

# Technical Data Sheet

## Opto Interrupter

**ITR20304**

### ■ 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 **ITR20304** 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 IR908-7C/F2/304 and PT5529B/L3/F2.

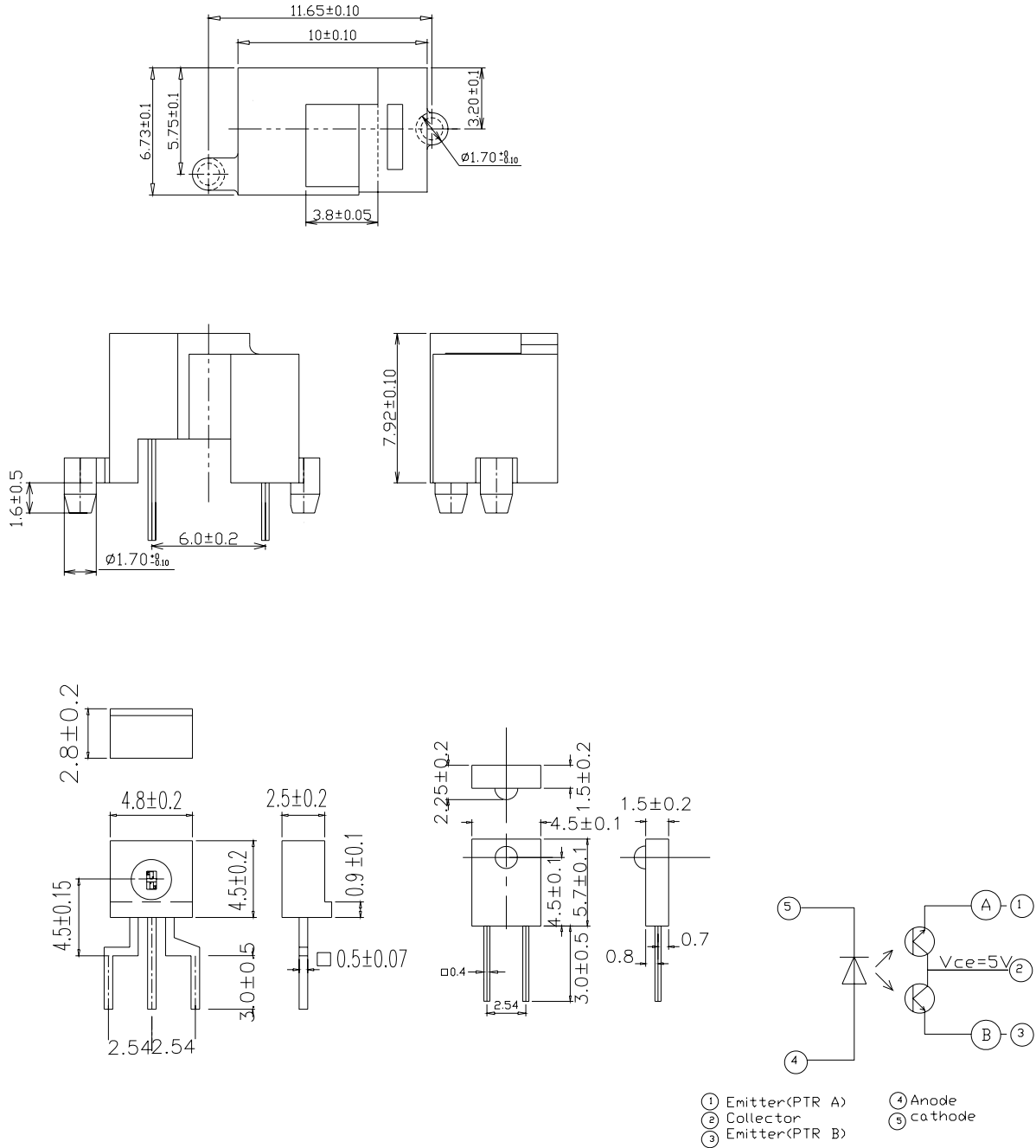
### ■ Applications

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

### ■ Device Selection Guide

Device No.	Chip Material	Lens Color
IR908-7C/F2/304	GaAlAs	Water Clear
PT5529B/L3/F2	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 ≤ 100μs, 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>	30	mA
	Collector-Emitter Voltage	BV <sub>CEO</sub>	30	V
	Emitter-Collector Voltage	BV <sub>ECO</sub>	5	V
	Operating Temperature	T <sub>opr</sub>	-25~+85	°C
Storage Temperature		T <sub>stg</sub>	-40~+100	°C
Lead Soldering Temperature (*2) (1/16 inch form body for 5 seconds)		T <sub>sol</sub>	260	°C

