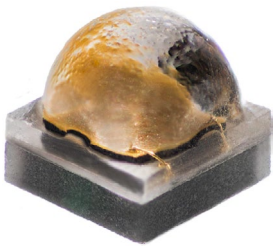
CLD-DS110 REV 1E

Cree® XLamp® XQ-E Torch LEDs



PRODUCT DESCRIPTION

The XLamp® XQ-E Torch LED provides lumen output 20% brighter than the XLamp XP-C LED but in a package that is 78% smaller. Together with a higher maximum current rating than XQ-E and simplified binning, the XLamp XQ-E Torch LED is fully optimized for a wide range of mainstream portable lighting applications.

FEATURES

- Available in cool white
- Binned at 25 °C
- 1050 mA maximum drive current
- Low thermal resistance: 12.5 °C/W
- Viewing angle: 100°
- Reflow solderable - JEDEC J-STD-020C compatible
- Unlimited floor life at ≤ 30 °C/85% RH
- RoHS-compliant

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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		12.5	
Viewing angle (FWHM)	degrees		100	
Temperature coefficient of voltage	mV/°C		-4	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current	mA			1050
Reverse voltage	V			5
Forward voltage (@ 700 mA, 25 °C)	V		3.45	3.9
LED junction temperature	°C			150

FLUX CHARACTERISTICS (T_J = 25 °C)

The following table provides the order code for XLamp XQ-E Torch LEDs.

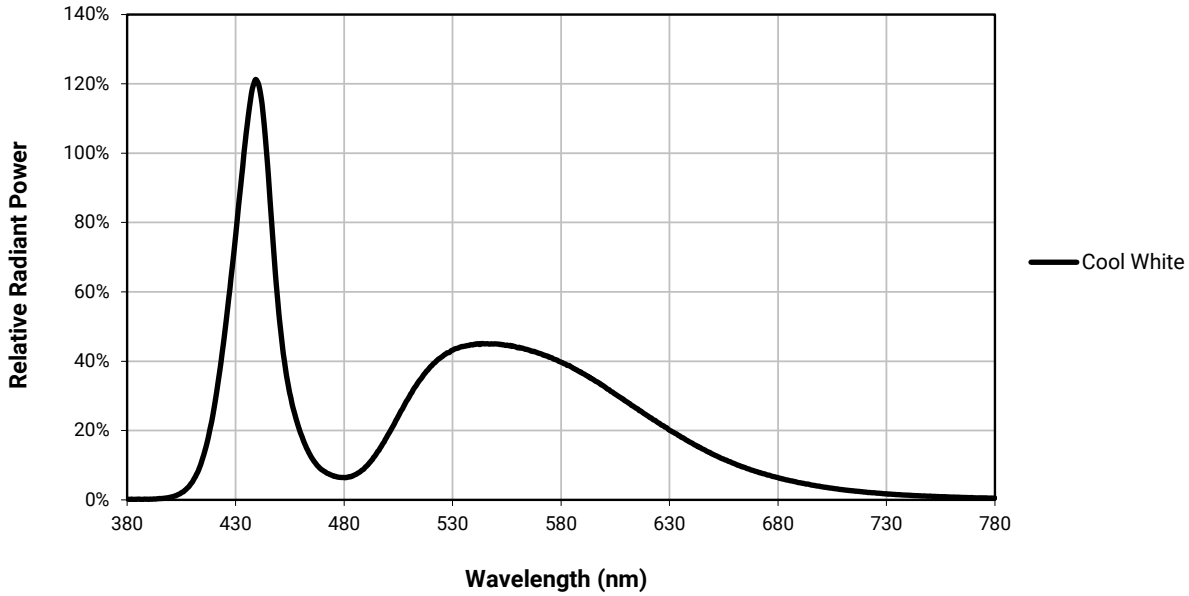
Color	CCT Range		Luminous Flux (lm) @ 700 mA			Calculated Minimum Luminous Flux (lm)*	Order Code
	Min.	Max.	Group	Min. Flux (lm)	Typ. Flux (lm)	1000 mA	
Cool White	6000 K	10,500 K	S7	190	216	239	XQEATT-00-0000-000000A80

Notes:

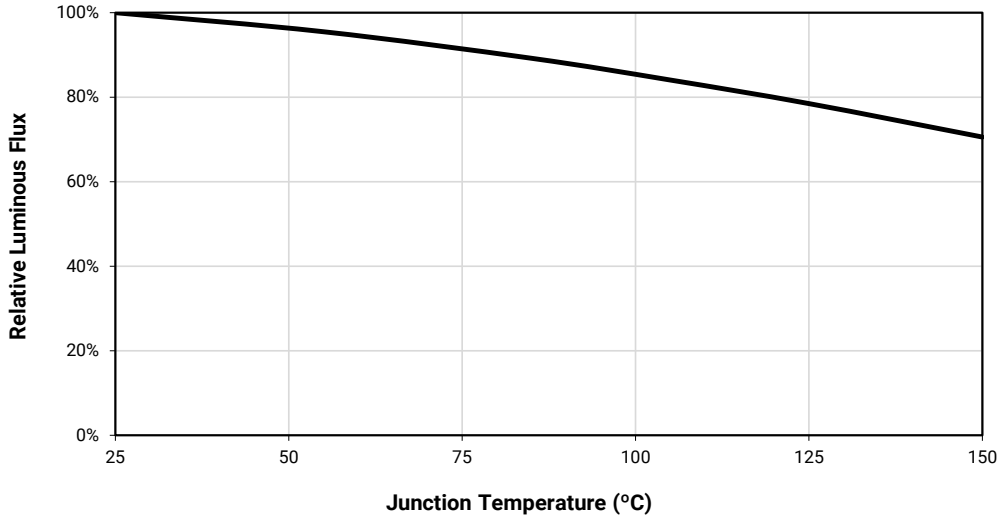
- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 9).
- Typical CRI for Cool White (6000 K – 10,500 K CCT) is 65.

* Calculated flux value at 1000 mA is for reference only.

