

## Technical Data Sheet

### Side View Red SMD LEDs

#### 57-21/R6C-AP1Q2B/BF

#### Features

- Fluorescence Type
- High Luminous Intensity
- High Efficiency
- Pb-free.
- The product itself will remain with RoHS compliant version



#### Descriptions

The 57-21series 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 ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

#### Applications

- OA Equipment
- Backlighting of Full Color LCD
- Replacement of Conventional Light Bulbs and Fluorescent Lamps

#### Device Selection Guide

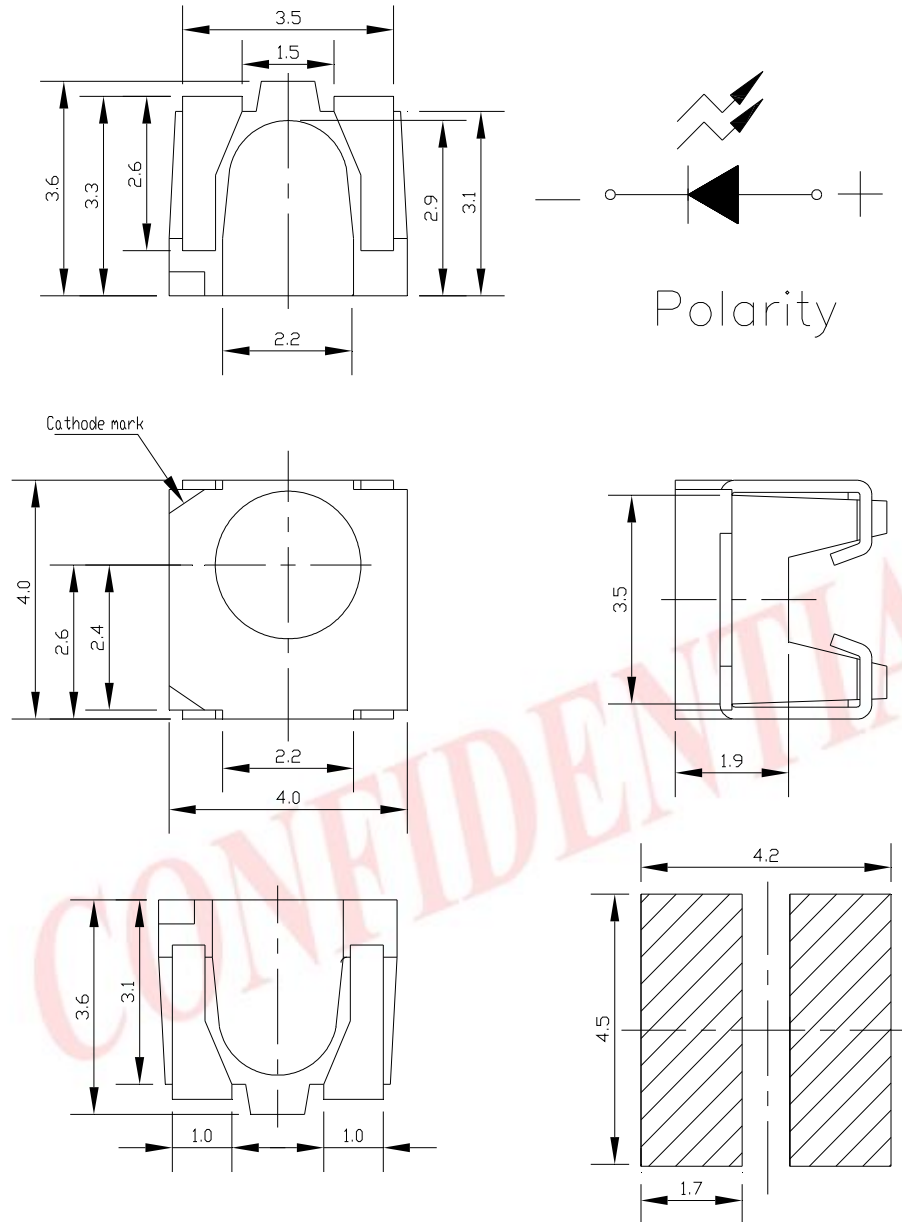
| Chip     |               | Lens Color  |
|----------|---------------|-------------|
| Material | Emitted Color |             |
| AlGaInP  | Brilliant Red | Water Clear |

