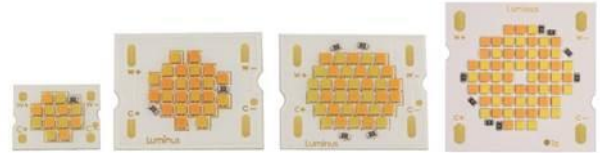


CCT Tunable LED Spot Modules



Features:

- Two channel cool and warm 90+ CRI MP-1616 XNOVA Cube LEDs on metal PC board
- 95 CRI typical with both channels powered on
- High lumen density for directional lighting
- Enables system beam angles from 10 to 40 degrees
- 4000K to 1800K CCT range for residential and hospitality lighting
- 6500K to 2700K CCT range for commercial lighting
- Robust design with 9000 hour LM-80 tested MP-1616 series LEDs
- Consistent white light <3 SDCM
- Specified “hot” performance and 100% factory tested at $T_j=85^{\circ}\text{C}$

Applications:

- Human centric lighting
- Hospitality / hotel / restaurant lighting
- Residential lighting
- Museum and high-end retail lighting
- Circadian lighting in hospitals, offices, or schools
- Public, commercial buildings
- Ceiling and wall mounted lights
- Multi-function space lighting

Products Families

- CTM-9-XXXX-YY-36-TW01: Typical 7W per channel, 9.5mm LES
- CTM-14-XXXX-YY-36-TW01: Typical 15W per channel, 14.5mm LES
- CTM-18-XXXX-YY-36-TW01: Typical 20W per channel, 17.5mm LES
- CTM-22-XXXX-YY-36-TW01: Typical 32W per channel, 22mm LES
 - XXXX: CCT range (“4018” = 4000K to 1800K)
 - YY: minimum CRI
 - “36” = 36V typical voltage
 - TW01 = standard configuration

Technical Data

Electrical data @ $T_j=85^{\circ}\text{C}$

Part number	Nominal forward current per channel	Nominal input power per channel	Nominal voltage per channel	Maximum voltage per channel	Maximum forward current per channel*	Maximum input power per channel*
CTM-9-4018-90-36-TW01	200mA	7W	37V	39V	220mA	9W
CTM-9-6527-90-36-TW01	200mA	7W	37V	39V	220mA	9W
CTM-14-4018-90-36-TW01	400mA	15W	37V	39V	440mA	18W
CTM-14-6527-90-36-TW01	400mA	15W	37V	39V	440mA	18W
CTM-18-4018-90-36-TW01	550mA	20W	37V	39V	660mA	27W
CTM-18-6527-90-36-TW01	550mA	20W	37V	39V	660mA	27W
CTM-22-4018-90-36-TW01	875mA	32W	37V	39V	1100mA	45W
CTM-22-6527-90-36-TW01	875mA	32W	37V	39V	1100mA	45W

