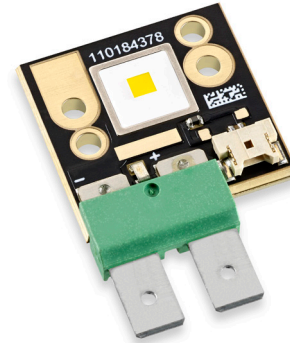


# CFT-90 Converted Green High Brightness Green LED



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## Features

- Large, monolithic chip with uniform emitting area of 9 mm<sup>2</sup>
- 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 <sup>1,2</sup>                                |
|---|-----------------------|---------------------|-----------------------|---|
| CFT: Copper-core PCB,<br>No Encapsulation | 90: 9 mm <sup>2</sup> | CG: Converted Green | Internal package code | Refer to ordering<br>part numbers in this<br>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<sup>1,2</sup>

| Color           | Luminous Flux Bin (FF) <sup>3</sup> | Binning @ 22.5 A CW, T <sub>c</sub> = 40°C <sup>4, 5</sup> |                   |
|-----------------|-------------------------------------|--|-------------------|
|                 |                                     | 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 Bins<sup>2</sup>

| Color           | Binning @ 22.5 A CW, T <sub>c</sub> = 40°C <sup>4, 5</sup> |                         |
|-----------------|--|-------------------------|
|                 | 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<sub>c</sub> = Case temperature.

### Typical Device Performance

| General Characteristics  |     | Symbol           | Value     | Unit            |
|--|-----|------------------|-----------|-----------------|
| Emitting Area  |     | $A_e$            | 9.0       | mm <sup>2</sup> |
| Emitting Area Dimensions   |     |                  | 3.0 x 3.0 | mm x mm         |
| Characteristics at Recommended Test Drive Current ( $I_f$ ) <sup>1,2</sup> |     |                  |           |                 |
| Reference Duty Cycle   |     |                  | 100       | %               |
| Test Peak Drive Current  | typ | $I_f$            | 22.5      | A               |
| Radiometric Flux <sup>3,4,5</sup>  | min | $\Phi_{rmin}$    | 11.38     | W               |
|  | typ | $\Phi_r$         | 13.69     | W               |
|  | max | $\Phi_{rmax}$    | 15.75     | W               |
| Filtered Radiometric Power in [500 to 600nm] range (for reference only).   | min | $\Phi_{frmin}$   | 7.4       | W               |
|  | typ | $\Phi_{fr}$      | 8.9       | W               |
|  | max | $\Phi_{frmax}$   | 10.2      | W               |
| Center Wavelength <sup>3</sup>   | min | $\lambda_{cmin}$ | 573       | nm              |
|  | typ | $\lambda_c$      | 576       | nm              |
|  | max | $\lambda_{cmax}$ | 579       | nm              |
| FWHM- Spectral bandwidth at 50% of $\Phi_v^3$                              | 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 <sup>6</sup> (electrical)           | typ | $R_{th(j-c)}$    | 0.45      | °C/W            |
| Thermal Resistance of junction to thermistor <sup>6,7</sup> (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 % $I_v^8$  |     | $2\phi$          | 120+/-6   | degrees         |

### Absolute Maximum Ratings

|  | Symbol     | Value    | Unit |
|--|------------|----------|------|
| Absolute Minimum Current (CW or Pulsed) <sup>9</sup>   |            | 0.2      | A    |
| Absolute Maximum Current (CW) <sup>10</sup>  |            | 22.5     | A    |
| Absolute Maximum Surge Current <sup>10</sup><br>(Frequency > 240 Hz, duty cycle =10%, t = 1ms) |            | 36       | A    |
| Absolute Maximum Junction Temperature <sup>10</sup>  | $T_{jmax}$ | 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>

