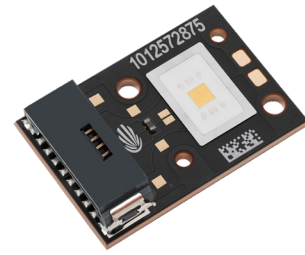


# CFT-50X-WDH

## High CRI White LED



### Features

- Monolithic electrically isolated White LED with 5 mm<sup>2</sup> emitting area for optimal coupling into 2-4 mm diameter fiber bundles
- Over 2800 lumens at maximum drive current
- Comprehensive product line spanning the entire visible range in the same package platform
- High drive current operation: up to 10 A under CW conditions and 12.5 A under pulse conditions
- Windowless package improves coupling-efficiency into fiber optics
- Excellent peak wavelength stability with current and temperature across the spectrum
- Compatible with high voltage / low current operation



### Applications

- Fiber-coupled Illumination
- Life-science/ Biomedical
- Fluorescence microscopy
- Machine Vision
- Industrial Lighting
- Light engines

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## Ordering Information

### Ordering Part Numbers<sup>1,2</sup>

Color	Luminous flux		Chromaticity		Ordering Part Number
	Min. Flux Bin	Min. Flux	CRI	Bins	
WDH	LD	2100 lm	>85	R*, S*, T*	CFT-50X-WDH-L42-LD261
	LD	2100 lm	>85	R*, S*	CFT-50X-WDH-L42-LD260
	LD	2100 lm	>85	S*, T*	CFT-50X-WDH-L42-LD257
	LD	2100 lm	>88	R*, S*, T*	CFT-50X-WDH-L42-LD561
	LD	2100 lm	>88	R*, S*	CFT-50X-WDH-L42-LD560
	LD	2100 lm	>88	S*, T*	CFT-50X-WDH-L42-LD557

### Part Number Nomenclature

CFT	50X	W<tc>	L42	<Bin kit>
Product Family	Chip Area	Color	Package Configuration	Bin Kit
CFT: Copper-core PCB, no encapsulation	50X: 5.0 mm <sup>2</sup>	W: White t: Color temperature -D: Daylight c: CRI -H: High	Internal package code	Refer to ordering part numbers in this document

#### Note

1. Flux Bin listed is minimum bin shipped, higher bins may be included at Luminus' discretion.
2. Product test condition: 7.5 A, 20 ms single pulse, 25°C case temperature.



## Binning Structure

### Flux Bins<sup>1,2</sup>

Color	Luminous Flux Bin <sup>3</sup>	Binning @ 7.5 A, T <sub>c</sub> = 25°C <sup>4</sup>	
		Minimum Flux (lm)	Maximum Flux (lm)
WDH	LD	2100	2250
	LE	2250	2400
	LF	2400	2600
	LG	2600	2800

### CRI Bins<sup>1,2</sup>

Color	CRI Bin <sup>3</sup>	Binning @ 7.5 A, T <sub>c</sub> = 25°C <sup>4</sup>		Correlated CRI (CW)	
		Minimum CRI	Maximum CRI	Minimum CRI	Maximum CRI
WDH	C2	85	88	88	91
	C5	88	90	91	93
	C7	90	100	93	100

