MP-5050-250R

Mid Power LED

Features

- High efficacy
- Sulfur resistance for outdoor and horticulture applications
- Low thermal resistance
- Compatible with automatic placement equipment
- Compatible with infrared reflow solder process

Applications

- Replacement lamps
- Panel lighting
- Down lights
- Architectural lighting

Table of Contents

Ordering Information

Ordering Part Numbers[1]

Minimum CRI	CCT	Luminous Flux		Ordering Part Number
		Minimum Flux (lm)	Typical Flux (lm)	
70	2700K	600	640	MP-5050-250R-27-70
80		560	610	MP-5050-250R-27-80
90		480	520	MP-5050-250R-27-90
70	3000K	600	670	MP-5050-250R-30-70
80		600	640	MP-5050-250R-30-80
90		480	540	MP-5050-250R-30-90
70	4000K	650	705	MP-5050-250R-40-70
80		600	680	MP-5050-250R-40-80
90		520	585	MP-5050-250R-40-90
70	5000K	650	705	MP-5050-250R-50-70
80		600	680	MP-5050-250R-50-80
90		520	585	MP-5050-250R-50-90
70	5700K	650	705	MP-5050-250R-57-70
80		600	680	MP-5050-250R-57-80
90		520	585	MP-5050-250R-57-90
70	6500K	650	705	MP-5050-250R-65-70
80		600	680	MP-5050-250R-65-80
90		520	585	MP-5050-250R-65-90

Note:

1. Test condition I_f=640 mA, T_c= 25°C.

Ordering Information

Part Number Nomenclature

MP	5050	250R	##	##

Product Family	Package Type	Package Configurator	Nominal CCT[1]	Minimum CRI
MP: Mid Power LED	**5050**: 5.0 mm x 5.0 mm	**250R**: Package code	**27**: 2700K **30**: 3000K **40**: 4000K **50**: 5000K **57**: 5700K **65**: 6500K	**70**: CRI>70 **80**: CRI>80 **90**: CRI>90

Note:

1. Correlated Color Temperatures (CCT)

Binning Structure

Each mid power product shipped will be labeled with its specific flux and voltage bins. Not all bins listed are available in all CCTs and CRIs.

Flux Bins

Flux Bin	Binning @ 640 mA, T_c=25°C	
	Minimum Flux (lm)	Maximum Flux (lm)
3B	480	520
3C	520	560
3D	560	600
3E	600	650
3F	650	700
3G	700	800

Forward Voltage Bins[1]

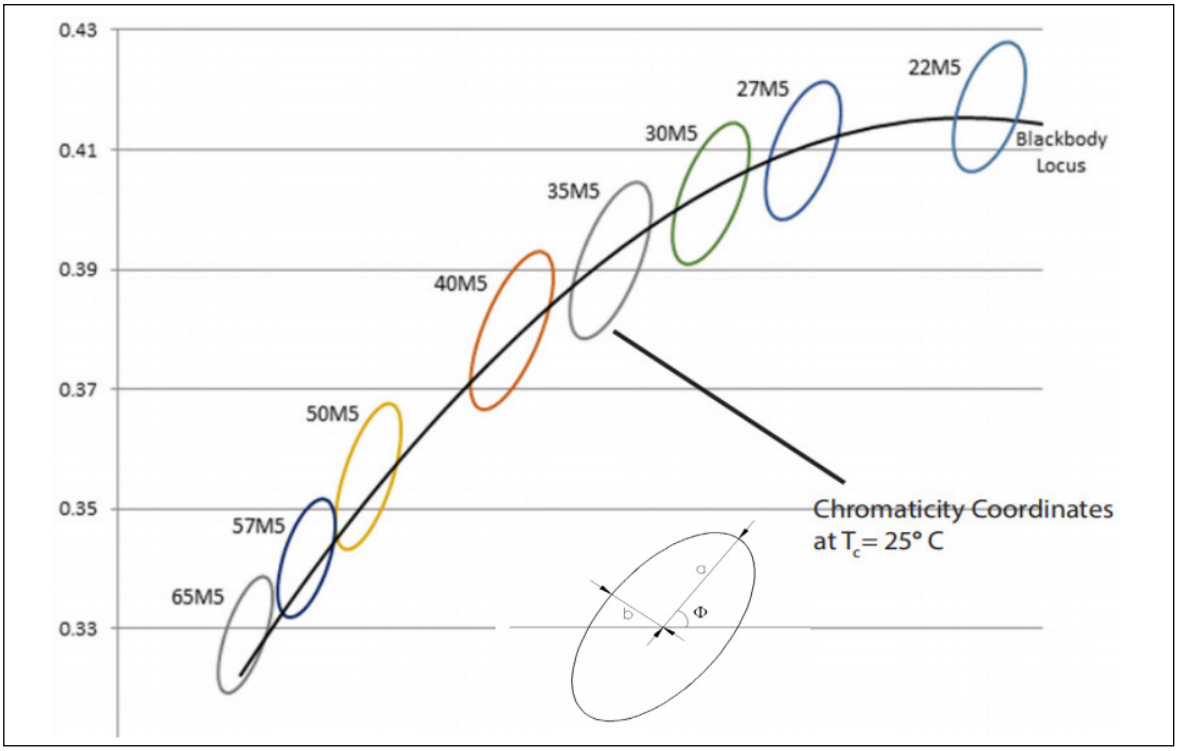
Voltage Bin	Binning @ 640 mA, T_c= 25°C	
	Minimum Voltage (V)	Maximum Voltage (V)
Z3	5.6	5.8
B4	5.8	6
C4	6	6.2
D4	6.2	6.4

