

Cree® XLamp® 7090 LEDs

XR Series

Cree XLamp 7090 LEDs combine the brightness of power LED chips with a rugged package capable of operating in excess of one watt. Cree XLamp LEDs lead the solid-state lighting industry in brightness while providing a reflow-solderable design that is optimized for ease-of-use and thermal management. Lighting applications featuring XLamp LEDs maximize light output and increase design flexibility, while minimizing environmental impact.

Cree XLamp 7090 LEDs bring the power of brightness to a wide range of lighting and backlighting applications including portable lighting and flashlights, computer and television screens, signaling, architectural, landscaping and entertainment/advertising.



FEATURES

- Full range of drive currents up to 700 mA
- Surface-mount technology — reflow solderable
- Wide range of colors
 - White, Royal Blue, Blue, Cyan, Green, Amber, Red-Orange and Red
- Low operating voltage
- Electrically neutral thermal path
- RoHS-compliant — lead-free
- Integrated lens
- Small footprint — 7.0 mm x 9.0 mm
- ESD > 2000V

Characteristics

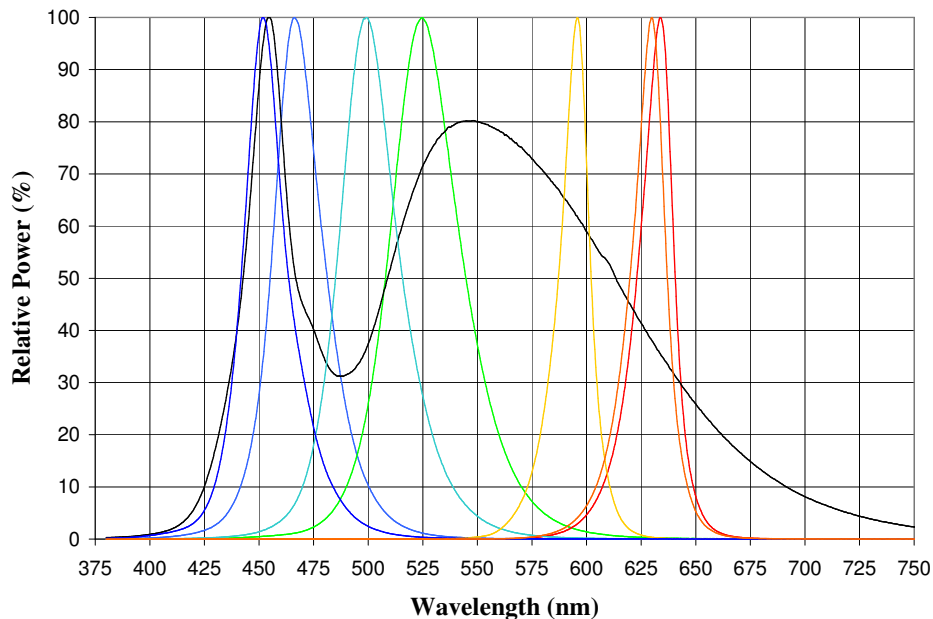
Color	Dominant wavelength (nm) or CCT (K)		Typical Luminous or Radiant flux @ 350mA
	Min.	Max.	
White	2700K	10000K	57 lm
Royal Blue	455nm	465nm	255 mW
Blue	465nm	475nm	19 lm
Cyan	500nm	510nm	45 lm
Green	520nm	535nm	52 lm
Amber	585nm	595nm	42 lm
Red-Orange	610nm	620nm	49 lm
Red	620nm	635nm	40 lm

Characteristics

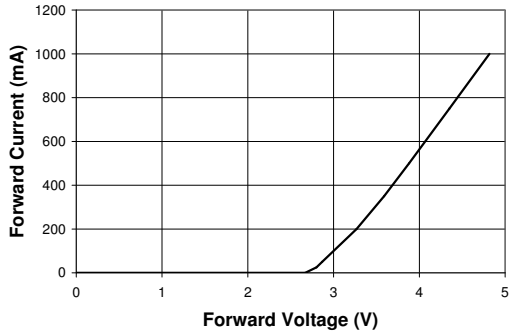
Characteristics	Unit	XLamp 7090
Thermal Resistance, junction to solder point (white, royal blue, blue, cyan, green)	°C/W	8
Thermal Resistance, junction to solder point (amber, red-orange, red)	°C/W	15
Maximum forward voltage @ 350mA (white, royal blue, blue, cyan, green)	V	4
Maximum forward voltage @ 350mA (amber, red-orange, red)	V	3
Viewing angle	degrees	100
Temperature coefficient of voltage (royal blue, blue, cyan, green, white)	mV/°C	-3.0 to -2.8
Temperature coefficient of voltage (amber, red-orange, red)	mV/°C	-3.2 to -3.0
ESD Classification (HBM per Mil-Std-883D)		Class 2
Maximum DC Forward Current (royal blue, blue, cyan, green, red-orange, red, white > 4444K)	mA	700
Maximum DC Forward Current (amber, white < 4444K)	mA	350
Maximum Reverse Voltage	V	5
Maximum LED Junction Temperature	°C	145
Minimum Operating Temperature	°C	-40
Maximum Operating Temperature	°C	85

