

SST-10-IRD-810nm

Dual Junction Surface Mount Series

Low Thermal Resistance Infrared LED

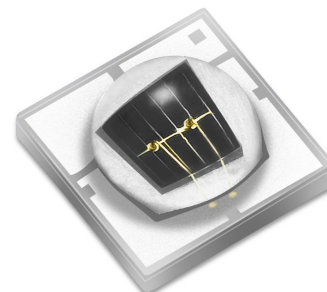


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Features

- High Power Infrared LED with typical 810 nm centroid wavelength
- High thermal conductivity substrate
- 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
- RoHS and REACH compliant

Applications

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

Ordering Information and Binning Structure

All SST-10-IRD-810nm products are packaged and labeled with part numbers as outlined in below. When shipped, each reel will contain only a single flux wavelength and V_f bin. The part number designation is as follows:

SST — **10** — **IRD** — **B###** — **F###-V#**

Product Family	Chip Area	Color	Package Configuration	Bin Kit
SST - Ceramic Surface Mount package w/ encapsulation	10 : 1.0 mm ²	IRD : Dual Junction Infrared	B90H : 90 deg Beam Angle B130H : 130 deg Beam Angle High Performance Ceramic 3.45mm x 3.45mm See Pages 8-9 for Detailed Drawings	See below for flux, wavelength and forward voltage binning information

Flux Bins¹

Bin Code	Radiometric Power at 350 mA, $t_p=20ms$	
	Minimum Flux (mW)	Maximum Flux (mW)
S	475	505
T	505	535
U	535	565
V	565	595
W	595	625
X	625	655
Y	655	685
Z	685	715

Wavelength Bins¹

Bin Code	Minimum Peak Wavelength (nm)	Maximum Peak Wavelength (nm)
810	800	830

Forward Voltage Bins¹

Bin Code	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
V9	2.8	3.0
Va	3.0	3.2
Vb	3.2	3.4

Peak Wavelength	Minimum Flux Bin(mW)	Lens Angle	Ordering Part Number
810	475	90	<i>SST-10-IRD-B90H-S810</i>
	475	130	<i>SST-10-IRD-B130H-S810</i>

Absolute Maximum Ratings

Absolute Maximum Ratings²

Parameter	Symbol	Rating	Unit
Forward Current ^{3,4}	I	1.5 (CW) / 5 (Pulse)	A
Power Dissipation	P _D	6	W
Reverse Voltage	V _R	5	V
Storage Temperature	T _{STG}	-40 to 100	°C
Junction Temperature ^{3,4}	T _J	115°C	°C
ESD Sensitivity (HBM) - JEDEC JS-001-2014 Class 3B	V _{HBM}	≥8000	V
ESD Sensitivity (CDM) - JEDEC JS-002-2018 Class C3	V _{CDM}	≥1000	V

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

Note 2: To prevent damage refer to operating conditions and derating curves for appropriate maximum operating conditions

Note 3: Luminus SST-10-IRD-810nm 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.

Note 4: Maximum operating case temperature combined with maximum drive current defines the total maximum operating condition for the device. To prevent damage, please operate devices within specified conditions.

