



Technical Data Sheet

Opto Interrupter ITR

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.

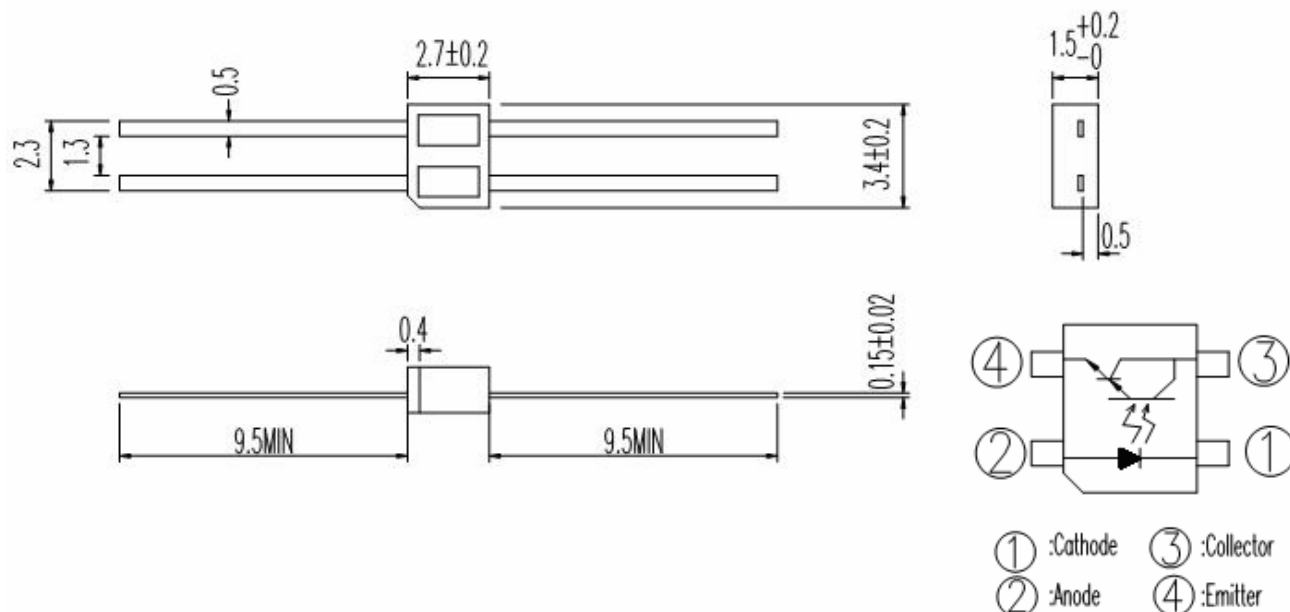
■ Applications

- 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 $\pm 0.25\text{mm}$

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation at(or below) 25°C Free Air Temperature	P_d	75	mW
	Reverse Voltage	V_R	6	V
	Forward Current	I_F	50	mA
	Peak Forward Current (*1) Pulse width $\leq 100 \mu\text{s}$, Duty cycle=1%	I_{FP}	1	A
Output	Collector Power Dissipation	P_C	100	mW
	Collector Current	I_C	20	mA
	Collector-Emitter Voltage	$B V_{CEO}$	35	V
	Emitter-Collector Voltage	$B V_{ECO}$	6	V
Operating Temperature		T_{opr}	$-25 \sim +85$	$-20 \sim +70$
Storage Temperature		T_{stg}	$-30 \sim +90$	$-30 \sim +80$
Lead Soldering Temperature (*2)		T_{sol}	260	260

(* 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 _F	-	1.2	1.4	V	I _F =20mA
	Reverse Current	I _R	-	-	10	μA	V _R =6V
	Peak Wavelength	λ _P	-	940	-	nm	-
Output	Dark Current	I _{CEO}	-	-	1	μA	V _{CE} =10V, E _e =1mW/cm ²
Transfer Characteristics	Collector Current	I _{C(ON)}	0.5	3.0	15.0	mA	V _{CE} =2V, I _F =4mA
	Leakage Current	I _{LEAK}	-	-	5	μA	V _{CE} =2V, I _F =4mA
	Rise time	t _r	-	80	400	μs	V _{CE} =2V I _C =10mA
	Fall time	t _f	-	70	400	μs	R _L =100Ω, d=1mm

Rank

Conditions : I_F=4mA V_{CE}=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

