

CFT-90 Converted Green High Brightness Green LED

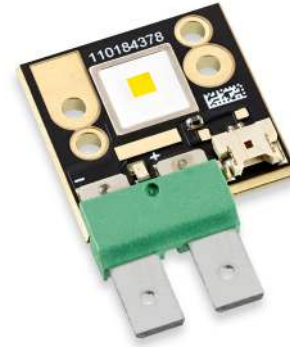


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Features

- Large, monolithic chip with uniform emitting area of 9 mm²
- Phosphor Converted Green LED device with typical center wavelength emission of 576 nm
- Windowless package improves coupling-efficiency into fiber optics
- Common Anode package design with low thermal resistance of 0.45°C/W typical (junction to case)
- Ultra High thermal conductivity package allows operation at up to 22.5 A CW
- High precision LEDs placement on copper core PCB for easier thermal management and optical integration
- Environmentally friendly: RoHS and Halogen compliant

Applications

- Fluorescence Microscopy and imaging
- Medical Endoscopy

Ordering Information

Ordering Part Numbers

Color	Luminous Flux		Ordering Part Number
	Min. Power	Min. Power Bins	
Converted Green	11.38	CG3	CFT-90-CG-L11-G300
	13.69	CG4A	CFT-90-CG-L11-G400

Part Number Nomenclature

CFT — 90 — CG — L## — FF###

Product Family	Chip Area	Color	Package Configuration	Bin Kit ^{1,2}
CFT: Copper-core PCB, No Encapsulation	90: 9 mm ²	CG: Converted Green	Internal package code	Refer to ordering part numbers in this document

Note 1: A Bin Kit represents a group of individual flux or power bins that are shippable for a given ordering part number. Individual flux bins are not orderable.

Note 2: Flux Bin listed is minimum bin shipped - higher bins may be included at Luminus' discretion.

CFT-90 CG Binning Structure

All CFT-90 Converted Green LEDs are tested for radiometric power / center wavelength and placed into the following flux/ wavelength bins. The binning structure is universally applied across each monochromatic color of the CFT-90 product line.

Flux Bins^{1,2}

Color	Luminous Flux Bin (FF) ³	Binning @ 22.5 A CW, T _c = 40°C ^{4, 5}	
		Minimum Power (W)	Maximum Power (W)
Converted Green	CG3	11.38	12.8
	CG3B	12.8	13.69
	CG4A	13.69	14.92
	CG4B	14.92	15.74

Center Wavelength Bins²

Color	Binning @ 22.5 A CW, T _c = 40°C ^{4, 5}	
	Minimum Wavelength (nm)	Maximum Wavelength (nm)
Converted Green	573	579

Note 1: Luminus maintains a +/- 6% tolerance on flux measurements.

Note 2: Products are production tested then sorted and packed by bin.

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

Note 4: Product test condition: 22.5 A CW, 40°C case temperature.

Note 5: T_c = Case temperature.

Typical Device Performance

General Characteristics		Symbol	Value	Unit
Emitting Area		A_e	9.0	mm ²
Emitting Area Dimensions			3.0 x 3.0	mm x mm
Characteristics at Recommended Test Drive Current (I_f) ^{1,2}				
Reference Duty Cycle			100	%
Test Peak Drive Current	typ	I_f	22.5	A
Radiometric Flux ^{3,4,5}	min	Φ_{rmin}	11.38	W
	typ	Φ_r	13.69	W
	max	Φ_{rmax}	15.75	W
Filtered Radiometric Power in [500 to 600nm] range (for reference only).	min	Φ_{frmin}	7.4	W
	typ	Φ_{fr}	8.9	W
	max	Φ_{frmax}	10.2	W
Center Wavelength ³	min	λ_{cmin}	573	nm
	typ	λ_c	576	nm
	max	λ_{cmax}	579	nm
FWHM- Spectral bandwidth at 50% of Φ_v^3	min		91	nm
	typ		103	nm
	max		115	nm
Forward Voltage	min	V_{Fmin}	3.2	V
	typ	V_F	3.4	V
	max	V_{Fmax}	4.4	V
Device Thermal Characteristics				
Thermal Resistance of junction to case ⁶ (electrical)	typ	$R_{th(j-c)}$	0.45	°C/W
Thermal Resistance of junction to thermistor ^{6,7} (electrical)	typ	$R_{th(j-ref)}$	0.48	°C/W
Thermal Coefficient of Photometric Flux	typ		-0.3	%/°C
Thermal Coefficient of Radiometric Flux	typ		-0.3	%/°C
Forward Voltage Temperature Coefficient	typ		-2	mV/°C
Angular Distribution Pattern				
Viewing angle at 50 % I_v^8		2ϕ	120+/-6	degrees

