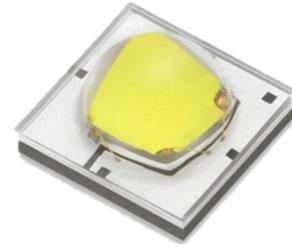


SST-20-WE (CRI>70)

High Power White LEDs



Features

- High-efficacy white LEDs for high-performance indoor and outdoor directional lighting applications.
- The vertical chip features high lumen density and small emitting angle, ideal for maximizing the light intensity and reducing the optics size in optical beam shaping.
- The phosphor-on-chip technology delivers high color uniformity over radiation angle, enabling superior light quality for beam spots.
- LM-80 10,000-hr test data available, excellent TM-21 lifetime and color stability.
- Maximum Drive Current: 3.0 A
- Color Temperature: 4000K
- Color Rendering Index: > 70
- Low thermal resistance: 1.6°C/W
- ANSI-compatible chromaticity bins
- Electrically isolated thermal path
- 8 kV HBM ESD rating per ANSI/ESDA/JEDEC JS-001



Applications

- Roadway and Street Lighting
- Sports Field Lighting
- Outdoor Area Lighting
- Landscape Lighting
- Garage and Canopy Lights
- High / Low Bay Industrial Lighting
- Automotive Auxiliary Lights
- LED Work Lights
- Portable Lights

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Ordering Information

Ordering Part Numbers¹

CRI	CCT	Luminous Flux		Chromaticity Bin Kit ³	Ordering Part Numbers
		Minimum Flux Bin ¹	Minimum Flux ²		
> 70	4000K	D5	325 lm	401	SST-20-WE40-B2-D5401
				402	SST-20-WE40-B2-D5402
		D6	340 lm	401	SST-20-WE40-B2-D6401
				402	SST-20-WE40-B2-D6402

Part Number Nomenclature

SST

20

W<xyy>

<p#>

<ffcc>

Product Family	Chip Area	Color	Package Configuration	Bin Kit
S: Surface Mount S: Dome Lensed T: Single Emitter	20: 2.0 mm ²	W: White <x> CRI Category Code E: CRI > 70 <yy> Color Temperature 40: 4000K	<p> Solder Pad Configuration B: 3535 Package, Type B Solder Pad <#> Chip Generation 2: Gen 2	<ff> Minimum Flux Bin, see 'Luminous Flux Bins' table for details <ccc> Chromaticity Bin Kit, see 'Chromaticity Bin Kit Codes' table 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 Bins' table for details of all flux bins.
2. Product test condition: $I_f = 700 \text{ mA}$, $T_j = 85^\circ\text{C}$.
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 Bins^{1,2}

Flux Bin	Binning @ 700 mA			Correlated Minimum Flux (lm) @ $T_j=85^\circ\text{C}^2$				
	$T_j=85^\circ\text{C}$		$T_j=25^\circ\text{C}$					
	Minimum Flux (lm)	Maximum Flux (lm)	Minimum Flux (lm)	350 mA	1000 mA	1500 mA	2000 mA	3000 mA
D4	310	325	341	167	422	592	744	1001
D5	325	340	358	176	442	621	780	1050
D6	340	355	374	184	462	649	816	1098
D7	355	375	391	192	483	678	852	1147
D8	375	395	413	203	510	716	900	1211

Forward Voltage Bin³

Voltage Bin ³	Binning @ 700 mA, $T_j=85^\circ\text{C}$	
	Minimum Voltage (V)	Maximum Voltage (V)
VH	2.5	2.7
VJ	2.7	2.9
VK	2.9	3.1

Notes:

- 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 $\pm 6\%$ tolerance on flux measurement.
- Flux values at other junction temperature (T_j) and/or forward current conditions are calculated and for reference only.
- Individual voltage bins are not orderable.