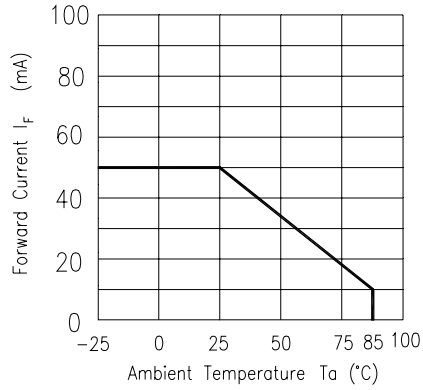


Fig. 2 Spectral Distribution

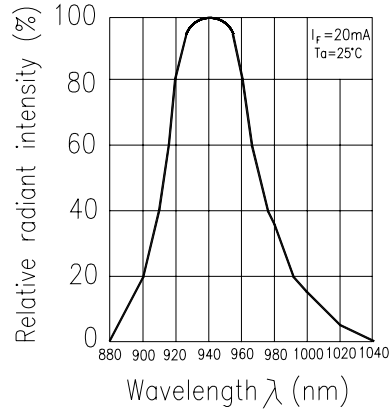


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

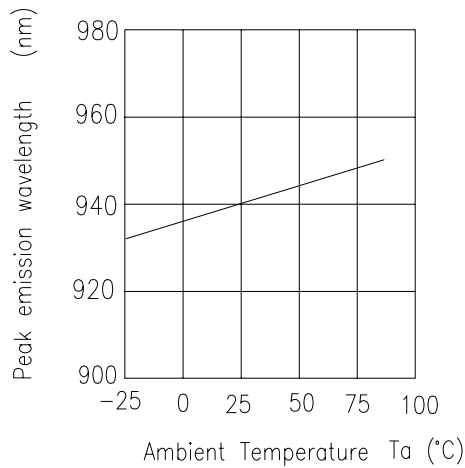


Fig. 4 Forward Current vs. Forward Voltage

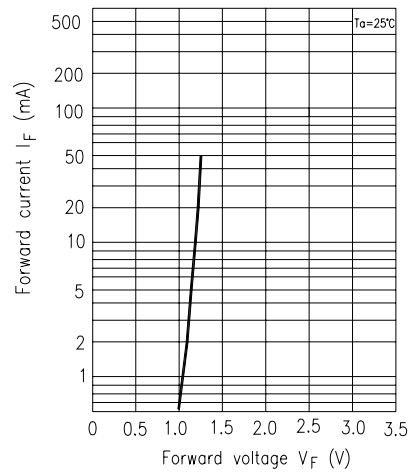


Fig. 5 Forward Voltage vs. Ambient Temperature

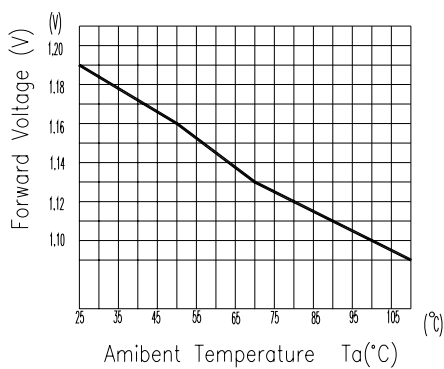
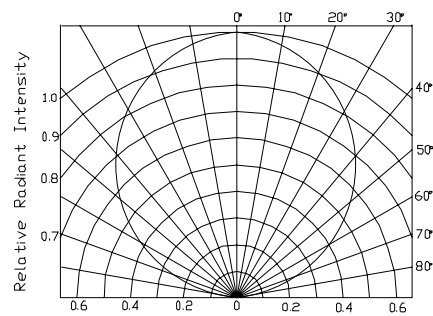


