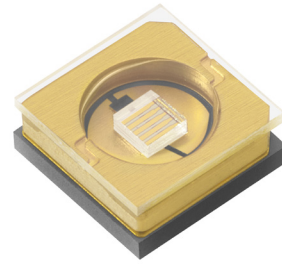


XBT-3535-265/275 nm

Surface Mount UVC LED



Features

- UV LED with peak wavelengths 265 nm and 275 nm
- High Optical Power: Up to 135 mW of UVC power at maximum rated current
- Compact form factor: 3.5 mm x 3.5 mm package with optically transparent window
- Viewing angle of 130 degrees
- Standard SMT process



Applications

- Water/ Air/ Surface Disinfection
- Healthcare
- Food & Pharmaceutical Processing
- Analytical Instruments
- Horticulture

Table of Contents

| | |
|--|----|
| Ordering Information. | 2 |
| Binning Structure. | 3 |
| Absolute Maximum Ratings | 5 |
| Device Performance | 6 |
| Angular distribution and Typical Spectrum. | 9 |
| Soldering Profile. | 10 |
| Mechanical Dimensions | 11 |
| Shipping Reel Outline | 12 |
| Shipping Label | 13 |
| Notes | 14 |
| Revision History. | 15 |



Ordering Information

Ordering Part Numbers¹

| Wavelength Range (nm) | Wavelength Bins | Radiometric Flux | | Ordering Part Number |
|-----------------------|-----------------|-------------------|----------------|----------------------------|
| | | Bin Kit Flux Code | Min. Flux (mW) | |
| 260 - 270 | 260, 265 | CH | 55 | XBT-3535-UV-A130H-CH260-00 |
| 270 - 280 | 270, 275 | DA | 60 | XBT-3535-UV-A130H-DA270-00 |

Part Number Nomenclature

XBT

3535

UV

A130H

<FFWW-#>

| Product Family | Package Size | Color | Package Configuration | Bin Kit |
|--------------------------------|--------------------|-----------------|------------------------------|---|
| XBT: UVC Surface Mount Package | 3535: 3.5 x 3.5 mm | UV: Ultraviolet | A130H: 130 deg viewing angle | Flux and Wavelength bin kit code - See ordering information |

Note:

1. Flux Bin listed is minimum bin shipped, higher bins may be included at Luminus' discretion.



Binning Structure

XBT-3535-UV LEDs are tested at a drive current of 500 mA, 20 ms single pulse at 25°C and placed into one of the following radiometric flux and wavelength bins. The LEDs can also be driven at different drive currents to achieve the correlated flux values listed in the table.

Radiometric Flux Bins^{1,2}

| Color | Flux Bin ³ | Binning @ 500 mA, T _c = 25°C ^{4,5} | | Correlated Minimum Flux (mW) @ T _c = 25°C | | |
|-------|-----------------------|--|----------------|--|--------|--------|
| | | Min. Flux (mW) | Max. Flux (mW) | 350 mA | 650 mA | 800 mA |
| UV | CH | 55 | 60 | 41 | 68 | 81 |
| | DA | 60 | 70 | 44 | 75 | 89 |
| | DB | 70 | 80 | 52 | 87 | 103 |
| | DC | 80 | 90 | 59 | 100 | 118 |
| | DD | 90 | 100 | 66 | 112 | 133 |
| | DE | 100 | 120 | 74 | 125 | 148 |
| | FA | 120 | 140 | 88 | 149 | 177 |

Note:

1. Luminus maintains a +/- 6% tolerance on flux measurements.
2. Products are production tested then sorted and packed by bin.
3. Individual bins are not orderable. Please refer to the Product Ordering information page for a list of orderable bin kits.
4. Product test condition: 500 mA, 20 ms pulse at 25 °C.
5. T_c = Case temperature.
6. The wavelength bin as marked on the product label may be followed by a letter which is for internal use only.



Binning Structure

XBT-3535-UV LEDs are tested at a drive current of 500 mA, 20 ms single pulse at 25°C and placed into one of the following radiometric flux and wavelength bins. The LEDs can also be driven at different drive currents to achieve the correlated flux values listed in the table.

Wavelength Bins²

| Color | Wavelength Bin ^{3,6} | Binning @ 500 mA, T _c = 25°C ^{4,5} | |
|-------|-------------------------------|--|-------------------------|
| | | Minimum Wavelength (nm) | Maximum Wavelength (nm) |
| UV | 260 | 260 | 265 |
| | 265 | 265 | 270 |
| | 270 | 270 | 275 |
| | 275 | 275 | 280 |

Forward Voltage Bins

| Color | Voltage Bin | Binning @ 500 mA, T _c = 25°C | |
|-------|-------------|---|---------------------|
| | | Minimum Voltage (V) | Maximum Voltage (V) |
| UV | V3 | 5 | 5.5 |
| | V4 | 5.5 | 6 |
| | V5 | 6 | 6.5 |
| | V6 | 6.5 | 7 |
| | V7 | 7 | 7.5 |

Note:

1. Luminus maintains a +/- 6% tolerance on flux measurements.
2. Products are production tested then sorted and packed by bin.
3. Individual bins are not orderable. Please refer to the Product Ordering information page for a list of orderable bin kits.
4. Product test condition: 500 mA, 20 ms pulse at 25 °C.
5. T_c = Case temperature.
6. The wavelength bin as marked on the product label may be followed by a letter which is for internal use only.