Note: For details on Cree's procedures for sorting, binning and labeling and a list of standard order codes, see application note: *Cree XLamp 7090 LED Binning and Labeling, XR Series*.

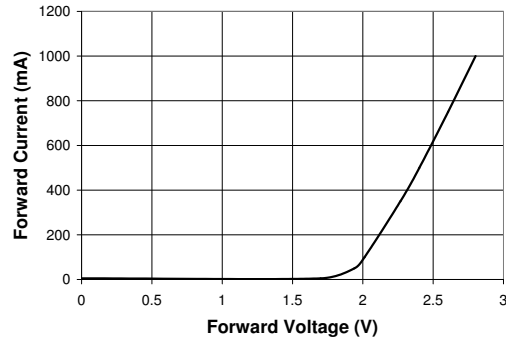
Relative Spectral Power



Electrical Characteristics ($T_j = 25^\circ\text{C}$)



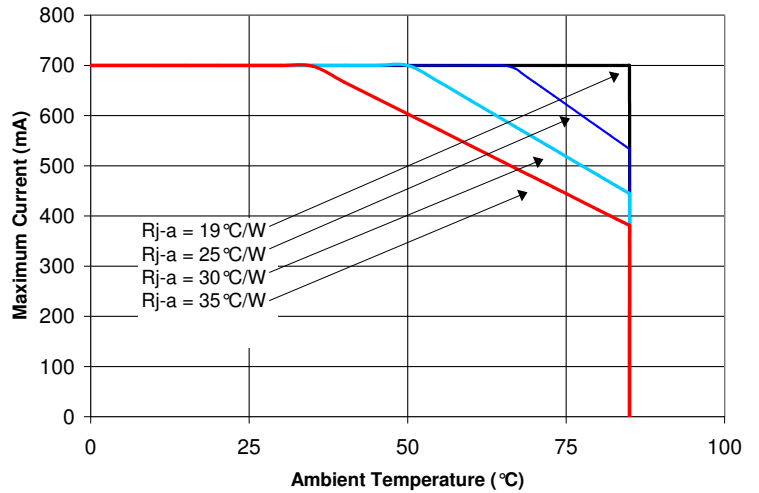
White, Royal Blue, Blue, Cyan, Green



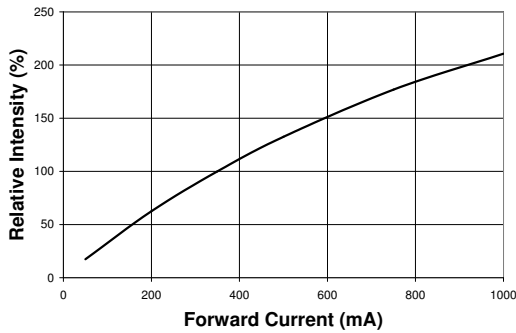
Red, Red-Orange, Amber

Thermal Design

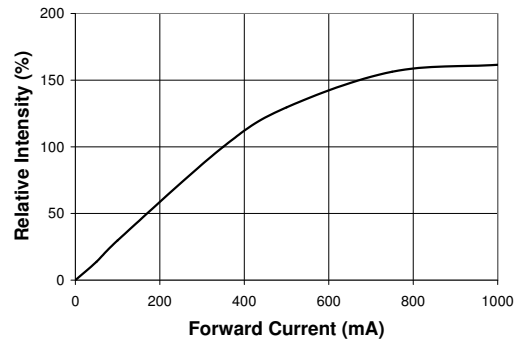
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. Given an existing thermal resistance of $8^\circ\text{C}/\text{W}$ between the junction and the solder point, it is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.



