



## Technical Data Sheet - Preliminary

### Luminosity Full Color LED

#### 61-23 /R6GHBHC-A01/ET

#### Features

- Super-luminosity chip LED.
- White SMT package.
- Built in Red, Green, and Blue chips.
- Lead frame package with individual 6 pins.
- Wide viewing angle.
- Soldering methods: IR reflow soldering.
- Pb-free.
- The product itself will remain within RoHS compliant version.



#### Descriptions

- Due to the package design, 61-23 has wide viewing angle , low power consumption and adjusting each color is possible thanks to serial connection by 6 terminal connection (Individual driving by each terminal) in case of using several number of LED. And makes it ideal for light pipe application.

#### Applications

- Amusement equipment.
- Information boards.
- Flashlight for digital camera of cellular phone.

#### Device Selection Guide

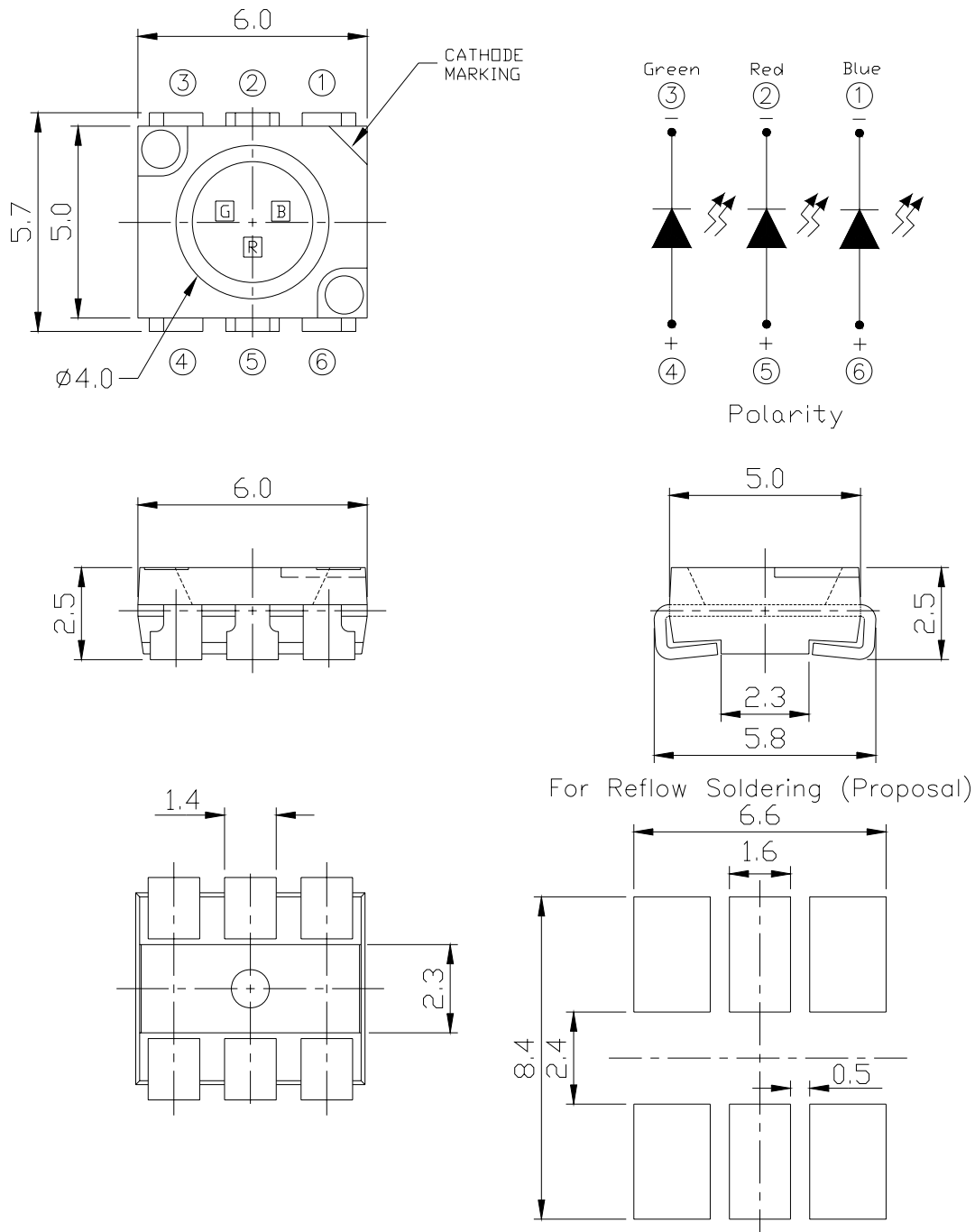
| Chip |          | Emitted Color   | Resin Color |
|------|----------|-----------------|-------------|
| Type | Material |                 |             |
| R6   | AlGaInP  | Brilliant Red   | Water Clear |
| GH   | InGaN    | Brilliant Green |             |
| BH   | InGaN    | Blue            |             |

