

## 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 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<sub>j</sub>=85°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.

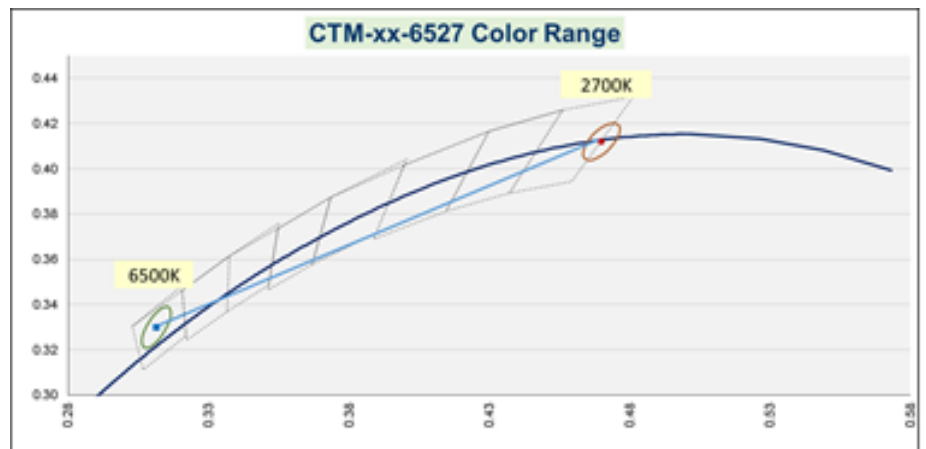
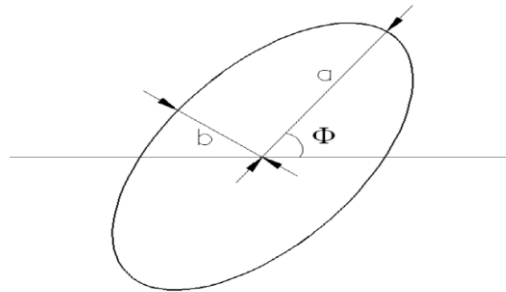
## Photometric Data @ T<sub>j</sub>=85°C and Nominal Forward Current:

| 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             | 635                   | 685                   | 1800K             | 375                   | 405                   |
| CTM-9-6527-90-36-TW01  | 90        | 6500K             | 660                   | 710                   | 2700K             | 570                   | 615                   |
| CTM-14-4018-90-36-TW01 | 90        | 4000K             | 1300                  | 1370                  | 1800K             | 785                   | 825                   |
| CTM-14-6527-90-36-TW01 | 90        | 6500K             | 1350                  | 1420                  | 2700K             | 1190                  | 1255                  |
| CTM-18-4018-90-36-TW01 | 90        | 4000K             | 1850                  | 1950                  | 1800K             | 1120                  | 1180                  |
| CTM-18-6527-90-36-TW01 | 90        | 6500K             | 1900                  | 2000                  | 2700K             | 1700                  | 1785                  |
| CTM-22-4018-90-36-TW01 | 90        | 4000K             | 2945                  | 3100                  | 1800K             | 1780                  | 1875                  |
| CTM-22-6527-90-36-TW01 | 90        | 6500K             | 3000                  | 3160                  | 2700K             | 2700                  | 2840                  |

## Chromaticity Bins @ $T_j=85^\circ\text{C}$ :

| Nominal CCT | Center point     |                  | Angle              | 3-step Bin |         |
|-------------|------------------|------------------|--------------------|------------|---------|
|             | CIE <sub>x</sub> | CIE <sub>y</sub> | $\Theta(^{\circ})$ | 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       | 0.3108           | 0.3300           | 65.23              | 0.00992    | 0.00341 |

