

# SST-10-IR

## Surface Mount Infrared LED



### Features

- High power infrared LED
- Built-in ESD protection.
- Low thermal resistance.
- Suitable for all SMT assembly methods.



### Applications

- Surveillance Systems / CCTV
- License Plate Scanning
- Automotive Sensing
- Machine Vision
- Night Vision

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## Ordering Information

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

| Peak Wavelength | Radiometric Flux              |                           | Lens Angle | Ordering Part Number   |
|-----------------|-------------------------------|---------------------------|------------|------------------------|
|                 | Minimum Flux Bin <sup>1</sup> | Minimum Flux <sup>2</sup> |            |                        |
| 850 nm          | K                             | 265 mW                    | 90 °       | SST-10-IR-B90-K850-00  |
|                 |                               |                           | 130 °      | SST-10-IR-B130-K850-00 |
|                 | L                             | 295 mW                    | 90 °       | SST-10-IR-B90-L850-00  |
|                 |                               |                           | 130 °      | SST-10-IR-B130-L850-00 |
| 940 nm          | K                             | 265 mW                    | 90 °       | SST-10-IR-B90-K940-00  |
|                 |                               |                           | 130 °      | SST-10-IR-B130-K940-00 |

### Part Number Nomenclature

| SST  | 10  | IR                  | B###  | F###-00   |
|--|---|---------------------|---|---|
| Product Family   | Chip Area                                 | Color               | Package Configuration   | Bin Kit   |
| <b>S:</b> Surface Mount<br><b>S:</b> Dome Lensed<br><b>T:</b> Single Emitter | <b>10:</b> 1.0 mm <sup>2</sup> class chip | <b>IR:</b> Infrared | <b>B90:</b> 90 deg beam angle<br><b>B130:</b> 130 deg beam angle<br>Ceramic 3.45 mm x 3.45 mm, see pg. 10 - 12 for details. | Refer to flux bin and wavelength bin table in page3 for more details. |

#### Note:

1. The Ordering Part Number specifies the Minimum Flux Bin in shipment; higher flux bins may be shipped without advance notice. Please refer to 'Radiometric Flux Bins' table for details of all flux bins.



## Binning Structure

### Radiometric Flux Bins<sup>1,2</sup>

| Flux Bin | Binning @ 350 mA, T <sub>j</sub> = 25°C |                   |
|----------|---|-------------------|
|          | Minimum Flux (mW)                       | Maximum Flux (mW) |
| K        | 265                                     | 295               |
| L        | 295                                     | 325               |
| M        | 325                                     | 355               |
| N        | 355                                     | 385               |
| P        | 385                                     | 415               |

### Wavelength Bins<sup>2,3</sup>

| Wavelength Bin | Binning @ 350 mA, T <sub>j</sub> = 25°C |                              |
|----------------|---|------------------------------|
|                | Minimum Peak Wavelength (nm)            | Maximum Peak Wavelength (nm) |
| 850            | 840                                     | 870                          |
| 940            | 925                                     | 955                          |

### Forward Voltage Bins<sup>2,3</sup>

| Voltage Bin | Binning @ 350 mA, T <sub>j</sub> = 25°C |                     |
|-------------|---|---------------------|
|             | Minimum Voltage (V)                     | Maximum Voltage (V) |
| V1          | 1.2                                     | 1.4                 |
| V2          | 1.4                                     | 1.6                 |
| V3          | 1.6                                     | 1.8                 |
| V4          | 1.8                                     | 2.0                 |

#### Notes:

1. Luminus maintains a ±6% tolerance on flux measurement.
2. Products are production tested then sorted and packed by bin.
3. Individual bins are not orderable. The wavelength bin as marked on the product label may be followed by a letter which is for internal use only.
4. T<sub>c</sub> = Case temperature



## Characteristics<sup>1</sup>

| Parameter ( $I_f=350$ mA, $T_j=25^\circ\text{C}$ )            |             | Symbol                  | Value |       | Unit   |
|---|-------------|-------------------------|-------|-------|--------|
|   |             |                         | 850nm | 940nm |        |
| Forward Current   |             | $I_f$                   | 350   |       | mA     |
| Forward Voltage   | Minimum     | $V_{f\min}$             | 1.2   | 1.2   | V      |
|   | Typical     | $V_{f\text{typ}}$       | 1.5   | 1.4   |        |
|   | Maximum     | $V_{f\max}$             | 2.0   | 2.0   |        |
| Viewing Angle   | <b>B90</b>  | $2\ \varnothing_{1/2}$  | 90    |       | °      |
|   | <b>B130</b> |                         | 130   |       |        |
| Typical Output Power  | <b>B90</b>  | $\varphi_v$             | 360   |       | mW     |
|   | <b>B130</b> |                         | 370   |       |        |
| Radiant Intensity at 350 mA, $t = 20\text{ms}$                | <b>B90</b>  | $f_{e\text{typ}}$       | 200   |       | mW/Str |
|   | <b>B130</b> |                         | 125   |       |        |
| Typical Peak Wavelength                                       |             | $\lambda_p$             | 850   | 940   | nm     |
| FWHM  |             | $\Delta\lambda_{1/2}$   | 30    |       |        |
| Electrical Thermal Resistance (junction to case) <sup>2</sup> |             | $R_{\text{th JC elec}}$ | 3.5   |       | °C/W   |

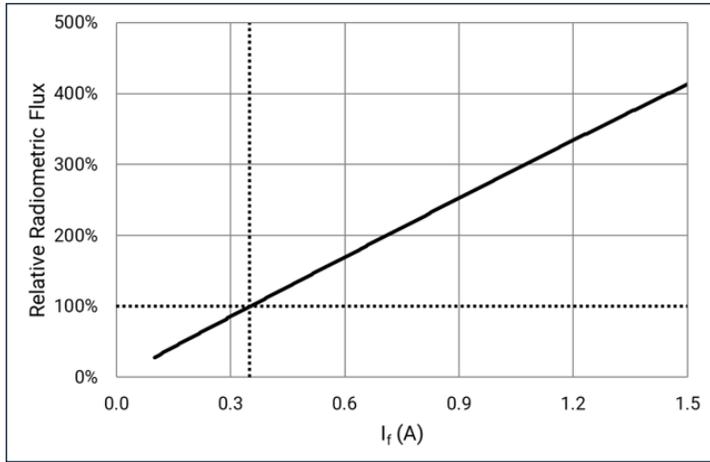
**Note:**

1. Binning based on operation at a current of 350 mA, 20 ms single pulse and a constant case temperature of  $T_j = 25^\circ\text{C}$ . Parts are binned and shipped in  $V_f=0.2$  V increments.