Note:

1. The Forward Voltage measurement tolerance is ±0.1 V.

Binning Structure

Chromaticity Binning Diagram



Color Bins [1]

Color Code	Center point		Radius		Angle(deg)
	x	y	a	b	Φ
22M5	0.5065	0.4171	0.012500	0.00700	53.00
27M5	0.4582	0.4099	0.013500	0.007000	53.42
30M5	0.4342	0.4028	0.013900	0.006800	53.13
35M5	0.4080	0.3916	0.015450	0.006900	54.00
40M5	0.3825	0.3798	0.015650	0.006700	53.43
50M5	0.3451	0.3554	0.013700	0.005900	59.37
57M5	0.3290	0.3417	0.011175	0.005500	58.35
65M5	0.3130	0.3290	0.011150	0.004750	58.34

Notes:

1. The Chromaticity Coordinates tolerance is ± 0.01.

Absolute Maximum Ratings[1,2]

Parameter	Symbol	Values	Unit
Forward Current	I_f	1000	mA
Pulse Forward Current	I_{fp}	1200	mA
Power Dissipation	P_d	6600	mW
Reverse Voltage	V_r	5	V
Junction Temperature	T_j	125	°C
Operating Temperature Range	T_{opr}	-40~+105	°C
Storage Temperature Range	T_{stg}	-40~+105	°C

Notes:

1. Frequency 10 KHz, duty ratio ≤10 %.

2. The forward pulse current is the maximum current used by the chip at 25°C.

Characteristics[1,2,3]

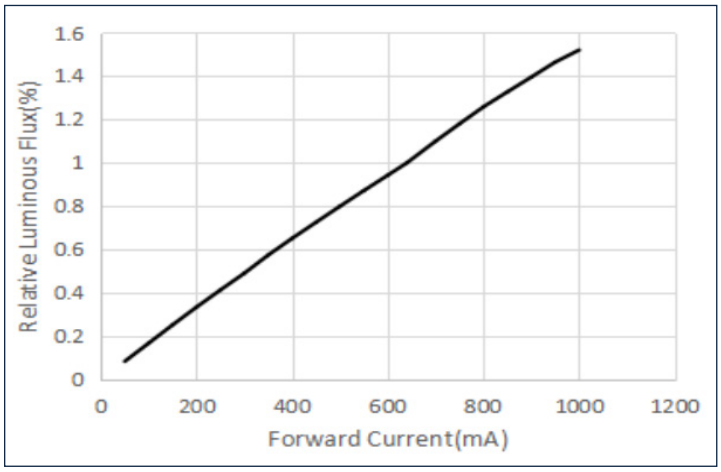
Parameter (I_f= 640 mA, T_c= 25°C)		Symbol	Value	Unit
Forward Voltage	Minimum	$V_{f\ min}$	5.6	V
	Typical	$V_{f\ typ}$	5.95	
	Maximum	$V_{f\ max}$	6.4	
Reverse Current (V_r=5 V)		I_r	10	uA
Viewing Angle		$2\theta_{1/2}$	115	°
Thermal Resistance		$R_{th\ J\text{-}S}$	2	°C/W
Electrostatic Discharge		V_{ESD}	1000	V

Notes:

1. To prevent damage refer to operating conditions and derating curves for appropriate maximum operating conditions.
2. Maximum operating case temperature combined with maximum drive current defines the total maximum operating condition for the device. To prevent damage, please follow derating curves for all operating conditions.
3. Mid power LEDs are designed for operation up to an absolute maximum forward drive current as specified below. Product lifetime data is specified at typical forward drive currents. Sustained operation at absolute maximum currents will result in a reduction of device lifetime compared to typical forward drive currents. Actual device lifetimes will also depend on case temperature. Refer to the current vs. case temperature derating curves for further information.

