



# American Opto Plus LED Corp.

SMP-MUBC-S

3.5 x 2.7 x 1.9 mm Blue PLCC-4 SMD LED

## DATA SHEET UPDATE HISTORY

Version 1.0 – September 12, 2012

Version 1.1 – August 4, 2016

- Luminous Intensity Increased
- Forward Voltage updated
- Forward Current vs Ambient Temperature graph updated
- Moisture Sensitivity Spec Added

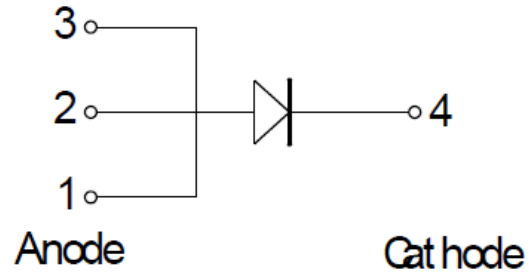
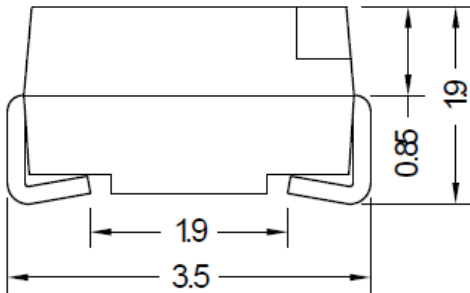
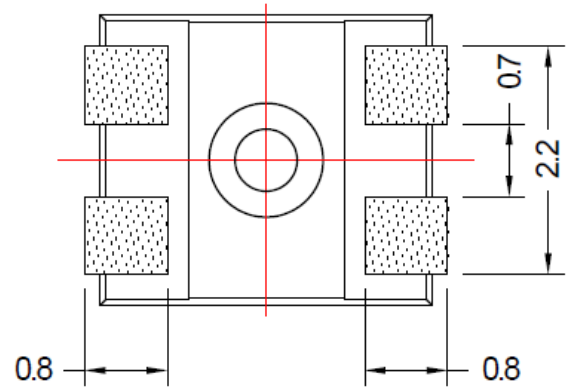
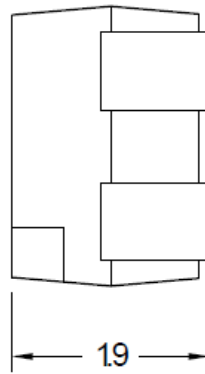
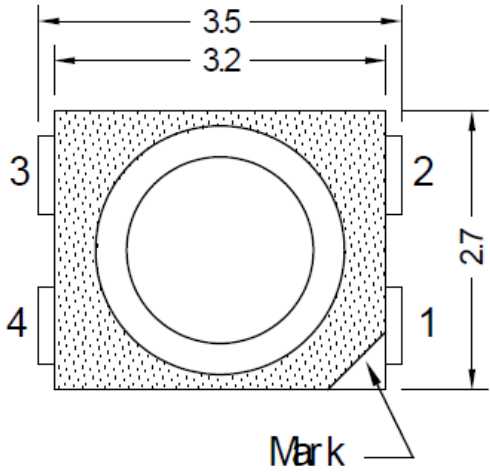


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## PACKAGE OUTLINES



### NOTES:

1. All dimensions are in millimeters;
2. Electrical connection between all cathodes is recommended
3. 2000 pcs per reel

ITEM	MATERIALS
Package	Heat-Resistant Polymer
Encapsulating Resin	Silicone
Electrodes	Ag Plating Copper Alloy



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## ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

Parameter	Symbol	Value	Unit
DC Forward Current	$I_F$	30	mA
Peak Pulsed Forward Current	$I_{FP}$	100	mA
Reverse Voltage	$V_R$	5	V
Power Dissipation	$P_d$	108	mW
Operating Temperature	$T_{OPR}$	-30 ~ +100	°C
Storage Temperature	$T_{STG}$	-40 ~ +100	°C
Solder Temperature	$T_{SOL}$	265°C for 10 sec	

## OPTICAL-ELECTRICAL CHARACTERISTICS

(Ta=25°C)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage	$V_F$	$I_F = 20\text{mA}$	--	3.0	3.4	V
Reverse Current	$I_R$	$V_R = 5\text{V}$	--	--	50	$\mu\text{A}$
Luminous intensity	$I_V$	$I_F = 20\text{mA}$	310	500	680	mcd
Dominant Wavelength	$\lambda_D$	$I_F = 20\text{mA}$	460	470	480	Nm
Peak Wavelength	$\lambda_P$	$I_F = 20\text{mA}$	--	465	--	nm
Spectral Half Width	$\Delta\lambda_{1/2}$	$I_F = 20\text{mA}$	--	20	--	nm

\*Measurement uncertainty of luminous intensity:  $\pm 10\%$ .

