CBM-120-UV
Ultraviolet
Chip On Board LEDs

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Features:

- Mosaic Array UV LED chipset with surface emitting area of 12 mm^2, 4:3 aspect ratio
- Chip on board package eliminates the need for complicated assembly process
- Vertical chip UV LED technology for high power density and uniform emission
- Wide Range of UVA Wavelengths: 365 nm-405 nm
- High thermal conductivity common cathode copper coreboard package
- Low-profile window for efficient coupling into small-etendue systems
- Can be operated at drive currents up to 24 A
- Environmentally friendly: REACH, RoHS and Halogen compliant

Applications:

- 3D printing and Additive Manufacturing
- Machine Vision
- Maskless Lithography
- Curing
    - Inks
    - Coatings
    - Adhesives
- Medical and Scientific Instrumentation

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Technology Overview

Luminus LEDs benefit from innovations in device technology, chip packaging and thermal management. This suite of technologies give engineers and system designers the freedom to develop solutions both high in power and efficiency.

Luminus Mosaic Array LED Technology

Luminus' vertical chip technology enables LED chips with uniform brightness over the entire chip surface. The optical power and brightness produced by these densely packed chips enable solutions not just to replace arc and halogen lamps but also create novel solutions.

Packaging Technology

Thermal management is critical in high power LED applications. With a thermal resistance from junction to board of 0.4 ^{o}C/W, the CBM-120-UV has one of the lowest thermal resistances of UV LEDs in the market. The low Rth, along with Luminus chip techology allows users to drive the LEDs at high current densities while maintaining a low junction temperature, thereby resulting in brighter solutions and longer lifetimes.

Reliability

Luminus LEDs are one of the most reliable light sources in the world. They pass a rigorous suite of environmental and mechanical stress tests, including mechanical shock, vibration, temperature cycling and humidity, and have been qualified for use in high power and high current applications. Luminus UV LEDs are designed for the most demanding applications with median lifetimes exceeding 30,000 hours.

Environmental Benefits

Luminus LEDs help reduce power consumption and the amount of hazardous waste entering the environment. All Luminus LEDs are RoHS and Halogen compliant and free of hazardous materials, including lead and mercury.

Static Electricity

The products are 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 an anti-electrostatic gloves when handling the LEDs. 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

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Ordering Information

Ordering Part Numbers

Wavelength Range	Radiometric Flux		Wavelength Bins	Ordering Part Number[1,2]
	Bin Kit Flux Code	Min. Flux		
365-375	I	9.1	365, 370	CBM-120-UV-X31-I365-22
380-390	M	13.3	380, 385	CBM-120-UV-X31-M380-22
400-410	L	12.1	400, 405	CBM-120-UV-X31-L400-22

Note 1: A Bin Kit represents a group of flux and wavelength bins that are shippable for a given ordering part number. Individual bins are not always orderable, contact Luminus for special requests.

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

Part Number Nomenclature

CBM	120	UV	X31	FWWW-2#
Product Family	**Chip Area**	**Color**	**Package Configuration**	**Bin Kit**
CBM: Copper-core PCB, Mosiac Array	120:12 mm^2	UV: Ultraviolet	X31: 28 mm x 26.75 mm - common cathode package See Mechanical Drawing section	See ordering part numbers table below for complete bin definition

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Binning Structure

CBM-120-UV LEDs are specified for flux and peak wavelength at a drive current of 9 A with a 20 ms pulse at 25°C and placed into one of the following Power Bins and Wavelength Bins.

Power Bins[3]

Color	Power Flux Bin (FF)	Minimum Flux (W)	Maximum Flux (W)
UV	I	9.1	10.0
	J	10.0	11.0
	K	11.0	12.1
	L	12.1	13.3
	M	13.3	14.6
	N	14.6	16.1
	P	16.1	17.7
	Q	17.7	19.5

Note 3: Luminus maintains a +/- 6% tolerance on power measurements.

Peak Wavelength Bins

Color	Wavelength Bin (WWW)	Minimum Wavelength (nm)	Maximum Wavelength (nm)
UV	365	365	370
	370	370	375
	380	380	385
	385	385	390
	400	400	405
	405	405	410

Note 4: The wavelength bin as marked on the product label may be followed by a letter which is for internal use only.

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Optical & Electrical Characteristics (T_{hs} = 25°C)

UV					
Parameter	**Symbol**		**Values** [5]		**Unit**
Peak Wavelength Range	λ	365-375	380-390	400-410	nm
Test Current for binning [6]	I	9.0	9.0	9.0	A
Peak Wavelength Typ.	$λ_p$	369	385	405	nm
Forward Voltage	$V_{F\ min}$	3.2	2.9	2.9	V
	V_F	3.9	3.5	3.3	V
	$V_{F\ max}$	4.3	3.7	3.7	V
Radiometric Flux [7]	$Φ_{typ}$	10.3	14.4	12.8	W
FWHM at 50% of Φ	$Δλ_{1/2}$	15	15	15	nm

Parameter	Symbol	Values	Unit
Absolute Minimum Current (CW or Pulsed) [8]	I_{min}	0.2	A
Absolute Maximum Current (CW) [9]	I_{max}	365 nm- 18 A 385-405 nm- 24 A	A
Absolute Maximum Surge Current [9] (Frequency > 240 Hz, duty cycle =10%, t=1ms)	I_s	30	A
Maximum Junction Temperature [9]	T_{jmax}	125	°C
Storage Temperature Range	T_s	-40 to +100	°C
Emitting Area [10]	A_e	15.6	mm^2
Emitting Area Dimensions		3.4 x 4.6	mm × mm

Note 5: Unless otherwise noted, values listed are typical. Devices are production tested and specified at 9 A with a 20 ms pulse at 25°C .

Note 6: While CBM-120-UV devices are tested at 9 A, they can be driven at CW currents ranging from 200 mA to 18 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.

Note 7: Typical radiometric flux is for reference only. Minimum flux values are guaranteed based on the bin kit ordered. For product roadmap and future performance of devices, contact Luminus.

Note 8: Special design considerations must be observed for operation under 1 A. Please contact Luminus for further information.

Note 9: CBM-120-UV LEDs are designed for operation to an absolute maximum current as specified above. Product lifetime data is specified at or below maximum drive current. Sustained operation beyond absolute maximum currents will result in a reduction of device life time . Actual device lifetimes will also depend on junction temperature and operation beyond maximum junction temperature is not recommended. Contact Luminus for lifetime derating curves and for further information. In pulsed operation, rise time from 10-90% of forward current should be longer than 0.5 μseconds.

