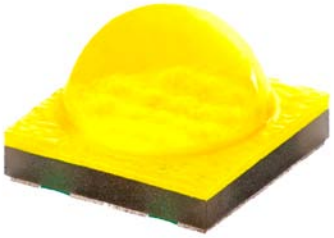
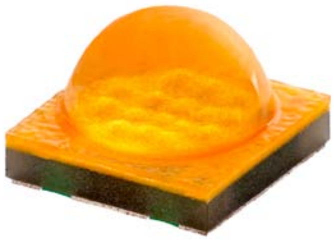
# Cree® XLamp® XT-E HVW LEDs





## PRODUCT DESCRIPTION

The Cree XLamp XT-E High Voltage White LED provides the lighting-class performance and reliability of Cree XLamp LEDs in a small-form, high-voltage configuration. The XT-E HVW LED is an order of magnitude smaller than other high voltage LED arrays, allowing easy implementation of space-constrained lighting applications with smaller, more efficient high voltage drivers. Among these applications are small lamps such as B10, GU10 and E17.

## FEATURES

- Binned at 85 °C
- Typical forward voltage of 46 V @ 22 mA, with Vf binning available
- Cree-standard mechanical footprint of 3.45 X 3.45 mm with electrically neutral thermal path
- Low thermal resistance: 6.5 °C/W
- Wide viewing angle: 115°
- Maximum drive current: 66 mA
- Maximum junction temperature: 150 °C
- Unlimited floor life at ≤30 ºC/85% RH
- Reflow solderable
- Available in standard CRI and 80 minimum CRI configurations
- UL-recognized component (E349212)

## TABLE OF CONTENTS

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## FLUX CHARACTERISTICS ($T_J$ = 85 °C)

The following table provides several base order codes for XLamp XT-E HVW LEDs. It is important to note that the base order codes listed here are a subset of the total available order codes for the product family. For more order codes, as well as a complete description of the order-code nomenclature, please consult the XLamp XT Family Binning and Labeling document.

| Color | CCT Range | | Base Order Codes Min. Luminous Flux @ 22 mA | | | Order Code |
|---|---|---|---|---|---|---|
| | Min. | Max. | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| Cool White | 5000 K | 8300 K | R4 | 130 | 150 | XTEHVW-Q0-0000-00000LG51 |
| | | | R5 | 139 | 161 | XTEHVW-Q0-0000-00000LH51 |
| Neutral White | 3700 K | 5000 K | Q5 | 107 | 124 | XTEHVW-Q0-0000-00000LDE5 |
| | | | R2 | 114 | 132 | XTEHVW-Q0-0000-00000LEE5 |
| Warm White | 2600 K | 3700 K | Q4 | 100 | 116 | XTEHVW-Q0-0000-00000LCE7 |
| | | | Q5 | 107 | 124 | XTEHVW-Q0-0000-00000LDE7 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements.
- Typical CRI for Cool White (5000 K - 8300 K CCT) is 68.
- Typical CRI for Neutral White (3700 K - 5000 K CCT) is 75.
- Typical CRI for Warm White (2600 K - 3700 K CCT) is 82.

* Flux values at 25 °C are calculated and for reference only.

## CHARACTERISTICS

| Characteristics | Unit | Minimum | Typical | Maximum |
|---|---|---|---|---|
| Thermal Resistance, junction to solder point | °C/W | | 6.5 | |
| Viewing Angle (FWHM) | degrees | | 115 | |
| Temperature coefficient of voltage | mV/°C | | -37 | |
| ESD Classification (HBM per Mil-Std-883D) | | | Class 2 | |
| DC Forward Current | mA | | | 66 |
| Reverse Current | mA | | | 0.1 |
| Forward voltage (@ 22 mA, 85 °C) | V | | 46 | 55 |
| LED Junction Temperature | °C | | | 150 |

