CFT-90-W

Specialty White LED



Features

- Second generation monolithic 9 mm^2 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

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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

Ordering Information

Ordering Part Numbers[1]

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

Flux Bin[3]	Binning @ 22.5 A, T_{hs}= 40°C[4,5]	
	Minimum Flux (lm)	Maximum Flux (lm)
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.

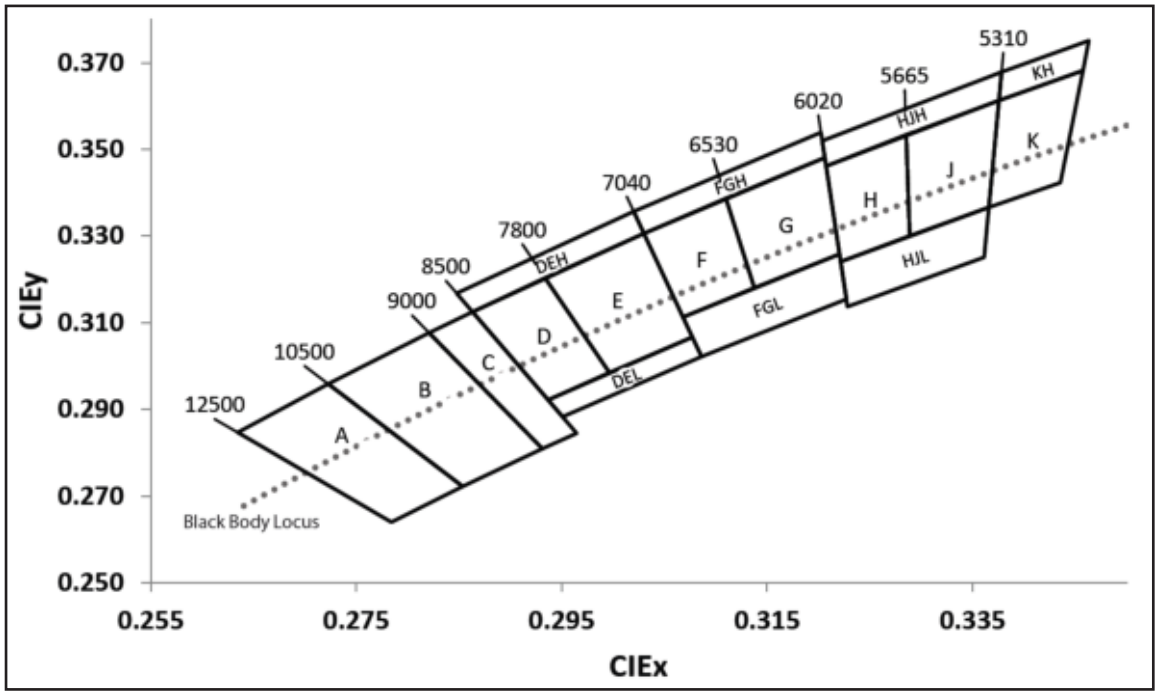
3. Individual bins are not orderable. Please refer to the Product Ordering information page for a list of orderable bin kits.

4. Product test condition: 22.5 A DC, 40°C heat sink temperature.

5. T_{hs}= heat sink temperature.

Binning Structure

Chromaticity Binning Diagram



Note:

