



# Technical Data Sheet

## Opto Interrupter ITR

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**ITR8307/L24**

### ■ Features

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

### ■ Descriptions

ITR8307/L24/F43 is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo-darlington with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side- by- side in a plastic package.

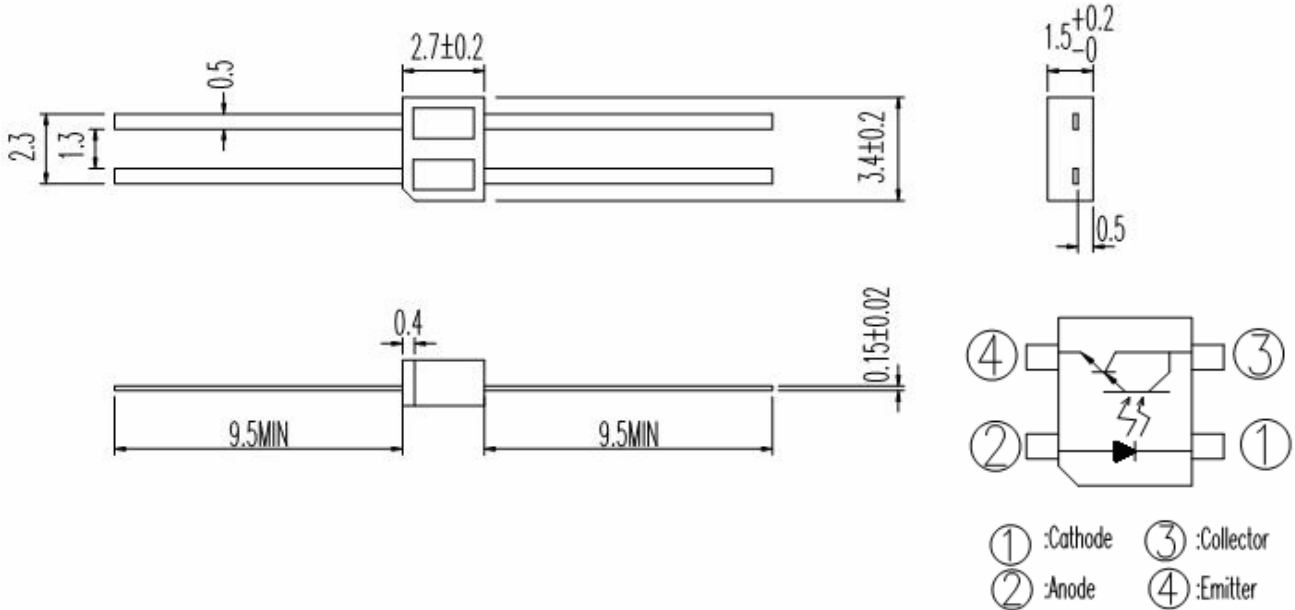
### ■ Applications

- 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**



- Notes:** 1.All dimensions are in millimeters  
2.Tolerances unless dimensions ±0.25mm

**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>	6	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>	100	mW
	Collector Current	I <sub>C</sub>	20	mA
	Collector-Emitter Voltage	B V <sub>CEO</sub>	35	V
	Emitter-Collector Voltage	B V <sub>ECO</sub>	6	V
Operating Temperature		T <sub>opr</sub>	-25~+85	-20~+70
Storage Temperature		T <sub>stg</sub>	-30~+90	-30~+80
Lead Soldering Temperature (*2)		T <sub>sol</sub>	260	260

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

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	VF	-	1.2	1.4	V	IF=20mA
	Reverse Current	IR	-	-	10	μA	VR=6V
	Peak Wavelength	λP	-	940	-	nm	-
Output	Dark Current	ICEO	-	-	1	μA	VCE=10V, Ee=1mW/cm2
Transfer Characteristics	Collector Current	IC(ON)	0.5	3.0	15.0	mA	VCE=2V, IF=4mA
	Leakage Current	ILEAK	-	-	5	μA	VCE=2V, IF=4mA
	Rise time	tr	-	80	400	μs	VCE=2V IC=10mA
	Fall time	tf	-	70	400	μs	RL=100Ω, d=1mm

**Rank**

Conditions : IF=4mA VCE=2V

Unit: mA

Bin number	Min	Max
B	0.50	1.10
C	0.90	1.90
D	1.45	3.20
E	2.45	5.40
F	4.05	8.90
G	6.30	15.0

