

CFT-90-W

Specialty White LED



Features

- Second generation monolithic 9 mm² specialty white LED delivers increased peak lumens and drive current over CBT-90-W
- High current operation: up to 27 A DC
- Over 6,500 lumens at maximum drive current
- Available in 5700K, 6500K and 7800K (typical) color temperatures
- Window-less package design improves optical coupling efficiency
- Low thermal resistance chip-on-board packaging technology: 0.45°C/W typical junction to back of board
- Common cathode chip technology delivers increased performance and simplifies system design
- Hot lumens specification, production tested at 22.5 A DC, 90°C junction temperature



Applications

- Fiber illumination including:
 - Medical endoscopy
 - Machine vision
 - Microscopy and other instrumentation
- Inspection and industrial applications
- Stage and Entertainment spot lights, narrow beam projectors
- Architectural Lighting
- Off-road vehicle and truck projector lights
- Search Lights
- Beacons

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Ordering Information

Ordering Part Numbers¹

Color Point	Luminous Flux		Chromaticity Bins	Binkit	Ordering Part Number
	Min. Flux Bin	Min. Flux			
WDS	UA	3,680 lm	H, J, HJH, HJL, K, KH	UA500	CFT-90-WDS-X11-UA500
			H, J, HJH, HJL	UA501	CFT-90-WDS-X11-UA501
			H, J	UA502	CFT-90-WDS-X11-UA502
	UB	3,955 lm	H, J, HJH, HJL, K, KH	UB500	CFT-90-WDS-X11-UB500
			H, J, HJH, HJL	UB501	CFT-90-WDS-X11-UB501
			H, J	UB502	CFT-90-WDS-X11-UB502
	VA	4,230 lm	H, J, HJH, HJL, K, KH	VA500	CFT-90-WDS-X11-VA500
			H, J, HJH, HJL	VA501	CFT-90-WDS-X11-VA501
	VB	4,545 lm	H, J, HJH, HJL, K, KH	VB500	CFT-90-WDS-X11-VB500
			H, J, HJH, HJL	VB501	CFT-90-WDS-X11-VB501
	WA	4,860 lm	H, J, HJH, HJL, K, KH	WA500	CFT-90-WDS-X11-WA500
WCS	UA	3,680 lm	D, E, F, G, DEH, DEL, FGH, FGL	UA600	CFT-90-WCS-X11-UA600
			F, G, FGH, FGL	UA601	CFT-90-WCS-X11-UA601
	UB	3,955 lm	D, E, F, G, DEH, DEL, FGH, FGL	UB600	CFT-90-WCS-X11-UB600
			F, G, FGH, FGL	UB601	CFT-90-WCS-X11-UB601
	VA	4,230 lm	D, E, F, G, DEH, DEL, FGH, FGL	VA600	CFT-90-WCS-X11-VA600
			F, G, FGH, FGL	VA601	CFT-90-WCS-X11-VA601
	VB	4,545 lm	D, E, F, G, DEH, DEL, FGH, FGL	VB600	CFT-90-WCS-X11-VB600
			F, G, FGH, FGL	VB601	CFT-90-WCS-X11-VB601
	WA	4,860 lm	D, E, F, G, DEH, DEL, FGH, FGL	WA600	CFT-90-WCS-X11-WA600
WSS	UA	3,680 lm	C, D, E, DEH, DEL	UA700	CFT-90-WSS-X11-UA700
			D, E, DEH, DEL	UA701	CFT-90-WSS-X11-UA701
			B, C, D	UA900	CFT-90-WSS-X11-UA900
	UB	3,955 lm	C, D, E, DEH, DEL	UB700	CFT-90-WSS-X11-UB700
			D, E, DEH, DEL	UB701	CFT-90-WSS-X11-UB701
			B, C, D	UB900	CFT-90-WSS-X11-UB900
	VA	4,230 lm	C, D, E, DEH, DEL	VA700	CFT-90-WSS-X11-VA700
			D, E, DEH, DEL	VA701	CFT-90-WSS-X11-VA701
	VB	4,545 lm	C, D, E, DEH, DEL	VB700	CFT-90-WSS-X11-VB700

Note:

1. Flux Bin listed is minimum bin shipped, higher bins may be included at Luminus' discretion.



Ordering Information

Part Number Nomenclature

CFT	90	W<tc>	X11	<Bin kit>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
C : Chip on board F : Flat-top window-less package T : single monolithic emitter	90: 9.0 mm ²	W: White t: Color temperature D: Daylight C: Cool White S: Stage White c: CRI S: Standard	Internal package code	Refer to ordering part numbers in this document



Binning Structure

Flux Bins^{1,2}

Color	Luminous Flux Bin ³	Binning @ 22.5 A, T _{hs} = 40°C ^{4,5}	
		Minimum Flux (lm)	Maximum Flux (lm)
White	UA	3,680	3,955
	UB	3,955	4,230
	VA	4,230	4,545
	VB	4,545	4,860
	WA	4,860	5,225
	WB	5,225	5,590
	XA	5,590	6,011
	XB	6,011	6,430
	YA	6,430	6,910

