

### ITR1502SR40A/TR8



#### Features

- High sensitivity
- Cut-Off visible wavelength
- Compliance Halogen Free(Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)
- Compliance with EU REACH
- This product itself will remain within RoHS compliant version.
- Optimal Sensing Distance: 4 mm
- Package size : 4.0\*3.0\*2.0 mm

#### Description

- **ITR1502SR40A/TR8** is a compact-package, phototransistor output, reflective photo interrupter, with emitter and detector facing the same direction in a molding that provides non-contact sensing. The compact package series is a result of unique technology, combining transfer and injection molding, that also blocks visible light to minimize false detection. This device has a long focal distance for this family of devices and has a leadless (T&R) package, suitable for reflow soldering.

#### Applications

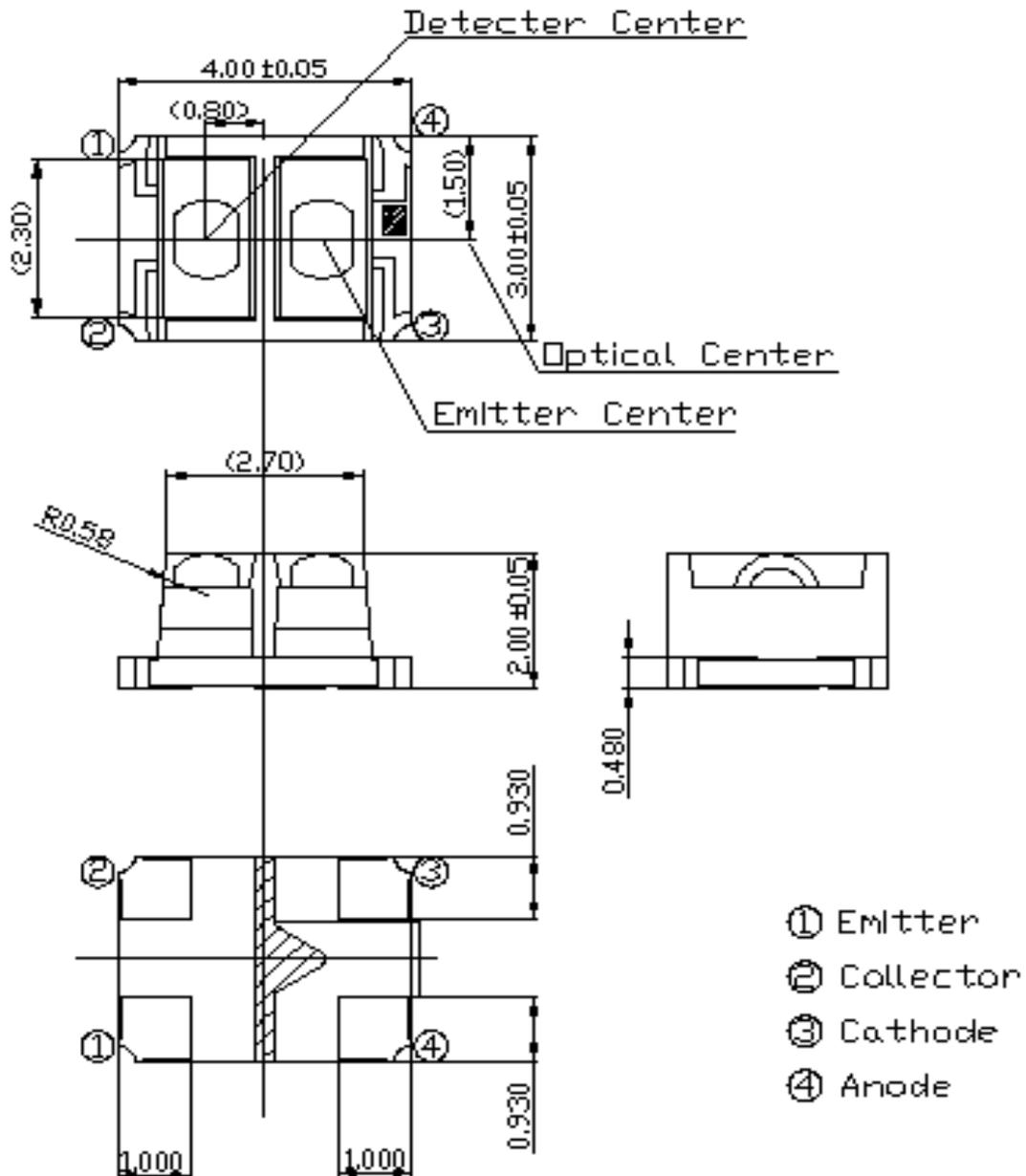
- Detection of object presence or motion.
- Example : printer, optical storage, Projector

