

### SMD ■ Middle Power LED 67-21S/DRKC-P4060C4D12834Z15/2T(TJB)



#### Features

- PLCC-2 package
- Top view Deep Red LED
- Wide viewing angle
- Pb-free
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)

#### 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

## Production List

Horticulture	Part number	Radiometric Power(mW) Avg.(1)	Peak Wavelength (nm) (3)	Forward Voltage (V)(2)	PPF (umol/s)	PPE (umol/J)	WPE (%)
<b>Deep Red</b>	67-21S/DRKC-P406 0C4D12834Z15/2T( TJB)	163	640~660	2.8~3.4	0.88	1.81	33.44

Notes:

1. Tolerance of Luminous flux:  $\pm 11\%$
2. Tolerance of Forward Voltage:  $\pm 0.05V$
3. Dominant / Peak wavelength measurement tolerance:  $\pm 1nm$

## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Deep Red	Water Clear

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

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	180	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	360	mA
Power Dissipation	P <sub>d</sub>	612	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>	21	°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 <sup>(1)</sup>	Φ	140	-----	220	mW	I <sub>F</sub> =150mA
Forward Voltage <sup>(2)</sup>	V <sub>F</sub>	2.8	-----	3.4	V	I <sub>F</sub> =150mA
Viewing Angle	2θ <sub>1/2</sub>	-----	120	-----	deg	I <sub>F</sub> =150mA
Reverse Current	I <sub>R</sub>	-----	-----	10	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
C4	140	160	mW	I <sub>F</sub> =150mA
C5	160	180		
D1	180	220		

Notes:  
 Tolerance of Radiometric Power: ±11%

### Bin Range of Forward Voltage

Group	Bin Code	Min.	Max.	Unit	Condition
2834	35	2.8	2.9	V	I <sub>F</sub> =150mA
	36	2.9	3.0		
	37	3.0	3.1		
	38	3.1	3.2		
	39	3.2	3.3		
	40	3.3	3.4		

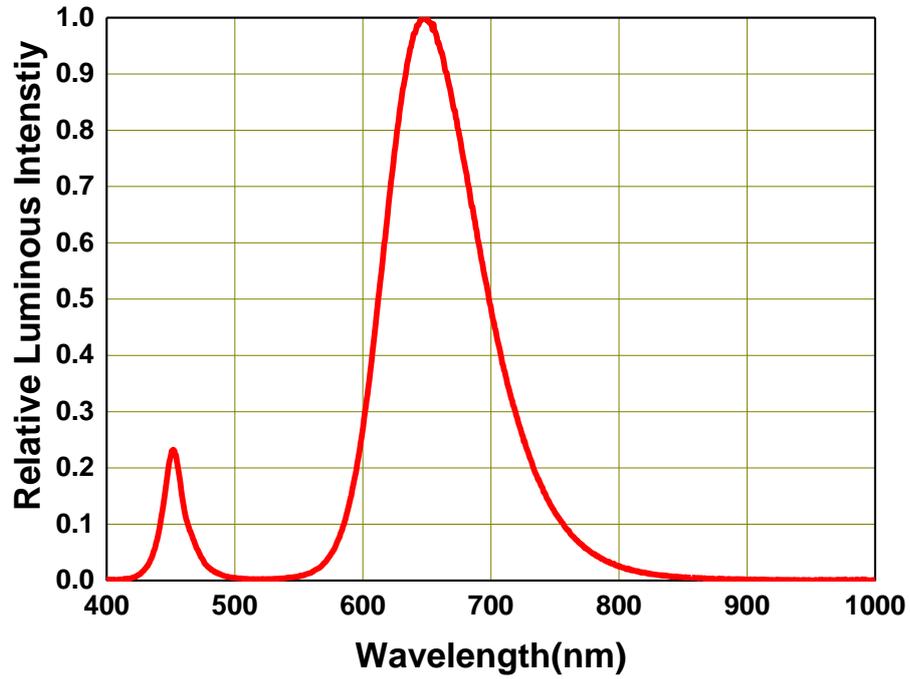
Note:  
 Tolerance of Forward Voltage: ±0.1V.