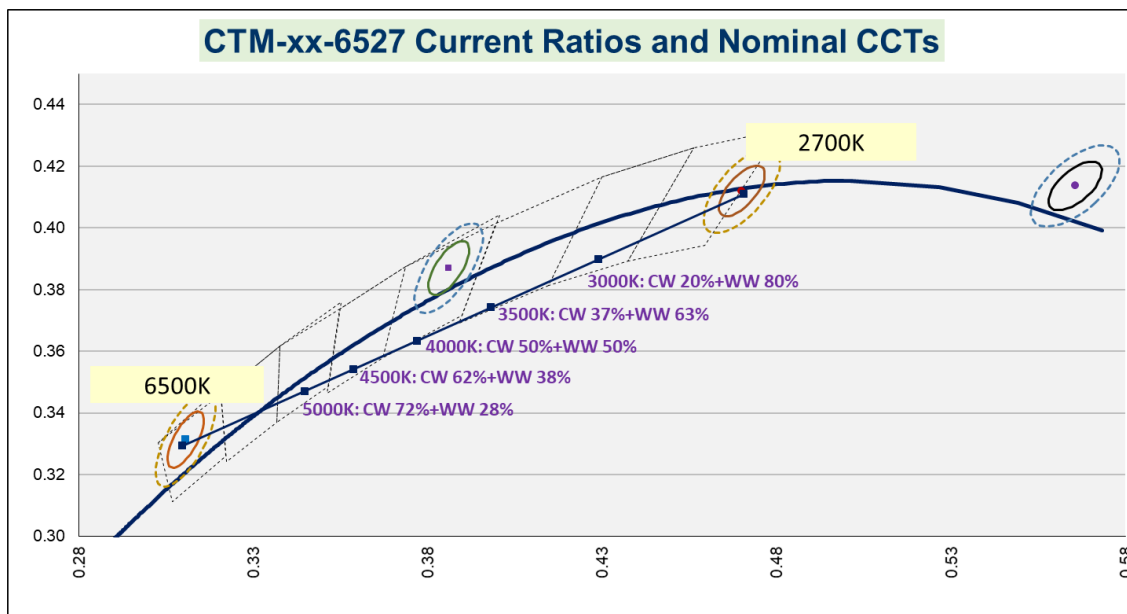
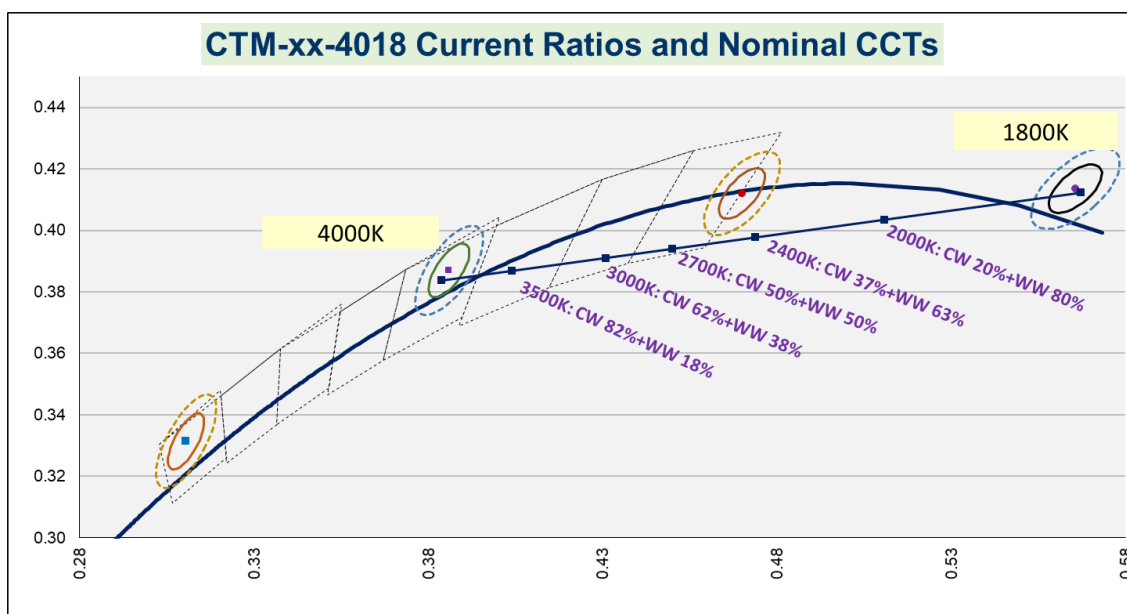
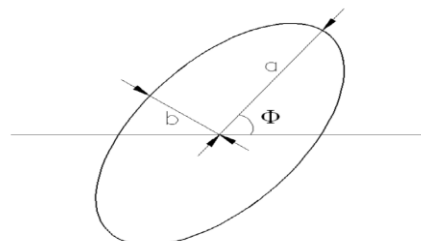
* Note that the maximum current and maximum power per channel also serve as guidelines for maximum current and maximum power for both channels combined. Luminaire thermal system capability and power derating curves on page 6 must be considered, and most 2 channel drivers will limit or should limit the combined maximum forward current of both channels per the values in the table above.

