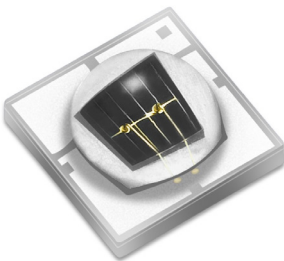


SST-10-IRD-850nm

Dual Junction Surface Mount Series
Low Thermal Resistance Infrared LED



Features

- High Power Infrared LED with typical 840 nm centroid wavelength
- High thermal conductivity substrate
- 50, 90 and 130-degree viewing angle
- Operation at up to 1.5 A CW and 5 A pulse
- Corrosion Robustness Class: 3B
- Built-in ESD protection
- Low Thermal Resistance
- Suitable for all SMT Assembly Methods



Applications

- Surveillance Systems / CCTV
- Iris and Face Recognition
- License Plate Scanning
- Automotive Sensing
- Machine Vision
- Night Vision

Table of Contents

Ordering Information.	2
Binning Structure.	3
Characteristics	4
Angular Distribution and Typical Spectrum.	7
Absolute Maximum Ratings	9
Mechanical Dimensions.	10
Mechanical Characteristics.	13
Soldering Profile.	14
Tape and Reel Outline	15
Shipping Label	18
Packaging	19
Notes	20
Revision History	21



Ordering Information

Ordering Part Numbers^{1,2}

Peak Wavelength	Radiometric Flux		Viewing Angle	Ordering Part Number
	Minimum Flux Bin	Minimum Flux		
850 nm	V	565 mW	50	SST-10-IRD-B50H-V850
	V	565 mW	90	SST-10-IRD-B90H-V850
	W	595 mW	130	SST-10-IRD-B130H-W850

Part Number Nomenclature

SST	10	IRD	B<###>H	<fwww>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
S: Surface Mount S: Dome Lensed T: Single Emitter	10: 1.0 mm ²	IRD: Dual Junction Infrared	50/90/130: Viewing angle in degrees	<f> Minimum Flux Bin <www> Wavelength Bin See 'Binning Structure' on page3 for details

Notes:

1. The Ordering Part Number specifies the Minimum Flux Bin in shipment; higher flux bins may be shipped without advance notice. Please refer to 'Luminous Flux Binning' table for details of all flux bins.
2. Product test condition: $I_f = 350 \text{ mA}$, $T_c = 25^\circ\text{C}$.



Binning Structure

Radiometric Flux Bins¹

Flux Bin	Binning @ 350 mA, T _c =25°C ²	
	Minimum Flux (mW)	Maximum Flux (mW)
V	565	595
W	595	625
X	625	655
Y	655	685
Z	685	715

Forward Voltage Bins²

Voltage Bin	Binning @ 350 mA, T _c = 25°C	
	Minimum Voltage (V)	Maximum Voltage (V)
V8	2.6	2.8
V9	2.8	3.0
Va	3.0	3.2

Peak Wavelength Bins³

Wavelength Bin	Binning @ 350 mA, T _c = 25°C	
	Minimum Wavelength (nm)	Maximum Wavelength (nm)
850	840	870

Notes:

1. Luminus maintains a ±6% tolerance on flux measurement.
2. Individual voltage bins are not orderable. Parts are binned and shipped in 0.2 V_f increments.
3. The wavelength bin as marked on the product label may be followed by a letter which is for internal use only.



Characteristics¹

Parameter ($I_f=350\text{ mA}$, $T_c=25^\circ\text{C}$)		Symbol	Value	Unit
Forward Current		I_f	350	mA
Typical Output Power	B50H	Φ_v	620	mW
	B90H			
	B130H		640	
Typical Output Power @ 1.0A, t = 20ms	B50H	$\Phi_{v\ 1.0A}$	1740	
	B90H			
	B130H		1800	
Forward Voltage	Minimum	$V_{f\ min}$	2.6	V
	Typical	$V_{f\ typ}$	2.9	
	Maximum	$V_{f\ max}$	3.2	
Viewing Angle	B50H	$2\ \varnothing_{1/2}$	50	°
	B90H		90	
	B130H		130	
Radiant Intensity @ 1.0A, t = 20ms	B50H	$f_{e\ typ}$	1237	mW/sr
	B90H		844	
	B130H		560	
Peak Wavelength		λ_p	850	nm
Centroid Wavelength		λ_c	840	
FWHM		$\Delta\lambda_{1/2}$	26	
Temperature Coefficient of Voltage		$\Delta V_f / \Delta T$	-3.0	mV/°C
Temperature Coefficient of Radiometric Power		$\Delta \Phi / \Delta T$	-0.2	%/°C
Temperature Coefficient of Wavelength		$\Delta \lambda / \Delta T$	0.3	nm/°C
Electrical Thermal Resistance (Junction to Solder Point) ²		$R_{th\ JS\ elec}$	2.4	°C/W

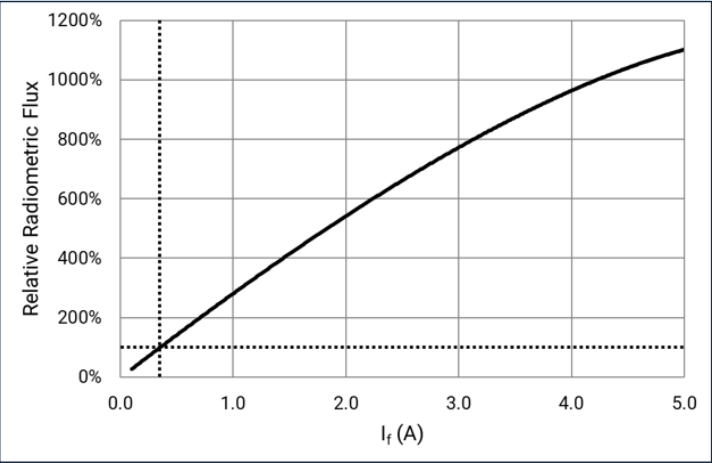
Notes:

1. Caution must be taken not to stare at the light emitted from these LEDs. Under special circumstances, the high intensity could damage the eye.
2. Thermal measurements are in accordance with JEDEC 51-14.