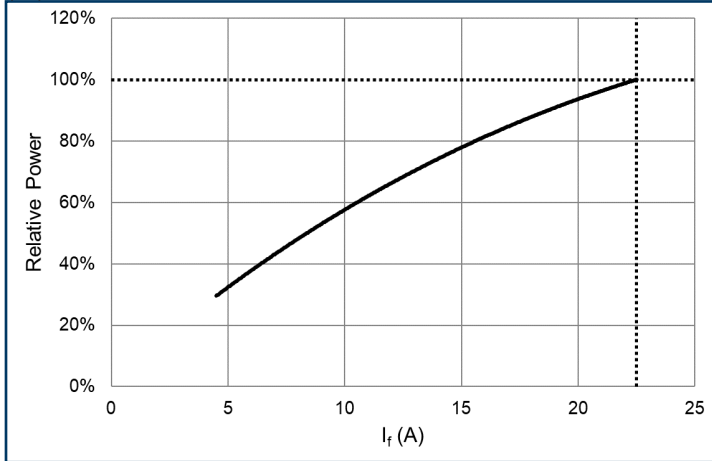
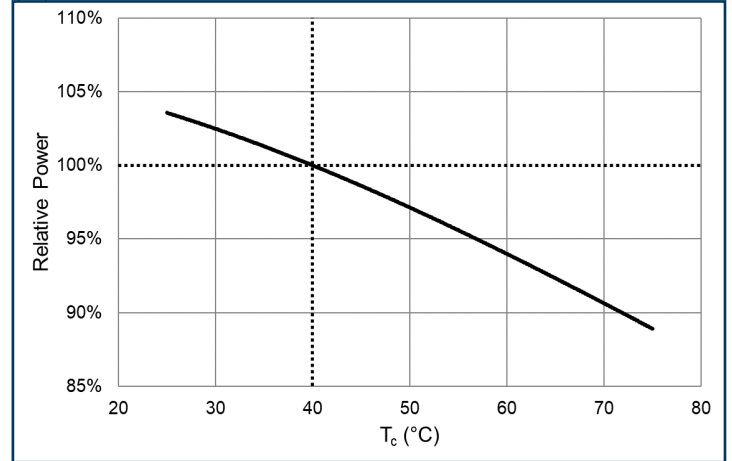
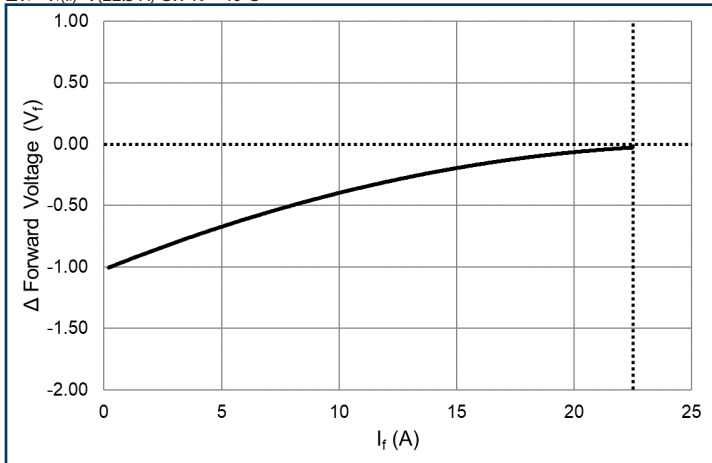
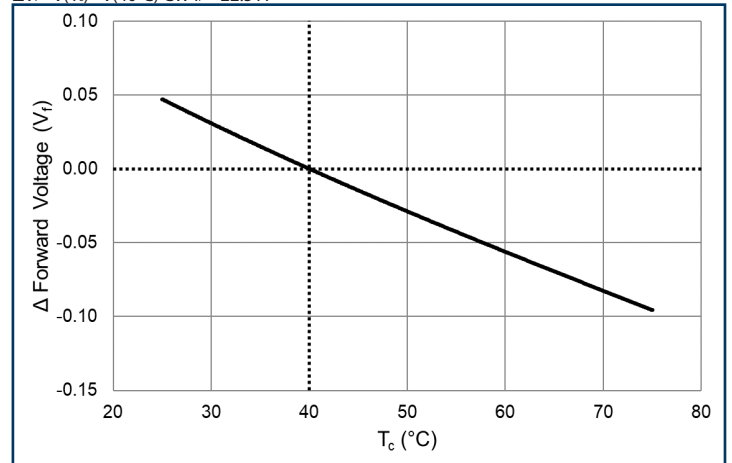
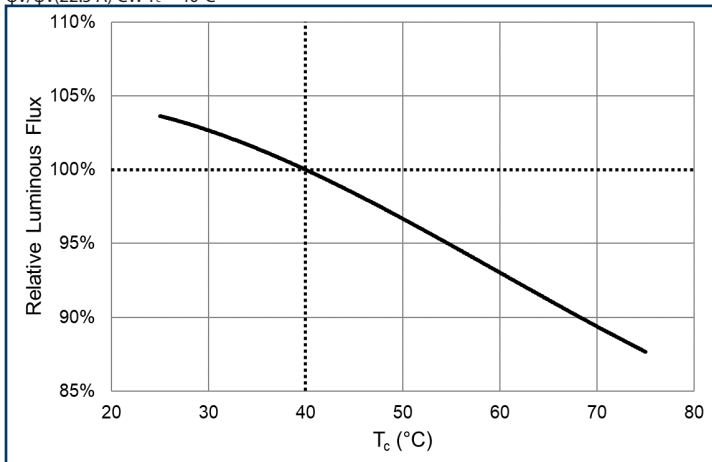
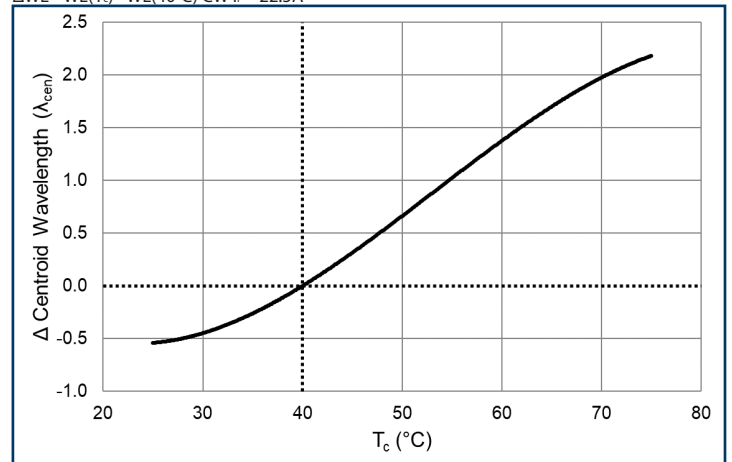
Note 7: For more about calculating thermistor temperature, please see <https://luminusdevices.zendesk.com/hc/en-us/articles/4412023747341-How-to-determine-the-temperature-from-Luminus-on-board-Thermistor->

