# Technical Data Sheet
# OPTO INTERRUPTER ITR

**ITR20005**

## Features

- Wide gap between lighter and detector (3.8mm)
- High sensing accuracy
- PWB mounting type package
- Pb free
- The product itself will remain within RoHS compliant version.

## Descriptions

The ITR20005(Slot Optical switch) is a gallium arsenide infrared emitting diode which is coupled with a silicon photo transistor in a plastic housing. The package system is designed to optimize the mechanical resolution, coupling efficiency, and insulates ambient light. The ITR is useful in the application of interrupting the signal with printer, scanner, copier, or other opaque material, switching the output from an “ON” to “OFF” state.

## Applications

- Mouse
- Opto-electronic switches
-

## Device Selection Guide

| Device No. | Chip Material | Len Color |
|---|---|---|
| IR | GaAs,GaAlAs | CLEAR |
| PT | Silicon | CLEAR |

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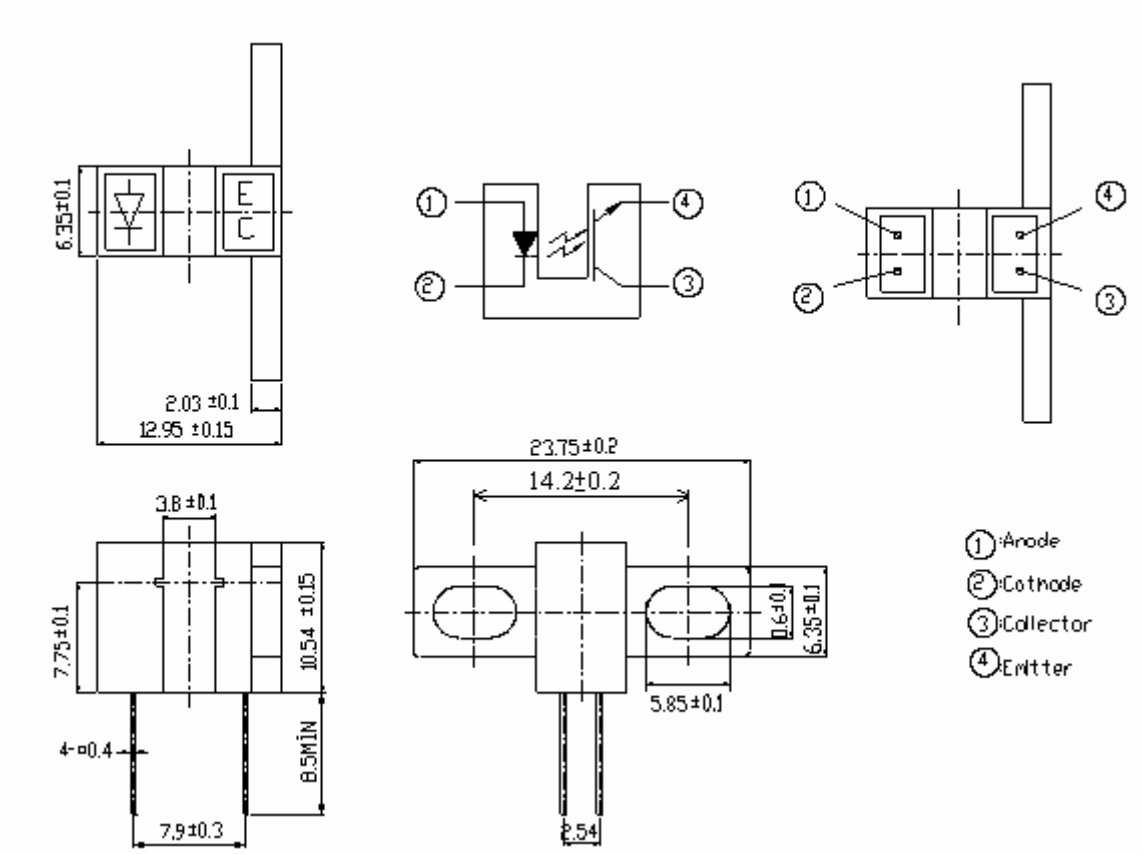
## Package Dimensions




