

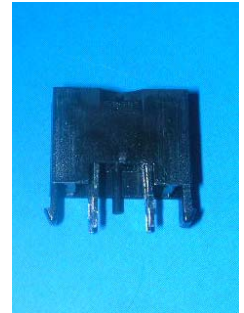
# Technical Data Sheet

## Opto Interrupter

### ITR20002-A

#### ■ Features

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



#### ■ Descriptions

The **ITR20002-A** 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 reflecting object close to ITR , phototransistor receives the reflecting radiation .For additional component information, please refer to IR4204-10 and PT4204-6B/H26.

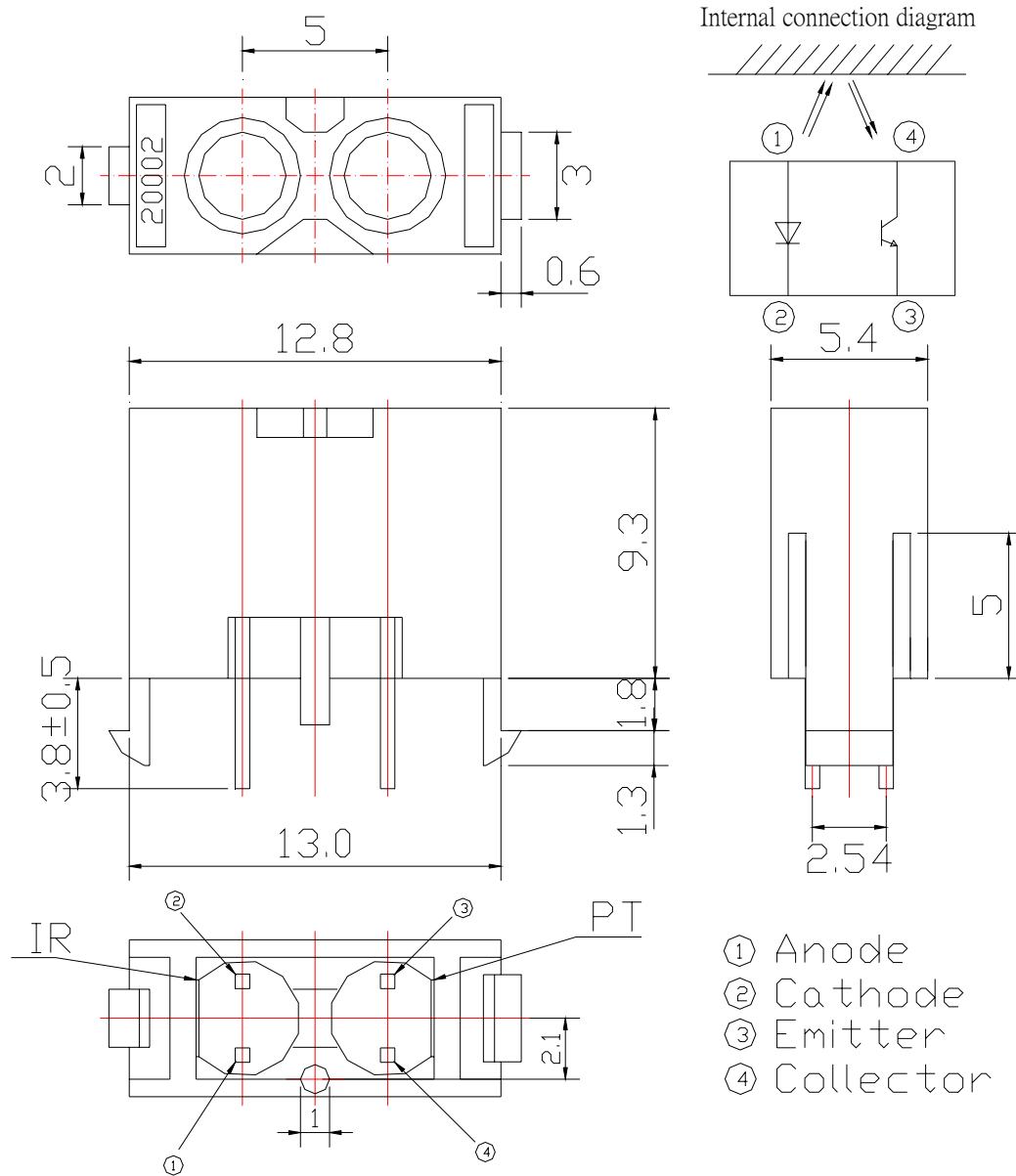
#### ■ Applications

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

#### ■ Device Selection Guide

| Device No.    | Chip Material | LENS COLOR |
|---------------|---------------|------------|
| IR4204-10     | GaAlAs        | Blue       |
| PT4204-6B/H26 | Silicon       | Black      |

