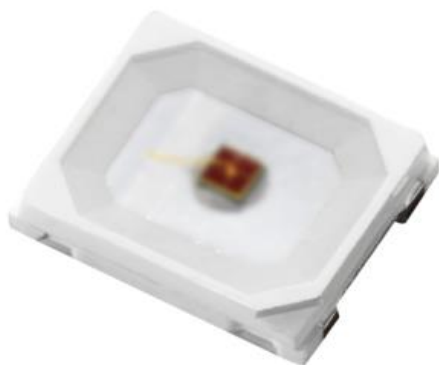


### SMD ▪ Middle Power LED 67-21S/NFR2C-P2050A3B21522Z6/2T



#### Features

- PLCC-2 package
- Top view Red LED
- Wide viewing angle
- Pb-free
- RoHS compliant

#### Description

The Everlight 67-21S package has high efficacy, Middle power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

#### Applications

- Decorative and Entertainment Lighting
- Agriculture Lighting
- General use

## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
AlGaInP	Far-Red	Water Clear

## Absolute Maximum Ratings (T<sub>Soldering</sub>=25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	60	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	120	mA
Power Dissipation	P <sub>d</sub>	135	mW
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
Thermal Resistance (Junction / Soldering point)	R <sub>th J-S</sub>	50	°C/W
Junction Temperature	T <sub>j</sub>	115	°C
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Note:

The products are sensitive to static electricity and must be carefully taken when handling products

## Electro-Optical Characteristics (T<sub>Soldering</sub>=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Radiometric Power	I <sub>v</sub>	15	-----	50	mW	I <sub>F</sub> =60mA
Forward Voltage	V <sub>F</sub>	1.5	-----	2.2	V	I <sub>F</sub> =60mA
Viewing Angle	2θ <sub>1/2</sub>	-----	120	-----	deg	I <sub>F</sub> =60mA
Reverse Current	I <sub>R</sub>	-----	-----	1.5	μA	V <sub>R</sub> =5V

Notes:

1. Tolerance of Radiometric Power: ±11%.
2. Tolerance of Forward Voltage: ±0.1V.

### Bin Range of Radiometric Power

Bin Code	Min.	Max.	Unit	Condition
A3	15	20	mW	I <sub>F</sub> =60mA
A4	20	25		
A5	25	30		
B1	30	40		
B2	40	50		

Notes:  
 Tolerance of Radiometric Power : ±11%

### Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
22	1.5	1.6	V	I <sub>F</sub> =60mA
23	1.6	1.7		
24	1.7	1.8		
25	1.8	1.9		
26	1.9	2.0		
27	2.0	2.1		
28	2.1	2.2		

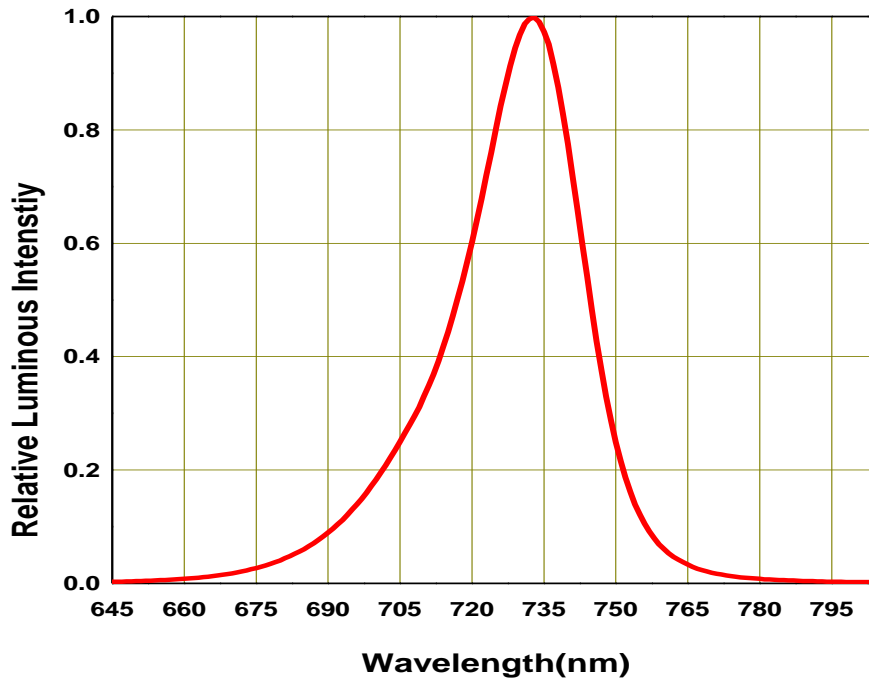
Note:  
 Tolerance of Forward Voltage: ±0.1V.