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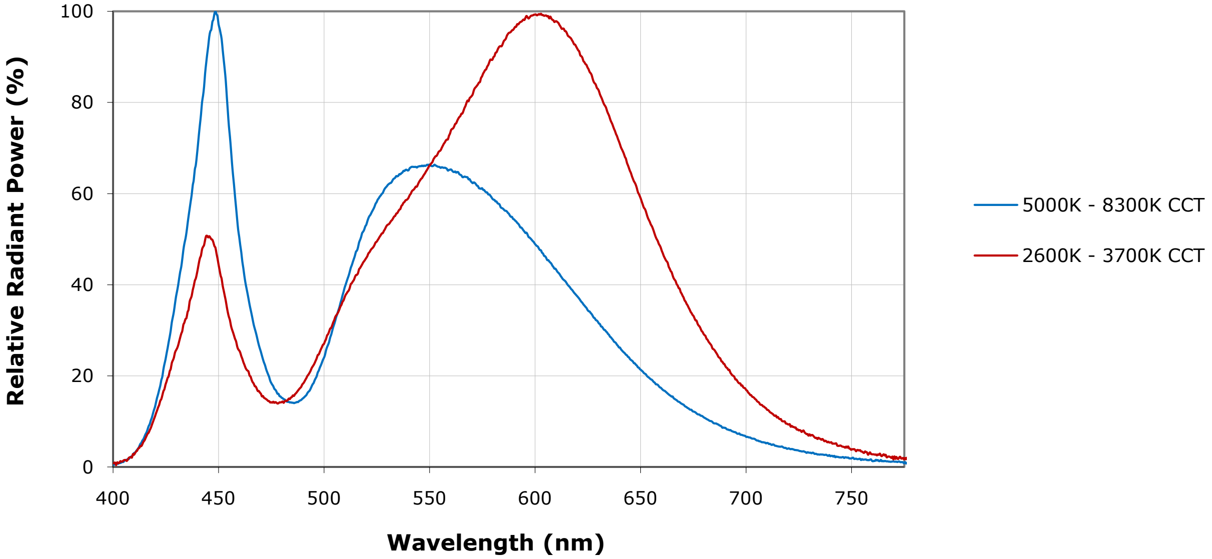
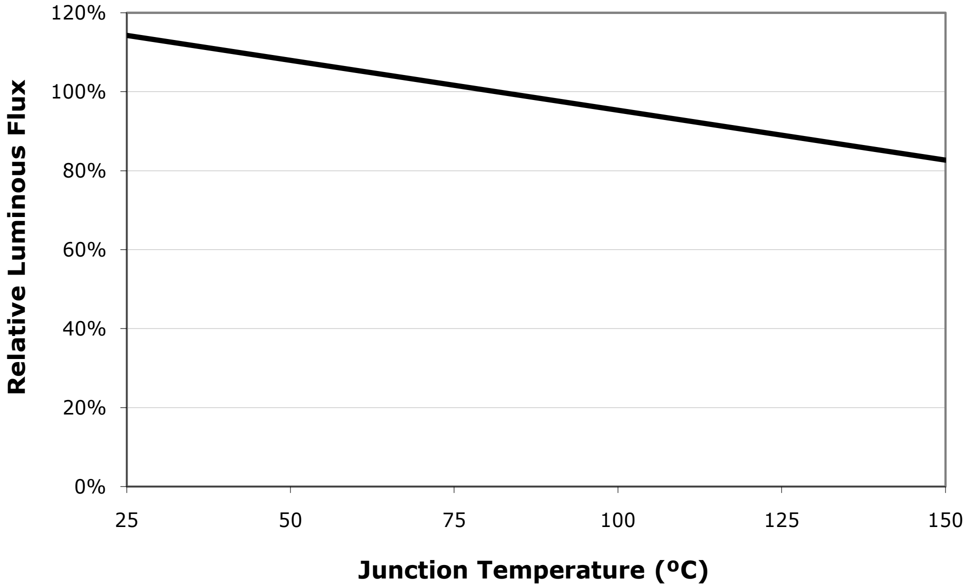
## RELATIVE SPECTRAL POWER DISTRIBUTION