Note 10: Emitting Area is for reference only and subject to change without notice.

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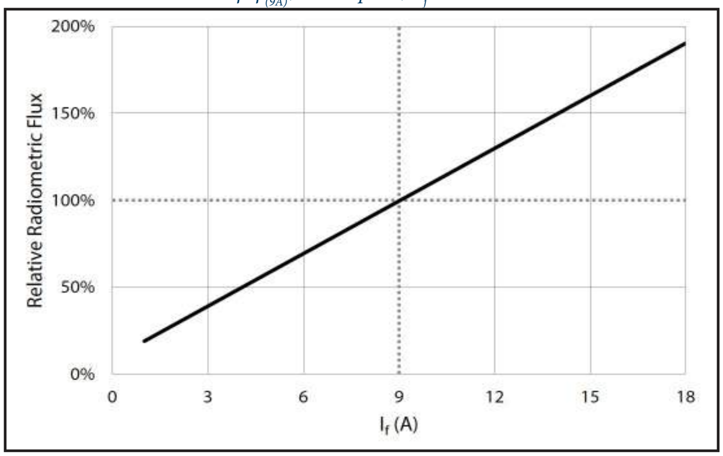
Optical & Electrical Characteristics- 365 nm

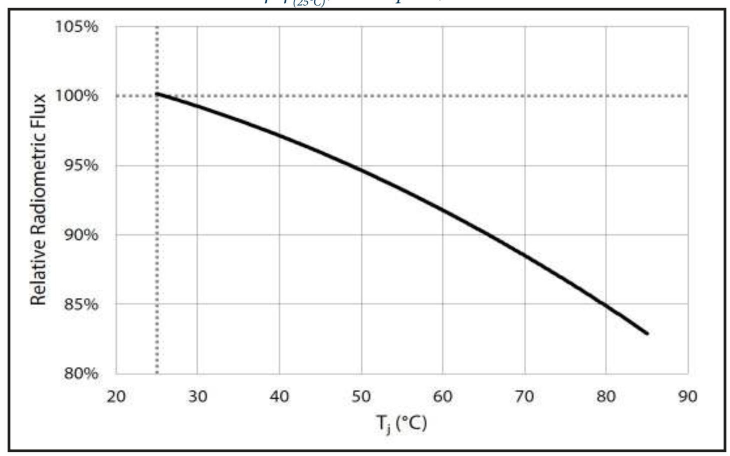
Relative Power vs. Forward Current

$\varphi/\varphi_{(9A)}$, 20 ms pulse, $T_j = 25°C$



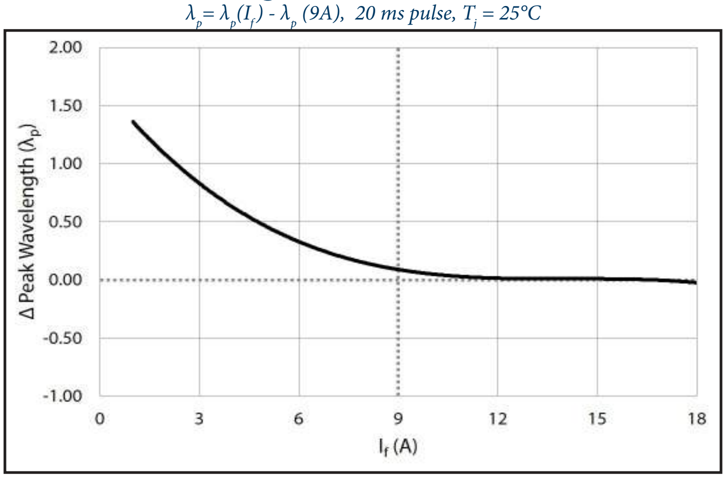
Relative Power vs. Junction Temperature

$\varphi/\varphi_{(25°C)}$, 20 ms pulse, 9A



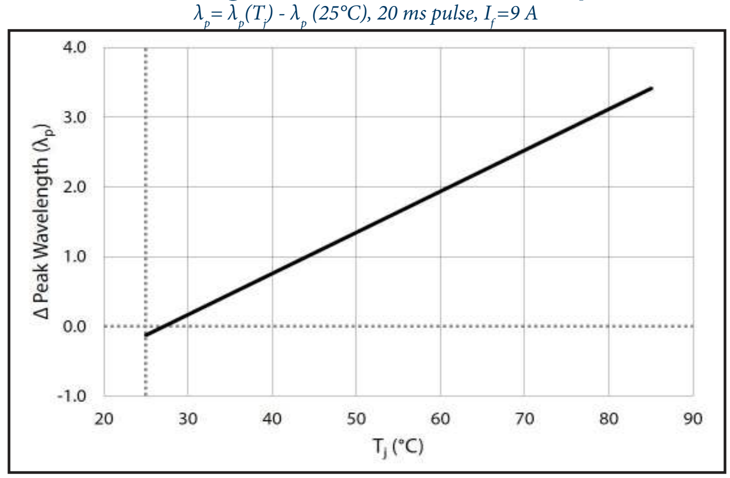
Peak Wavelength Shift vs. Forward Current