Absolute Maximum Ratings¹

| Parameter | Symbol | Value | Unit |
|---|--------------|-------|------|
| Forward Current | $I_{f\ max}$ | 800 | mA |
| Storage Temperature | $T_{s\ min}$ | -40 | °C |
| | $T_{s\ max}$ | 100 | |
| Junction Temperature | $T_{j\ max}$ | 100 | °C |
| ESD sensitivity ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B) | V_{ESD} | 8000 | V |

Note:

1. XBT-3535-UV 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.



Device Performance^{1,2}

| Optical and Electrical Characteristics | Symbol | Value | Unit |
|--|------------------|-------|------|
| Test Current | I_f | 500 | mA |
| Forward Voltage | V_{fmin} | 5.0 | V |
| | V_{ftyp} | 5.9 | |
| | V_{fmax} | 7.5 | |
| FWHM | $\Delta\lambda$ | 13 | nm |
| Viewing Angle | $2\theta_{1/2}$ | 130 | ° |
| Thermal Characteristics | | | |
| Thermal Resistance (junction to case) ³ | $R_{\theta j-c}$ | 5.4 | °C/W |

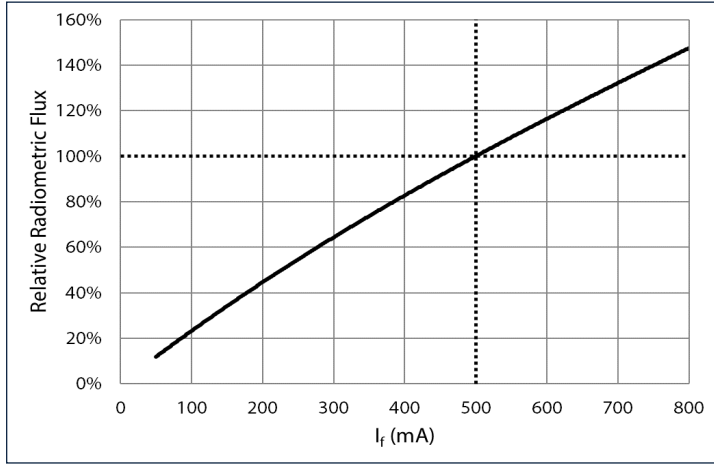
Note:

1. Ratings are based on operation at a constant temperature of $T_c = 25^\circ\text{C}$. Test conditions: 500 mA, 20 ms pulse at 25°C .
2. XBT-3535-UV LEDs are short wavelength, deep UV LEDs. During operation, the LED emits high intensity UVC radiation, which is harmful to skin and eyes. UV light is also hazardous to skin and may cause cancer. Avoid exposure to deep UV light when LED is operational.
3. Measurements are in accordance with JEDEC 51-14.

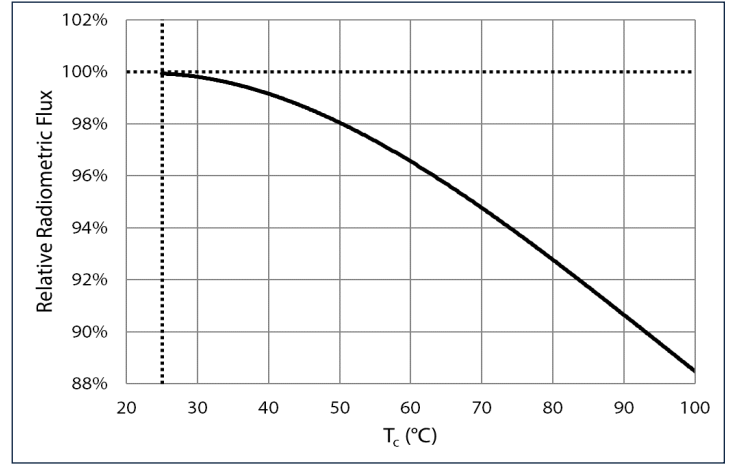


Relative Radiometric Flux - 265 nm

Forward current: $\phi_v/\phi_v(500\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$

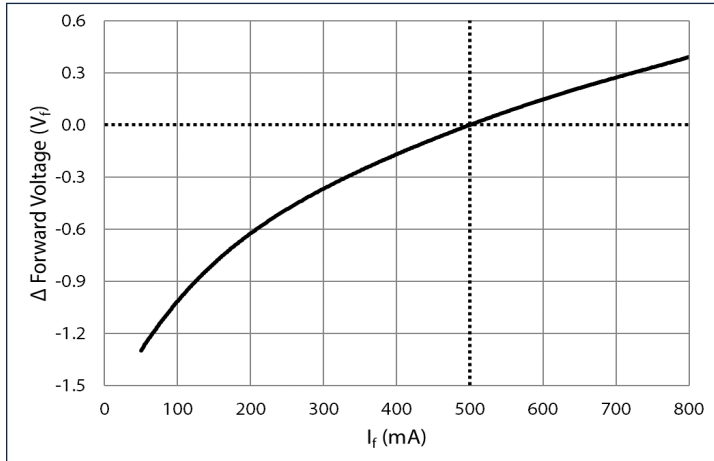


Temperature: $\phi_v/\phi_v(25^\circ\text{C})$, 20 ms pulse, $I_f = 500\text{ mA}$