Relative Intensity vs. Current ($T_j = 25^\circ\text{C}$)

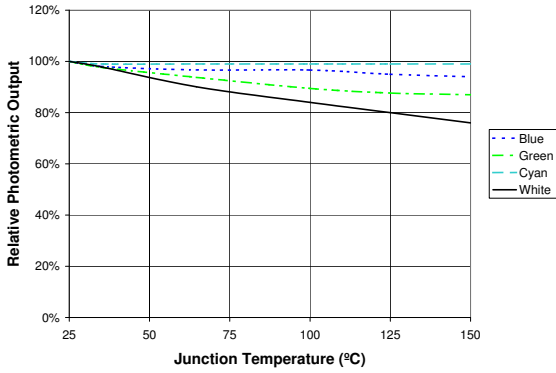


White, Royal Blue, Blue, Cyan, Green

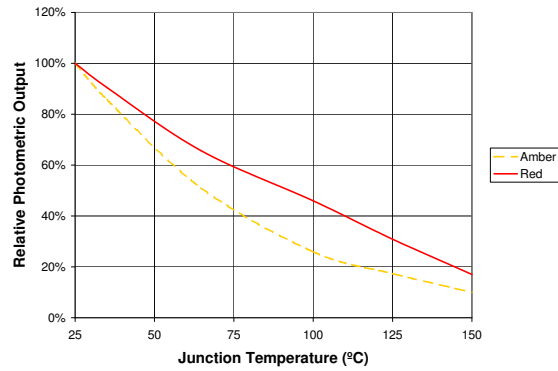


Red, Red-Orange, Amber

Photometric Output vs. Junction Temperature ($I_f = 350\text{mA}$)



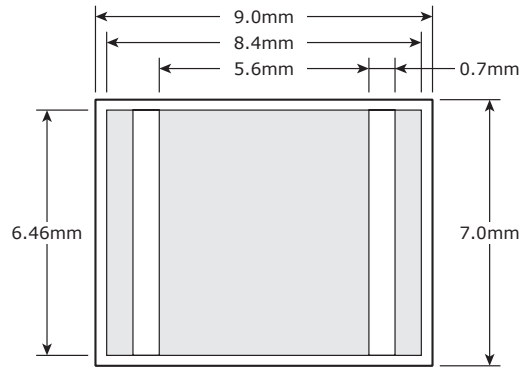
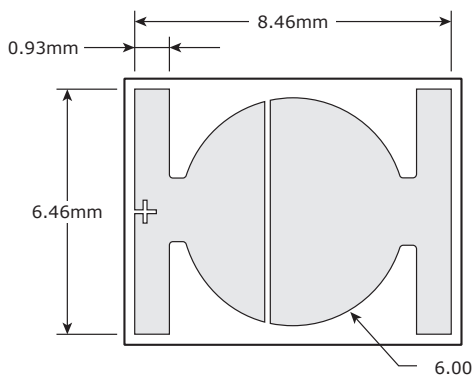
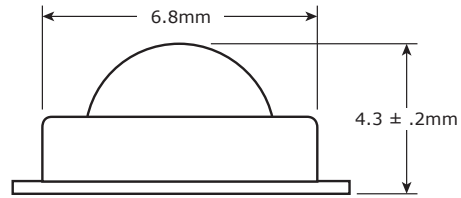
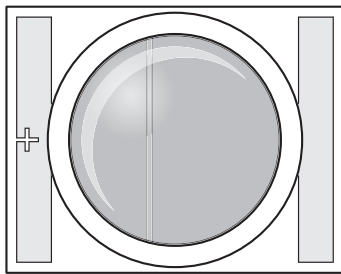
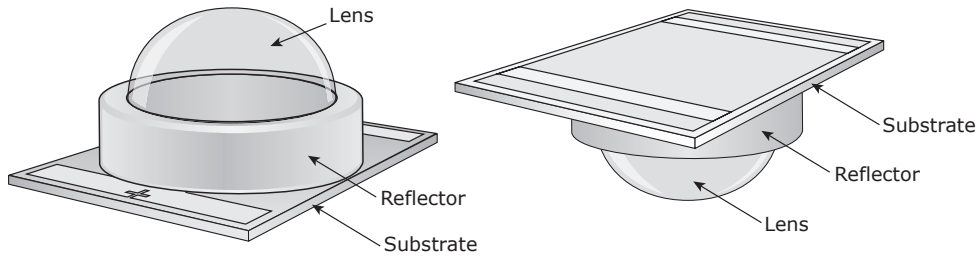
White, Royal Blue, Blue, Cyan, Green