## RELATIVE FLUX VS. JUNCTION TEMPERATURE ($I_F$ = 22 mA)



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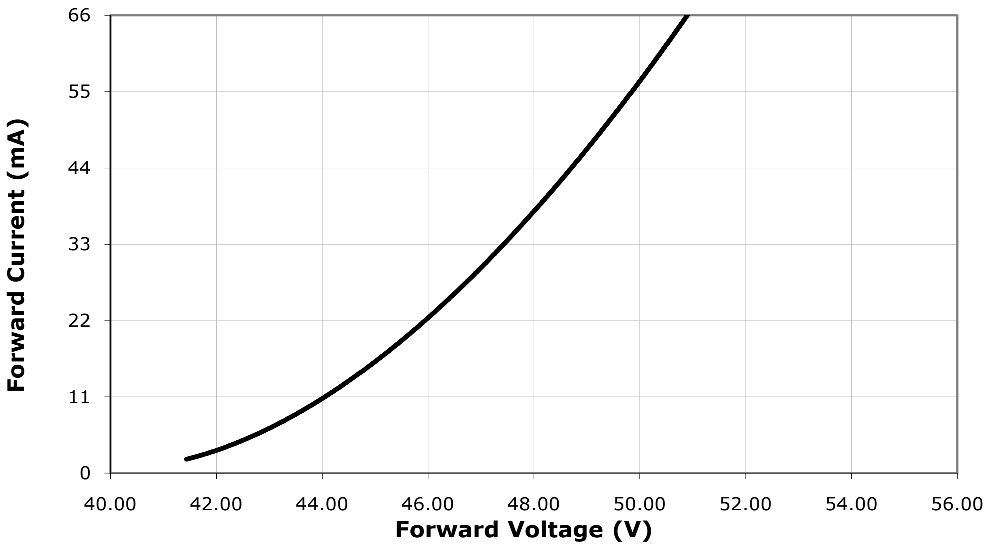
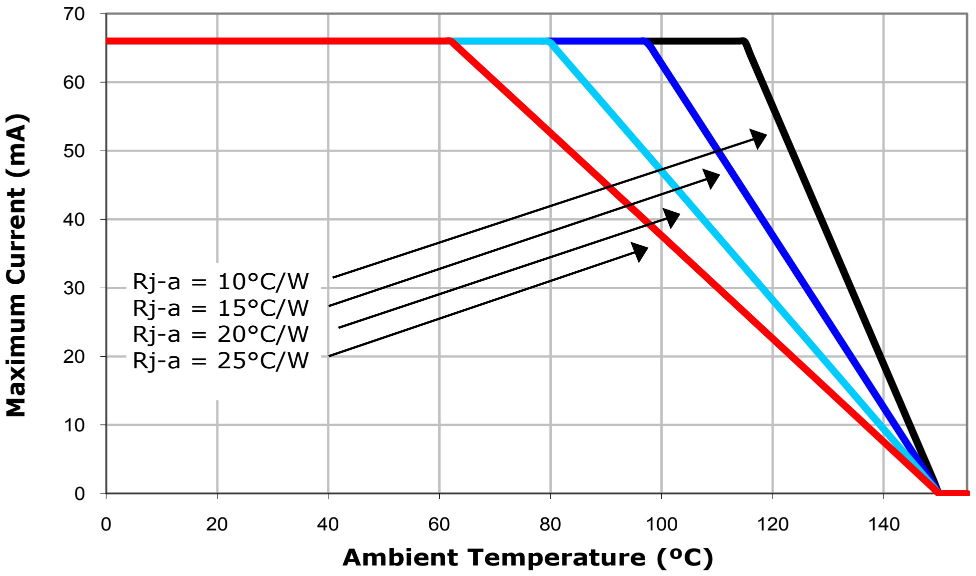
## ELECTRICAL CHARACTERISTICS ($T_J$ = 85 °C)



