

### SMD ■ Side View LEDs

### EAPL4508RGBA4

#### Features

- White package.
- Optical indicator.
- Colorless clear window.
- Ideal for backlight and light pipe application.
- Inter reflector.
- Wide viewing angle.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- Computable with automatic placement equipment.
- Available on tape and reel (12mm Tape)
- Pb-free
- The product itself will remain within RoHS compliant version.
- MSL-3



#### Descriptions

- The 99-235 series is available in soft red, green and blue.  
Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes the 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

- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
- General use.

## Device Selection Guide

Type	Chip Material	Emitted Color	Resin Color
RS	AlGaInP	Brilliant Red	Water Clear
GB	InGaN	Brilliant Green	
B7	InGaN	Blue	

## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit	
Reverse Voltage	$V_R$	5	V	
Forward Current	$I_F$	RS	50	mA
		GB	30	
		B7	30	
Peak Forward Current(Duty 1/10@ 1KHZ)	$I_{FP}$	RS	100	mA
		GB	100	
		B7	100	
Power Dissipation	$P_d$	RS	130	mW
		GB	110	
		B7	110	
Electrostatic Discharge(HBM)	ESD	RS	2000	V
		GB	1000	
		B7	1000	
Operating Temperature	$T_{opr}$	-40 ~ +85	°C	
Storage Temperature	$T_{stg}$	-40~ +90	°C	
Soldering Temperature	$T_{sol}$	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.		

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

**Electro-Optical Characteristics (Ta=25°C)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
Luminous Intensity	I <sub>v</sub>	RS	225	-----	560	mcd	
		GB	715	-----	1420		
		B7	57	-----	140		
Viewing Angle	2 θ 1/2	-----	120	-----	deg	I <sub>F</sub> =17mA (R) I <sub>F</sub> =18mA (G) I <sub>F</sub> =9mA (B)	
Dominant Wavelength	λ d	RS	618	-----	627		nm
		GB	520	-----	535		
		B7	457	-----	466		
Forward Voltage	V <sub>F</sub>	RS	1.80	-----	2.30		V
		GB	2.75	-----	3.45		
		B7	2.75	-----	3.45		
White point coordinate	x	-----	0.294	-----	-----		
	y	-----	0.286	-----	-----		
Reverse Current	I <sub>R</sub>	RS	-----	-----	10	μ A	V <sub>R</sub> =5V

Notes:

- 1.Tolerance of Luminous Intensity ±11%
- 2.Tolerance of Dominant Wavelength ±1nm
3. Tolerance of Forward Voltage : ±0.1V

### Bin Range of Luminous Flux

Symbol		Bin Code	Min.	Max.	Unit	Condition
I <sub>v</sub>	RS	S2	225	285	mcd	I <sub>F</sub> =17mA (R) I <sub>F</sub> =18mA (G) I <sub>F</sub> =9mA (B)
		T1	285	360		
		T2	360	450		
		U1	450	560		
	GB	V1	715	900		
		V2	900	1120		
		W1	1120	1420		
	B7	P2	57	72		
		Q1	72	90		
		Q2	90	112		
		R1	112	140		

Notes: Tolerance of Luminous Flux: ±7%

### Bin Range of Forward Voltage

Symbol		Bin Code	Min.	Max.	Unit	Condition
V <sub>F</sub>	RS	RV1	1.80	2.05	V	I <sub>F</sub> =17mA (R) I <sub>F</sub> =18mA (G) I <sub>F</sub> =9mA (B)
		RV2	2.05	2.30		
	GB	GV1	2.75	3.10		
		GV2	3.10	3.45		
	B7	BV1	2.75	3.10		
		BV2	3.10	3.45		

Note:

1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.1V

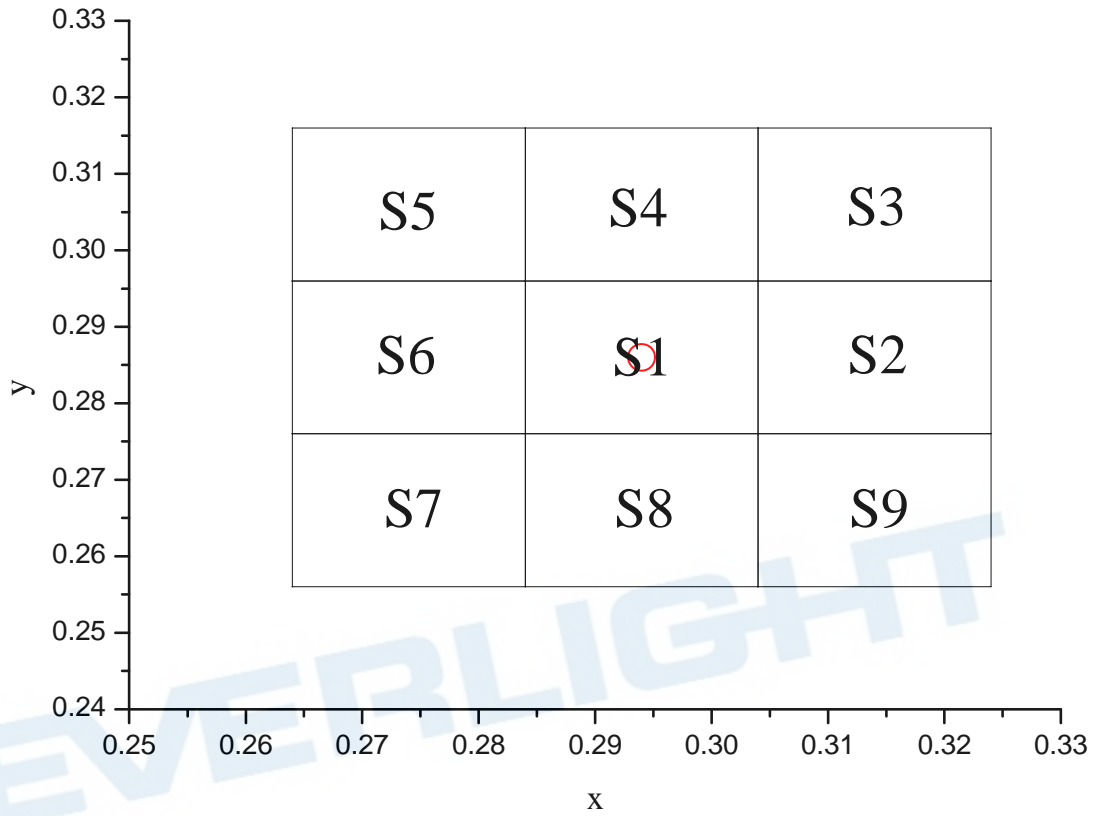
### Bin Range of Chromaticity Coordinate