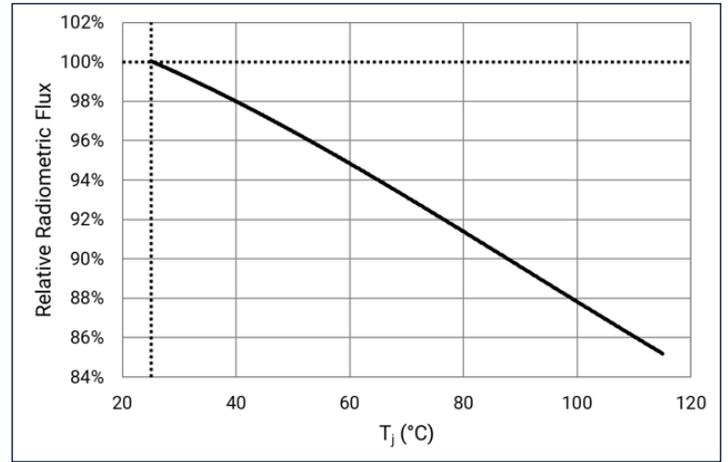
**Relative Radiometric Flux vs Forward Current**

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



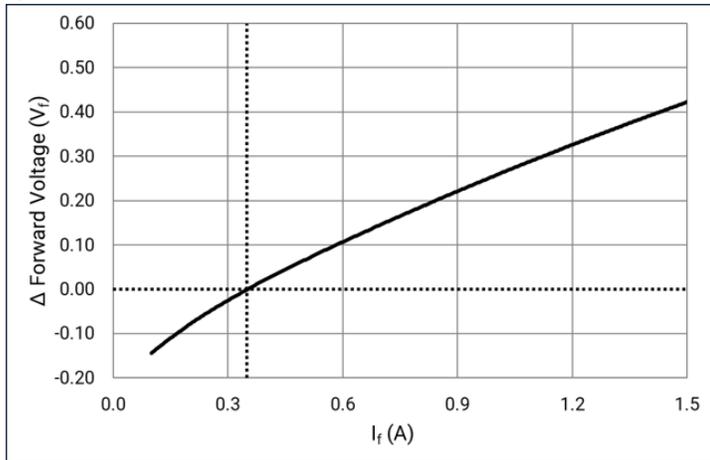
**Relative Radiometric Flux vs Temperature**

$I_f = 350\text{ mA}$



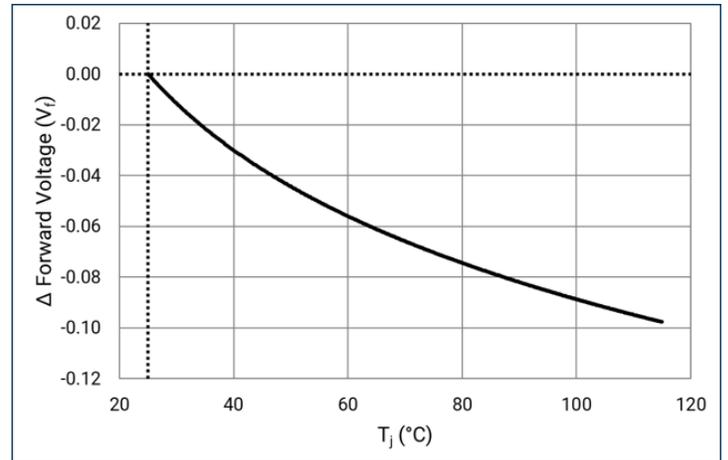
**Forward Voltage vs Forward Current**

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



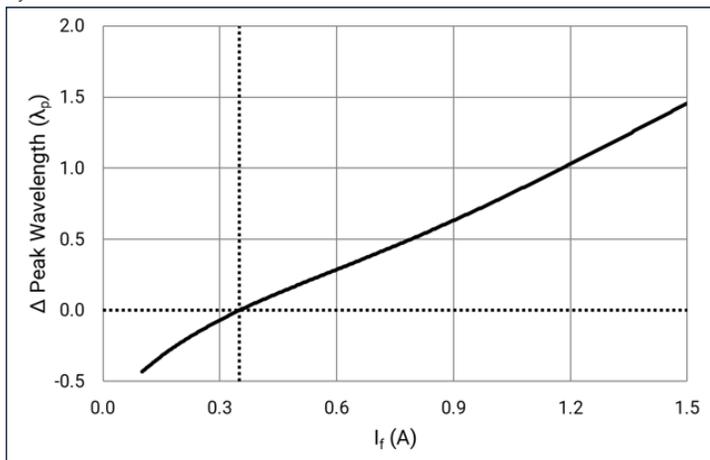
**Forward Voltage vs Temperature**

$I_f = 350\text{ mA}$



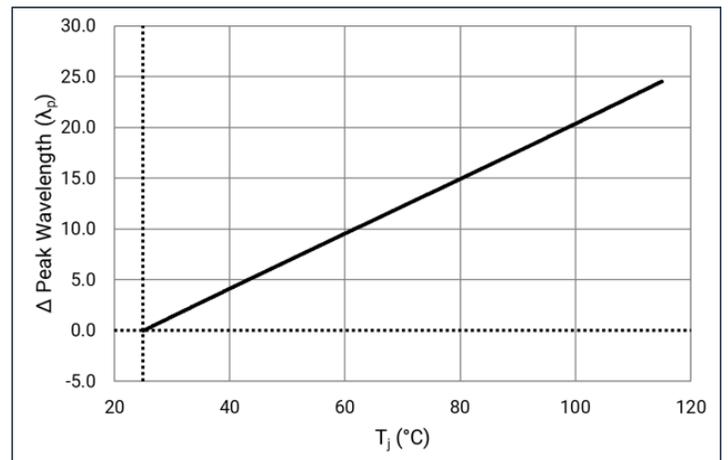
**Peak Wavelength Shift vs Forward Current**