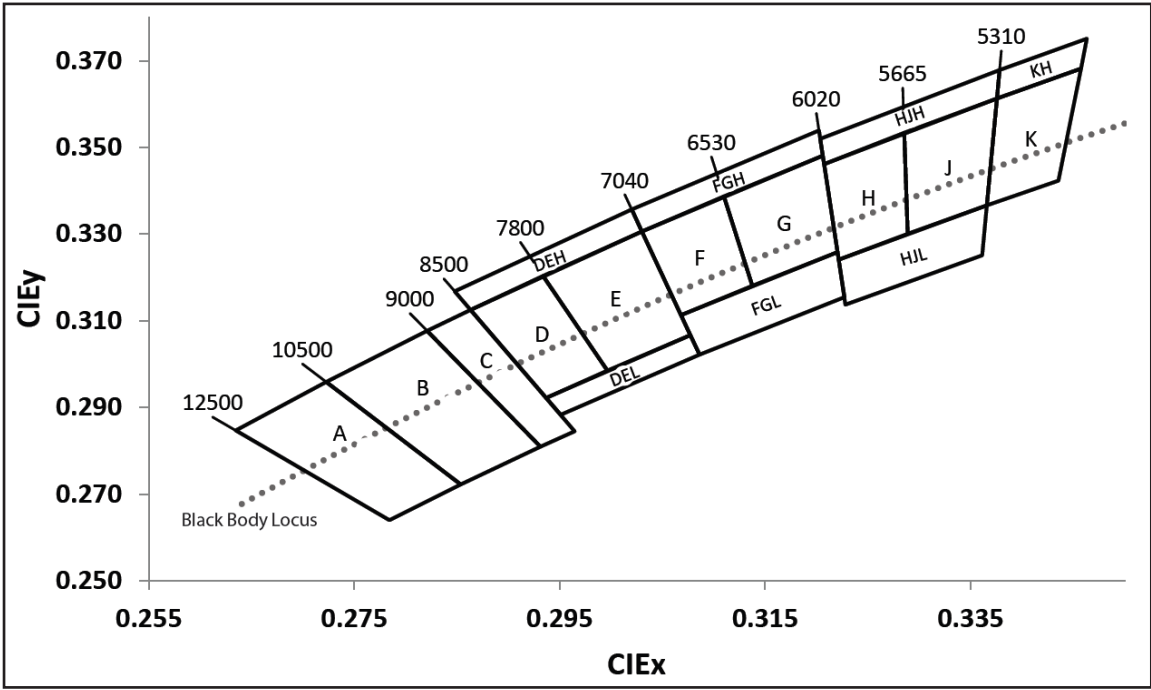
Note:

1. Luminus maintains a +/- 6% tolerance on flux measurements.
2. Products are production tested then sorted and packed by bin.
3. Individual bins are not orderable. Please refer to the Product Ordering information page for a list of orderable bin kits.
4. Product test condition: 22.5 A DC, 40°C heat sink temperature.
5. T_{hs} = heat sink temperature.



Binning Structure

Chromaticity Bins



Note:

1. Product test condition: 22..5 A DC, 20 ms single pulse, 40°C heat sink temperature.



Binning Structure

Chromaticity Binning Coordinates¹

Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy
A	0.263	0.285	DEH	0.285	0.317	G	0.311	0.339	K	0.338	0.361
	0.272	0.296		0.302	0.336		0.321	0.348		0.346	0.368
	0.285	0.272		0.303	0.331		0.322	0.326		0.344	0.342
	0.278	0.264		0.286	0.313		0.314	0.318		0.337	0.337
B	0.272	0.296	E	0.293	0.320	H	0.321	0.346	KH	0.338	0.368
	0.282	0.308		0.303	0.331		0.329	0.353		0.346	0.375
	0.293	0.281		0.308	0.307		0.329	0.330		0.346	0.368
	0.285	0.272		0.300	0.298		0.322	0.324		0.338	0.361
C	0.282	0.308	F	0.303	0.331	HJL	0.322	0.324			
	0.286	0.313		0.311	0.339		0.337	0.337			
	0.296	0.285		0.314	0.318		0.336	0.325			
	0.293	0.281		0.307	0.311		0.323	0.314			
D	0.286	0.313	FGH	0.302	0.336	HJH	0.320	0.352			
	0.293	0.320		0.320	0.354		0.338	0.368			
	0.300	0.298		0.321	0.348		0.338	0.361			
	0.294	0.292		0.303	0.331		0.321	0.346			
DEL	0.294	0.292	FGL	0.307	0.311	J	0.329	0.353			
	0.308	0.307		0.322	0.326		0.338	0.361			
	0.309	0.302		0.323	0.315		0.337	0.337			
	0.295	0.288		0.309	0.302		0.329	0.330			

