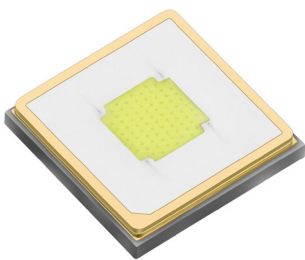


SFT-40-WES Gen 2

High Power White LEDs



Features

- SFT white series is a powerful light source for beam pattern critical lighting applications. The flat window of an SFT white LED results in a much smaller light emitting surface than a dome-shaped cover, enabling smaller optics and higher optical efficiency in directional lighting systems.
- Vertical chip with high lumen density and small emitting angle, ideal for efficient optical beam shaping to achieve high intensity, narrow beam angle and long beam distance.
 - Phosphor-on-chip with superior color uniformity over radiation angles, delivering homogeneous color in beam spots.
 - Maximum Drive Current: 8 A
 - Color Temperature: 5000K, 5700K, 6500 K
 - 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

Table of Contents

Ordering Information.....	2
Binning Structure.....	3
Absolute Maximum Ratings	7
Characteristics	7
Angular Distribution and Typical Spectrum.....	9
Soldering Profile.....	10
Mechanical Dimensions.....	11
Tape and Reel Outline	12
Shipping Label	13
Packaging	14
Notes	15



Applications

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



Ordering Information

Ordering Part Numbers¹

CRI	CCT	Luminous Flux		Chromaticity Bin Kit Code ³	Ordering Part Numbers
		Minimum Flux Bin ¹	Minimum Flux ²		
Min. 70	5000K	F8	610 lm	501	SFT-40-WE50-F2-F8501
				502	SFT-40-WE50-F2-F8502
		F9	640 lm	501	SFT-40-WE50-F2-F9501
				502	SFT-40-WE50-F2-F9502
		G1	680 lm	501	SFT-40-WE50-F2-G1501
				502	SFT-40-WE50-F2-G1502
	5700K	F8	610 lm	571	SFT-40-WE57-F2-F8571
				572	SFT-40-WE57-F2-F8572
		F9	640 lm	571	SFT-40-WE57-F2-F9571
				572	SFT-40-WE57-F2-F9572
		G1	680 lm	571	SFT-40-WE57-F2-G1571
				572	SFT-40-WE57-F2-G1572
Typ. 70 Min. 65	6500K	F8	610 lm	651	SFT-40-WS65-F2-F8651
				652	SFT-40-WS65-F2-F8652
				703	SFT-40-WS65-F2-F8703
		F9	640 lm	651	SFT-40-WS65-F2-F9651
				652	SFT-40-WS65-F2-F9652
		G1	680 lm	651	SFT-40-WS65-F2-G1651
				652	SFT-40-WS65-F2-G1652



Ordering Information

Part Number Nomenclature

SFT	40	W<yxx>	F<#>	<ffccc>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
S: Surface Mount F: Flat Window T: Single Emitter	40: 4.0 mm ²	W: White <y> CRI Category Code E: CRI > 70 S: CRI > 65 <xx> Color Temperature 50: 5000K 65: 6500K	F: Package Code <#> Chip Generation 2: Gen 2	<ff> Minimum Flux Bin, see 'Luminus Flux Binning' 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 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	8000 mA
F7	580	610	650	290	1038	1757	2123
F8	610	640	683	305	1092	1848	2233
F9	640	680	717	320	1146	1939	2342
G1	680	720	762	340	1217	2060	2489
G2	720	760	806	360	1289	2182	2635

