

**OPTO INTERRUPTER ITR**

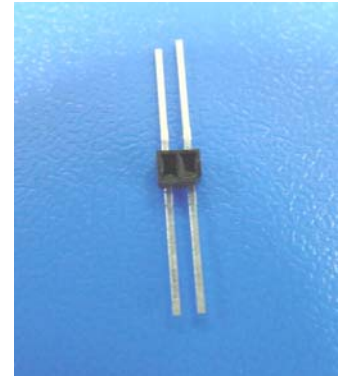
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**ITR8307****■ Features**

- Fast response time
- High sensitivity
- Cut-Off visible wavelength
- Thin
- Compact
- Pb free

**■ Descriptions**

**ITR8307** 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

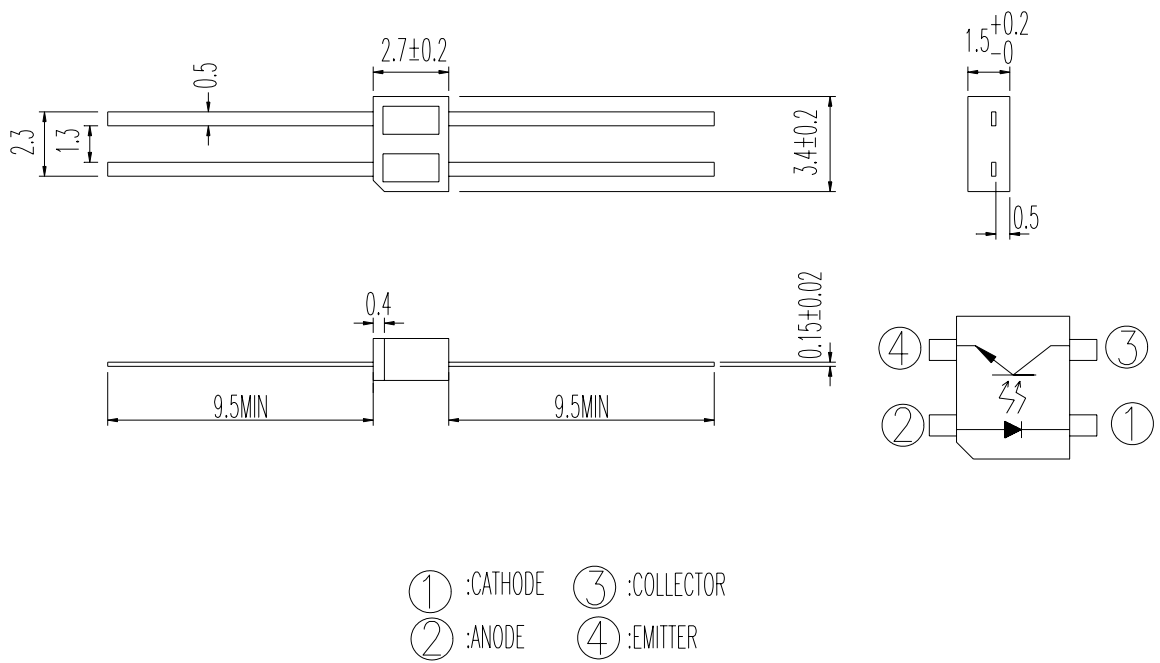
**■ Device Selection Guide**

Device No.	Chip Material
IR	GaAs
PT	Silicon

## OPTO INTERRUPTER ITR

**ITR8307**

### Package Dimensions



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

### 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 $\leq 100 \mu\text{s}$ , Duty cycle=1%	I <sub>FP</sub>	1	A
	Collector Power Dissipation	P <sub>C</sub>	75	mW
Output	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	T <sub>opr</sub>	-25~+85	°C
Storage Temperature	T <sub>stg</sub>	-30~+90	°C	
Lead Soldering Temperature (*2)	T <sub>sol</sub>	260	°C	

(\* 1)  $t_w=100 \mu\text{sec.}$ ,  $T=10 \text{msec.}$  (\* 2)  $t=5 \text{Sec}$