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## Package Outline Dimensions



**Notes:** 1.All dimensions are in millimeters. 2.Tolerances unspecified are  $\pm 0.1\text{mm}$ .



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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>   | R6                                                                          | 50   | mA   |
|                                            |                  | GH                                                                          | 25   |      |
|                                            |                  | BH                                                                          | 25   |      |
| Peak Forward Current<br>(Duty 1/10 @ 1KHz) | I <sub>FP</sub>  | R6                                                                          | 100  | mA   |
|                                            |                  | GH                                                                          | 100  |      |
|                                            |                  | BH                                                                          | 100  |      |
| Power Dissipation                          | P <sub>d</sub>   | R6                                                                          | 120  | mW   |
|                                            |                  | GH                                                                          | 110  |      |
|                                            |                  | BH                                                                          | 110  |      |
| Electrostatic<br>Discharge(HBM)            | ESD              | R6                                                                          | 2000 | V    |
|                                            |                  | GH                                                                          | 150  |      |
|                                            |                  | BH                                                                          | 150  |      |
| 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. |      |      |



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

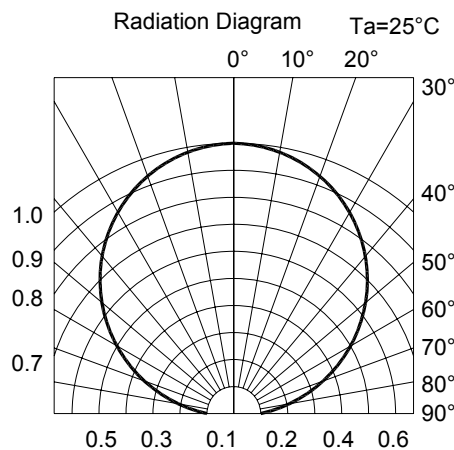
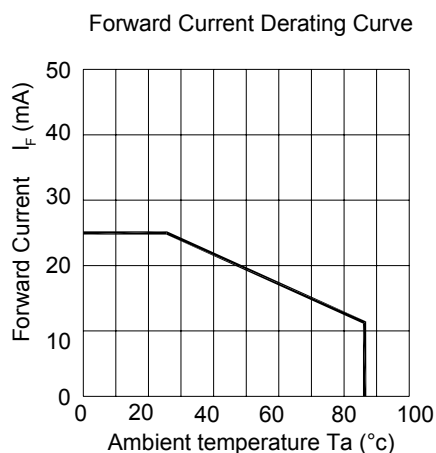
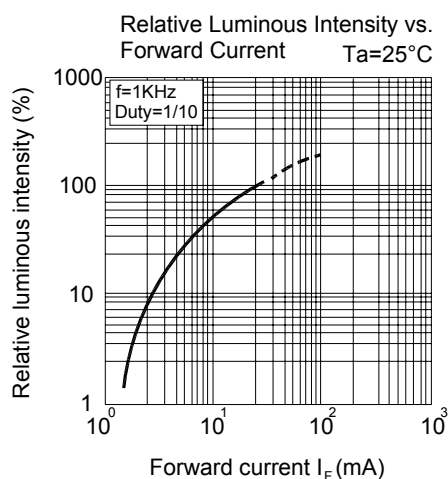
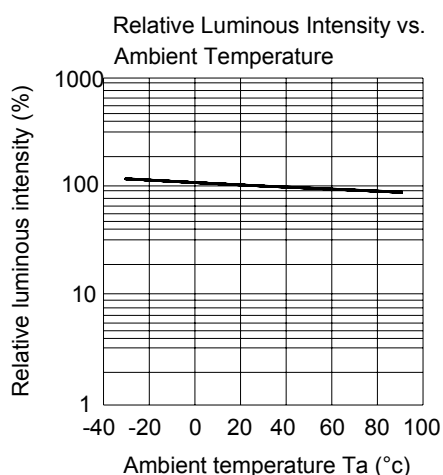
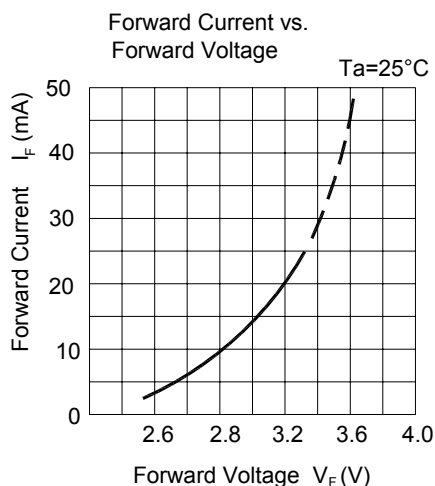
