

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.
- ESD protection.
- Pb-free.
- The product itself will remain within RoHS compliant version.



Descriptions

- 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.

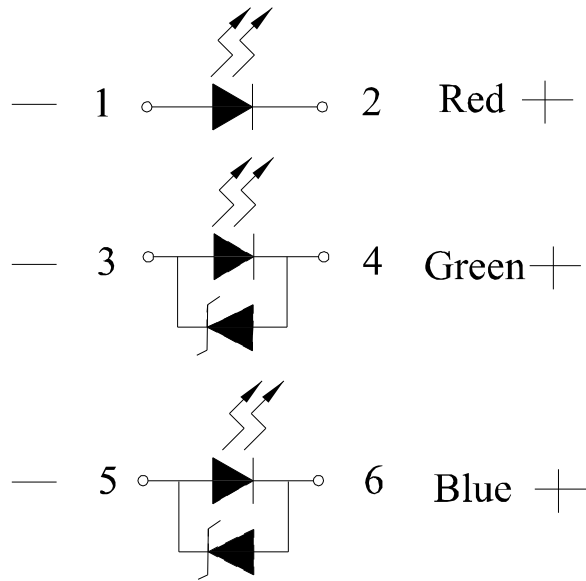
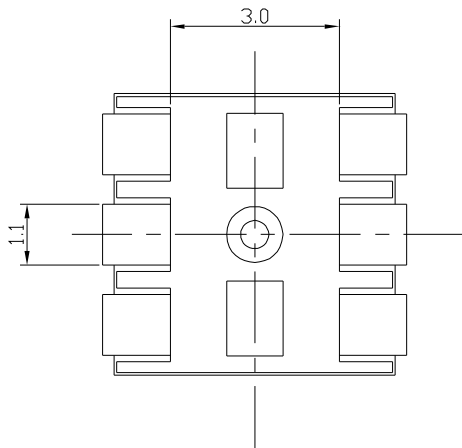
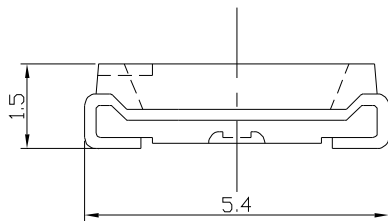
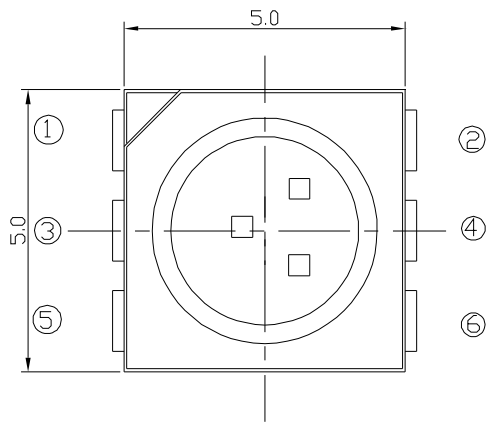
Applications

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

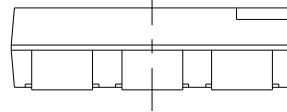
Device Selection Guide

| Chip | | | Lens Color |
|------|----------|-----------------|-------------|
| Type | Material | Emitted Color | |
| R | AlGaInP | Brilliant Red | Water Clear |
| G | InGaN | Brilliant Green | |
| B | InGaN | Blue | |

