, R <sub>L</sub> =1KΩ     |

**Typical Electrical/Optical/Characteristics Curves for IR**

Fig.1 Forward Current vs.

Ambient Temperature

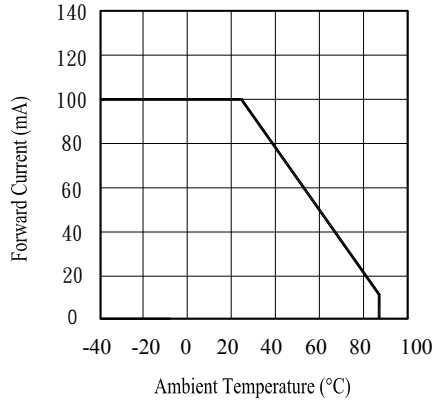


Fig.2 Spectral Distribution

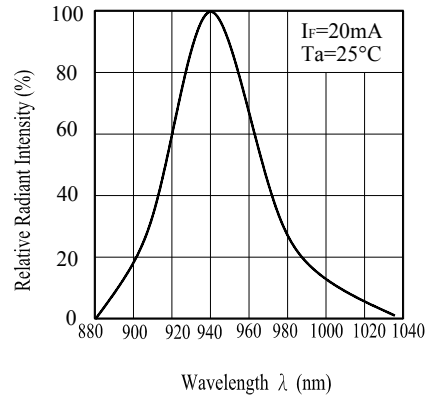


Fig.5 Relative Intensity vs.

Forward Current

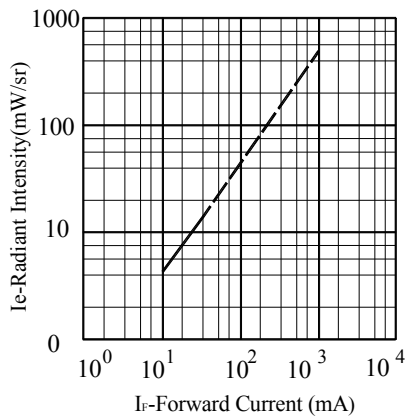


Fig.6 Relative Radiant Intensity vs.

Angular Displacement

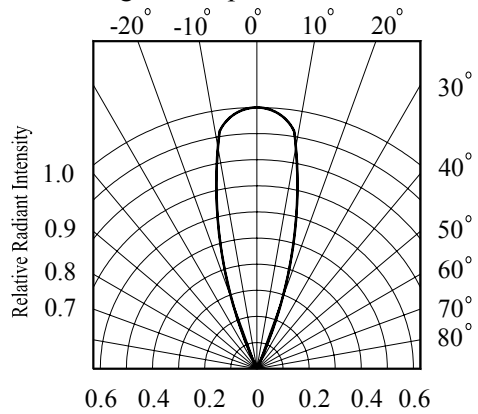


Fig.7 Relative Intensity vs.

Ambient Temperature(°C)

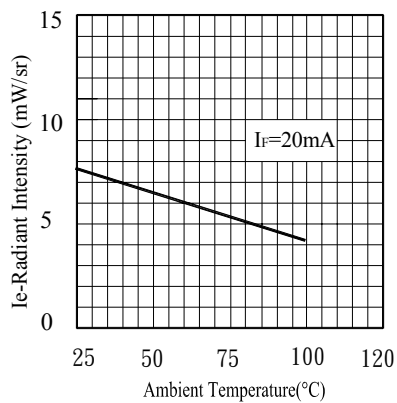
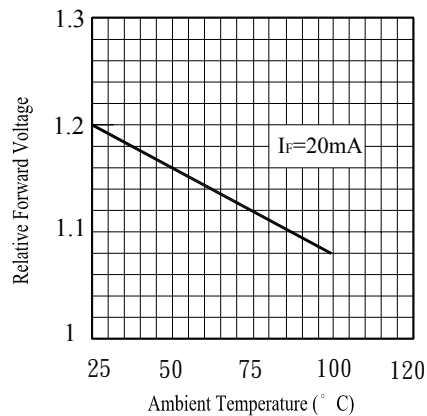


Fig.8 Forward Current vs.

Ambient Temperature(°C)