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

Fig. 1 Forward Current vs. Ambient Temperature

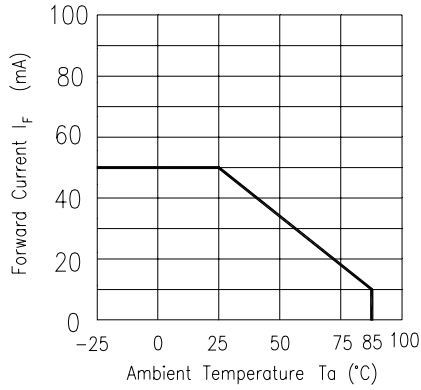


Fig. 2 Spectral Distribution

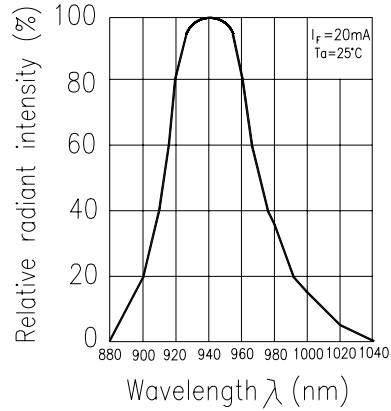


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

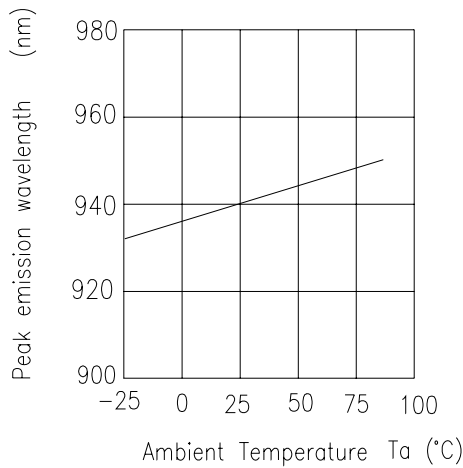


Fig. 4 Forward Current vs. Forward Voltage

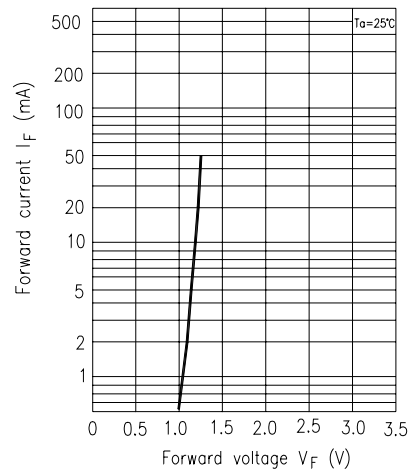


Fig. 5 Forward Voltage vs. Ambient Temperature

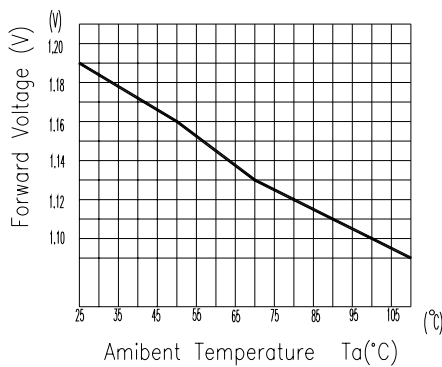
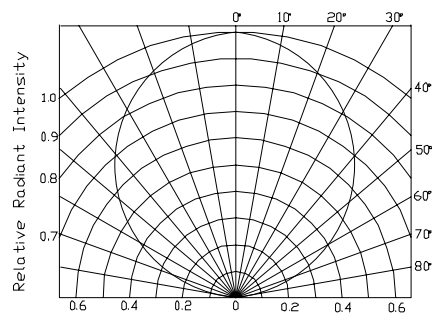