R/G/B=17/18/9mA

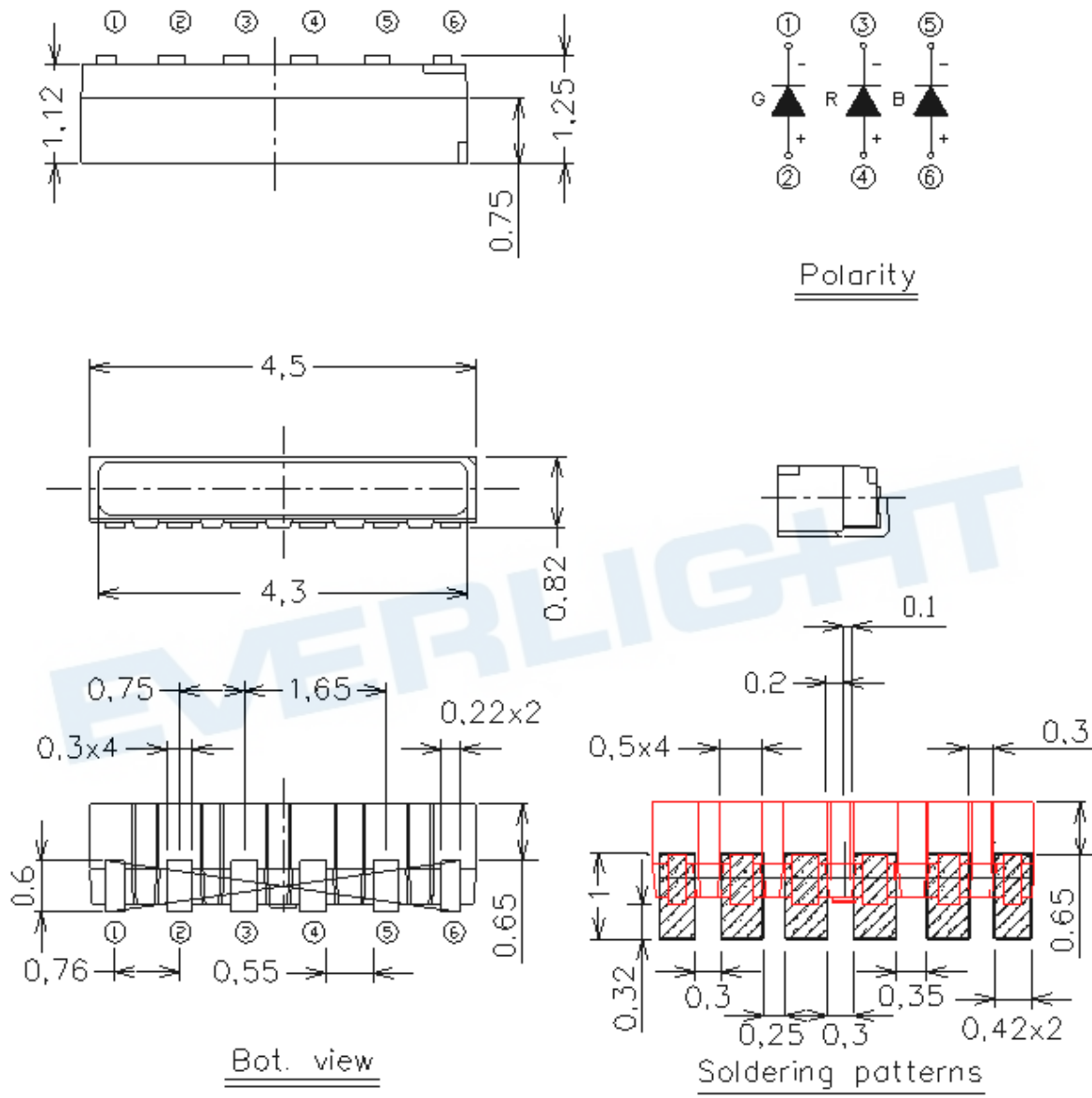
Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
S1	0.284	0.276	S2	0.304	0.276
	0.284	0.296		0.304	0.296
	0.304	0.296		0.324	0.296
	0.304	0.276		0.324	0.276
S3	0.304	0.296	S4	0.284	0.296
	0.304	0.316		0.284	0.316
	0.324	0.316		0.304	0.316
	0.324	0.296		0.304	0.296
S5	0.264	0.296	S6	0.264	0.276
	0.264	0.316		0.264	0.296
	0.284	0.316		0.284	0.296
	0.284	0.296		0.284	0.276
S7	0.264	0.256	S8	0.284	0.256
	0.264	0.276		0.284	0.276
	0.284	0.276		0.304	0.276
	0.284	0.256		0.304	0.256
S9	0.304	0.256			
	0.304	0.276			
	0.324	0.276			
	0.324	0.256			