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.

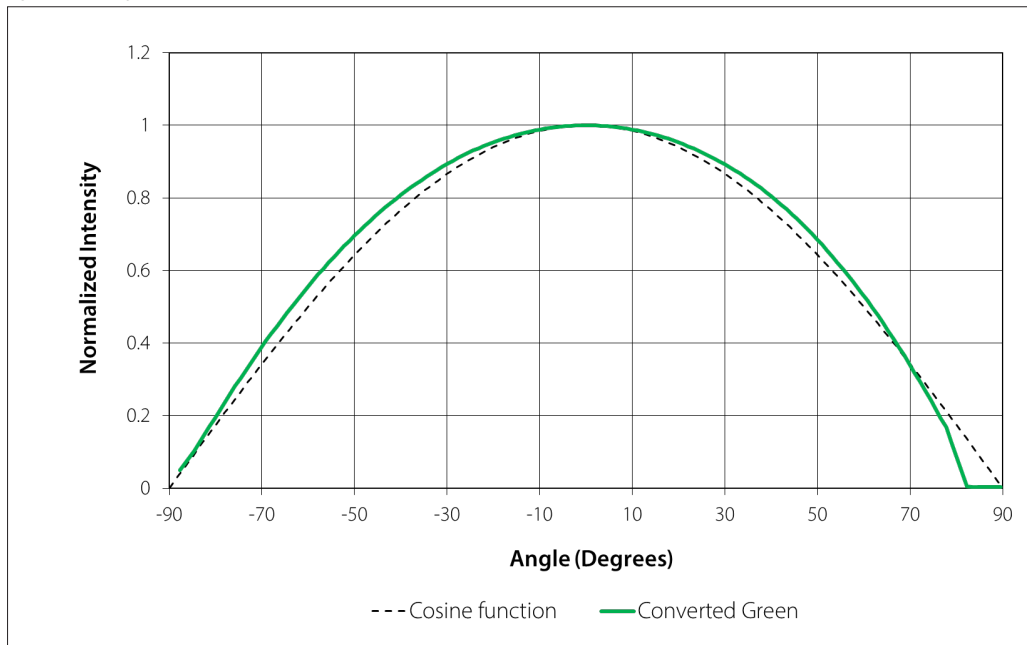
Note 10: CFT-90 Converted Green LEDs are designed for operation to an absolute maximum current and temperature as specified above. Product lifetime data is specified at recommended forward drive currents. Sustained operation at or beyond absolute maximum currents or temperatures will result in a reduction 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**
 $\Delta WL = WL(T_c) - WL(40^\circ\text{C})$  CW  $I_f = 22.5\text{ A}$ 