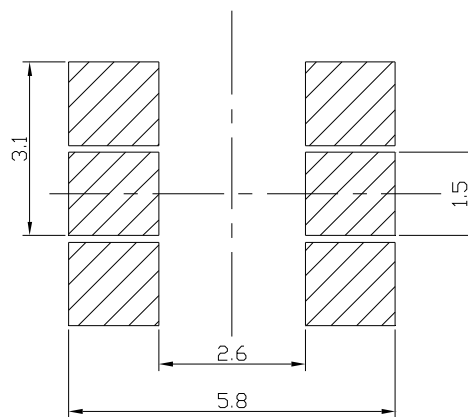
Package Outline Dimensions



Polarity



Recommended soldering pad design



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

Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Rating | | Unit |
|--|-----------------|---|-----|------|
| Reverse Voltage | V _R | 5 | | V |
| Forward Current | I _F | R | 30 | mA |
| | | G | 30 | |
| | | B | 30 | |
| Peak Forward Current (Duty 1/10 @ 1KHz) | I _{FP} | R | 120 | mA |
| | | G | 110 | |
| | | B | 110 | |
| Power Dissipation | P _d | R | 80 | mW |
| | | G | 110 | |
| | | B | 110 | |
| Electrostatic Discharge(HBM) | ESD | 2000 | | V |
| Operating Temperature | Topr | -40 ~ +85 | | °C |
| Storage Temperature | Tstg | -40~ +90 | | °C |
| Soldering Temperature | Tsol | Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec. | | |

Electro-Optical Characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition | |
|------------------------------|-------------------|-------|-------|-------|-------|----------------------|----------------------|
| Luminous Intensity | I _v | R | 450 | ----- | 715 | mcd | I _F =20mA |
| | | G | 715 | ----- | 1420 | | |
| | | B | 225 | ----- | 450 | | |
| Viewing Angle | 2θ _{1/2} | ----- | 120 | ----- | deg | I _F =20mA | |
| Peak Wavelength | λ _p | R | ----- | 632 | ----- | nm | I _F =20mA |
| | | G | ----- | 518 | ----- | | |
| | | B | ----- | 468 | ----- | | |
| Dominant Wavelength | λ _d | R | 617.5 | ----- | 633.5 | nm | I _F =20mA |
| | | G | 523.5 | ----- | 535.5 | | |
| | | B | 466 | ----- | 472 | | |
| Spectrum Radiation Bandwidth | Δλ | R | ----- | 20 | ----- | nm | I _F =20mA |
| | | G | ----- | 35 | ----- | | |
| | | B | ----- | 35 | ----- | | |
| Forward Voltage | V _F | R | 1.75 | ----- | 2.35 | V | I _F =20mA |
| | | G | 2.75 | ----- | 3.95 | | |
| | | B | 2.75 | ----- | 3.95 | | |
| Reverse Current | I _R | ----- | ----- | 10 | μA | V _R =5V | |

Notes:

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

Bin Range Of Luminous Intensity

| Symbol | Bin Code | Min. | Max. | Unit | Condition |
|--------|----------|------|------|------|----------------------|
| R | U1 | 450 | 565 | mcd | I _F =20mA |
| | U2 | 565 | 715 | | |
| G | V1 | 715 | 900 | | |
| | V2 | 900 | 1120 | | |
| | W1 | 1120 | 1420 | | |
| B | S2 | 225 | 285 | | |
| | T1 | 285 | 360 | | |
| | T2 | 360 | 450 | | |

Bin Range Of Dominant Wavelength

| Symbol | Groups | Bin Code | Min. | Max. | Unit | Condition |
|--------|--------|----------|-------|-------|------|----------------------|
| R | A | E4 | 617.5 | 621.5 | nm | I _F =20mA |
| | | E5 | 621.5 | 625.5 | | |
| | | E6 | 625.5 | 629.5 | | |
| | | E7 | 629.5 | 633.5 | | |
| G | B | B13 | 523.5 | 525.5 | | |
| | | B14 | 525.5 | 527.5 | | |
| | | B15 | 527.5 | 529.5 | | |
| | | B16 | 529.5 | 531.5 | | |
| | | B17 | 531.5 | 533.5 | | |
| | | B18 | 533.5 | 535.5 | | |
| B | D | AA2 | 466 | 468 | | |
| | | AA3 | 468 | 470 | | |
| | | AA4 | 470 | 472 | | |

