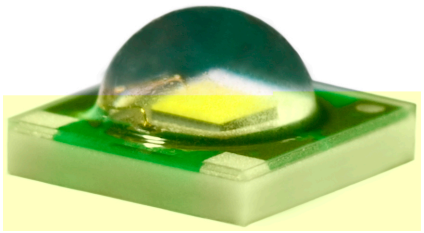
Cree® XLamp® XP-E LEDs
Data Sheet

The XLamp XP-E LED combines the proven lighting-class performance and reliability of the XLamp XR-E LED in a package with 80% smaller footprint. The XLamp XP-E LED continues Cree's history of innovation in LEDs for lighting

and electrically neutral thermal path.

Cree XLamp LEDs bring high performance and quality of light to a wide range of lighting applications, including color-changing lighting, portable and personal lighting, outdoor lighting, indoor directional lighting, commercial lighting and emergency-vehicle lighting.



FEATURES

- Available in white (2,600 K to 10,000 K CCT)
- Maximum drive current: 700 mA
- Low thermal resistance: 9 °C/W
- Wide viewing angle: 115°
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  compatible
- Electrically neutral thermal path
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Table of Contents

Flux Characteristics (T_J = 25°C)

The following table provides several base order codes for XLamp XP-E 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 XP-E & XP-C Binning and Labeling document.

Color	CCT Range		Base Order Codes Min Luminous Flux (lm)		Order Code
	Min.	Max.	Group	Flux (lm)	
Cool White	5,000 K	10,000 K	Q2	87.4	
			Q3	93.9	
			Q4	100	
Neutral White	3,700 K	5,000 K	P4	80.6	
			Q2	87.4	
Warm White	2,600 K	3,700 K	P2	67.2	
			P3	73.9	
			P4	80.6	

Notes:

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- Typical CRI for Cool White & Neutral White (3,700 K – 10,000 K CCT) is 75.
- Typical CRI for Warm White (2,600 K – 3,700 K CCT) is 80.

Characteristics

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		9	
	degrees		115	
	mV/°C		-4.0	
			Class 2	
DC forward current	mA			700
Reverse voltage	V			5
Forward voltage (@ 350 mA)	V		3.2	3.9
Forward voltage (@ 700 mA)	V		3.4	
LED junction temperature	°C			150

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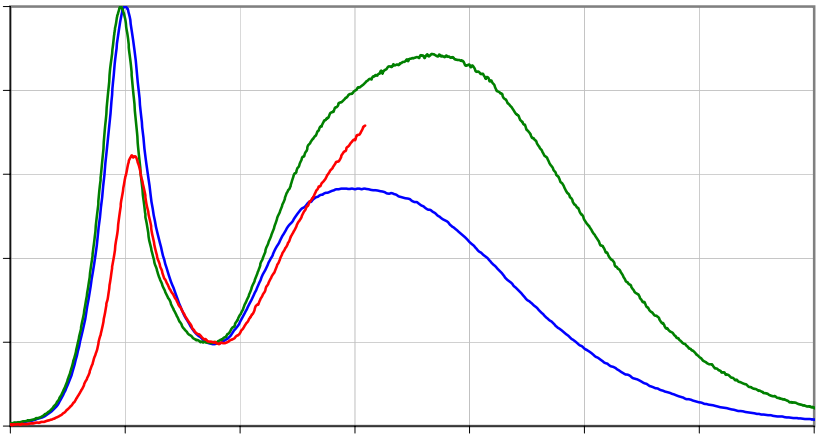
Relative Spectral Power Distribution



Relative Flux vs. Junction Temperature (I_F = 350 mA)

