



# Technical Data Sheet

## Opto Interrupter

### ITR20001/T24

#### ■ Features

- Fast response time
- High analytic
- High sensitivity
- Cut-off visible wavelength  $\lambda_p=940\text{nm}$
- Pb Free
- This product itself will remain within RoHS compliant version.



#### ■ Descriptions

The **ITR20001/T24** consist of an infrared emitting diode and an NPN silicon phototransistor, encased side-by-side on converging optical axis in a black thermoplastic housing. The phototransistor receives radiation from the IR only . This is the normal situation. But when an reflecting object close to ITR , phototransistor receives the reflecting radiation .For additional component information, please refer to IR2424-3C and PT2424-6B.

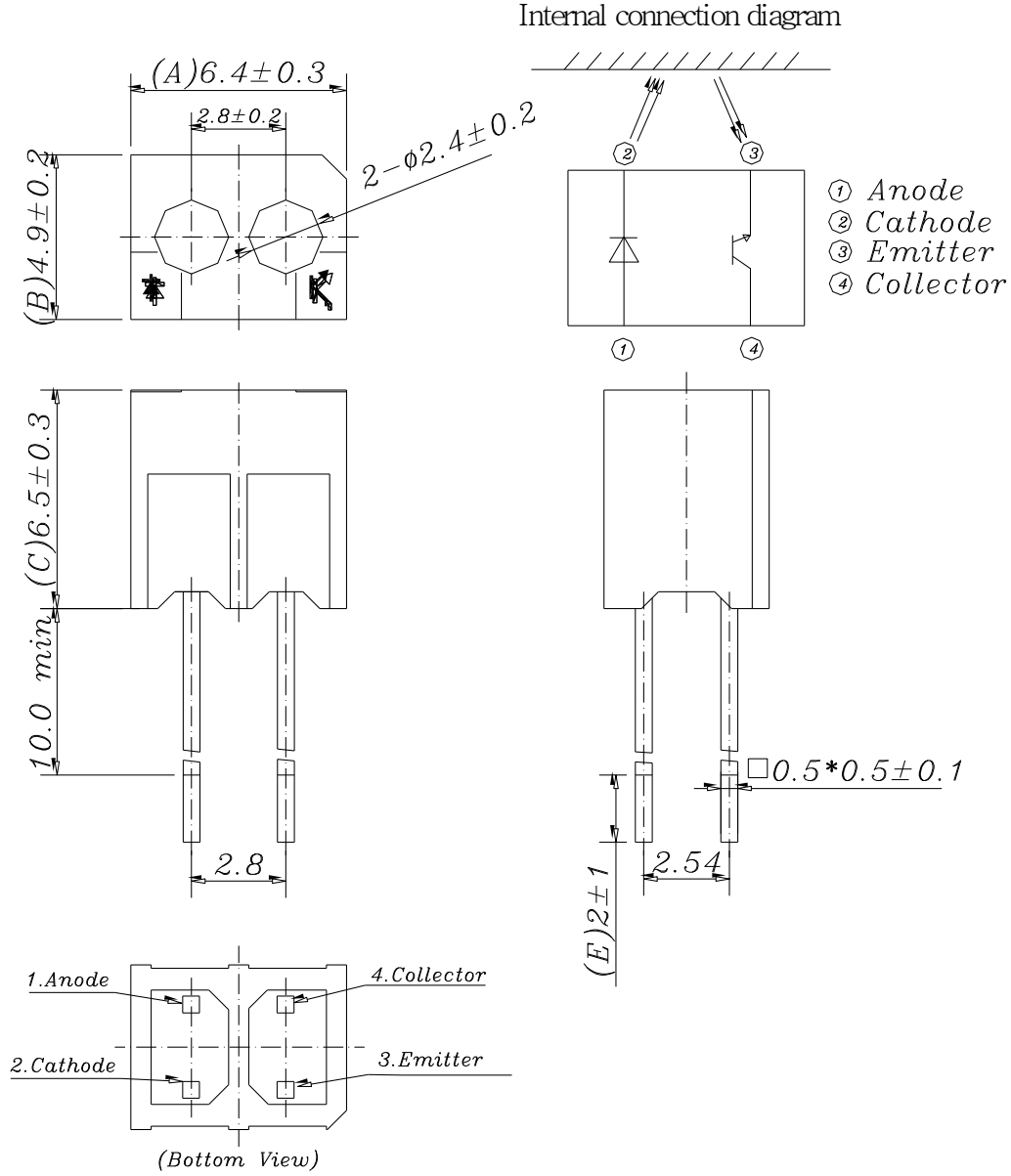
#### ■ Applications

- Mouse Copier
- Switch Scanner
- Floppy disk driver
- Non-contact Switching
- For Direct Board

#### ■ Device Selection Guide

Device No.	Chip Material	LENS COLOR
IR2424-3C	GaAlAs	Water Clear
PT2424-6B	Silicon	Black

**Package Dimensions**



**■ 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>	20	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>	-40~+85	°C
Lead Soldering Temperature (*2) (1/16 inch form body for 5 seconds)		T <sub>sol</sub>	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	Condition
