

## CSP Top view LEDs

## CSP0603AN101-WP26220602801-3T(DEL)(SHB)

**Features**

- Dimension: 0.6\*0.3\*0.15 mm LED
- Direct attach-Flip Chip type
- Wide viewing angle.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes
- Computable with automatic placement equipment.
- Available on tape and reel (8mm Tape).
- Pb-free.
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)
- Precondition: Bases on JEDEC J-STD 020D Level 3

**Descriptions**

- The 0603 CSP LED is much smaller than general components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.

**Applications**

- Status indicator, keypad, keyboard, and industrial equipment.
- Light pipe application.
- General use.

## Device Selection Guide

Type	Chip Materials	Emitted Color	Resin Color
W	InGaN	White	Yellowish

## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	20	mA
Peak Forward Current (Duty 1/10 @1KHz)	I <sub>FP</sub>	40	mA
Power Dissipation	P <sub>d</sub>	72	mW
Junction Temperature	T <sub>j</sub>	115	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +90	°C
ESD	ESD <sub>HBM</sub>	2000	V
Soldering Temperature	T <sub>sol</sub>	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 <sub>v</sub>	60	77	90	mcd	I <sub>F</sub> =1mA
Viewing Angle	2θ <sub>1/2</sub>	-----	150	-----	deg	I <sub>F</sub> =1mA
Forward Voltage	V <sub>F</sub>	2.45	2.6	2.75	V	I <sub>F</sub> =1mA
Low Current Voltage	V <sub>FL</sub>	2.2	-----	2.5	V	I <sub>F</sub> =1uA
High Current Voltage	V <sub>FH</sub>	2.9	-----	3.5	V	I <sub>F</sub> =60mA @5ms
Reverse Current	I <sub>R</sub>	-----	-----	0.1	μA	V <sub>R</sub> =5V

### Notes:

1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.1V
3. Led components are not supposed to be reverse operated
4. Electric and optical data are reference only.

### Chip Domain Wavelength (Wd)

Chip	Min.	Max.	Unit
Blue Chip	450.0	452.5	nm
	452.5	455.0	
	455.0	457.5	

Note:  
Tolerance of Domain Wavelength:  $\pm 1\text{nm}$

### Bin Range of Luminous Intensity

Chip	Bin Code	Min.	Max.	Unit	Condition
W	A	60	71	mcd	IF=1mA
	B	71	90		

Note:  
Tolerance of Luminous Intensity:  $\pm 11\%$

### Bin Range of Forward Voltage

Chip	Bin Code	Min.	Max.	Unit	Condition
W	VA	2.45	2.55	V	IF=1mA
	VB	2.55	2.65		
	VC	2.65	2.75		

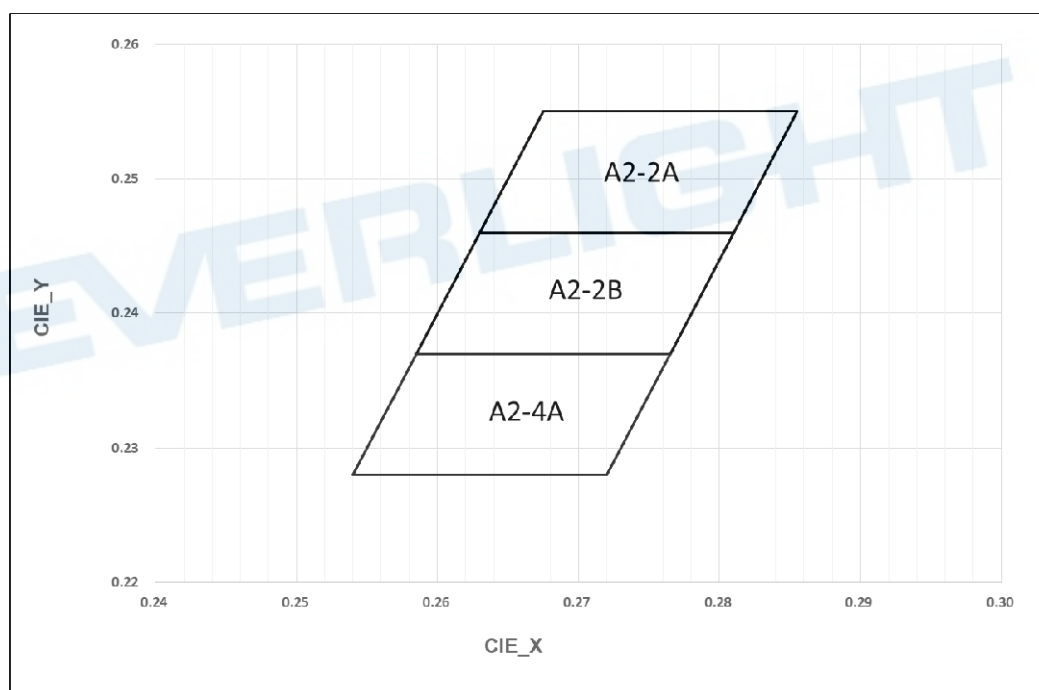
Note:  
Tolerance of Forward Voltage:  $\pm 0.1\text{V}$

