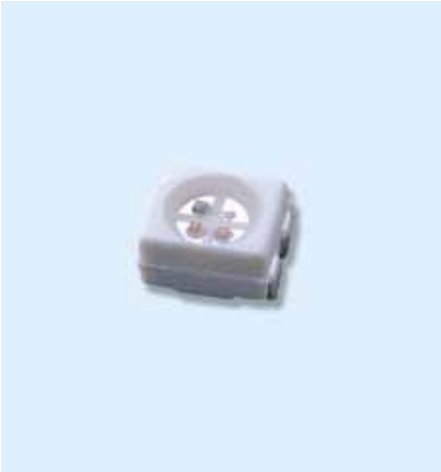
# Full Color PLCC4 Type SMD LED
VAOS-SP4RGB4

## Features

- PLCC4 package.
- White package.
- Colorless clear window.
- Pb free
- RoHS compliant version.



## Descriptions

- 120° viewing angle.
- Low power comsumption.

## Applications

- Automotive: backlighting in dashboard and switch.
- Portable equipment.
- Flat backlight for LCD's, switches and symbols.
- General use.

## Device Selection Guide

| Chip | | | Lens Color |
|---|---|---|---|
| Type | Material | Emitted Color | |
| R6 | AlGaInP | Brilliant Red | Water Clear |
| GH | InGaN | Brilliant Green | |
| BH | InGaN | Blue | |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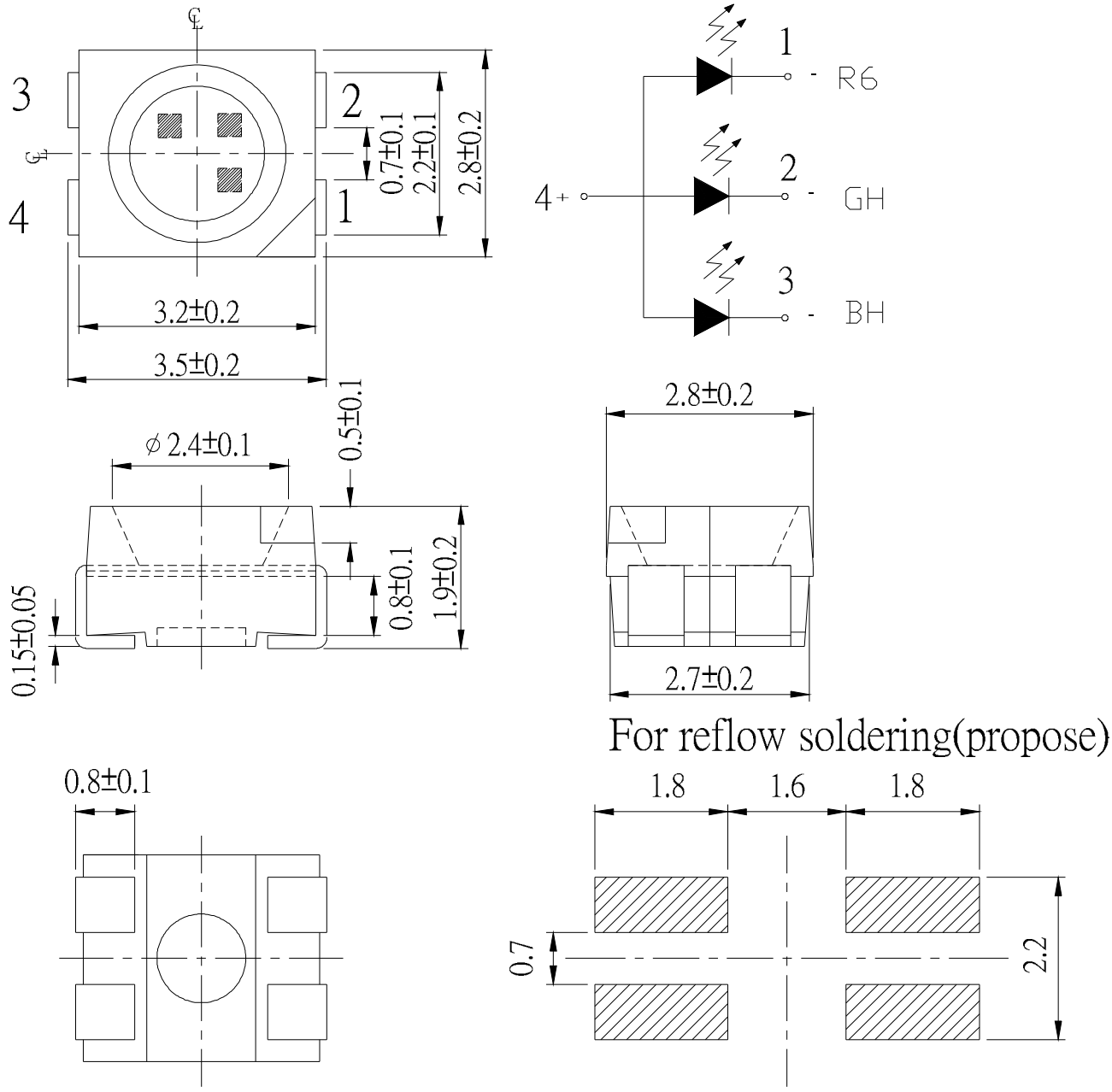
## Package Outline Dimensions