#### Device Selection Guide

| Device No. | Chip Material | Lens Color  |
|------------|---------------|-------------|
| IR         | GaAs          | Black clear |
| PT         | Silicon       | Black clear |

## Package Dimensions

Top View



● Notes:

1. All dimensions are in millimeters
2. Tolerances unless dimensions  $\pm 0.1\text{mm}$
3. Lead spacing is measured where the lead emerge from the package
4. Product mass : approx. 0.025g

### 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 ≤100μs, Duty cycle=1% | I <sub>FP</sub>    | 1        | A    |
| Output                                                                 | Collector Power Dissipation                                 | P <sub>C</sub>     | 75       | mW   |
|                                                                        | Collector Current                                           | I <sub>C</sub>     | 25       | 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~+100 | °C   |
| Lead Soldering Temperature (*2)<br>(1/16 inch form body for 5 seconds) |                                                             | Tsol               | 260      | °C   |

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

### Electro-Optical Characteristics (Ta=25°C)

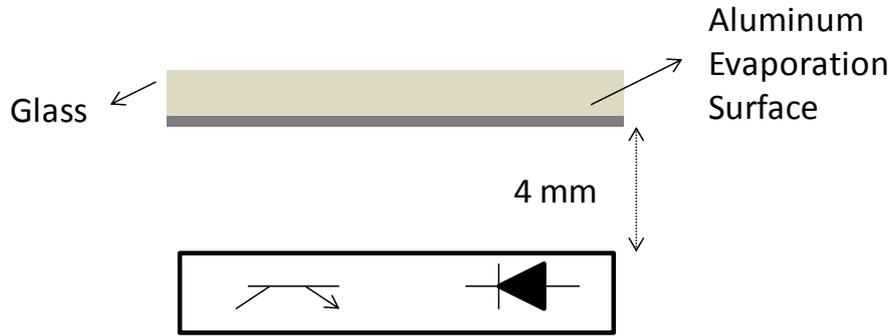
| Parameter                |                 | Symbol               | Min. | Typ. | Max. | Unit | Conditions                                                         |
|--------------------------|-----------------|----------------------|------|------|------|------|--------------------------------------------------------------------|
| Input                    | Forward Voltage | V <sub>F</sub>       | –    | 1.2  | 1.4  | V    | I <sub>F</sub> =20mA                                               |
|                          | Reverse Current | I <sub>R</sub>       | –    | –    | 10   | μA   | V <sub>R</sub> =6V                                                 |
|                          | Peak Wavelength | λ <sub>p</sub>       | –    | 940  | –    | nm   | I <sub>F</sub> =10mA                                               |
| Output                   | Dark Current    | I <sub>CEO</sub>     | –    | 1    | 100  | nA   | V <sub>CE</sub> =20V                                               |
| Transfer Characteristics | Collect Current | I <sub>C</sub> (ON)  | 60   | –    | 450  | μA   | V <sub>CE</sub> =2V<br>I <sub>F</sub> =4mA<br>d=4mm                |
|                          |                 | I <sub>C</sub> (OFF) | –    | –    | 600  | nA   | V <sub>CE</sub> =2V<br>I <sub>F</sub> =4mA                         |
|                          | Response time   | tr                   | –    | 20   | 100  | μs   | V <sub>CE</sub> =2V,<br>I <sub>C</sub> =100μA,<br>RL=1kΩ,<br>d=4mm |
|                          |                 | tf                   | –    | 20   | 100  | μs   |                                                                    |