## Package Dimensions



1.All dimensions are in millimeters

2.Tolerances unless dimensions  $\pm 0.3\text{mm}$

3.Lead spacing is measured where the lead emerge from the package

## ITR20002-A

### 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                                                  |                                                                  | T <sub>opr</sub>   | -40~+85 | °C   |
| Storage Temperature                                                    |                                                                  | T <sub>stg</sub>   | -40~+85 | °C   |
| Lead Soldering Temperature (*2)<br>(1/16 inch form body for 5 seconds) |                                                                  | T <sub>sol</sub>   | 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 | Condition                                                             |
|-----------------------|------------------------|----------------------|------|------|------|------|-----------------------------------------------------------------------|
| 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             | 2θ 1/2               | -    | 35   | -    | 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> =0.04mA, I <sub>F</sub> =40mA                          |
| Collector Current(*3) |                        | I <sub>C(ON)</sub>   | 150  | -    | -    | μA   | V <sub>CE</sub> =5V, I <sub>F</sub> =20mA                             |
|                       |                        | I <sub>C(OFF)</sub>  | -    | -    | 30   |      |                                                                       |
| Response Time         | Rise Time              | t <sub>R</sub>       | -    | 15   | -    | μs   | V <sub>CE</sub> =5V, I <sub>C</sub> =100 μA<br>, R <sub>L</sub> =100Ω |
|                       | Fall Time              | t <sub>F</sub>       | -    | 15   | -    | μs   |                                                                       |

(\*3) I<sub>C(on)</sub> at the testing condition—with reflector in 6mm away,

I<sub>C(off)</sub> at the testing condition—without reflector and external light less than 10 Lux at the module surface.

# Typical Electrical/Optical/Characteristics Curves for IR

Fig. 1 Forward Current vs. Ambient Temperature

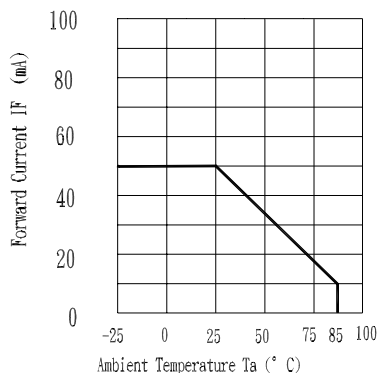


Fig. 2 Spectral Distribution

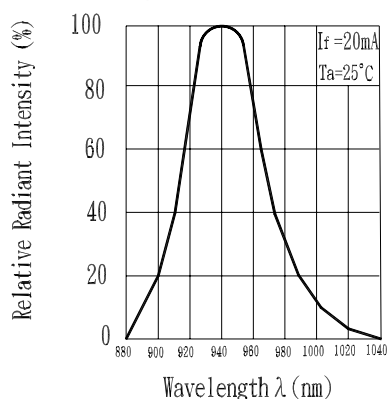


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

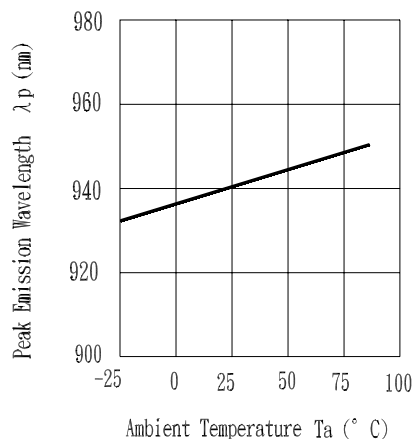


Fig. 4 Forward Current vs. Forward Voltage

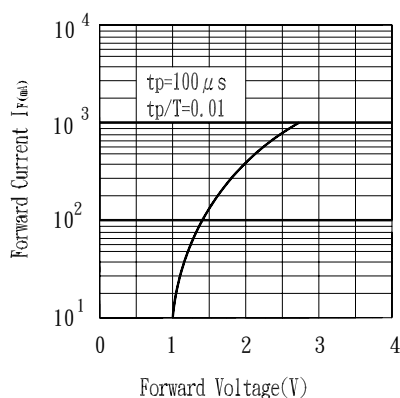


Fig. 5 Relative Intensity vs. Forward Current

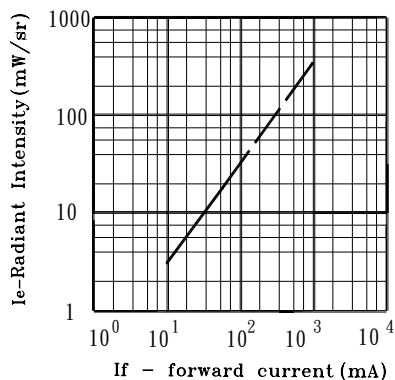
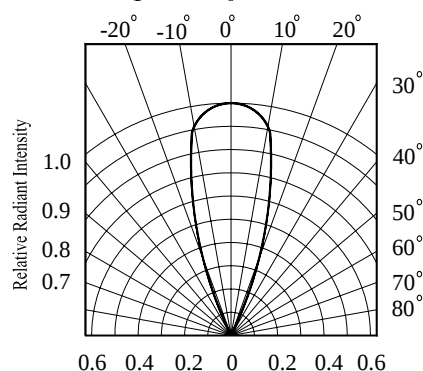