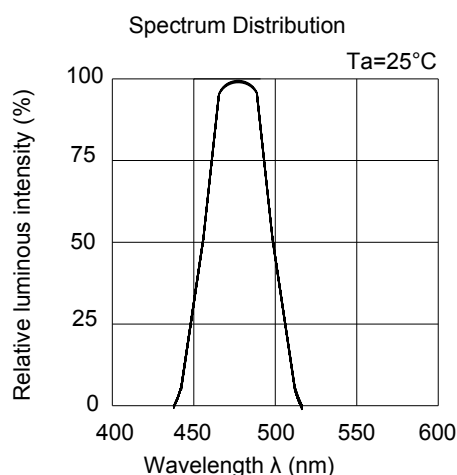
| Parameter                    | Symbol         |    | Min.  | Typ.  | Max.  | Unit | Condition            |
|------------------------------|----------------|----|-------|-------|-------|------|----------------------|
| Luminous Intensity           | I <sub>v</sub> | R6 | 112   | 200   | ----- | mcd  | I <sub>F</sub> =20mA |
|                              |                | GH | 225   | 280   | ----- |      | I <sub>F</sub> =20mA |
|                              |                | BH | 90    | 150   | ----- |      | I <sub>F</sub> =20mA |
| Viewing Angle                | 2 θ 1/2        |    | ----- | 120   | ----- | deg  | I <sub>F</sub> =20mA |
| Peak Wavelength              | λ <sub>p</sub> | R6 | ----- | 632   | ----- | nm   | I <sub>F</sub> =20mA |
|                              |                | GH | ----- | 518   | ----- |      |                      |
|                              |                | BH | ----- | 468   | ----- |      |                      |
| Dominant Wavelength          | λ <sub>d</sub> | R6 | ----- | 624   | ----- | nm   | I <sub>F</sub> =20mA |
|                              |                | GH | ----- | 525   | ----- |      |                      |
|                              |                | BH | ----- | 470   | ----- |      |                      |
| Spectrum Radiation Bandwidth | △ λ            | R6 | ----- | 20    | ----- | nm   | I <sub>F</sub> =20mA |
|                              |                | GH | ----- | 35    | ----- |      |                      |
|                              |                | BH | ----- | 35    | ----- |      |                      |
| Forward Voltage              | V <sub>F</sub> | R6 | ----- | 2.0   | 2.4   | V    | I <sub>F</sub> =20mA |
|                              |                | GH | ----- | 3.5   | 4.0   |      |                      |
|                              |                | BH | ----- | 3.5   | 4.0   |      |                      |
| Reverse Current              | I <sub>R</sub> | R6 | ----- | ----- | 10    | μ A  | V <sub>R</sub> =5V   |
|                              |                | GH | ----- | ----- | 10    |      |                      |
|                              |                | BH | ----- | ----- | 10    |      |                      |

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### Typical Electro-Optical Characteristics Curves (BH)

