# R1608BC-B4-1B

1.6x0.8mm, Blue LED
Surface Mount PLCC-2 LED Indicator

Luckylight

## Technical Data Sheet

### Features:

- PLCC-2 package.
- High reliability LED package.
- Colorless clear window.
- Inter reflector.
- Suitable for automatic placement equipment.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- Available on tape and reel (8mm Tape).
- The product itself will remain within RoHS compliant Version.

### Descriptions:

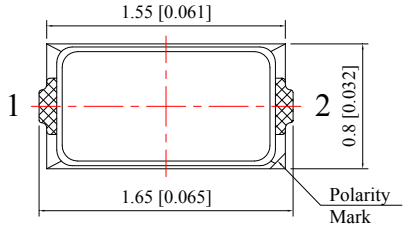
- The R1608 series is available in soft red, orange, yellow, green, blue and white. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes the SMT TOP LED ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

### Applications:

- Indicator and backlight in office and family equipment.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
- General use.

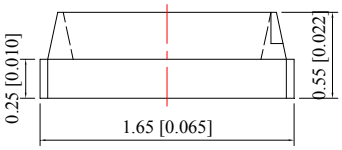
| Part No. | Emitting Color | Lens Color |
|---|---|---|
| R1608BC-B4-1B | Blue | Water Clear |

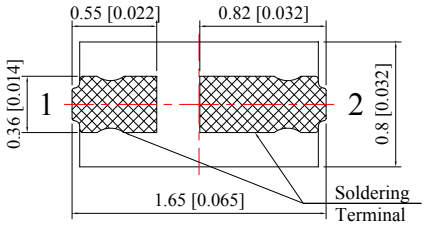
## Package Dimension:



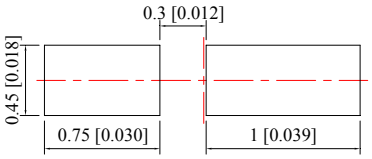


**Polarity**




**Recommended Soldering Pad Dimensions**




Unit: mm
Tolerance: ±0.10mm

1. Soldering terminal may shift in x, y direction.
2. Polarity referring onto the cathode mark is reversed on the UR/HR/SR.

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010″) unless otherwise noted.

## Absolute Maximum Ratings at Ta=25℃

| Parameters | Symbol | Max | Unit |
|---|---|---|---|
| Power Dissipation | Pd | 90 | mW |
| Peak Forward Current[a] | IFP | 100 | mA |
| DC Forward Current[b] | IF | 25 | mA |
| Reverse Voltage | VR | 5 | V |
| Electrostatic Discharge (HBM) | ESD | 1000 | V |
| Operating Temperature Range | Topr | -40℃ to +80℃ | |
| Storage Temperature Range | Tstg | -40℃ to +85℃ | |
| Soldering Temperature | Tsld | 260℃ for 5 Seconds | |

Notes:
a. Derate linearly as shown in derating curve.
b. Duty Factor = 10%, Frequency = 1 kHz

## Electrical Optical Characteristics at Ta=25℃

| Parameters | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Luminous Intensity[a] | IV | 200 | 300 | --- | mcd | IF=20mA |
| Viewing Angle[b] | 2θ1/2 | --- | 120 | --- | Deg | IF=20mA |
| Peak Emission Wavelength | λp | --- | 460 | --- | nm | IF=20mA |
| Dominant Wavelength[C] | λd | --- | 465 | --- | nm | IF=20mA |
| Spectral Line Half-Width | △λ | --- | 25 | --- | nm | IF=20mA |
| Forward Voltage | VF | 2.80 | 3.20 | 3.60 | V | IF=20mA |
| Reverse Current | IR | --- | --- | 10 | μA | VR=5V |

Notes:

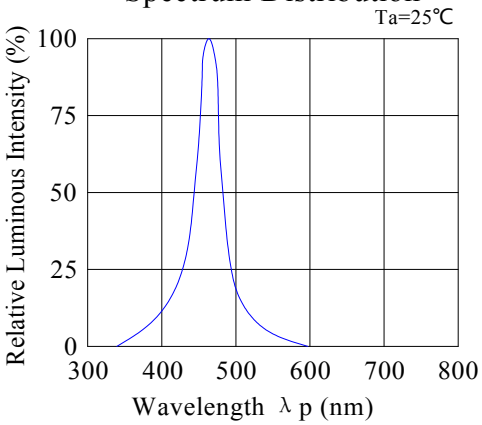
a. ALuminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

b. 2θ1/2 is the o -axis angle where the luminous intensity is 1⁄2 the peak intensity

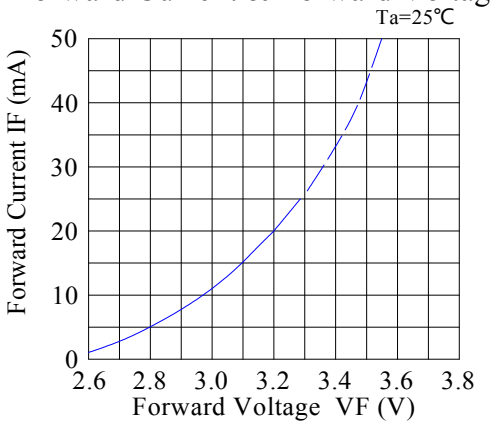
c. The dominant wavelength (λd) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