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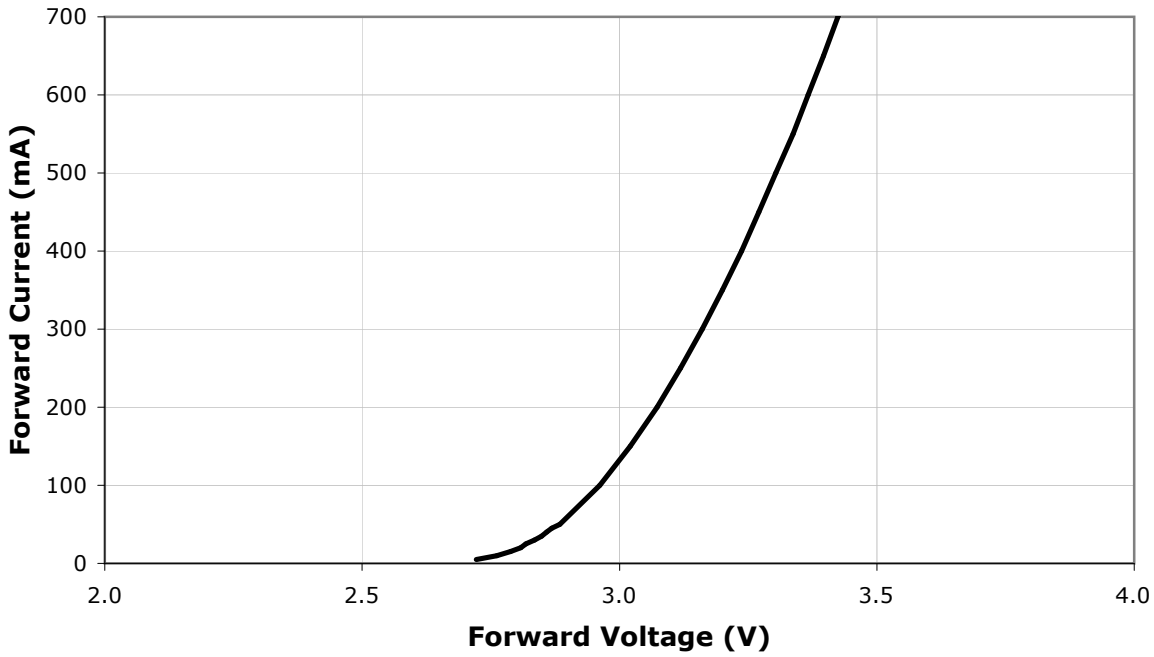
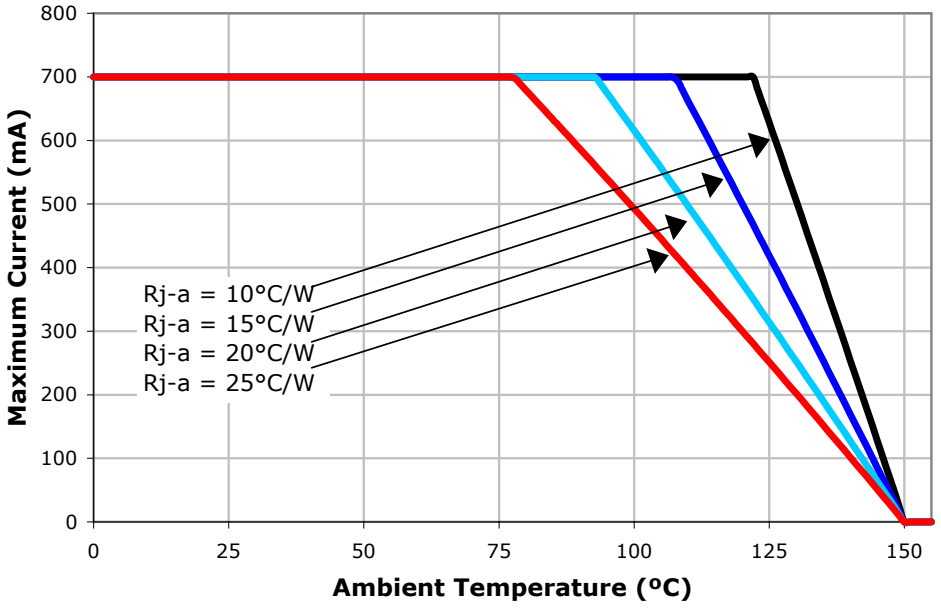
Electrical Characteristics (T_j = 25°C)



Thermal Design

The maximum forward current is determined by the thermal resistance between the LED junction and ambient. Given an existing thermal resistance of 9°C/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.



