EVERLIGHT AMERICAS

DATASHEET

# Top View LEDs
# EAPL5050ICRGBA0

## Features

- P-LCC-6 package.
- Inner reflector and white package.
- Colorless clear resin
- Wide viewing angle 120.
- White SMT package.
- Soldering methods: IR reflow soldering.
- Pb-free.
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br<900ppm,CI<900ppm,Br+CI<1500ppm).

## Description

This 3-channel LED driver with 8 bit PWM linear control uses a single communication wire to identify LED PWM signal in total 24bit RGB display. This is a simple and cost effective for any LED model design.
Wide viewing angle and low power consumption is due to the package design. The mixture of blue, green, and red LEDs results in a white emission that makes it ideal for light pipe application. The LED PWM output controlled by duty ration which depends on the 24 bit data each package. All package will latch new data when DIN port received the reset signal. (>50us low-level signal)

## Applications

- Indoor / Outdoor LED video display
- Full color LED light strip
- LED decorative lighting
- Gaming Exterior

## Device Selection Guide

| Type | Chip Materials | Emitted Color | Resin Color |
|---|---|---|---|
| RQH | AlGaInP | Brilliant Red | Water Clear |
| GR | InGaN | Brilliant Green | Water Clear |
| BY | InGaN | Brilliant Blue | Water Clear |

## Absolute Maximum Ratings (Ta=25℃)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Power supply voltage | Vdd | 4.2-5.5 | V |
| Output Voltage | Vout | 17 | V |
| Input voltage | Vin | -0.5~Vdd+0.5 | V |
| LED Output Current | Iout | 5 | mA |
| Operating Temperature | $T_{opr}$ | -25 ~ +85 | ℃ |
| Storage Temperature | Tstg | -40 ~ +90 | ℃ |
| ESD | ESD | 2000 | V |
| Soldering Temperature | $T_{sol}$ | Reflow Soldering : 260 ℃ for 10 sec.<br>Hand Soldering : 350 ℃ for 3 sec. | |

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

| Parameter | Symbol | Type | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|---|
| Luminous Intensity | Iv | RQH | 90 | ----- | 280 | mcd | $I_F$=5mA |
| | | GR | 280 | ----- | 900 | | |
| | | BY | 71 | ----- | 224 | | |
| Viewing Angle | $2\theta_{1/2}$ | | ----- | 120 | ----- | deg | |
| Dominant Wavelength | λd | RQH | 617.5 | ----- | 629.5 | nm | |
| | | GR | 525 | ----- | 540 | | |
| | | BY | 462 | ----- | 474 | | |

Notes:
1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Dominant Wavelength: ±1nm

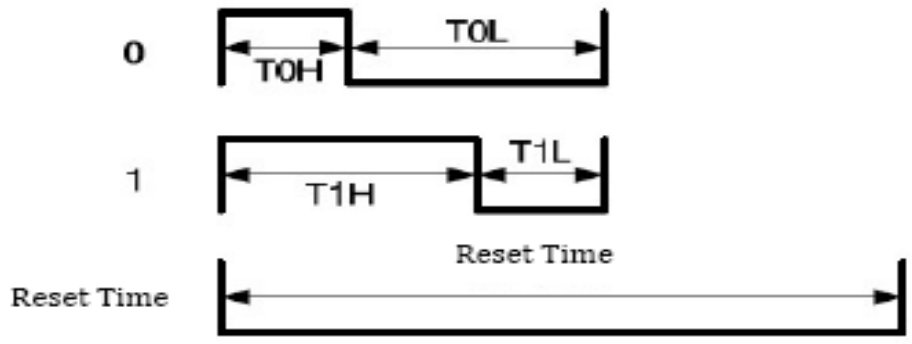
## Electrical Characteristics (Ta=-20~+70°C, Vdd=4.5~5.5V, Vss=0V)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|
| Output Current | IOL | | 5 | | mA | --- |
| Input current | $I_I$ | --- | --- | ±1 | μA | VI=Vdd/Vss |
| Input Voltage | $V_{IH}$ | 3.3 | --- | --- | V | Din, SET |
| | $V_{IL}$ | --- | --- | 0.3Vdd | V | Din, SET |
| Hysteresis Voltage | $V_H$ | --- | 0.35 | -- | V | Din, SET |
| Dynamic Current Dissipation | $IDD_{dyn}$ | --- | 2.5 | -- | mA | |