$\lambda_p = \lambda_p(I_f) - \lambda_p$ (9A), 20 ms pulse, $T_j = 25°C$

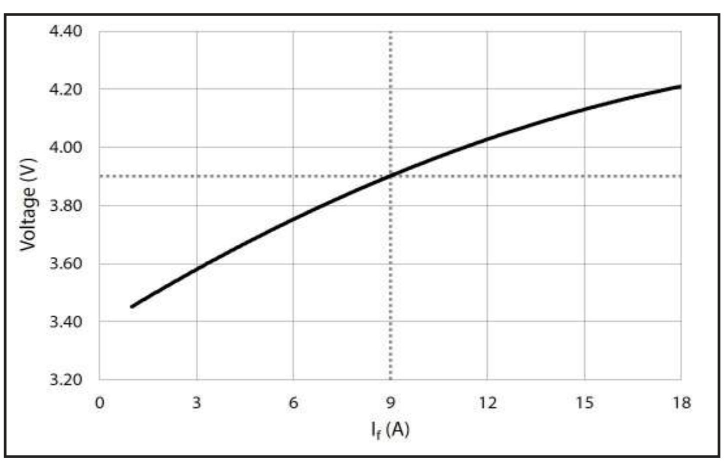


Peak Wavelength Shift vs. Junction Temperature

$\lambda_p = \lambda_p(T_j) - \lambda_p$ (25°C), 20 ms pulse, I_f=9 A

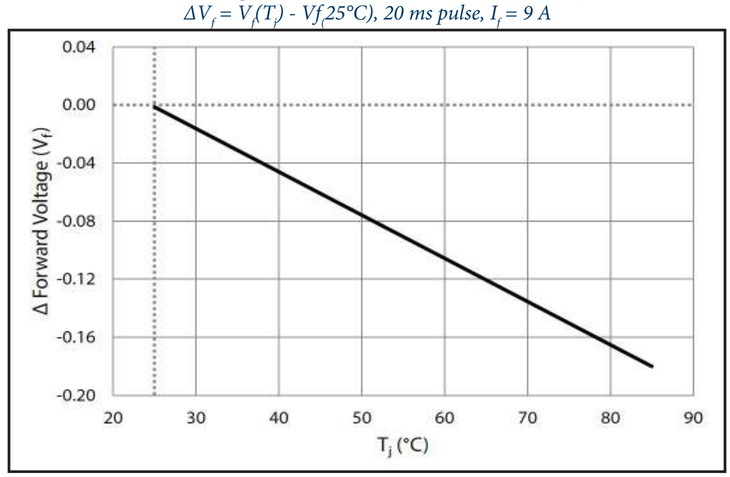


Forward Voltage vs Forward Current



Forward Voltage Shift vs. Junction Temperature

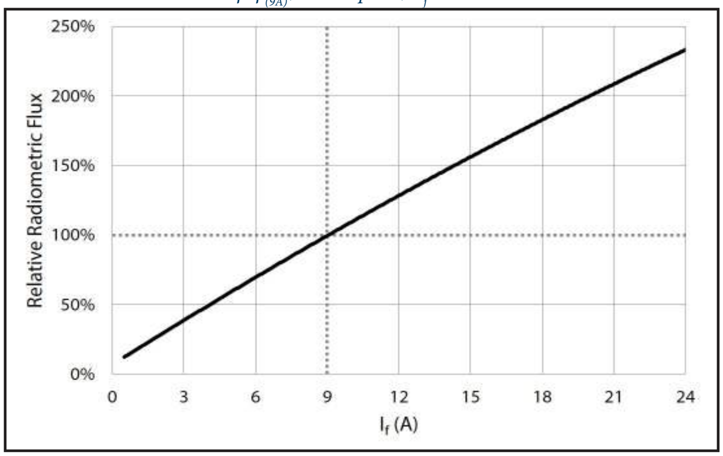
$\Delta V_f = V_f(T_j) - Vf_{(}25°C)$, 20 ms pulse, I_f = 9 A



Optical & Electrical Characteristics- 385 nm

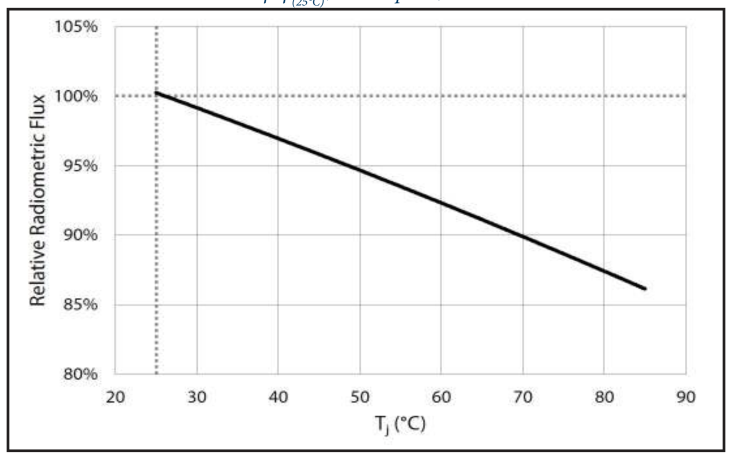
Relative Power vs. Forward Current

$\varphi/\varphi_{(9A)}$, 20 ms pulse, T_j = 25°C



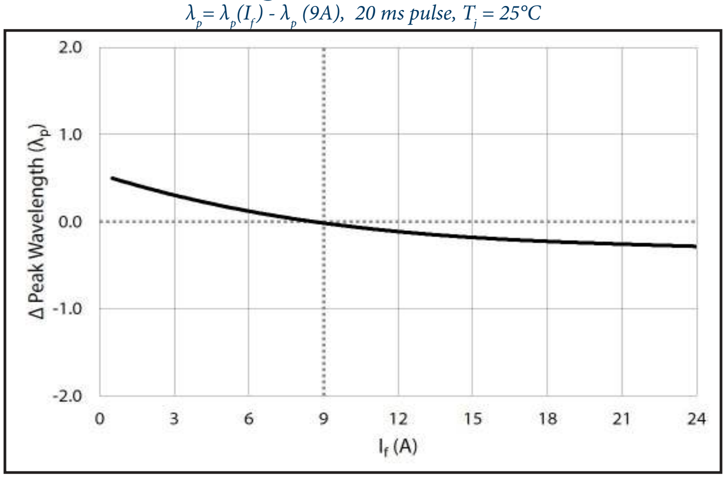
Relative Power vs. Junction Temperature

$\varphi/\varphi_{(25°C)}$, 20 ms pulse, 9A



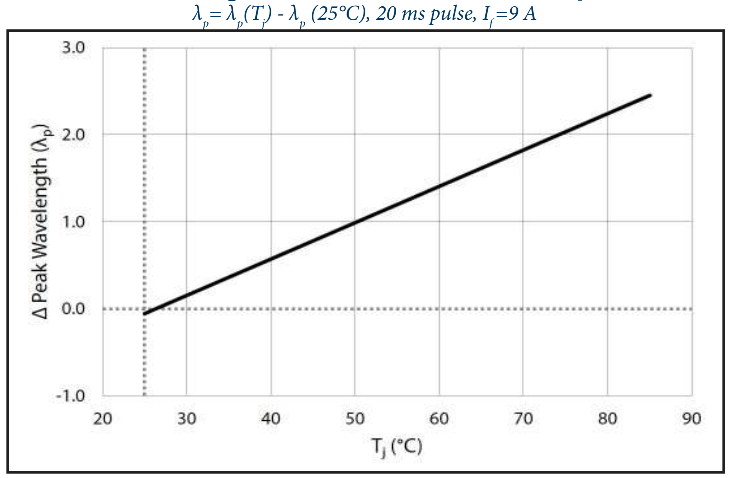
Peak Wavelength Shift vs. Forward Current

