

## SMD ▪ Low Power LED 61-238/XK2C-SXXXXXXXXXX/ET



### Features

- P-LCC-6 package
- Top view LED
- Wide viewing angle:120°
- High Luminous intensity
- High Efficacy
- Pb-free
- RoHS-compliant
- ANSI Binning

### Description

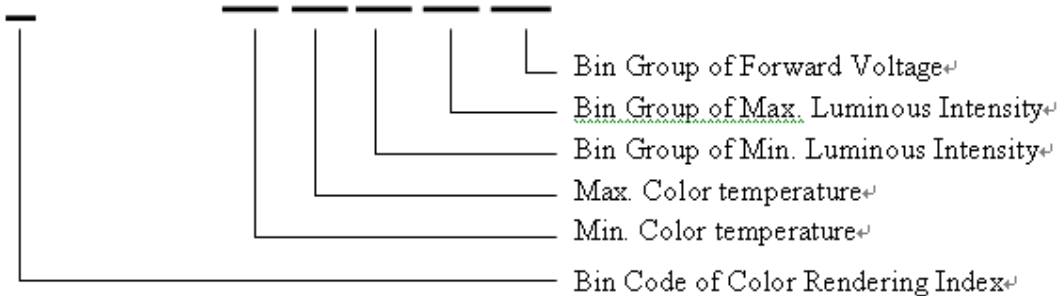
The Everlight 61-238 package has high efficacy, high CRI, low power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

### Applications

- General lighting
- Decorative and Entertainment Lighting
- Indicators
- Illumination
- Switch lights

**Product Number Explanation**

**61-238 / X K 2 C - S XX XX XX XX XX / ET**



**Notes**

**Table of Color Rendering Index**

| Symbol | Description   |
|--------|---------------|
| M      | CRI(min) : 60 |
| N      | CRI(min) : 65 |
| L      | CRI(min) : 70 |
| Q      | CRI(min) : 75 |
| K      | CRI(min) : 80 |
| H      | CRI(min) : 90 |

**Notes:**

1. Tolerance of Color Rendering Index: ±2

**Example:**

61-238/KK2C-S30306F4GB2/ET

|     |                 |
|-----|-----------------|
| CRI | Min=80          |
| CCT | 3000K           |
| IV  | 5400mcd~6400mcd |
| VF  | 2.9V~3.6V       |

**Mass Production list**

| Product                    | CRI min. | CCT(K) | IV(mcd) Min | IV(mcd) Max | Φ(lm) Typ. |
|----------------------------|----------|--------|-------------|-------------|------------|
| 61-238/KK2C-S30306F4GB2/ET | 80       | 3000K  | 5400        | 6400        | 17.0       |
| 61-238/KK2C-S40408F6GB2/ET | 80       | 4000K  | 5600        | 6600        | 18.0       |

## Device Selection Guide

| Chip Materials | Emitted Color               | Resin Color |
|----------------|-----------------------------|-------------|
| InGaN          | Neutral White<br>Warm White | Water Clear |

## Absolute Maximum Ratings (Ta=25°C) \*1

| Parameter                                | Symbol           | Rating  | Unit |
|--|------------------|---|------|
| Reverse Voltage*1                        | V <sub>R</sub>   | 5   | V    |
| Forward Current*1                        | I <sub>F</sub>   | 30  | mA   |
| Peak Forward Current(Duty 1/10 @ 1KHZ)*1 | I <sub>FP</sub>  | 100   | mA   |
| Power Dissipation*1                      | P <sub>d</sub>   | 110   | mW   |
| Electrostatic Discharge(HBM) *1          | ESD              | 1000  | °C   |
| Operating Temperature                    | T <sub>opr</sub> | -40 ~ +85   | °C   |
| Storage Temperature                      | T <sub>stg</sub> | -40 ~ +90   | °C   |
| Soldering Temperature                    | T <sub>sol</sub> | Reflow Soldering : 260 °C for 10 sec.<br>Hand Soldering : 350 °C for 3 sec. |      |

\* 1. The value are based on 1 die performance

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

| Parameter       | Symbol            | Min.  | Typ.  | Max.  | Unit | Condition              |
|-----------------|-------------------|-------|-------|-------|------|------------------------|
| Viewing Angle*1 | 2θ <sub>1/2</sub> | ----- | 120   | ----- | deg  | I <sub>F</sub> =20mA*2 |
| Reverse Current | I <sub>R</sub>    | ----- | ----- | 50    | μA   | V <sub>R</sub> =5V     |

\*1 When three LED dies are operated simultaneously.