Absolute Maximum Ratings

	Symbol	Value	Unit
Absolute Minimum Current (CW or Pulsed) ⁹		0.2	A
Absolute Maximum Current (CW) ¹⁰		22.5	A
Absolute Maximum Surge Current ¹⁰ (Frequency > 240 Hz, duty cycle =10%, t = 1ms)		36	A
Absolute Maximum Junction Temperature ¹⁰	T_{jmax}	170	°C
Storage Temperature Range		-40/+100	°C

Note 1: All ratings are based on operation with a constant case temperature $T_c = 40^\circ\text{C}$.

Note 2: CFT-90 Converted Green devices can be driven at currents ranging from 200 mA to 36 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. In pulsed operation, rise time from 10-90% of forward current should be larger than 0.5 microseconds.

Note 3: Unless otherwise noted, values listed are typical. Devices are production tested and specified at 22.5 A.

Note 4: Typical junction temperature at test ($T_c=40^\circ\text{C}$, 22.5 A CW) is around 120°C.

Note 5: Caution must be taken not to stare at the light emitted from these LEDs. Under special circumstances, the high intensity could damage the eye.

Note 6: 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>

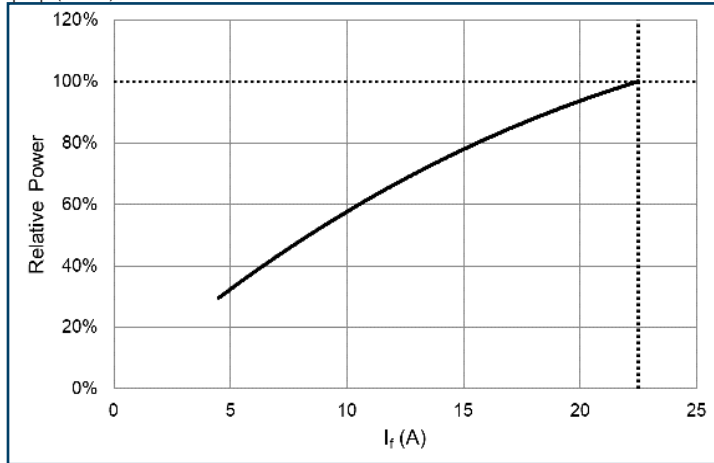
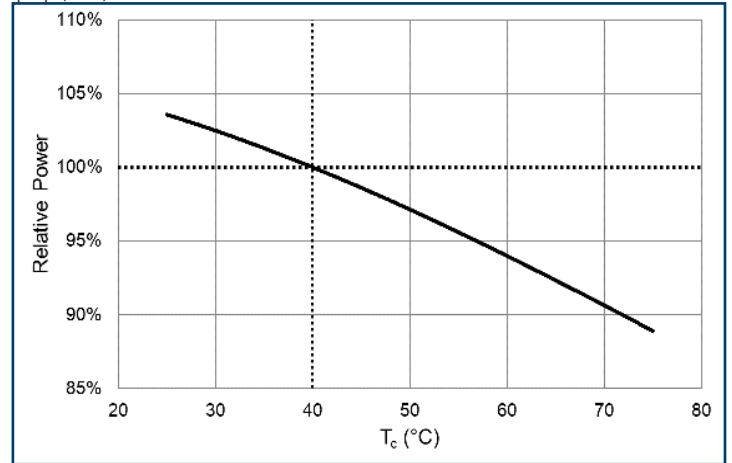
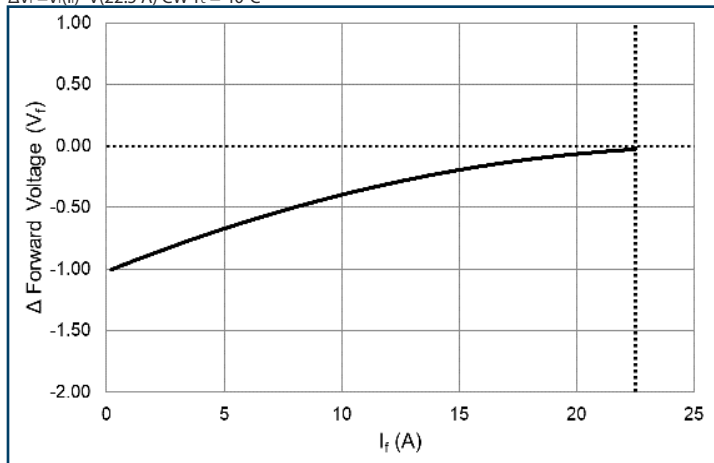
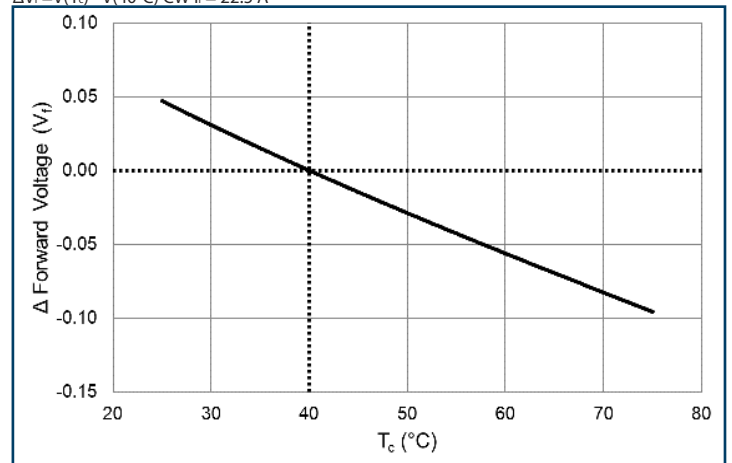
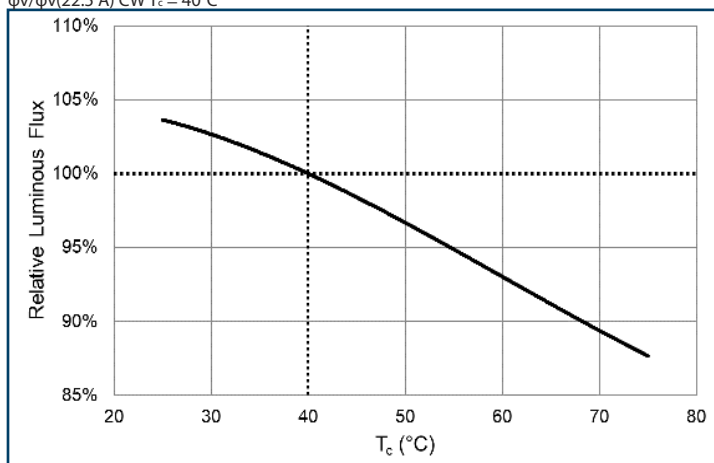
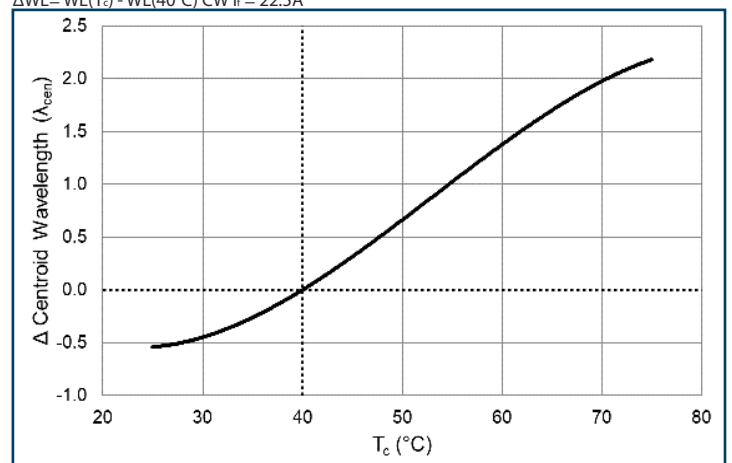
Note 7: For more about calculating thermistor temperature, please see <https://luminusdevices.zendesk.com/hc/en-us/articles/4412023747341-How-to-determine-the-temperature-from-Luminus-on-board-Thermistor->

Note 8: Angular Distribution parameter is guaranteed by design and is not measured in Production. Viewing angle specification range was established using Luminus goniometer set-up and compliance to this specification should be verified on the same equipment.

