DATASHEET

# SMD ▪ Side View LEDs

# EAPL3811WA1



## Features

.Side view white LED.

.White SMT package.

.Lead frame package with individual 2 pins.

.Wide viewing angle

.Soldering methods: IR reflow soldering

.Pb-free

.The product itself will remain within RoHS compliant version.

.Compliance with EU REACH.

.Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

## Description

Due to the package design, EAPL3811WA1 has wide viewing angle, low power consumption and white LEDs are devices which are materialized by combing blue chips and special phosphor. This feature makes the LED ideal for light guide application.

## Applications

.Mobile phones.

.Indicators.

.Illuminations.

.Switch lights.


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Device Selection Guide

| Chip Materials | Emitted Color | Resin Color |
|---|---|---|
| InGaN | Pure White | Water Clear |

## Absolute Maximum Ratings (Ta=25℃)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Reverse Voltage | $V_R$ | 5 | V |
| Forward Current | $I_F$ | 30 | mA |
| Peak Forward Current (Duty 1/10 @10ms) | $I_{FP}$ | 60 | mA |
| Power Dissipation | $P_d$ | 110 | mW |
| Operating Temperature | $T_{opr}$ | -40 ~ +85 | ℃ |
| Storage Temperature | $T_{stg}$ | -40 ~ +90 | ℃ |
| Soldering Temperature | $T_{sol}$ | Reflow Soldering : 260 ℃ for 10 sec.<br>Hand Soldering : 350 ℃ for 3 sec. | |

Notes: *1The products are sensitive to static electricity and must be carefully taken when handling products.

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|
| Luminous Intensity | $I_V$ | 1900 | ----- | 2150 | mcd | $I_F$=20mA |
| Viewing Angle | 2θ1/2 | ----- | 120 | ----- | deg | $I_F$=20mA |
| Forward Voltage | $V_F$ | 2.95 | ----- | 3.45 | V | $I_F$=20mA |
| Reverse Current | $I_R$ | ----- | ----- | 50 | μA | $V_R$ =5V |

**Notes:**

1. Tolerance of Luminous Intensity: ±7%.
2. Tolerance of Forward Voltage: ±0.05V.


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Bin Range of Luminous Intensity

| Bin Code | Min. | Max. | Unit | Condition |
|---|---|---|---|---|
| 36 | 1900 | 1950 | mcd | $I_F$=20mA |
| 37 | 1950 | 2000 | | |
| 38 | 2000 | 2050 | | |
| 39 | 2050 | 2100 | | |
| 40 | 2100 | 2150 | | |

**Notes:** Tolerance of Luminous Intensity: ±7%.

## Bin Range of Forward Voltage

| Bin Code | Min. | Max. | Unit | Condition |
|---|---|---|---|---|
| 6-1 | 2.95 | 3.05 | V | $I_F$=20mA |
| 6-2 | 3.05 | 3.15 | | |
| 7-1 | 3.15 | 3.25 | | |
| 7-2 | 3.25 | 3.35 | | |
| 8-1 | 3.35 | 3.45 | | |