## Bin Range of Chromaticity Coordinates

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
A2-2A	0.2675	0.2550	A2-2B	0.2630	0.2460	A2-4A	0.2585	0.2370
	0.2855	0.2550		0.2810	0.2460		0.2765	0.2370
	0.2810	0.2460		0.2765	0.2370		0.2720	0.2280
	0.2630	0.2460		0.2585	0.2370		0.2540	0.2280

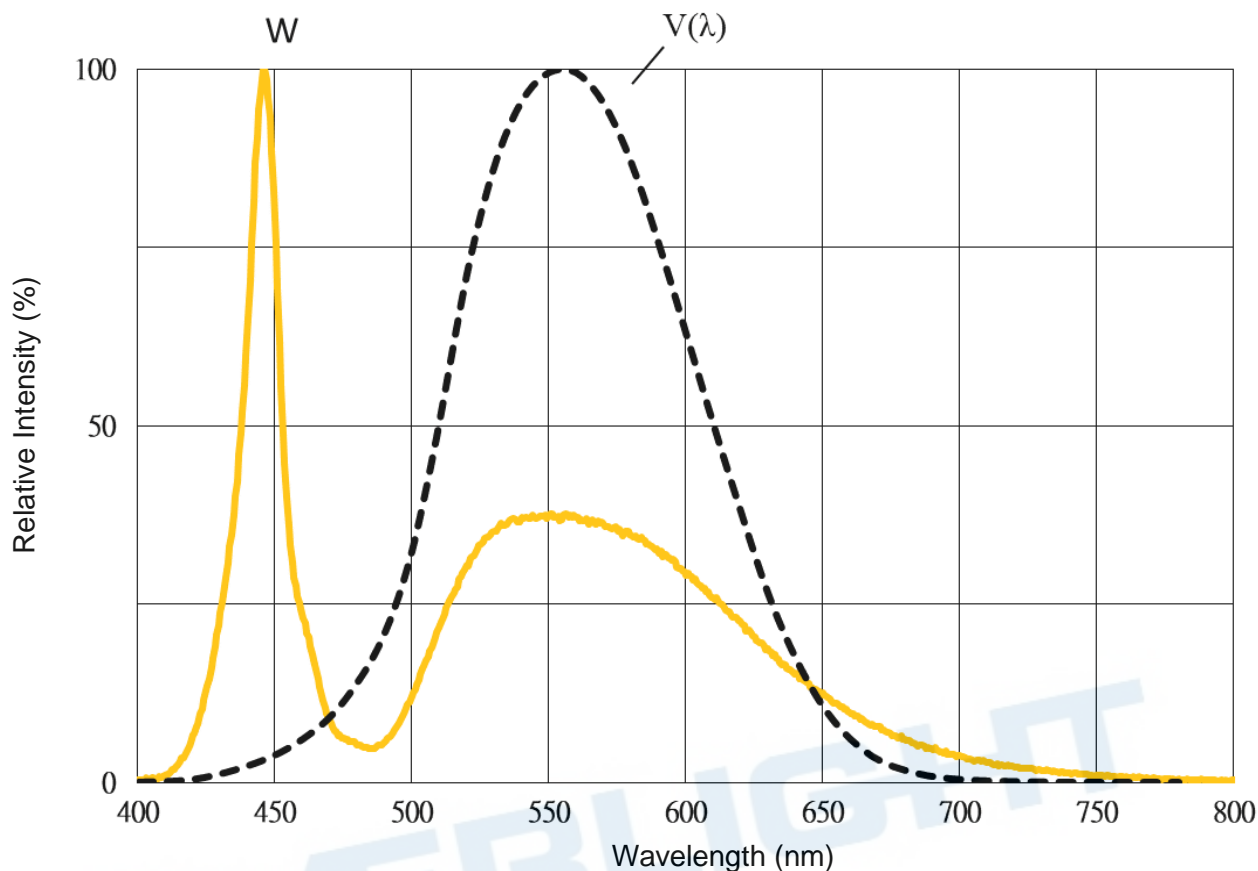
Notes: Tolerance of Chromaticity Coordinates :  $\pm 0.01$