Note 9: For reference only.

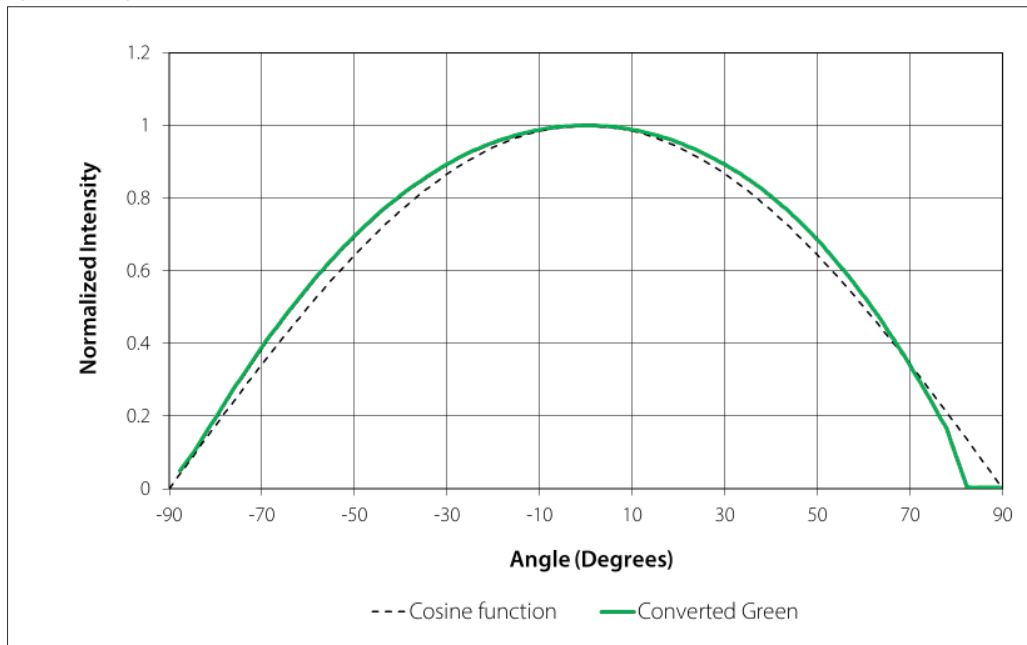
Note 10: CFT-90 Converted Green LEDs are designed for operation to an absolute maximum current and temperature as specified above. Product lifetime data is specified at recommended forward drive currents. Sustained operation at or beyond absolute maximum currents or temperatures will result in a reduction of device lifetime compared to recommended conditions. Refer to the lifetime derating curves for further information.

Optical & Electrical Characteristics

Relative Power vs Forward Current
 $\phi_v/\phi_v(22.5\text{ A})$ CW $T_c = 40^\circ\text{C}$

Relative Power vs Temperature
 $\phi_v/\phi_v(40^\circ\text{C})$ CW $I_f = 22.5\text{ A}$

Forward Voltage Shift vs Forward Current
 $\Delta V_f = V_f(I_f) - V_f(22.5\text{ A})$ CW $T_c = 40^\circ\text{C}$

Forward Voltage Shift vs Temperature
 $\Delta V_f = V_f(T_c) - V_f(40^\circ\text{C})$ CW $I_f = 22.5\text{ A}$

Relative Luminous Flux vs Temperature
 $\phi_v/\phi_v(22.5\text{ A})$ CW $T_c = 40^\circ\text{C}$

Center Wavelength Shift vs Temperature
 $\Delta \lambda_{\text{cen}} = \lambda_{\text{cen}}(T_c) - \lambda_{\text{cen}}(40^\circ\text{C})$ CW $I_f = 22.5\text{ A}$