### Peak Wavelength Bins

Bin Code	Min.	Max.	Unit	Condition
FA3	720	730	nm	I <sub>F</sub> =60mA
FA4	730	740		
FA5	740	750		

Notes:  
 Dominant / Peak wavelength measurement tolerance: ±1nm.

## Spectrum Distribution



## Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

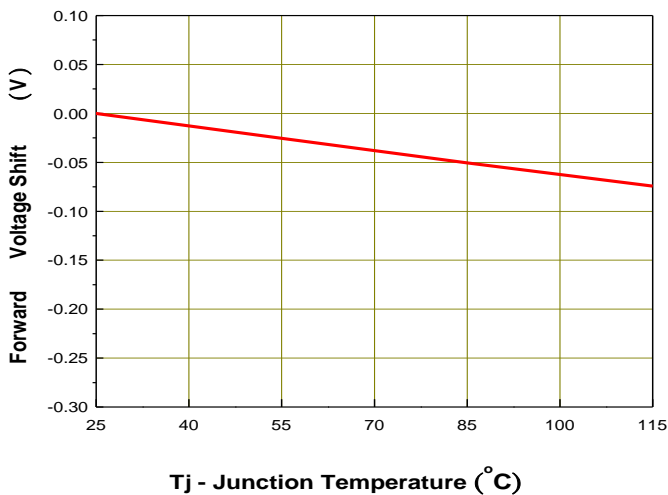
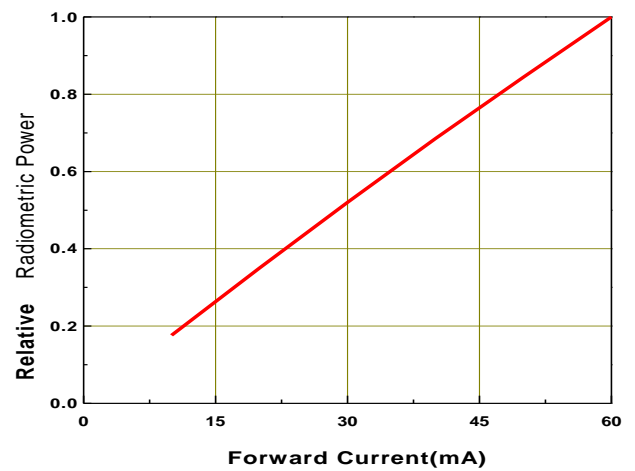


Fig.2 - Relative Radiometric Power vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