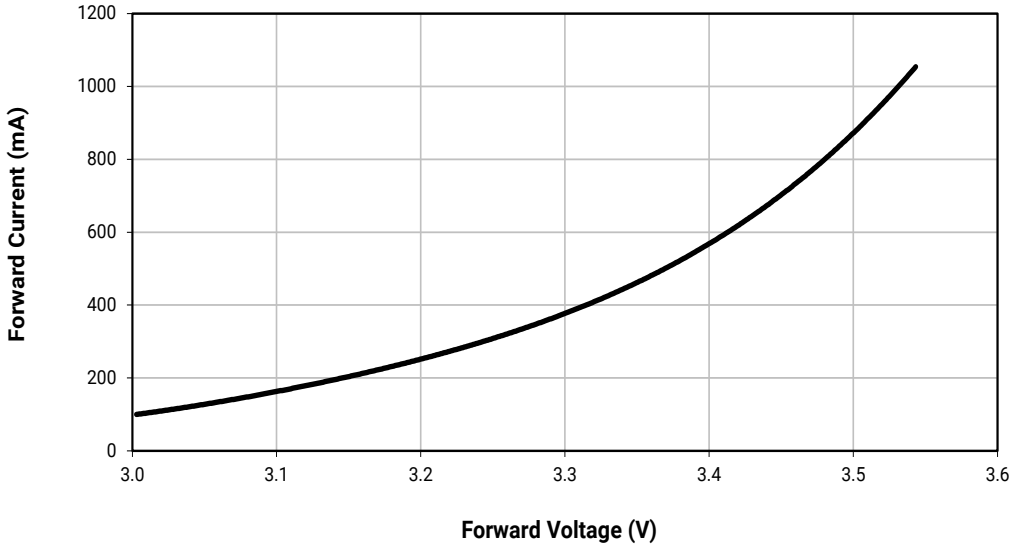
RELATIVE SPECTRAL POWER DISTRIBUTION



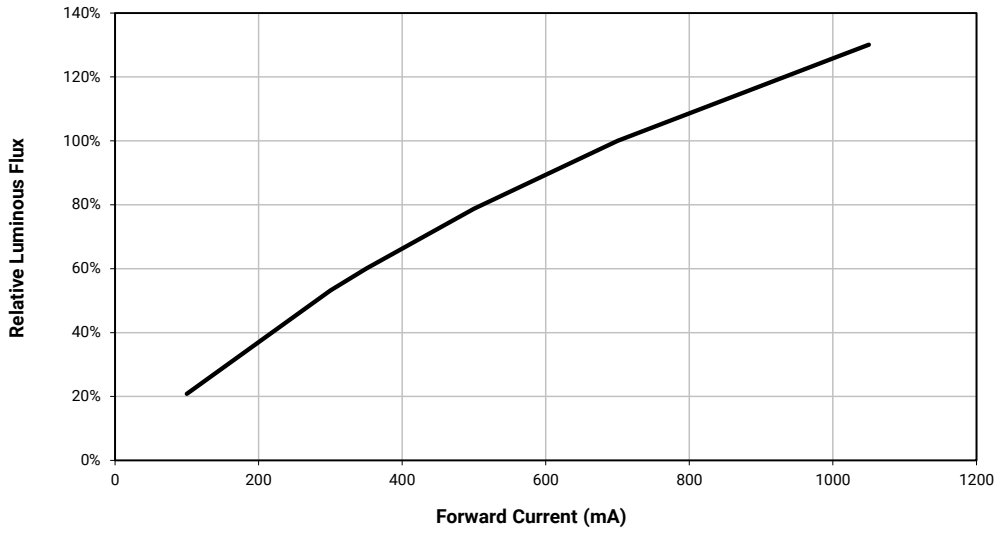
RELATIVE FLUX VS. JUNCTION TEMPERATURE (I_F = 700 mA)



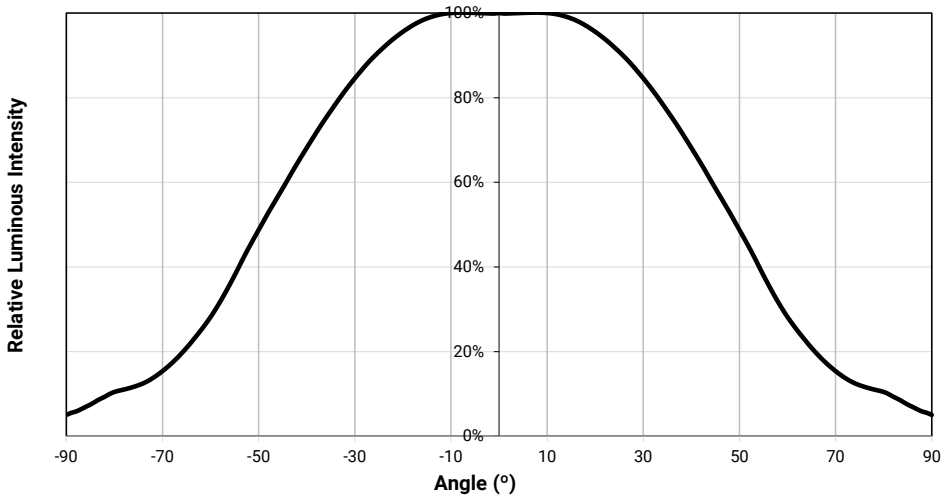
ELECTRICAL CHARACTERISTICS (T_J = 25 °C)



RELATIVE FLUX VS. CURRENT (T_J = 25 °C)