**Notes:** All dimensions are in millimeters.

## Absolute Maximum Ratings (Ta=25℃)

| Parameter | Symbol | Rating | | Unit |
|---|---|---|---|---|
| Reverse Voltage | $V_R$ | 5 | | V |
| Forward Current | $I_F$ | R6 | 25 | mA |
| | | GH | 25 | |
| | | BH | 25 | |
| Operating Temperature | Topr | -40 ~ +85 | | ℃ |
| Storage Temperature | Tstg | -40~ +100 | | ℃ |
| Electrostatic Discharge(HBM) | ESD | R6 | 2000 | V |
| | | GH | 150 | |
| | | BH | 150 | |
| Power Dissipation | Pd | R6 | 120 | mW |
| | | GH | 110 | |
| | | BH | 110 | |
| Peak Forward Current(Duty 1/10 @ 1KHz) | $I_{FP}$ | R6 | 100 | mA |
| | | GH | 100 | |
| | | BH | 100 | |
| Soldering Temperature | Tsol | Reflow Soldering : 260 ℃ for 10 sec.<br>Hand Soldering : 350 ℃ for 3 sec. | | |

Specific binning requirements- please contact our home office

**Electro-Optical Characteristics (Ta=25℃)**

| Parameter | Symbol | | Min. | Typ. | | Unit | Condition |
|---|---|---|---|---|---|---|---|
| Luminous Intensity | $I_V$ | R6 | 112 | ----- | 285 | mcd | $I_F$=20mA |
| | | GH | 180 | ----- | 450 | | |
| | | BH | 72 | ----- | 180 | | |
| Peak Wavelength | $\lambda p$ | R6 | ----- | 632 | ----- | nm | I =20mA |
| | | GH | ----- | 518 | ----- | | |
| | | BH | ----- | 468 | ----- | | |
| Dominant Wavelength | $\lambda d$ | R6 | 621 | ----- | 631 | nm | $I_F$=20mA |
| | | GH | 520 | ----- | 530 | | |
| | | BH | 465 | ----- | 475 | | |
| Spectrum Radiation Bandwidth | $\triangle\lambda$ | R6 | ----- | 20 | ----- | nm | $I_F$=20mA |
| | | GH | ----- | 35 | ----- | | |
| | | BH | ----- | 35 | ----- | | |
| Forward Voltage | $V_F$ | R6 | ----- | 2.0 | 2.4 | V | $I_F$=20mA |
| | | GH | ----- | 3.4 | 3.95 | | |
| | | BH | ----- | 3.4 | 3.95 | | |
| Viewing Angle | $2\theta 1/2$ | | ----- | 120 | ----- | deg | $I_F$=20mA |
| Reverse Current | $I_R$ | R6 | ----- | ----- | 10 | $\mu$A | $V_R$=5V |
| | | GH | ----- | ----- | 50 | | |
| | | BH | ----- | ----- | 50 | | |

*The luminous intensity data did not including ±10% testing tolerance.

