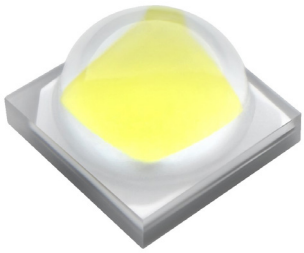
SST-20F-W-AH

The F-Line High Power White LEDs



Features

- The flip chip in an optimized ceramic package has a typical light output of 700 lm @ 1.5 A, 85 °C (6500K).
- Excellent cost per lumen performance.
- Luminous Efficacy: Up to 185 lm/W @700 mA, 85℃ (6500K)
- Maximum Drive Current: 2.5 A
- Color Temperature: 5000K - 6500K
- Color Rendering Index: 70
- Low thermal resistance: 2.0°C/W
- Standard ANSI-compatible central 4 chromaticity bins.
- Electrically isolated thermal path.
- 8 kV HBM ESD rating per ANSI/ESDA/JEDEC JS-001.

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Applications

- Flood Lights
- Work Lights
- Portable Lights
- Outdoor and Roadway Lighting
- Indoor and Linear Lighting
- Stadium Lights

Ordering Information

Ordering Part Numbers[1]

CRI	CCT	Luminous Flux		Chromaticity Bin Kit[3]	Ordering Part Number
		Minimum Flux Bin[1]	Minimum Flux[2]		
Min. 70	5000K	D6	340	502	SST-20F-WE50-AH-D6502
	5700K	D6	340	572	SST-20F-WE57-AH-D6572
Typ. 70 Min. 65	5000K	D6	340	502	SST-20F-WS50-AH-D6502
	5700K	D6	340	572	SST-20F-WS57-AH-D6572
	6500K	D6	340	652	SST-20F-WS65-AH-D6652

Part Number Nomenclature

SST **20F** **W<xyy>** **AH** **<ffccc>**

Product Family	Chip Area	Color	Package Configuration	Bin Kit
S: Surface Mount **S**: Dome Lensed **T**: Single Emitter	**20**: 2.0 mm^2 **F**: F-Line, Flip Chip	**W**: White <**x**> CRI Category Code **S**: CRI>65 **E**: CRI>70 <**yy**> Color Temperature **50**: 5000K **65**: 6500K	**AH**: Package Code	<**ff**> Minimum Flux Bin, see 'Luminus Flux Binning' table for details <**ccc**> Chromaticity Bin Kit, see 'Chromaticity Bin Kit Codes' table for 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 'Luminous Flux Binning' table for details of all flux bins.
2. Product test condition: I_f=700 mA, T_j=85°C.
3. Shipments always adhere to the color bins specified in each Chromaticity Bin Kit. See 'Chromaticity Bin Kit Codes' table for the color bins included in each Bin Kit.

Binning Structure

Luminous Flux Binning[1,2]

Flux Bin Code	Binning @ 700 mA			Correlated Minimum Flux (lm) @ T_j=85°C[2]			
	T_j= 85°C[1]		T_j= 25°C				
	Minimum Flux (lm)	Maximum Flux (lm)	Minimum Flux (lm)	350 mA	1000 mA	1500 mA	2500mA
D6	340	355	378	184	462	649	966
D7	355	375	394	192	483	678	1008
D8	375	395	417	203	510	716	1065
D9	395	415	439	213	537	754	1122

Forward Voltage Binning[3]

Voltage Bin Code[3]	Binning @ 700 mA, T_j= 85°C	
	Minimum Voltage (V)	Maximum Voltage (V)
VH	2.5	2.7
VJ	2.7	2.9
VK	2.9	3.1
VL	3.1	3.3

Note:

1. LEDs are measured at 25°C ambient temperature with 700 mA 20 ms single pulse. The measured values are correlated to values at 85°C junction temperature (T_j). Luminus maintains a ±7% tolerance on flux measurement.
2. Flux values at other junction temperature (T_j) and/or forward current conditions are calculated and for reference only.
3. Individual voltage bins are not orderable. Luminus maintains a ±0.1V tolerance on forward voltage measurement.

