

CBM-50X-UV

Ultraviolet

Chip On Board LEDs

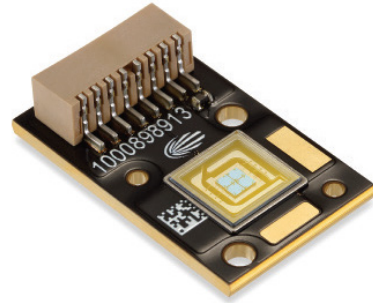


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Features:

- Mosaic Array UV LED chipset with 5.2 mm² emitting area, 1:1 aspect ratio
- Latest chip technology enables ultra-high power density operation up to 4 A/mm²
- Available in wide range of UVA wavelengths: 365 nm - 410 nm
- Isolated, high thermal conductivity isolated copper coreboard package
- Low-profile window for efficient coupling into small-extendue systems
- Environmentally friendly: REACH, RoHS and Halogen compliant

Applications:

- 3D Printing and Additive Manufacturing
- Machine Vision
- Fiber-coupled illumination
- Medical and Scientific Instrumentation

Ordering Information

Ordering Part Numbers

Wavelength Range	Radiometric Flux		Wavelength Bins	Ordering Part Number ^{1,2}
	Min. Flux Bin	Min. Flux		
365-375	DC	4.7	365, 370	CBM-50X-UV-Y31-DC365-22
380-390	FA	6.0	380, 385	CBM-50X-UV-Y31-FA380-22
400-410	FA	6.0	400, 405	CBM-50X-UV-Y31-FA400-22

Part Number Nomenclature

CBM — **50X** — **UV** — **Y31** — **FFWW-2#**

Product Family	Chip Area	Color	Package Configuration	Bin Kit
CBM: Copper-core PCB, Mosaic Array	50X: 5.0 mm ²	UV: Ultraviolet	Y31: 26.5 mm x 16 mm See Mechanical Drawing section	See ordering part numbers table below for complete bin definition

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.

Binning Structure

CBM-50X-UV LEDs are specified for flux and peak wavelength at a drive current of 2.0 A with a 20 ms pulse at 25°C and placed into one of the following Power Bins and Wavelength Bins.

Flux Bins

Color	Flux Bin (FF)	Binning @ 2A, 20ms pulse, $T_{hs} = 25^{\circ}\text{C}^3$	
		Minimum Flux (W)	Maximum Flux (W)
UV	DA	4.0	4.3
	DB	4.3	4.7
	DC	4.7	5.0
	EA	5.0	5.5
	EB	5.5	6.0
	FA	6.0	6.5
	FB	6.5	7.0
	GA	7.0	7.5

Peak Wavelength Bins

Color	Wavelength Bin (WWW)	Binning @ 2A, 20ms pulse, $T_{hs} = 25^{\circ}\text{C}^3$	
		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 1: Luminus maintains a +/- 6% tolerance on flux measurements.

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

Note 3: T_{hs} = Testing Heat Sink Temperature.

Typical Device Performance ($T_{hs} = 25^{\circ}\text{C}$)

General Characteristics		Symbol	Value			Unit
Emitting Area ³		A_e	5.2			mm ²
Emitting Area Dimensions ³			2.29 x 2.29			mm x mm
Characteristics at Recommended Test Drive Current, I_F ¹						
Peak Wavelength Range		λ	365-375	380-390	400-410	nm
Peak Wavelength ¹	typ	λ_p	369	385	405	nm
Test Peak Drive Current	typ	I_F	2.0	2.0	2.0	A
Radiometric Flux ^{1,2}	typ	Φ_{typ}	4.8	6.4	6.2	W
FWHM at 50% of Φ_v ¹	typ	$\Delta\lambda_{1/2}$	15	15	15	nm
Forward Voltage	min	V_{Fmin}	6.5	6.3	6.4	V
	typ	V_F	7.5	7.2	7.4	V
	max	V_{Fmax}	8.3	8.1	8.2	V

Note 1: Unless otherwise noted, values listed are typical. Devices are tested and specified at 2.0 A with a 20 ms pulse at 25°C.

Note 2: 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 3: Emitting Area, Emitting Area Dimensions are for reference only and subject to change without notice.

Absolute Maximum Ratings

	Symbol	Value	Unit
Absolute Minimum Current (CW or Pulsed) ¹	I_{min}	0.4	A
Absolute Maximum Current (CW) ²	I_{max}	365nm: 6.0 385 & 405nm: 8.0	A
Absolute Maximum Surge Current ² (Frequency > 240 Hz, duty cycle =10%, t=1ms)	I_s	365nm: 9.0 385 & 405nm: 12.0	A
Absolute Maximum Junction Temperature ²	T_{jmax}	125	°C
Storage Temperature Range	T_s	-40/+100	°C

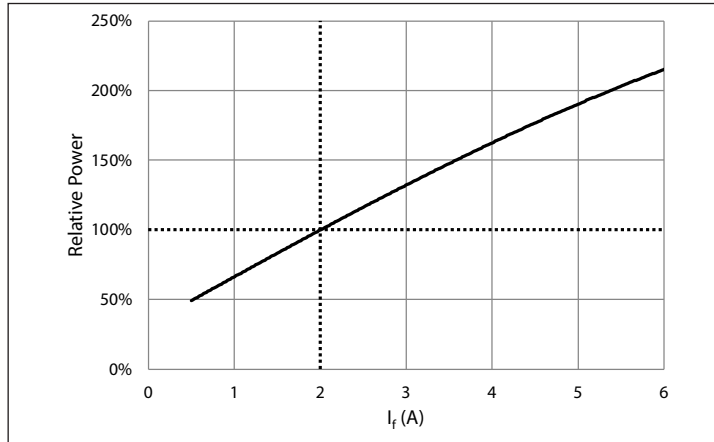
Note 1: Special design considerations must be observed for operation under 1.0 A. Please contact Luminus for further information.