\*Please refer to CIE 1931 chromaticity diagram



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## LUMINOUS INTENSITY BIN TABLE

$I_F = 20\text{mA}$

Rank Name	Min (mcd)	Max (mcd)
K	310	400
L	400	520
M	520	680

\*Tolerance for each bin limit is  $\pm 15\%$

## COLOR BIN TABLE

$I_F = 20\text{mA}$

Rank Name	Min (nm)	Max (nm)
1	460	465
2	465	470
3	470	475
4	475	480

\*Tolerance for each bin limit is  $\pm 1\text{nm}$

### Note

1. One delivery will include several color ranks and  $I_V$  ranks of products.  
The quantity-ratio of the different rank is decided by AOP.
2. Bin Name typed on the Label: IV RANK + Color Rank.  
For Example, **BIN K2 Means IV: 310~400mcd , Color: 465nm~470nm**
3. Static Electricity or Surge Voltage damages the LEDs.  
It is recommended to use a wrist band or Anti-Electrostatic glove when handling the LEDs.
4. AOP has the right to update the information without notice.



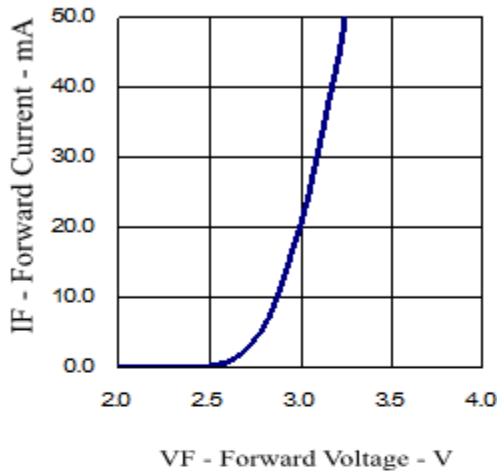
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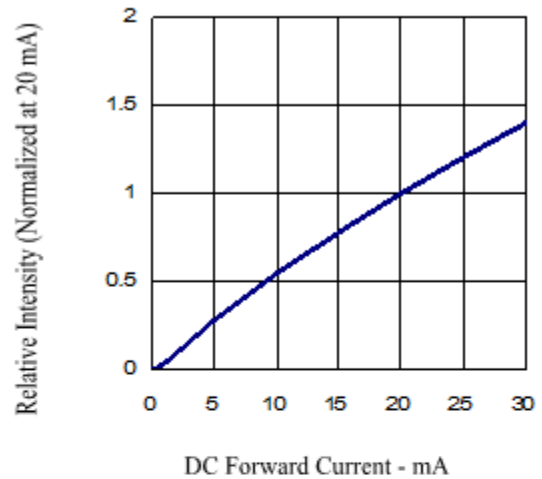
3.5 x 2.7 x 1.9 mm Blue PLCC-4 SMD LED

