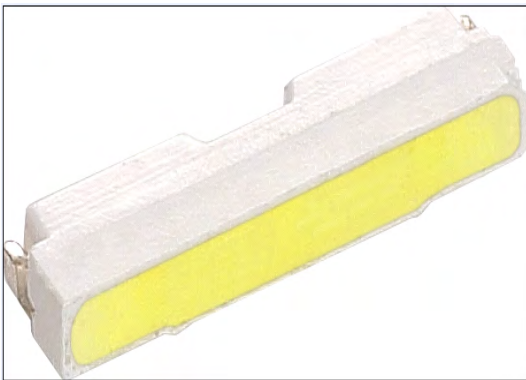


## DATASHEET

### SMD - Side View EAPL4210A1



#### 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.

#### Descriptions

Due to the package design, EAPL4210A1 has wide viewing angle and low power consumption. White LEDs devices are materialized by combing blue chip and special phosphor, which makes this feature ideal for light guide application.

#### Applications

- LCD Back Light
- Mobile phones
- Indicators
- Illuminations
- Switch Lights

### Device Selection Guide

Chip	Emitted Color	Resin Color
Material		
InGaN	Pure White	Water Clear

### Bin Range of Luminous Flux

Bin Code	Min.	Max.	Unit	Condition
V30	13.0	13.5	lm	I <sub>F</sub> =20mA
V35	13.5	14.0		
V40	14.0	14.5		
V45	14.5	15.0		

**Note:** Tolerance of Luminous Intensity Luminous Flux: ± 7%

### Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
S6	5.4	5.6	V	I <sub>F</sub> =20mA
S7	5.6	5.8		
S8	5.8	6.0		
S9	6.0	6.2		

**Note:** Tolerance of Forward Voltage: ± 0.05V

### Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Forward Current	I <sub>F</sub>	30	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	100	mA
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +90	°C
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering: 260 °C for 10 sec. Hand Soldering: 350 °C for 3 sec.	

**Note:** The 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 Flux	Φ	13	-----	15	lm	I <sub>F</sub> =20mA
Viewing Angle	2θ1/2	-----	120	-----	deg	
Forward Voltage	V <sub>F</sub>	5.40	-----	6.20	V	
Reverse Current	I <sub>R</sub>	-----	-----	50	μA	V <sub>R</sub> =5V

**Notes:**

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

**Chromaticity Coordinates of Bin Code**

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
NA0-3-1	0.2760	0.2530	NA0-3-2	0.2805	0.2600
	0.2720	0.2580		0.2770	0.2650
	0.2770	0.2650		0.2820	0.2720
	0.2805	0.2600		0.2850	0.2670
NA0-3-3	0.2800	0.2480	NA0-3-4	0.2840	0.2550
	0.2760	0.2530		0.2805	0.2600
	0.2805	0.2600		0.2850	0.2670
	0.2840	0.2550		0.2880	0.2620
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