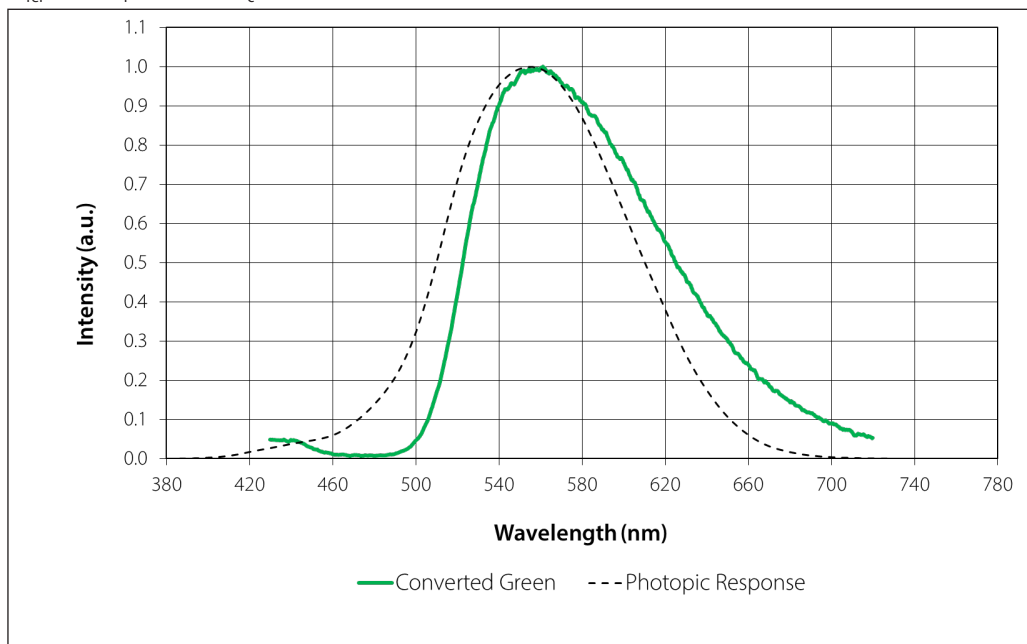
### Angular Intensity Distribution (Typical)

