Technical Data Sheet
Opto Interrupter ITR

ITR20004

Features

- Fast response time
- High sensitivity
- Cut-Off visible wavelength
- Thin
- Compact
- Pb free

Descriptions

ITR20004 is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo transistor with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side- by- side in a plastic package.

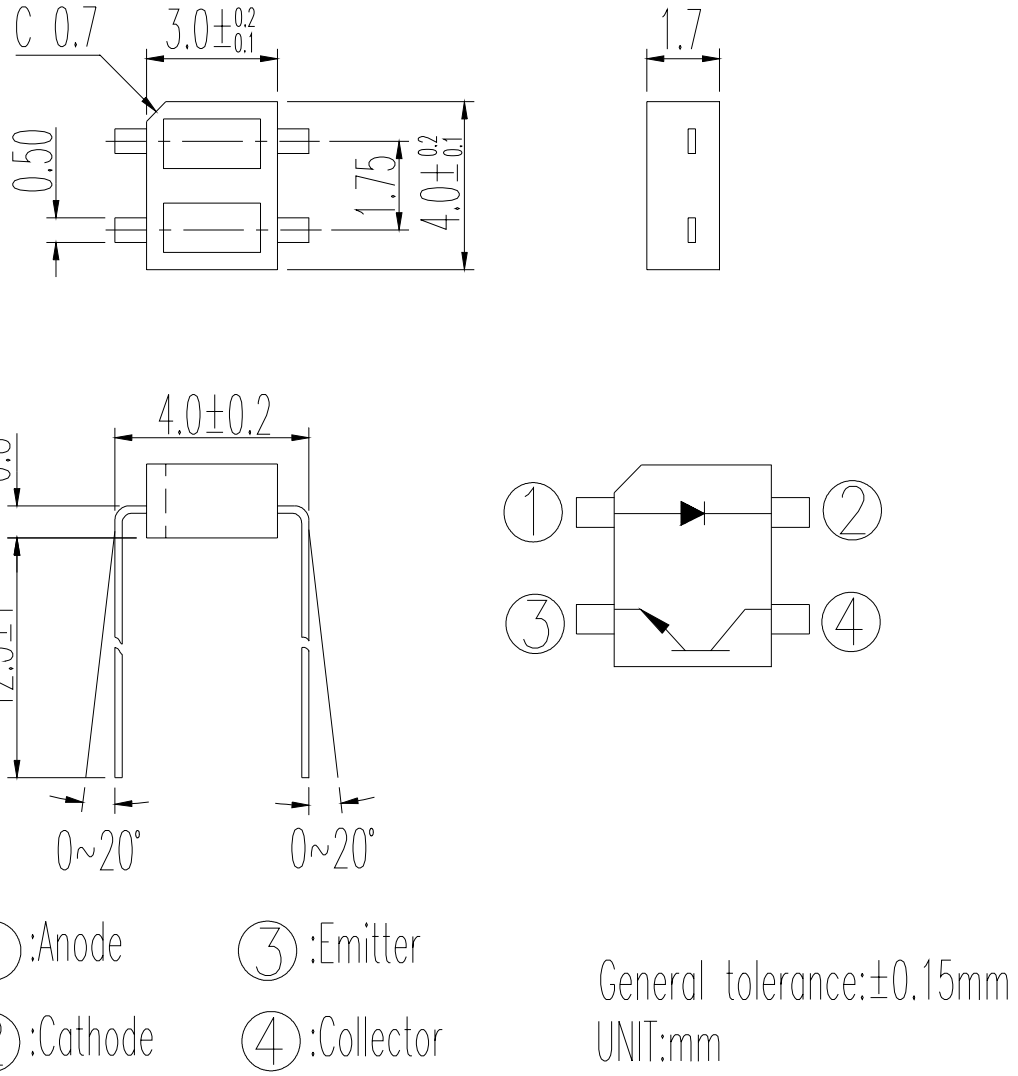
Applications

- 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 ±0.25mm

■Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation at(or below) 25℃ Free Air Temperature	Pd	130	mW
	Reverse Voltage	V_R	5	V
	Forward Current	I_F	50	mA
	Peak Forward Current (*1) Pulse width ≦100 μs, Duty cycle=1%	I_{FP}	1	A
Output	Collector Power Dissipation	P_C	75	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	B V_{CEO}	30	V
	Emitter-Collector Voltage	B V_{ECO}	5	V
Operating Temperature		Topr	-25~+85	℃
Storage Temperature		Tstg	-30~+85	℃
Lead Soldering Temperature (*2)		Tsol	260	℃

