

### SMD ▪ Middle Power LED

67-22ST/NFR3C-P2050C1C41827Z15/2T(EMM)



#### Features

- PLCC-2 package
- Top view Deep Red LED
- Wide viewing angle
- Pb-free
- ANSI Binning
- 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 67-22ST 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 ( $T_{\text{Soldering}}=25^{\circ}\text{C}$ )

| Parameter                                       | Symbol              | Rating                                                                      | Unit |
|-------------------------------------------------|---------------------|-----------------------------------------------------------------------------|------|
| Forward Current                                 | $I_F$               | 150                                                                         | mA   |
| Peak Forward Current (Duty 1/10 @10ms)          | $I_{FP}$            | 300                                                                         | mA   |
| Power Dissipation                               | $P_d$               | 405                                                                         | mW   |
| Operating Temperature                           | $T_{\text{opr}}$    | -40 ~ +85                                                                   | °C   |
| Storage Temperature                             | $T_{\text{stg}}$    | -40 ~ +100                                                                  | °C   |
| Thermal Resistance (Junction / Soldering point) | $R_{\text{th J-S}}$ | 50                                                                          | °C/W |
| Junction Temperature                            | $T_j$               | 115                                                                         | °C   |
| Soldering Temperature                           | $T_{\text{sol}}$    | Reflow Soldering : 260 °C for 10 sec.<br>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 ( $T_{\text{Soldering}}=25^{\circ}\text{C}$ )

| Parameter         | Symbol          | Min. | Typ. | Max. | Unit          | Condition          |
|-------------------|-----------------|------|------|------|---------------|--------------------|
| Radiometric Power | mW              | 80   | ---- | 160  | mW            | $I_F=150\text{mA}$ |
| Forward Voltage   | $V_F$           | 1.8  | ---- | 2.7  | V             | $I_F=150\text{mA}$ |
| Viewing Angle     | $2\theta_{1/2}$ | ---- | 120  | ---- | deg           | $I_F=150\text{mA}$ |
| Reverse Current   | $I_R$           | ---- | ---- | 10   | $\mu\text{A}$ | $V_R = 5\text{V}$  |

Notes:

1. Tolerance of Radiometric Power:  $\pm 11\%$ .
2. Tolerance of Forward Voltage:  $\pm 0.1\text{V}$ .

**Bin Range of Radiometric Power**

| Bin Code | Min. | Max. | Unit | Condition          |
|----------|------|------|------|--------------------|
| C1       | 80   | 100  | mW   | $I_F=150\text{mA}$ |
| C2       | 100  | 120  |      |                    |
| C3       | 120  | 140  |      |                    |
| C4       | 140  | 160  |      |                    |

Note:

Tolerance of Luminous flux:  $\pm 11\%$ **Bin Range of Forward Voltage**

| Bin Code | Min. | Max. | Unit | Condition          |
|----------|------|------|------|--------------------|
| 25       | 1.8  | 1.9  | V    | $I_F=150\text{mA}$ |
| 26       | 1.9  | 2.0  |      |                    |
| 27       | 2.0  | 2.1  |      |                    |
| 28       | 2.1  | 2.2  |      |                    |
| 29       | 2.2  | 2.3  |      |                    |
| 30       | 2.3  | 2.4  |      |                    |
| 31       | 2.4  | 2.5  |      |                    |
| 32       | 2.5  | 2.6  |      |                    |
| 33       | 2.6  | 2.7  |      |                    |

Note:

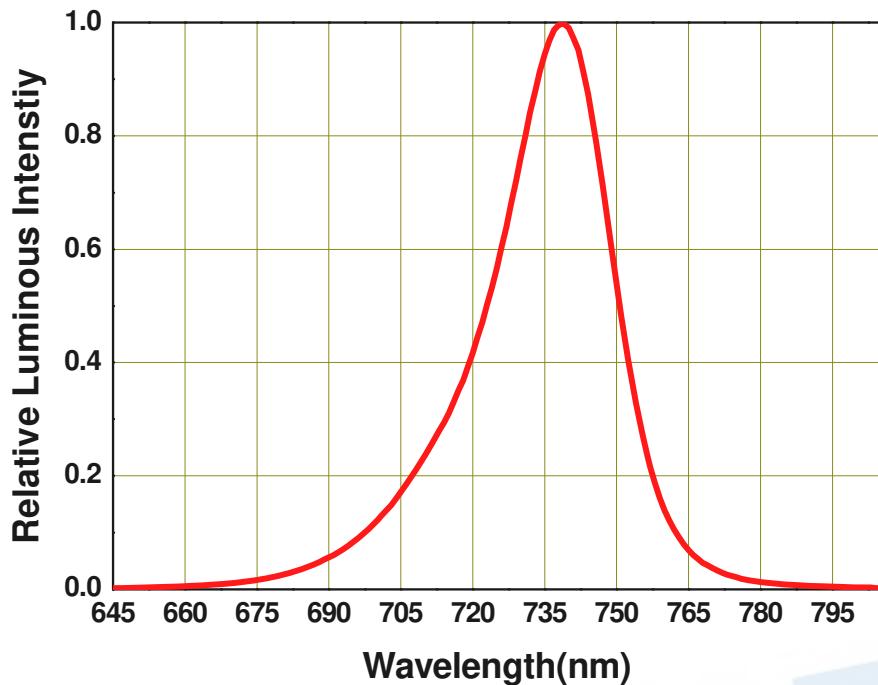
Tolerance of Forward Voltage:  $\pm 0.1\text{V}$ .**Peak Wavelength Bins**

| Bin Code | Min. | Max. | Unit | Condition          |
|----------|------|------|------|--------------------|
| FA3      | 720  | 730  | nm   | $I_F=150\text{mA}$ |
| FA4      | 730  | 740  |      |                    |
| FA5      | 740  | 750  |      |                    |

Note:

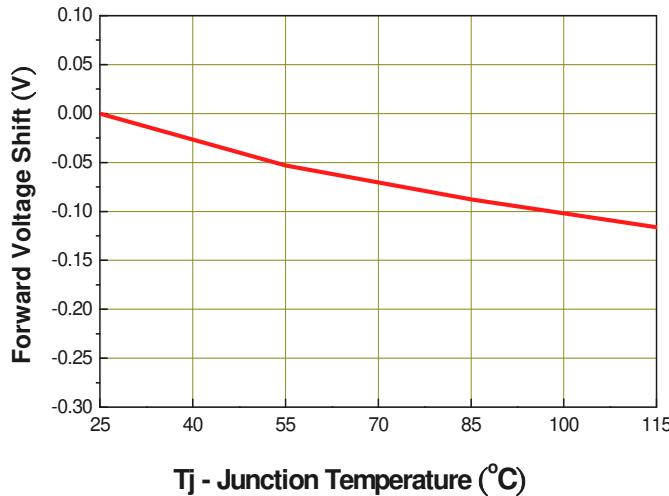
Dominant / Peak wavelength measurement tolerance:  $\pm 1\text{nm}$ .