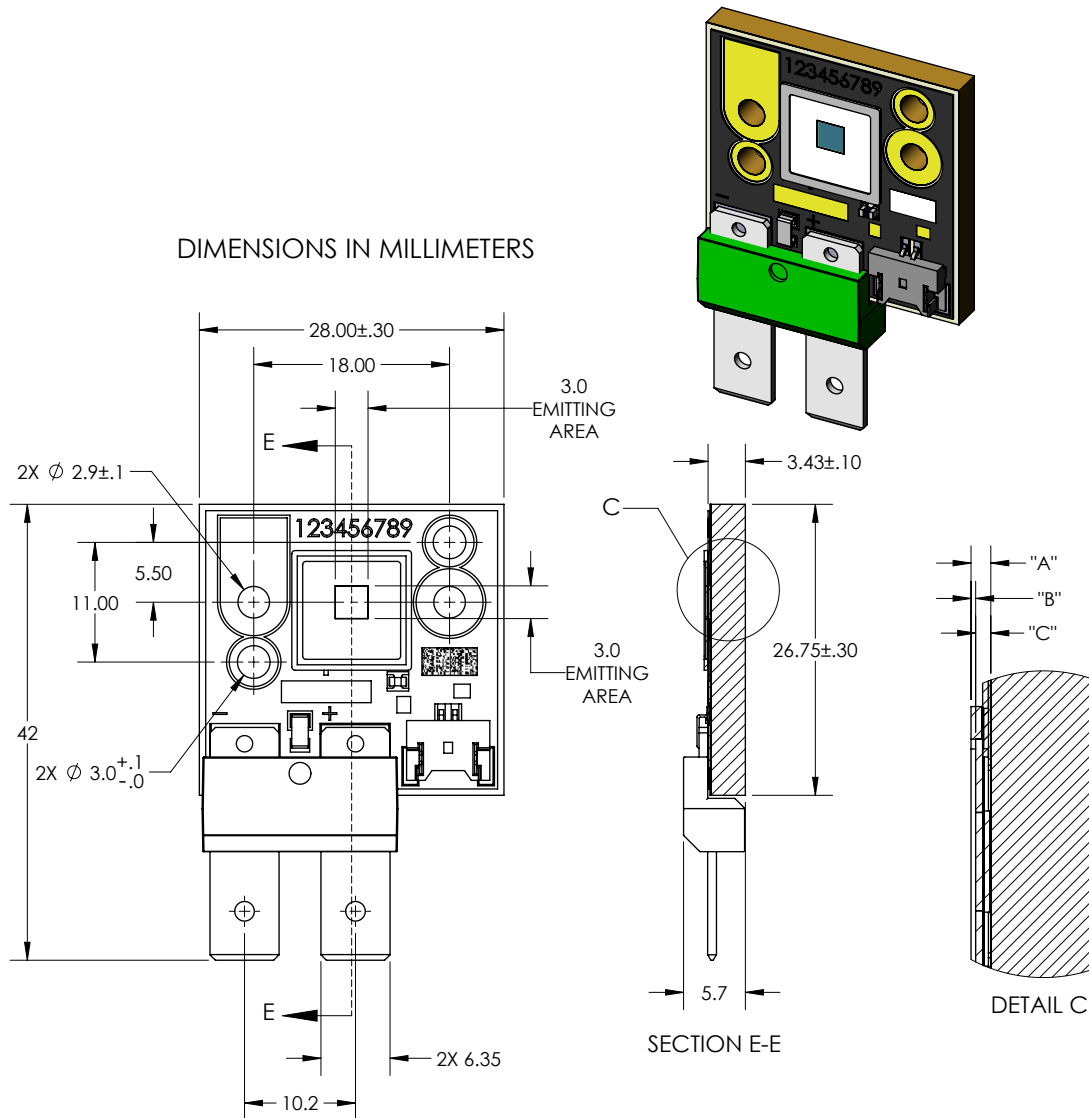
$$I_{ref} = f(\Phi); T_c = 25^\circ\text{C}$$



### 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**


| 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           | .14               | ±.10      |
| "C"            | TOP OF METAL SUBSTRATE TO TOP OF EMITTING AREA | .46               | ±.02      |