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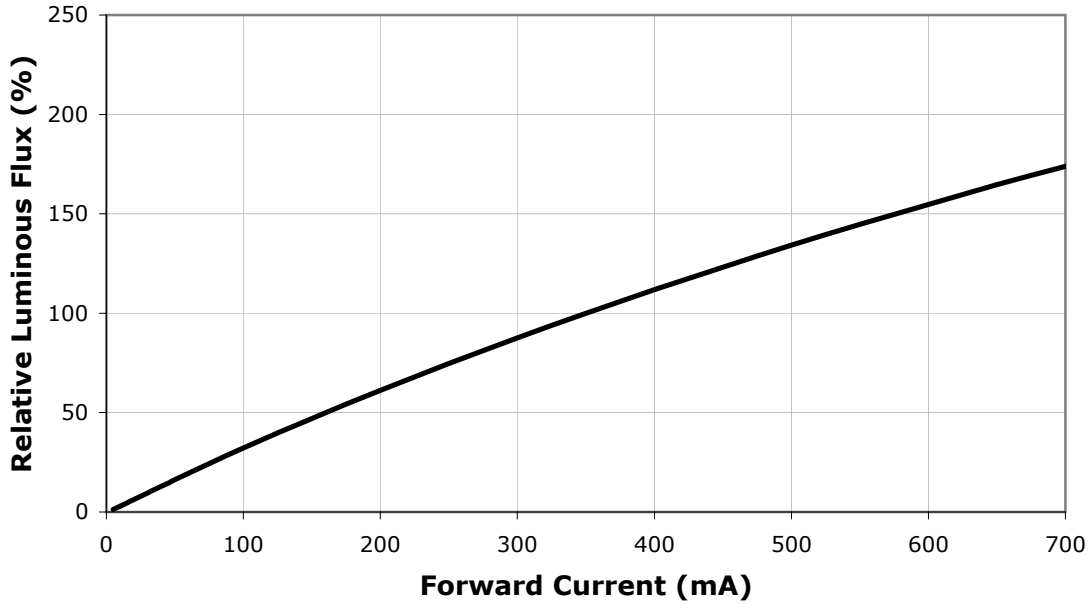
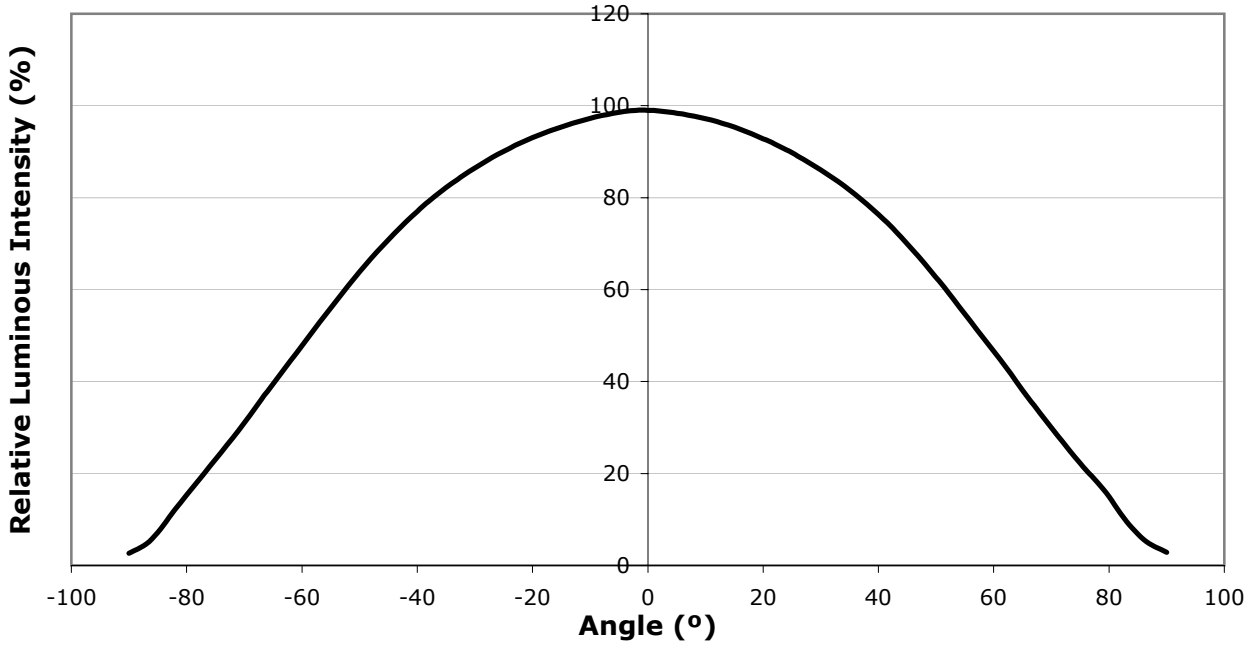
Relative Flux vs. Current (T_J = 25°C)