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



**Peak Wavelength Shift vs Temperature**

$I_f = 350\text{ mA}$

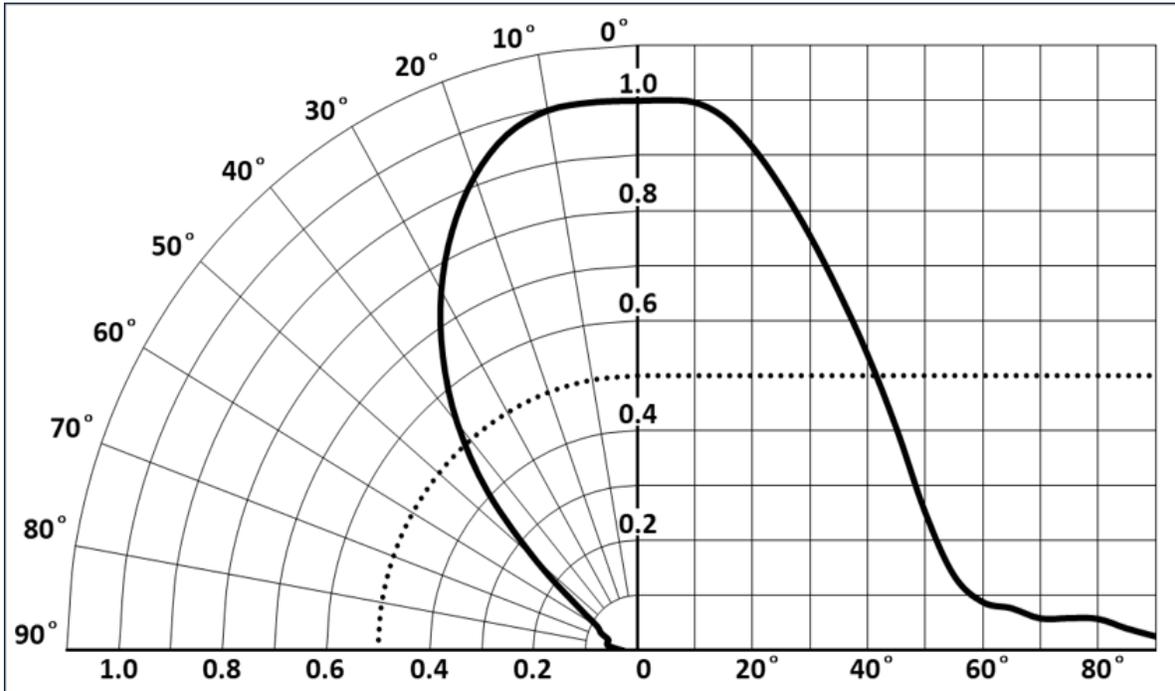




## Angular Distribution

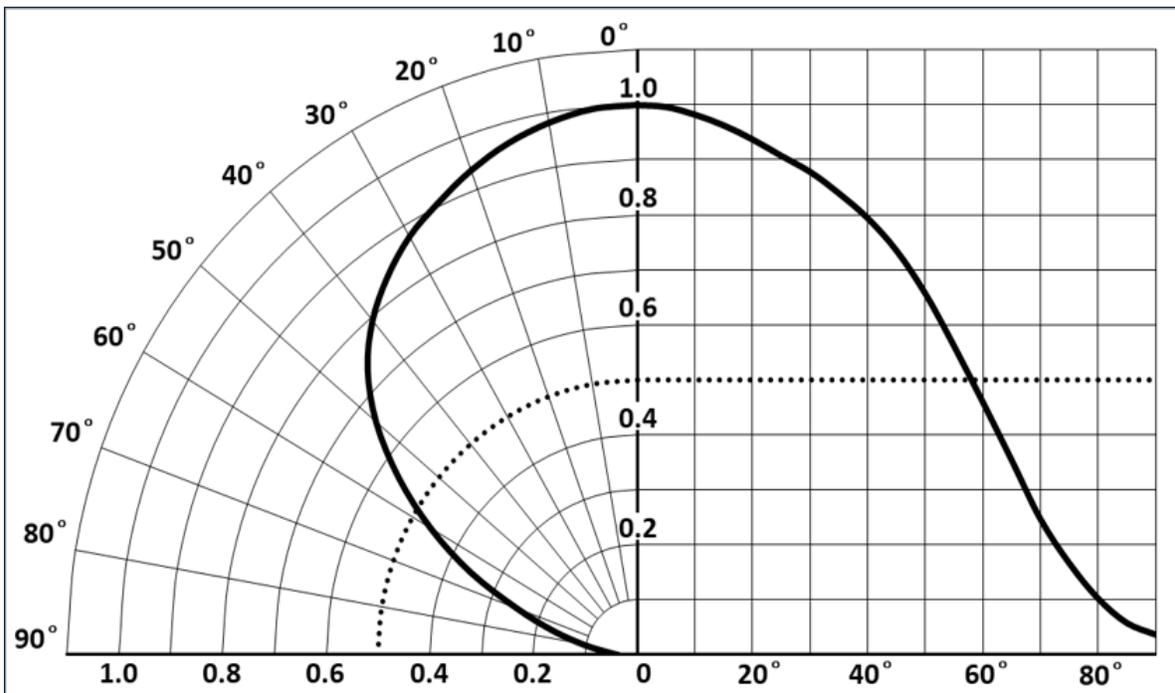
### Typical Polar Radiation - B90

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