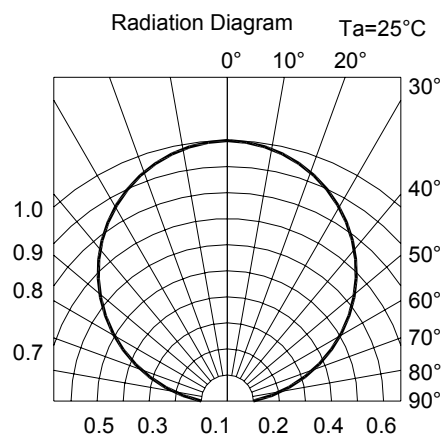
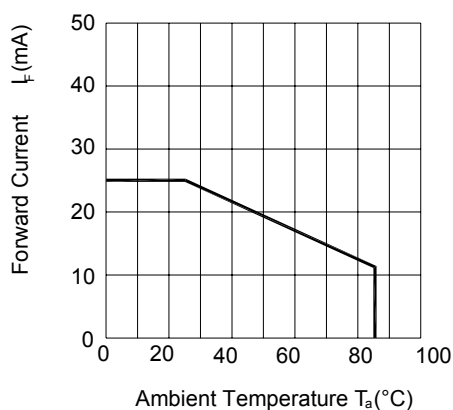
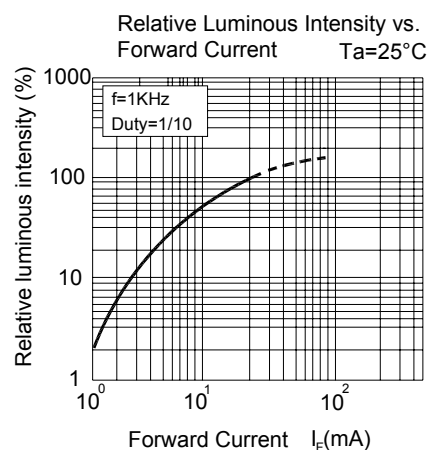
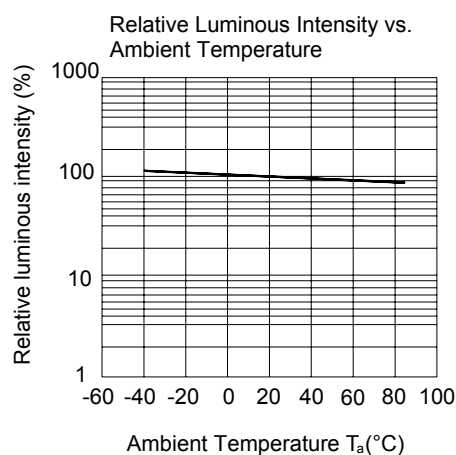
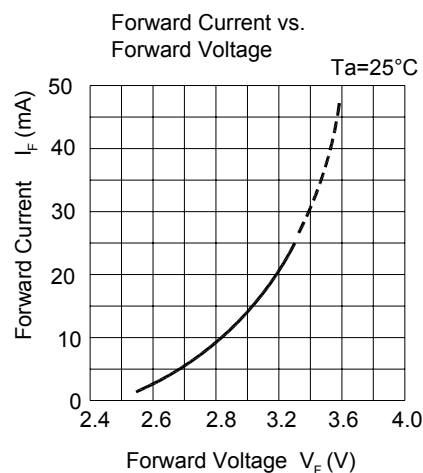
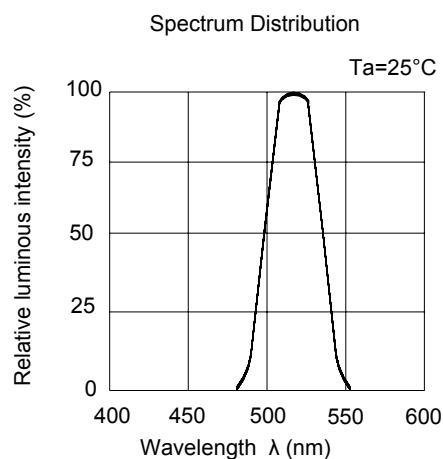


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### Typical Electro-Optical Characteristics Curves (GH)