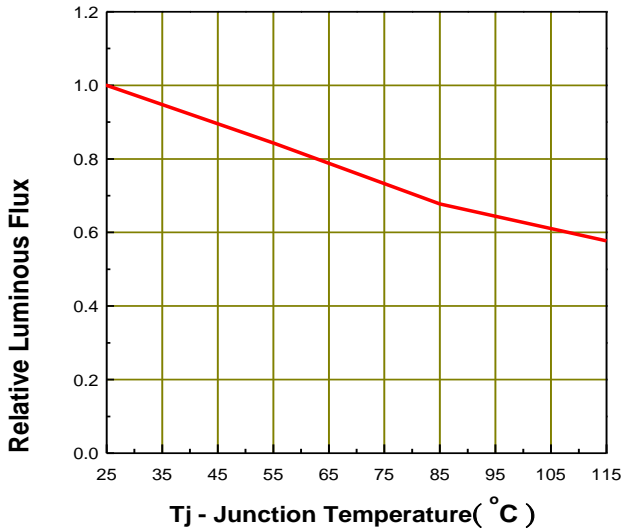


Fig.4 - Forward Current vs. Forward Voltage

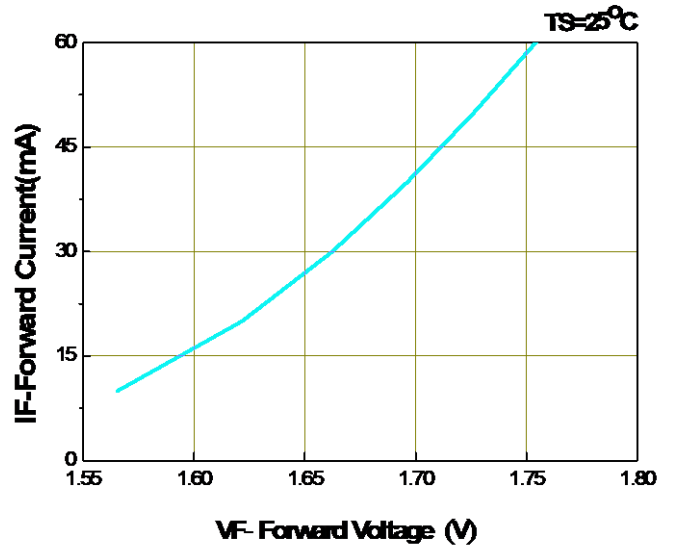


Fig.5 - Max. Driving Forward Current vs. Soldering Temperature

$R_{th\ j-s} = 50\ ^\circ\text{C/W}$

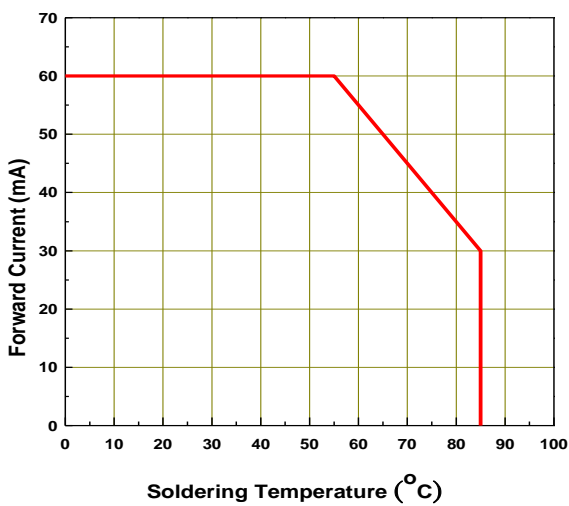
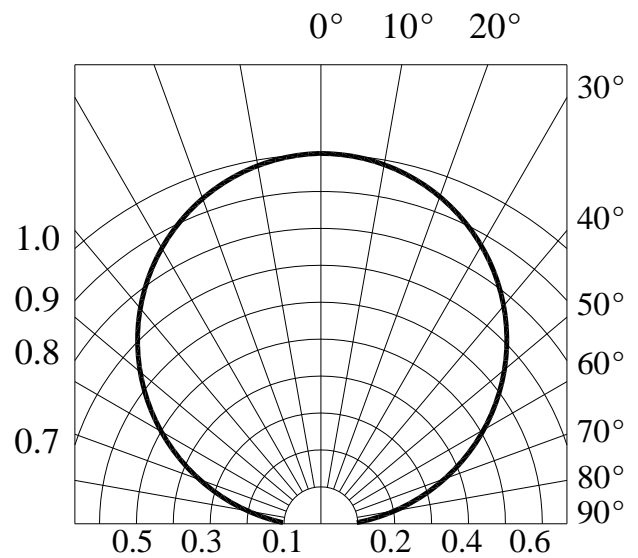
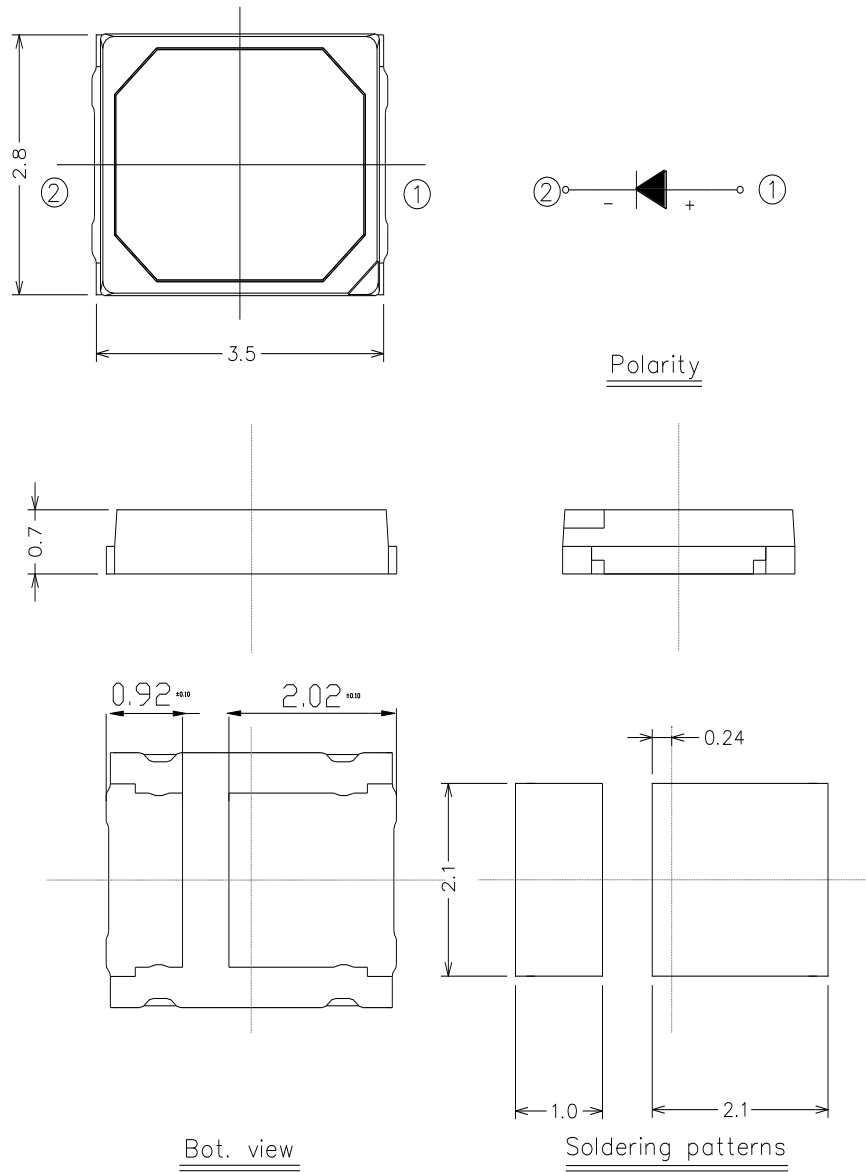