\*2 For each die.

**Bin Range of Luminous Intensity<sup>\*1</sup>**

| Bin Code | Min. | Max. | Unit | Condition                          |
|----------|------|------|------|------------------------------------|
| 4D       | 3200 | 3400 |      |                                    |
| 6D       | 3400 | 3600 |      |                                    |
| 8D       | 3600 | 3800 |      |                                    |
| AE       | 3800 | 4000 |      |                                    |
| 2E       | 4000 | 4200 |      |                                    |
| 4E       | 4200 | 4400 |      |                                    |
| 6E       | 4400 | 4600 |      |                                    |
| 8E       | 4600 | 4800 |      |                                    |
| AF       | 4800 | 5000 | mcd  | I <sub>F</sub> =20mA <sup>*2</sup> |
| 2F       | 5000 | 5200 |      |                                    |
| 4F       | 5200 | 5400 |      |                                    |
| 6F       | 5400 | 5600 |      |                                    |
| 8F       | 5600 | 5800 |      |                                    |
| AG       | 5800 | 6000 |      |                                    |
| 2G       | 6000 | 6200 |      |                                    |
| 4G       | 6200 | 6400 |      |                                    |
| 6G       | 6400 | 6600 |      |                                    |

Notes:

- \*1 When three LED dies are operated simultaneously.
- \*2 For each die.
- Tolerance of Luminous Intensity ±11%

**Bin Range of Forward Voltage <sup>\*1</sup>**

| Group | Bin Code | Min. | Max. | Unit | Condition |                 |
|-------|----------|------|------|------|-----------|-----------------|
| G     |          | 34   | 2.7  | 2.8  | v         | $I_F=20mA^{*2}$ |
|       |          | 35   | 2.8  | 2.9  |           |                 |
|       | B2       | 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  |           |                 |
|       |          | 41   | 3.4  | 3.5  |           |                 |
|       |          | 42   | 3.5  | 3.6  |           |                 |
|       |          | 43   | 3.6  | 3.7  |           |                 |

Notes:

