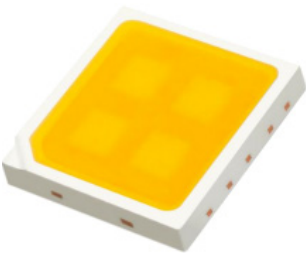


# MP-5050-22FK

## 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

- Architectural / Decorative lighting
- General lighting/Street Light/Flood Light
- Indoor & Outdoor sign board back light
- Downlight & Spotlight
- Retrofits (replacement)

### Table of Contents

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## Ordering Information

### Ordering Part Numbers<sup>1</sup>

| Minimum CRI | CCT   | Luminous Flux     |                   |                   | Ordering Part Number |
|-------------|-------|-------------------|-------------------|-------------------|----------------------|
|             |       | Minimum Flux (lm) | Typical Flux (lm) | Maximum Flux (lm) |                      |
| 70          | 2200K | 190               | 210               | 230               | MP-5050-22FK-22-70F  |
|             | 2700K | 210               | 228               | 250               | MP-5050-22FK-27-70F  |
|             | 3000K | 220               | 237               | 260               | MP-5050-22FK-30-70F  |
|             | 3500K | 220               | 241               | 260               | MP-5050-22FK-35-70F  |
|             | 4000K | 230               | 247               | 270               | MP-5050-22FK-40-70F  |
|             | 5000K | 230               | 247               | 270               | MP-5050-22FK-50-70F  |
|             | 5700K | 230               | 243               | 270               | MP-5050-22FK-57-70F  |
|             | 6500K | 230               | 241               | 270               | MP-5050-22FK-65-70F  |

**Note:**

1. Test condition :  $I_f = 180 \text{ mA}$ ,  $T_c = 25^\circ\text{C}$ .

## Ordering Information

## Part Number Nomenclature

MP

5050

## 22FK

## ##

## ##

| Product Family    | Package Type          | Package Configurator | Nominal CCT¹                                                                                         | Minimum CRI           |
|-------------------|-----------------------|----------------------|------------------------------------------------------------------------------------------------------|-----------------------|
| MP: Mid Power LED | 5050: 5.0 mm x 5.0 mm | 22FK: Package code   | 22: 2200K<br>27: 2700K<br>30: 3000K<br>35: 3500K<br>40: 4000K<br>50: 5000K<br>57: 5700K<br>65: 6500K | 70: CRI>70<br>F: flip |

**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<sup>1</sup>

| Flux Bin | Binning @ 180 mA, T <sub>c</sub> = 25°C |                   |
|----------|-----------------------------------------|-------------------|
|          | Minimum Flux (lm)                       | Maximum Flux (lm) |
| JL       | 190                                     | 200               |
| JM       | 200                                     | 210               |
| JN       | 210                                     | 220               |
| JP       | 220                                     | 230               |
| JQ       | 230                                     | 240               |
| JR       | 240                                     | 250               |
| JS       | 250                                     | 260               |
| JT       | 260                                     | 270               |

### Forward Voltage Bins<sup>2</sup>

| Voltage Bin | Binning @ 180 mA, T <sub>c</sub> = 25°C |                     |
|-------------|-----------------------------------------|---------------------|
|             | Minimum Voltage (V)                     | Maximum Voltage (V) |
| X3          | 5.2                                     | 5.4                 |
| Y3          | 5.4                                     | 5.6                 |
| Z3          | 5.6                                     | 5.8                 |