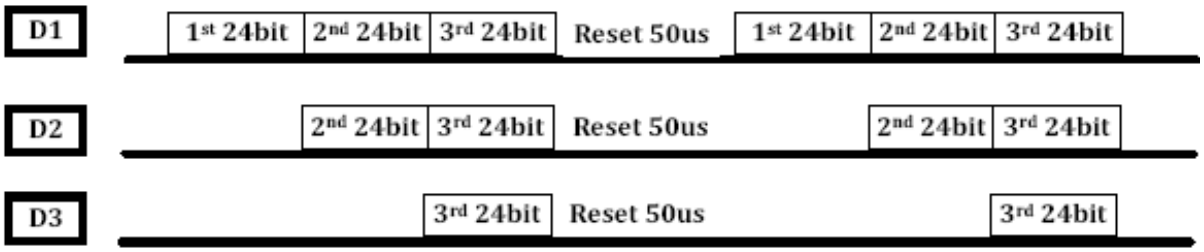
## Data transfer time (TH+TL=1.2μs±600ns)

| | | | |
|---|---|---|---|
| T0H | 0 code, high voltage time | 0.30 μs | ±80ns |
| T1H | 1 code, high voltage time | 0.90 μs | ±80ns |
| T0L | 0 code, low voltage time | 0.90 μs | ±80ns |
| T1L | 1 code, low voltage time | 0.30 μs | ±80ns |
| RES | Low voltage time | Above 50μs | --- |

