

XBT-3535-UV-Mini

Surface Mount

310 nm UVB LED

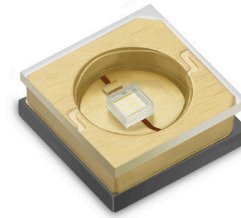


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Features:

- UVB LED with peak wavelength from 300-315 nm
- High optical power: up to 30 mW
- Compact form factor: 3.5 mm x 3.5 mm package with optically transparent window
- Viewing angle of 130 degrees
- Standard SMT process
- RoHS and REACH compliant

Applications

- Phototherapy
- Disinfection
- UV curing
- Fluorescence spectroscopy
- Analytical instruments

Ordering Information

Ordering Part Numbers

The table below lists ordering part numbers available for XBT-3535-UV-Mini LEDs. The part number includes a bin kit, a group of flux and wavelength bins described in page 3, that are shippable for a given ordering part number. Individual flux or wavelength bins are not orderable. Flux bin listed is minimum bin shipped - higher bins may be included at Luminus' discretion.

Radiometric Flux		Wavelength		Ordering Part Number
Bin Kit Flux Code	Min. Flux (mW)	Bins	Range (nm)	
TBA		TBA	300-315	XBT-3535-UV-A130-300-00-ENG-M

Part Number Nomenclature

XBT — **3535** — **<UV>** — **<A###>** — **<FF###-##>**

Product Family	Package Type	Color	Package Configuration	Bin kit
XBT: UV Surface Mount Package	3535: 3.5 mm x 3.5 mm	Ultraviolet	A130: 130 degree viewing angle	Flux and Wavelength bin kit code - See ordering informaton

XBT-3535-UV-Mini Binning Structure

XBT-3535-UV-Mini LEDs are tested at a drive current of 150 mA, 20 ms single pulse at 25° C and placed into one of the following radiometric flux, wavelength, and forward voltage bins.

Radiometric Flux Bins

The LEDs can also be driven at higher drive currents, to achieve the correlated flux values listed in the table.

Flux Bin (FF)	Binning @ 150 mA, $T_c = 25^\circ\text{C}$		Correlated Minimum Flux (mW) at $T_c = 25^\circ\text{C}$		
	Minimum Flux (mW)	Maximum Flux (mW)	50 mA	100 mA	225 mA
BB	12	14	TBA		
BC	14	16	TBA		
BD	16	18	TBA		
BE	18	20	TBA		
BF	20	22	TBA		
CA	22	25	TBA		
CB	25	30	TBA		

Note 1: Product lifetime is a function of drive current. Sustained operation at absolute maximum current of 225 mA will result in a reduction of device lifetime compared to typical forward drive currents. Actual device lifetimes will also depend on junction temperature. Contact Luminus for information on product lifetime.

Wavelength Bins

Wavelength Bin (WWW)	Binning @ 150 mA, $T_c = 25^\circ\text{C}$	
	Minimum Wavelength (nm)	Maximum Wavelength (nm)
300	300	305
305	305	310
310	310	315

Forward Voltage Bins

Voltage Bin	Binning @ 150 mA, $T_c = 25^\circ\text{C}$	
	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
V3	5	5.5
V4	5.5	6
V5	6	6.5
V6	6.5	7

Note 3: Individual flux bins are not orderable. Please refer to product ordering information on page 2 for a list of ordering part numbers.

Typical Device Performance^{1,3}

Parameter		Symbol	Value	Unit
Typical Radiometric Flux		Φ_R	20	mW
Minimum Forward Voltage	min	V_{f-min}	5	V
Typical Forward Voltage	typ	V_{f-typ}	5.6	V
Maximum Forward Voltage	max	V_{f-max}	7	V
FWHM		$\Delta\lambda$	10	nm
Viewing Angle		$2\theta_{1/2}$	130	°
Thermal Resistance of junction-coreboard		R_{j-b}	12.2	°C/W
Thermal Resistance of junction-thermistor		R_{j-ref}	16.0	°C/W
ESD sensitivity ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)		V_{ESD}	TBA	KV

Absolute Maximum Ratings^{2,3}

Parameter	Symbol	Value	Unit
Forward Current	I_{f-max}	225	mA
Junction Temperature	T_{j-max}	85	°C

Note 1: Ratings are based on operation at 150 mA, 20 ms pulse and case temperature 25 °C.