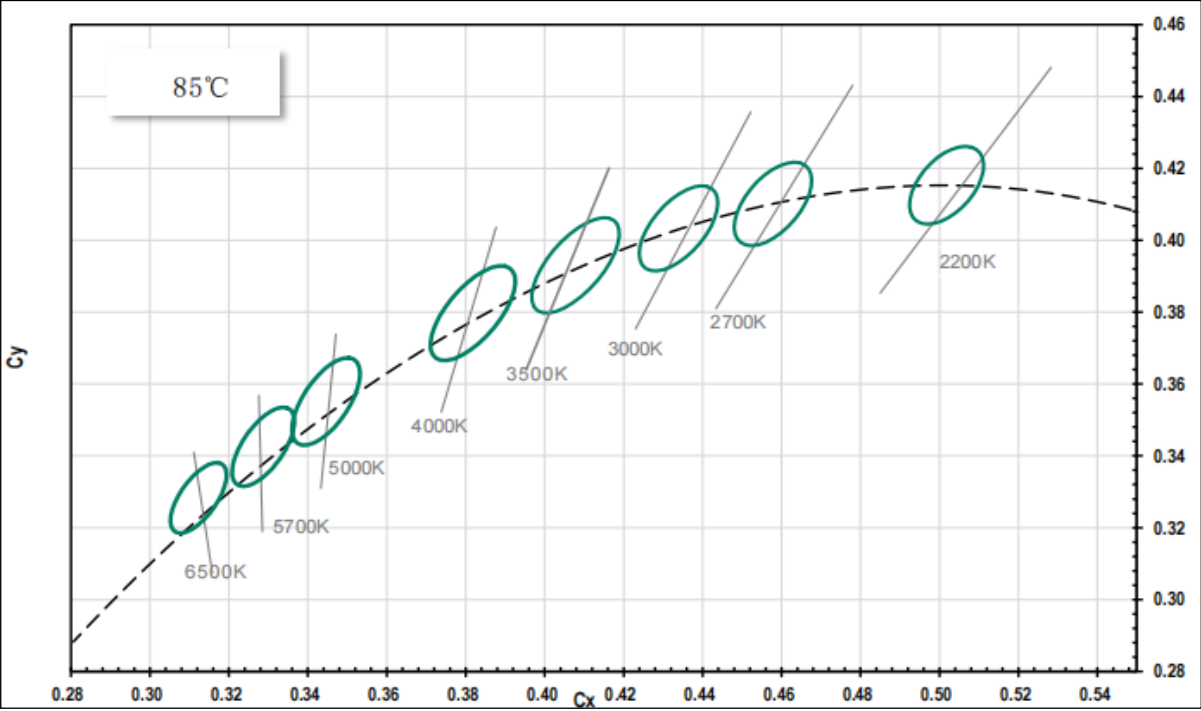
#### Notes:

1. Luminus maintains a 7% tolerance on flux measurement.
2. Luminus maintains a ±0.2V tolerance on forward voltage measurement.



Binning Structure

Chromaticity Binning Diagram



Color Bins<sup>1</sup> (I<sub>f</sub>=180 mA)

| CCT   | Center point |        | Radius   |          | Angle(deg) | Step |
|-------|--------------|--------|----------|----------|------------|------|
|       | x            | y      | a        | b        | Φ          |      |
| 2200K | 0.5018       | 0.4153 | 0.002700 | 0.001400 | 57.3       | 3/5  |
| 2700K | 0.4578       | 0.4101 | 0.002700 | 0.001400 | 57.3       | 3/5  |
| 3000K | 0.4339       | 0.4033 | 0.002780 | 0.001360 | 53.22      | 3/5  |
| 3500K | 0.4078       | 0.3930 | 0.003090 | 0.001380 | 54         | 3/5  |
| 4000K | 0.3818       | 0.3797 | 0.003130 | 0.001340 | 53.72      | 3/5  |
| 5000K | 0.3446       | 0.3551 | 0.002740 | 0.001180 | 59.62      | 3/5  |
| 5700K | 0.3287       | 0.3425 | 0.002487 | 0.001067 | 59.09      | 3/5  |
| 6500K | 0.3123       | 0.3283 | 0.002230 | 0.000950 | 58.57      | 3/5  |

Note:

1. Luminus maintains a +/- 0.005 tolerance on chromaticity (CIEx and CIEy) measurements.



## Absolute Maximum Ratings

| Parameter                            | Symbol    | Values          | Unit |
|--------------------------------------|-----------|-----------------|------|
| Forward Current                      | $I_f$     | 800             | mA   |
| Pulse Forward Current <sup>1,2</sup> | $I_{fp}$  | 1200            | mA   |
| Power Dissipation                    | $P_d$     | 4880            | mW   |
| Junction Temperature                 | $T_j$     | 125             | °C   |
| Case Temperature                     | $T_c$     | 105             | °C   |
| Operating Temperature Range          | $T_{opr}$ | -40 to 105      | °C   |
| Storage Temperature Range            | $T_{stg}$ | -40 to 105      | °C   |
| Soldering Temperature                | $T_{sld}$ | 260 °C < 10 sec |      |

### 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

| Parameter ( $I_f = 180 \text{ mA}$ , $T_c = 25^\circ\text{C}$ ) |         | Symbol               | Value | Unit               |
|-----------------------------------------------------------------|---------|----------------------|-------|--------------------|
| Forward Voltage                                                 | Minimum | $V_{f \text{ min}}$  | 5.2   | V                  |
|                                                                 | Maximum | $V_{f \text{ max}}$  | 5.8   |                    |
| Reverse Current ( $V_r = 5\text{V}$ )                           |         | $I_r$                | 10    | $\mu\text{A}$      |
| Thermal Resistance                                              |         | $R_{th \text{ J-C}}$ | 1.3   | $^\circ\text{C/W}$ |
| View Angle                                                      |         | $2\theta_{1/2}$      | 120   | $^\circ$           |
| Electrostatic Discharge                                         |         | $V_{ESD}$            | 8000  | V                  |

