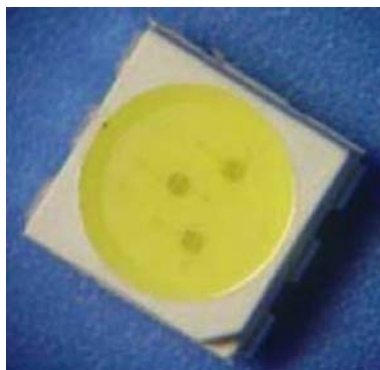


1.50mm Height 2220 Package Top View  
White Chip LED  
Technical Data Sheet

Part No.: LL-R5050WC-W2-3A



## Features:

- ◇ P-LCC package.
- ◇ Lead frame package with individual 6 pins.
- ◇ Available on tape and reel (12mm Tape).
- ◇ White SMT package.
- ◇ Super luminosity white LED.
- ◇ Built in 3 LED chips.
- ◇ The Chips can be controlled separately.
- ◇ Optical indicator.
- ◇ Colorless clear window.
- ◇ Ideal for backlight and light pipe application.
- ◇ Inter reflector.
- ◇ Low current (2mA) operation.
- ◇ High performance.
- ◇ Wide viewing angle.
- ◇ Suitable for vapor-phase reflow, infrared reflow and wave solder processes.
- ◇ Computable with automatic placement equipment.
- ◇ The product itself will remain within RoHS complaint Version.

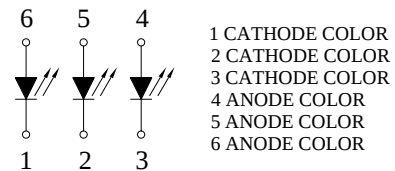
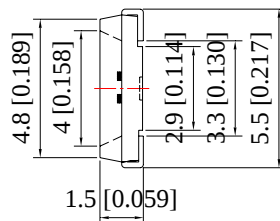
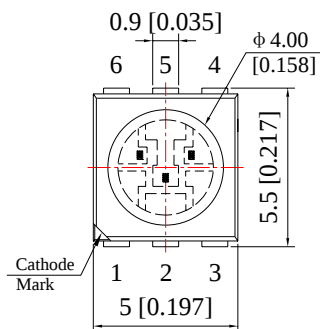
## Descriptions:

- ◇ The R6050 is available in soft orange, green, blue and yellow. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector, this feature makes the SMT TOP LED ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application

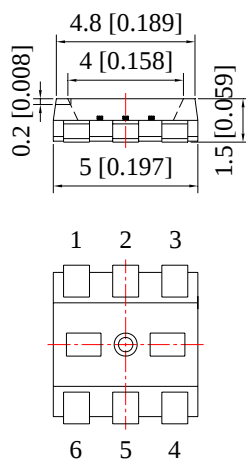
## Applications:

- ◇ Automotive: Backlight in dashboards and switches.
- ◇ Telecommunication: Indicator and backlight in telephone and fax.
- ◇ Indicator and backlight for audio and video equipment.
- ◇ Indicator and backlight in office and family equipment.
- ◇ Flat backlight for LCD's, switches and symbols.
- ◇ Light pipe application.
- ◇ General use.

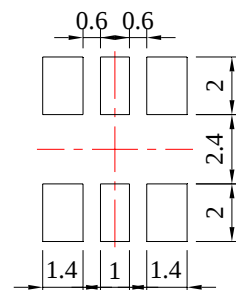
## Package Dimension:



### Polarity



### Recommended Soldering Pad dimensions



Unit: mm  
Tolerance:  $\pm 0.10\text{mm}$

| Part No.         | Chip Material | Lens Color      | Source Color |
|------------------|---------------|-----------------|--------------|
| LL-R5050WC-W2-3A | InGaN         | Yellow Diffused | White        |

### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{ mm}$  (.010") unless otherwise specified.
3. Specifications are subject to change without notice.

