



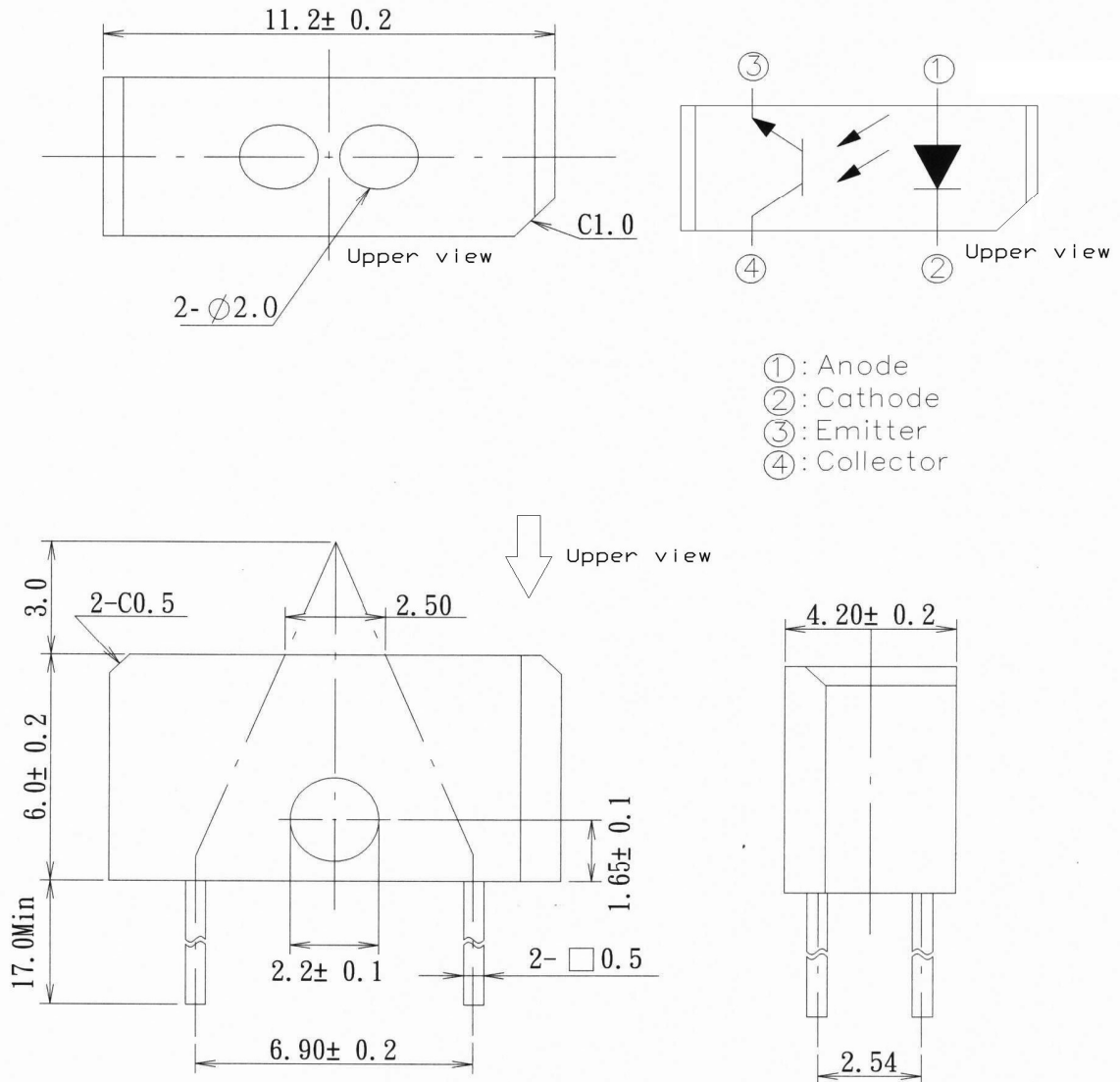
EVERLIGHT ELECTRONICS CO, LTD.

Device Number: DRX-904-101 REV: 1.0

MODEL NO: ITR9904

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■ Package Dimensions :



Office: NO 25, Lane. 76, Chung Yang Rd., Sec. 3, Tucheng, Taipei 236, Taiwan, R.O.C.

TEL: 886-2-2267-2000, 2267-9936 (22 Lines)

FAX: 886-2-2267-6189

http: [//www.everlight.com](http://www.everlight.com)



■Description

The **ITR9904** consists of an infrared emitting diode and an NPN silicon phototransistor, encased oblique angle (45°) on converging optical axis in a black thermoplastic housing. The phototransistor receives radiation from the IRED only. This is the normal situation. For additional component information, please refer to **IR1254-R8** and **PT1254-6B**.