## Spectrum Distribution

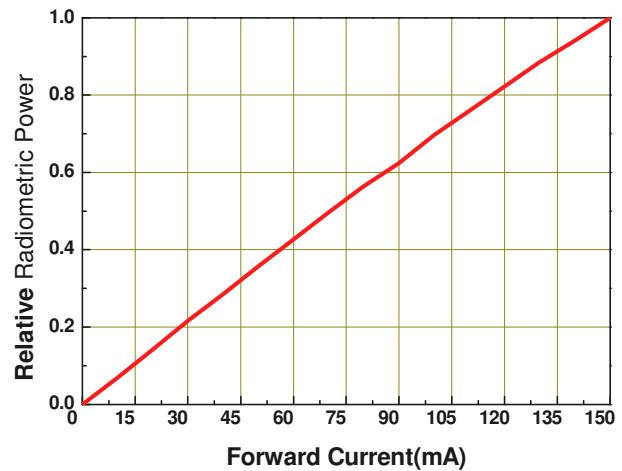


## Typical Electro-Optical Characteristics Curves

**Fig.1 – Forward Voltage Shift vs. Junction Temperature**

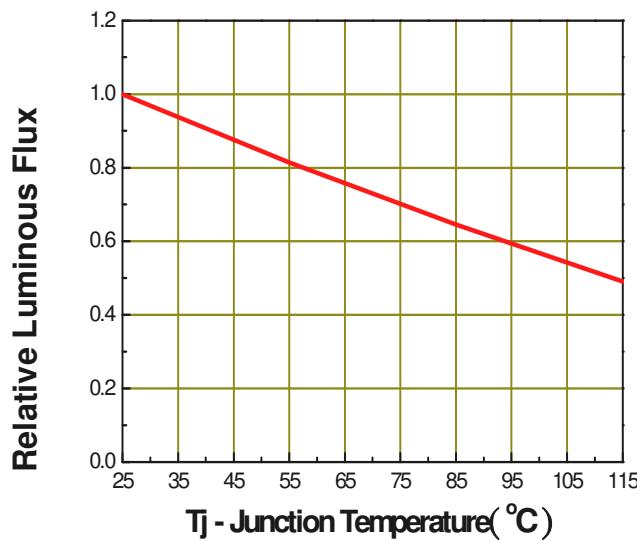


**Fig.2 - Relative Radiometric Power vs. Forward Current**

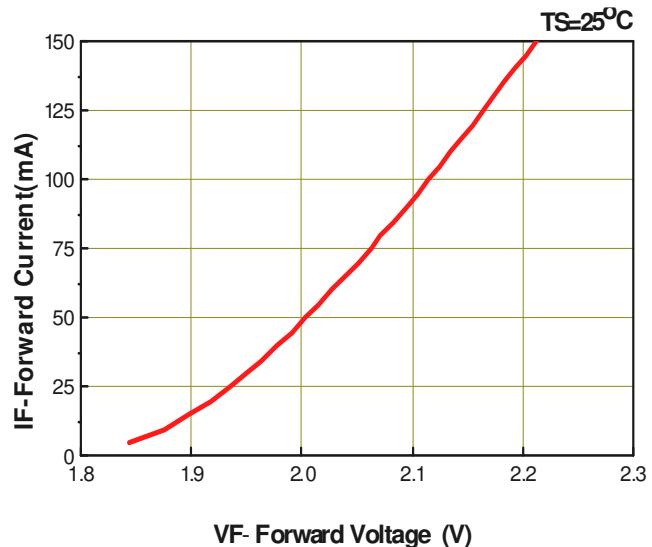


## Typical Electro-Optical Characteristics Curves

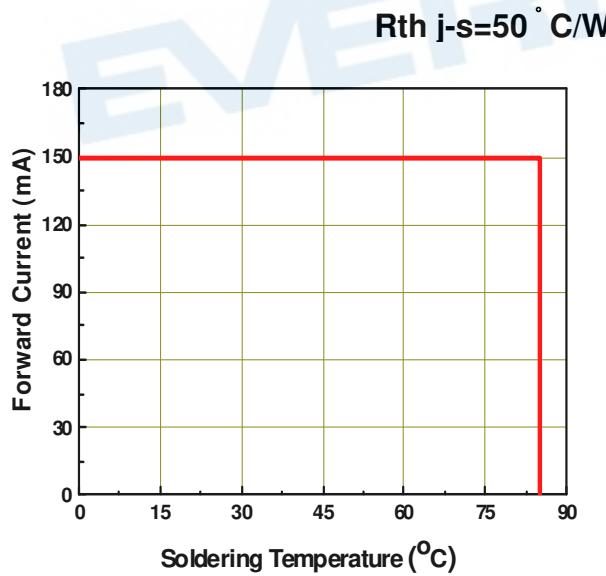
**Fig.3 - Relative Luminous Intensity vs. Junction Temperature**



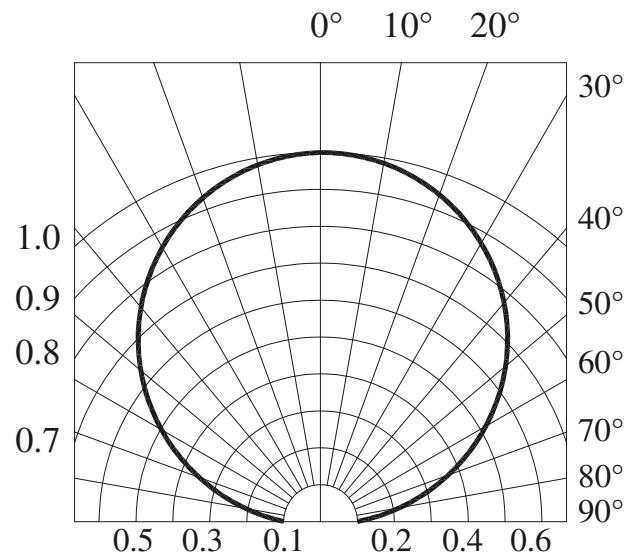
**Fig.4 - Forward Current vs. Forward Voltage**