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



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

Fig.1 Collector Power Dissipation vs. Ambient Temperature

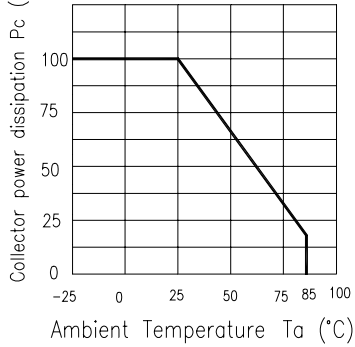


Fig.2 Collector Dark Current vs. Ambient Temperature

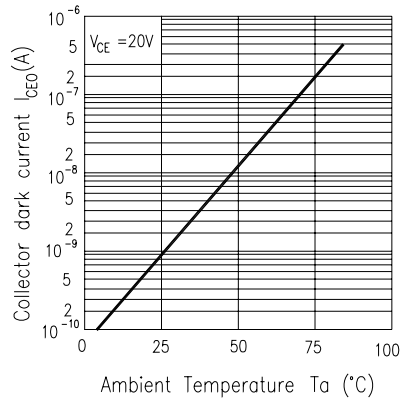


Fig. 3 Relative Collector Current vs. Ambient Temperature

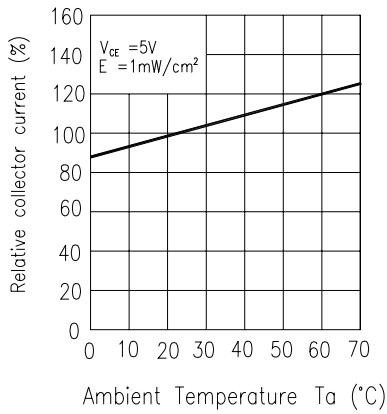


Fig.4 Collector Current vs. Irradiance

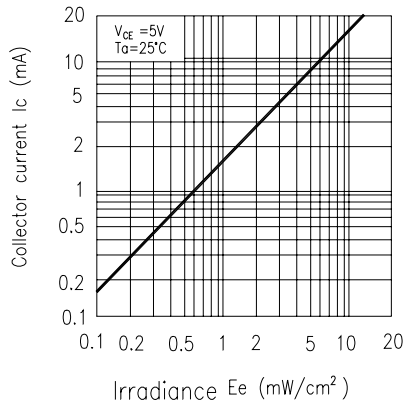


Fig.5 Spectral Sensitivity

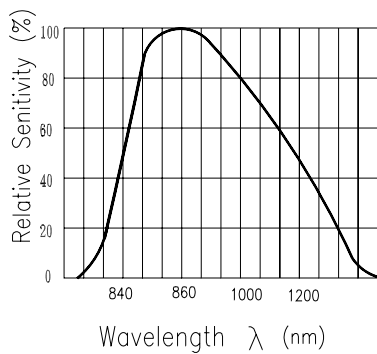
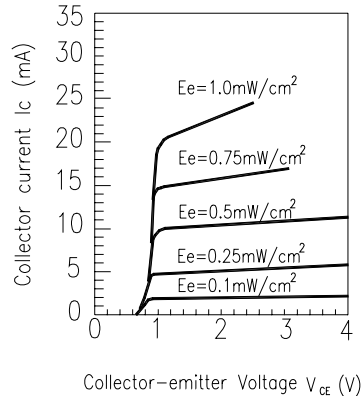


Fig.6 Collector Current vs. Collector-emitter Voltage



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

Fig.7 Relative Collector Current vs. Distance between Sensor and Al Evaporation Galss

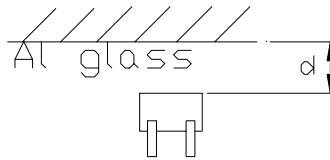
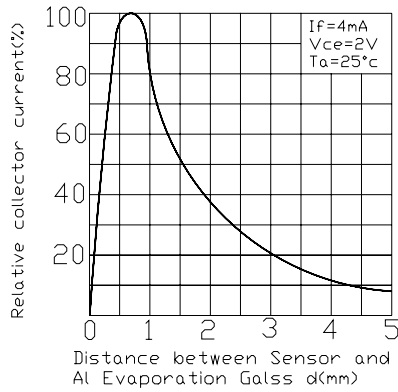


Fig.8 Relative Collector Current vs. Card Moving Distance (1)

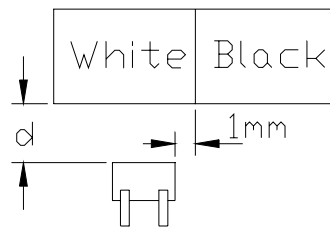
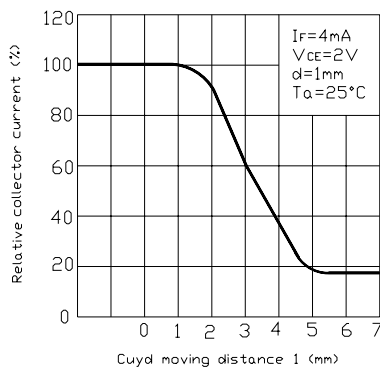
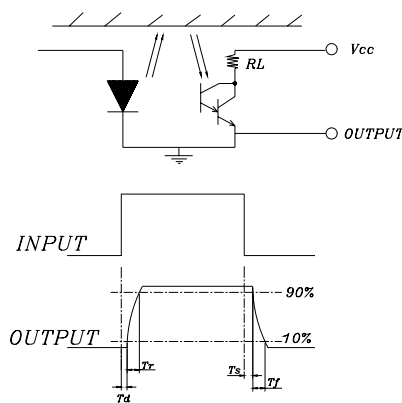
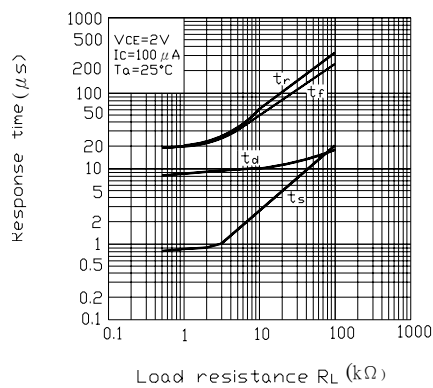