$\lambda_p = \lambda_p(I_f) - \lambda_p$ (9A), 20 ms pulse, T_j = 25°C

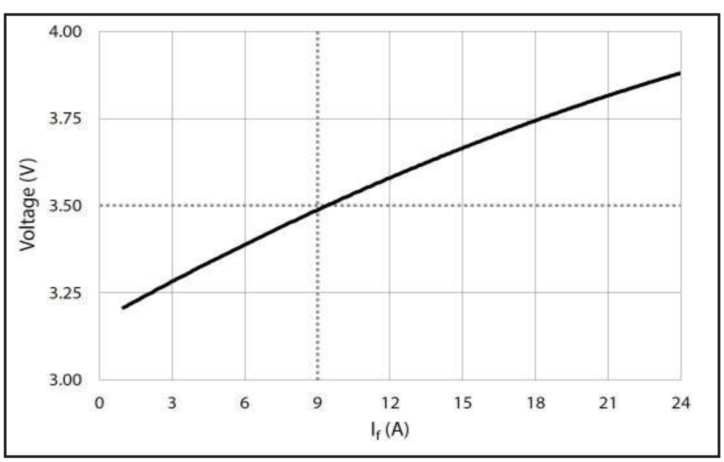


Peak Wavelength Shift vs. Junction Temperature

$\lambda_p = \lambda_p(T_j) - \lambda_p$ (25°C), 20 ms pulse, I_f=9 A

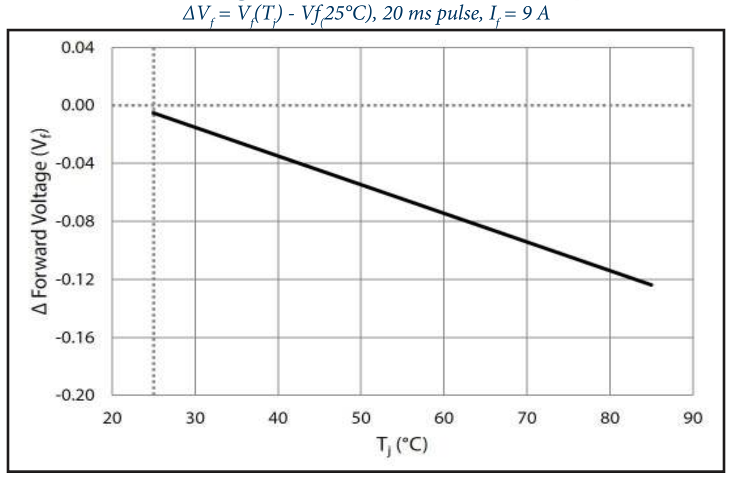


Forward Voltage vs Forward Current



Forward Voltage Shift vs. Junction Temperature

$\Delta V_f = V_f(T_j) - Vf_{(}25°C)$, 20 ms pulse, I_f = 9 A



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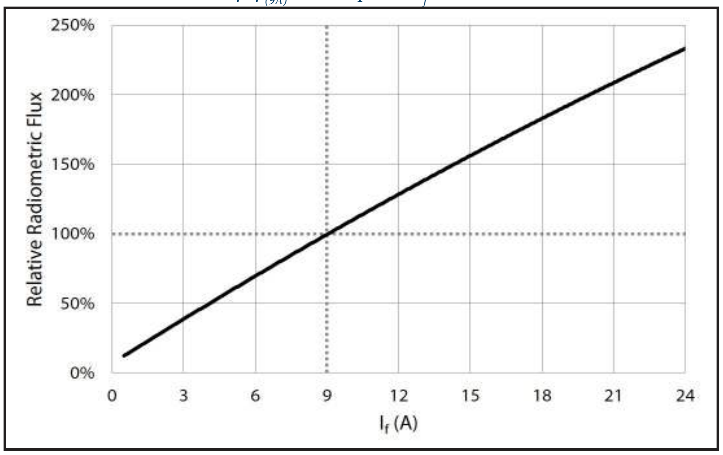
Optical & Electrical Characteristics- 405 nm