\*Operating dark current may be affected by surrounding situation

### Bin Range of Collect Current

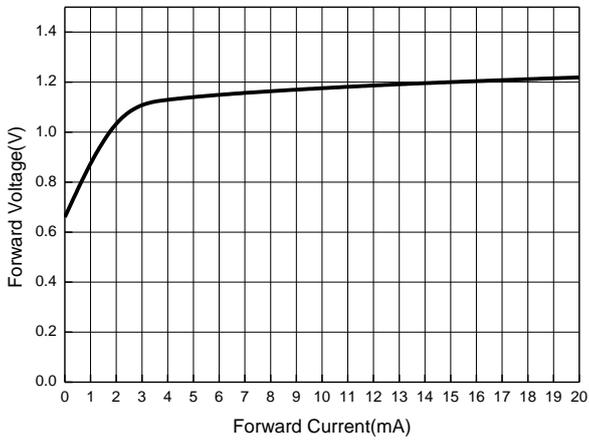
| Bin number | Min | Max |
|------------|-----|-----|
| A          | 60  | 120 |
| B          | 100 | 220 |
| C          | 180 | 350 |
| D          | 310 | 450 |

### Test Condition and Arrangement for Collector Current

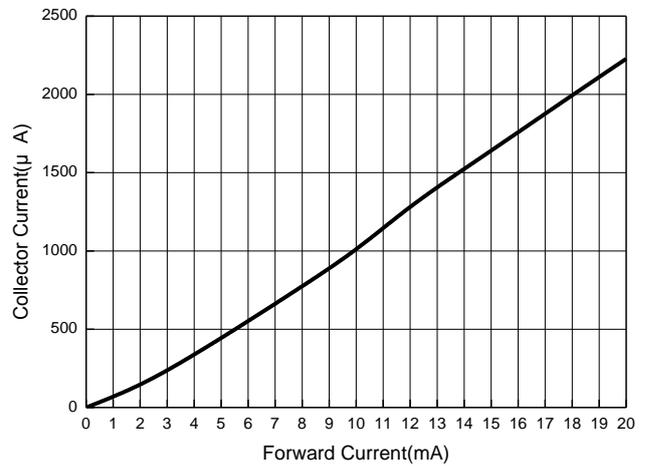


### Typical Electro-Optical Characteristics Curves

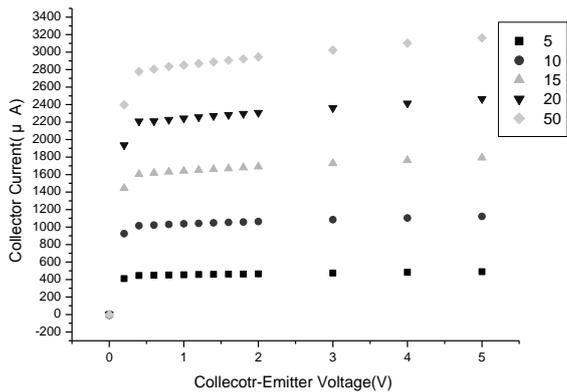