## OPTO INTERRUPTER ITR

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

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Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	$V_F$	---	1.2	1.6	V	$I_F=20mA$
	Reverse Current	$I_R$	---	---	10	$\mu A$	$V_R=5V$
	Peak Wavelength	$\lambda_P$	---	940	---	nm	---
Output	Dark Current	$I_{CEO}$	---	---	100	nA	$V_{CE}=10V$
	C-E Saturation Voltage	$V_{CE(sat)}$	---	---	0.4	V	$I_C=2mA$ $E_e=1mW/cm^2$
Transfer Characteristics	Collector Current	$I_C(ON)$	0.1	-	---	mA	$V_{CE}=5V$ , $I_F=20mA$
	Leakage Current	$I_{CEOD}$	---	---	1	$\mu A$	$V_{CE}=5V$ $I_F=20mA$
	Rise time	$t_r$	---	20	---	$\mu sec$	$V_{CE}=2V$ $I_C=100 \mu A$ $R_L=1K\Omega$
	Fall time	$t_f$	---	20	---	$\mu sec$	

### Rank

Conditions :  $I_F=20mA$   $V_{CE}=5V$

Unit:  $\mu A$

Bin number	Min	Max
B	300	600
C	500	800

## OPTO INTERRUPTER ITR

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

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Fig.1 Forward Current vs. Ambient Temperature