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



Typical Electrical/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

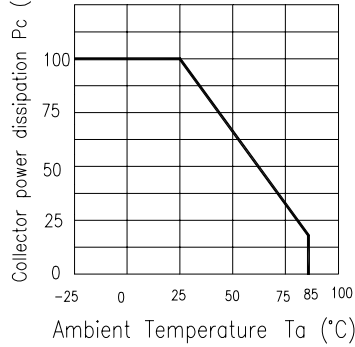


Fig.2 Collector Dark Current vs. Ambient Temperature

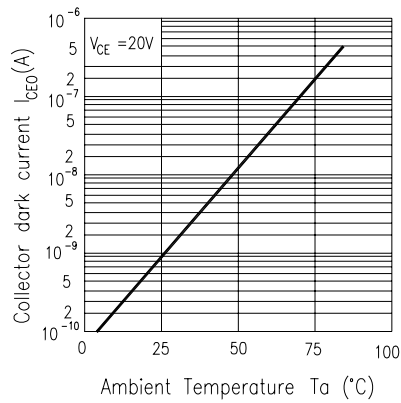


Fig. 3 Relative Collector Current vs. Ambient Temperature

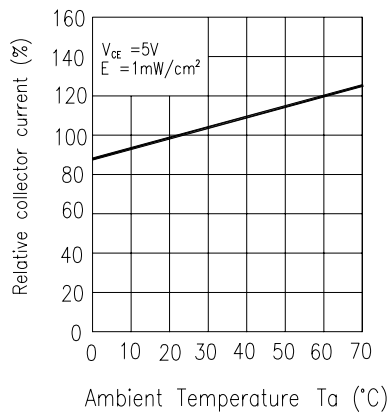


Fig.4 Collector Current vs. Irradiance

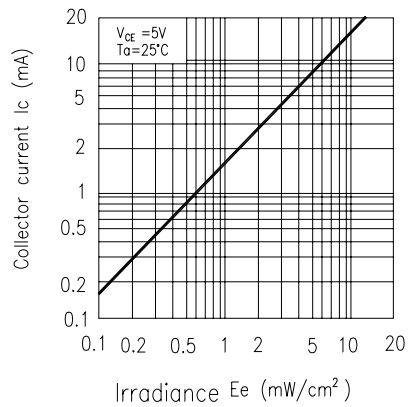


Fig.5 Spectral Sensitivity

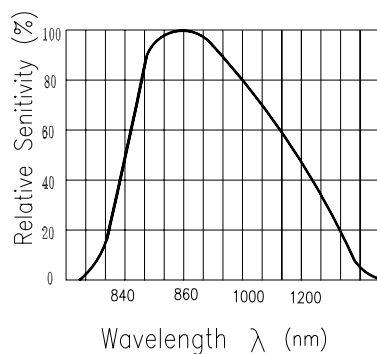
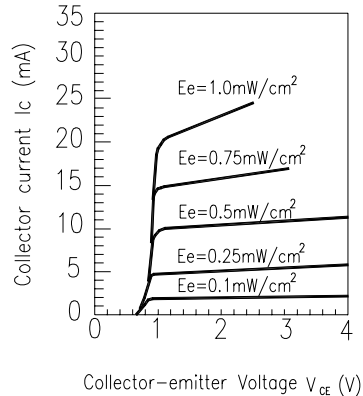


Fig.6 Collector Current vs. Collector-emitter Voltage



Typical Electrical/Optical/Characteristics Curves for ITR

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

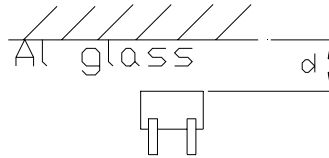
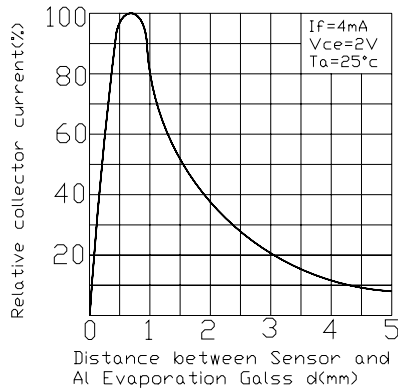


Fig.8 Relative Collector Current vs. Card Moving Distance (l)

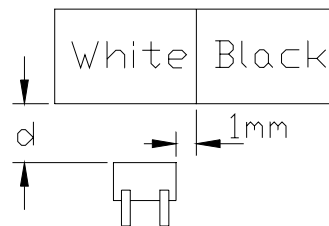
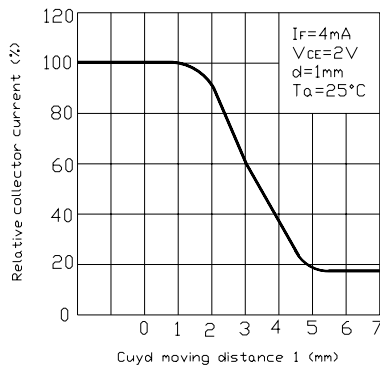
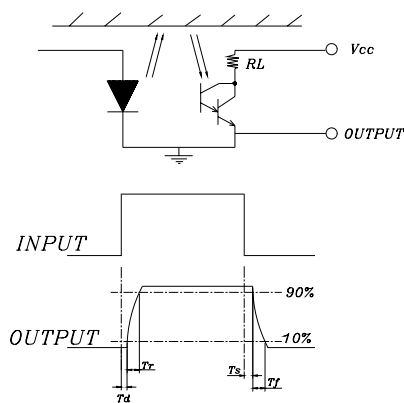
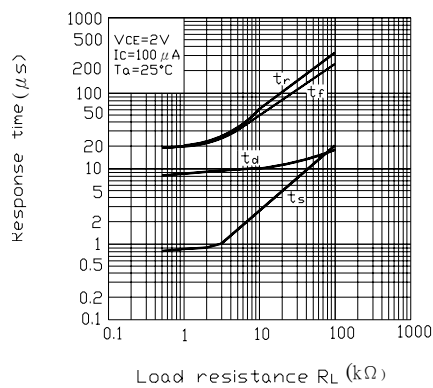