## Ellipse Definition:

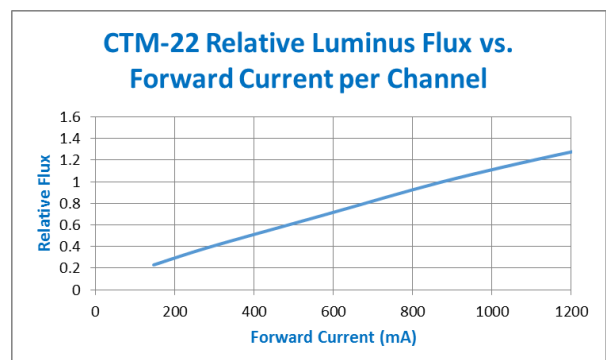
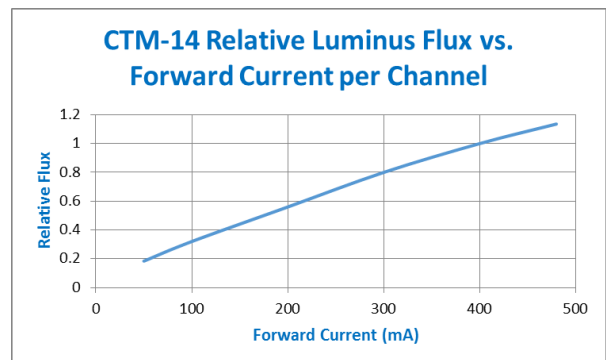
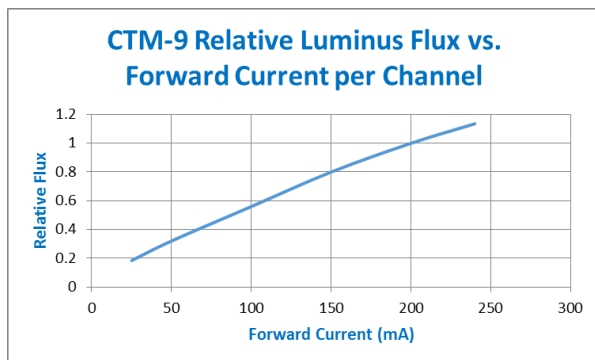
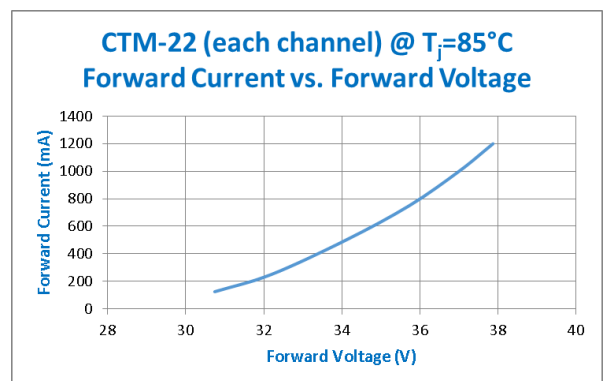
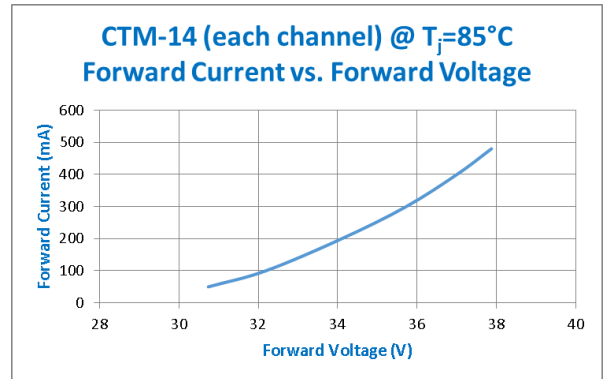