Forward Current VS. Forward Voltage



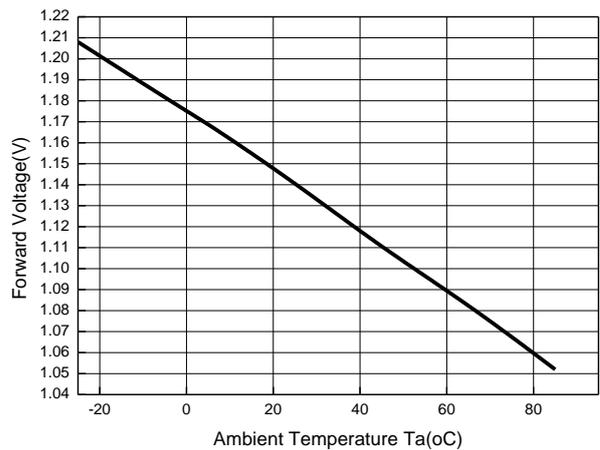
Forward Current V.S Collector Current



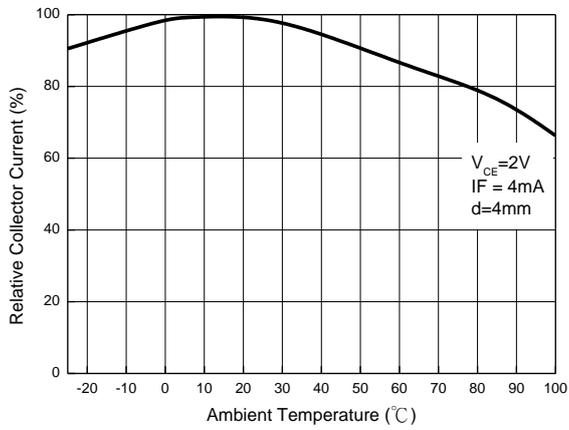
Collector Current V.S Collector-Emitter Voltage



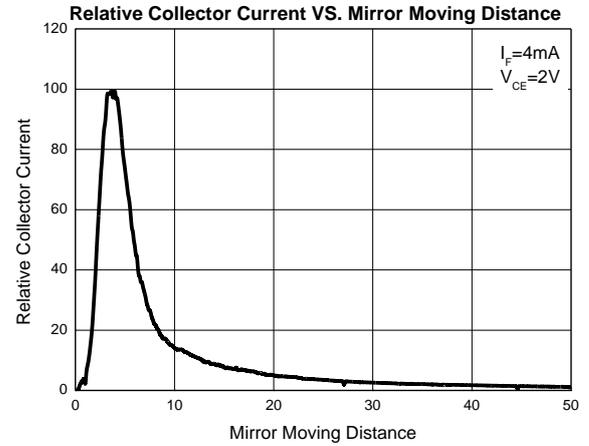
Forward Voltage V.S Ambient Temperature



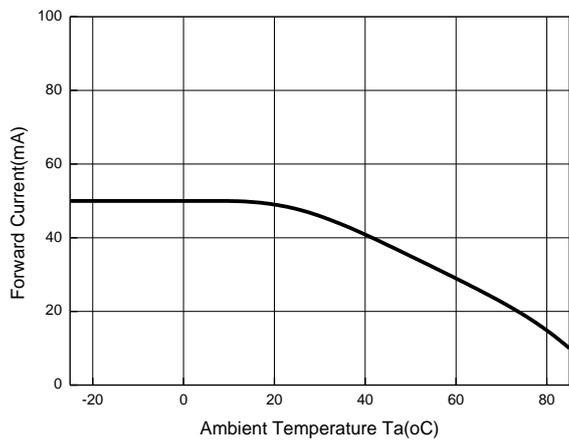
Relative Collector Current V.S Ambient Temperature



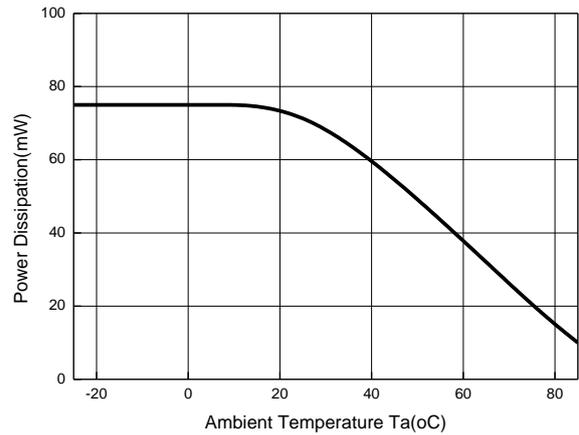
Relative Collector Current V.S Z-Moving Distance  
Condition :  $I_F=4mA$  、  $V_{CE}=2V$