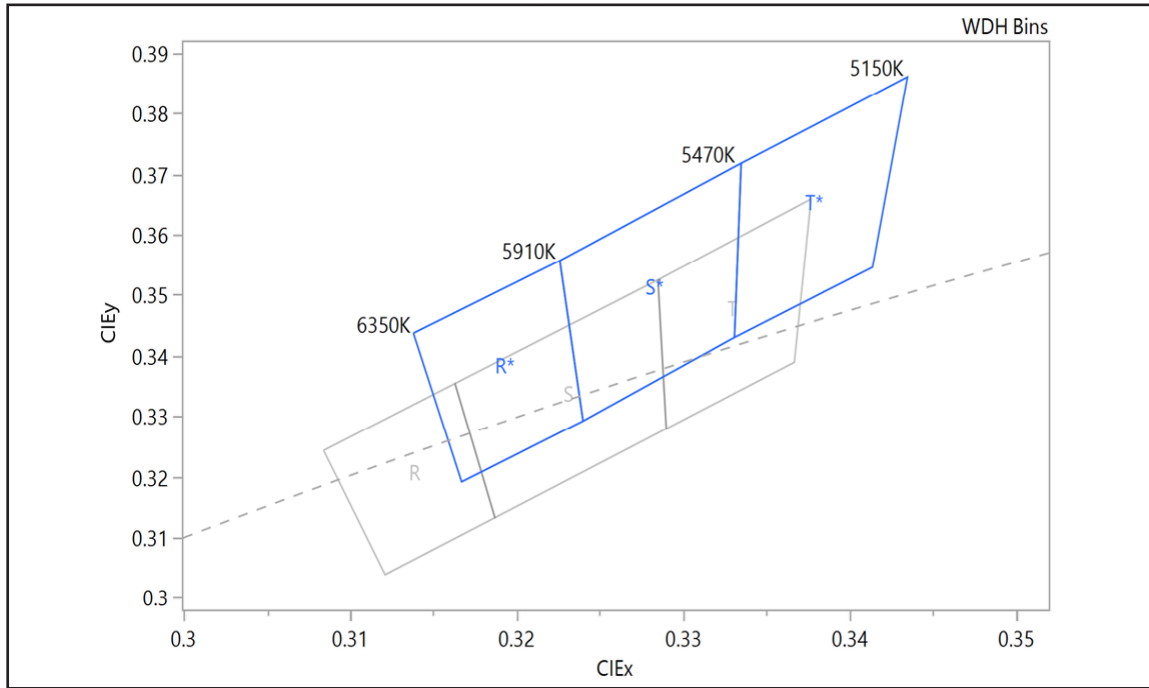
**Note:**

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: 7.5 A, 20 ms single pulse, 25°C case temperature.



## Binning Structure

### Chromaticity Bins



### Chromaticity Binning Coordinates<sup>1,2</sup>

Bin Code	CIE <sub>x</sub>	CIE <sub>y</sub>	Bin Code	CIE <sub>x</sub>	CIE <sub>y</sub>	Bin Code	CIE <sub>x</sub>	CIE <sub>y</sub>
R*	0.3138	0.3437	S*	0.3226	0.3557	T*	0.3335	0.3718
	0.3167	0.3191		0.3240	0.3292		0.3331	0.3430
	0.3240	0.3292		0.3331	0.343		0.3414	0.3546
	0.3226	0.3557		0.3335	0.3718		0.3435	0.3861

- Note:**
1. Product test condition: 7.5 A, 20 ms single pulse, 25°C case temperature.
  2. R\*, S\*, and T\* represent the correlated color bins corresponding to R, S, and T, respectively, under continuous wave (CW) test conditions.



## Absolute Maximum Ratings

	Symbol	Values	Unit
Minimum Forward Current (CW or Pulsed) <sup>1</sup>	$I_{f \min}$	0.1	A
Maximum Forward Current (CW) <sup>2</sup>	$I_{f \text{ CW max}}$	10.0	
Maximum Forward Current (Pulsed) <sup>2</sup> (duty cycle < 50%)	$I_{f \text{ Pulsed max}}$	12.5	
Forward Surge Current (Pulsed) <sup>2</sup> (Frequency >240Hz, duty cycle <10%, t=1ms)	$I_{\text{surge max}}$	15	A
Storage Temperature		100	°C
Junction Temperature <sup>2</sup>	$T_{j \text{ max}}$	150	°C

**Note:**

1. For reference only.
2. CFT-50X-WDH LED is designed for operation current up to 10 A under CW conditions, 12.5 A under pulse conditions 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 life time compared to recommended conditions.



## Device Characteristics<sup>1,2,3</sup>

Optical and Electrical Characteristics		Symbol	Value	Unit
Emitting Area		$A_E$	4.95	mm <sup>2</sup>
Emitting Area Dimension			2.225 x 2.225	mm x mm
Test Peak Drive Current		$I_f$	7.5	A
Peak Luminous Flux <sup>4,5,6</sup>		$\Phi_V$	2300	lm
Peak Radiometric Flux <sup>4,5,6</sup>		$\Phi_E$	7.3	W
Forward Voltage		$V_{f\ min}$	6.4	V
		$V_f$	7.2	
		$V_{f\ max}$	8.0	
Color Rendering Index (SP)	Typical	CRI	90	
CRI (CW) - CRI (SP)	Typical		+3	
Thermal Characteristics				
Thermal Resistance (junction to case) <sup>8</sup>		$R_{\theta j-c\ real}$	0.85	°C/W
Thermal Resistance at WPE = 15% (junction to case) <sup>8,9</sup>		$R_{\theta j-c\ elec}$	0.72	°C/W
Thermal Resistance at WPE = 15% (junction to thermistor) <sup>8,9</sup>		$R_{\theta j-ref\ elec}$	0.84	°C/W
Thermal Coefficient of Photometric Flux			-0.3	%/°C
Thermal Coefficient of Radiometric Flux			-0.3	%/°C
Forward Voltage Temperature Coefficient			-4.5	mV/°C