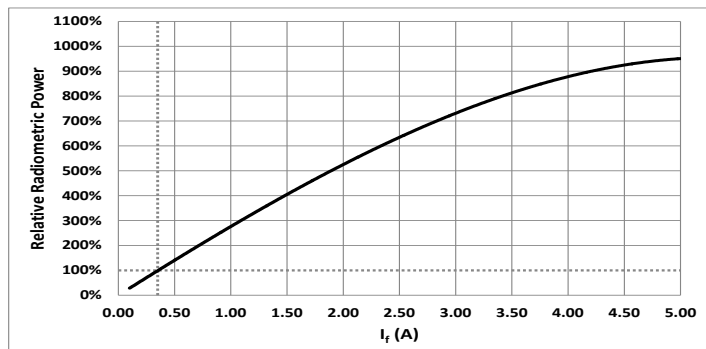
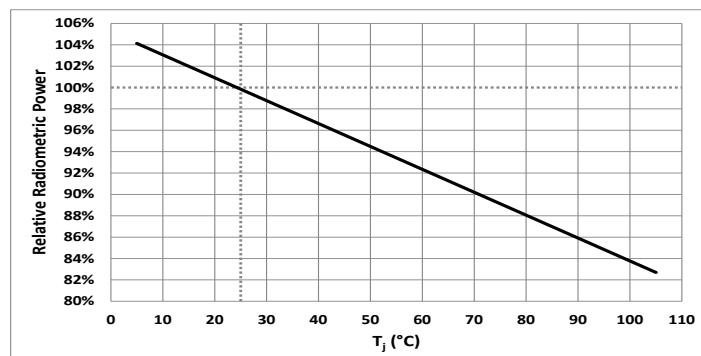
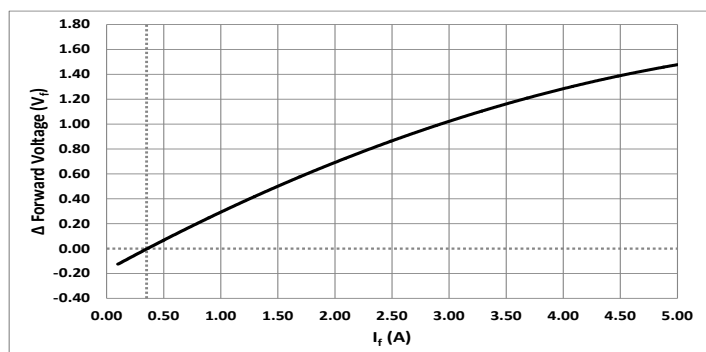
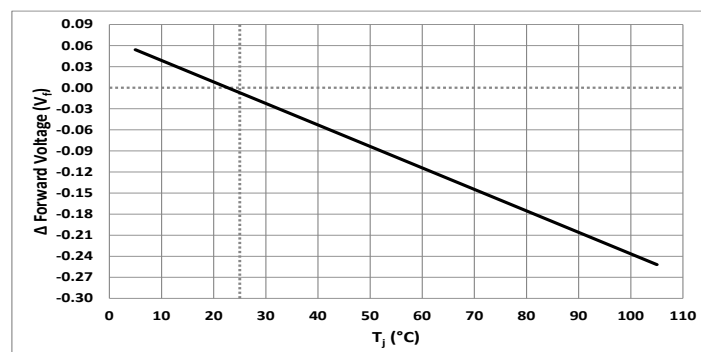
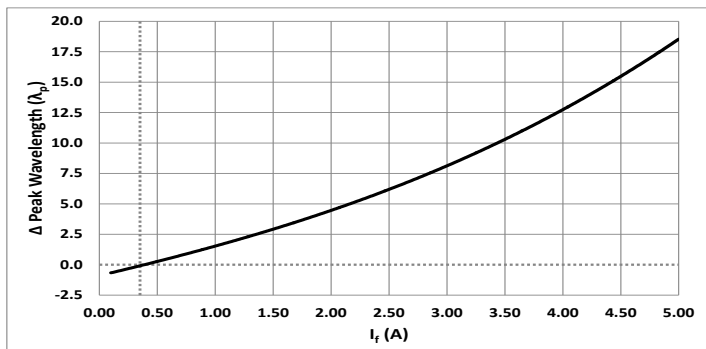
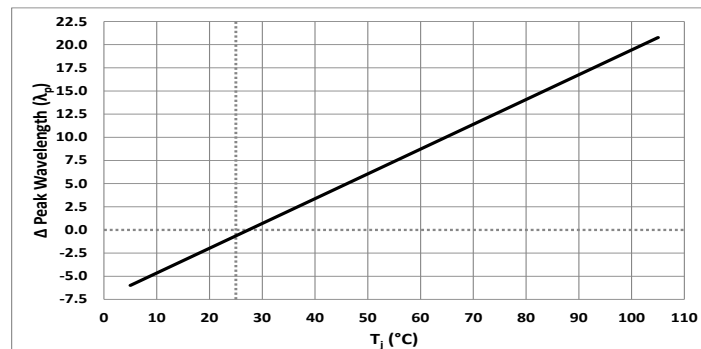
Device Characteristics

Optical and Electrical Characteristics^{1,2}

Parameter	Symbol	Package Type		Unit
		B90H	B130H	
Forward Current	I_f	350		mA
Output Power Typical	PO	535		mW
Output Power at 1.0 A, $t_r=20$ ms (typ.)	$PO_{1.0A}$	1470		mW
Radiant Intensity at 1.0 A, $t_r=20$ ms (typ.)	ϕ_e	770	410	mW/sr
Minimum Forward Voltage ¹	V_{fmin}	2.8		V
Forward Voltage Typical	V_f	3.0		V
Maximum Forward Voltage ¹	V_{fmax}	3.4		V
Viewing Angle	$2\theta_{1/2}$	90	130	deg
Peak Wavelength Typical	λ_p	815		nm
Centroid Wavelength Typical	λ_c	810		nm
FWHM Typical	$\Delta\lambda_{1/2}$	30		nm
Temperature Coefficient of Forward Voltage	TC_{V_f}	-3.0		mV/°C
Temperature Coefficient of Radiometric Power	TC_{PO}	-0.2		%/°C
Temperature Coefficient of Wavelength	TC_{λ}	0.3		nm/°C
Thermal Resistance (Electrical)	R_{th}	2.4		°C/W

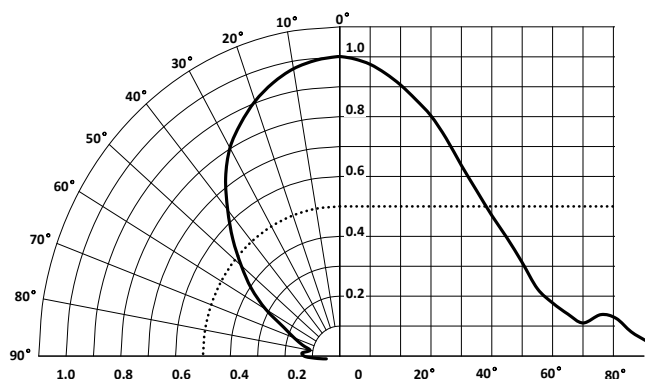
Note 1: Binning based on operation at a current of 350 mA, 20 ms single pulse and a constant junction temperature of $T_j = 25^\circ\text{C}$. Parts are binned and shipped in 0.2 V V_f increments.

Note 2: Caution must be taken not to stare at the light emitted from these LEDs. Under special circumstances, the high intensity could damage the eye.