Fig.6 - Radiation Diagram



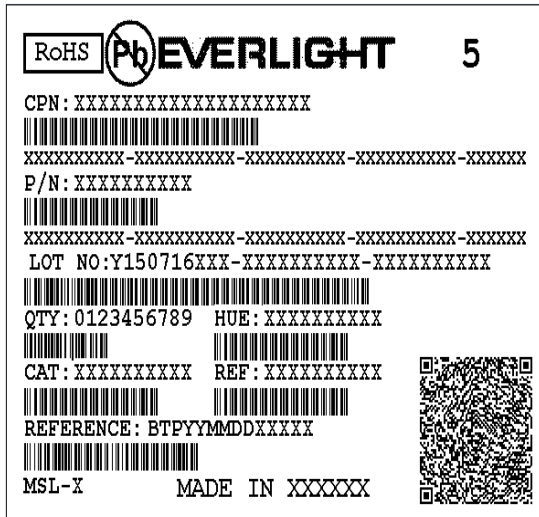
## Package Dimension



Note:  
Tolerance unless mentioned is  $\pm 0.1$  mm; Unit = mm

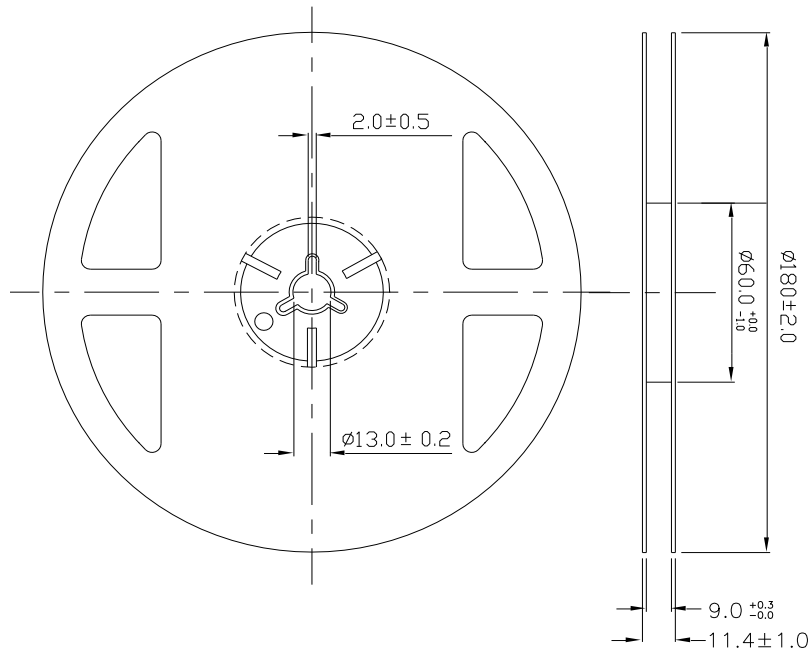
**Moisture Resistant Packing Materials**