## Absolute Maximum Ratings at Ta=25°C

| Parameters                                                              | Symbol | Max.                                                                         | Unit |
|-------------------------------------------------------------------------|--------|------------------------------------------------------------------------------|------|
| Power Dissipation (Per Chip)                                            | PD     | 100                                                                          | mW   |
| Peak Forward Current (Per Chip)<br>(1/10 Duty Cycle, 0.1ms Pulse Width) | IFP    | 100                                                                          | mA   |
| Forward Current (Per Chip)                                              | IF     | 25                                                                           | mA   |
| Reverse Voltage (Per Chip)                                              | VR     | 5                                                                            | V    |
| Electrostatic Discharge (HBM)                                           | ESD    | 150                                                                          | V    |
| Operating Temperature Range                                             | Topr   | -40°C to +80°C                                                               |      |
| Storage Temperature Range                                               | Tstg   | -40°C to +85°C                                                               |      |
| Soldering Temperature                                                   | Tsld   | Reflow Soldering: 260°C for 5 Seconds<br>Hand Soldering: 350°C for 3 Seconds |      |

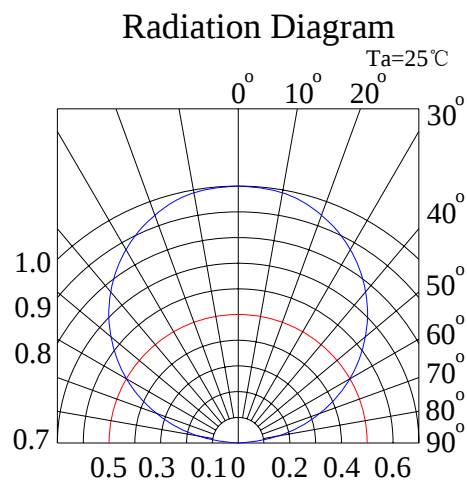
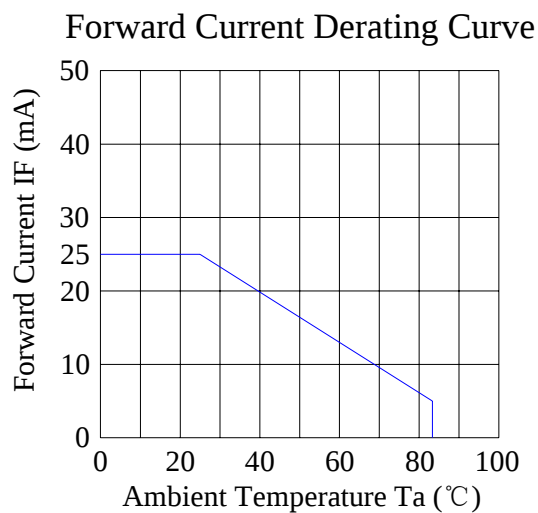
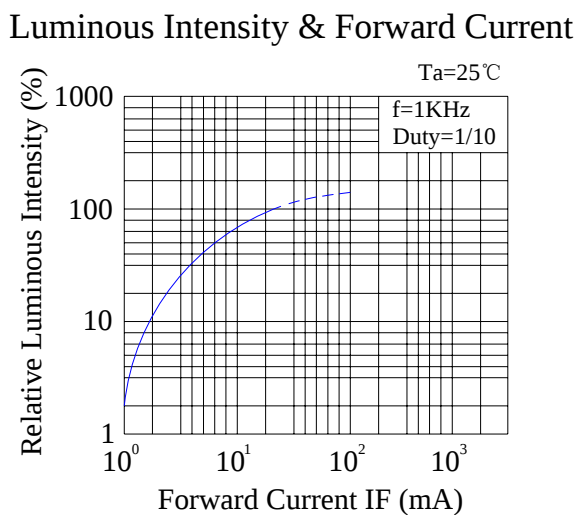
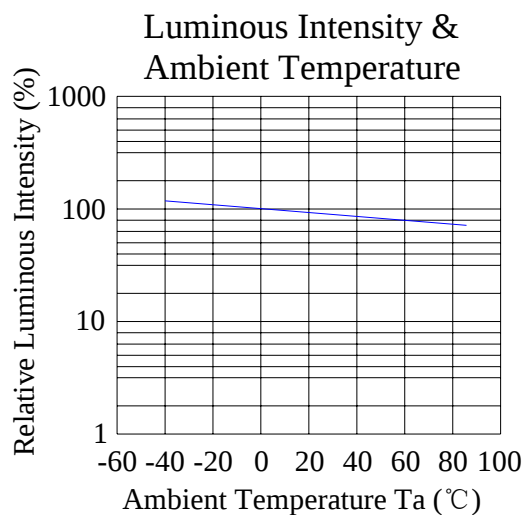
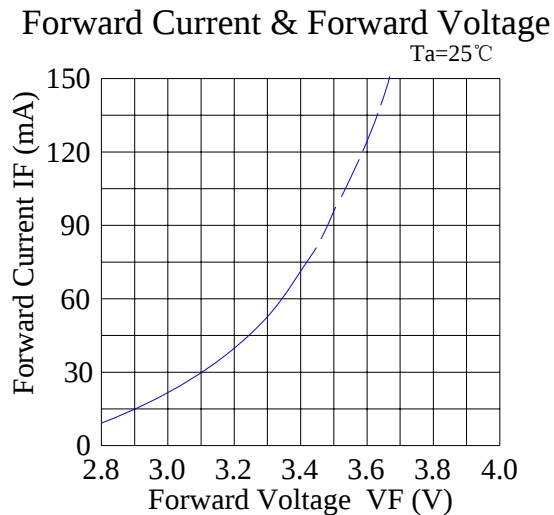
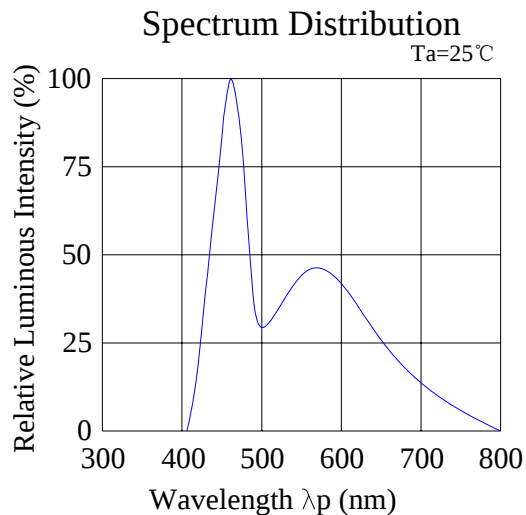
## Electrical Optical Characteristics at Ta=25°C