**Bin Rang Of Luminous Intensity**

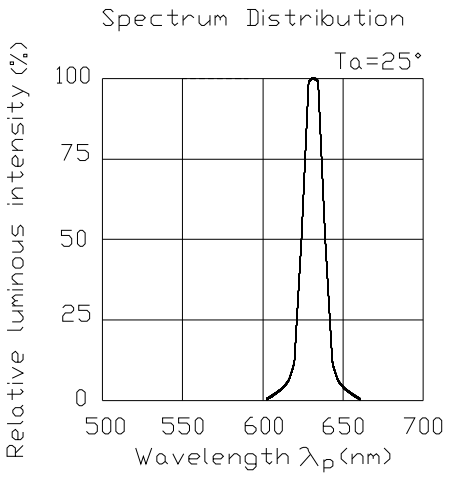
| Chip | Bin | Min | Max | Unit | Condition |
|---|---|---|---|---|---|
| R6 | R | 112 | 180 | mcd | $I_F$=20mA |
| | S | 180 | 285 | | |
| GH | S | 180 | 285 | | |
| | T | 285 | 450 | | |
| BH | Q | 72 | 112 | | |
| | R | 112 | 180 | | |

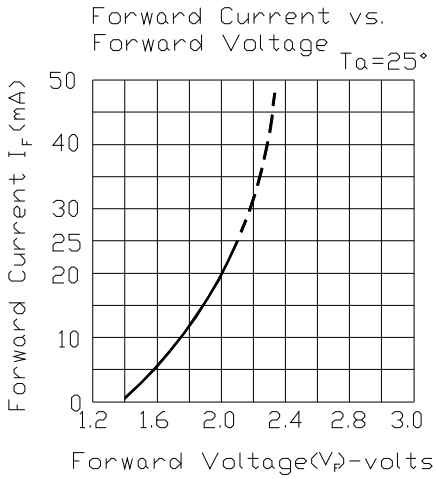
**Bin Rang Of Dominate Wavelength**

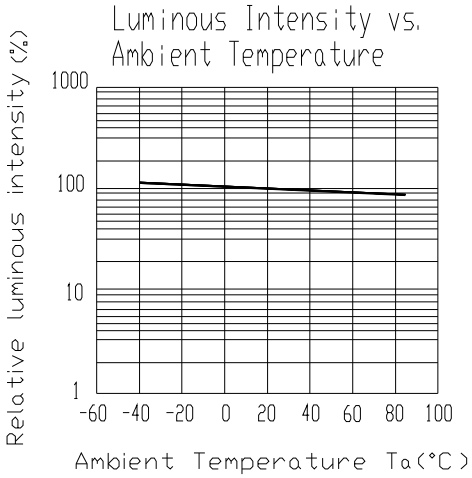
| Chip | Bin | Min | Max | Unit | Condition |
|---|---|---|---|---|---|
| R6 | FF1 | 621 | 626 | nm | I =20mA |
| | FF2 | 626 | 631 | | |
| GH | X | 520 | 525 | | |
| | Y | 525 | 530 | | |
| BH | X | 465 | 470 | | |
| | Y | 470 | 475 | | |

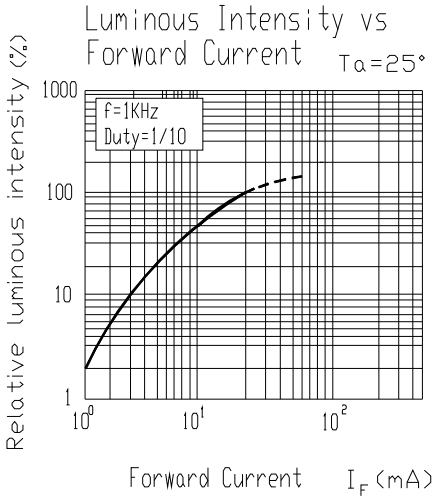
*The luminous intensity data did not including ±10% testing tolerance.

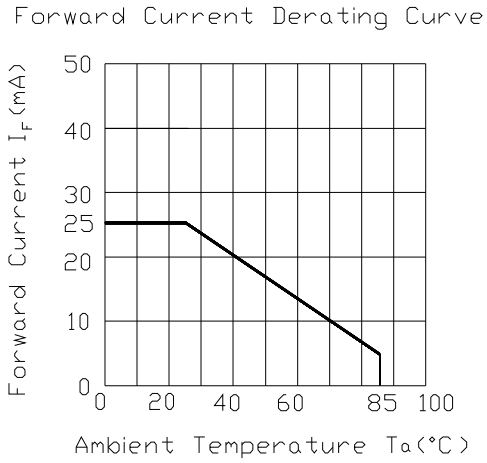
# Typical Electro-Optical Characteristics Curves (R6)

