

# Technical Data Sheet

## Opto Interrupter

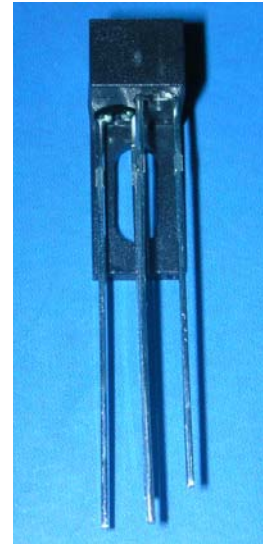
### ITR20501

#### ■ 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 **ITR20501** 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 IR234C/L110 and PT234-6B.



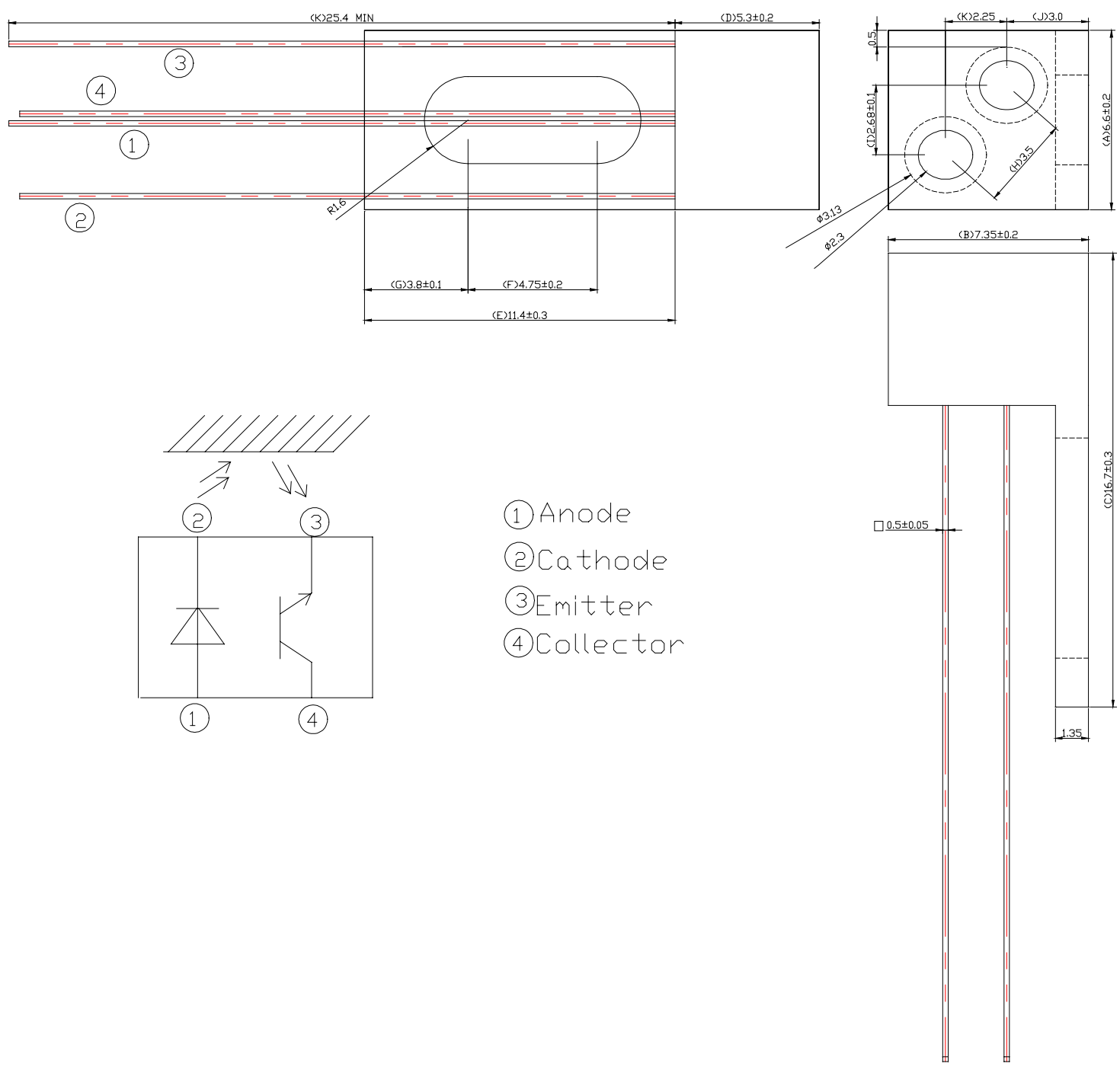
#### ■ Applications

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

#### ■ Device Selection Guide

Device No.	Chip Material	LENS COLOR
IR234C/L110	GaAlAs	Water Clear
PT234-6B	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
	Collector Power Dissipation	P <sub>C</sub>	75	mW
Output	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	Topr	-25~+85	°C
Storage Temperature		Tstg	-40~+85	°C
Lead Soldering Temperature (*2) (1/16 inch form body for 5 seconds)		Tsol	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=100 μs, tp/T=0.01
		V <sub>F3</sub>	-	2.6	4.0		I <sub>F</sub> =1A, tp=100 μs, 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	2θ 1/2	-	35	-	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>
	C-E Saturation Voltage	V <sub>CE(sat)</sub>	-	-	0.4	V	I <sub>C</sub> =0.04mA, I <sub>F</sub> =40mA
Collector Current		I <sub>C(ON)</sub>	20	-	110	μA	V <sub>CE</sub> =3V, I <sub>F</sub> =35mA
Response Time	Rise Time	t <sub>R</sub>	-	15	-	μs	V <sub>CE</sub> =5V, I <sub>C</sub> =100 μA , R <sub>L</sub> =100Ω
	Fall Time	t <sub>F</sub>	-	15	-	μs	