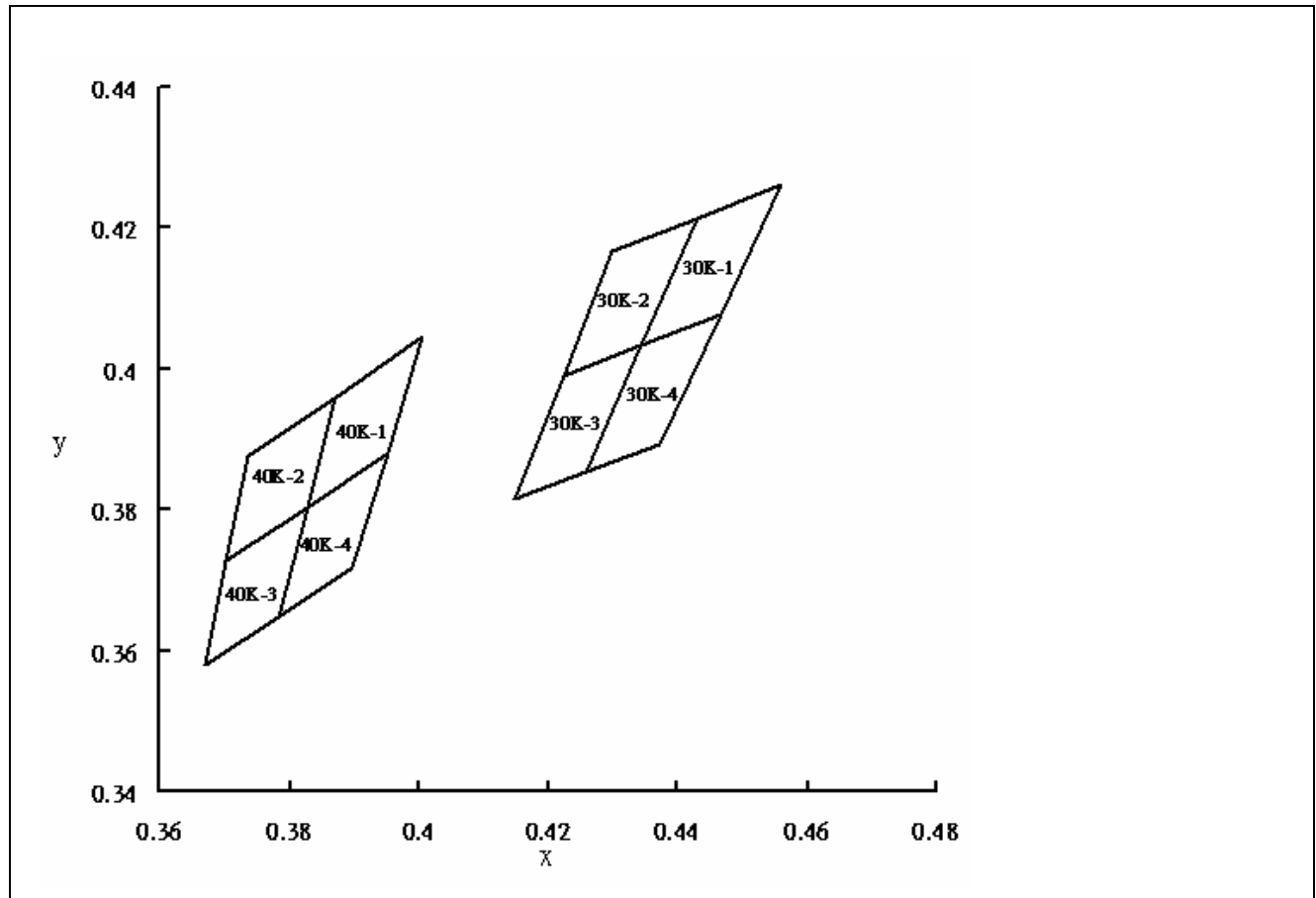
1. \*1 When three LED dies are operated simultaneously.
2. \*2 For each die.
3. Tolerance of Forward Voltage  $\pm 0.05V$
4. Forward Voltage rank is the average forward voltage of three dies

**Bin Range of Chromaticity Coordinates**

| CCT   | Bin Code | CIE_x  | CIE_y  | Bin Code | CIE_x  | CIE_y  |
|-------|----------|--------|--------|----------|--------|--------|
| 4000K | 40K-1    | 0.4006 | 0.4044 | 40K-3    | 0.3828 | 0.3803 |
|       |          | 0.3871 | 0.3959 |          | 0.3703 | 0.3726 |
|       |          | 0.3828 | 0.3803 |          | 0.3670 | 0.3578 |
|       |          | 0.3952 | 0.3880 |          | 0.3784 | 0.3647 |
|       | 40K-2    | 0.3871 | 0.3959 | 40K-4    | 0.3952 | 0.3880 |
|       |          | 0.3736 | 0.3874 |          | 0.3828 | 0.3803 |
|       |          | 0.3703 | 0.3726 |          | 0.3784 | 0.3647 |
|       |          | 0.3828 | 0.3803 |          | 0.3898 | 0.3716 |
| 3000K | 30K-1    | 0.4562 | 0.4260 | 30K-3    | 0.4345 | 0.4033 |
|       |          | 0.4431 | 0.4213 |          | 0.4223 | 0.3990 |
|       |          | 0.4345 | 0.4033 |          | 0.4147 | 0.3814 |
|       |          | 0.4468 | 0.4077 |          | 0.4260 | 0.3854 |
|       | 30K-2    | 0.4431 | 0.4213 | 30K-4    | 0.4468 | 0.4077 |
|       |          | 0.4299 | 0.4165 |          | 0.4345 | 0.4033 |
|       |          | 0.4223 | 0.3990 |          | 0.4260 | 0.3854 |
|       |          | 0.4345 | 0.4033 |          | 0.4373 | 0.3893 |

