

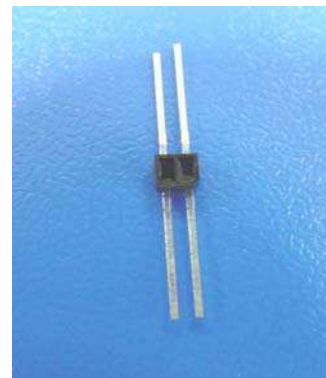
OPTO INTERRUPTER ITR

ITR8307**Features**

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

Descriptions

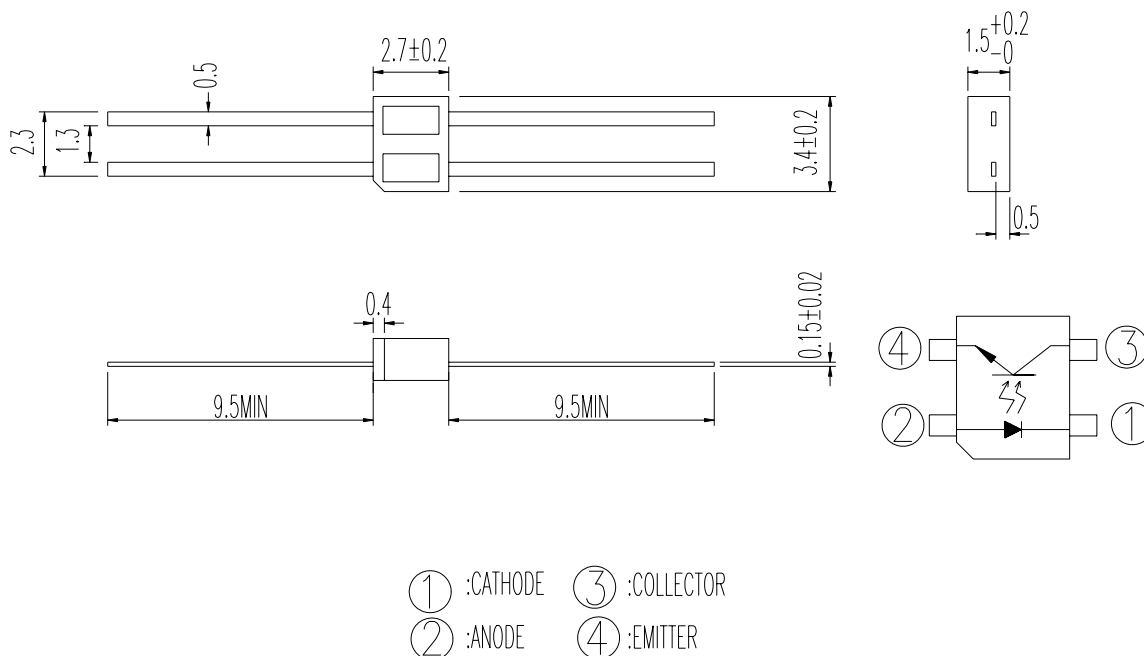
ITR8307 is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo-transistor with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side- by- side in a plastic package.

**Applications**

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

Device Selection Guide

Device No.	Chip Material
IR	GaAs
PT	Silicon

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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	P_d	75	mW
	Reverse Voltage	V_R	5	V
	Forward Current	I_F	50	mA
	Peak Forward Current (*1)	I_{FP}	1	A
	Pulse width $\leq 100 \mu\text{s}$, Duty cycle=1%			
Output	Collector Power Dissipation	P_C	75	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	$B V_{CEO}$	30	V
	Emitter-Collector Voltage	$B V_{ECO}$	5	V
Operating Temperature		T_{opr}	-25~+85	°C
Storage Temperature		T_{stg}	-30~+90	°C
Lead Soldering Temperature (*2)		T_{sol}	260	°C