Photometric Data @ $T_j=85^{\circ}\text{C}$ and Nominal Forward Current:

Part number	CRI (min)	CCT of cool white	Minimum flux (lumens)	Nominal flux (lumens)	CCT of warm white	Minimum flux (lumens)	Nominal flux (lumens)
CTM-9-4018-90-36-TW01	90	4000K	650	715	1800K	415	470
CTM-9-6527-90-36-TW01	90	6500K	670	740	2700K	600	675
CTM-14-4018-90-36-TW01	90	4000K	1300	1400	1800K	850	940
CTM-14-6527-90-36-TW01	90	6500K	1350	1490	2700K	1200	1350
CTM-18-4018-90-36-TW01	90	4000K	1850	1950	1800K	1200	1320
CTM-18-6527-90-36-TW01	90	6500K	1900	2050	2700K	1700	1860
CTM-22-4018-90-36-TW01	90	4000K	2945	3100	1800K	1850	2150
CTM-22-6527-90-36-TW01	90	6500K	3000	3250	2700K	2750	2950

Chromaticity Bins and Ellipse Definitions @ $T_j=85^{\circ}\text{C}$:

Nominal CCT	Center Point		Angle	3-step Bin	
	CIE _x	CIE _y	$\Theta(^{\circ})$	a	b
1800K	0.5656	0.4136	46.51	0.00989	0.00476
2700K	0.4700	0.4120	54.39	0.00964	0.00421
4000K	0.3860	0.3870	60.58	0.00979	0.00385
6500K	0.3160	0.3375	65.10	0.00995	0.00348



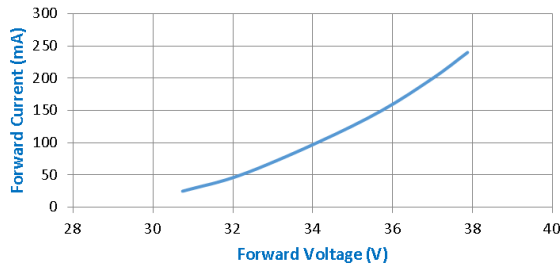
Absolute Maximum Ratings & Optical/Electrical Characteristics:

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating case temperature	T _c			105	°C
Junction temperature	T _j			125	°C
Viewing angle	2(Θ _{1/2})		130		degrees
Reverse voltage	V _r			5	volts
Ambient operating temperature	T _{opr}	-40		+85	°C
Storage temperature	T _{sto}	-40		+85	°C
Electrostatic Discharge	ESD			4000V	HBM

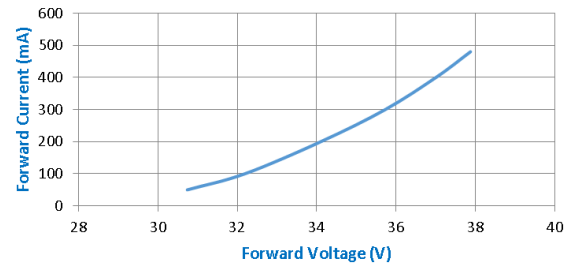
Mechanical Dimensions & Thermal Resistance:

Part Number	Light Emitting Surface (LES) Diameter	Board Size	Typical Thermal Resistance (R _{thj-c})	PCB Thickness
CTM-9-4018-90-36-TW01	9.5mm	12x15mm	1.8 K/W	1mm
CTM-9-6527-90-36-TW01	9.5mm	12x15mm	1.8 K/W	1mm
CTM-14-4018-90-36-TW01	14.5mm	20x24mm	0.67 K/W	1mm
CTM-14-6527-90-36-TW01	14.5mm	20x24mm	0.67 K/W	1mm
CTM-18-4018-90-36-TW01	17.5mm	20x24mm	0.5 K/W	1mm
CTM-18-6527-90-36-TW01	17.5mm	20x24mm	0.5 K/W	1mm
CTM-22-4018-90-36-TW01	22mm	28x28mm	0.4 K/W	1mm
CTM-22-6527-90-36-TW01	22mm	28x28mm	0.4 K/W	1mm