Note:

1. Product test condition: 22..5 A DC, 20 ms single pulse, 40°C heat sink temperature.



Absolute Maximum Ratings

Parameter	Symbol	Values	Unit
Forward Current (CW) ¹	$I_{f \min}$	0.2	A
	$I_{f \max}$	27	
Forward Surge Current (Pulsed) ² (Frequency >240Hz, duty cycle <10%, $t \leq 1\text{ms}$)	$I_{\text{surge max}}$	36	A
Storage Temperature	$T_{s \min}$	-40	°C
	$T_{s \max}$	100	
Junction Temperature ²	$T_{j \max}$	150	°C
Operating Temperature	$T_{\text{opr min}}$	-40	°C
	$T_{\text{opr max}}$	85	

Note:

1. For reference only.
2. CFT-90-W LED is designed for operation to an absolute maximum current and temperature as specified above. Product lifetime data is specified at recommended forward drive currents. Sustained operation at or beyond absolute maximum currents or temperatures will result in a reduction of device lifetime compared to recommended conditions.



Device Characteristics

Optical and Electrical Characteristics	Symbol	Value			Unit
		WSS	WCS	WDS	
Emitting Area	A _E	9.0			mm ²
Emitting Area Dimension		3.0 x 3.0			mm x mm
Typical Peak Luminous Flux ^{1,2}	Φ _V	5,300	5,400	5,500	lm
Typical Peak Radiometric Flux ^{1,2}	Φ _E	17.4	17.2	17.0	W
Viewing Angle (50% of peak flux)	2 Ø _{1/2}	120			degrees
Forward Voltage ¹	V _{f min}	2.9			V
	V _f	3.4			
	V _{f max}	4.2			
Typical Color Rendering Index	CRI	65	65	65	
Thermal Characteristics					
Thermal Resistance (junction to coreboard) ³	R _{th j-b}	0.35-0.55			°C/W
Thermal Resistance (junction to thermistor) ³	R _{th j-ref}	0.38-0.58			°C/W
Thermal Coefficient of Radiometric Flux (typical)		-0.3			%/°C

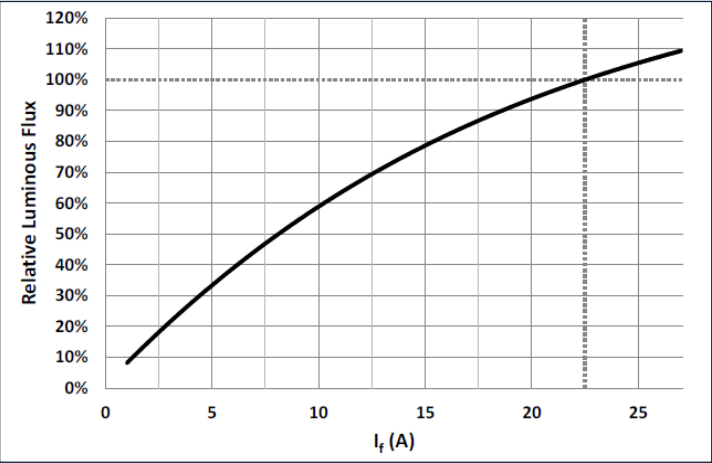
Note:

1. Unless otherwise noted, values listed are typical. All ratings are based on operation with a constant temperature = 90°C.
2. Total flux from emitting area at listed dominant wavelength. Reported performance is included to show trends for a selected power level. For specific minimum and maximum values, use bin tables. For product roadmap and future performance of devices, contact Luminus.
3. Measurements are in accordance with JEDEC 51-14. For more about thermal resistance calculation, please see <https://luminusdevices.zendesk.com/hc/en-us/articles/4416807960717-Thermal-Heatsink-Required-Rth-Calculator>

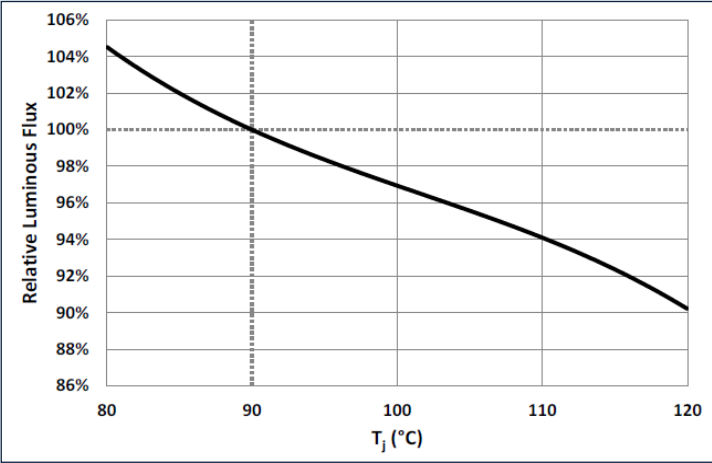


Relative Luminous Flux

Forward current: $\phi_v/\phi_v(22.5\text{ A})\text{ DC}, T_{hs} = 40^\circ\text{C}$