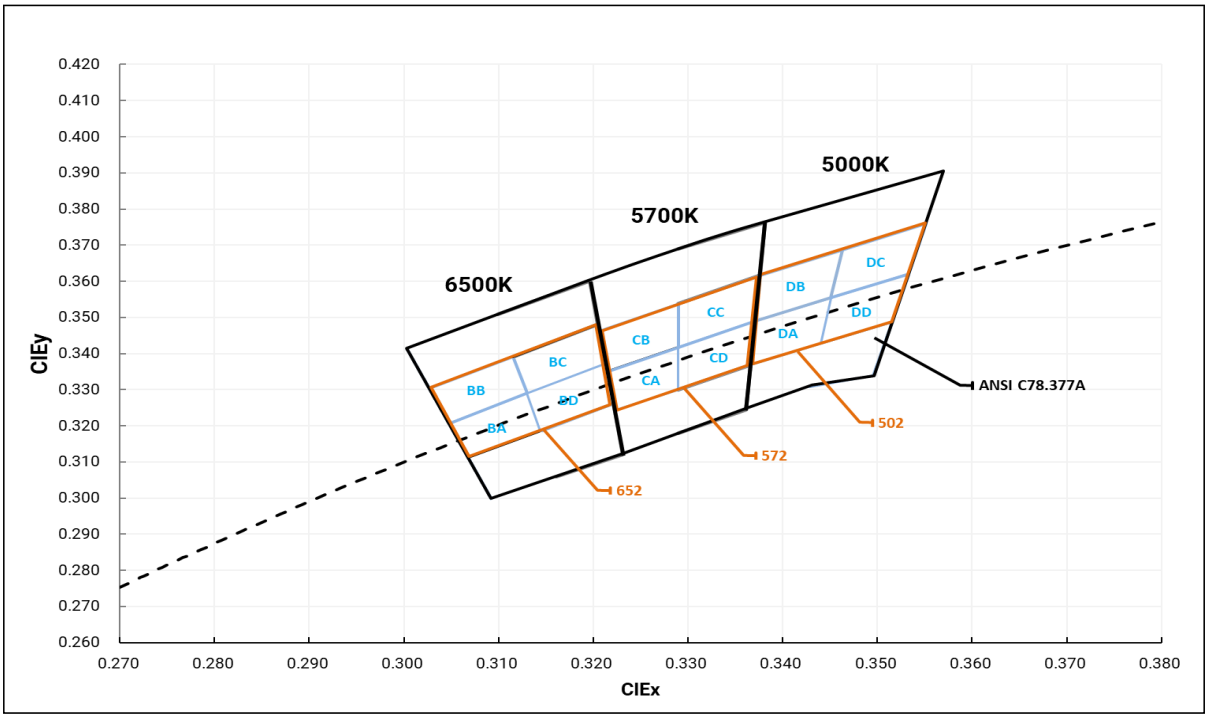
Binning Structure

Chromaticity Binning Coordinates

CCT	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy
5000K	DA	0.3371	0.3490	DB	0.3376	0.3616	DC	0.3463	0.3687	DD	0.3451	0.3554
		0.3451	0.3554		0.3463	0.3687		0.3551	0.3760		0.3533	0.3620
		0.3440	0.3427		0.3451	0.3554		0.3533	0.3620		0.3515	0.3487
		0.3366	0.3369		0.3371	0.3490		0.3451	0.3554		0.3440	0.3427
5700K	CA	0.3215	0.3350	CB	0.3207	0.3462	CC	0.3290	0.3538	CD	0.3290	0.3417
		0.3290	0.3417		0.3290	0.3538		0.3376	0.3616		0.3371	0.3490
		0.3290	0.3300		0.3290	0.3417		0.3371	0.3490		0.3366	0.3369
		0.3222	0.3243		0.3215	0.3350		0.3290	0.3417		0.3290	0.3300
6500K	BA	0.3048	0.3207	BB	0.3028	0.3304	BC	0.3115	0.3391	BD	0.3130	0.3290
		0.3130	0.3290		0.3115	0.3391		0.3205	0.3481		0.3213	0.3373
		0.3144	0.3186		0.3130	0.3290		0.3213	0.3373		0.3221	0.3261
		0.3068	0.3113		0.3048	0.3207		0.3130	0.3290		0.3144	0.3186

Binning Structure

Chromaticity Binning Diagram[1,2]



Chromaticity Bin Kit Codes

CCT	Bin Kit	Chromaticity Bins
5000K	502	DA, DB, DC, DD
5700K	572	CA, CB, CC, CD
6500K	652	BA, BB, BC, BD

Note:

1. LED chromaticity is measured and binned at 25°C ambient temperature with 700 mA 20 ms single pulse.

2. Luminus maintains a tolerance of ±0.005 on Chromaticity (CIEx, CIEy) measurement.

Absolute Maximum Ratings

		Symbol	Values	Unit
DC Forward Current	Minimum	$I_{f\,min}$	0.2	A
	Maximum	$I_{f\,max}$	2.5	
Surge Current (t<10 ms, Duty Cycle < 10%)		$I_{s\,max}$	4	A
Reverse Voltage (I_r= 10 mA)		V_r	5	V
Power Dissipation		P_D	10	W
Junction Temperature		T_j	150	°C
Operating Temperature Range		T_{opr}	-40 to 105	°C
Storage Temperature Range		T_{stg}	-40 to 105	°C
ESD withstand Voltage HBM Per ANSI/ESDA/JEDEC JS-001		V_{HBM}	8	kV
ESD withstand Voltage CDM Per ANSI/ESDA/JEDEC JS-002		V_{CDM}	1	kV

Characteristics

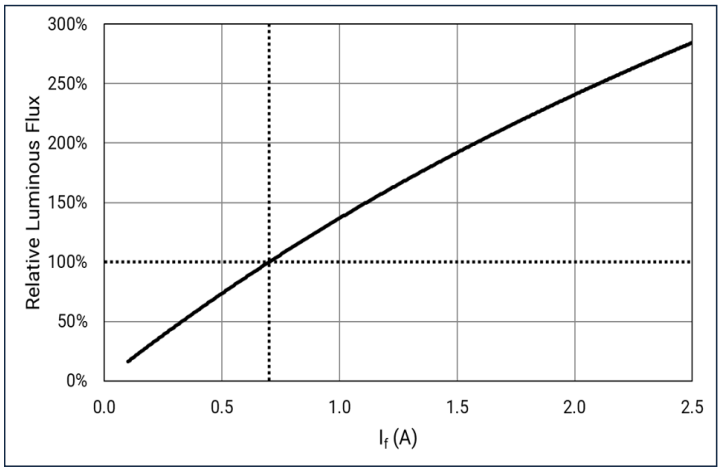
Parameter		Symbol	Value		Unit
			WS	WE	
Color Rendering Index[1] (T_j=85°C)	Minimum	CRI	65	70	
Viewing Angle (FWHM)		$2\theta_{1/2}$	120		°
Forward Voltage (I_f =700 mA, T_j = 85°C)	Minimum	$V_{f\,min}$	2.6		V
	Typical	$V_{f\,typ}$	2.8		
	Maximum	$V_{f\,max}$	3.1		
Temperature Coefficient of Voltage		∂_{Vf}/∂_T	-1.4		mV/°C
Thermal Resistance (Electrical) Junction/Solder Point		$R_{thjs\text{-}EL}$	2.0		°C/W