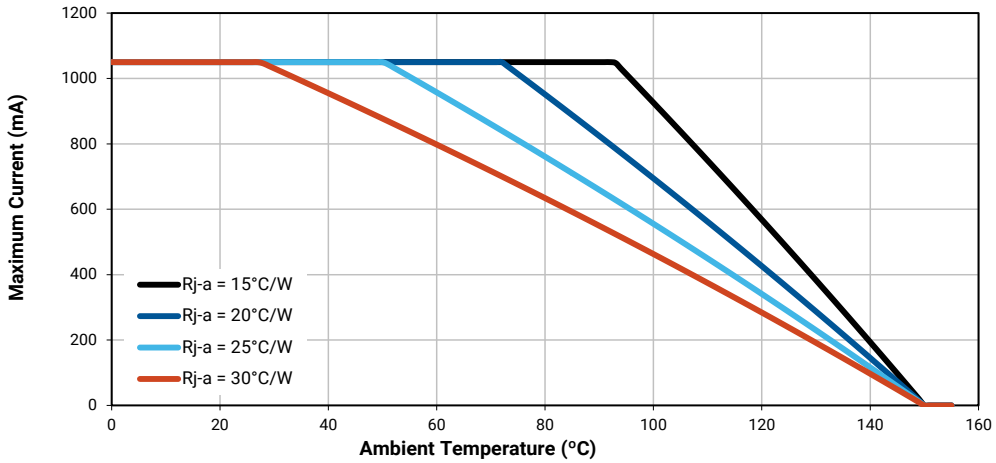


TYPICAL SPATIAL DISTRIBUTION



THERMAL DESIGN

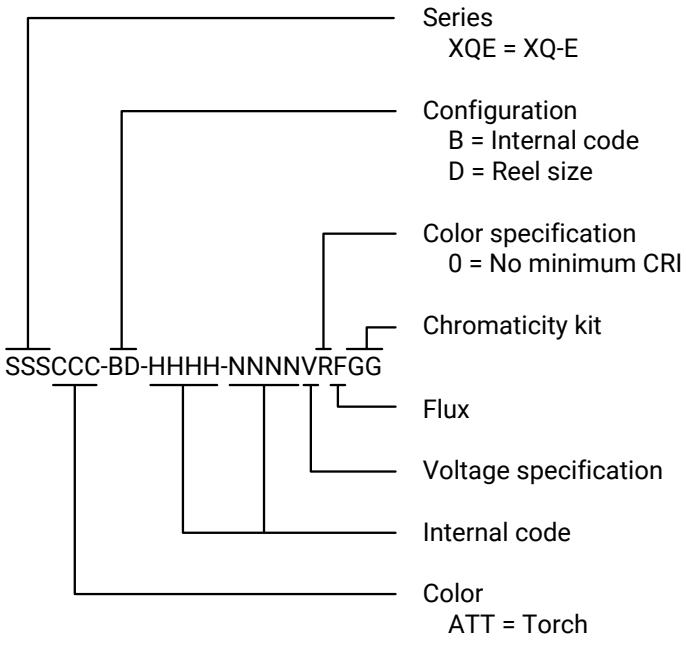
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.



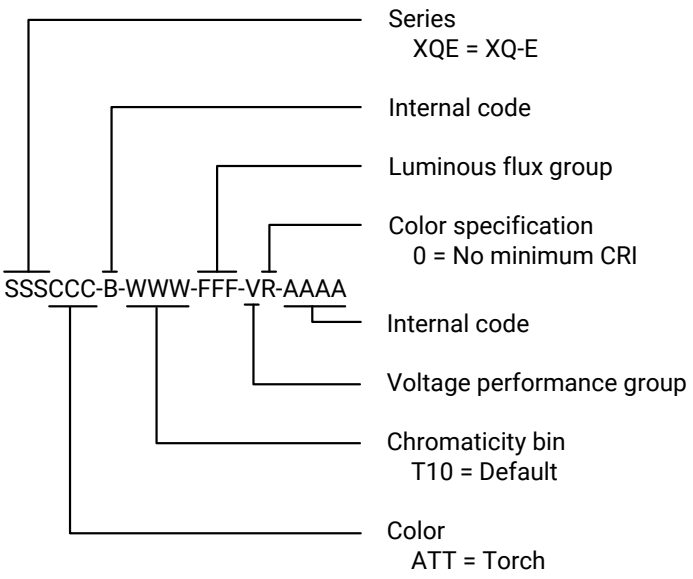
BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows.