Fig.9 Response Time vs. Load Resistance



■ Reliability Test Item And Condition

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

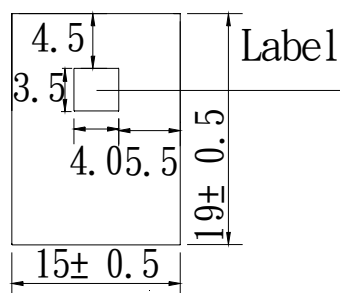
Confidence level : 90%

LTPD : 10%

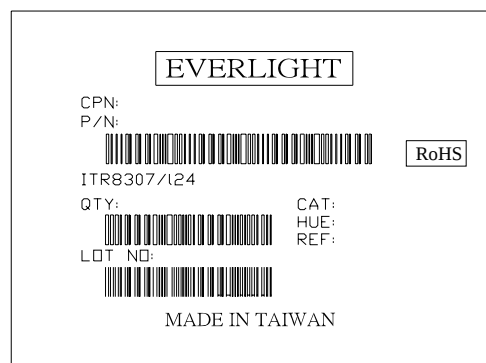
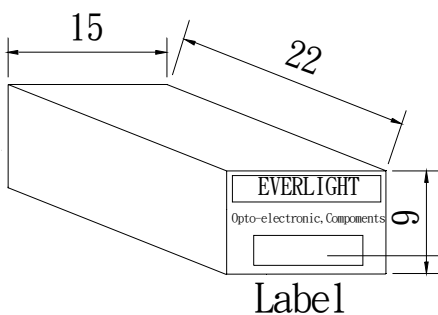
NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	Solder Heat	TEMP. : $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$	10secs	22pcs	$I_R \geq U \times 2$ $E_e \leq L \times 0.8$ $V_F \geq U \times 1.2$ U : Upper Specification Limit L : Lower Specification Limit	0/1
2	Temperature Cycle	H : $+85^{\circ}\text{C}$ 30mins $\updownarrow$ 5mins L : -25°C 30mins	50Cycles	22pcs		0/1
3	Thermal Shock	H : $+100^{\circ}\text{C}$ 5mins $\updownarrow$ 10secs L : -10°C 5mins	50Cycles	22pcs		0/1
4	High Temperature Storage	TEMP. : $+100^{\circ}\text{C}$	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP. : -30°C	1000hrs	22pcs		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

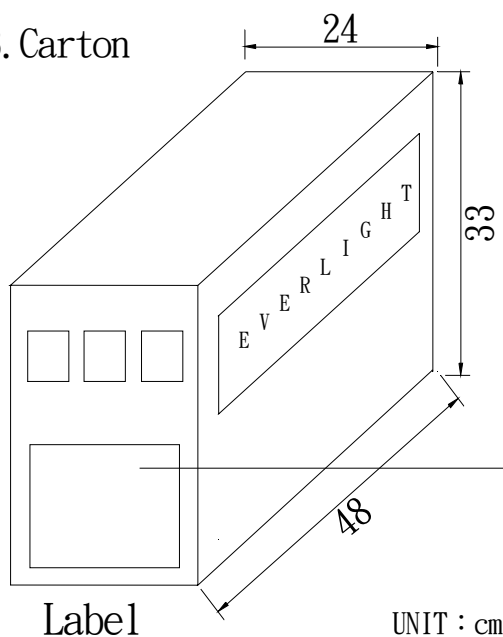
1. Bag



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

- 1000Pcs/1Bag
- 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 $< 40^{\circ}\text{C}$ 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

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