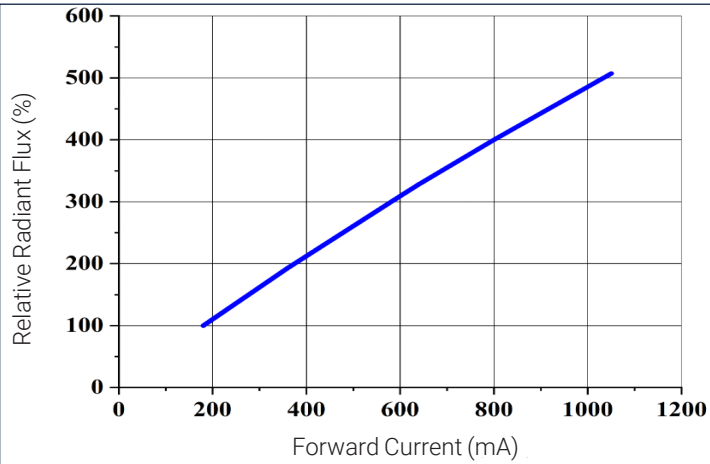
### Notes:

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.



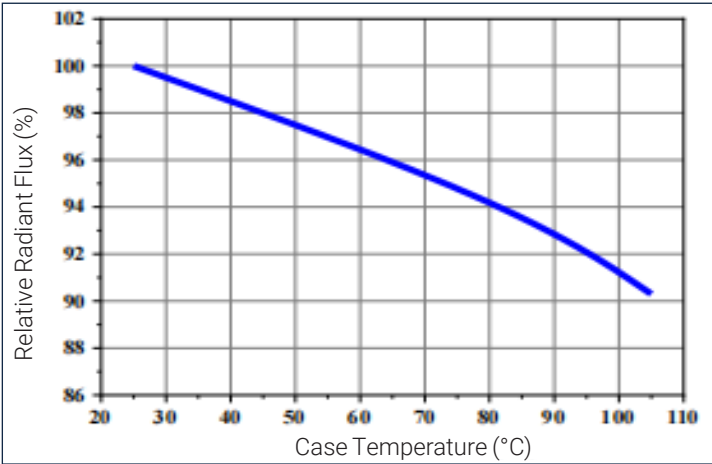
Relative Luminous Flux vs Forward Current

$T_c = 25^{\circ}\text{C}$



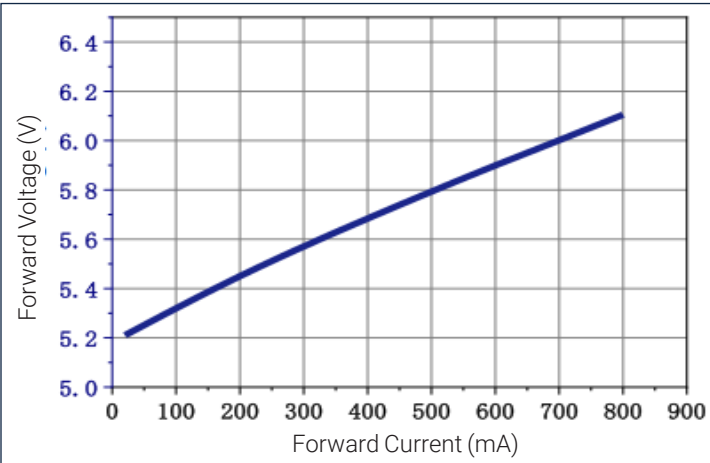
Relative Radiant Flux vs Case Temperature