Order Code



Bin Code

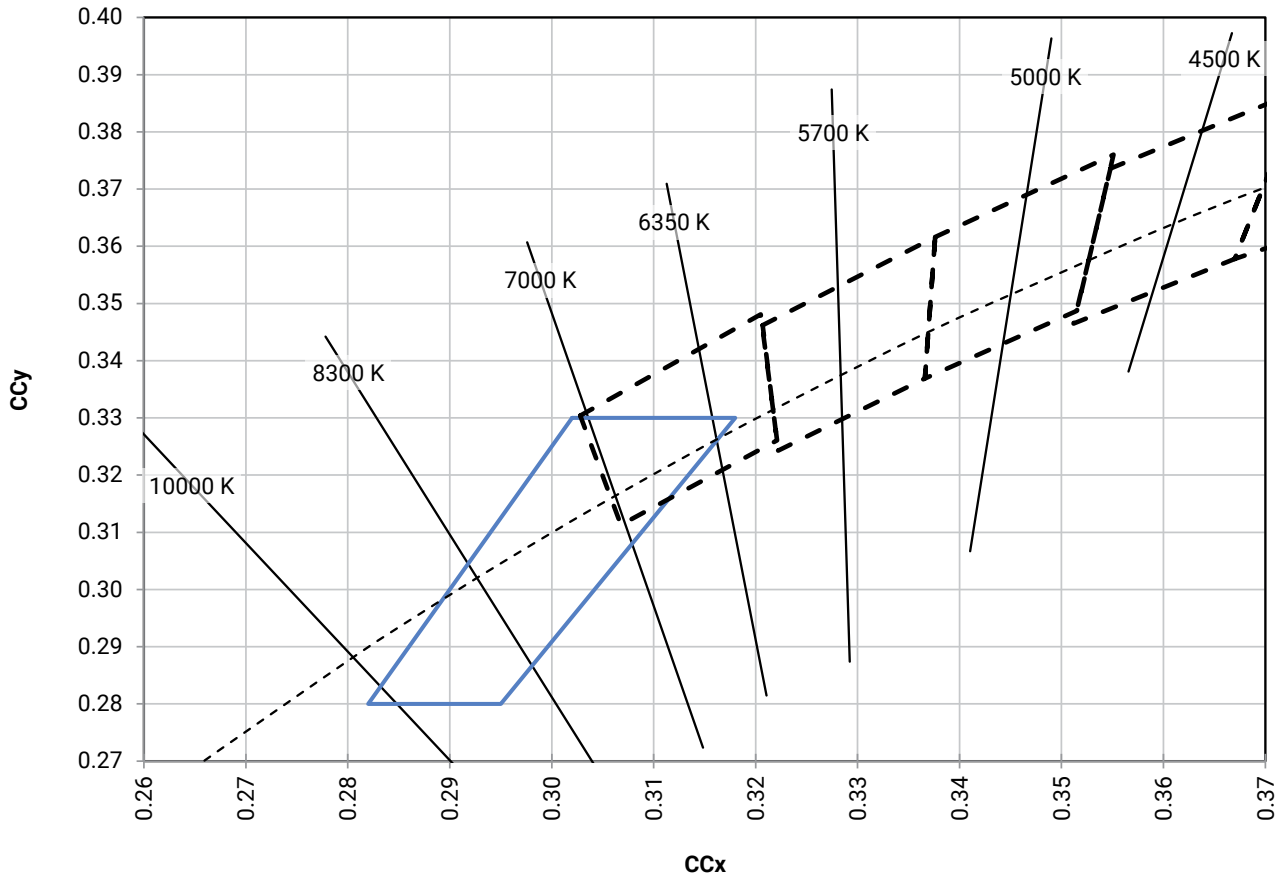


PERFORMANCE GROUPS - CHROMATICITY (T_J = 25 °C)

XLamp XQ-E Torch LEDs are tested for chromaticity and placed into the bin defined by the following bounding coordinates.

Bin	x	y
T1	0.302	0.33
	0.318	0.33
	0.295	0.28
	0.282	0.28

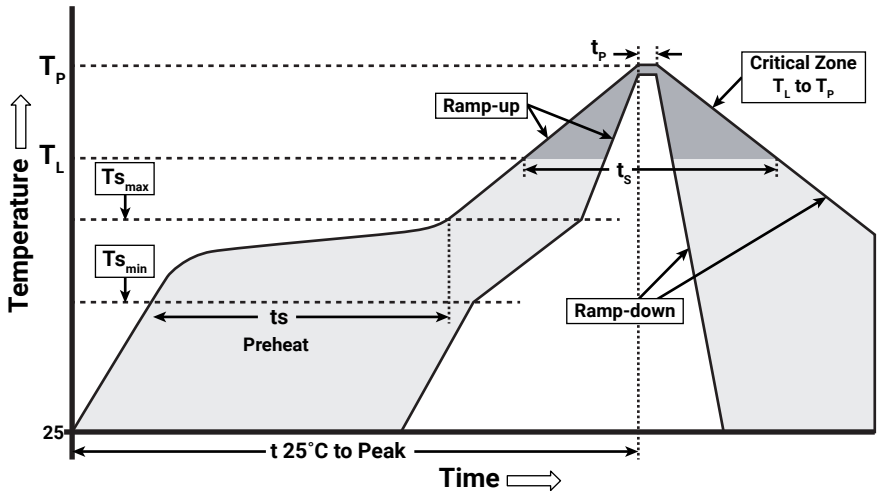
CREE ANSI WHITE BIN PLOTTED ON THE 1931 CIE COLOR SPACE (T_J = 25 °C)



REFLOW SOLDERING CHARACTERISTICS

In testing, Cree has found XLamp XQ-E Torch LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, Cree recommends that users follow the recommended soldering profile provided by the manufacturer of the solder paste used.

Note that this general guideline may not apply to all PCB designs and configurations of reflow soldering equipment.



