

MP-5050-14L0-RGBW

Mid Power LED



Features

- Top view LED
- Thermally Enhanced Package Design
- High luminous flux output
- High current capability
- Compact Package Size
- Wide viewing angle
- Pb-free Reflow Soldering Application



Applications

- Outdoor lighting
- Architectural / Decorative lighting

Table of Contents

Binning Structure.....	2
Absolute Maximum Ratings.....	6
Angular Distribution and Typical Spectrum.....	9
Mechanical Dimensions.....	10
Soldering Profile.....	11
Tape and Reel Outline.....	12
Shipping Label.....	14
Packaging Boxes.....	15
Notes.....	16
Revision History.....	17



Binning Structure

Flux Bins¹

Color	CCT/WLD	Bin Code	Binning @ 120 mA, T _j = 25°C	
			Minimum Flux (lm)	Maximum Flux (lm)
RED	618-625	ER3	10	30
GREEN	520-530	EG3	30	55
BLUE	455-465	EB4	4	14
WHITE	2700K/3000/4000 /5700K/6500K	EW3	40	70

Forward Voltage Bins²

Color	CCT/WLD	Bin Code	Binning @120 mA, T _j = 25°C	
			Minimum Voltage (V)	Maximum Voltage (V)
RED	618-625	RV3	1.8	2.5
GREEN	520-530	GV4	2.7	3.3
BLUE	455-465	GV4	2.7	3.3
WHITE	2700K/3000/4000 /5700K/6500K	GV4	2.7	3.3

Notes:

1. The Luminous Flux measurement tolerance is $\pm 7\%$.
2. The Forward Voltage measurement tolerance is ± 0.1 V.



Binning Structure

Wavelength Bins¹

Color	Bin Code	Binning @ 120 mA, T _j = 25°C	
		Minimum Wavelength (nm)	Maximum Wavelength (nm)
RED	RB2	618	625
GREEN	GC1	520	525
	GC2	525	530
BLUE	BD3	455	460
	BD4	460	465

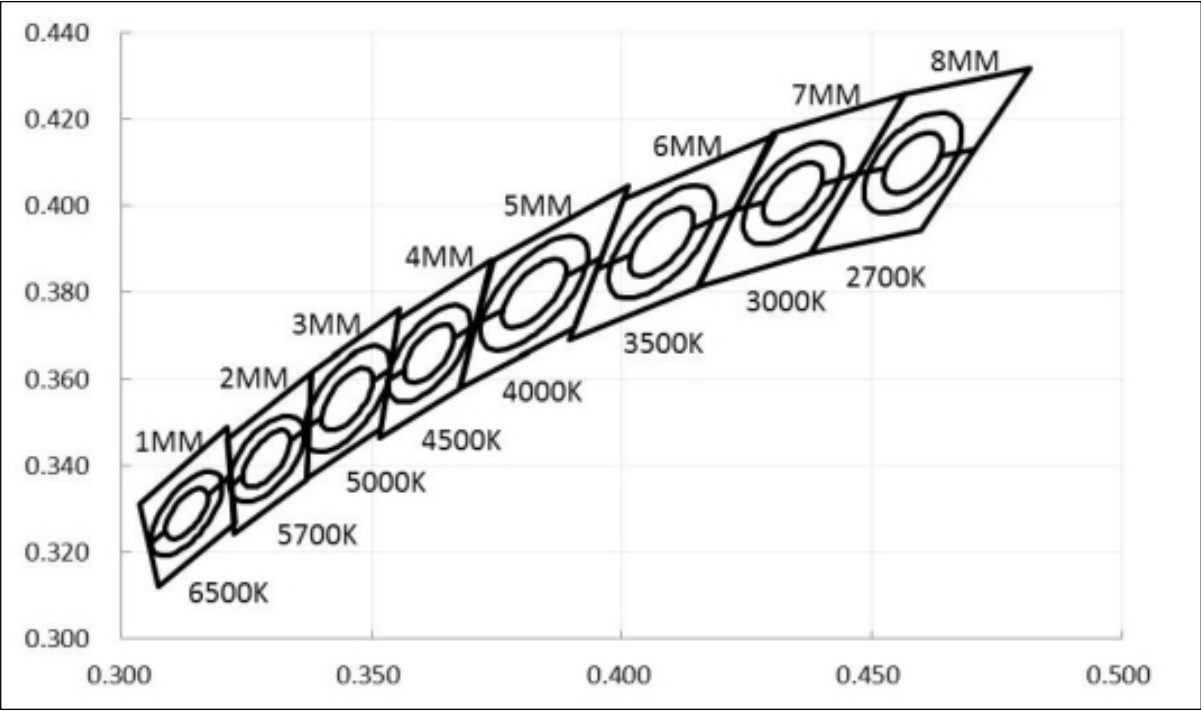
Note:

1. The Dominant Wavelength measurement tolerance is ±1 nm.



Binning Structure

Chromaticity Binning Diagram



Chromaticity Bins¹ (I_f=120 mA, T_j= 25°C)

Color Code	CCT	Center		3 Radius		5 Radius		Angle(deg)
		x	y	a	b	a	b	Φ
8MM	2700K	0.4582	0.4099	0.008100	0.004200	0.013500	0.00700	53.42
7MM	3000K	0.4342	0.4028	0.008340	0.004080	0.013900	0.00680	53.13
6MM	3500K	0.4080	0.3916	0.009270	0.004140	0.01545	0.00690	54.00
5MM	4000K	0.3825	0.3798	0.009390	0.004020	0.015650	0.00670	53.43
4MM	4500K	0.3615	0.3659	0.008220	0.003540	0.01370	0.00590	59.37
3MM	5000K	0.3451	0.3554	0.008220	0.003540	0.01370	0.00590	59.37
2MM	5700K	0.3290	0.3417	0.006705	0.003300	0.011175	0.00550	58.35
1MM	6500K	0.3130	0.3290	0.006690	0.002850	0.011150	0.00475	58.34

Note:

1. The Chromaticity Coordinate measurement tolerance is ±0.005.



Binning Structure

Bin Code Description¹

CCT	CIEx	CIEy	CCT	CIEx	CIEy	CCT	CIEx	CIEy	CCT	CIEx	CIEy
2700K	0.4377	0.3891	3000K	0.4151	0.3812	3500K	0.3896	0.3689	4000K	0.3677	0.3579
	0.4566	0.4258		0.4303	0.4166		0.4003	0.4014		0.3743	0.3875
	0.4597	0.3942		0.4377	0.3891		0.4154	0.3813		0.3905	0.3717
	0.4817	0.4317		0.4566	0.4258		0.4306	0.4164		0.4013	0.4045
4500K	0.3516	0.3464	5000K	0.3370	0.3370	5700K	0.3225	0.3243	6500K	0.3075	0.3121
	0.3552	0.3735		0.3380	0.3617		0.3210	0.3462		0.3035	0.3312
	0.3674	0.3577		0.3519	0.3488		0.3369	0.3369		0.3212	0.3489
	0.3740	0.3873		0.3555	0.3761		0.3379	0.3616		0.3228	0.3269

Note:

1. The Chromaticity Coordinate measurement tolerance is ±0.005.



Absolute Maximum Ratings

Parameter	Symbol	Values		Unit
Forward Current	I_f	180		mA
Pulse Forward Current ¹	I_{fp}	270		mA
Power Dissipation	P_d	RED	450	mW
		GREEN	594	
		BLUE	594	
		WHITE	594	
Junction Temperature	T_j	110		°C
Operating Temperature Range	T_{opr}	-40~+105		°C
Storage Temperature Range	T_{stg}	-40~+105		°C
Soldering Temperature	T_{sld}	230 °C or 260 °C for 10 sec		°C

Note:

1. I_{fp} condition with Pulse: Width≤100μs, Duty cycles≤1/10.



Characteristics

Parameter ($I_f=120\text{ mA}$, $T_j= 25^\circ\text{C}$)	Symbol	Color	Min	Typ	Max	Unit
Forward Voltage ¹	V_f	RED	1.8	2.0	2.5	V
		GREEN	2.7	3.0	3.3	
		BLUE	2.7	3.0	3.3	
		WHITE	2.7	3.0	3.3	
Reverse Current($V_r=5\text{ V}$)	I_r	RED	-	-	10	μA
		GREEN				
		BLUE				
		WHITE				
Viewing Angle ²	$2\theta_{1/2}$	RED	-	120	-	°
		GREEN				
		BLUE				
		WHITE				
Optical Characteristics ³	Flux	RED	10	22	-	lm
		GREEN	30	44	-	
		BLUE	4	8	-	
		WHITE	40	56	-	
Dominant Wavelength	λ_d	RED	618	622	625	nm
		GREEN	520	525	530	
		BLUE	455	460	465	

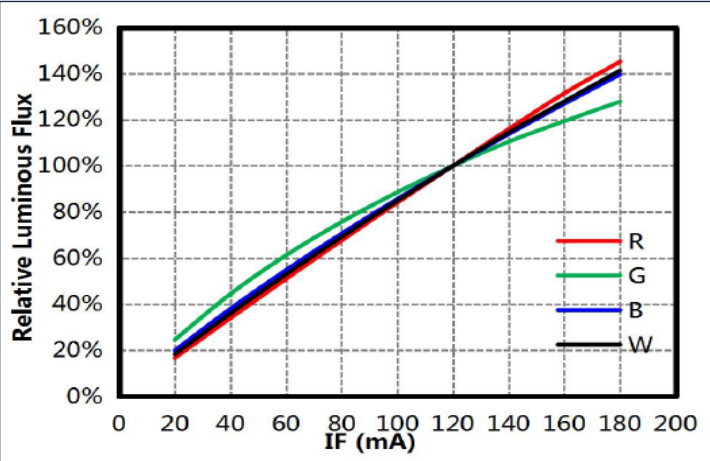
Notes:

1. Tolerance of measurements of the Forward Voltage is $\pm 0.1\text{ V}$.
2. $2\theta_{1/2}$ is the off-axis where the luminous intensity is 1/2 of the peak intensity.
3. Tolerance of measurements of the Luminous Flux is $\pm 7\%$.
4. Tolerance of measurements of the Dominant Wavelength is $\pm 1\text{ nm}$.



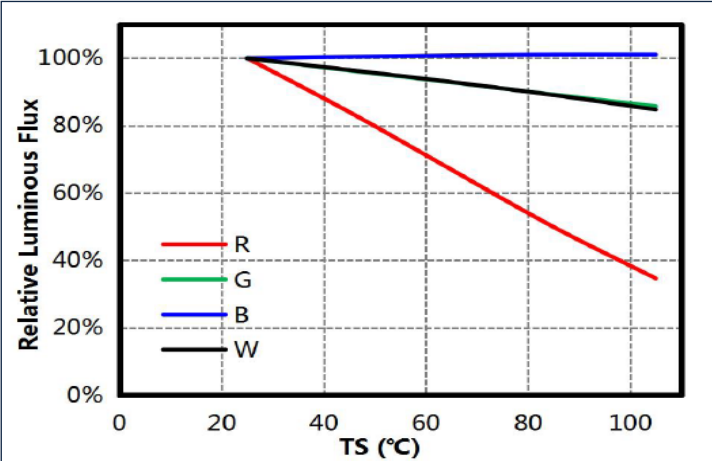
Relative Luminous Flux vs Forward Current