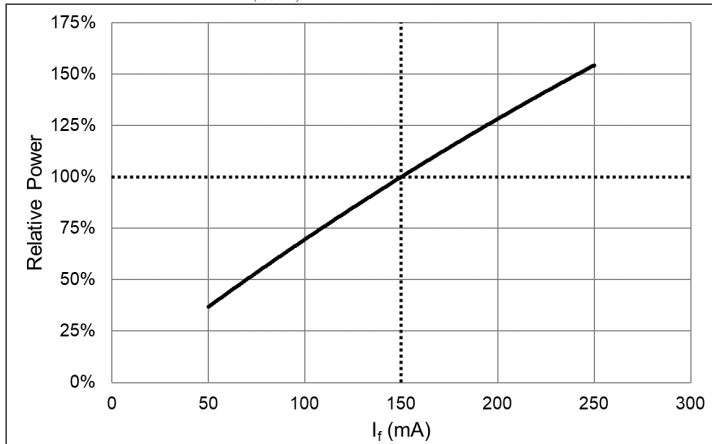
Note 2: Product lifetime is a function of drive current. Sustained operation at absolute maximum current of 225 mA will result in a reduction of device lifetime compared to typical forward drive currents. Actual device lifetimes will also depend on junction temperature. Contact Luminus for details.

Note 3: XBT-3535-UV-Mini LEDs are short wavelength, deep UV LEDs. During operation, the LED emits high intensity UVB 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.