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

Fig. 1 Forward Current vs. Ambient Temperature

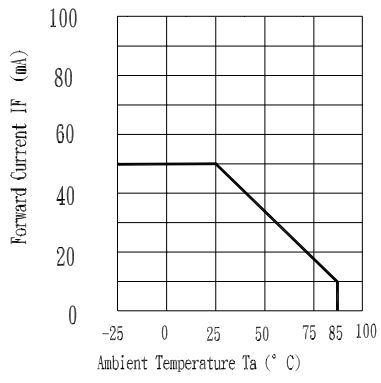


Fig. 2 Spectral Distribution

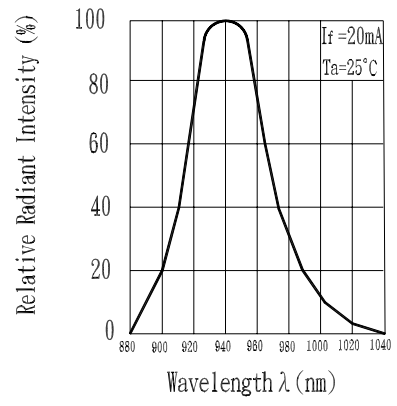


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

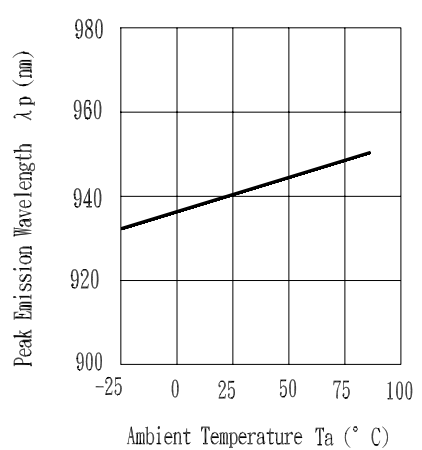


Fig. 4 Forward Current vs. Forward Voltage

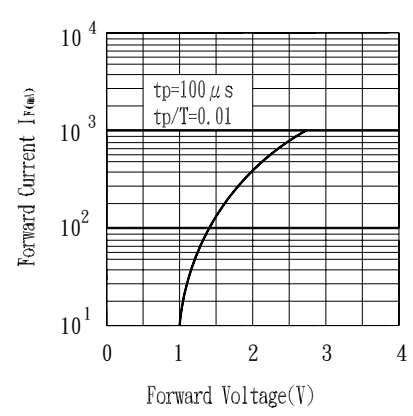


Fig. 5 Relative Intensity vs. Forward Current

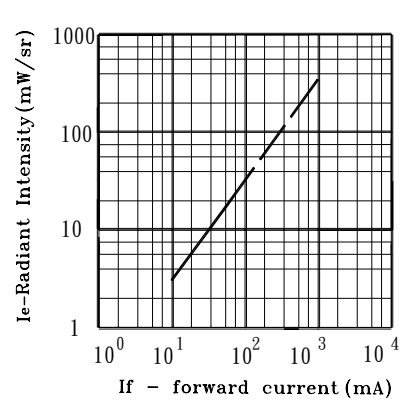
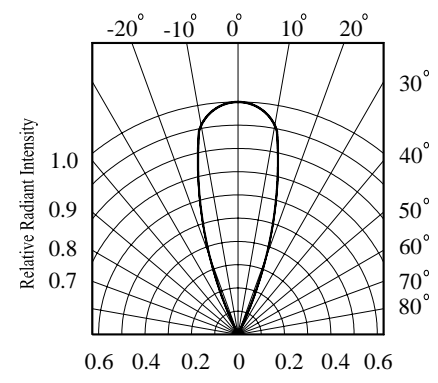
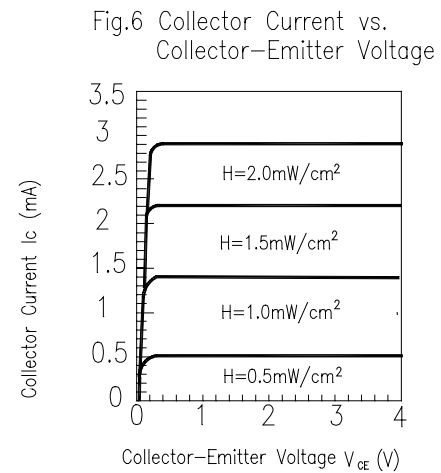
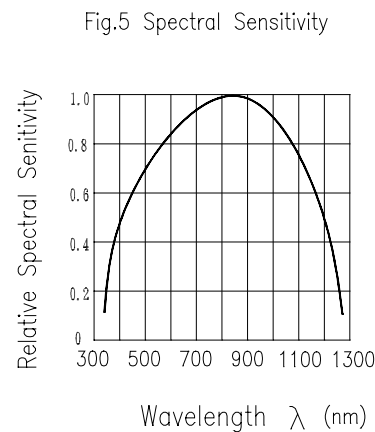