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



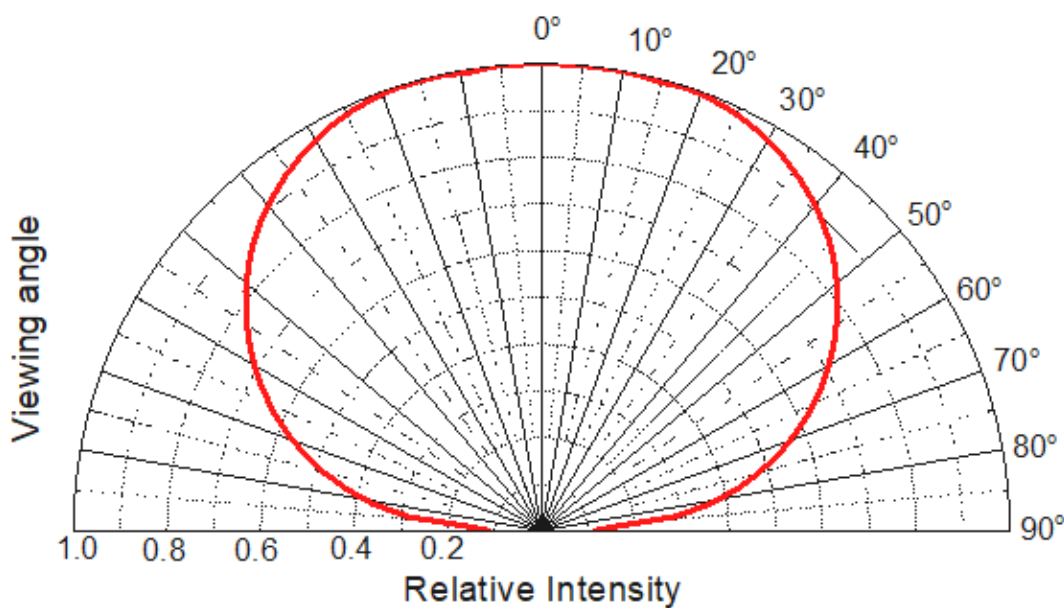
## Typical Electro-Optical Characteristics Curves

### Typical Curve of Spectral Distribution



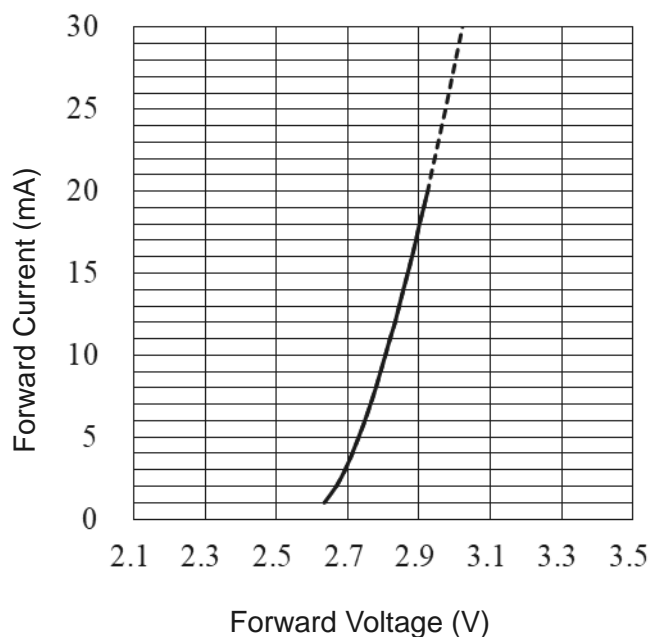
Note:  $V(\lambda)$ =Standard eye response curve;  $I_F = 1\text{mA}$

