

# Technical Data Sheet

## Top View LEDs

### 67-21/X2C-BXXXXXXXXXX/2T

#### Features

- P-LCC-2 package.
- Fluorescence Type
- High Luminous Intensity
- High Efficiency
- Pb-free.
- The product itself will remain within RoHS compliant version.



#### Descriptions

- Due to the package design, 67-21 has wide viewing angle, low power consumption and white LEDs are devices which are materialized by combing Blue LEDs and special phosphors. This feature makes the LED ideal for light guide application.

#### Applications

- General lighting
- Decorative and Entertainment Lighting.
- Indicators.
- Illuminations.
- Switch lights.

#### Device Selection Guide

| Chip     | Emitted Color            | Resin Color |
|----------|--------------------------|-------------|
| Material |                          |             |
| InGaN    | Cool White<br>Warm White | Water Clear |



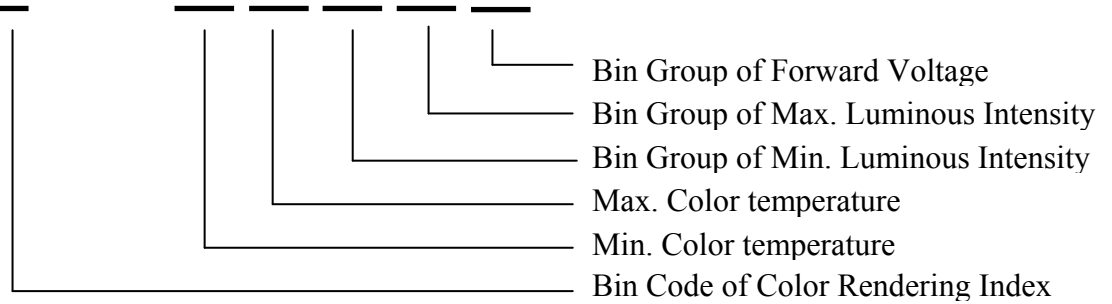
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67-21/X2C-BXXXXXXXXXX/2T

Product Number Explanation

67-21 / X 2 C - B XX XX XX XX XX / 2T



Notes

Table of Color Rendering Index

| Symbol | Description               |
|--------|---------------------------|
| M      | CRI <sub>(min)</sub> : 60 |
| L      | CRI <sub>(min)</sub> : 70 |
| K      | CRI <sub>(min)</sub> : 80 |
| H      | CRI <sub>(min)</sub> : 90 |

Example:

67-21/L2C-B45560C2CB2/2T

|     |                 |
|-----|-----------------|
| CRI | Min=70          |
| CCT | 4500K~5650K     |
| IV  | 1800mcd~2200mcd |
| VF  | 2.9V~3.6V       |



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### 67-21/X2C-BXXXXXXXXXX/2T