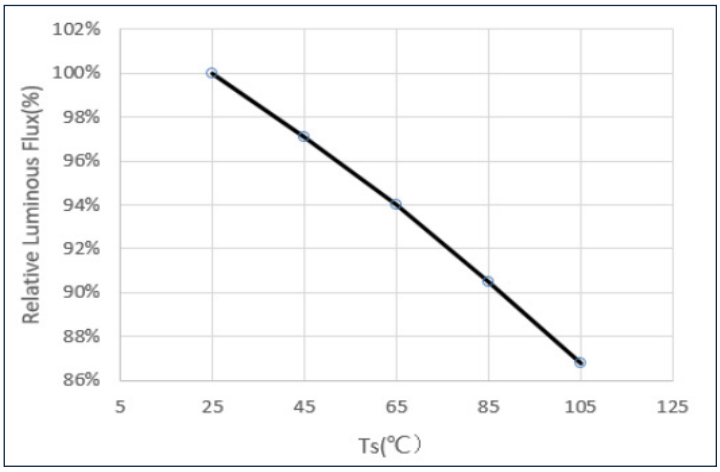
Relative Luminous Flux vs Forward Current

T_c = 25°C



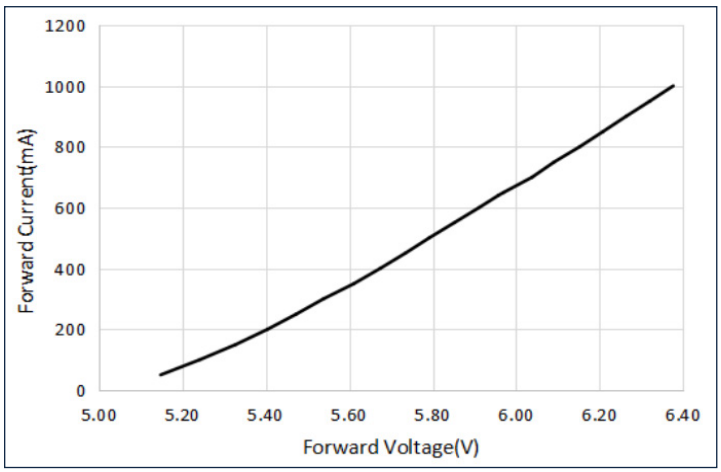
Relative Luminous Flux vs Temperature

I_f = 640 mA



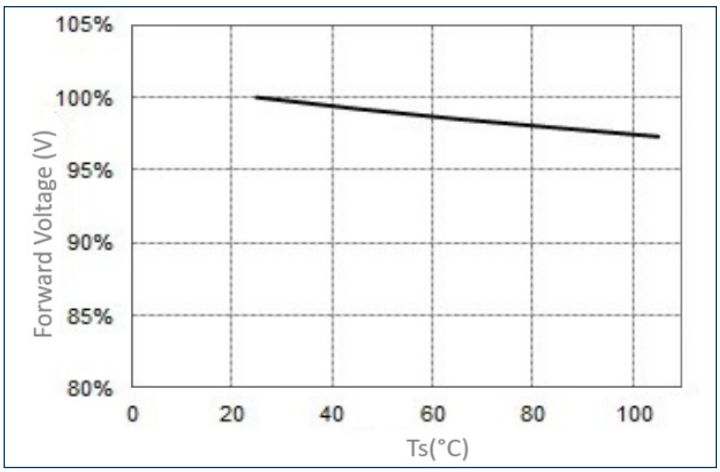
Forward Current vs Forward Voltage

T_c = 25°C