### Peak Wavelength Bins

Bin Code	Min.	Max.	Unit	Condition
DA1	640	650	nm	I <sub>F</sub> =150mA
DA2	650	660		

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

### Spectrum Distribution



### Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

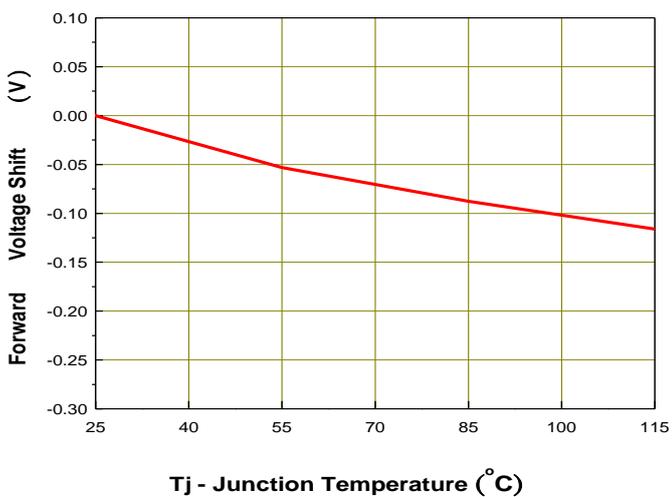
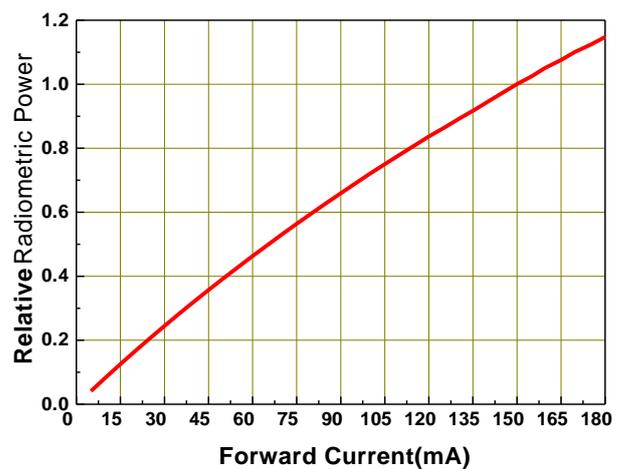


Fig.2 - Relative Radiometric Power vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