### Typical Polar Radiation - B130

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

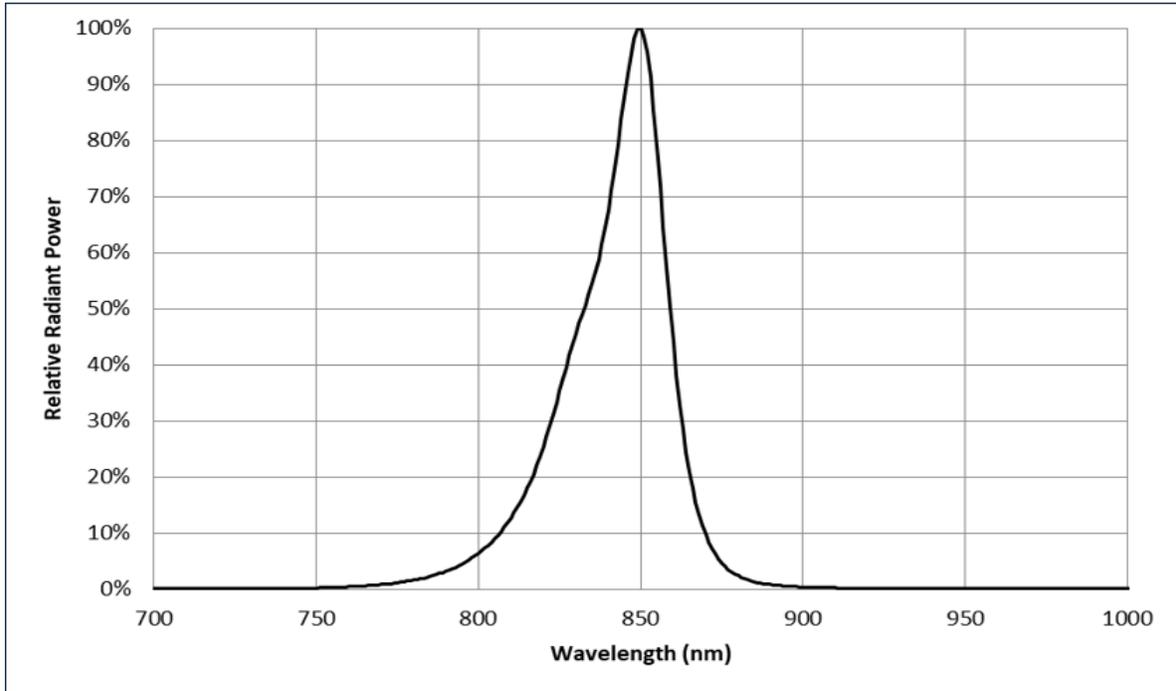




## Typical Spectrum

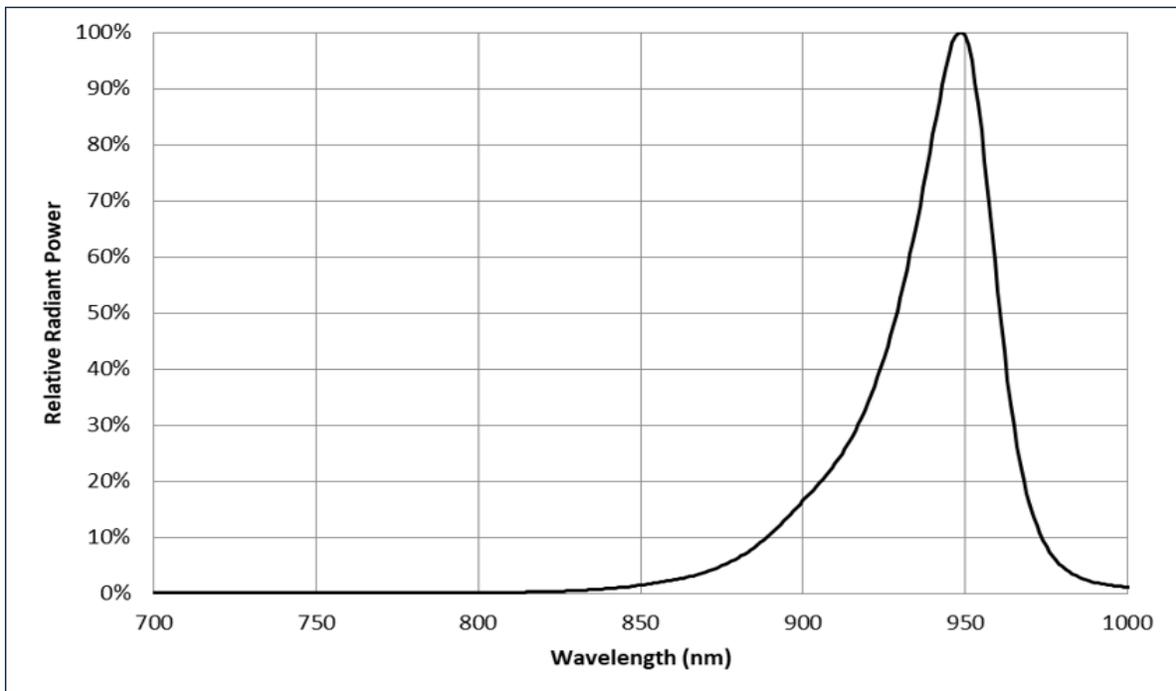
### Relative Spectral Power Distribution - 850nm