**Notes:** Tolerance of Forward Voltage: ±0.05V.


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

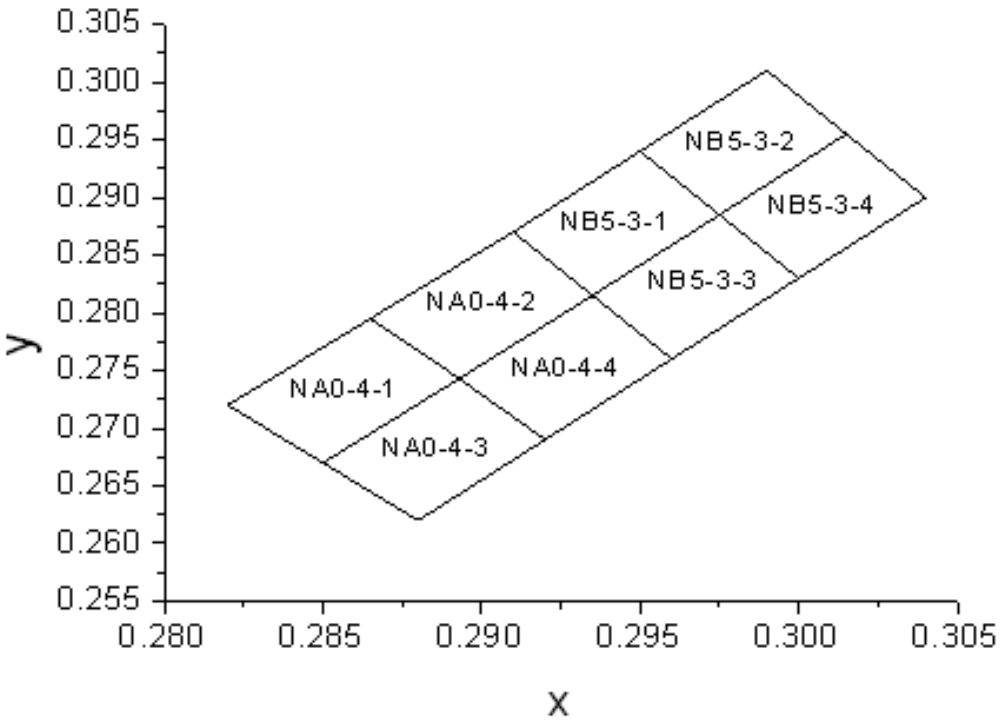
## Chromaticity Coordinates of Bin Code

| Bin Code | CIE_x | CIE_y | Bin Code | CIE_x | CIE_y |
|---|---|---|---|---|---|
| NA0-4-1 | 0.2850 | 0.2670 | NA0-4-2 | 0.2893 | 0.2743 |
| | 0.2820 | 0.2720 | | 0.2865 | 0.2795 |
| | 0.2865 | 0.2795 | | 0.2910 | 0.2870 |
| | 0.2893 | 0.2743 | | 0.2935 | 0.2815 |
| NA0-4-3 | 0.2880 | 0.2620 | NA0-4-4 | 0.2920 | 0.2690 |
| | 0.2850 | 0.2670 | | 0.2893 | 0.2743 |
| | 0.2893 | 0.2743 | | 0.2935 | 0.2815 |
| | 0.2920 | 0.2690 | | 0.2960 | 0.2760 |
| NB5-3-1 | 0.2935 | 0.2815 | NB5-3-2 | 0.2975 | 0.2885 |
| | 0.2910 | 0.2870 | | 0.2950 | 0.2940 |
| | 0.2950 | 0.2940 | | 0.2990 | 0.3010 |
| | 0.2975 | 0.2885 | | 0.3015 | 0.2955 |
| NB5-3-3 | 0.2960 | 0.2760 | NB5-3-4 | 0.3000 | 0.2830 |
| | 0.2935 | 0.2815 | | 0.2975 | 0.2885 |
| | 0.2975 | 0.2885 | | 0.3015 | 0.2955 |
| | 0.3000 | 0.2830 | | 0.3040 | 0.2900 |