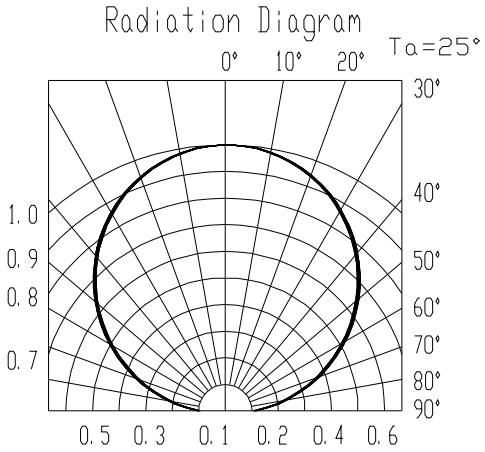


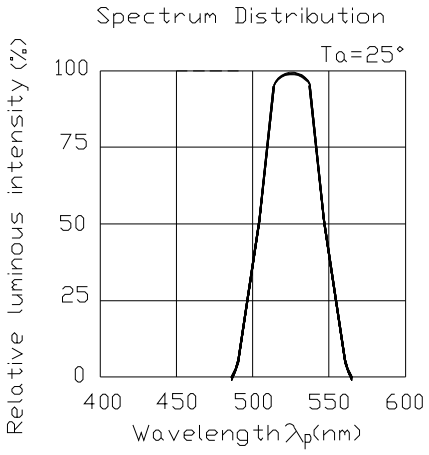



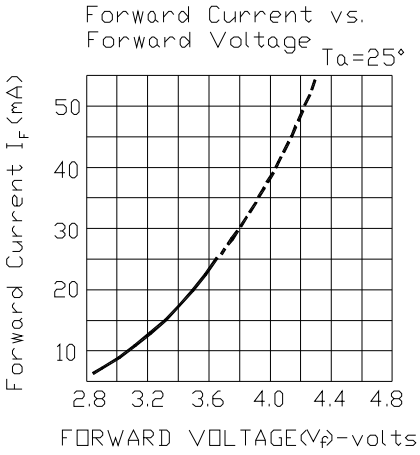



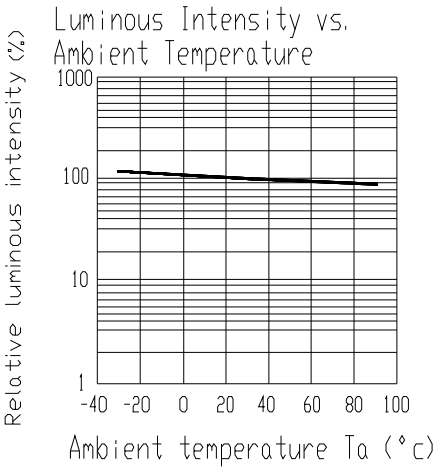



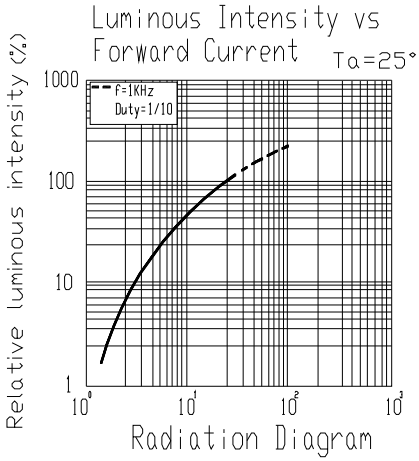



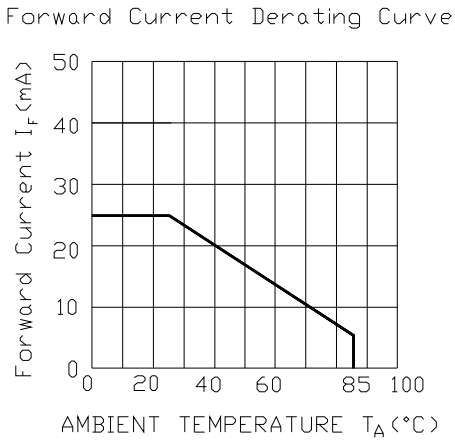
# Typical Electro-Optical Characteristics Curves (GH)

