



# Technical Data Sheet

## Opto Interrupter

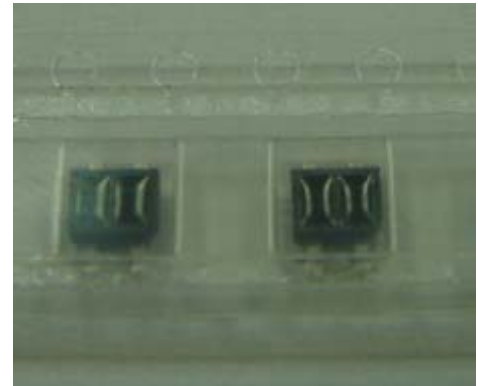
### ITR8307/TR8

#### ■ Features

- Fast response time
- High sensitivity
- Cut-Off visible wavelength
- Thin
- Compact
- Pb free
- The product itself will remain within RoHS compliant version.

#### ■ Descriptions

**ITR8307/TR8** is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo-transistor with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side- by- side in a plastic package.



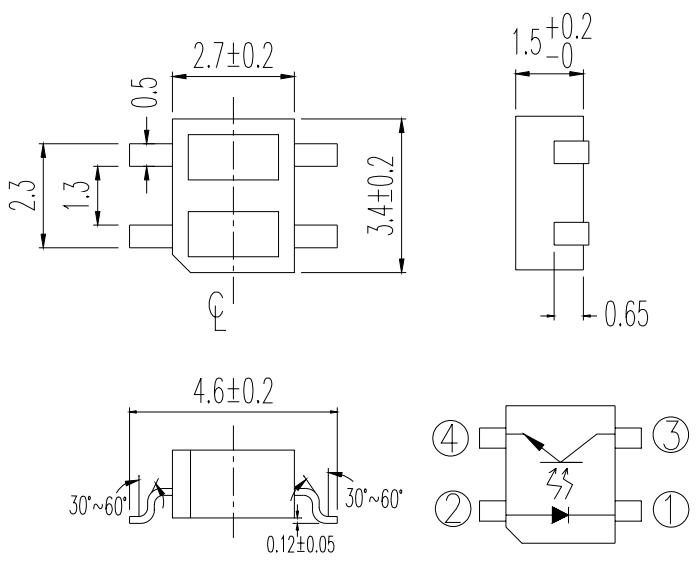
#### ■ Applications

- Camera
- VCR
- Floppy disk driver
- Cassette type recorder
- Various microcomputer control equipment

#### ■ Device Selection Guide

Device No.	Chip Material
IR	GaAs
PT	Silicon

**Package Dimensions**



- ① : CATHODE
- ② : ANODE
- ③ : COLLECTOR
- ④ : EMITTER

**Notes:** 1.All dimensions are in millimeters  
 2.Tolerances unless dimensions  $\pm 0.15$ mm

**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) 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>	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	-30~+90	°C
Lead Soldering Temperature (*2)		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>F</sub>	---	1.2	1.6	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	---
Output	Dark Current	I <sub>CEO</sub>	---	---	100	nA	V <sub>CE</sub> =10V
	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	Light Current	I <sub>C(ON)</sub>	0.1	---	---	mA	V <sub>CE</sub> =5V
	Leakage Current	I <sub>CEOD</sub>	---	---	1	μA	I <sub>F</sub> =20mA
	Rise time	t <sub>r</sub>	---	20	---	μsec	V <sub>CE</sub> =2V
	Fall time	t <sub>f</sub>	---	20	---	μsec	I <sub>C</sub> =100 μA R <sub>L</sub> =1KΩ

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

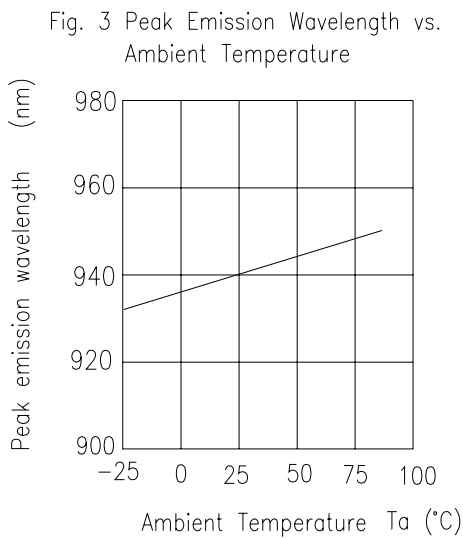
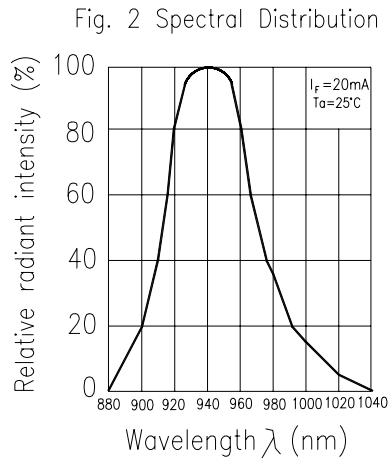
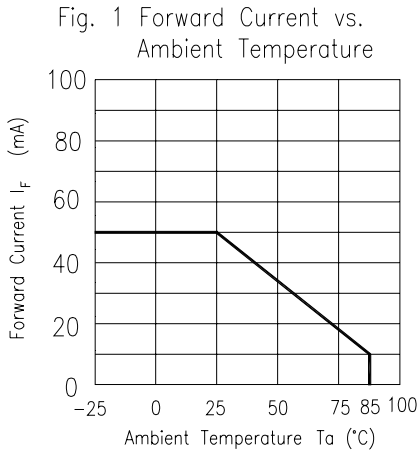