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

### Reliability Test Items and Conditions

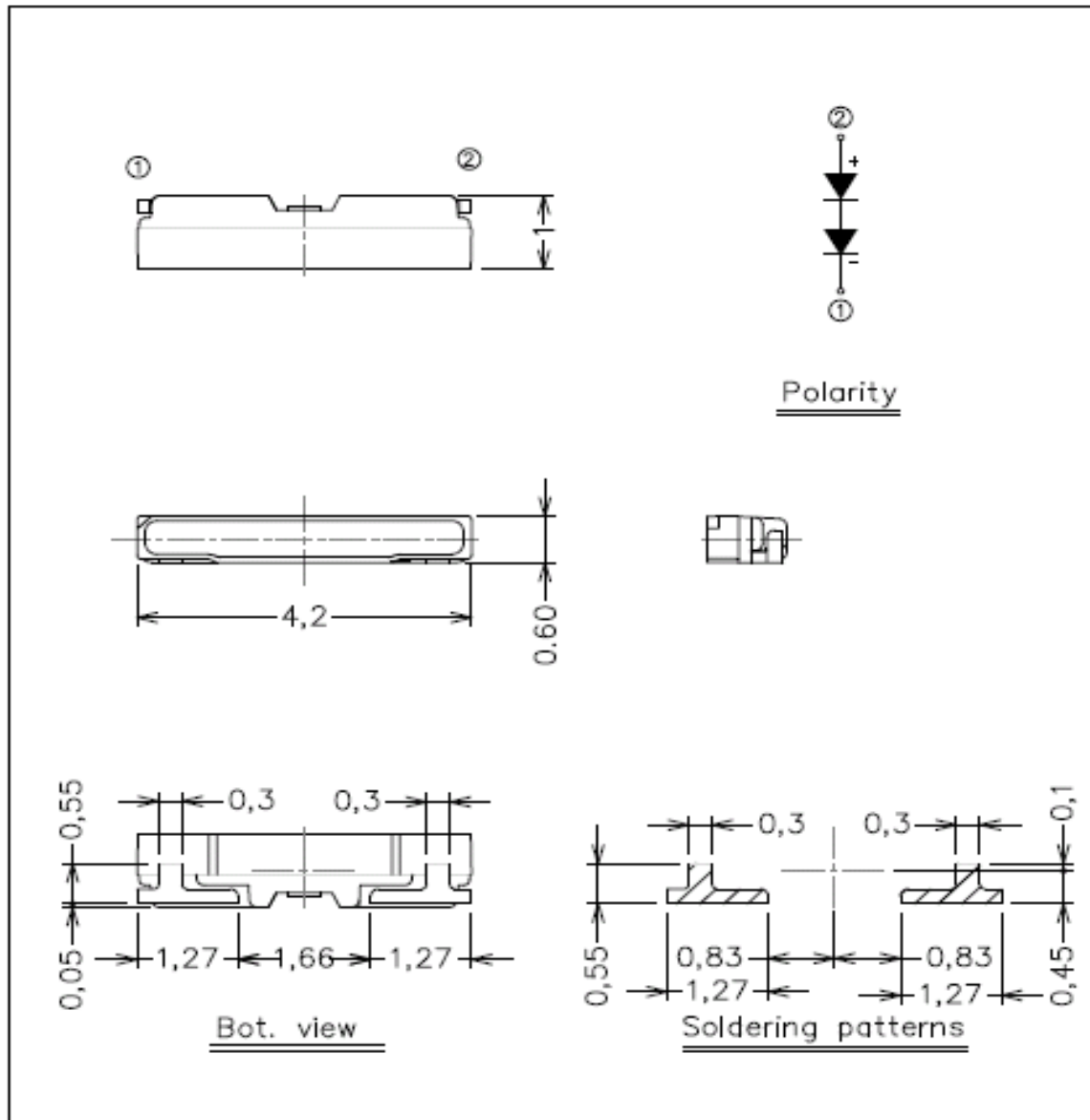
The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

