

## Technical Data Sheet

### OPTO INTERRUPTER ITR

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**ITR9904**

#### ■ Features

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



#### ■ Descriptions

The **ITR9904** consists of an infrared emitting diode and an NPN silicon phototransistor, encased oblique angle (45°) on converging optical axis in a black Thermo-plastic housing. The phototransistor receives radiation from the IRED only, and avoids the noise from ambient light.

#### ■ Applications

- Copier
- Scanner
- Non-contact Switching
- For Direct PC Board

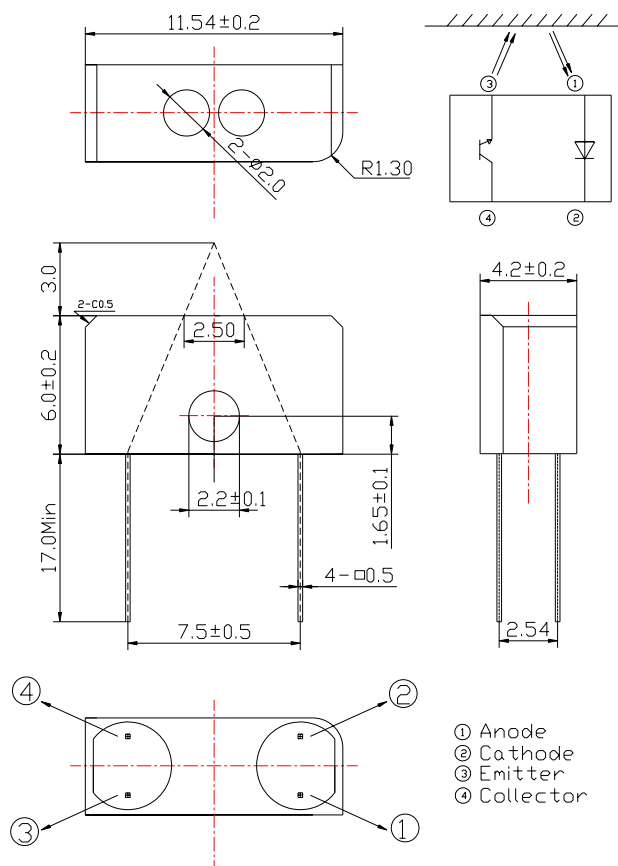
#### ■ Device Selection Guide

| Device No. | Chip Material | LENS COLOR |
|------------|---------------|------------|
| IR1254-R8  | GaAs          | Blue       |
| PT1254-6B  | Silicon       | Black      |

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**ITR9904**

## Package Dimensions



## Notes:

1. All dimensions are in millimeter.
2. General tolerance:  $\pm 0.2 \text{ mm}$
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 copy right 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. EVERIGHT assumes noonsibility 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.

**Technical Data Sheet**  
**OPTO INTERRUPTER ITR****ITR9904****■ Absolute Maximum Ratings (Ta=25°C)**

| Parameter                 |                           | Symbol    | Rating  | Unit |
|---------------------------|---------------------------|-----------|---------|------|
| Input                     | Power Dissipation         | $P_D$     | 75      | mW   |
|                           | Reverse Voltage           | $V_R$     | 5       | V    |
|                           | Forward Current           | $I_F$     | 50      | mA   |
|                           | Peak Forward Current(*1)  | $I_{FP}$  | 1.0     | A    |
| Output                    | Collect Power Dissipation | $P_C$     | 75      | mW   |
|                           | Collect Current           | $I_C$     | 20      | mA   |
|                           | Collector-Emitter Voltage | $V_{CE}$  | 30      | V    |
|                           | Emitter-Collector Voltage | $V_{EC}$  | 5       | V    |
| Operating Temperature     |                           | $T_{opr}$ | -25~+85 | °C   |
| Storage Temperature       |                           | $T_{stg}$ | -40~+85 | °C   |
| Soldering Temperature(*2) |                           | $T_{sol}$ | 260     | °C   |

(\*1) Pause width= 100  $\mu$  s, Duty Cycle=1%

(\*2) t=5 secs\_



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Electro-Optical Characteristics (Ta=25°C)