Binning Structure

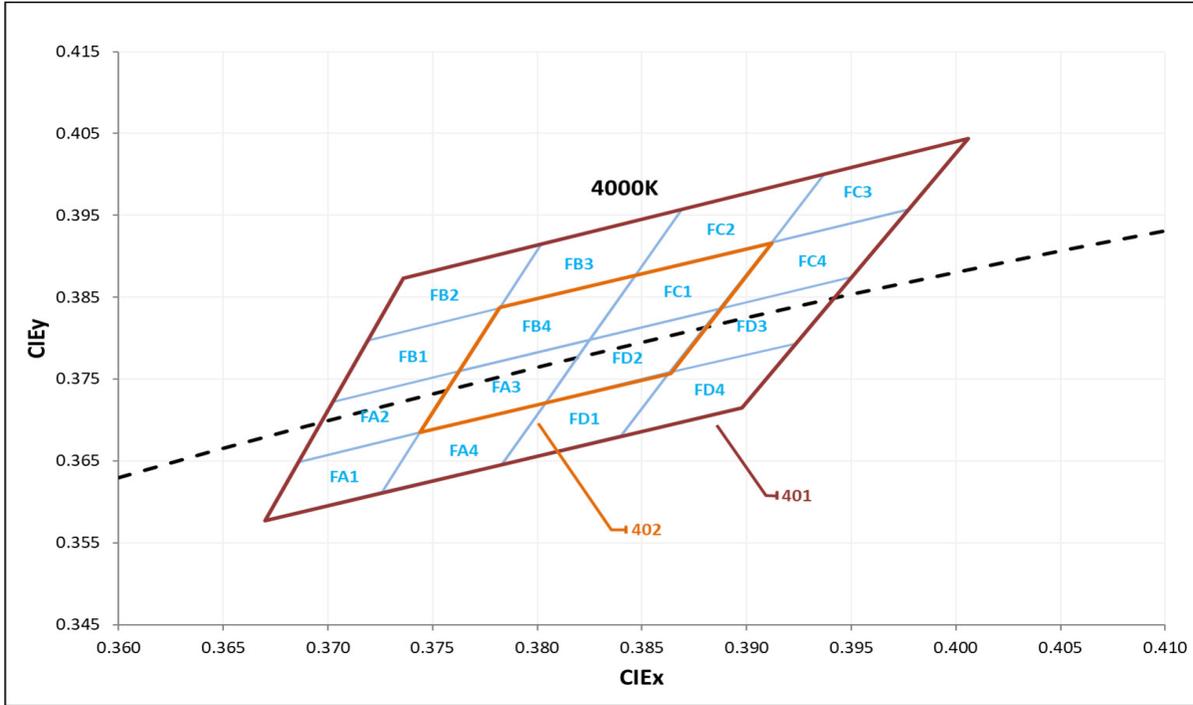
Chromaticity Binning Coordinates

CCT	Bin	CIE _x	CIE _y									
4000K	FA1	0.3670	0.3578	FA2	0.3686	0.3649	FA3	0.3744	0.3685	FA4	0.3726	0.3612
		0.3686	0.3649		0.3702	0.3722		0.3763	0.3760		0.3744	0.3685
		0.3744	0.3685		0.3763	0.3760		0.3825	0.3798		0.3804	0.3721
		0.3726	0.3612		0.3744	0.3685		0.3804	0.3721		0.3783	0.3646
	FB1	0.3702	0.3722	FB2	0.3719	0.3797	FB3	0.3782	0.3837	FB4	0.3763	0.3760
		0.3719	0.3797		0.3736	0.3874		0.3802	0.3916		0.3782	0.3837
		0.3782	0.3837		0.3802	0.3916		0.3869	0.3958		0.3847	0.3877
		0.3763	0.3760		0.3782	0.3837		0.3847	0.3877		0.3825	0.3798
	FC1	0.3825	0.3798	FC2	0.3847	0.3877	FC3	0.3912	0.3917	FC4	0.3887	0.3836
		0.3847	0.3877		0.3869	0.3958		0.3937	0.4001		0.3912	0.3917
		0.3912	0.3917		0.3937	0.4001		0.4006	0.4044		0.3978	0.3958
		0.3887	0.3836		0.3912	0.3917		0.3978	0.3958		0.3950	0.3875
	FD1	0.3783	0.3646	FD2	0.3804	0.3721	FD3	0.3863	0.3758	FD4	0.3840	0.3681
		0.3804	0.3721		0.3825	0.3798		0.3887	0.3836		0.3863	0.3758
		0.3863	0.3758		0.3887	0.3836		0.3950	0.3875		0.3924	0.3794
		0.3840	0.3681		0.3863	0.3758		0.3924	0.3794		0.3898	0.3716



Binning Structure

Chromaticity Binning Diagram¹



Chromaticity Bin Kit Codes

CCT	Bin Kit	Chromaticity Bins
4000K	401	FA1, FA2, FA3, FA4, FB1, FB2, FB3, FB4, FC1, FC2, FC3, FC4, FD1, FD2, FD3, FD4
	402	FA3, FB4, FC1, FD2

Notes:

- LED chromaticity is measured and binned at 25°C ambient temperature with 700 mA 20 ms single pulse.
- Luminus maintains a tolerance of ± 0.005 on Chromaticity (CIE_x, CIE_y) measurement.



Absolute Maximum Ratings

Parameter		Symbol	Values	Unit
DC Forward Current	Minimum	$I_{f\ min}$	0.10	A
	Maximum	$I_{f\ max}$	3.0	
Surge Current ($t < 10\ ms$, Duty Cycle $< 10\%$)		I_s	4.0	
Reverse Voltage (@ $I_f = 10\ mA$)		V_r	5	V
Power Dissipation		P_D	11	W
Junction Temperature		T_j	150	°C
Operating Temperature Range		T_{opr}	-40 to 100	
Storage Temperature Range		T_{stg}	-40 to 100	
ESD withstand Voltage ANSI/ESDA/JEDEC JS-001 (HBM)		V_{HBM}	8	kV
ESD withstand Voltage ANSI/ESDA/JEDEC JS-002 (CDM)		V_{CDM}	1	