## ELECTRICAL-OPTICAL CHARACTERISTICS

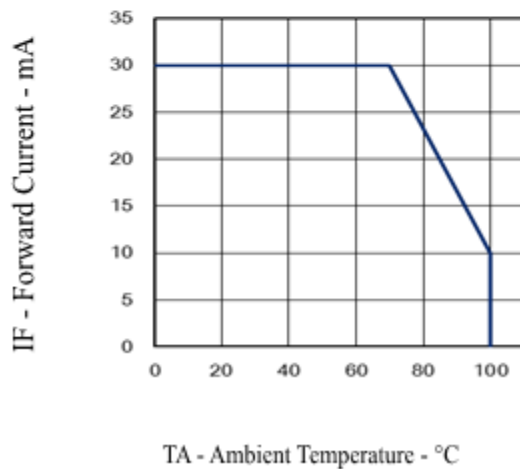
Forward Current vs. Forward Voltage



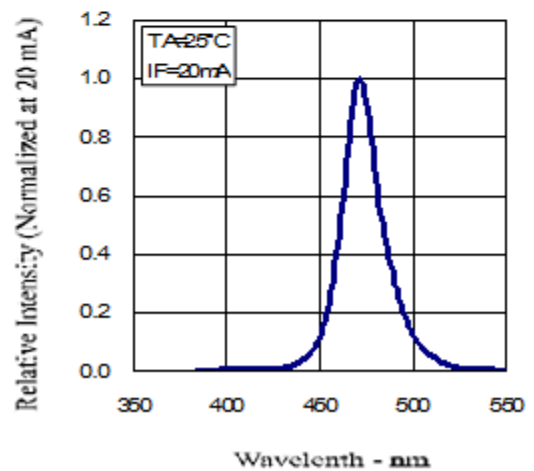
Relative Intensity vs. Forward Current



Forward Current vs. Ambient Temperature



Relative Intensity vs. Wavelength



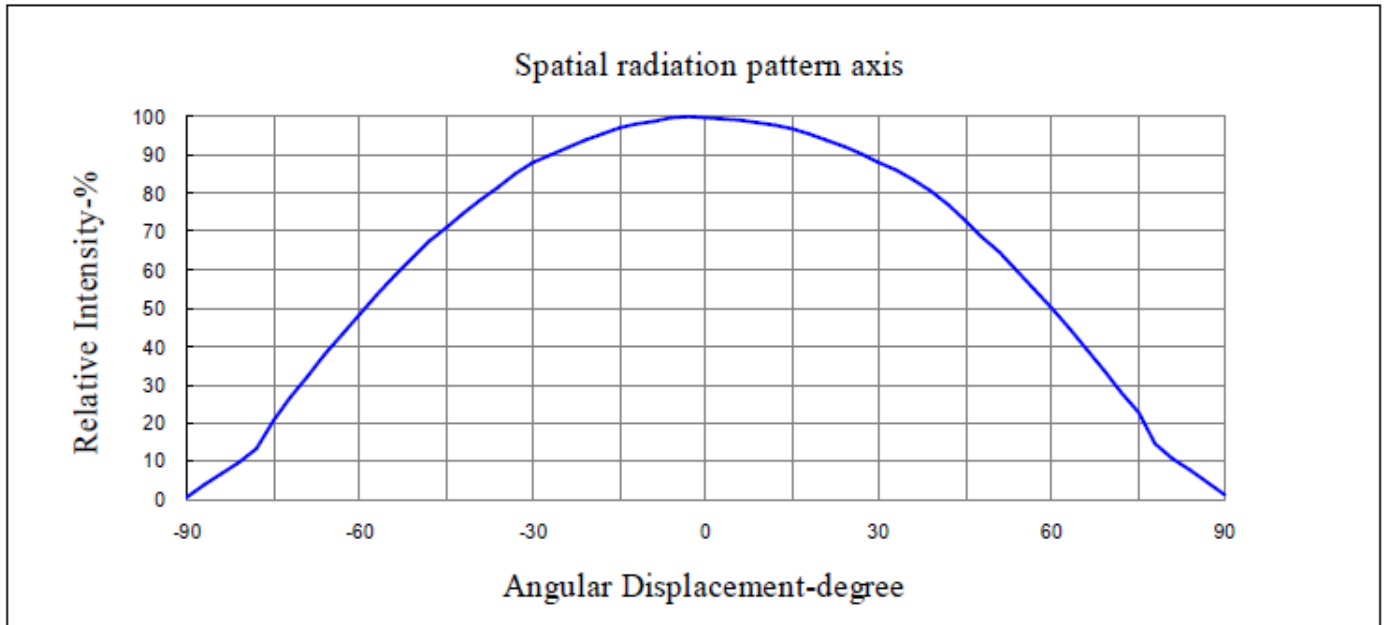


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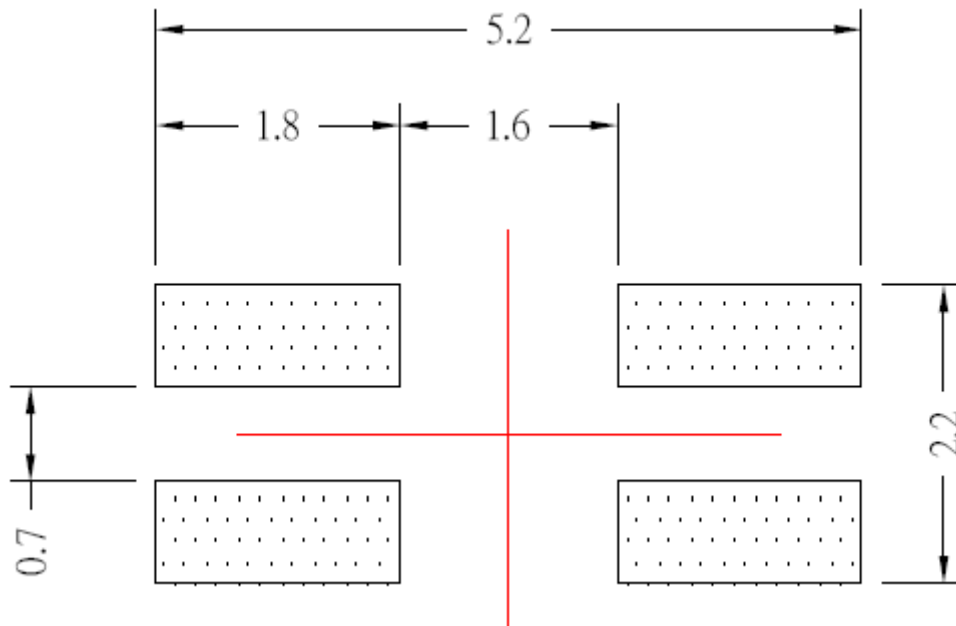
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## RADIATION PATTERN