$I_f = 180\text{ mA}$



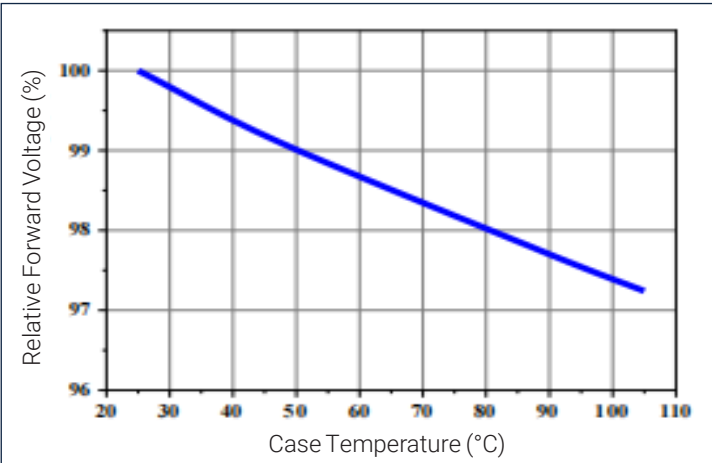
Forward Current vs Forward Voltage

$T_c = 25^{\circ}\text{C}$

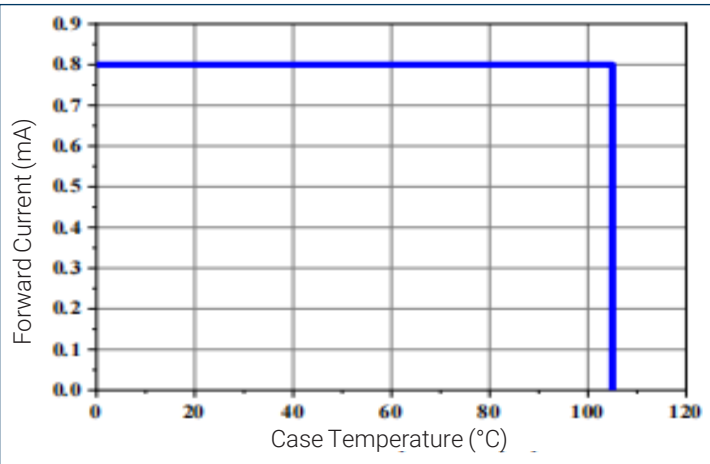


Relative Forward Voltage vs Case Temperature

$I_f = 180\text{ mA}$



Forward Current vs Case Temperature



