

SFT-42R-WES

High Power White LEDs

Features

SFT white series is a powerful light source for beam pattern critical lighting applications. With Luminus' advanced chip and packaging technologies, SFT-42R-WES maximizes the Candela/Lumen K-Factor for high optical performance in directional lighting:

- A patented round emitter, in comparison with a square emitter, enables better uniformity and higher intensity in beam spots.
- The vertical chip with high lumen density enables high intensity, long beam distance and narrow beam angles.
- A flat window, in comparison with a domed cover, allows the optics to be closer to the emitter to achieve higher intensity and high precision in beam patterns.

In addition, Luminus phosphor-on-chip technology's high uniformity of color over radiation angle enables superior beam spot light quality.

- Package Size: 5050
- Maximum Drive Current: 11 A
- Color Temperature: 5000K, 5700K, 6500K
- Color Rendering Index: Typ. 73 (5000K, 5700K), Typ.70 (6500K)
- Low thermal resistance: 0.7 °C/W
- ANSI-compatible chromaticity bins
- Electrically isolated thermal path
- 8 kV HBM ESD rating per ANSI/ESDA/JEDEC JS-001

Applications

- Portable Lights
- LED Work Lights
- Entertainment Lighting
- Bicycle Lights
- Outdoor and Roadway Lighting
- Directional Light Fixtures
- Automotive Auxiliary Lights
- High Bay Industrial Lighting

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Ordering Information

Ordering Part Numbers¹

CRI	CCT	Luminous Flux		Chromaticity Bin Kit ³	Ordering Part Number
		Minimum Flux Bin ¹	Minimum Flux ²		
Min. 70	5000K	F9	640 lm	501	SFT-42R-WE50-FV2-ENG
	5700K	F9	640 lm	571	SFT-42R-WE57-FV2-ENG
Typ. 70 Min. 65	6500K	F9	640 lm	651	SFT-42R-WS65-FV2-ENG

Part Number Nomenclature

SFT	42R	W<xy>	FV2	ENG
Product Family	Chip Area	Color	Package Configuration	Bin Kit
S: Surface Mount F: Flat Window T: Single Emitter	42: 4.2 mm ² R: Round Shape	W: White <x> CRI Category Code E: CRI>70 S: CRI>65 <yy> Color Temperature 50: 5000K 65: 6500K	FV2: 5050 package code	ENG: Pre-Production Parts

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: $I_f = 1500 \text{ mA}$, $T_j = 85^\circ\text{C}$.
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 @ 1500 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)	700 mA	3000 mA	6000 mA	9000 mA	11000 mA
F8	610	640	671	305	1104	1903	2525	2898
F9	640	680	704	320	1158	1997	2650	3040
G1	680	720	748	340	1231	2122	2815	3230
G2	720	760	792	360	1303	2246	2981	3420
G3	760	815	836	380	1376	2371	3146	3610

Forward Voltage Bins³

Voltage Bin	Binning @ 1500 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 1500 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 bins are not orderable.