## RECOMMENDED SOLDERING PAD PATTERN



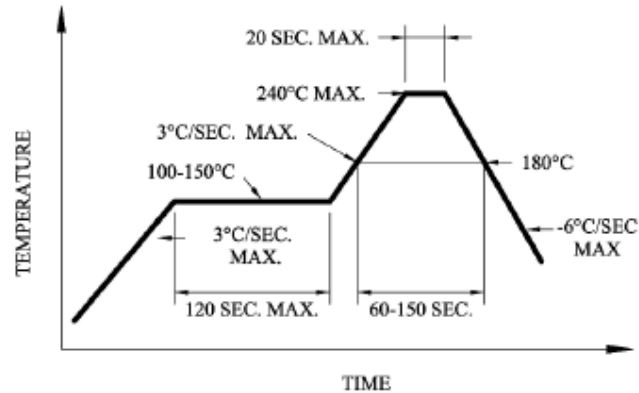


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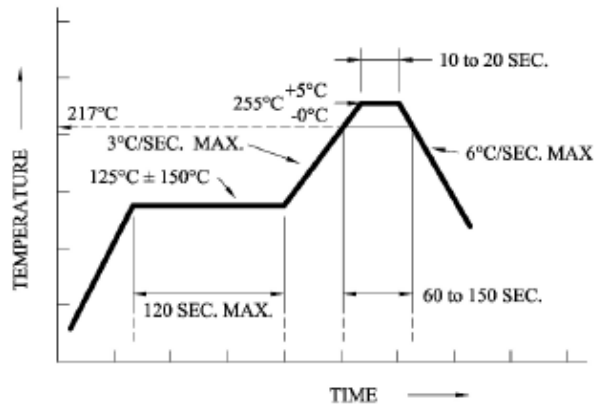
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## SOLDERING CONDITIONS



### Recommended reflow soldering profile



### Recommended Pb-free reflow soldering profile.

- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than two times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board