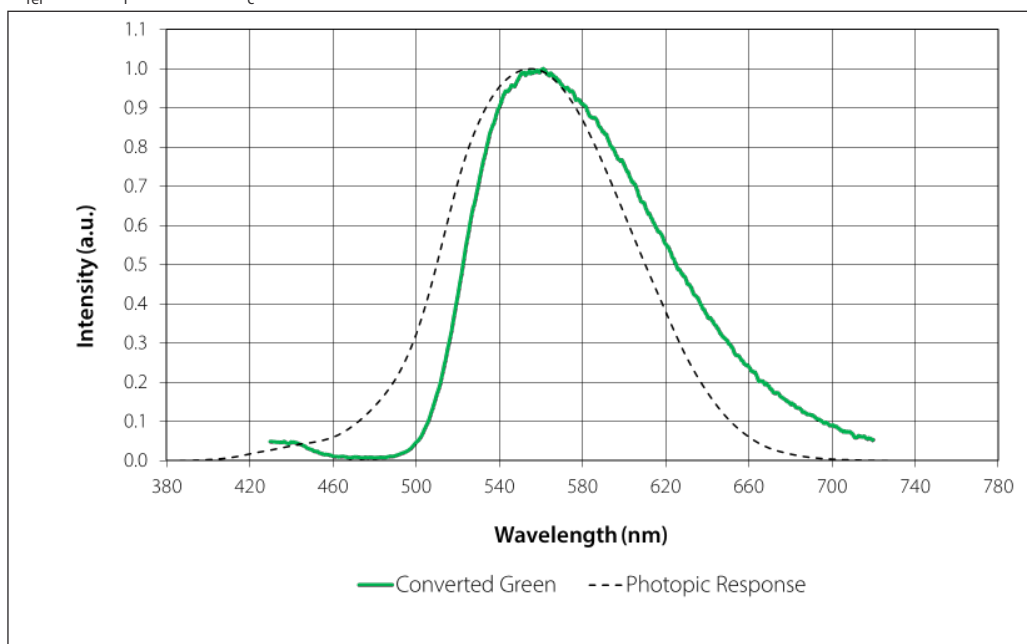
Angular Intensity Distribution (Typical)

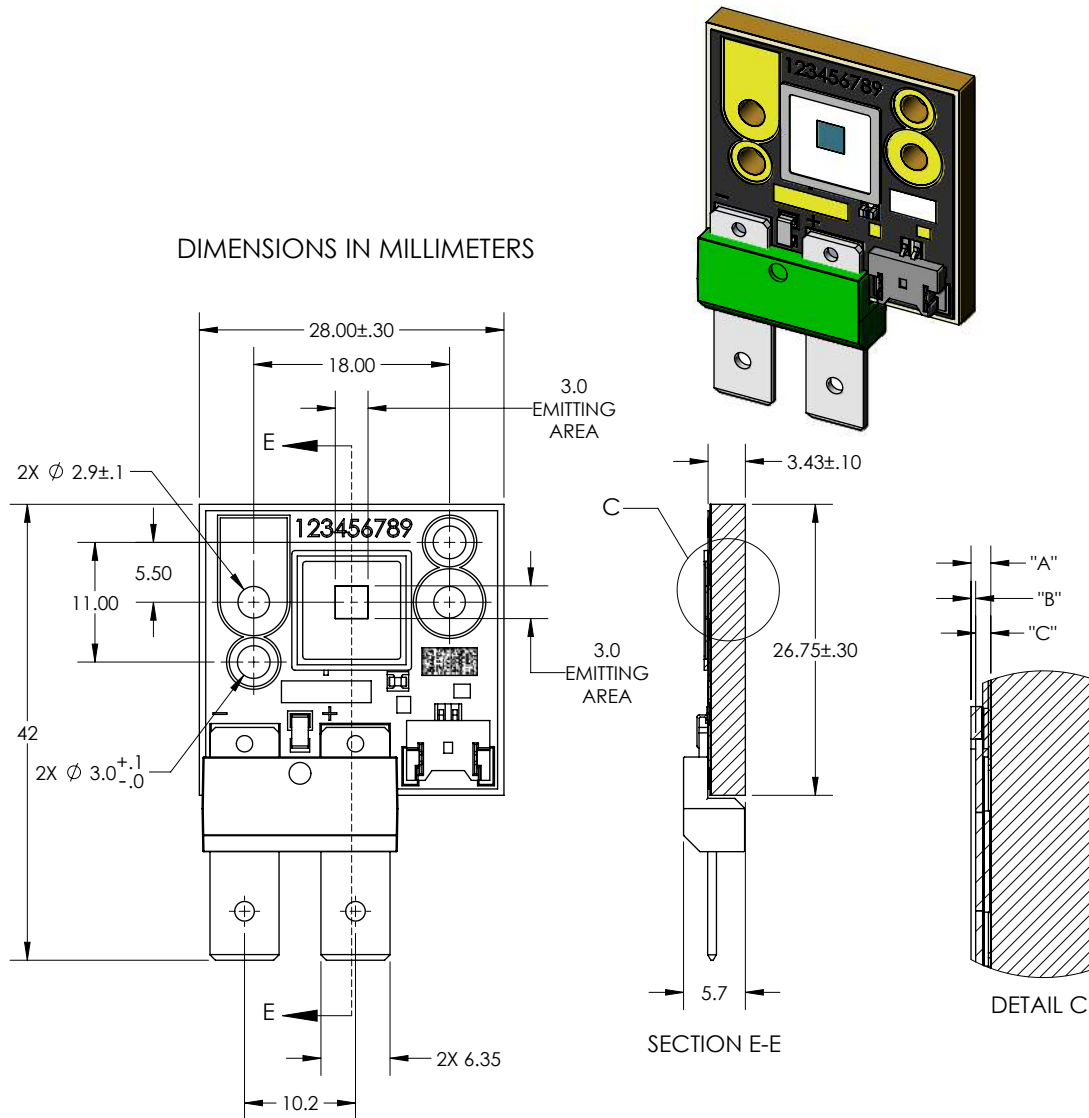
$$I_{ref} = f(\Phi); T_c = 25^\circ\text{C}$$