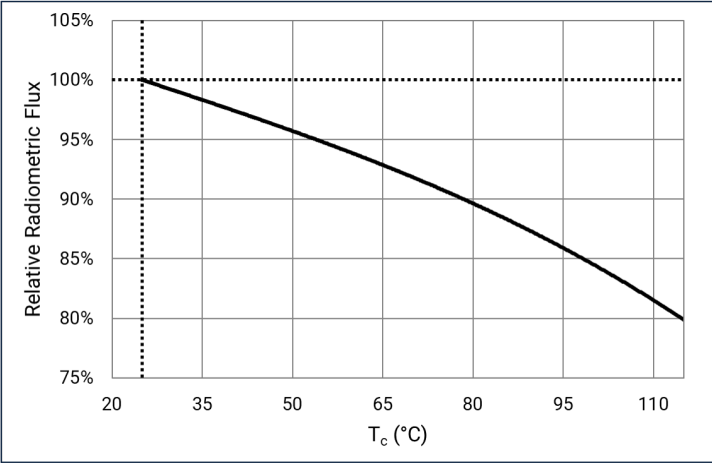
Relative Radiometric Flux vs Forward Current

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



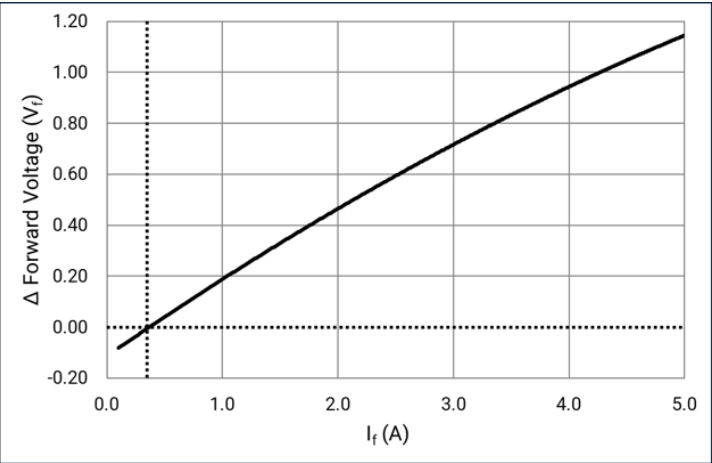
Relative Radiometric Flux vs Temperature

