

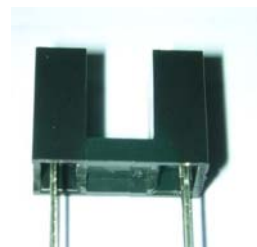
# Technical Data Sheet

## Opto Interrupter

### ITR9608-F

#### Features

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



#### Descriptions

The **ITR9608-F** 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 IR only .This is the normal situation. But when an object is between the IR and PT, phototransistor could not receives the radiation. For additional component information, please refer to IR and PT.

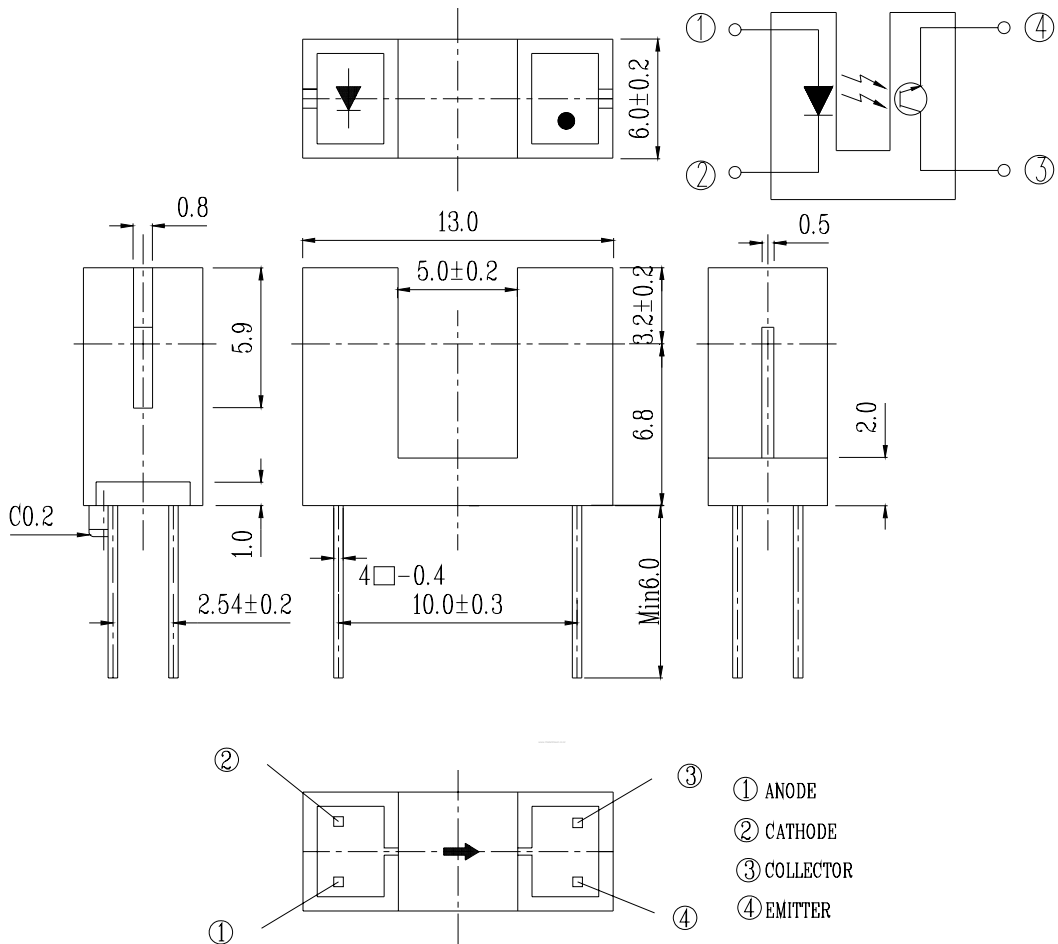
#### Applications

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

#### Device Selection Guide

| Device No. | Chip Material | LENS COLOR  |
|------------|---------------|-------------|
| IR         | GaAlAs        | Water clear |
| PT         | Silicon       | Water clear |