**Label Explanation**



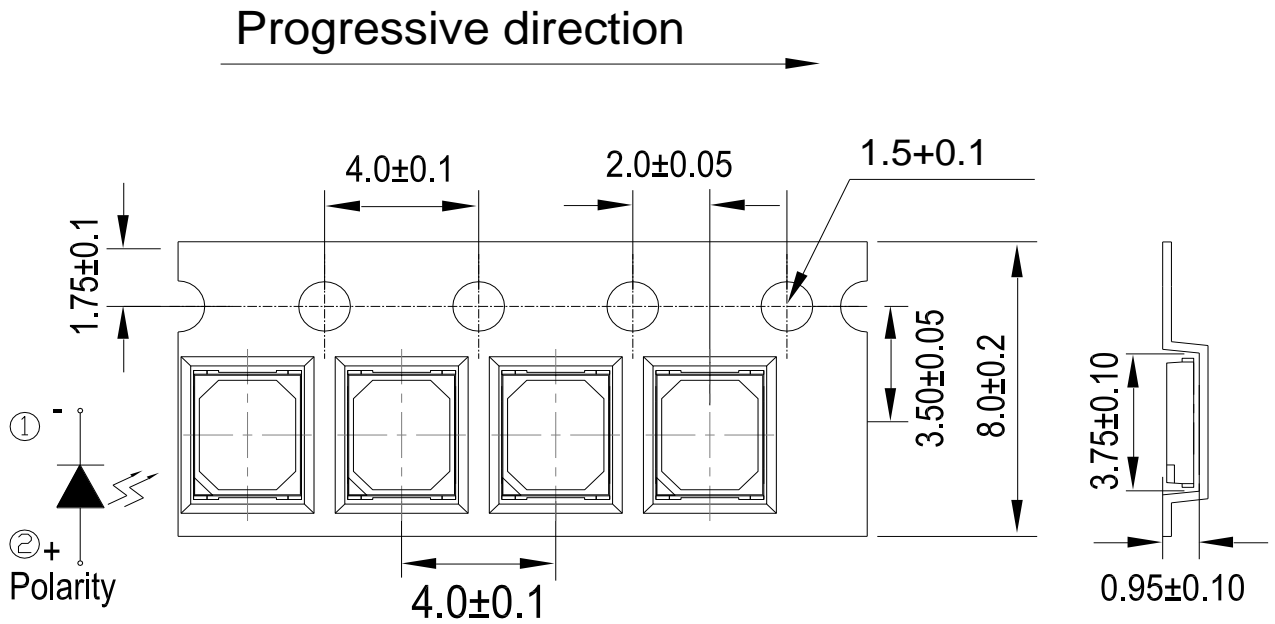
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

**Reel Dimensions**



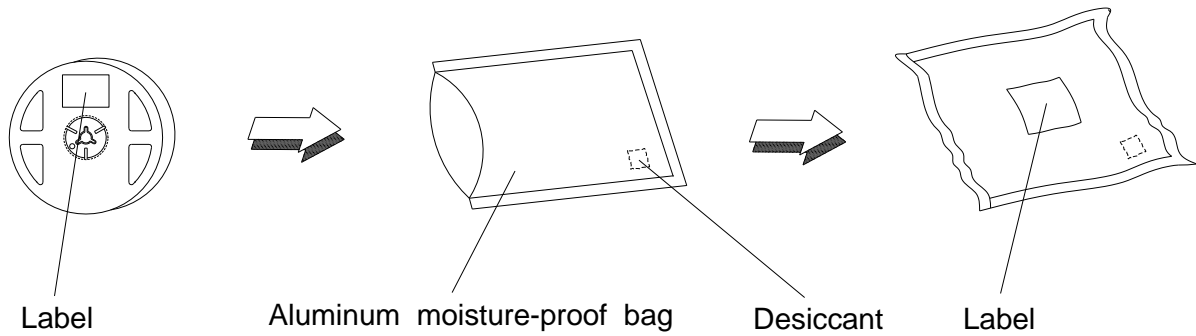
Note:  
 Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