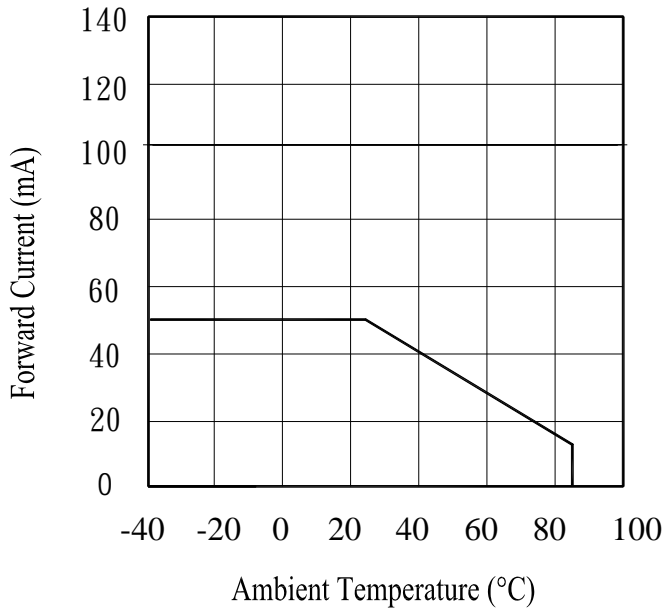


Fig.2 Spectral Distribution

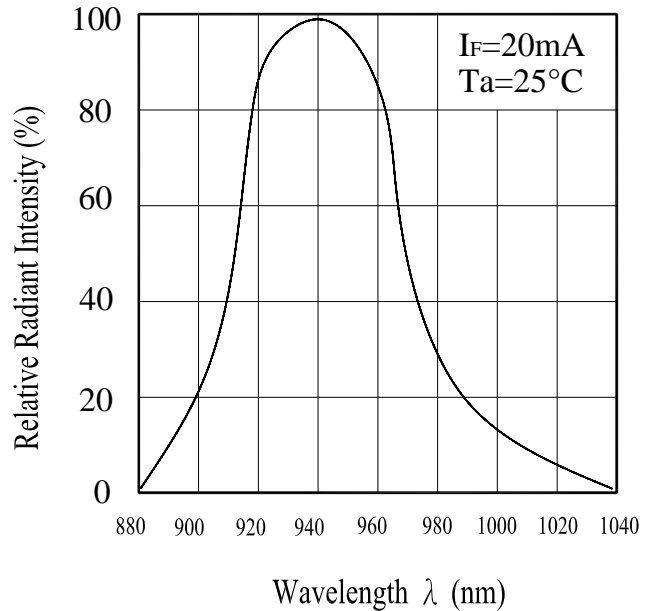


Fig.3 Peak Emission Wavelength vs. Ambient Temperature

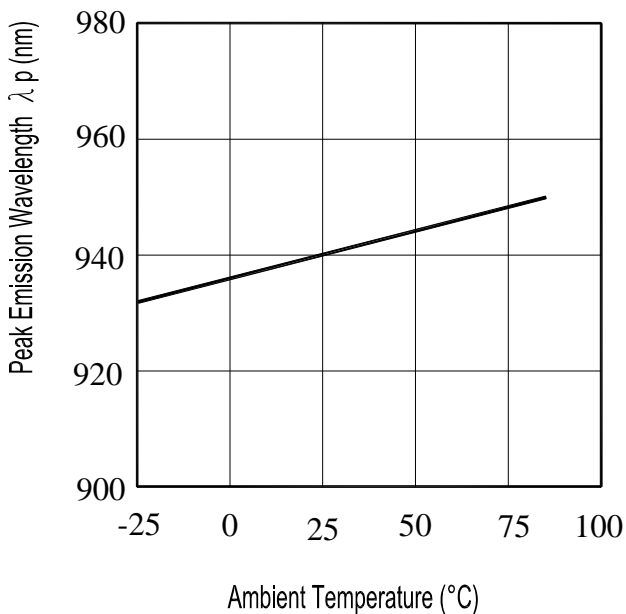
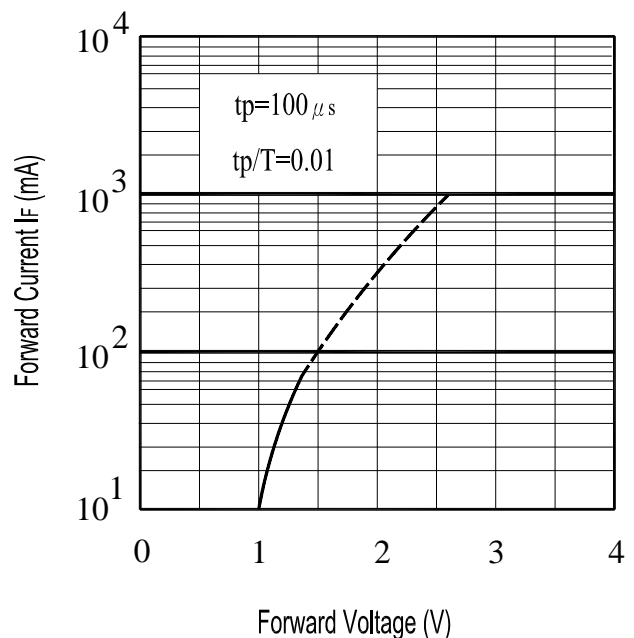


Fig.4 Forward Current vs. Forward Voltage



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Fig.5 Relative Intensity vs.