**Notes:** Tolerance of Chromaticity Coordinates: ±0.01


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

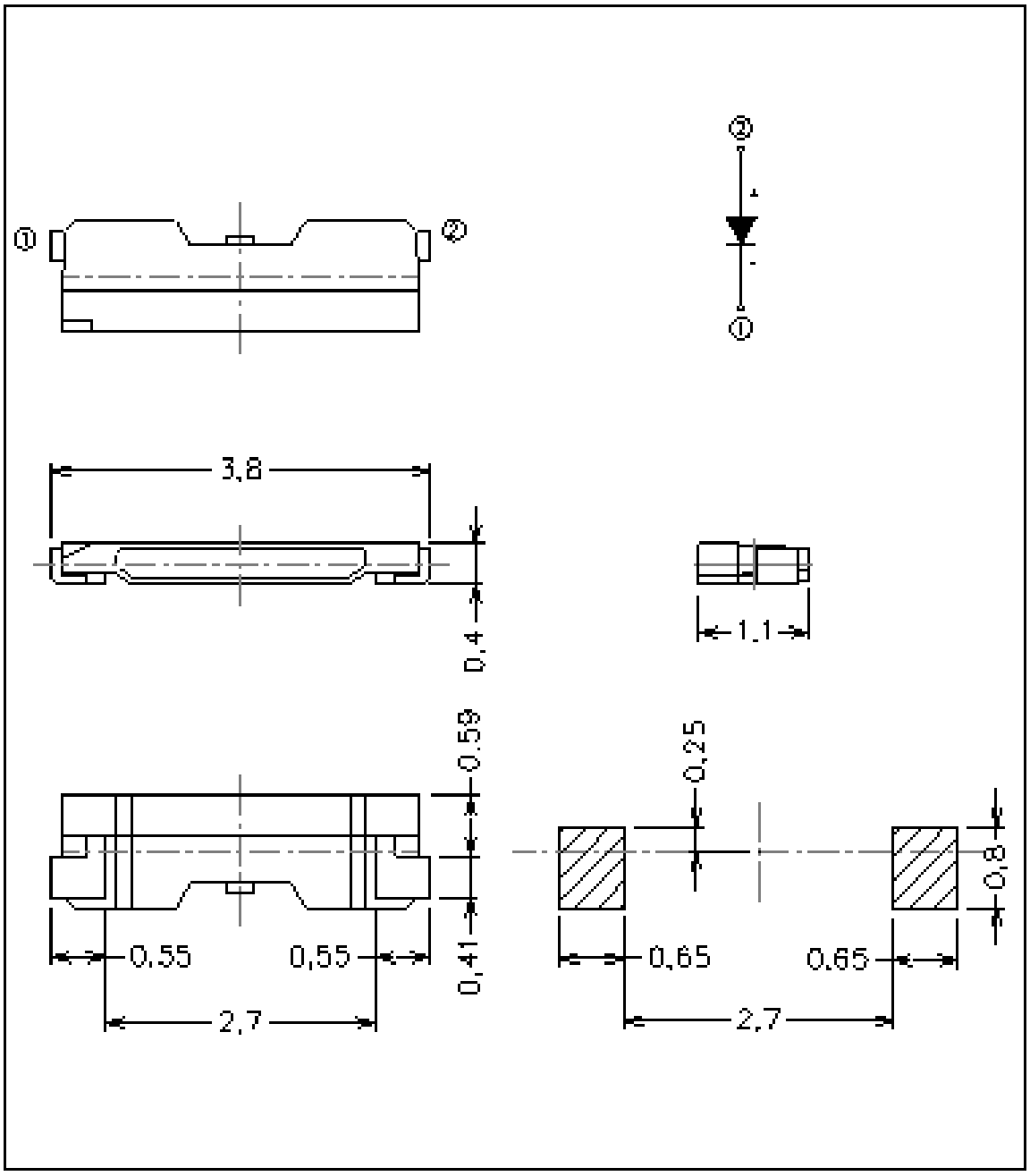
## The C.I.E. 1931 Chromaticity Diagram





Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Package Outline Dimensions



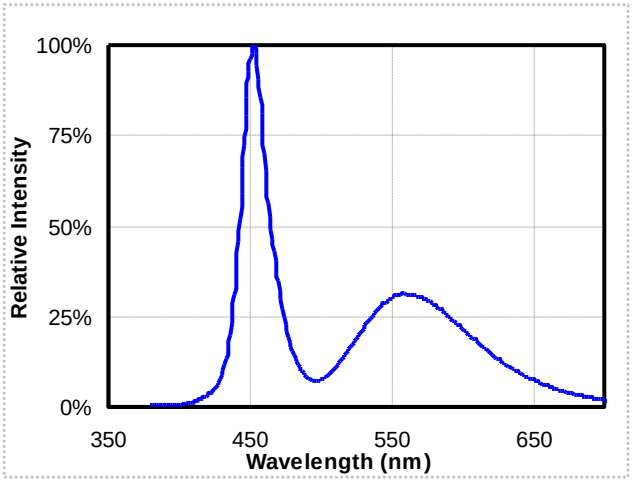

**Notes:** The tolerances unless mentioned is ±0.1mm,Unit = mm.


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Typical Electro-Optical-Thermal Characteristics Curves