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

Binning Structure

Chromaticity Binning Coordinates

Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy	Bin Code	CIEx	CIEy
A	0.2635	0.2847	DEH	0.2848	0.3168	G	0.3110	0.3387	K	0.3376	0.3613
	0.2697	0.2927		0.3020	0.3357		0.3206	0.3480		0.3457	0.3682
	0.2833	0.2699		0.3030	0.3306		0.3220	0.3258		0.3436	0.3423
	0.2784	0.2640		0.2863	0.3125		0.3137	0.3181		0.3366	0.3366
B	0.2697	0.2927	E	0.2934	0.3204	H	0.3207	0.3461	KH	0.3378	0.3678
	0.2821	0.3076		0.3030	0.3306		0.3285	0.3533		0.3463	0.3751
	0.2931	0.2809		0.3077	0.3067		0.3289	0.3300		0.3457	0.3682
	0.2833	0.2699		0.2996	0.2985		0.3222	0.3241		0.3376	0.3613
C	0.2821	0.3076	F	0.3030	0.3306	HJL	0.3222	0.3241			
	0.2863	0.3125		0.3110	0.3387		0.3366	0.3366			
	0.2965	0.2845		0.3137	0.3181		0.3361	0.3251			
	0.2931	0.2809		0.3068	0.3113		0.3228	0.3137			
D	0.2863	0.3125	FGH	0.3020	0.3357	HJH	0.3204	0.3519			
	0.2934	0.3204		0.3202	0.3539		0.3378	0.3678			
	0.2996	0.2985		0.3206	0.3480		0.3376	0.3613			
	0.2937	0.2922		0.3030	0.3306		0.3207	0.3461			
DEL	0.2937	0.2922	FGL	0.3068	0.3113	J	0.3285	0.3533			
	0.3077	0.3067		0.3220	0.3258		0.3376	0.3613			
	0.3086	0.3022		0.3227	0.3154		0.3366	0.3366			
	0.2951	0.2883		0.3086	0.3022		0.3289	0.3300			

Characteristics

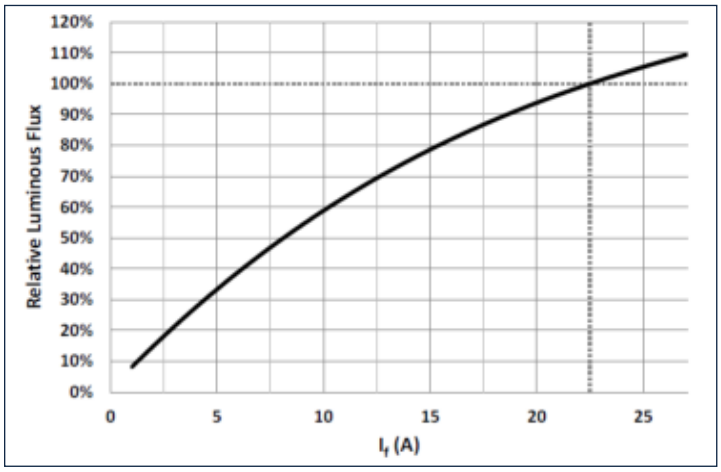
Optical and Electrical Characteristics	Symbol	Value			Unit
		WSS	WCS	WDS	
Emitting Area	A_E	9.0			mm^2
Emitting Area Dimension	LES	3.0 x 3.0			mm x mm
Typical Peak Luminous Flux[1,2]	Φ_V	5,300	5,400	5,500	lm
Typical Peak Radiometric Flux[1,2]	Φ_E	17.4	17.2	17.0	W
Viewing Angle (50% of peak flux)	$2\ \emptyset_{1/2}$	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]	$R_{th\,j\text{-}b}$	0.35-0.55			°C/W
Thermal Resistance (junction to thermistor)[3]	$R_{th\,j\text{-}ref}$	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.

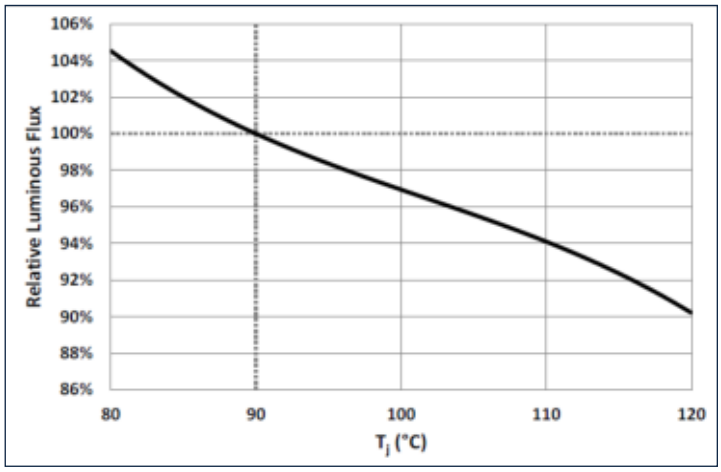
Relative Luminous Flux vs Forward Current