| Parameters               | Symbol            | Min. | Typ. | Max. | Unit | Test Condition   |
|--------------------------|-------------------|------|------|------|------|------------------|
| Luminous Intensity *     | IV                | 2900 | 4400 | ---  | mcd  | IF=60mA (Note 1) |
| Viewing Angle *          | 2θ <sub>1/2</sub> | ---  | 120  | ---  | Deg  | IF=60mA (Note 2) |
| Chromaticity Coordinates | X                 | ---  | 0.28 | ---  |      | IF=60mA (Note 3) |
|                          | Y                 | ---  | 0.29 | ---  |      |                  |
| Forward Voltage          | VF                | 2.8  | 3.3  | 3.8  | V    | IF=60mA          |
| Reverse Current          | IR                | ---  | ---  | 10   | μA   | VR=5V            |

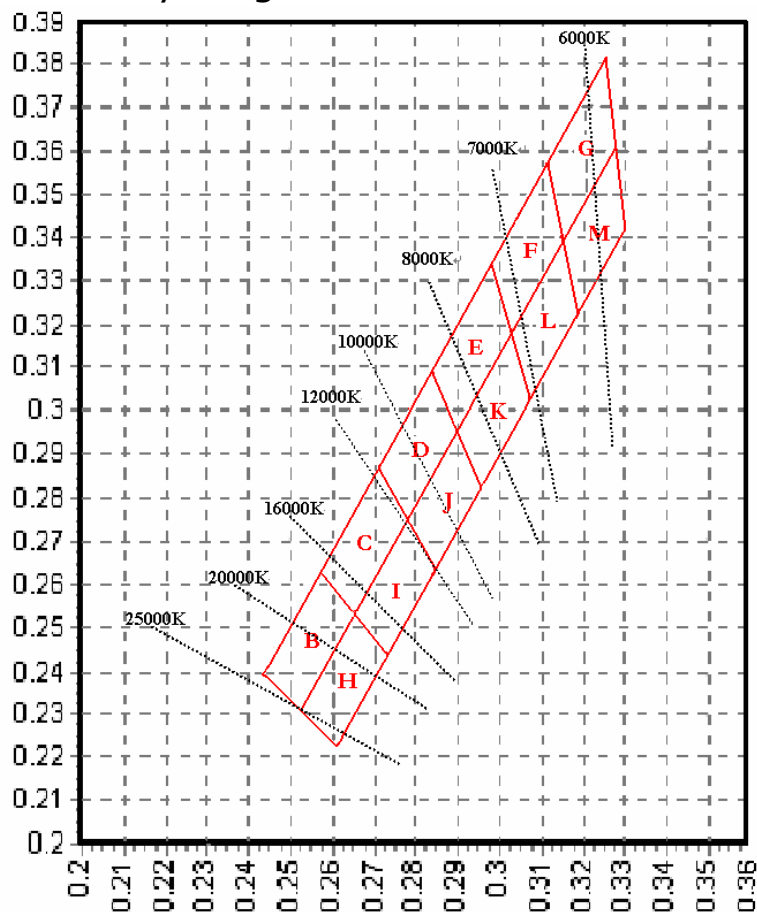
### Notes:

1. Luminous Intensity Measurement allowance is  $\pm 10\%$ .
2.  $\theta_{1/2}$  is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
3. It use many parameters that correspond to the CIE 1931 2°. X, Y, and Z are CIE 1931 2° values of Red, Green and Blue content of the measurement.

## Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)



## CIE 1931 Chromaticity Diagram



IF=60mA.Ta=25℃

| Bin code | x     | y     | Color(K) | Bin code | x     | y     | Color(K) |
|----------|-------|-------|----------|----------|-------|-------|----------|
| B        | 0.255 | 0.247 | 20000    | H        | 0.263 | 0.237 | 20000    |
| C        | 0.268 | 0.270 | 16000    | I        | 0.275 | 0.259 | 16000    |
| D        | 0.281 | 0.293 | 10000    | J        | 0.288 | 0.279 | 10000    |
| E        | 0.294 | 0.315 | 8000     | K        | 0.299 | 0.300 | 8000     |
| F        | 0.307 | 0.339 | 7000     | L        | 0.311 | 0.321 | 7000     |
| G        | 0.320 | 0.361 | 6000     | M        | 0.323 | 0.341 | 6000     |

Measurement uncertainty of the color coordinates :  $\pm 0.01$ .

## Reliability Test Items And Conditions:

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

Confidence level: 90%.

LTPD: 10%.