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

 (*2) $t=5 \text{Sec}$

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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	$I_F=20\text{mA}$
	Reverse Current	I_R	---	---	10	μA	$V_R=5\text{V}$
	Peak Wavelength	λ_p	---	940	---	nm	---
Output	Dark Current	I_{CEO}	---	---	100	nA	$V_{CE}=10\text{V}$
	C-E Saturation Voltage	$V_{CE(sat)}$	---	---	0.4	V	$I_C=2\text{mA}$ $E_e=1\text{mW/cm}^2$
Transfer Characteristics	Collector Current	$I_C(ON)$	0.1	-	---	mA	$V_{CE}=5\text{V}$, $I_F=20\text{mA}$
	Leakage Current	I_{CEOD}	---	---	1	μA	$V_{CE}=5\text{V}$ $I_F=20\text{mA}$
	Rise time	t_r	---	20	---	μsec	$V_{CE}=2\text{V}$ $I_C=100\mu\text{A}$ $R_L=1\text{K}\Omega$
	Fall time	t_f	---	20	---	μsec	

Rank

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

Unit: μA

Bin number	Min	Max
B	300	600
C	500	800

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Typical Electrical/Optical/Characteristics Curves for IR

ITR8307

Fig.1 Forward Current vs.
Ambient Temperature

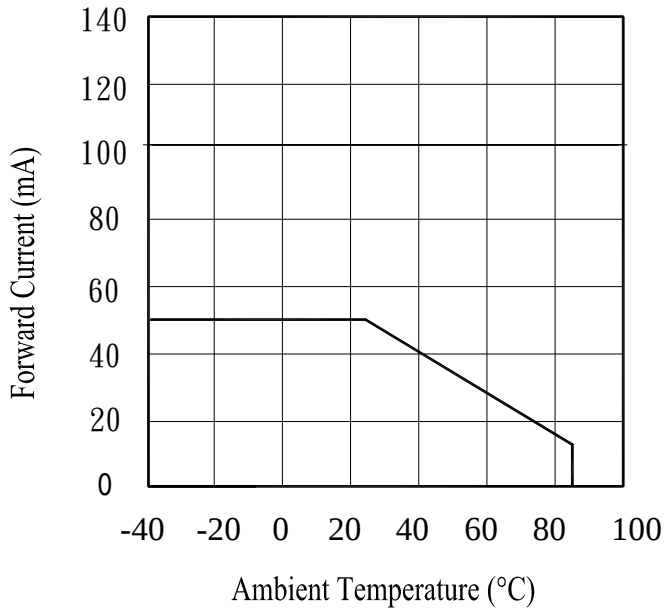


Fig.2 Spectral Distribution

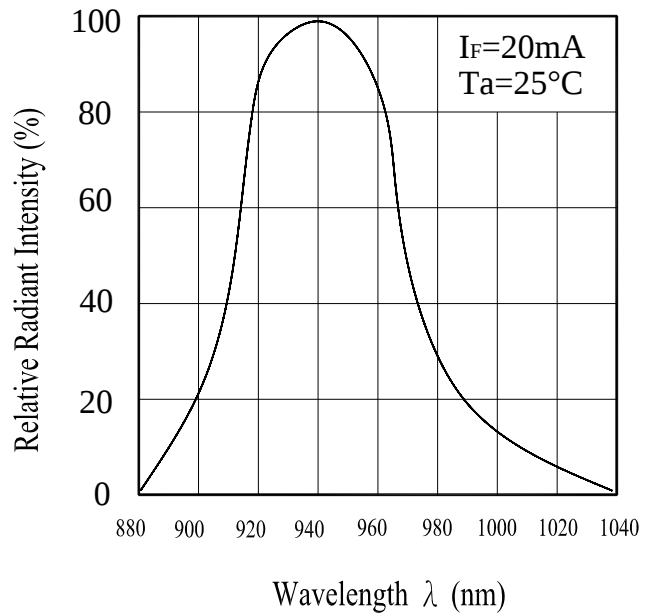


Fig.3 Peak Emission Wavelength
Ambient Temperature

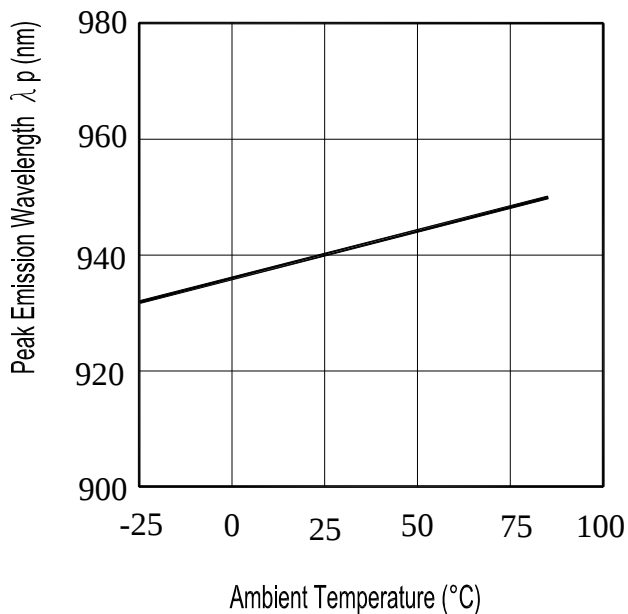
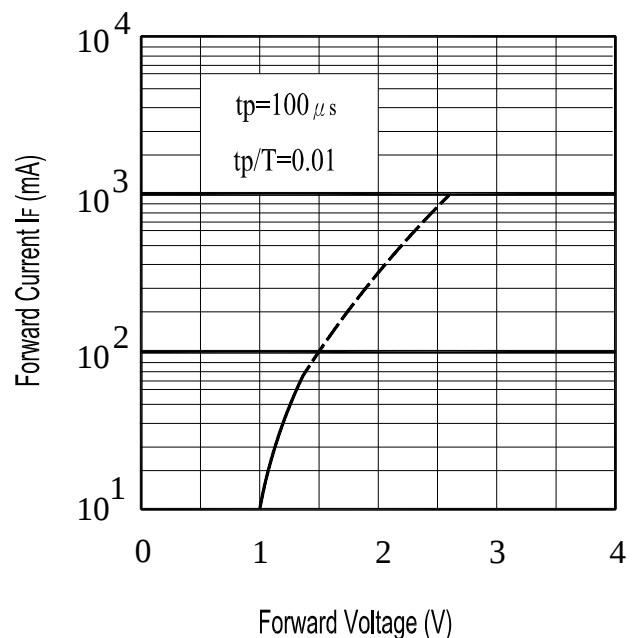


Fig.4 Forward Current
vs. Forward Voltage



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Fig.5 Relative Intensity vs.