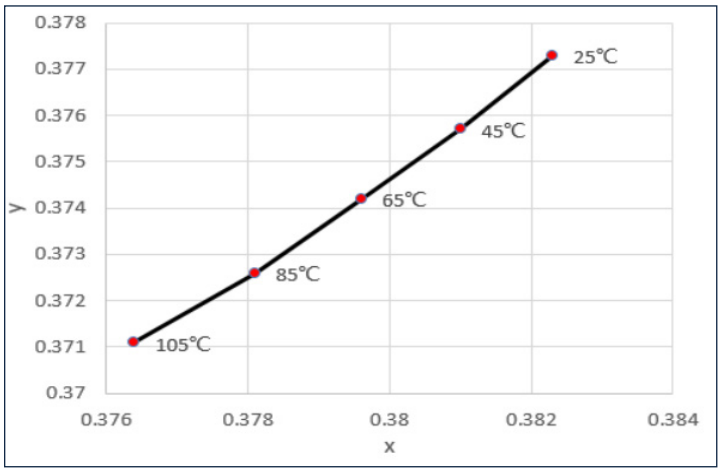
Forward Voltage vs Temperature

I_f = 640 mA

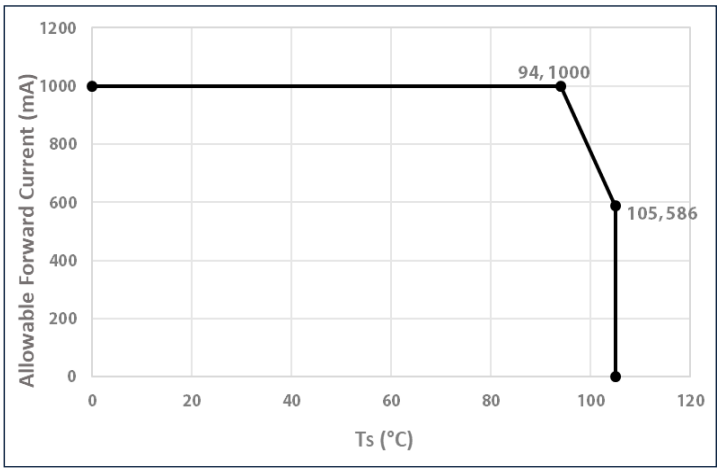


Relative Chromaticity vs Temperature

I_f = 640 mA



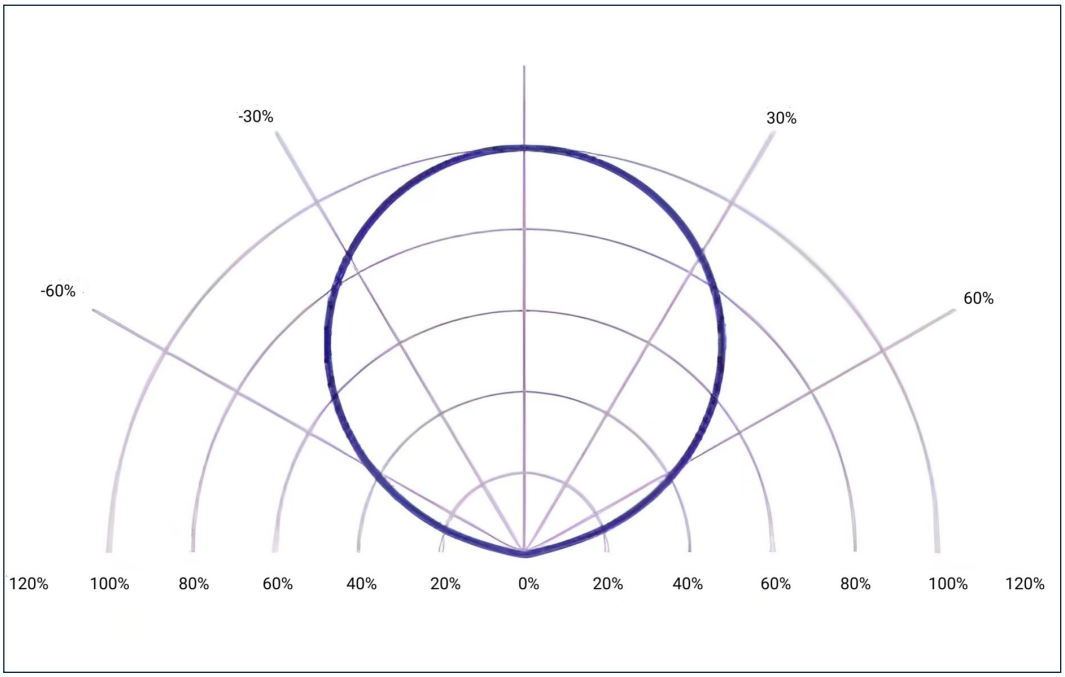
Forward Current vs Temperature



Angular Distribution and Typical Spectrum