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### Package Dimensions



**Note:** The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , Unit = mm

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**Absolute Maximum Ratings (Ta=25°C)**

| Parameter                              | Symbol           | Rating                                                                      | Unit |
|----------------------------------------|------------------|-----------------------------------------------------------------------------|------|
| Reverse Voltage                        | V <sub>R</sub>   | 5                                                                           | V    |
| Forward Current                        | I <sub>F</sub>   | 25                                                                          | mA   |
| Peak Forward Current (Duty 1/10 @1KHz) | I <sub>FP</sub>  | 60                                                                          | mA   |
| Power Dissipation                      | P <sub>d</sub>   | 60                                                                          | mW   |
| Electrostatic Discharge(HBM)           | ESD              | 2000                                                                        | V    |
| Operating Temperature                  | T <sub>opr</sub> | -40 ~ +85                                                                   | °C   |
| Storage Temperature                    | T <sub>stg</sub> | -40 ~+100                                                                   | °C   |
| Soldering Temperature                  | T <sub>sol</sub> | Reflow Soldering : 260 °C for 10 sec.<br>Hand Soldering : 350 °C for 3 sec. |      |

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

| Parameter                    | Symbol            | Min.  | Typ.  | Max.  | Unit | Condition            |
|------------------------------|-------------------|-------|-------|-------|------|----------------------|
| Luminous Intensity           | I <sub>v</sub>    | 45    | ----- | 112   | mcd  | I <sub>F</sub> =20mA |
| Viewing Angle                | 2θ <sub>1/2</sub> | ----- | 120   | ----- | deg  | I <sub>F</sub> =20mA |
| Peak Wavelength              | λ <sub>p</sub>    | ----- | 632   | ----- | nm   | I <sub>F</sub> =20mA |
| Dominant Wavelength          | λ <sub>d</sub>    | 617.5 | ----- | 633.5 | nm   | I <sub>F</sub> =20mA |
| Spectrum Radiation Bandwidth | △λ                | ----- | 20    | ----- | nm   | I <sub>F</sub> =20mA |
| Forward Voltage              | V <sub>F</sub>    | 1.75  | ----- | 2.35  | V    | I <sub>F</sub> =20mA |
| Reverse Current              | I <sub>R</sub>    | ----- | ----- | 10    | μA   | V <sub>R</sub> =5V   |

**Notes:**

- 1.Tolerance of Luminous Intensity ±10%
- 2.Tolerance of Dominant Wavelength ±1nm
- 3.Tolerance of Forward Voltage ±0.1V

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**Bin Range of Dominant Wavelength**

| Group | Bin Code | Min.  | Max.  | Unit | Condition |
|-------|----------|-------|-------|------|-----------|
| A     | E4       | 617.5 | 621.5 | nm   | IF=20mA   |
|       | E5       | 621.5 | 625.5 |      |           |
|       | E6       | 625.5 | 629.5 |      |           |
|       | E7       | 629.5 | 633.5 |      |           |

**Bin Range of Luminous Intensity**

| Bin | Min | Max | Unit | Condition |
|-----|-----|-----|------|-----------|
| P1  | 45  | 57  | mcd  | IF=20mA   |
| P2  | 57  | 72  |      |           |
| Q1  | 72  | 90  |      |           |
| Q2  | 90  | 112 |      |           |