Red, Red-Orange, Amber

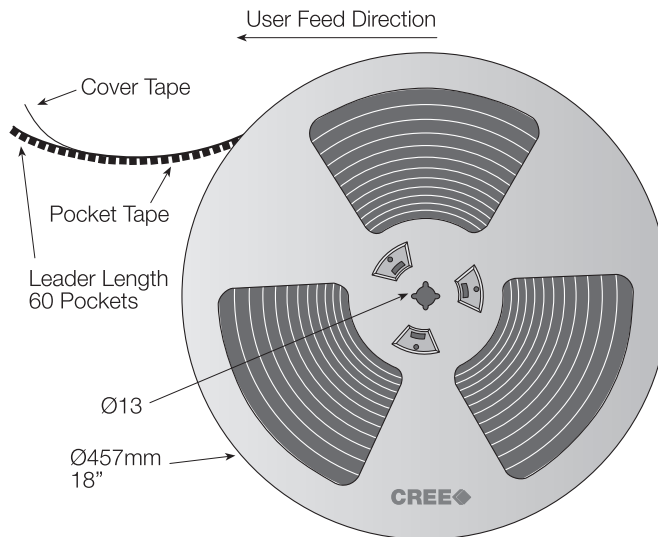
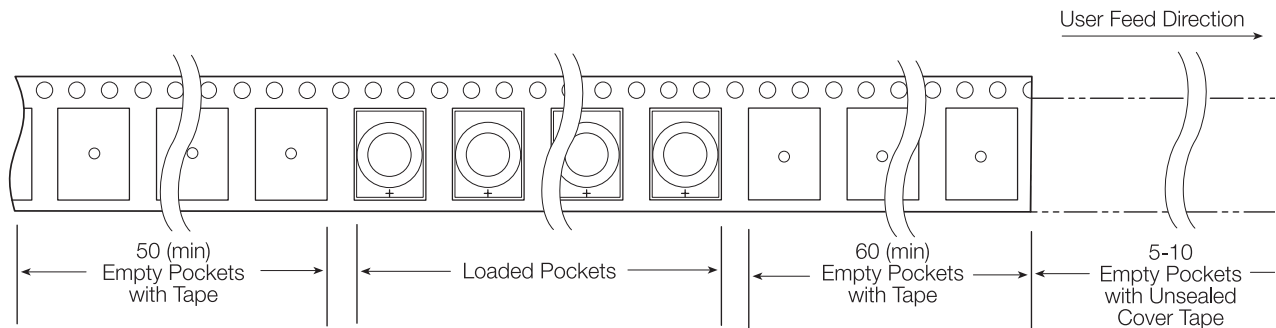
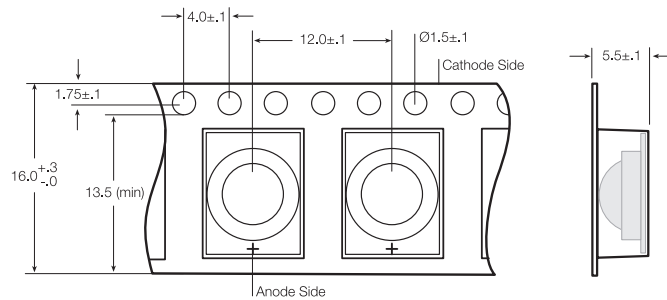
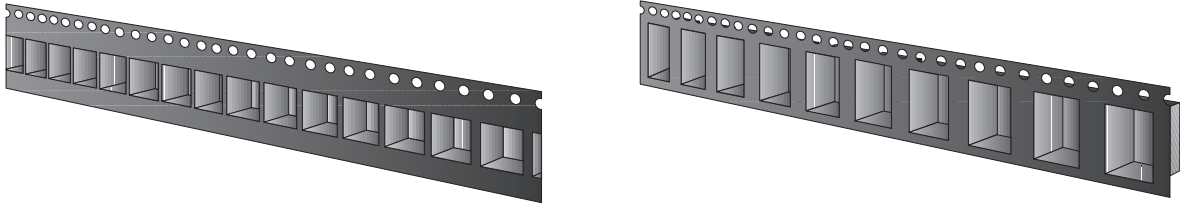
Mechanical Dimensions

All measurements are $\pm 0.1\text{mm}$ unless otherwise indicated.

