

ITR20510/TR8



Features

- Fast response time
- High sensitivity
- Cut-Off visible wavelength
- Thin
- Compact
- Pb free
- This product itself will remain within RoHS compliant version.

Description

TR20510/TR8 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	GaAlAs
PT	Silicon

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Power Dissipation at(or below) 25°C Free Air Temperature	Pd	75	mW
	Reverse Voltage	V _R	5	V
	Forward Current	I _F	50	mA
	Peak Forward Current (*1) Pulse width ≤100μs, 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	-40~+85	°C
Storage Temperature		Tstg	-40~+90	°C
Lead Soldering Temperature (*2)		Tsol	260	°C

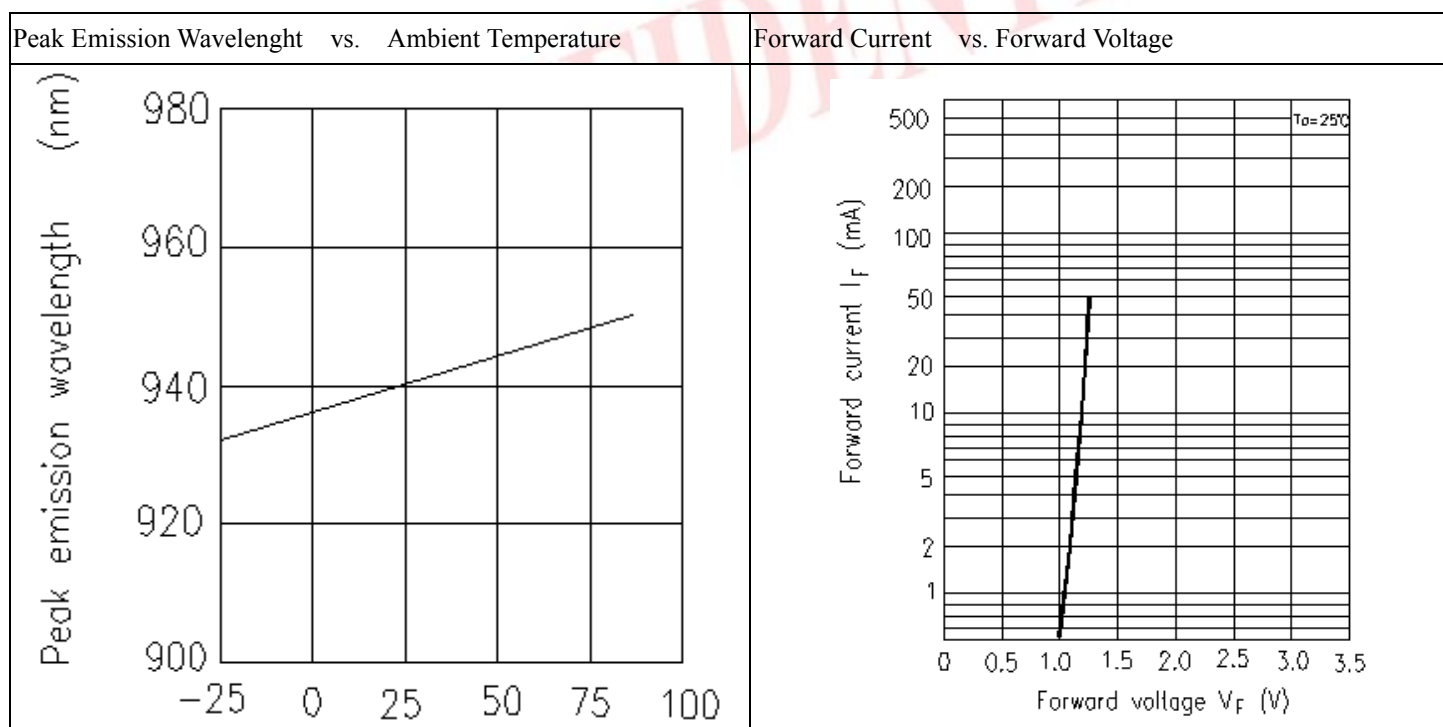
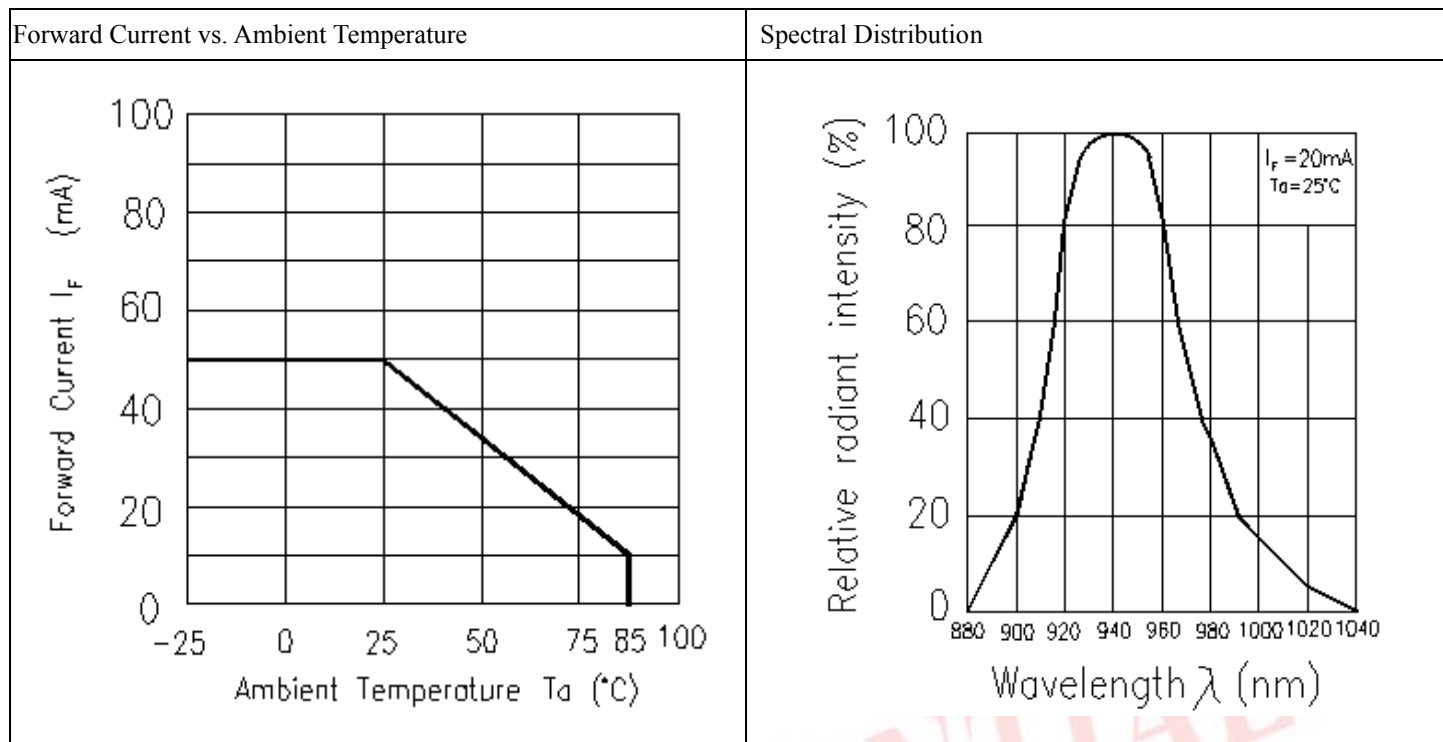
Notes: (*1) tw=100 μsec. , T=10 msec. (*2) t=5 Sec

Electro-Optical Characteristics (Ta=25°C)