Note:

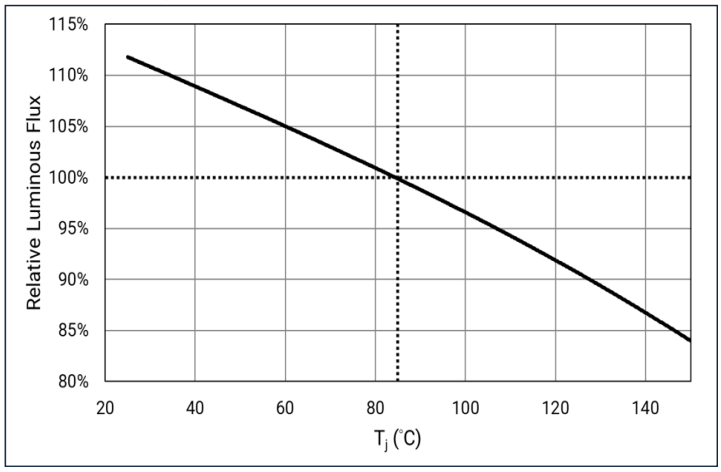
1. Luminus maintains a tolerance of ±2 on Color Rendering Index (CRI) measurement.

Relative Luminous Flux

Forward Current: $\varphi_v/\varphi_v(0.7\ A)$, $T_j = 85°C$

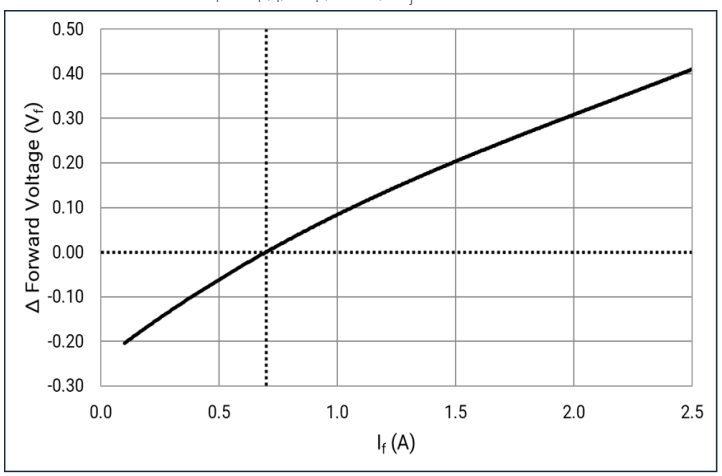


Temperature (T_j): $\varphi_v/\varphi_v(85°C)$, $I_f = 0.7\ A$

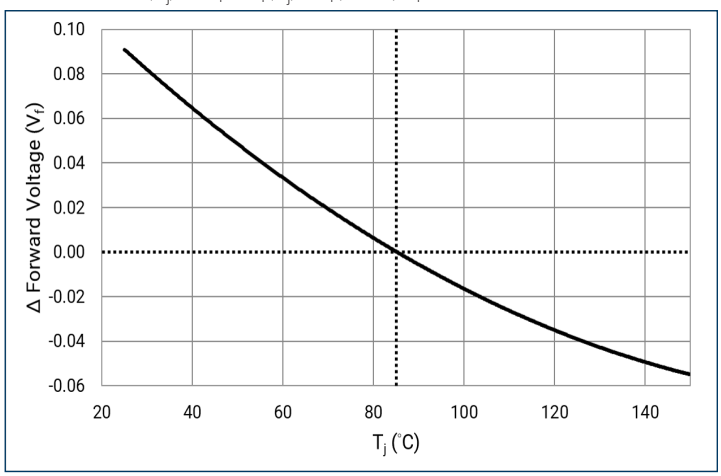


Forward Voltage

Forward Current: $\Delta V_f = V_f(I_f) - V_f(0.7\ A)$, $T_j = 85°C$

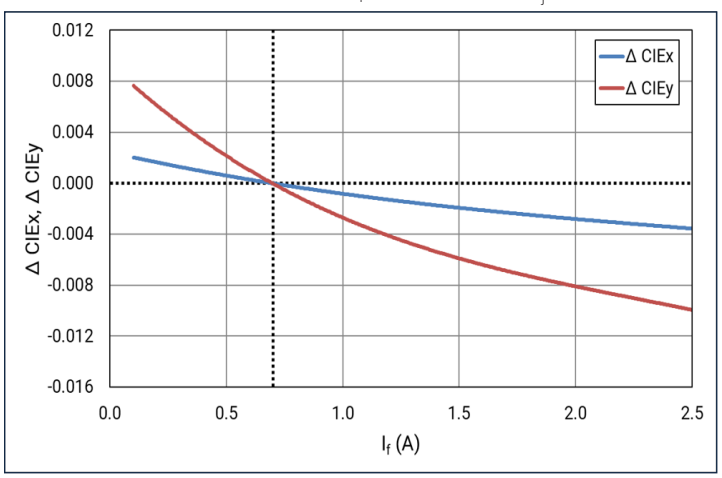