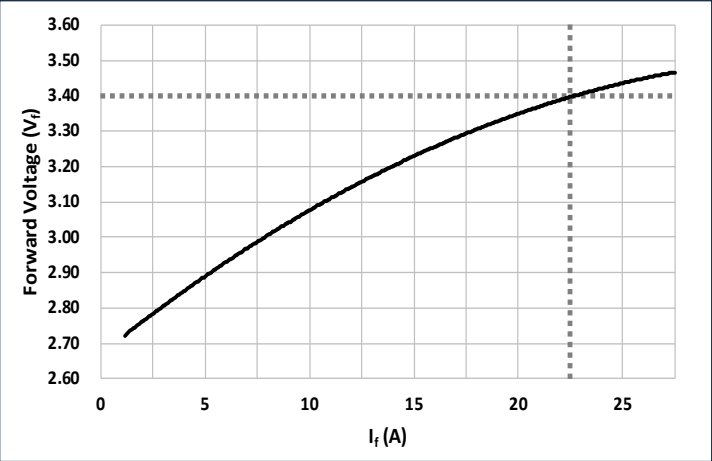


Temperature: $\phi_v/\phi_v(90^\circ\text{C})\text{ DC}, I_f = 22.5\text{ A}$

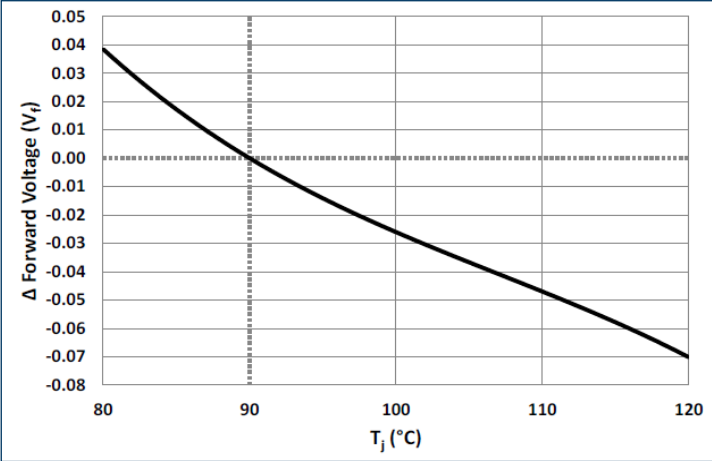


Forward Voltage

Forward current: $V_f = V(I_f)\text{ DC}, T_{hs} = 40^\circ\text{C}$

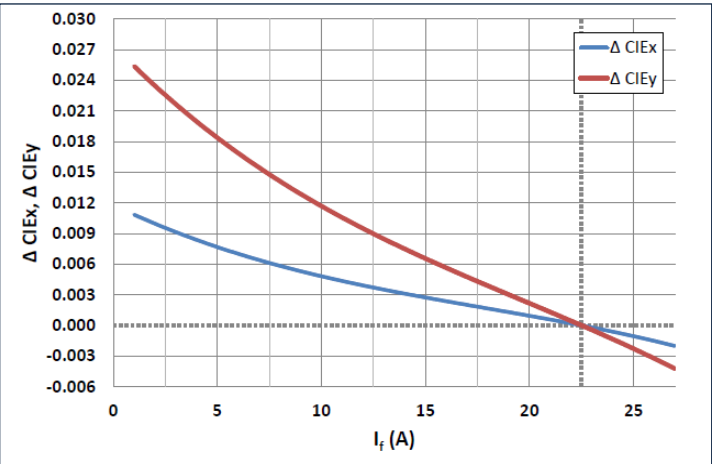


Temperature: $\Delta V_f = V(T_j) - V(90^\circ\text{C})\text{ DC}, I_f = 22.5\text{ A}$

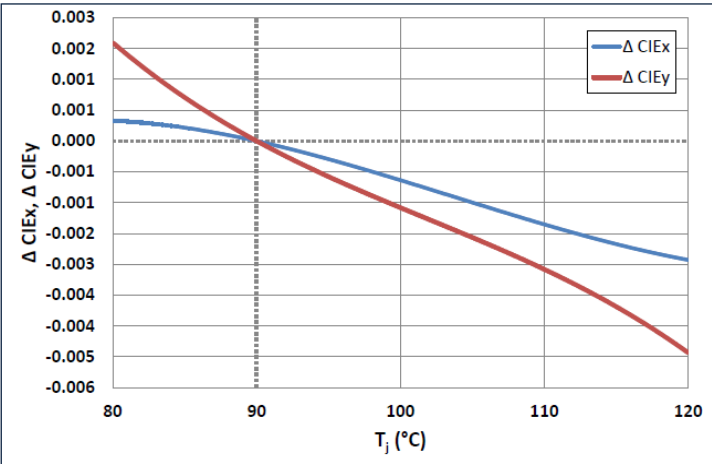


Relative Chromaticity Shift

Forward current: $\Delta\text{CIEx,y} = \text{CIEx,y}(I_f) - \text{CIEx,y}(22.5\text{ A})\text{ DC}, T_{hs} = 40^\circ\text{C}$