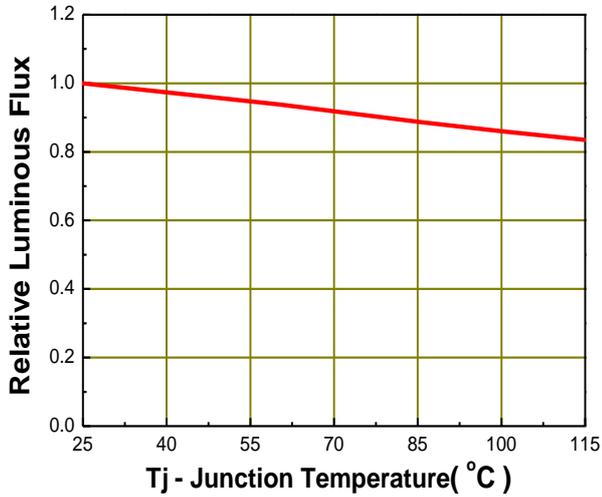


Fig.4 - Forward Current vs. Forward Voltage

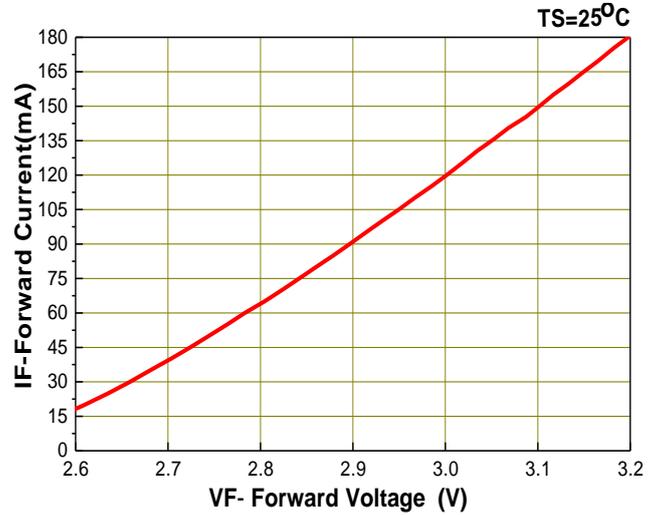


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

$R_{th\ j-s} = 21\ ^\circ\text{C/W}$

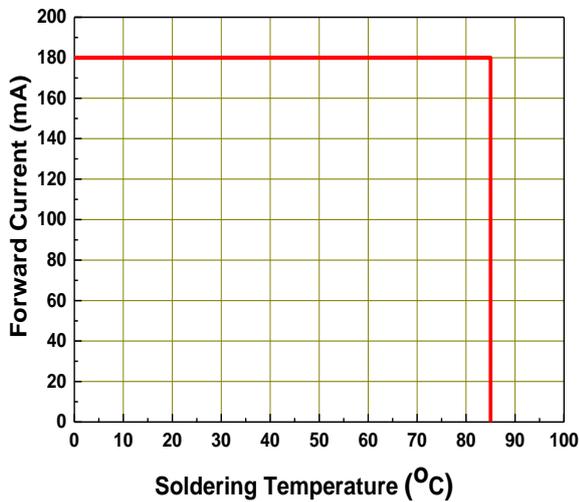
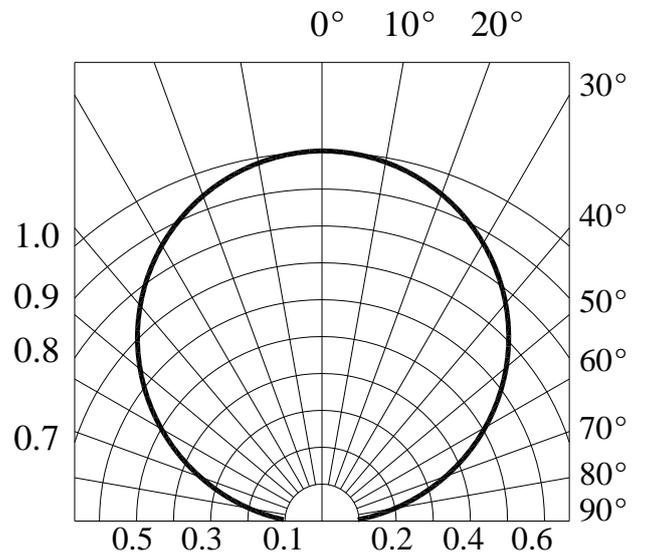
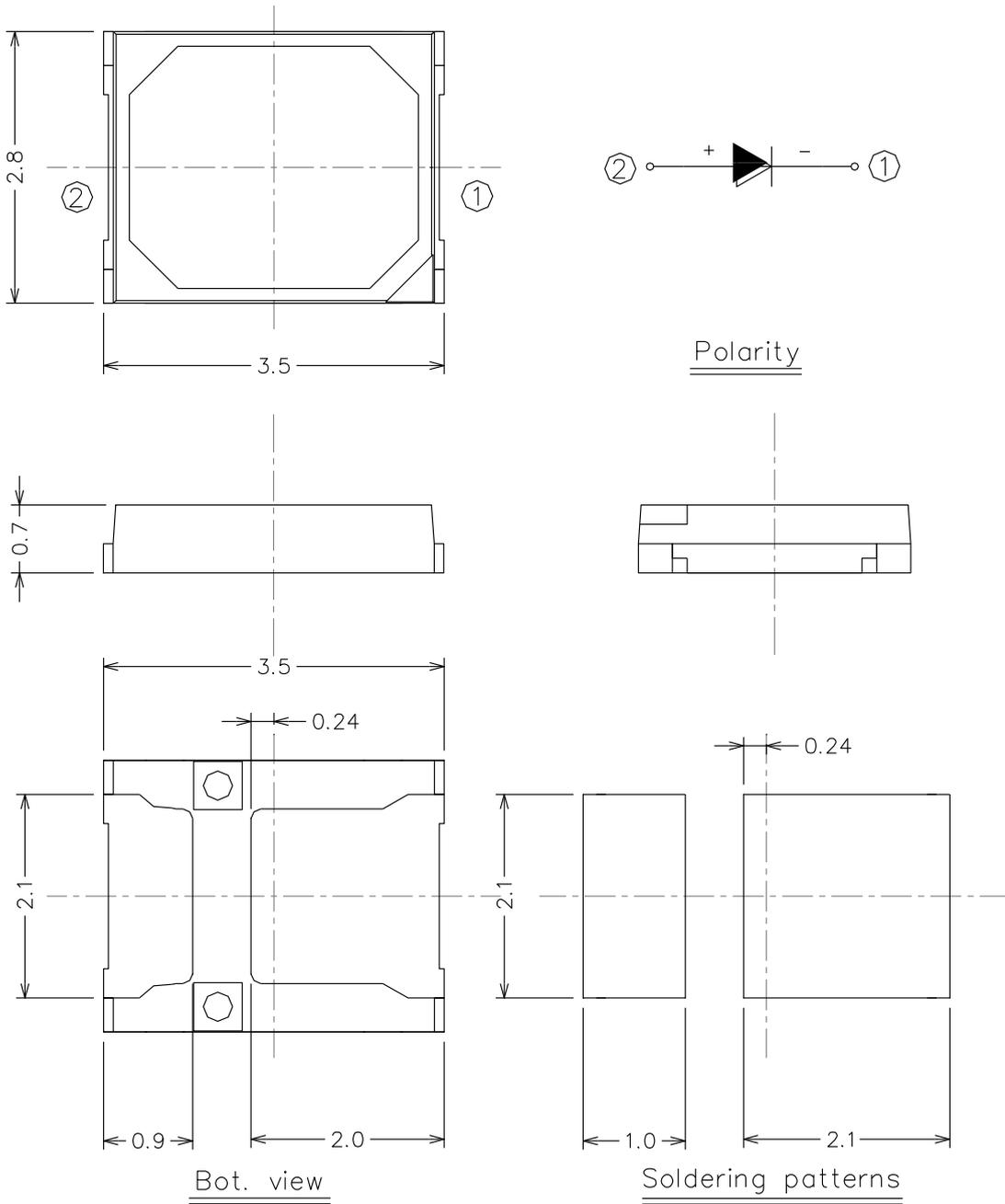