Binning Structure

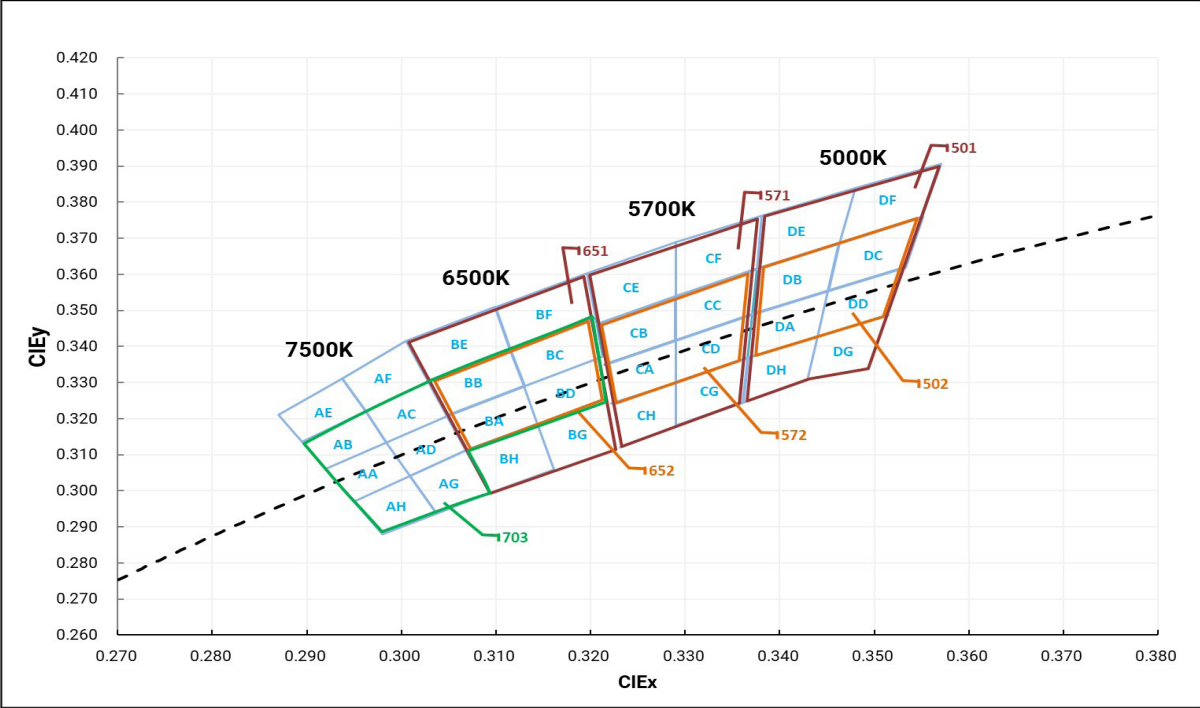
Chromaticity Binning Coordinates

CCT	Bin	CIE _x	CIE _y	Bin	CIE _x	CIE _y	Bin	CIE _x	CIE _y	Bin	CIE _x	CIE _y
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
	DH	0.3366	0.3369	DE	0.3381	0.3762	DF	0.3480	0.3840	DG	0.3440	0.3428
		0.3440	0.3428		0.3480	0.3840		0.3571	0.3907		0.3515	0.3487
		0.3429	0.3307		0.3463	0.3687		0.3551	0.3760		0.3495	0.3339
		0.3361	0.3245		0.3376	0.3616		0.3463	0.3687		0.3429	0.3307
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
	CH	0.3222	0.3243	CE	0.3196	0.3602	CF	0.3290	0.3690	CG	0.3290	0.3300
		0.3290	0.3300		0.3290	0.3690		0.3381	0.3762		0.3366	0.3369
		0.3290	0.3180		0.3290	0.3538		0.3376	0.3616		0.3361	0.3245
		0.3231	0.3120		0.3207	0.3462		0.3290	0.3538		0.3290	0.3180
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
	BH	0.3068	0.3113	BE	0.3005	0.3415	BF	0.3099	0.3509	BG	0.3144	0.3186
		0.3144	0.3186		0.3099	0.3509		0.3196	0.3602		0.3221	0.3261
		0.3161	0.3059		0.3115	0.3391		0.3205	0.3481		0.3231	0.3120
		0.3093	0.2993		0.3028	0.3304		0.3115	0.3391		0.3161	0.3059
7500K	AA	0.2950	0.297	AB	0.2920	0.3060	AC	0.2984	0.3133	AD	0.2984	0.3133
		0.2920	0.306		0.2895	0.3135		0.2962	0.3220		0.3048	0.3207
		0.2984	0.3133		0.2962	0.3220		0.3028	0.3304		0.3068	0.3113
		0.3009	0.3042		0.2984	0.3133		0.3048	0.3207		0.3009	0.3042
	AH	0.2980	0.2880	AE	0.2895	0.3135	AF	0.2962	0.3220	AG	0.3037	0.2937
		0.2950	0.2970		0.2870	0.3210		0.2937	0.3312		0.3009	0.3042
		0.3009	0.3042		0.2937	0.3312		0.3005	0.3415		0.3068	0.3113
		0.3037	0.2937		0.2962	0.3220		0.3028	0.3304		0.3093	0.2993



Binning Structure

Chromaticity Binning Diagram^{1,2}



Chromaticity Bin Kit Codes

CCT	Bin Kit	Chromaticity Bins
5000K	501	DA, DB, DC, DD, DE, DF, DG, DH
	502	DA, DB, DC, DD
5700K	571	CA, CB, CC, CD, CE, CF, CG, CH
	572	CA, CB, CC, CD
6500K	651	BA, BB, BC, BD, BE, BF, BG, BH
	652	BA, BB, BC, BD
6500K - 7500K	703	AA, AB, AC, AD, AG, AH, BA, BB, BC, BD

Notes:

- 1. LED chromaticity is measured and binned at 25°C ambient temperature with 1500 mA 20 ms single pulse.
- 2. Luminus maintains a tolerance of ±0.005 on Chromaticity (CIE_x, CIE_y) measurement.