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

**The C.I.E. 1931 Chromaticity Diagram**  
**R/G/B=17/18/9mA**

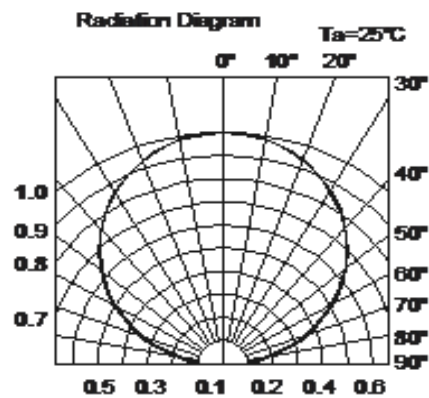
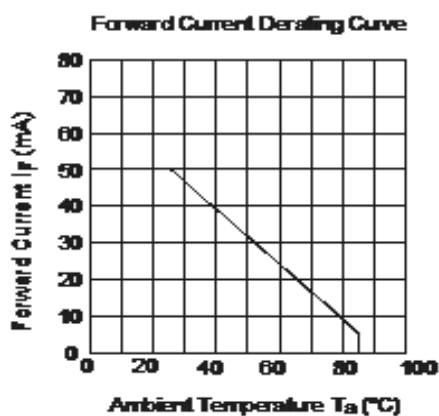
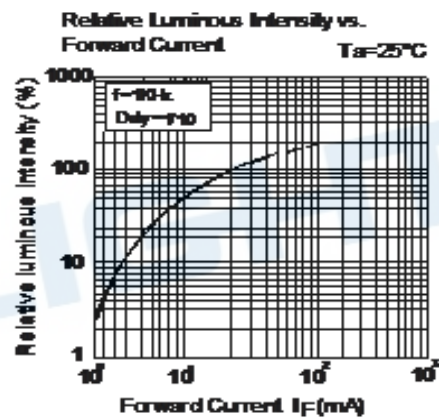
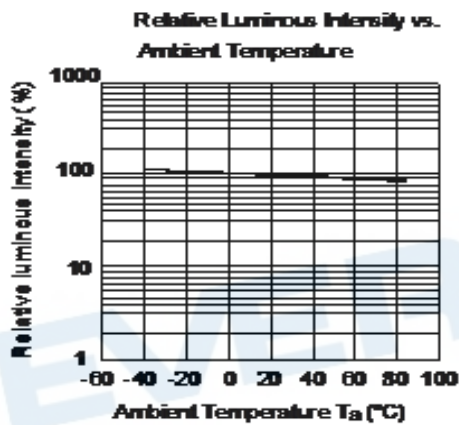
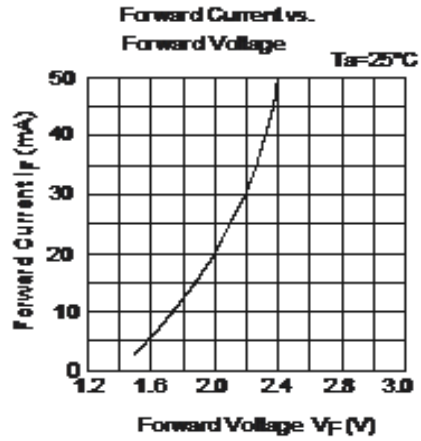
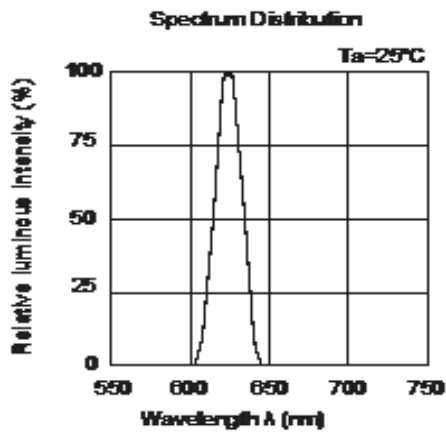


### Package Outline Dimensions



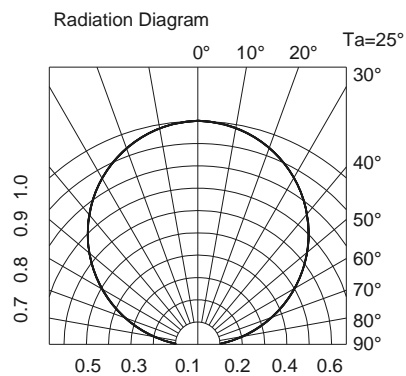
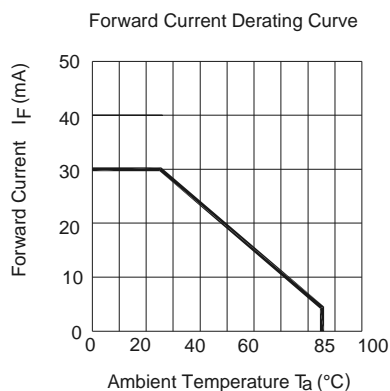
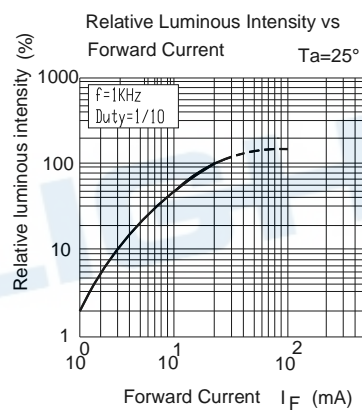
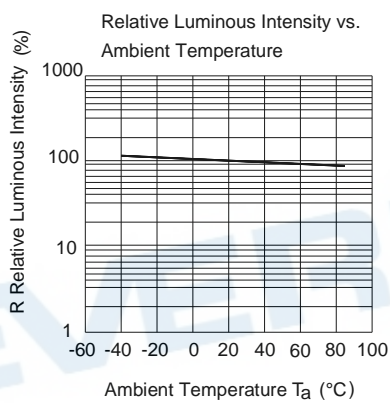
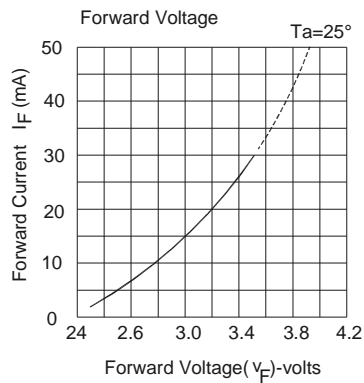
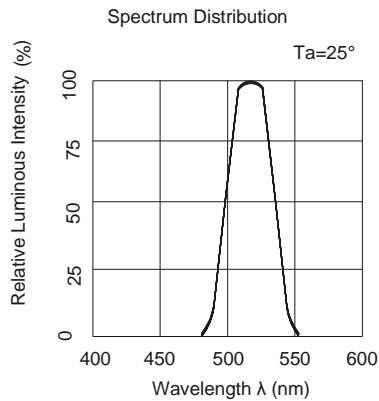
**Notes:** The tolerances unless mentioned is  $\pm 0.1$ mm, Unit = mm.