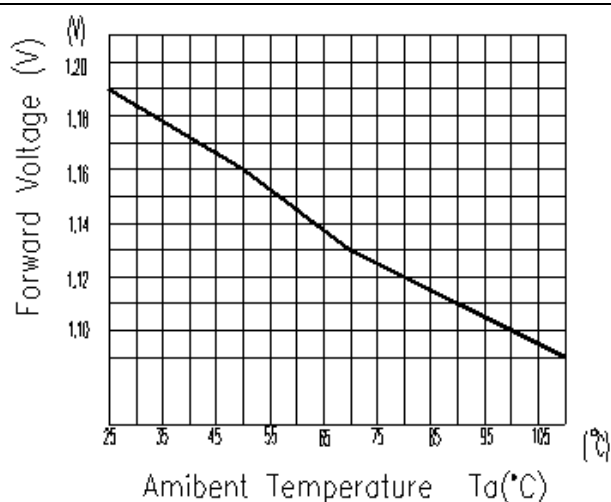
Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Forward Voltage	V_F	---	1.2	1.6	V	$I_F=20\text{mA}$
	Reverse Current	I_R	---	---	10	μA	$V_R=5\text{V}$
	Peak Wavelength	λ_p	---	940	---	nm	---
Output	Dark Current	I_{CEO}	---	---	100	nA	$V_{CE}=10\text{V}$
	C-E Saturation Voltage	$V_{CE(sat)}$	---	---	0.4	V	$I_C=2\text{mA}$ $E_e=1\text{mW/cm}^2$
Transfer Characteristcs	Light Current	$I_C(ON)$	0.1	---	---	mA	$V_{CE}=5\text{V}$ $I_F=20\text{mA}$
	Leakage Current	I_{CEOD}	---	---	1	μA	
	Rise time	t_r	---	20	---	μsec	$V_{CE}=2\text{V}$ $I_C=100\mu\text{A}$ $R_L=1\text{K}\Omega$
	Fall time	t_f	---	20	---	μsec	

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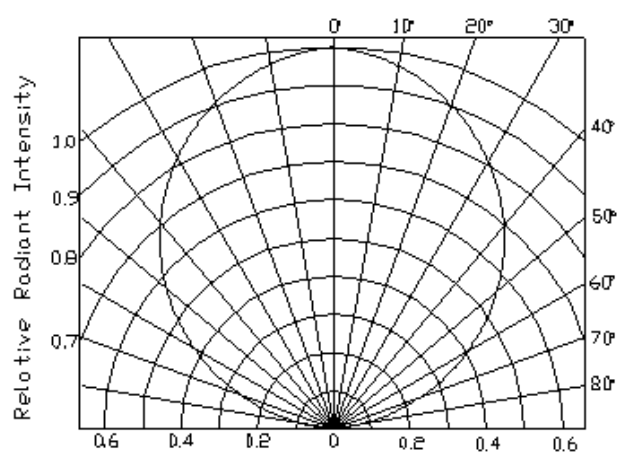
Typical Electrical/Optical/Characteristics Curves for IR