### 1) Test Items and Results:

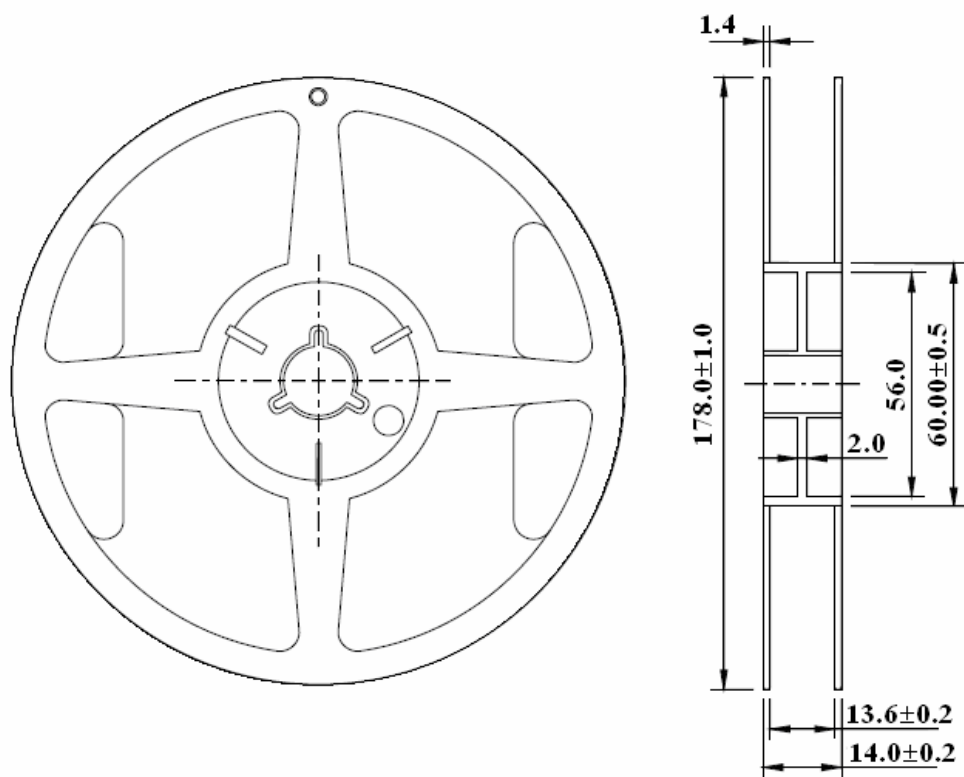
| No. | Test Item                          | Test Hours/Cycles | Test Conditions                           | Sample Size | Ac/Re |
|-----|------------------------------------|-------------------|-------------------------------------------|-------------|-------|
| 1   | Resistance to Soldering Heat       | 6 Min             | Tsld=260±5℃,<br>Min. 5sec                 | 25pcs       | 0/1   |
| 2   | Thermal Shock                      | 300 Cycles        | H: +100℃ 5min ∫ 10<br>sec<br>L: -10℃ 5min | 25pcs       | 0/1   |
| 3   | Temperature Cycle                  | 300 Cycles        | H: +100℃ 15min ∫<br>5min<br>L: -40℃ 15min | 25pcs       | 0/1   |
| 4   | High Temperature Storage           | 1000Hrs.          | Temp: 100℃                                | 25pcs       | 0/1   |
| 5   | DC Operating Life                  | 1000Hrs.          | IF=60mA                                   | 25pcs       | 0/1   |
| 6   | Low Temperature Storage            | 1000Hrs.          | Temp: -40℃                                | 25pcs       | 0/1   |
| 7   | High Temperature/<br>High Humidity | 1000Hrs.          | 85℃/85%RH                                 | 25pcs       | 0/1   |

### 2) Criteria for Judging the Damage:

| Item               | Symbol | Test Conditions | Criteria for Judgment |            |
|--------------------|--------|-----------------|-----------------------|------------|
|                    |        |                 | Min                   | Max        |
| Forward Voltage    | VF     | IF=60mA         | ---                   | F.V.*)×1.1 |
| Reverse Current    | IR     | VR=5V           | ---                   | F.V.*)×2.0 |
| Luminous Intensity | IV     | IF=60mA         | F.V.*)×0.7            | ---        |

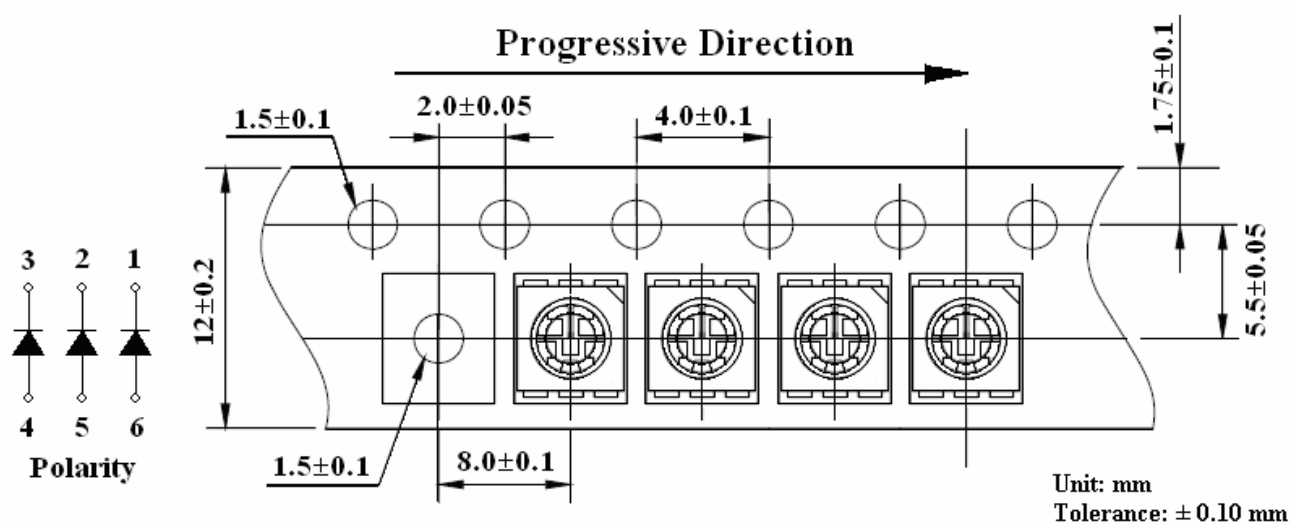
\*) F.V.: First Value.