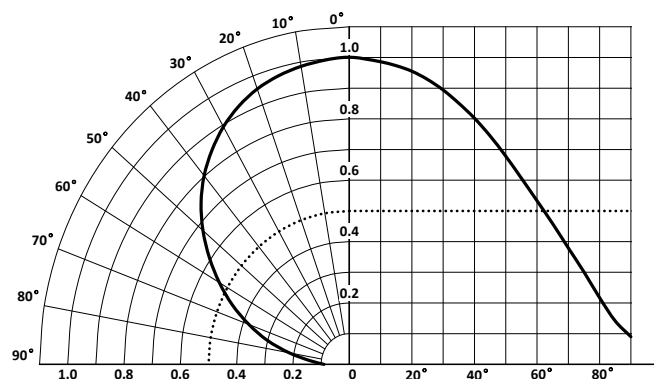
Relative Output Flux vs. Forward Current

Relative Output Flux vs. Temperature

Relative Forward Voltage vs. Forward Current

Relative Forward Voltage vs. Temperature

Relative Peak Wavelength vs. Forward Current

Relative Peak Wavelength vs. Temperature


Angular Distribution and Spectrum

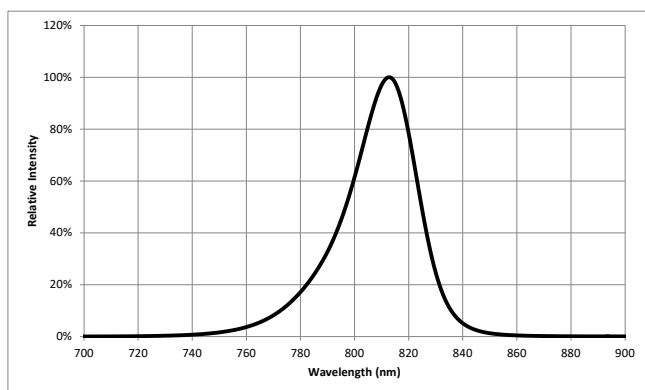
Typical Polar Radiation Plot - B90H



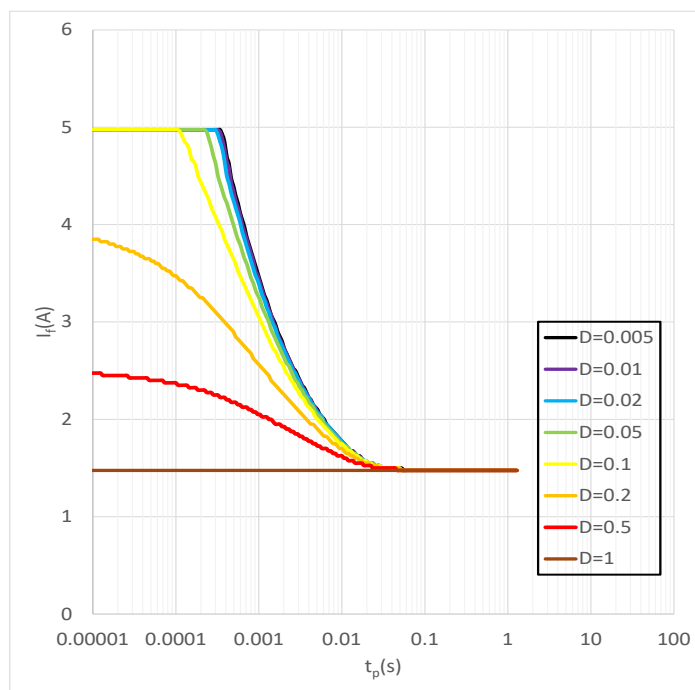
Typical Polar Radiation Plot - B130H



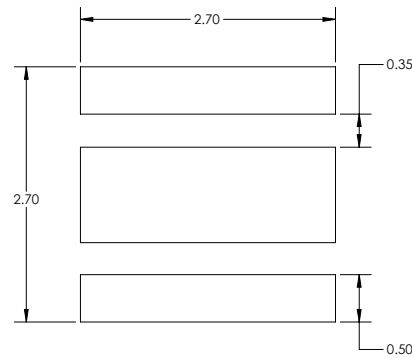
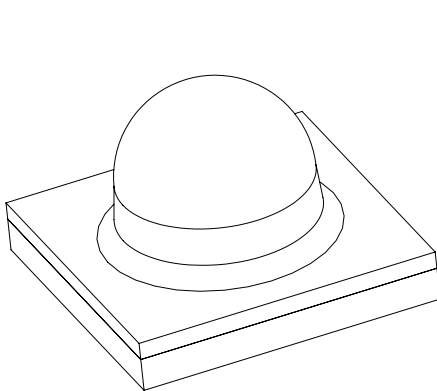
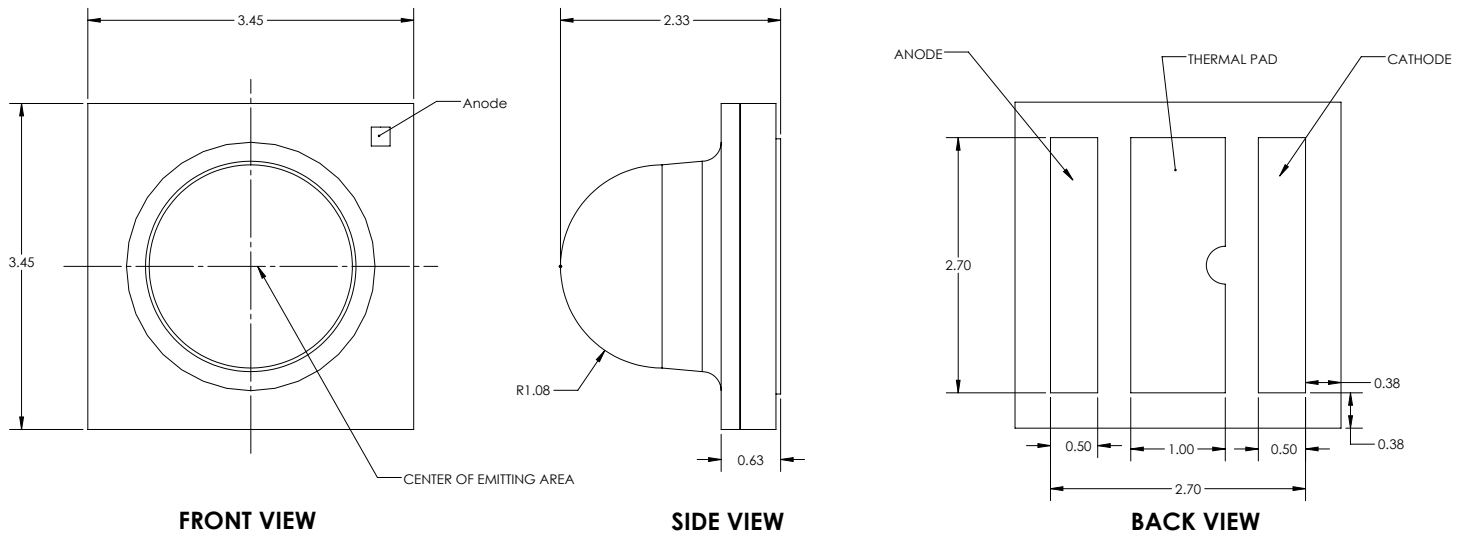
Typical Spectrum