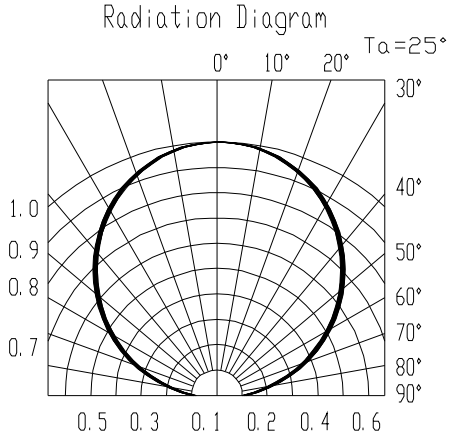
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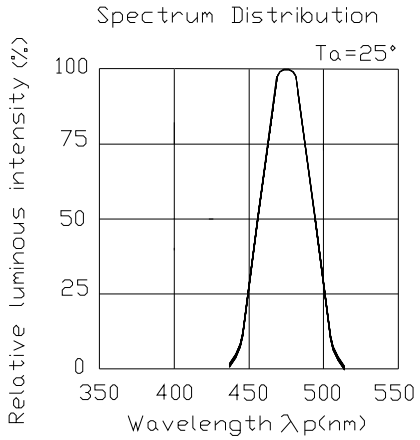
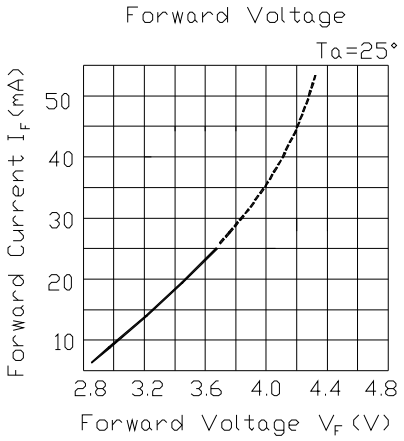
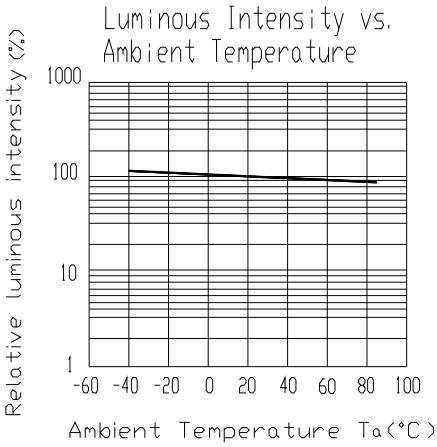
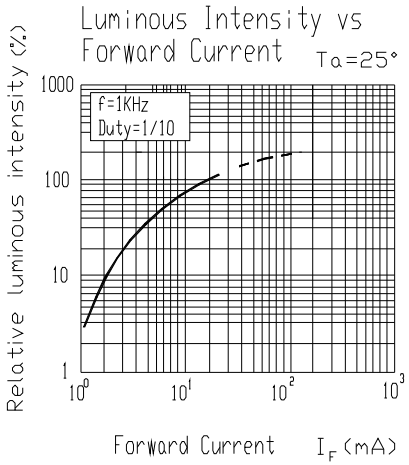
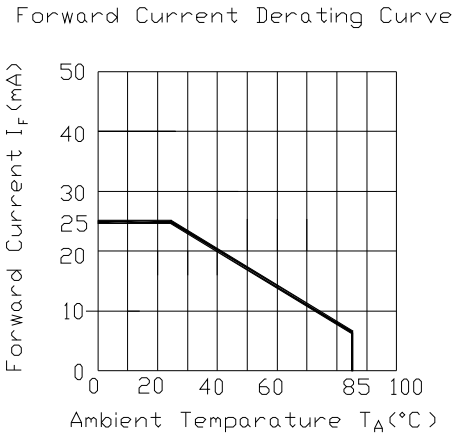
# Typical Electro-Optical Characteristics Curves (BH)

