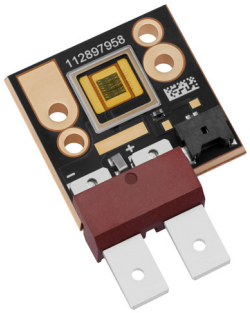
CBM-90-IRD-X33-850nm

Mosaic Array Series
Infrared Chip On Board LEDs



Features

- Mosaic Array Infrared LED chipset with surface emitting area of 9 mm^2
- Vertical chip LED technology for high power density and uniform emission
- High thermal conductivity copper coreboard package
- Can be operated at variable drive currents up to 18 A

RoHS REACH

Applications

- Medical and Scientific Instrumentation
- Fiber-coupled illumination
- Inspection
- Machine Vision

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Ordering Information

Ordering Part Numbers[1]

Typical Centroid Wavelength	Radiometric Flux		Viewing Angle	Ordering Part Number
	Minimum Flux Bin[1]	Minimum Power[2]		
850 nm	K	11.0 W	120°	CBM-90-IRD-X33-K850

Part Number Nomenclature

CBM **90** **IRD** **X33** **<fwww>**

Product Family	Chip Area	Color	Package Configuration	Bin Kit
CBM: Copper-core PCB, Multi Chip Array, No Encapsulation	**90**: 9.0 mm^2	**IRD**: Dual Junction Infrared	**X33**: 28 mm x 26.75 mm Common Anode Package, see Mechanical Drawing section for details	<**f**> Minimum Flux Bin <**www**> Wavelength Bin See 'Binning Structure' tables on page 3 for details

Notes:

1. The Ordering Part Number specifies the Minimum Flux Bin in shipment; higher flux bins may be shipped without advance notice. Please refer to 'Binning Structure' tables on page 3 for details.
2. Product test condition: I_f =13.5 A, T_{hs} = 40°C.

Binning Structure

Radiometric Flux Bins[1]

Flux Bin	Binning @ 13.5 A, T_{hs}= 40°C[2]	
	Minimum Power (W)	Maximum Power (W)
K	11.00	12.10
L	12.10	13.31
M	13.31	14.64
N	14.64	16.11
P	16.11	17.72

Peak Wavelength Bins[2]

Wavelength Bin	Binning @ 13.5 A, T_{hs}= 40°C	
	Minimum Wavelength (nm)	Maximum Wavelength (nm)
840	840	845
845	845	850
850	850	855
855	855	860
860	860	865
865	865	870

Notes:

1. LEDs are measured at 40°C heatsink temperature with 13.5 A, 20 ms single pulse. Luminus maintains a ±6% tolerance on flux measurement.
2. The 3 digit wavelength bin as marked on the product label may be followed by a letter which is for internal use only.

Characteristics

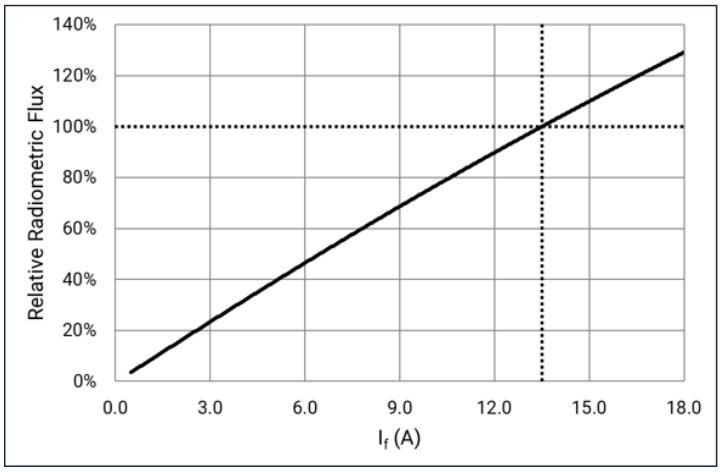
Parameter (I_f=13.5 A, T_{hs}= 40°C)		Symbol	Value	Unit
Emitting Area Dimensions		LES	3.2 x 3.2 = 10.24	mm^2
Forward Voltage	Minimum	$V_{f\ min}$	3.0	V
	Typical	$V_{f\ typ}$	3.6	
	Maximum	$V_{f\ max}$	4.0	
Forward Current		I_f	13.5	A
Output Power		PO	13	W
FWHM		$\Delta\lambda_{1/2}$	35	nm
Viewing Angle		$2\theta_{1/2}$	120	°
Peak Wavelength		λ_p	855	nm
Centroid Wavelength		λ_c	850	
Temperature Coefficient of Voltage		Δ_{Vf}/Δ_T	-2	mV/°C
Temperature Coefficient of Radiometric Power		Δ_Φ/Δ_T	-0.3	%/°C
Temperature Coefficient of Wavelength		Δ_λ/Δ_T	0.2	nm/°C
Electrical Thermal Resistance (Junction to Solder Point)[1]		$R_{th\ JS\ elec}$	0.5	°C/W