IPC/JEDEC J-STD-020C

Profile Feature	Lead-Free Solder
Average Ramp-Up Rate (Ts_{max} to Tp)	1.2 °C/second
Preheat: Temperature Min (Ts_{min})	120 °C
Preheat: Temperature Max (Ts_{max})	170 °C
Preheat: Time (ts_{min} to ts_{max})	65-150 seconds
Time Maintained Above: Temperature (T_L)	217 °C
Time Maintained Above: Time (t_L)	45-90 seconds
Peak/Classification Temperature (Tp)	235 - 245 °C
Time Within 5 °C of Actual Peak Temperature (tp)	20-40 seconds
Ramp-Down Rate	1 - 6 °C/second
Time 25 °C to Peak Temperature	4 minutes max.

Note: All temperatures refer to topside of the package, measured on the package body surface.

NOTES

Measurements

The luminous flux, radiant power, chromaticity and CRI measurements in this document are binning specifications only and solely represent product measurements as of the date of shipment. These measurements will change over time based on a number of factors that are not within Cree's control and are not intended or provided as operational specifications for the products. Calculated values are provided for informational purposes only and are not intended as specifications.

Pre-Release Qualification Testing

Please read the LED Reliability Overview for details of the qualification process Cree applies to ensure long-term reliability for XLamp LEDs and details of Cree's pre-release qualification testing for XLamp LEDs.

Moisture Sensitivity

Cree recommends keeping XLamp LEDs in the provided, resealable moisture-barrier packaging (MBP) until immediately prior to soldering. Unopened MBPs that contain XLamp LEDs do not need special storage for moisture sensitivity.

Once the MBP is opened, XLamp XQ-E Torch LEDs may be stored as MSL 1 per JEDEC J-STD-033, meaning they have unlimited floor life in conditions of ≤ 30 ºC/85% relative humidity (RH). Regardless of the storage condition, Cree recommends sealing any unsoldered LEDs in the original MBP.

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree representative or from the Product Documentation sections of www.cree.com.

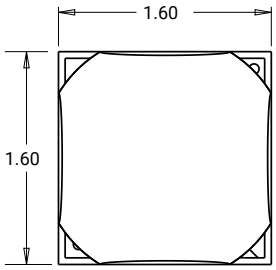
Vision Advisory

WARNING: Do not look at exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the LED Eye Safety application note.

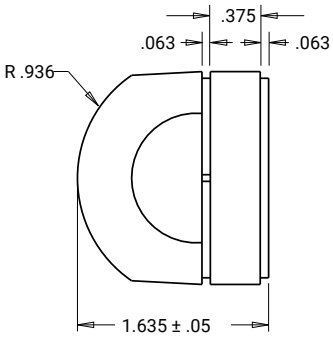
MECHANICAL DIMENSIONS

All dimensions in mm.

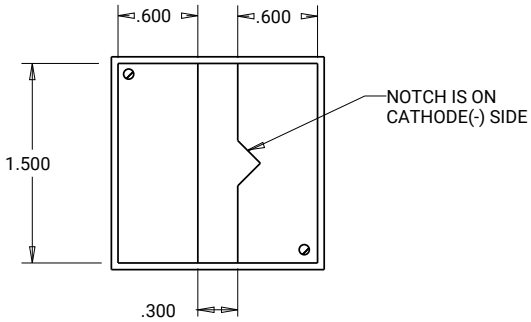
Measurement tolerances unless indicated otherwise: ±.13 mm



