



# Technical Data Sheet

## Opto Interrupter

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### ITR20005-F

#### ■ 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 **ITR20005-F** 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 LED 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 IR928-6C-F and PT928-6C-F.

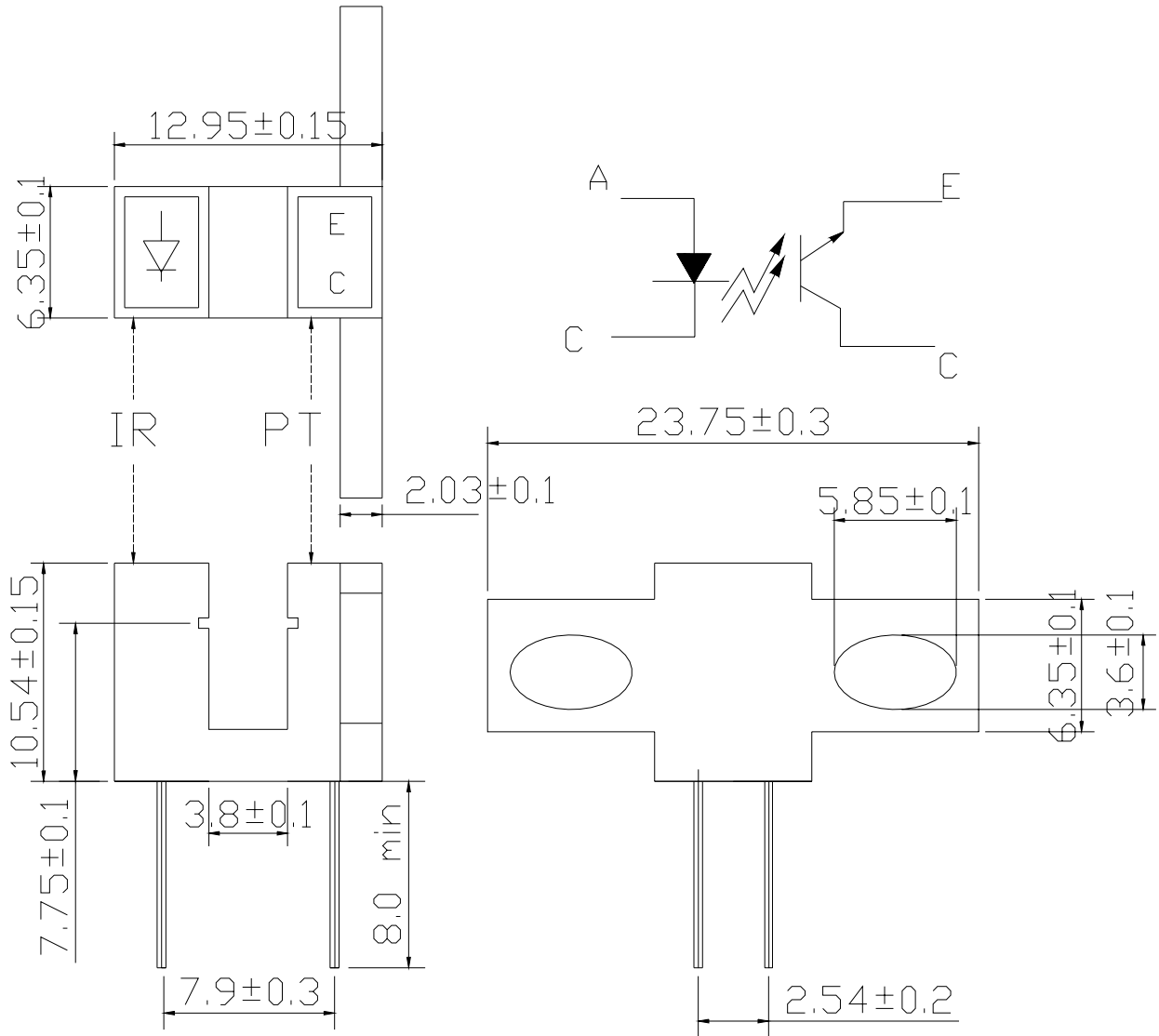
#### ■ Applications

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

#### ■ Device Selection Guide

Device No.	Chip Material	LENS COLOR
IR928-6C-F	GaAlAs	Water clear
PT928-6C-F	Silicon	Water clear

**Package Dimensions**



1. All dimensions are in millimeters
2. Tolerances unless dimensions  $\pm 0.3$ mm
3. Lead spacing is measured where the lead emerge from the package