Forward Voltage Bins³

Voltage Bin ³	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

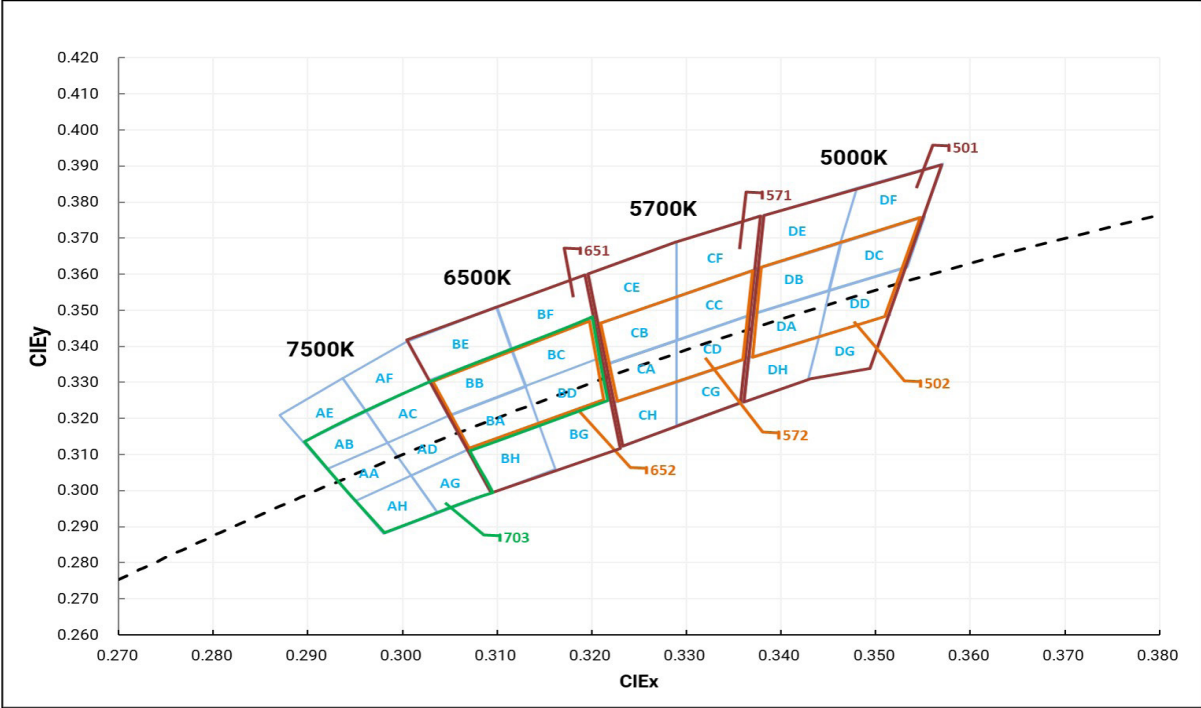
Chromaticity Binning Coordinates

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 Diagram¹



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
DC Forward Current	Minimum	$I_{f\ min}$	0.1	A
	Maximum	$I_{f\ max}$	8.0	
Surge Current ($t < 10\ ms$, Duty Cycle $< 10\%$)		I_s	10.0	
Reverse Voltage (@ $I_f = 10\ mA$)		V_r	5	V
Power Dissipation		P_D	29	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 =1500 mA, T _j = 85°C)		Symbol	Value		Unit
			WS	WE	
Color Rendering Index ¹	Minimum	CRI _{min}	65	70	
	Typical	CRI _{typ}	70	-	
Viewing Angle		2θ _{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		Δ _{vf} /Δ _T	-1.3		mV/°C
Electrical Thermal Resistance (Junction to Solder Point) ²		R _{th JS elec}	0.7		°C/W

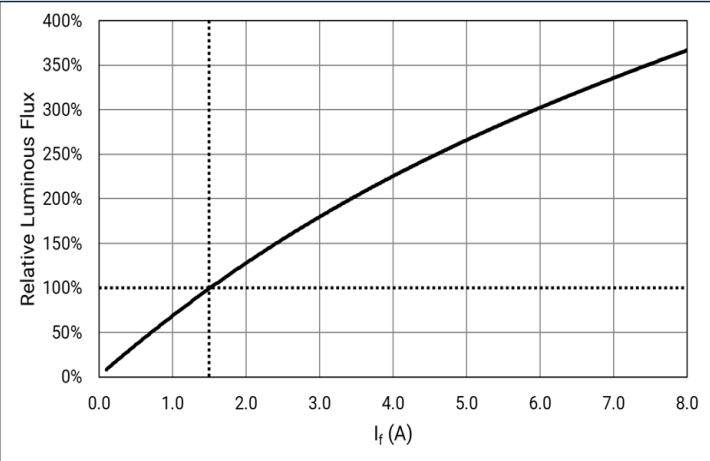
Notes:

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



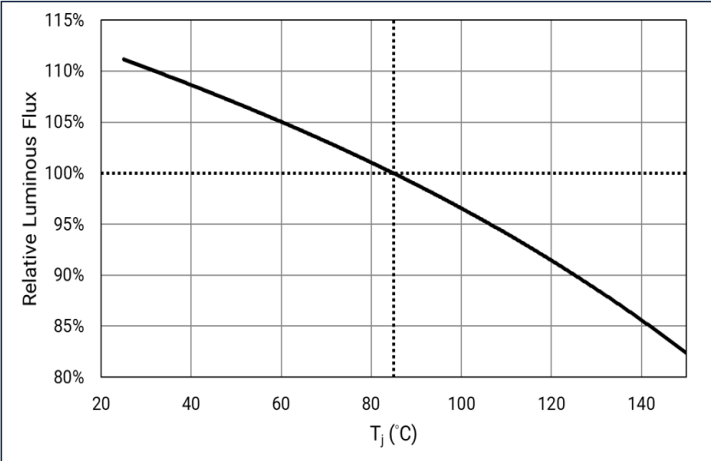
Relative Luminous Flux vs Forward Current

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



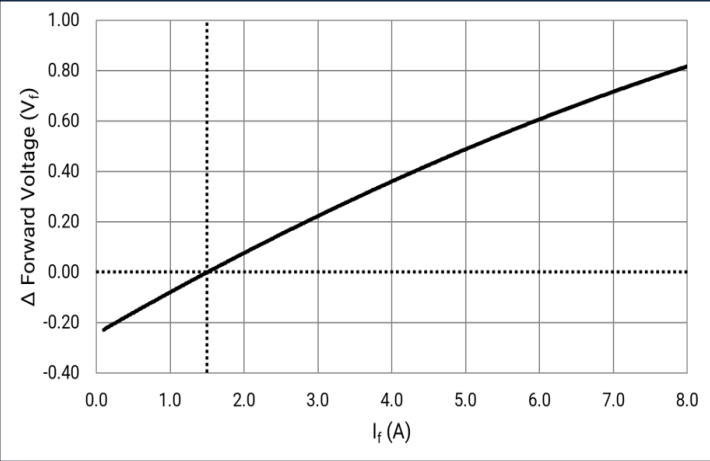
Relative Luminous Flux vs Temperature

$I_f = 1.5\text{ A}$



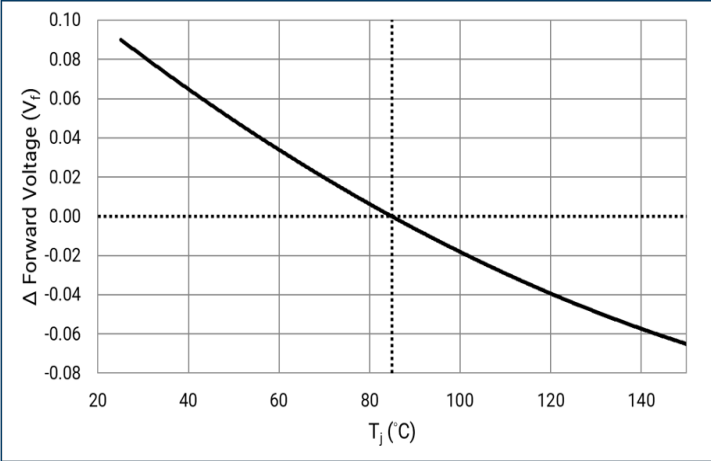
Forward Voltage Shift vs Forward Current