### Diagram Characteristics of Radiation

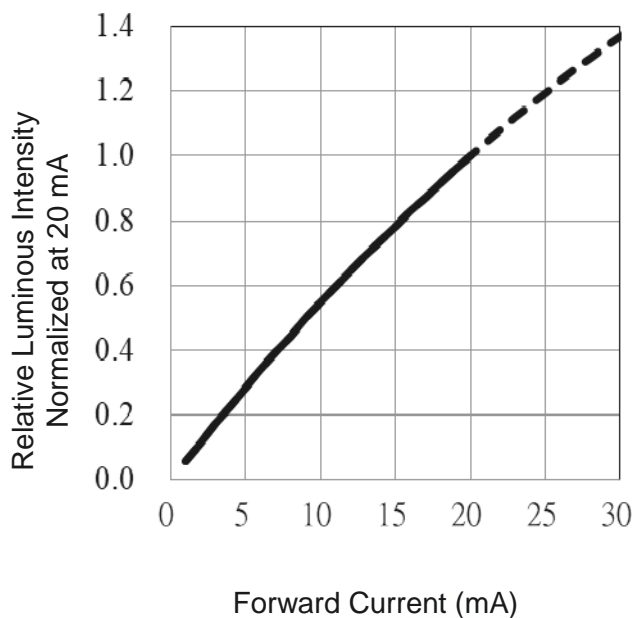


## Typical Electrical-Optical Characteristics Curves (25°C Ambient Temperature)

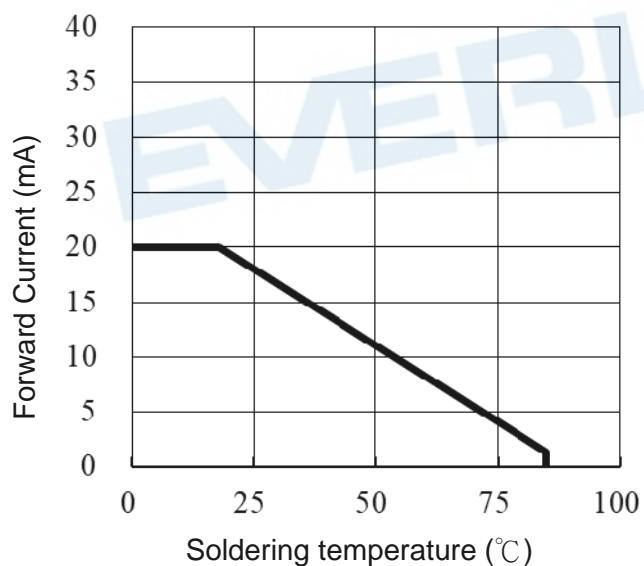
Forward Current vs. Forward Voltage



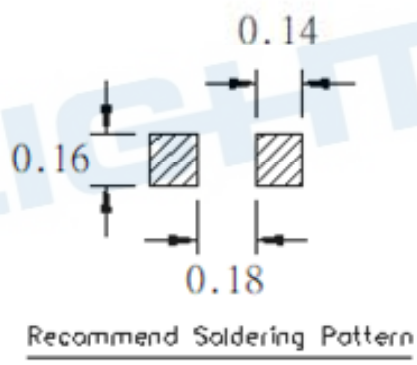
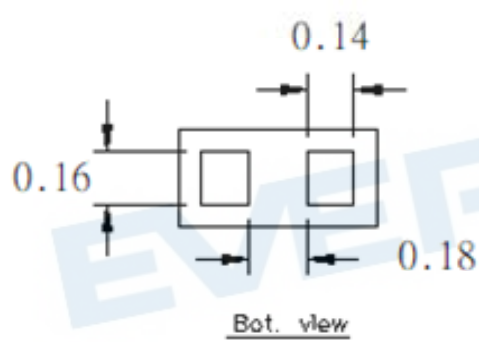
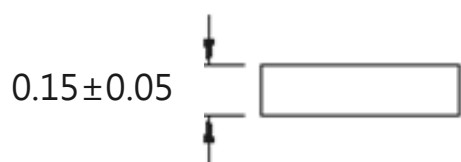
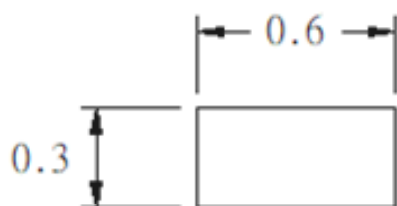
Relative Luminous Intensity vs. Forward Current



Forward Current Derating Curve



## Package Dimension



Suggested pad dimension is just reference only.