Notes:

1. Thermal measurements are in accordance with JEDEC 51-14.

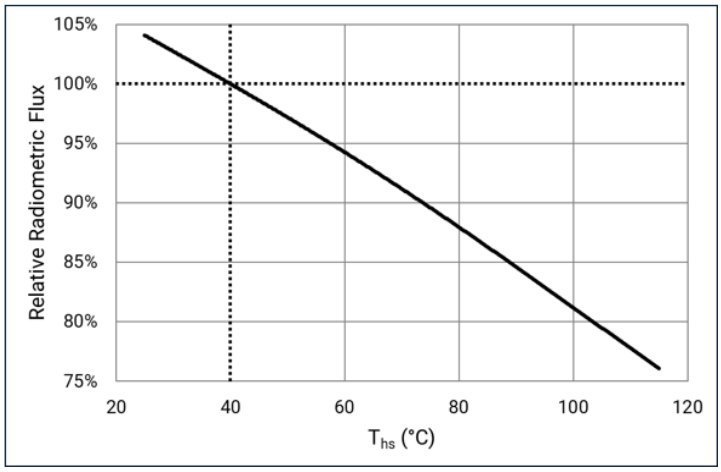
Relative Radiometric Flux vs Forward Current

T_{hs} = 40°C



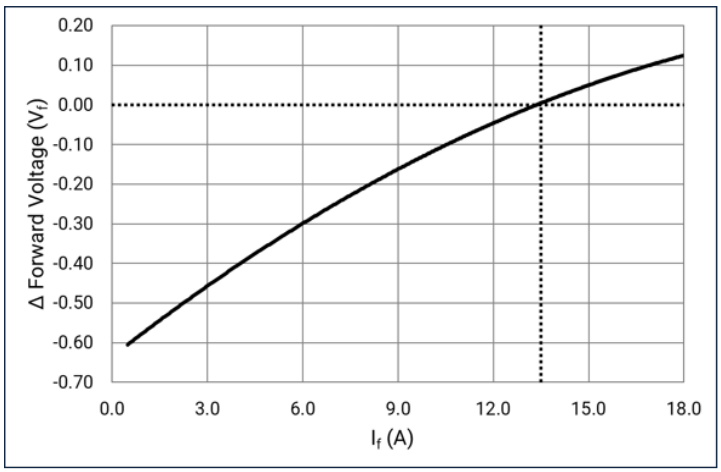
Relative Radiometric Flux vs Temperature