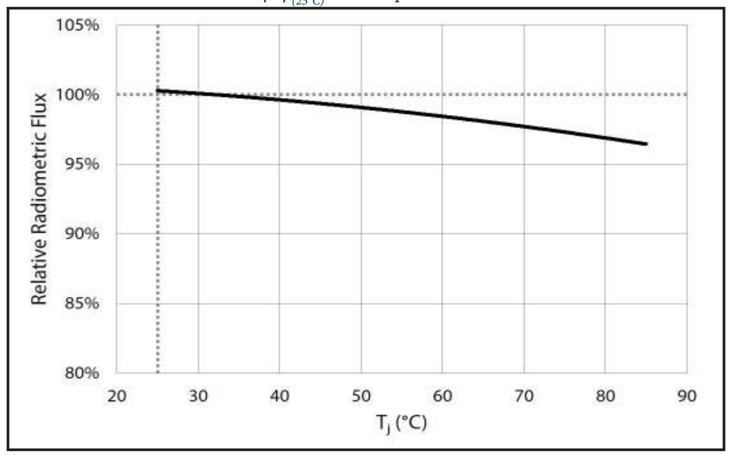
Relative Power vs. Forward Current

$\varphi/\varphi_{(9A)}$, 20 ms pulse, T_j = 25°C



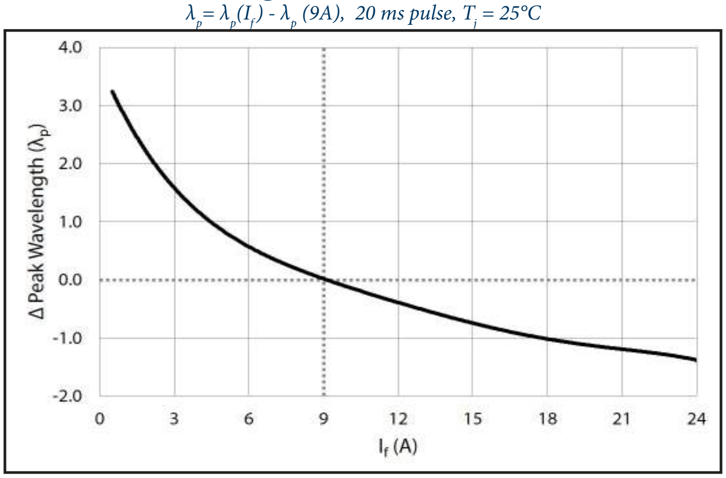
Relative Power vs. Junction Temperature

$\varphi/\varphi_{(25°C)}$, 20 ms pulse, 9A



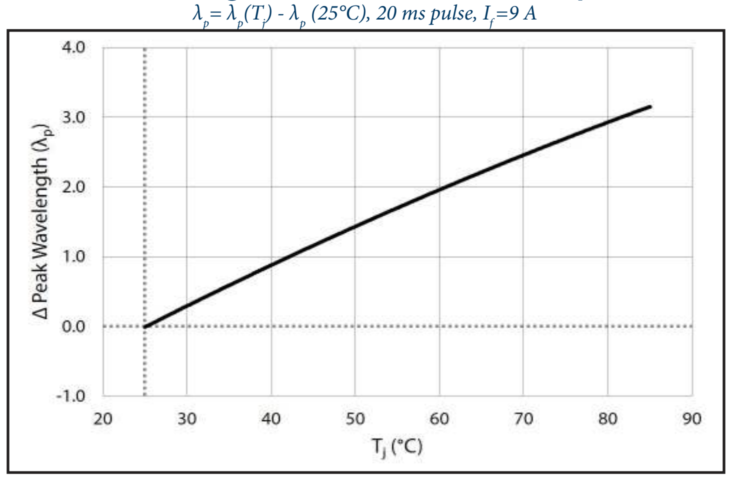
Peak Wavelength Shift vs. Forward Current