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



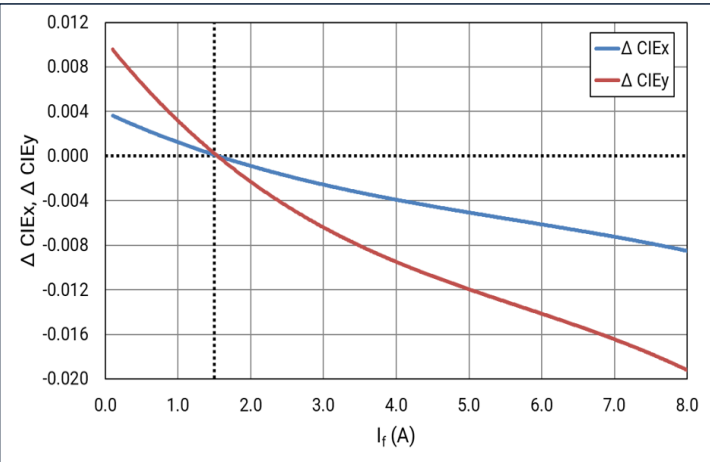
Forward Voltage Shift vs Temperature

$I_f = 1.5\text{ A}$



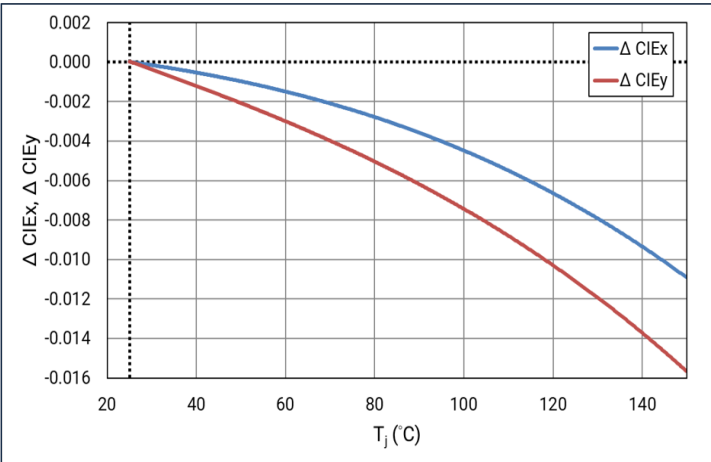
Relative Chromaticity vs Forward Current