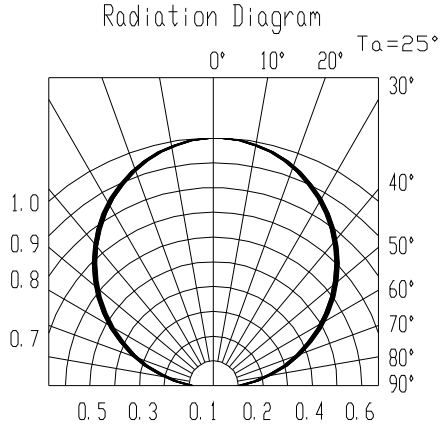


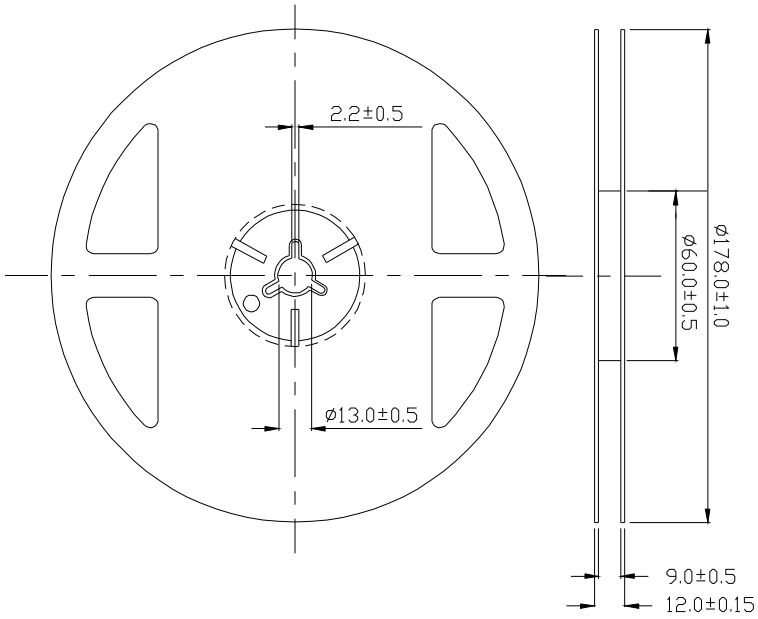



## Reel Dimensions




**Note:** Tolerances Unless Dimension ±0.1mm ,Unit = mm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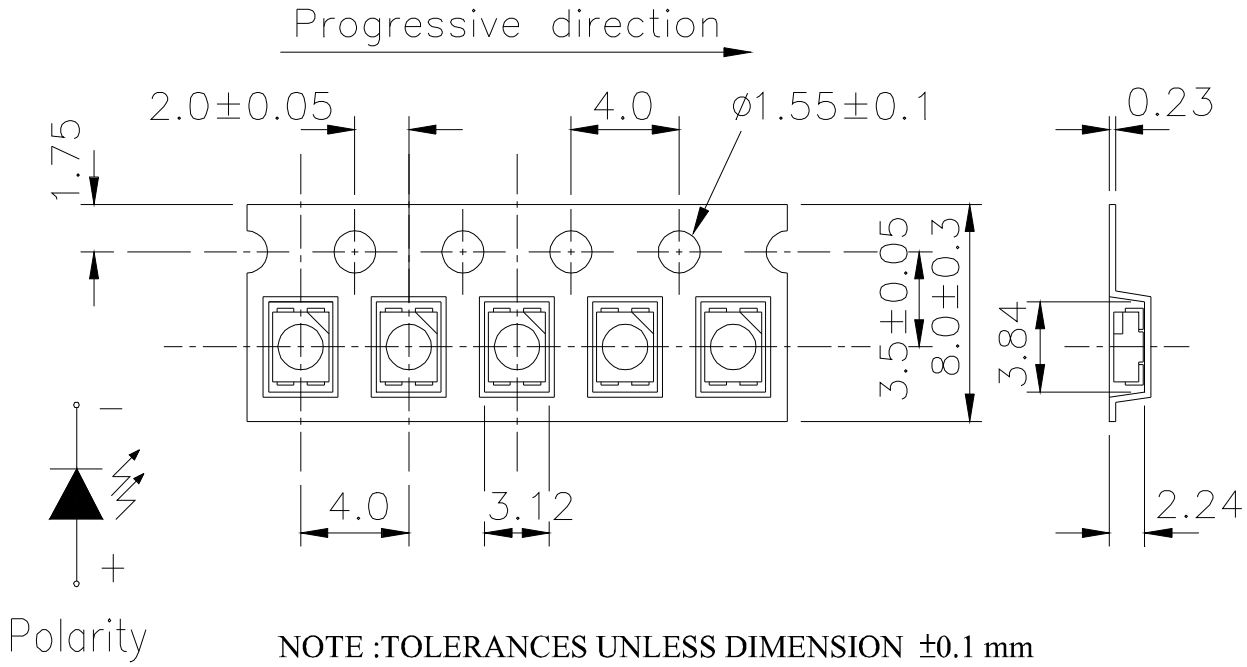
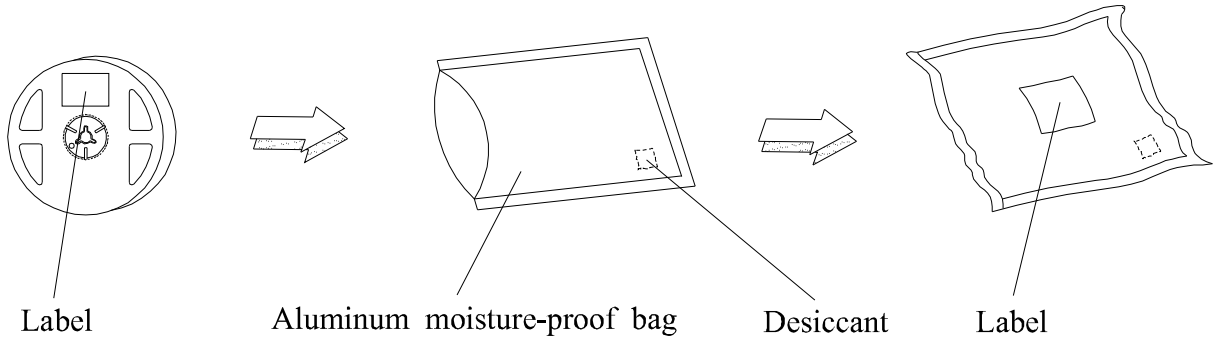
## Carrier Tape Dimensions: Loaded quantity 2000 PCS per reel.