Typical Spectrum

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



Mechanical Dimensions – CFT-90-CG Common Anode LED


DWG-002650

Recommended connector for Anode and Cathode:

Panduit Disco Lok™ Series P/N: DNF14-250FIB-C or JST Manufacturing Co: SPS-61T-250 for AWG 16 to 14

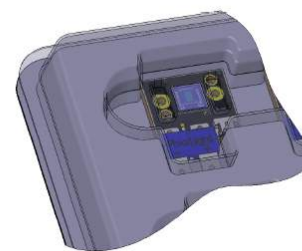
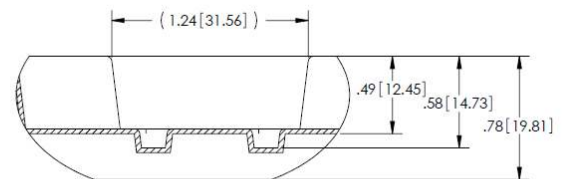
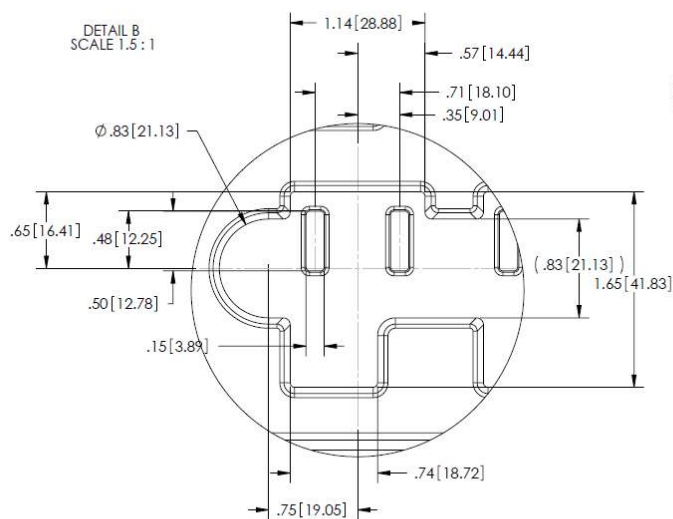
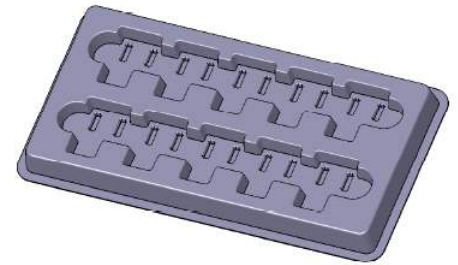
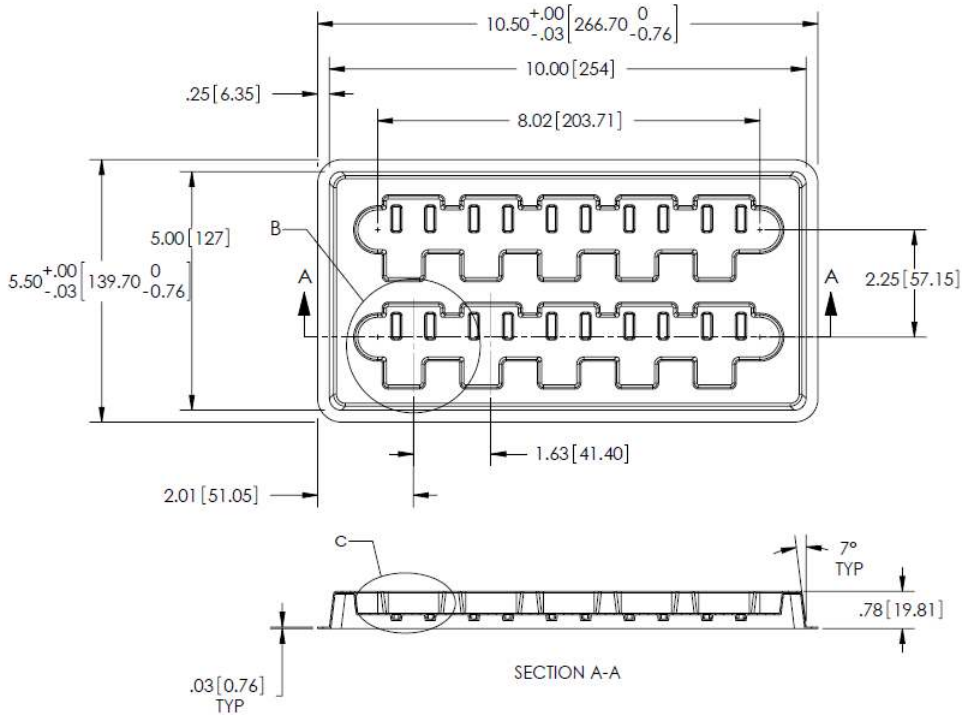
Panduit Disco Lok™ Series P/N: DNF10-250FIB-L or JST Manufacturing Co: SPS-91T-250 for AWG 12 to 10