Characteristics

Parameter ($I_f = 700\ mA$, $T_j = 85^\circ C$)		Symbol	Value	Unit
Color Rendering Index ¹		CRI	> 70	
Viewing Angle		$2\theta_{1/2}$	120	°
Forward Voltage	Minimum	$V_{f\ min}$	2.5	V
	Typical	$V_{f\ typ}$	2.8	
	Maximum	$V_{f\ max}$	3.1	
Temperature Coefficient of Voltage		$\Delta V_f / \Delta T$	-1.13	mV/°C
Electrical Thermal Resistance (Junction to Solder Point) ²		$R_{th\ JS\ elec}$	1.6	°C/W

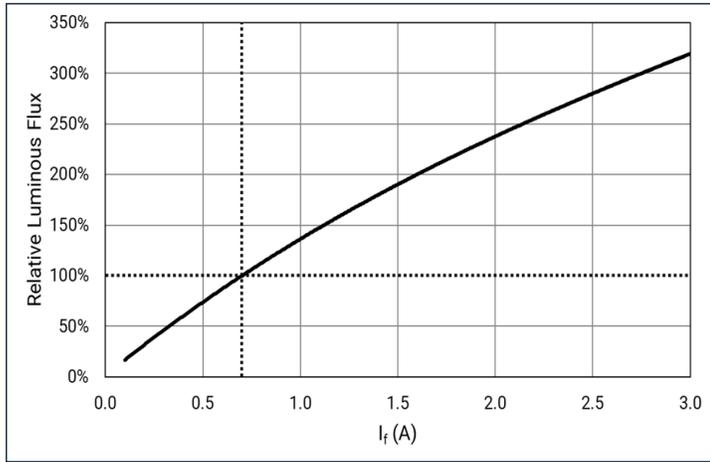
Notes:

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



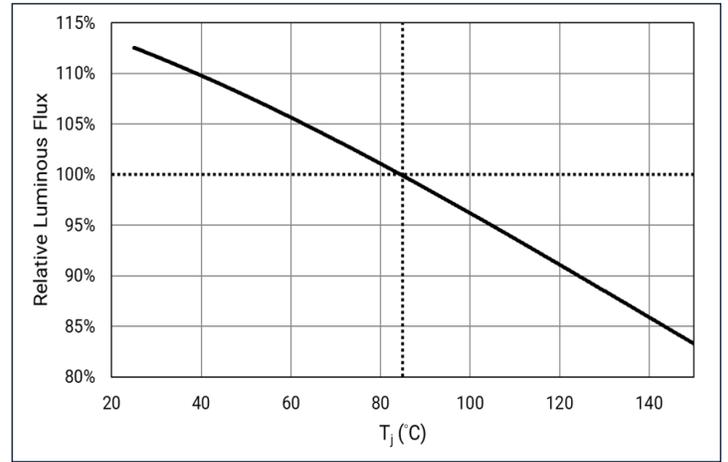
Relative Luminous Flux vs Forward Current