Note 2: CBM-50X-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 microseconds.

Optical & Electrical Characteristics -365nm

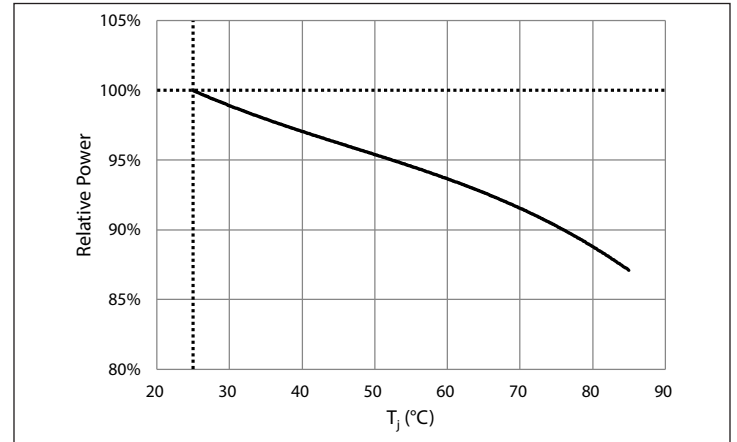
Relative Power vs. Forward Current

$\phi/\phi(2A)$, 20ms pulse, $T_j = 25^\circ C$



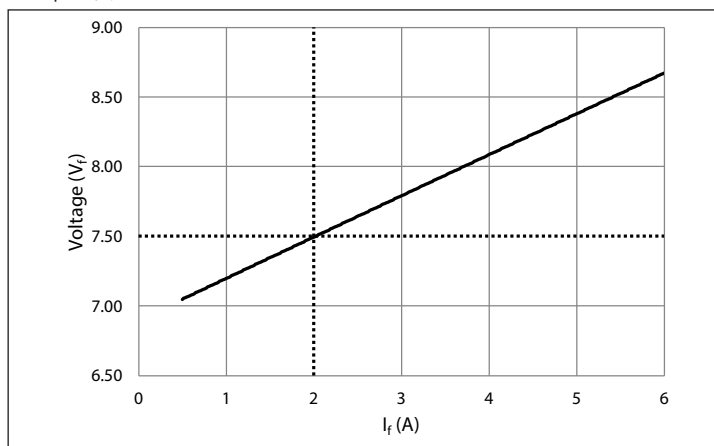
Relative Power vs. Junction Temperature

$\phi/\phi(25^\circ C)$, 20ms pulse, $I_f = 2A$



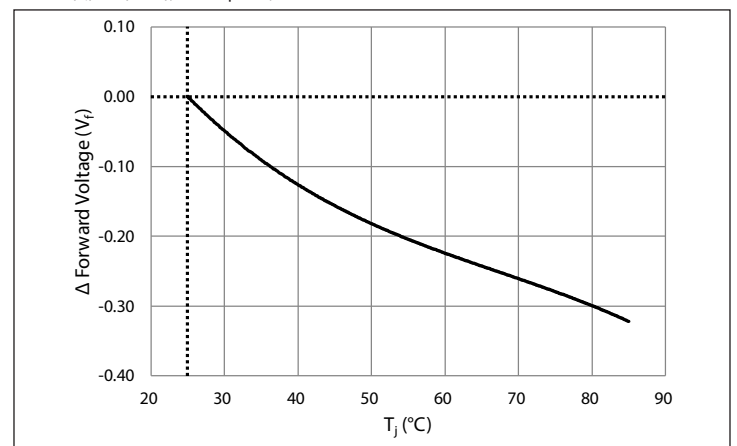
Forward Voltage vs. Forward Current

20ms pulse, $T_j = 25^\circ C$



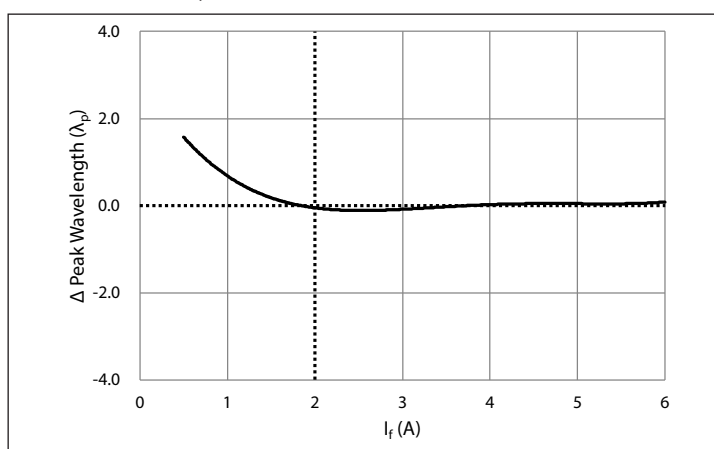
Forward Voltage Shift vs. Junction Temperature