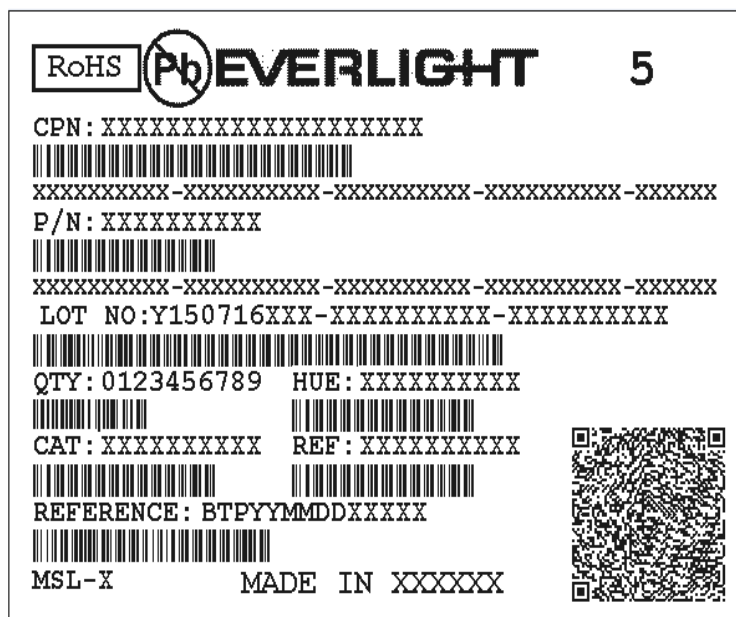
Please modify the pad dimension based on individual need.

### Note:

1. Tolerances unless mentioned  $\pm 0.05\text{mm}$ . Unit = mm
2. Chip to colloid edge size is controlled to a minimum of 0.025mm