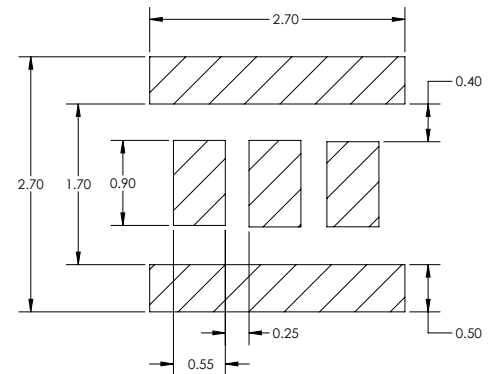
Permissible Pulse Handling Capability



Mechanical Dimensions - B90H Package

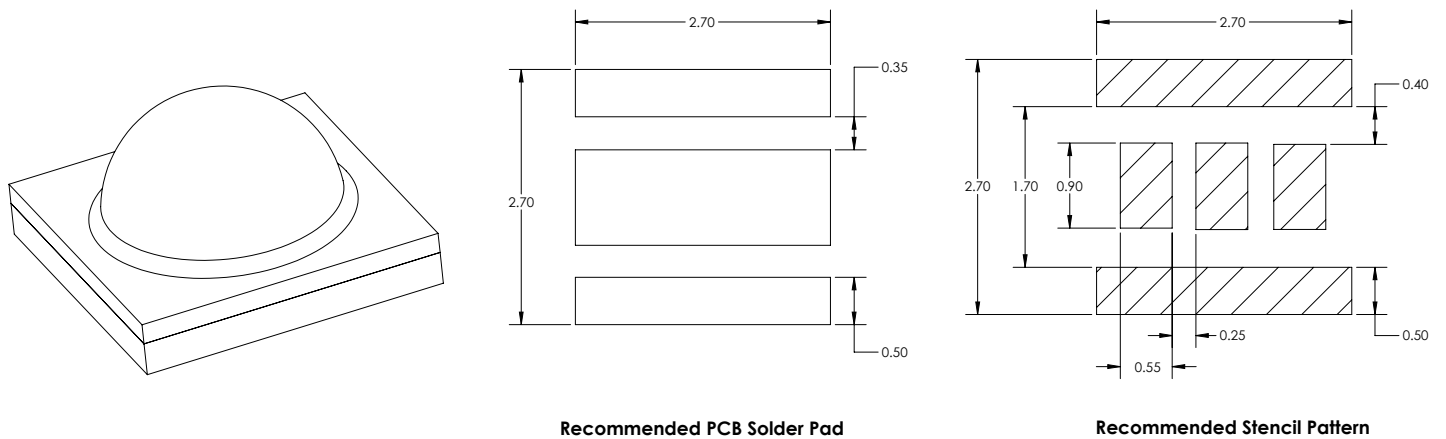
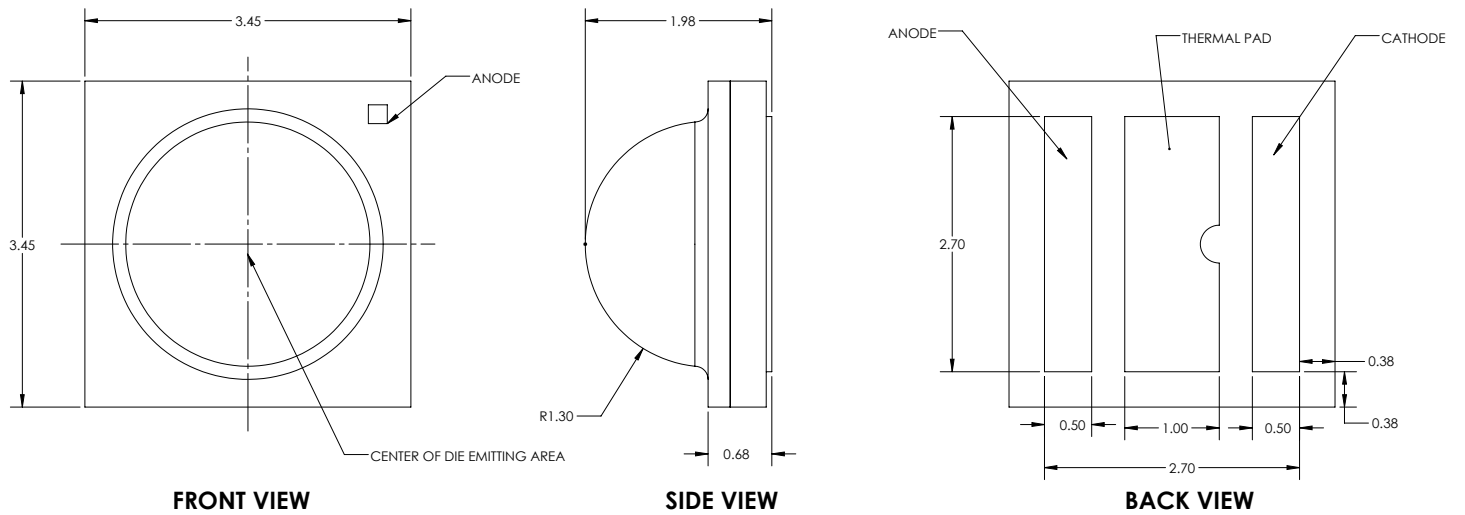