$I_f = 350 \text{ mA}$ ;  $T_c = 25^\circ\text{C}$



### Relative Spectral Power Distribution - 940nm

$I_f = 350 \text{ mA}$ ;  $T_c = 25^\circ\text{C}$





## Absolute Maximum Ratings

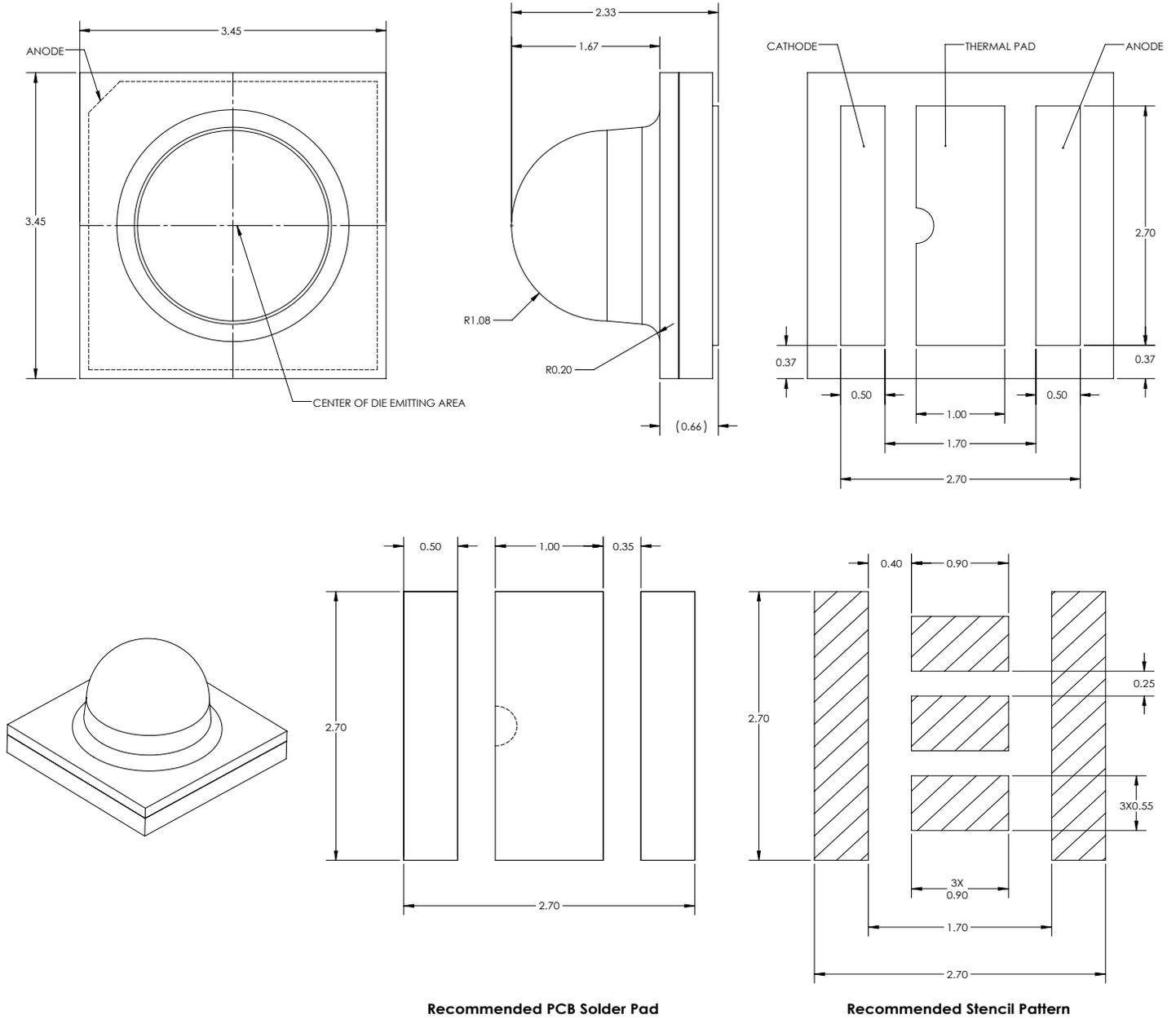
| Parameter  | Symbol           | Values     | Unit |
|--|------------------|------------|------|
| Forward Current (CW) <sup>1,2</sup>                | $I_{f\ CW\ max}$ | 1.5        | A    |
| Power Dissipation                                  | $P_D$            | 3.0        | W    |
| Reverse Voltage                                    | $V_r$            | 5.0        | V    |
| Storage Temperature Range                          | $T_{stg}$        | -40 to 100 | °C   |
| Junction Temperature <sup>1,2</sup>                | $T_j$            | 115        |      |
| Soldering Temperature                              | $T_s$            | 260        |      |
| ESD withstand Voltage ANSI/ESDA/JEDEC JS-001 (HBM) | $V_{ESD}$        | 6          | kV   |

**Notes:**

1. Luminus LEDs are designed for operation up to an absolute maximum forward drive current as specified above. 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 junction temperature.