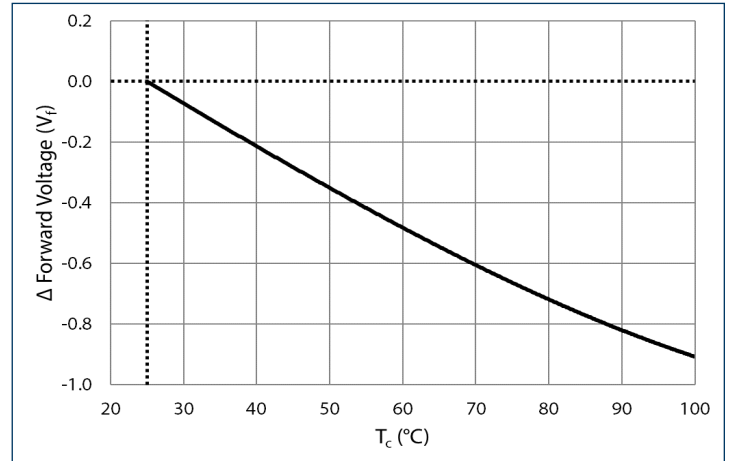


Forward Voltage Shift - 265 nm

Forward current: $\Delta V_f = V(I_f) - V(500\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$

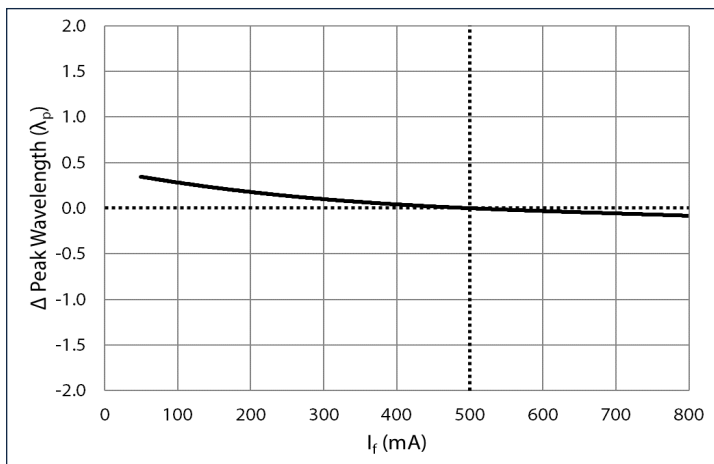


Temperature: $\Delta V_f = V(T_c) - V(25^\circ\text{C})$, 20 ms pulse, $I_f = 500\text{ mA}$

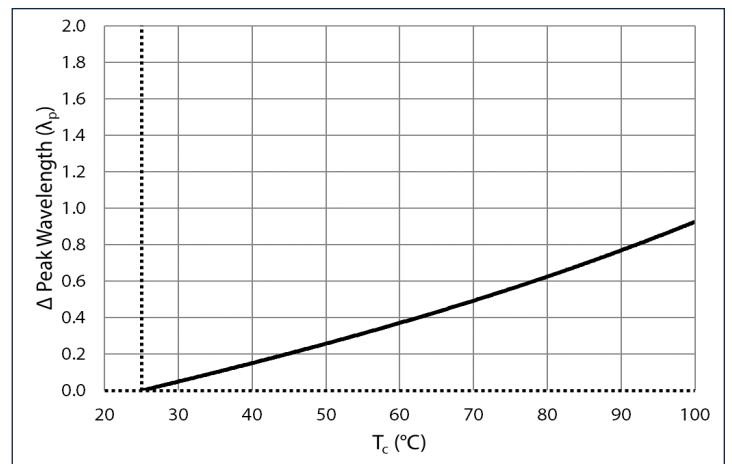


Peak Wavelength Shift - 265 nm

Forward current: $\Delta\lambda_d = \lambda_d(I_f) - \lambda_d(500\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$



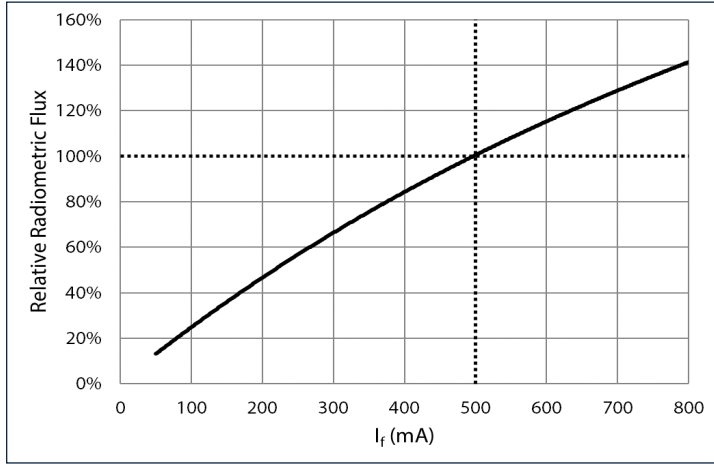
Temperature: $\Delta\lambda_d = \lambda_d(T_c) - \lambda_d(25^\circ\text{C})$, 20 ms pulse, $I_f = 500\text{ mA}$