Optical & Electrical Characteristics

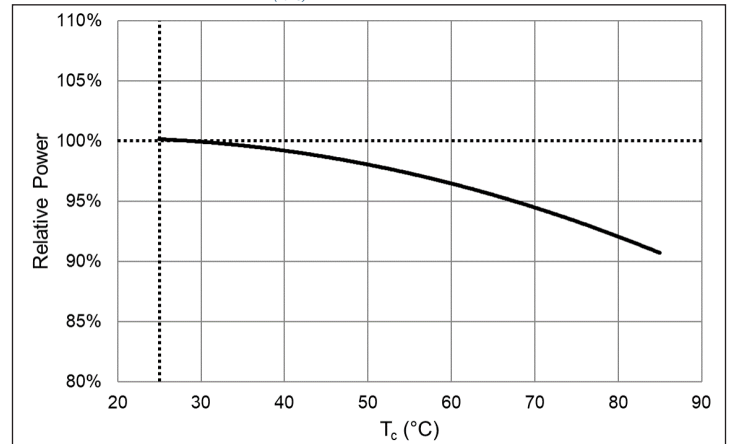
Relative Power vs. Forward Current

$\phi/\phi_{(150\text{ mA})}$, 20 ms pulse, $T_c = 25^\circ\text{C}$



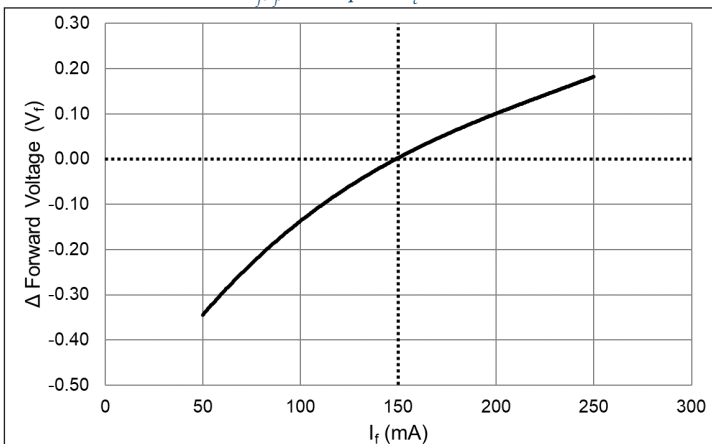
Relative Power vs. Temperature

$\phi/\phi_{(25^\circ\text{C})}$, 20 ms pulse, 150 mA



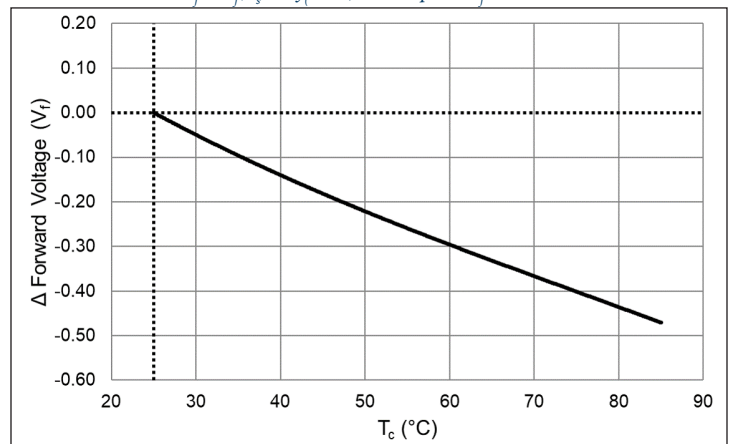
Forward Voltage Shift vs. Current

$V_f(I_f)$, 20 ms pulse, $T_c = 25^\circ\text{C}$



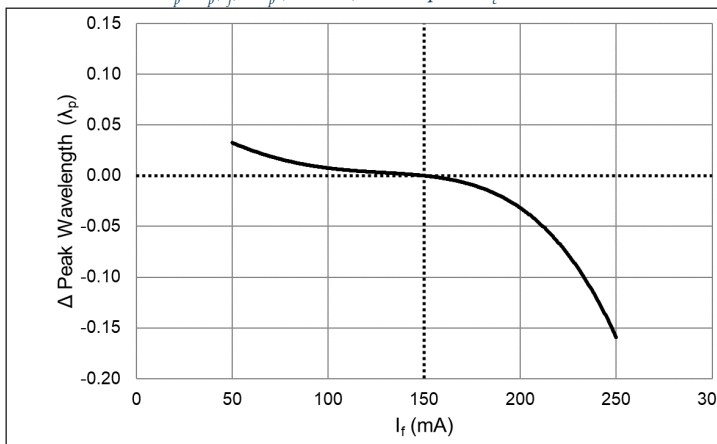
Forward Voltage Shift vs. Temperature

$\Delta V_f = V_f(T) - V_f(25^\circ\text{C})$, 20 ms pulse, $I_f = 150\text{ mA}$



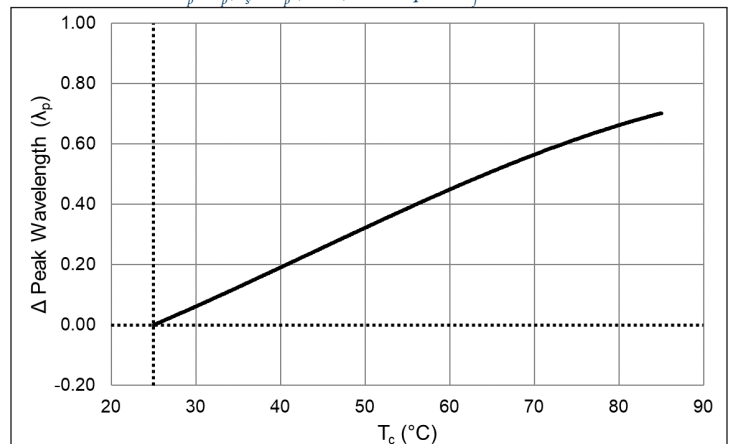
Peak Wavelength Shift vs. Forward Current

$\lambda_p = \lambda_p(I_f) - \lambda_p(150\text{ mA})$, 20 ms pulse, $T_c = 25^\circ\text{C}$