$I_f = 350\text{ mA}$



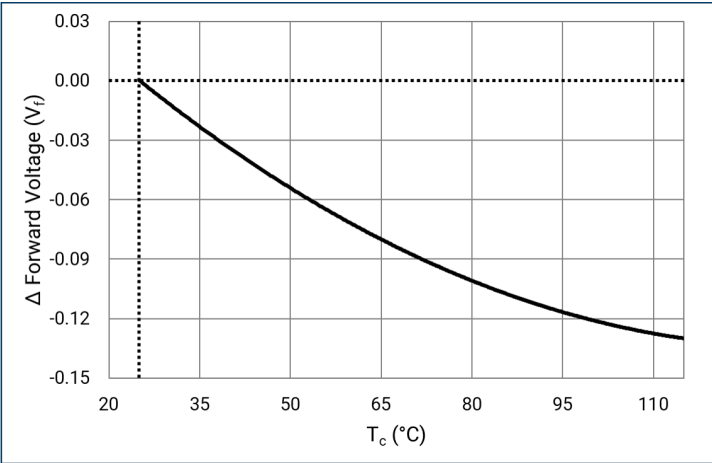
Forward Voltage vs Forward Current

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



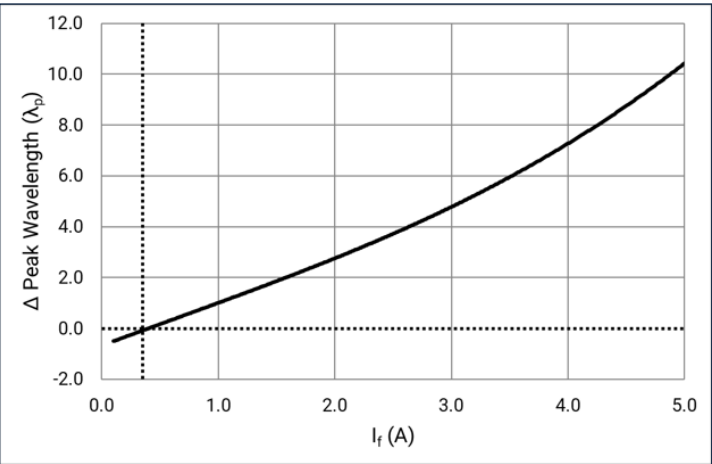
Forward Voltage vs Temperature

$I_f = 350\text{ mA}$



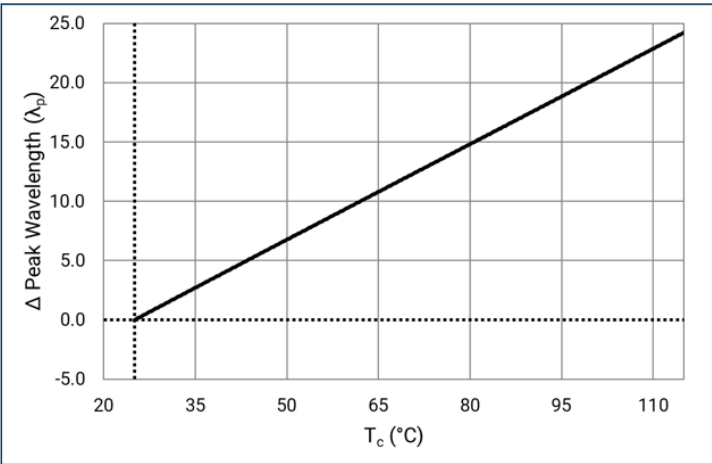
Peak Wavelength vs Forward Current

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



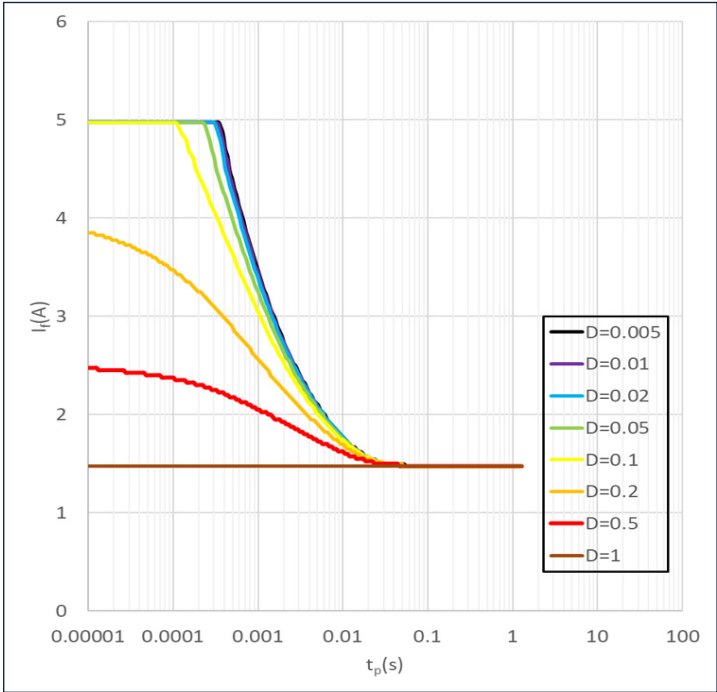
Peak Wavelength vs Temperature

$I_f = 350\text{ mA}$





Permissible Pulse Handling Capability

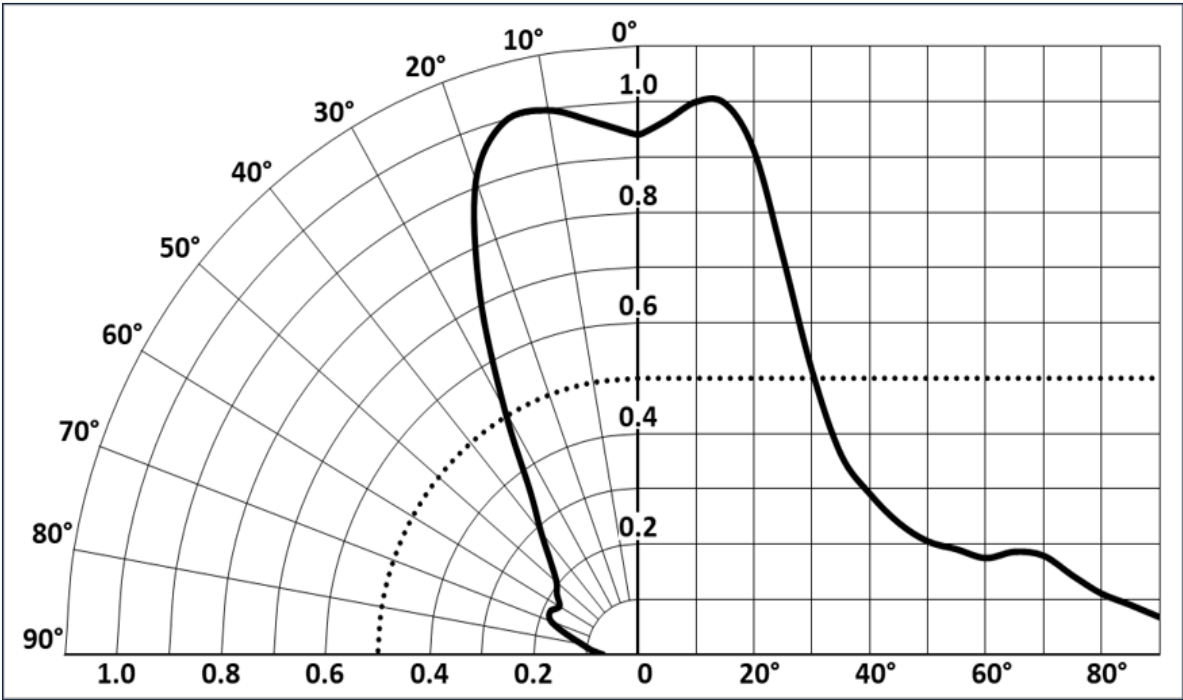




Angular Distribution and Typical Spectrum

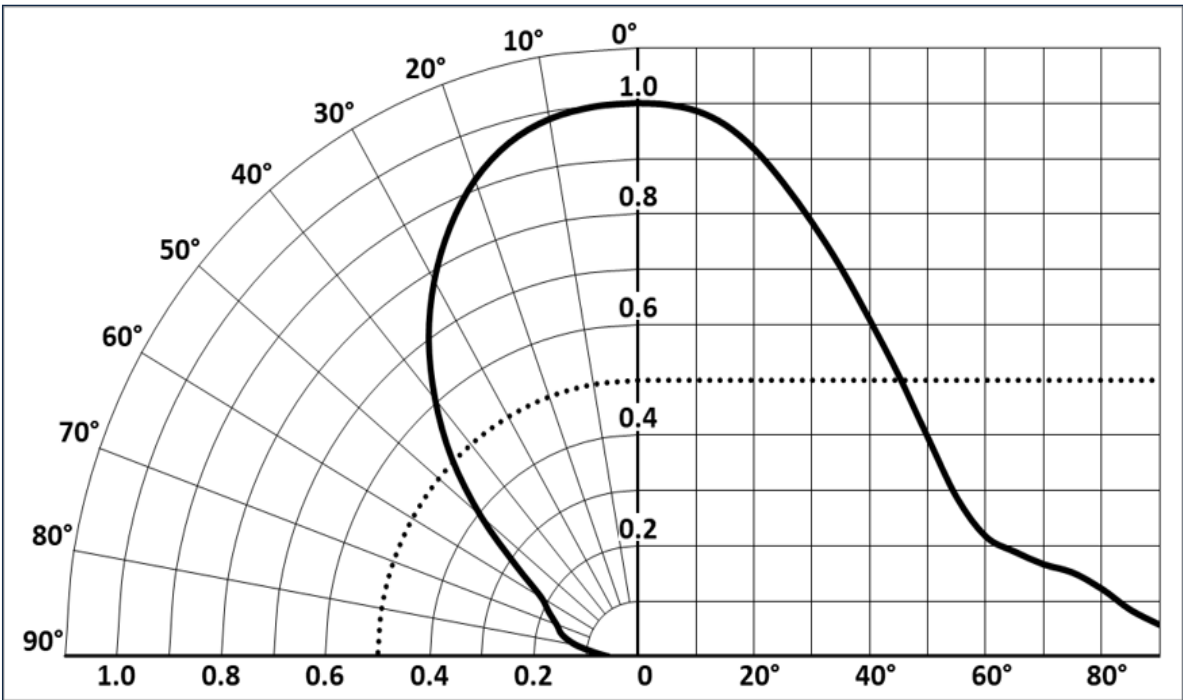
Typical Polar Radiation - B50H

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