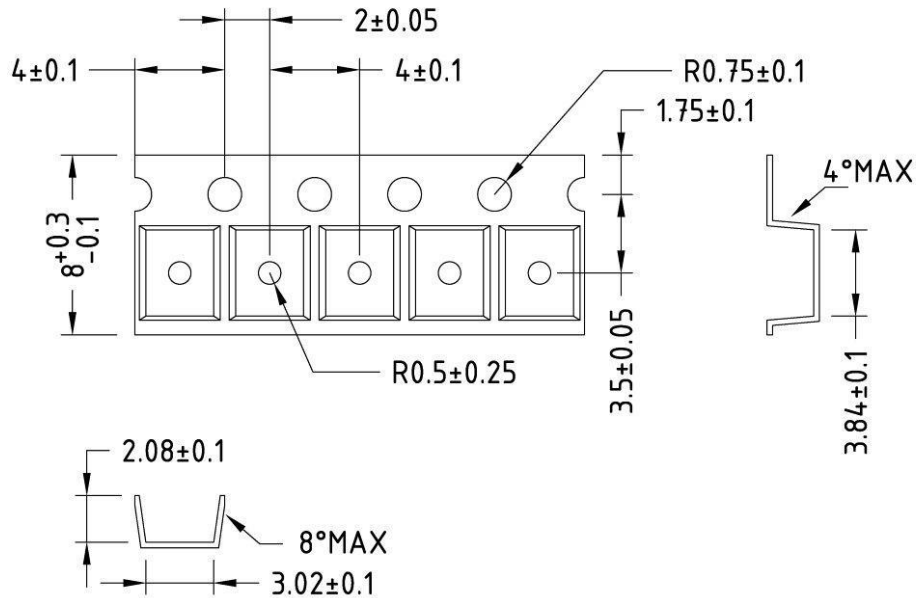


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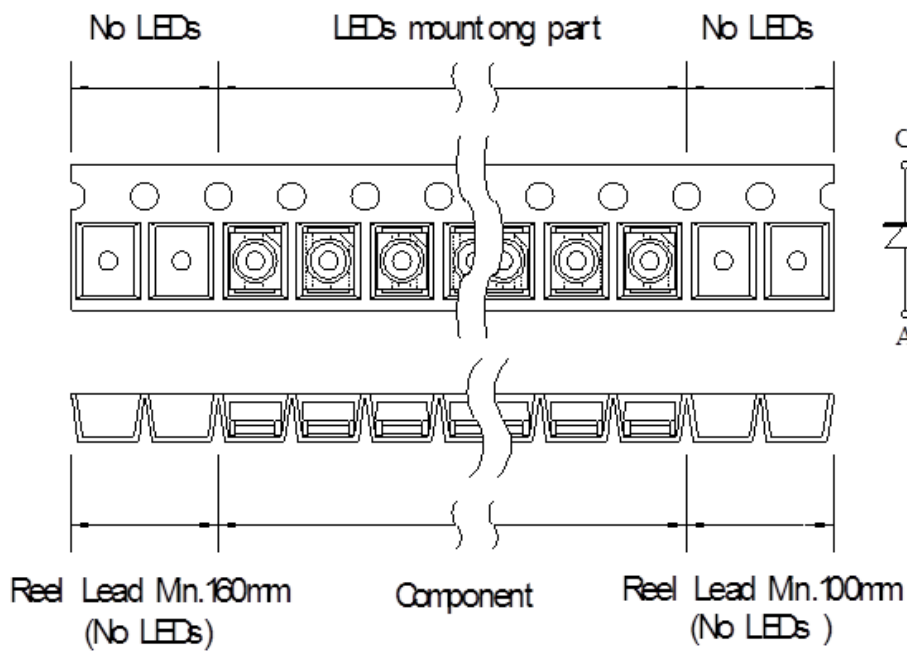
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## TAPE DIMENSION