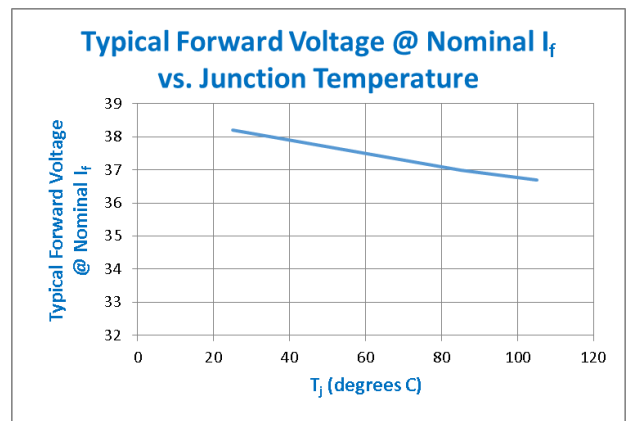
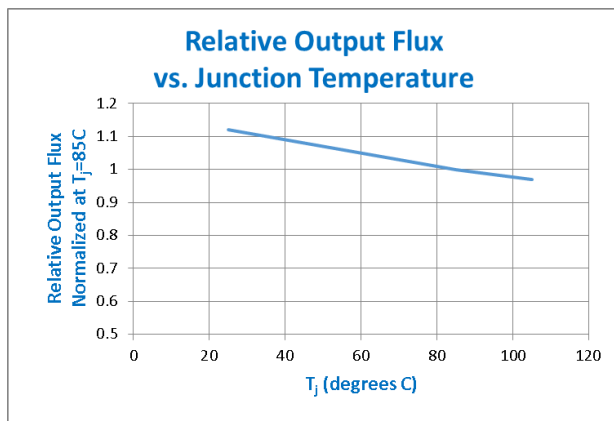
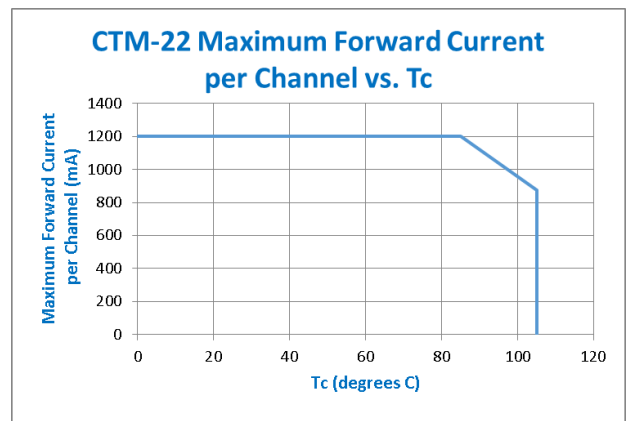
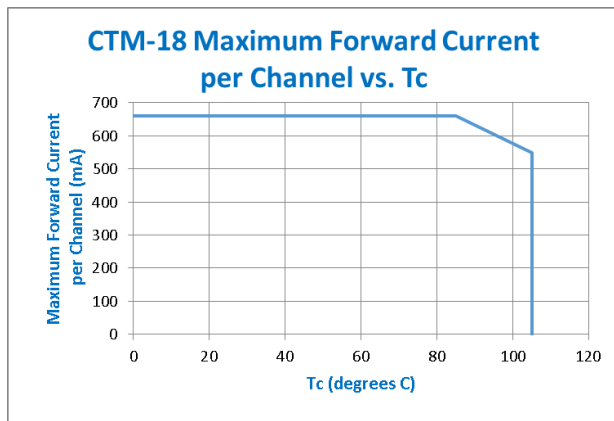
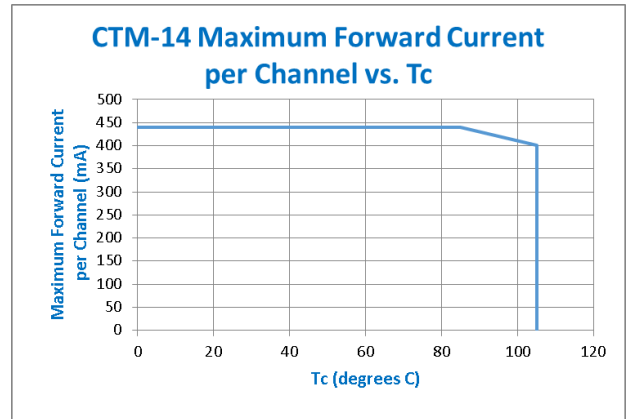
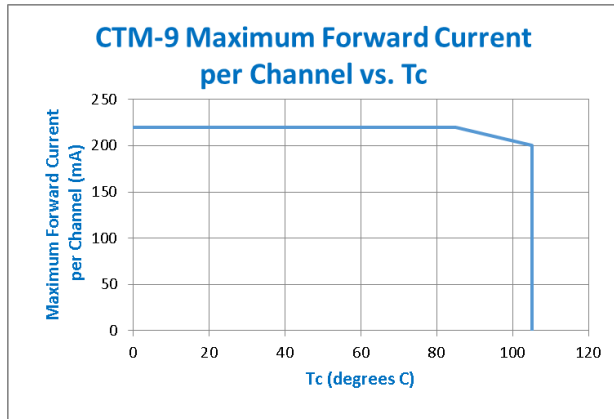
**Absolute Maximum Ratings & Optical/Electrical Characteristics:**

| Parameter                     | Symbol  | Minimum | Typical | Maximum | Unit    |
|-------------------------------|---------|---------|---------|---------|---------|
| Operating case temperature    | Tc      |         |         | 105     | °C      |
| Junction temperature          | Tj      |         |         | 125     | °C      |
| Viewing angle                 | 2(Θ1/2) |         | 130     |         | degrees |
| Reverse voltage               | Vr      |         |         | 5       | volts   |
| Ambient operating temperature | Topr    | -40     |         | +85     | °C      |
| Storage temperature           | Tsto    | -40     |         | +85     | °C      |
| Electrostatic Discharge       | ESD     |         |         | 4000V   | HBM     |