Fig. 4 Forward Current vs. Forward Voltage

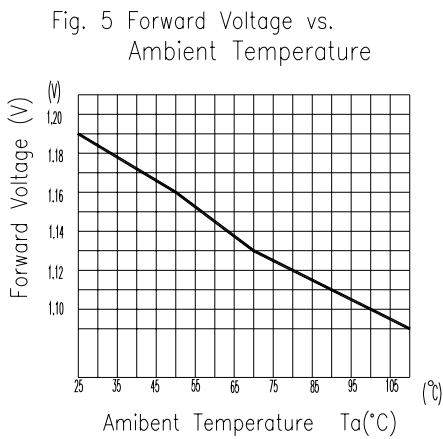
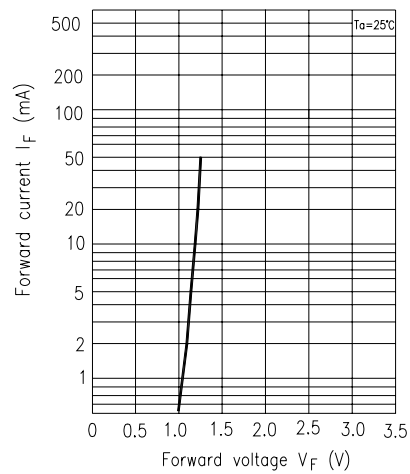
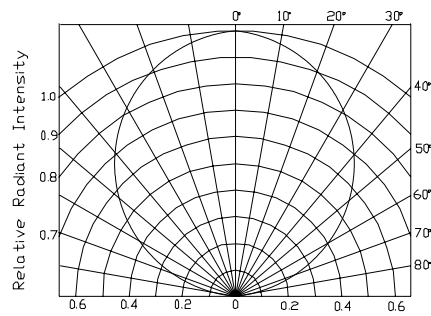