#### Mass Production list

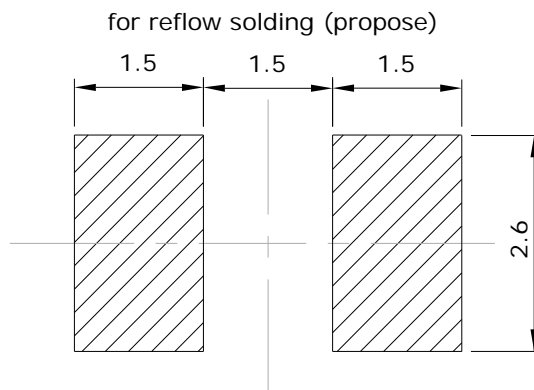
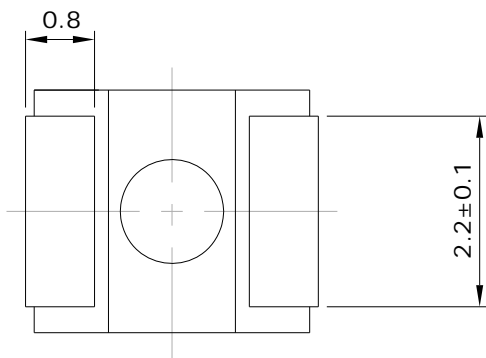
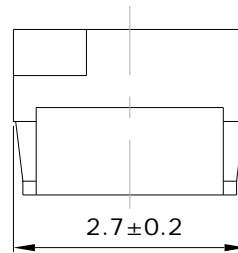
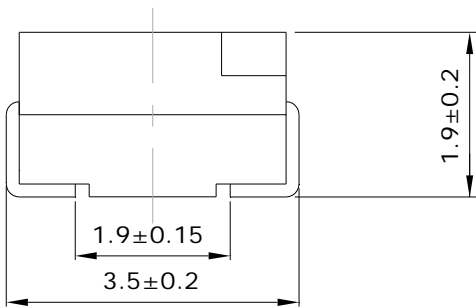
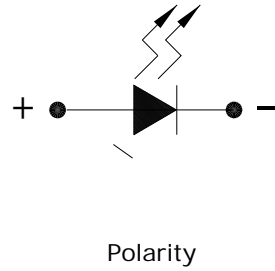
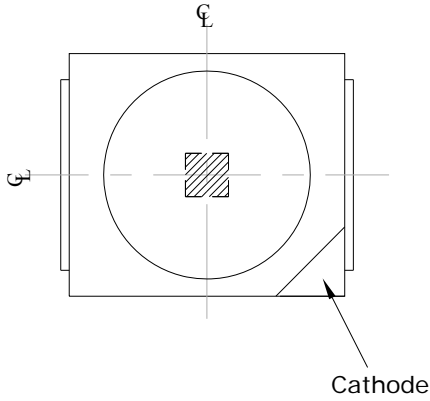
| Product                  | CRI min. | CCT(K)      | I <sub>V</sub> (mcd) Min | I <sub>V</sub> (mcd) Max | Φ(lm) Typ. |
|--------------------------|----------|-------------|--------------------------|--------------------------|------------|
| 67-21/M2C-B50632C4CB2/2T | 60       | 5000K~6300K | 2000                     | 2400                     | 5.78       |
| 67-21/M2C-B50638BACB2/2T | 60       | 5000K~6300K | 1600                     | 2000                     | 4.86       |
| 67-21/M2C-B50634B6BB2/2T | 60       | 5000K~6300K | 1200                     | 1600                     | 3.93       |
| 67-21/L2C-B4556AC2CB2/2T | 70       | 4500K~5650K | 1800                     | 2200                     | 5.39       |
| 67-21/L2C-B45566B8BB2/2T | 70       | 4500K~5650K | 1400                     | 1800                     | 4.53       |
| 67-21/L2C-B45564B6BB2/2T | 70       | 4500K~5650K | 1200                     | 1600                     | 3.67       |
| 67-21/L2C-B28328BACB2/2T | 70       | 2850K~3250K | 1600                     | 2000                     | 4.62       |
| 67-21/L2C-B28326B8BB2/2T | 70       | 2850K~3250K | 1400                     | 1800                     | 3.88       |
| 67-21/L2C-B28322B4BB2/2T | 70       | 2850K~3250K | 1000                     | 1400                     | 3.14       |

**Technical Data Sheet**

**Top View LEDs**

**67-21/X2C-BXXXXXXXXXX/2T**

**Package Dimensions**



**Note:** Tolerance unless mentioned is ±0.1mm; Unit = mm

**Technical Data Sheet****Top View LEDs****67-21/X2C-BXXXXXXXXXX/2T****Absolute Maximum Ratings (Ta=25°C)**

| Parameter                              | Symbol          | Rating  | Unit |
|--|-----------------|---|------|
| Reverse Voltage                        | V <sub>R</sub>  | 5   | V    |
| Forward Current                        | I <sub>F</sub>  | 30  | mA   |
| Peak Forward Current (Duty 1/10 @1KHz) | I <sub>FP</sub> | 100   | mA   |
| Power Dissipation                      | P <sub>d</sub>  | 110   | mW   |
| Electrostatic Discharge                | ESD             | 1000  | V    |
| Operating Temperature                  | Topr            | -40 ~ +85   | °C   |
| Storage Temperature                    | Tstg            | -40 ~ +90   | °C   |
| Soldering Temperature                  | Tsol            | 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            |
|-----------------|----------------|-------|-------|-------|------|----------------------|
| Viewing Angle   | 2θ1/2          | ----- | 120   | ----- | deg  | I <sub>F</sub> =20mA |
| Reverse Current | I <sub>R</sub> | ----- | ----- | 50    | μ A  | V <sub>R</sub> =5V   |