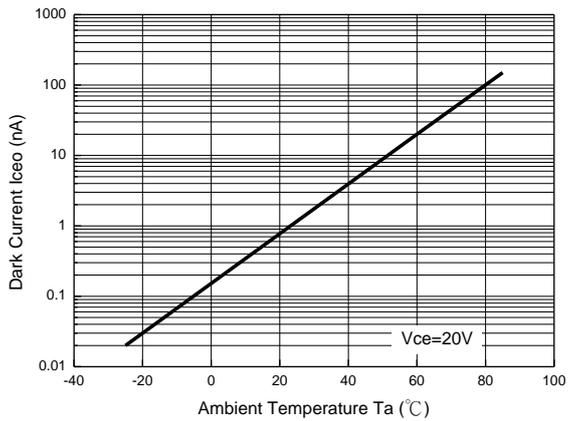
Forward Current V.S Ambient Temperature



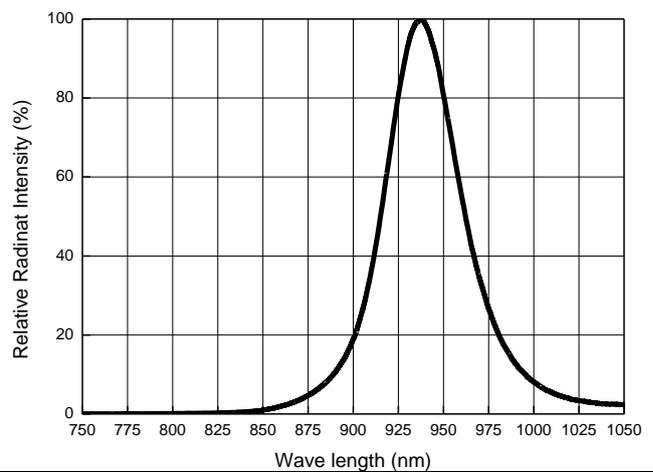
Power Dissipation vs. Ambient Temperature



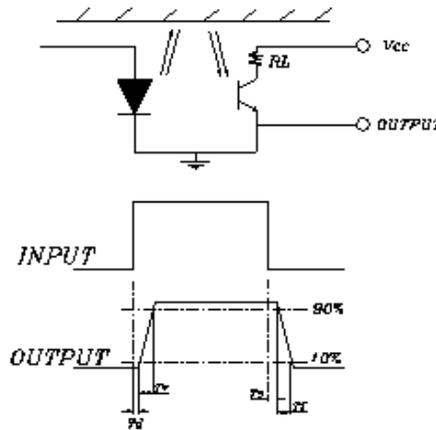
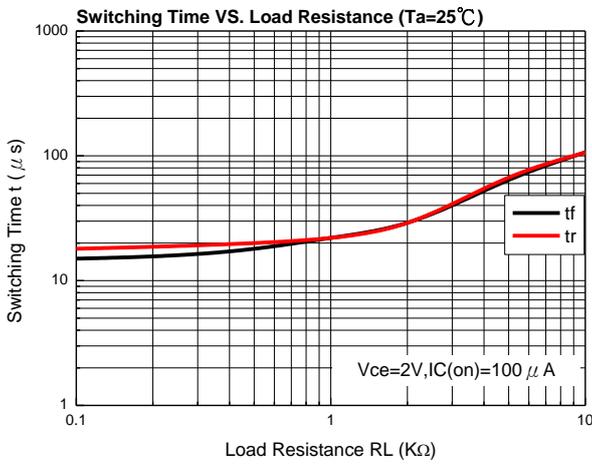
Collector Dark Current vs. Ambient Temperature