Absolute Maximum Ratings

Parameter		Symbol	Values	Unit
Forward Current	Minimum	$I_{f\ min}$	0.1	A
	Maximum	$I_{f\ max}$	Est. 10 to 11	
Surge Current ($t < 10\ ms$, Duty Cycle $< 10\%$)		I_s	12	
Reverse Voltage (@ $I_f = 10\ mA$)		V_r	5	V
Power Dissipation		P_D	42	W
Junction Temperature		T_j	Est. 130 to 150	°C
Operating Temperature Range		T_{opr}	-40 to 100	°C
Storage Temperature Range		T_{stg}	-40 to 100	°C
ESD withstand Voltage ANSI/ESDA/JEDEC JS-001 (HBM)		V_{ESD}	8	kV
ESD withstand Voltage ANSI/ESDA/JEDEC JS-002 (CDM)		V_{CDM}	1	kV

Characteristics

Parameter (I _f =1500 mA, T _j =85°C)		Symbol	Value		Unit
			WS	WE	
Color Rendering Index ¹		CRI _{min}	65	70	
		CRI _{max}	70	-	
Forward Voltage	Minimum	V _{f min}	2.5		V
	Typical	V _{f typ}	2.8		
	Maximum	V _{f max}	3.1		
Viewing Angle		2θ _{1/2}	120		°
Temperature Coefficient of Voltage		∂ _{Vf} /∂ _T	-1.3		mV/°C
Electrical Thermal Resistance (Junction to Solder Point) ²		R _{th JS elec}	0.7		°C/W

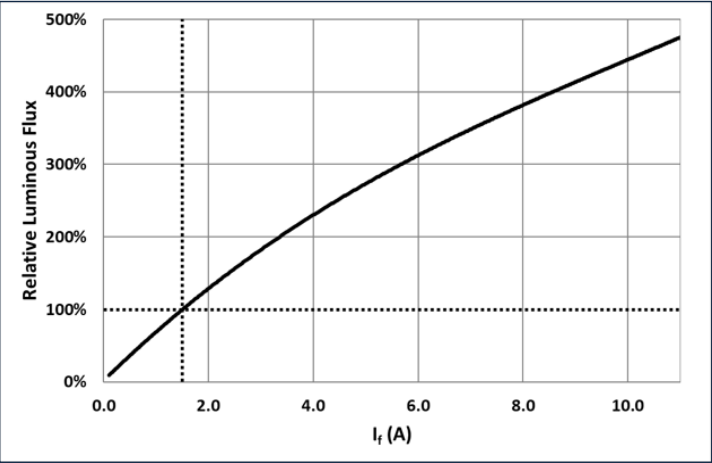
Notes:

1. Luminus maintains a tolerance of ± 2 on Color Rendering Index (CRI) measurement.
2. Thermal measurements are in accordance with JEDEC 51-14.



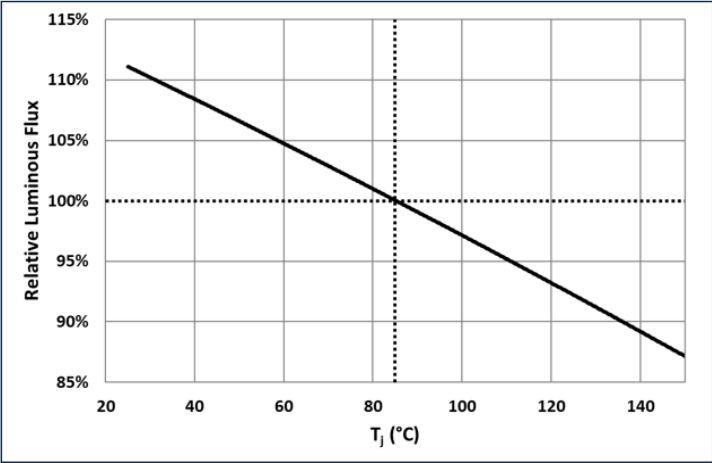
Relative Luminous Flux vs Forward Current