## THERMAL DESIGN



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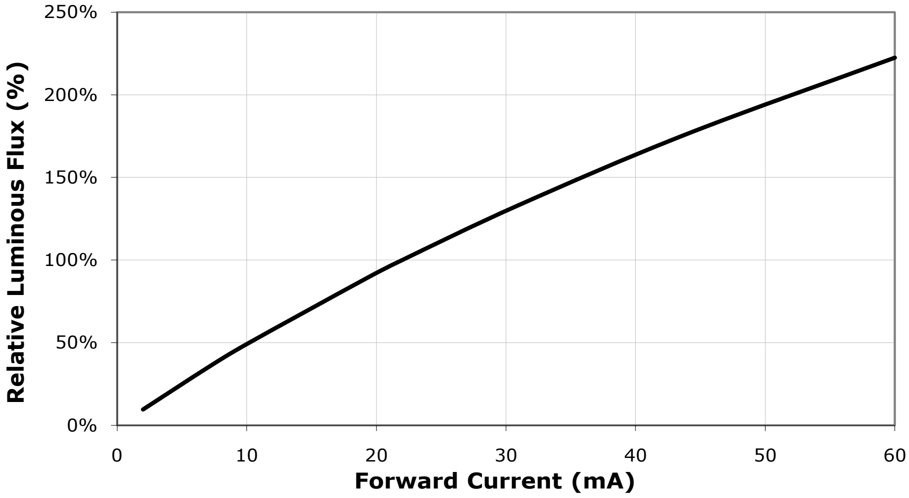
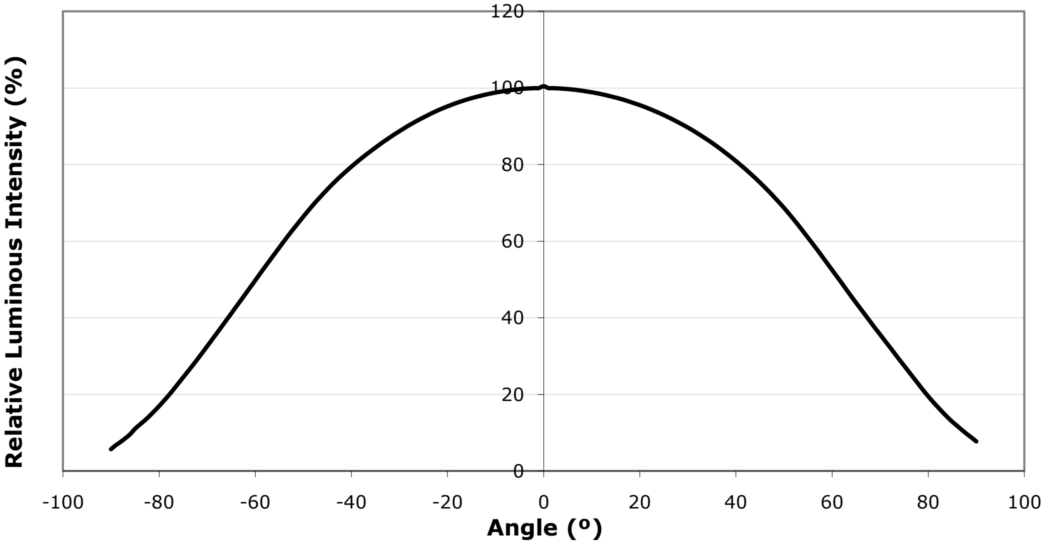
## RELATIVE FLUX VS. CURRENT ($T_J$ = 85 °C)



## TYPICAL SPATIAL DISTRIBUTION



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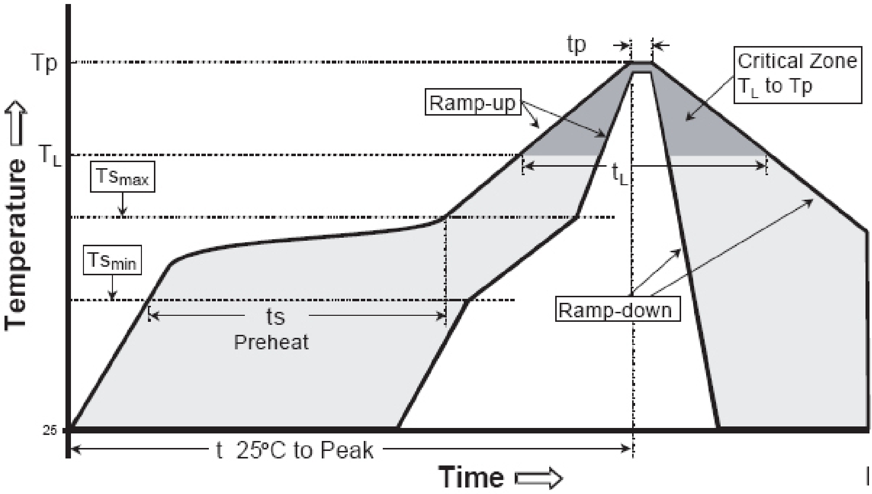
## REFLOW SOLDERING CHARACTERISTICS

In testing, Cree has found XLamp XT-E HVW 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-based solder | Lead-free solder |
|---|---|---|
| Average ramp-up rate ($Ts_{MAX}$ to Tp) | 3 °C/second max | 3 °C/second max |
| Preheat: Temperature min ($Ts_{MIN}$) | 100 °C | 150 °C |
| Preheat: Temperature max ($Ts_{MAX}$) | 150 °C | 200 °C |
| Preheat: Time ($ts_{MIN}$ to $ts_{MAX}$) | 60-120 seconds | 60-180 seconds |
| Time maintained above: temperature (TL) | 183 °C | 217 °C |
| Time maintained above: time (tL) | 60-150 seconds | 60-150 seconds |
| Peak/classification temperature (Tp) | 215 °C | 260 °C |
| Time within 5 °C of actual peak temperature (tp) | 10-30 seconds | 20-40 seconds |
| Ramp-down rate | 6 °C/second max | 6 °C/second max |
| Time 25 °C to peak temperature | 6 minutes max | 8 minutes max |