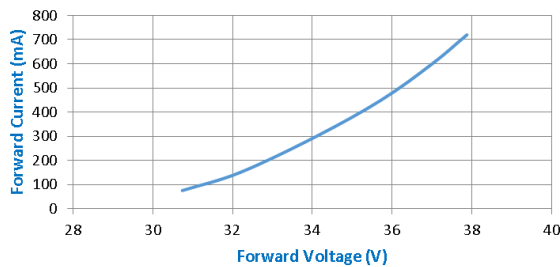
**CTM-9 (each channel) @ $T_j=85^\circ\text{C}$
Forward Current vs. Forward Voltage**



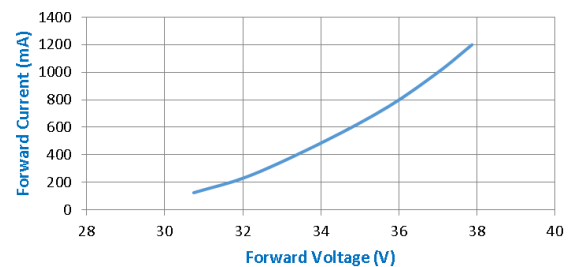
**CTM-14 (each channel) @ $T_j=85^\circ\text{C}$
Forward Current vs. Forward Voltage**



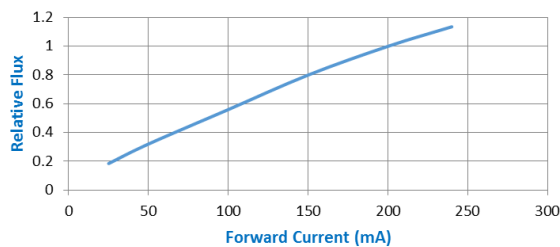
**CTM-18 (each channel) @ $T_j=85^\circ\text{C}$
Forward Current vs. Forward Voltage**



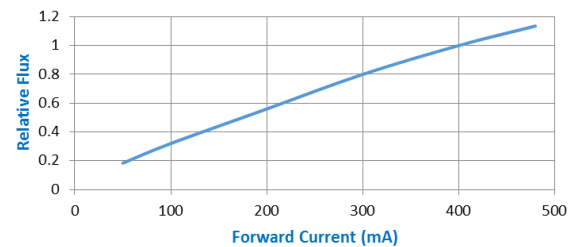
**CTM-22 (each channel) @ $T_j=85^\circ\text{C}$
Forward Current vs. Forward Voltage**



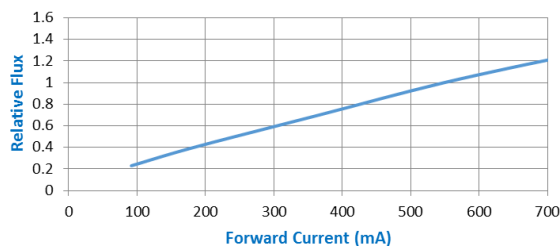
**CTM-9 Relative Luminus Flux vs.
Forward Current per Channel**



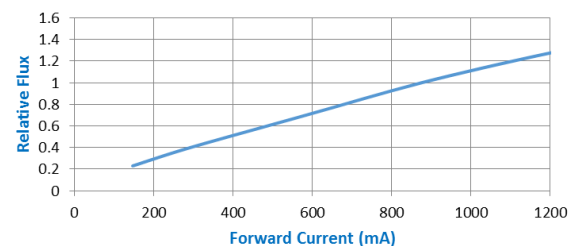
**CTM-14 Relative Luminus Flux vs.
Forward Current per Channel**



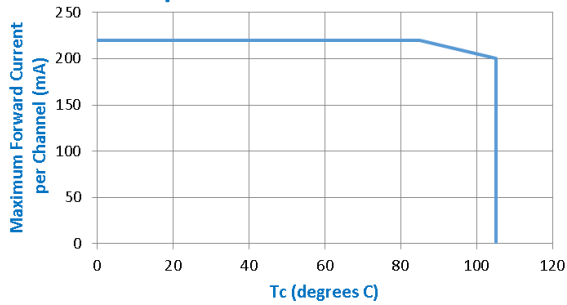
**CTM-18 Relative Luminus Flux vs.
Forward Current per Channel**