$T_j = 85^\circ\text{C}$



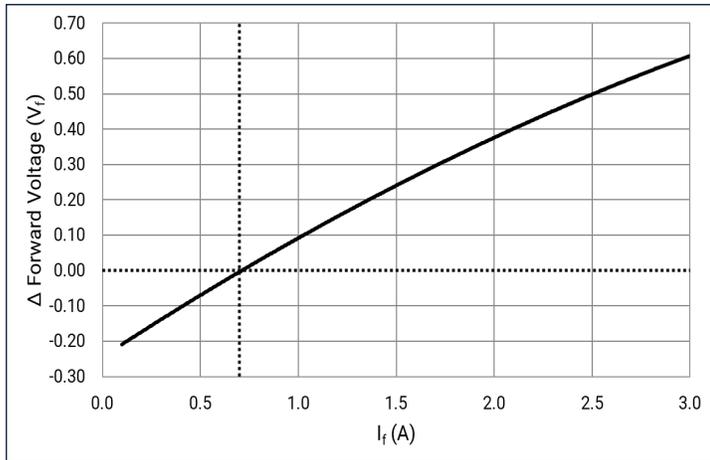
Relative Luminous Flux vs Temperature

$I_f = 0.7\text{ A}$



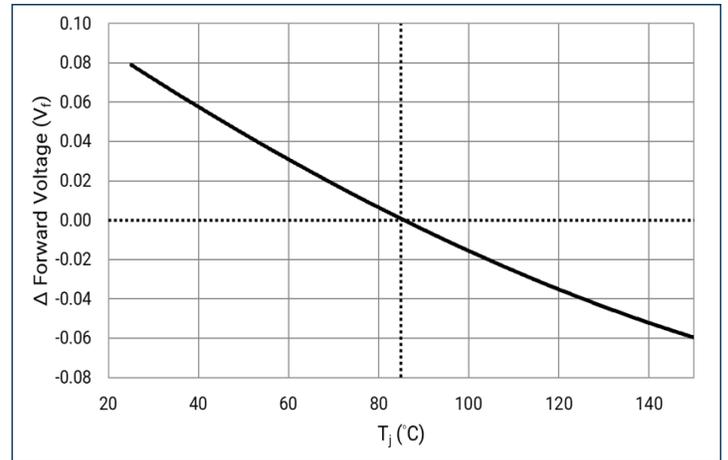
Forward Voltage vs Forward Current

$T_j = 85^\circ\text{C}$



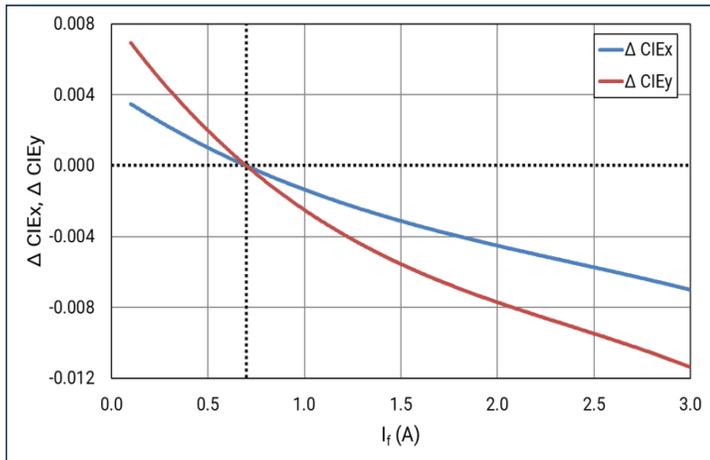
Forward Voltage vs Temperature

$I_f = 0.7\text{ A}$



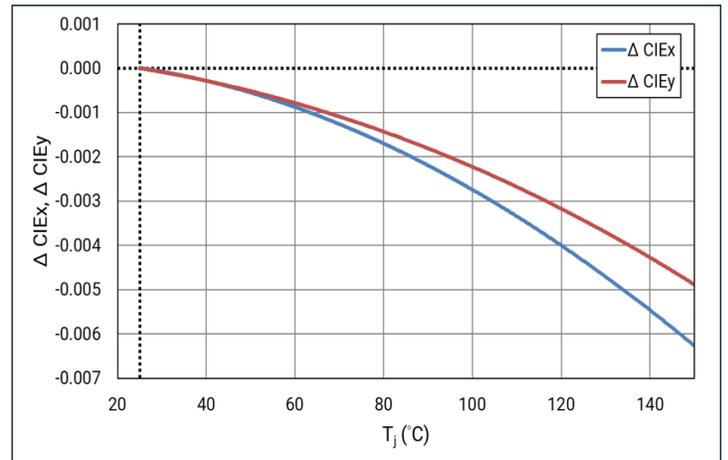
Relative Chromaticity vs Forward Current