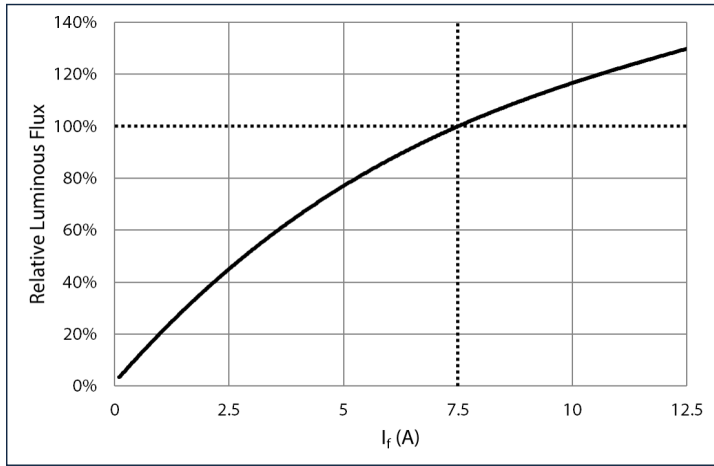
**Note:**

- All ratings are based on operation with a constant case temperature  $T_c = 25^\circ\text{C}$ .
- CFT-50X-WDH device can be driven at currents ranging from 100 mA to 12.5 A and at duty cycles ranging from 1% to 100%. Drive current and duty cycle should be adjusted as necessary to maintain the junction temperature desired to meet application lifetime requirements.
- Tested at Current of 7.5 A, 20 ms single pulse.
- Unless otherwise noted, values listed are typical. Devices are production tested and specified at 7.5 A.
- Total flux from emitting area at listed peak 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.
- Caution must be taken not to stare at the light emitted from these LEDs. Under special circumstances, the high intensity could damage the eye.
- In CIE 1931 chromaticity diagram coordinates, normalized to X+Y+Z=1.
- Measurements are in accordance with JEDEC 51-14.
- $R_{\theta j-ref}$  is measured on a water-cooled stage with e-graf as the thermal interface material.  $R_{\theta j-ref}$  is system-dependent. For instructions on how to calculate  $R_{\theta j-ref}$  for your specific system, please refer to application brief [https://download.luminus.com/datasheets/Luminus-White-Paper-Thermal-Mgmt\\_Thermistors.pdf](https://download.luminus.com/datasheets/Luminus-White-Paper-Thermal-Mgmt_Thermistors.pdf)

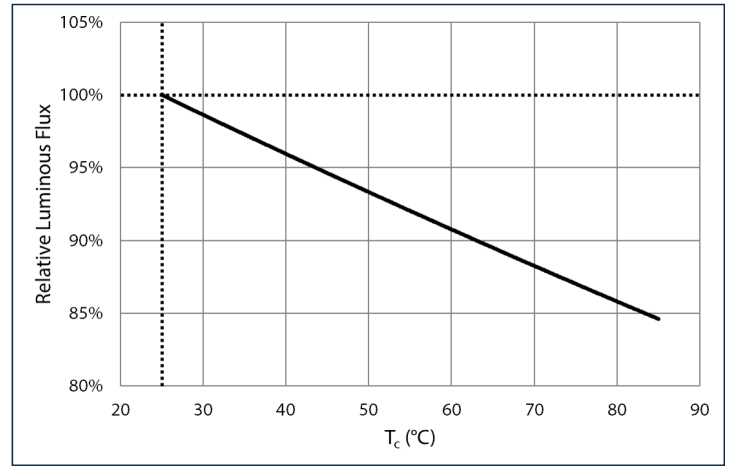


### Relative Luminous Flux-Single Pulse Mode

Forward current:  $\phi_v/\phi_v(7.5\text{ A})$  Single Pulse 20 ms,  $T_c = 25^\circ\text{C}$

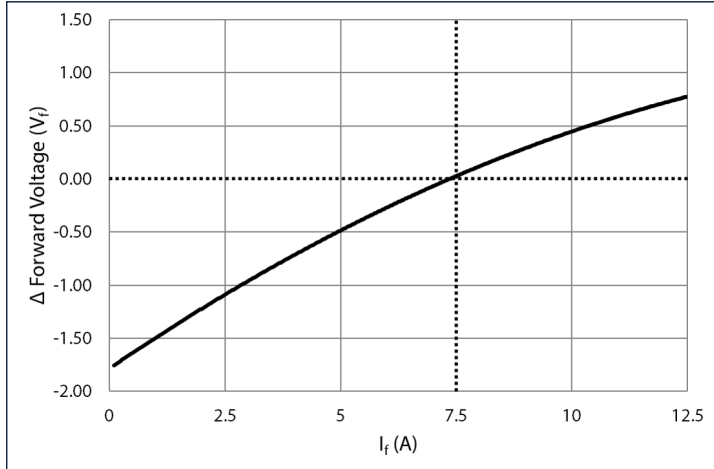


Temperature:  $\phi_v/\phi_v(25^\circ\text{C})$  Single Pulse 20 ms,  $I_f = 7.5\text{ A}$

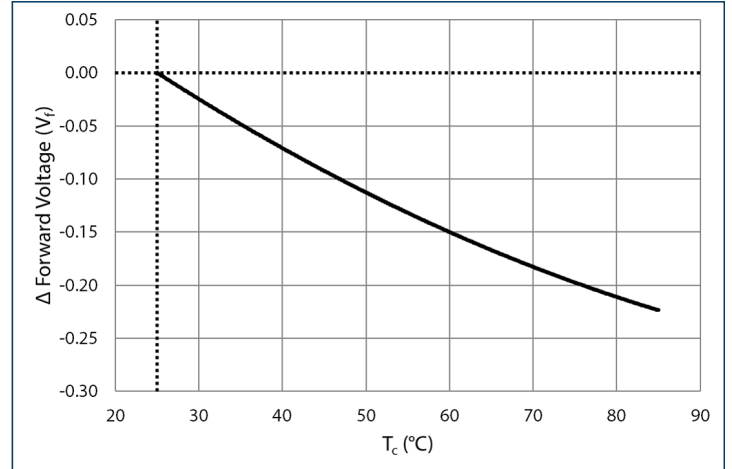


### Forward Voltage-Single Pulse Mode

Forward current:  $\Delta V_f = V_f(I_f) - V_f(7.5\text{ A})$  Single Pulse 20 ms,  $T_c = 25^\circ\text{C}$