Typical Electro-Optical-Thermal Characteristics Curves(RS)

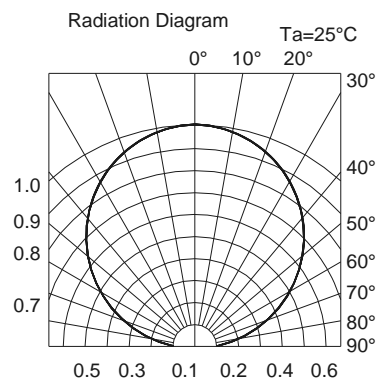
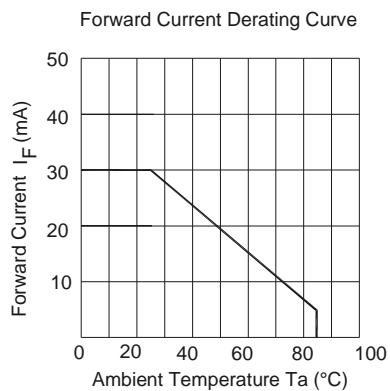
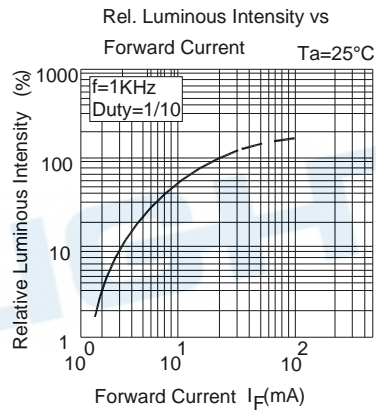
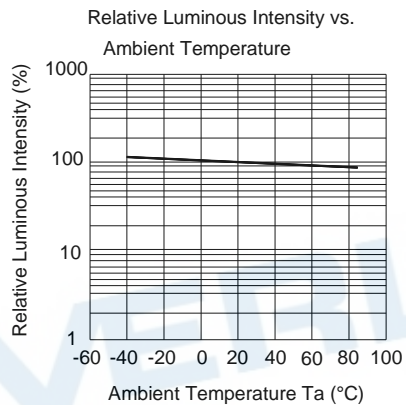
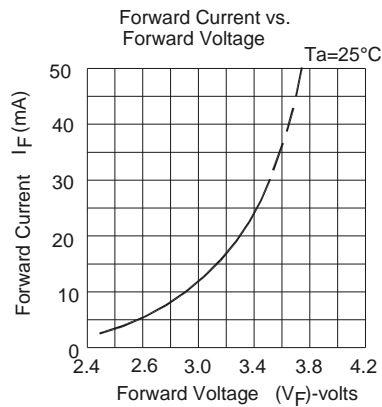
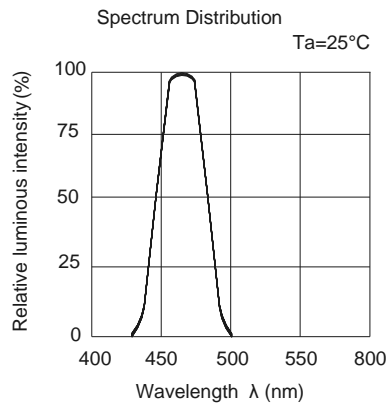