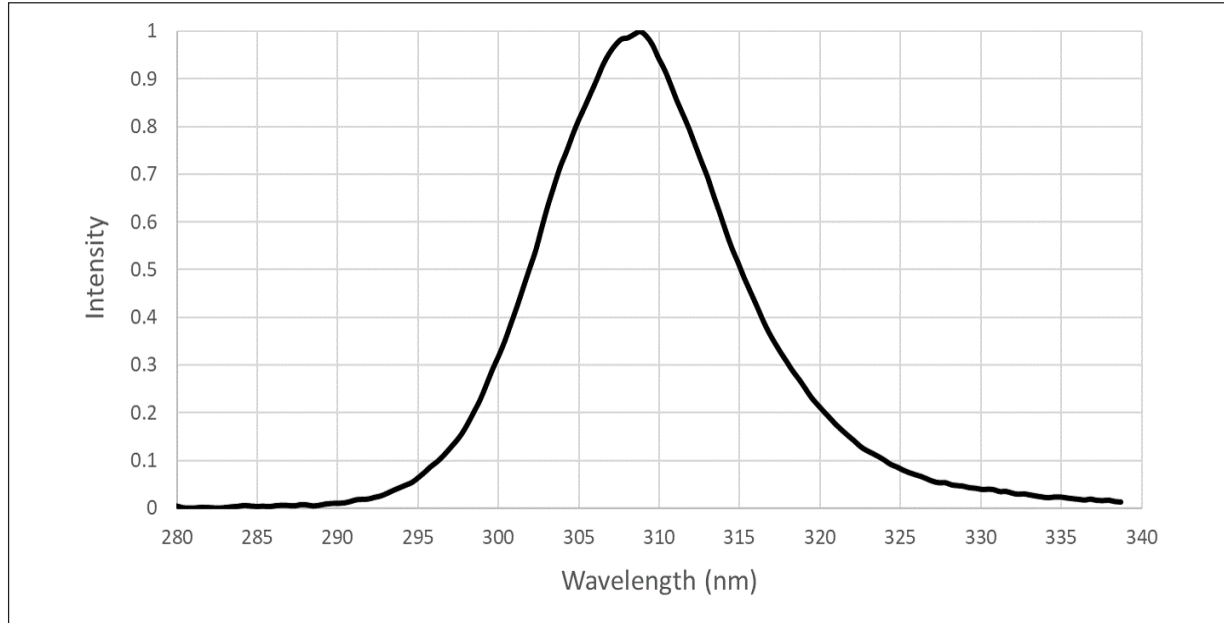
Peak Wavelength Shift vs. Temperature

$\lambda_p = \lambda_p(T) - \lambda_p(25^\circ\text{C})$, 20 ms pulse, $I_f = 150\text{ mA}$