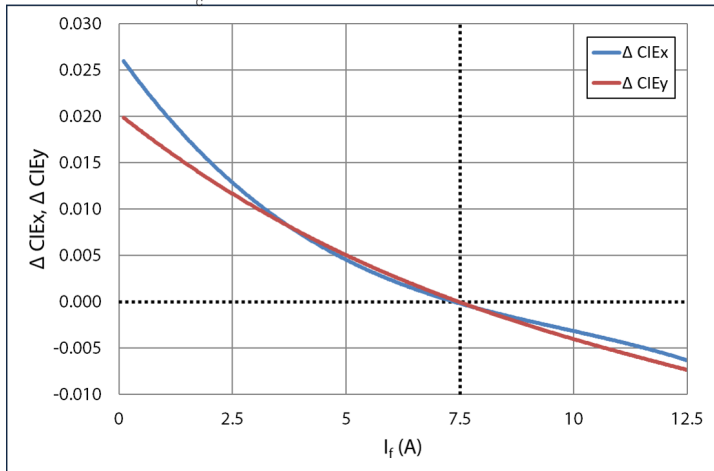


Temperature:  $\Delta V_f = V(T_c) - V(25^\circ\text{C})$  Single Pulse 20 ms,  $I_f = 7.5\text{ A}$

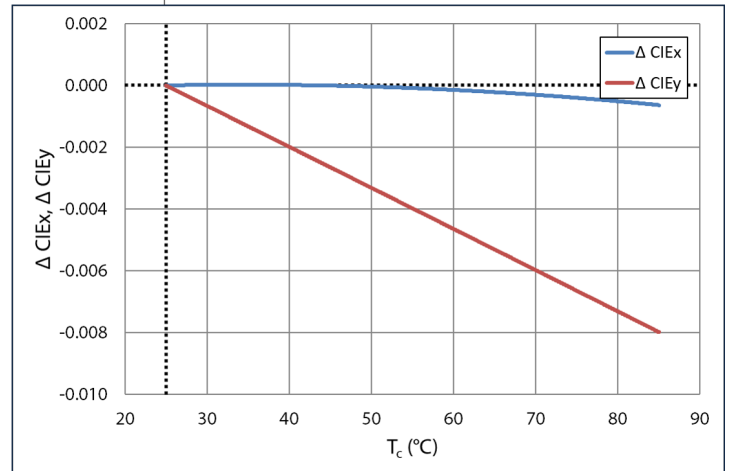


### Chromaticity Shift-Single Pulse Mode

Forward current:  $\Delta \text{CIEx,y} = \text{CIEx,y}(I_f) - \text{CIEx,y}(7.5\text{ A})$  Single Pulse 20 ms,  $T_c = 25^\circ\text{C}$



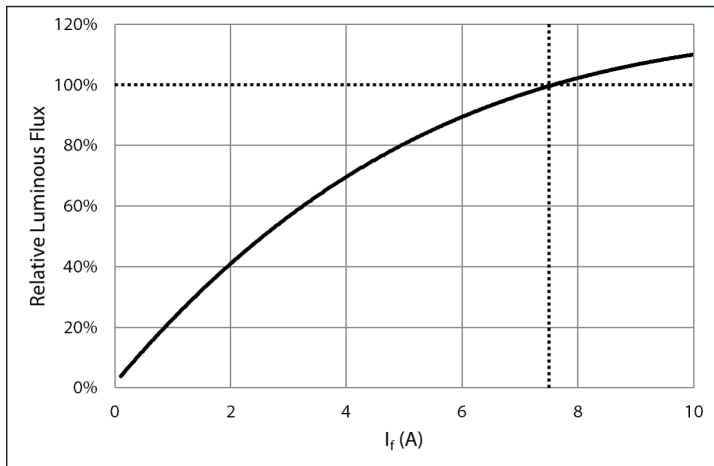
Temperature:  $\Delta \text{CIEx,y} = \text{CIEx,y}(T_c) - \text{CIEx,y}(25^\circ\text{C})$  Single Pulse 20 ms,  $I_f = 7.5\text{ A}$