**Notes:** 1.All dimensions are in millimeters
2.Tolerances unless dimensions ±0.15mm

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## ■Absolute Maximum Ratings (Ta=25℃)

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Input | Power Dissipation at(or below) 25℃ Free Air Temperature | Pd | 75 | mW |
| | Reverse Voltage | $V_R$ | 5 | V |
| | Forward Current | $I_F$ | 50 | mA |
| | Peak Forward Current (*1) Pulse width ≦100 μs, Duty cycle=1% | $I_{FP}$ | 1 | A |
| Output | Collector Power Dissipation | $P_C$ | 75 | mW |
| | Collector Current | $I_C$ | 20 | mA |
| | Collector-Emitter Voltage | B $V_{CEO}$ | 30 | V |
| | Emitter-Collector Voltage | B $V_{ECO}$ | 5 | V |
| Operating Temperature | | Topr | -25~+85 | ℃ |
| Storage Temperature | | Tstg | -40~+85 | ℃ |
| Lead Soldering Temperature (*2) | | Tsol | 260 | ℃ |

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

## Electro-Optical Characteristics (Ta=25℃)

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|---|
| Input | Forward Voltage | $V_F$ | - | 1.2 | 1.6 | V | $I_F$=20mA |
| | Reverse Current | $I_R$ | - | - | 10 | μA | $V_R$=5V |
| | Peak Wavelength | λ P | - | 940 | - | nm | $I_F$=20mA |
| | View Angle | 2□1/2 | - | 60 | - | Deg | $I_F$=20mA |
| Output | Collector Dark Current | $I_{CEO}$ | - | - | 100 | nA | $V_{CE}$=10V Ee=0mW/cm$^2$ |
| Transfer Characteristic | C-E Saturation Voltage | $V_{CE}$(sat) | - | - | 0.4 | V | $I_C$=2mA Ee=1mW/cm$^2$ |
| | Collector Current | $I_C$(ON) | 0.5 | - | - | mA | $V_{CE}$=5V $I_F$=20mA |
| | Rise time | $t_r$ | - | 20 | - | μsec | $V_{CE}$=5V |
| | Fall time | $t_f$ | - | 20 | - | μsec | $I_C$=1mA $R_L$=1KΩ |

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## Typical Electrical/Optical/Characteristics Curves for IR