T_j = 25°C



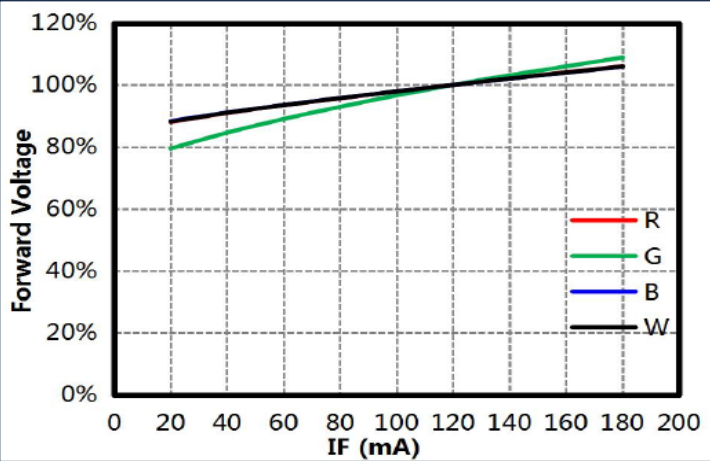
Relative Luminous Flux vs Temperature

I_f = 120 mA



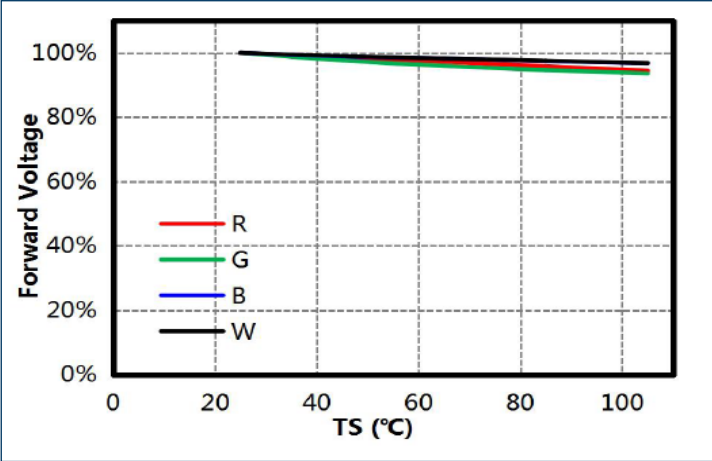
Forward Voltage vs Forward Current

T_j = 25°C



Forward Voltage vs Temperature

I_f = 120 mA

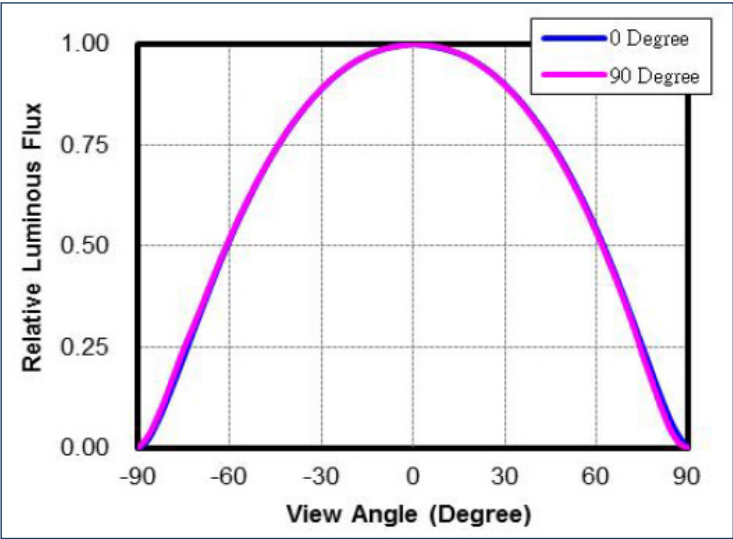