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

Recommended Female: GCT P/N WTB06-020H-A, MOLEX P/N 51146-0200 (not recommended for new designs) or equivalent

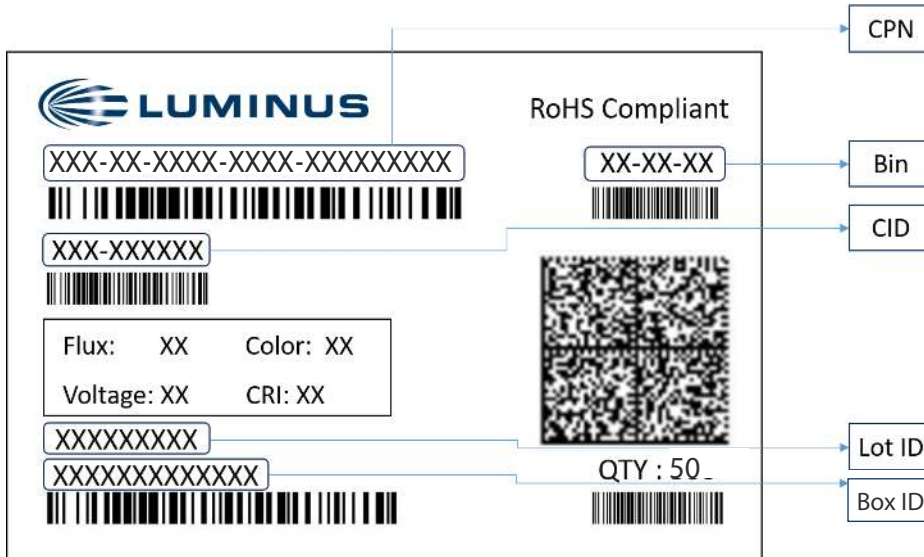
For detailed drawing please refer to DWG-002650 document

Shipping Tray Outline



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 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

Revision History

Rev	Date	Description of Change
01	02/20/2018	Initial Release - Preliminary Specifications
02	06/07/2018	- Removed note 3 on page 4
03	06/20/2018	- Revised Relative Output Flux vs. Forward Current graph on page 7
04	02/01/2022	- Added CG4 bin and updated Max Radiometric power accordingly. Added G200 and G300 bin kits
05	04/15/2023	- Added G400 bin kit, removed G100 and G200 bin kits - Updated flux bin: removed CG1 and CG2; added CG3A, CG4A and CG4B - Updated characteristics