$\Delta V_f = V_f(T_j) - V_f(25^\circ C)$, 20 ms pulse, $I_f = 2A$



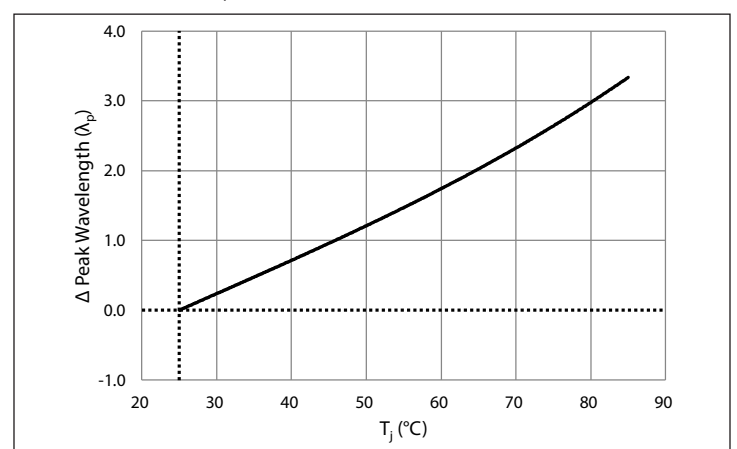
Peak Wavelength Shift vs. Forward Current

$\Delta \lambda_p = \lambda_p(I_f) - \lambda_p(2A)$, 20ms pulse, $T_j = 25^\circ C$



Peak Wavelength Shift vs. Junction Temperature

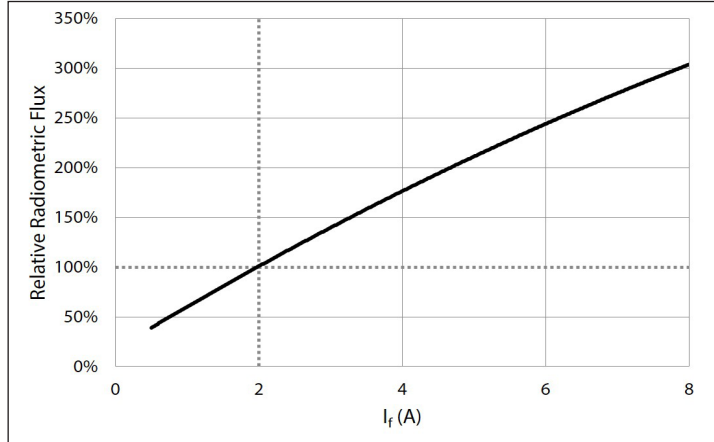
$\Delta \lambda_p = \lambda_p(T_j) - \lambda_p(25^\circ C)$, 20ms pulse, $I_f = 2A$