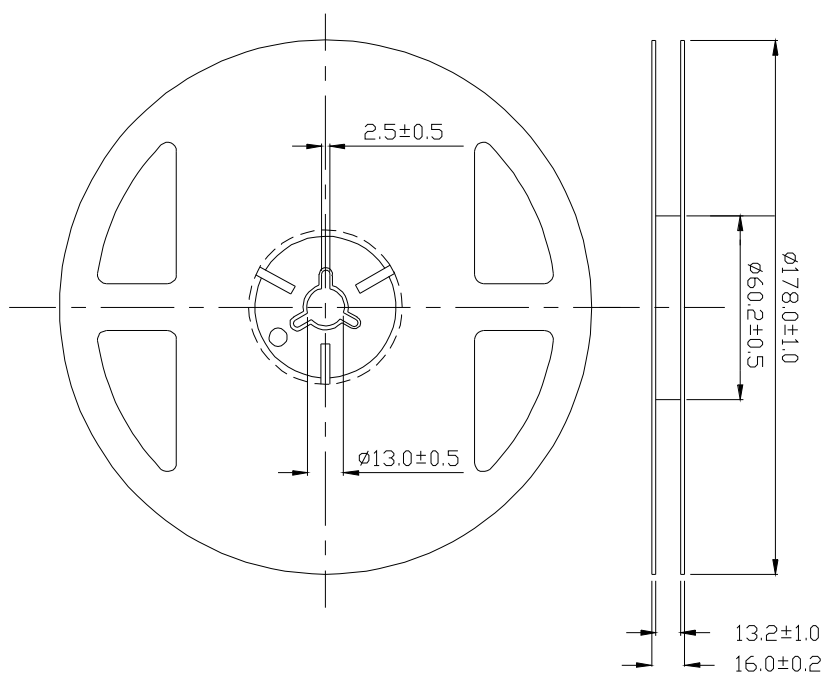
Notes:

1. Tolerance of Luminous Intensity $\pm 10\%$
2. Tolerance of Dominant Wavelength ± 1 nm

Bin Range of Forward Voltage

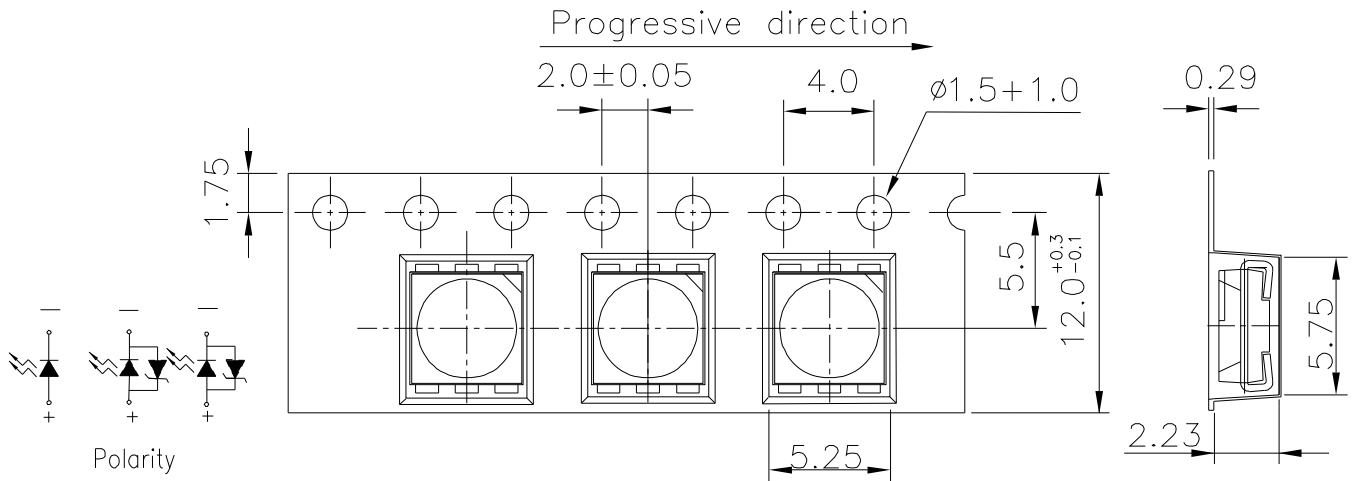
| Symbol | Groups | Bin Code | Min. | Max. | Unit | Condition |
|--------|--------|----------|------|------|------|----------------------|
| R | B | 1 | 1.75 | 1.95 | V | I _F =20mA |
| | | 2 | 1.95 | 2.15 | | |
| | | 3 | 2.15 | 2.35 | | |
| G | M | 5 | 2.75 | 3.05 | | |
| | | 6 | 3.05 | 3.35 | | |
| | | 7 | 3.35 | 3.65 | | |
| | | 8 | 3.65 | 3.95 | | |
| B | M | 5 | 2.75 | 3.65 | | |
| | | 6 | 3.05 | 3.05 | | |
| | | 7 | 3.35 | 3.65 | | |
| | | 8 | 3.65 | 3.95 | | |