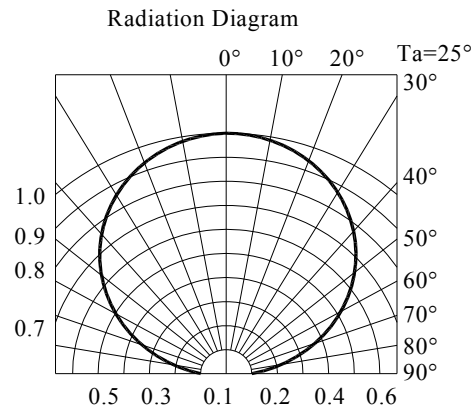
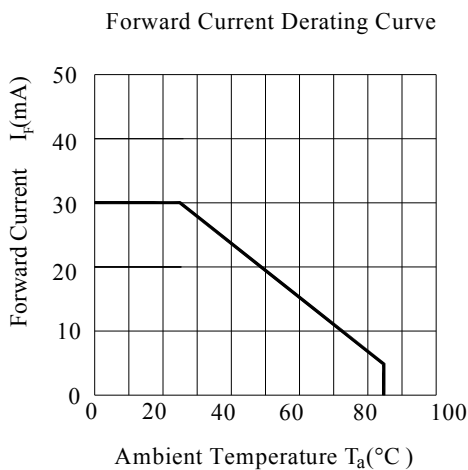
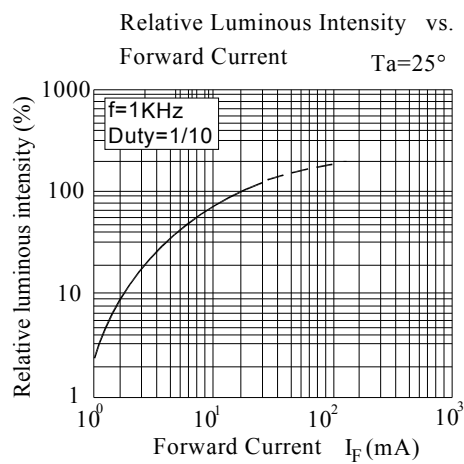
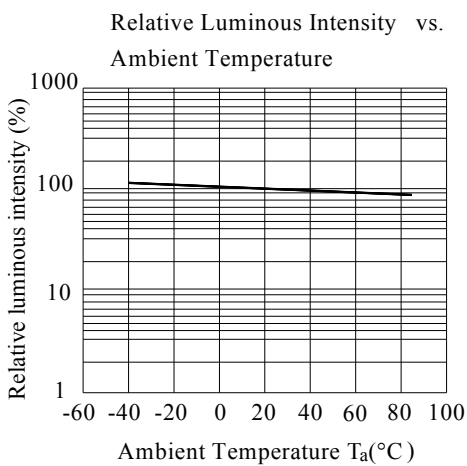
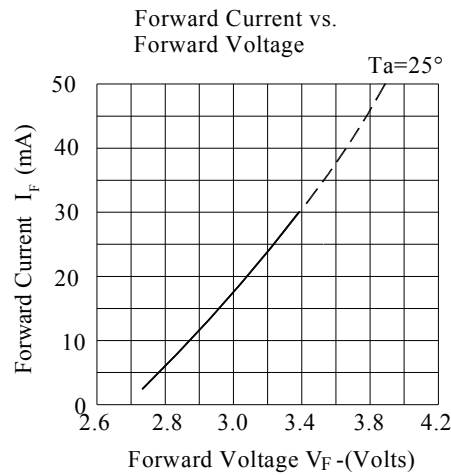
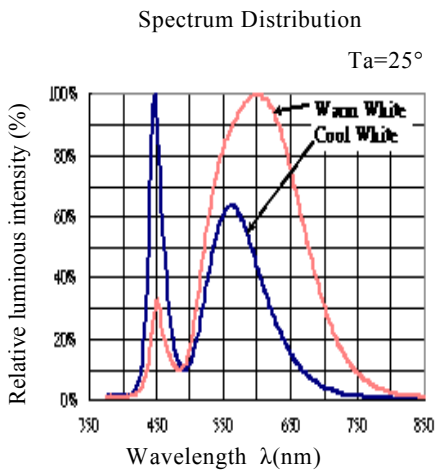
Note:  
 Tolerance of Chromaticity Coordinates: ±0.01