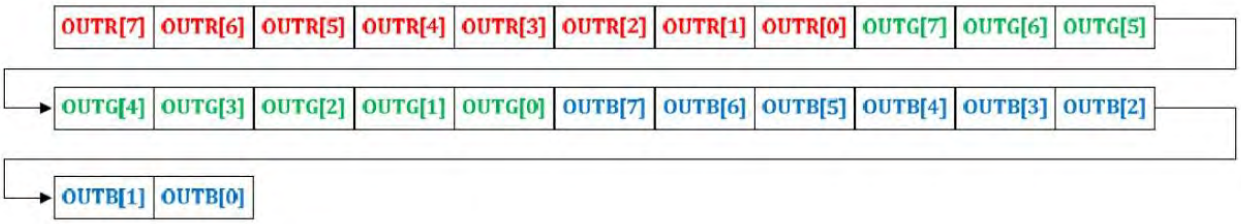
## Timing Wave Form：



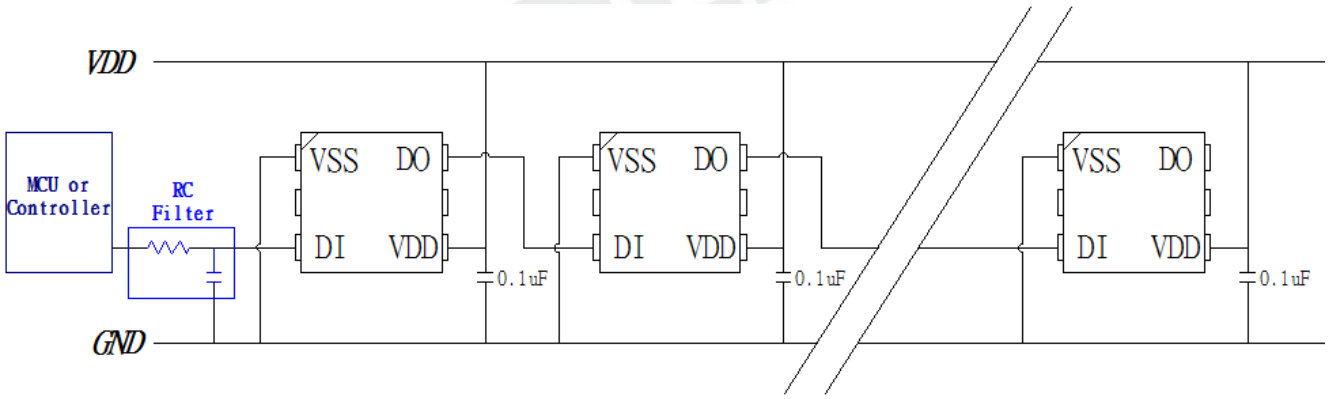
## Data Communication：




## Single Data in 24bit for RGB：

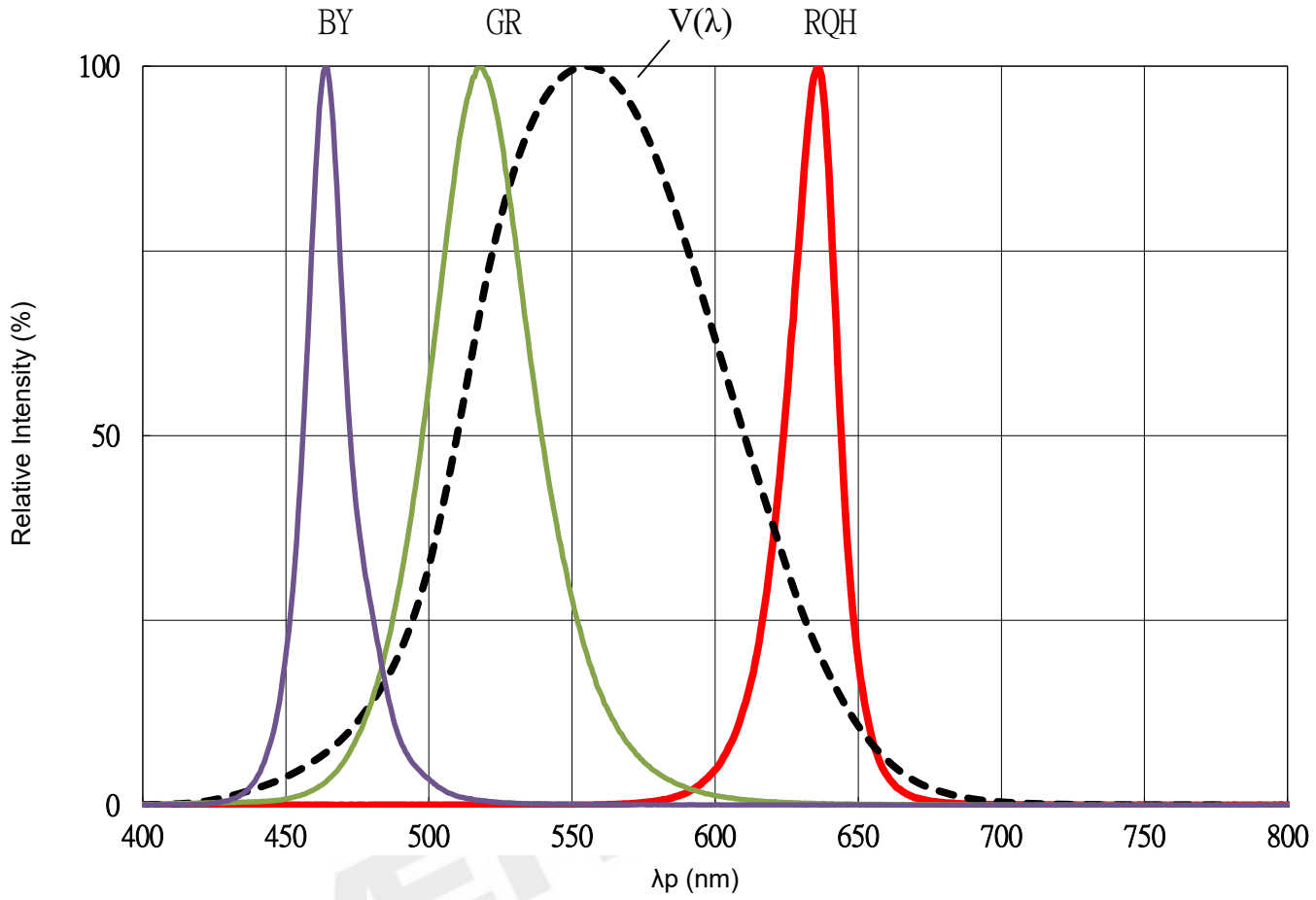