Fig.6 – Radiation Diagram



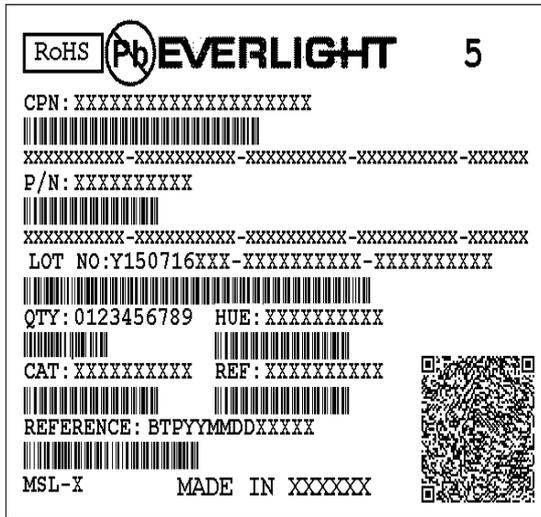
Package Dimension



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

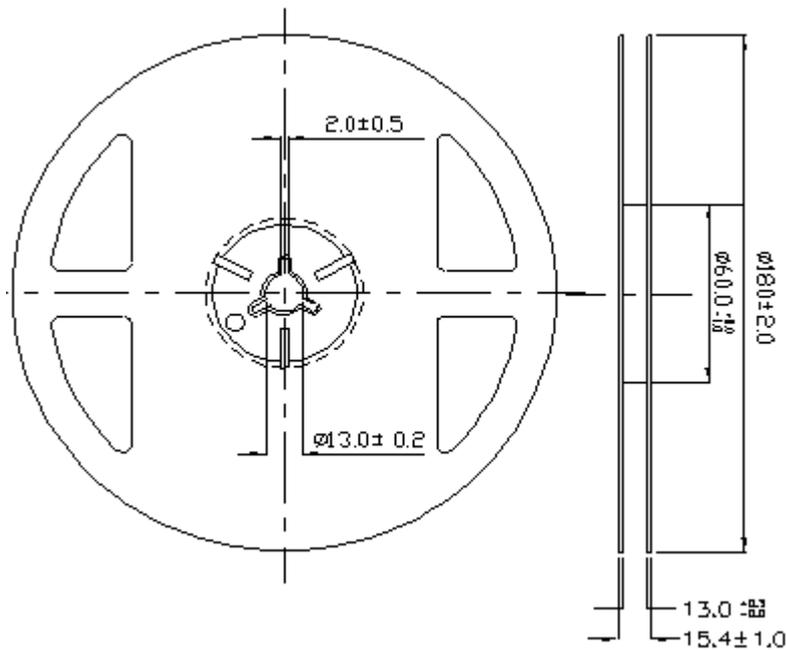
**Moisture Resistant Packing Materials**