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



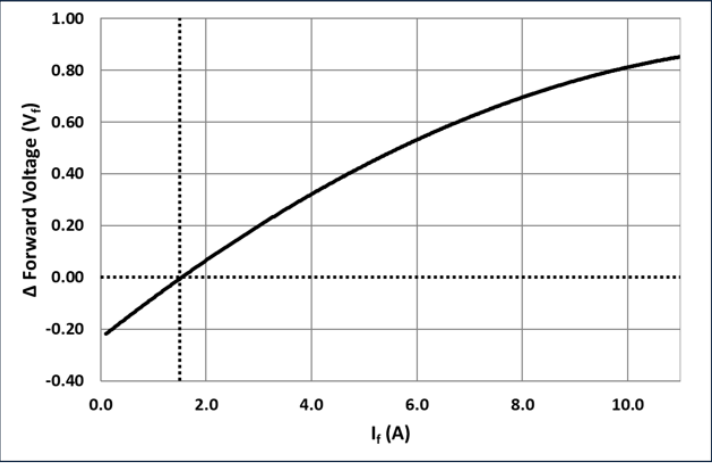
Relative Luminous Flux vs Temperature

$I_f = 1.5\text{ A}$



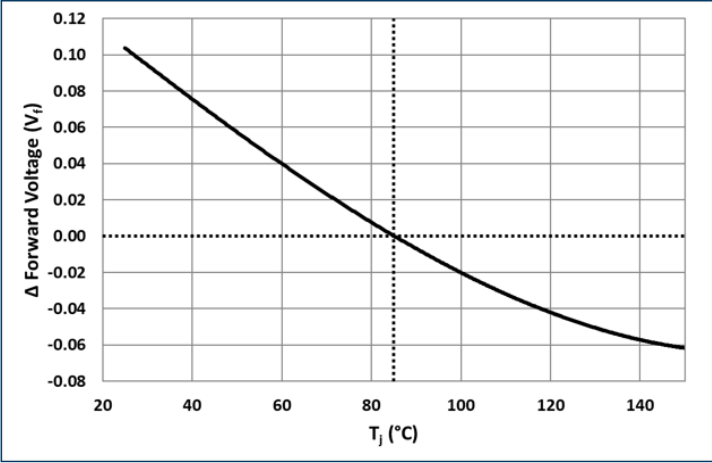
Forward Voltage vs Forward Current

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



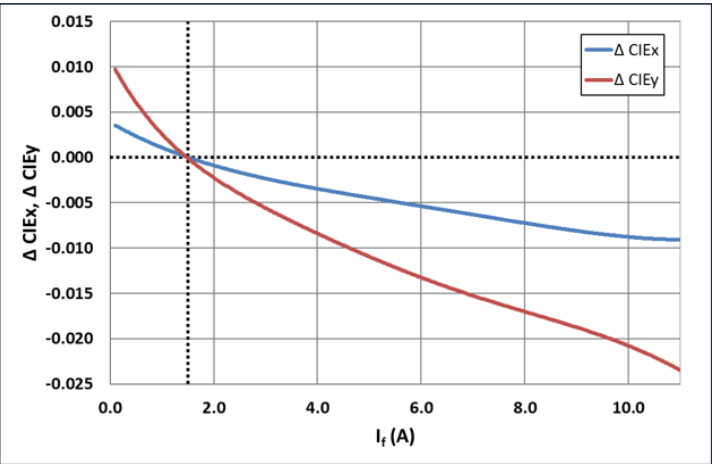
Forward Voltage vs Temperature

$I_f = 1.5\text{ A}$



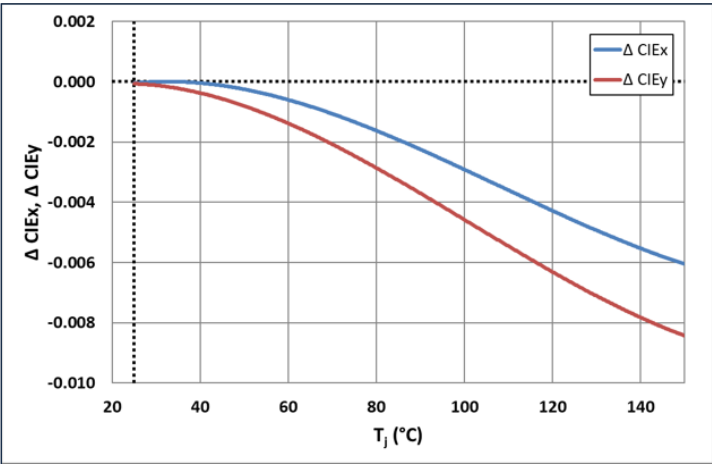
Relative Chromaticity vs Forward Current