$\lambda_p = \lambda_p(I_f) - \lambda_p$ (9A), 20 ms pulse, T_j = 25°C

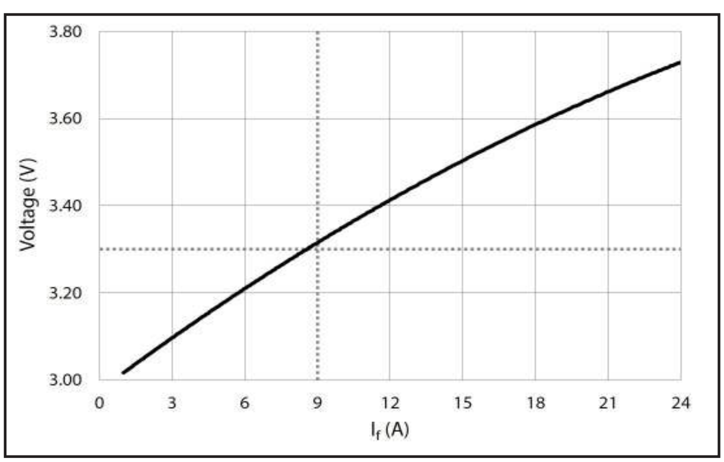


Peak Wavelength Shift vs. Junction Temperature

$\lambda_p = \lambda_p(T_j) - \lambda_p$ (25°C), 20 ms pulse, I_f=9 A

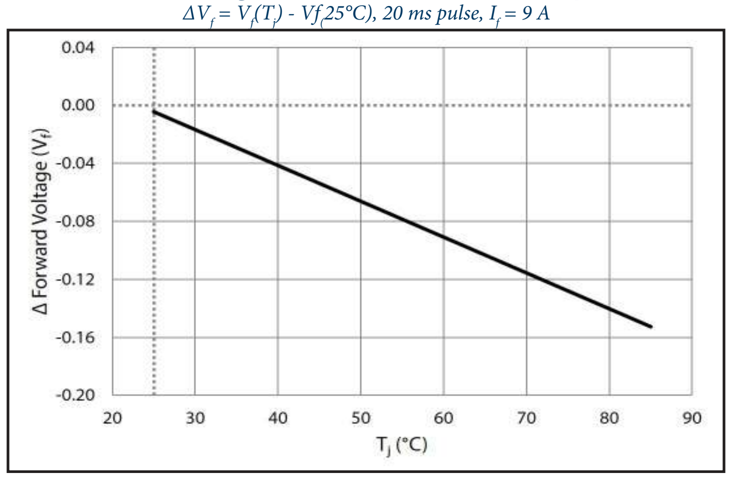


Forward Voltage vs Forward Current



Forward Voltage Shift vs. Junction Temperature

$\Delta V_f = V_f(T_j) - Vf_{(}25°C)$, 20 ms pulse, I_f = 9 A



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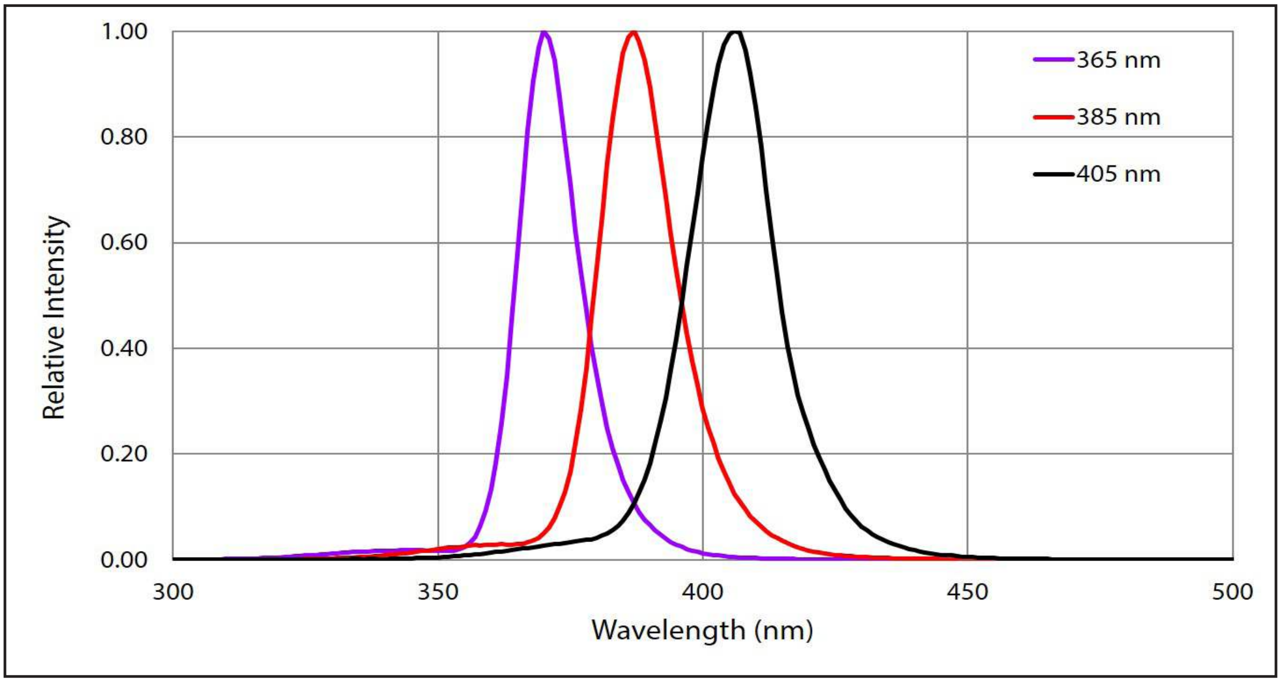
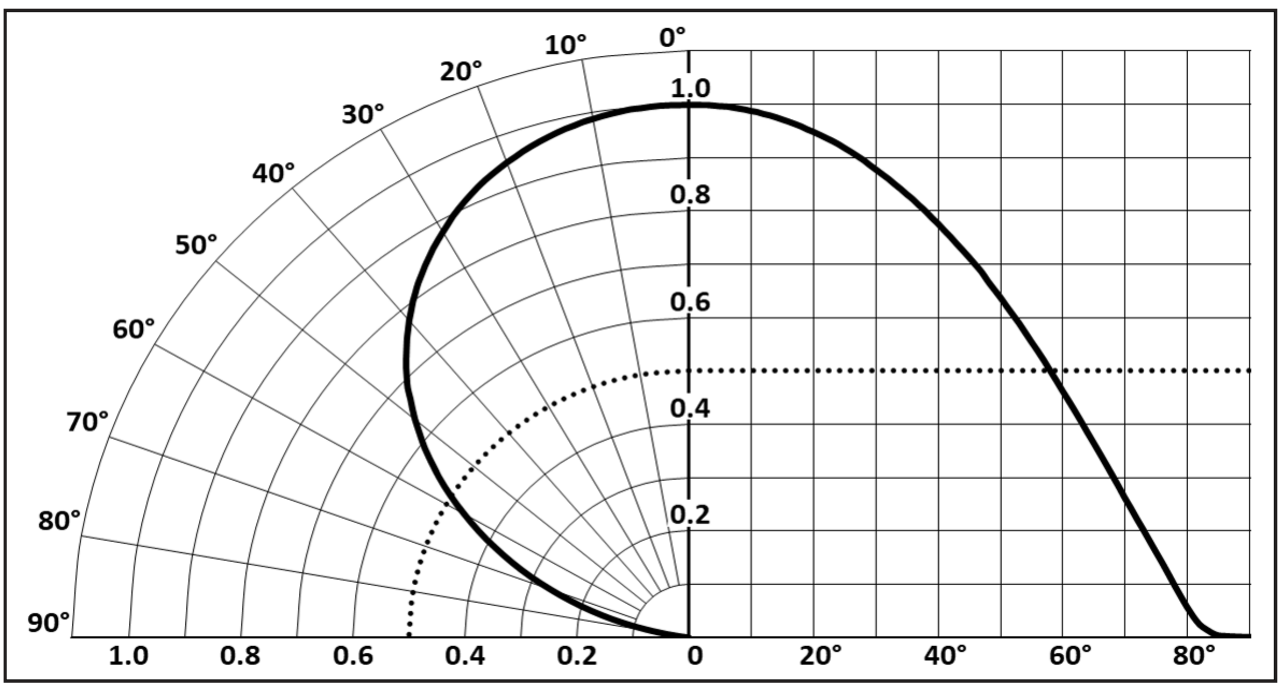
Typical Spectrum [11]



Radiation Pattern [12]



Note 11 : Typical spectrum at 9 A drive current.

Note 12: Detailed information on radiation pattern including ray trace files can be found at: http://www.luminus.com

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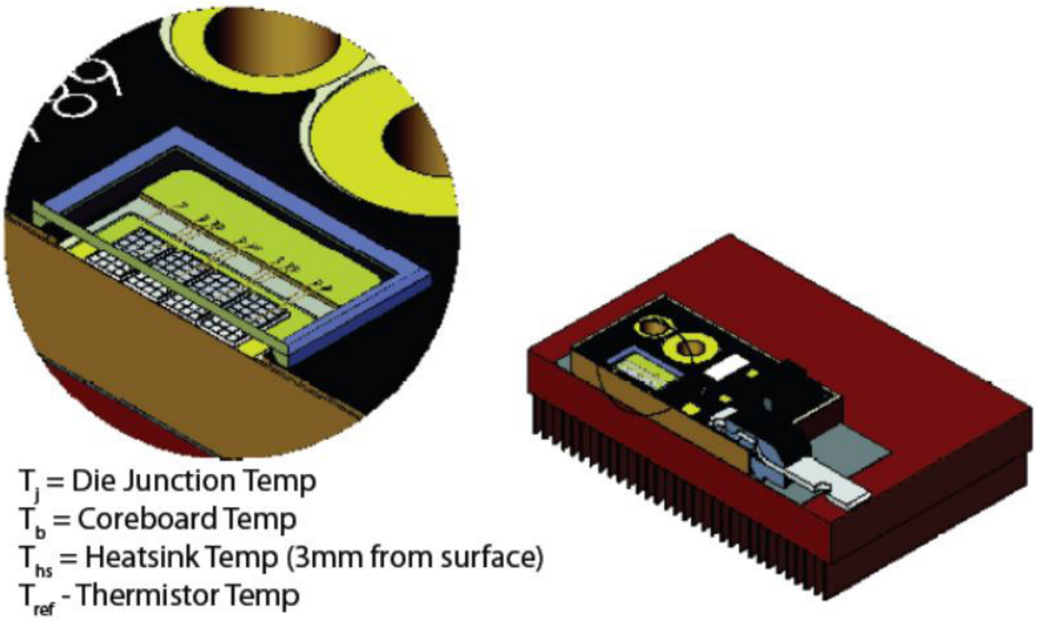
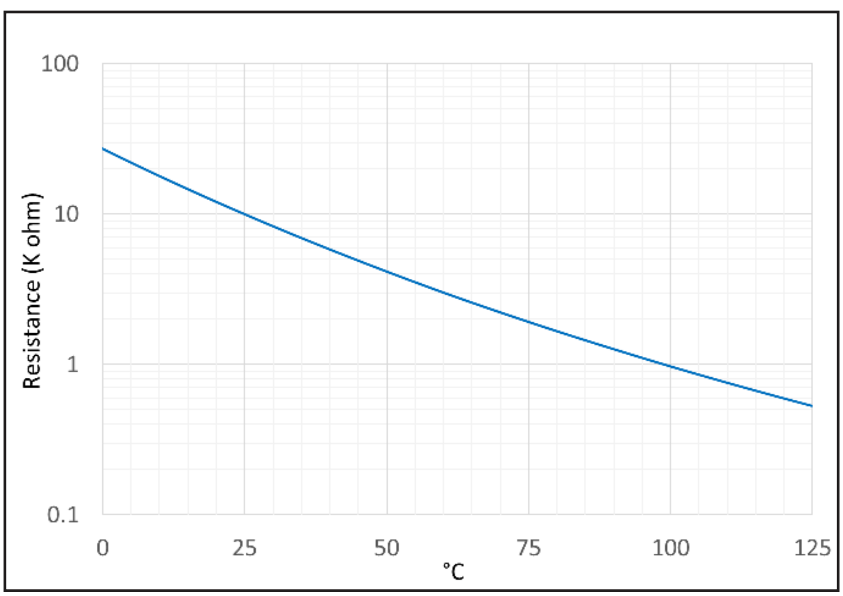
Thermal Resistance



Thermistor Information



$R_{\theta j\text{-}b}$[11]	0.41 °C/W
$R_{\theta j\text{-}ref}$	0.31 °C/W

Note 13: Electrical thermal resistance based on input electrical power at 3A and measured per JESD51-14

Note 14: Thermal Resistance is based on eGraf 1205 Thermal interface.