Optical & Electrical Characteristics -385nm

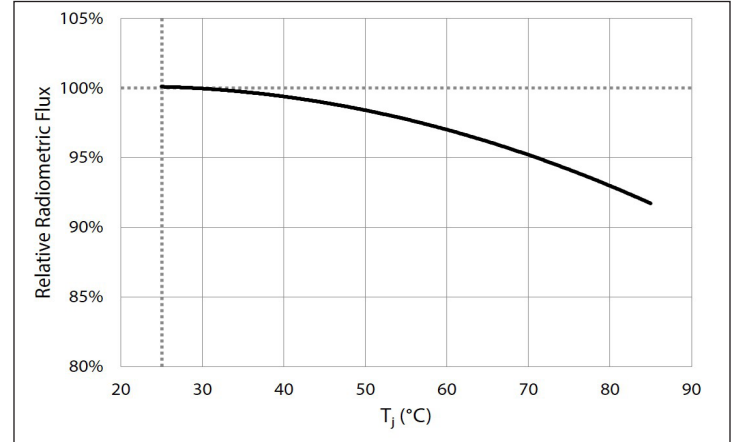
Relative Power vs. Forward Current

$\phi/\phi(2A)$, 20ms pulse, $T_j = 25^\circ C$



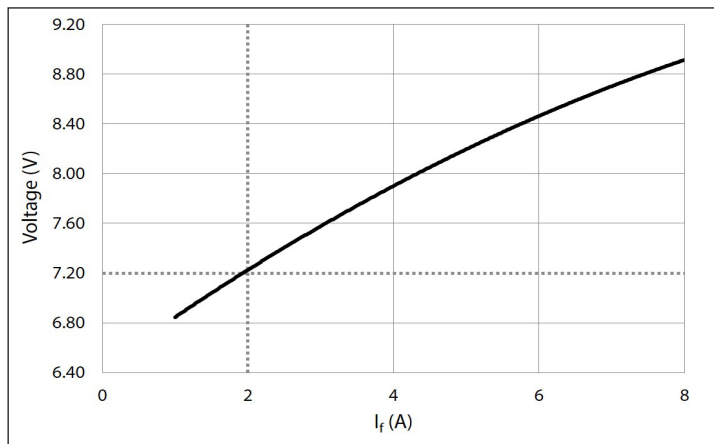
Relative Power vs. Junction Temperature

$\phi/\phi(25^\circ C)$, 20ms pulse, $I_f = 2A$



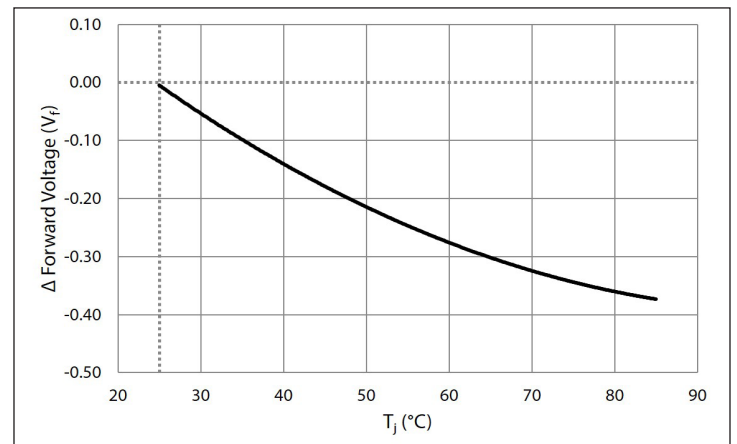
Forward Voltage vs. Forward Current

20ms pulse, $T_j = 25^\circ C$



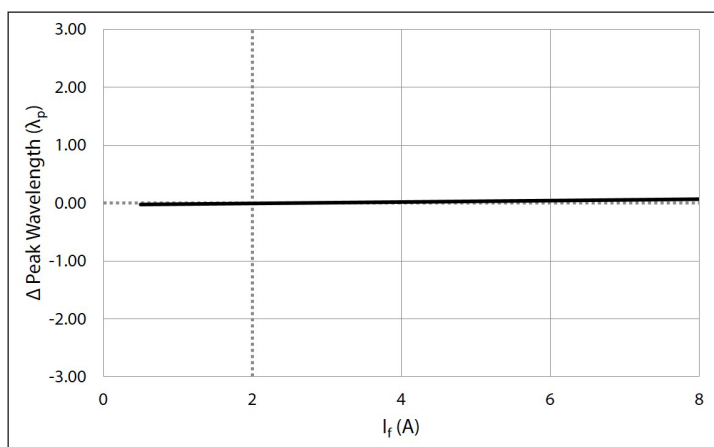
Forward Voltage Shift vs. Junction Temperature

$\Delta V_f = V_f(T_j) - V_f(25^\circ C)$, 20 ms pulse, $I_f = 2A$



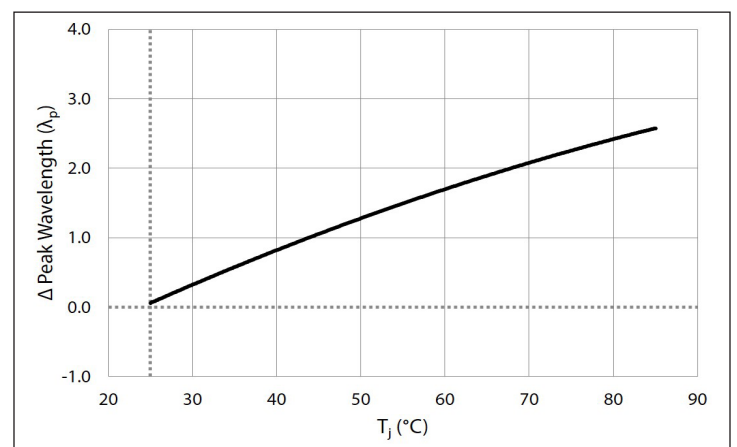
Peak Wavelength Shift vs. Forward Current

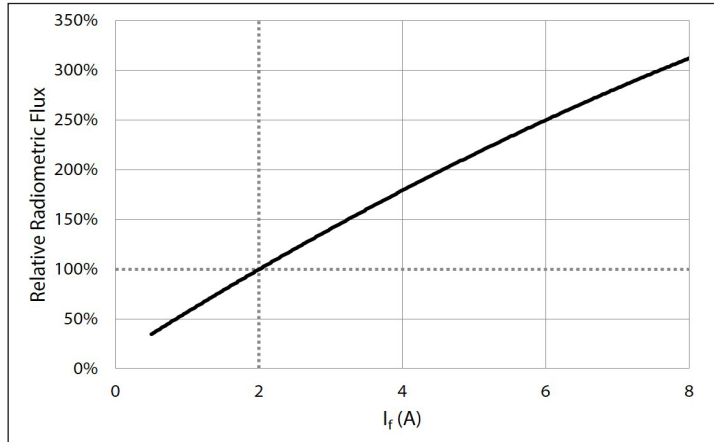
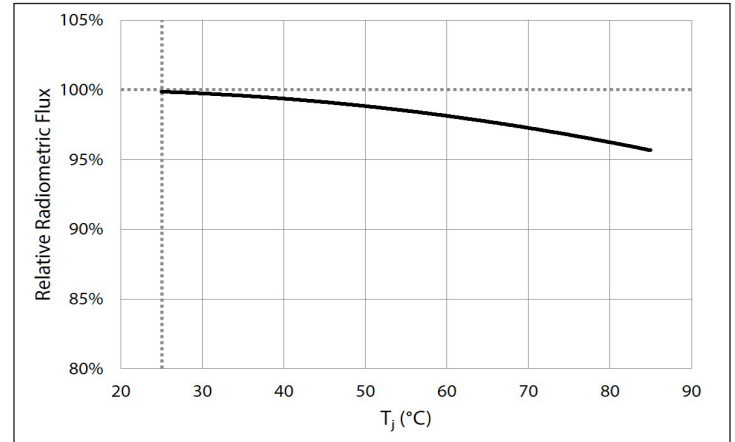
$\Delta \lambda_p = \lambda_p(I_f) - \lambda_p(2A)$, 20ms pulse, $T_j = 25^\circ C$