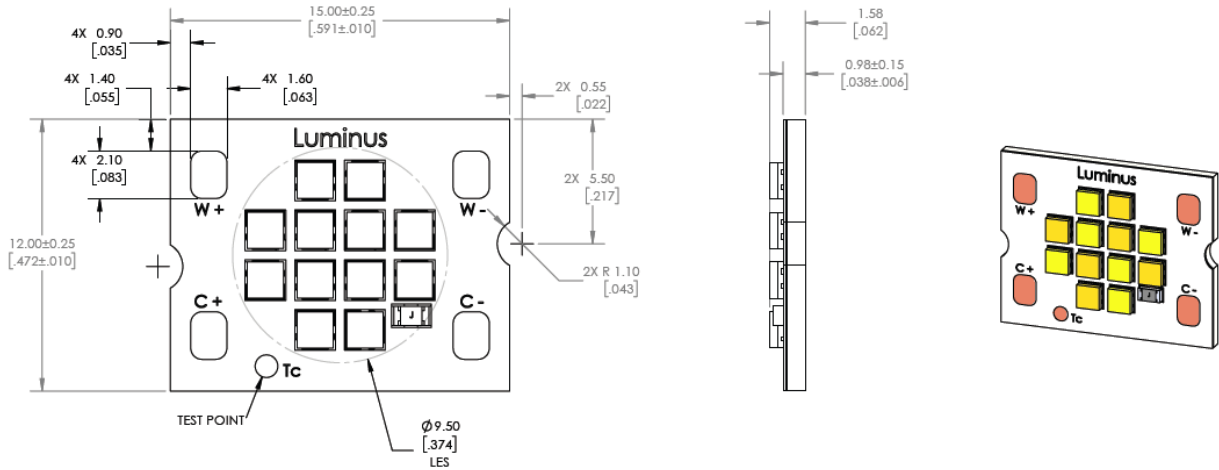
**Mechanical Dimensions & Thermal Resistance:**

| Part Number            | Light Emitting Surface (LES) Diameter | Board Size | Typical Thermal Resistance (Rthj-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           |