T_{hs} = 40°C



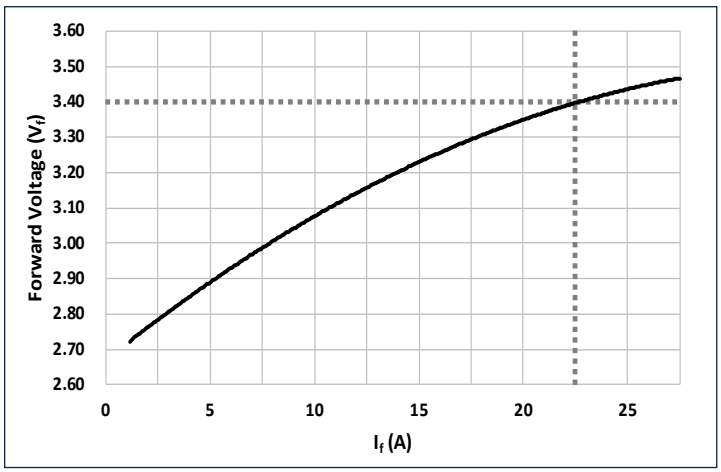
Relative Luminous Flux vs Temperature

I_f = 22.5 A



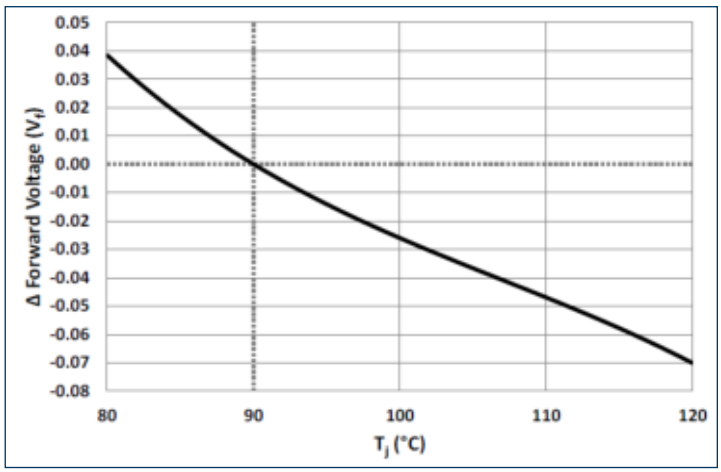
Forward Voltage vs Forward Current

T_{hs} = 40°C



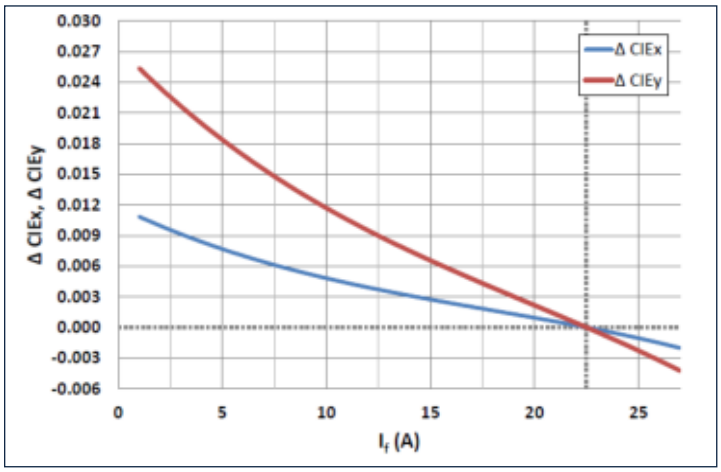
Forward Voltage vs Temperature

I_f = 22.5 A



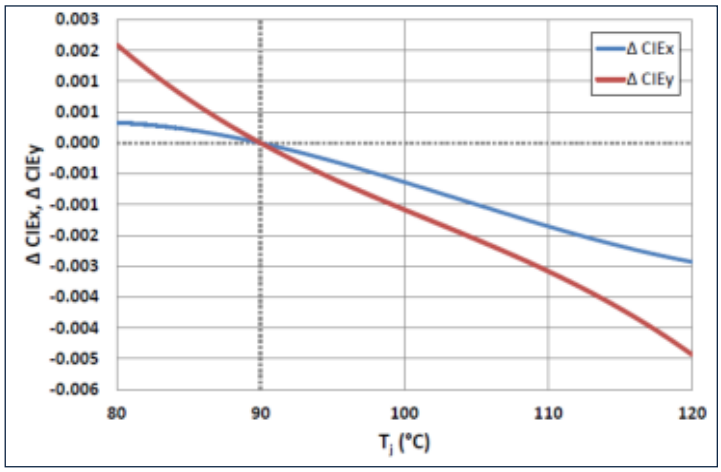
Relative Chromaticity vs Forward Current