**Label Explanation**



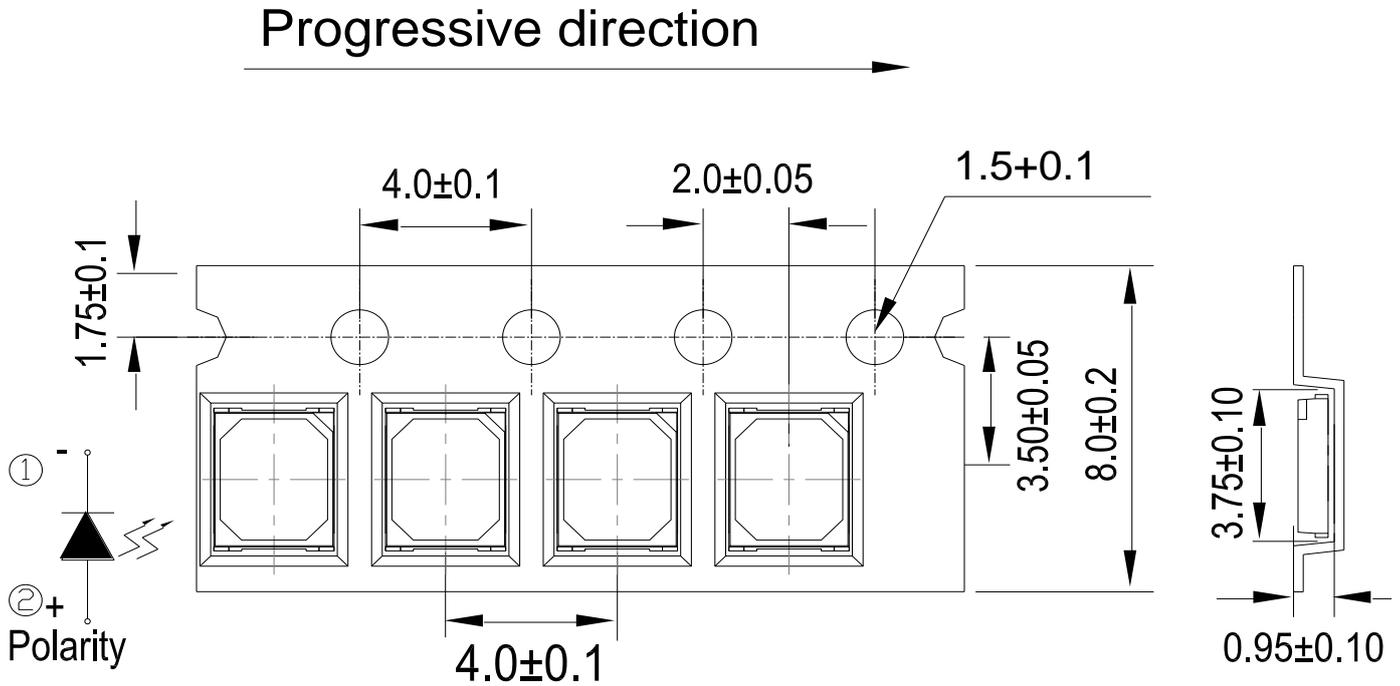
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