## 5V Application circuit：



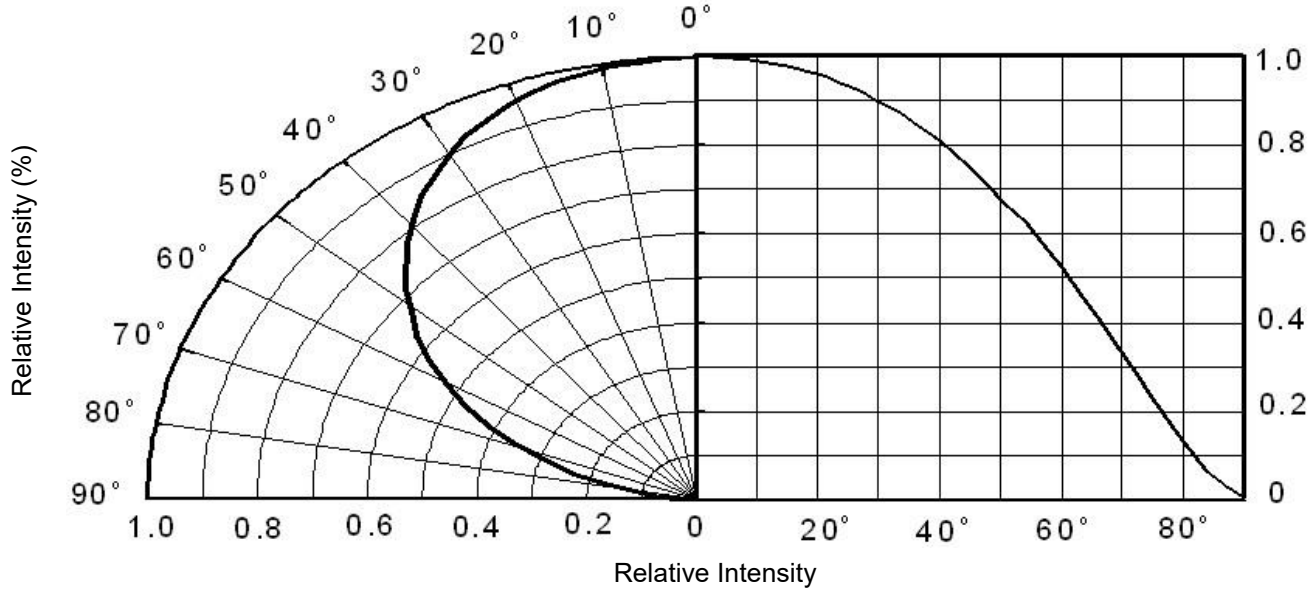
## Typical Electro-Optical Characteristics Curves

### Typical Curve of Spectral Distribution

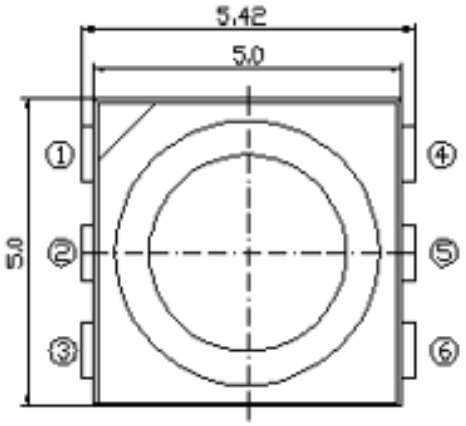



Note: V(λ)=Standard eye response curve;