## Typical Electro-Optical-Thermal Characteristics Curves(GB)

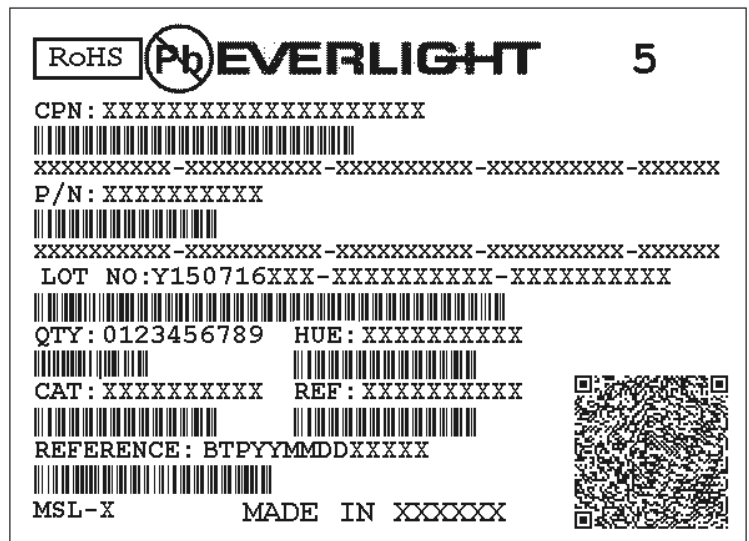


## Typical Electro-Optical Characteristics Curves(B7)

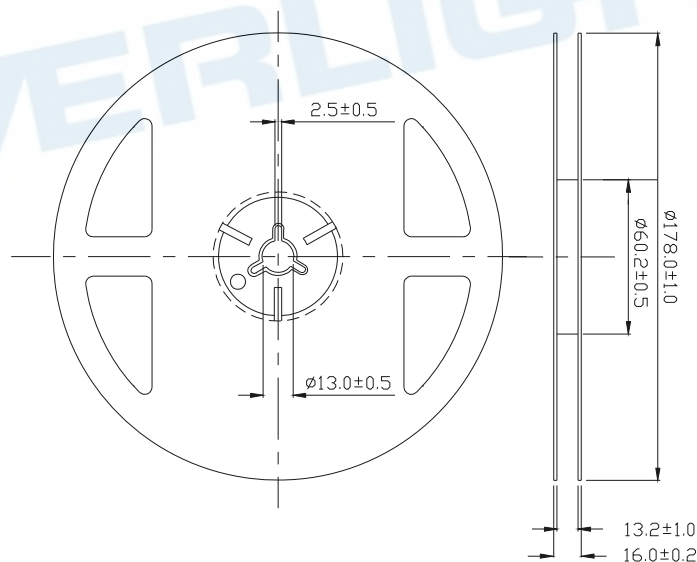


### Label Explanation

- CAT: Luminous Flux Rank
- HUE: Chromaticity Coordinates
- REF: Forward Voltage Rank