Forward Current vs. Ambient Temperature

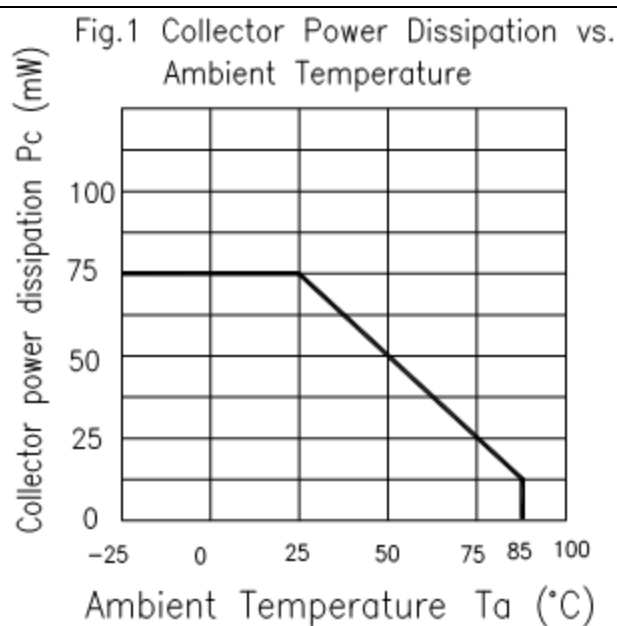


Relative Radiant Intensity vs. Angular Displacement

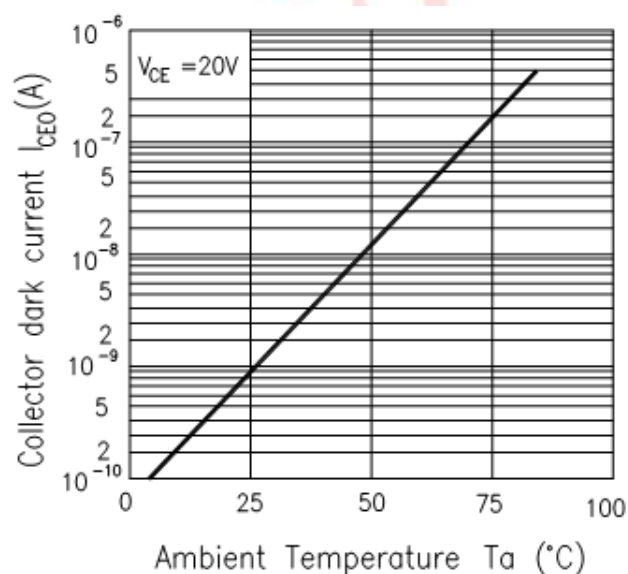


Typical Electro/Optical/Characteristics Curves for PT

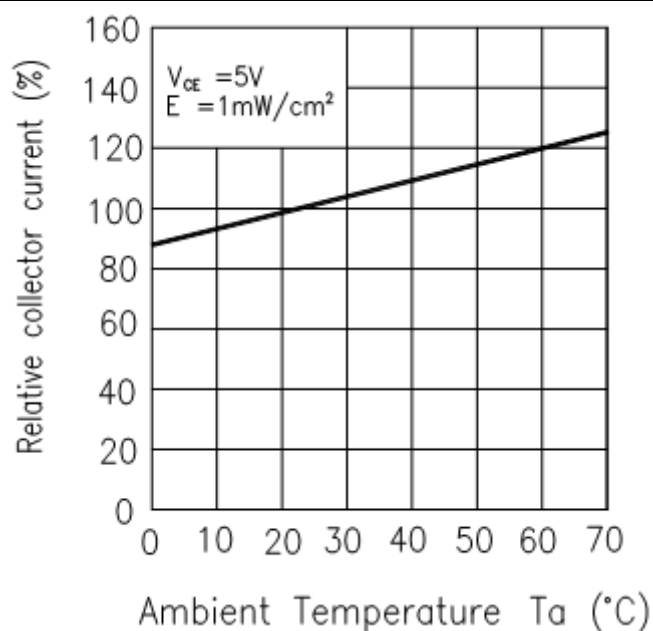
Collector Power Dissipation vs. Ambient Temperature



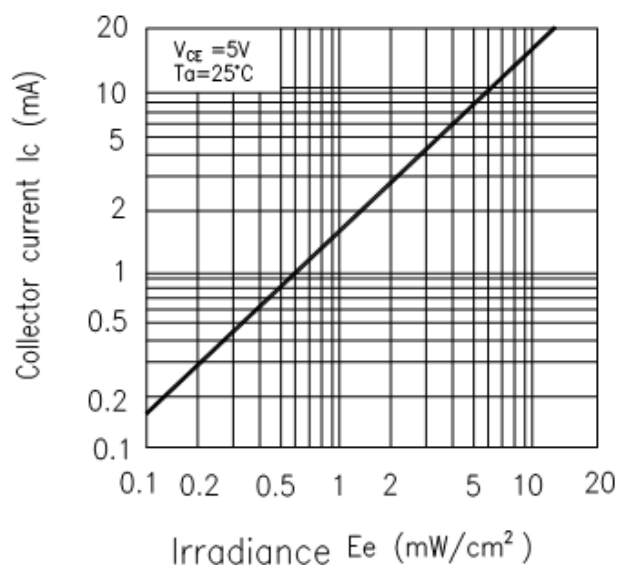
Collector Dark Current vs. Ambient Temperature