$T_j = 85^\circ\text{C}$



Relative Chromaticity vs Temperature

$I_f = 0.7\text{ A}$

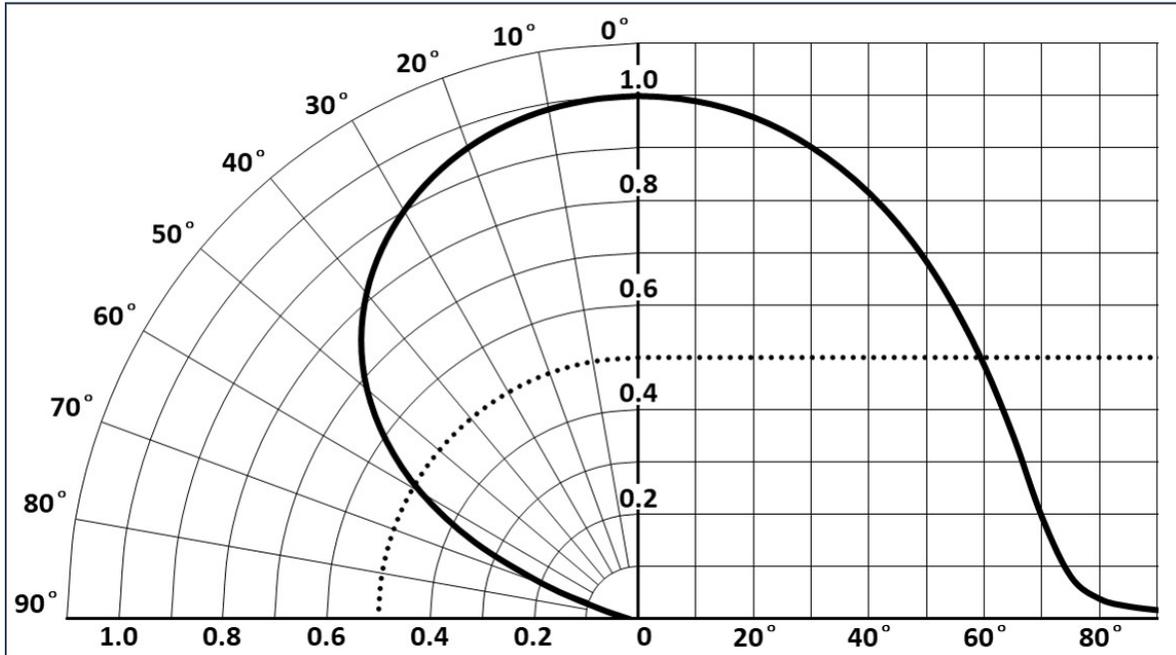




Angular Distribution and Typical Spectrum

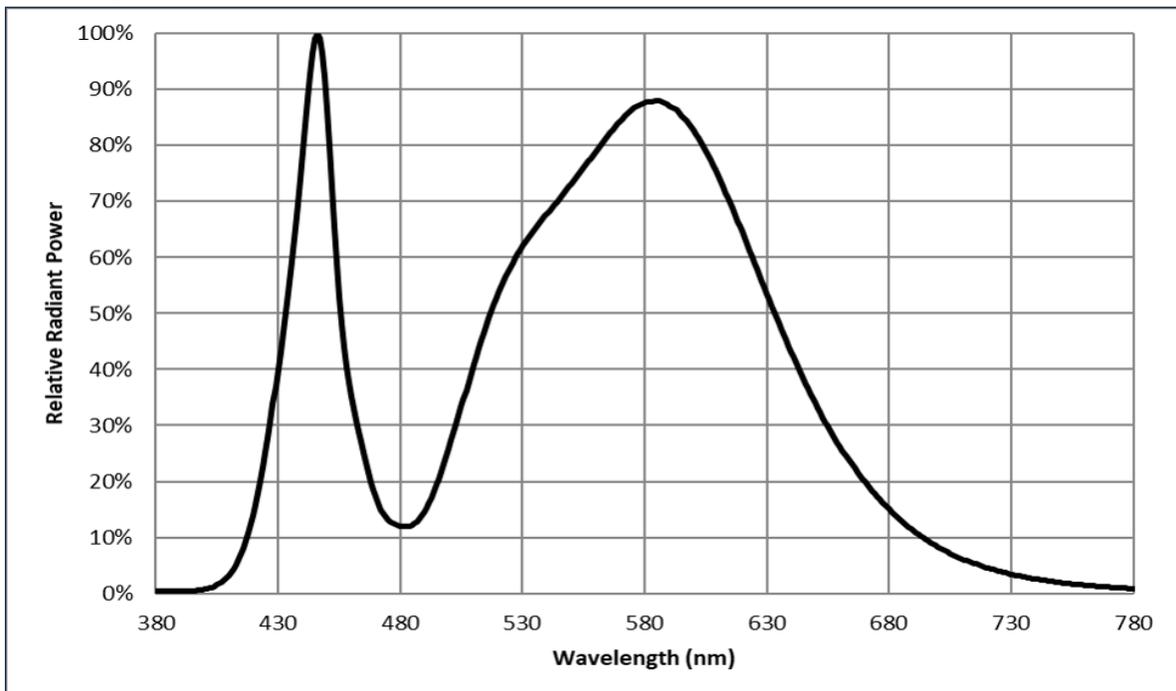
Angular Distribution

$I_f = 0.7 \text{ A}; T_j = 25^\circ\text{C}$



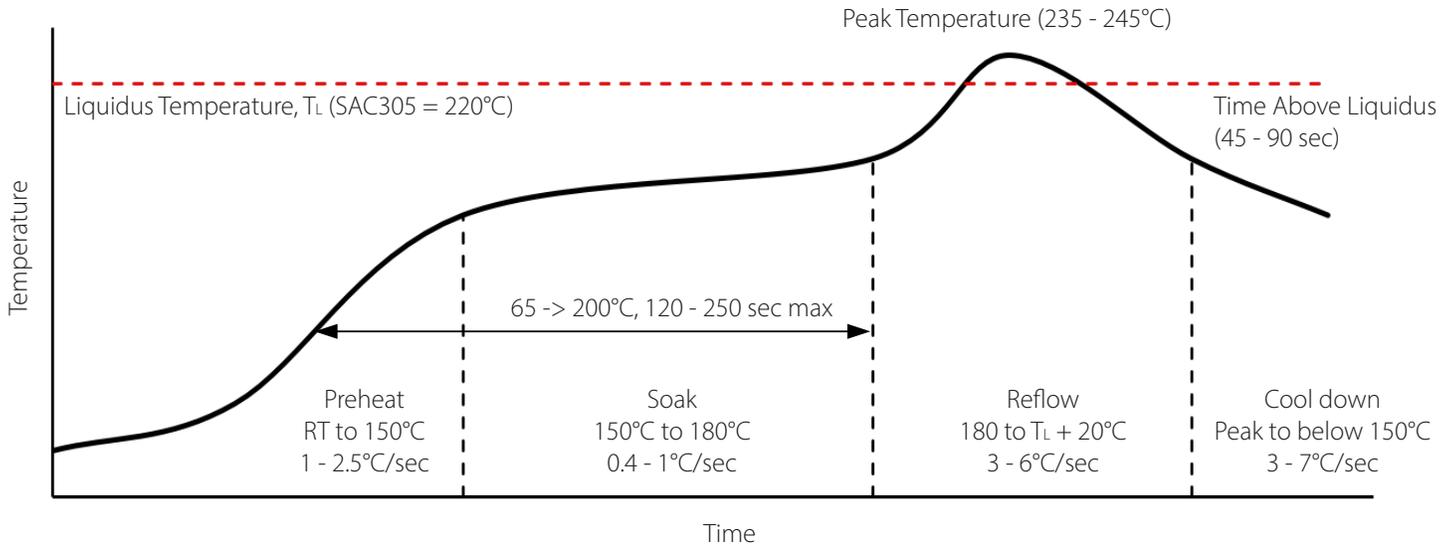
Relative Spectral Power Distribution