T_{hs} = 40°C



Relative Chromaticity vs Temperature

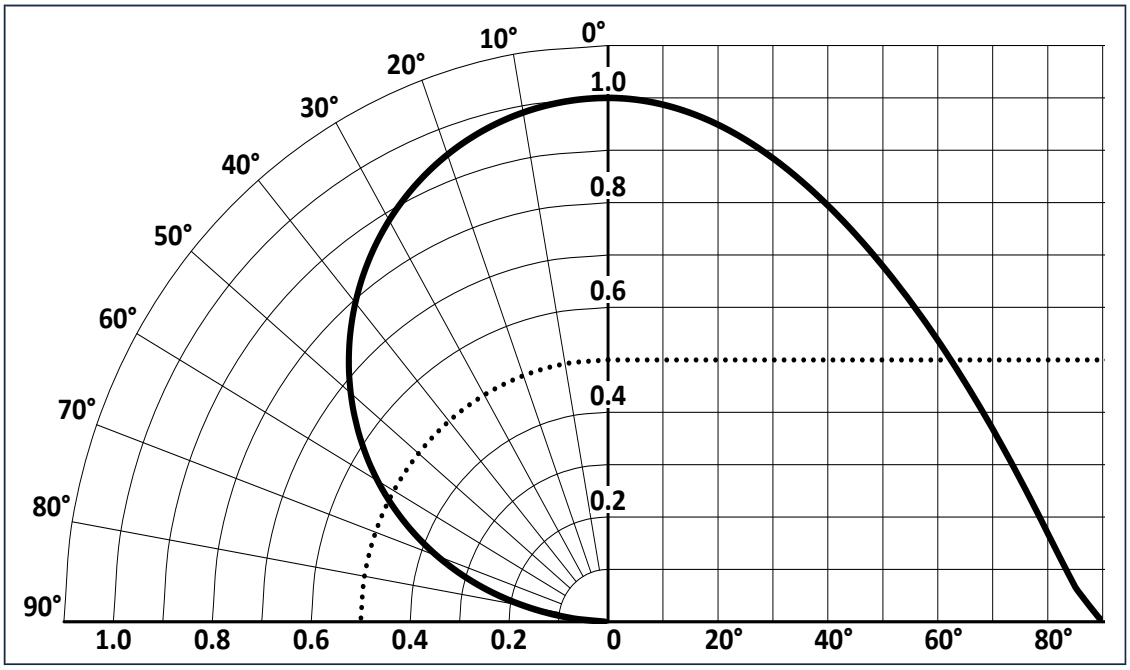
I_f = 22.5 A



Angular Distribution and Typical Spectrum

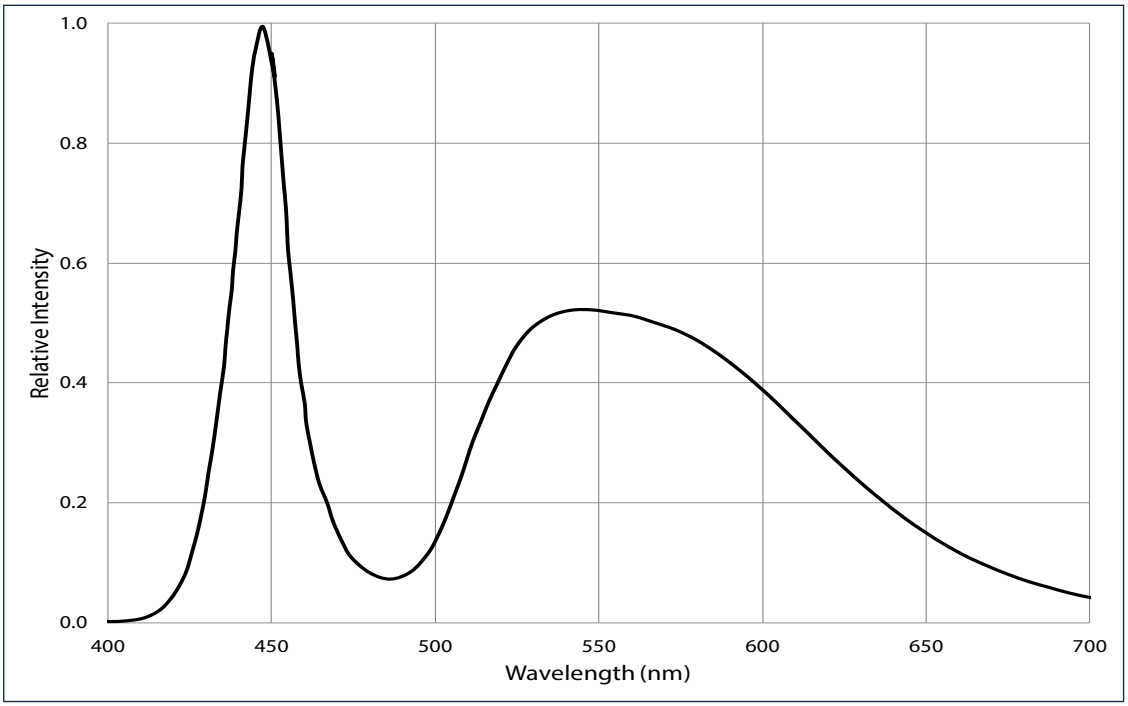