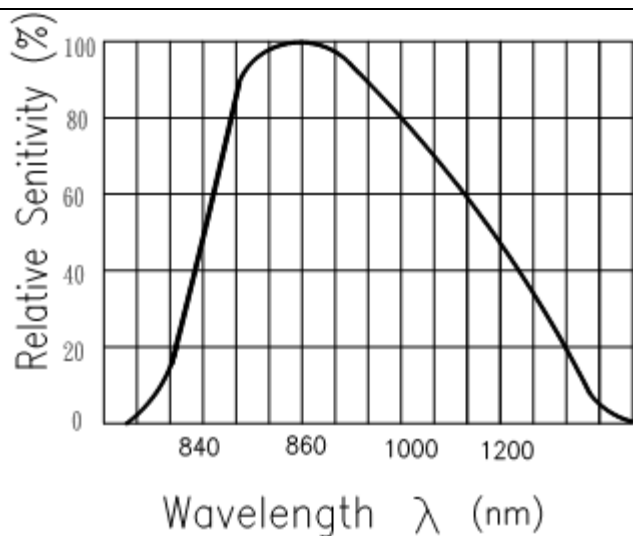
Relative Collector Current vs Ambient Temperature



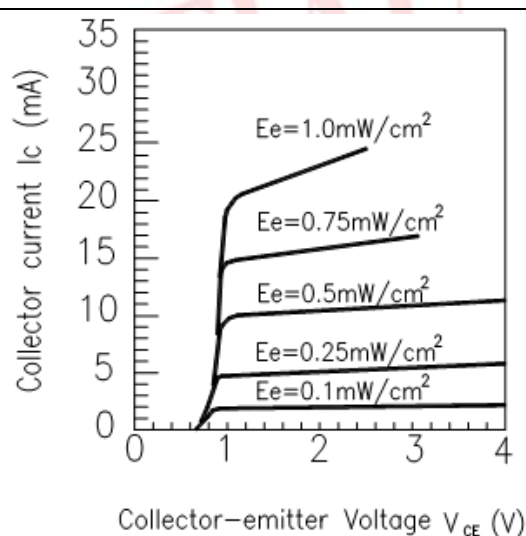
Collector Current vs. Irradiance



Spectral Sensitivity



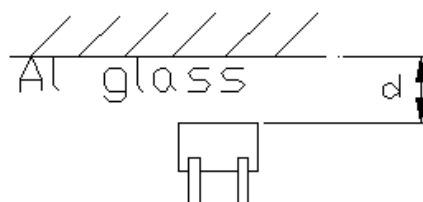
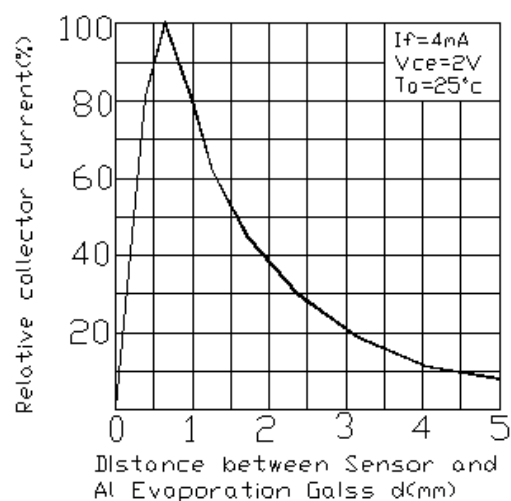
Collector Current vs. Collector-emitter Voltage