Temperature: $\Delta\text{CIEx,y} = \text{CIEx,y}(T_j) - \text{CIEx,y}(90^\circ\text{C})\text{ DC}, I_f = 22.5\text{ A}$

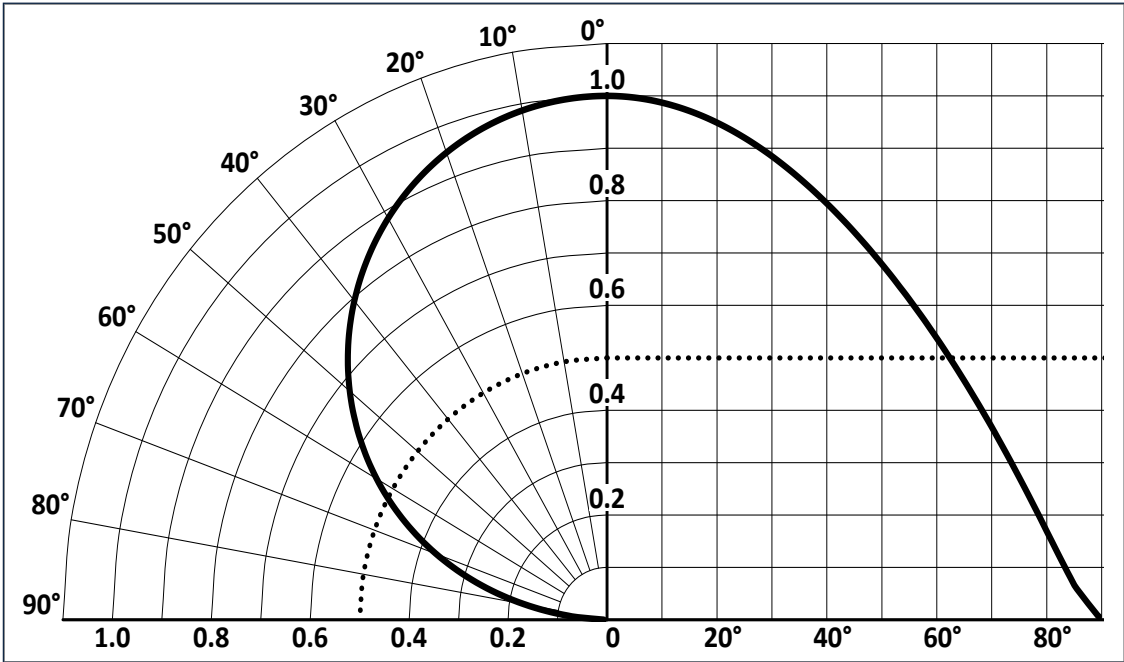




Angular Distribution and Typical Spectrum

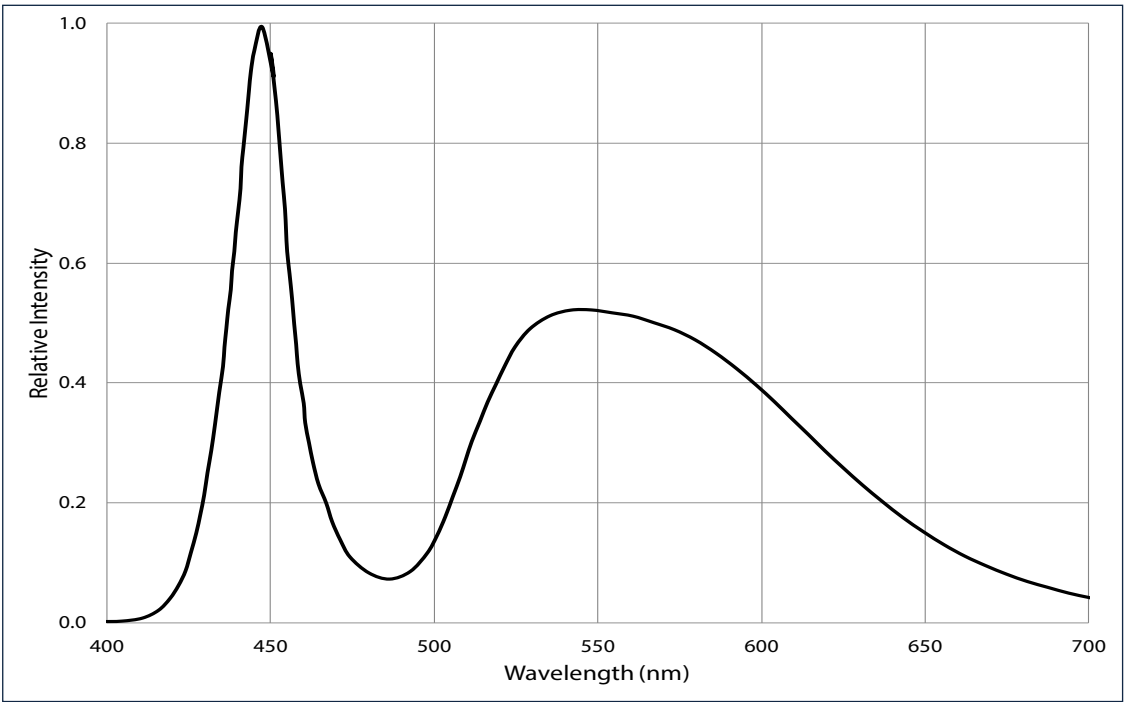
Angular Intensity Distribution

$I_{ref} = f(\Phi); T_c = 25^{\circ}\text{C}$



Typical Spectrum

$\Phi_{ref} = f(\lambda); I_f = 22.5\text{ A}; T_c = 25^{\circ}\text{C}$