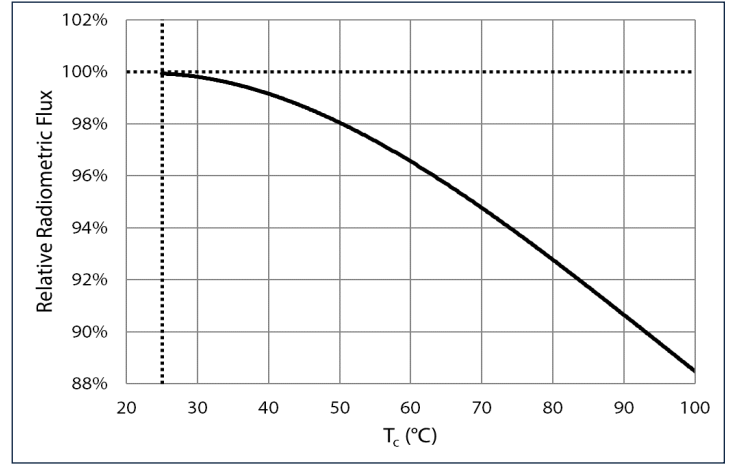


Relative Radiometric Flux - 275 nm

Forward current: $\phi_v/\phi_v(500\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$

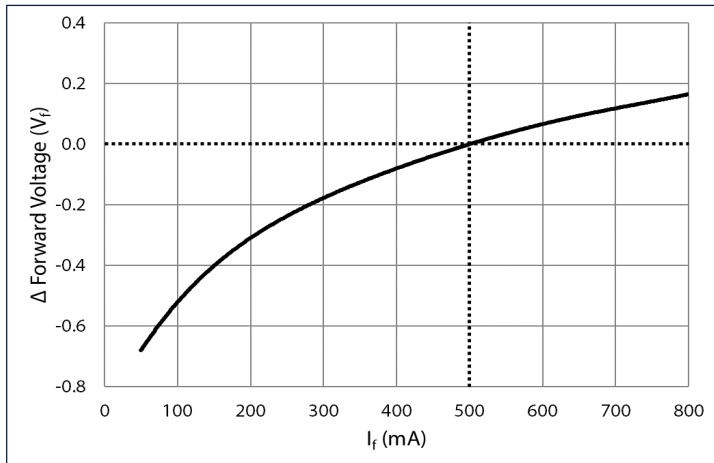


Temperature: $\phi_v/\phi_v(25^\circ\text{C})$, 20 ms pulse, $I_f = 500\text{ mA}$

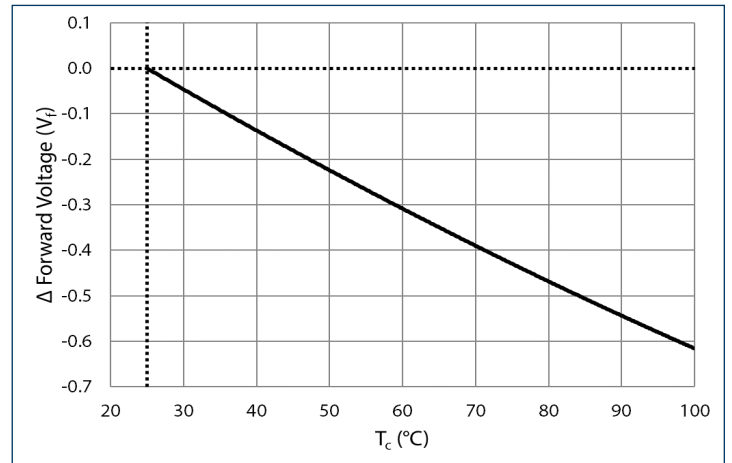


Forward Voltage Shift - 275 nm

Forward current: $\Delta V_f = V(I_f) - V(500\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$

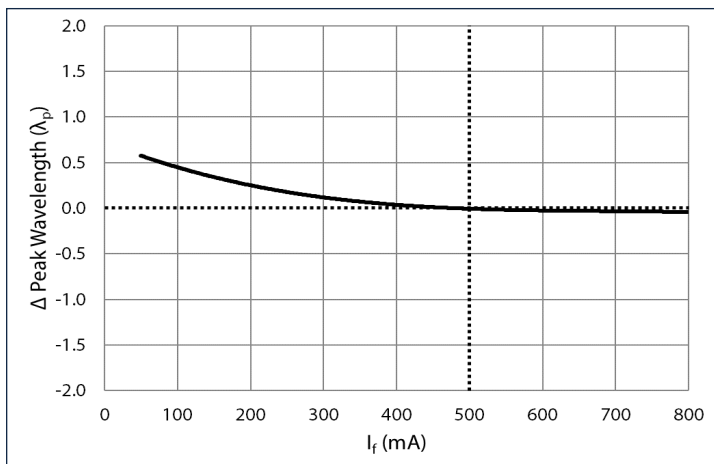


Temperature: $\Delta V_f = V(T_c) - V(25^\circ\text{C})$, 20 ms pulse, $I_f = 500\text{ mA}$