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



Typical Electrical/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

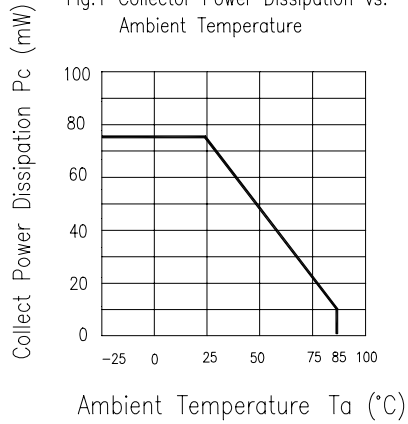


Fig.2 Collector Dark Current vs. Ambient Temperature

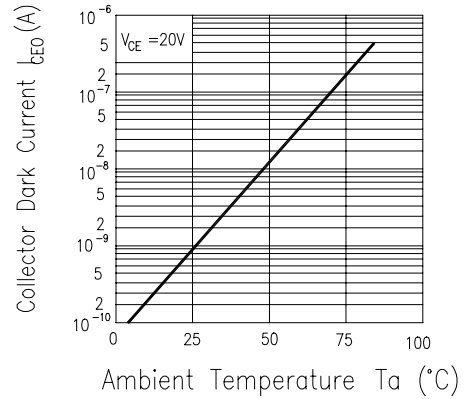


Fig. 3 Relative Collector Current vs. Ambient Temperature

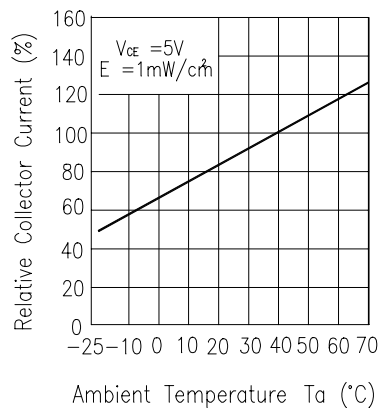


Fig.4 Collector Current vs. Irradiance

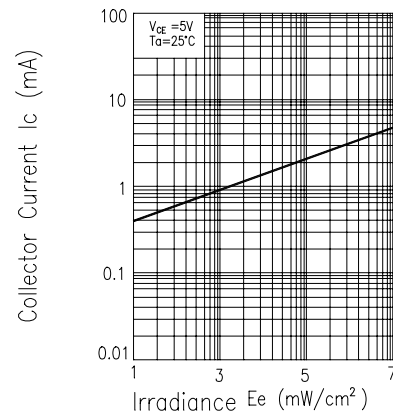


Fig.5 Spectral Sensitivity

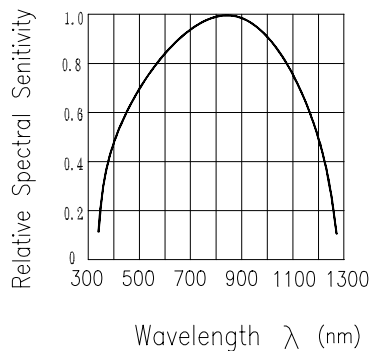
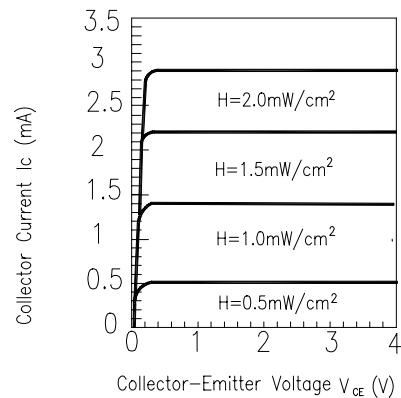


Fig.6 Collector Current vs. Collector-Emitter Voltage



### 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      | $I_{c(on)} \leq L \times 0.8$<br><br>L :Lower specification limit | 0/1   |
| 2   | Temperature Cycle                | H : +100°C    15 mins<br>↕<br>5 min<br>L : -40°C    15 min | 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                | $V_{CE}=5V$<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   |



## ITR20002-A

### Packing Quantity Specification

- 1.150PCS/1Bag, 5Bag/1Box
2. 10Boxes/1Carton

### Label Form Specification



CPN: Customer's Production Number  
P/N : Production Number  
QTY: Packing Quantity  
CAT: Ranks  
HUE: Peak Wavelength  
REF: Reference  
LOT No: Lot Number

### Notes

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**EVERLIGHT ELECTRONICS CO., LTD.**

Office: No 25, Lane 76, Sec 3, Chung Yang Rd,  
Tucheng, Taipei 236, Taiwan, R.O.C

Tel: 886-2-2267-2000, 2267-9936

Fax: 886-2267-6244, 2267-6189, 2267-6306

<http://www.everlight.com>