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

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Forward Voltage	V <sub>F1</sub>	-	1.2	1.5	V	I <sub>F</sub> =20mA
		V <sub>F2</sub>	-	1.4	1.8		I <sub>F</sub> =100mA, tp=100μs, tp/T=0.01
		V <sub>F3</sub>	-	2.6	4.0		I <sub>F</sub> =1A, tp=100μs, tp/T=0.01
	Reverse Current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> =5V
	Peak Wavelength	λ <sub>p</sub>	-	940	-	nm	I <sub>F</sub> =20mA
	View Angle	2θ1/2	-	60	-	Deg	I <sub>F</sub> =20mA
Output	Dark Current	I <sub>CEO</sub>	-	-	100	nA	V <sub>CE</sub> =5V, Ee=0mW/cm <sup>2</sup>
Collector Current	C-E Saturation Voltage	V <sub>CE(sat)</sub>	-	-	0.4	V	I <sub>C</sub> =0.5mA, Ee=10mW/cm <sup>2</sup>
	Light current (Use ITR9906Holder)	I <sub>C(A)</sub>	200	-	400	μA	V <sub>CE</sub> =5V, I <sub>F</sub> =4mA
		I <sub>C(B)</sub>	300	-	500	μA	
		I <sub>C(C)</sub>	400	-	600	μA	
	ABS[Ic(up.PT)-Ic(Dow n.PT)]					80	μA
Response Time	Rise Time	t <sub>R</sub>	-	25	-	μs	V <sub>CE</sub> =5V, I <sub>C</sub> =100μA , R <sub>L</sub> =100Ω
	Fall Time	t <sub>F</sub>	-	25	-	μs	

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

Fig. 1 Forward Current vs. Ambient Temperature

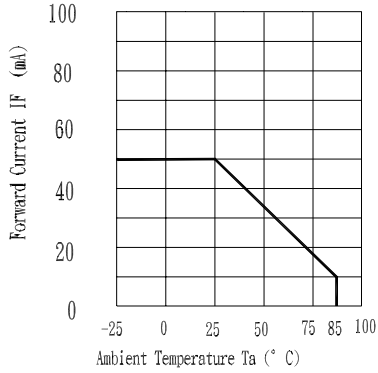


Fig. 2 Spectral Distribution

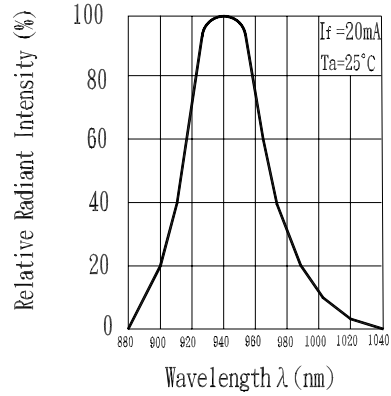


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

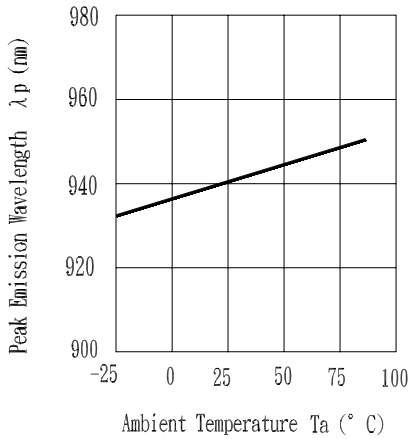


Fig. 4 Forward Current vs. Forward Voltage

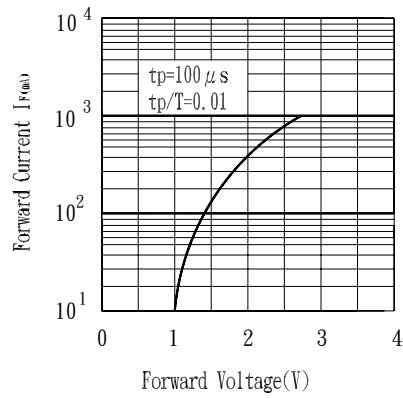


Fig. 5 Relative Intensity vs. Forward Current

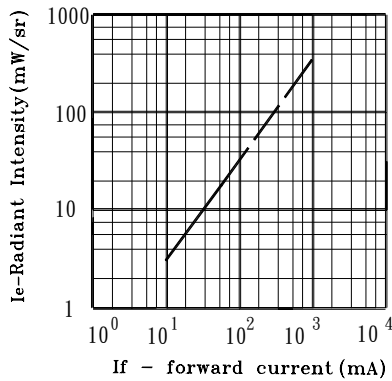
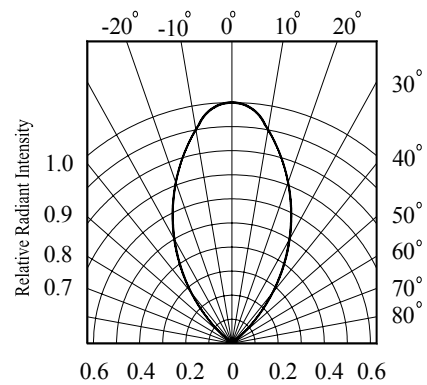
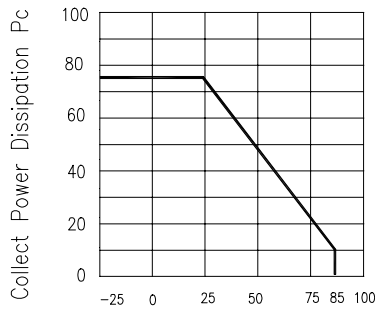