Angular Distribution

$I_{ref} = f(\Phi)$; $T_c = 25°C$



Typical Spectrum

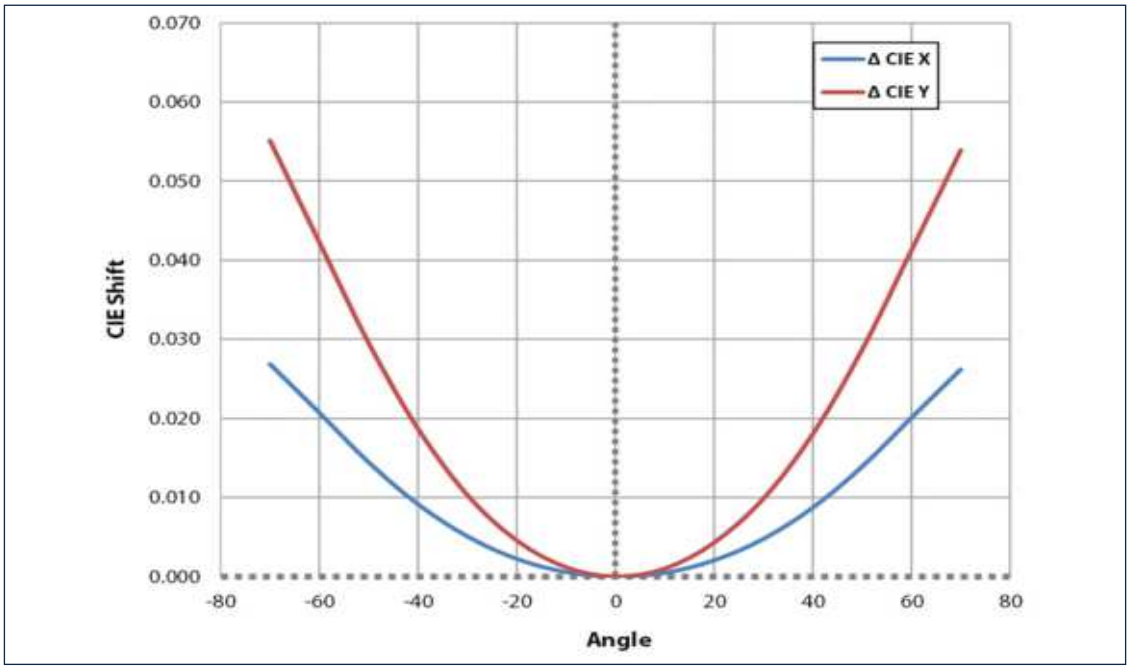
$\Phi_{ref} = f(\lambda)$; $I_f = 22.5$ A; $T_c = 25°C$