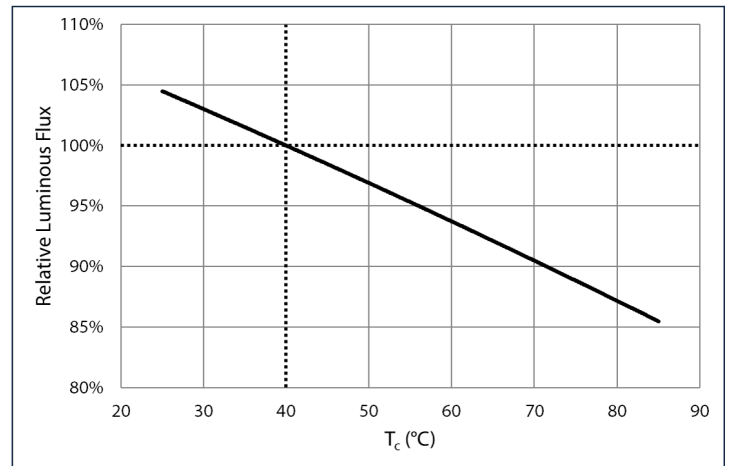


### Relative Luminous Flux-CW Mode

Forward current:  $\phi_v/\phi_v(7.5\text{ A})$  CW,  $T_c = 40^\circ\text{C}$

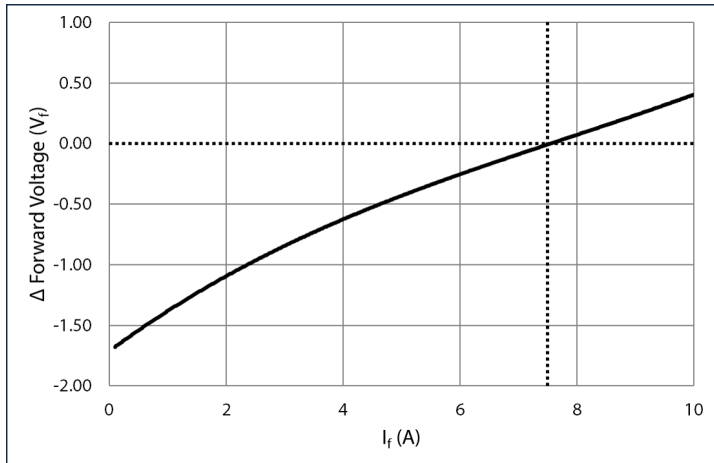


Temperature:  $\phi_v/\phi_v(40^\circ\text{C})$  CW,  $I_f = 7.5\text{ A}$

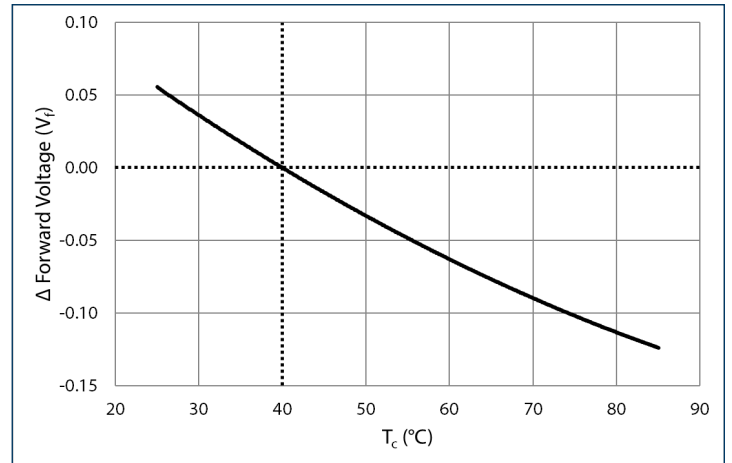


### Forward Voltage-CW Mode

Forward current:  $\Delta V_f = V_f(I_f) - V_f(7.5\text{ A})$  CW,  $T_c = 40^\circ\text{C}$

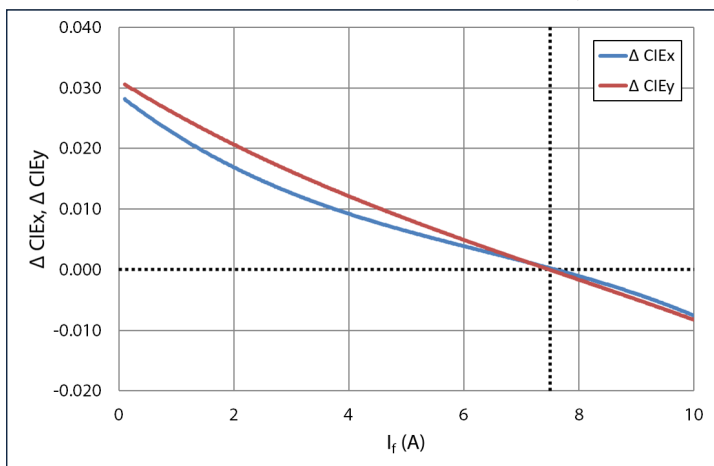


Temperature:  $\Delta V_f = V(T_c) - V(40^\circ\text{C})$  CW,  $I_f = 7.5\text{ A}$