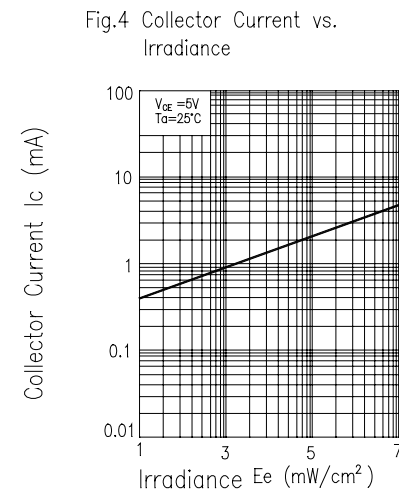
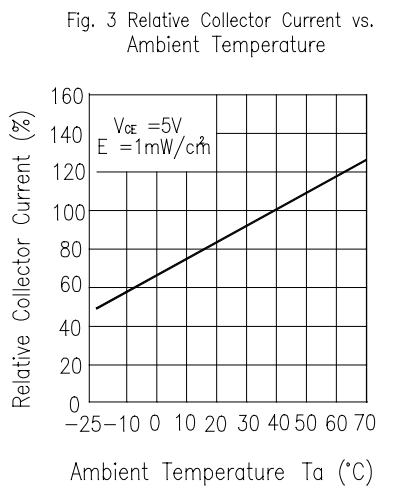
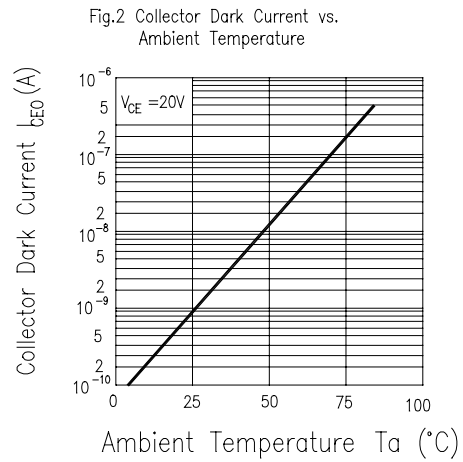
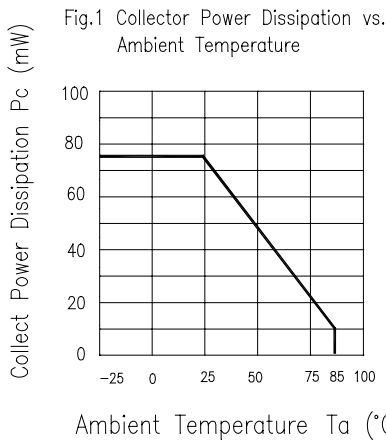


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



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





**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	$I_c(on) \leq L \times 0.8$  L : Lower specification limit	0/1
2	Temperature Cycle	H : +100°C    15 mins  5 min L : -40°C    15 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	$V_{CE}=5V$ $I_F=20mA$	1000 hrs	22 PCs		0/1
7	High Temperature / High Humidity	85°C / 85% R.H.	1000 hrs	22 PCs		0/1