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



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

Fig.1 Collector Power Dissipation vs. Ambient Temperature

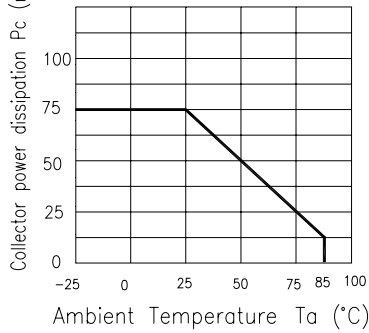


Fig.2 Collector Dark Current vs. Ambient Temperature

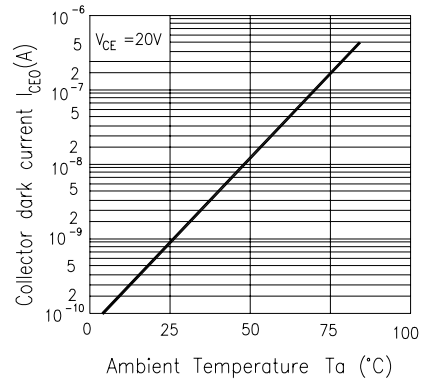


Fig. 3 Relative Collector Current vs. Ambient Temperature

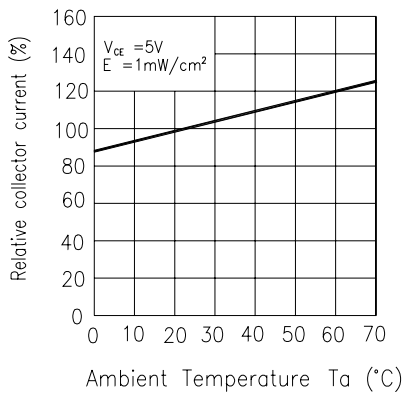


Fig.4 Collector Current vs. Irradiance

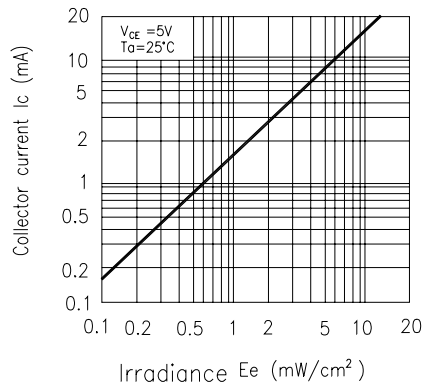


Fig.5 Spectral Sensitivity

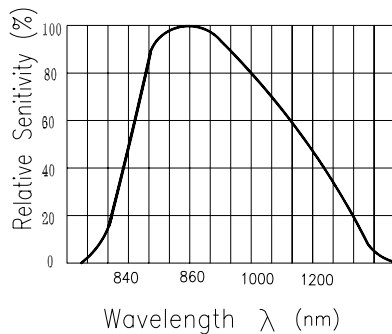
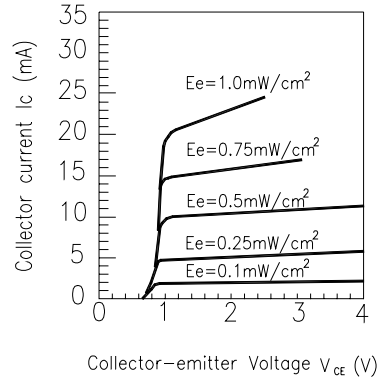


Fig.6 Collector Current vs. Collector-emitter Voltage



**Typical Electrical/Optical/Characteristics Curves For ITR**

Fig.1 Relative Collector Current vs. Distance between Sensor and Al Evaporation Galss

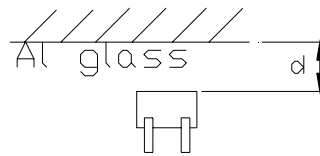
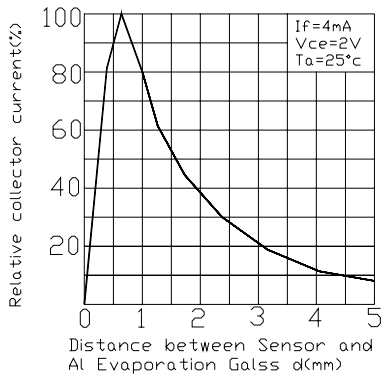


Fig.2 Relative Collector Current vs. Card Moving Distance (l)