Typical Polar Radiation - B90H

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

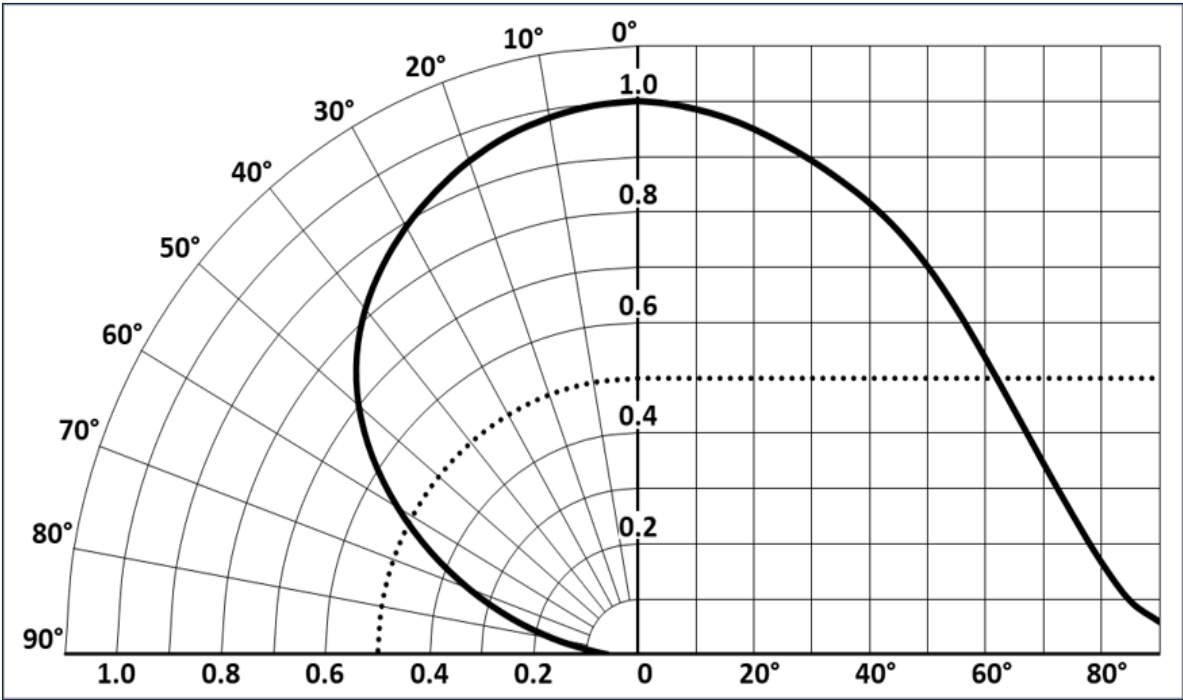




Angular Distribution and Typical Spectrum

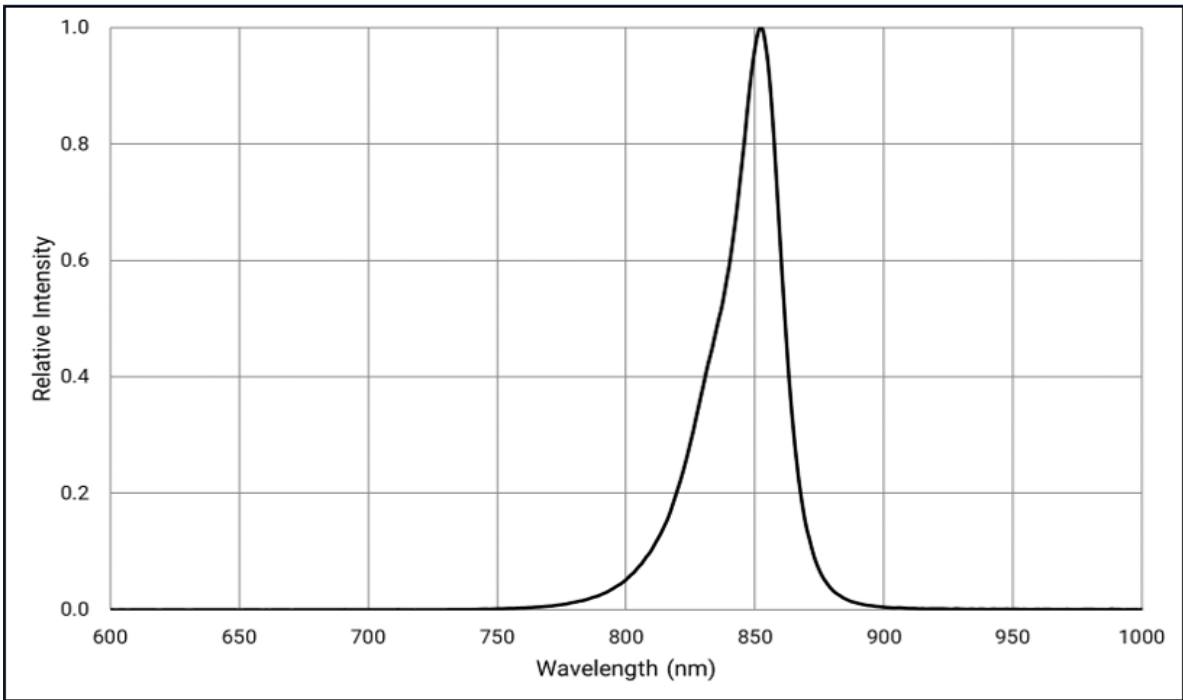
Typical Polar Radiation - B130H

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



Relative Spectral Power Distribution

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





Absolute Maximum Ratings^{1,2}

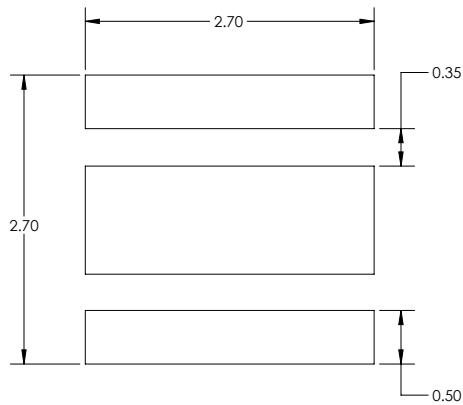
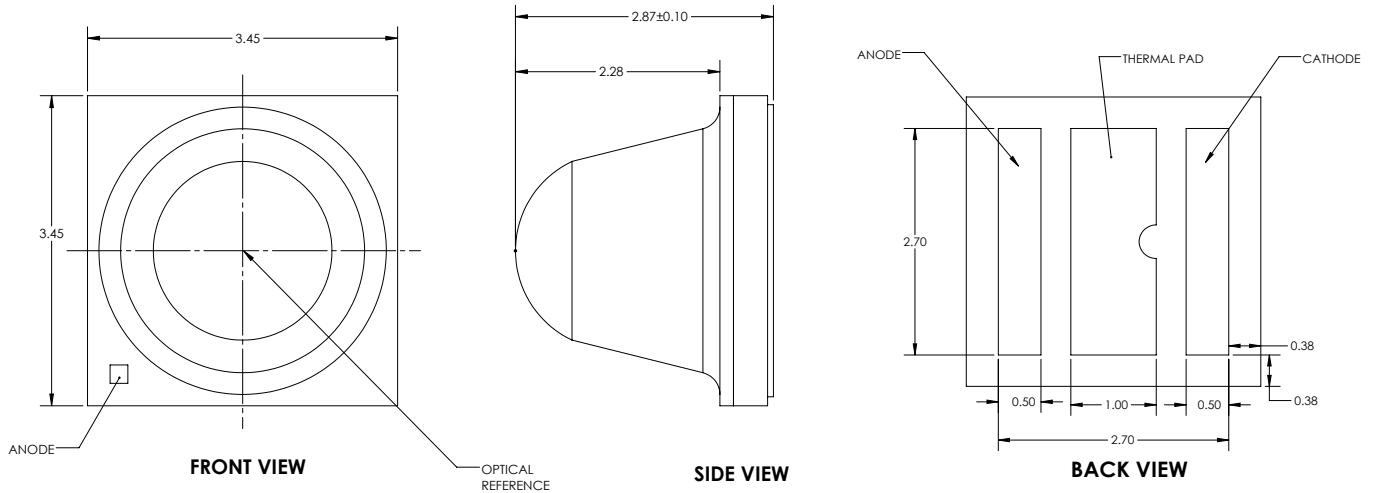
Parameter	Symbol	Values	Unit
Forward Current (Pulsed) ³	$I_{f\ pulse}$	5	A
Forward Current (CW)	$I_{f\ CW}$	1.5	
Reverse Voltage (@ $I_f = 10\text{ mA}$)	V_r	5	V
Power Dissipation	P_D	6	W