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



Relative Chromaticity vs Temperature

$I_f = 1.5\text{ A}$

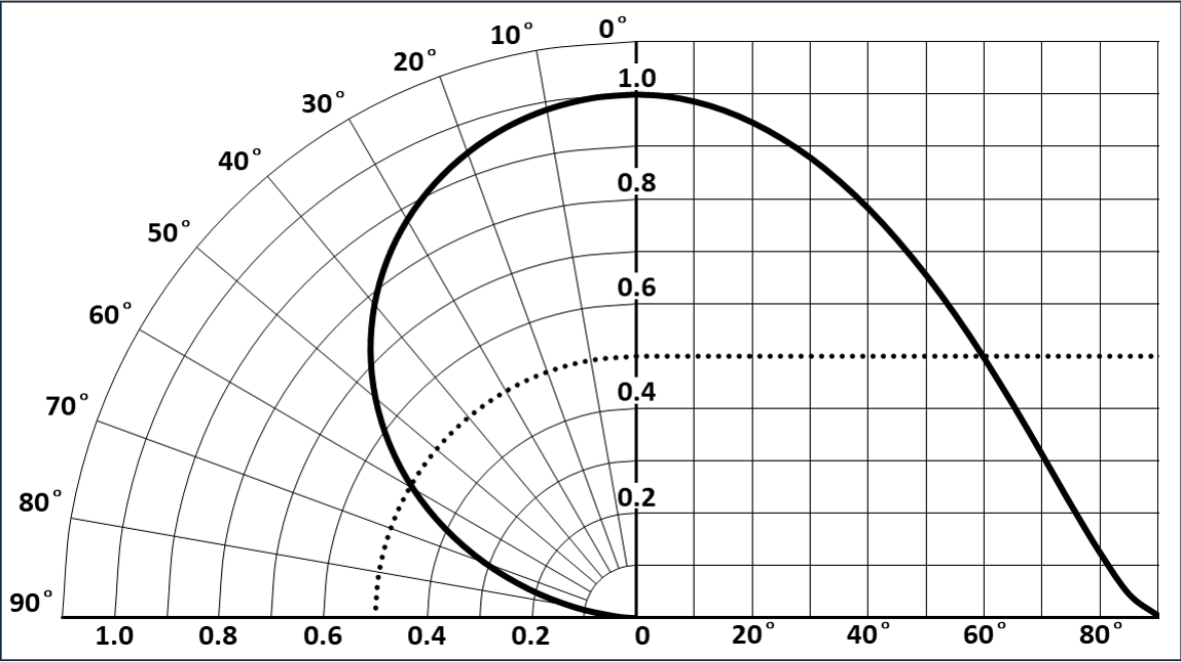




Angular Distribution and Typical Spectrum

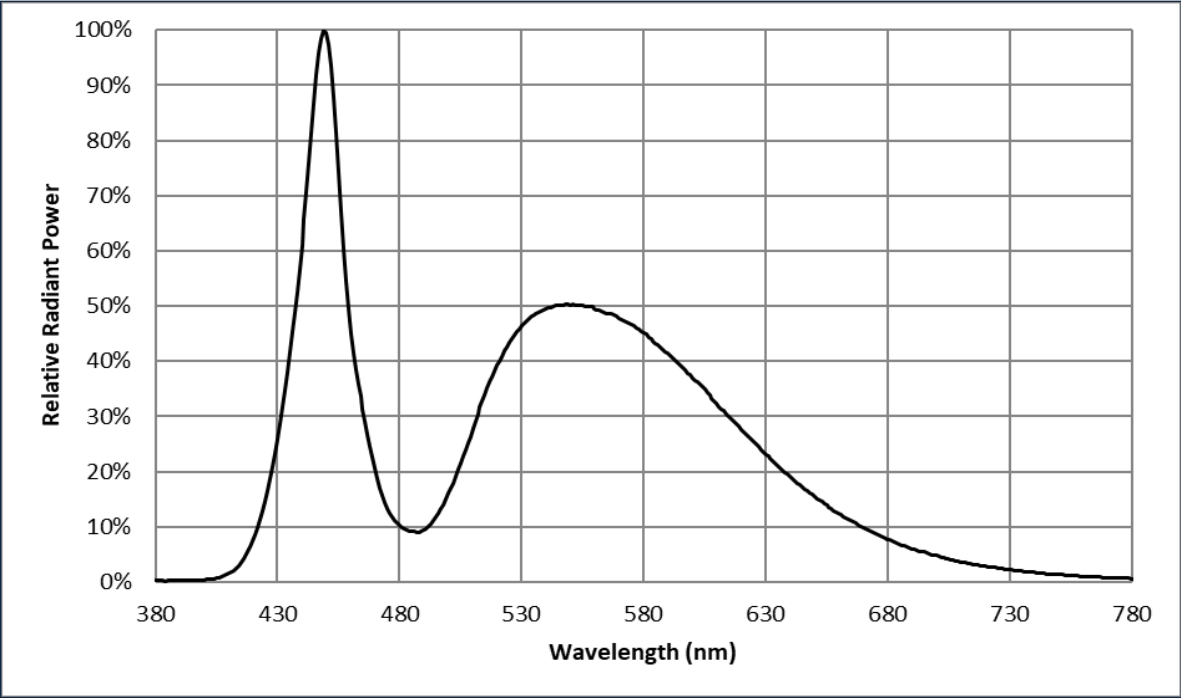
Angular Distribution

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