## Reel Dimensions:



## Carrier Tape Dimensions:

Loaded quantity 1000 or 800PCS Per reel.



Please read the following notes before using the product:

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 The LEDs should be used within a year.

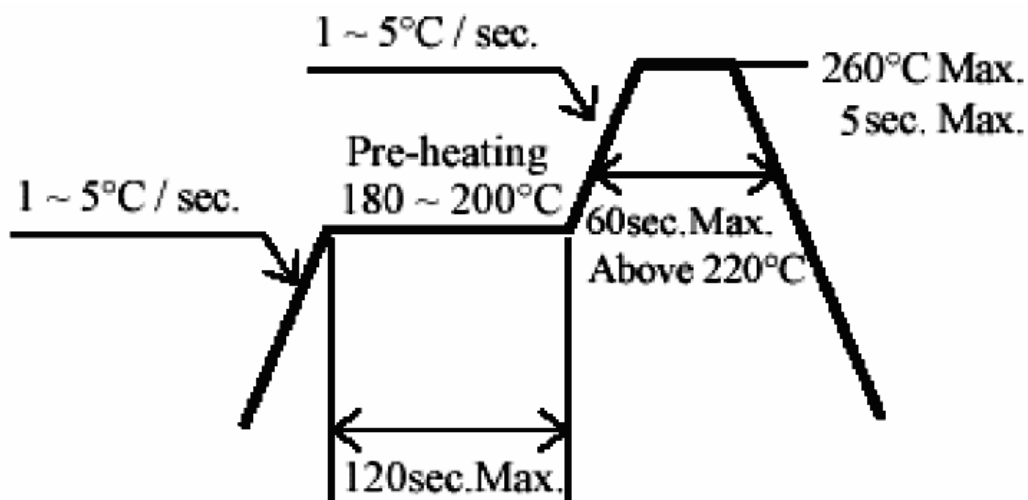
2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

2.6 If the moisture adsorbent material (silica gel) has fabled 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.

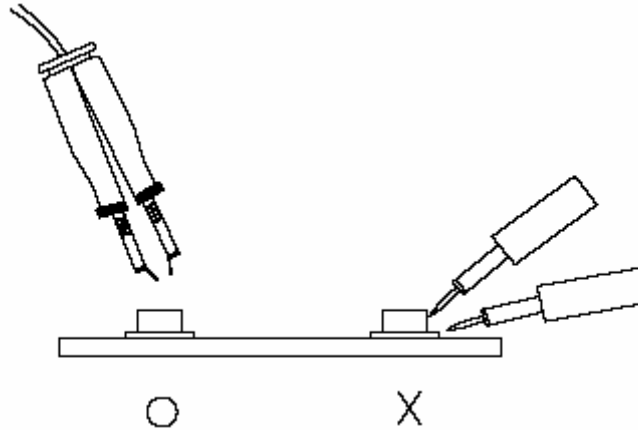
3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 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.



## 6. Caution in ESD

Static Electricity and surge damages the LED. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.