Forward Current

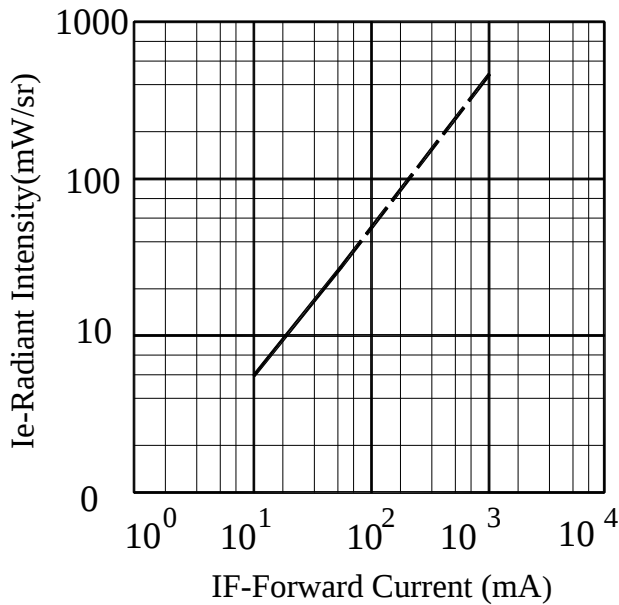


Fig.6 Relative Radiant Intensity vs. **ITR8307**

Angular Displacement

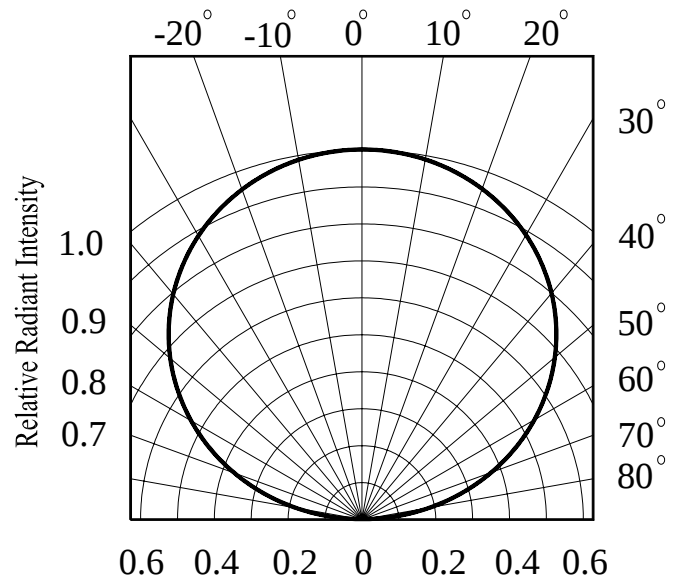


Fig.7 Relative Intensity vs.

Ambient Temperature(°C)

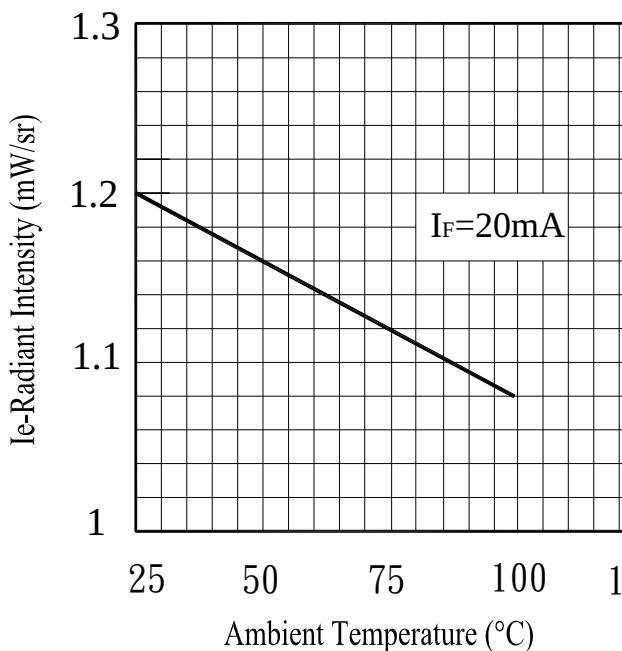
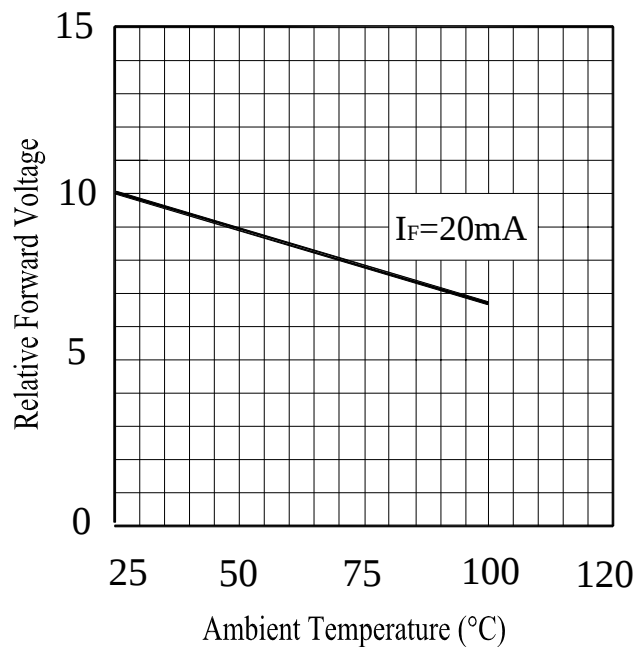


Fig.8 Forward Current vs.