| Parameter       |                        | Symbol          | Min. | Typ. | Max. | Unit    | Condition                          |
|-----------------|------------------------|-----------------|------|------|------|---------|------------------------------------|
| Input           | Forward Voltage        | $V_{F1}$        | -    | 1.2  | 1.5  | V       | $I_F=20mA$                         |
|                 |                        | $V_{F2}$        | -    | 1.4  | 1.85 |         | $I_F=100mA$                        |
|                 |                        | $V_{F3}$        | -    | 2.6  | 4.0  |         | $I_F=1A$                           |
|                 | Reverse Current        | $I_R$           | -    | -    | 10   | $\mu A$ | $V_R=5V$                           |
|                 | Peak Wavelength        | $\lambda_P$     | -    | 940  | -    | nm      | ---                                |
|                 | View Angle             | $2\theta_{1/2}$ | -    | 35   | -    | Deg     | $I_F=20mA$                         |
| Output          | Dark Current           | $I_{CEO}$       | -    | -    | 100  | nA      | $V_{CE}=20V, E_e=0mW/cm^2$         |
|                 | C-E Saturation Voltage | $V_{CE(sat)}$   | -    | -    | 0.4  | V       | $I_C=2mA, I_B=0.1mA$               |
| Collect Current |                        | $I_{C(ON)A}$    | 100  | -    | 300  | $\mu A$ | $V_{CE}=5V, I_F=20mA$              |
|                 |                        | $I_{C(ON)B}$    | 200  | -    | 600  |         |                                    |
|                 |                        | $I_{C(ON)C}$    | 400  | -    | 1200 |         |                                    |
| Response Time   | Rise Time              | $t_R$           | -    | 15   | -    | $\mu S$ | $V_{CE}=2V, I_C=1mA, R_L=1K\Omega$ |
|                 | Fall Time              | $t_F$           | -    | 15   | -    | $\mu S$ |                                    |

# Technical Data Sheet

## OPTO INTERRUPTER ITR

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

Fig. 1 Forward Current vs. Ambient Temperature

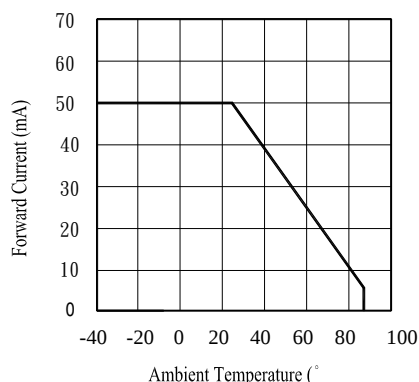


Fig. 2 Spectral Distribution

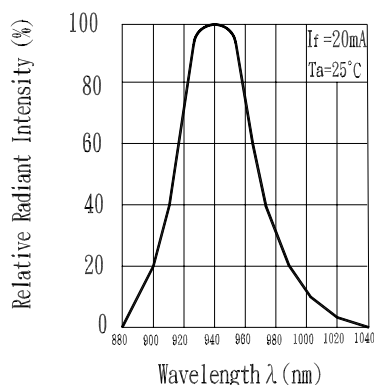


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

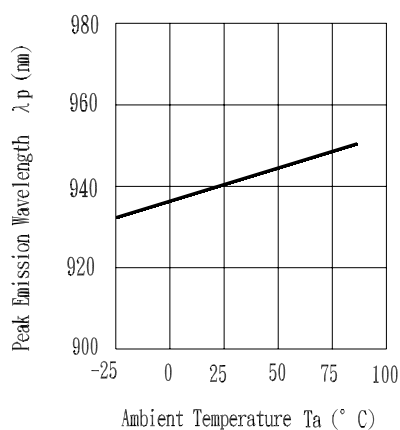


Fig. 4 Forward Current vs. Forward Voltage

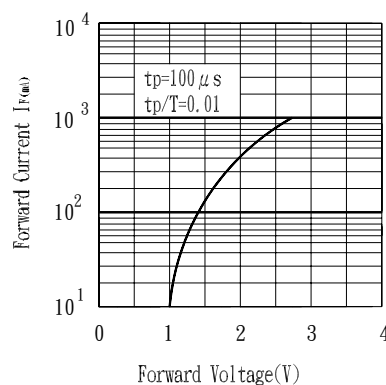


Fig. 5 Relative Intensity vs. Forward Current

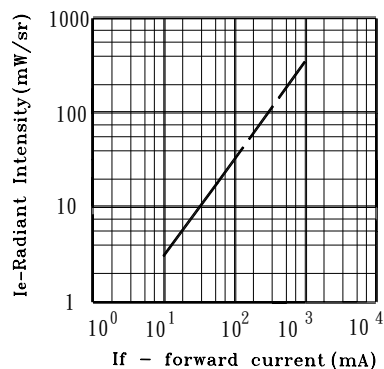
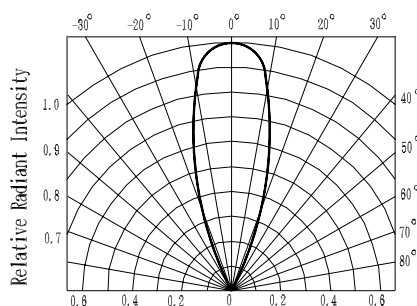