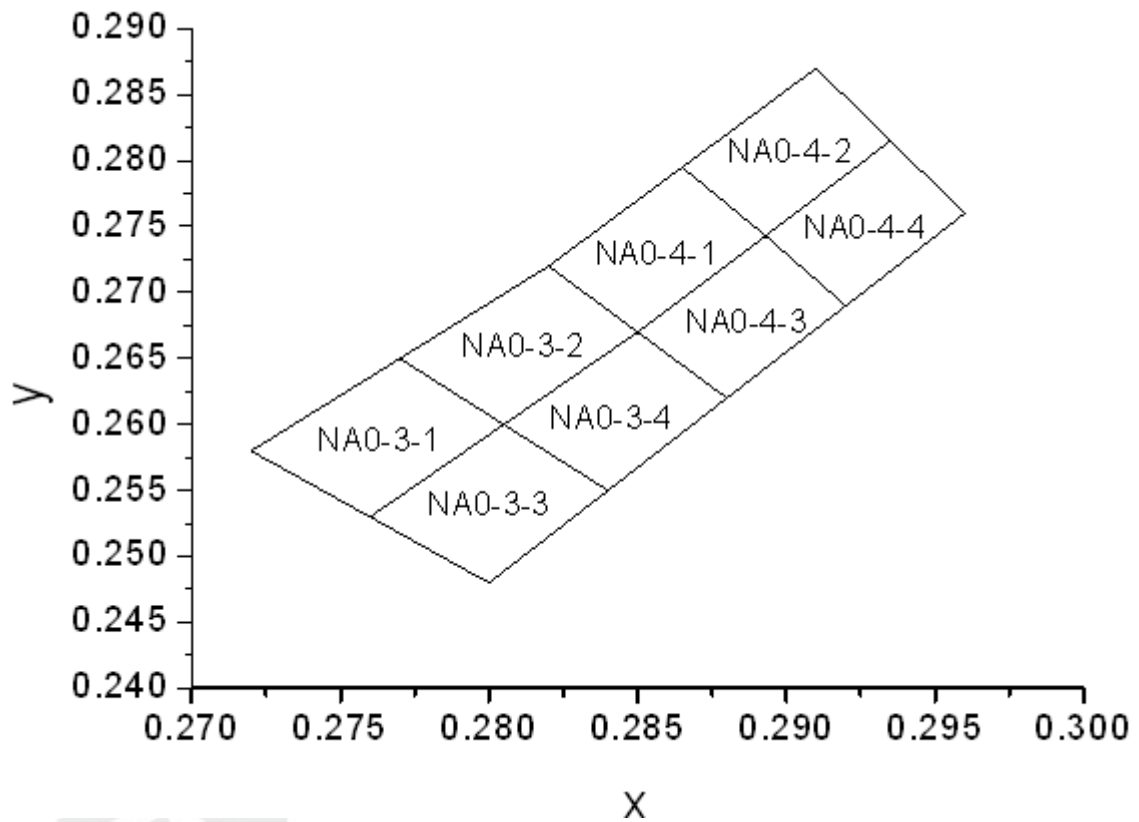
NO	Item	Test Condition		Test Hours / Times	Criteria	
		Temp./ Humidity	I <sub>F</sub> (mA)		I <sub>v</sub> @ 20mA	V <sub>F</sub> @ 20mA
1	Reflow Soldering	TSld = 260°C, Max. 10sec.		2 times	<±10%	<±10%
2	Thermal Cycle	-40°C ~ 100°C 30min. (5min.) 30min.		200 cycles	I <sub>v</sub> > 70%, V <sub>F</sub> < 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		

## Package Outline Dimensions



**Note:** The tolerances unless mentioned are  $\pm 0.1$ mm, unit = mm.

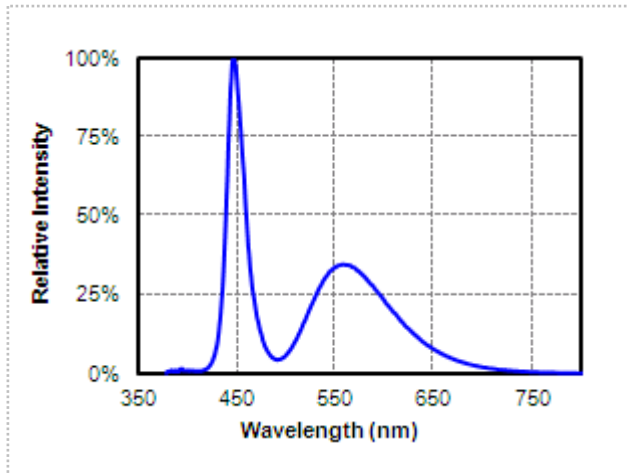
### The C.I.E. 1931 Chromaticity Diagram