## Mechanical Dimensions - B90 Package

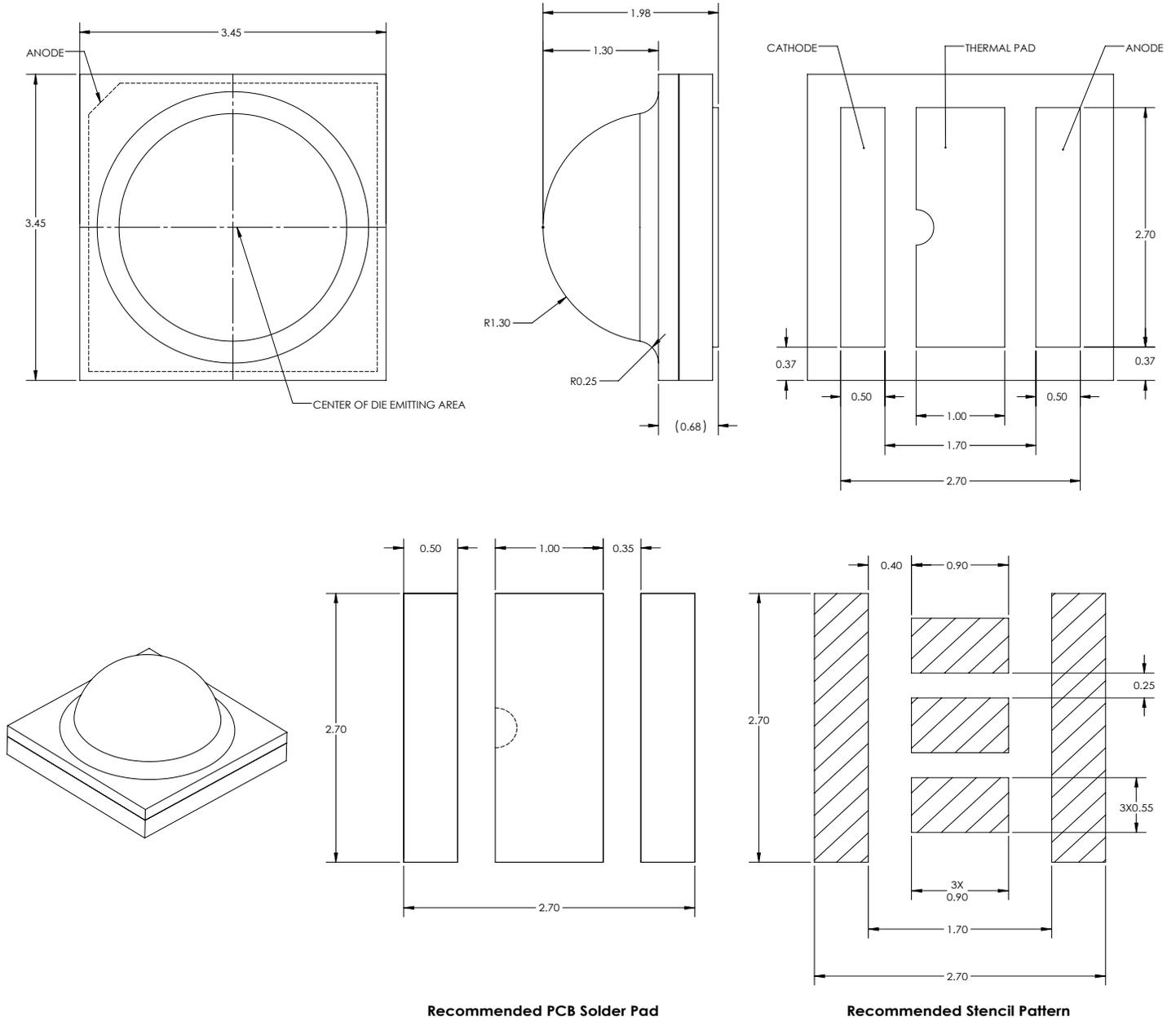


**Note:**

1. All dimensions are in millimeter  $\pm 0.05$  mm.



## Mechanical Dimensions - B130 Package



Recommended PCB Solder Pad

Recommended Stencil Pattern

**Note:**

1. All dimensions are in millimeter  $\pm 0.05$  mm.



## Mechanical Characteristics

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

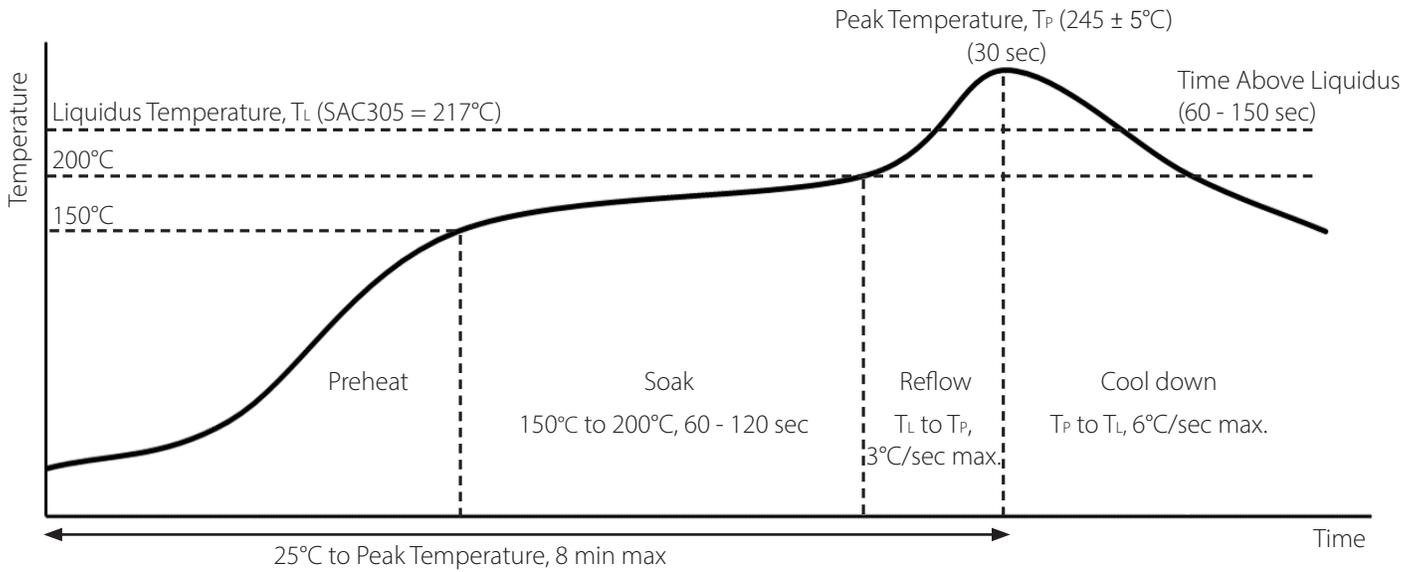
| Level | Floor Life |                |
|-------|------------|----------------|
|       | Time       | Conditions     |
| 1     | Unlimited  | ≤30°C / 85% RH |