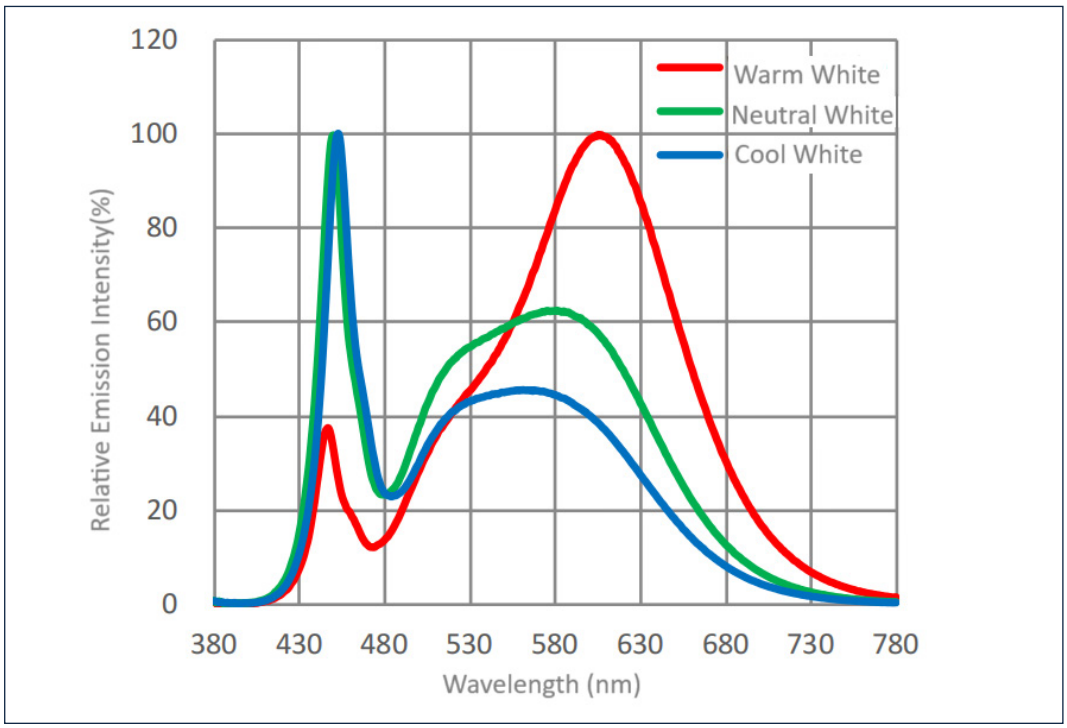
Polar Distribution

T_c = 25°C

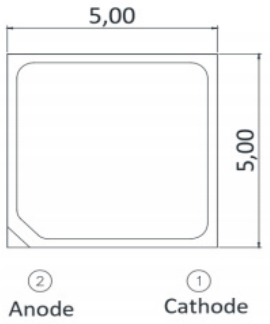


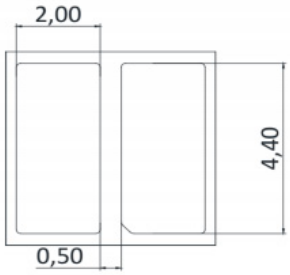
Relative Spectral Power Distribution

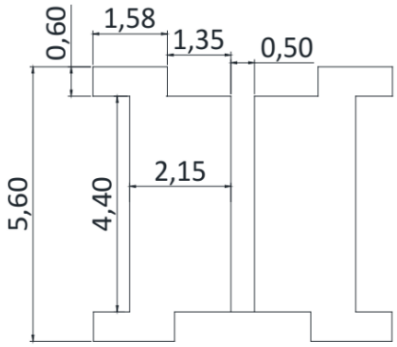
Ra >90; T_c = 25°C



Mechanical Dimensions[1]