Angular Distribution and Typical Spectrum

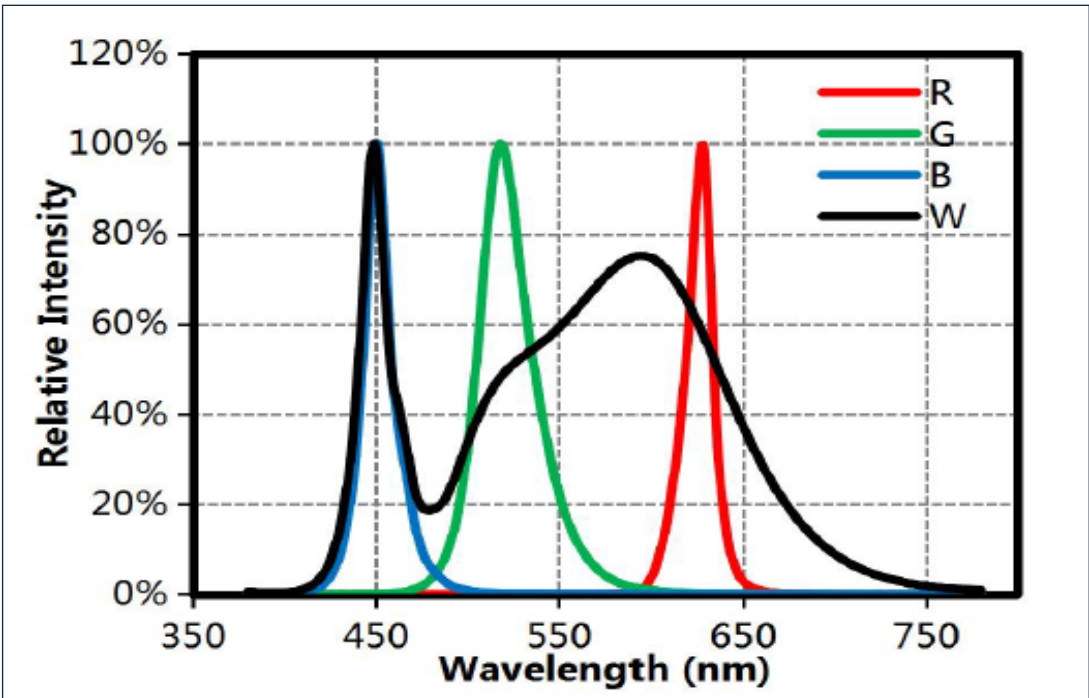
Angular Distribution

T_j = 25°C

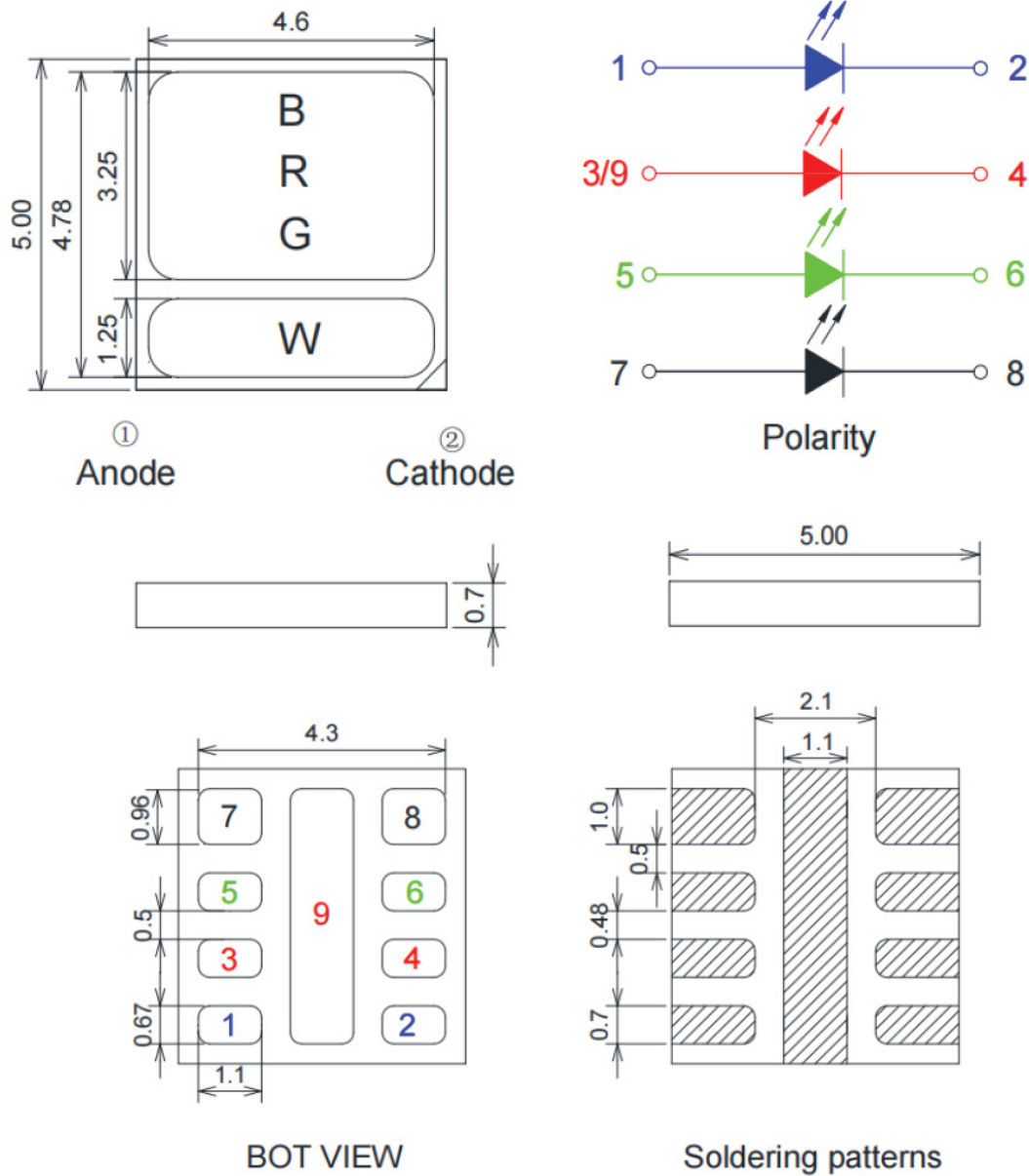


Relative Spectral Power Distribution

T_j = 25°C



Mechanical Dimensions^{1,2}

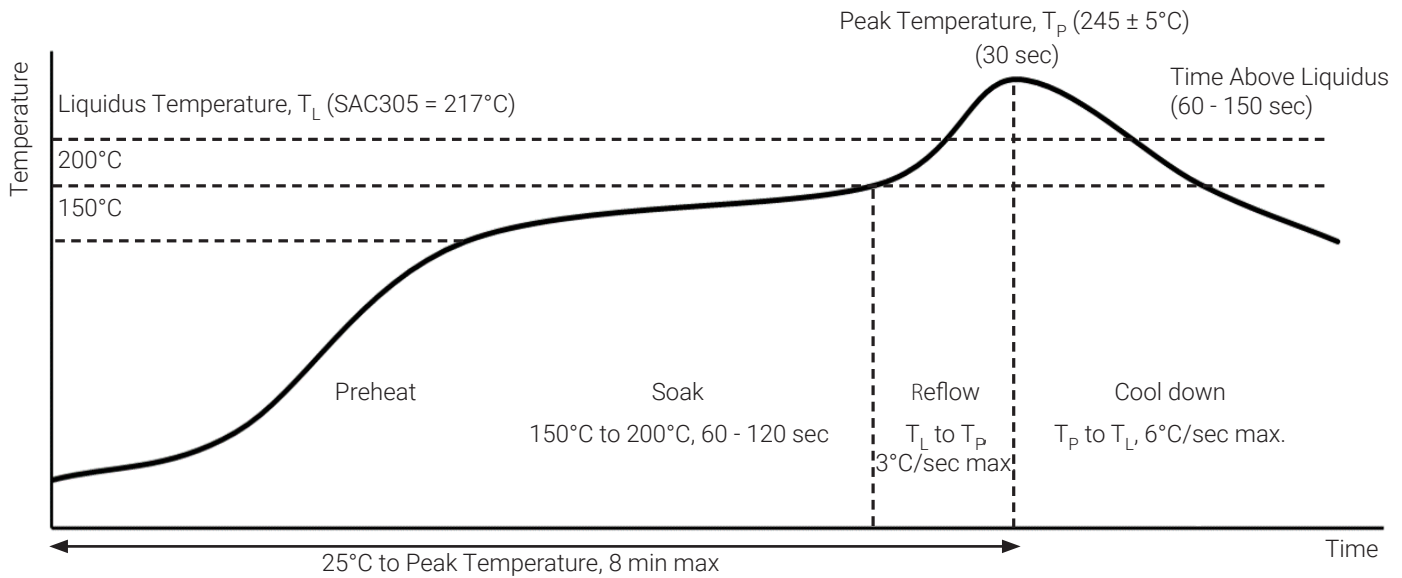


RECOMMENDED PCB SOLDER PAD DESIGN

Notes:

1. The tolerance unless mentioned is ± 0.1 mm, unit = mm.
2. The soldering pad pattern is only for reference and can be modified according to actual requirements.

Soldering Profile



SMT Solder Rework Temperature Guidelines

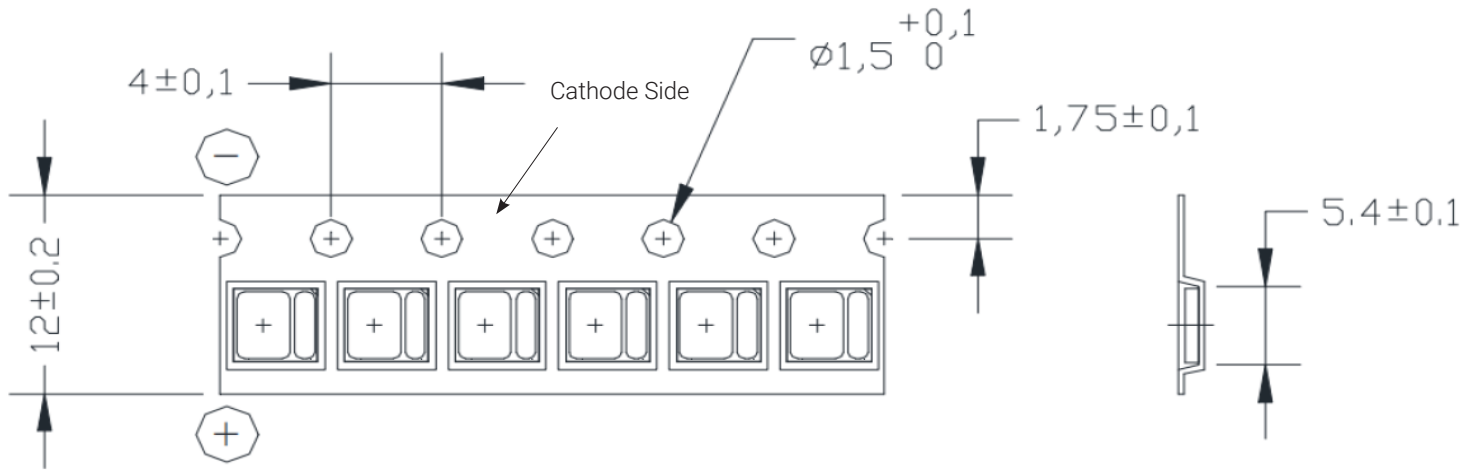
Parameter	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

Notes:

- The numbers in the table are specific to SAC305. Luminus recommends using an SAC305 solder paste with a no-clean flux for RoHS compliant products.
- Use of a multi-zone IR reflow oven with a nitrogen blanket is recommended.
- Time-temperature profile of the reflow process showing the four functional profile zones are defined in IPC-7801. All the temperatures refer to the application PCB measured adjacent to the package body.
- The actual profile shall be optimized per the PCB design and configuration.
- Key visual and LED performance characteristics to consider include solder bridging, solder voiding, solder balling, LED component placement or shifting, potential contamination that may impact light emissions, and the functional performance of the LED.
- Luminus recommends to use the solder paste data sheet information as a starting point in time-temperature process development.
- These are general guidelines. Consult the solder paste manufacturer's datasheet for guidelines specific to the alloy and flux combination used in your application. For more information, please refer to:
<https://luminusdevices.zendesk.com/hc/en-us/articles/360060306692-How-do-I-Reflow-Solder-Luminus-SMD-Components->
- For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.