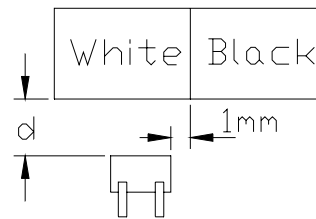
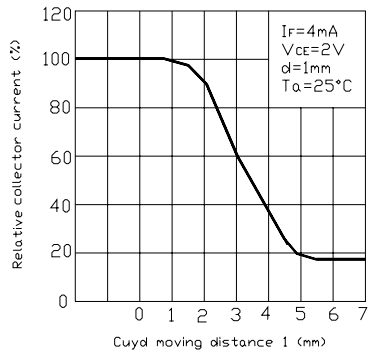
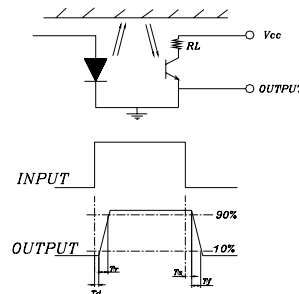
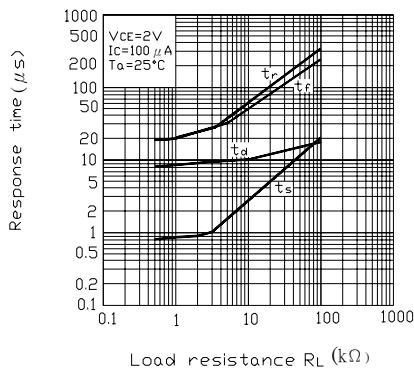
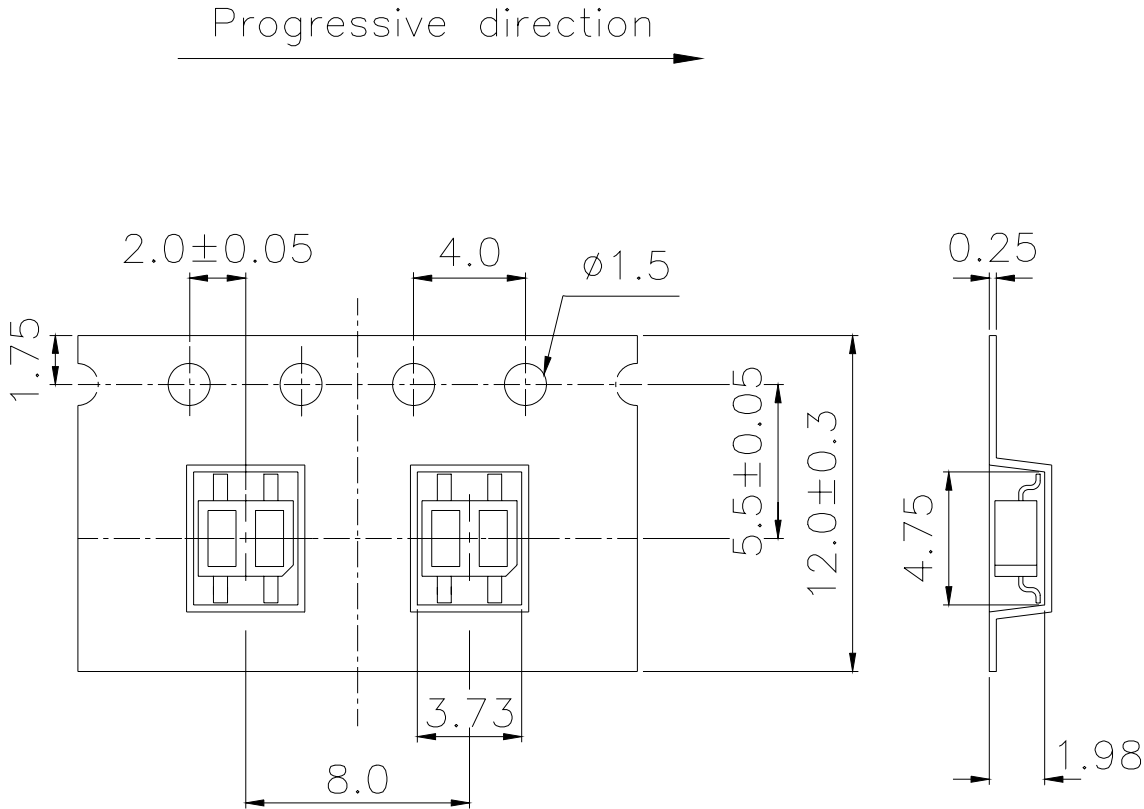


Fig.3 Response Time vs. Load Resistance



**■ Taping Dimension**



General Tolerance  $\pm 0.1$   
UNIT:mm

**Packing Quantity**

- 1. 1000 Pcs/ 1Roll
- 2. 15roll /1 Box
- 3. 2 Box/ 1 Carton

**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 Heat	TEMP. : 260°C±5°C	10secs	22pcs		0/1
2	Temperature Cycle	H : +85°C     30mins ↑ 5mins ↓ L : -55°C     30mins	50Cycles	22pcs	$I_R \geq U \times 2$ $E_e \leq L \times 0.8$ $V_F \geq U \times 1.2$	0/1
3	Thermal Shock	H : +100°C     5mins ↑ 10secs ↓ L : -10°C     5mins	50Cycles	22pcs	U : Upper Specification	0/1
4	High Temperature Storage	TEMP. : +100°C	1000hrs	22pcs	Limit L : Lower	0/1
5	Low Temperature Storage	TEMP. : -55°C	1000hrs	22pcs	Specification Limit	0/1
6	DC Operating Life	$I_F = 20mA$	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1



## Recommended Method of Storage

The following are general recommendations for moisture sensitive level (MSL) 4 storage and use:

- Shelf life in sealed bag: 12 months at  $< 40\text{ }^{\circ}\text{C}$  and  $< 90\%$  relative humidity (RH)
- After bag is opened, devices that will be subjected to reflow solder or other high temperature process must
  - a) Mounted within 72 hours of factory conditions  $< 30\text{ }^{\circ}\text{C}/60\%$ RH, or
  - b) Stored at  $<20\%$  RH
    - Devices require bake, before mounting, if:  
Humidity Indicator Card is  $> 20\%$  when read at  $23 \pm 5\text{ }^{\circ}\text{C}$
- If baking is required, devices may be baked:
  - a) 192 hours at  $40\text{ }^{\circ}\text{C}$ , and  $<5\%$  RH(dry air/nitrogen) or
  - b) 96 hours at  $60\text{ }^{\circ}\text{C}$ , and  $<5\%$  RH for all device containers
  - c) 24 hours at  $125\text{ }^{\circ}\text{C}$

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