### The C.I.E. 1931 Chromaticity Diagram

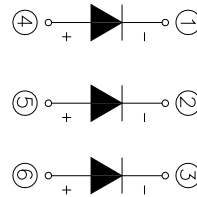
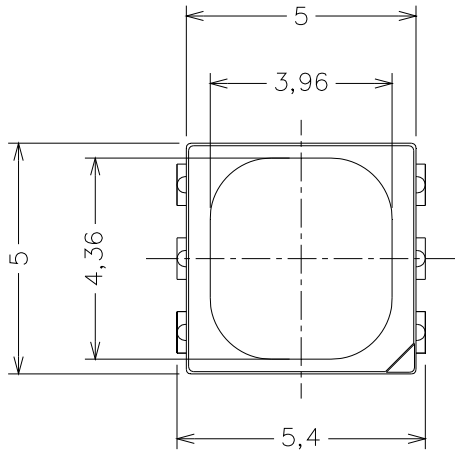




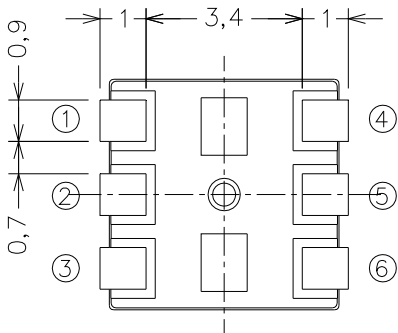
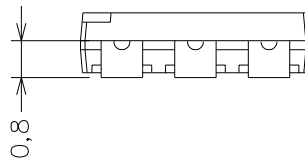
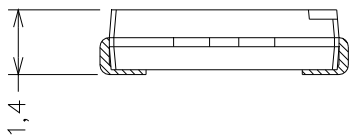
**Typical Electro-Optical Characteristics Curves**



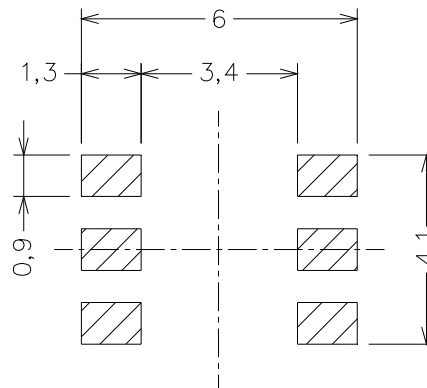
**Package Dimension**



Polarity



Bot. view



Soldering patterns

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

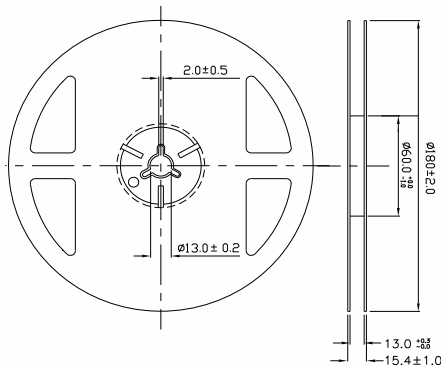
**Moisture Resistant Packing Materials**