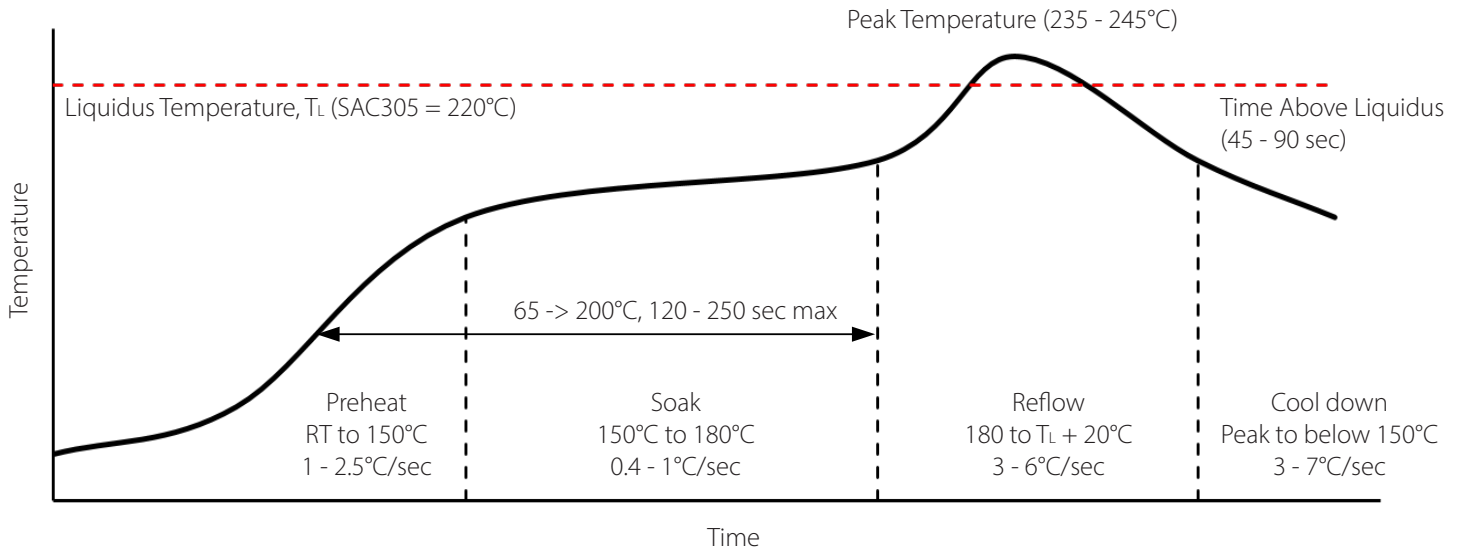


Relative Spectral Power Distribution

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



Soldering Profile



SMT Solder Rework Temperature Guidelines

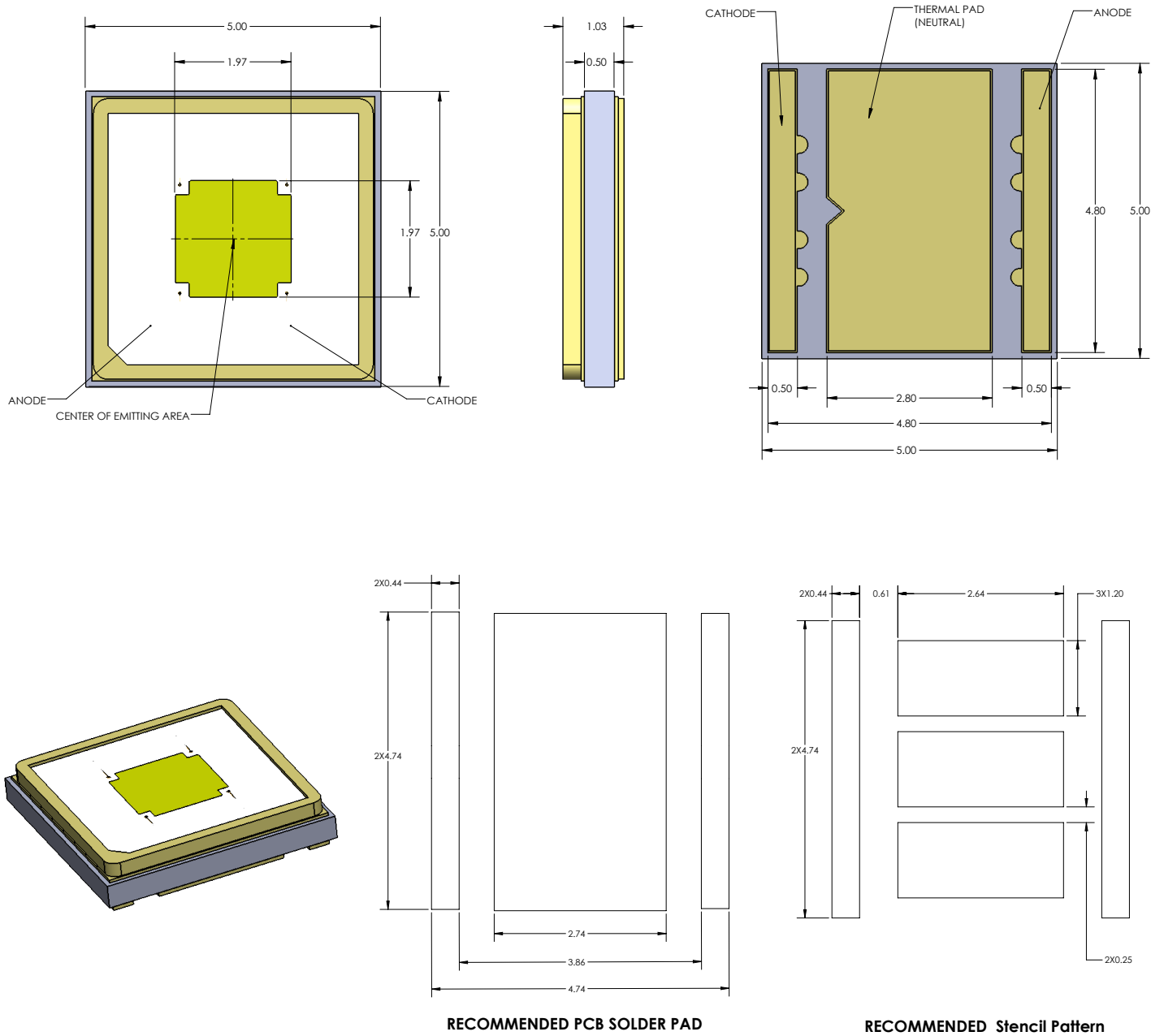
Parameter	Manual Hotplate Reflow	Hot Air Gun Reflow
Heating Time	< 60 sec	
Hotplate Temperature	< 245°C	< 150°C