**Reel Dimensions**



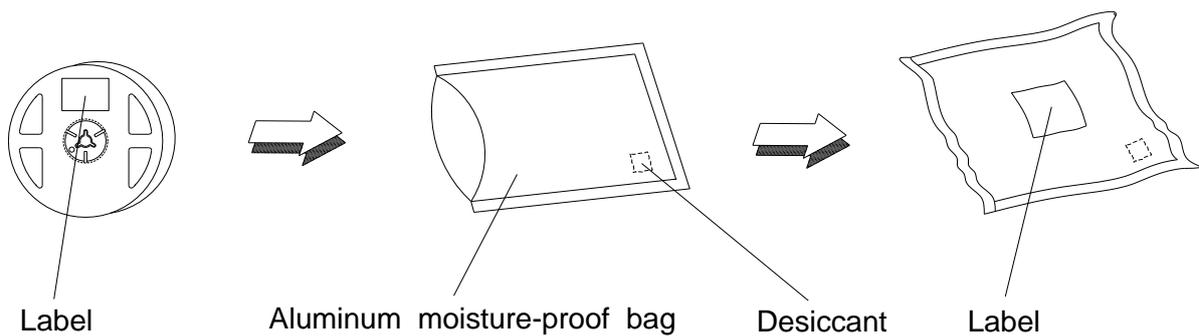
Note:  
 Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

**Carrier Tape Dimensions: Loaded Quantity 1000/2000/3000/4000 pcs. Per Reel**



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

**Moisture Resistant Packing Process**



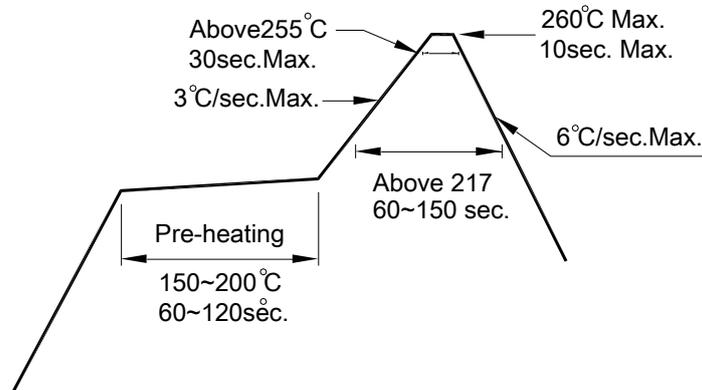
## Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.  
 Confidence level : 90%  
 LTPD : 10%

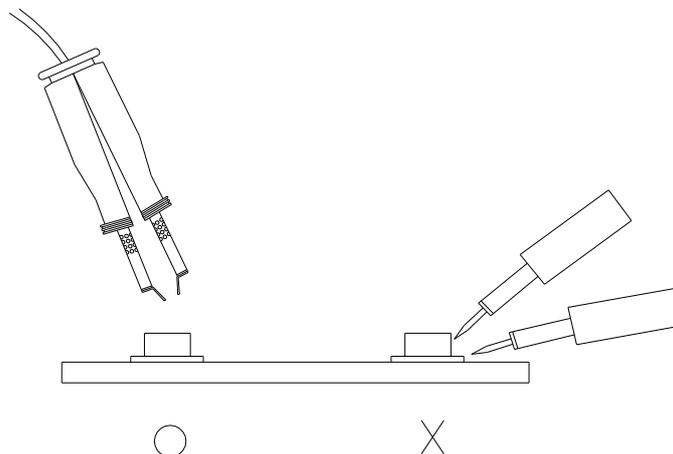
No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Resistance to Solder Heat	Temp. : 260°C/10sec.	3 Times.	8 PCS.	0/1
2	Temperature Cycle	-40°C~100°C / Dwell time 30min	200 Cycles	8 PCS.	0/1
3	High Temperature/Humidity Life	Ta=85°C,85%RH, I <sub>F</sub> = 180mA	1000 Hrs.	8 PCS.	0/1
4	Low Temperature Life	Ta=-40°C, I <sub>F</sub> = 180 mA	1000 Hrs.	8 PCS.	0/1
5	High Temperature Life	Ta=60°C, I <sub>F</sub> =180 mA	3000 Hrs.	8 PCS.	0/1
6	High Temperature Life	Ta=85°C, I <sub>F</sub> =180 mA	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> = 120 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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