## Typical Electro-Optical Characteristics Curves

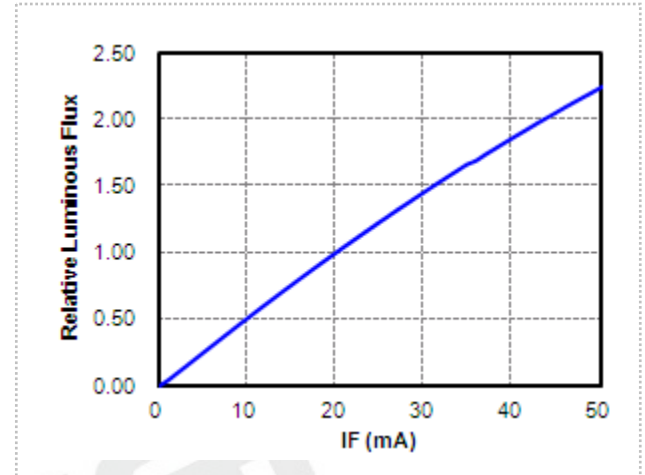
### 1. Spectrum Distribution

( $T_s=25^\circ\text{C}$ ,  $I_F=20\text{mA}$ )



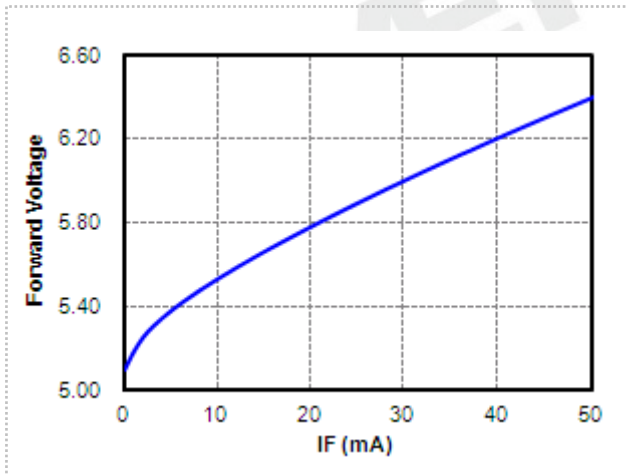
### 2. Relative Luminous Flux vs. Forward Current

( $T_s=25^\circ\text{C}$ )



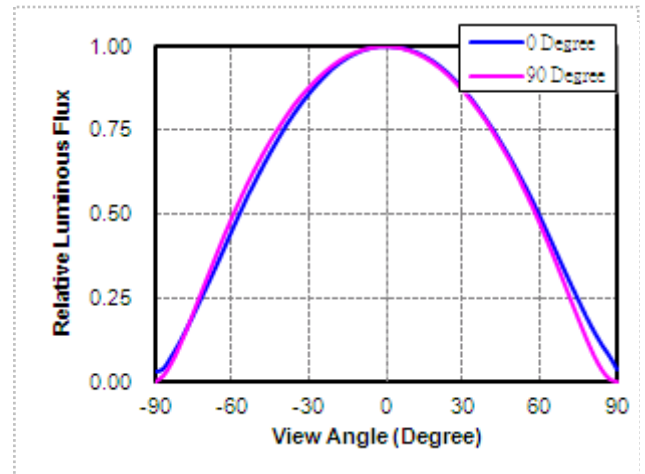
### 3. Relative Forward Voltage vs. Forward Current

( $T_s=25^\circ\text{C}$ )



### 4. Radiation Diagram

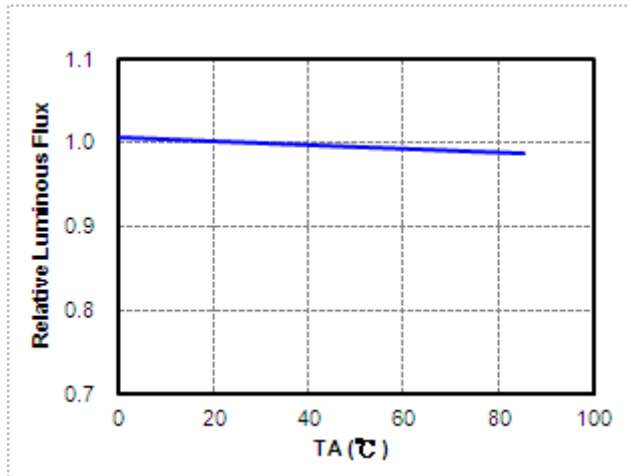
( $T_s=25^\circ\text{C}$ ,  $I_F=20\text{mA}$ )