Junction Temperature	T_c	115	°C
Storage Temperature Range	T_{stg}	-40 to 100	
ESD withstand Voltage ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}	8	kV
ESD withstand Voltage ANSI/ESDA/JEDEC JS-002 (CDM)	V_{CDM}	1	

Notes:

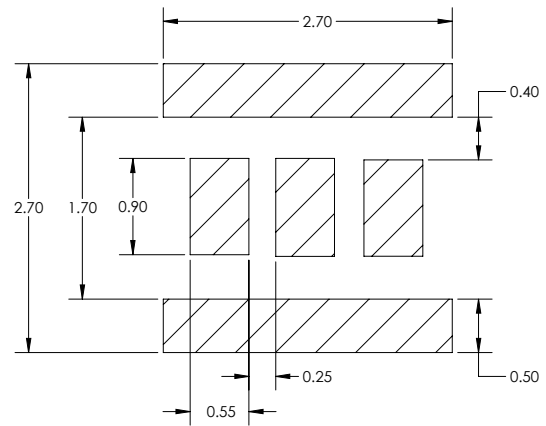
1. The LED is safe for operation at the absolute maximum ratings as specified above. However, note that product lifetime data is provided based on nominal drive conditions. If sustained operation occurs at the absolute maximum ratings, it may lead to a reduction in device lifetime.
2. Avoid operating the LED beyond the maximum ratings.
3. In pulsed operation, rise time from 10% to 90% of forward current should be larger than 0.5 microseconds.