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 Dimensions



Notes:

1. All dimensions are in millimeter ± 0.13 mm.

Technical drawing of a cathode assembly, showing a top view and two cross-sectional views.

Top View:

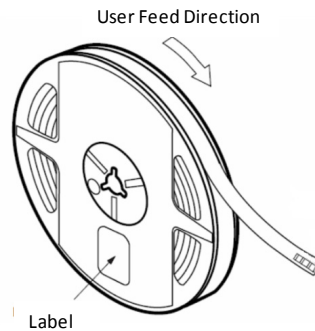
- The assembly consists of a central cathode element (labeled "Cathode") surrounded by a support structure.
- Dimensions include:
 - $P0$: Distance between the centers of the first two cathode elements.
 - $P2$: Distance between the center of the first cathode element and the center of the first support structure.
 - $P1$: Distance between the centers of two support structures.
 - $D0$: Diameter of the cathode element.
 - $D1$: Diameter of the support structure.
 - E : Thickness of the top layer.
 - F : Thickness of the middle layer.
 - W : Total thickness of the assembly.

Left Cross-Section:

- Shows the profile of the cathode element and support structure.
- Dimensions include:
 - $A0$: Width of the cathode element.
 - τ : Thickness of the top layer.
 - $MAX\ 8^\circ$: Maximum angle of the top surface.

Right Cross-Section:

- Shows the profile of the support structure.
- Dimensions include:
 - $K0$: Width of the support structure.
 - $B0$: Total height of the support structure.
 - $MAX\ 7^\circ$: Maximum angle of the top surface.

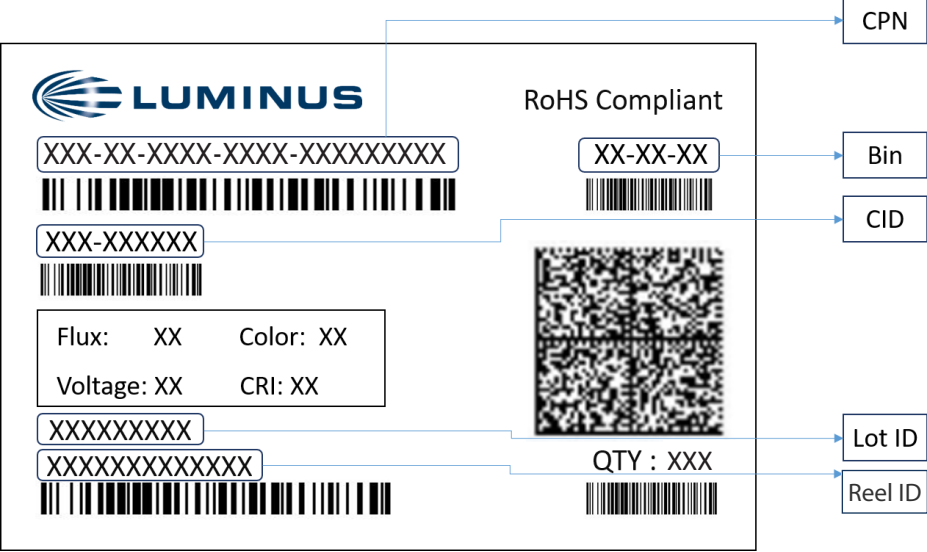


1. Each reel contains 500 units of LEDs.
2. Black anti-static tape material (Denka ECM3/ECAP3)
3. The accumulated tolerance for ten chain holes should be no more than 0.2 mm.
4. The tortuosity of 250 mm tape should be no more than 1 mm.
5. Leave minimum 800 mm with empty compartments sealed by cover tape for lead in.
6. Leave minimum 1200 mm 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