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



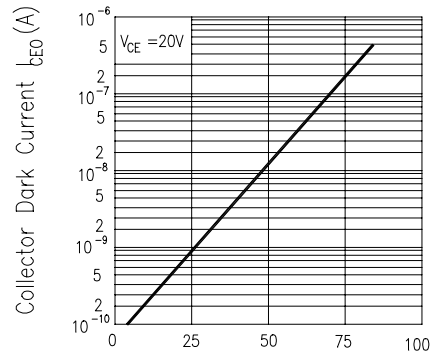
**Typical Electrical/Optical/Characteristics Curves for PT**

Fig.1 Collector Power Dissipation vs. Ambient Temperature



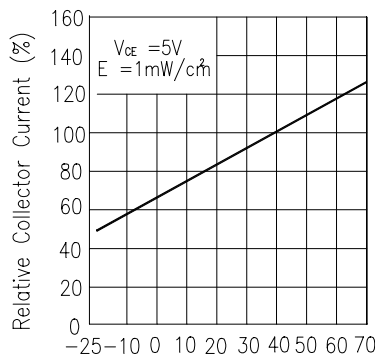
Ambient Temperature  $T_a$  (°C)

Fig.2 Collector Dark Current vs. Ambient Temperature



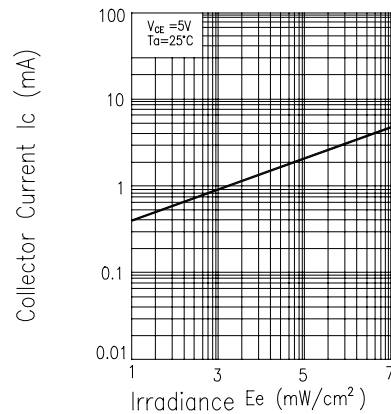
Ambient Temperature  $T_a$  (°C)

Fig. 3 Relative Collector Current vs. Ambient Temperature



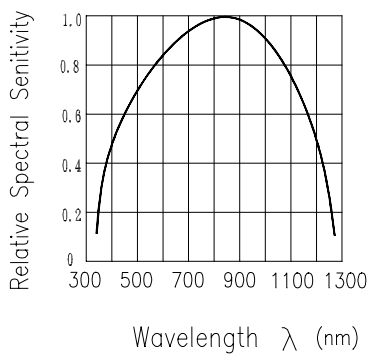
Ambient Temperature  $T_a$  (°C)

Fig.4 Collector Current vs. Irradiance



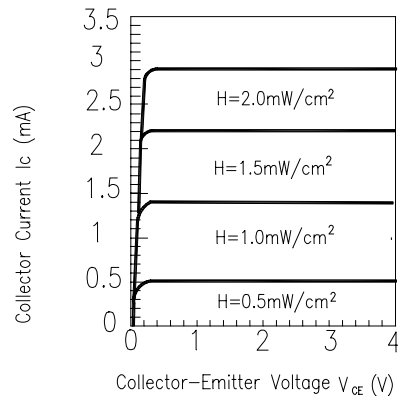
Irradiance  $E_e$  (mW/cm²)

Fig.5 Spectral Sensitivity



Wavelength  $\lambda$  (nm)

Fig.6 Collector Current vs. Collector-Emitter Voltage



Collector-Emitter Voltage  $V_{CE}$  (V)

**Reliability Test Item And Condition**

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

Confidence level : 90%

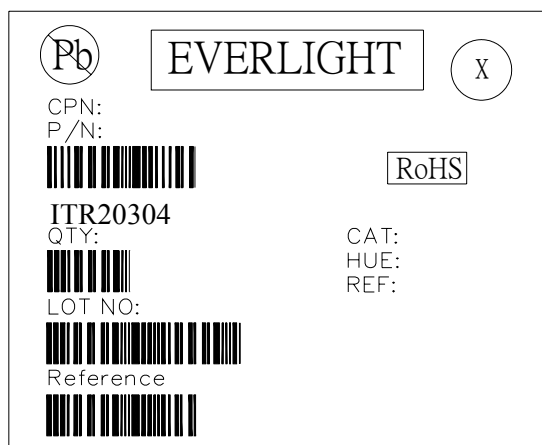
LTPD : 10%

NO.	Item	Test Condition	Test Hours/ Cycle	Sample Size	Failure Judgement Criteria	Ac/Re
1	Solder Heat	TEMP : 260°C ± 5 °C	10 sec	22 PCs	(IR)Attenuation of Power brightness or Electrical value>20% (PT) Attenuation of Light Current >20%	0/1
2	Temperature Cycle	H : +100°C    30 mins 5 min L : -40°C        30 min	300 cycle	22 PCs		0/1
3	Thermal Shock	H : +100°C    5 min 10 sec L : -10°C       5 min	300 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

## Packing Quantity Specification

1. 72PCS/1Tube, 100 Tubes/1Box
2. 4Boxes/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

X: Month

Reference: Identify Label 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
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6. When using this product , please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.

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