Temperature (T_j): $\Delta V_f = V_f(T_j) - V_f(85°C)$, $I_f = 0.7\ A$

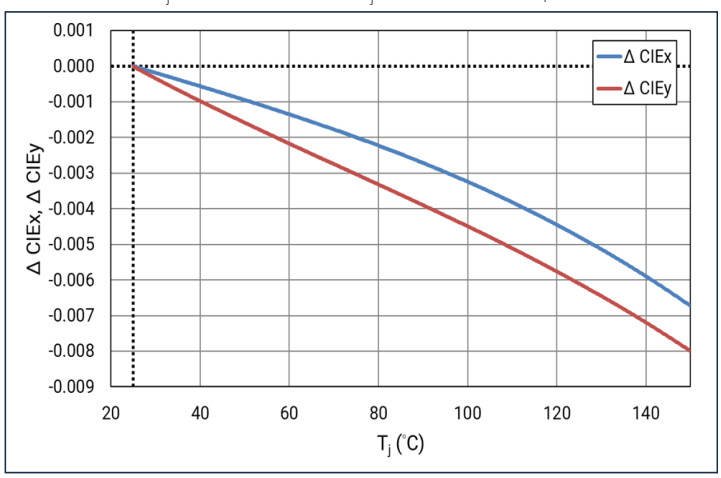


Relative Chromaticity

Forward Current: $\Delta CIEx,y = CIEx,y(I_f) - CIEx,y(0.7\ A)$, $T_j = 85°C$

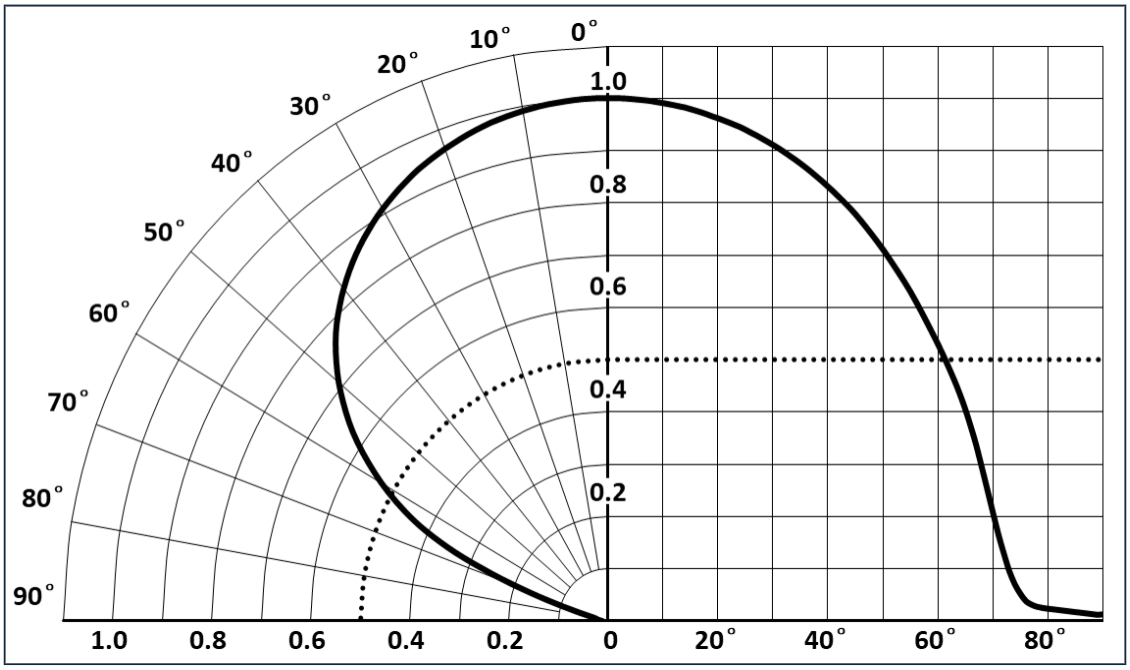


Temperature (T_j): $\Delta CIEx,y = CIEx,y(T_j) - CIEx,y(25°C)$, $I_f = 0.7\ A$



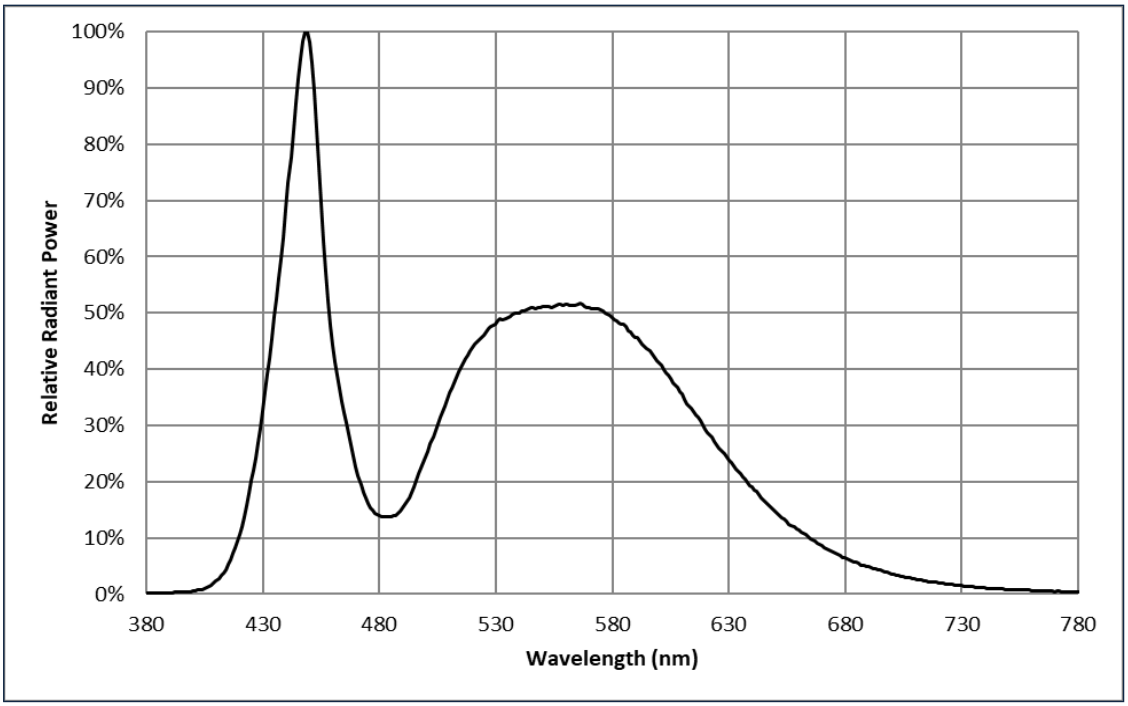
Angular Distribution

I_f = 0.7 A; T_j = 25°C

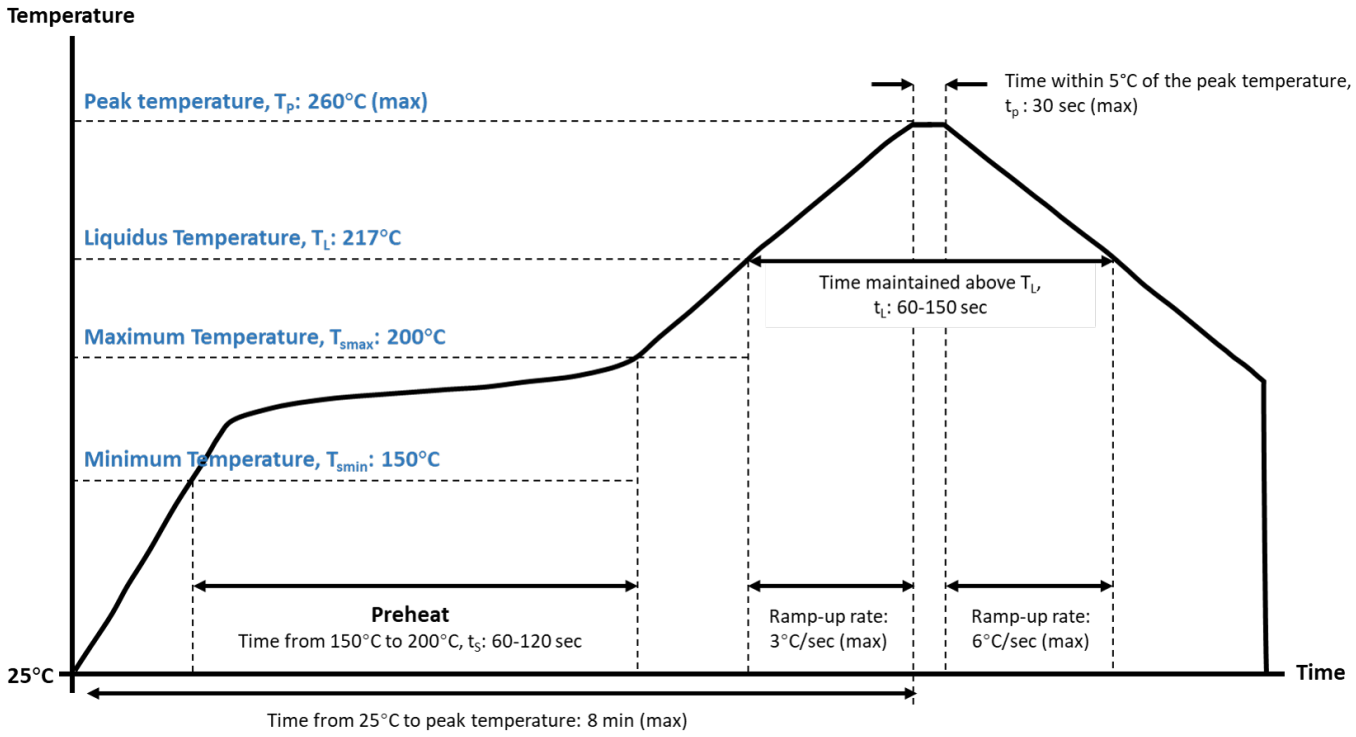


Relative Spectral Power Distribution