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



Relative Chromaticity vs Temperature

$I_f = 1.5\text{ A}$

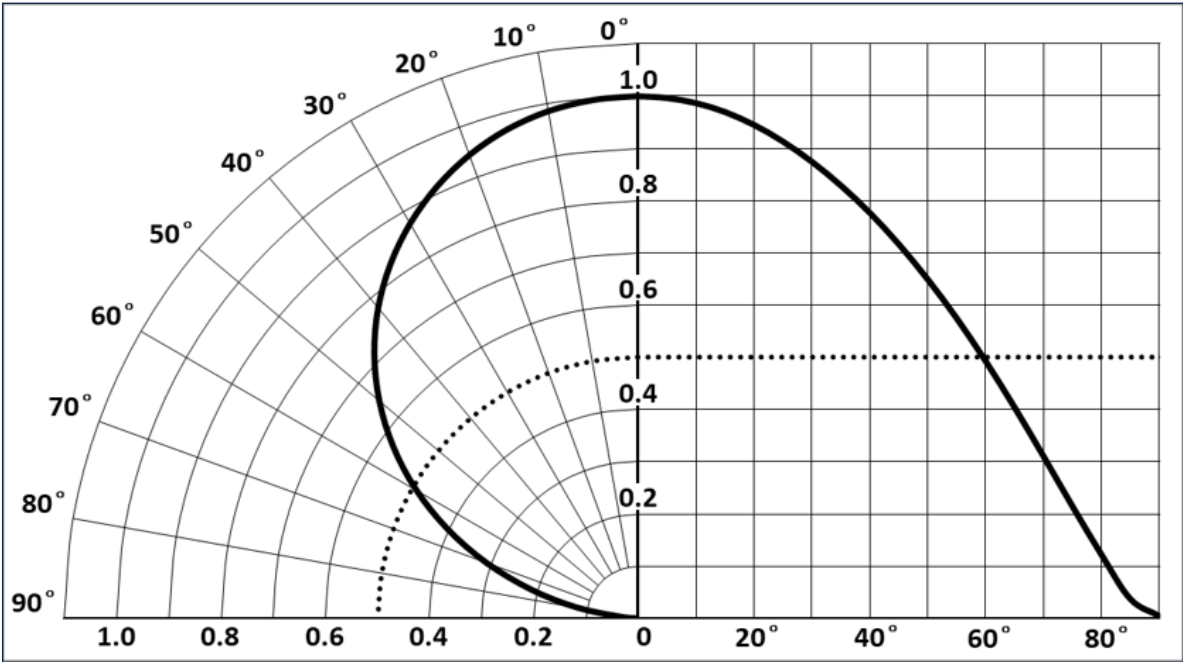




Angular Distribution and Typical Spectrum

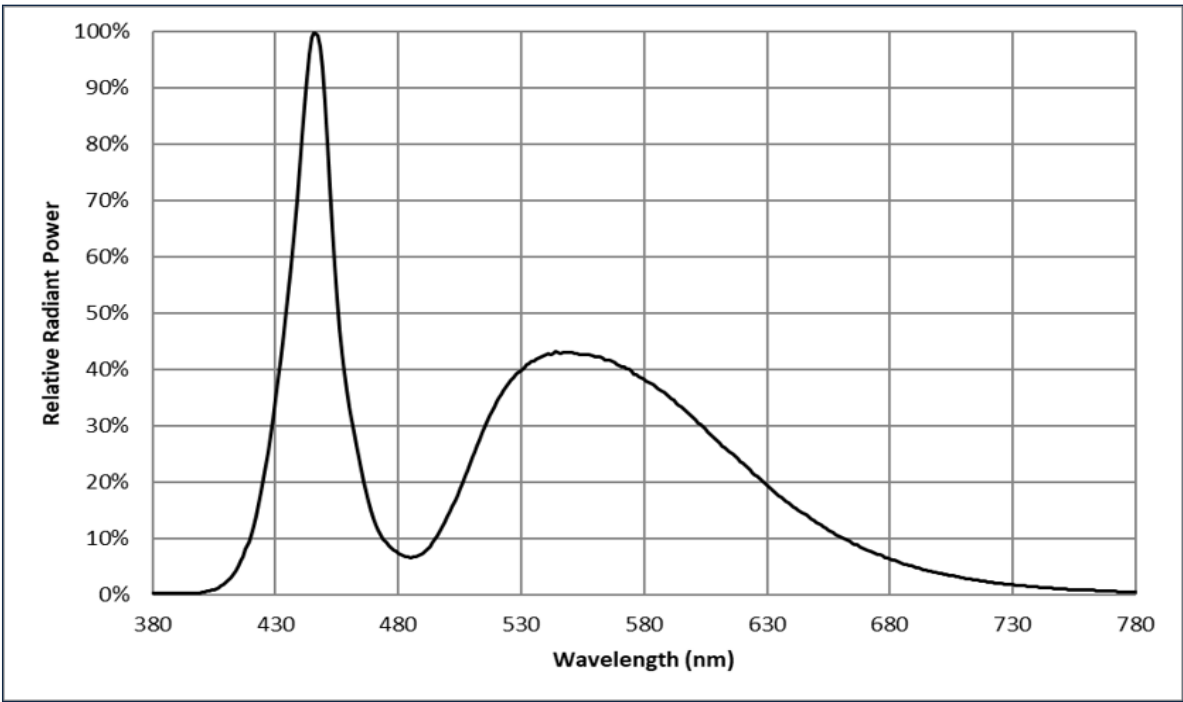
Angular Distribution

$I_f = 1.5\text{ A}$; $T_j = 25^\circ\text{C}$



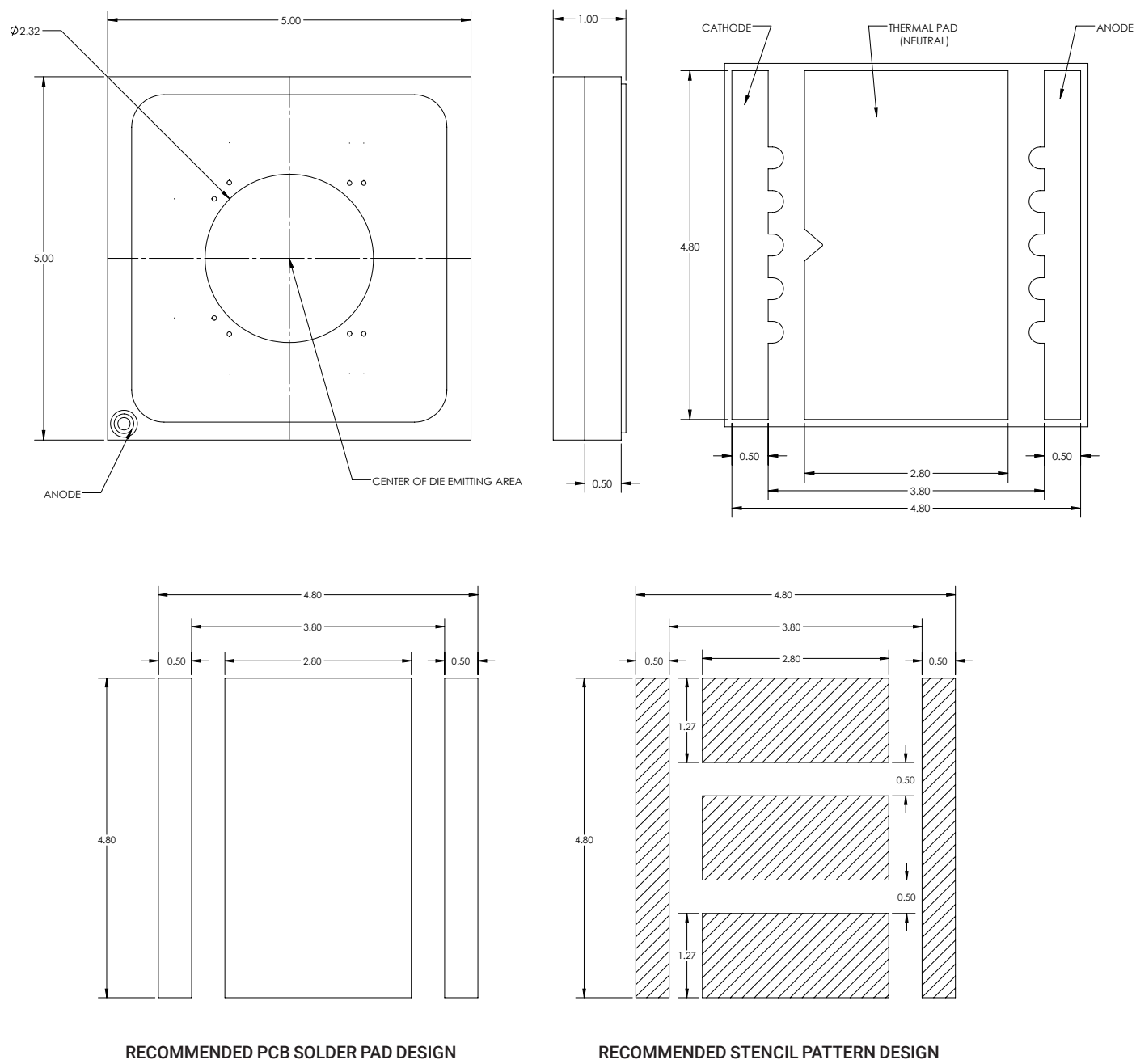
Relative Spectral Power Distribution

$I_f = 1.5\text{ A}$; $T_j = 85^\circ\text{C}$