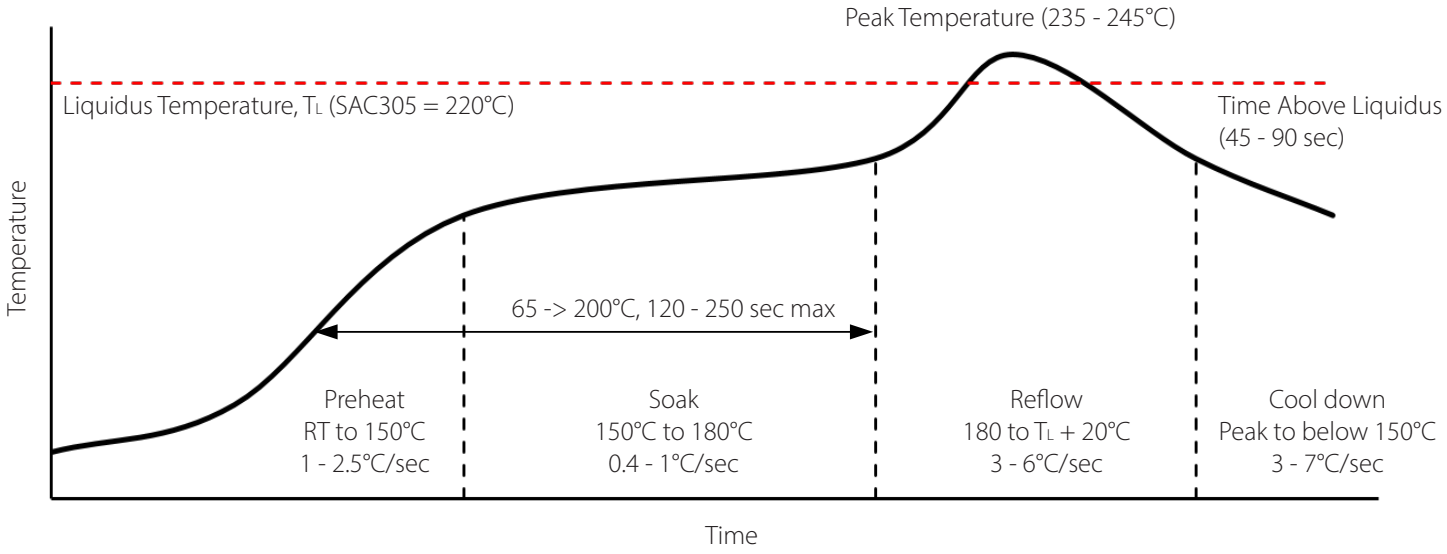


Recommended Soldering Pad Pattern

Note:

1. All dimensions are in millimeter ± 0.15 mm, unless otherwise noted.

Soldering Profile



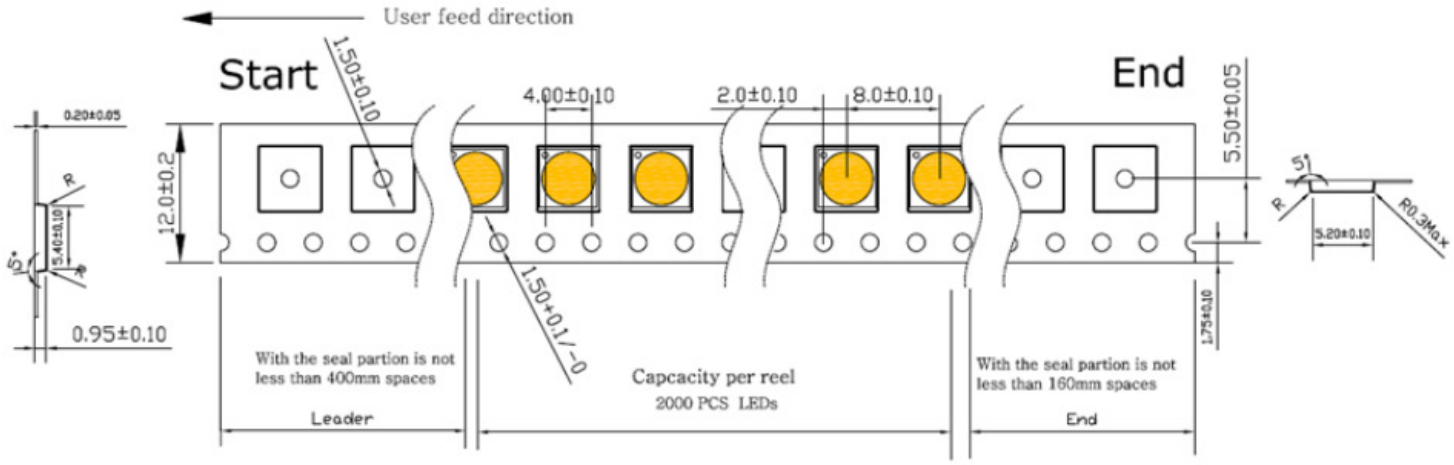
SMT Rework Guideline	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	