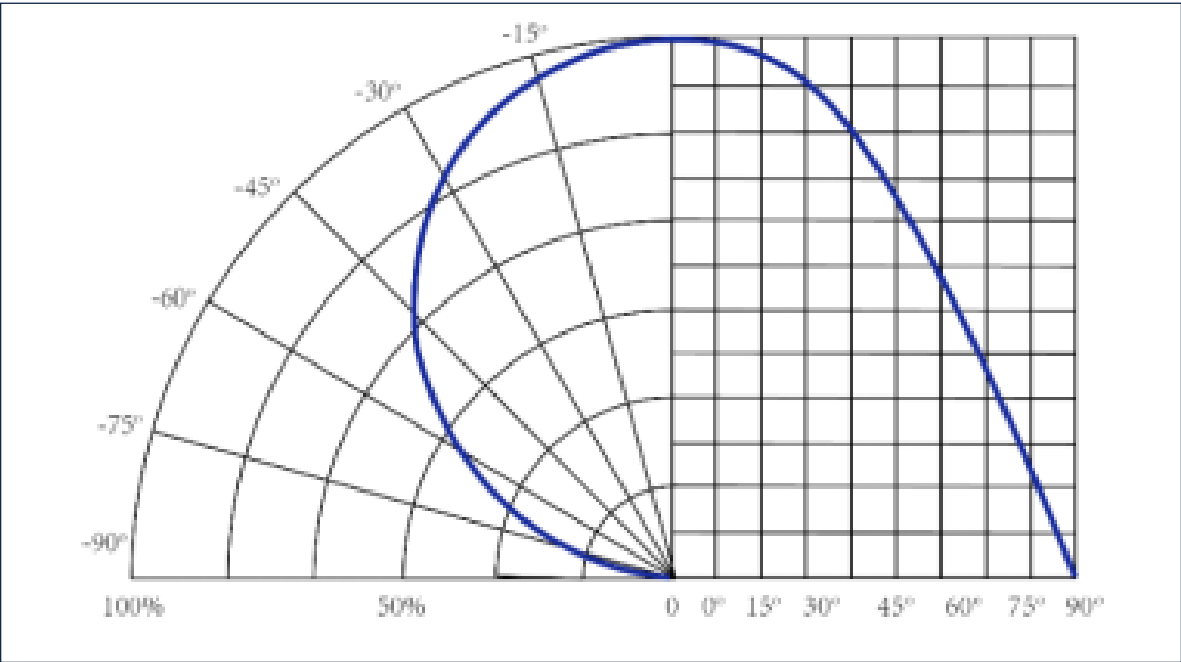




## Angular Distribution and Typical Spectrum

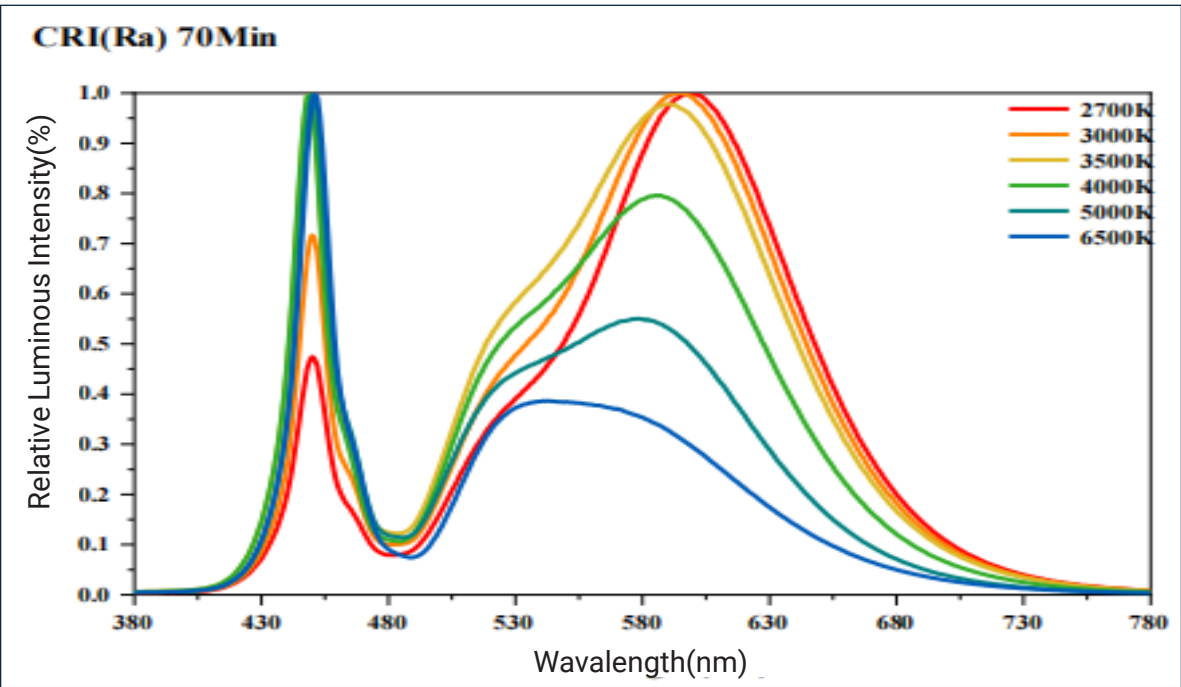
### Angular Distribution

$T_c = 25^{\circ}\text{C}$



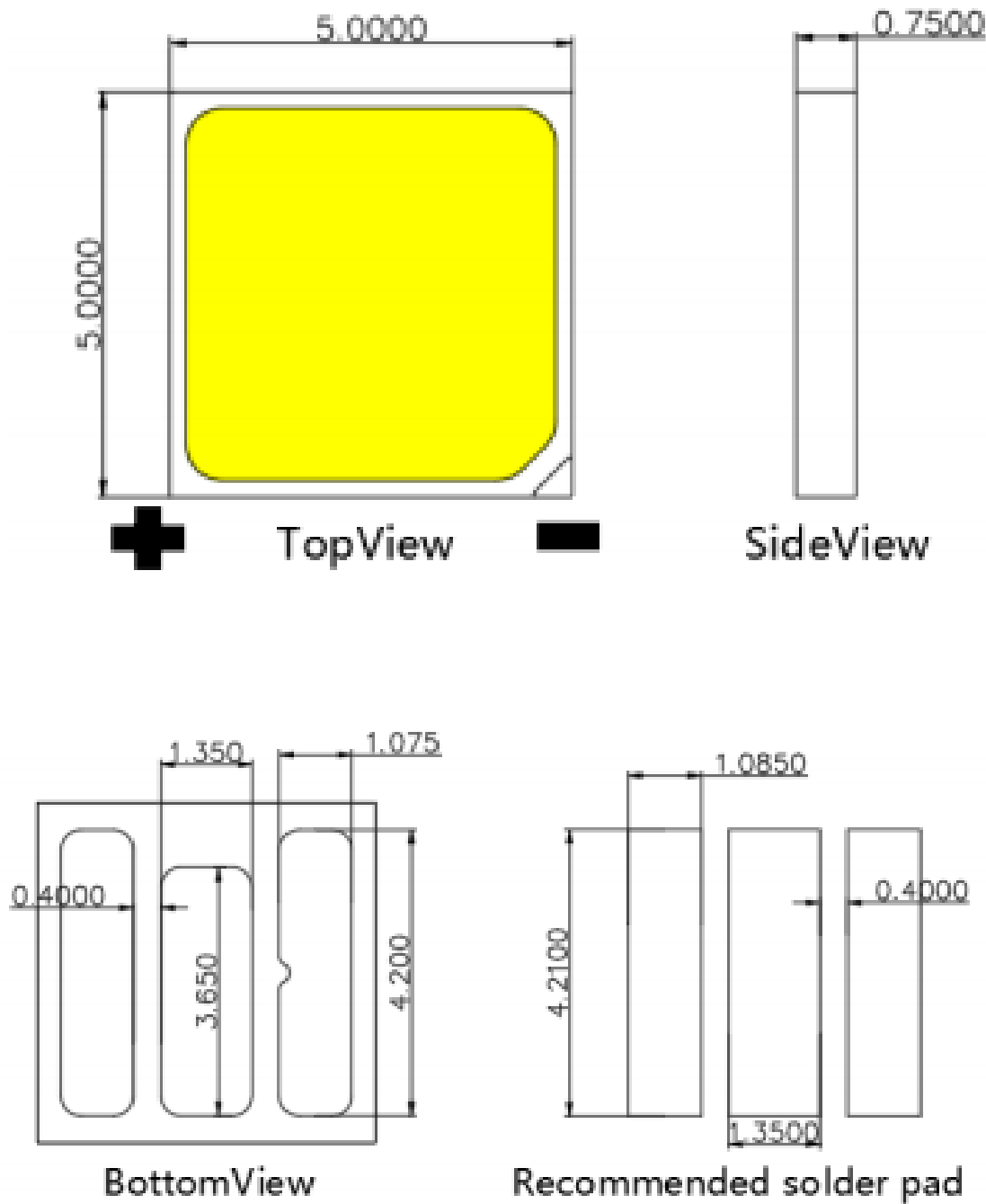
### Relative Spectral Power Distribution