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

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## NOTES

Lumen Maintenance Projections

Cree now uses standardized IES LM-80-08 and TM-21-11 methods for collecting long-term data and extrapolating LED lumen maintenance. For information on the specific LM-80 data sets available for this LED, refer to the public LM-80 results document at www.cree.com/xlamp_app_notes/LM80_results.

Please read the XLamp Long-Term Lumen Maintenance application note at www.cree.com/xlamp_app_notes/lumen_maintenance for more details on Cree's lumen maintenance testing and forecasting. Please read the XLamp Thermal Management application note at www.cree.com/xlamp_app_notes/thermal_management for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

Moisture Sensitivity

In testing, Cree has found XLamp XT-E LEDs to have unlimited floor life in conditions ≤30 ºC/85% relative humidity (RH). Moisture testing included a 168-hour soak at 85 ºC/85% RH followed by 3 reflow cycles, with visual and electrical inspections at each stage.

Cree recommends keeping XLamp LEDs in their sealed moisture-barrier packaging until immediately prior to use. Cree also recommends returning any unused LEDS to the resealable moisture-barrier bag and closing the bag immediately fter use.

UL Recognized Component

Level 4 enclosure consideration. The LED package or a portion thereof has been investigated as a fire and electrical enclosure per ANSI/UL 8750.

Vision Advisory Claim

WARNING: Do not look at an exposed lamp in operation. Eye injury can result. See LED Eye Safety at www.cree.com/xlamp_app_notes/led_eye_safety.

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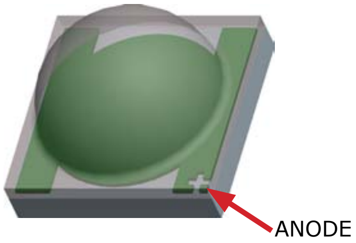
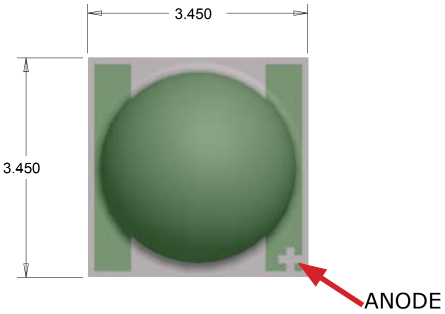
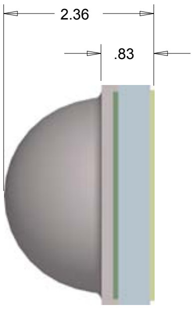
## MECHANICAL DIMENSIONS

All measurements are ±.13 mm unless otherwise indicated.