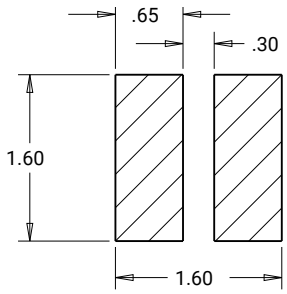
Top View



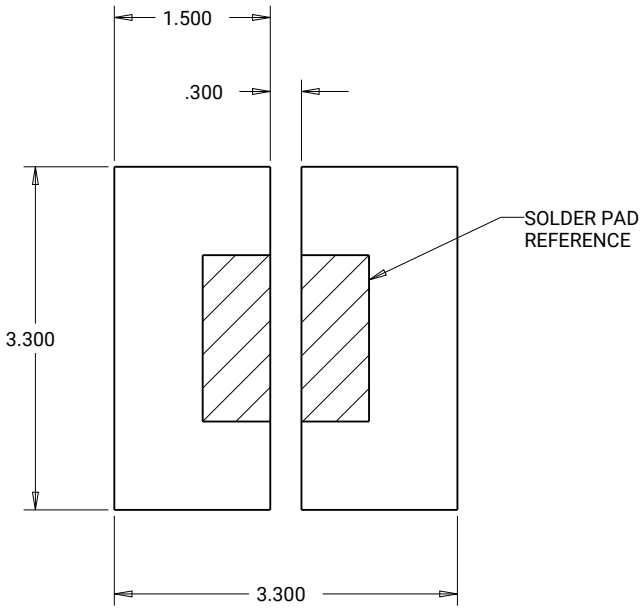
Side View



Bottom View



Recommended PCB solder pad



Recommended trace layout

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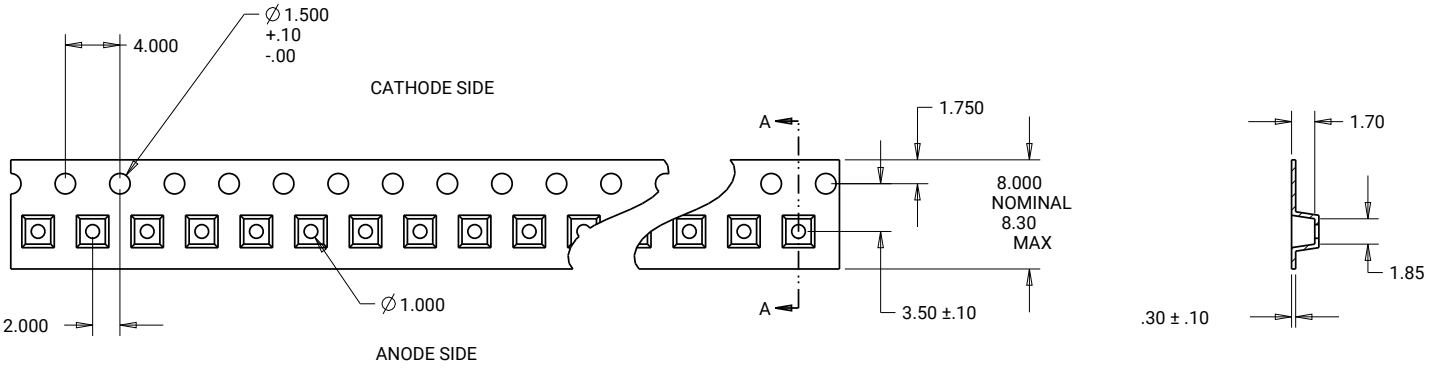
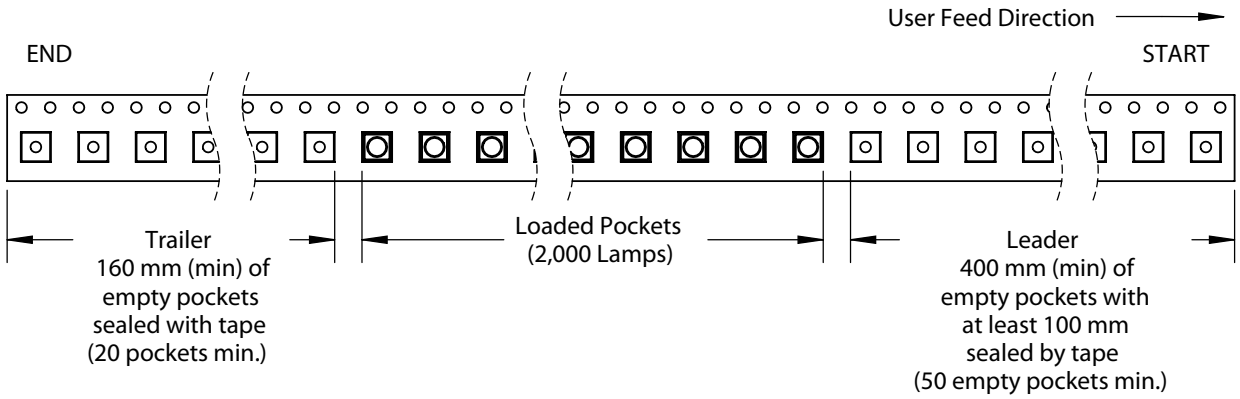
TAPE AND REEL