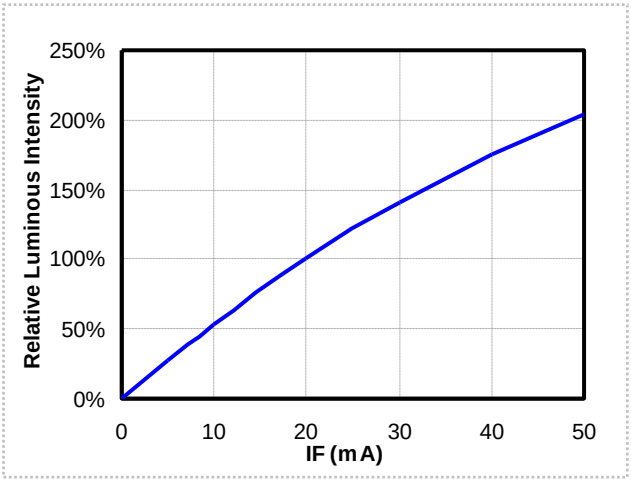
1. Spectrum Distribution

($T_A$=25℃, $I_F$=20mA)



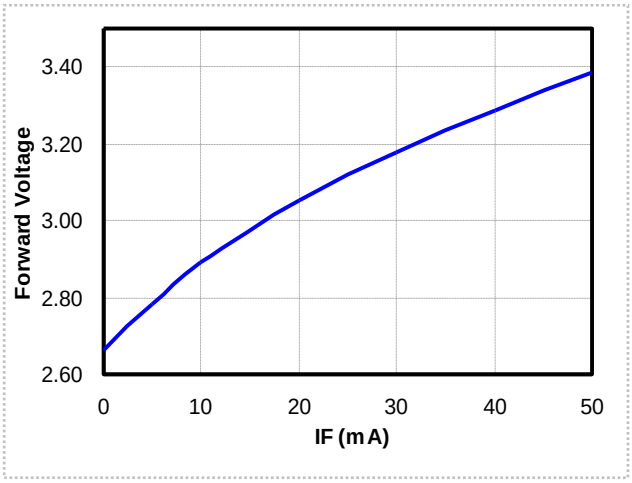

2. Relative Luminous Intensity vs. Forward Current

($T_A$=25℃)



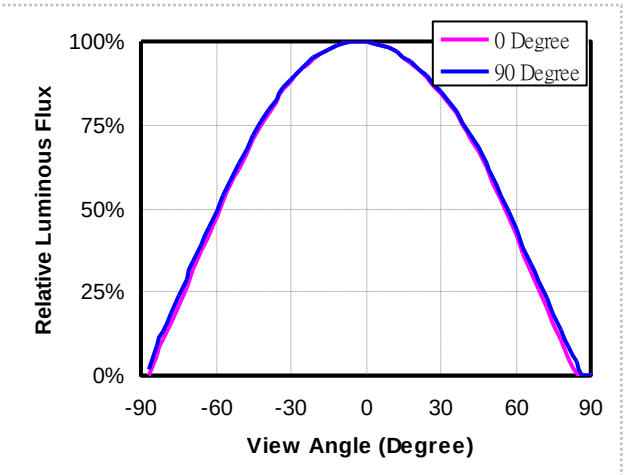

3. Relative Forward Voltage vs. Forward Current

($T_A$=25℃)




4. Radiation Diagram

($T_A$=25℃, $I_F$=20mA)