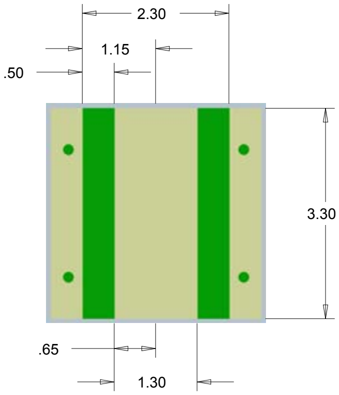




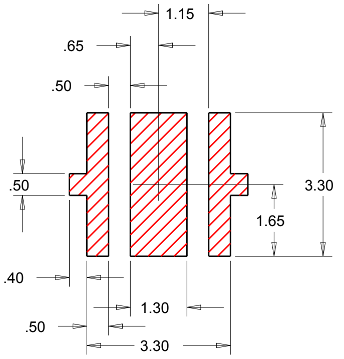
**Top View**



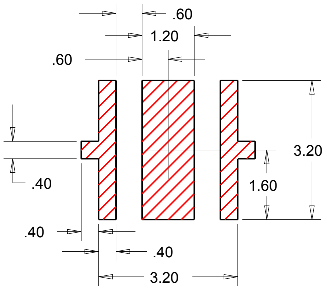
**Side View**



**Bottom View**



**Recommended PCB Solder Pad**



**Recommended Stencil Pattern**

**Hatched Area is Opening**

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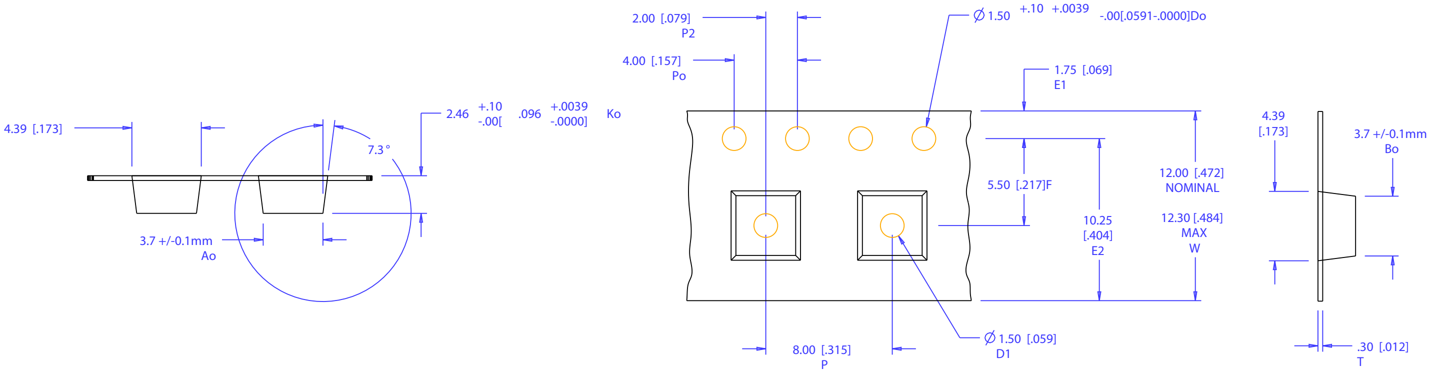
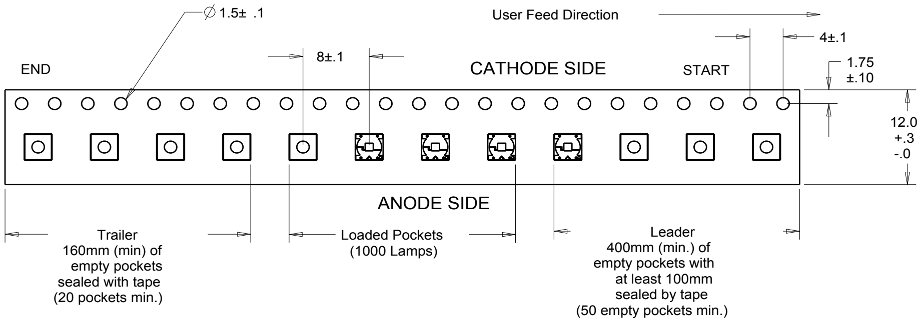
## TAPE AND REEL

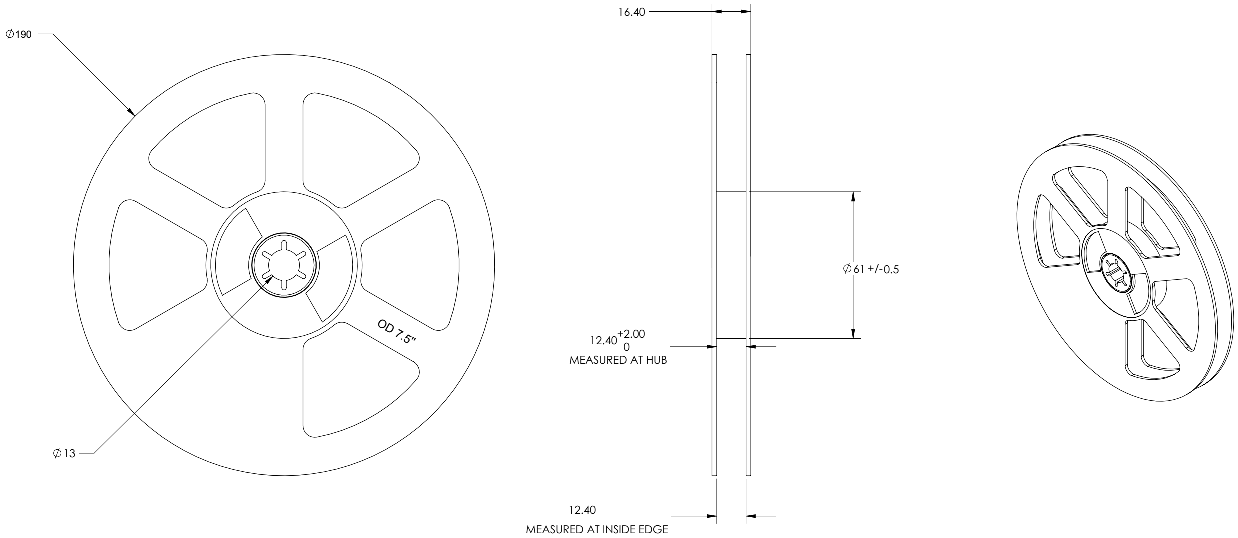
All Cree carrier tapes conform to EIA-481D, Automated Component Handling Systems Standard.