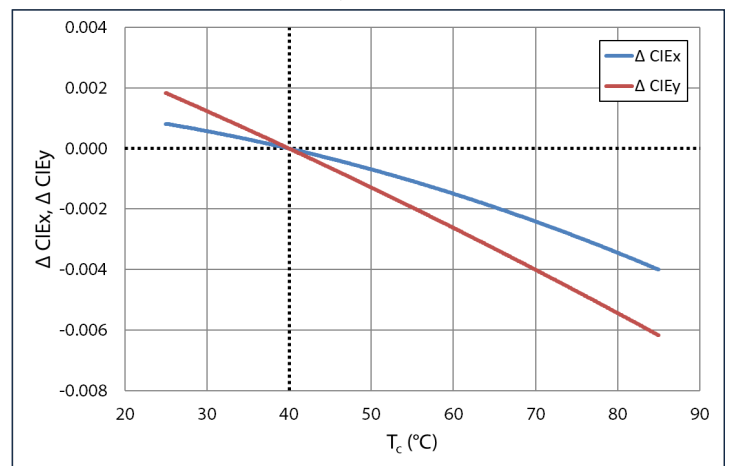


### Chromaticity Shift-CW Mode

Forward current:  $\Delta \text{CIEx,y} = \text{CIEx,y}(I_f) - \text{CIEx,y}(7.5\text{ A})$  CW,  $T_c = 40^\circ\text{C}$



Temperature:  $\Delta \text{CIEx,y} = \text{CIEx,y}(T_c) - \text{CIEx,y}(40^\circ\text{C})$  CW,  $I_f = 7.5\text{ A}$