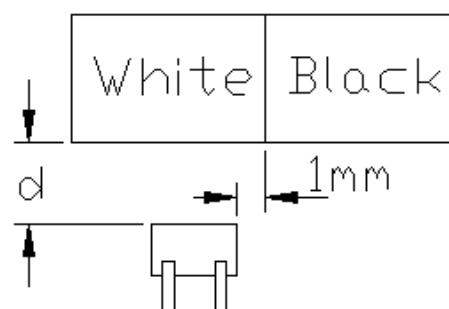
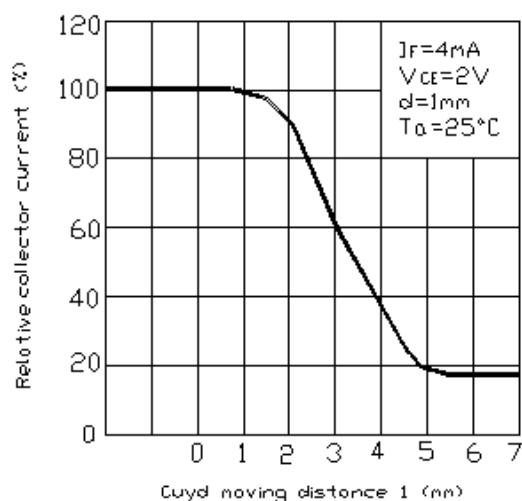
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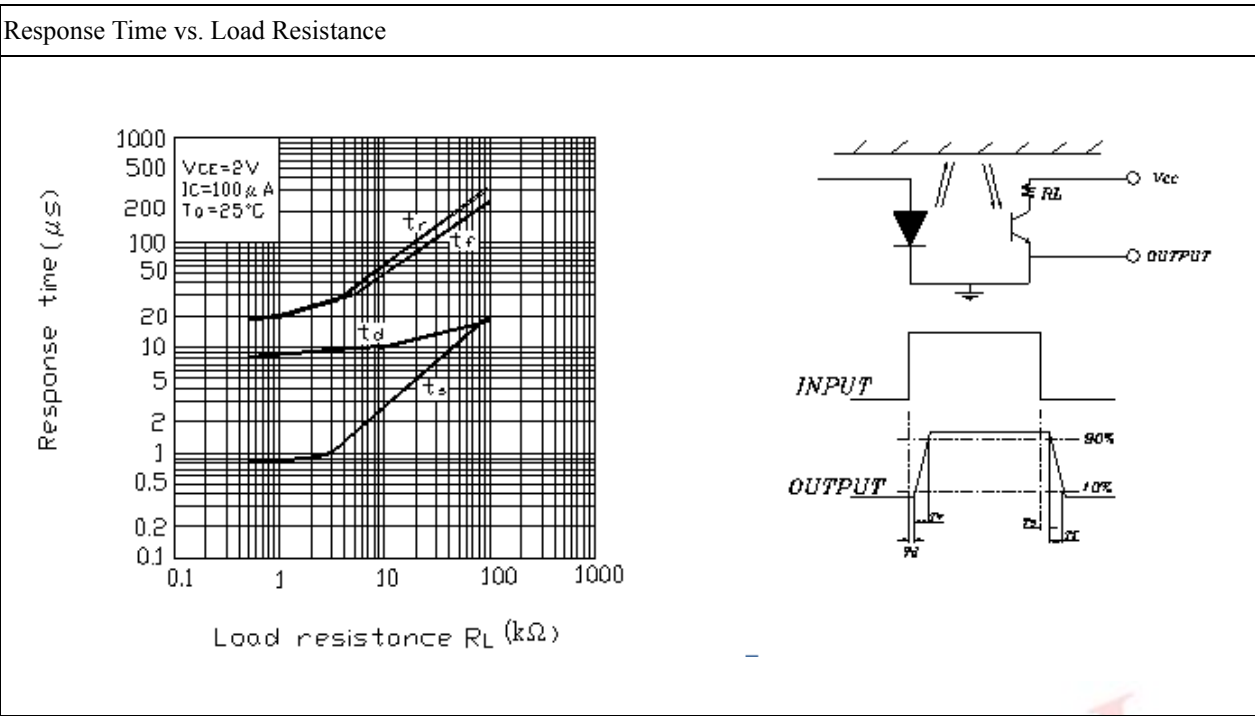
Typical Electrical/Opical/Characteristics Curves For ITR

Relative Collector Current vs. Distance between Sensor and AL Evaporation Galss.