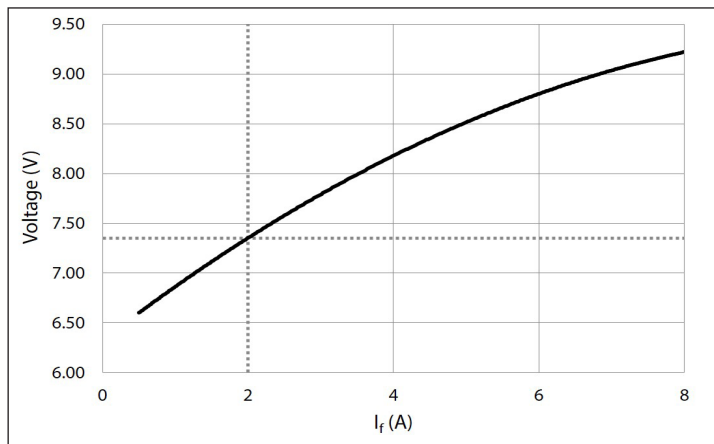
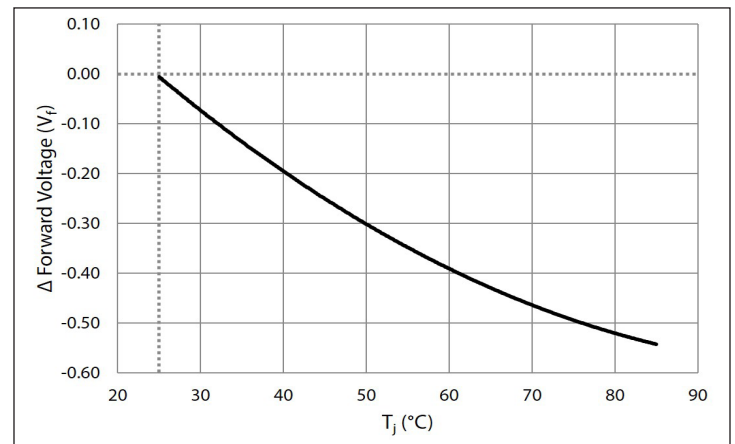
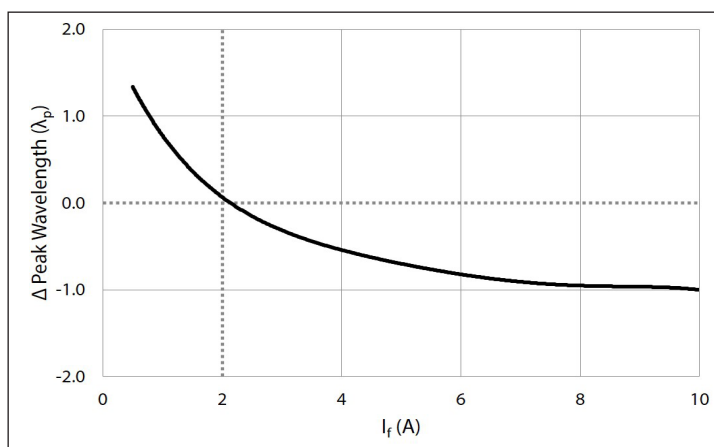
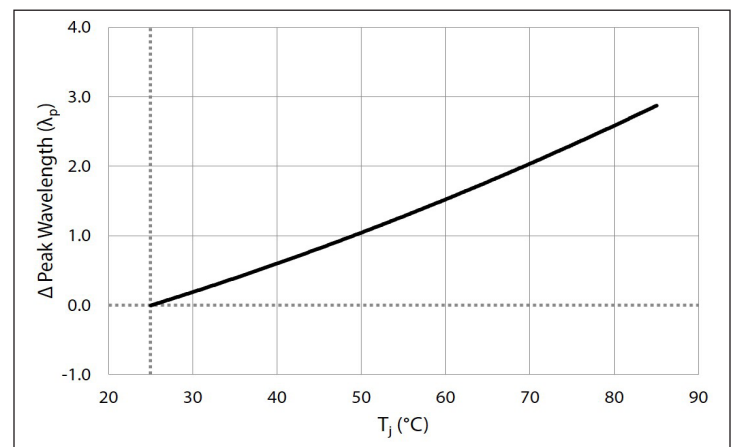