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

■Electro-Optical Characteristics (Ta=25℃)

Parameter		Symbol		Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	VF		-	1.2	1.6	V	IF=20mA
	Reverse Current	IR		-	-	10	μA	VR=5V
	Peak Wavelength	λP		-	940	-	nm	-
Output	Dark Current	ICEO		-	-	0.1	μA	VCE=20V,
Transfer Characteristics	Collector Current	IC(ON)	B	34	-	71	uA	VCE=2V, IF=4mA
			C	20	-	90		
	Leakage Current	ICEOD		-	-	1	μA	VCE=5V, IF=10mA
	Rise time	tr		-	20	-	μs	VCE=2V IC=100uA RL=1000Ω
	Fall time	tf		-	20	-	μs	

Typical Electrical/Optical/Characteristics Curves for IR

Fig. 1 Forward Current vs. Ambient Temperature

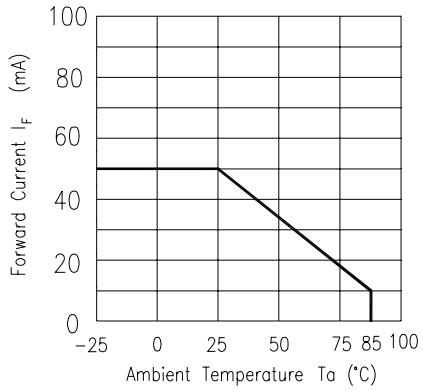


Fig. 2 Spectral Distribution

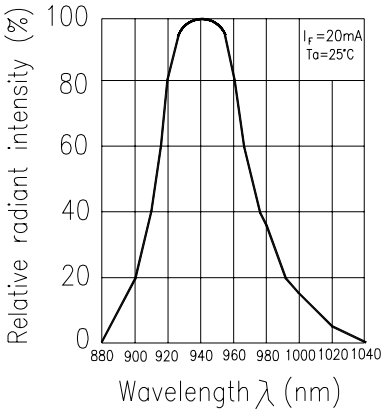


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

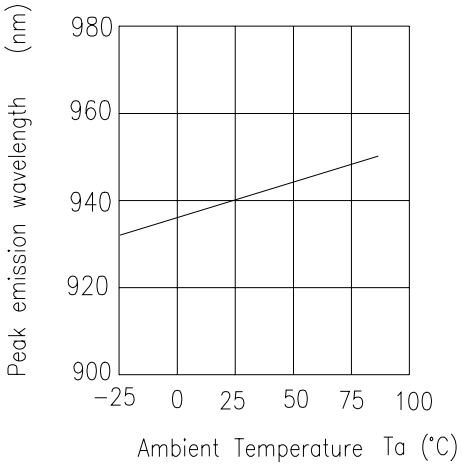


Fig. 4 Forward Current vs. Forward Voltage

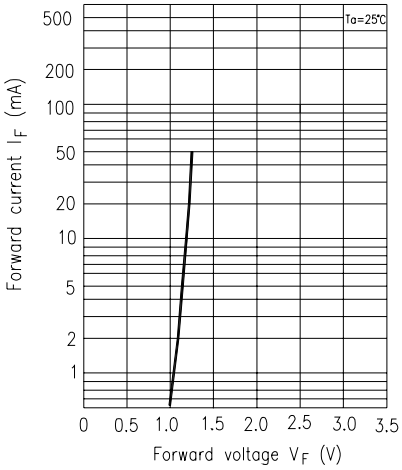


Fig. 5 Forward Voltage vs. Ambient Temperature

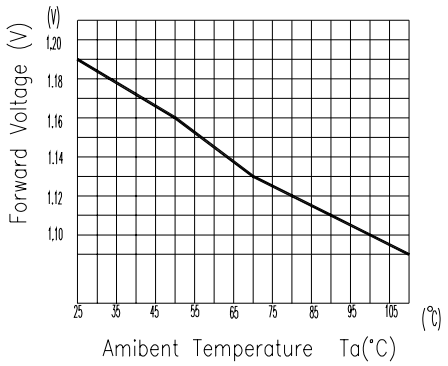
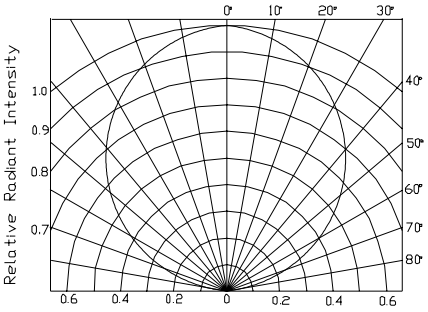