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

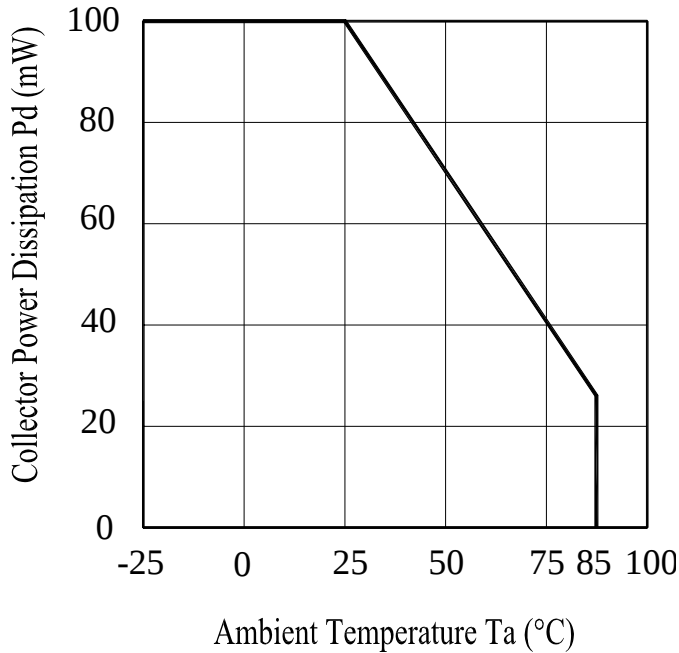


Fig.2 Collector Dark Current vs Ambient.
Temperature

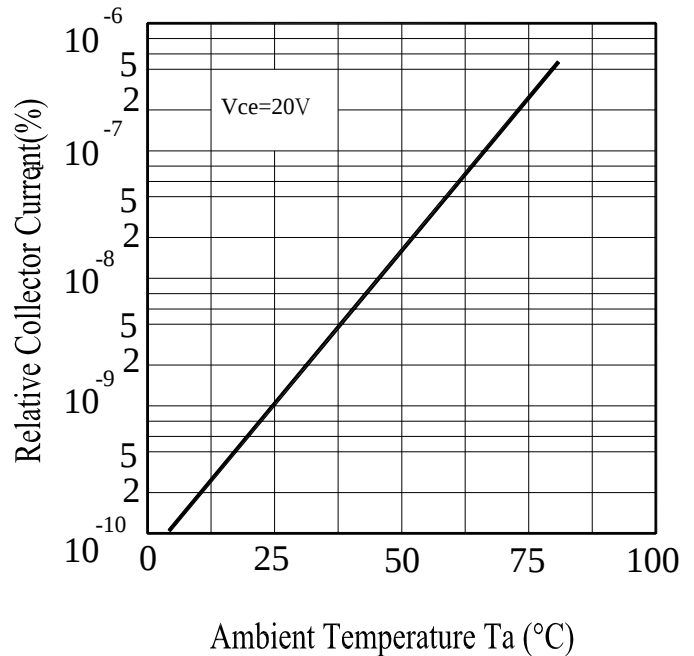


Fig.3 Relative Collector Current vs
Ambient Temperature