Forward Current

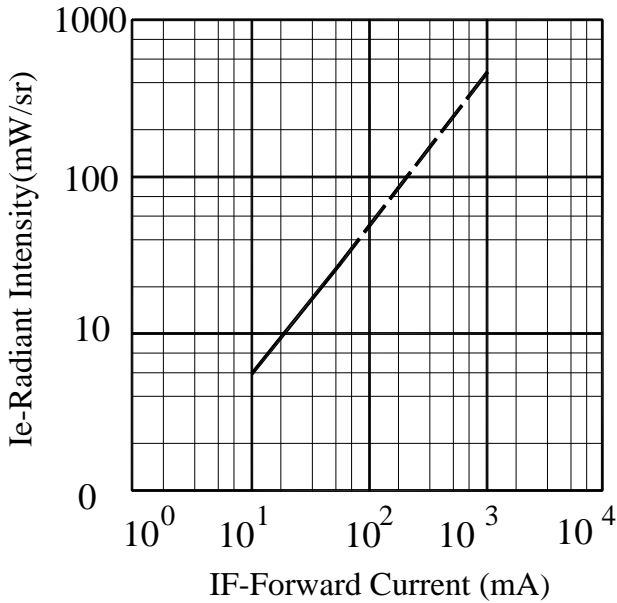


Fig.6 Relative Radiant Intensity vs. **ITR8307**

Angular Displacement

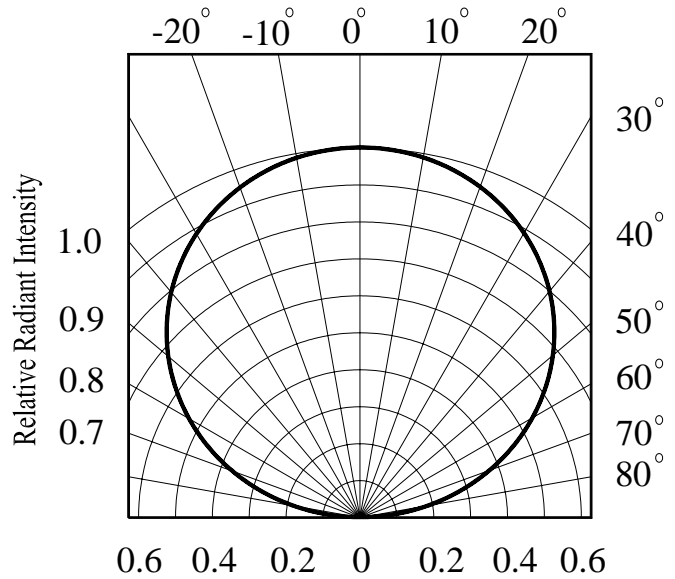


Fig.7 Relative Intensity vs.

Ambient Temperature(°C)

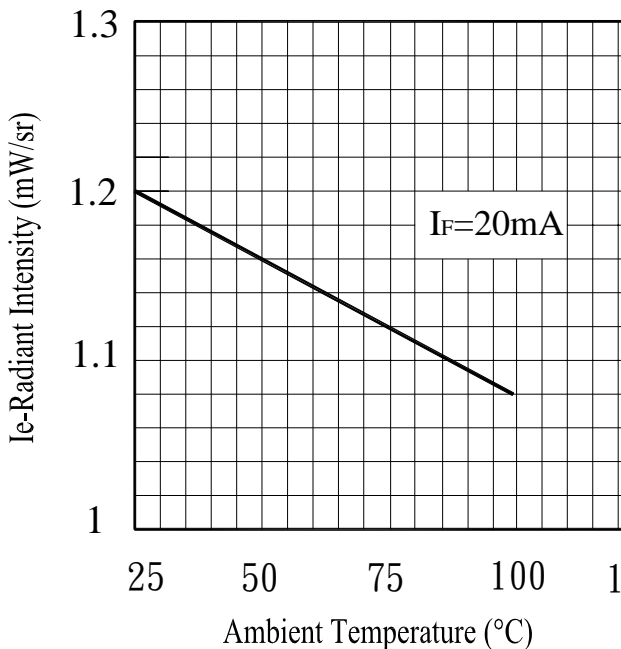
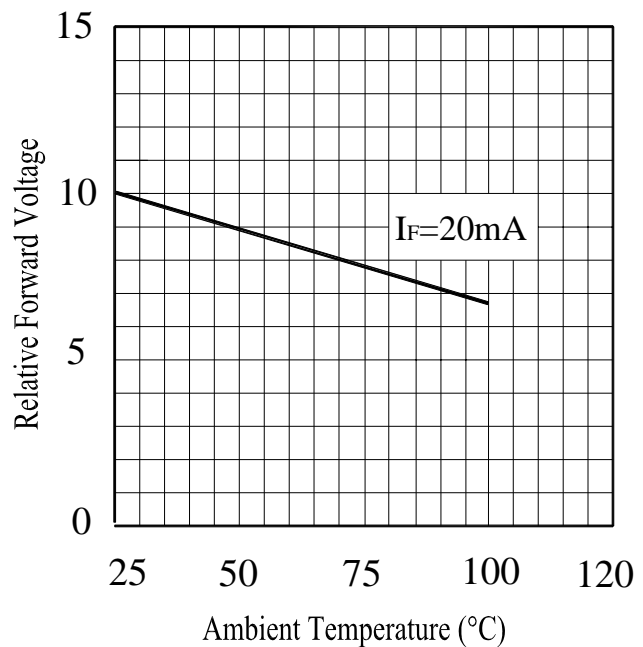


Fig.8 Forward Current vs.