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Top View LEDs

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Bin Range of Luminous Intensity

| Bin Code | Min. | Max. | Unit | Condition            |
|----------|------|------|------|----------------------|
| 8A       | 600  | 800  | mcd  | I <sub>F</sub> =20mA |
| AB       | 800  | 1000 |      |                      |
| 2B       | 1000 | 1200 |      |                      |
| 4B       | 1200 | 1400 |      |                      |
| 6B       | 1400 | 1600 |      |                      |
| 8B       | 1600 | 1800 |      |                      |
| AC       | 1800 | 2000 |      |                      |
| 2C       | 2000 | 2200 |      |                      |
| 4C       | 2200 | 2400 |      |                      |
| 6C       | 2400 | 2600 |      |                      |

Bin Range of Forward Voltage

| Group | Bin Code | Min. | Max. | Unit | Condition |                      |
|-------|----------|------|------|------|-----------|----------------------|
| G     | [Grey]   | 34   | 2.7  | 2.8  | V         | I <sub>F</sub> =20mA |
|       |          | 35   | 2.8  | 2.9  |           |                      |
|       | B2       | 36   | 2.9  | 3    |           |                      |
|       |          | 37   | 3    | 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. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.05V



**Technical Data Sheet**

**Top View LEDs**

**67-21/X2C-BXXXXXXXXXX/2T**

**Bin Range of Chromaticity Coordinates**

I<sub>F</sub>=20mA

| CCT             | Bin Code | CIE_x  | CIE_y  | CCT             | Bin Code | CIE_x  | CIE_y  |
|-----------------|----------|--------|--------|-----------------|----------|--------|--------|
| 6300K<br>~5650K | W5       | 0.3148 | 0.3444 | 3250K<br>~3050K | P5       | 0.4312 | 0.4234 |
|                 |          | 0.3288 | 0.3569 |                 |          | 0.4456 | 0.4287 |
|                 |          | 0.3290 | 0.3451 |                 |          | 0.4376 | 0.4116 |
|                 |          | 0.3160 | 0.3332 |                 |          | 0.4240 | 0.4065 |
|                 | W6       | 0.3160 | 0.3332 |                 | 0.4240   | 0.4065 |        |
|                 |          | 0.3290 | 0.3451 |                 | 0.4376   | 0.4116 |        |
|                 |          | 0.3292 | 0.3313 |                 | 0.4294   | 0.3943 |        |
|                 |          | 0.3175 | 0.3204 |                 | 0.4165   | 0.3890 |        |
| 5650K<br>~5000K | V5       | 0.3288 | 0.3569 | 3050K<br>~2850K | N5       | 0.4456 | 0.4287 |
|                 |          | 0.3469 | 0.3717 |                 |          | 0.4614 | 0.4333 |
|                 |          | 0.3458 | 0.3592 |                 |          | 0.4525 | 0.4162 |
|                 |          | 0.3290 | 0.3451 |                 |          | 0.4376 | 0.4116 |
|                 | V6       | 0.3290 | 0.3451 |                 | 0.4376   | 0.4116 |        |
|                 |          | 0.3458 | 0.3592 |                 | 0.4525   | 0.4162 |        |
|                 |          | 0.3444 | 0.3442 |                 | 0.4436   | 0.3991 |        |
|                 |          | 0.3292 | 0.3313 |                 | 0.4294   | 0.3943 |        |
| 5000K<br>~4500K | U5       | 0.3469 | 0.3717 | /               | U6       | 0.3458 | 0.3592 |
|                 |          | 0.3642 | 0.3829 |                 |          | 0.3622 | 0.3716 |
|                 |          | 0.3622 | 0.3716 |                 |          | 0.3458 | 0.3592 |
|                 |          | 0.3458 | 0.3592 |                 |          | 0.3622 | 0.3716 |
|                 | U6       | 0.3594 | 0.3557 |                 | 0.3594   | 0.3557 |        |
|                 |          | 0.3622 | 0.3716 |                 | 0.3444   | 0.3442 |        |
|                 |          | 0.3594 | 0.3557 |                 |          |        |        |
|                 |          | 0.3444 | 0.3442 |                 |          |        |        |