Recommended PCB Solder Pad

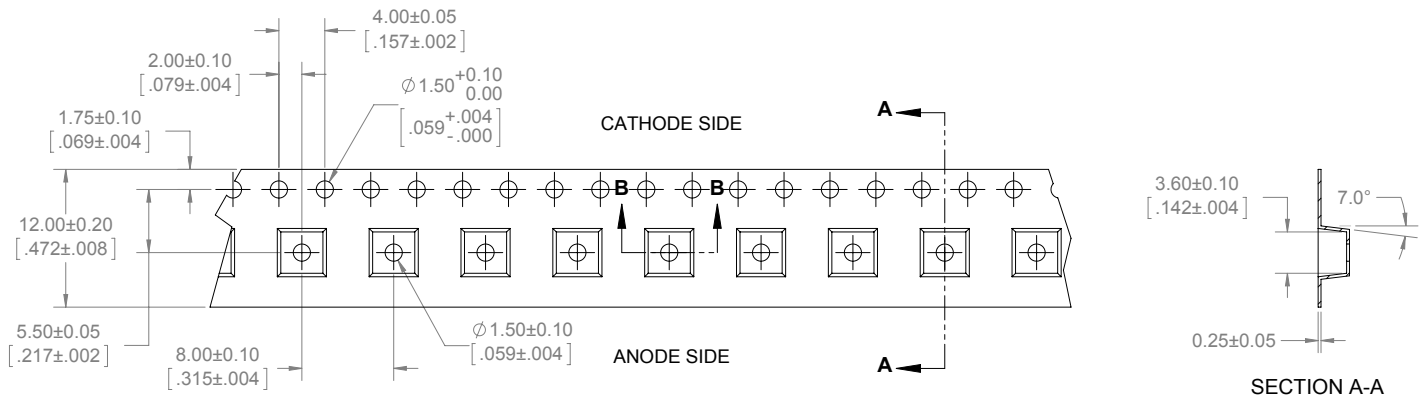


Recommended Stencil Pattern

Mechanical Dimensions - B130H Package

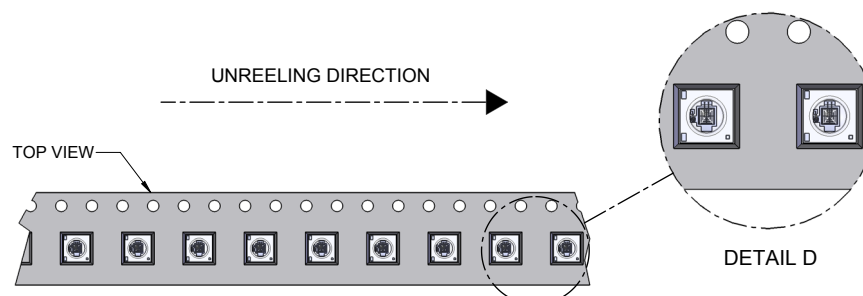
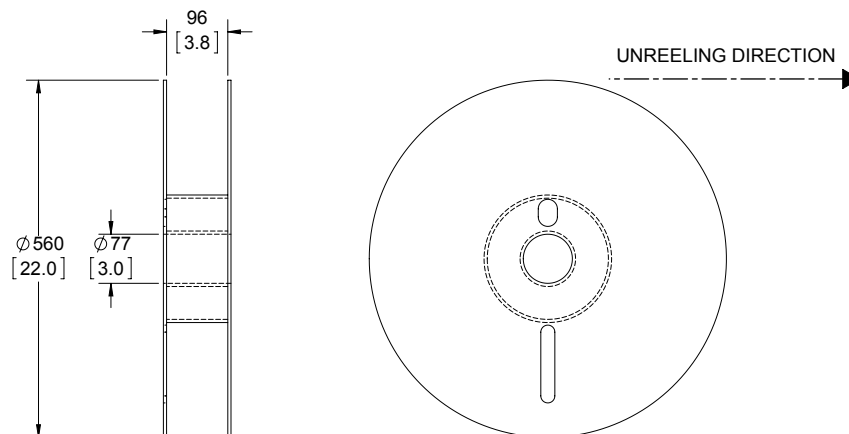