**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

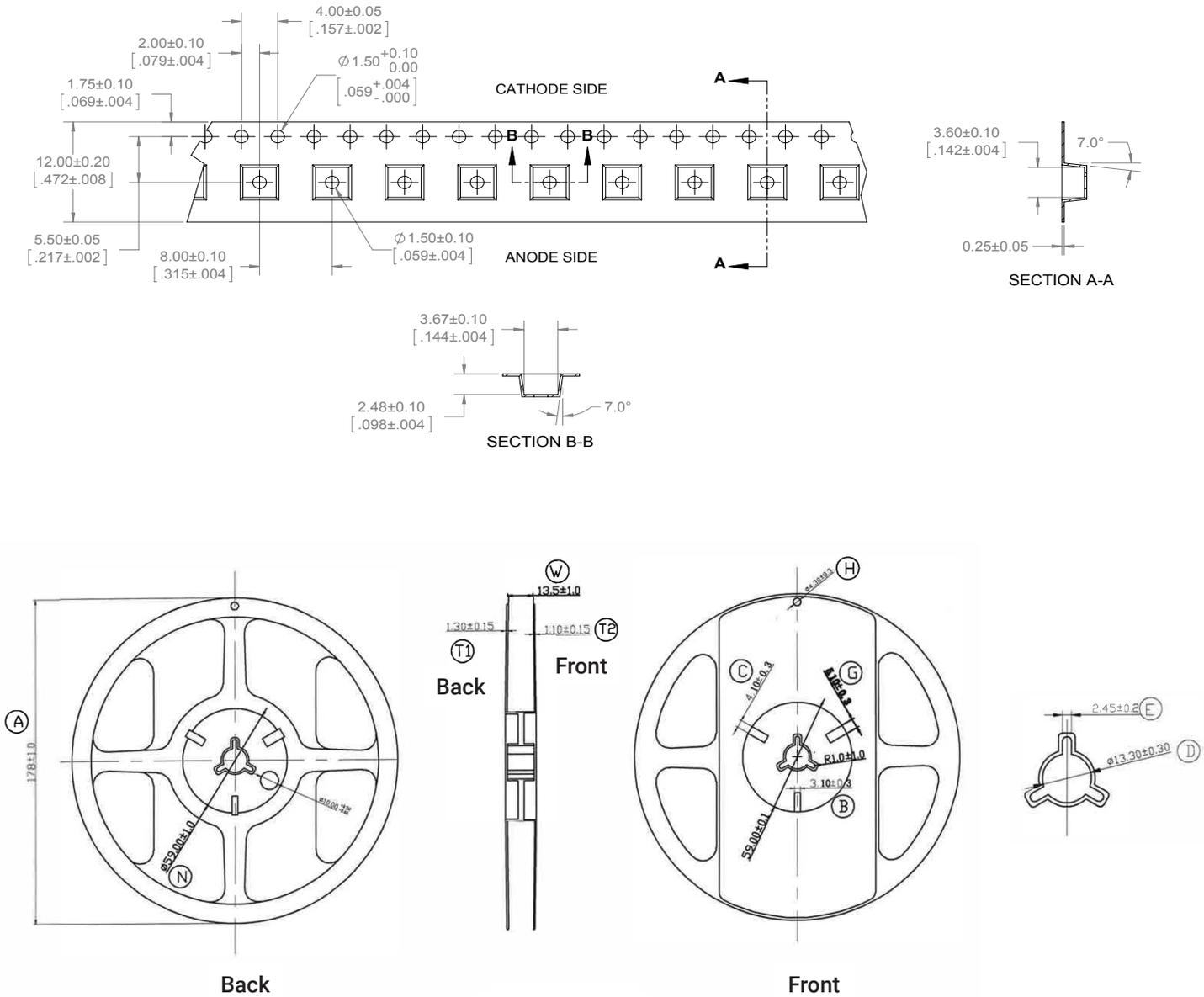
| Parameter            | Manual Hotplate Reflow | Hot Air Gun Reflow    |
|----------------------|------------------------|-----------------------|
| Heating Time         | < 60 sec               |                       |
| Hotplate Temperature | < $245^\circ\text{C}$  | < $150^\circ\text{C}$ |

#### 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 - B90

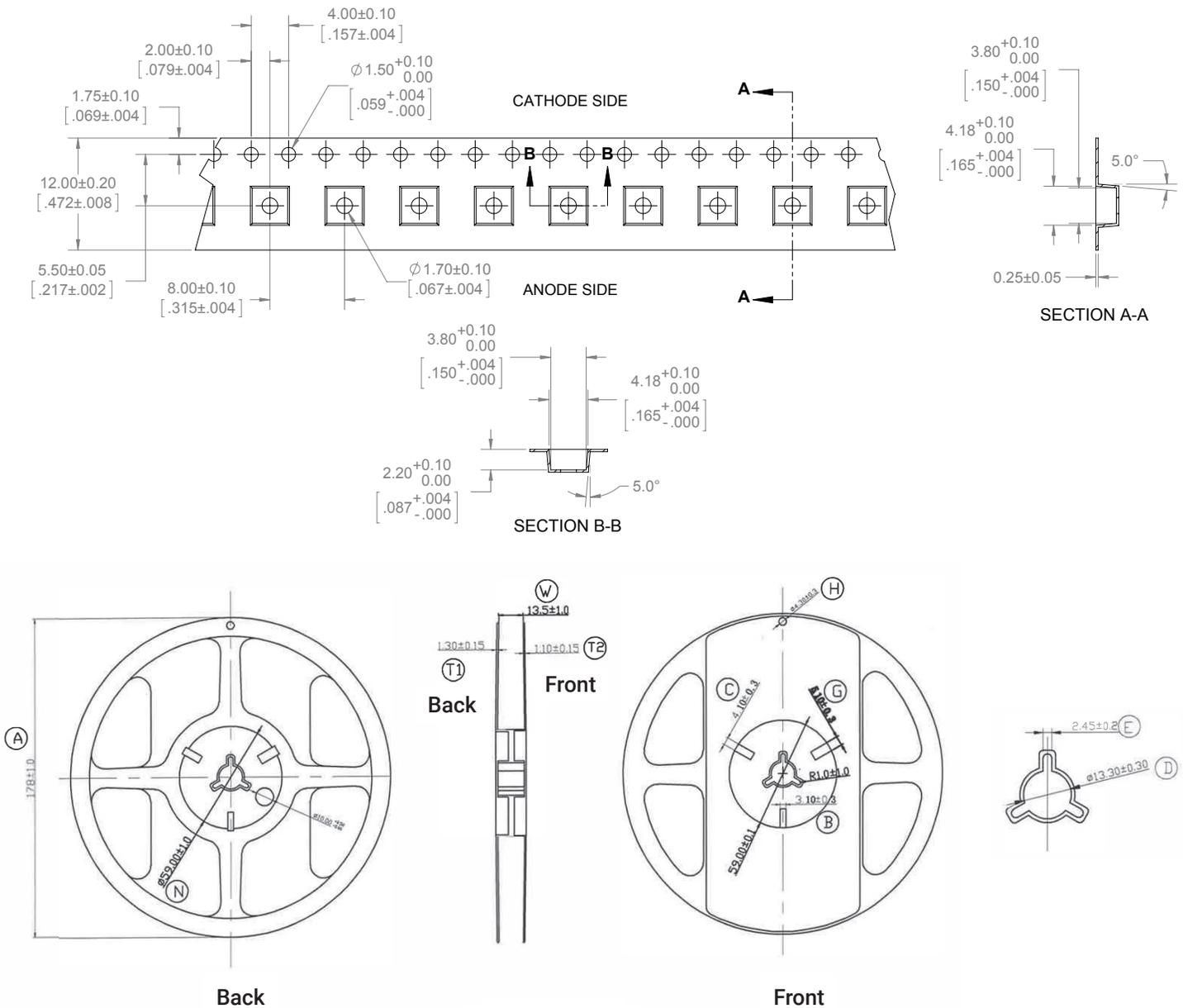


**Notes:**

1. Each reel contains 500 units.
2. Leave minimum 304.8 mm with empty compartments sealed by cover tape for lead in.
3. Leave minimum 457.2 mm with empty compartments sealed by cover tape for trailer.
4. All dimensions must comply to EIA-481-D.
5. Final tape and reel packaging must meet the requirements of JEDEC-STD-033, LEVEL 2A.