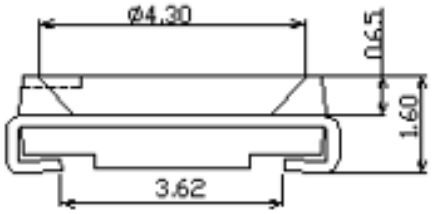
## Diagram Characteristics of Radiation

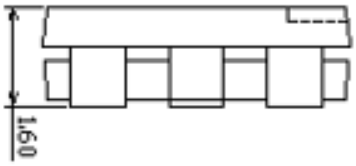


## Package Dimension

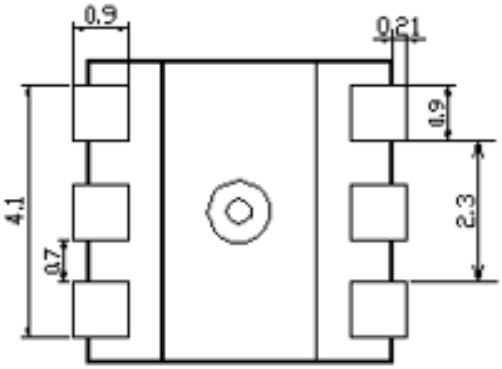


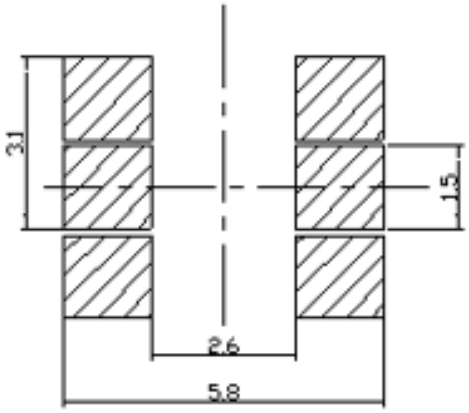

1. Vss 4. Do
2. NA 5. NA
3. Di 6. Vdd




Recommend solding pad design



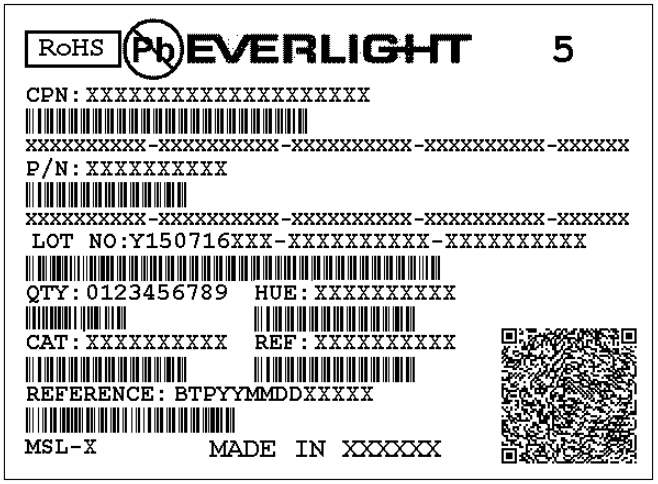

## PIN Configuration

| NO. | Symbol | Function description |
|---|---|---|
| 1 | Vss | Ground |
| 2 | NA | NA |
| 3 | Di | Control data signal input |
| 4 | Do | Control data signal output |
| 5 | NA | NA |
| 6 | Vdd | Power supply control circuit |

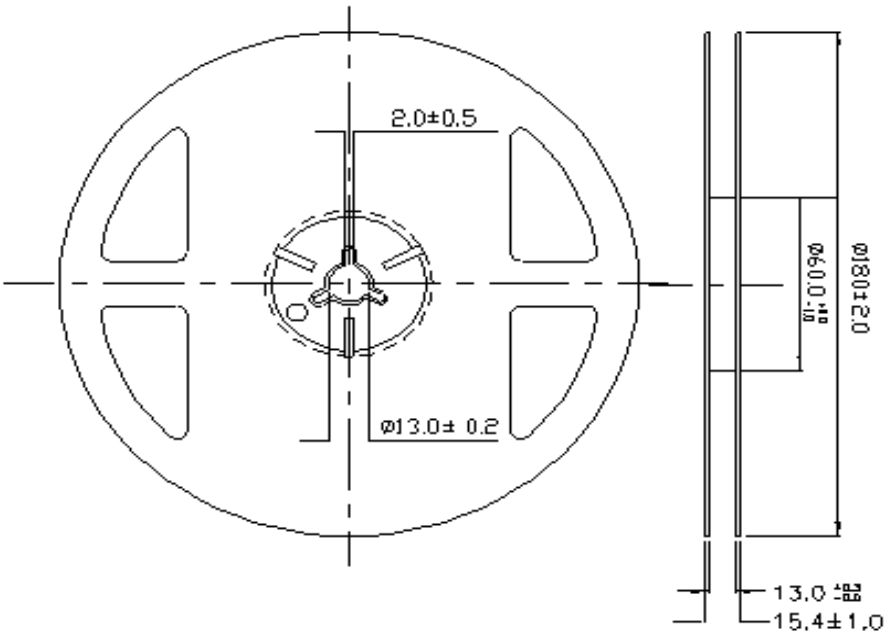
Note: Tolerances unless mentioned ±0.1mm. Unit = mm