■Features

ITR:

- Fast response time
- High analytic
- Cut-off visible wavelength $\lambda_p=980\text{nm}$
- High sensitivity

■Applications

- Copier
- Scanner
- Non-contact Switching
- For Direct PC Board



■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation	Pd	100	mW
	Reverse Voltage	V _R	5	V
	Forward Current	I _F	50	mA
	Peak Forward Current (*1)	I _{FP}	1.0	A
Output	Collector Power Dissipation	PC	75	mW
	Collector Current	I _C	20	mA
	Collector-Emitter Voltage	V _{CEO}	30	V
	Emitter-Collector Voltage	V _{ECO}	5	V
Operating Temperature		Topr	-25~+85	°C
Storage Temperature		Tstg	-40~+85	°C
Soldering Temperature (*2)		Tsol	260	°C

(*1) tw=100 μsec. , Duty cycle=1% (*2) t=5 Sec

■ Electrical Characteristics (Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	V _{F1}	-	1.2	1.5	V	I _F =20mA
		V _{F2}	-	1.4	1.85	V	I _F =100mA
		V _{F3}	-	2.6	4.0	V	I _F =1A
	Reverse Current	I _R	-	-	10	μA	V _R =5V
	Peak Wavelength	λ _P	-	940	-	nm	-
	View Angle	2θ _{1/2}	-	35	-	Deg	I _F =20mA
Output	Dark Current	I _{CEO}	-	-	100	nA	V _{CE} =20V Ee=0mW/cm ²
	C-E Saturation Voltage	V _{CE(sat)}	-	-	0.4	V	I _C =2mA I _B =0.1mA
Collector Current		I _{C(ON)A}	100	-	300	μA	V _{CE} =5V I _F =20mA
		I _{C(ON)B}	200	-	600		
		I _{C(ON)C}	400	-	1200		
Speed	Rise time	t _R	-	15	-	μsec	V _{CE} =2V I _C =1mA R _L =1kΩ
	Fall time	t _F	-	15	-	μsec	