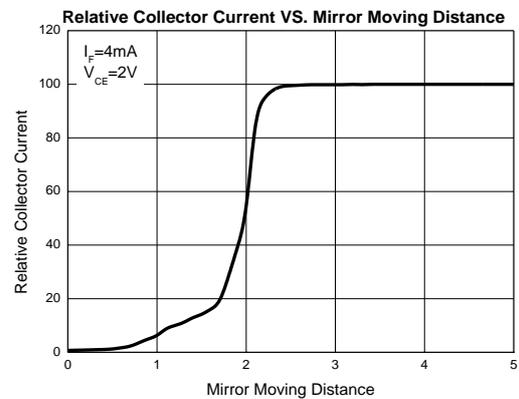
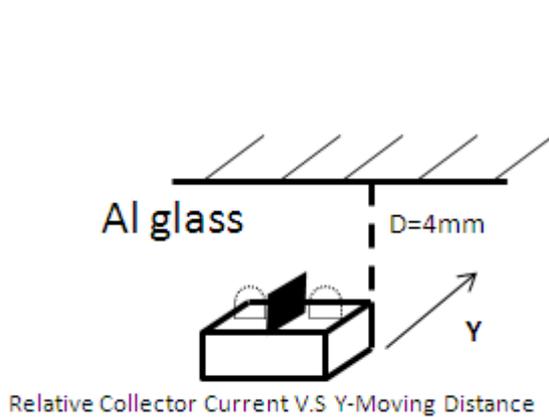
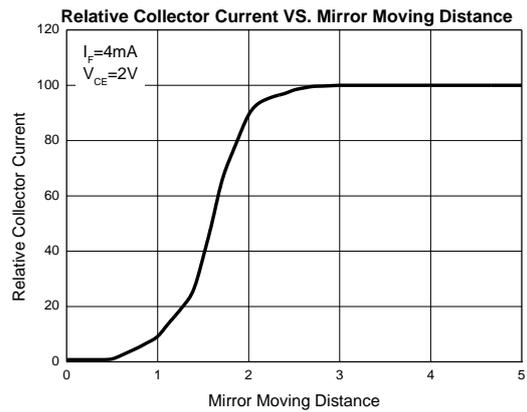
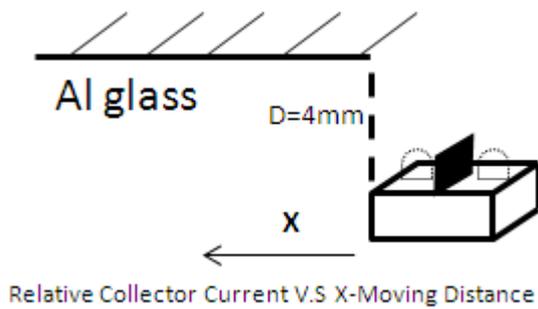
Wave length