I_f = 0.7 A; T_j = 25°C



Soldering Profile



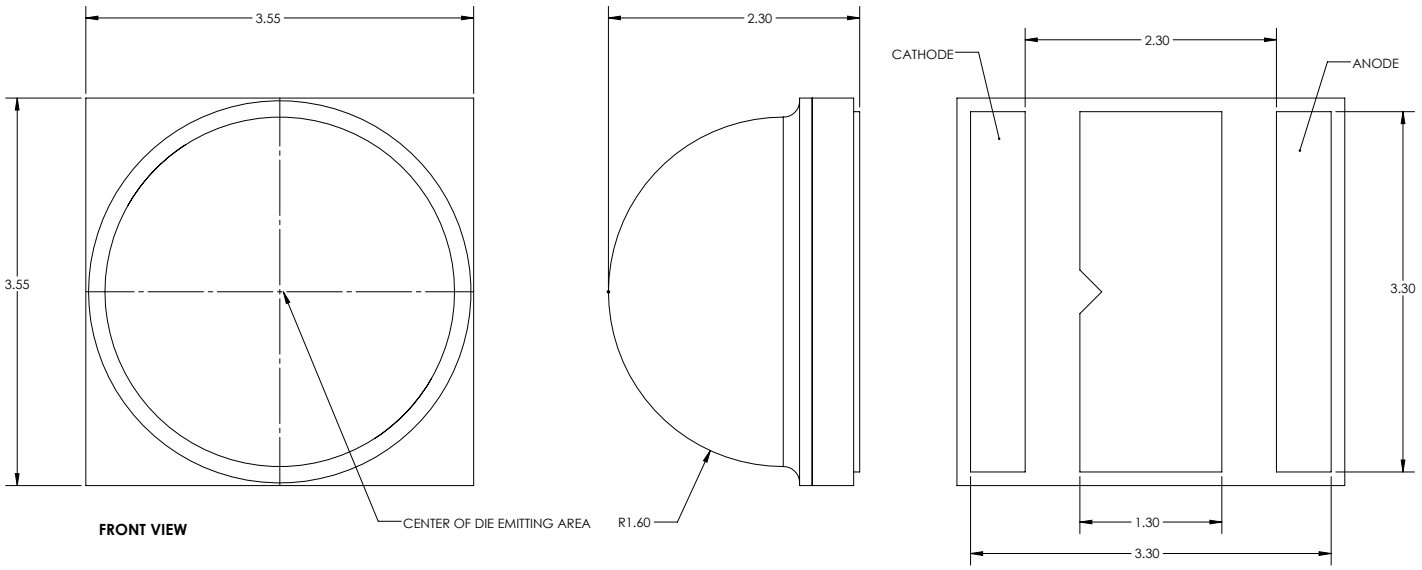
SMT Rework Guideline	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

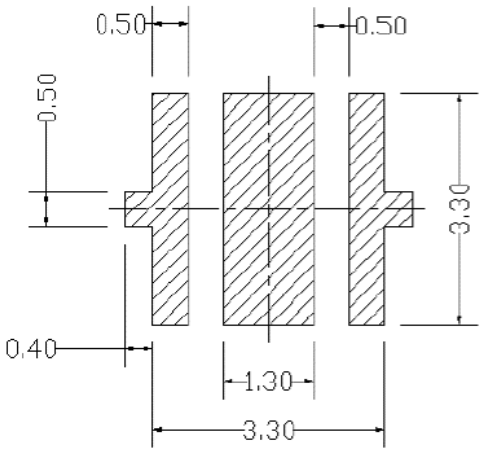
Note:

1. Product complies to Moisture Sensitivity Level 3 (MSL 3).
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.
3. During the pick and place process, axial forces on the dome (or window) should not exceed 0.5 Newtons (N).
4. Use of a multi-zone IR reflow oven with a nitrogen blanket is recommended.
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.
6. Luminus recommends to use the solder paste data sheet information as a starting point in time-temperature process development.
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:

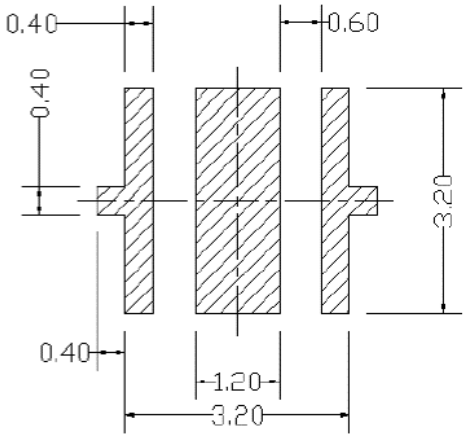
   https://luminusdevices.zendesk.com/hc/en-us/articles/360060306692-How-do-I-Reflow-Solder-Luminus-SMD-Components-
8. For any technical questions about soldering process, please contact Luminus at techsupport@luminus.com.