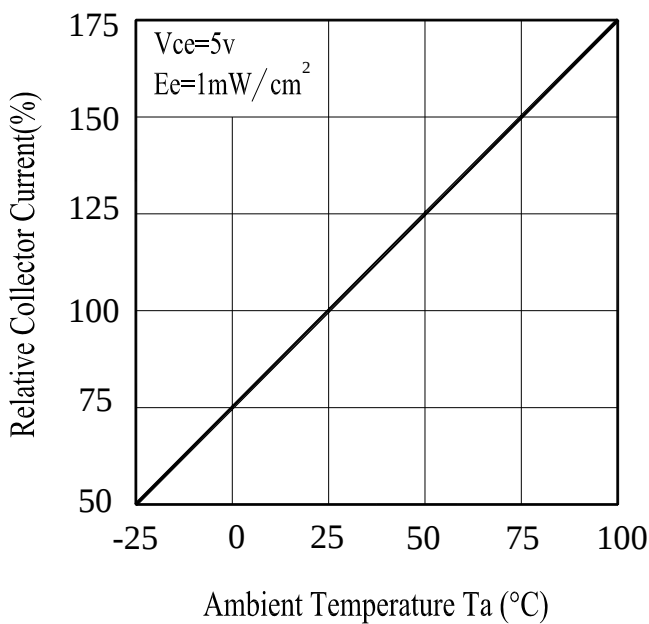
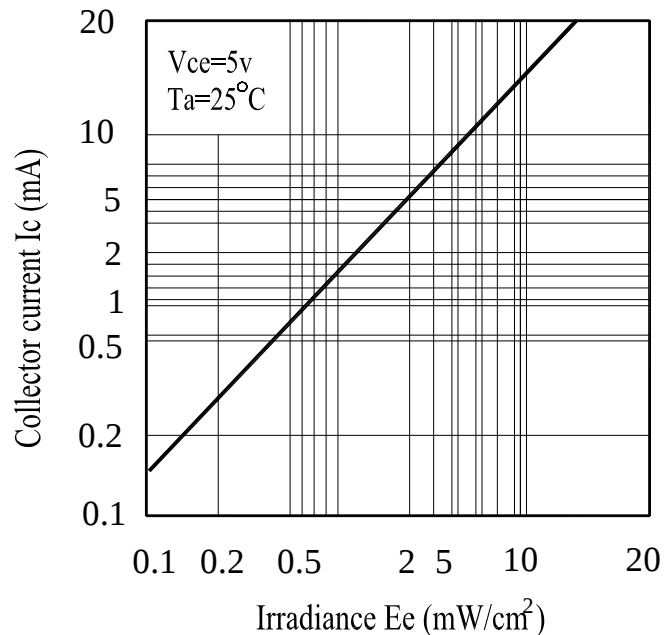


Fig.4 Collector Current vs.Irradiance



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Fig.5 Spectral Sensitivity

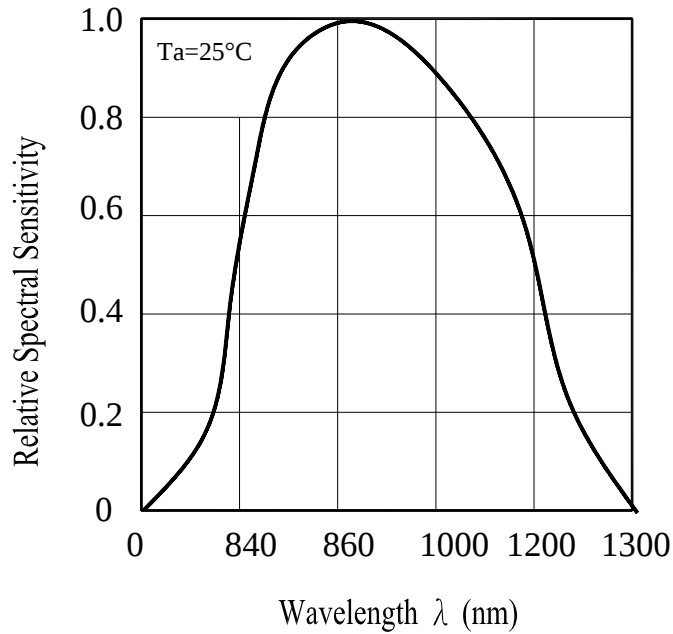
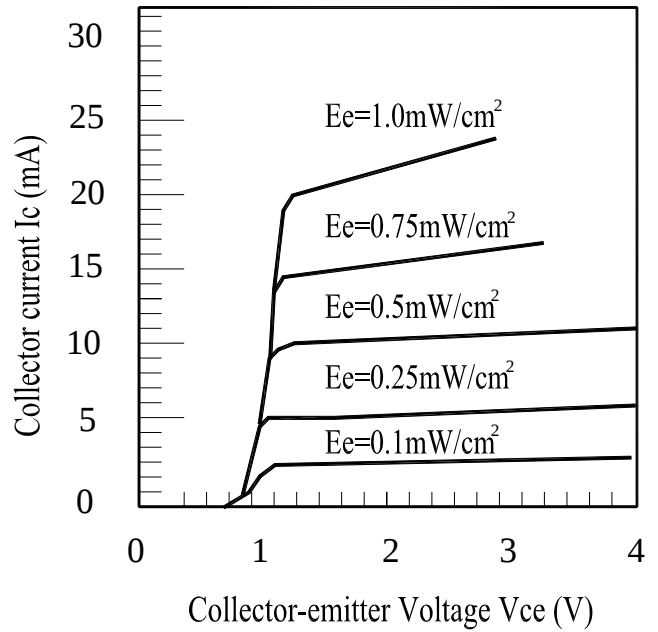