Peak Wavelength Shift vs. Junction Temperature

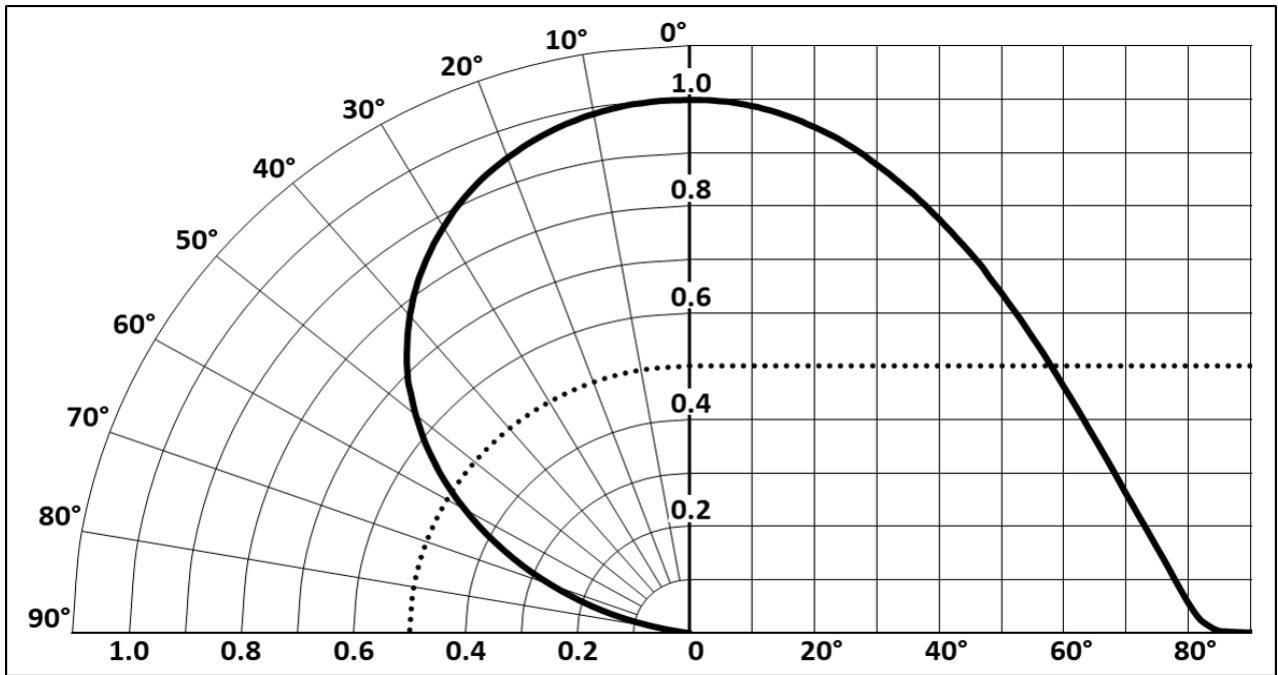
$\Delta \lambda_p = \lambda_p(T_j) - \lambda_p(25^\circ C)$, 20ms pulse, $I_f = 2A$



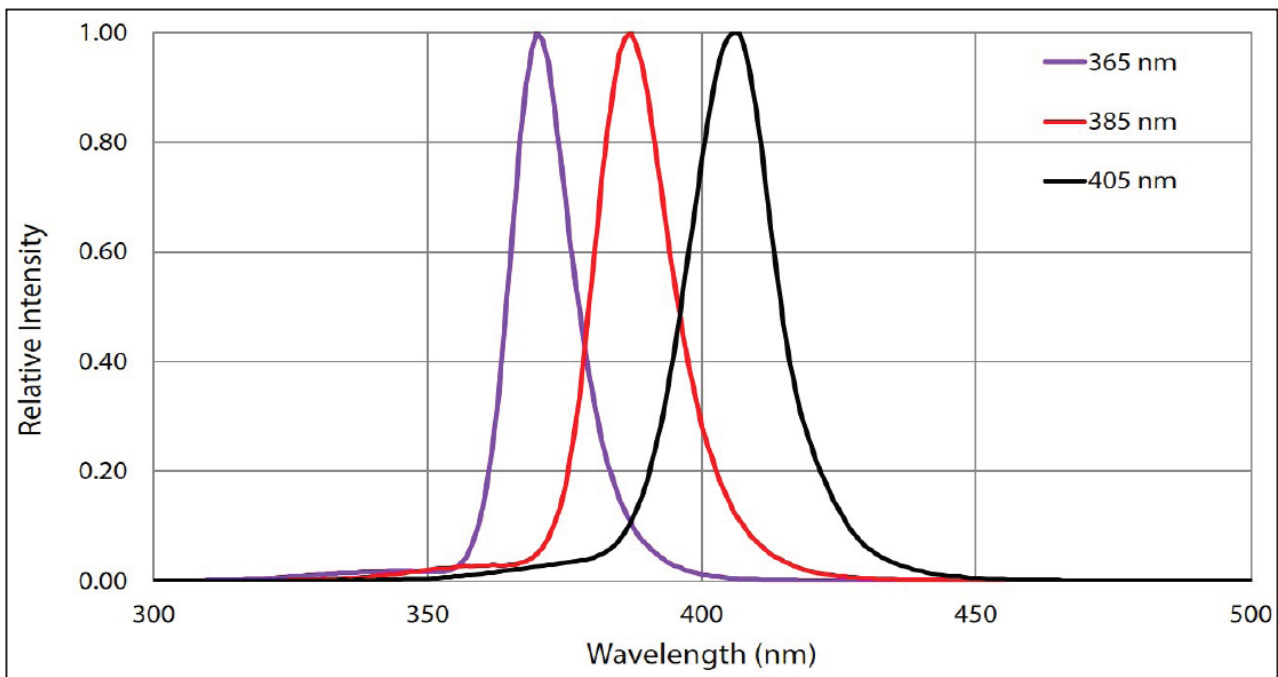
Optical & Electrical Characteristics- 405nm
Relative Power vs. Forward Current
 $\phi/\phi(2A)$, 20ms pulse, $T_j = 25^\circ C$