Angular Distribution and Typical Spectrum

Color Over Angle

$I_{ref} = f(\Phi)$; $T_c = 25°C$



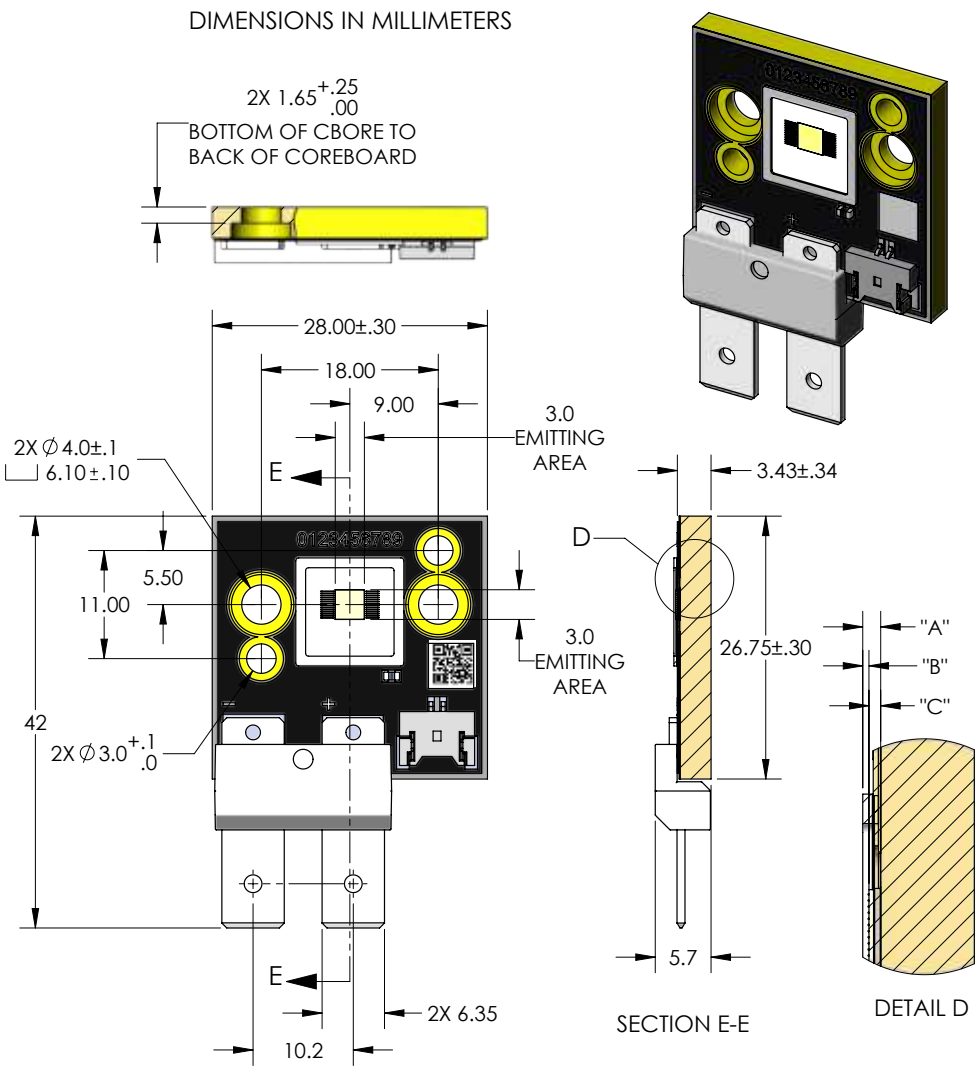
Absolute Maximum Ratings

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<=1ms)	$I_{surge\ max}$	36	A
Storage Temperature	$T_{s\ min}$	-40	°C
	$T_{s\ max}$	100	
Junction Temperature[2]	$T_{j\ max}$	150	°C