**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	T <sub>opr</sub>	-40~+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 <sub>F</sub>	-	1.2	1.5	V	I <sub>F</sub> =20mA
	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	-	40	-	Deg	I <sub>F</sub> =20mA
Output	Dark Current	I <sub>CE O</sub>	-	-	100	nA	V <sub>CE</sub> =20V, Ee=0mW/cm <sup>2</sup>
	C-E Saturation Voltage	V <sub>CE(sat)</sub>	-	-	0.4	V	I <sub>C</sub> =2mA, Ee=1mW/cm <sup>2</sup>
Collector Current(*3)		I <sub>C(ON)</sub>	0.6	-	-	mA	V <sub>CE</sub> =5V, I <sub>F</sub> =20mA
		I <sub>C(OFF)</sub>	-	-	20	μA	
Response Time	Rise Time	t <sub>R</sub>	-	15	-	μs	V <sub>CE</sub> =5V, I <sub>C</sub> =1mA , R <sub>L</sub> =1KΩ
	Fall Time	t <sub>F</sub>	-	15	-	μs	

(\*3) I<sub>C(on)</sub> at the testing condition—with reflector in 6mm away,

I<sub>C(off)</sub> 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.

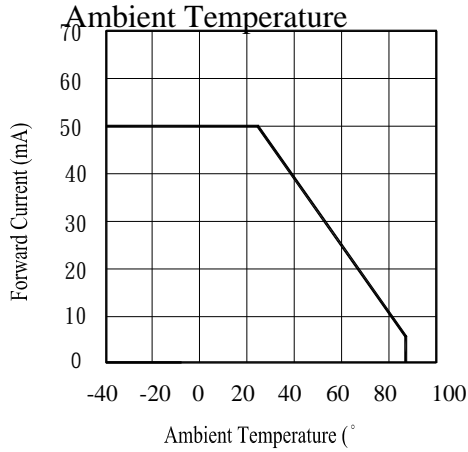


Fig.2 Spectral Distribution

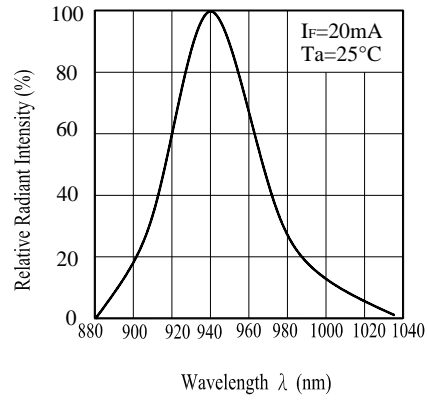


Fig.5 Relative Intensity vs.

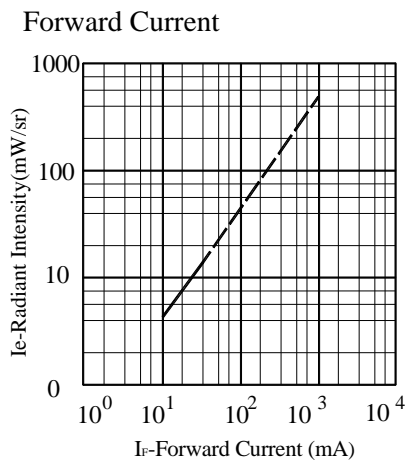


Fig.6 Relative Radiant Intensity vs.

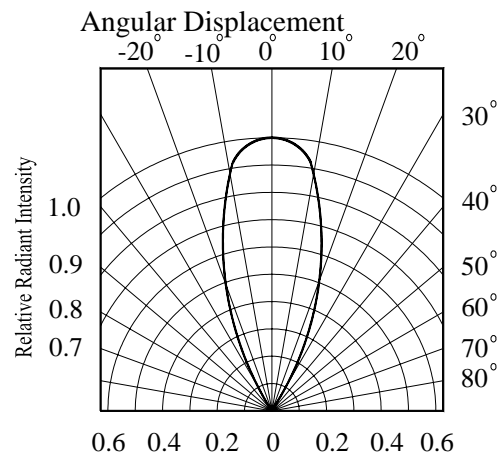


Fig.7 Relative Intensity vs.

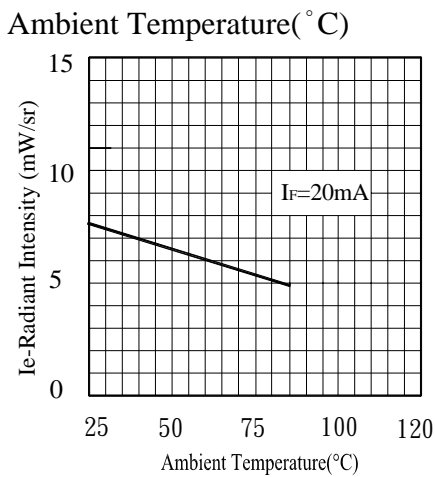
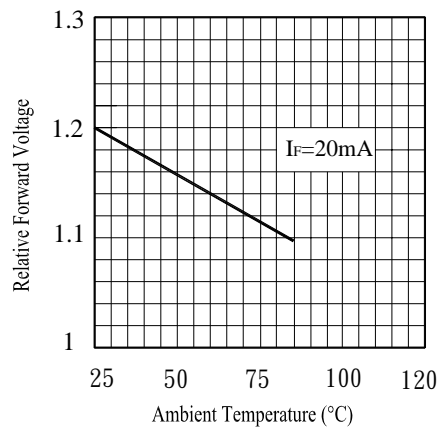