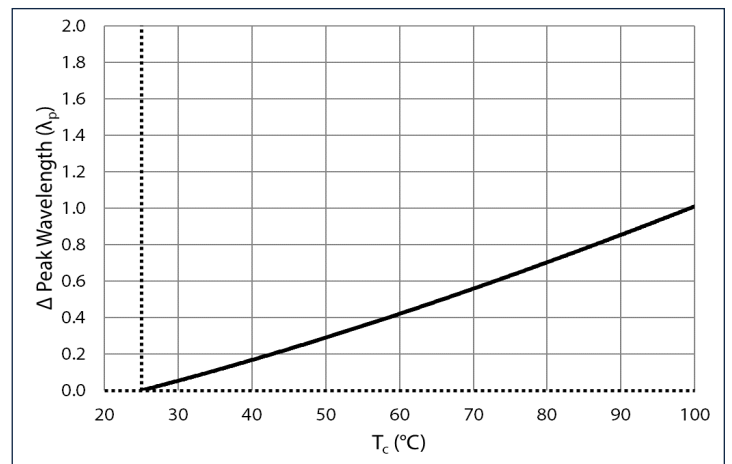


Peak Wavelength Shift - 275 nm

Forward current: $\Delta \lambda_d = \lambda_d(I_f) - \lambda_d(500\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$



Temperature: $\Delta \lambda_d = \lambda_d(T_c) - \lambda_d(25^\circ\text{C})$, 20 ms pulse, $I_f = 500\text{ mA}$