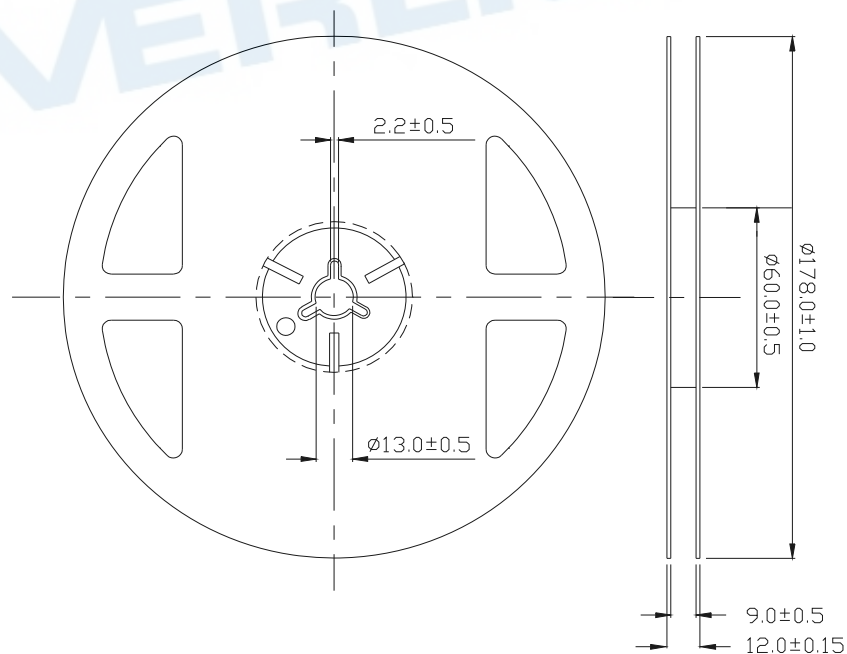
## Moisture Resistant Packing Materials

### Label Explanation



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

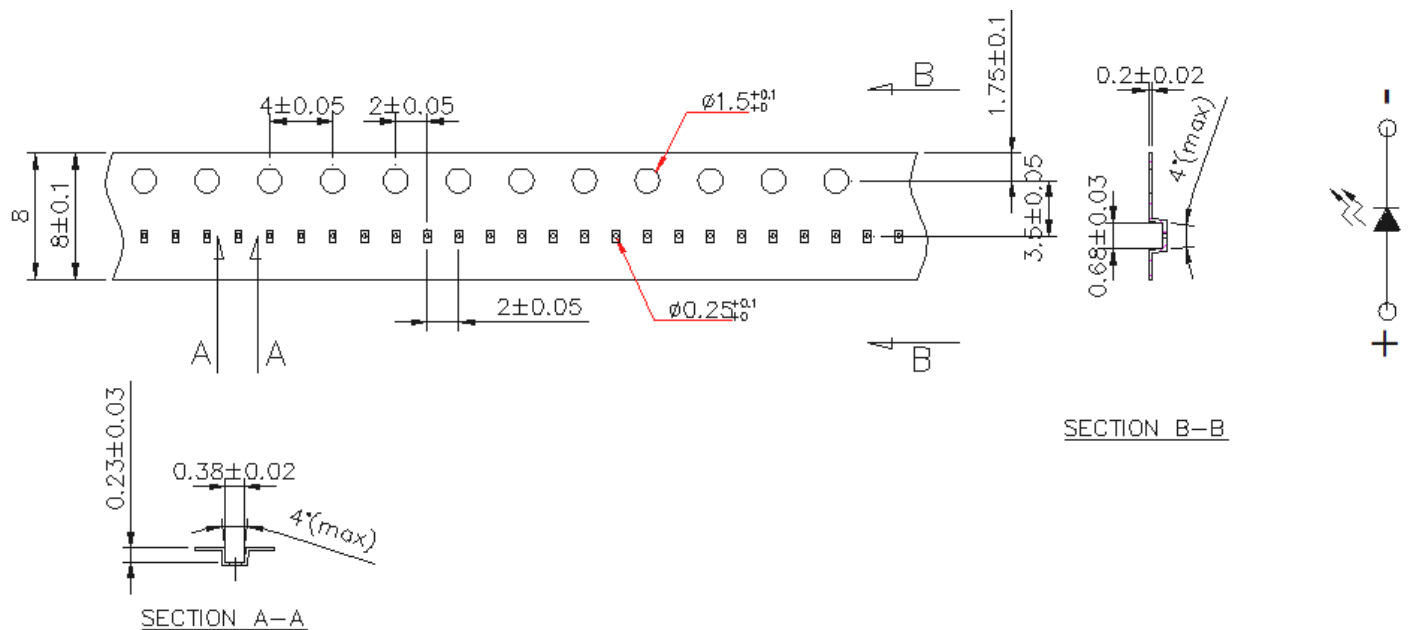
### Reel Dimensions



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



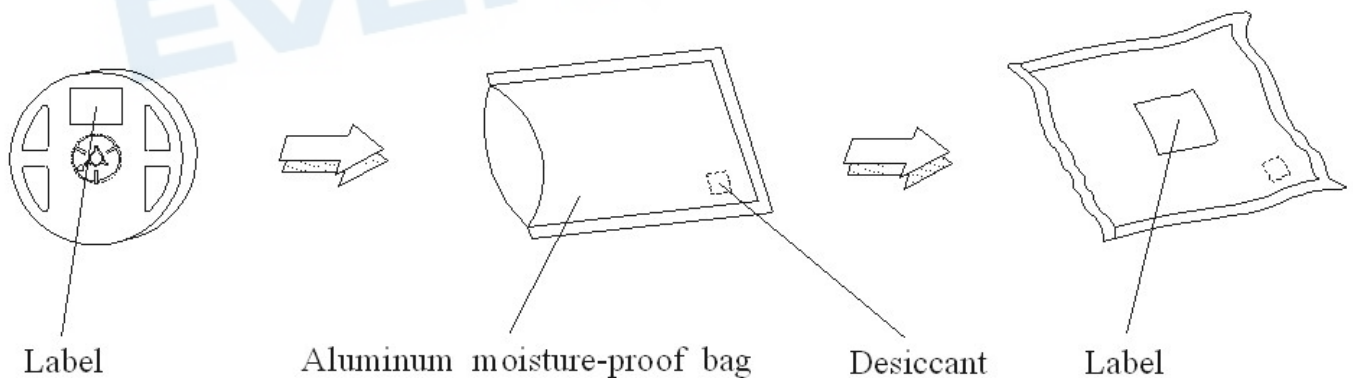
## Carrier Tape Dimensions:



### Notes:

1. Tolerances unless mentioned  $\pm 0.1$  mm. Unit = mm
2. Minimum package quantity is 250 pieces for remainders
3. All dimensions without tolerances are for reference only.

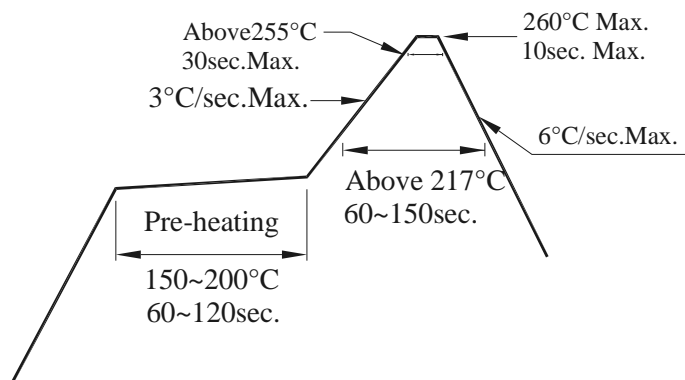
## Moisture Resistant Packing Process



## 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 Moisture proof bag should only be opened immediately prior to usage.

2.2 Environment should be less than 30°C and 60% RH when moisture proof bag is opened.

2.3 After opening the package MSL Conditions stated on page 1 of this spec should not be exceeded.

2.4 If the moisture sensitivity card indicates higher than acceptable moisture, the component should be baked at min. 60deg +/-5deg 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.

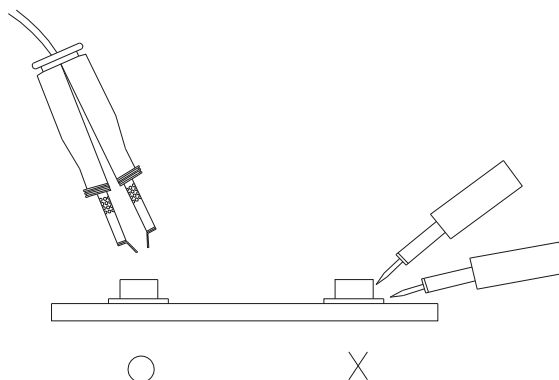
3.4 After soldering, do not warp the circuit board.

### 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.

### 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.



## Reliability Test Items and Conditions

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

No.	Item	Test Condition		Test Hours/ Times
		Temp./ Humidity	IF (mA)	
1	Reflow* <sup>3</sup>	Temp.: 245°C±5°C Max. 10 sec.	--	5 time
2	Steady State Operating Life of Low Temp.	TA=25°C	20	1000 hrs
3	High Temp. Storage	TA=100°C	--	1000 hrs
4	Low Temp. Storage	TA=-40°C	--	1000 hrs
5	Temp. Humidity Storage	TA=85°C/ 85%RH	--	1000 hrs
6	Temperature Cycle	-40°C ~ 100°C 15min. (5min.) 15min.	--	300 cycles
7	Thermal Shock	-25°C ~ 100°C 5min. (10sec.) 5min.	--	300 cycles

### Notes:

1. Sampling for each test item: 22 (pcs)
2. Measurements are performed after allowing the LEDs to return to room temperature.
3. Reflow test for Independent LED package only.

### Mini CSP recommendation

Action	Suggestions
Move or place	Avoid touching the LED with sharp tools or fingers to prevent damage to the LED; For manual assembly and placement, vacuum nozzle or rubber tipped tweezers are recommended.
Rework	Recycling and reuse of LED are not recommended after rework.
Carry	To avoid stacking and collision, special holders must be used.
Clean	1. Do not use cyclohexane or other organic solvent products to clean flux(Alcohol is exception) 2. Do not use acetone to clean.

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## 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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