Relative Power vs. Junction Temperature
 $\phi/\phi(25^\circ C)$, 20ms pulse, $I_f = 2A$

Forward Voltage vs. Forward Current

 20ms pulse, $T_j = 25^\circ C$

Forward Voltage Shift vs. Junction Temperature
 $\Delta V_f = V_f(T_j) - V_f(25^\circ C)$, 20 ms pulse, $I_f = 2A$

Peak Wavelength Shift vs. Forward Current
 $\Delta \lambda_p = \lambda_p(I_f) - \lambda_p(2A)$, 20ms pulse, $T_j = 25^\circ C$

Peak Wavelength Shift vs. Junction Temperature
 $\Delta \lambda_p = \lambda_p(T_j) - \lambda_p(25^\circ C)$, 20ms pulse, $I_f = 2A$


Typical Angular Intensity Distribution¹



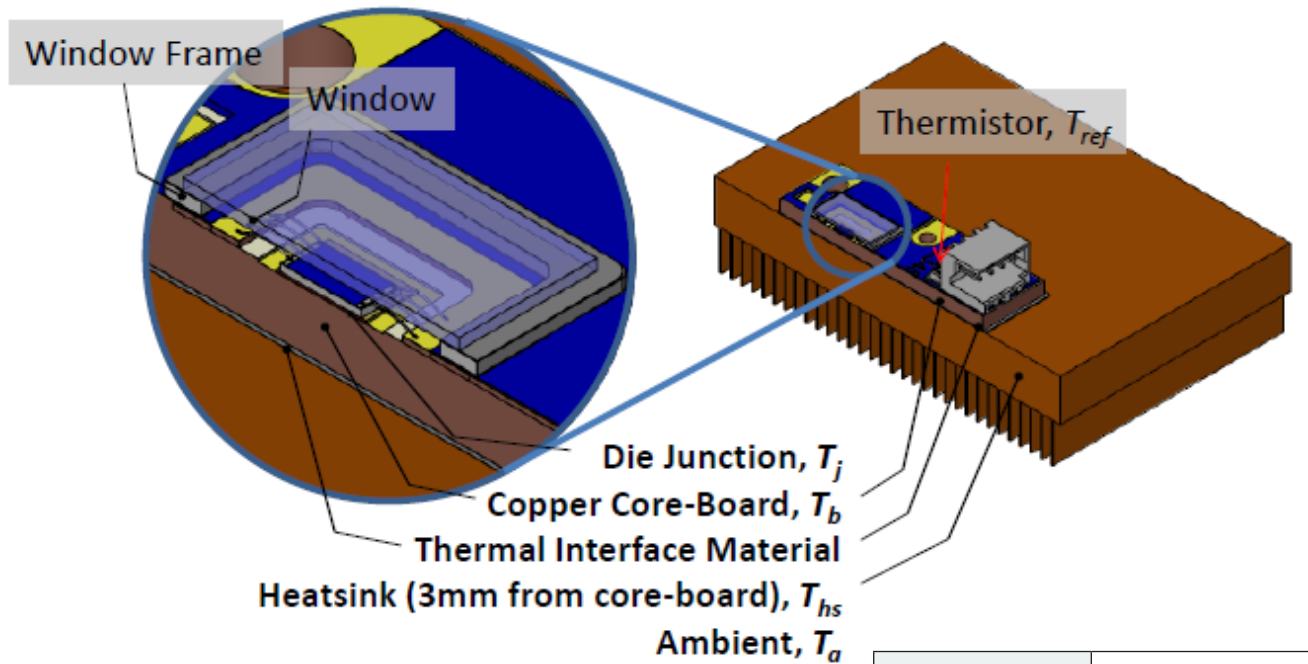
Typical Spectrum²



Note 1: Contact Luminus for ray trace files.

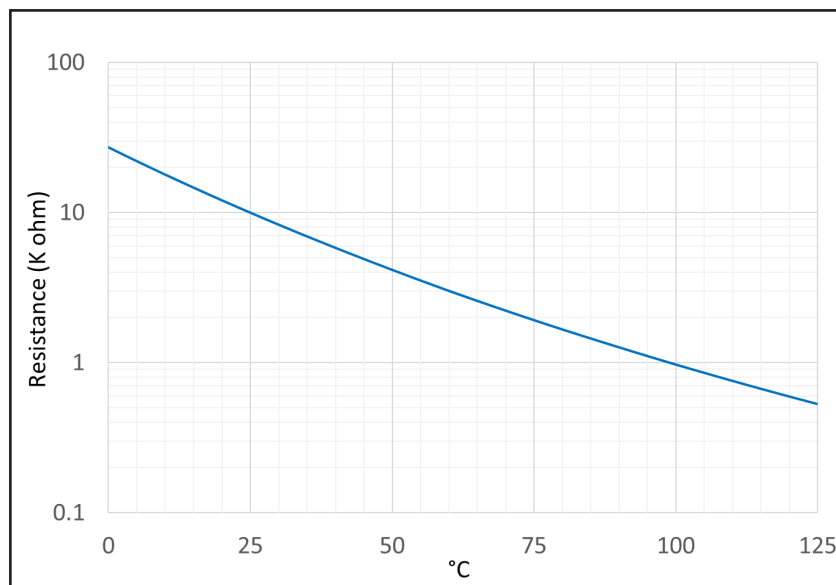
Note 2: Typical spectrum at 2.0 A drive current.