## Tape and Reel Outline - B130



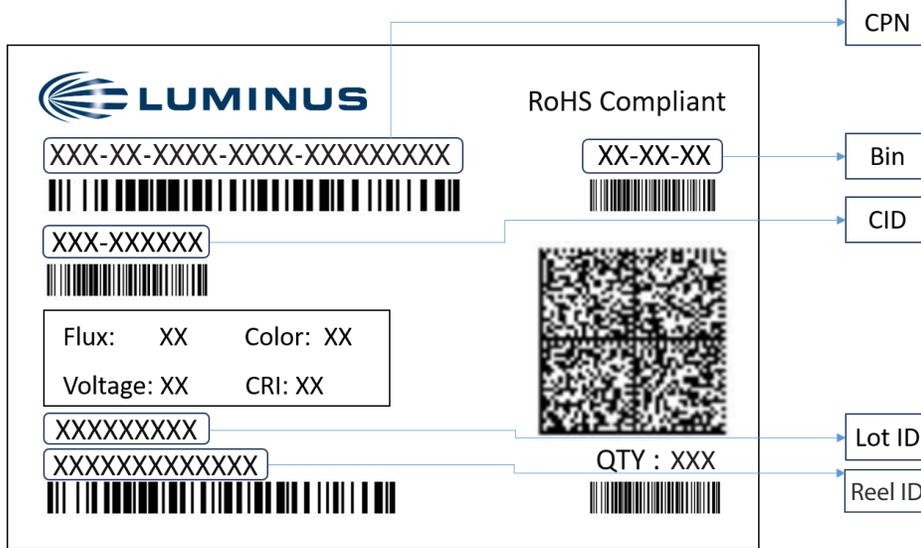
**Notes:**

1. Each reel contains 1,000 units.
2. Leave minimum 304.8 mm with empty compartments sealed by cover tape for lead in.
3. Leave minimum 457.2 mm with empty compartments sealed by cover tape for trailer.
4. All dimensions must comply to EIA-481-D.
5. Final tape and reel packaging must meet the requirements of JEDEC-STD-033, LEVEL 2A.



## Shipping Label

### Label on Packaging Box



### Label Fields:

- CPN: Luminus ordering part number
- CID: Customer's part number
- QTY: Quantity of parts per reel
- Flux: Bin as defined on page 3
- Voltage: Bin as defined on page 3
- Color: NA
- CRI: NA
- Lot ID & Reel ID: For Luminus internal use

### Packing Configuration:

- 500 units per reel for B90 package, 1,000 units per reel for B130 package
- Each reel is placed in an anti-static moisture barrier bag
- Partial reep may be shipped
- Shipping label is placed on top of each packaging box



## Notes

### Environmental Compliance

Luminus complies with RoHS and REACH. Luminus is committed to selling environmentally friendly and sustainable products. We do not use harmful or hazardous substances in our composites and products. Luminus will not intentionally add the following restricted materials to our products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), or polybrominated diphenyl ethers (PBDE).

### 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 anti-electrostatic gloves or wristband 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.

Reference: [APN-002815](#) Electrical Stress Damage to LEDs and How to Prevent It

### Storage

Please follow J-STD-033D guidance on safe storage and bake treatment.

### Mechanical Handling

1. xFx series: During the pick and place process, ensure the pick-up tool does not touch any die components.
2. xBx and xSx series: During the pick and place process, axial forces on the dome (or window) should not exceed 0.5 Newtons (N).
3. PT series: During the pick and place process, ensure the pick-up tool does not touch any die components. This profile applies when attaching surface mount components.
4. SBT series: During the pick and place process, axial forces on the dome (or window) should not exceed 0.5 Newtons (N). Vapor phase soldering is not recommended as the package is not hermetic.



## Notes

### Corrosion Robustness

1. The LEDs were tested in accordance with the AEC-Q102 Rev A standard. Test condition used was: 40°C / 90 % RH / 15 ppm H<sub>2</sub>S / 14 days.
2. The LEDs passed the optical and electrical Pass/Fail criteria as defined in AEC-Q102 Rev A – “Appendix 5: Parametric Test Requirements and Failure Criteria”
3. Corrosion test: Class 3B based on the corrosion class definition as below:

| Class | Grade A                  | Grade B                | Test Condition   |
|-------|--------------------------|------------------------|--|
| 0     | NA                       | Discoloration possible | Not Tested   |
| 1     | No visible discoloration | Discoloration possible | 25 °C / 75 % RH / 200ppb SO <sub>2</sub> , 200ppb NO <sub>2</sub> ,<br>10ppb H <sub>2</sub> S, 10ppb Cl <sub>2</sub> / 21 days<br>(EN 60068-2-60 (Method 4)) |
| 2     | No visible discoloration | Discoloration possible | 25 °C / 75 % RH / 10ppm H <sub>2</sub> S / 21 days (IEC<br>60068-2-43)   |
| 3     | No visible discoloration | Discoloration possible | 40 °C / 90 % RH / 15ppm H <sub>2</sub> S / 14 days<br>(stricter than IEC 60068-2-43)   |



## Revision History

| Rev | Date       | Description of Change  |
|-----|------------|--|
| 01  | 01/13/2016 | Initial release.   |
| 02  | 03/28/2016 | Updated Binning and Angular Distribution Data, Added 90deg Tape and Reel.                                  |
| 03  | 02/08/2022 | Updated Solder Profile, Precaution for use & add flux bin.   |
| 04  | 05/08/2025 | Updated to new template. Update photo, Ordering Part Number, Characteristics, Mechanical Drawing and Notes |
| 05  | 06/03/2025 | Update Characteristics, Tape and Reel and Mechanical Dimensions tolerance.                                 |