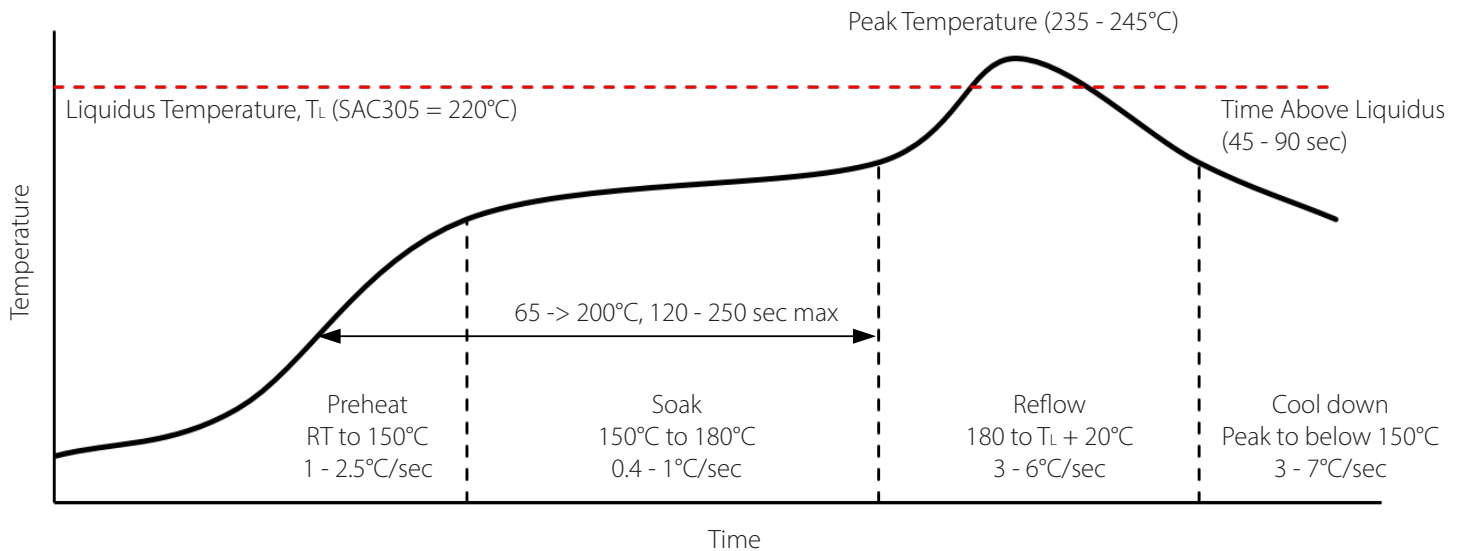


Mechanical Dimensions¹



Note:
1. All dimensions are in millimeter ± 0.13 mm.

Soldering Profile

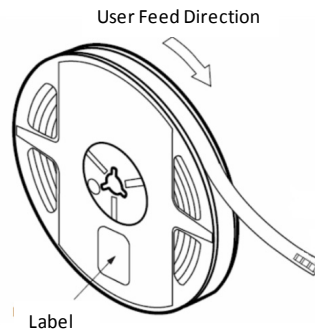
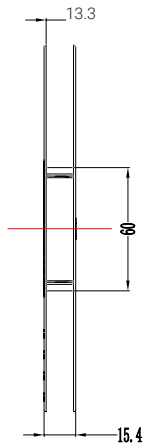


SMT Solder Rework Temperature Guidelines

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.

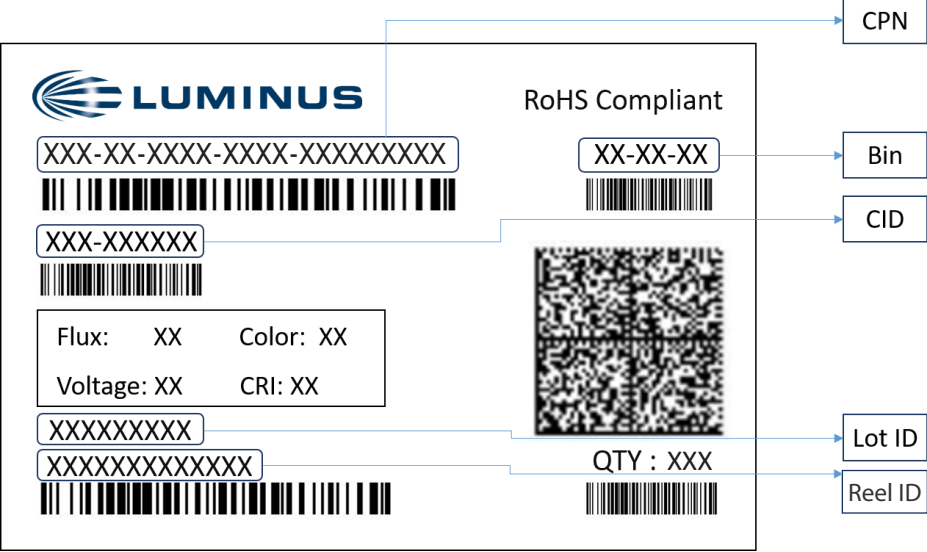
[illegible]

1. Each Reel contains 500 units of LEDs.
2. Black anti-static tape material (Denka ECM3/ECAP3)
3. The accumulated tolerance for ten chain holes should be no more than 0.2 mm.
4. The tortuosity of 250 mm tape should be no more than 1 mm.
5. Leave minimum 800 mm with empty compartments sealed by cover tape for lead in.
6. Leave minimum 1200 mm with empty compartments sealed by cover tape for trailer.
7. All dimensions must comply to EIA-481-D
8. Final tape and reel packaging must meet the requirements of JEDEC-STD-033, LEVEL 2A.