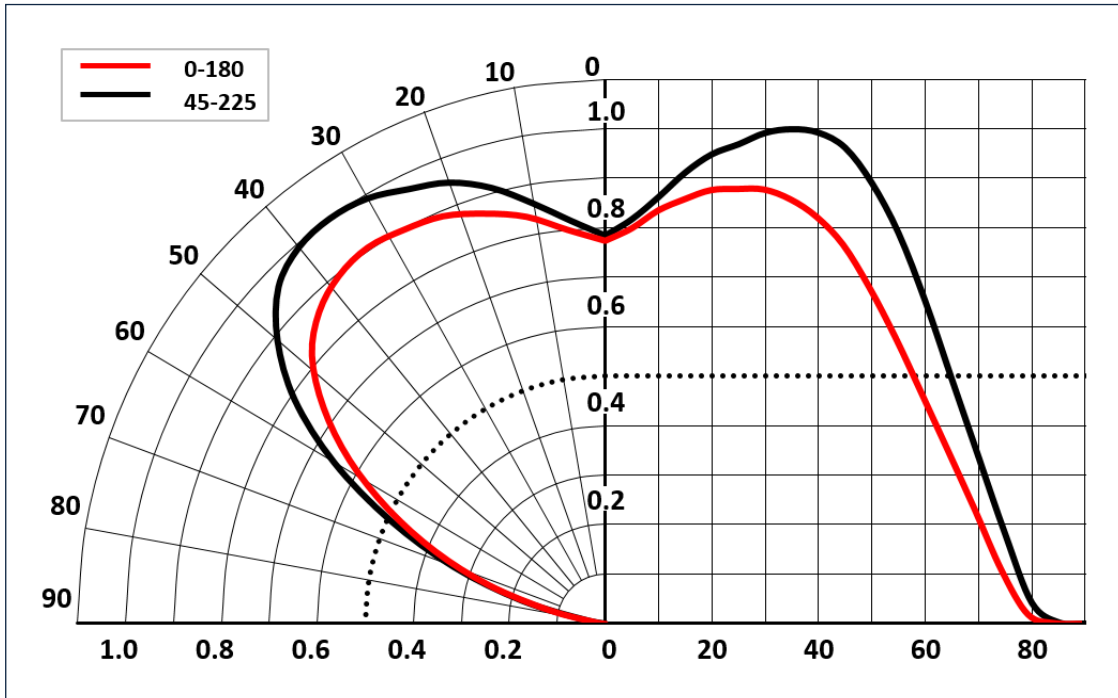




Angular distribution and Typical Spectrum

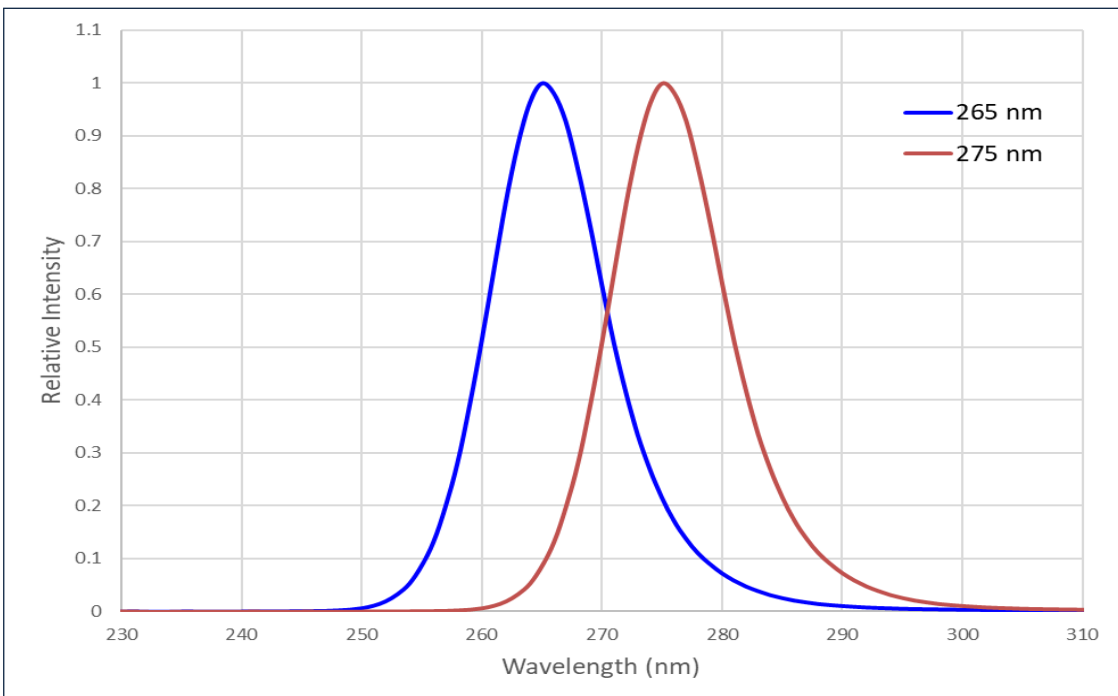
Angular distribution

$$I_{\text{ref}} = f(\Phi); T_c = 25^\circ\text{C}$$



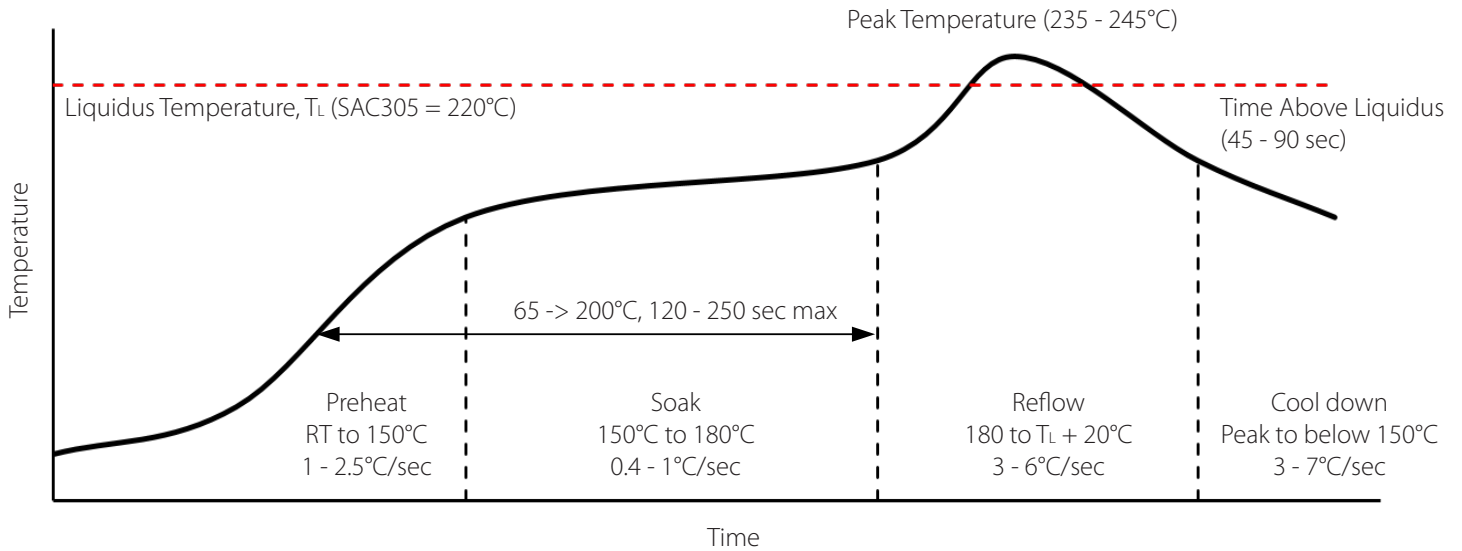
Typical Spectrum

$$\Phi_{\text{ref}} = f(\lambda); I_f = 500 \text{ mA}; T_c = 25^\circ\text{C}$$





Soldering Profile



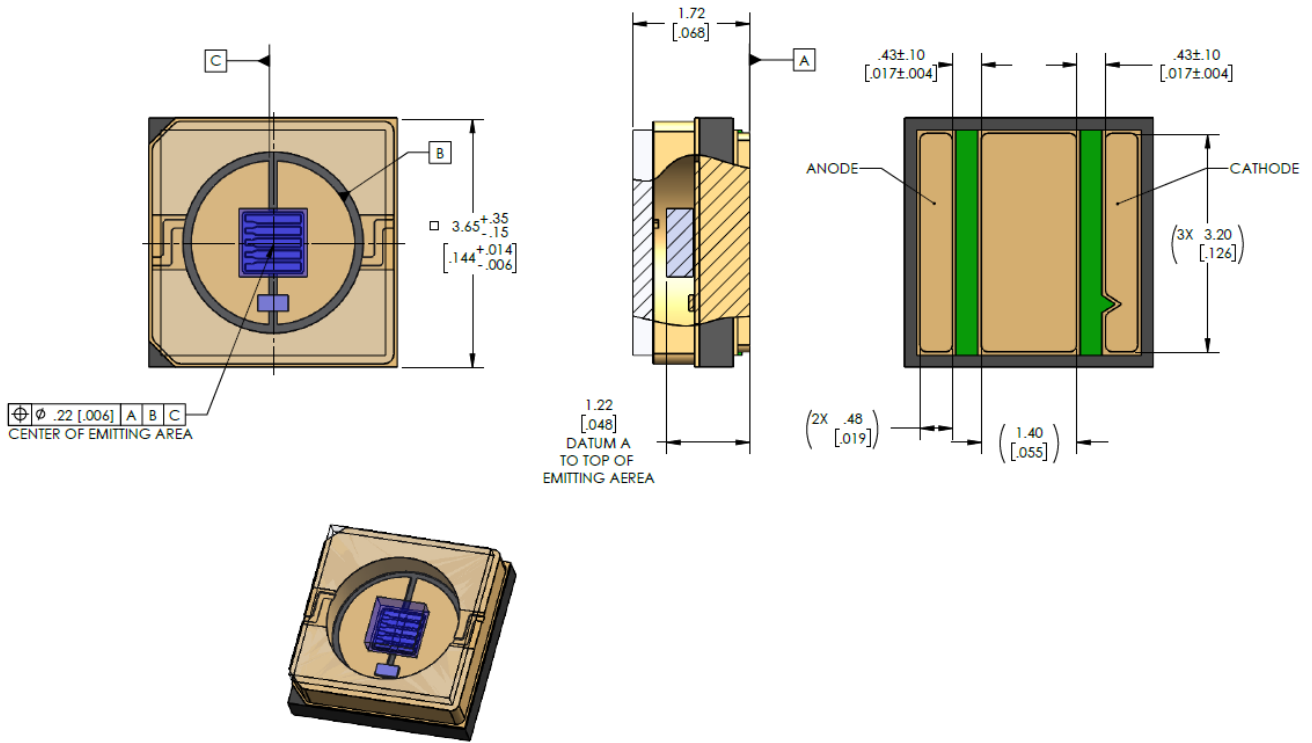
| SMT Rework Guideline | Manual Hotplate Reflow | Hot Air Gun Reflow |
|----------------------|------------------------|--------------------|
| Heating Time | < 60 sec | |
| Hotplate Temperature | < 245°C | < 150°C |

Note:

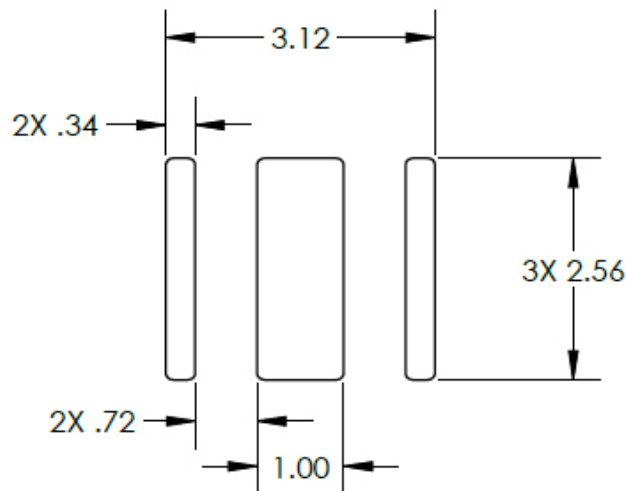
- Product complies to Moisture Sensitivity Level 1 (MSL 1).
- The numbers in the table are specific to SAC305. Luminus recommends using an SAC305 solder paste with a no-clean flux for RoHS compliant products.
- During the pick and place process, axial forces on the dome (or window) should not exceed 0.5 Newtons (N).
- 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. Temperature is referenced to the center of the PCB.
- 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.



Mechanical Dimensions



Recommended Solder Pad

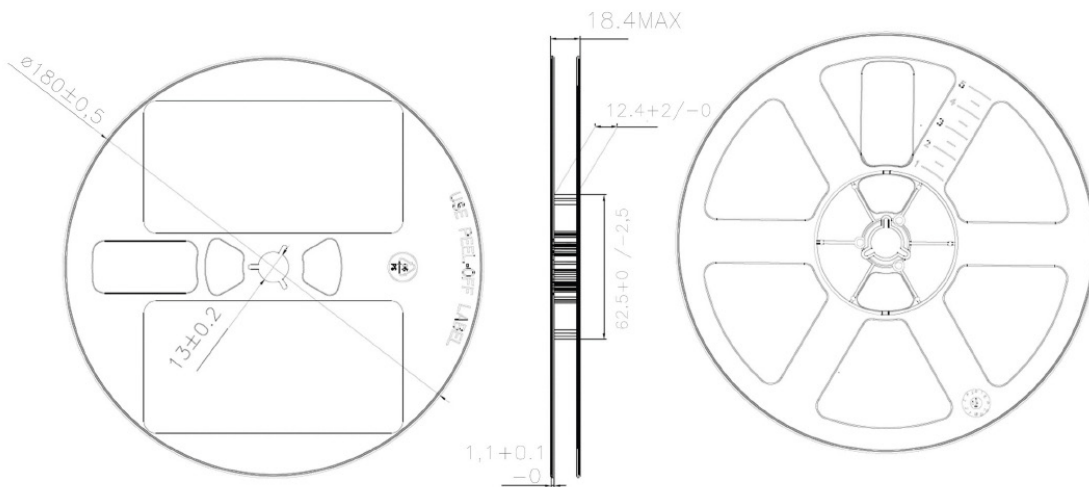
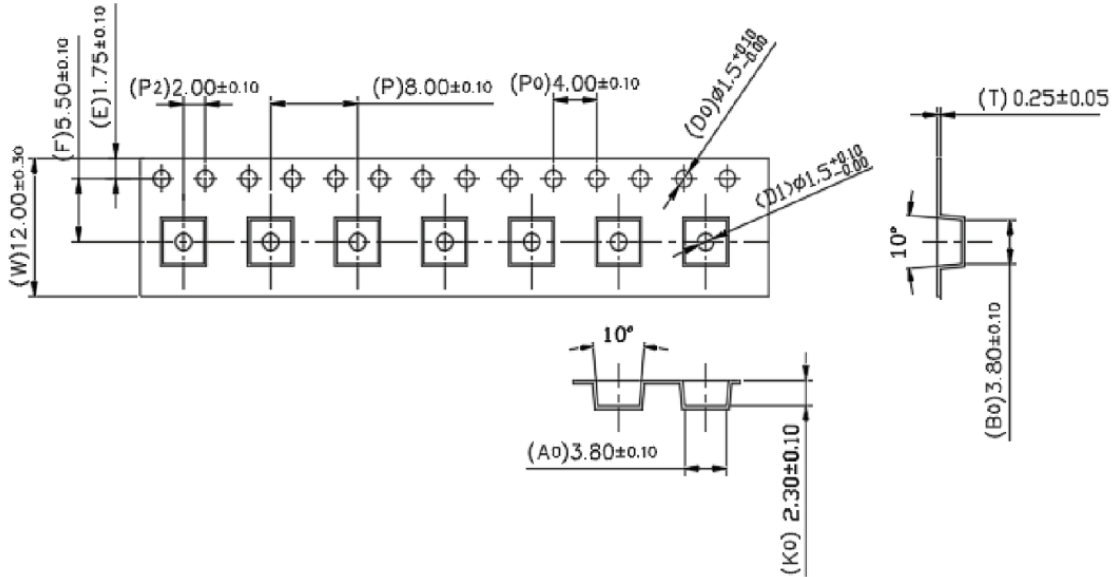