$R_a > 70$ ;  $T_c = 25^{\circ}\text{C}$





Mechanical Dimensions



Notes:

- 1. All dimensions are in millimeter  $\pm 0.2$  mm, unless otherwise noted.
- 2. The soldering pad pattern is only for reference and can be modified according to actual requirements.



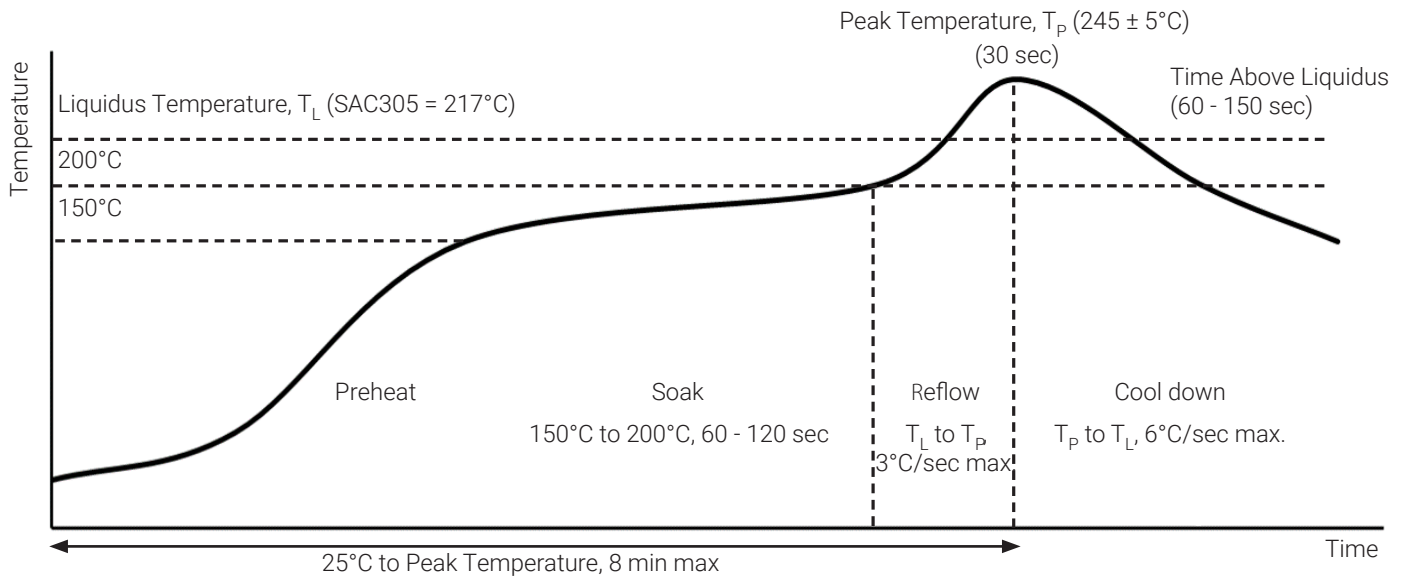
## Mechanical Characteristics

### JEDEC Moisture Sensitivity<sup>1, 2</sup>

| Level | Floor Life |                |
|-------|------------|----------------|
|       | Time       | Conditions     |
| 3     | 168 Hours  | ≤30°C / 60% RH |

- Notes:
- 1. Please note that the above MSL level based on the MSL qualification rating.
  - 2. This LED has silver-plated pads, and for LEDs with silver plating, MSL3 environment control is required to protect silver-plated surface from oxidation, even though the products may be qualified as MSL1 or 2.