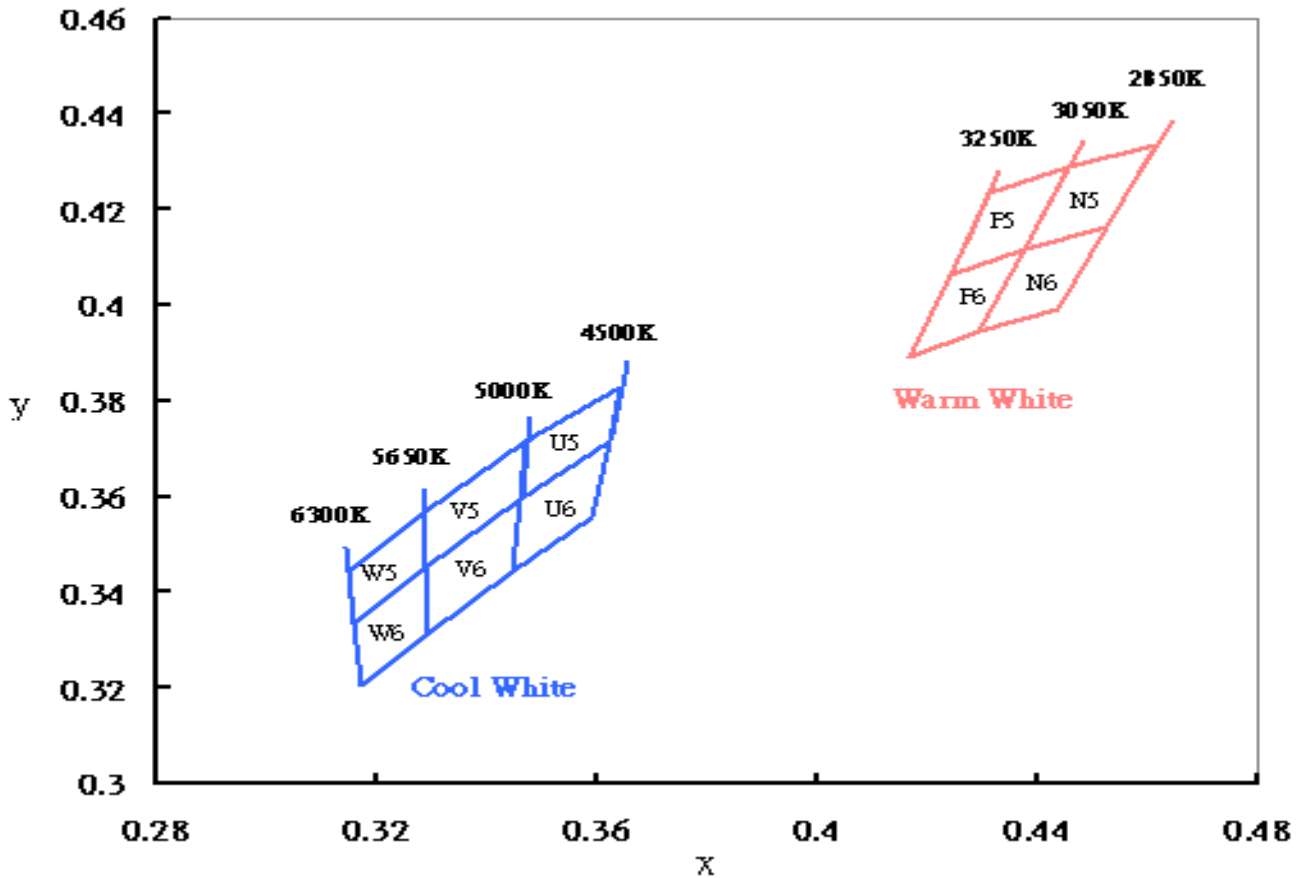
**Note:** Tolerance of Chromaticity Coordinates: ±0.01

**Technical Data Sheet**

**Top View LEDs**

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The C.I.E. 1931 Chromaticity Diagram