Input	Forward Voltage	$V_{F1}$	-	1.2	1.5	V	$I_F=20\text{mA}$
		$V_{F2}$	-	1.4	1.8		$I_F=100\text{mA}, t_p=100\mu\text{s}, t_p/T=0.01$
		$V_{F3}$	-	2.6	4.0		$I_F=1\text{A}, t_p=100\mu\text{s}, t_p/T=0.01$
	reverse Current	$I_R$	-	-	10	$\mu\text{A}$	$V_R=5\text{V}$
	Peak Wavelength	$\lambda_P$	-	940	-	nm	$I_F=20\text{mA}$
	View Angle	$2\theta_{1/2}$	-	35	-	Deg	$I_F=20\text{mA}$
Output	Dark Current	$I_{CEO}$	-	-	100	nA	$V_{CE}=5\text{V}, E_e=0\text{mW}/\text{cm}^2$
	C-E Saturation Voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_C=0.04\text{mA}, I_F=40\text{mA}$
Collector Current(*3)		$I_{C(ON) L}$	400	-	900	$\mu\text{A}$	$V_{CE}=2\text{V}, I_F=10\text{mA}$
		$I_{C(ON) K}$	800	-	1800	$\mu\text{A}$	
		$I_{C(ON) J}$	1600	-	3600	$\mu\text{A}$	
		$I_{C(OFF)}$	-	-	2	$\mu\text{A}$	
Response Time	Rise Time	$t_R$	-	25	-	$\mu\text{s}$	$V_{CE}=5\text{V}, I_C=100\mu\text{A}$ $, R_L=100\Omega$
	Fall Time	$t_F$	-	25	-	$\mu\text{s}$	

(\*3)  $I_{C(on)}$  at the testing condition—without reflector in 5mm away,

$I_{C(off)}$  at the testing condition—without reflector and external light less than 10 Lux at the module surface.

