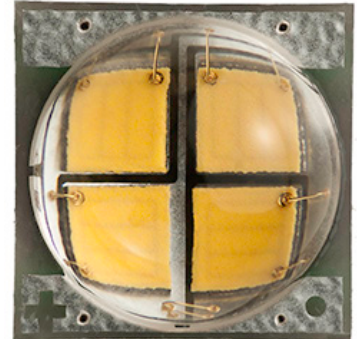


Cree® XLamp® XM-L EasyWhite™ LEDs Data Sheet



FEATURES

- Cree EasyWhite™ color temperature
- Low thermal resistance: 3°C/W
- Viewing angle: 110°
- Unlimited floor life at $\leq 30^{\circ}\text{C}/85\% \text{ RH}$
- Reflow solderable - JEDEC J-STD-020C
- Electrically neutral thermal path

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Flux Characteristics (T_j = 25°C)

The following table provides several base order codes for XLamp XM-L 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 XM-L Binning and Labeling document.

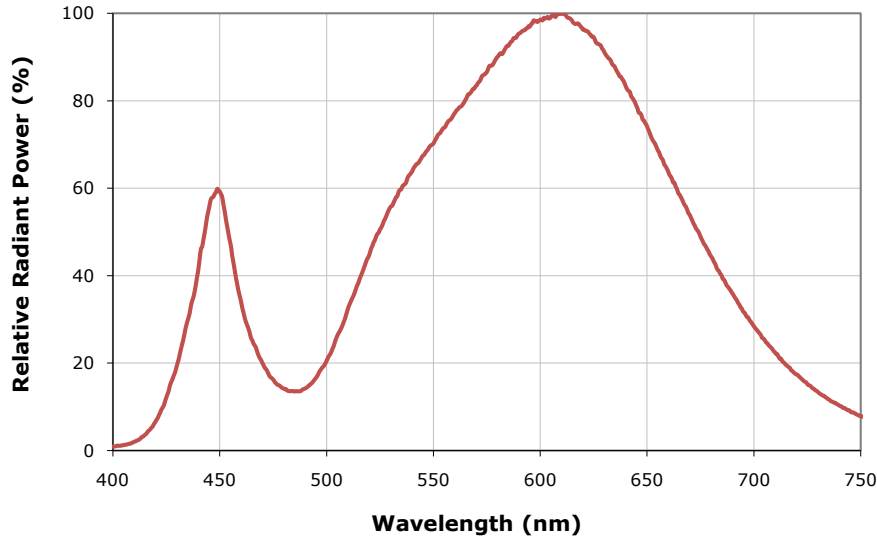
Color	CCT Range	Base Order Codes Min Luminous Flux @ 350 mA (lm)		Order Code
		Group	Flux (lm)	
EasyWhite 4-Step	3,000 K	S6	182	XMLBEZ-00-0000-0000S630F
	2,700 K	S5	172	XMLBEZ-00-0000-0000S527F

Note: Cree maintains a tolerance of ±7% on flux and power measurements.

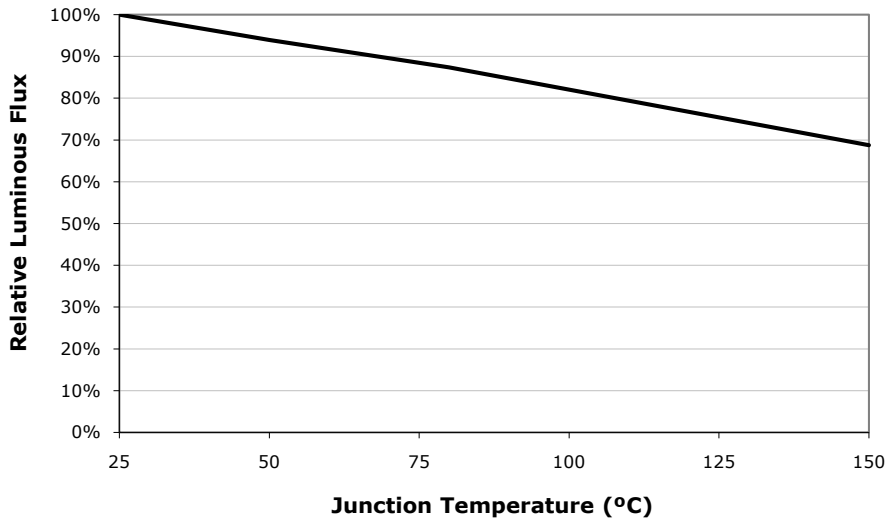
Characteristics

Characteristics	Unit	Minimum	Typical	Maximum
Thermal Resistance, junction to solder point	°C/W		3	
Viewing Angle (FWHM)	degrees		110	
Temperature coefficient of voltage	mV/°C		-3.0	
ESD Classification (HBM per Mil-Std-883D)			Class 2	
Reverse Voltage	V			5
Forward voltage (@ 350 mA)	V		5.9	
Forward voltage (@ 700 mA)	V		6.2	