Typical Spatial Distribution



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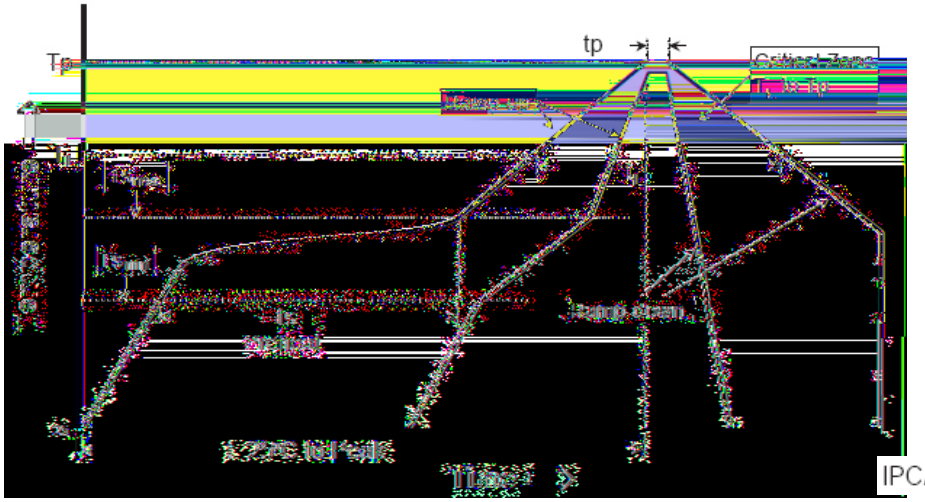
Reflow Soldering Characteristics

In testing, Cree has found XLamp XP-E LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed manufacturer of solder paste used.



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 (T_L)	183°C	217°C
Time Maintained Above: Time (t_L)	60-150 seconds	60-150 seconds
	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

Moisture Sensitivity

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electrical inspections at each stage.

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise 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

as amended through April 21, 2006.

Vision Advisory Claim

Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.