## ■ Package Dimensions



- 1.All dimensions are in millimeters
- 2.Tolerances unless dimensions  $\pm 0.25\text{mm}$
- 3.Lead spacing is measured where the lead emerge from the package

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

| Parameter                                                              |                                                                  | Symbol             | Ratings  | Unit |
|------------------------------------------------------------------------|------------------------------------------------------------------|--------------------|----------|------|
| Input                                                                  | Power Dissipation at(or below) 25°C Free Air Temperature         | Pd                 | 75       | 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    |
| Output                                                                 | Collector Power Dissipation                                      | P <sub>C</sub>     | 75       | mW   |
|                                                                        | Collector Current                                                | I <sub>C</sub>     | 20       | 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~+100 | °C   |
| Lead Soldering Temperature (*2)<br>(1/16 inch form body for 5 seconds) |                                                                  | Tsol               | 260      | °C   |

(\*1) tw=100 μsec., T=10 msec. (\*2) t=5 Sec

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

| Parameter                |                        | Symbol               | Min. | Typ. | Max. | Unit | Conditions                                                        |
|--------------------------|------------------------|----------------------|------|------|------|------|-------------------------------------------------------------------|
| Input                    | Forward Voltage        | V <sub>F</sub>       | ---  | 1.2  | 1.5  | V    | I <sub>F</sub> =20mA                                              |
|                          | 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                | ---  | 40   | ---  | 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<br>Ee=1mW/cm <sup>2</sup>                     |
| Transfer Characteristics | Collect Current        | I <sub>C(ON)</sub>   | 0.5  | ---  | ---  | mA   | V <sub>CE</sub> =5V<br>I <sub>F</sub> =20mA                       |
|                          | Rise time              | t <sub>r</sub>       | ---  | 15   | ---  | μsec | V <sub>CE</sub> =5V<br>I <sub>C</sub> =1mA<br>R <sub>L</sub> =1KΩ |
|                          | Fall time              | t <sub>f</sub>       | ---  | 15   | ---  | μsec |                                                                   |

## Typical Electrical-Optical Characteristics Curves for IR

Fig.1 Forward Current vs.

Ambient Temperature

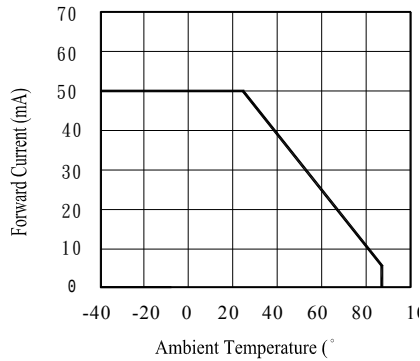


Fig.2 Spectral Distribution

Wavelength

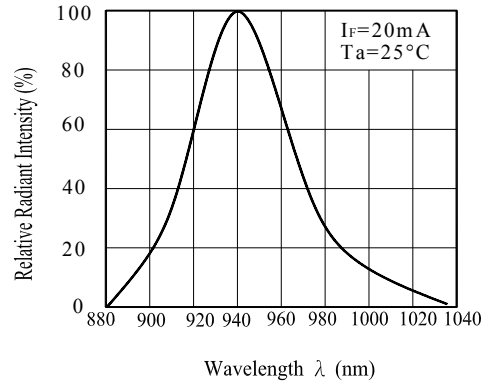


Fig.3 I<sub>e</sub>-Radiant Intensity vs.

I<sub>F</sub>- Forward Current

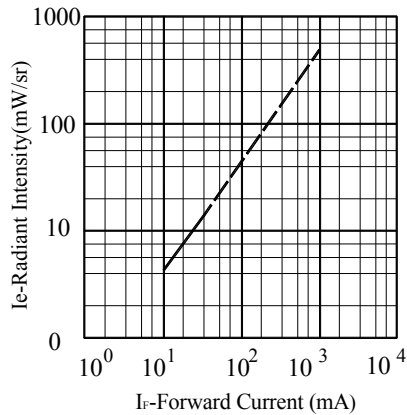


Fig.4 Relative Radiant Intensity vs.