Fig.8 Forward Current vs. Ambient Temperature (°C)



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

Fig.1 Collector Power Dissipation vs. Ambient Temperature

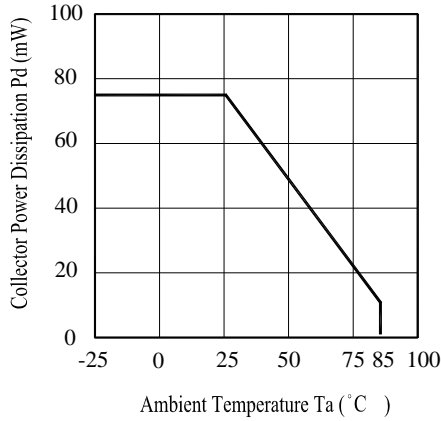


Fig.2 Spectral Sensitivity

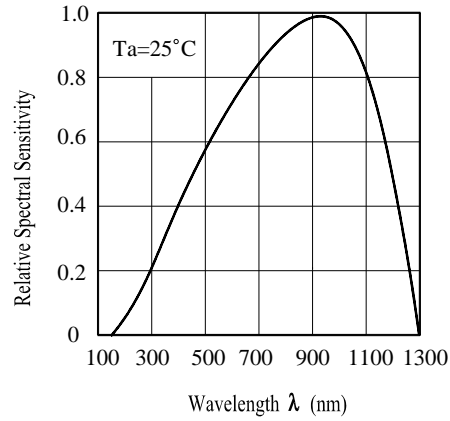


Fig.3 Relative Collector Current vs. Ambient Temperature

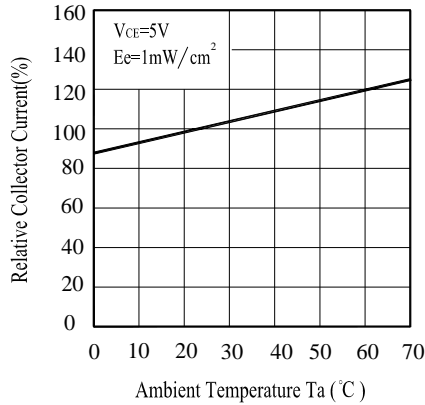


Fig.4 Collector Current vs. Irradiance

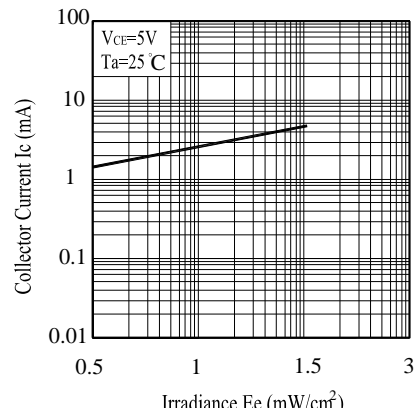


Fig.5 Collector Dark Current vs. Ambient Temperature

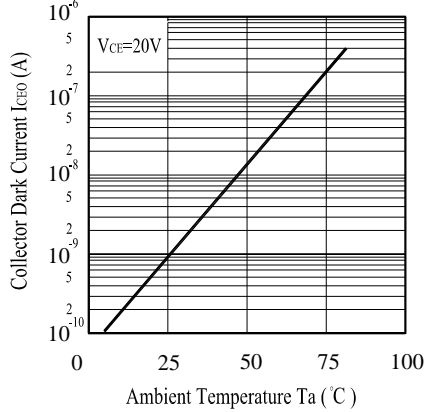
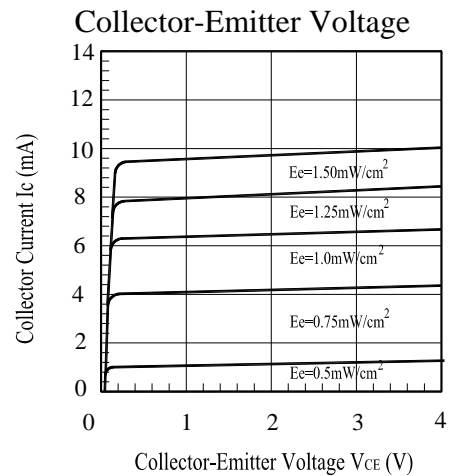


Fig.6 Collector Current vs. Collector-Emitter Voltage



**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	$I_{c(on)} \leq L \times 0.8$  L : Lower specification limit	0/1
2	Temperature Cycle	H : +100°C    15 mins ⇕ 5 min L : -40°C    15 mins	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



**ITR20005-F**

## Packing Quantity Specification

- 1.150PCS/1Bag, 4Bag/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

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