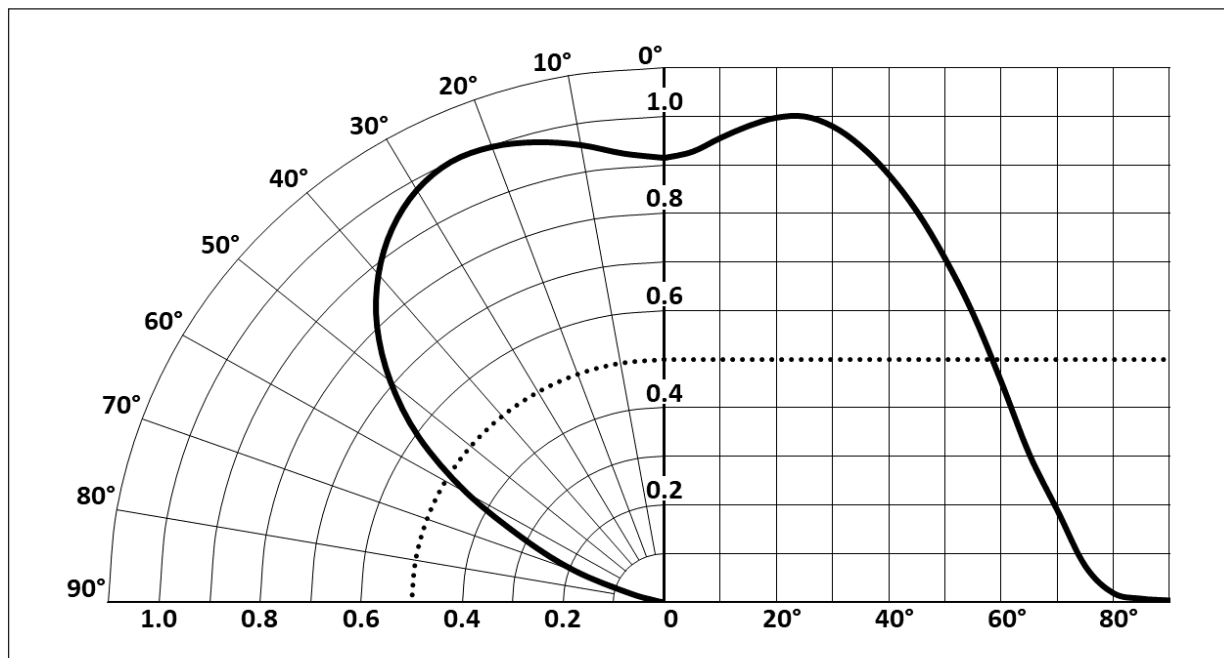
Typical Spectrum

$$\Phi_{\text{ref}} = f(\lambda); I_f = 150 \text{ mA}; T_c = 25^\circ\text{C}$$

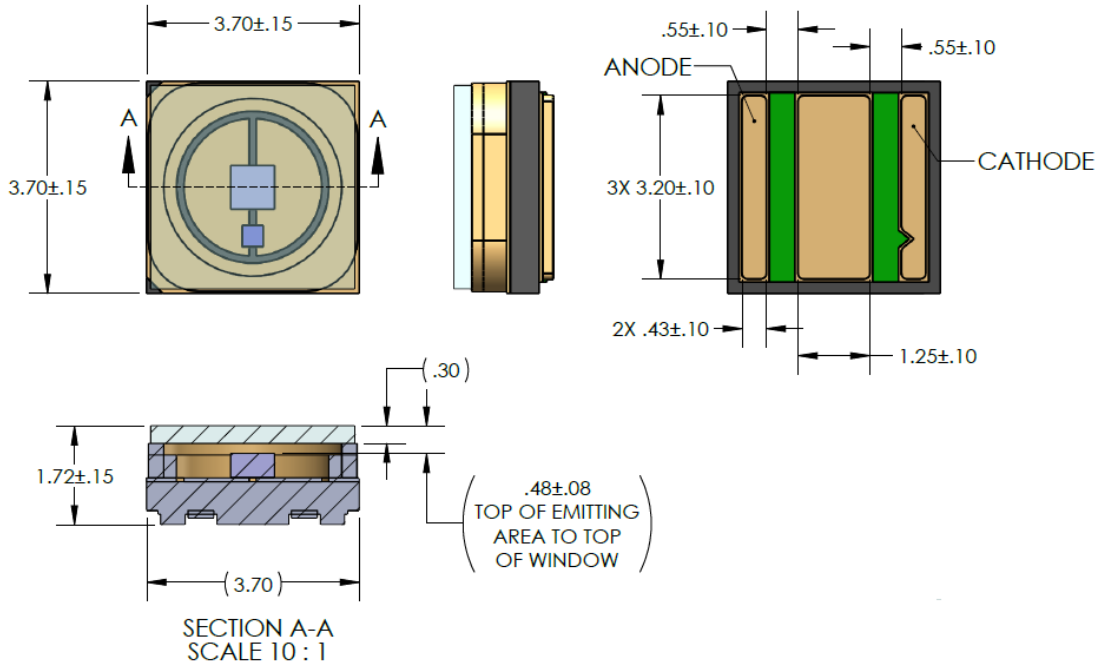


Radiation Pattern

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

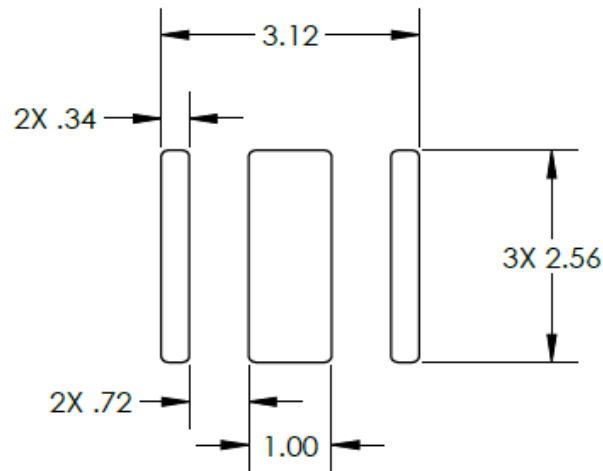


Mechanical Dimensions



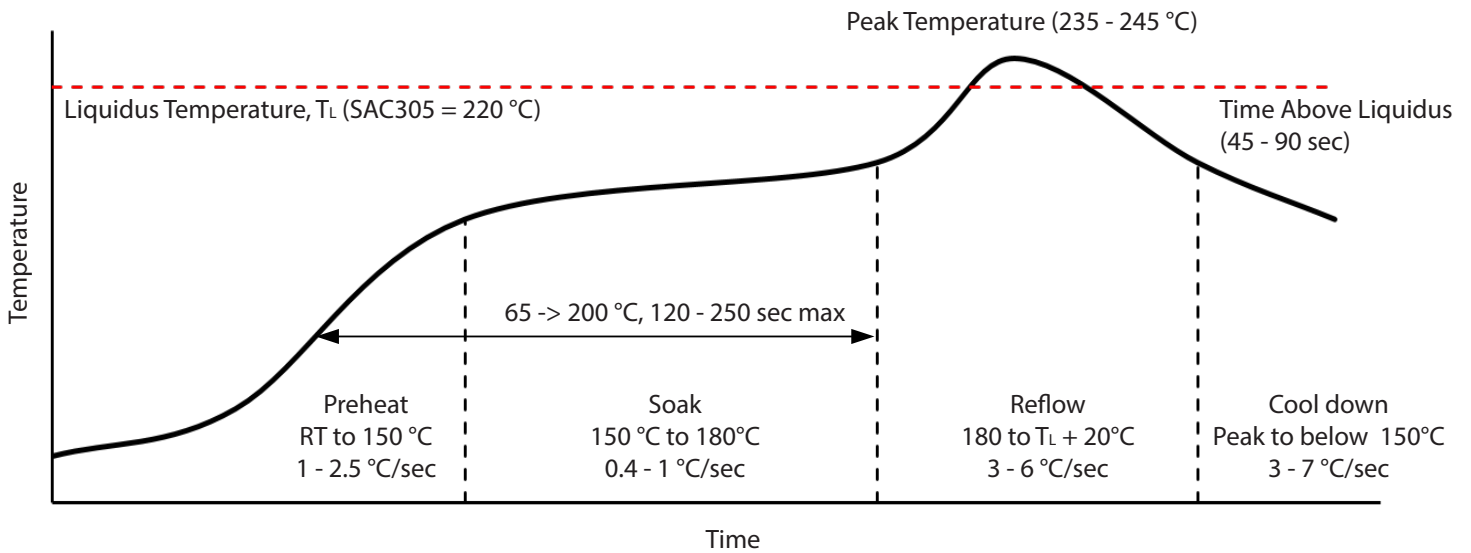
unit: mm

Recommended Solder Pad



unit: mm

Solder Profile



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

Note 1: Product complies to Moisture Sensitivity Level 3 (MSL 3)

Note 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.

Note 3: During the pick and place process, axial forces on the dome (or window) should not exceed 0.5 Newtons (N)

Note 4: Use of a multi-zone IR reflow oven with a nitrogen blanket is recommended.

Note 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.

Note 6: Luminus recommends to use the solder paste data sheet information as a starting point in time-temperature process development.