Fig. 1 Forward Current vs. Ambient Temperature

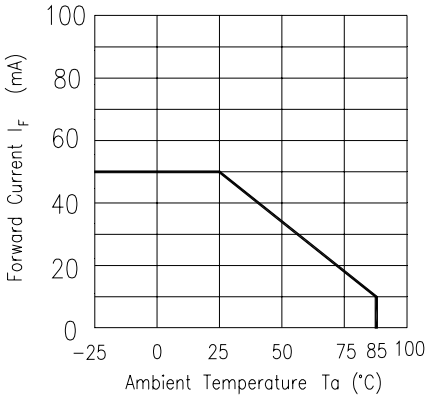



Fig. 2 Spectral Distribution

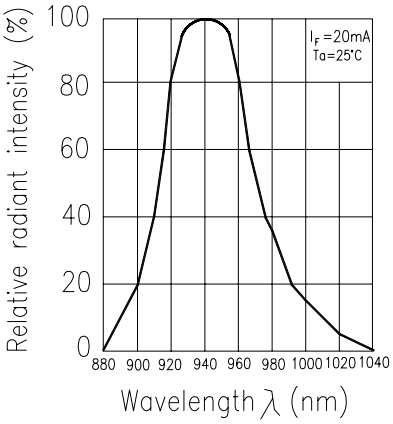



Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

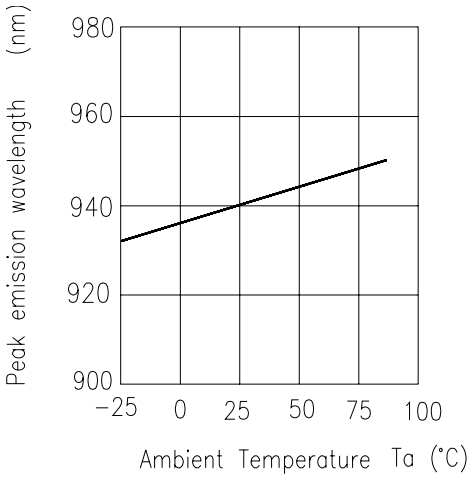



Fig. 4 Forward Current vs. Forward Voltage

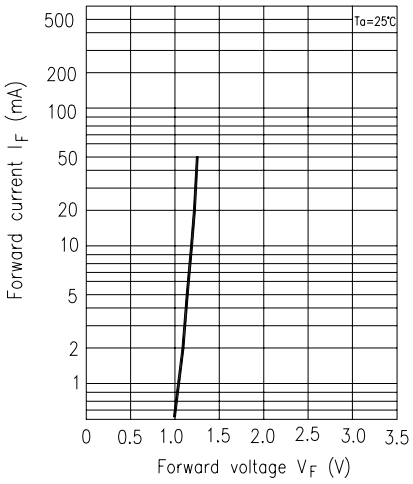



Fig. 5 Forward Voltage vs. Ambient Temperature

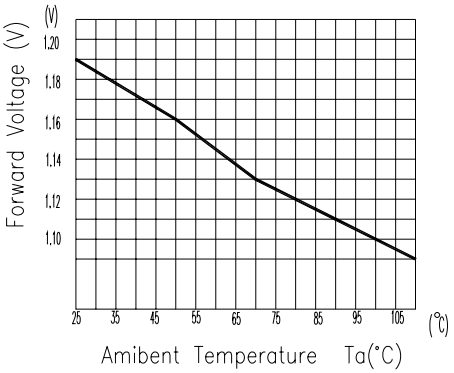
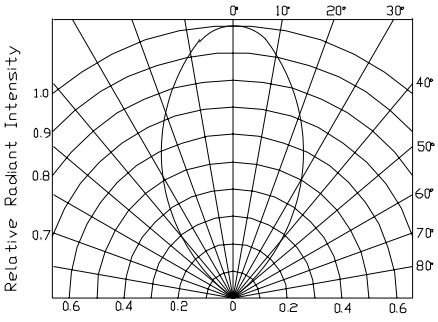



Fig. 6 Relative Radiant Intensity vs Angular Displacement



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

Fig.1 Collector Power Dissipation vs. Ambient Temperature

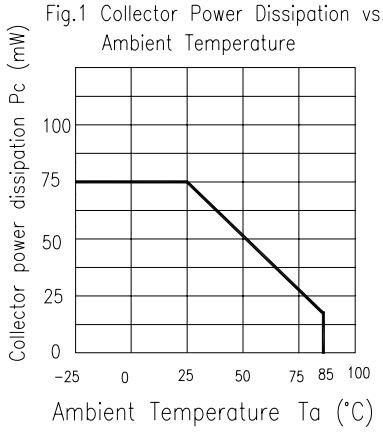



Fig.2 Collector Dark Current vs. Ambient Temperature

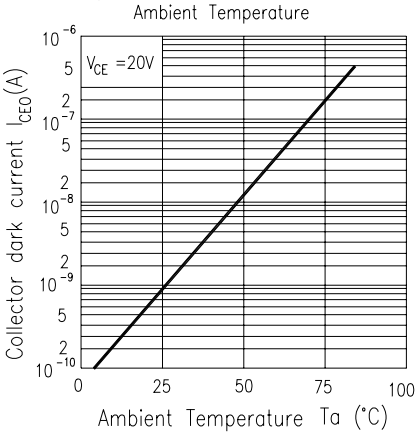



Fig.3 Spectral Sensitivity

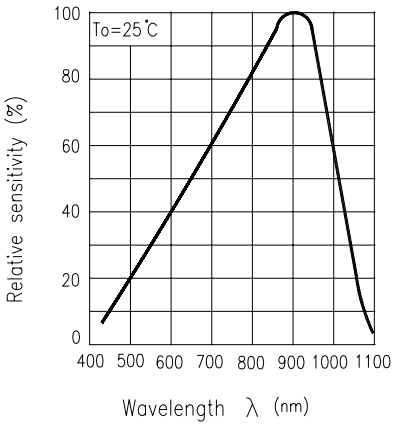
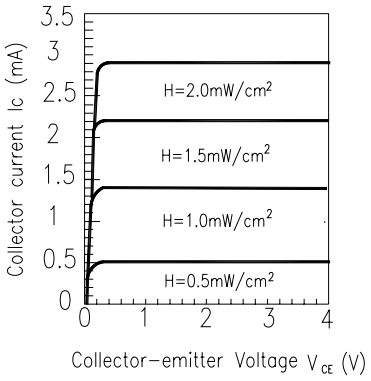