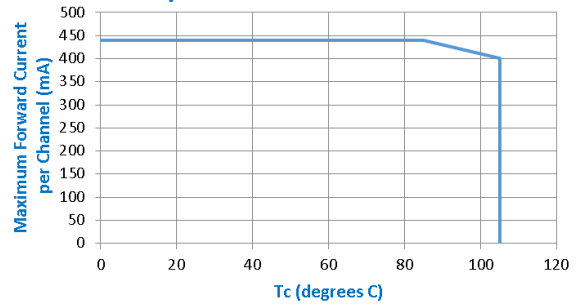
**CTM-22 Relative Luminus Flux vs.
Forward Current per Channel**



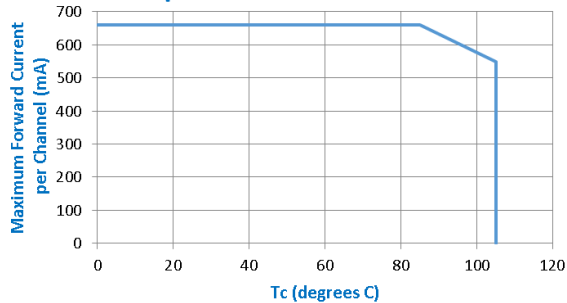
**CTM-9 Maximum Forward Current
per Channel vs. Tc**



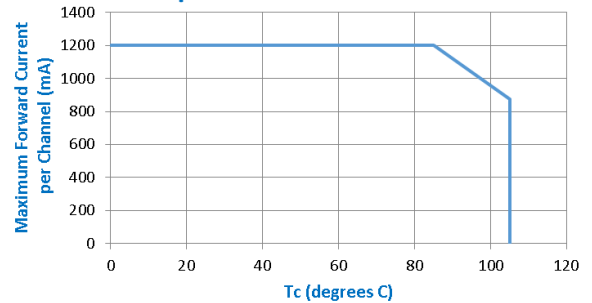
**CTM-14 Maximum Forward Current
per Channel vs. Tc**



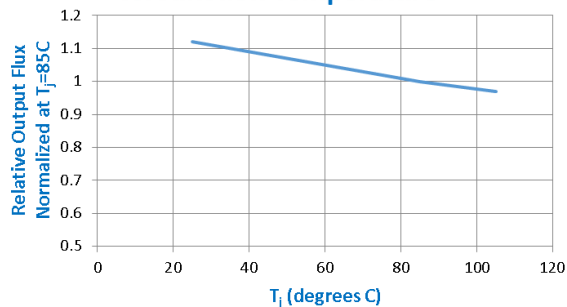
**CTM-18 Maximum Forward Current
per Channel vs. Tc**



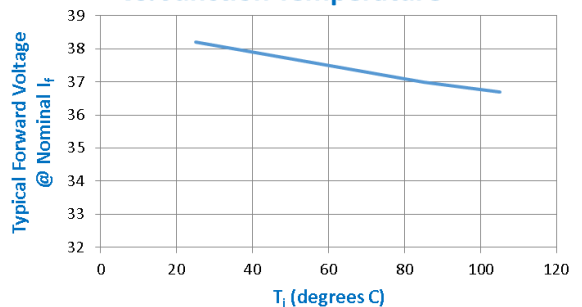
**CTM-22 Maximum Forward Current
per Channel vs. Tc**



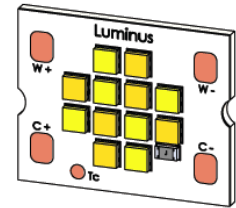
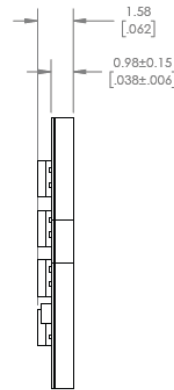
**Relative Output Flux
vs. Junction Temperature**