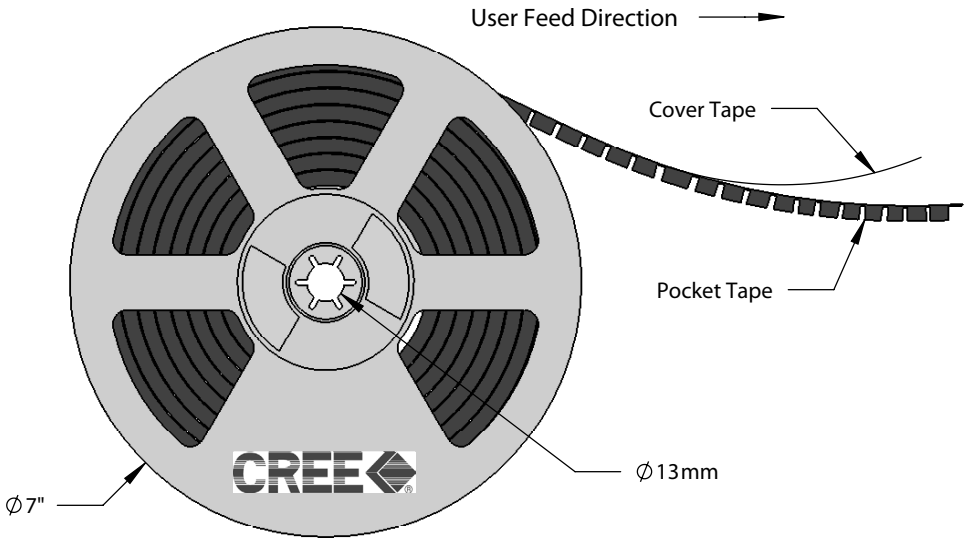
All Cree carrier tapes conform to EIA-481D, Automated Component Handling Systems Standard.

Except as noted, all dimensions in mm.

Measurement tolerances unless indicated otherwise: .xx = .25 mm, .xxx = .125 mm



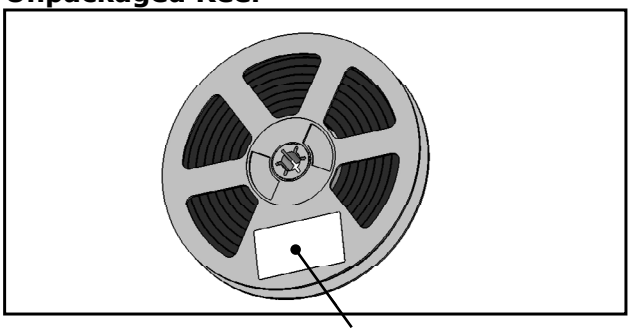




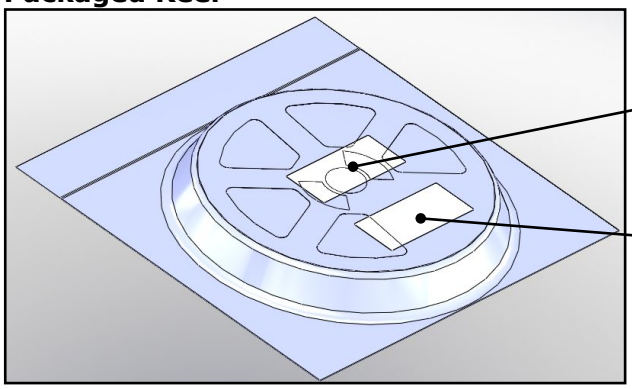
PACKAGING

The diagrams below show the packaging and labels Cree uses to ship XLamp XQ-E Torch LEDs. XLamp XQ-E Torch LEDs are shipped in tape loaded on a reel. Each box contains only one reel in a moisture barrier bag.

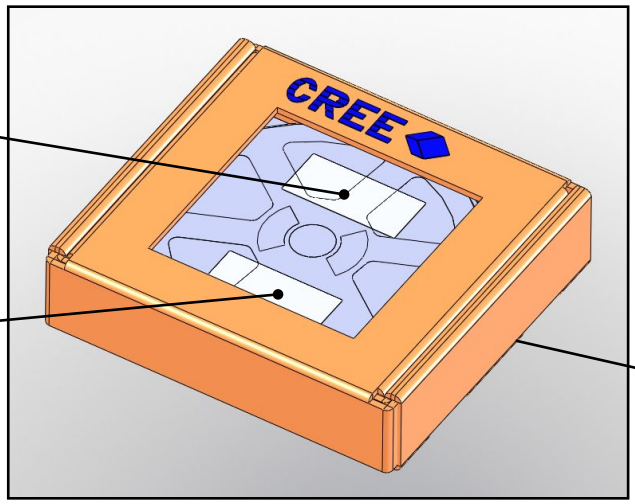
Unpackaged Reel



Packaged Reel



Boxed Reel



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Cree, Inc.:

XQEATT-00-0000-000000A80 XQEATT-02-0000-000000A80