Carrier Tape Dimensions: Loaded Quantity 4000 pcs. Per Reel



Note:  
Tolerance unless mentioned is  $\pm 0.1$  mm; Unit = mm

### Moisture Resistant Packing Process





## Reliability Test Items and Conditions

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

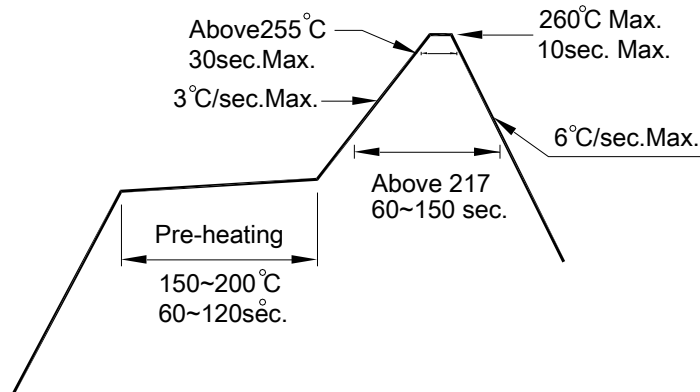
Confidence level : 90%

LTPD : 10%

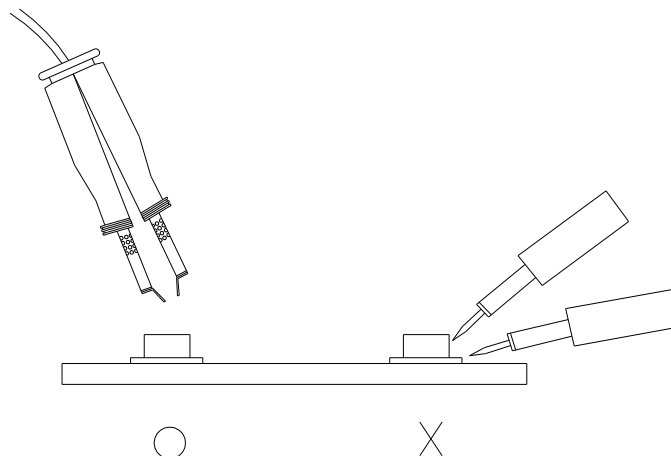
No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Resistance to Solder Heat	Temp. : 260°C/10sec.	3 Times.	8 PCS.	0/1
2	Temperature Cycle	-40°C~100°C / Dwell time 30min	200 Cycles	8 PCS.	0/1
3	High Temperature/Humidity Life	Ta=85°C,85%RH, I <sub>F</sub> = 60mA	1000 Hrs.	8 PCS.	0/1
4	Low Temperature Life	Ta=-40°C, I <sub>F</sub> = 60 mA	1000 Hrs.	8 PCS.	0/1
5	High Temperature Life	Ta=60°C, I <sub>F</sub> =60mA	3000 Hrs.	8 PCS.	0/1
6	High Temperature Life	Ta=85°C, I <sub>F</sub> =60mA	3000 Hrs.	8 PCS.	0/1
7	Pulse	ON 30ms / OFF 2500ms	30000 CYCLES	8 PCS.	0/1
8	Thermal Shock	H : +100°C 20min ∫ 10 sec L : -40°C 20min	200 Cycles	8 PCS.	0/1
9	Power Temperature Cycle	H : +100°C 15min ∫ 5 min L : -40°C 15min I <sub>F</sub> = 40 mA	200 Cycles	8 PCS.	0/1

## Precautions for Use

1. Over-current-proof  
Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).
2. Storage
  - 2.1 Do not open moisture proof bag before the products are ready to use.
  - 2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.
  - 2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.
  - 2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.  
Baking treatment: 60±5°C for 24 hours.
3. Soldering Condition
  - 3.1 Pb-free solder temperature profile



- 3.2 Reflow soldering should not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.
4. Soldering Iron  
Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.
5. 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.



## **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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6. This product is not intended to be used for military, aircraft, automotive, medical,