**Typical Forward Voltage @ Nominal If
vs. Junction Temperature**

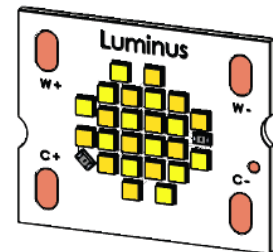
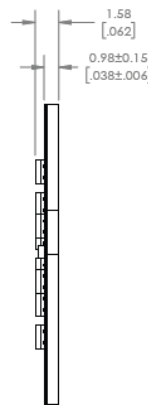


Technical drawing of the Luminus test cell. The drawing shows a rectangular component with a central circular area labeled "Luminus". The central area contains a 3x3 grid of square cells. The overall dimensions are 15.00±0.25 [.591±.010] in width and 12.00±0.25 [.472±.010] in height. The central circular area has a diameter of Ø 9.50 [.374] LES. The central area is divided into four quadrants labeled W+, W-, C+, and C-. The central area is also labeled Tc. The central area is also labeled LES. The central area is also labeled Ø 9.50 [.374] LES. The central area is also labeled Tc. The central area is also labeled W+, W-, C+, and C-. The central area is also labeled 4X 0.90 [.035], 4X 1.40 [.055], 4X 1.60 [.063], 2X 0.55 [.022], 2X 5.50 [.217], and 2X R 1.10 [.043].

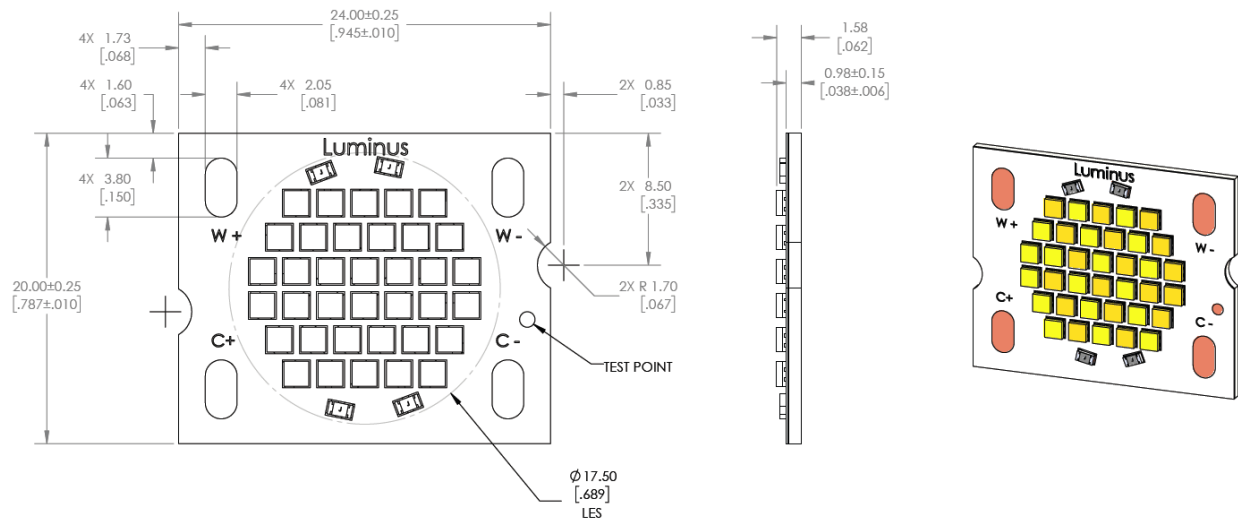


Technical drawing of the Luminus test point. The drawing shows a rectangular component with a central circular area labeled "Luminus". The central area contains a grid of 16 squares. The component has four test points labeled W+, W-, C+, and C-. The dimensions are as follows:

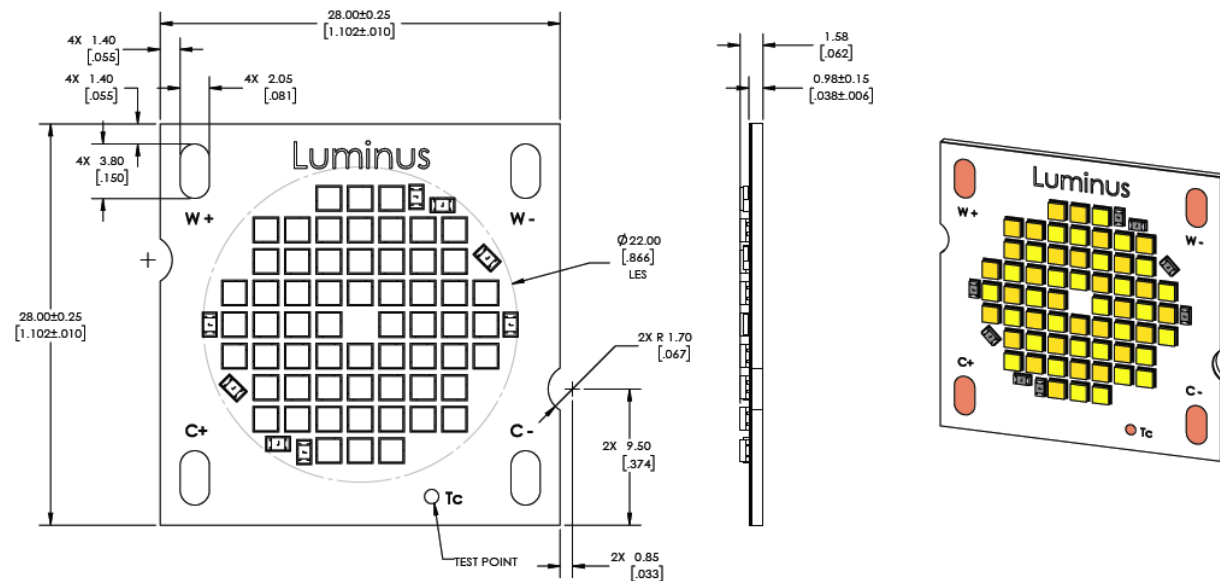
- Overall width: 24.00 ± 0.25 [$.945 \pm .010$]
- Overall height: 20.00 ± 0.25 [$.787 \pm .010$]
- Top left corner: $4X$ 1.73 [$.068$]
- Top center: $4X$ 2.05 [$.081$]
- Top right corner: $2X$ 0.85 [$.033$]
- Left side: $2X$ 3.80 [$.150$]
- Right side: $2X$ 8.50 [$.335$]
- Bottom right corner: $2X$ R 1.70 [$.067$]
- Central circular area: $\phi 14.50$ [$.571$]
- Central circular area label: Luminus
- Test points: W+, W-, C+, C-
- TEST POINT label pointing to the bottom right corner.



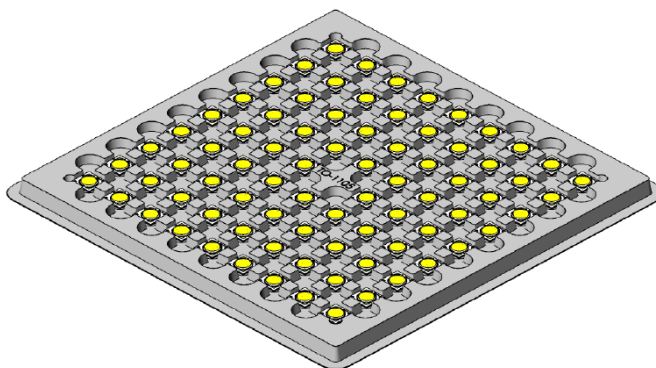
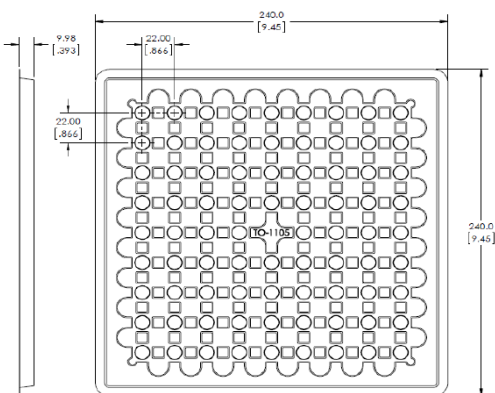
CTM-18 Series Package Dimensions