Shipping Label

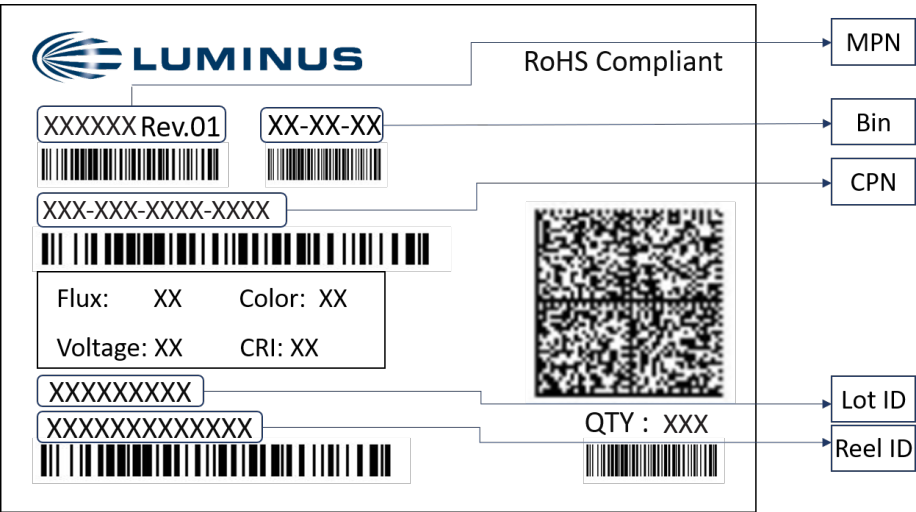
Label on Packaging Box



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



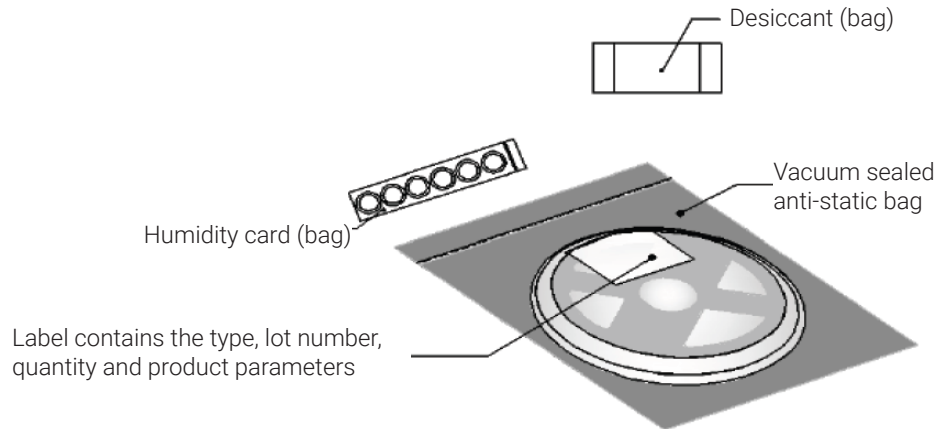
Label Fields:

- 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



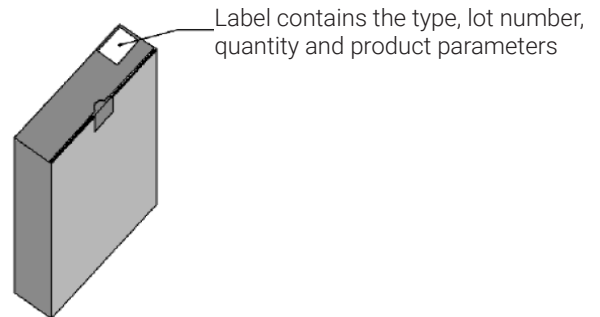
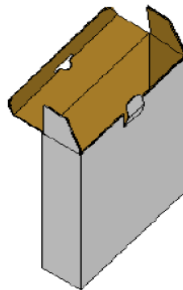
Packaging

Packaged Reel

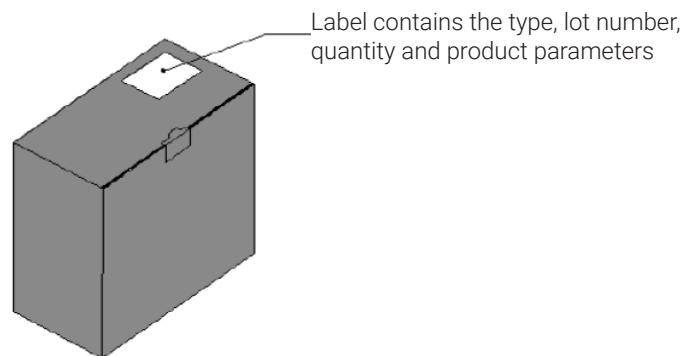
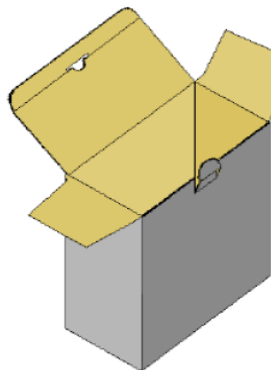


Packaging boxes

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



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



Packing Configuration:

- 500 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.



About Luminus

Luminus has been dedicated to lighting innovation, collaborating closely with industry leaders to address complex challenges. Initially focused on enhancing energy efficiency and light quality, we've since expanded our efforts to ensure seamless integration of our LED solutions across various applications. Our partnerships span diverse sectors, from agriculture to automotive, where we tailor our products to meet specific needs. As a solutions-driven company, Luminus is committed to illuminating the way forward, both indoors and outdoors, for a brighter and more sustainable future.

To learn more about our lighting solutions, visit www.luminus.com.