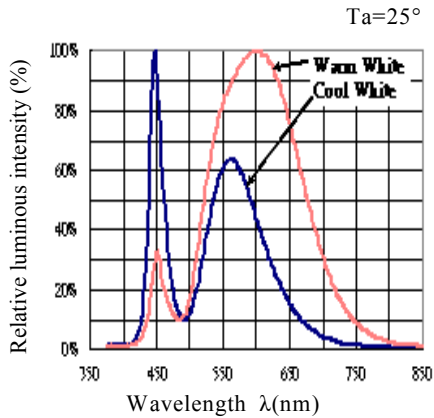
**Technical Data Sheet**

**Top View LEDs**

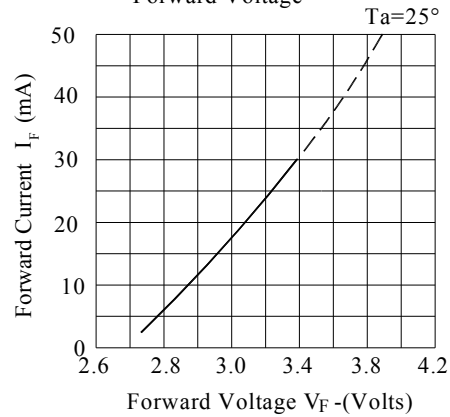
**67-21/X2C-BXXXXXXXXXX/2T**

**Typical Electro-Optical Characteristics Curves**

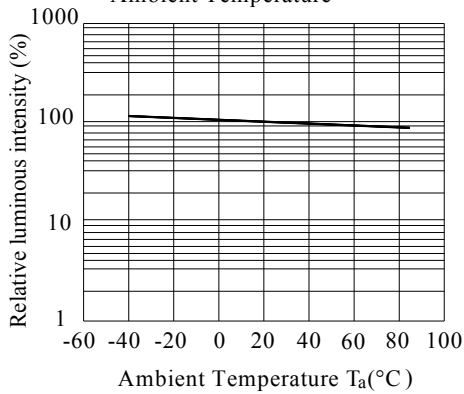
Spectrum Distribution



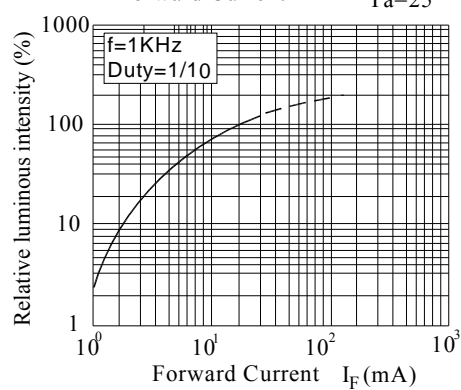
Forward Current vs. Forward Voltage



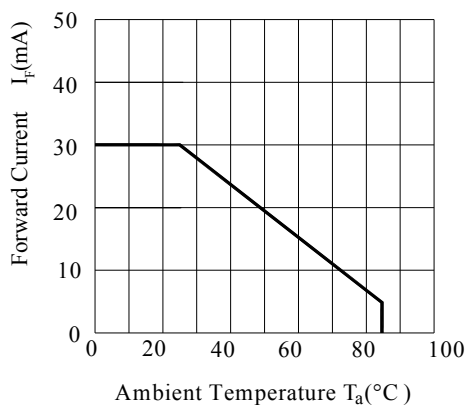
Relative Luminous Intensity vs. Ambient Temperature



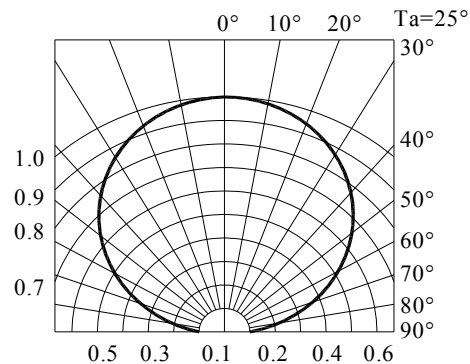
Relative Luminous Intensity vs. Forward Current