Relative Collector Current vs. Card Moving Distance





Reliability Test Item And Condition

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

Confidence level : 90%

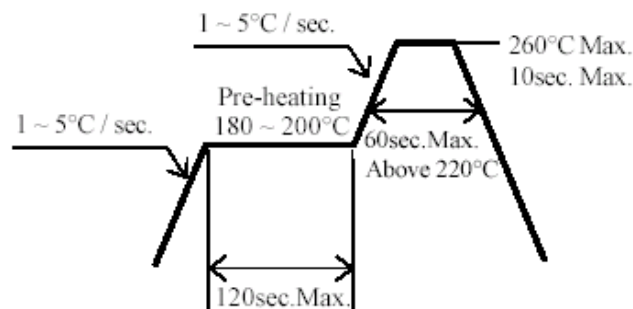
LTPD : 10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	Solder Heat	TEMP. : $260^\circ C \pm 5^\circ C$	10secs	22pcs	$I_R \geq U \times 2$ $I_{con} \leq L \times 0.8$ $V_F \geq U \times 1.2$ U : Upper Specification Limit L : Lower Specification Limit	0/1
2	Temperature Cycle	H : $+85^\circ C$ 30mins ↕ 5mins L : $-30^\circ C$ 30mins	50Cycles	22pcs		0/1
3	Thermal Shock	H : $+85^\circ C$ 5mins ↕ 10secs L : $-10^\circ C$ 5mins	50Cycles	22pcs		0/1
4	High Temperature Storage	TEMP. : $+90^\circ C$	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP. : $-30^\circ C$	1000hrs	22pcs		0/1
6	DC Operating Life	$I_F=20mA$	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	$85^\circ C$ / 85% R.H	1000hrs	22pcs		0/1

Recommended Method of Storage

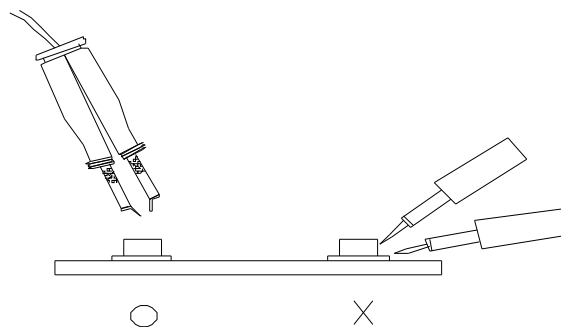
The following are general recommendations for moisture sensitive level (MSL) 4 storage and use:

- Shelf life in sealed bag: 12 months at $< 40^{\circ}\text{C}$ 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 $< 30^{\circ}\text{C}/60\%\text{RH}$, or
 - b) Stored at $< 20\%$ RH
- Devices require bake, before mounting, if:
Humidity Indicator Card is $> 20\%$ when read at $23 \pm 5^{\circ}\text{C}$
- If baking is required, devices may be baked:
 - a) 192 hours at 40°C , and $< 5\%$ RH (dry air/nitrogen) or
 - b) 96 hours at 60°C , and $< 5\%$ RH for all device containers
 - c) 24 hours at 125°C
- Soldering Condition
 - a) Pb-free solder temperature profile