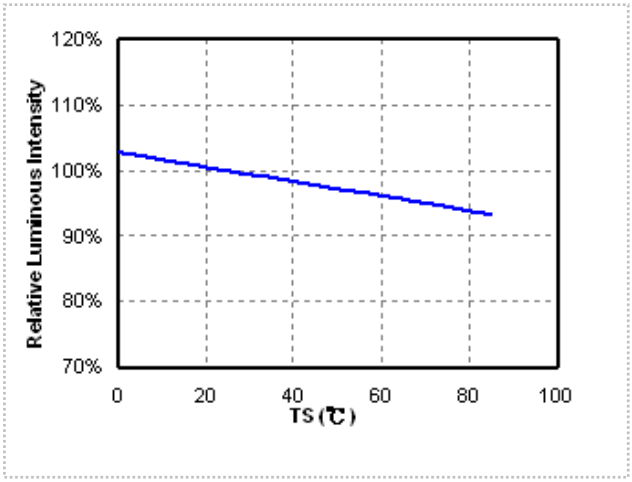




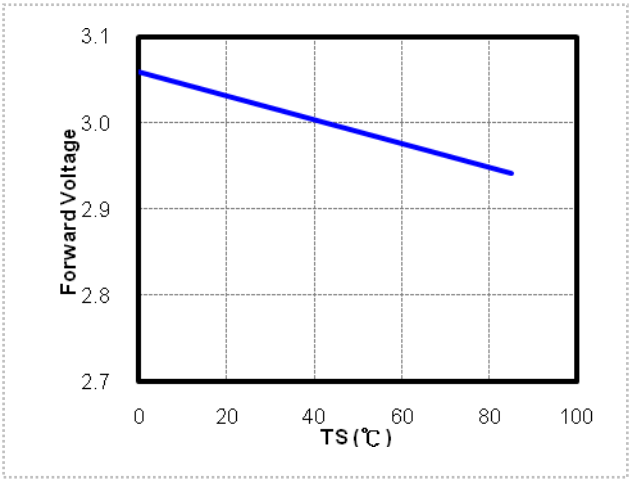
Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Typical Electro-Optical-Thermal Characteristics Curves

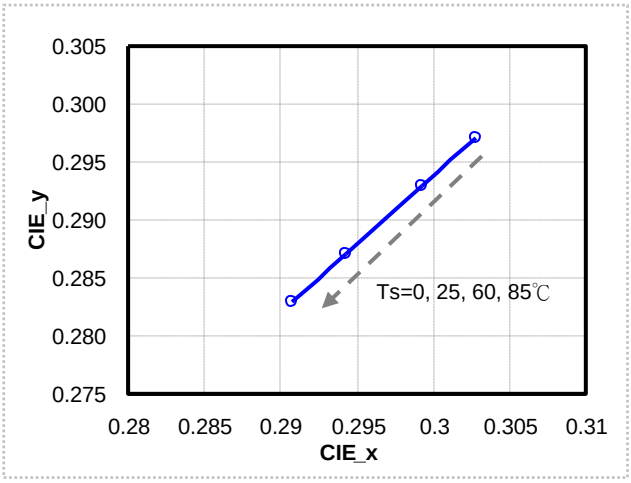
5. Relative Luminous Intensity vs. Solder Temperature ($I_F$=20mA)