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



Typical Electrical/Optical/Characteristics Curves for PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

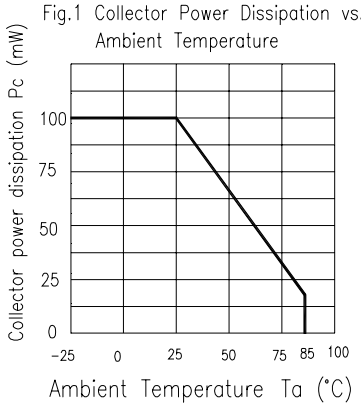


Fig.2 Collector Dark Current vs. Ambient Temperature

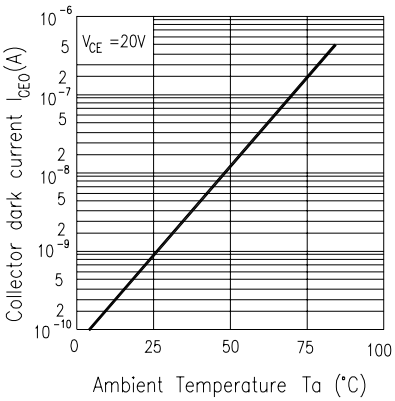


Fig. 3 Relative Collector Current vs. Ambient Temperature

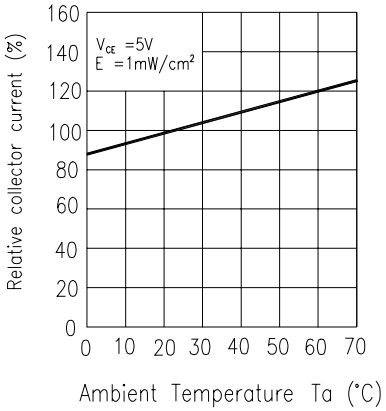


Fig.4 Collector Current vs. Irradiance

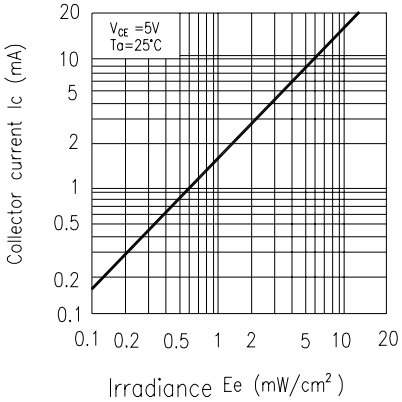


Fig.5 Spectral Sensitivity

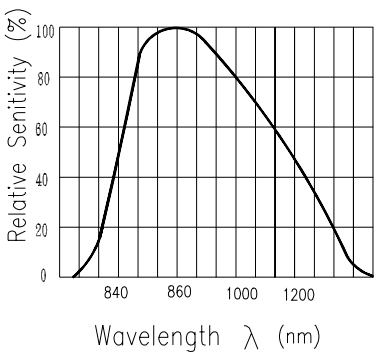
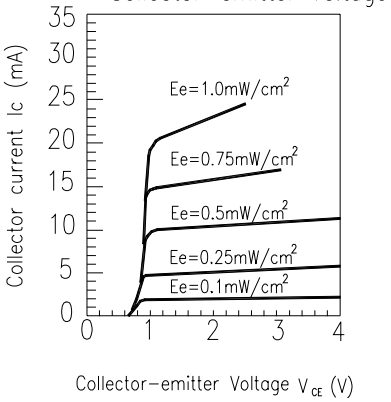
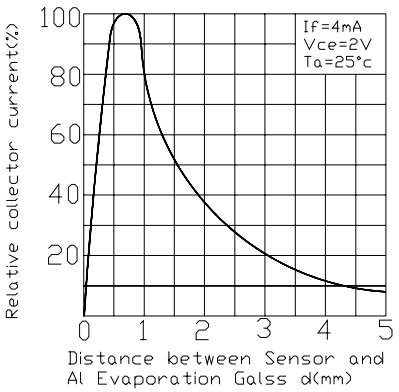


Fig.6 Collector Current vs. Collector-emitter Voltage



Typical Electrical/Optical/Characteristics Curves for ITR

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



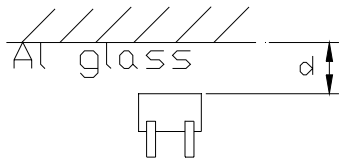
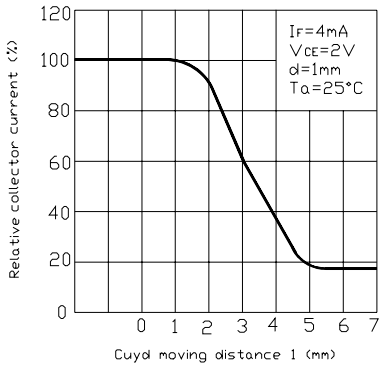