Tape and Reel - B90H Package

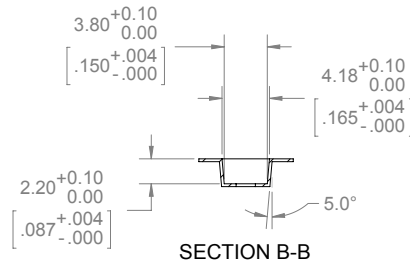
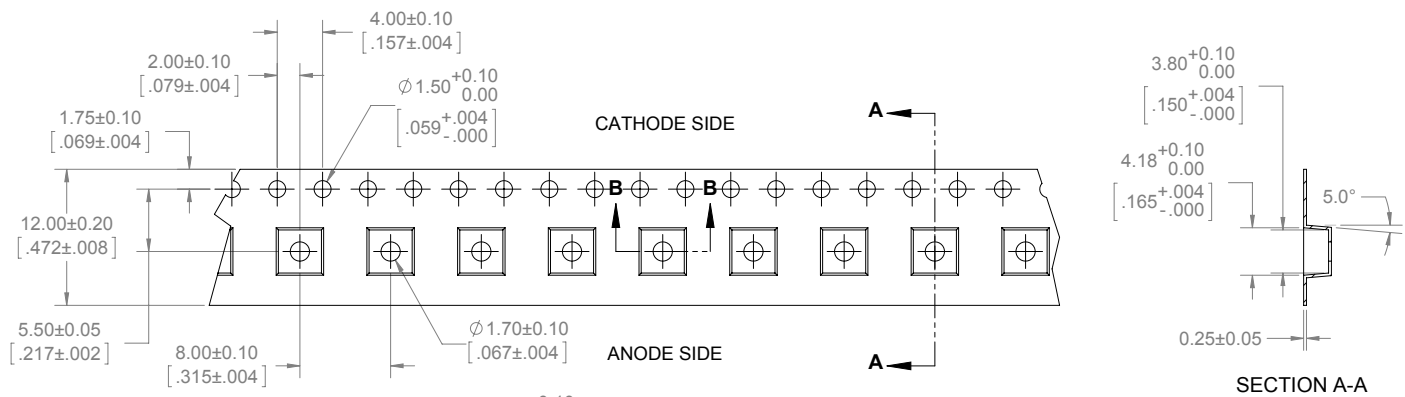


NOTES:

1. FINAL TAPE AND REEL PACKAGING MUST MEET THE REQUIREMENTS OF JEDEC-STD-033, LEVEL 2A.
2. LEAVE 304.8mm [12.00 in] OF TAPE EMPTY FOR LEAD IN (38 EMPTY POCKETS).
3. LEAVE 457.2mm [18.00 in] OF TAPE FOR TRAILER (57 EMPTY POCKETS).
4. MUST COMPLY TO EIA-481-C-2003

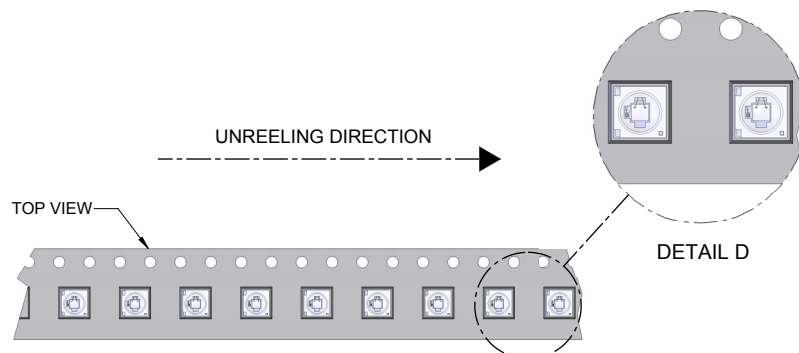
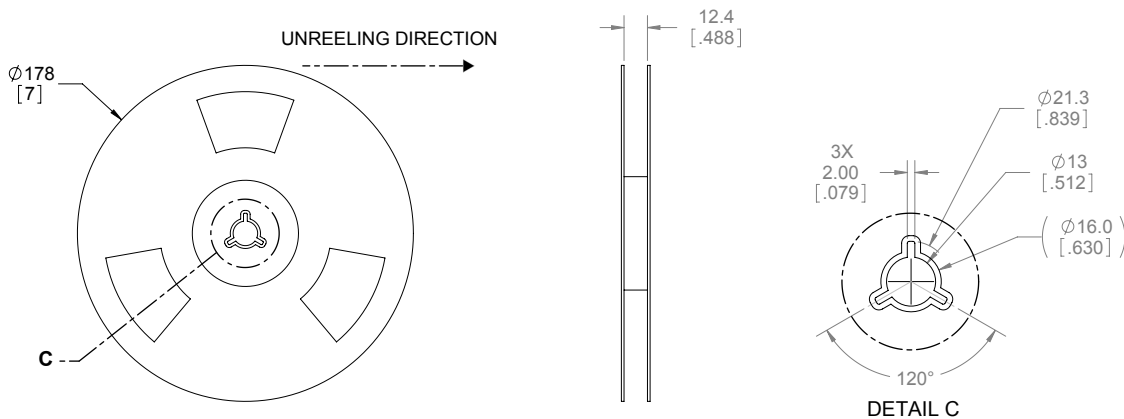