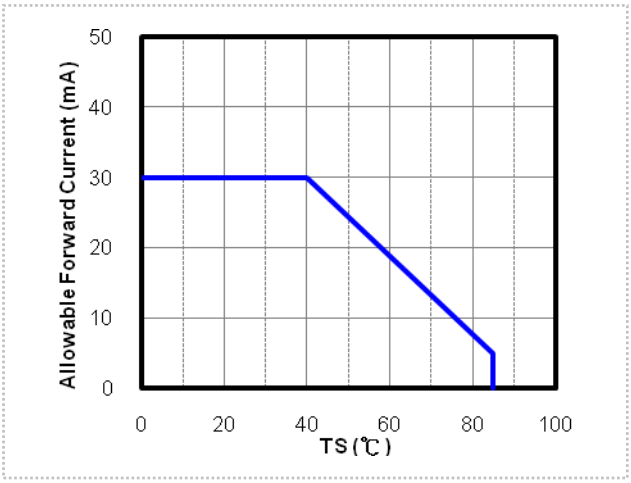

6. Forward Voltage vs. Solder Temperature ($I_F$=20mA)




7. Chromaticity Coordinates vs. Solder Temperature ($I_F$=20mA)




8. Forward Current De-rating Curve





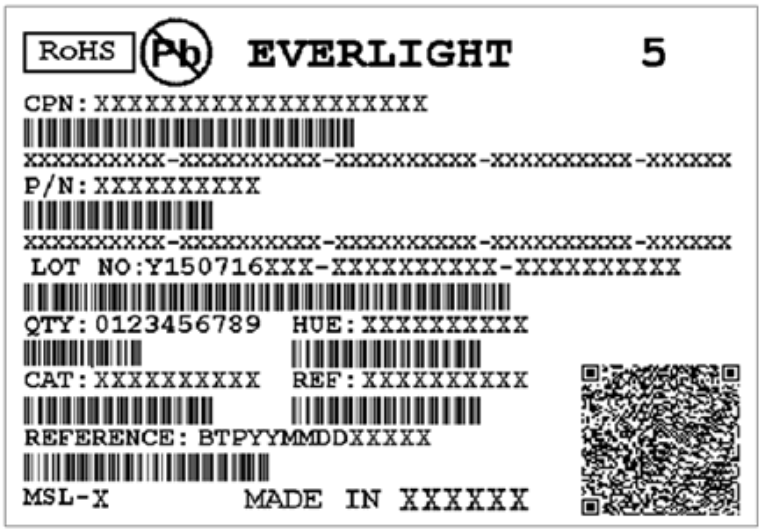
Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Label Explanation

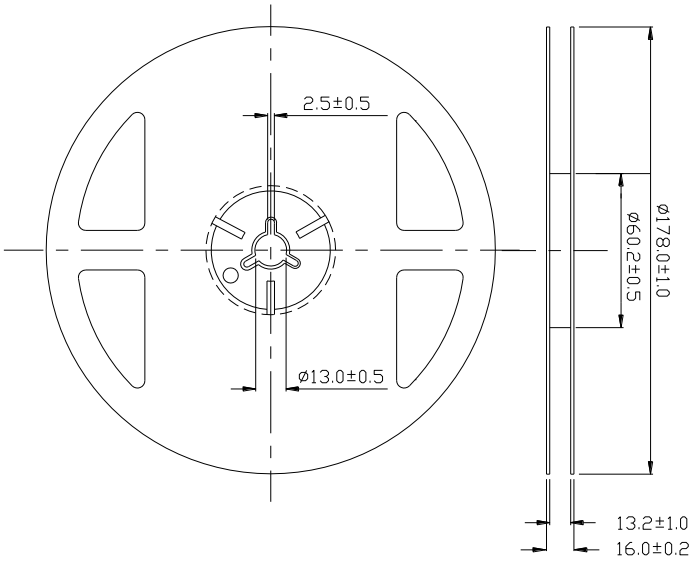
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank




## Reel Dimensions

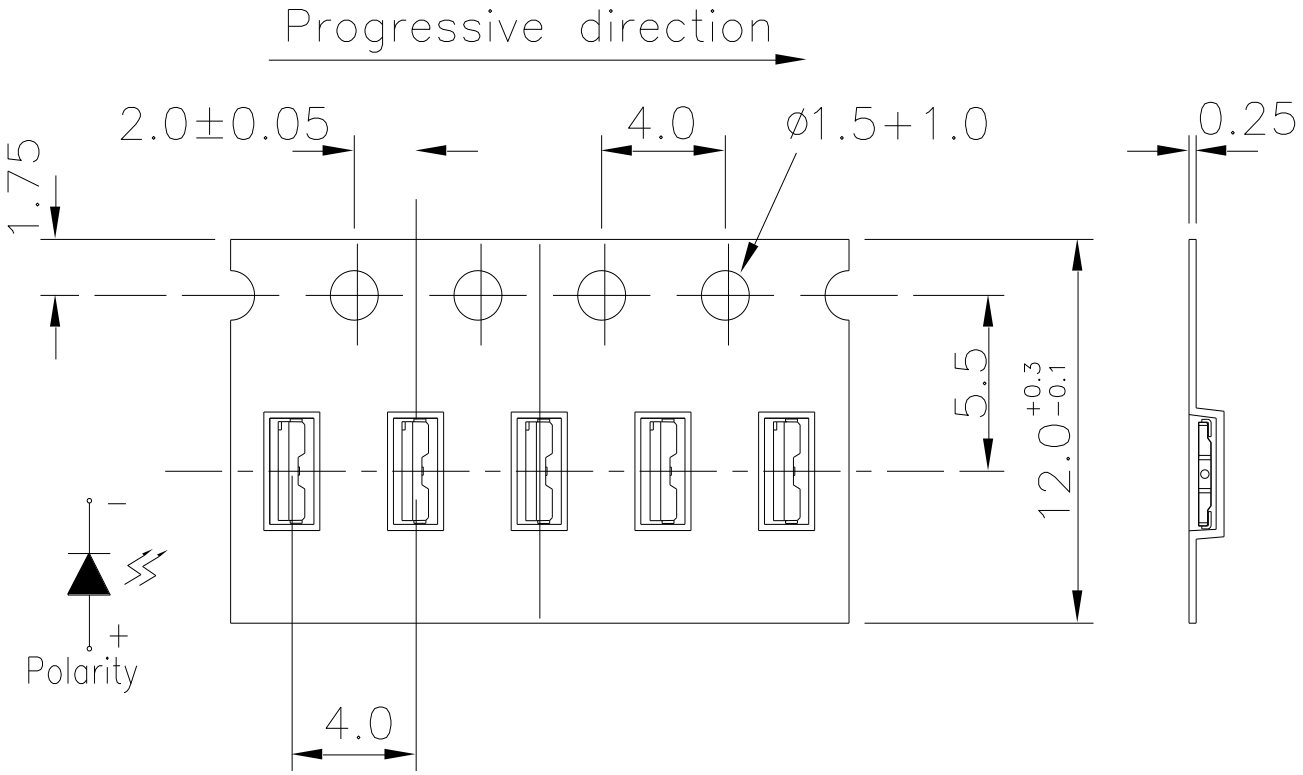



## Note:

The tolerances unless mentioned is ±0.1mm,Unit = mm.

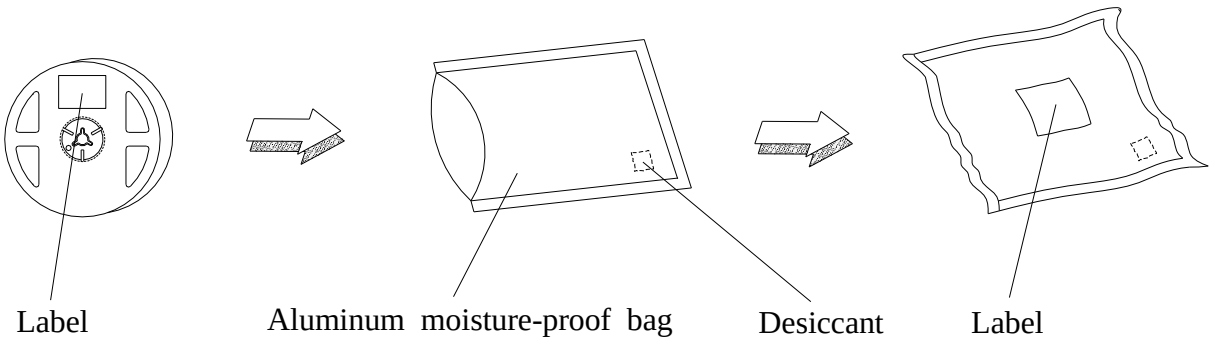

Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Carrier Tape Dimensions: Loaded Quantity 250 up/500/1000/2000 pcs. Per Reel




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

## Moisture Resistant Packaging





Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

| NO | Item | Test Condition | | Test Hours / Times | Criteria | |
|---|---|---|---|---|---|---|
| | | Temp./ Humidity | IF (mA) | | Iv@20 mA | $V_F$@ 20mA |
| 1 | Reflow Soldering | T = 260℃, Max. 10sec. | | 2 time | <±10% | <±10% |
| 2 | Temperature cycle | -40℃ ~ 100℃<br>30min. (5min.) 30min. | | 200 cycles | Iv > 70%,<br>VF < 110%, | |
| 3 | Thermal Shock | -10℃ ~ 100℃<br>20min. (<15sec.) 20min. | | 200 cycles | | |
| 4 | Low Temp. Storage | Ta= -40℃ | -- | 1000 hrs | | |
| 5 | High Temp. Storage | Ta= 100℃ | -- | 1000 hrs | | |
| 6 | Temp. Humidity Storage | Ta= 60℃/ 90%RH | -- | 1000 hrs | | |
| 7 | Steady State Operating Life of Low Temp. | Ta= -40℃ | 20 | 1000 hrs | | |
| 8 | Steady State Operating Life Condition 1 | Ta= 25℃/ Room Humidity | 20 | 1000 hrs | | |
| 9 | Steady State Operating Life Condition 2 | Ta= 60℃ | 20 | 1000 hrs | | |
| 10 | Steady State Operating Life of High Temp. | Ta= 85℃ | 5 | 1000 hrs | | |
| 11 | Steady State Operating Life of High Humidity Heat | Ta= 60℃/ 90%RH | 20 | 1000 hrs | | |