Forward Current Derating Curve



Radiation Diagram





LIGHTING FOREVER

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Top View LEDs

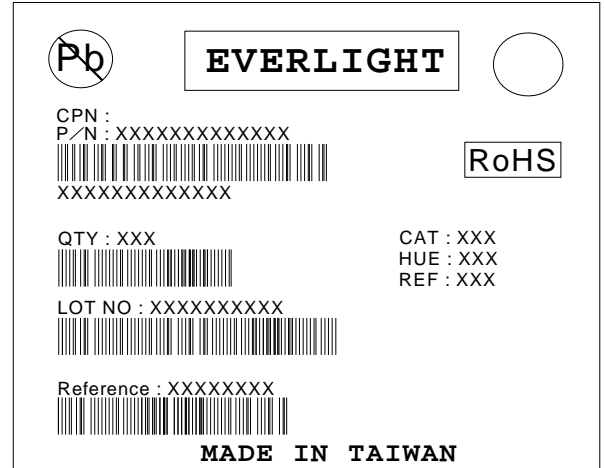
67-21/X2C-BXXXXXXXXXX/2T

Label Explanation

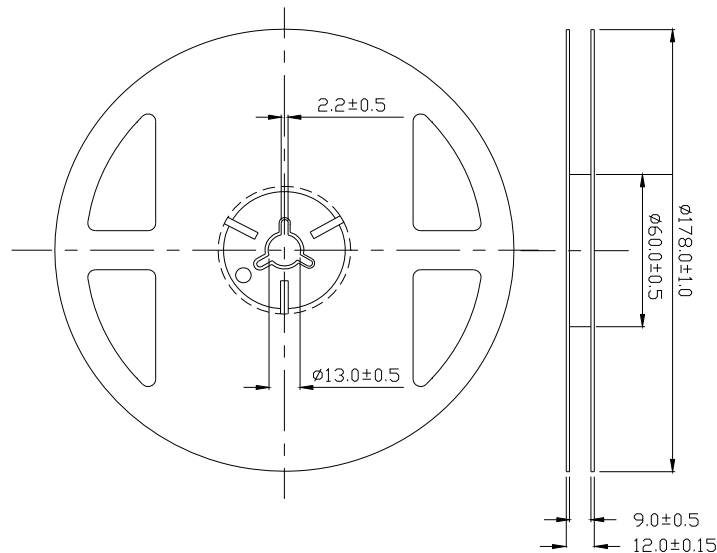
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



Reel Dimensions



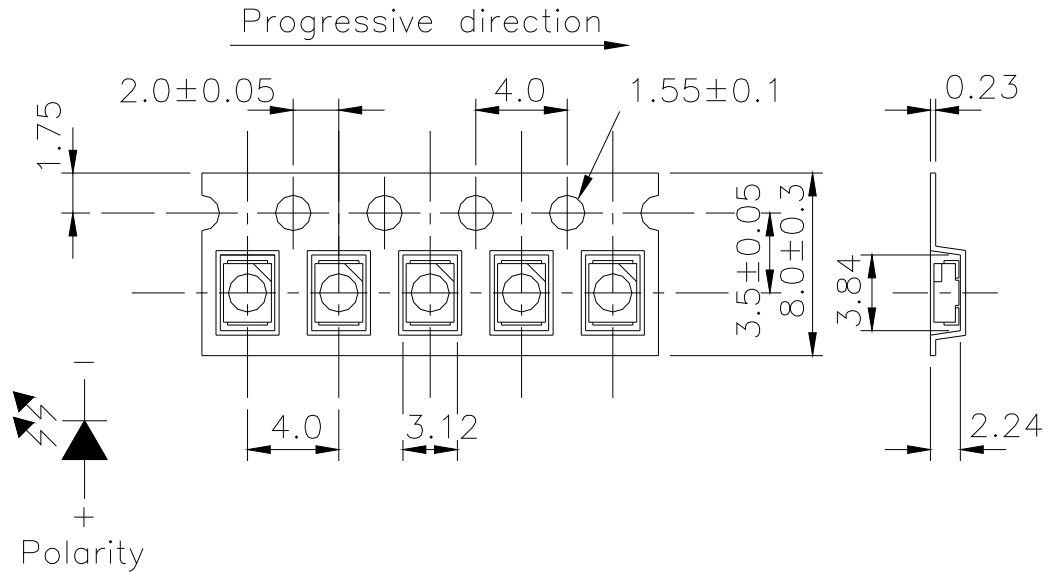
Note: Tolerance unless mentioned is ±0.1mm; Unit = mm