## Typical Electrical / Optical Characteristics Curves
## (25℃ Ambient Temperature Unless Otherwise Noted)

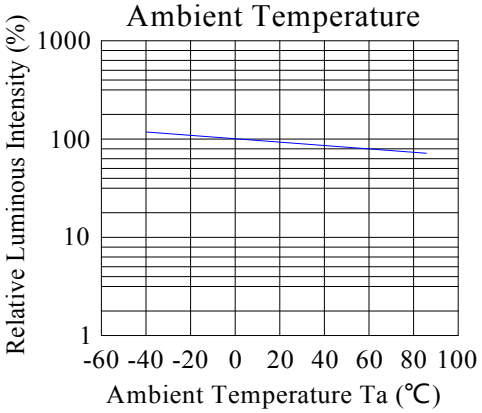
Spectrum Distribution



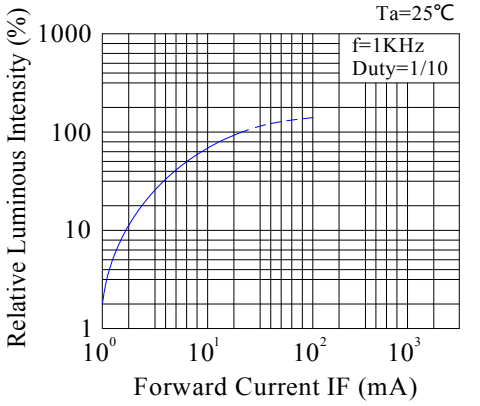

Forward Current & Forward Voltage



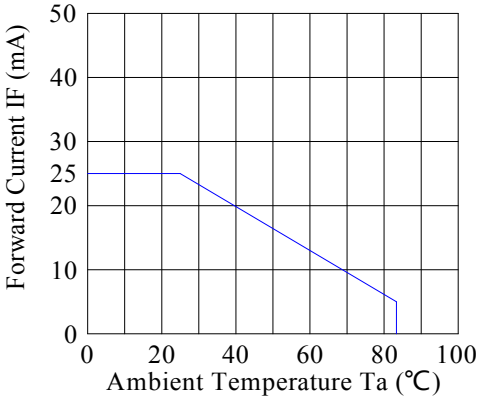

Luminous Intensity & Ambient Temperature



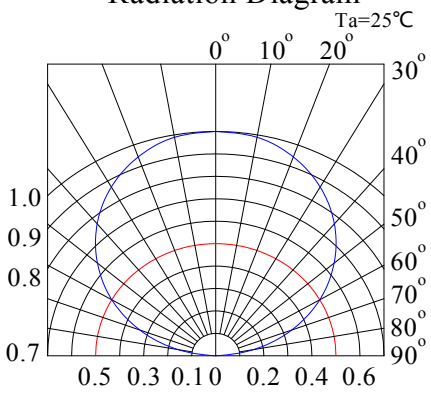

Luminous Intensity & Forward Current



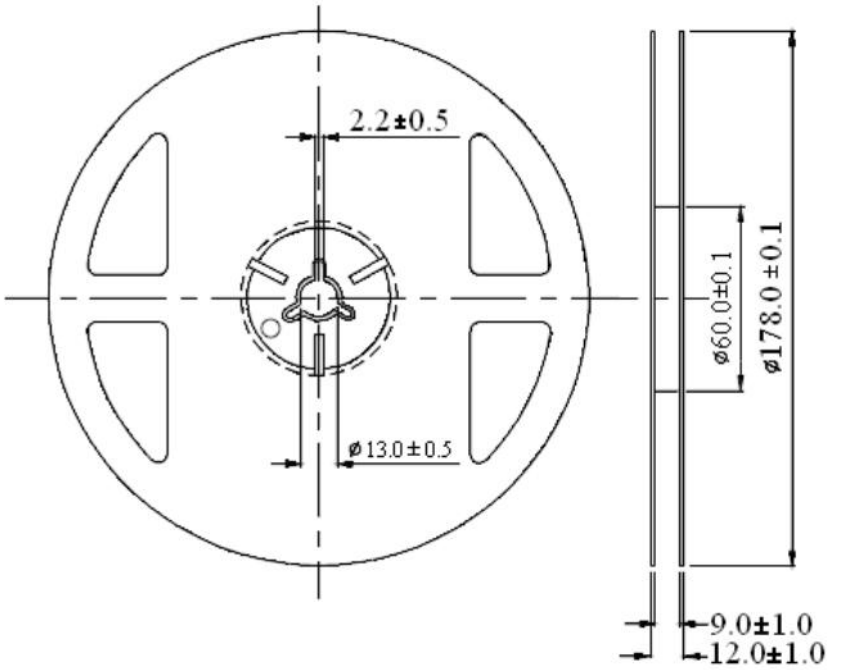

Forward Current Derating Curve




Radiation Diagram



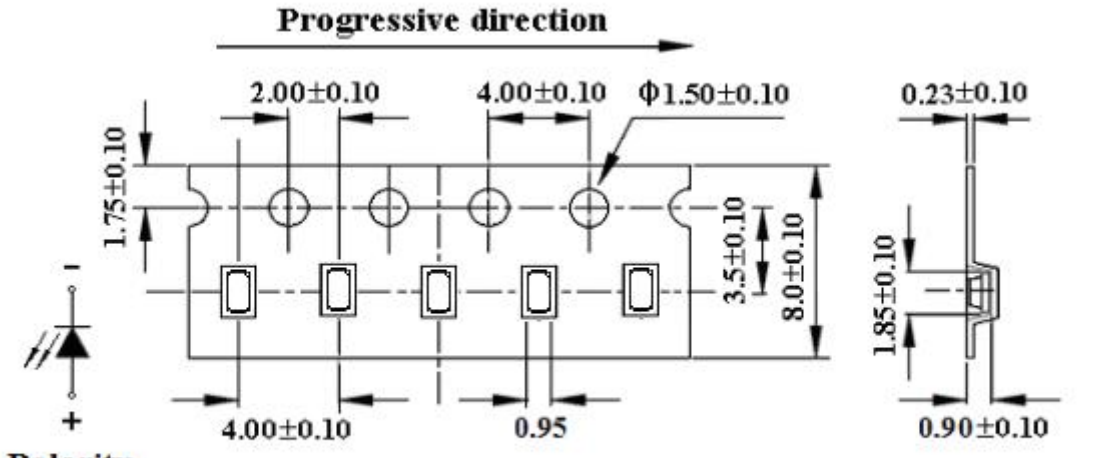
## Reel Dimensions:




Unit: mm
Tolerance: ±0.25mm

## Carrier Tape Dimensions:

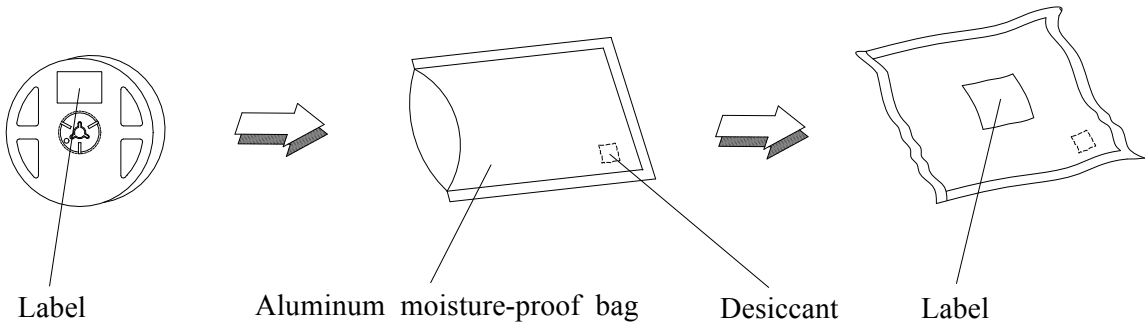
Loaded quantity 4000 pcs per reel.

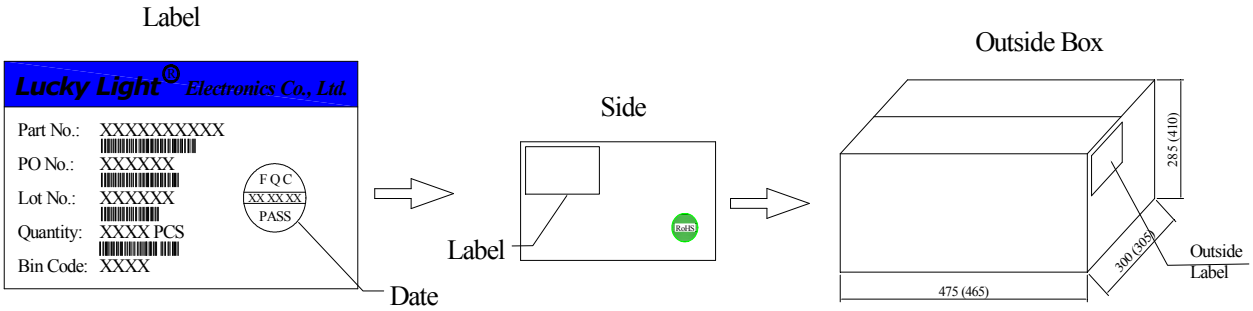



Unit: mm
Tolerance: ±0.10 mm

## Packing & Label Specifications:

Moisture Resistant Packaging:

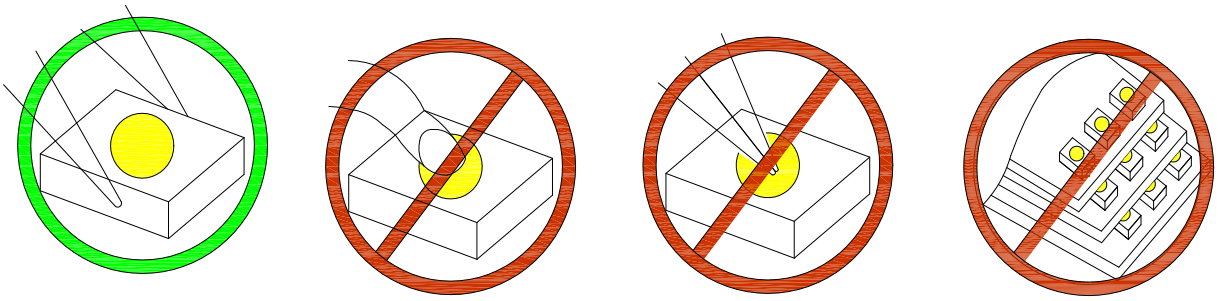


## CAUTIONS

### 1. Handling Precautions:

1.1. Handle the component along the side surfaces by using forceps or appropriate tools.
1.2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.
1.3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