Notes:

1. Sampling for each test item: 22 (pcs.)
2. Test board: PCB board thickness=1.0mm, copper layer thickness=0.07mm, Rth j-a≒380℃/W.
3. Measurements are performed after allowing the LEDs to return to room temperature


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

## 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.

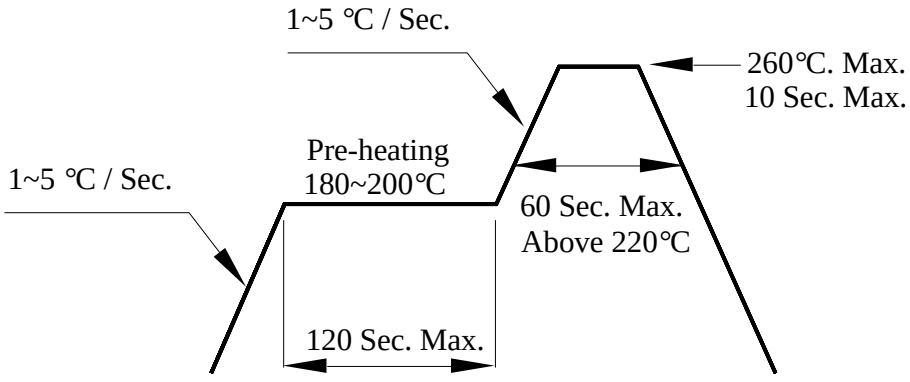
2.2 Before opening the package: The LEDs should be used within one year and kept at 30℃ or less and 70%RH or less.

2.3 After opening the package: We recommend that the LED should be soldered quickly (within 3 days). The soldering condition is 30℃ 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. (One time only)

3. Soldering Condition

3.1 Pb-free solder temperature profile





Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1

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.

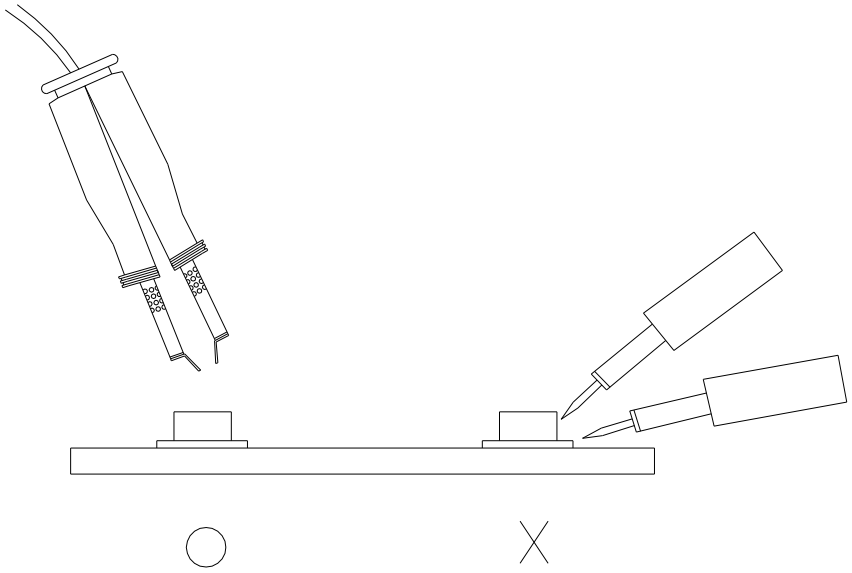
3.4 After soldering, do not warp the circuit board.

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.



6. Handling Indications

During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.


Copyright © 2014, Everlight All Rights Reserved. Release Date : 19.Jan.2017. Issue No: V1.1