Tape and Reel Outline

Tape Package Dimensions



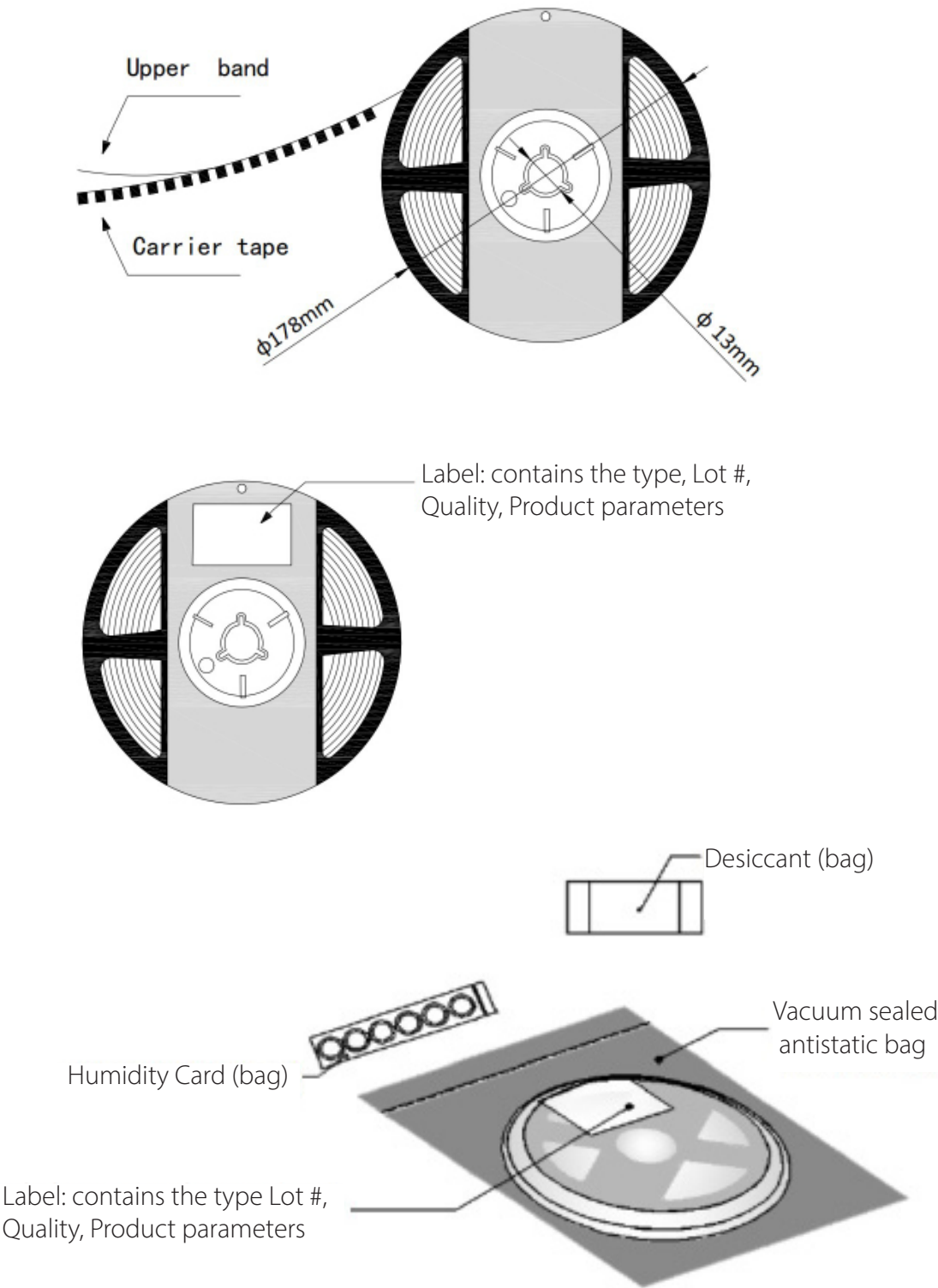
Notes:

1. Quantity: Max 2,000 pcs per reel.
2. Cumulative Tolerance: Cumulative Tolerance/10 pitches to be ± 0.2 mm.
3. Adhesion Strength of Cover Tape Adhesion strength to be 0.1-0.7 N when the cover tape is turned off from the carrier tape at the angle of 10° to the carrier tape.
4. Package: P/N, Manufacturing data Code No. and Quantity to be indicated on a damp proof package.