All dimensions in mm.



| POCKET SIZE | |
|---|---|
| Ao - | 3.7mm +/-0.1mm |
| Bo - | 3.7mm +/-0.1mm |
| Ko - | 2.46mm +0.1/-0mm |





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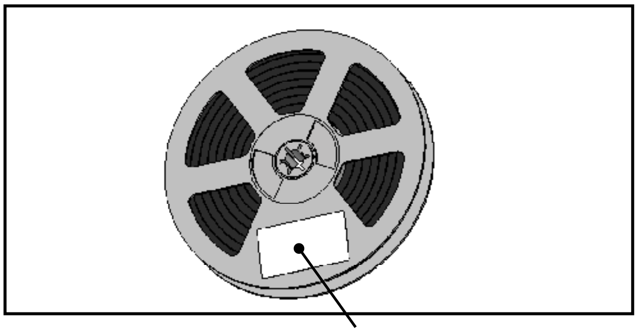
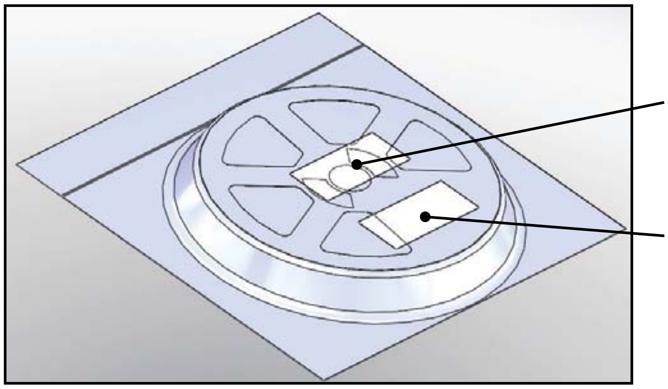
## PACKAGING

**Unpackaged Reel**



Label with Cree Bin Code, Qty, Reel ID

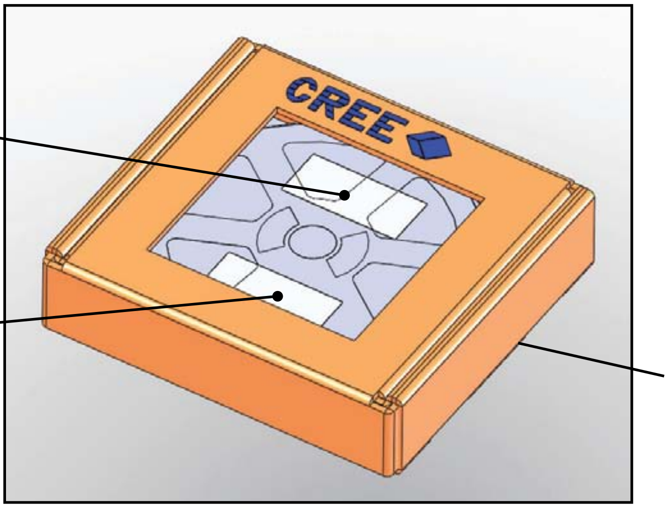
**Packaged Reel**



Label with Cree Order Code, Qty, Reel ID, PO #

Label with Cree Bin Code, Qty, Reel ID

**Boxed Reel**



Label with Cree Order Code, Qty, Reel ID, PO #

Label with Cree Bin Code, Qty, Reel ID

Patent Label (on bottom of box)

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