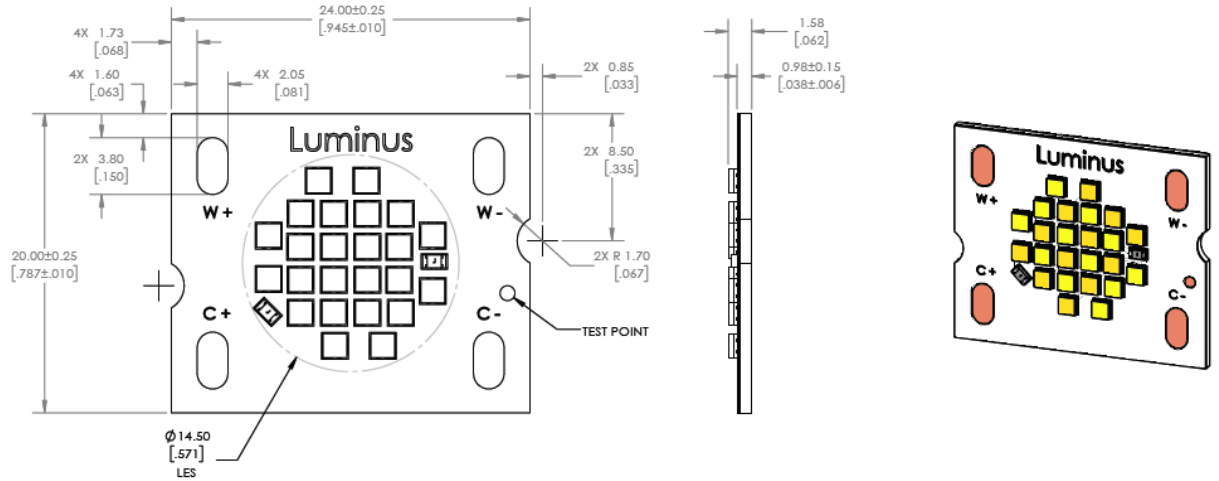




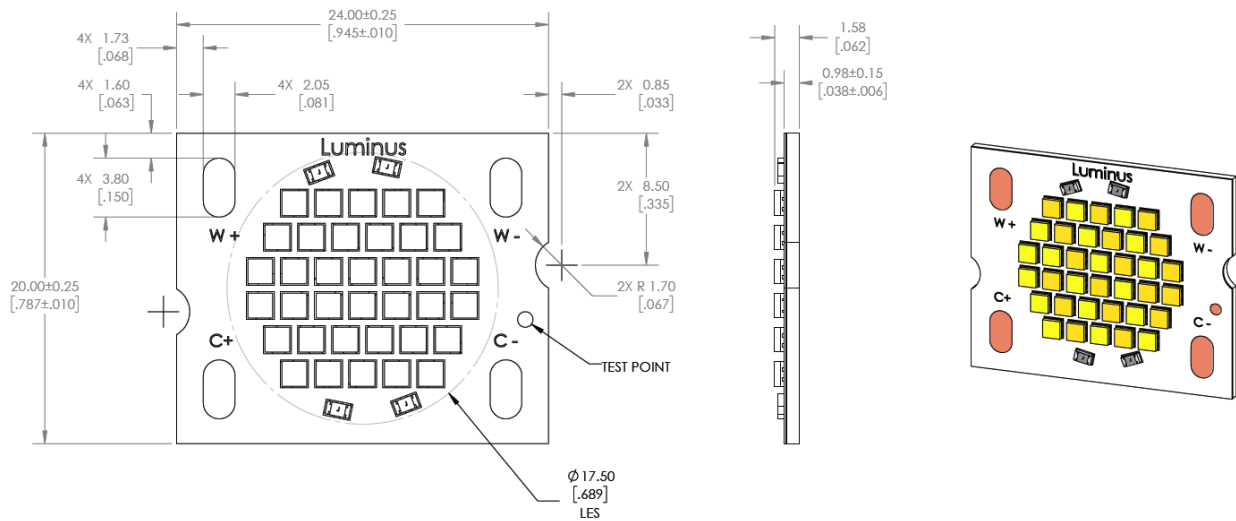
## CTM-9 Series Package Dimensions



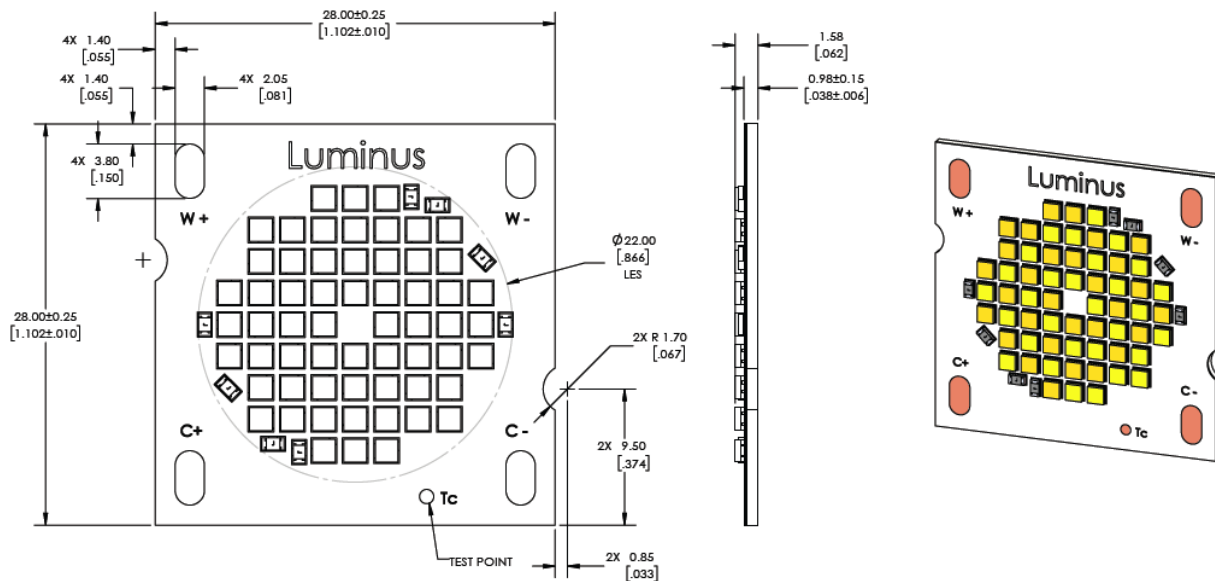
## CTM-14 Series Package Dimensions



## CTM-18 Series Package Dimensions



## CTM-22 Series Package Dimensions





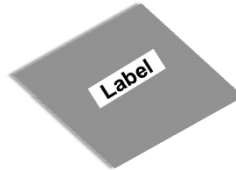
## Shipping Container (CTM-9)



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 Devices Inc                   |  | RoHS Compliant |
| XXXXXX-XX-XX (Manufacturer Part Number & Bin Kits) |  | Rev XX                                |  |                |
| <input type="text" value="Bar code"/>              |  | <input type="text" value="Bar code"/> |  |                |
| XXX-XX-XX-XX-XX-XXXX-XX-X (Customer Part Number)   |  |                                       |  |                |
| XXXXXXXXXXXXXXXX (Box ID)                          |  | Qty: XX                               |  |                |
| <input type="text" value="Bar code"/>              |  | <input type="text" value="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](http://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 get 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](http://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](http://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.