Tape and Reel - B130H Package



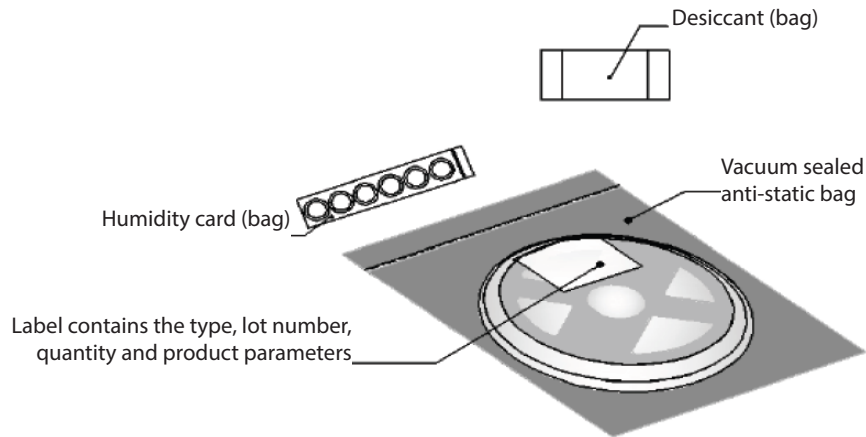
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2. LEAVE 304.8mm [12.00 in] OF TAPE EMPTY FOR LEAD IN (38 EMPTY POCKETS).
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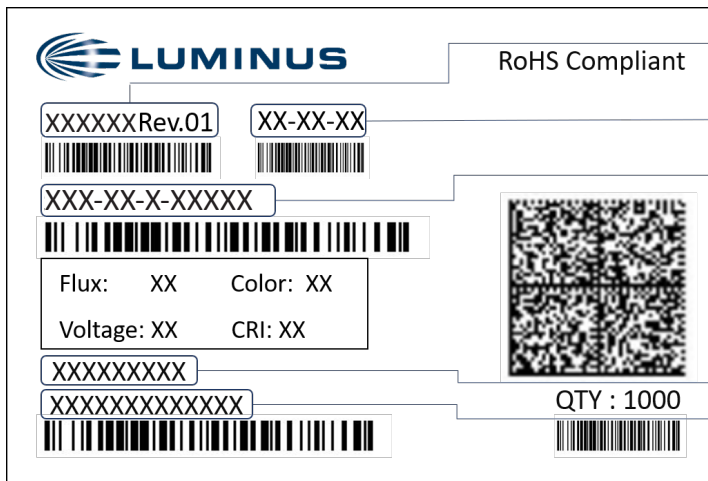


Packaging Information

Packaging Reel - 500 parts per reel for B90H Packages - 1,000 parts per reel for B130H Package



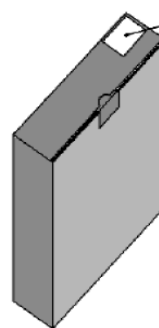
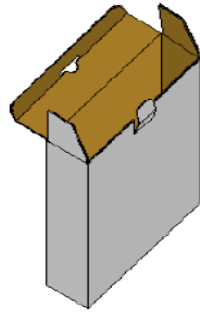
Label on Reel



Label Information	
CPN	Luminus ordering part number
MPN	For Luminus internal use
QTY	Quantity of parts per reel
Flux	Single flux bin code (see <i>Flux Bins</i> table on page 2)
Color	Single Dominant Wavelength bin code (see <i>Dominant Wavelength Bins</i> table on page 2)
Voltage	N/A
CRI	N/A
Lot ID & Reel ID	For Luminus internal use

Packaging Boxes

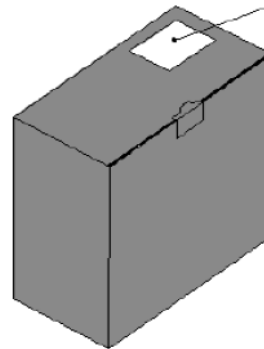
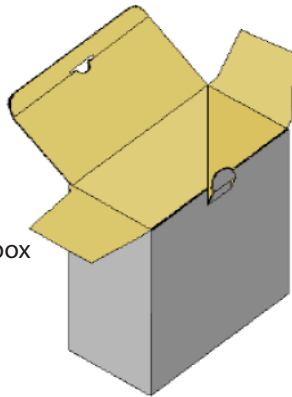
Box Size 1 - 5 reels per box
Size: 22.5 x 24.5 x 6.5 cm



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

*Capacity 5 reels per box

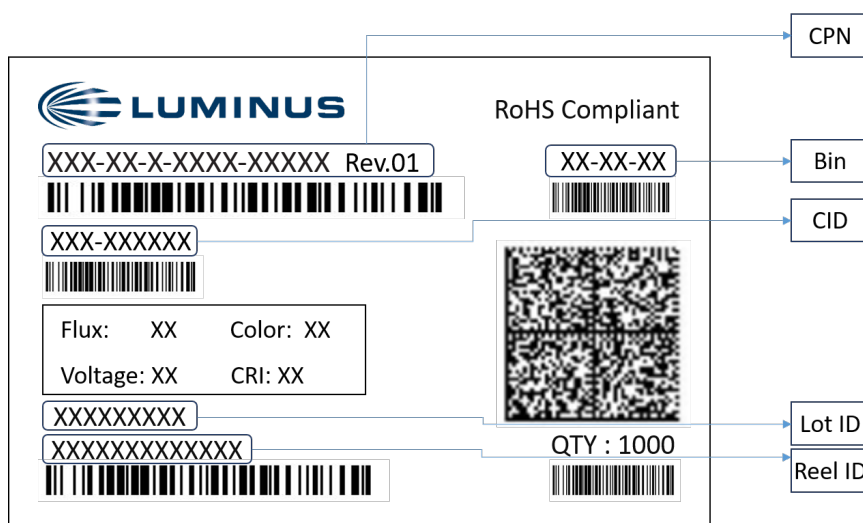
Box Size 2 - 10 reels per box
Size: 22.5 x 24.5 x 13 cm