Mechanical Dimensions - B50H Package



RECOMMENDED PCB SOLDER PAD DESIGN

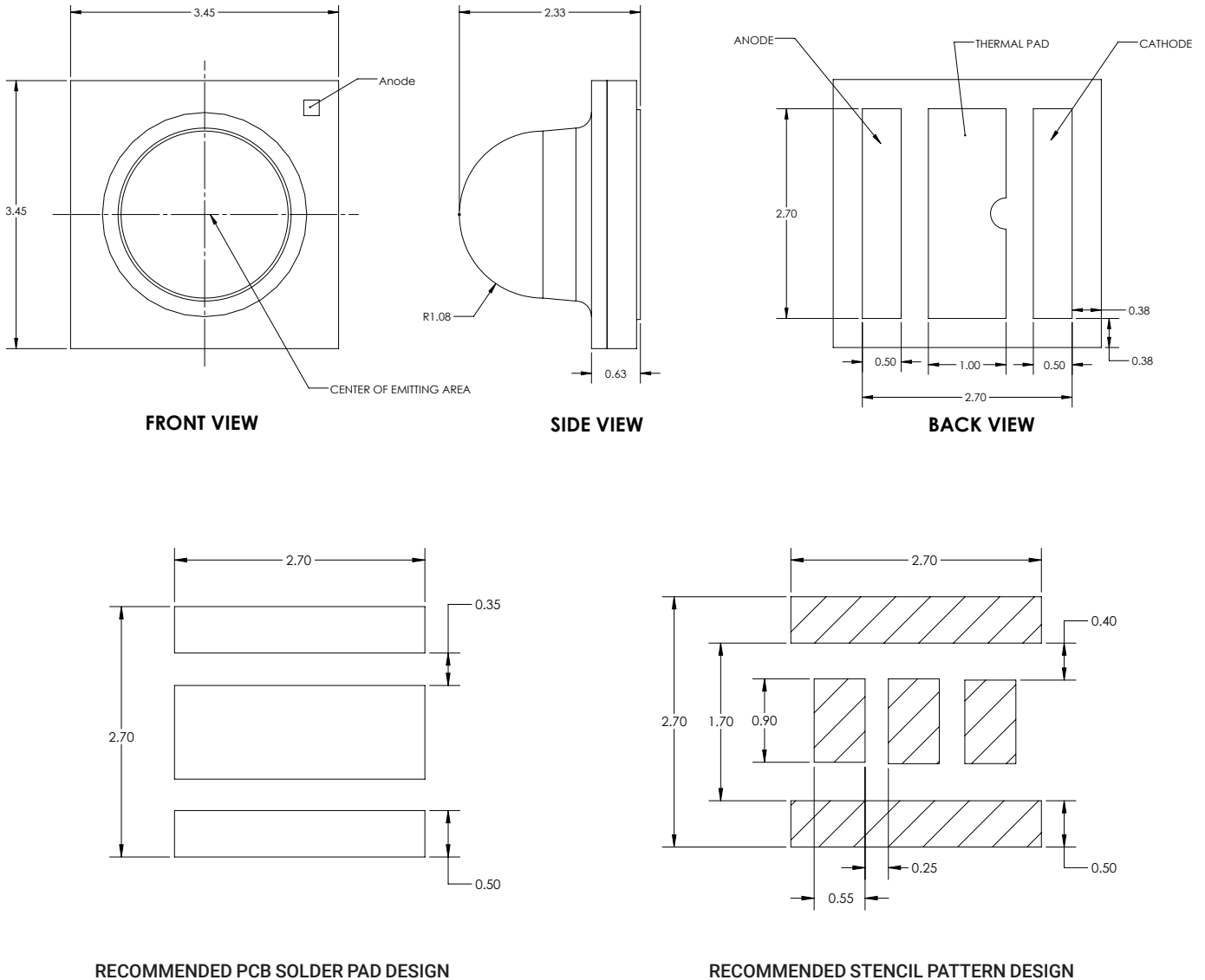


RECOMMENDED STENCIL PATTERN DESIGN

Note:

1. All dimensions are in millimeter ± 0.05 mm.

Mechanical Dimensions - B90H Package

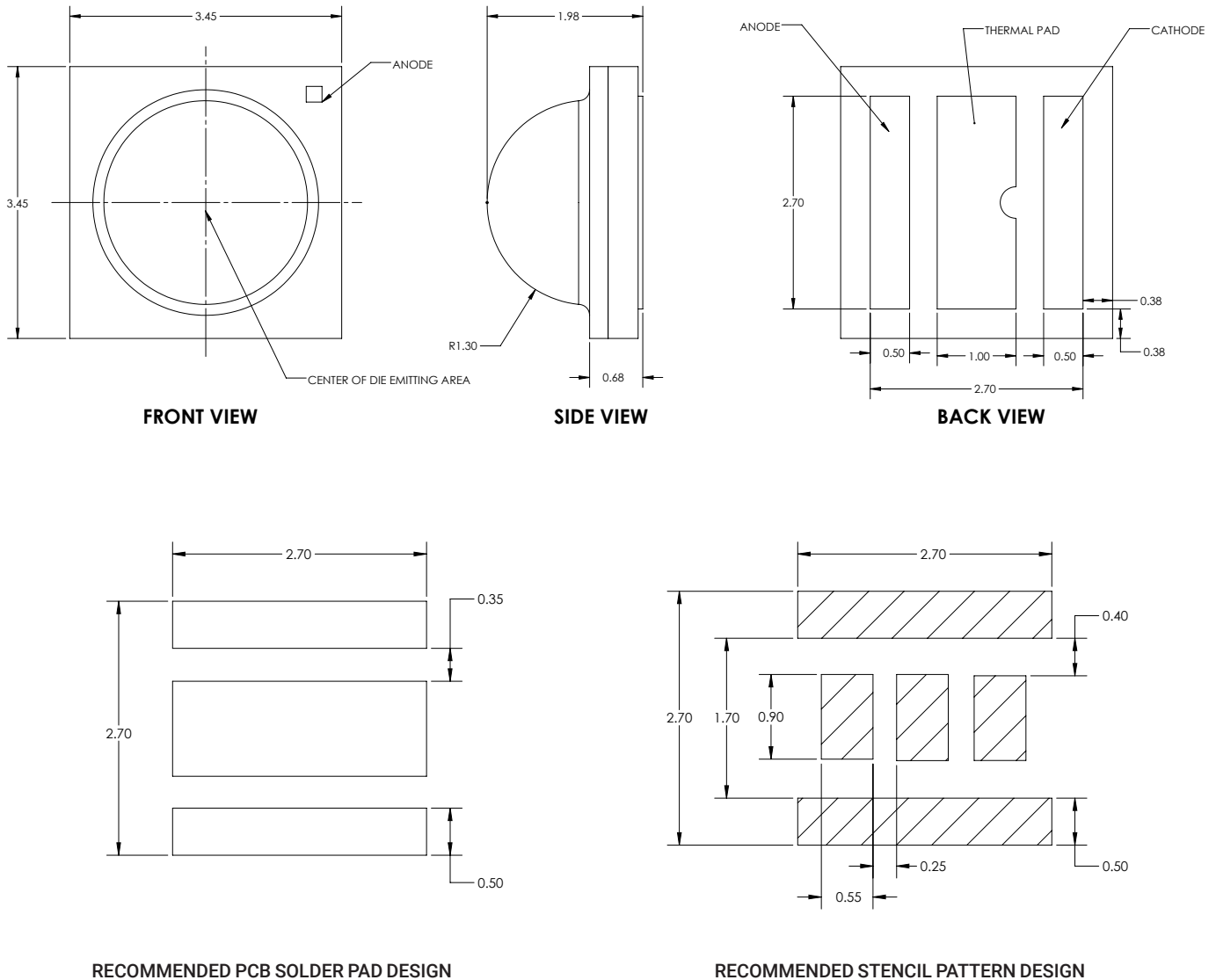


Note:

1. All dimensions are in millimeter ± 0.05 mm.



Mechanical Dimensions - B130H Package



Note:

1. All dimensions are in millimeter ± 0.05 mm.



Mechanical Characteristics

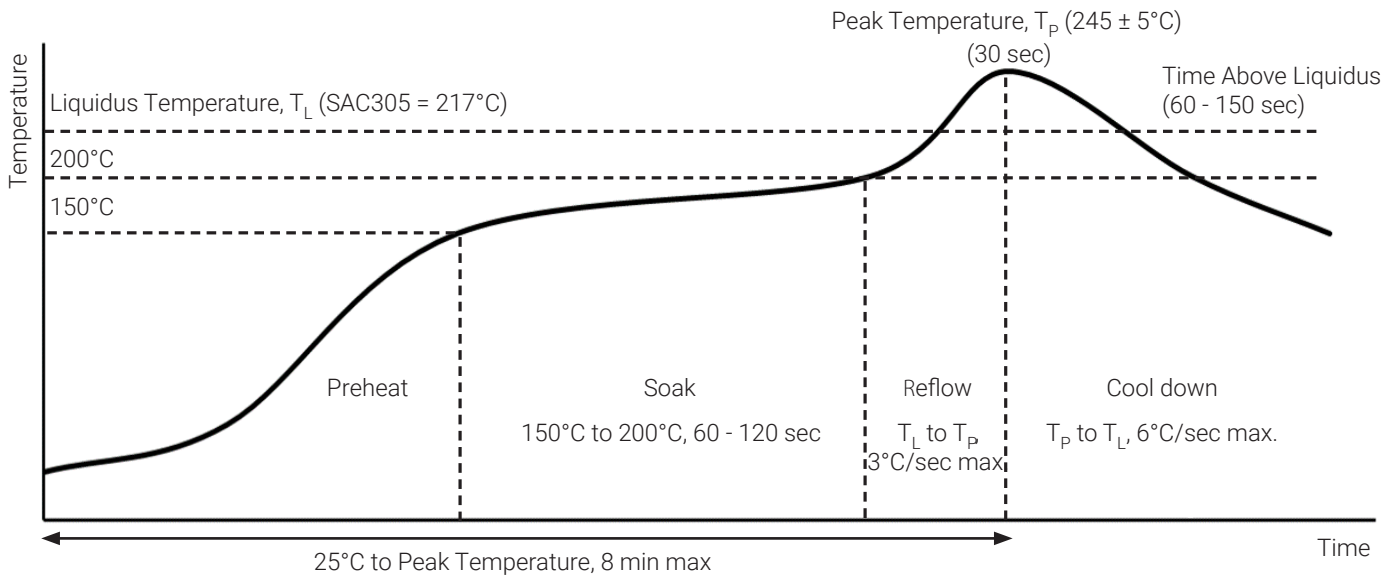
JEDEC Moisture Sensitivity^{1, 2}

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°C	< 150°C

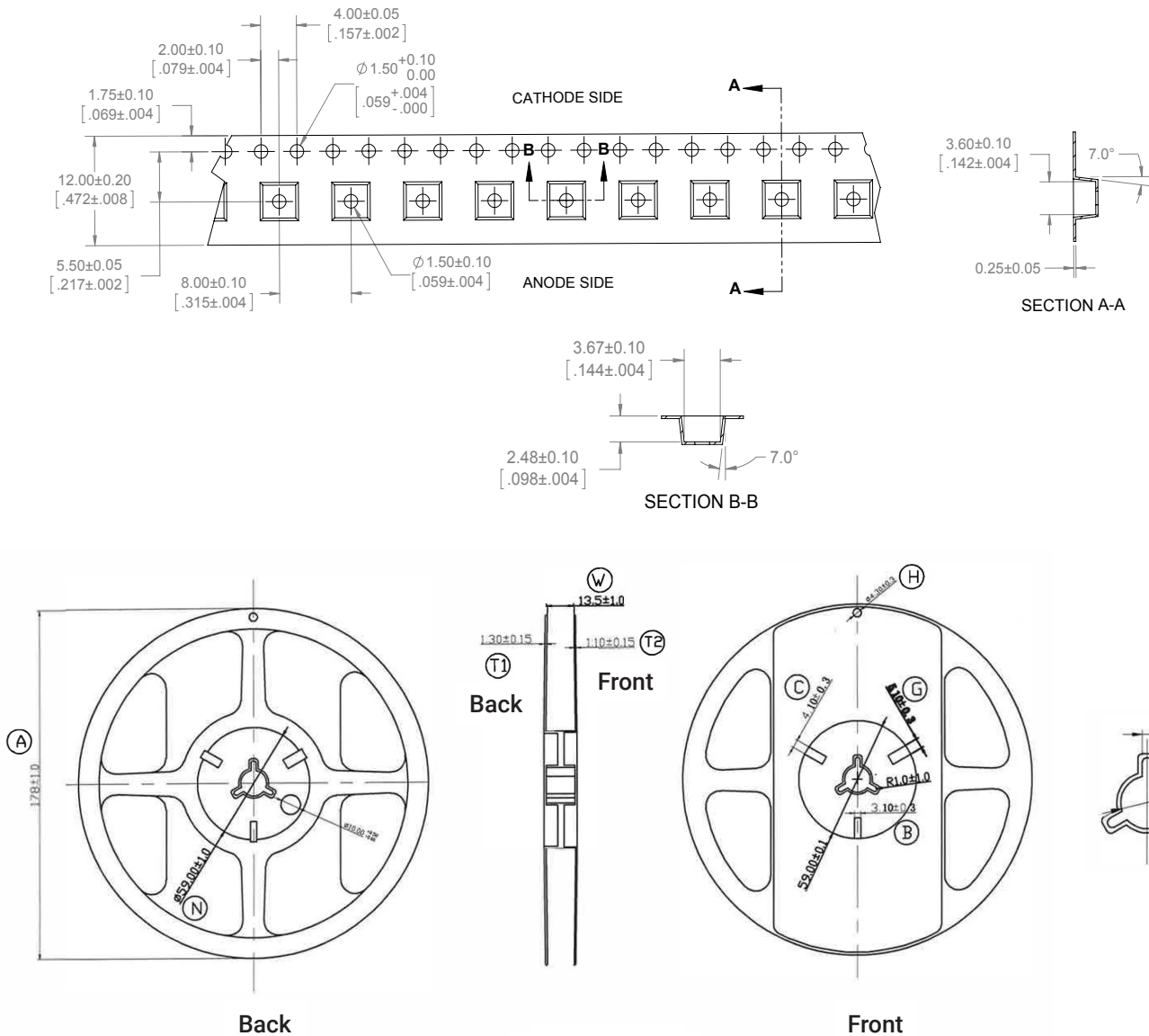
Notes:

- 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.