Fig.9 Response Time vs. Load Resistance



**Reliability Test Item And Condition**

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

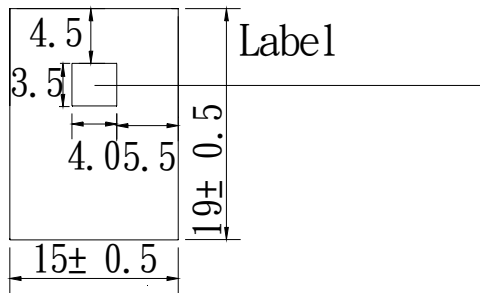
Confidence level : 90%

LTPD : 10%

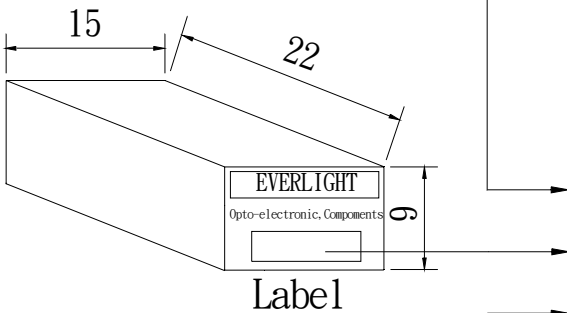
NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	Solder Heat	TEMP. : 260°C±5°C	10secs	22pcs		0/1
2	Temperature Cycle	H : +85°C     30mins ↑ 5mins ↓ L : -25°C     30mins	50Cycles	22pcs	$I_R \geq U \times 2$ $E_e \leq L \times 0.8$ $V_F \geq U \times 1.2$	0/1
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. : -30°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 Specifications**

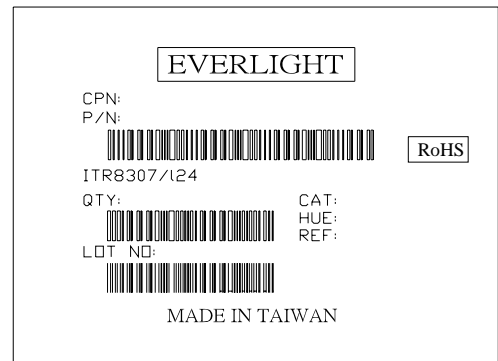
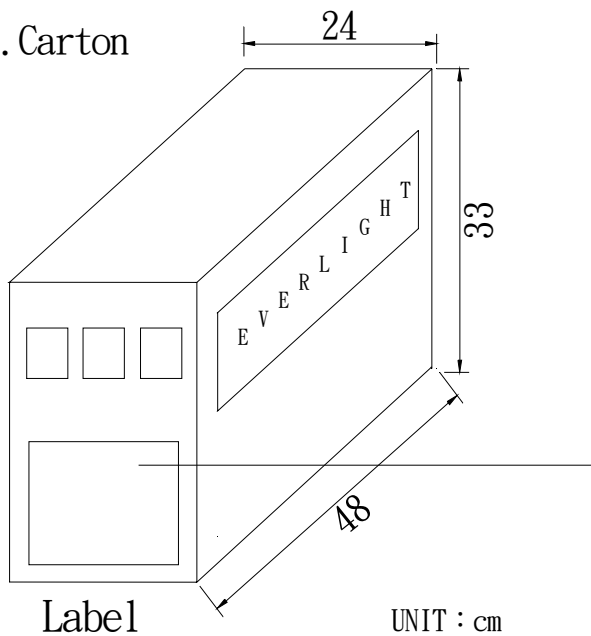
1. Bag



2. Box



3. Carton



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**

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

## 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  $125\text{ }^{\circ}\text{C}$

**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>