Shipping Reel Outline

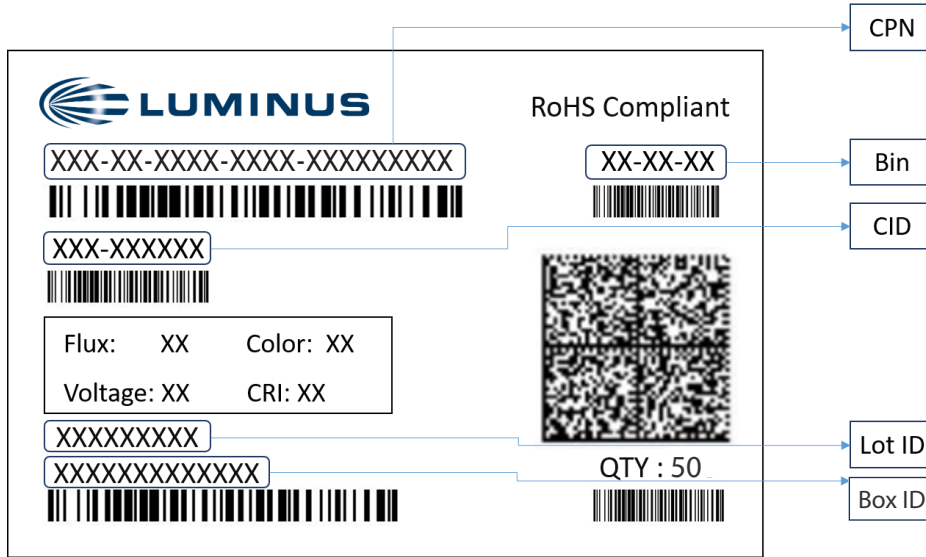
All XBT-3535 products are packaged and labeled with their respective bin as outlined in the tables on page 3.

Each reel will only contain one flux and one wavelength bin.





Shipping Label



Label Fields:

- CPN: Luminus ordering part number
- CID: Customer's part number
- QTY: Quantity of devices in pack
- Flux: Bin as defined on page 3
- Wavelength: Bin as defined in page 3
- Voltage: Bin as defined on page 3
- Color: Bin as defined on page 3
- CRI: NA

Packing Configuration:

- Maximum of 250 devices per reel, minimum of 50 devices per reel
- Partial reels may be shipped
- Each reel is enclosed in anti-static bag
- Shipping label is placed on top of each pack



Notes

Static Electricity

This product is sensitive to static electricity, and care should be taken when handling them. Static electricity or surge voltage will damage the LEDs. It is recommended to wear an anti-electrostatic wristband or anti-electrostatic gloves when handling the LEDs. All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken to isolate LED processing equipment from potential sources of voltage surges.

Reference: APN-002815 Electrical Stress Damage to LEDs and How to Prevent It

Eye Safety

According to the test specification risk group IEC 62471: 2008-Non-GLS under 500 mA, this product complies to Risk group 3 (RG3) High risk, exceed the limits for Risk Group 2.

Warning: This product emits invisible light - there is no aversion response.

Avoid eye and skin exposure to un-shielded product.

For more information, please refer to: <https://luminusdevices.zendesk.com/hc/en-us/articles/10532958752397>



Revision History

| Rev | Date | Description of Change |
|-----|------------|-----------------------|
| 01 | 11/27/2023 | Initial release |
| 02 | 03/06/2024 | Updated flux bins |