$I_f = 0.7 \text{ A}; T_j = 85^\circ\text{C}$





Soldering Profile



SMT Solder Rework Temperature Guidelines

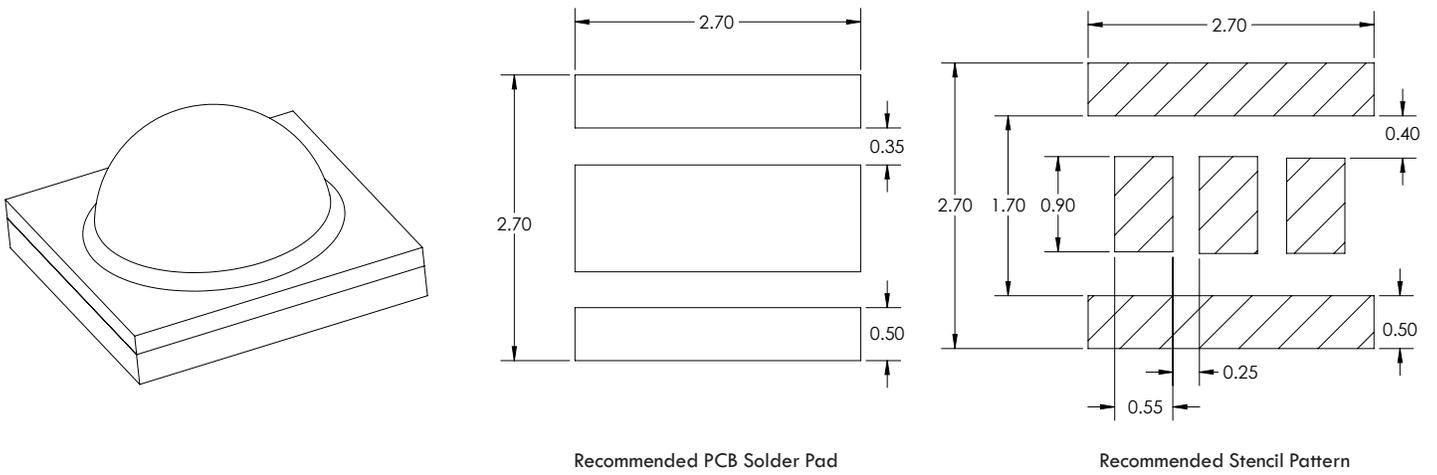
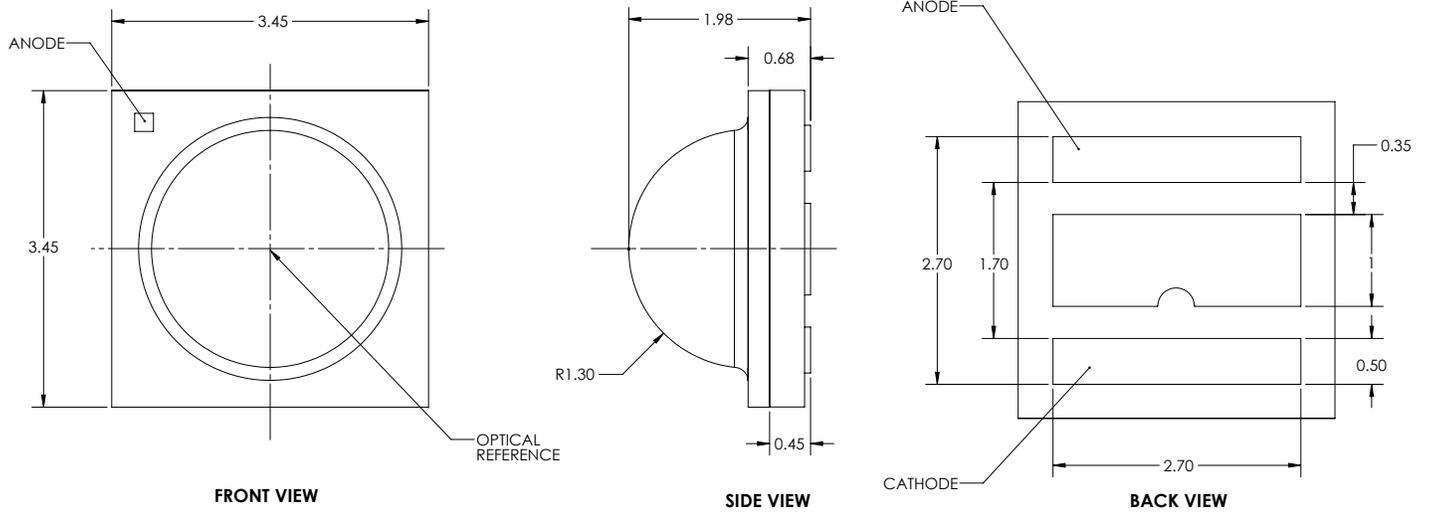
Parameter	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

Notes:

- Product complies to Moisture Sensitivity Level 3 (MSL 3).
- 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 Dimensions¹