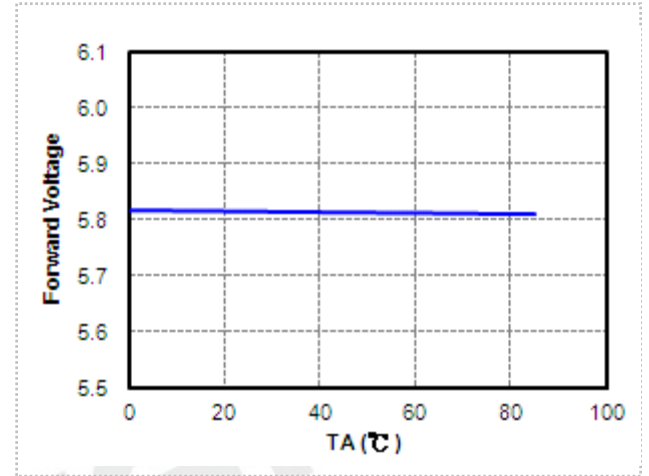


## Typical Electro-Optical-Thermal Characteristics Curves

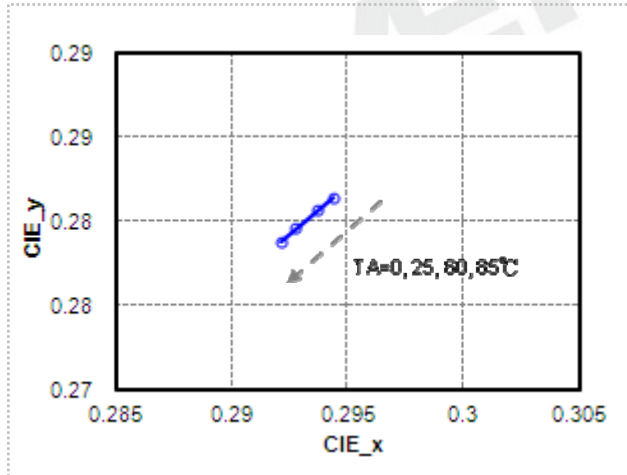
5. Relative Luminous Flux vs. Solder Temperature  
( $I_F=20\text{mA}$ )



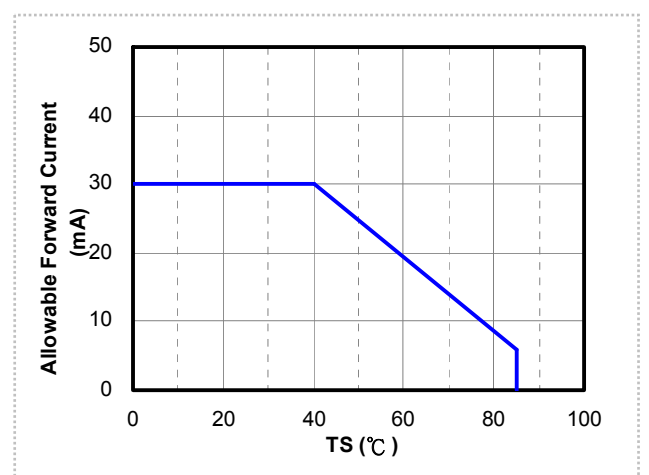
6. Forward Voltage vs. Solder Temperature  
( $I_F=20\text{mA}$ )