I_f = 13.5 A



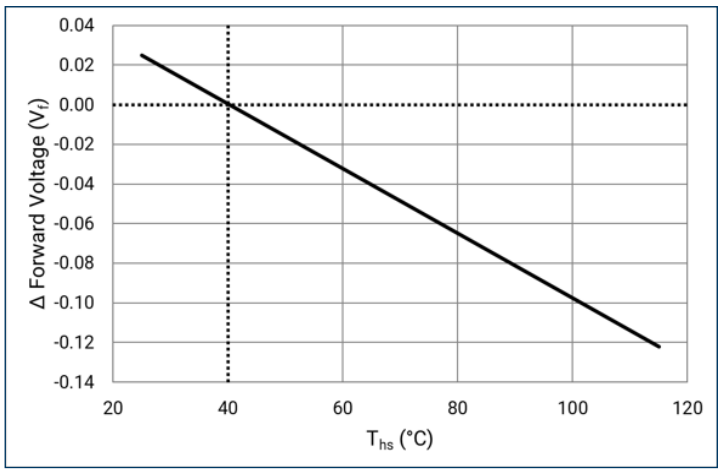
Forward Voltage Shift vs Forward Current

T_{hs} = 40°C



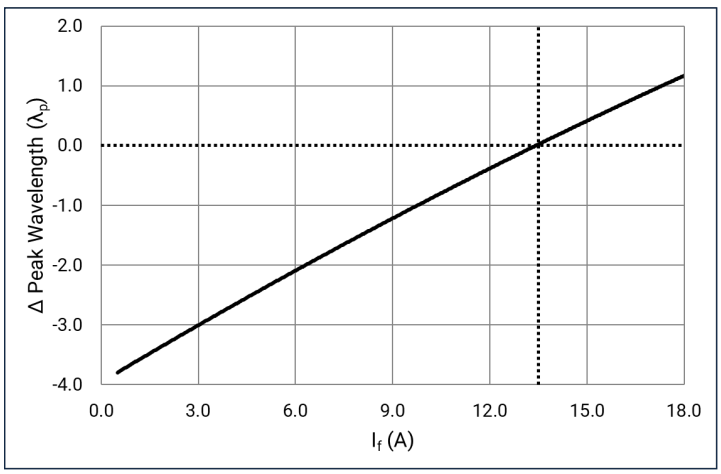
Forward Voltage Shift vs Temperature

I_f = 13.5 A



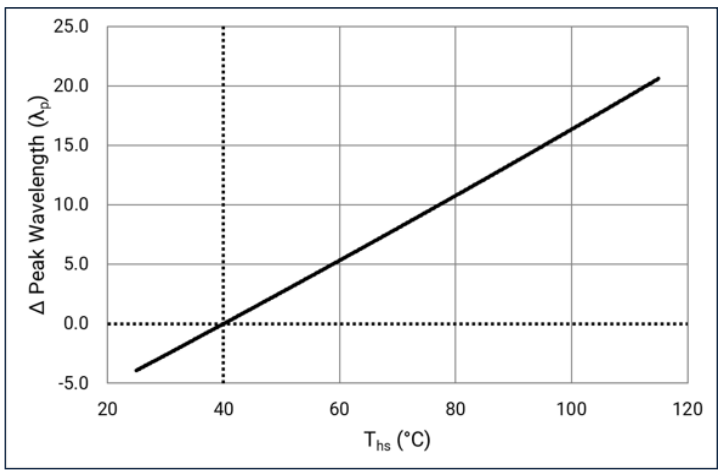
Peak Wavelength Shift vs Forward Current