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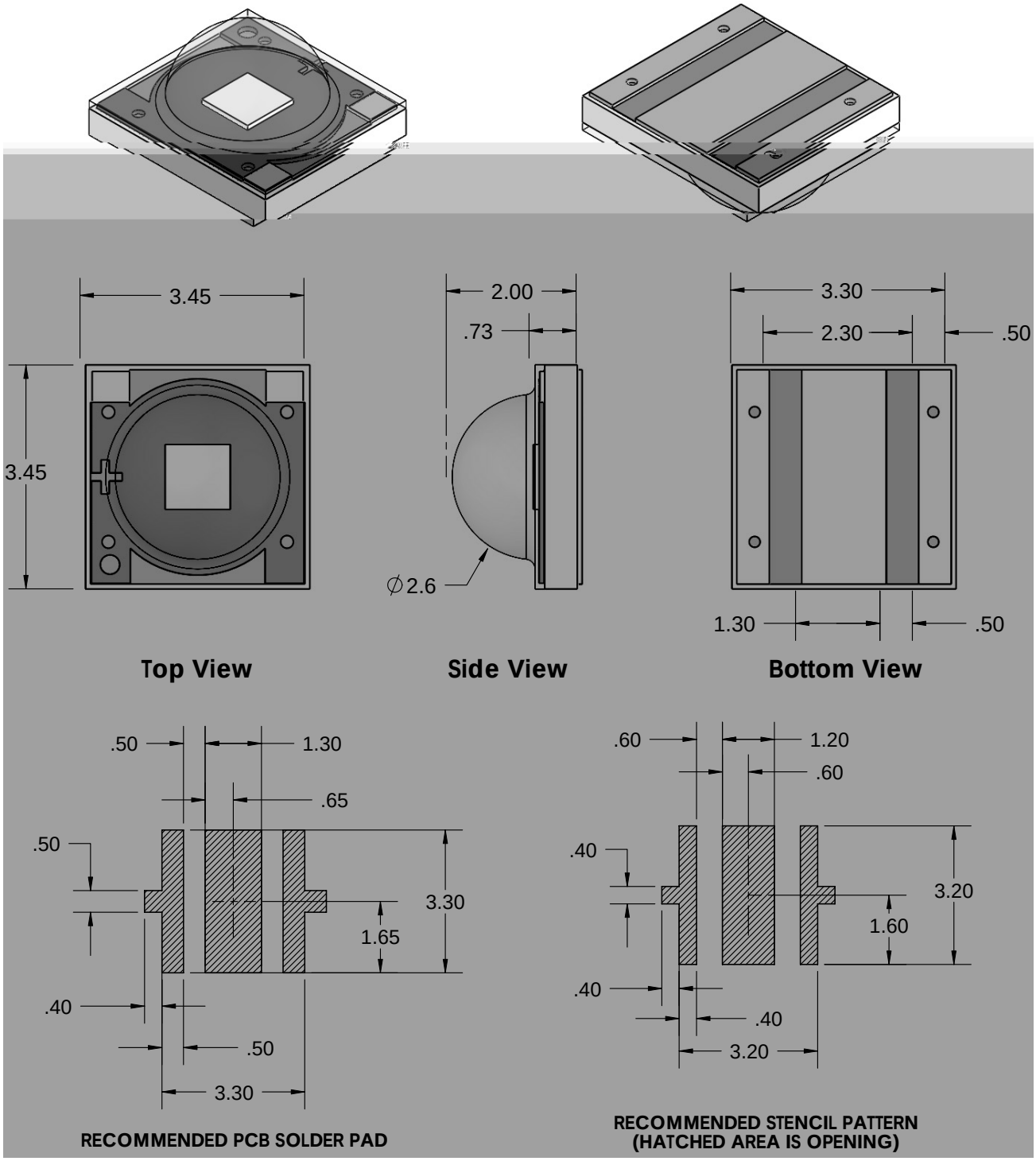
Mechanical Dimensions (T_A = 25°C)

All measurements are ±.13 mm unless otherwise indicated.