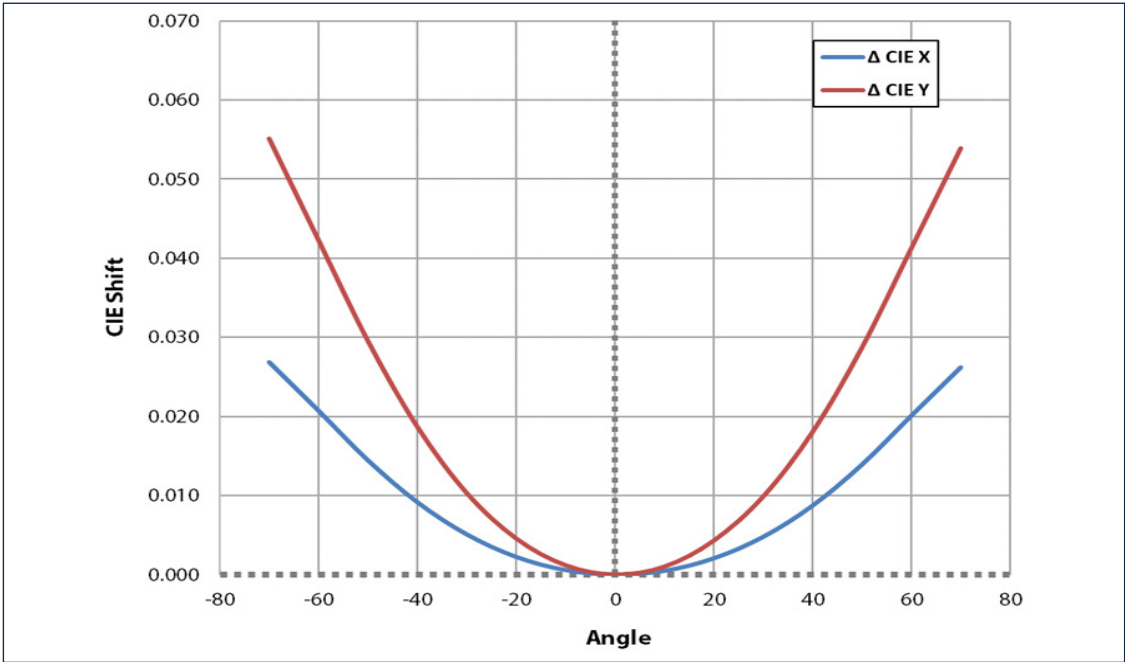




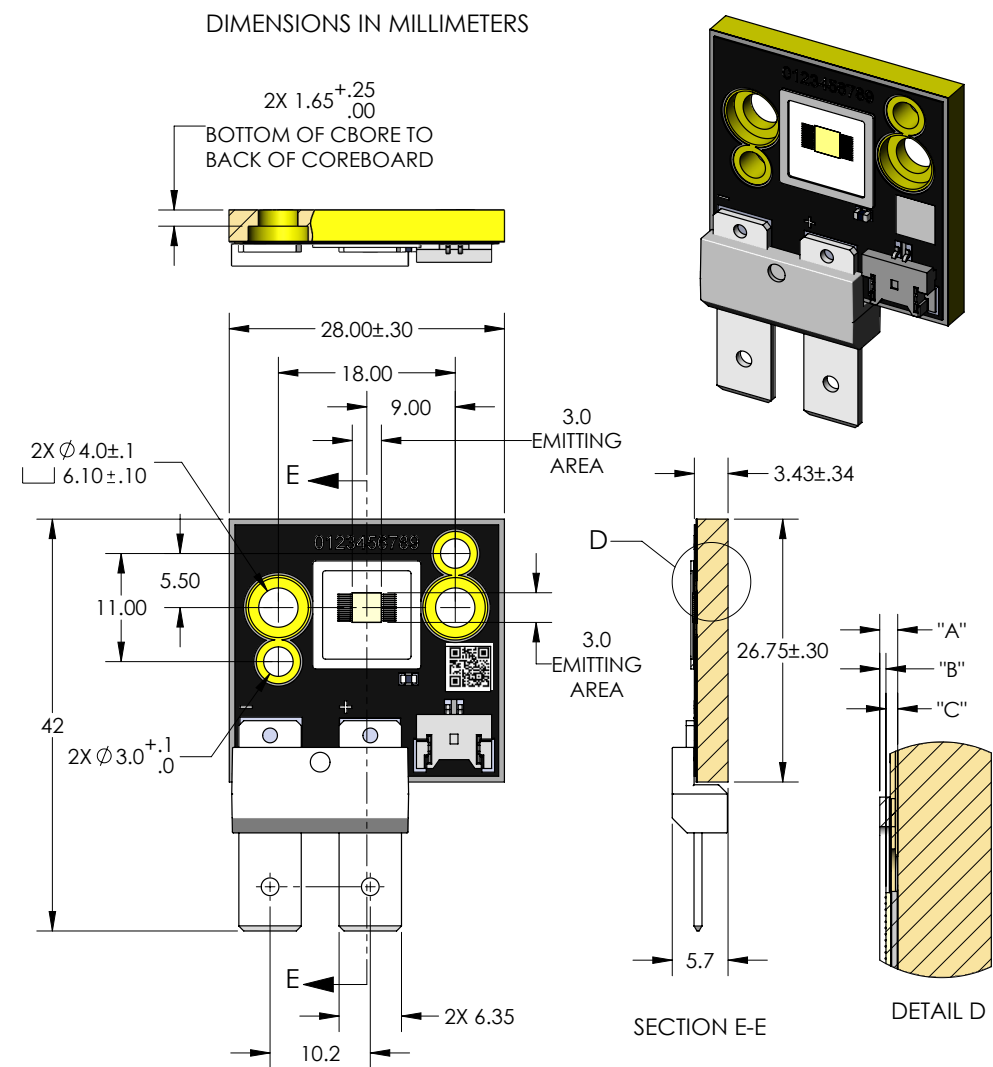
Angular Distribution and Typical Spectrum

Color Over Angle

$I_{ref} = f(\Phi); T_c = 25^{\circ}\text{C}$



Mechanical Dimensions



DIMENSION NAME	DESCRIPTION	NOMINAL DIMENSION	TOLERANCE
"A"	TOP OF METAL SUBSTRATE TO TOP OF FRAME	.61	±.08
"B"	TOP OF EMITTING AREA TO TOP OF FRAME	.21	±.12
"C"	TOP OF METAL SUBSTRATE TO TOP OF EMITTING AREA	.40	±.075

DWG-002705 REV04

Recommended Connector for Anode and Cathode:

Panduit Disco Lok™ Series P/N: DNG14-250FL-C

Male Thermistor Connector on board:

TYU P/N TU1212WBR-02S-C1-NL-A and MOLEX P/N 53780-0270

Check NEC standards for ampacity of the power cable being used.

Please note that the CFT-90-W copper PCB is electrically active with a common Cathode (-) polarity.