Angular Displacement

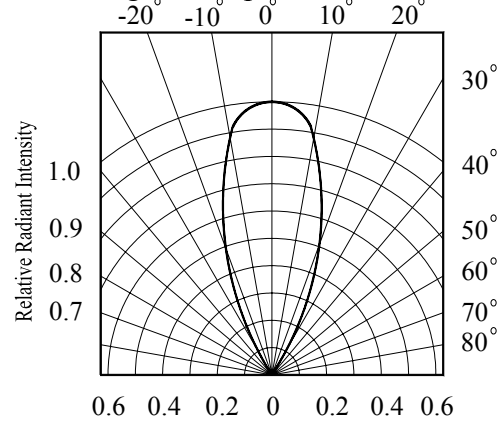


Fig.5 I<sub>e</sub>-Radiant Intensity vs.

Ambient Temperature(°C)

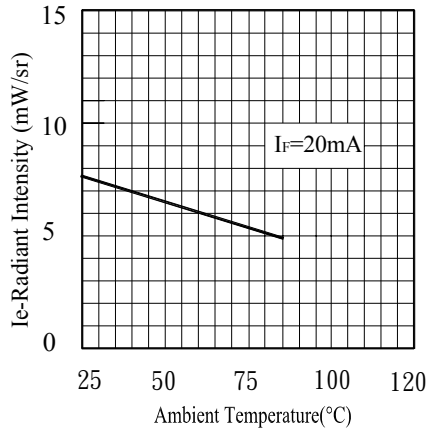
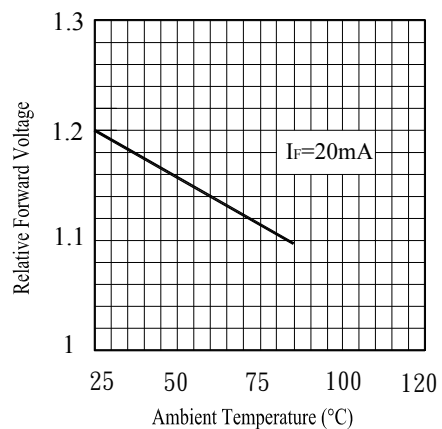


Fig.6 Relative Forward Voltage vs.

Ambient Temperature(°C)