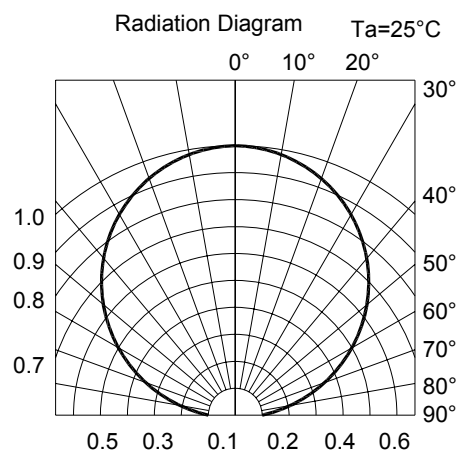
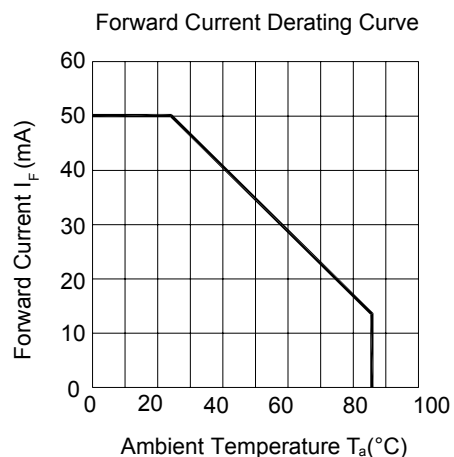
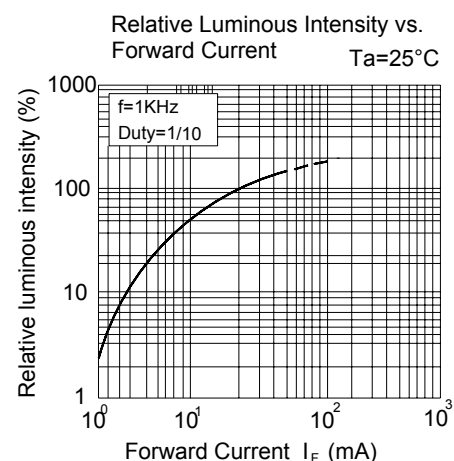
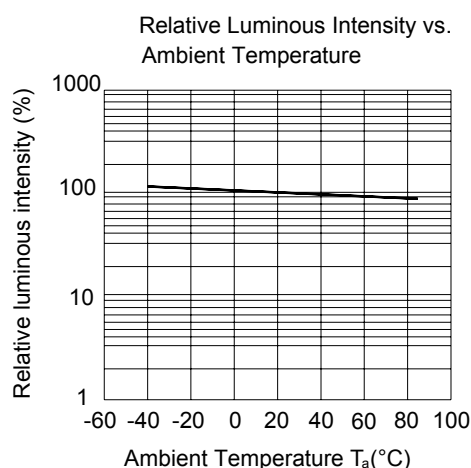
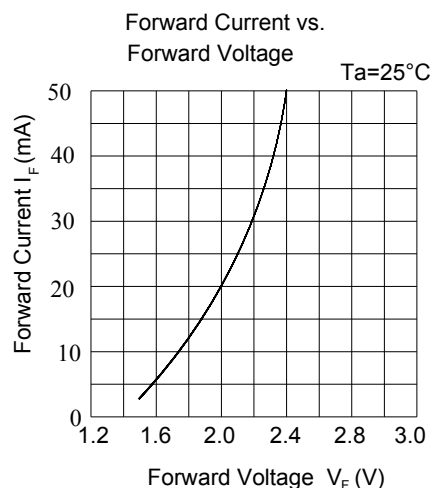
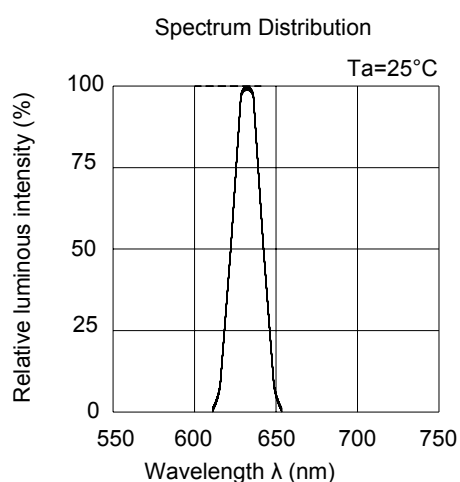


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**61-23 /R6GHBHC-A01/ET**

### Typical Electro-Optical Characteristics Curves (R6)





EVERLIGHT ELECTRONICS CO., LTD.