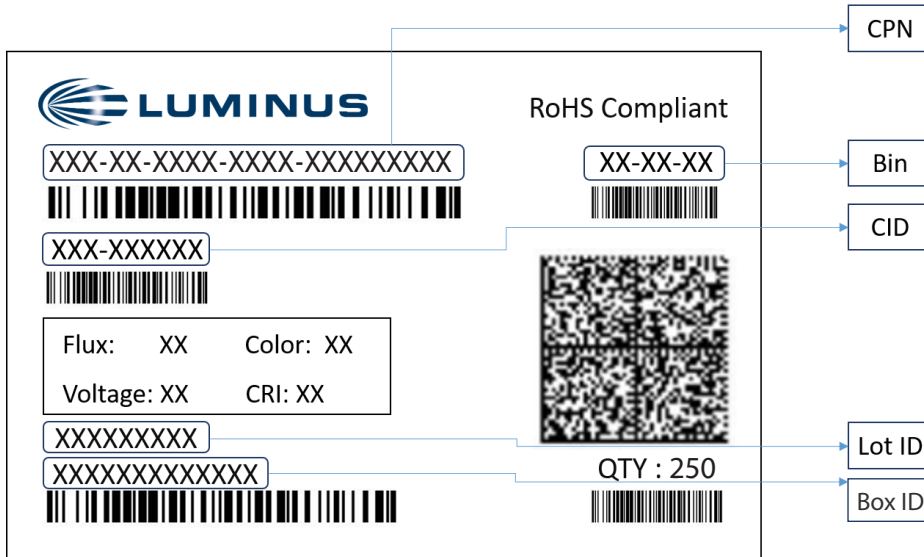
Note 7: These are general guidelines. Consult the solder paste manufacturer's datasheet for guidelines specific to the alloy and flux combination used in your application. For more information, please refer to: <https://luminusdevices.zendesk.com/hc/en-us/articles/360060306692-How-do-I-Reflow-Solder-Luminus-SMD-Components->

Note 8: For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.

Shipping Reel Outline

TBA

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
- Voltage: Bin as defined on page 3
- Color: Bin as defined on page 3
- CRI: NA

Packing Configuration:

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

Precautions for storage, handling and use of UV LEDs

1. UV Light

XBT-3535-UV-Mini LEDs are short wavelength, deep UV LEDs. During operation, the LED emits high intensity UVB 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.

Precautions must be taken to avoid looking directly at the UV light without the use of UV light protective glasses. Do not look directly at the front or at the LED's lens when LED is operational.

2. Static Electricity (ESD)

While XBT-3535-UV-Mini LEDs have built-in Zener protection diodes, they are particularly sensitive to ESD (Electrostatic Discharge). Static electricity and surge voltages seriously damage UV LEDs and can result in complete failure of the device. Anti-electrostatic wristband or gloves are recommended when handling the LEDs. All devices, equipment and machinery must be properly grounded and precautions must be taken against surge voltages.

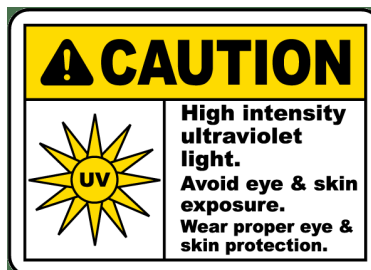
Reference: APN-002815 Electrical Stress Damage to LEDs and How to Prevent It

3. Operating Conditions

In order to ensure the correct functioning of these LEDs, compliance to maximum allowed specifications is important. UV LEDs are particularly sensitive to drive currents that exceed the max operating specifications and may be damaged by such drive currents. The use of current regulated drive circuits is strongly recommended when operating these devices. Customers should also provide adequate thermal management to ensure LEDs do not exceed maximum recommended temperatures. Operating LEDs at temperatures in excess of specification will result in damage and possibly complete failure of the device.

3. Storage Conditions

XBT-3535-UV-Mini LEDs have an MSL (TBA) moisture sensitivity rating and should be handled per JEDEC J-STD-020.



History of Changes

Rev		Description of Change
A	05/17/2022	Initial Release
B	07/29/2022	Update characterization



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