**Bin Range of Forward Voltage**

| Group | Bin | Min  | Max  | Unit | Condition |
|-------|-----|------|------|------|-----------|
| B     | 0   | 1.75 | 1.95 | V    | IF=20mA   |
|       | 1   | 1.95 | 2.15 |      |           |
|       | 2   | 2.15 | 2.35 |      |           |

**Notes:**

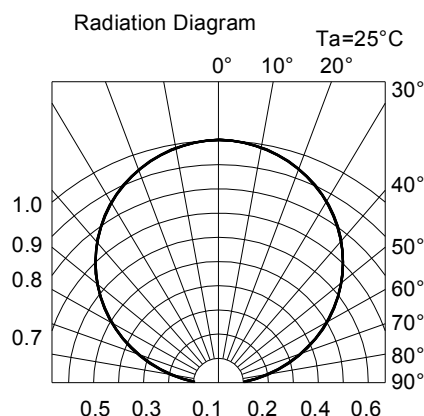
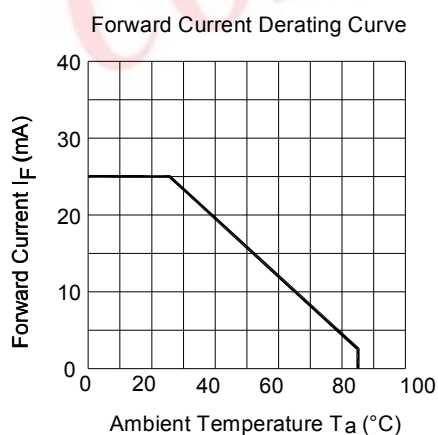
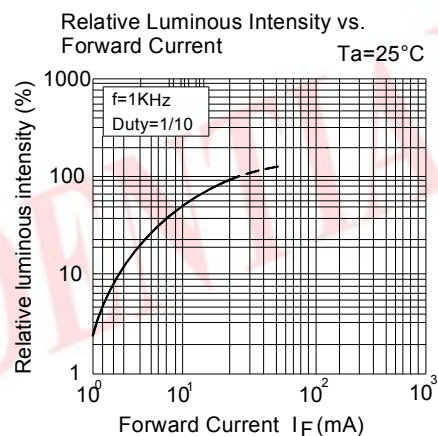
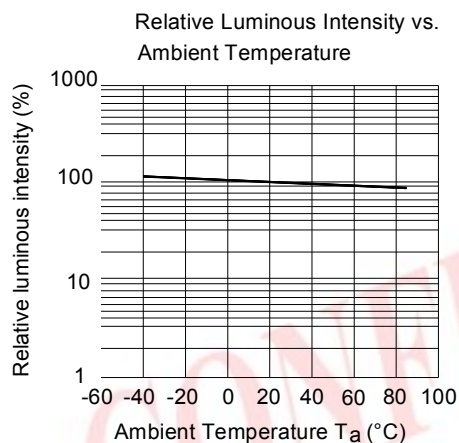
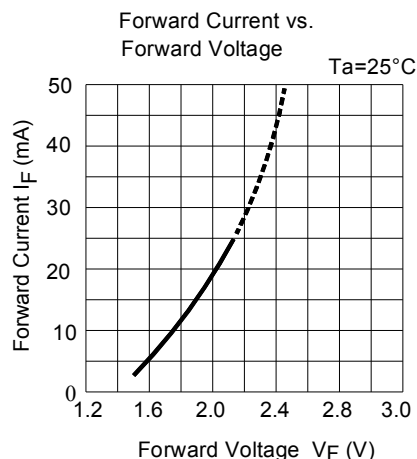
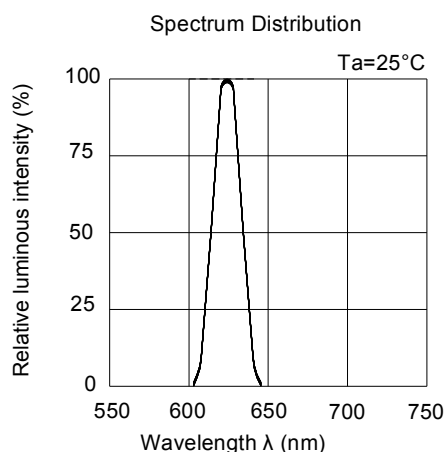
1. Tolerance of Dominant Wavelength  $\pm 1\text{nm}$
2. Tolerance of Luminous Intensity  $\pm 10\%$
3. Tolerance of Forward Voltage  $\pm 0.1\text{V}$