Thermal Resistance



$R_{\theta j-b}$	0.9 °C/W
$R_{\theta j-ref}$	0.8 °C/W

Thermistor Information

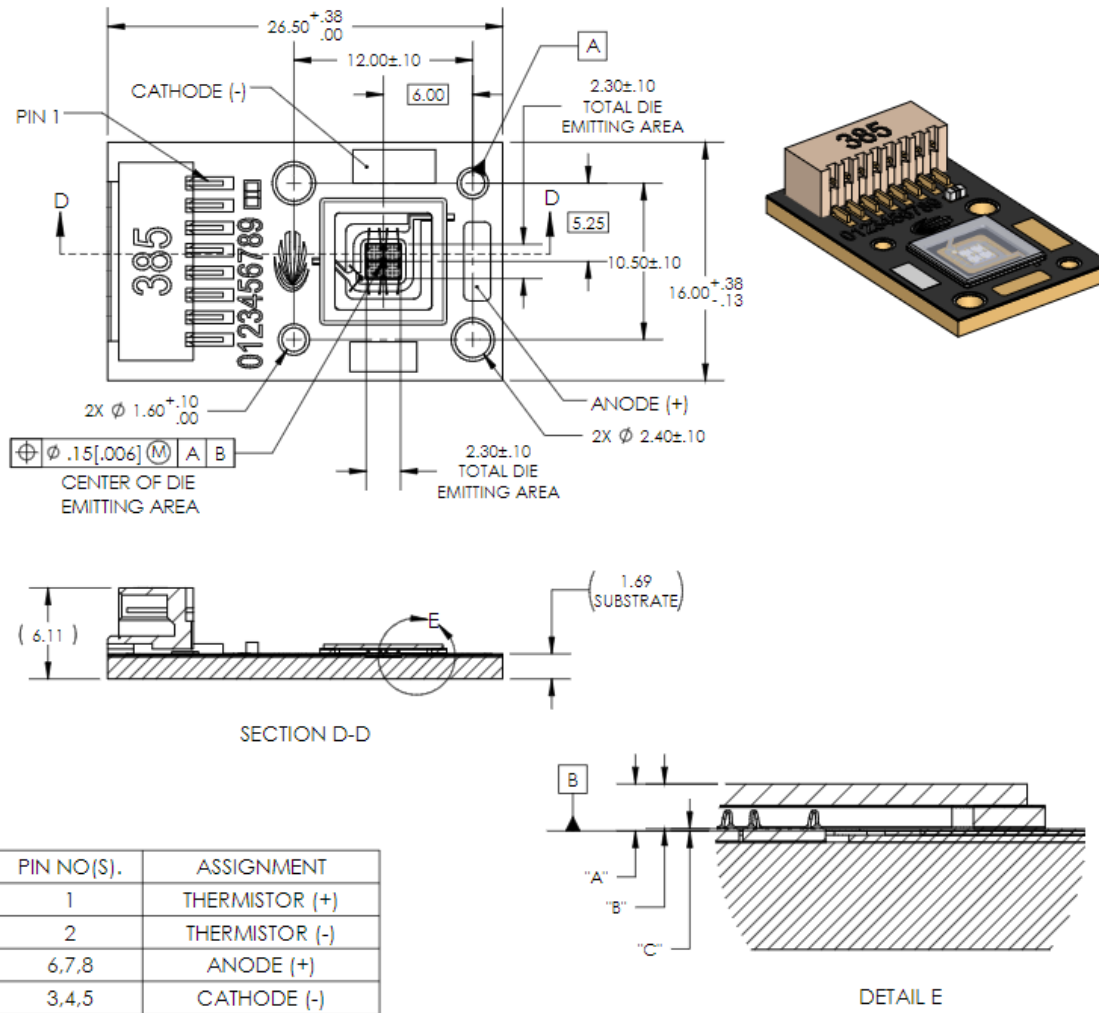


For more about calculating thermistor temperature, please see <https://7w4gu55aofsagtmy.anvil.app/S2C6EXFFQQ7SQYTBQ7MIUG2N>

Important note: The CBM-50X-UV copper PCB is electrically isolated and not active.

Mechanical Dimensions

DIMENSIONS IN MILLIMETERS



DWG-003121

Recommended connector harness:

Targ Yu HTQ001002-210609-01

Check NEC standards for ampacity of the power cable being used

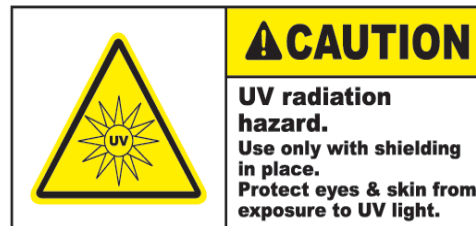
Note1: The coreboards and windows of LEDs may have minor cosmetic differences, for e.g. slightly different hues, because of different supply sources.

These differences are only cosmetic and do not affect form, fit or function of the LED

Note2: Back of the coreboard is electrically neutral

Revision History

Rev	Date	Description of Change
1	2/18/2022	Initial Release



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