■ Typical Characteristics For IR

Fig. 1 Forward Current vs. Ambient Temperature

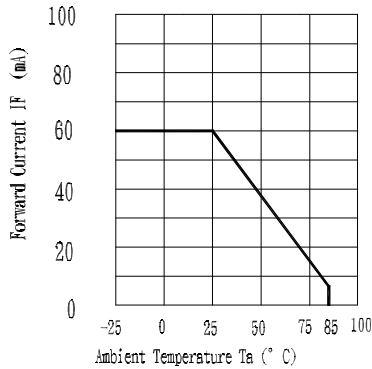


Fig. 2 Spectral Distribution

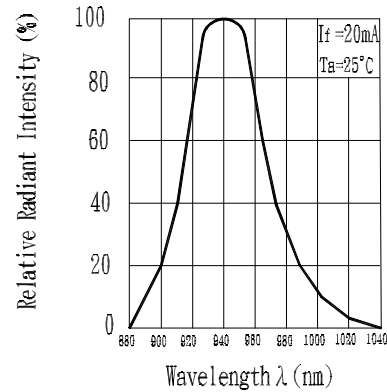


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

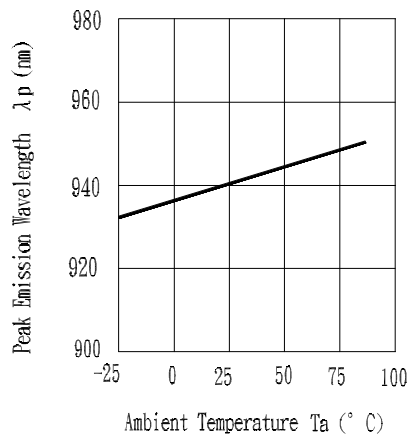


Fig. 4 Forward Current vs. Forward Voltage

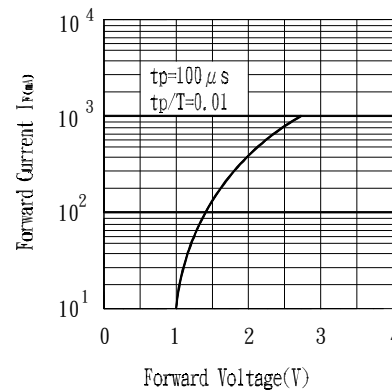


Fig. 5 Relative Intensity vs. Forward Current

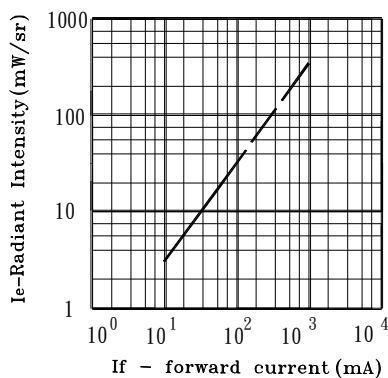
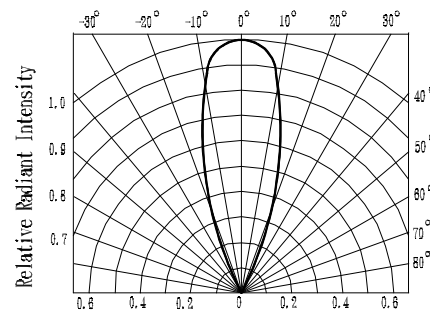


Fig. 6 Relative Radiant Intensity vs. Angular Displacement





■ Typical Characteristics For PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

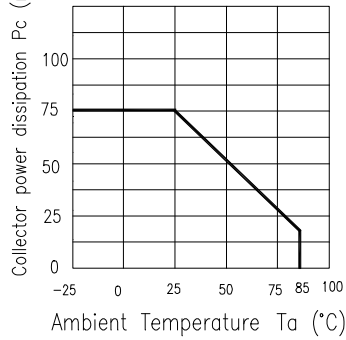


Fig.2 Collector Dark Current vs. Ambient Temperature

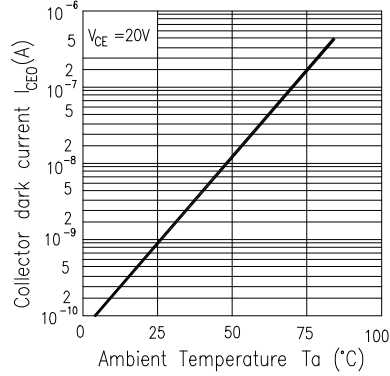


Fig. 3 Relative Collector Current vs. Ambient Temperature

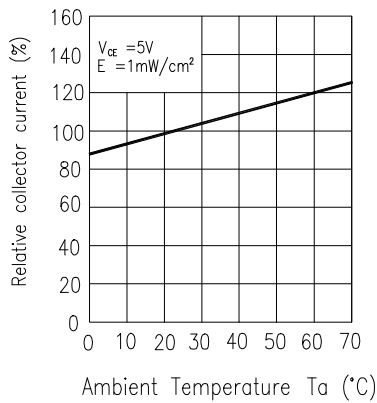


Fig.4 Collector Current vs. Irradiance

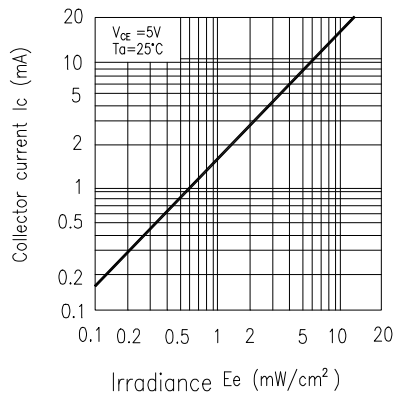


Fig.5 Spectral Sensitivity

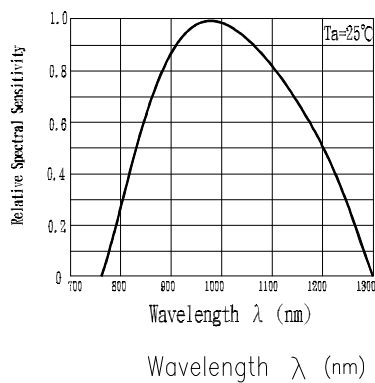
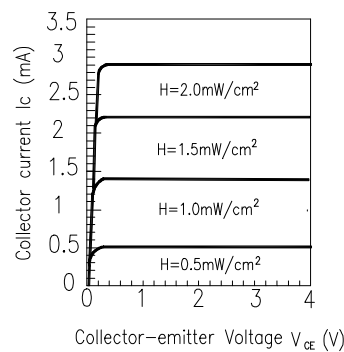


Fig.6 Collector Current vs. Collector-emitter Voltage





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■ Reliability Test Item And Condition