Operating Temperature	$T_{opr\ min}$	-40	°C
	$T_{opr\ max}$	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.

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.

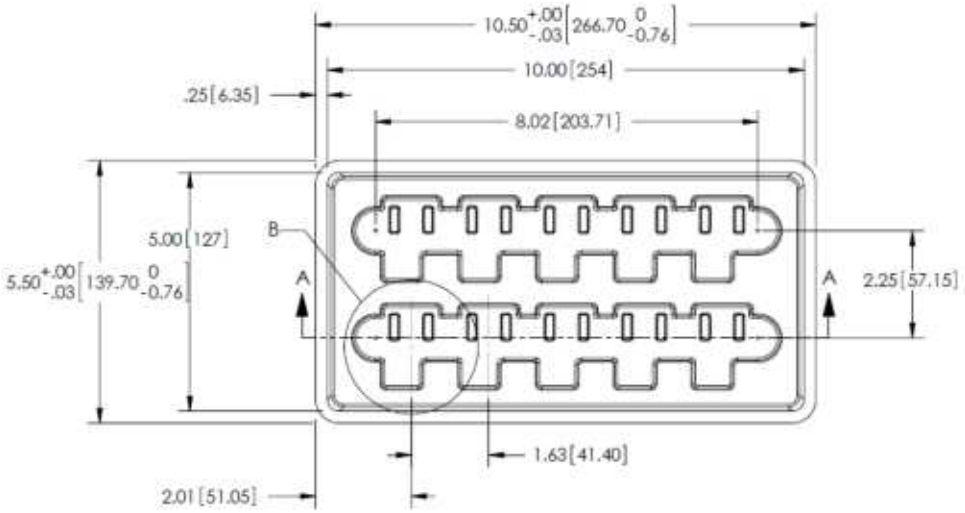
Please note that the CFT-90-W copper PCB is electrically active with a common Cathode (-) polarity.

Recommended Female Thermistor Connector (Mating connector):