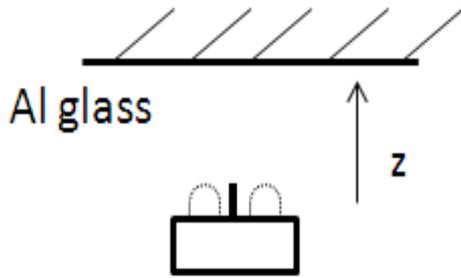


## Measuring Circuit For Response Time

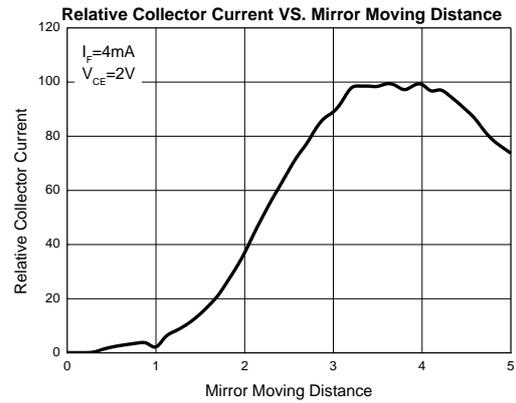


## Test Condition and Arrangement for Collector Current

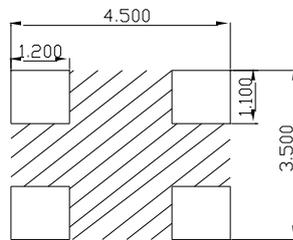




Relative Collector Current V.S z-Moving Distance



## Recommended pattern



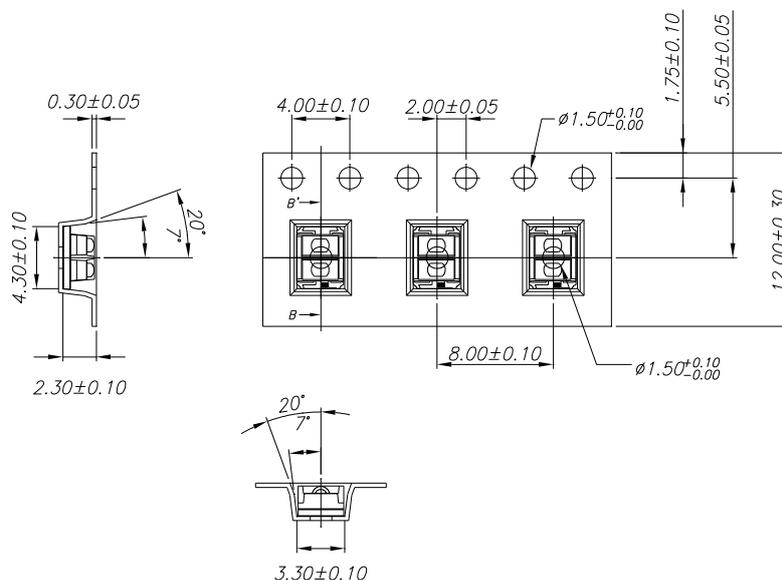
area : Please do not apply the pattern wiring to avoid the possibility of short circuit.

Regarding amount of solder, if there is solder leakage in terminal wiring pattern between PCB and housing main body, the reliability will be deteriorated.

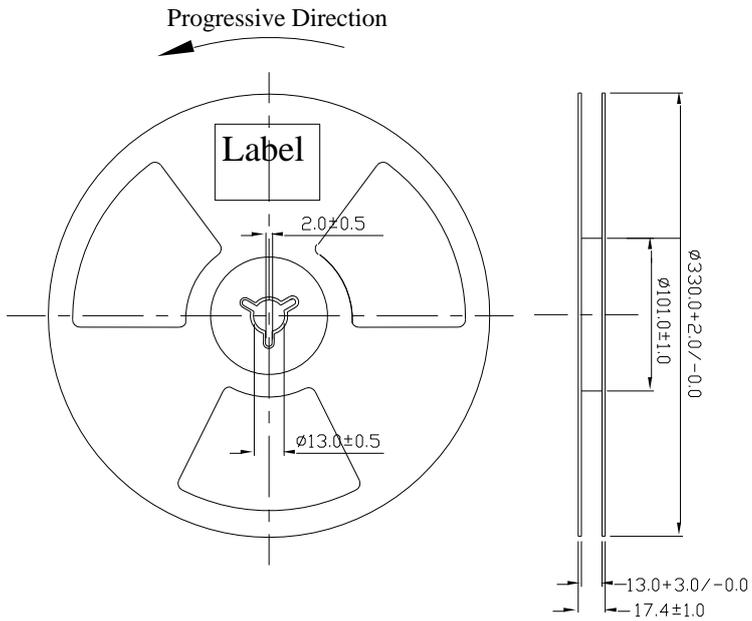
Please check the proper amount of solder in advance not to have solder leakage into terminal wiring pattern between PCB and housing main body.