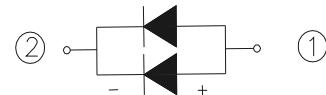
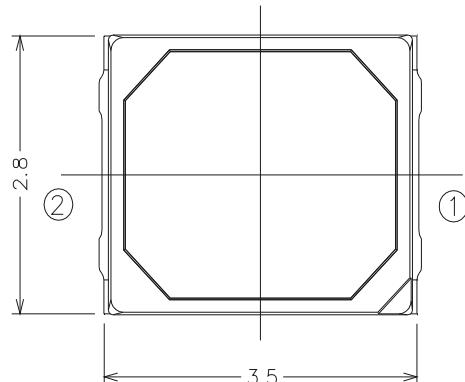
**Fig.5 – Max. Driving Forward Current vs. Soldering Temperature**



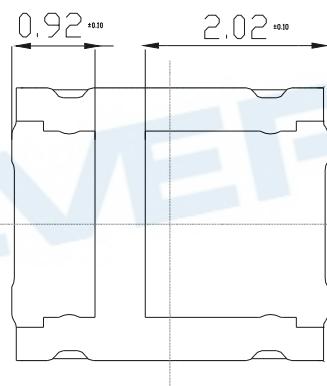
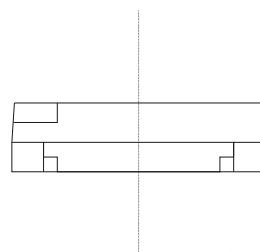
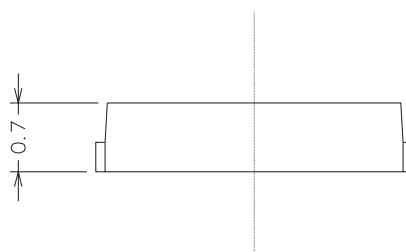
**Fig.6 – Radiation Diagram**



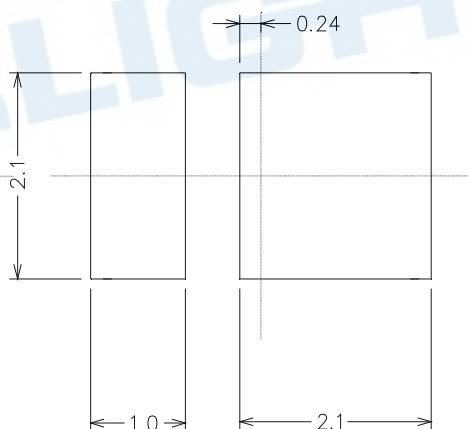
## Package Dimension



Polarity



Bot. view



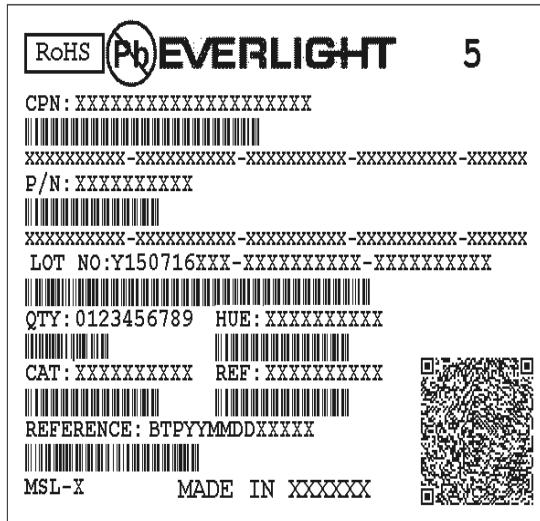
Soldering patterns

Note:

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

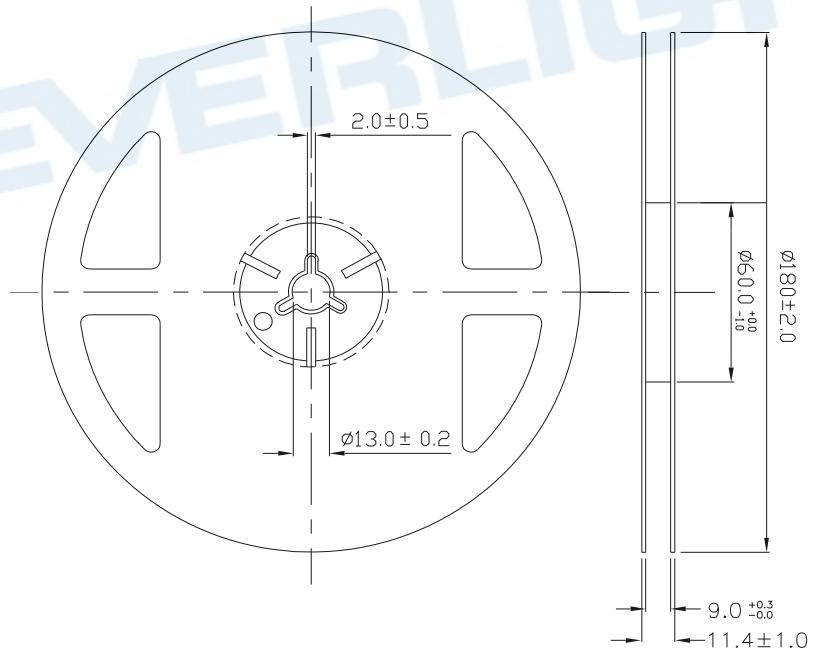
## Moisture Resistant Packing Materials

### 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

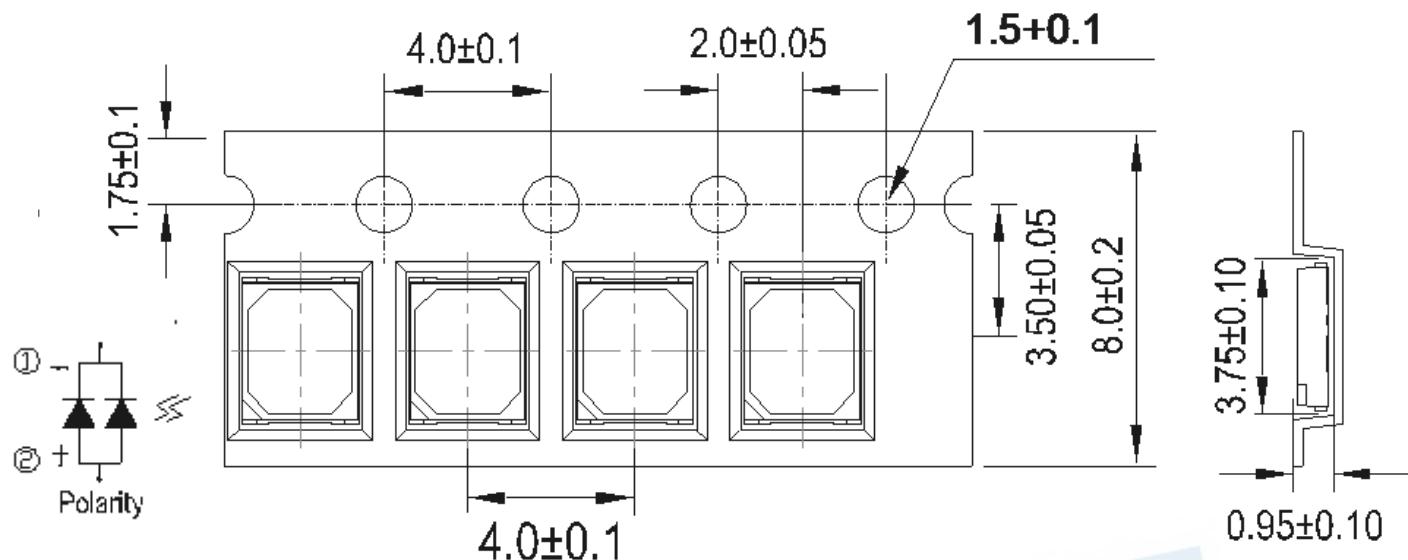


#### Note:

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

Carrier Tape Dimensions: Loaded Quantity 4000 pcs. Per Reel

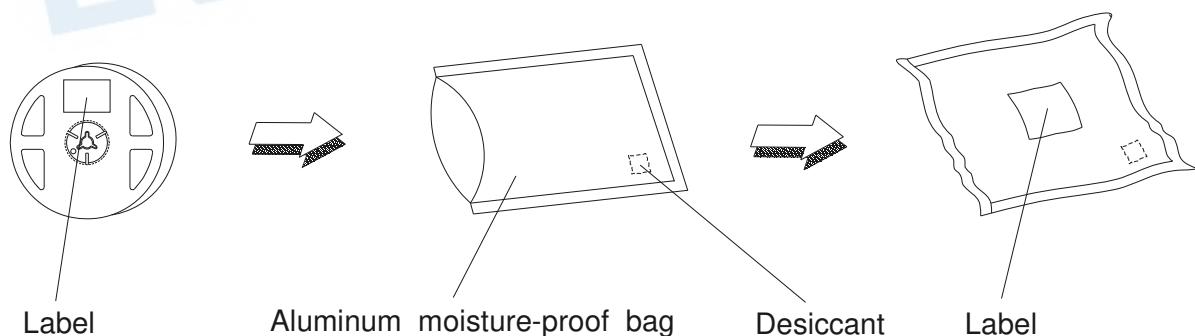
## Progressive direction



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 | T <sub>a</sub> =85°C, 85%RH,<br>I <sub>F</sub> = 150mA                    | 1000 Hrs.         | 8 PCS.      | 0/1   |
| 4   | Low Temperature Life           | T <sub>a</sub> =-40°C,<br>I <sub>F</sub> = 150 mA                         | 1000 Hrs.         | 8 PCS.      | 0/1   |
| 5   | High Temperature Life          | T <sub>a</sub> =60°C,<br>I <sub>F</sub> = 150mA                           | 3000 Hrs.         | 8 PCS.      | 0/1   |