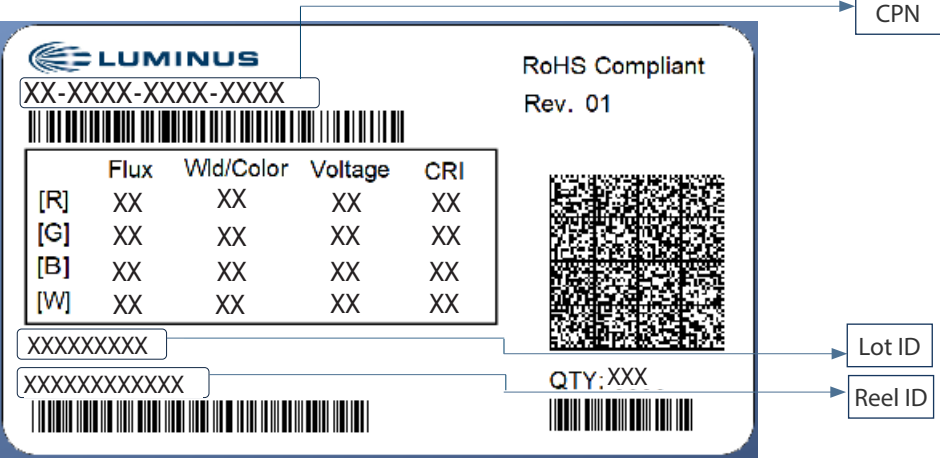
Tape and Reel Outline

Reel Package Dimensions





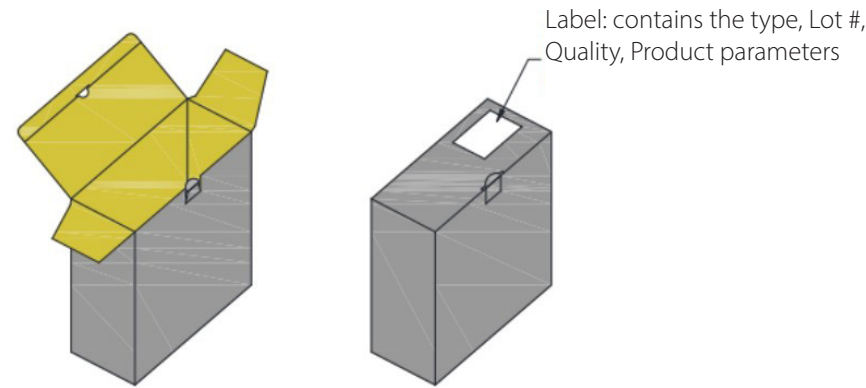
Shipping Label



- Label Fields:
- CPN: Luminus ordering part number
 - QTY: Quantity of parts per reel
 - Flux: Bin as defined on page 2
 - Voltage: Bin as defined on page 2
 - Color: Bin as defined on page 4
 - CRI: NA
 - Lot ID & Reel ID: For Luminus internal use

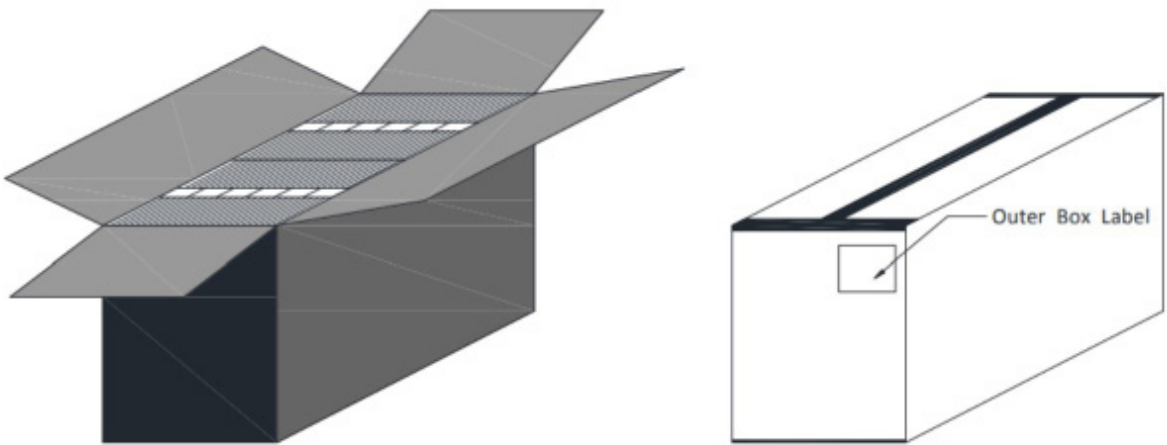


Packaging Boxes



*Capacity 4 or 8 reels per box

Outer Box



*Capacity 24 or 48 reels per box



Notes

Static Electricity

1. The products are sensitive to static electricity, and care should be taken when handling them.
2. Static electricity or surge voltage will damage the LEDs. It is recommended to wear a anti-electrostatic wristband or an anti-electrostatic gloves when handling the LEDs.
3. All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.

Storage

1. This device is rated at MSL 3 per JEDEC J-STD-020 standard.
2. Recommended storage condition: 5°C to 30°C and relative humidity 60 % RH in the original package
3. After this bag is opened, devices that will be applied to infrared reflow, vapor phase reflow, or equivalent soldering process must be:
 - a) Completed within 168 hours
 - b) Stored at less than 60 %RH
 - c) If not completely used within 168 hours, seal the remaining in the moisture barrier bag
4. Devices require baking before mounting, if 3 a) is not met.
5. If baking is required, devices must be baked under below conditions: 24 hours at 60°C±5°C



Revision History

Rev	Date	Description of Change
01	03/17/2026	Initial release
02	05/18/2026	Update Binning Structure and Characteristics