T_{hs} = 40°C



Peak Wavelength Shift vs Temperature

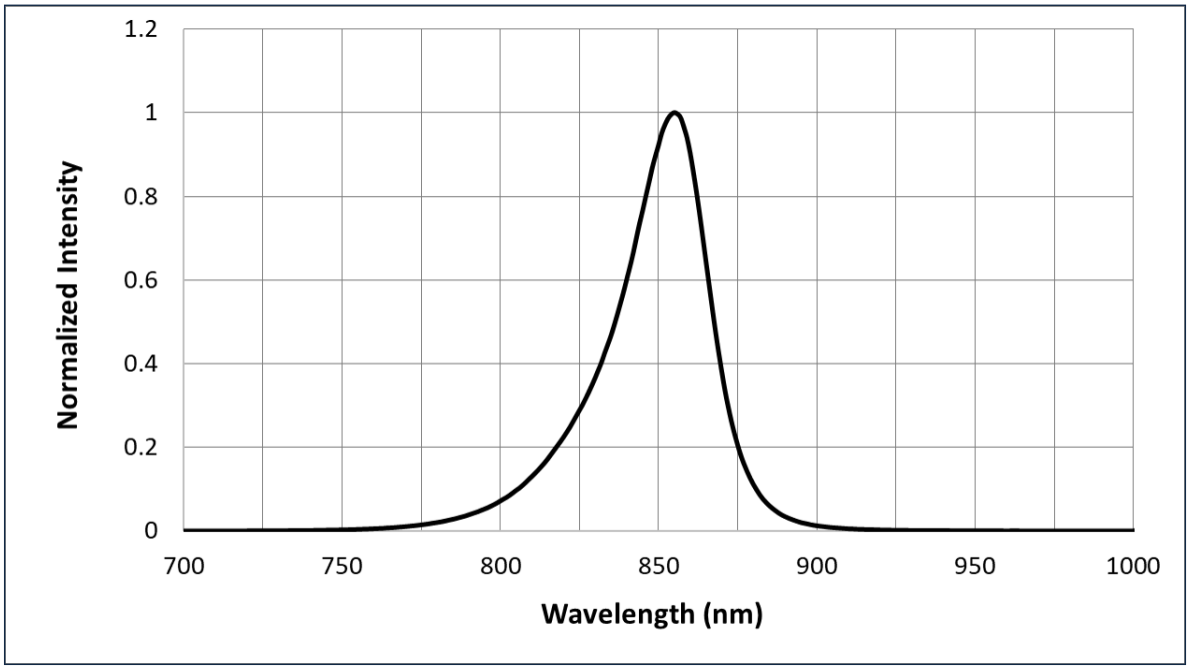
I_f = 13.5 A



Typical Spectrum

Relative Spectral Power Distribution

I_f = 13.5 A; T_{hs} = 25°C



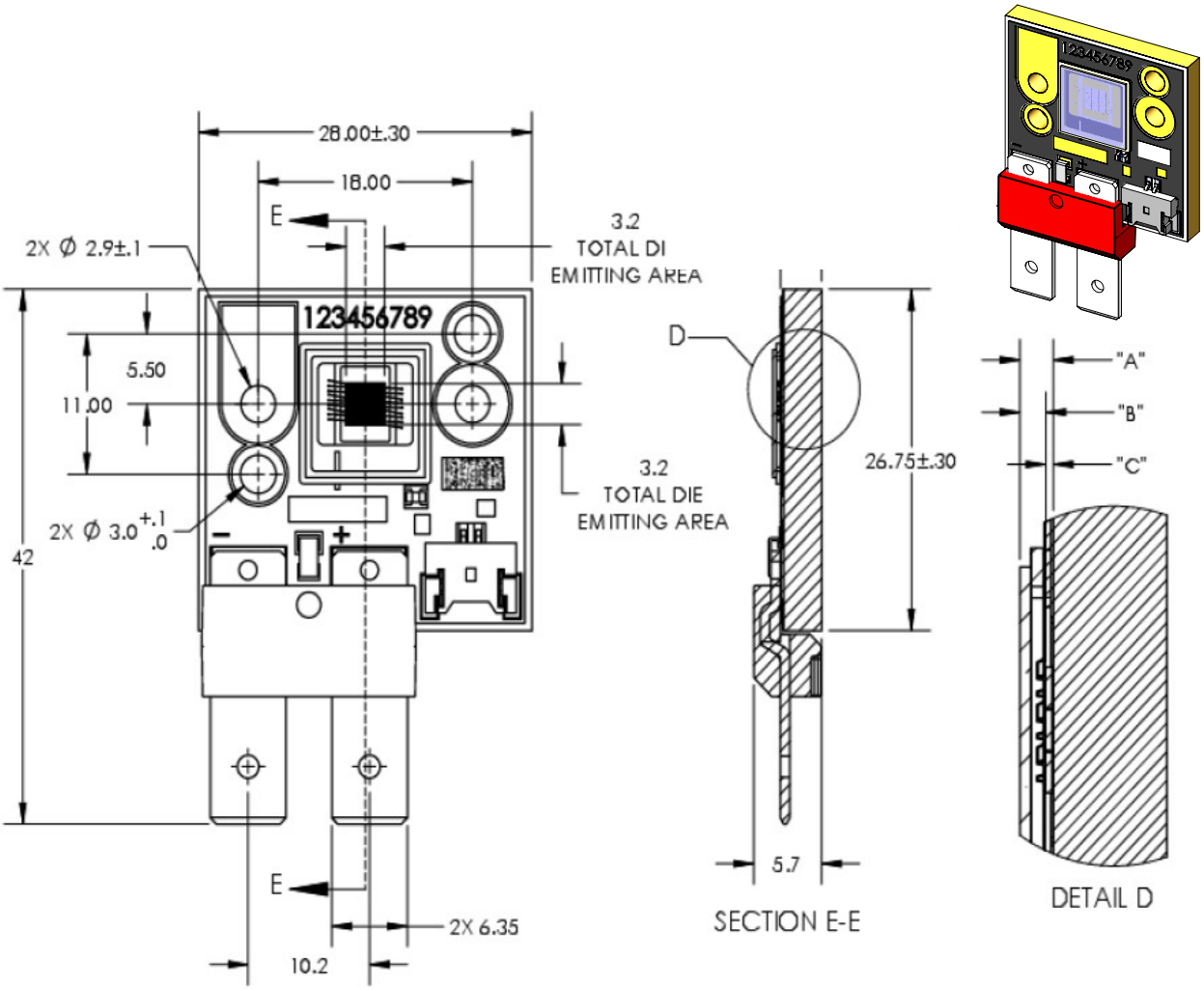
Absolute Maximum Ratings[1, 2, 3]

Parameter		Symbol	Values	Unit
Forward Current (CW or Pulsed)[4]	Minimum	$I_{f\,min}$	0.2	A
	Maximum	$I_{f\,max}$	18.0	
Reverse Voltage (@ I_f= 10 mA)		V_r	5	V
Junction Temperature		T_j	115	°C
Storage Temperature Range		T_{stg}	-40 to 100	

Notes:

1. The LED is safe for operation at the absolute maximum ratings as specified above. However, note that product lifetime data is provided based on nominal drive conditions. If sustained operation occurs at the absolute maximum ratings, it may lead to a reduction in device lifetime.
2. Avoid operating the LED beyond the maximum ratings.
3. Caution must be taken not to stare at the light emitted from these LEDs. Under special circumstances, the high intensity could damage the eye.
4. In pulsed operation, rise time from 10% to 90% of forward current should be larger than 0.5 microseconds.

Mechanical Dimensions[1]



Dimension Name	Description	Nominal Dimension	Tolerance
"A"	Top of metal substrate to top of window	.93	±.13
"B"	Top of die emitting area to top of window	.73	±.13
"C"	Top of metal substrate to top of die emitting area	.21	±.02