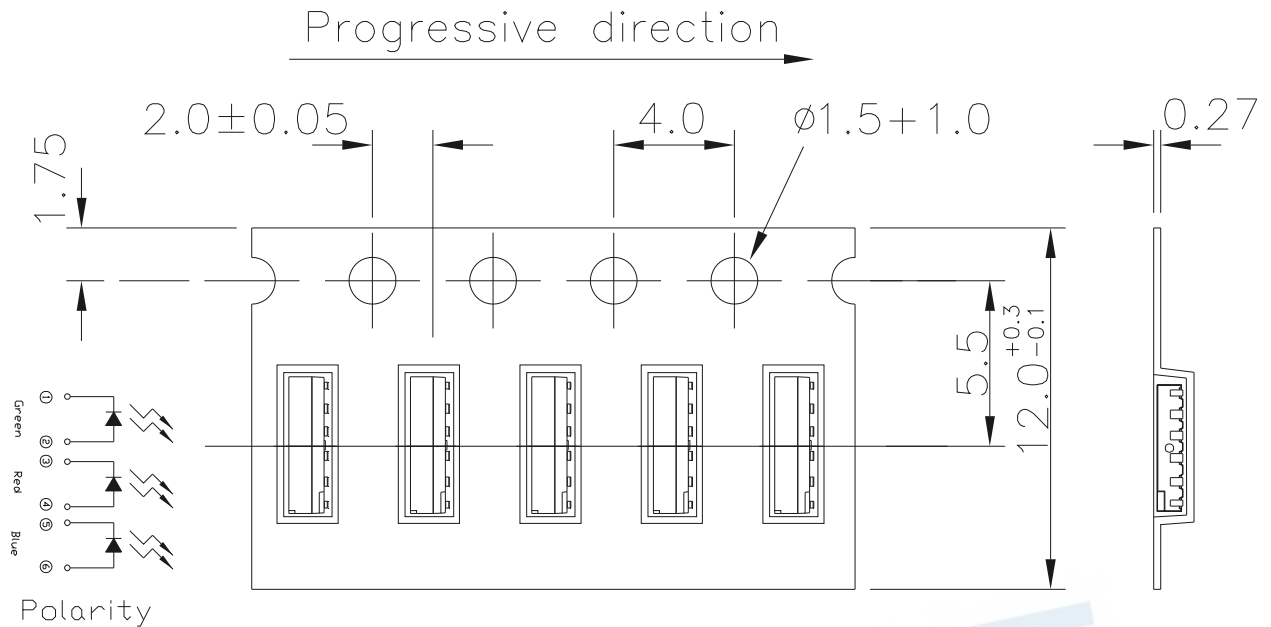


### Reel Dimensions



Note: The tolerances unless mentioned is  $\pm 0.1$ mm, Unit = mm.

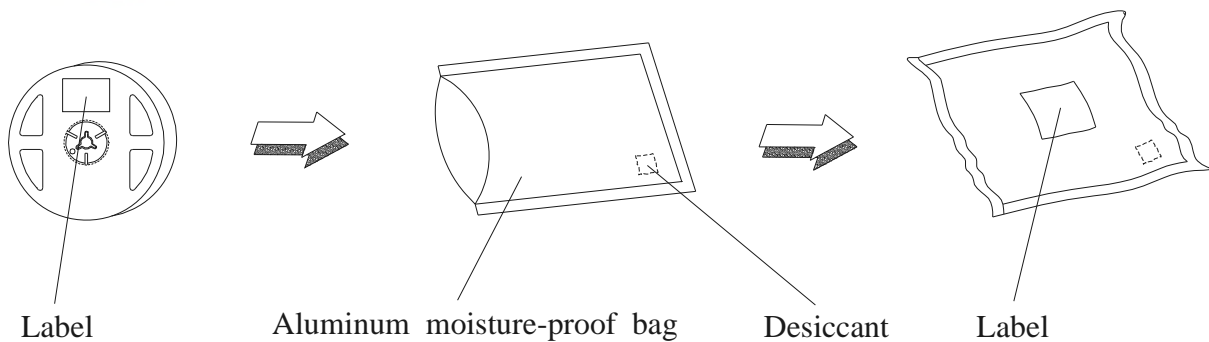
**Carrier Tape Dimensions: Loaded Quantity 2000pcs. Per Reel**



**Note:**

1. Tolerance unless mentioned is  $\pm 0.1$ mm; Unit = mm
2. Minimum packing amount is 250/500/1000/2000 pcs per reel.

**Moisture Resistant Packaging**



## 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	I <sub>F</sub> (mA)		I <sub>v</sub> @ 20mA	V <sub>F</sub> @ 20mA
1	Reflow Soldering	T = 260°C, Max. 10sec.		2 times	<±5%	<±5%
2	Temperature Cycle	-40°C ~ 100°C 30min. (5min.) 30min.		200 cycles	I <sub>v</sub> > 70%, V <sub>F</sub> < 110%,	
3	Thermal Shock	-10°C ~ 100°C 20min. (<15sec.) 20min.		200 cycles		
4	Low Temp. Storage	Ta= -40°C	--	1000 hrs		
5	High Temp. Storage	Ta= 100°C	--	1000 hrs		
6	Temp. Humidity Storage	Ta= 60°C/ 90%RH	--	1000 hrs		
7	Steady State Operating Life of Low Temp.	Ta= -40°C	20	1000 hrs		
8	Steady State Operating Life Condition 1	Ta= 25°C/ Room Humidity	20	1000 hrs		
9	Steady State Operating Life Condition 2	Ta= 60°C	20	1000 hrs		
10	Steady State Operating Life of High Temp.	Ta= 85°C	5	1000 hrs		
11	Steady State Operating Life of High Humidity Heat	Ta= 60°C/ 90%RH	20	1000 hrs		

Notes:

1. Sampling for each test item: 22 (pcs.)
2. Test board: MCPCB board thickness=1.0mm, copper layer thickness=0.07mm, R<sub>th j-a</sub>= 380°C/W.
3. Measurements are performed after allowing the LEDs to return to room temperature.