Reel Dimensions



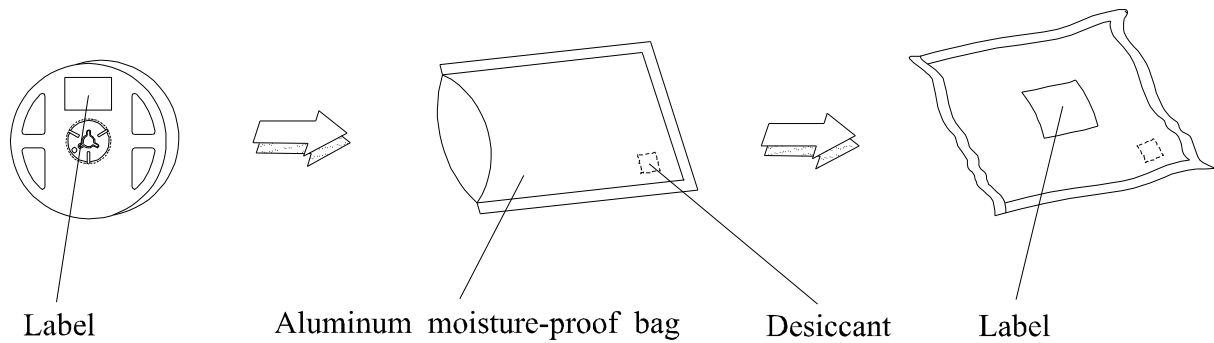
Note: The tolerances unless mentioned is ± 0.1 mm ,Unit = mm

Carrier Tape Dimensions; Loaded quantity per reel 800 PCS/reel



Note: The tolerances unless mentioned is ± 0.1 mm ,Unit = mm

Moisture Resistant Packaging



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. 5sec. | 6 Min. | 22 PCS. | 0/1 |
| 2 | Temperature Cycle | H : +100°C 15min ∫ 5 min L : -40°C 15min | 300 Cycles | 22 PCS. | 0/1 |
| 3 | Thermal Shock | H : +100°C 5min ∫ 10 sec 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 | IF = 20 mA | 1000 Hrs. | 22 PCS. | 0/1 |
| 7 | High Temperature / High Humidity | 85°C/ 85%RH | 1000 Hrs. | 22 PCS. | 0/1 |

* For each die

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.

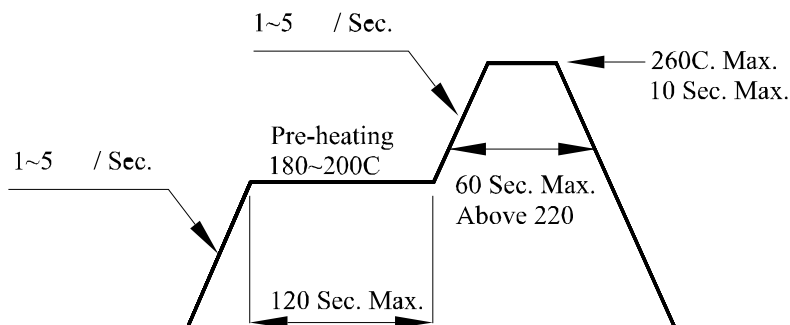
If unused LEDs remain, it should be stored in moisture proof packages.

- 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.

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.