Ambient Temperature(°C)



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

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Fig.1 Collector Power Dissipation vs. Ambient Temperature

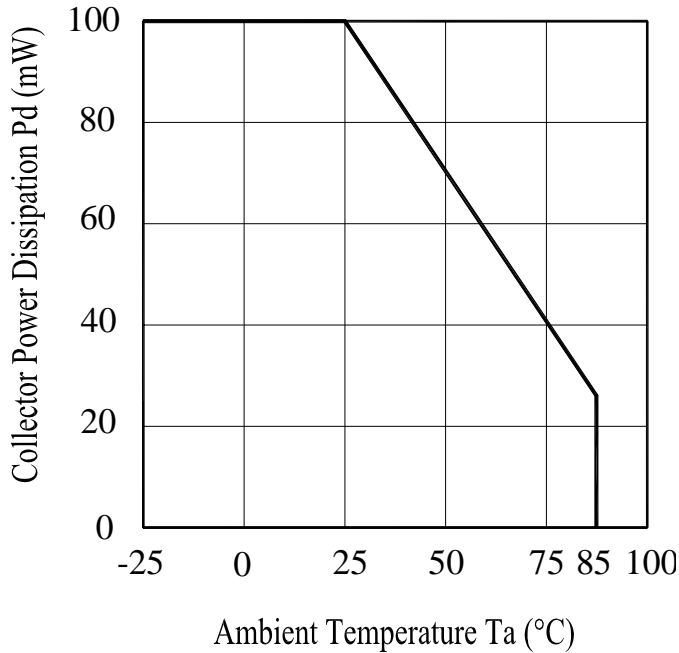


Fig.2 Collector Dark Current vs Ambient Temperature

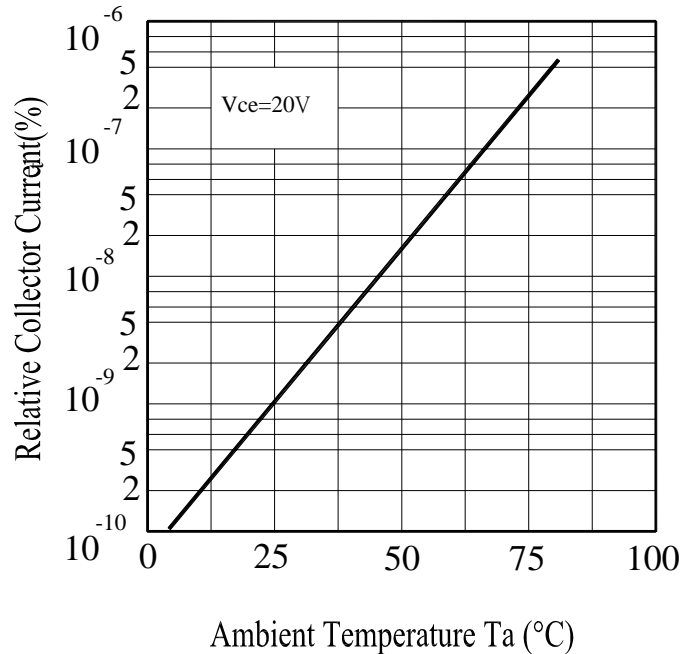