## Package specification

- Tape and Reel package



## Reel Dimensions

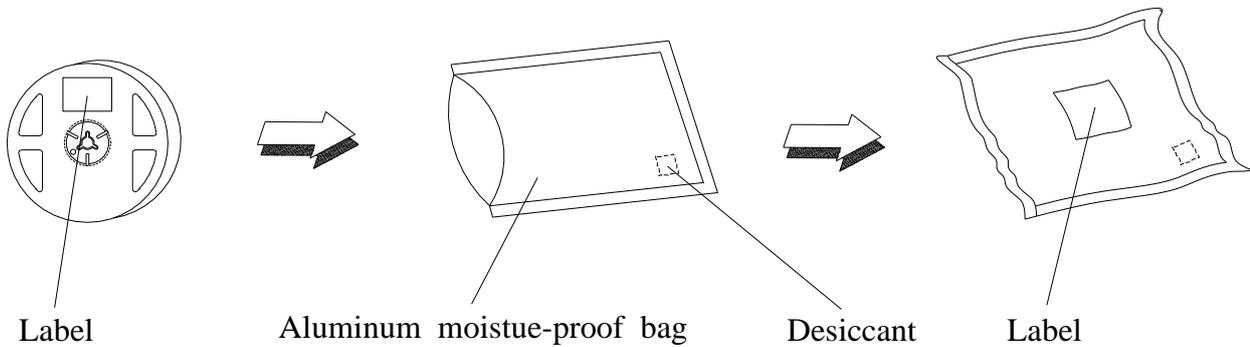


**Note:** The tolerances unless mentioned is  $\pm 1.0$ mm ,Unit = mm

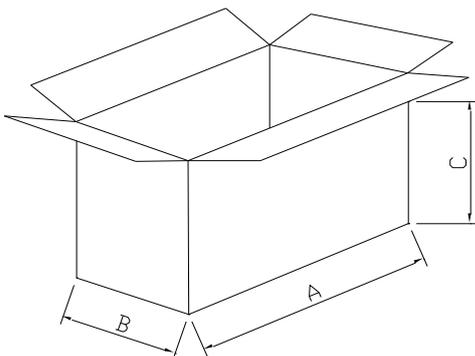
## Packing Quantity Specification

- 800pcs / 1 Reel
- 38 Reels / 1 Carton

## Packing Procedure



**Outer Carton Dimension : 409mm(A)\*245mm(B)\*360mm(C)**



## Recommended Method of Storage

The following are general recommendations for moisture sensitive level (MSL) 3 storage and use :

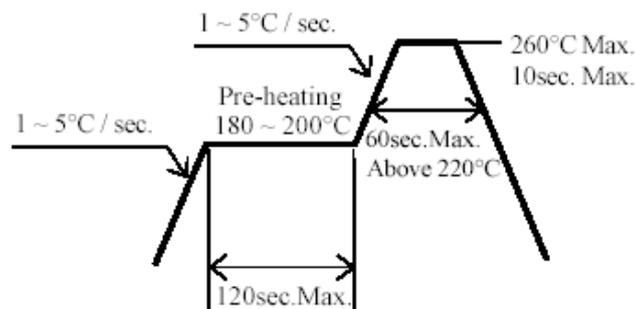
### 1. Storage

- 1.1 Do not open moisture proof bag before the products are ready to use.
- 1.2 Before opening the package, the device should be kept at 30°C or less and 90%RH or less.
- 1.3 The device should be used within a year.
- 1.4 After opening the package, the device should be kept at 30°C or less and 70%RH or less.
- 1.5 The device should be used within 168 hours (7 days) after opening the package.
- 1.6 If the moisture absorbent material (silica gel) has faded away or the device have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment : 60±5°C for 24 hours.

### 2. Soldering Condition

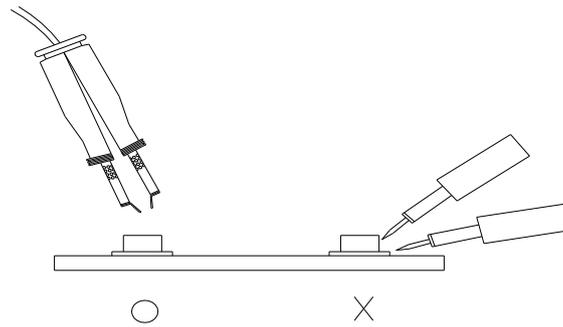
#### a) Pb-free solder temperature profile



- 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.



## Label Form Specification

|                                                    |      |                                                                                     |  |
|----------------------------------------------------|------|-------------------------------------------------------------------------------------|--|
| RoHS                                               |      | <b>EVERLIGHT</b>                                                                    |  |
| CPN: XXXXXXXX                                      |      |                                                                                     |  |
| XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX |      |                                                                                     |  |
| P/N:                                               |      |                                                                                     |  |
| XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX |      |                                                                                     |  |
| LOT NO:                                            |      |                                                                                     |  |
| XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX |      |                                                                                     |  |
| QTY:                                               | HUE: |  |  |
| CAT:                                               | REF: |                                                                                     |  |
| REFERENCE:                                         |      |                                                                                     |  |
|                                                    |      |                                                                                     |  |

CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: Peak Wavelength

REF: Reference

LOT No: Lot Number

MADE IN TAIWAN: Production Place

## Disclaimer

- 1.EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
- 2.The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
- 3.The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
- 4.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 the 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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