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## Side View Red SMD LEDs

**57-21/R6C-AP1Q2B/BF**

### Typical Electro-Optical Characteristics Curves



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## Side View Red SMD LEDs

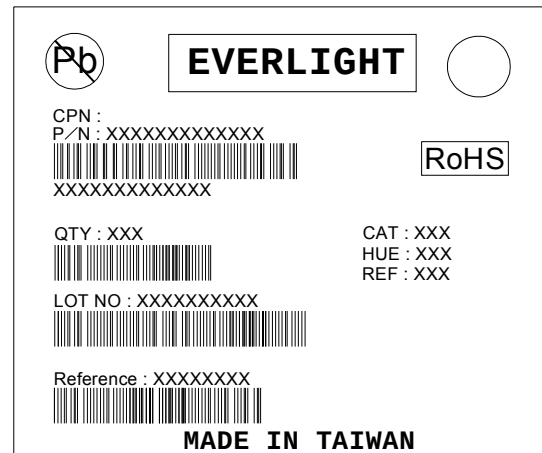
**57-21/R6C-AP1Q2B/BF**

### Label Explanation

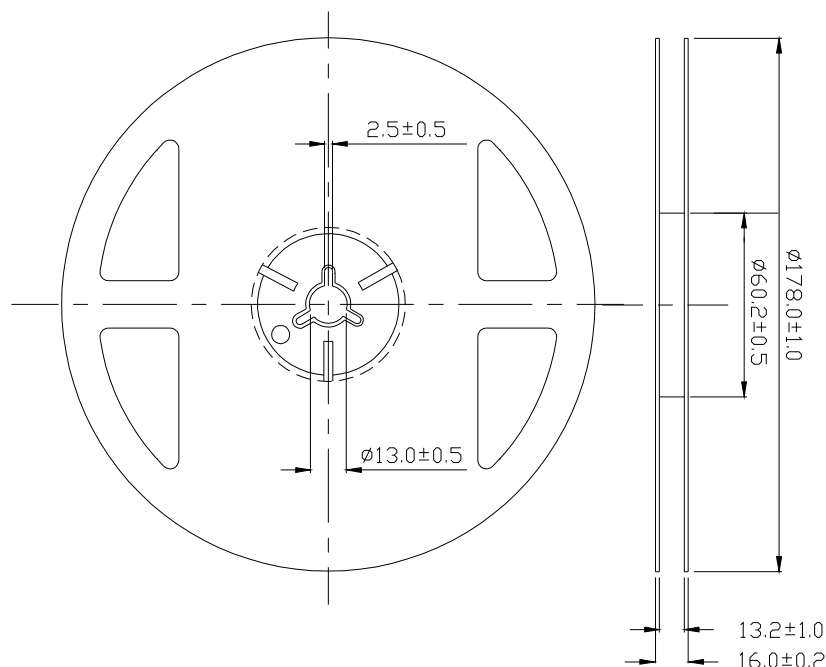