Fig.3 Relative Collector Current vs Ambient Temperature

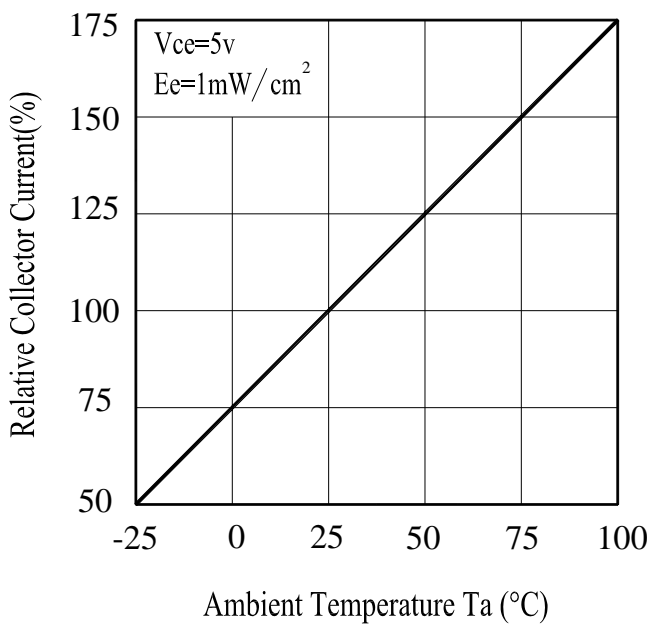
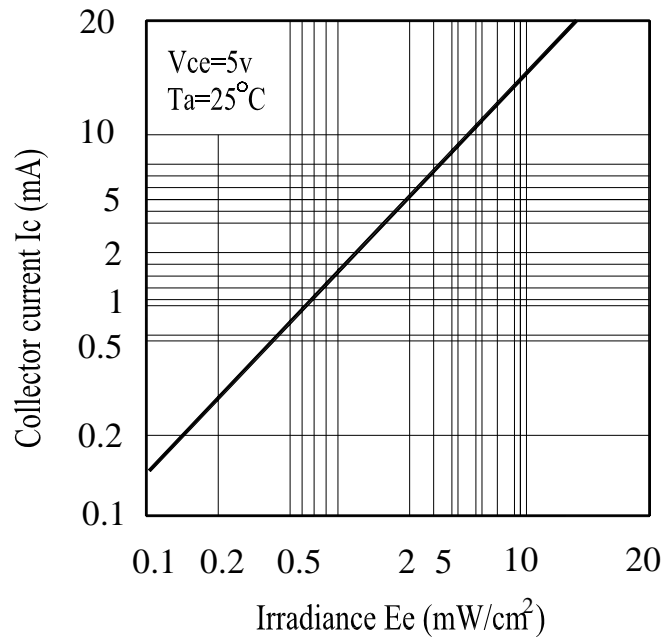


Fig.4 Collector Current vs.Irradiance



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Fig.5 Spectral Sensitivity

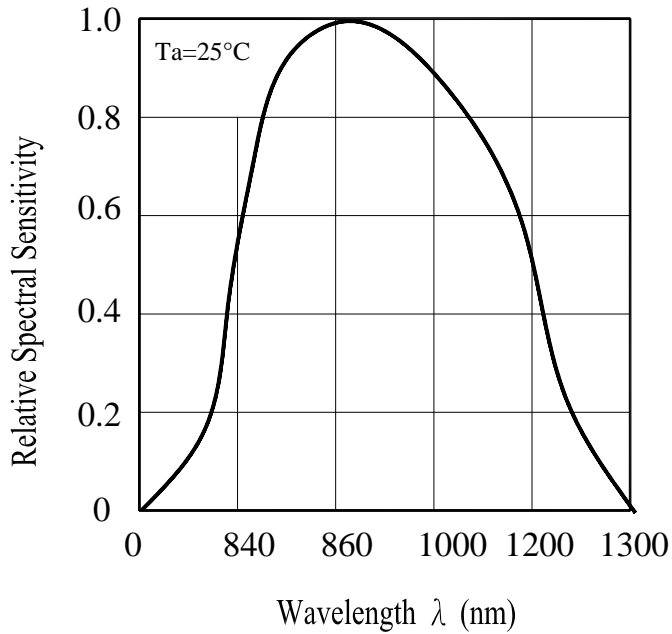
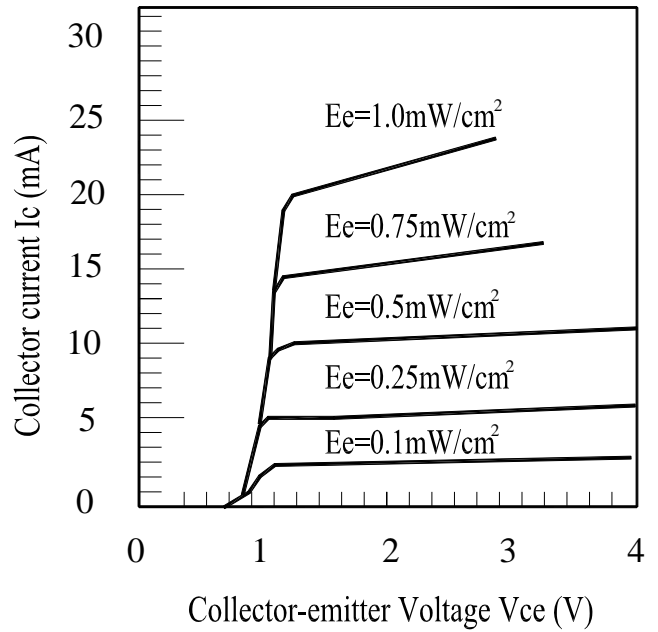