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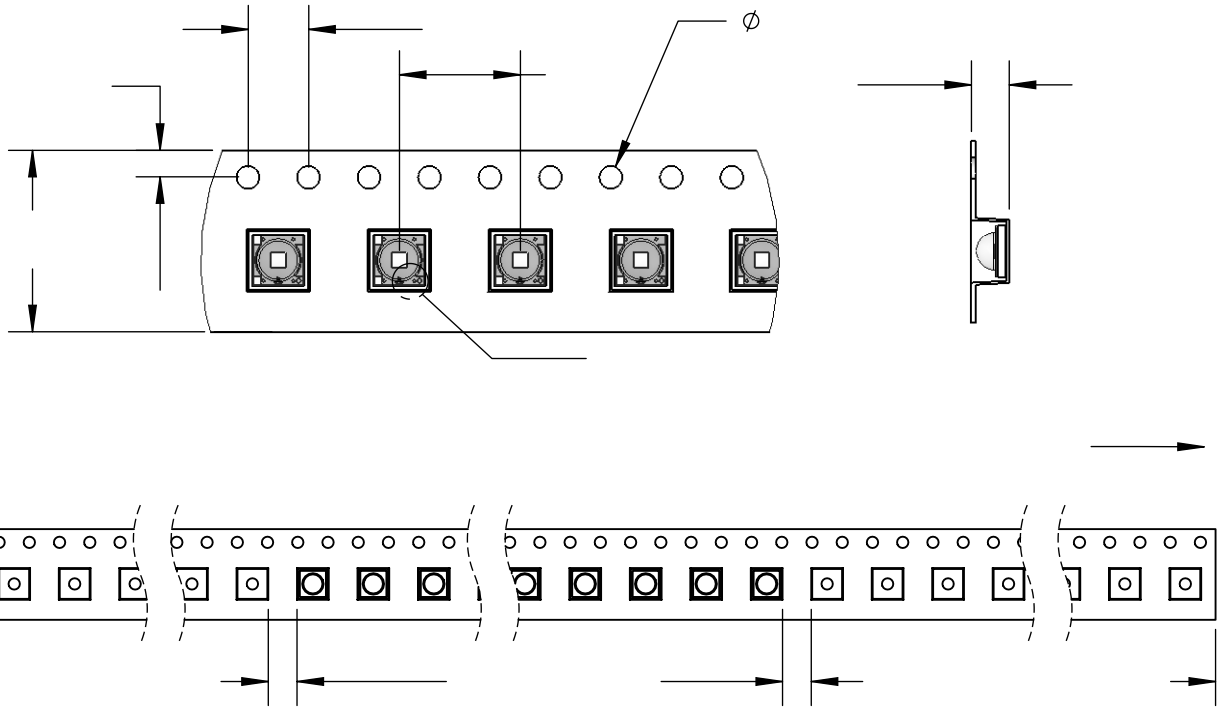
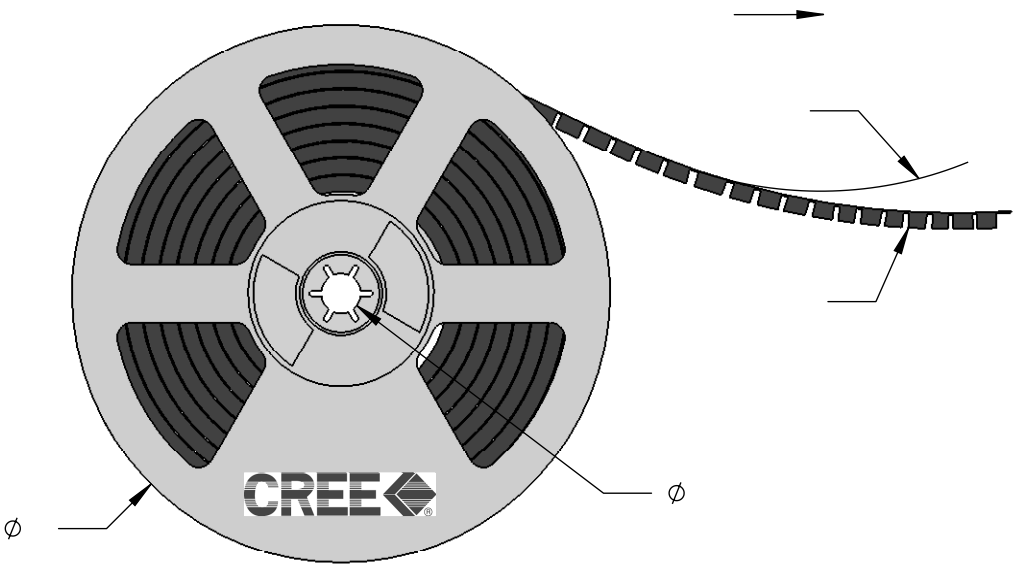
Tape and Reel

All dimensions in mm.