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



# Technical Data Sheet

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

Fig.1 Collector Power Dissipation vs. Ambient Temperature

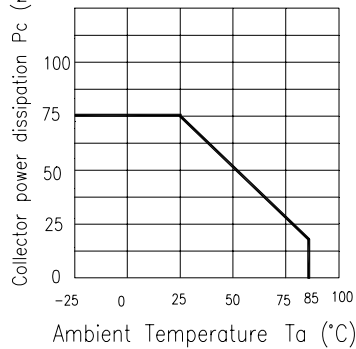


Fig.2 Collector Dark Current vs. Ambient Temperature

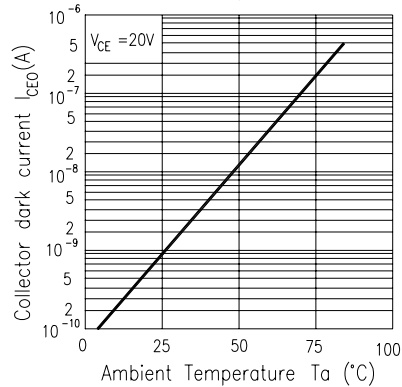


Fig. 3 Relative Collector Current vs. Ambient Temperature

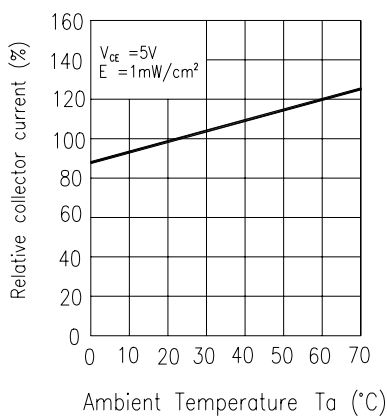


Fig.4 Collector Current vs. Irradiance

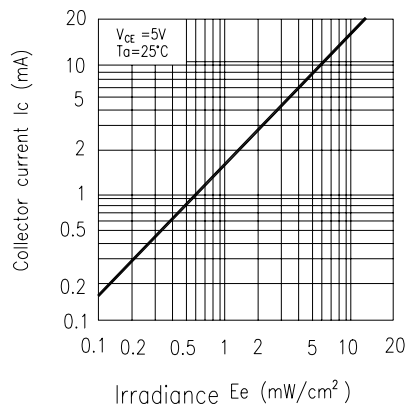


Fig.5 Spectral Sensitivity

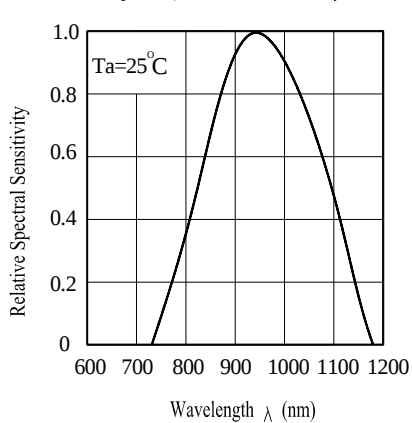
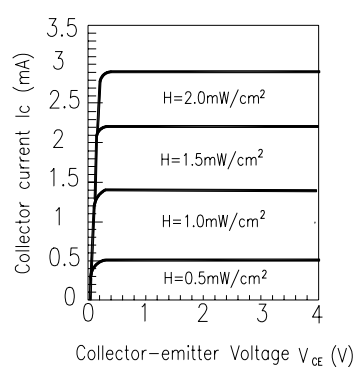


Fig.6 Collector Current vs. Collector-emitter Voltage



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### Reliability Test Item And Condition

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

Confidence level : 90%

LTPD : 10%

| NO. |                                  |                                                          | Test Hours/<br>Cycle | Sample Size | Failure Judgement Criteria                                         | Ac/Re |
|-----|----------------------------------|----------------------------------------------------------|----------------------|-------------|--------------------------------------------------------------------|-------|
| 1   | Solder Heat                      | TEMP : 260°C ± 5 °C                                      | 10 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 min<br>↑<br>5 min<br>↓<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>↓<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 IF=20mA                              | 1000 hrs             | 22 PCs      |                                                                    | 0/1   |
| 7   | High Temperature / High Humidity | 85°C / 85% R.H.                                          | 1000 hrs             | 22 PCs      |                                                                    | 0/1   |



## Technical Data Sheet OPTO INTERRUPTER ITR

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### ■ Packing Quantity Specification

150 pcs/1bag , 5 bags/1box , 10 boxes/1carton

### ■ Label Form Specification

EVERLIGHT

CPN:

P/N:



ITR9904

QTY:



LOT NO:

CAT:

HUE:

REF:

CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: Peak Wavelength

REF: Reference

LOT No: Lot Number



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