Mechanical Dimensions





Recommended PCB Solder Pad

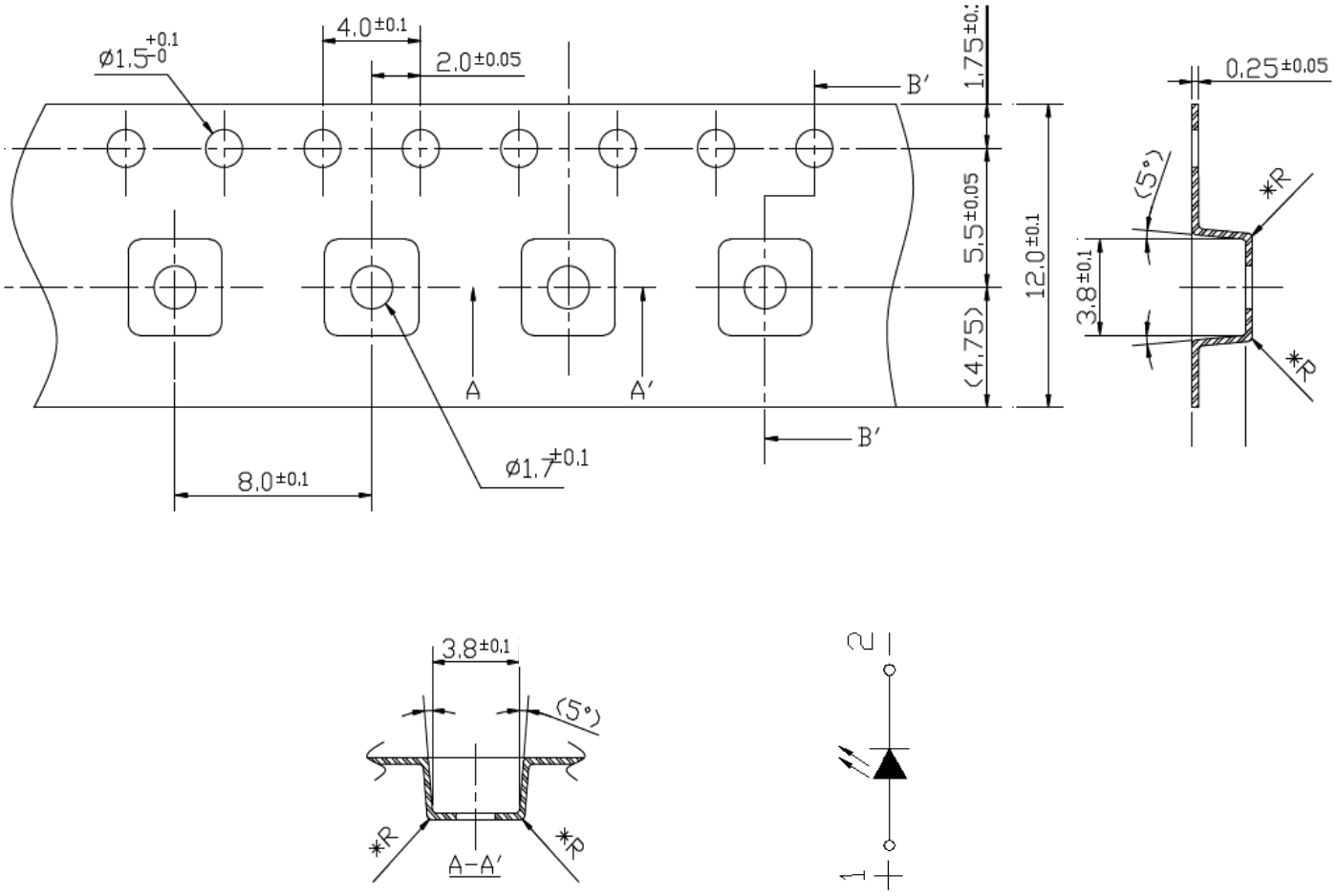


Recommended Stencil Pattern

Note:

1. All dimensions are in millimeter ± 0.1 mm.

Tape and Reel Outline

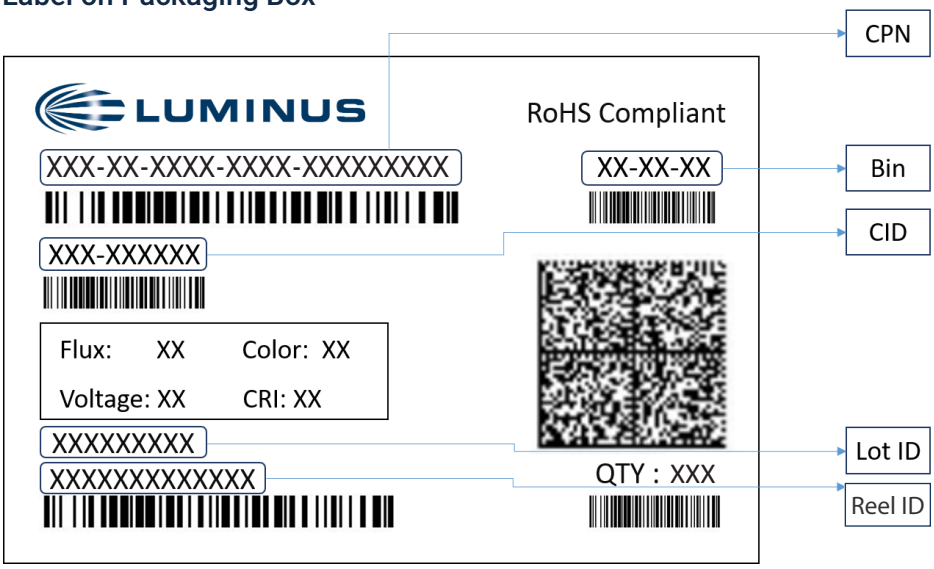


Note:

1. Each reel contains 900 units.
2. Luminus maintains a cumulative tolerance of ±0.25mm for every 10 pitches.
3. All dimensions are in millimeter.

Shipping Label

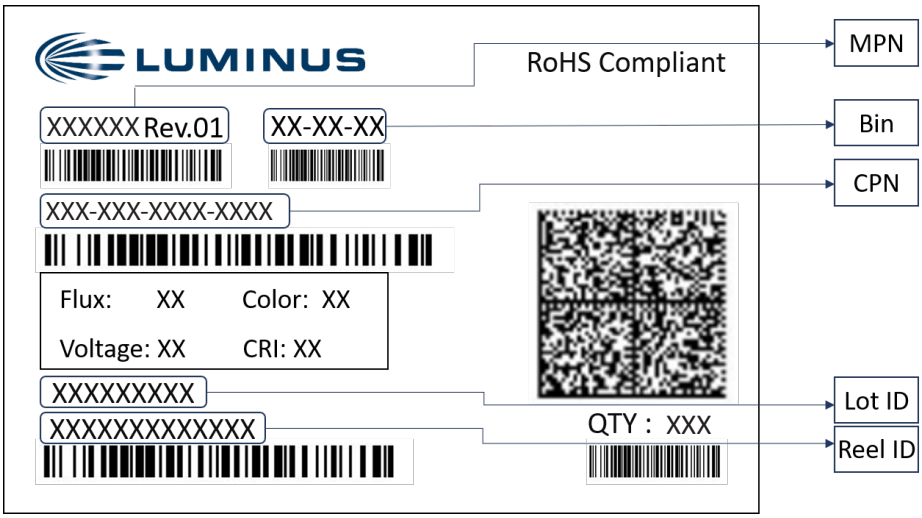
Label on Packaging Box



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: Bin as defined on page 4 & 5
CRI: NA
Lot ID & Reel ID: For Luminus internal use