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

Confidence level : 90%

LTPD : 10%

Items	Purpose & Condition	Failure Judgement Criteria	Samples (n)
			Defect (c)
Temperature Cycle	Evaluates product's ability to withstand exposure to high temperature, low temperature, and temperature variation between two limit temperature. Standard test Condition: $85^{\circ}\text{C} \sim 25^{\circ}\text{C} \sim -55^{\circ}\text{C} \sim 25^{\circ}\text{C}$ $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$ 30min 5min 30min 5min 50 cycle	$I_R \geq U \times 2$ $I_c(\text{on}) \leq L \times 0.8$ $V_F \geq U \times 1.2$ U : Upper specification limit	n = 22 , c = 0
Thermal Shock	Evaluates product's ability to withstand rapid temperature change Standard test Condition: $85^{\circ}\text{C} \sim -55^{\circ}\text{C}$ 5min(10sec) 5min 50cycle	L : Lower specification limit	n = 22 , c = 0
High Storage	Evaluates product's ability to withstand prolonged storage at high temperature Standard test Condition: Temperature : 100°C Time : 1000hrs		n = 22 , c = 0
Low Storage	Evaluates product's ability to withstand prolonged storage at low temperature Standard test Condition: Temperature : -55°C Time : 1000hrs		n = 22 , c = 0



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Items	Purpose & Condition	Failure Judgement Criteria	Samples (n)
			Defective (c)
Operating Life	Evaluates product's endurance to prolonged electrical or temperature stresses. Standard test Condition: $V_{CE}=5V$ $I_F=20mA$ Time : 1000hrs	$I_R \geq U \times 2$ $I_{c(on)} \leq L \times 0.8$ $V_F \geq U \times 1.2$	n =22 , c=0
High Temperature High Humidity	Evaluates product's ability to withstand prolonged storage at high temperature and high humidity. Standard test Condition: Temperature: 85°C Relative humidity:85% Time : 1000hrs	U : Upper specification limit L : Lower specification limit	n =22 , c=0
Soldering Heat	Evaluates product's ability to withstand soldering heat Standard test conditions Solder temperature : 260±5°C Solder time : 10 seconds		n =22 , c=0

■ Supplement

(1) Chip

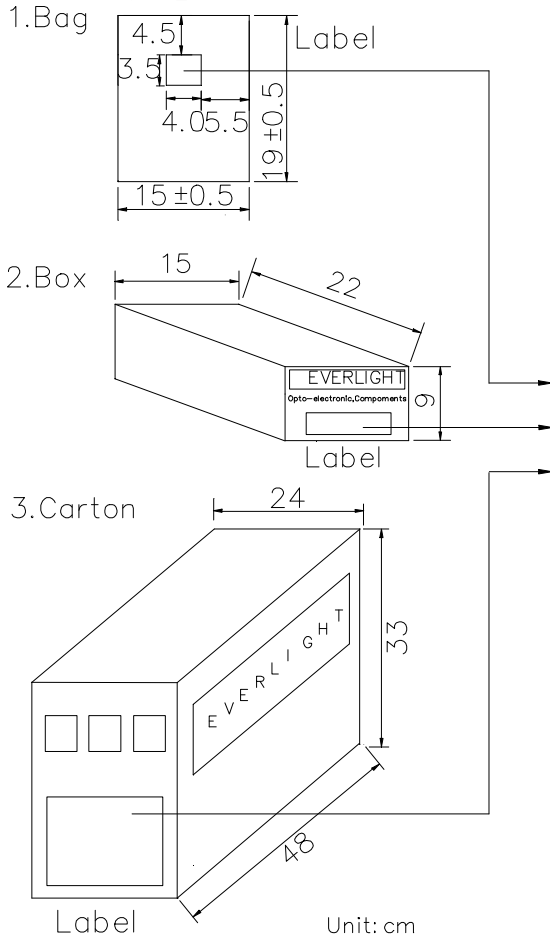
Type	Material	Peak Wavelength
IR	GaAlAs	940nm
PT	Silicon	980nm

(2) Material

Type	Lead frame	Wire	Package	Holder
ITR	SPCC	Gold	Epoxy	NORYL



■ Packing Specification



CPN: Customer's product number

P/N: Product number

QTY: Packing quantity

CAT: Ranks

HUE: Peak wavelength

REF: Reference

LOT NO: Lot number

MADE IN TAIWAN: Production place

■ Packing Quantity Specification

1. 200Pcs/1Bag

2. 6Bags/1Box

3. 10Boxes/1Carton