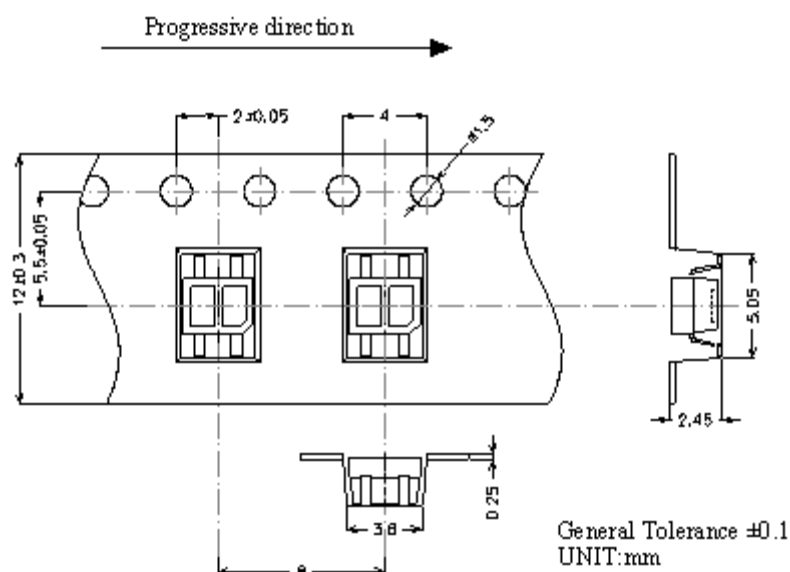


- b) Reflow soldering should not be done more than two times.
 - c) When soldering, do not put stress on the LEDs during heating.
 - d) After soldering, do not warp the circuit board.
- Repairing

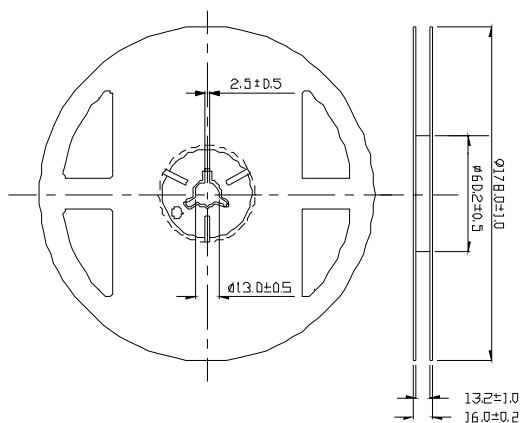
Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



Taping Dimension

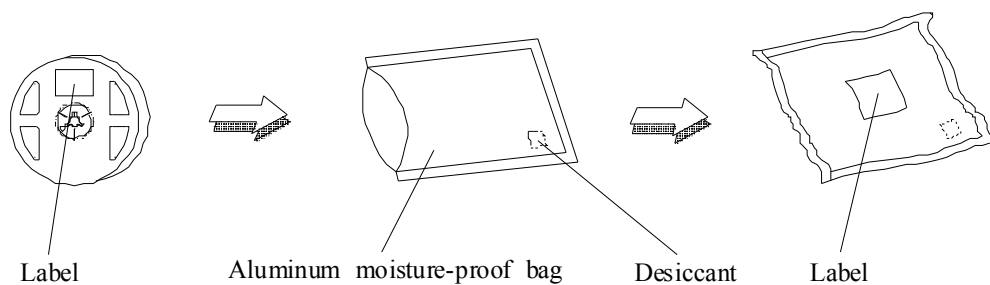


Reel Dimensions



Note: The tolerances unless mentioned is ± 0.1 mm ,Unit = mm

Moisture Resistant Packaging



Packing Quantity Specification

1. 1000 Pcs/ 1Reel
2. 15 Reel /1 Box
3. 2 Box/ 1 Carton

Label Form Specification

The diagram shows a rectangular label form with the following elements:

- Top left: A circle containing 'Pb'.
- Top center: A rectangle containing 'EVERLIGHT'.
- Top right: A circle containing 'X'.
- Below 'Pb': 'CPN:' and 'P/N:' labels.
- Below 'EVERLIGHT': A barcode.
- Below the barcode: 'ITR20510/TR8'.
- Below 'ITR20510/TR8': 'QTY:' label.
- Below 'QTY:': A barcode.
- Below the barcode: 'LOT NO:' label.
- Below 'LOT NO:': A barcode.
- Below the barcode: 'Reference' label.
- Below 'Reference': A barcode.
- Below 'ITR20510/TR8' and 'QTY:': 'CAT:', 'HUE:', and 'REF:' labels.
- Below 'CAT:', 'HUE:', and 'REF:': A rectangle containing 'RoHS'.

- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number
- X: Month
- Reference: Identify Label Number

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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