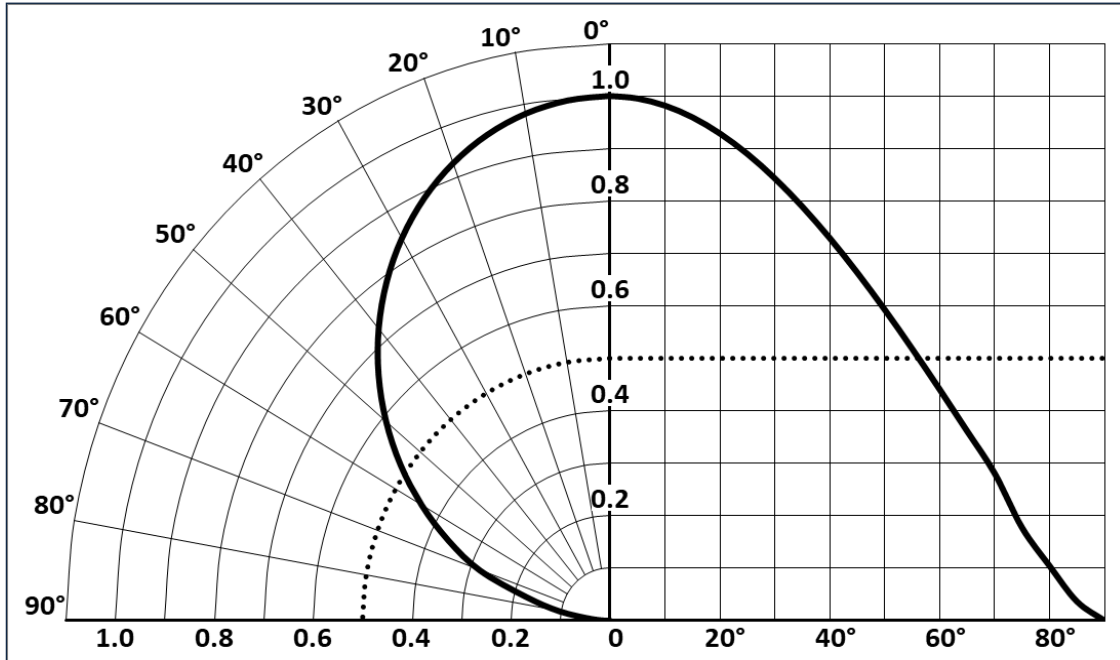




## Angular Distribution and Typical Spectrum

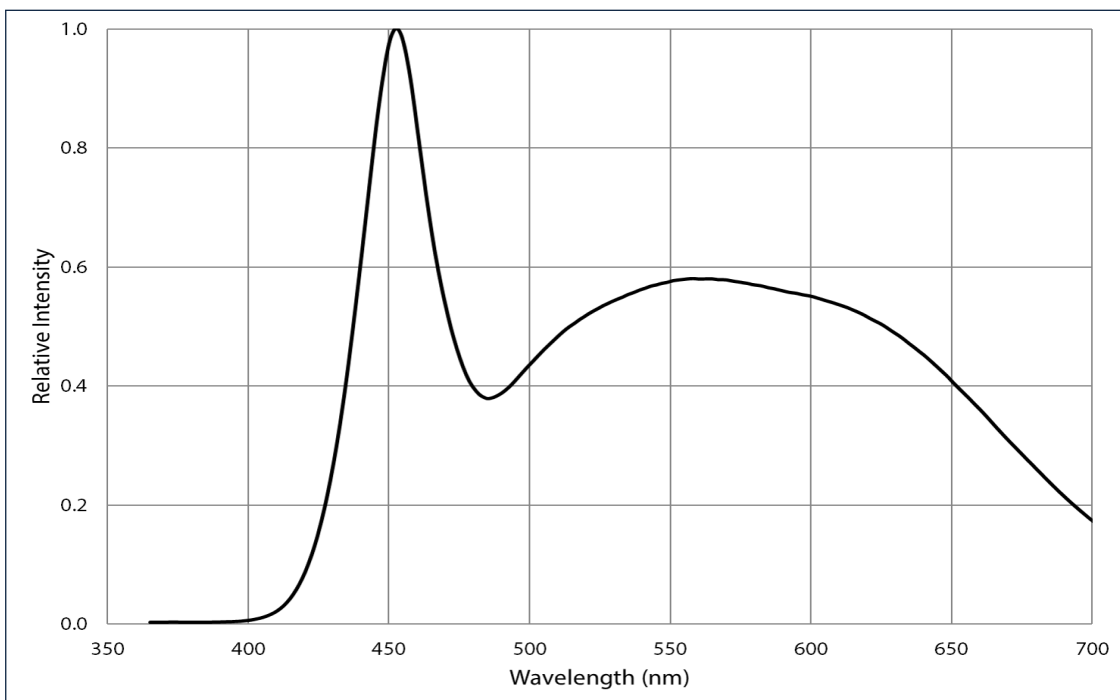
### Angular Intensity Distribution

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



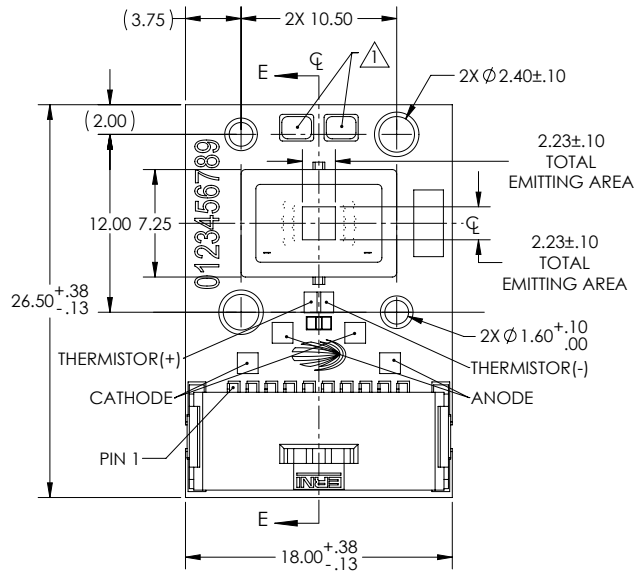
### Typical Spectrum


$$\Phi_{\text{ref}} = f(\lambda); I_f = 7.5 \text{ A}; T_c = 25^\circ\text{C}$$



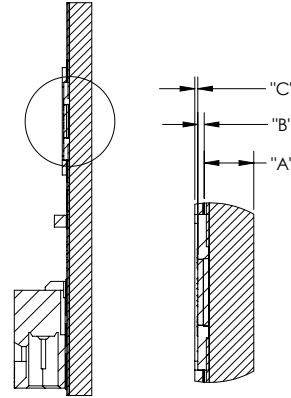
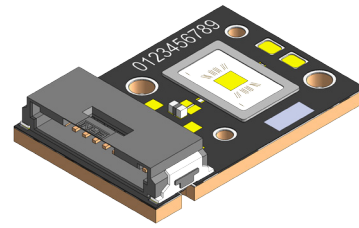
## Mechanical Dimensions

DIMENSIONS IN MILLIMETERS

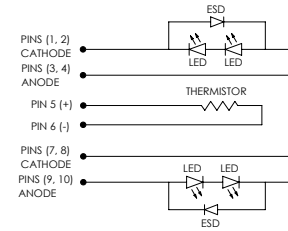


NOTES:  
 TEST PADS ARE ELECTRICALLY CONNECTED TO THE BOARD COPPER BASE.

PIN NO(S).	ASSIGNMENT
1,2	CATHODE (-)
3,4	ANODE (+)
5	THERMISTOR (+)
6	THERMISTOR (-)
7,8	CATHODE (-)
9,10	ANODE (+)