7. Chromaticity Coordinates vs. Solder Temperature  
( $I_F=20\text{mA}$ )



8. Forward Current De-rating Curve

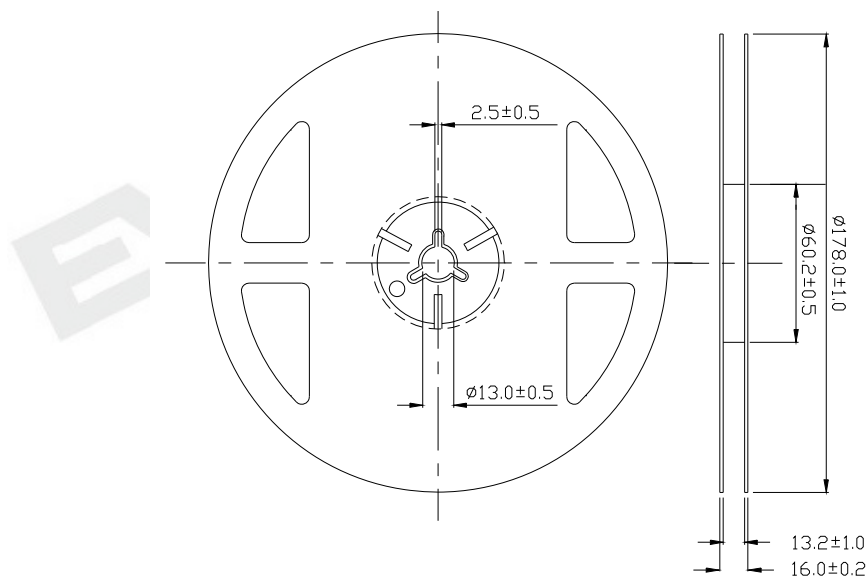


### Label Explanation

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

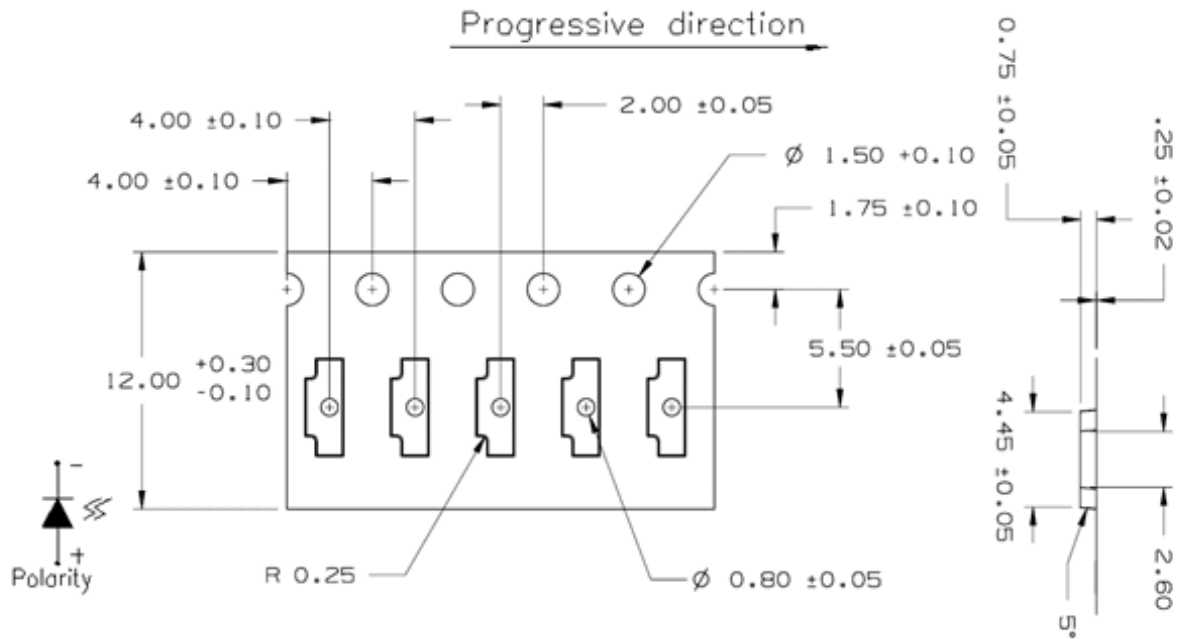


### Reel Dimensions



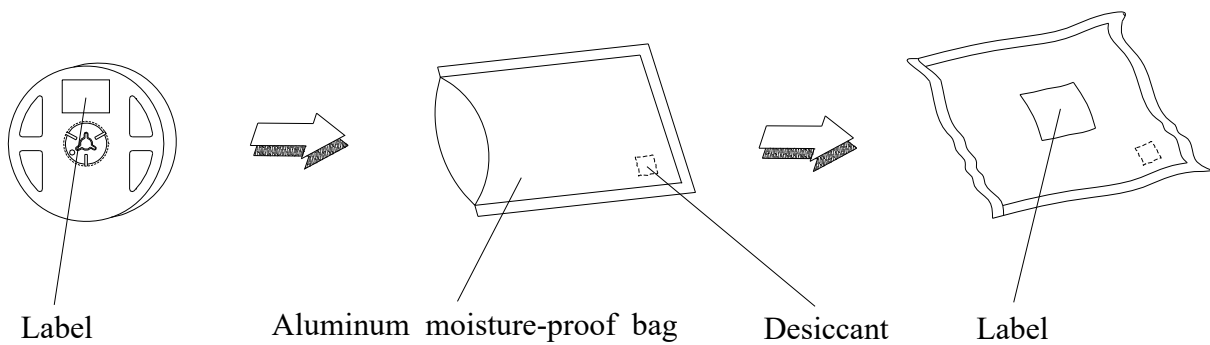
**Note:** The tolerance unless mentioned is  $\pm 0.1$  mm, unit = mm.

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



**Note:** The tolerance unless mentioned is ±0.1mm, unit = mm.