Notes:

1. Product complies to Moisture Sensitivity Level 3 (MSL 3).
2. 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.
3. During the pick and place process, axial forces on the dome (or window) should not exceed 0.5 Newtons (N).
4. Use of a multi-zone IR reflow oven with a nitrogen blanket is recommended.
5. Time-temperature profile of the reflow process showing the four functional profile zones are defined in IPC-7801. Temperature is referenced to the center of the PCB.
6. Luminus recommends to use the solder paste data sheet information as a starting point in time-temperature process development.
7. 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-
8. For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.

Tape and Reel Outline

Tape Package Dimensions

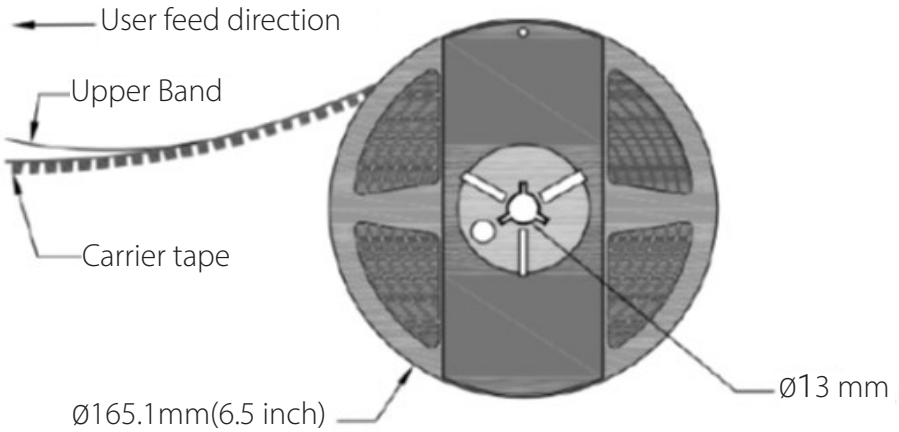


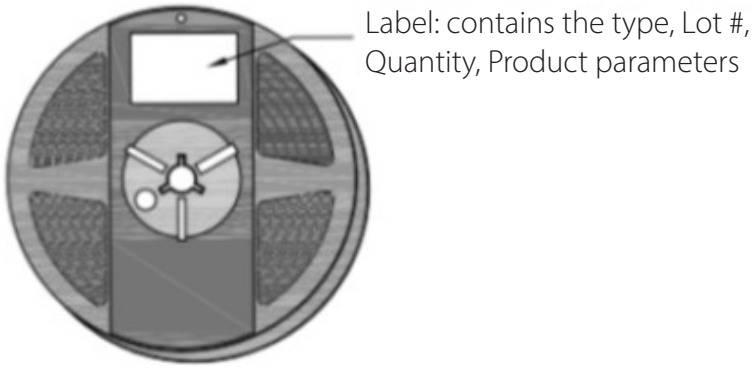
Notes:

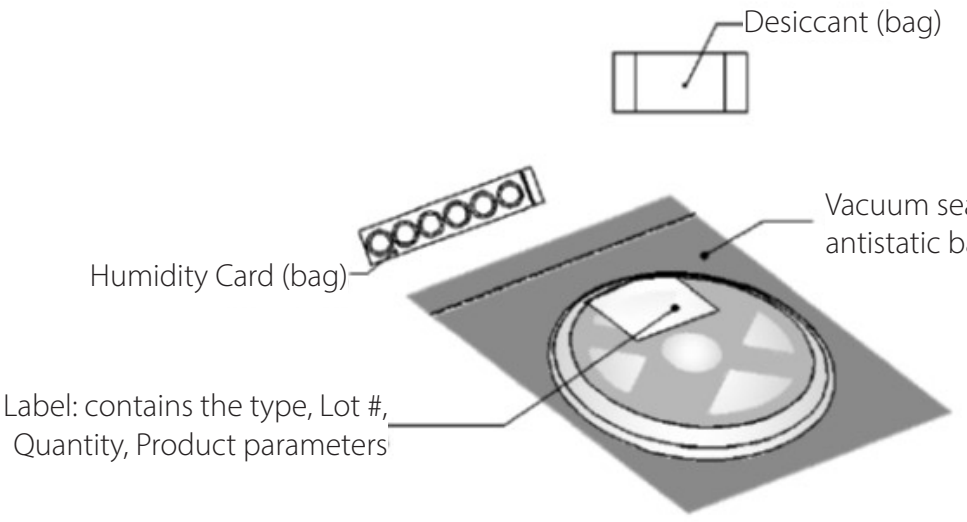
1. Quantity: Max 2000 pcs per reel.
2. Cumulative Tolerance: Cumulative Tolerance/10 pitches to be ±0.2 mm.
3. Adhesion Strength of Cover Tape Adhesion strength to be 0.1-0.7 N when the cover tape is turned off from the carrier tape at the angle of 10° to the carrier tape.
4. Package: P/N, Manufacturing data Code No. and Quantity to be indicated on a damp proof package.