## Moisture Resistant Packing Materials

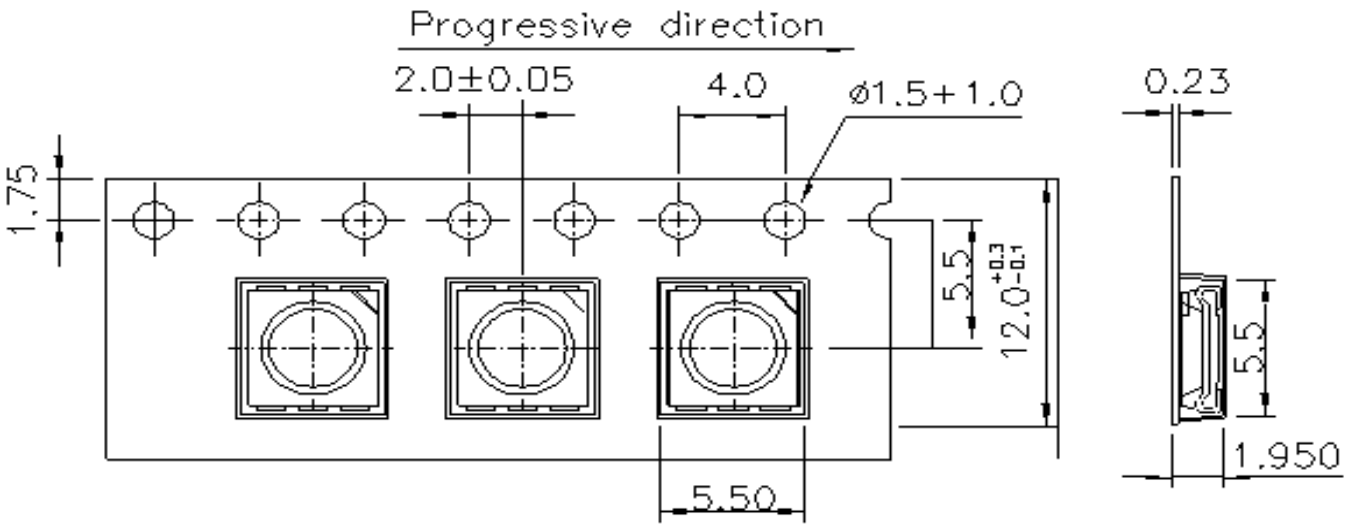
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dominant Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number