Label on Reel

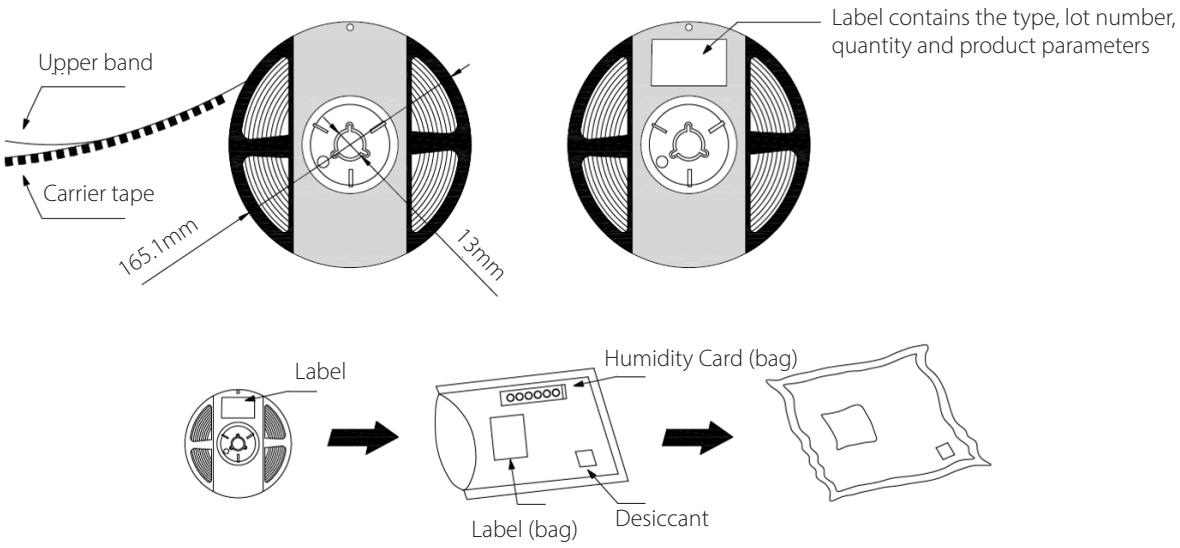


Label Fields:

CPN: Luminus ordering part number
MPN: For Luminus internal use
QTY: Quantity of parts per reel
Flux: Bin as defined on page 3
Voltage: Bin as defined on page 3
Color: Bin as defined on page 4 & 5
CRI: NA
Lot ID & Reel ID: For Luminus internal use

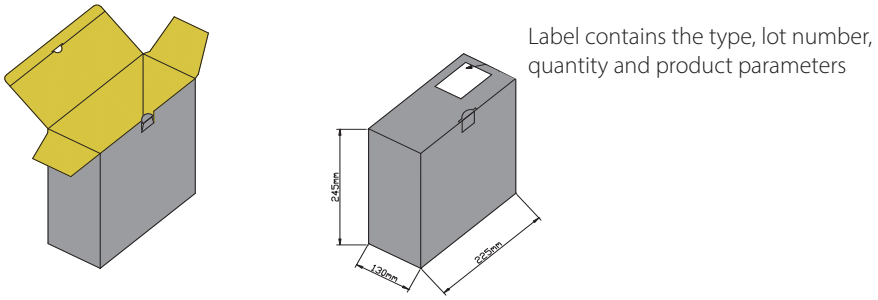
Packaging

Packaged Reel

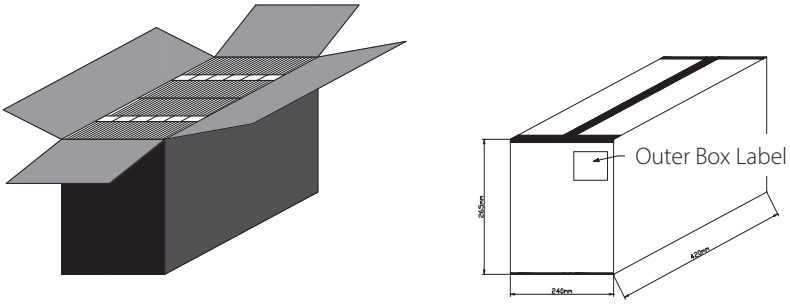


Packaging boxes

Box Size 1 - 4 or 8 reels per box



Box Size 2 - 48 or 64 reels per box



Packing Configuration:

- 900 units per reel
- Each reel is enclosed in anti-static bag
- Shipping label is placed on top of each reel
- Multiple labels are attached to the box (one label per reel inside the box)

Notes

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

1. Before opening the package

   The LEDs should be kept at a temperature lower than 40°C and relative humidity lower than 90%. The LEDs should be used within a year. When storing the LEDs, moisture proof package with absorbent material (silica gel) is recommended.

2. After opening the package

   The LEDs should be kept at a temperature lower than 30°C and relative humidity lower than 60%. The LEDs should be soldered within 168 hours (7 days) after opening the moisture proof package.

   If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with moisture absorbent material (silica gel). It is also recommended to return the unused LEDs to the original moisture proof package and to seal it again.

   If the moisture absorbent material (silica gel) vaporizes or passes the expiration date, baking treatment should be performed by using the following conditions : 60±5°C for 24 hours.

   The LED's electrode and lead frame comprise a silver plated copper alloy. The silver surface may be affected by environments. Please avoid conditions which may cause the LEDs to corrode or discolor. The corrosion or discoloration might lower solderability or affect optical characteristics.

   Please avoid rapid transition in ambient temperature, especially in high humidity environments where condensation can occur.