Fig.4 Collector Current vs. Collector−emitter Voltage




## ■ Typical Electrical/Optical/Characteristics Curves For ITR

Fig.1 Relative Collector Current vs. Shield Distance(1)

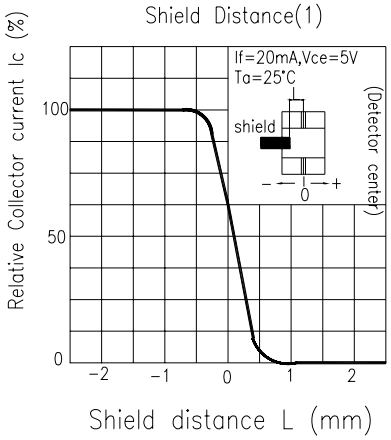
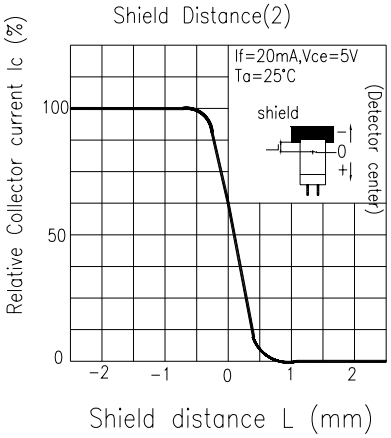



Fig.2 Relative Collector Current vs. Shield Distance(2)



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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. | Item | Test Conditions | Test Hours/ Cycles | Sample Sizes | Failure Judgement Criteria | Ac/Re |
|---|---|---|---|---|---|---|
| 1 | Solder Resistance | Ta = 260 ±3°C | 10 ± 1 sec | 22pcs | $I_R \geqq U \times 2$<br>$Ee \leqq L \times 0.8$<br>$V_F \geqq U \times 1.2$<br>U：Upper Specification Limit<br>L：Lower Specification Limit | 0/1 |
| 2 | Temperature Cycle | H : +85℃ 30 mins<br>↕ 5 mins<br>L : -55℃ 30mins | 50Cycles | 22pcs | | 0/1 |
| 3 | Thermal Shock | H :+100℃ 5mins<br>↕ 10secs<br>L :-10℃ 5mins | 50Cycles | 22pcs | | 0/1 |
| 4 | High Temperature Storage | TEMP.：+100℃ | 1000hrs | 22pcs | | 0/1 |
| 5 | Low Temperature Storage | TEMP.：-55℃ | 1000hrs | 22pcs | | 0/1 |
| 6 | DC Operating Life | $V_{CE}$=5V | 1000hrs | 22pcs | | 0/1 |
| 7 | High Temperature/ High Humidity | 85℃ / 85% R.H | 1000hrs | 22pcs | | 0/1 |

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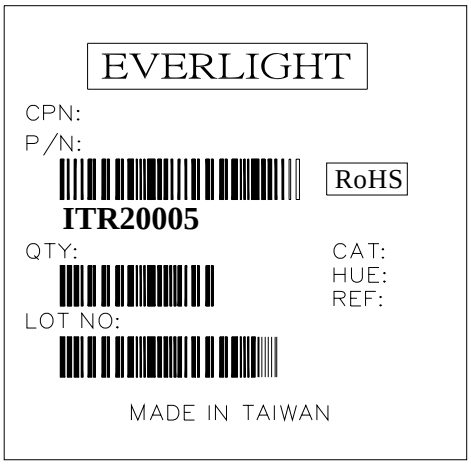
## Label Form Specification




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

## Packing Quantity Specification

1. 150 Pcs /1Bag , 4 Bags /1Box
2. 10 Boxes /1Carton

## Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using 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.
3. 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.

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