NOTE :TOLERANCES UNLESS DIMENSION ±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%

| | | | | | |
|---|---|---|---|---|---|
| 1 | Reflow Soldering | Temp. : 260℃±5℃<br>Min. 5sec. | 6 Min. | 22 PCS. | 0/1 |
| 2 | Temperature Cycle | H : +100℃ 15min<br>∫ 5 min<br>L : -40℃ 15min | 300 Cycles | 22 PCS. | 0/1 |
| 3 | Thermal Shock | H : +100℃ 5min<br>∫ 10 sec<br>L : -10℃ 5min | 300 Cycles | 22 PCS. | 0/1 |
| 4 | High Temperature Storage | Temp. : 100℃ | 1000 Hrs. | 22 PCS. | 0/1 |
| 5 | Low Temperature Storage | Temp. : -40℃ | 1000 Hrs. | 22 PCS. | 0/1 |
| 6 | DC Operating Life | $I_F$ = 20 mA | 1000 Hrs. | 22 PCS. | 0/1 |
| 7 | High Temperature / High Humidity | 85℃/85%RH. | 1000 Hrs. | 22 PCS. | 0/1 |
| 1 | Reflow Soldering | Temp. : 260℃±5℃<br>Min. 5sec. | 6 Min. | 22 PCS. | 0/1 |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## Precautions For Use

1. Customer must apply resistors for protection, otherwise a slight voltage shift will cause a big current change .

2. Storage

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

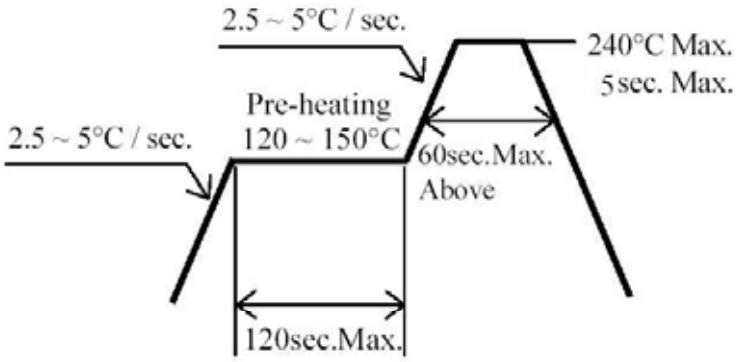
2.2 Before opening the package: The LEDs should be kept at 30℃ or less and 90%RH or less.

2.3 After opening the package: The LED's floor life is 1 year under 30 deg 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℃ 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℃ 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.

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