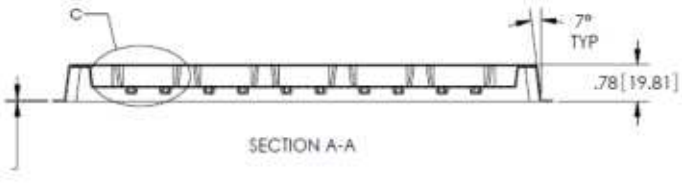
TYU P/N TU1212HNO-02 or equivalent

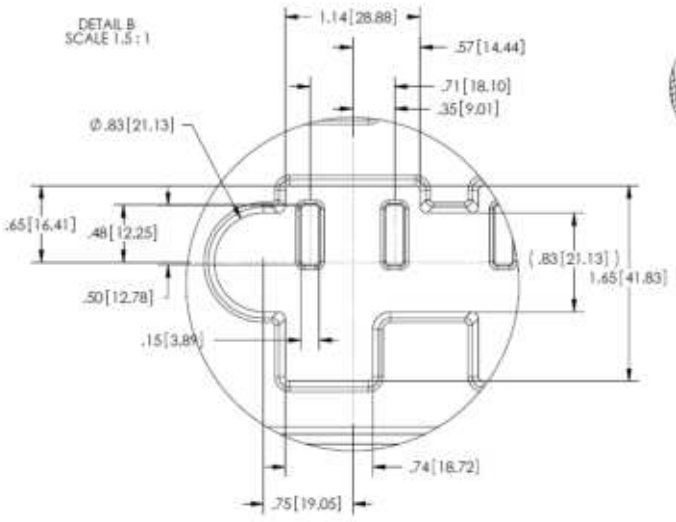
For detailed drawing please refer to DWG-002705 document

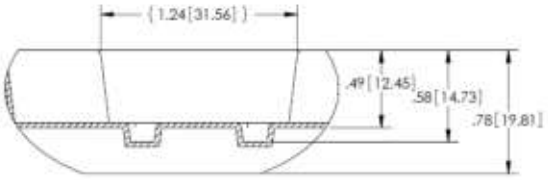
Shipping Tray Outline









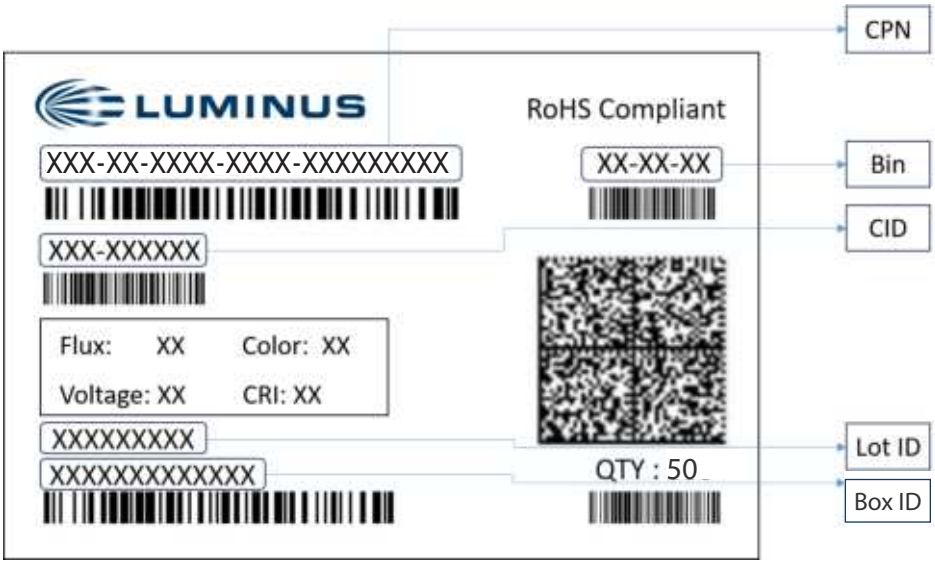


DETAIL C
SCALE 2 : 1



TOP TRAY SHOWN TRANSPARENT
FOR REFERENCE ONLY

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:

- 10 devices per tray, with a maximum stack of 5 trays per pack
- Partial pack or tray may be shipped
- Each pack is enclosed in anti-static moisture barrier bag
- The shipping label is placed on top of each pack

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.

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
05	12/06/2024	Editorial update on page 5 and 6 notes.Update recommended female thermistor connector PN.
06	05/05/2025	Update template. Update Chromaticity binning coordinates to four decimal places.