## TAPE LEADER AND TRAILER DIMENSION



USER FEED DIRECTION



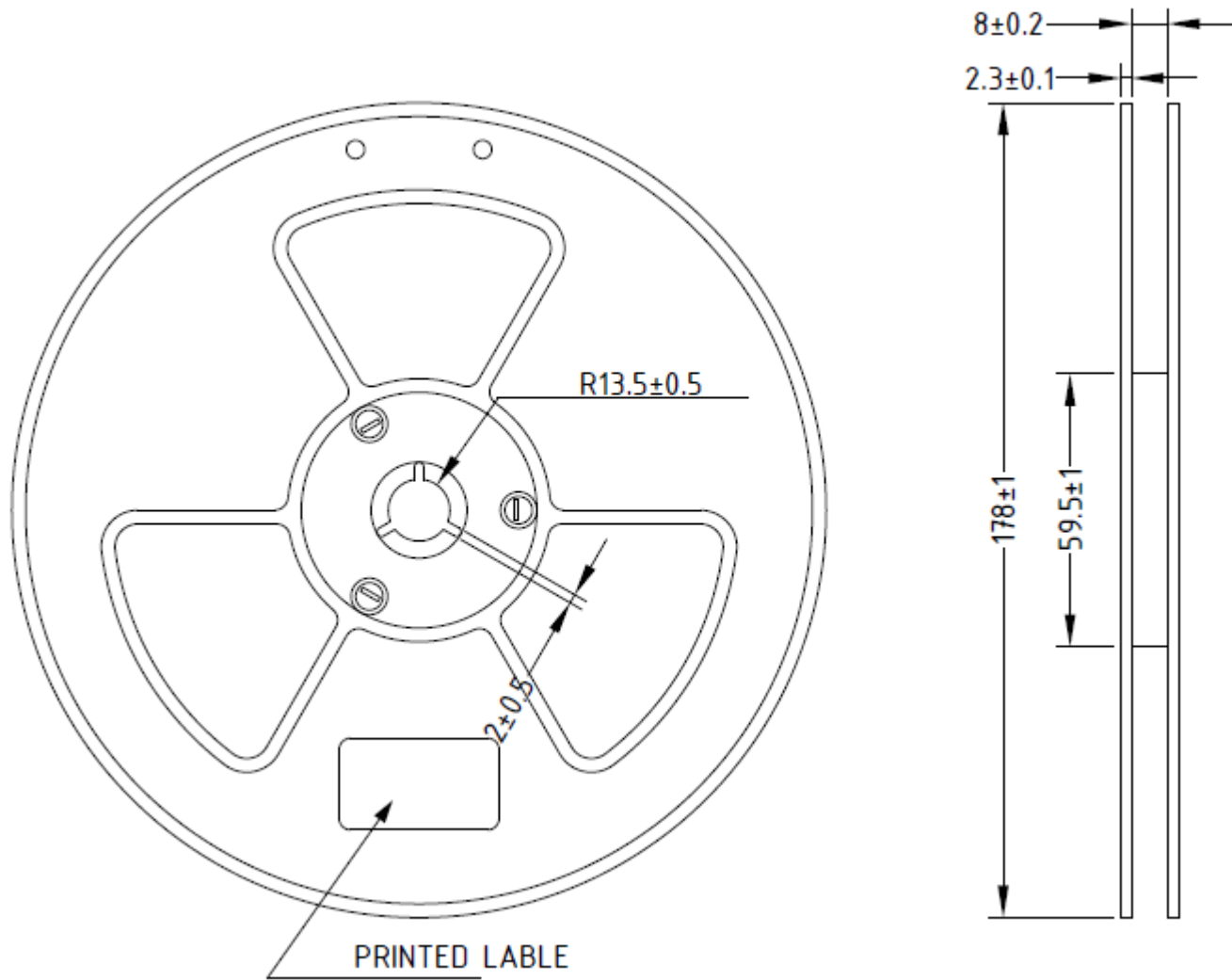


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## REEL DIMENSION



NOTE : Baking is required under the following conditions:  
The pack has been opened for more than four weeks.  
Baking recommended conditions:  
 $60 \pm 5$  °C for 20 hours



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## Moisture Sensitivity

AOP's SMD LED are shipped in sealed, moisture-barrier bags (MBB) designed for long shelf life. If SMD LED has exposed with moist environments before soldering, this may cause damage to SMD LED during soldering (reflow) operation.

## Storage / Floor Time

Condition	Temperature(C)	Humidity(RH)	Period of Time
Before Open	30	60	1 year from shipping date
After Open	30	60	Within 72 hours

- MSL of this product are MSL4, please see IPC/JEDEC STD020D for more detail.
- LEDs reach floor time may be damaged while soldering/reflow processing, please baking the LEDs before use.
- If RH indicator card show 60%RH when unseal the package, please bake/discard the LED.

## Reseal

- AOP's aluminum MBB may reuse as to reseal the unused LED if MBB has not damaged or had any holes on it.
- Moisture absorbent material (Silica gel) may be reuse if it does not become pink.
- Proper resealed LED's floor time will NOT RESET, only stop counting until open.
- If RH indicator card show 60%RH when open the package, please bake/discard the LED.

## Baking

Condition	Temperature(C)	Period of Time
With Reel	60	More than 24 hours, but not more than 48 hours
Without Reel	90	24 hours

- Baking of LED available ONCE only, more than once may damage the LEDs while baking.
- Baking only required when LED reach its floor time.