**Typical Electrical/Optical/Characteristics Curves for PT**

Fig.1 Collector Power Dissipation vs. Ambient Temperature

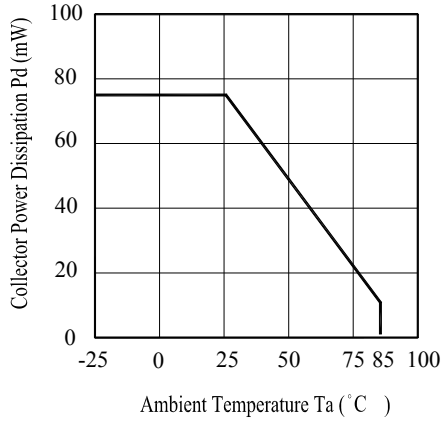


Fig.2 Spectral Sensitivity

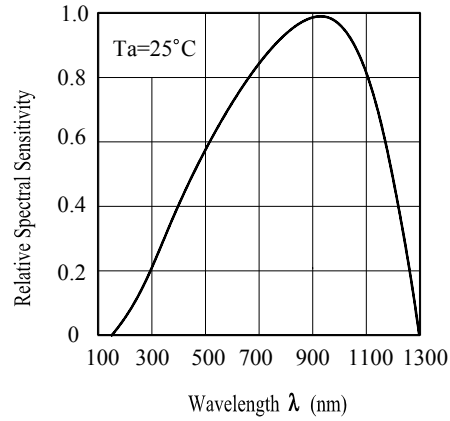


Fig.3 Relative Collector Current vs. Ambient Temperature

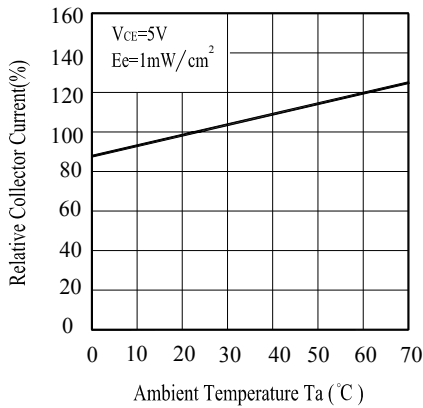


Fig.4 Collector Current vs. Irradiance

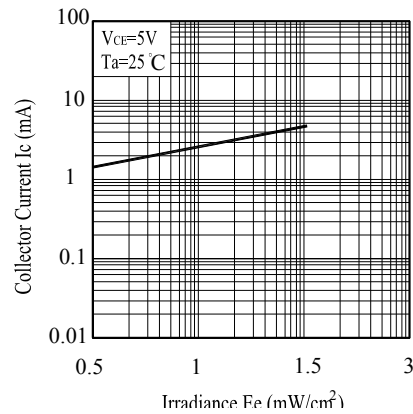


Fig.5 Collector Dark Current vs. Ambient Temperature

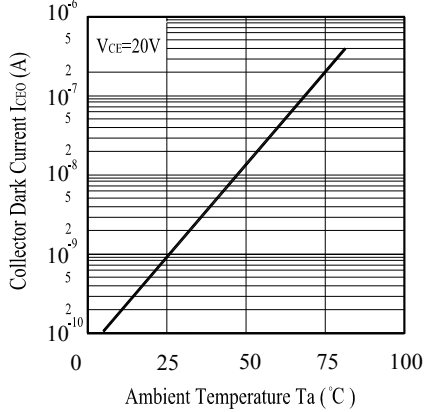
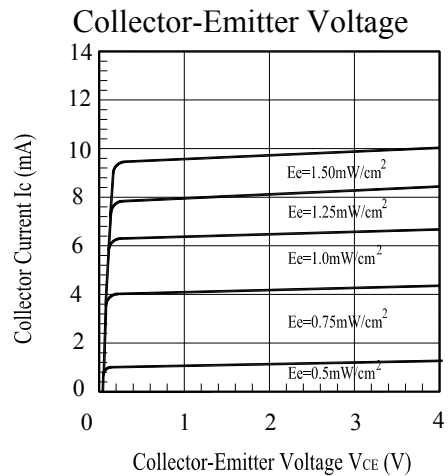


Fig.6 Collector Current vs. Collector-Emitter Voltage



**Reliability Test Item And Condition**

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

| NO. | Item                             | Test Condition  | Test Hours/<br>Cycle | Sample Size | Failure Judgement Criteria  | Ac/Re |
|-----|----------------------------------|---|----------------------|-------------|---|-------|
| 1   | Solder Heat                      | TEMP : 260°C ± 5 °C   | 5 sec                | 22 PCs      | More than 90% of lead to be covered by soldering<br><br>$I_R \geq U \times 2$<br>$E_e \leq L \times 0.8$<br>$V_F \geq U \times 1.2$<br><br>U : Upper specification limit<br>L : Lower specification limit | 0/1   |
| 2   | Temperature Cycle                | H : +100°C    15 mins<br>$\updownarrow$<br>5 min<br>$\updownarrow$<br>L : -40°C    15 min | 300 cycle            | 22 PCs      |   | 0/1   |
| 3   | Thermal Shock                    | H : +100°C    5 min<br>$\updownarrow$<br>10 sec<br>$\updownarrow$<br>L : -10°C    5 min   | 300 cycle            | 22 PCs      |   | 0/1   |
| 4   | High Temperature Storage         | TEMP. : +100°C  | 1000 hrs             | 22 PCs      |   | 0/1   |
| 5   | Low Temperature Storage          | TEMP. : -40°C   | 1000 hrs             | 22 PCs      |   | 0/1   |
| 6   | DC Operating Life                | $V_{CE}=5V$<br>$I_F=20mA$   | 1000 hrs             | 22 PCs      |   | 0/1   |
| 7   | High Temperature / High Humidity | 85°C / 85% R.H.   | 1000 hrs             | 22 PCs      |   | 0/1   |

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