## Typical Electrical-Optical Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

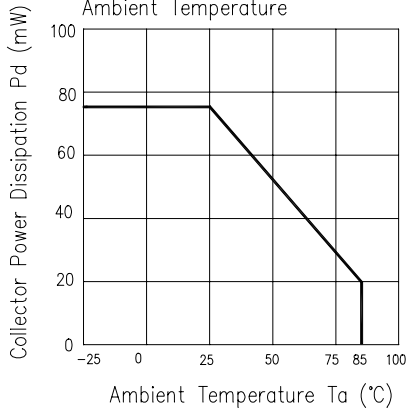


Fig.2 Collector Dark Current vs. Ambient Temperature

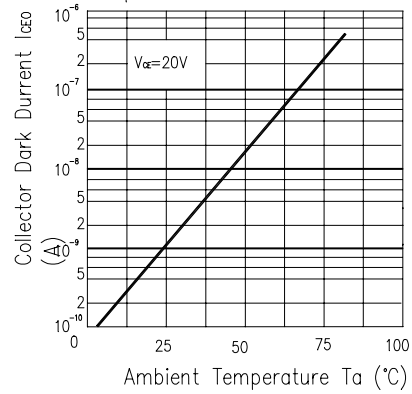


Fig.3 Relative Collector Current vs. Ambient Temperature

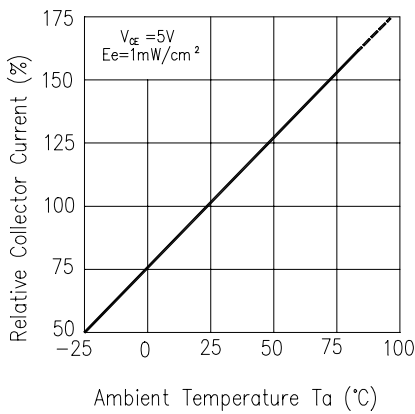


Fig.4 Collector Current vs. Irradiance

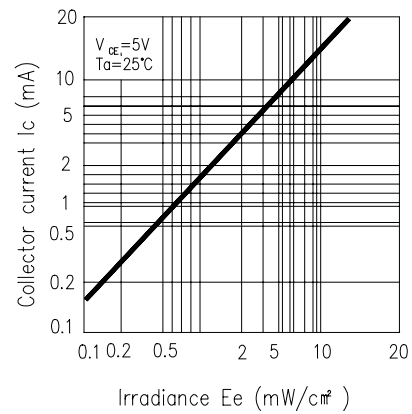


Fig.5 Spectral Sensitivity

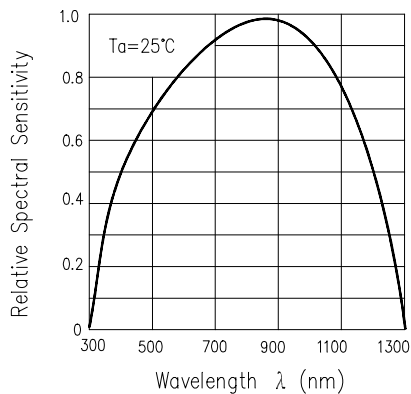
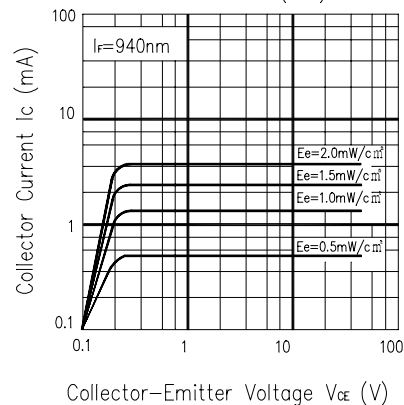


Fig.6 Collector Current vs. Collector Current Ic (mA)



## ■ 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                                    | 10sec                | 22 PCs      | Attenuation of Light Current value>20% | 0/1   |
| 2   | Temperature Cycle                | H : +100°C 15 mins<br>↕<br>5 min<br>L : -40°C 15 mins | 300 cycle            | 22 PCs      |                                        | 0/1   |
| 3   | Thermal Shock                    | H : +100°C 5 min<br>↕<br>10 sec<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 <sub>CE</sub> =5V<br>I <sub>F</sub> =20mA           | 1000 hrs             | 22 PCs      |                                        | 0/1   |
| 7   | High Temperature / High Humidity | 85°C / 85% R.H.                                       | 1000 hrs             | 22 PCs      |                                        | 0/1   |

## Packing Quantity Specification

38Pcs/Tube,100Tubes/Box,4Boxes/Carton

## Label Form Specification

|                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  | <b>EVERLIGHT</b>                                                                  |  |
| CPN:<br>P/N:                                                                      |                                                                                   |                                                                                   |
|  |  |                                                                                   |
| <b>ITR9608-F</b>                                                                  |                                                                                   |                                                                                   |
| QTY:                                                                              | CAT:                                                                              |                                                                                   |
|  | HUE:                                                                              |                                                                                   |
| LOT NO:                                                                           | REF:                                                                              |                                                                                   |
|  |                                                                                   |                                                                                   |
| Reference                                                                         |                                                                                   |                                                                                   |
|  |                                                                                   |                                                                                   |

CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: Peak Wavelength

REF: Reference

LOT No: Lot Number

X: Month

Reference: Identify Label Number

## Notes

- 1.All dimensions are in millimeters
- 2.Tolerances unless dimensions  $\pm 0.25\text{mm}$
- 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.

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