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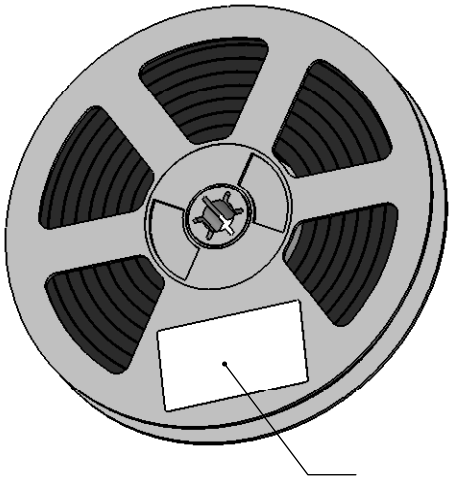
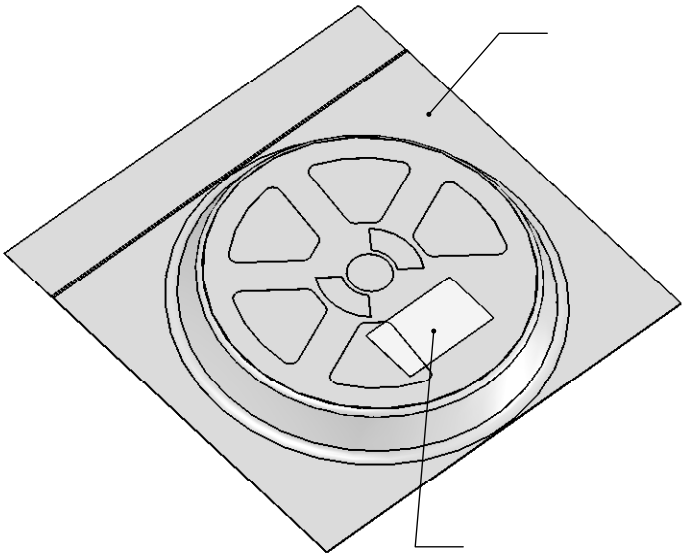
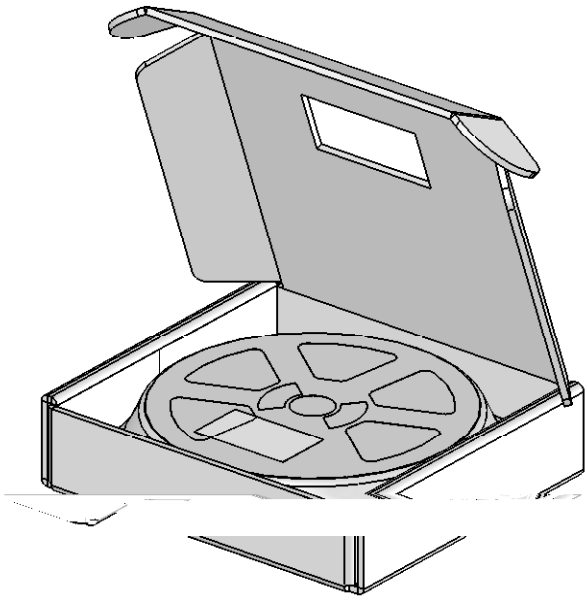
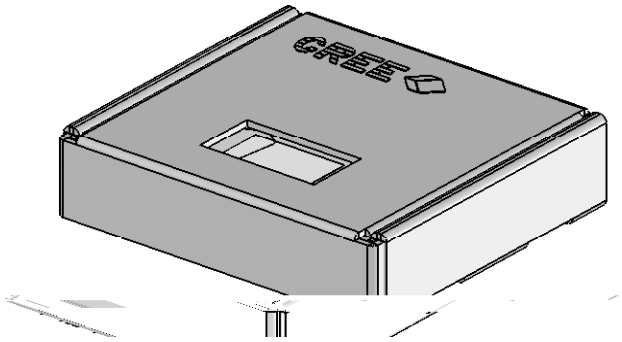
Packaging

All dimensions in mm.









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