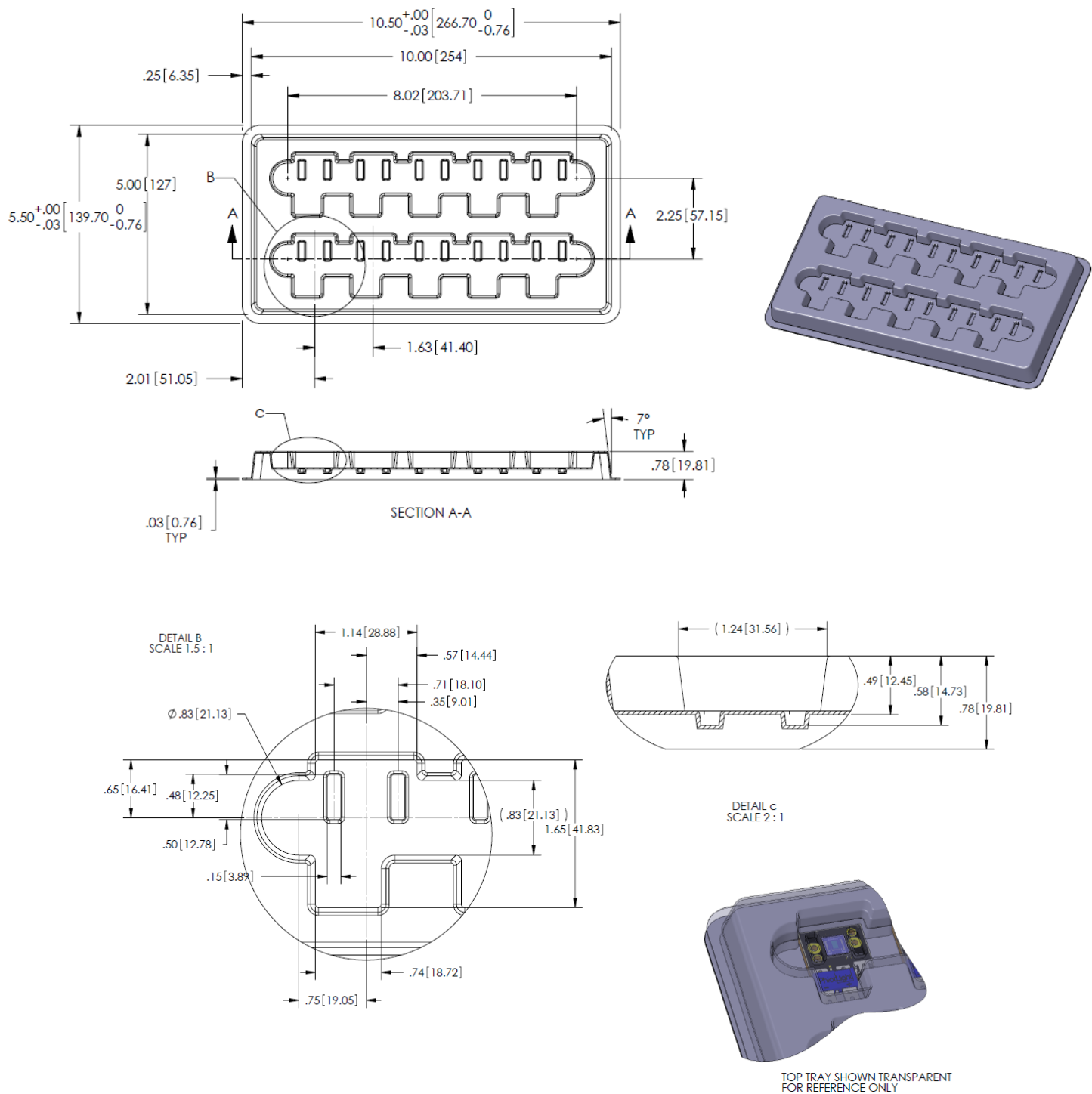
Recommended Female Thermistor Connector (Mating connector):

MOLEX P/N 51146-0200 (not recommended for new designs), TYU P/N TU1212HNO-02 or equivalent

For detailed drawing please refer to DWG-002705 document

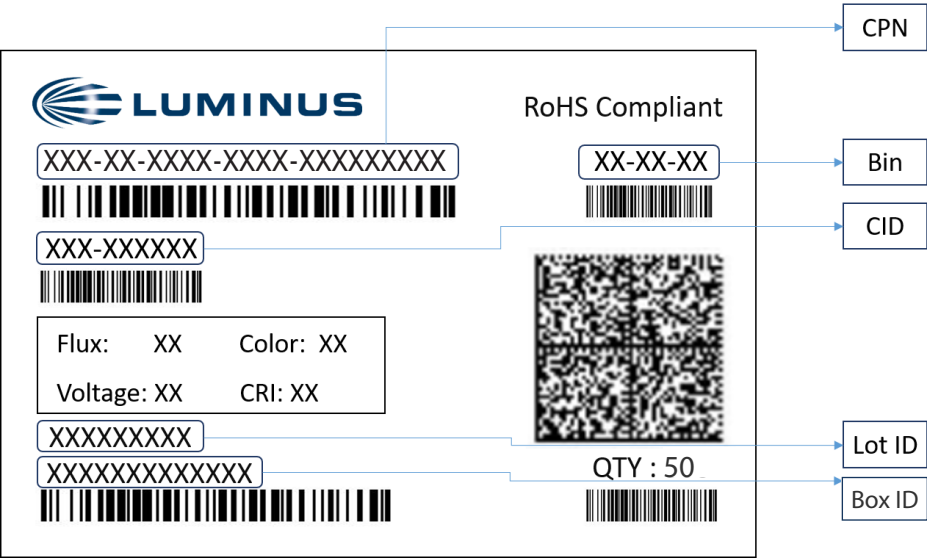


Shipping Tray Outline





Shipping Label



Label Fields:

- CPN: Luminus ordering part number
- CID: Customer's part number
- QTY: Quantity of devices in pack
- Flux: Bin as defined on page 4
- Voltage: NA
- Color: Bin as defined on page 6
- CRI: NA

Packing Configuration:

- Maximum stack of 5 trays per pack with 10 devices per tray
- Partial pack or tray may be shipped
- Each pack is enclosed in anti-static bag
- Shipping label is placed on top of each pack



Notes

Static Electricity

This product is 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



Revision History

Rev	Date	Description of Change
01	01/18/2017	Initial release
02	06/14/2017	Remove preliminary. Add B chromaticity bin and eliminated TB flux bin. Updated ordering bin kits.
03	07/07/2017	Add comment on mechanical drawing page.
04	06/05/2024	Update template, drawing, product image, characteristics and thermistor connector information