For more about calculating thermistor temperature, please see https://7w4gu55aofsagtmy.anvil.app/S2C6EXFFQQ7SQYTBQ7MIUG2N

Important note: The CBM-120-UV copper PCB is electrically active with a common cathode polarity.

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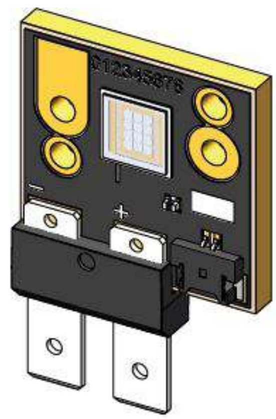
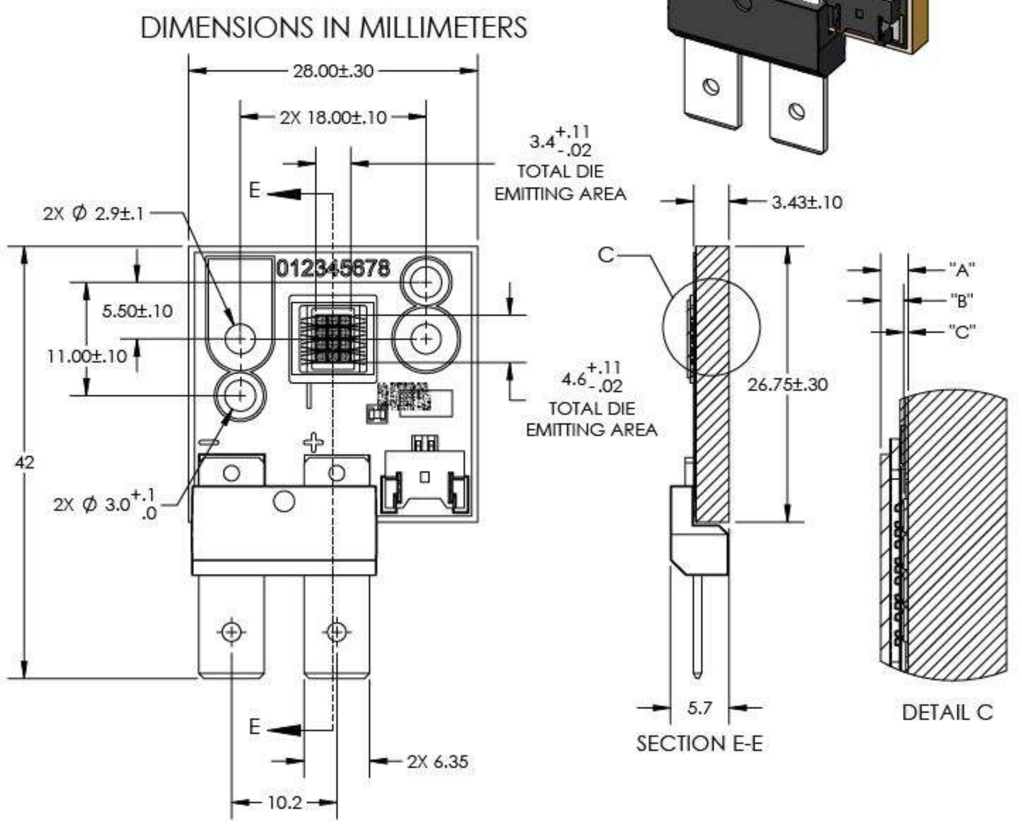
Mechanical Dimensions





DIMENSION NAME	DESCRIPTION	NOMINAL DIMENSION	TOLERANCE
"A"	TOP OF METAL SUBSTRATE TO TOP OF WINDOW	.88	±.13
"B"	TOP OF DIE EMITTING AREA TO TOP OF WINDOW	.74	±.11
"C"	TOP OF METAL SUBSTRATE TO TOP OF DIE EMITTING AREA	.14	±.02

DWG-002934

Recommended connector for Anode and Cathode:
Panduit Disco Lok™ Series P/N: DNF14-250FIB-C or JST Manufacturing Co: SPS-61T-250
Panduit Disco Lok™ Series P/N: DNF10-250FIB-L or JST Manufacturing Co: SPS-91T-250
Check NEC standards for ampacity of the power cable being used.
Recommended Female for Thermistor Connector:
MOLEX P/N 51146-0200 (not recommended for new designs), GCT P/N WTB06-020H-A or equivalent

Note: The coreboards and windows of LEDs may have minor cosmetic differences, for e.g. slightly different hues, because of different supply sources. These differences are only cosmetic and do not affect form, fit or function of the LED.