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

Fig. 1 Forward Current vs. Ambient Temperature

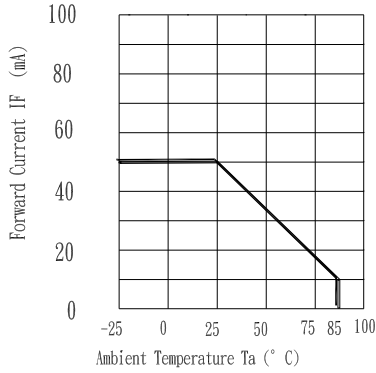


Fig. 2 Spectral Distribution

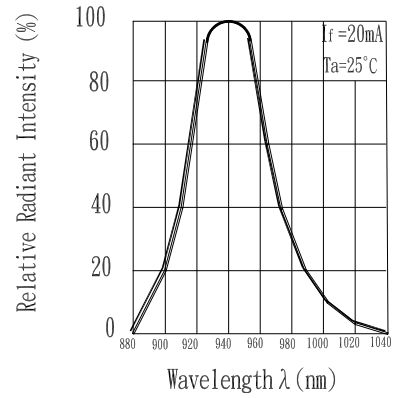


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

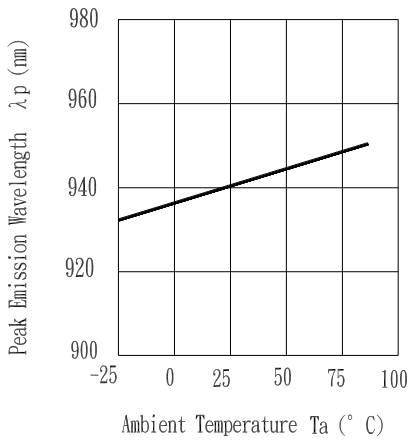


Fig. 4 Forward Current vs. Forward Voltage

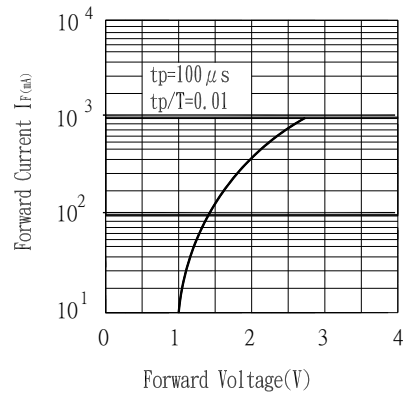


Fig. 5 Relative Intensity vs. Forward Current

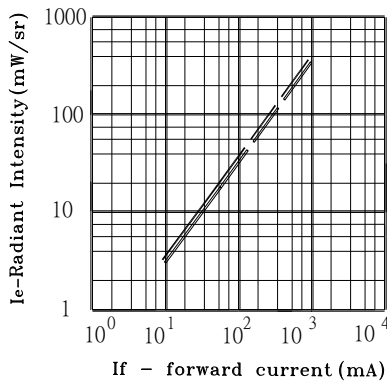
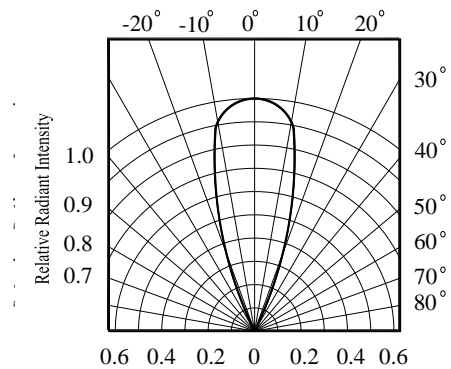
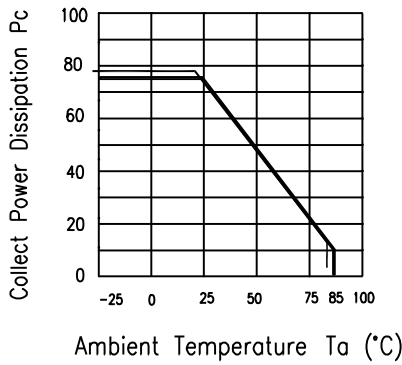


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



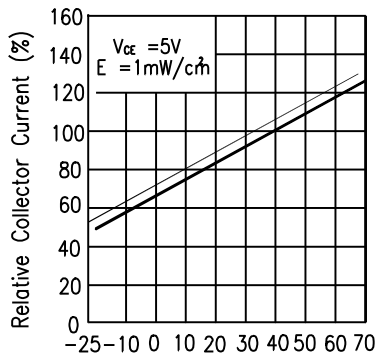
**Typical Electrical/Optical/Characteristics Curves for PT**

Fig.1 Collector Power Dissipation vs. Ambient Temperature



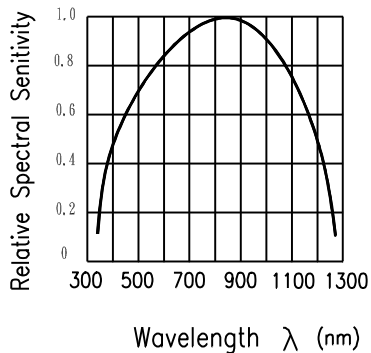
Ambient Temperature  $T_a$  (°C)