**CAT:** Luminous Intensity Rank

**HUE:** Dom. Wavelength Rank

**REF:** Forward Voltage Rank



### Reel Dimensions



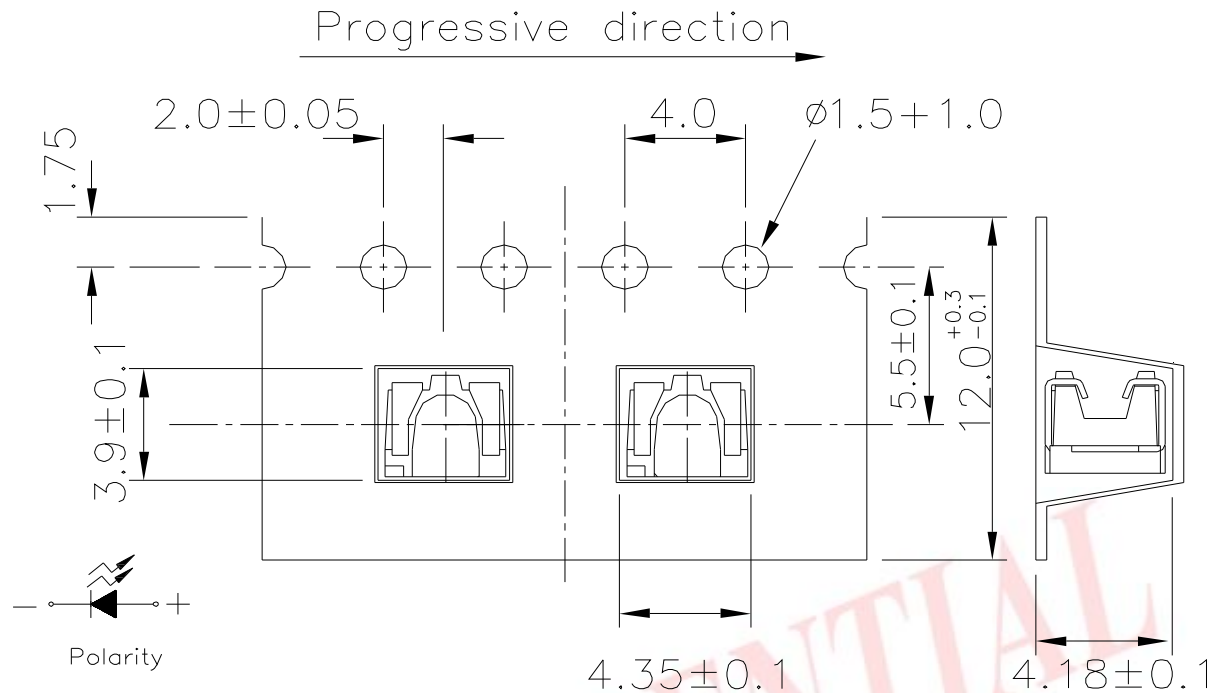
**Note:** The tolerances unless mentioned is  $\pm 0.1\text{mm}$  ,Unit = mm

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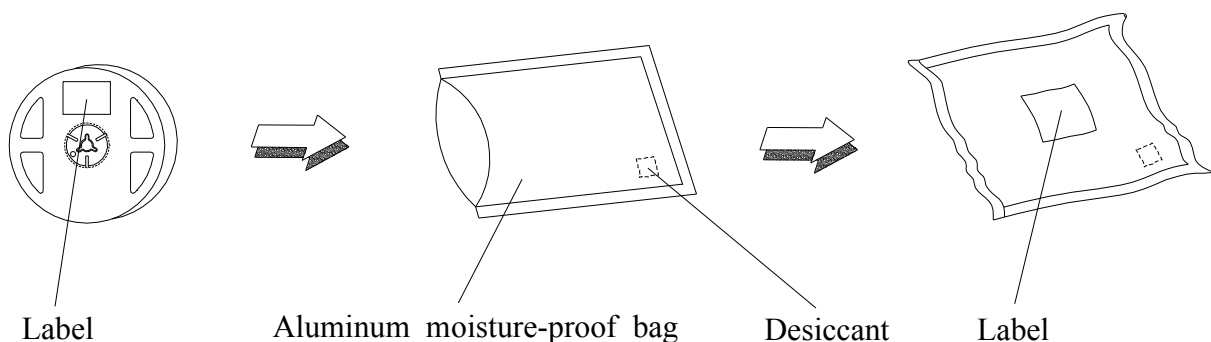
**57-21/R6C-AP1Q2B/BF**