Fig.6 Collector Current vs **ITR8307**
Collector Current I_c (mA)



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Typical Electrical/Optical/Characteristics Curves for ITR

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

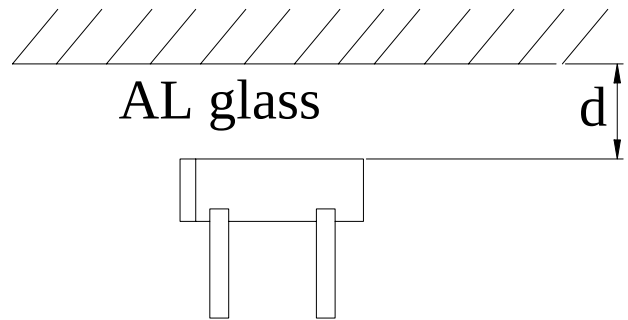
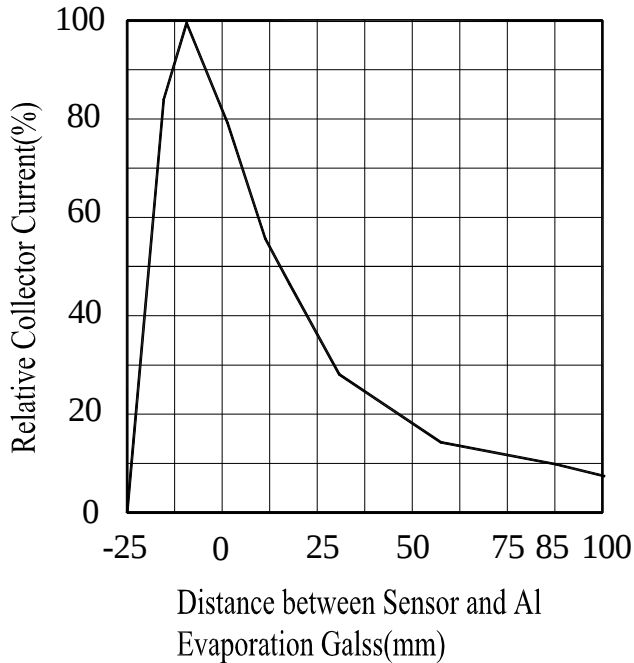
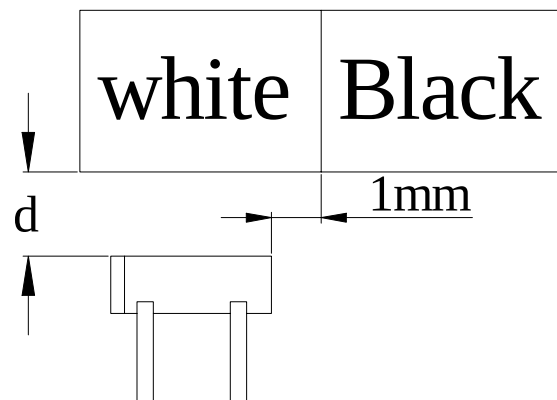
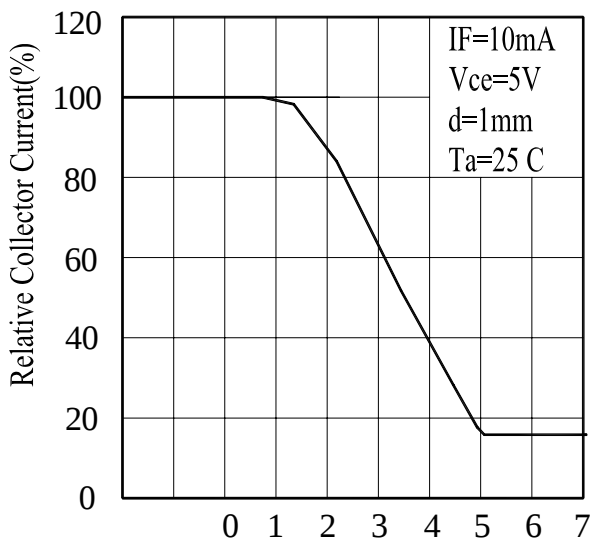