Fig.6 Collector Current vs **ITR8307**  
Collector Current  $I_c$  (mA)



## OPTO INTERRUPTER ITR

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

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

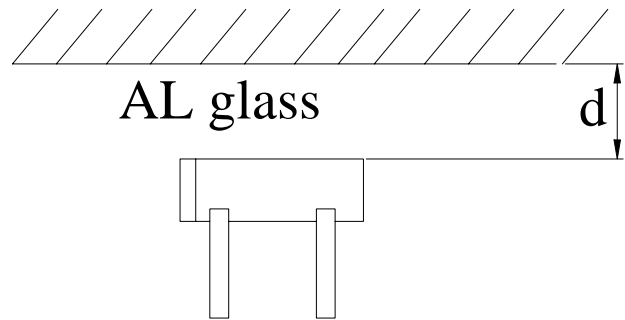
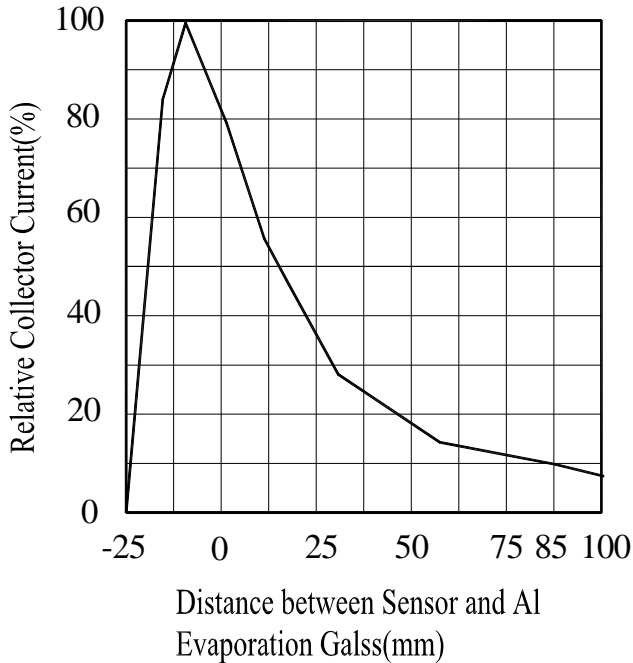
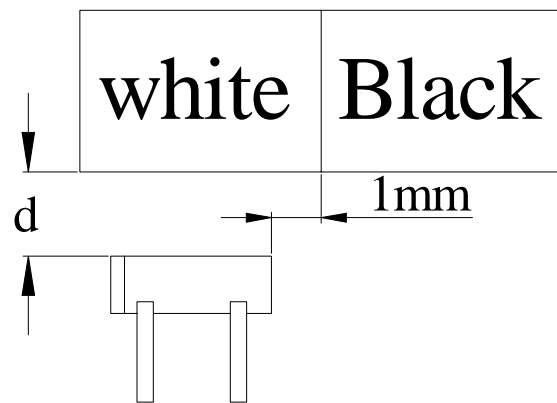
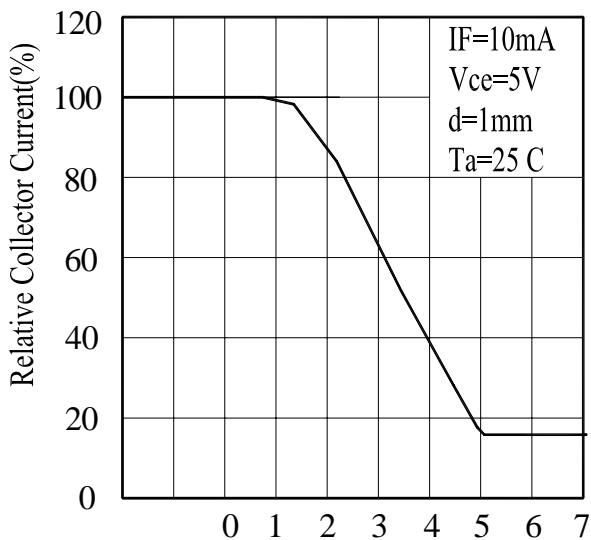