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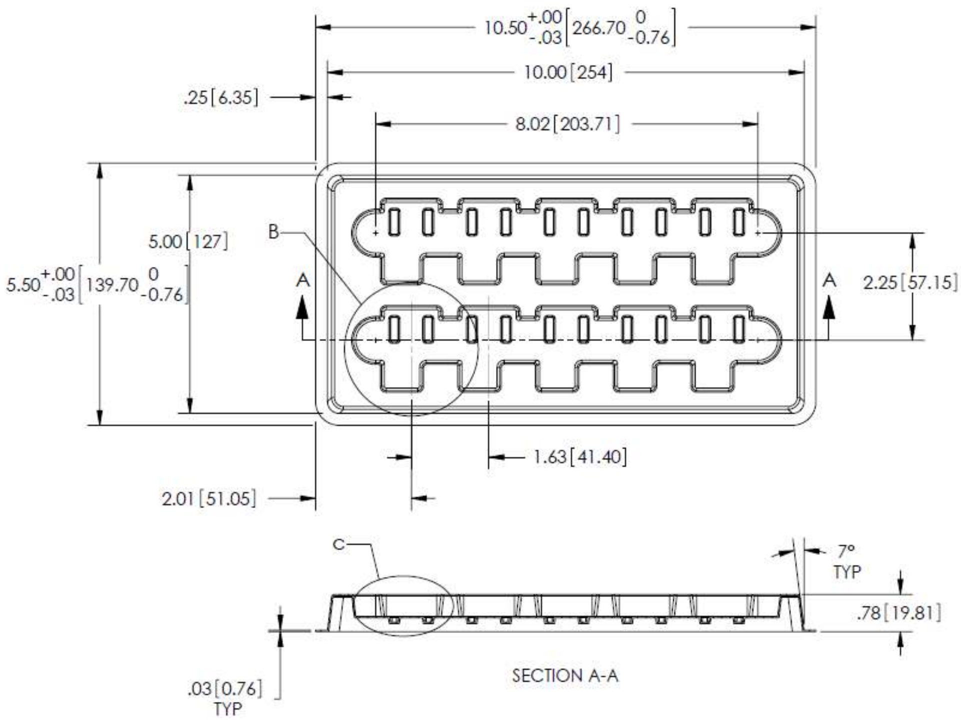
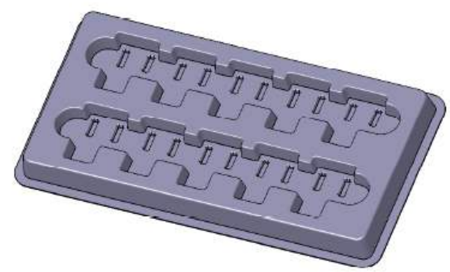
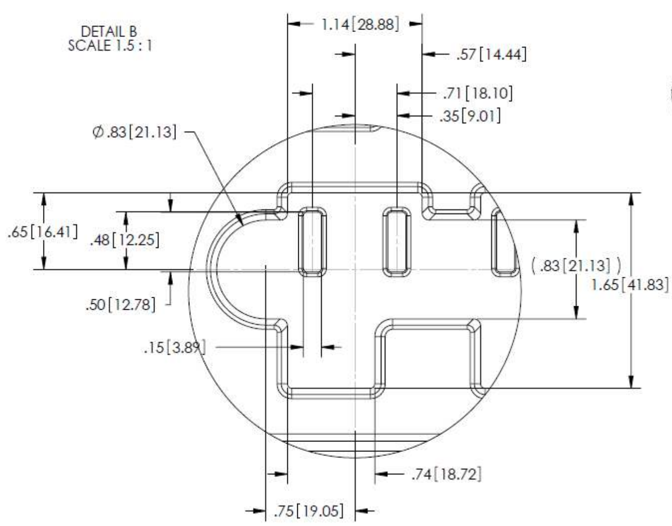
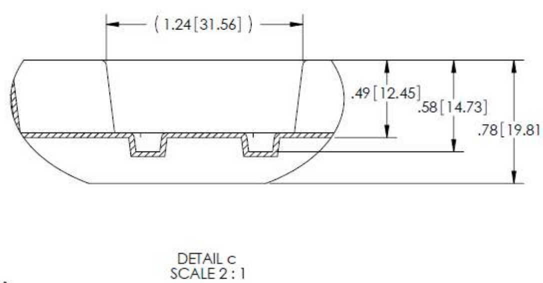
Shipping Tray Outline









TOP TRAY SHOWN TRANSPARENT
FOR REFERENCE ONLY

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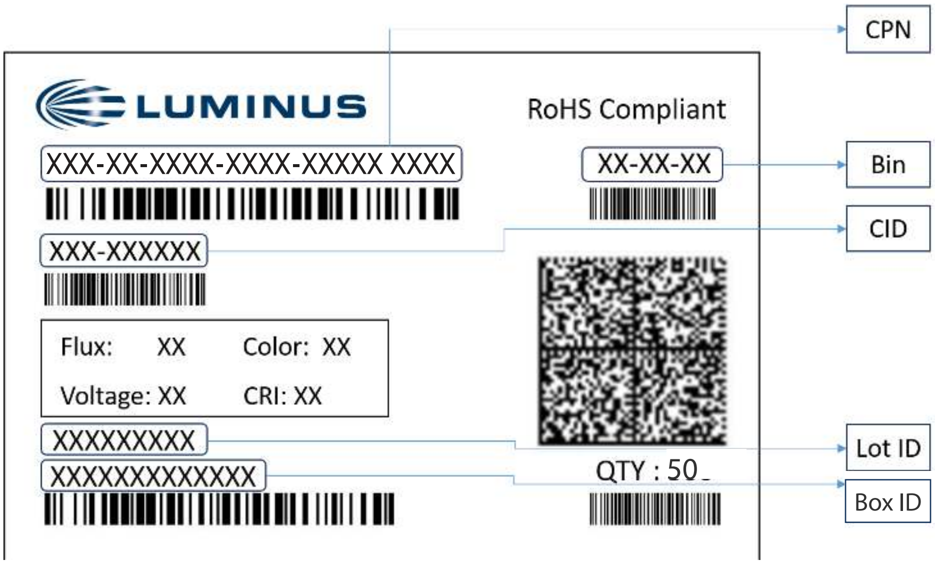
Shipping Label



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 4
- CRI: NA

Packing Configuration:

- Stack of 5 trays with 10 devices per tray
- Partial pack or tray may be shipped
- Each pack is enclosed in antistatic bag
- Shipping label is placed on top of each pack

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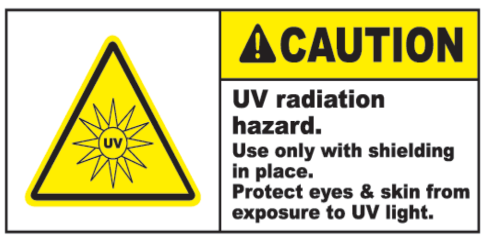
Revision History

Rev	Date	Description of Change
01	06/01/2018	Initial Release
02	06/13/2018	Tolerances in Mechanical Dimensions, Emitting Area
03	05/15/2019	Introduced 365 nm, revised Rth j-b, and updated recommended anode/cathode connectors
04	03/08/2022	Editorial changes



This product is protected by U.S. Patents 6,831,302; 7,074,631; 7,083,993; 7,084,434; 7,098,589; 7,105,861; 7,138,666; 7,166,870; 7,166,871; 7,170,100; 7,196,354; 7,211,831; 7,262,550; 7,274,043; 7,301,271; 7,341,880; 7,344,903; 7,345,416; 7,348,603; 7,388,233; 7,391,059 Patents Pending in the U.S. and other countries.

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