**Carrier Tape Dimensions: Loaded Quantity 500 pcs Per Reel.**



**Note:** The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , Unit = mm

## Moisture Resistant Packaging



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#### 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<br>Min. 5sec.                | 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> = 20 mA                         | 1000 Hrs.         | 22 PCS.     | 0/1   |
| 7   | High Temperature / High Humidity | 85°C/ 85%RH                                    | 1000 Hrs.         | 22 PCS.     | 0/1   |



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#### 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.

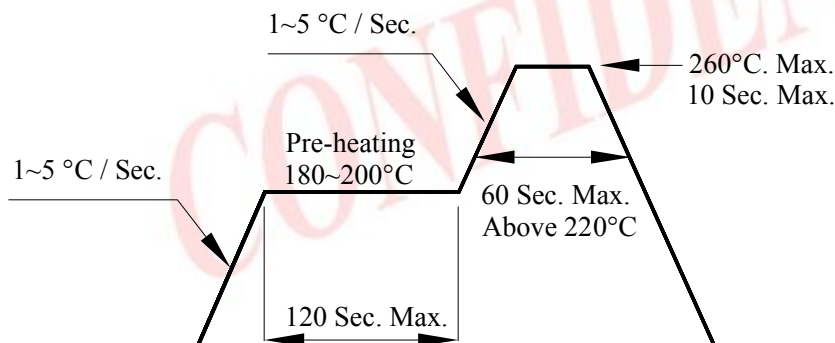
2.3 After opening the package: The LED's floor life is 48 hours under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

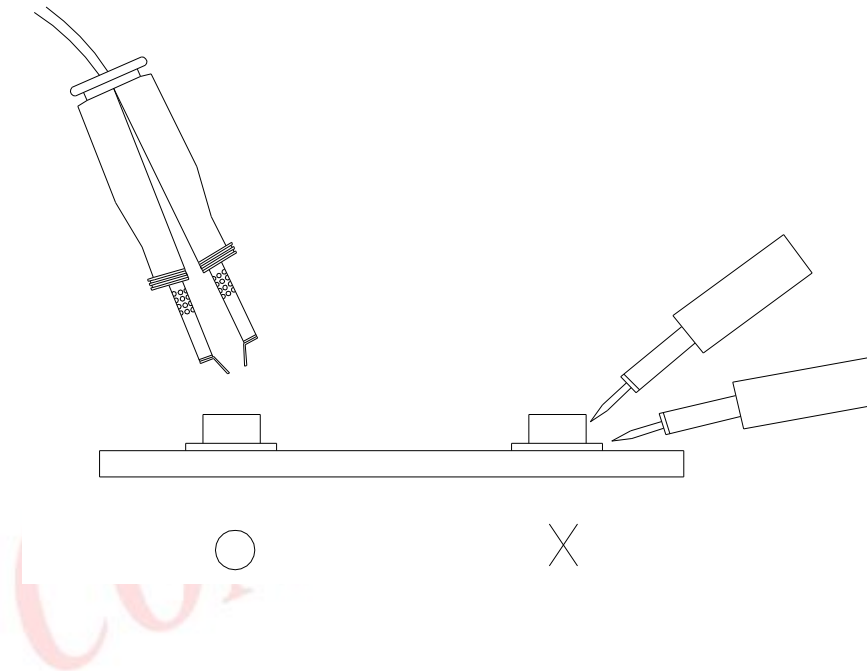
3.4 After soldering, do not warp the circuit board.

**Technical Data Sheet****Side View Red SMD LEDs****57-21/R6C-AP1Q2B/BF****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.

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