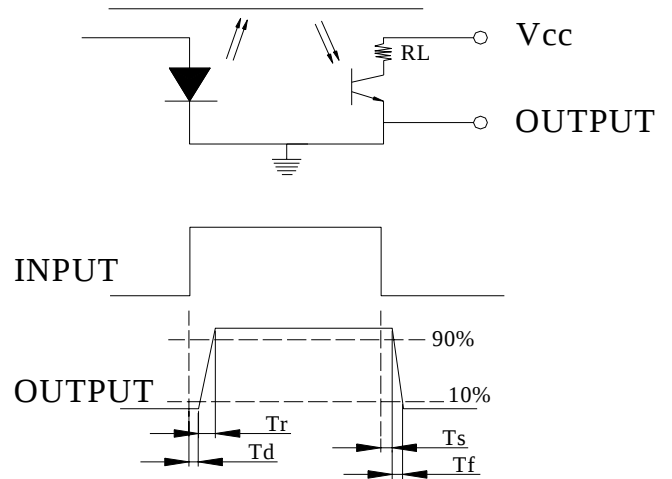
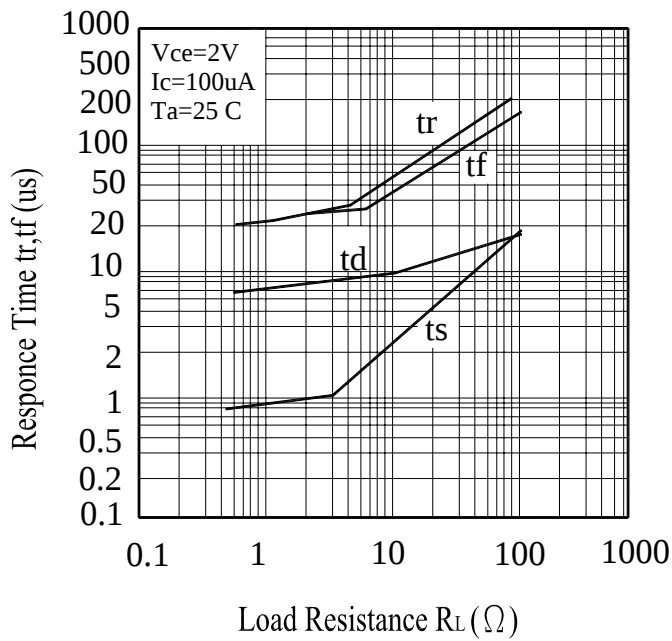
Fig.2 Relative Collector Current vs.
Card moving Distance d(mm)



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Fig.3 Response Time vs. Load Resistance

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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. : $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$	10secs	22pcs		0/1
2	Temperature Cycle	H : $+85^{\circ}\text{C}$ 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 : $+100^{\circ}\text{C}$ 5mins ↕ 10secs L : -10°C 5mins	50Cycles	22pcs	U : Upper Specification	0/1
4	High Temperature Storage	TEMP. : $+100^{\circ}\text{C}$	1000hrs	22pcs	Limit L : Lower	0/1
5	Low Temperature Storage	TEMP. : -55°C	1000hrs	22pcs	Specification Limit	0/1
6	DC Operating Life	$I_F = 20\text{mA}$	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1

Packing Quantity

- 1000Pcs/1Bag
- 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 $< 40^{\circ}\text{C}$ 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 $< 30^{\circ}\text{C}/60\%\text{RH}$, or
 - b) Stored at $< 20\%$ RH
 - Devices require bake, before mounting, if:
Humidity Indicator Card is $> 20\%$ when read at $23 \pm 5^{\circ}\text{C}$
- If baking is required, devices may be baked:
 - a) 192 hours at 40°C , and $< 5\%$ RH(dry air/nitrogen) or
 - b) 96 hours at 60°C , and $< 5\%$ RH for all device containers
 - c) 24 hours at 125°C

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>