Fig. 3 Relative Collector Current vs. Ambient Temperature



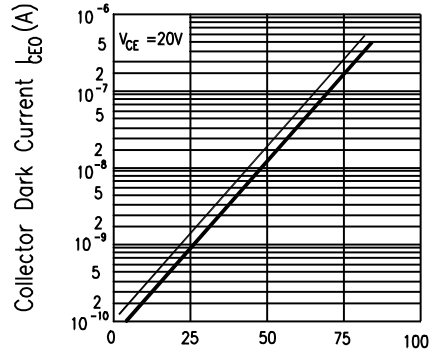
Ambient Temperature  $T_a$  (°C)

Fig.5 Spectral Sensitivity



Wavelength  $\lambda$  (nm)

Fig.2 Collector Dark Current vs. Ambient Temperature



Ambient Temperature  $T_a$  (°C)

Fig.4 Collector Current vs. Irradiance

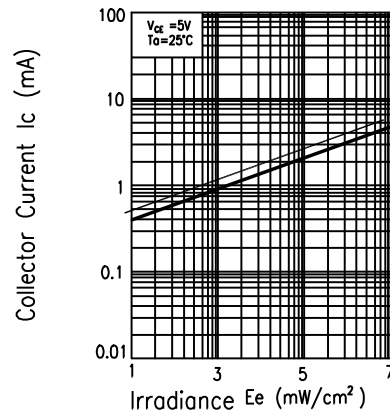
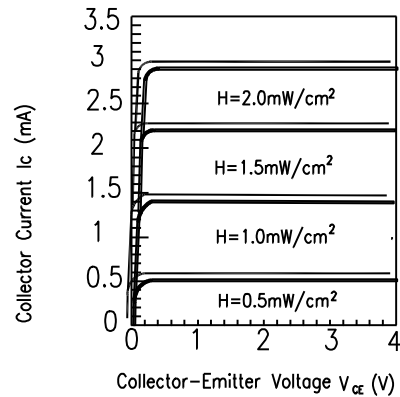


Fig.6 Collector Current vs. Collector-Emitter Voltage





**Reliability Test Item And Condition**

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

Confidence level : 90%

LTPD : 10%

NO.	Item	Test Condition	Test Hours/ Cycle	Sample Size	Failure Judgement Criteria	Ac/Re
1	Solder Heat	TEMP : 260°C ± 5 °C	5 sec	22 PCs	L :Lower specification limit	0/1
2	Temperature Cycle	H : +100°C    15 mins <div style="text-align: center;">  </div> L : -40°C    15 min	50 cycle	22 PCs		0/1
3	Thermal Shock	H : +100°C    5 min <div style="text-align: center;">  </div> L : -10°C    5 min	50 cycle	22 PCs		0/1
4	High Temperature Storage	TEMP. : +100°C	1000 hrs	22 PCs		0/1
5	Low Temperature Storage	TEMP. : -40°C	1000 hrs	22 PCs		0/1
6	DC Operating Life	V <sub>CE</sub> =5V I <sub>F</sub> =20mA	1000 hrs	22 PCs		0/1
7	High Temperature / High Humidity	85°C / 85% R.H.	1000 hrs	22 PCs		0/1



**ITR20001/T24**

**Packing Quantity Specification**

- 1.200PCS/1Bag, 6Bag/1Box
- 2. 10Boxes/1Carton

**Label Form Specification**



CPN: Customer's Production Number  
P/N : Production Number  
QTY: Packing Quantity  
CAT: Ranks  
HUE: Peak Wavelength  
REF: Reference  
LOT No: Lot Number

**Notes**

- 1.All dimensions are in millimeters
- 2.Tolerances unless dimensions  $\pm 0.2\text{mm}$
- 3.Lead spacing is measured where the lead emerge from the package
- 4.Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification
- 5.These specification sheets include materials protected under copyright of EVERLIGHT corporation . Please don' t reproduce or cause anyone to reproduce them without EVERLIGHT' s consent
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