SECTION E-E



PINS 1, 2, 7, 8 (CATHODE) AND 3, 4, 9, 10 (ANODE) MUST BE POWERED SIMULTANEOUSLY

LED CIRCUIT DIAGRAM

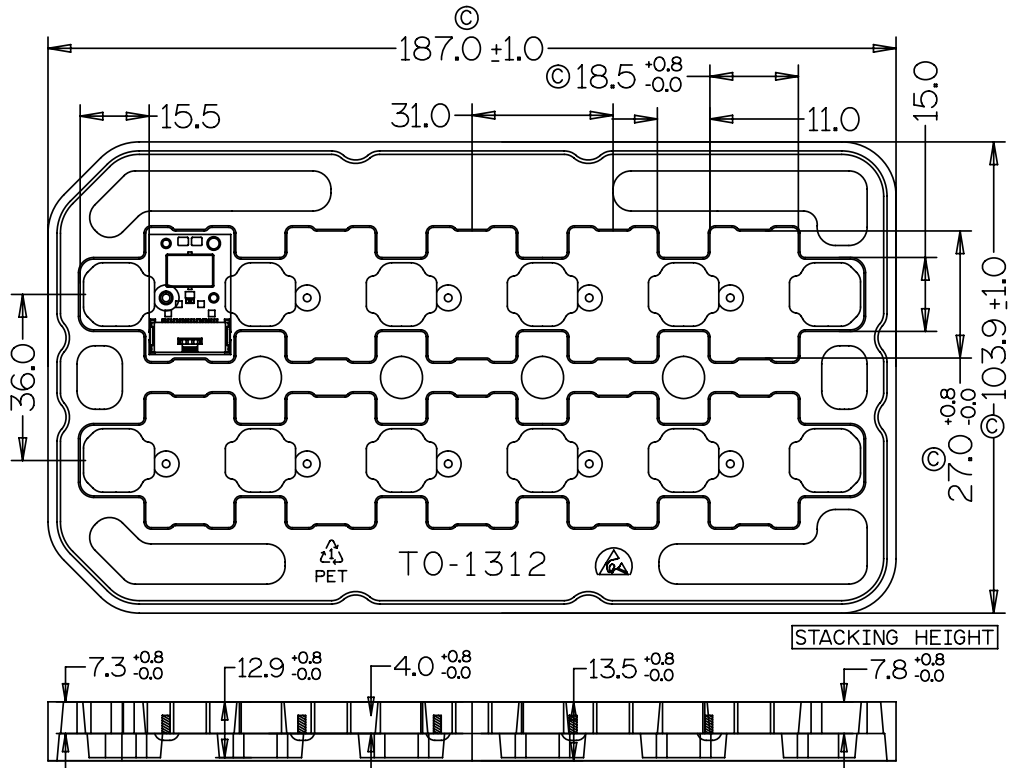
DEVICE CONFIG. CFT-50X	DIMENSIONS					
	"A"		"B"		"C"	
WCS	1.67	±.10	.21	±.04	.11	±.13
WDH			.22	±.04	.10	
"A" - TOP OF METAL SUBSTRATE TO BACK OF COREBOARD						
"B" - TOP OF METAL SUBSTRATE TO TOP OF LIGHT EMITTING AREA						
"C" - TOP OF LIGHT EMITTING AREA TO TOP OF FRAME						

DWG-003415 REVA

- For detailed drawing please refer to DWG-003415 document.
- The CFT-50X-WDH copper PCB is electrically neutral.
- Mating connector P/N: TE Connectivity (ERNI) 484084-E
- Check NEC standards for ampacity of the power cable being used.
- Recommended wire: MIL-W-16878/6 Type ET or equivalent
- Minimum requirements, manufacturer:
  - Gauge: AWG 22, Type: 7-strand plated copper or solid copper core
  - Maximum Outer Diameter (OD): 1.27 mm
  - Insulation material: PTFE or ETFE required for high-temperature and high-current rating



## Shipping Tray Outline

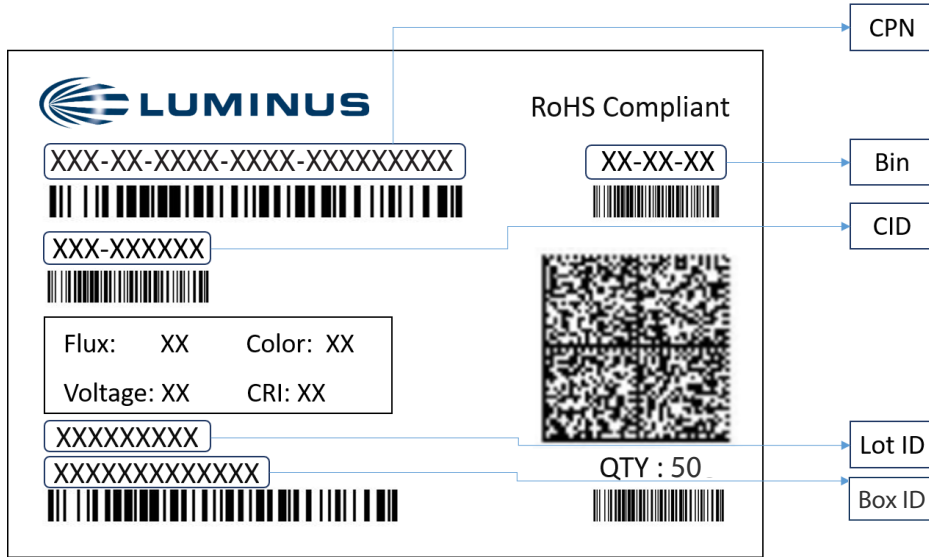


**Note:**

1. The maximum draft is 5 degrees unless otherwise stated.
2. All radii are to be 1.25 mm unless otherwise stated.
3. The surface resistivity is 10E6 ~ 10E9 Ohm/sq unless otherwise stated.
4. All cells are identical.
5. All dimensions are in millimeters (mm).
6. All numbers with © symbol designate a manufacturing inspection point.
7. All numbers without © symbol are for reference purposes only.
8. The material used is RoHS compliant.



## 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 3
- Voltage: NA
- Color: Bin as defined on page 3
- 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

### Eye Safety

According to the test specification risk group IEC 62471: 2006-Worst case under 10 A, this product complies to Risk group 2 (RG2) Moderate risk.

Do not stare at operating lamp, may be harmful to the eyes.

For more information, please refer to: <https://luminusdevices.zendesk.com/hc/en-us/articles/10532958752397>.



## Revision History

Rev	Date	Description of Change
01	01/07/2025	Initial release.