## Reel Dimensions

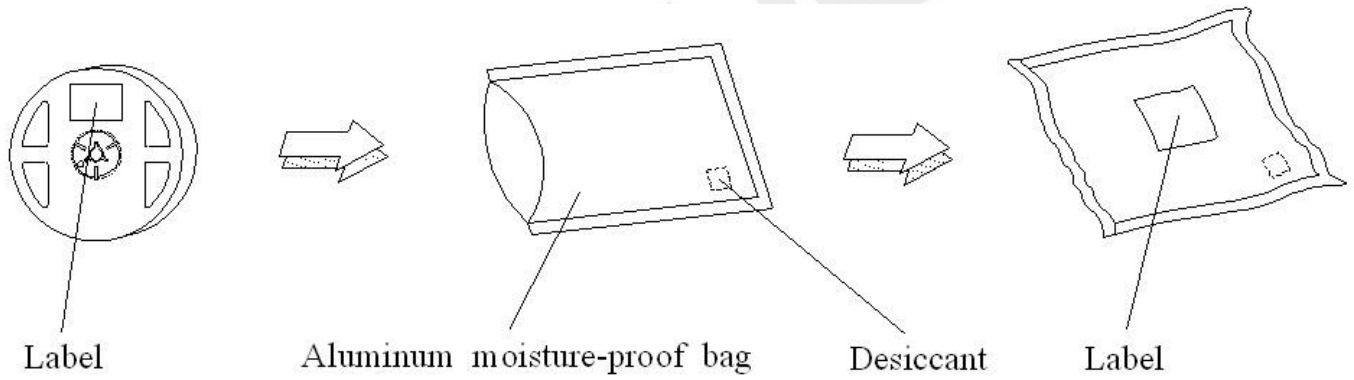


## Carrier Tape Dimensions: Loaded Quantity 800 pcs Per Reel




Note: Tolerances unless mentioned ±0.1mm. Unit = mm

### Moisture Resistant Packing Process

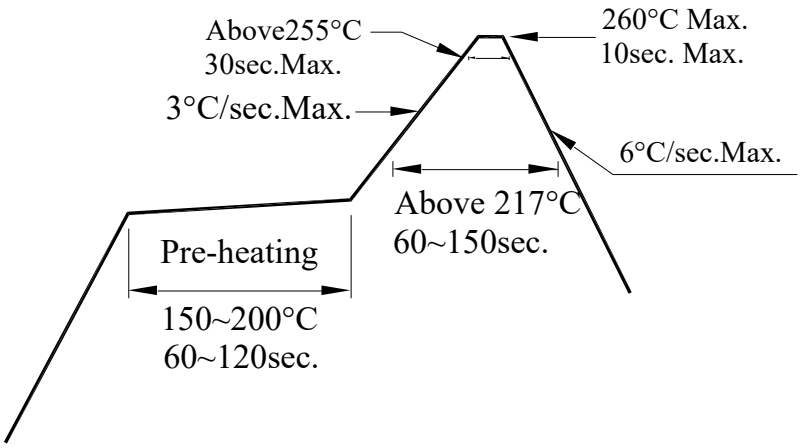



Note: Tolerances unless mentioned ±0.1mm. Unit = mm

## Precautions for Use

1. Over-current-proof

1.1 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℃ or less and 90%RH or less.
2.3 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.
2.4 It is recommended to solder the LED as soon as possible after unpacking the aluminum envelop, But in case that the LED have to be left unused after unpacking envelop again is requested.
The LED should be soldering within 24 hours after opening the package.
If baking is required, A baking treatment should be performed as follows:
60℃±5℃ for more than 24 hours.

3. Soldering Condition

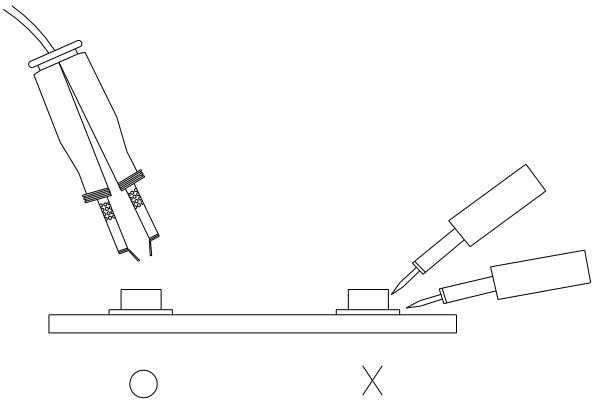
3.1 Pb-free solder temperature profile
3.2 Reflow soldering should not be done more than two times.
3.3 When soldering, do not put stress on the LEDs during heating.
3.4 After soldering, do not warp the circuit board.

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.

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.



## Application Restrictions

High reliability applications such as military/aerospace, automotive safety/security systems, and medical equipment may require different product. If you have any concerns, please contact Everlight before using this product in your application. This specification guarantees the quality and performance of the product as an individual component. Do not use this product beyond the specification described in this document.

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