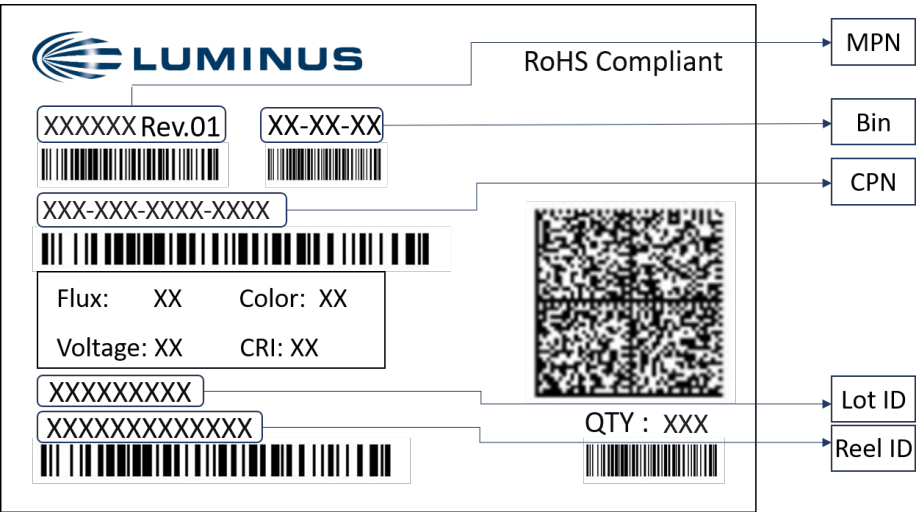
Label on Packaging Box



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

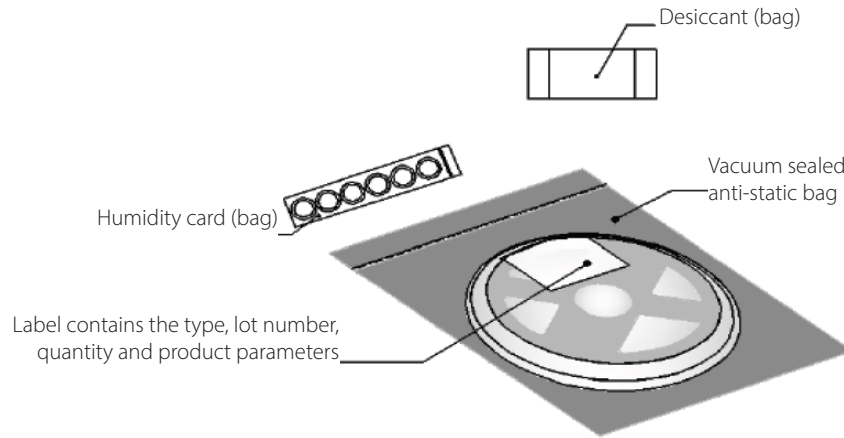


Label Fields:

- 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

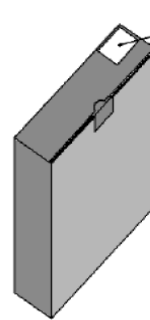
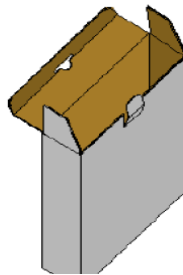
Packaging

Packaged Reel



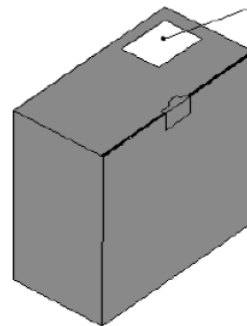
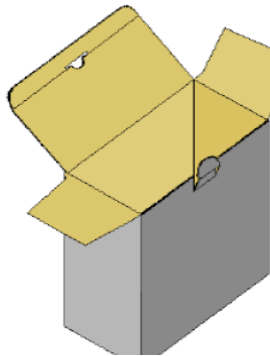
Packaging boxes

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



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

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.