Fig.2 Relative Collector Current vs.  
Card moving Distance d(mm)

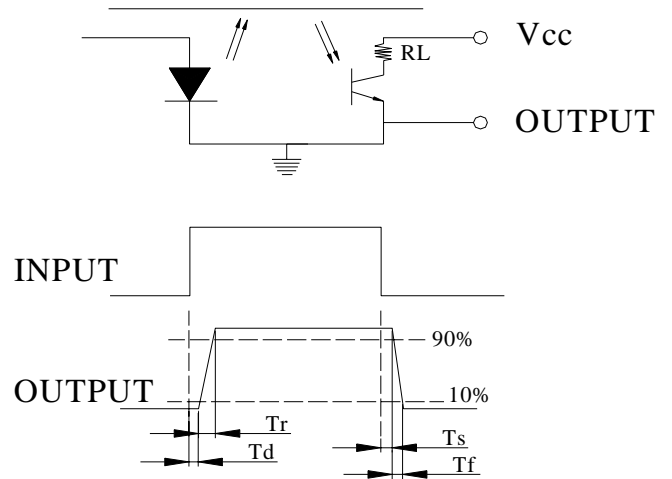
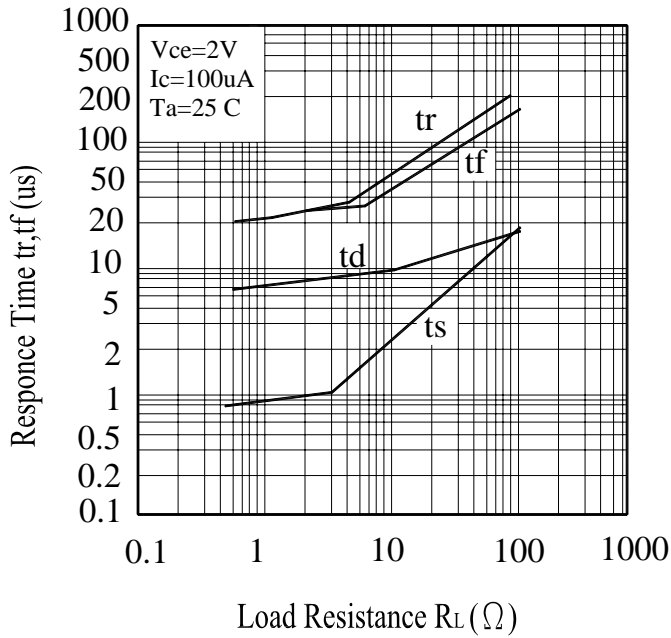




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Fig.3 Response Time vs. Load Resistance

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## OPTO INTERRUPTER ITR

### Reliability Test Item And Condition

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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 <div style="text-align: center;"> <math>\updownarrow</math>                      5mins  <math>\updownarrow</math>                      30mins                 </div> 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 <div style="text-align: center;"> <math>\updownarrow</math>                      10secs  <math>\updownarrow</math>                      5mins                 </div> 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

### Packing Quantity

1. 1000Pcs/1Bag
2. 1Bag/1Carton

**OPTO INTERRUPTER ITR****Recommended Method of Storage****ITR8307**

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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