### Moisture Resistant Packaging



## 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.

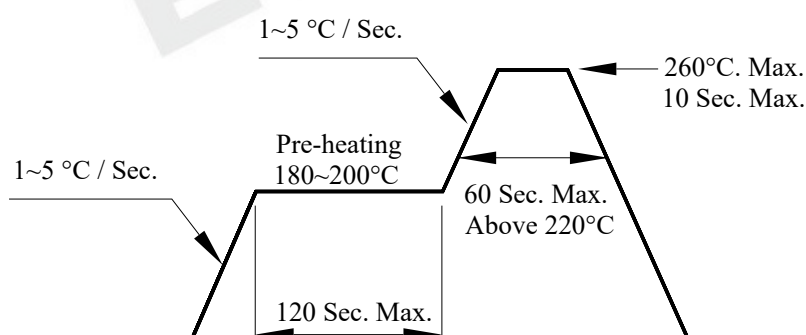
2.3 After opening the package: We recommend that the LED should be soldered quickly (within 3 days). The soldering condition is 30°C or less and 60%RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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.

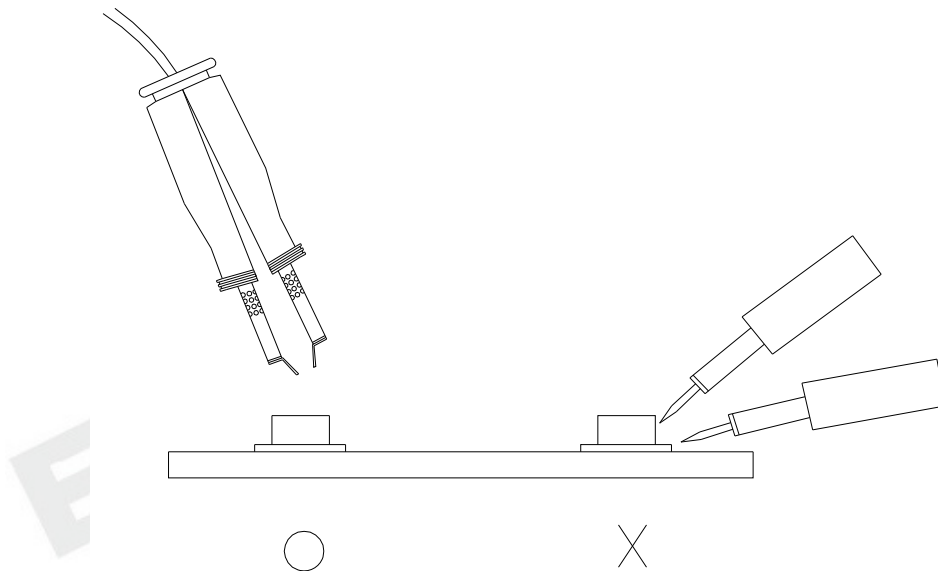
3.4 After soldering, do not warp the circuit board.

#### 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than  $350^{\circ}\text{C}$  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.