CTM-22 Series Package Dimensions



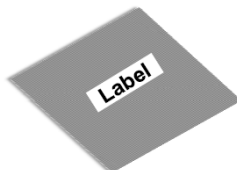
Shipping Container (CTM-9)



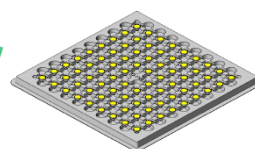
400 pcs per box
Each bag is boxed for
easier storage/ stacking



Trays are sealed in
an anti-static bag



80 pcs per tray
5 trays are stacked together
with separate cover



Shipping Container (CTM-14 and CTM-18)

Similar to above but 30 pcs per tray and 150 pcs per box

Shipping Container (CTM-22)

Similar to above but 20 pcs per tray and 100 pcs per box

Luminus Label Model:

LUMINUS		Luminus Devices Inc	
XXXXXX-XX-XX (Manufacturer Part Number & Bin Kits)	Rev XX	RoHS Compliant	
Bar code	Bar code		
XXX-XX-XX-XX-XX-XXXX-XX-X (Customer Part Number)			
XXXXXXXXXXXXXXXX (Box ID)	Qty: XX		
Bar code	Bar code		

Handling Notes for Luminus COBs

Luminus products are designed for robust performance in general lighting applications; however, care must be taken when handling and assembling the LEDs into their fixtures. To avoid damaging Luminus COBs, please follow these guidelines. The following is an overview of the application notes detailing some of the practices to follow when working with these devices. More detailed information is available on the Luminus website at www.luminus.com

General Handling

Devices are made to be lifted or carried with tweezers on two “mouse bite” locations. At no time should the devices be handled by or should anything come in contact with the light emitting surface (LES) area. There are electrical connections under the LES which, if damaged, will cause the device to fail.

Static Electricity

LEDs are electronic devices which can be damaged by electrostatic discharge (ESD). Please use appropriate measures to assure the devices do not experience ESD during their handling and/or storage. ESD protection guidelines should be used at all times when working with LEDs.

Storage: Luminus products are delivered in ESD shielded bags and should be stored in these bags until used.

Assembly: Individuals handling LEDs during assembly should be trained in ESD protection practices. Assemblers should maintain constant conductive contact with a path to ground by means of a wrist strap, ankle straps, mat, or other ESD protection system.

Transporting: When transporting the devices from one assembly area to another, ESD shielded carts and carriers should be used.

Electrical Contact

Luminus COBs are designed with electrical contact pads on their top surface. These pads are clearly marked with “+” and “-” polarity. Wires can be soldered to the contact pads for electrical connections or other solderless connector products are available. If wires are being soldered to the COB product, we recommend attaching these wires prior to mounting the devices to a heat sink. Please contact Luminus for specific recommendations on how to solder wires if not familiar with the standard practice. Luminus can also offer design recommendations for jigs to enable easy soldering of multiple products in rapid succession.

Chemical Compatibility

The resin material used to form the emitters inside the LES can getter hydrocarbons from the surrounding environment. As a result, certain chemical compounds are not recommended for use with Luminus products. Use of these compounds can cause damage to the light output of the device and may permanently damage the device. Please refer to www.luminus.com for a list of the compounds not recommended for use with Luminus COB products.

Thermal Interface Material (TIM)

Proper thermal management is critical for successful operation of any LED system. Excess operating temperature can reduce the light output of the device, and excessive heating can cause permanent damage to the device. Proper TIM material is a crucial component for effective heat transfer away from the LED during normal operation. Please refer to www.luminus.com for specific recommendations for TIM solutions.

Human Eye Safety

Caution must be taken not to stare at the light emitted from Luminus LEDs, as severe eye damage may occur.