Tape and Reel Outline

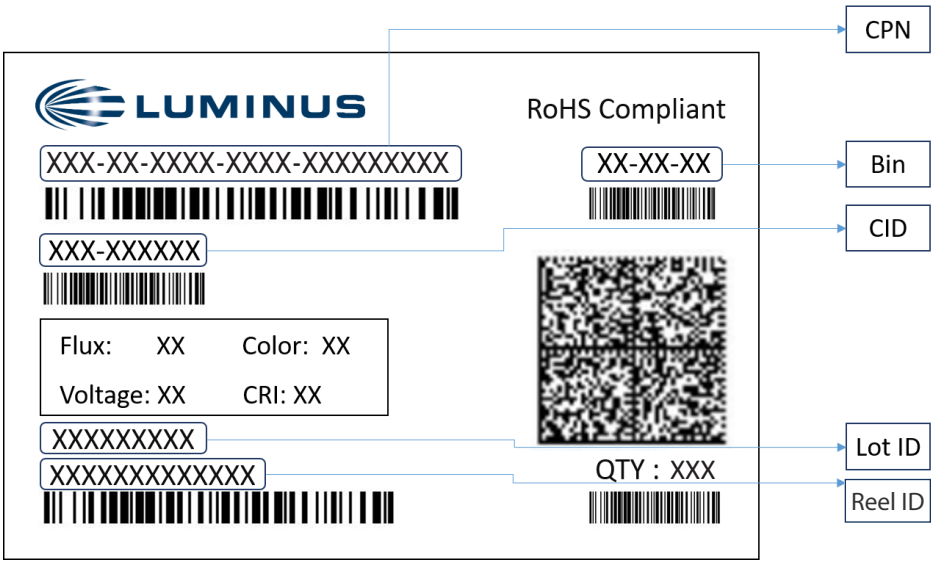
Reel Package Dimensions







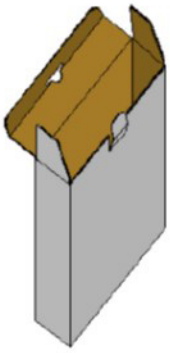
Shipping Label



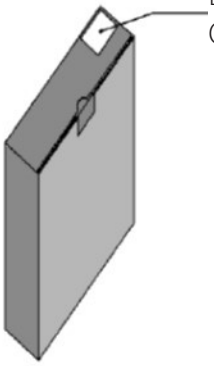
Label Fields:

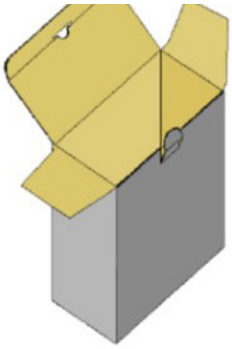
- CPN: Luminus ordering part number
- CID: Customer's part number
- QTY: Quantity of parts per reel
- Flux: Bin as defined on page 4
- Voltage: Bin as defined on page 4
- Color: Bin as defined on page 5
- CRI: NA
- Lot ID & Reel ID: For Luminus internal use

Packaging

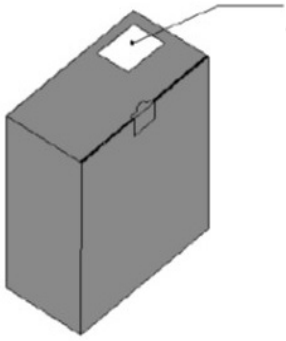


*Capacity 5 reels per box





*Capacity 10 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	10/14/2021	Initial release
02	07/13/2022	Add V_f vs Temperature graph，upload the solder profile
03	05/20/2023	Update thermal resistance value, adjust the position of the content
04	02/20/2025	Update format, adjust the T_j from 120°C to 125°C