## 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            |

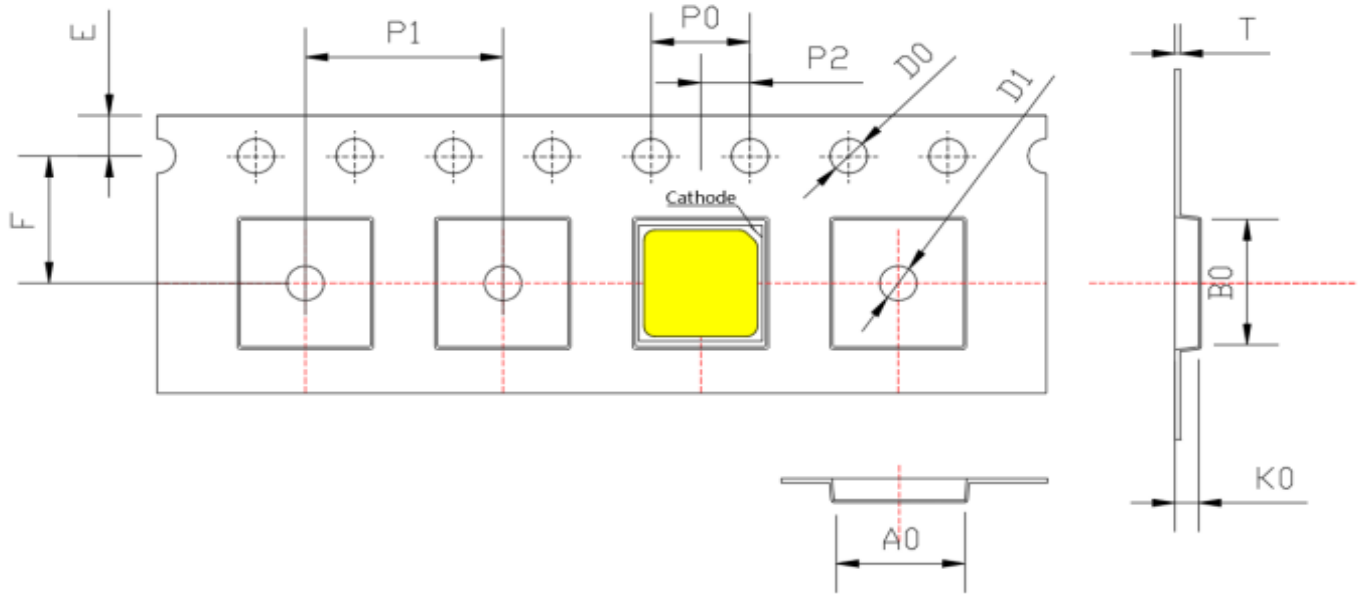
#### Notes:

- 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](mailto:techsupport@luminus.com).