**Label Explanation**

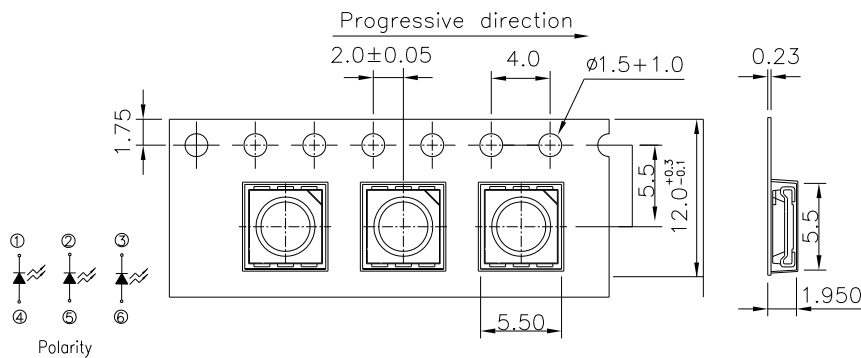


- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

**Reel Dimensions**

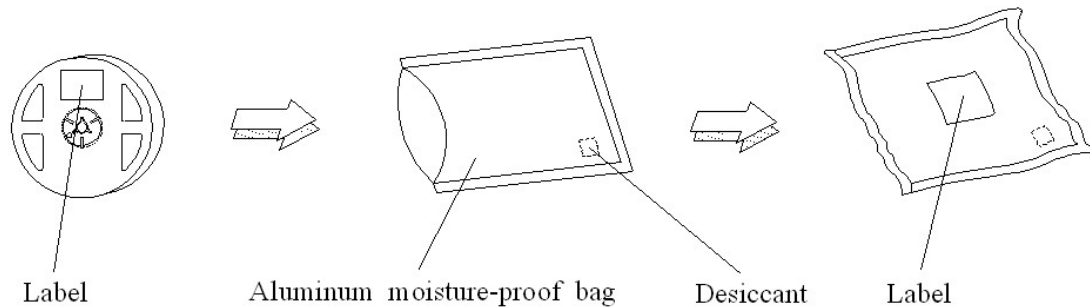


**Carrier Tape Dimensions: Loaded Quantity 800 pcs Per Reel**



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

**Moisture Resistant Packing Process**



Note:  
 Tolerances unless mentioned ±0.1mm. Unit = mm

**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   | Reflow Soldering                 | Temp. : 260°C±5°C Min.<br>10sec.               | 6 Min.            | 22 PCS.     | 0/1   |
| 2   | Temperature Cycle                | H : +100°C 15min<br>∫ 5 min<br>L : -40°C 15min | 300 Cycles        | 22 PCS.     | 0/1   |
| 3   | Thermal Shock                    | H : +100°C 5min<br>∫ 10 sec<br>L : -10°C 5min  | 300 Cycles        | 22 PCS.     | 0/1   |
| 4   | High Temperature Storage         | Temp. : 100°C                                  | 1000 Hrs.         | 22 PCS.     | 0/1   |
| 5   | Low Temperature Storage          | Temp. : -40°C                                  | 1000 Hrs.         | 22 PCS.     | 0/1   |
| 6   | DC Operating Life                | I <sub>F</sub> <sup>*2</sup> = 20 mA           | 1000 Hrs.         | 22 PCS.     | 0/1   |
| 7   | High Temperature / High Humidity | 85°C / 85%RH                                   | 1000 Hrs.         | 22 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.

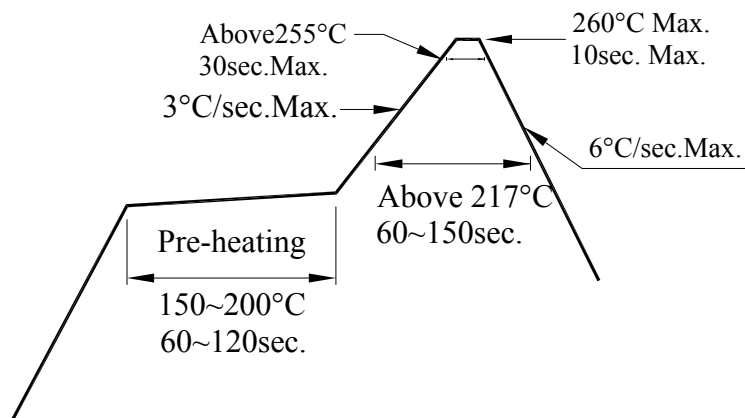
2.3 After opening the package: The LED's floor life are 168 hours under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