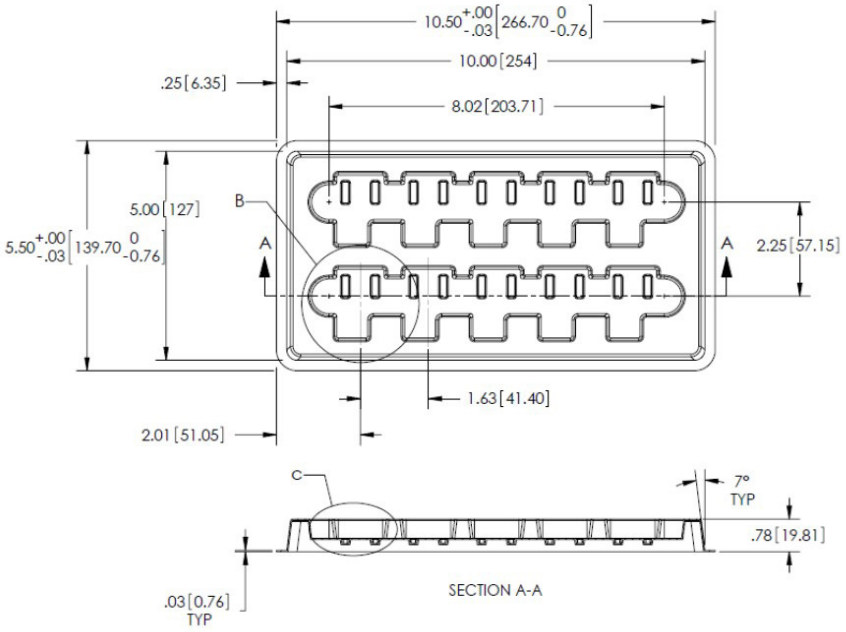
Notes:

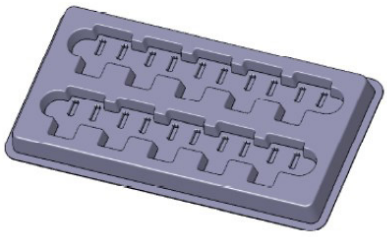
Recommended connector for Anode and Cathode:
Panduit Disco Lok™ Series P/N: DNF14-250FIB-C or JST Manufacturing Co: SPS-61T-250 for AWG 16 to 14.
Panduit Disco Lok™ Series P/N: DNF10-250FIB-L or JST Manufacturing Co: SPS-91T-250 for AWG 12 to 10.
(Check NEC standards for ampacity of the power cable being used.)

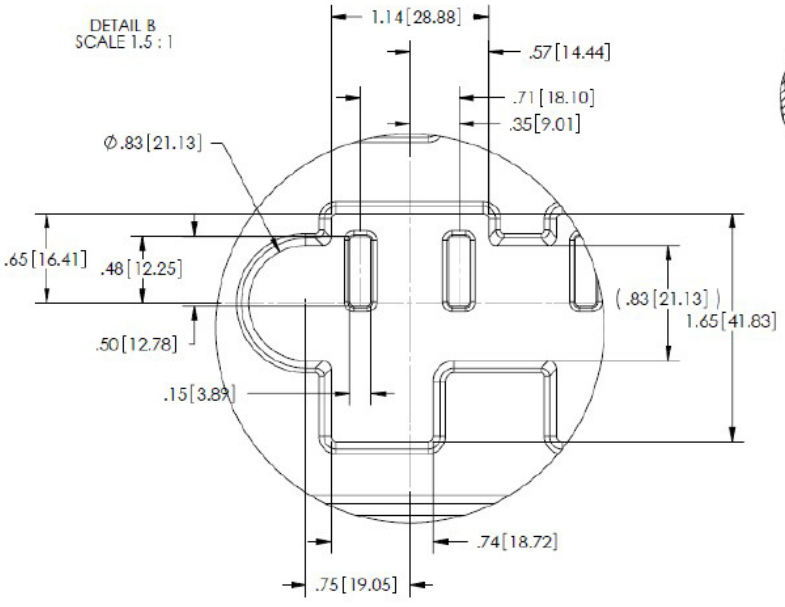
Thermistor Connector: TYU P/N TU1212WBR-02S-C1-NL-A and MOLEX P/N 53780-0270.