**Technical Data Sheet**

**Top View LEDs**

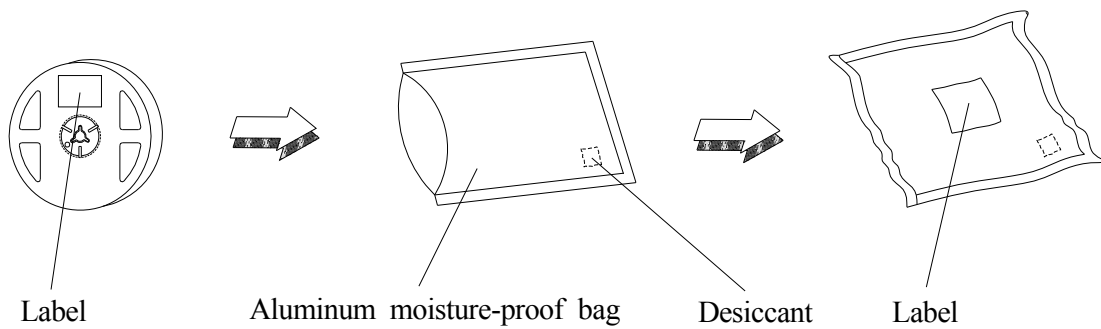
**67-21/X2C-BXXXXXXXXXX/2T**

**Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel.**



**Note:** Tolerance unless mentioned is ±0.1mm; 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   |

**Technical Data Sheet****Top View LEDs****67-21/X2C-BXXXXXXXXXX/2T****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.

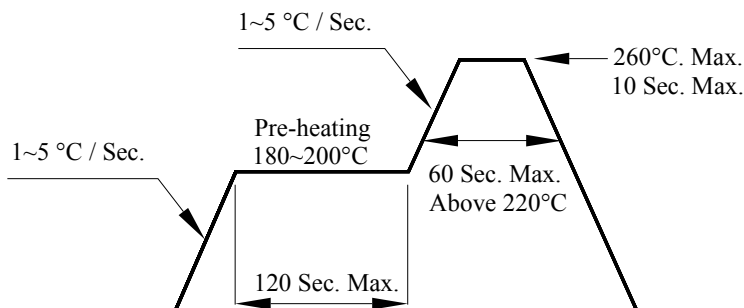
2.3 After opening the package: The LED's floor life are 168 hours under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

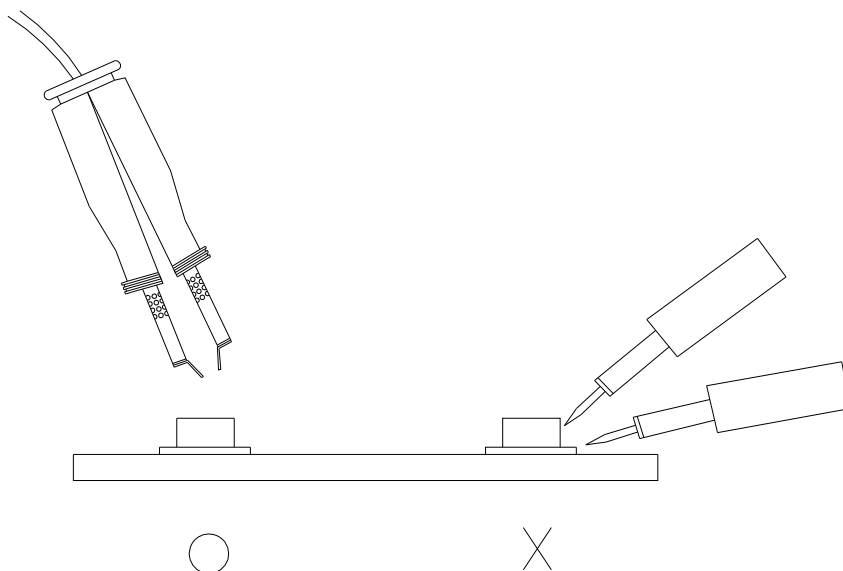
3.4 After soldering, do not warp the circuit board.

**Technical Data Sheet****Top View LEDs****67-21/X2C-BXXXXXXXXXX/2T****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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