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

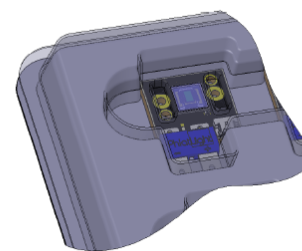
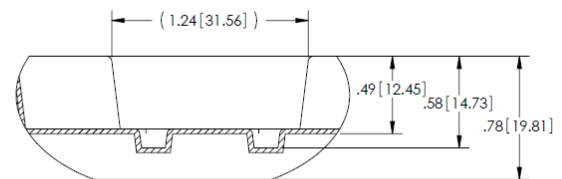
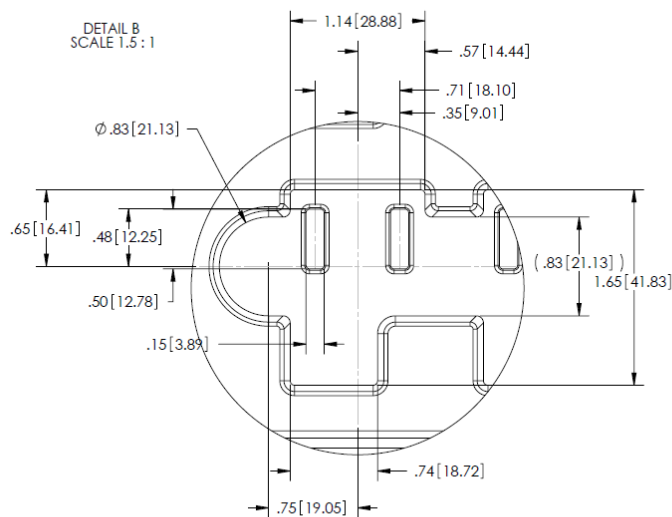
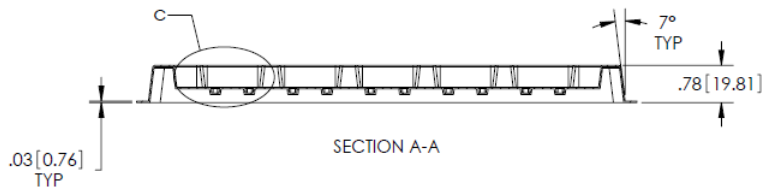
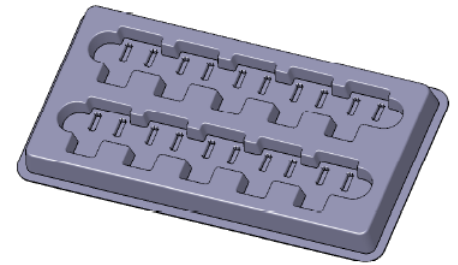
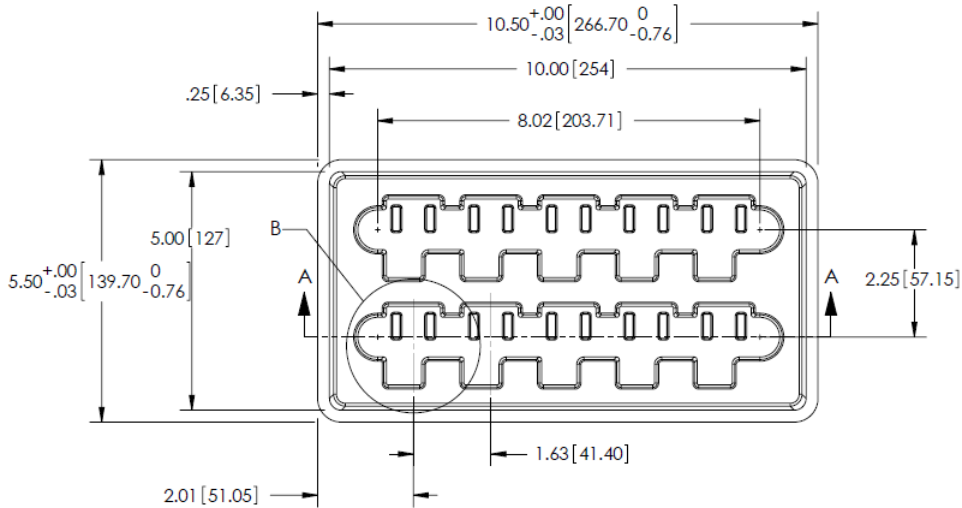
Check NEC standards for ampacity of the power cable being used.

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

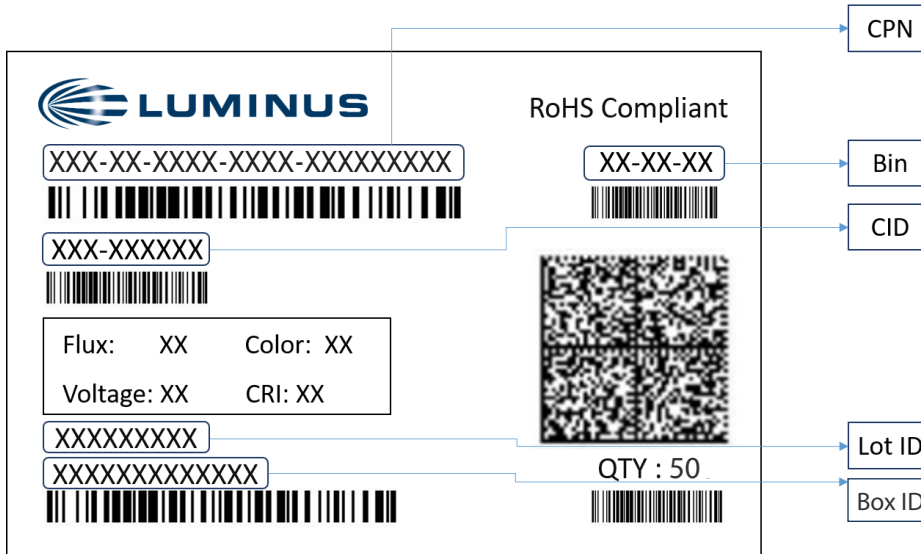


### Shipping Tray Outline



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<br>- Updated flux bin: removed CG1 and CG2; added CG3A, CG4A and CG4B<br>- Updated characteristics |