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

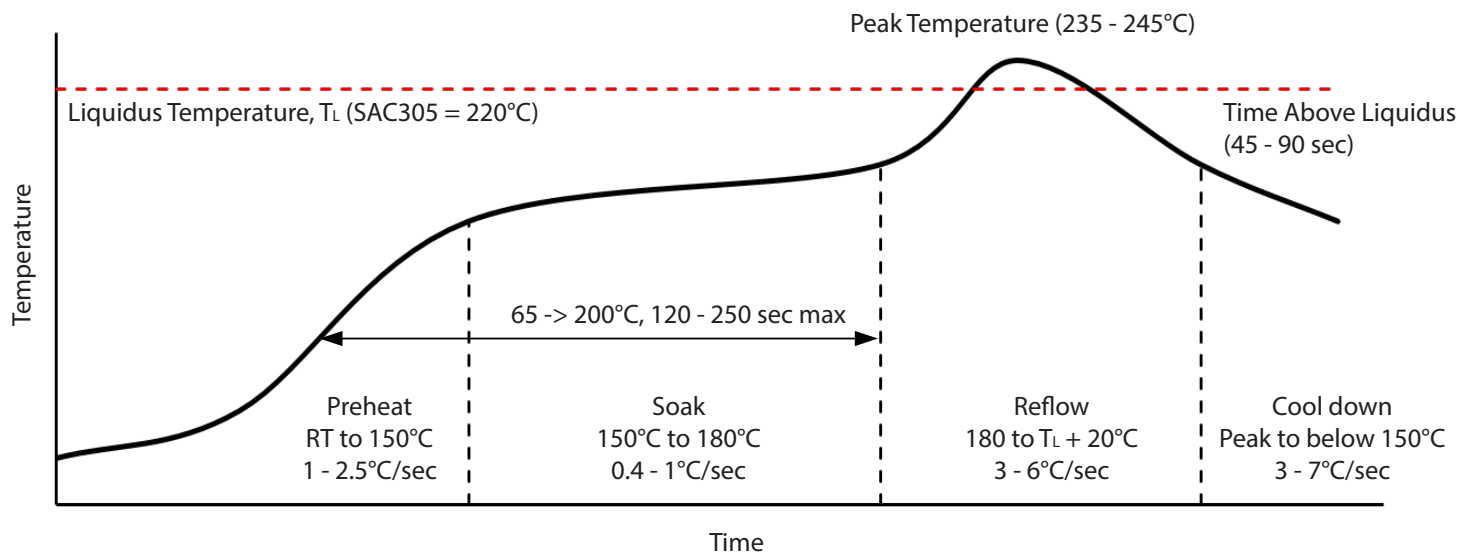
Shipping Label on Packaging Box

Multiple labels are attached to the box (one label per reel inside the box)



Label Information	
CPN	Luminus ordering part number
CID	Customer ID
QTY	Quantity of parts per reel
Flux	Single flux bin code (see <i>Flux Bins</i> table on page 2)
Voltage	N/A
Color	Single Dominant Wavelength bin code (see <i>Dominant Wavelength Bins</i> table on page 2)
CRI	N/A
Lot ID & Reel ID	For Luminus internal use

Soldering Profile



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

Notes

- 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.

Precautions for Use

Storage:

1. Before opening the package

Unopened LEDs bags should be kept at a temperature between 15°C & 40°C and should be used within a year.

2. After opening the package

Opened LED moisture proof packages should be stored between 30 and 60% RH. The LEDs should be soldered within 168 hours (7 days) after opening the package.

If unused LEDs remain on a reel, they should be stored in re-sealable moisture proof packages with new absorbent material (silica gel) and new moisture indicator cards, or better, in a dry box. If the moisture card indicates, or the first article run of the LEDs popcorns, an oven baking treatment should be performed using the following conditions: 60°C for 20 hours.

The LED electrodes and lead frames may incorporate a silver-plated copper alloy. These can be identified by a silver appearance (compared to a gold appearance). This silver surface may be affected by environmental contaminants, particularly sulfur containing compounds, during storage, and at the point of use. Please avoid conditions which may cause the LEDs to become corroded or discolored. Corrosion or discoloration can reduce solderability and/or affect optical characteristics.

Avoid rapid temperature transitions, especially in high humidity environments where condensation can occur.

Static Electricity:

These products are 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

Corrosion Resistance:

Corrosion Test: Class 3B - Test condition: 40°C / 90% RH / 15ppm H₂S / 14 days (stricter than IEC60068 2-43)

Revision History

Rev	Date	Description of Change
01	05/19/2021	Initial Release
02	11/17/2023	Add Flux bins, update Drawings and Soldering profile