## 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.

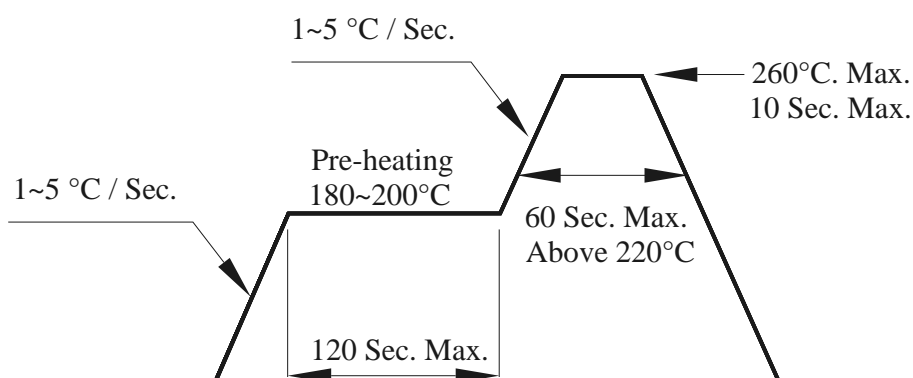
2.2 Before opening the package: The LEDs should be used within one year and kept at 30°C or less and 70%RH or less.

2.3 After opening the package: We recommend that the LED should be soldered quickly (within 3 days). The soldering condition is 30°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°C for 24 hours. (One time only)

### 3. Soldering Condition

#### 3.1 Pb-free solder temperature profile



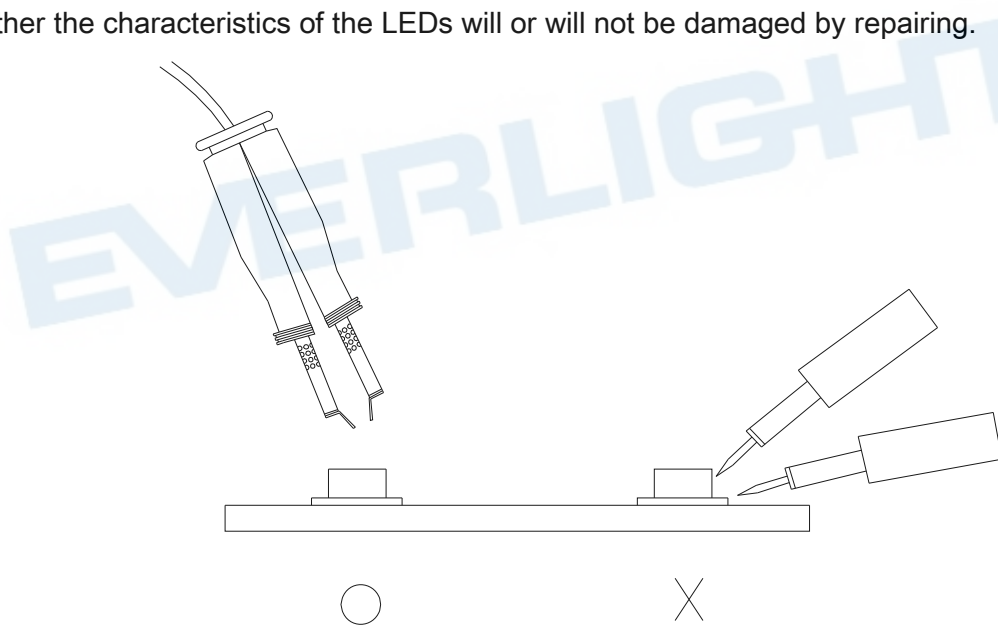
- 3.2 Reflow soldering should not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.

#### 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.



#### 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.

## 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.

## DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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