Fig.8 Relative Collector Current vs. Card Moving Distance (1)



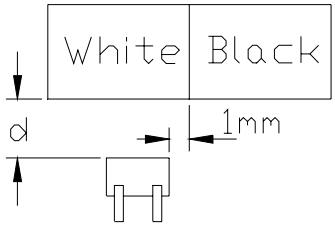
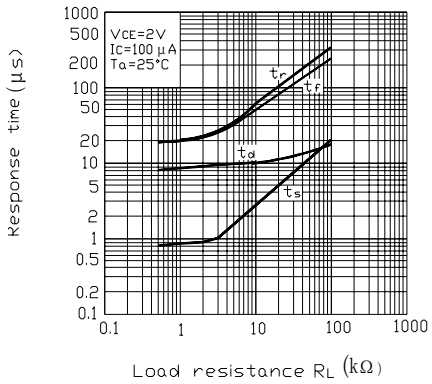
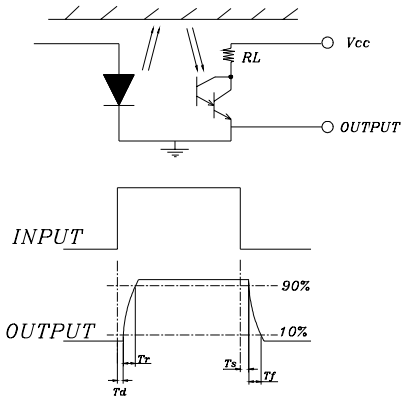


Fig.9 Response Time vs. Load Resistance





■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	Solderability	TEMP.：230℃±5℃	5secs	22pcs	More than 90% of lead to be covered by soldering	0/1
2	Temperature Cycle	H : +85℃ 30mins ↕ 5mins L : -55℃ 30mins	50Cycles	22pcs	$I_R \geqq U \times 2$ $Ee \leqq L \times 0.8$ $V_F \geqq U \times 1.2$ U：Upper Specification Limit L：Lower Specification Limit	0/1
3	Thermal Shock	H :+100℃ 5mins ↕ 10secs L :-10℃ 5mins	50Cycles	22pcs		0/1
4	High Temperature Storage	TEMP.：+100℃	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP.：-55℃	1000hrs	22pcs		0/1
6	DC Operating Life	I_F=20mA Vce=5V	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85℃ / 85% R.H	1000hrs	22pcs		0/1

■Recommended Method of Storage

The following are general recommendations for moisture sensitive level (MSL) 4 storage and use:

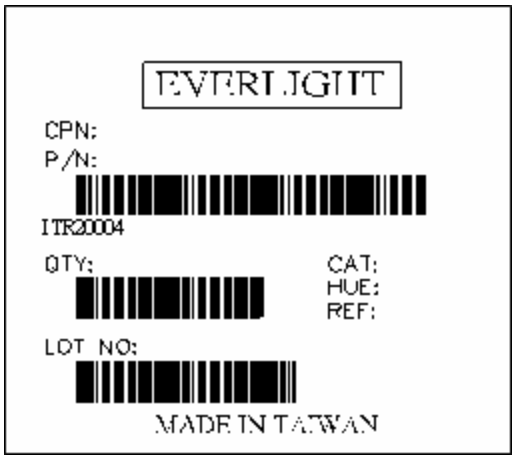
- Shelf life in sealed bag: 12 months at < 40 °C and < 90% relative humidity (RH)
- After bag is opened, devices that will be subjected to reflow solder or other high temperature process must
  a) Mounted within 72 hours of factory conditions < 30 °C/60%RH, or
  b) Stored at <20% RH
  - Devices require bake, before mounting, if:

  Humidity Indicator Card is > 20% when read at 23 ± 5 °C
- If baking is required, devices may be baked:
  a) 192 hours at 40℃,and <5% RH(dry air/nitrogen) or
  b) 96 hours at 60℃,and <5% RH for all device containers
  c) 24 hours at 125 °C

Packing Specifications

1. 100 Pcs/1 Tube
2. 44 Tube /1 Box
3. 6 Box/ 1 Carton

Label Form Specification



CPN: Customer's Production Number
P/N : Production Number
QTY: Packing Quantity
CAT: None
HUE: None
REF: Reference
LOT No: Lot Number
MADE IN TAIWAN: Production Place

Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT 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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