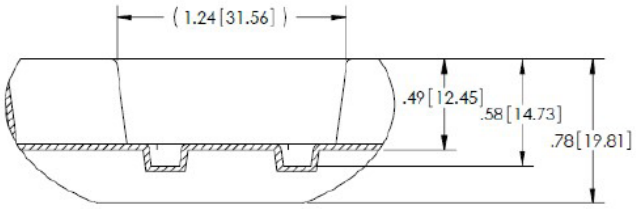
Recommended Mating Connector for Thermistor Connector: TYU P/N TU1212HNO-02 or equivalent.

Shipping Tray Outline

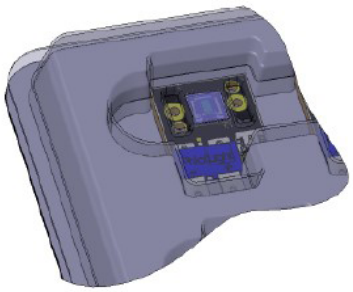






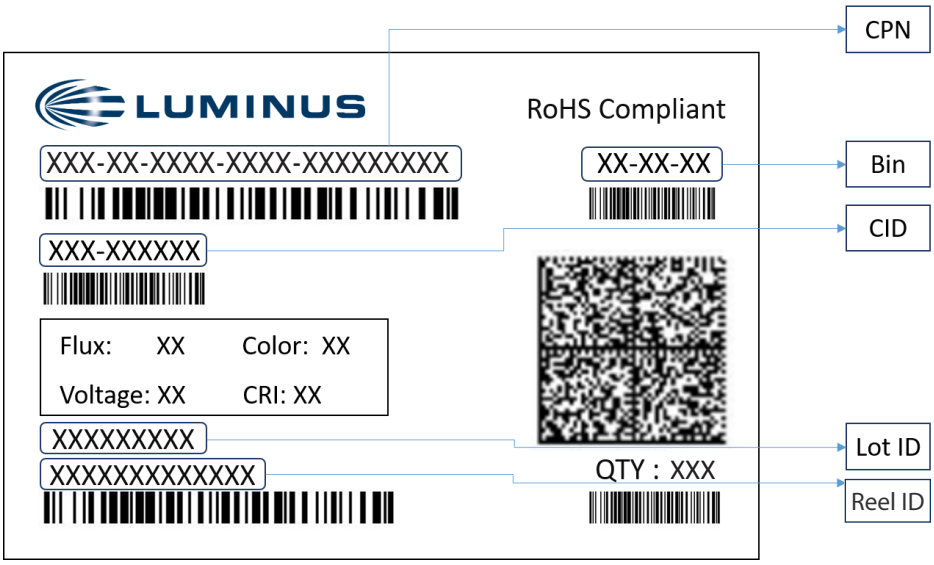


DETAIL c
SCALE 2 : 1



TOP TRAY SHOWN TRANSPARENT
FOR REFERENCE ONLY

Shipping Label



Label Fields:

- CPN: Luminus ordering part number
- CID: Customer's part number
- QTY: Quantity of parts per reel
- Flux: Bin as defined on page 4
- Voltage: NA
- Color: Bin as defined on page 4
- CRI: NA
- Lot ID & Reel ID: For Luminus internal use

Packing Configuration:

- 10 devices per tray, with a maximum stack of 5 trays per pack
- Each pack is placed in an anti-static moisture barrier bag
- Partial pack or tray may be shipped
- 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	03/04/2020	Initial release to Production. Updated thermal coefficient of radiometric power and typical FWHM on page 5. Updated graphs on page 7. Updated mechanical drawing on page 8.
02	08/04/2020	Updated product picture on front page. Updated temperature coefficient of radiometric power and thermal resistance on page 5. Updated mechanical drawing on page 8.
03	02/22/2022	Updated technology overview, ordering information. Added Notes2 in binning structure. Updated typical spectrum, shipping tray outline and shipping label.
04	07/11/2022	Updated characteristics graphs and some editorial changes.
05	07/25/2025	Updated characteristics graphs, mechanical dimensions and photo.