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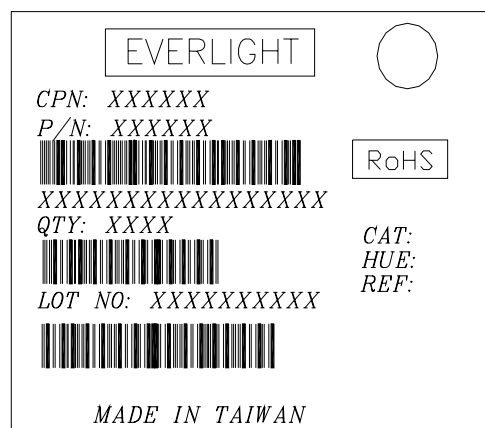
**61-23 /R6GHBHC-A01/ET**

#### Label Explanation

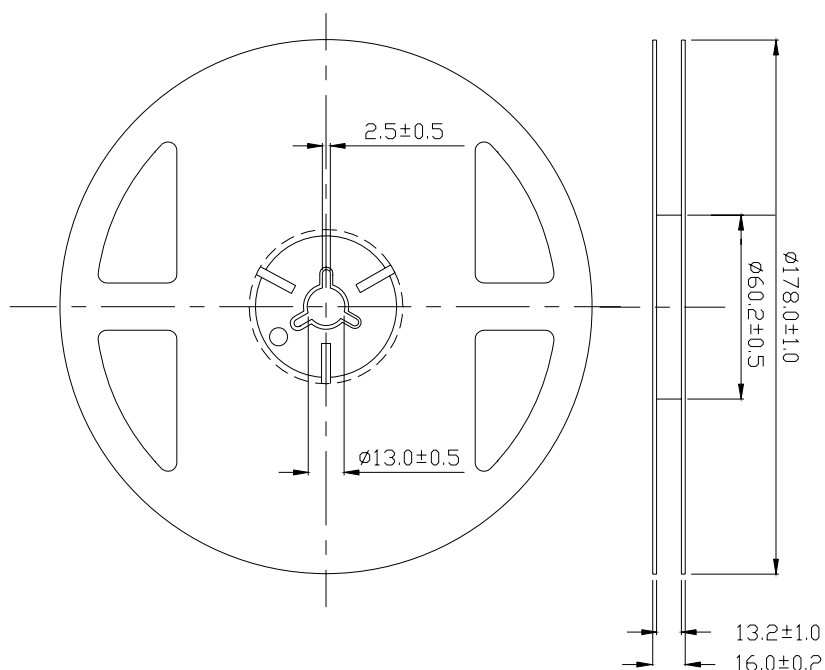
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank



#### Reel Dimensions



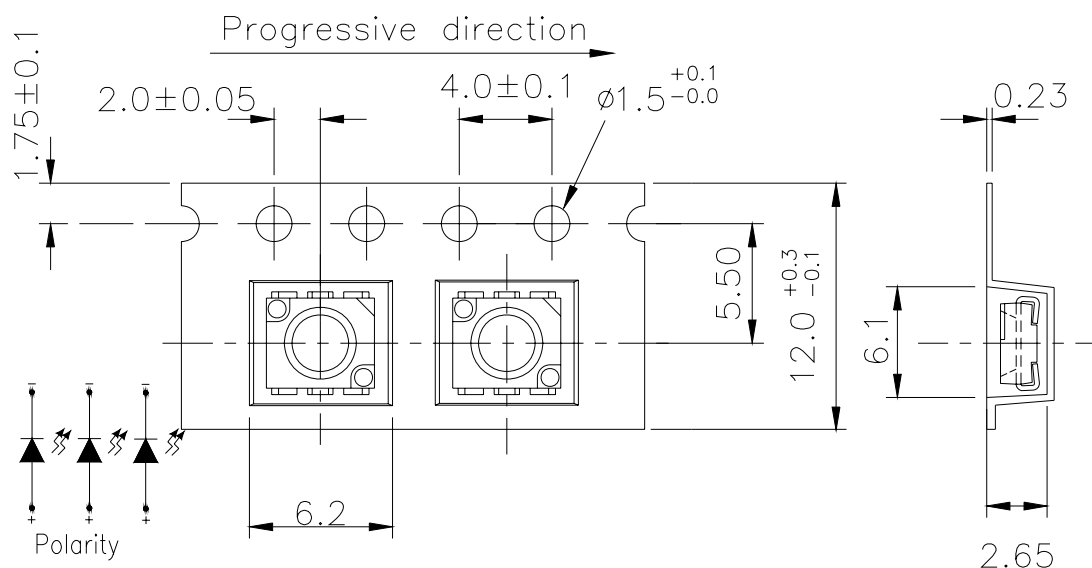
**Note:** Tolerance unless mentioned is  $\pm 0.1$ mm; Unit = mm