## Tape and Reel Outline

### Tape Package Dimensions



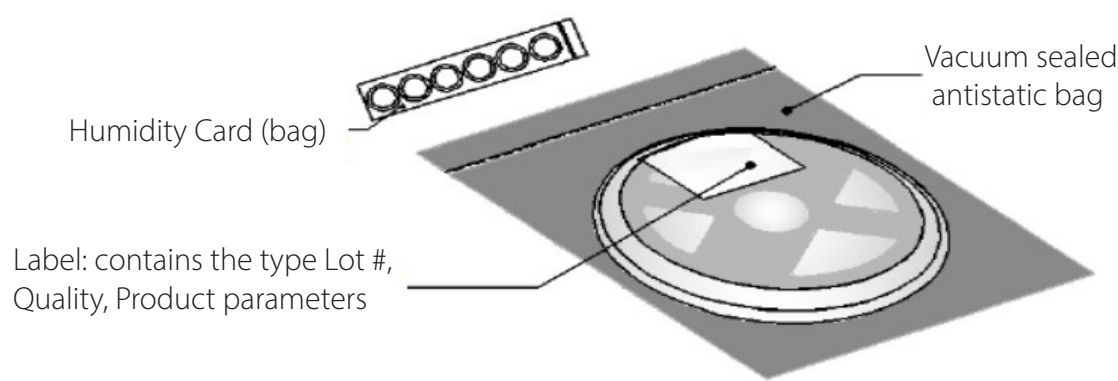
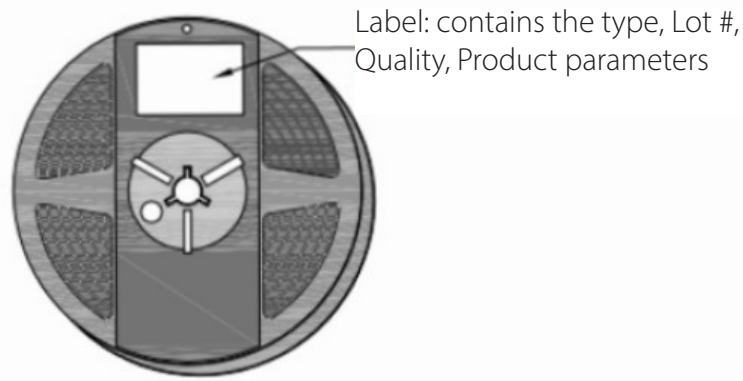
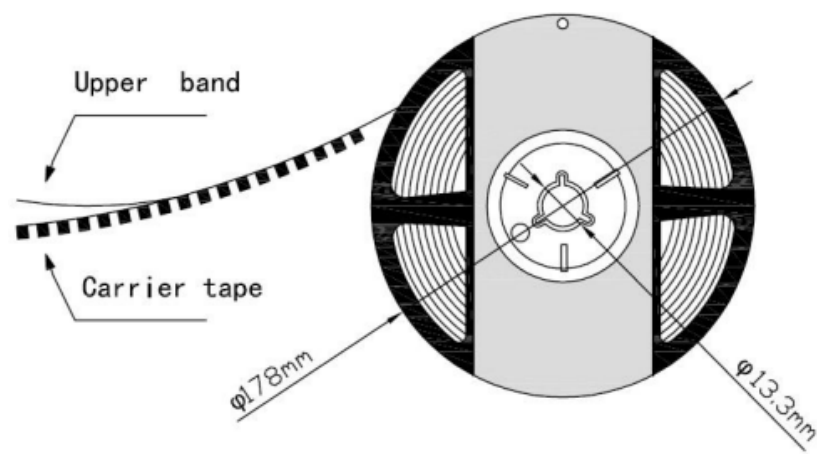
#### Notes:

1. Quantity: Max 2,000 pcs per reel.
2. Cumulative Tolerance: Cumulative Tolerance/10 pitches to be  $\pm 0.2$  mm.
3. Adhesion Strength of Cover Tape Adhesion strength to be 0.1-0.7 N when the cover tape is pulled off from the carrier tape at the angle of  $10^\circ$  to the carrier tape.
4. Package: P/N, Manufacturing data Code No. and Quantity to be indicated on a damp proof package.
5. All dimensions are in millimeter.



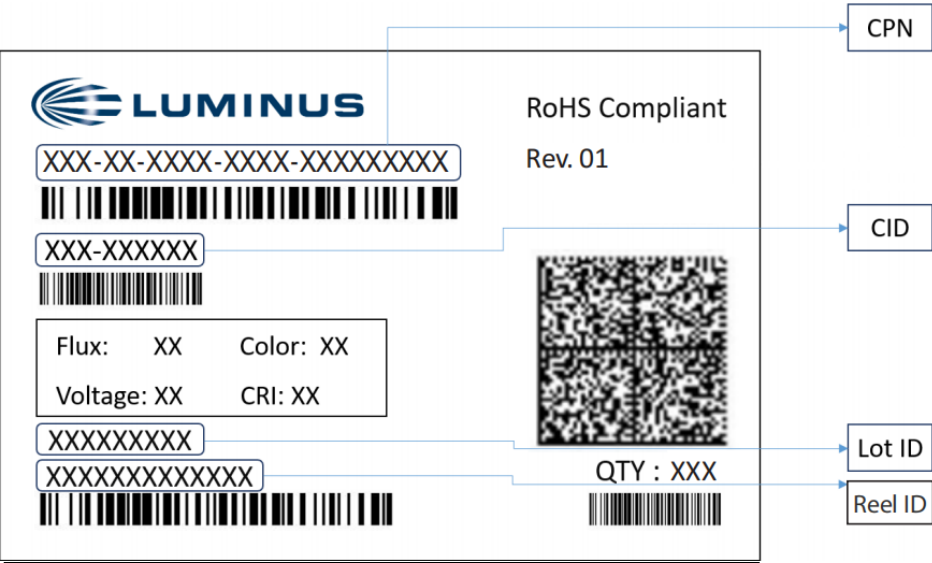
Tape and Reel Outline

Reel Package Dimensions<sup>1</sup>





## Shipping Label



### Label Fields:

- CPN: Luminus ordering part number
- CID: Customer's part number (this is a non-essential item)
- 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



## 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 an 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  | 07/27/2026 | Initial release       |