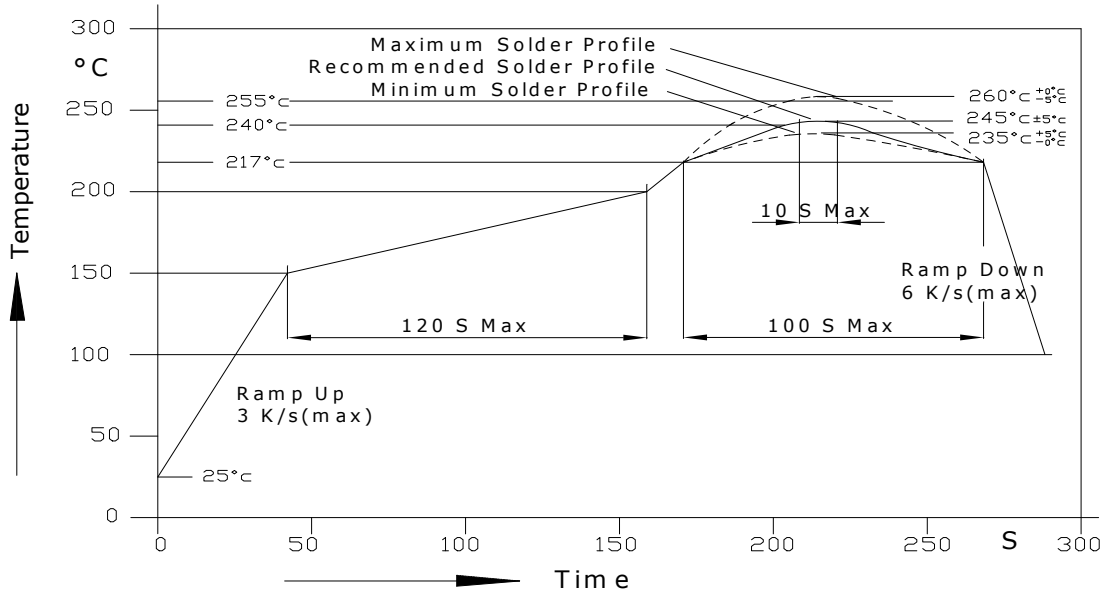
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force. As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

### 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 60%RH or less.
2.3. The LEDs should be used within a year.
2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.
2.5. The LEDs should be used within 24 hours after opening the package.
2.6. If the moisture adsorbent material has fabled away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 65±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.

3.5 Recommended soldering conditions:

| Reflow soldering | | Soldering iron | |
|---|---|---|---|
| Pre-heat | 150~200°C | Temperature | 300°C Max. |
| Pre-heat time | 120 sec. Max. | Soldering time | 3 sec. Max. |
| Peak temperature | 260°C Max. | | (one time only) |
| Soldering time | 10 sec. Max. (Max. two times) | | |

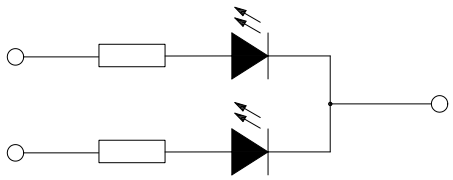
3.6 Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations.

However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

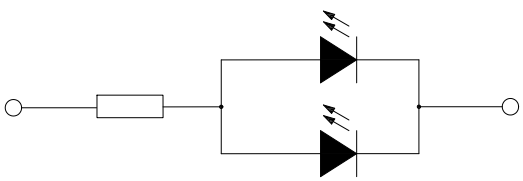
**4. Drive Method:**

4.1 An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model A




Circuit model B




(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

**5. ESD (Electrostatic Discharge):**

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents. To verify for ESD damage, check for "lightup" and Vf of the suspect LEDs at low currents. The Vf of "good" LEDs should be >2.0V@0.1mA for InGaN product and >1.4V@0.1mA for AlInGaP product.

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