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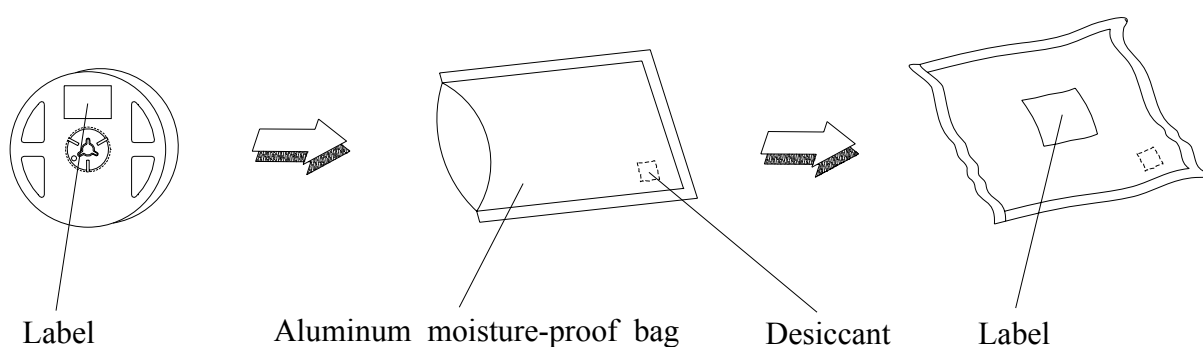
**61-23 /R6GHBHC-A01/ET**

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



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

## Moisture Resistant Packaging



**Technical Data Sheet - Preliminary****Luminosity Full Color LED****61-23 /R6GHBHC-A01/ET****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 - Preliminary****Luminosity Full Color LED****61-23 /R6GHBHC-A01/ET****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**

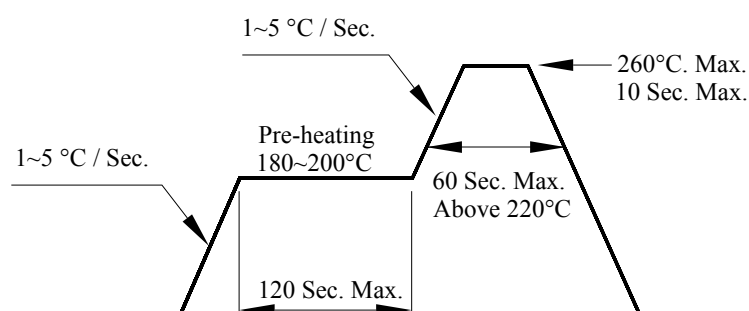
2.1 Do not open moisture proof bag before the products are ready to use.

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 1 year 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.

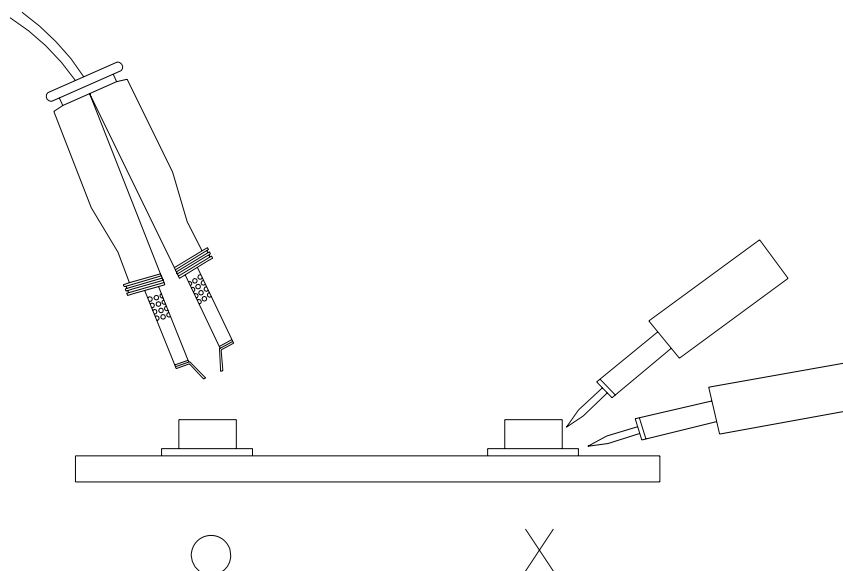
3.4 After soldering, do not warp the circuit board.

**Technical Data Sheet - Preliminary****Luminosity Full Color LED****61-23 /R6GHBHC-A01/ET****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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