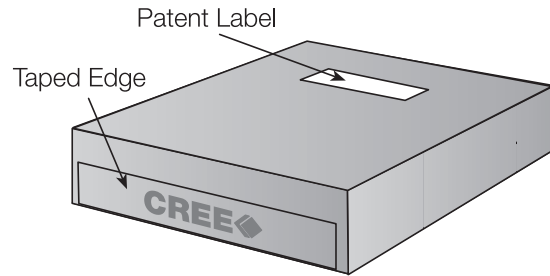
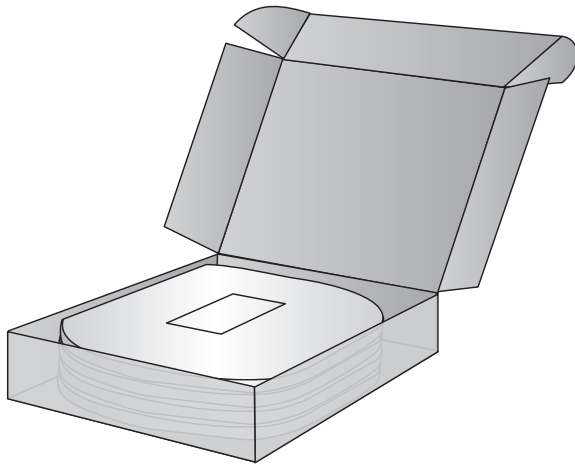
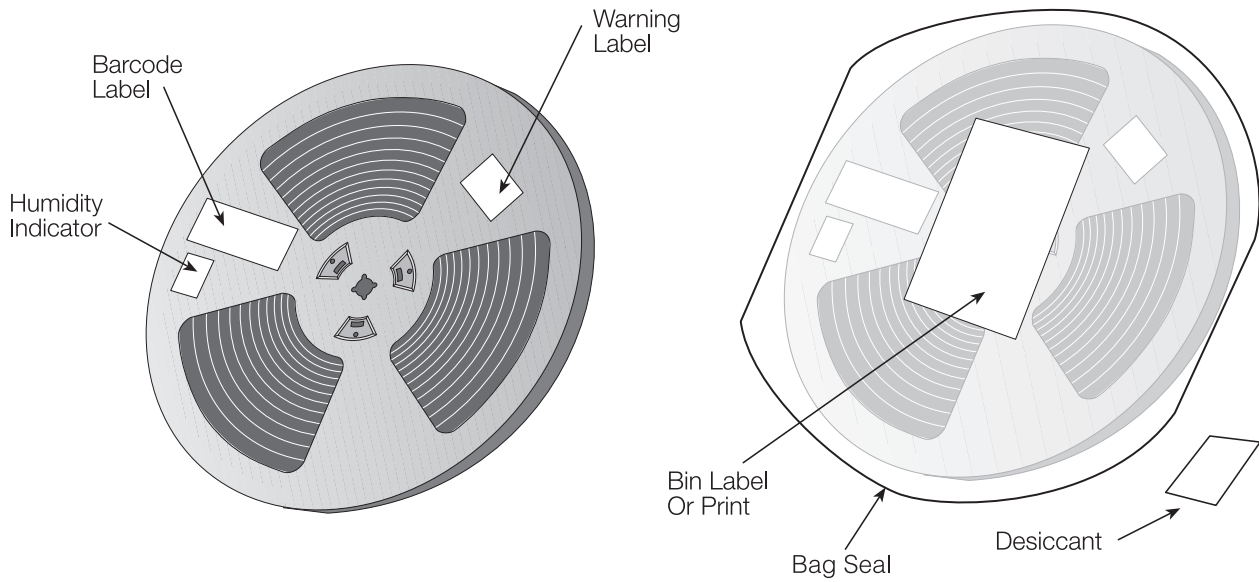


Tape and Reel

All dimensions in mm.



Dry Packaging and Packaging



Notes

If the LEDs have been exposed to greater than 45% relative humidity for more than 168 hours after opening the vacuum-sealed package, the exposed reels must be baked at 80°C for 24 hours. The reels should be removed from the plastic bag before baking. Exposure to temperatures higher than 80°C could result in damage to the tape and/or reel.