| 6   | High Temperature Life          | T <sub>a</sub> =85°C,<br>I <sub>F</sub> = 150 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<br>↓ 10 sec<br>L : -40°C 20min                           | 200 Cycles        | 8 PCS.      | 0/1   |
| 9   | Power Temperature Cycle        | H : +100°C 15min<br>↓ 5 min<br>L : -40°C 15min<br>I <sub>F</sub> = 100 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.

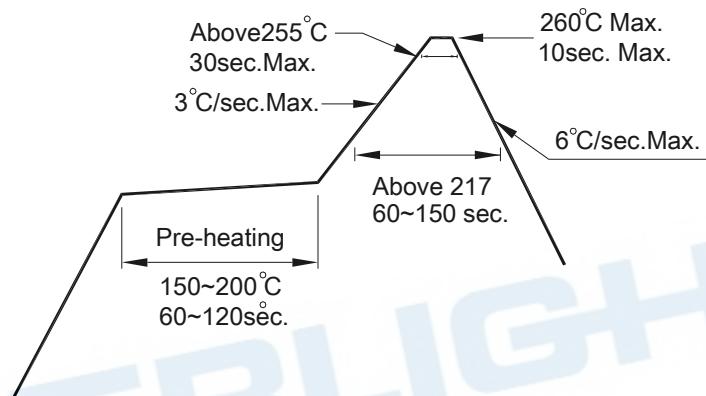
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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:  $60\pm5^\circ\text{C}$  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.

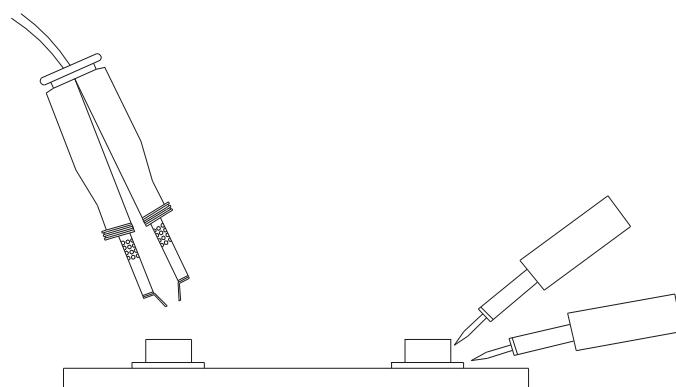
3.4 After soldering, do not warp the circuit board.

### 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

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A large, faint, diagonal watermark reading "EVERLIGHT" in a bold, sans-serif font. The text is oriented from the bottom-left towards the top-right, with a bounding box approximately from [138, 436] to [812, 612].