- 

Tape and Reel Outline - B90H Package

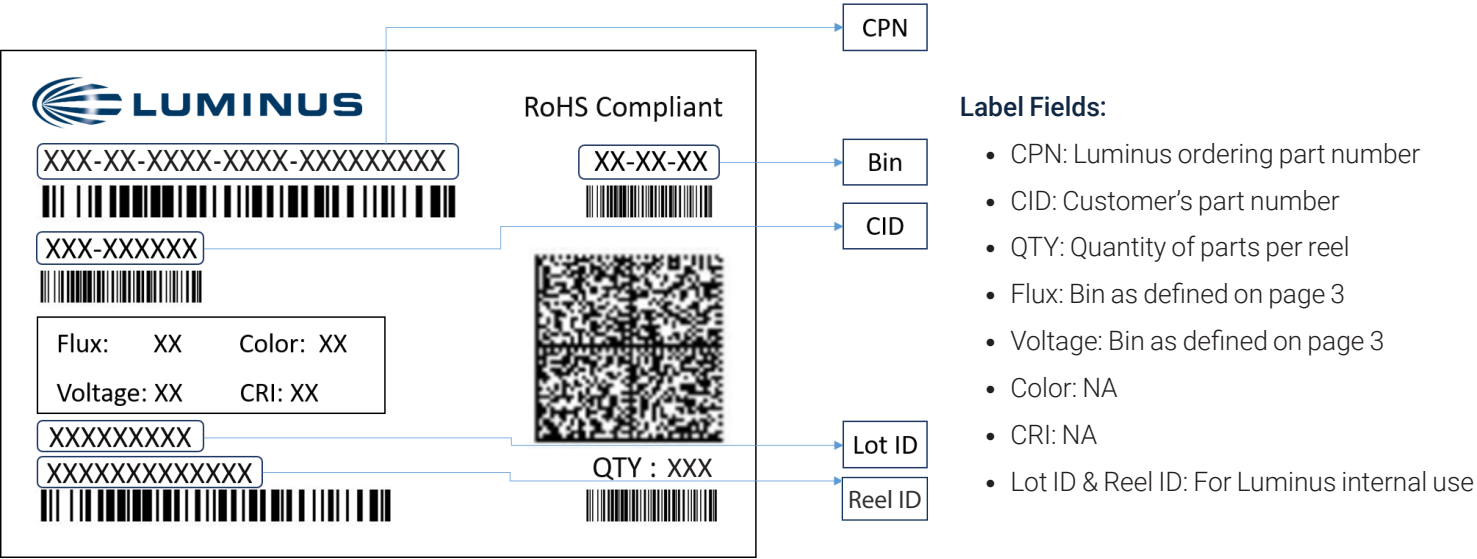


Notes:

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. Must comply to EIA-481-C-2003.
5. Final tape and reel packaging must meet the requirements of JEDEC-STD-033, LEVEL 2A.



Shipping Label



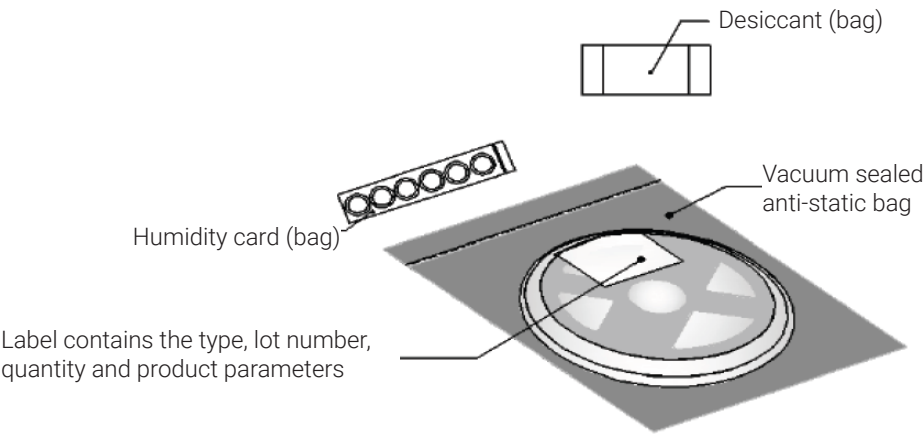
Packing Configuration:

- 500 units per reel for B50H and B90H package, 1,000 units per reel for B130H package
- Each reel is placed in an anti-static moisture barrier bag
- Partial reel may be shipped
- Shipping label is placed on top of each packaging box



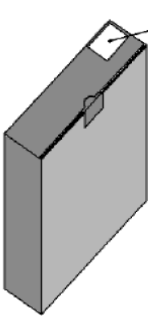
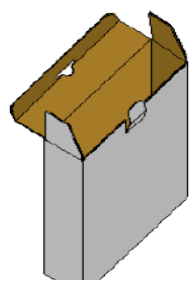
Packaging

Packaged Reel



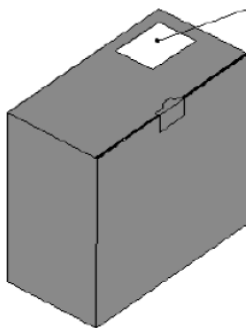
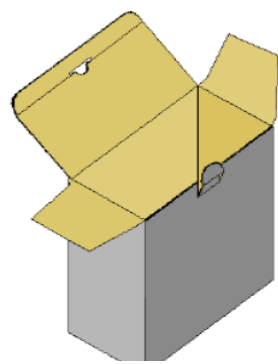
Packaging boxes

Box Size 1 - 5 reels per box
Size: 22.5 x 24.5 x 6.5 cm



Label contains the type, lot number, quantity and product parameters

Box Size 2 - 10 reels per box
Size: 22.5 x 24.5 x 13 cm



Label contains the type, lot number, quantity and product parameters



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

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

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 H₂S / 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 ₂ , 200ppb NO ₂ , 10ppb H ₂ S, 10ppb Cl ₂ / 21 days (EN 60068-2-60 (Method 4))
2	No visible discoloration	Discoloration possible	25 °C / 75 % RH / 10ppm H ₂ S / 21 days (IEC 60068-2-43)
3	No visible discoloration	Discoloration possible	40 °C / 90 % RH / 15ppm H ₂ S / 14 days (stricter than IEC 60068-2-43)



Revision History

Rev	Date	Description of Change
01	05/19/2021	Initial release
02	05/11/2023	Introduced Higher flux bins, updated typical values
02	08/17/2023	Editorial update on page 5
03	07/17/2025	Updated to new template. Updated Tape and Reel Drawing and added tolerance in Mechanical Dimension