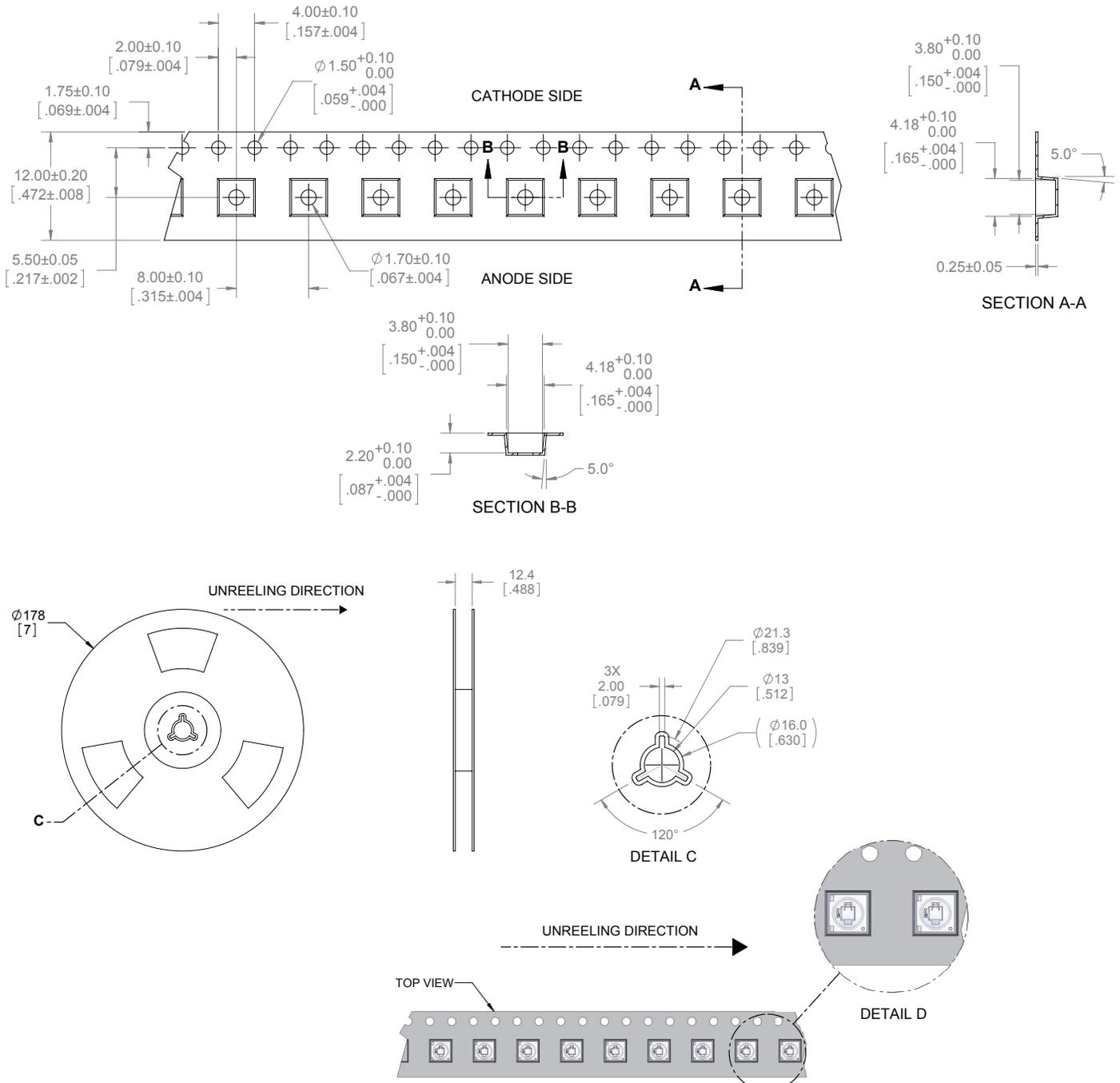


Notes:

1. All dimensions are in millimeter ± 0.13 mm.



Tape and Reel Outline



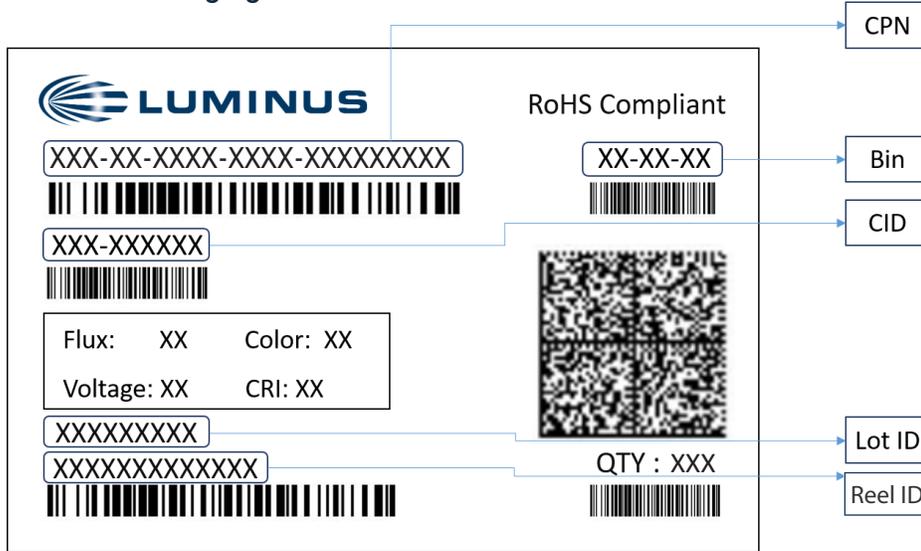
Notes:

1. Each reel contains 1,000 units.
2. Leave 160 mm of type empty for lead in (20 empty pockets).
3. Leave 480 mm of type empty for trailer (60 empty pockets).
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

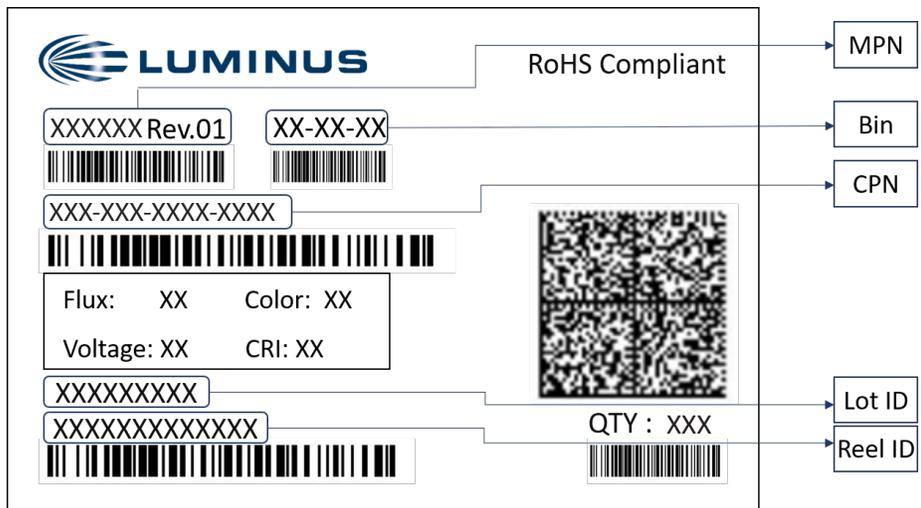
Label on Packaging Box



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
- CRI: NA
- Lot ID & Reel ID: For Luminus internal use

Label on Reel



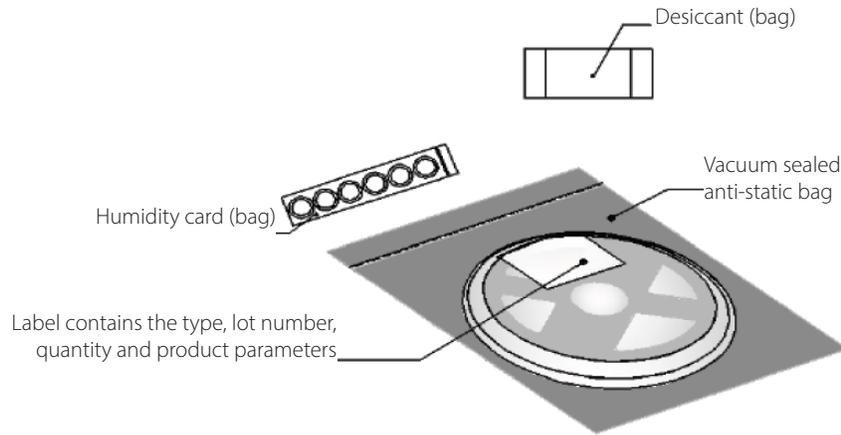
Label Fields:

- 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
- CRI: NA
- Lot ID & Reel ID: For Luminus internal use



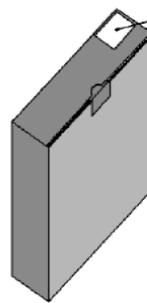
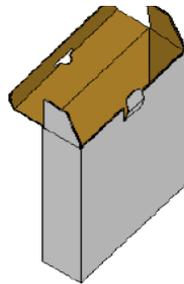
Packaging

Packaged Reel



Packaging boxes

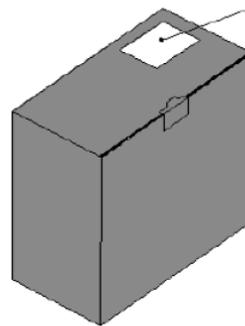
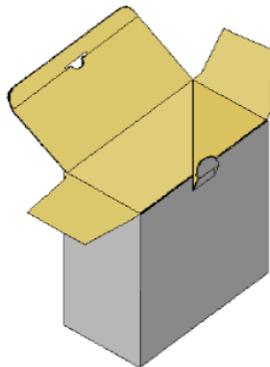
Box Size 1 - 5 reels per box
Size: 22.5 x 24.5 x 6.5 cm



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

*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

*Capacity 10 reels per box

Packing Configuration:

- 1,000 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

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.

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°C for 20 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.