Relative Spectral Power Distribution



Relative Flux vs. Junction Temperature ($I_f = 700$ mA)

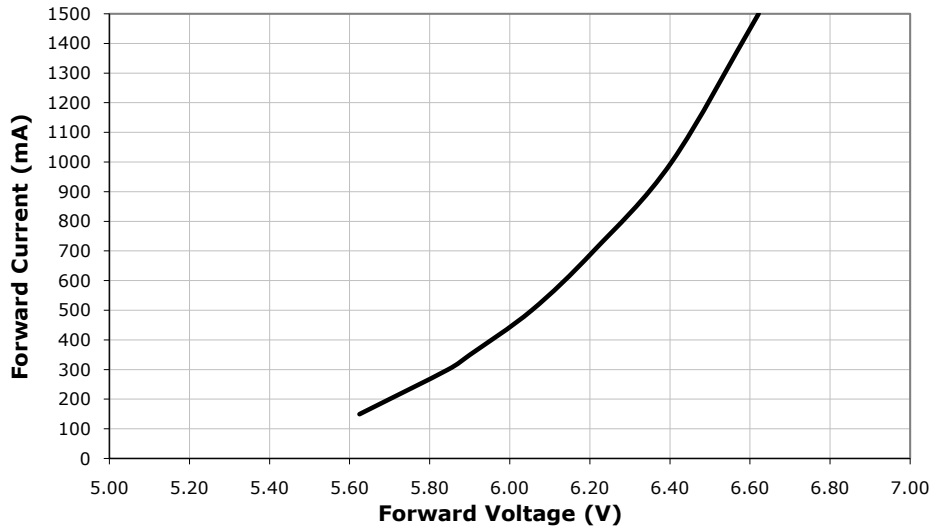


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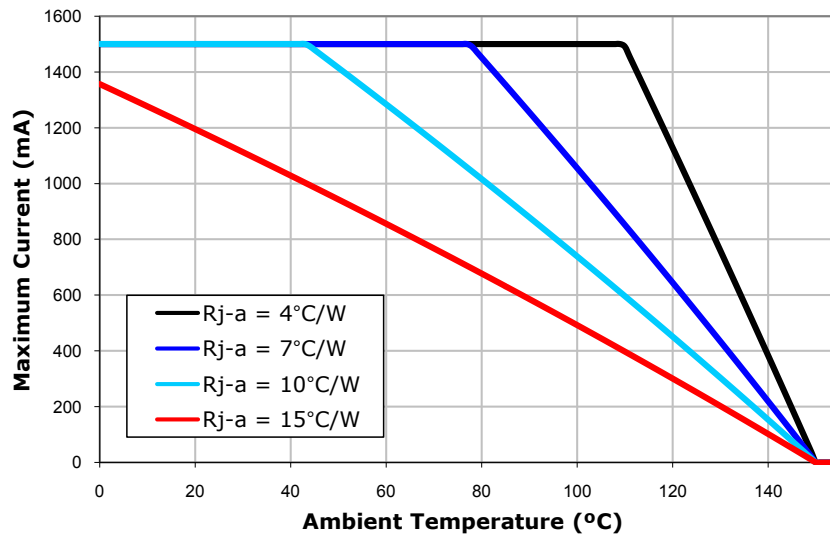
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4600 Silicon Drive
Durham, NC 27703
USA Tel: +1.919.313.5300
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Electrical Characteristics ($T_j = 25^\circ\text{C}$)



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.

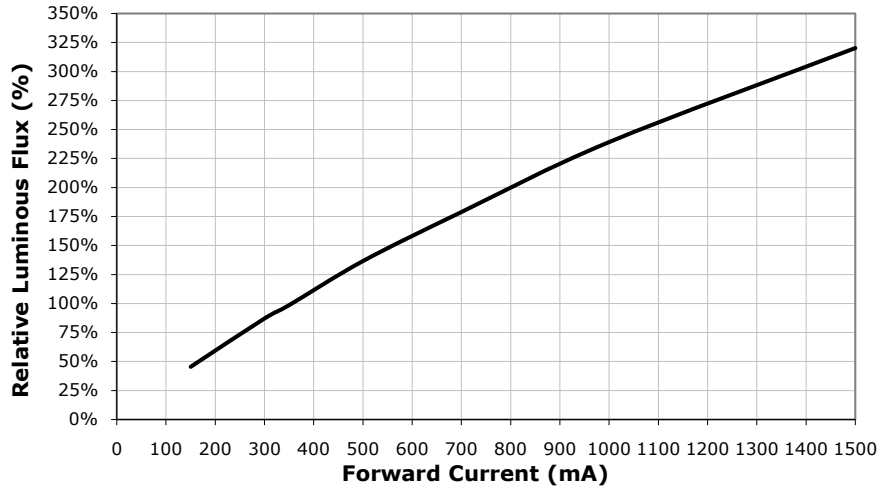


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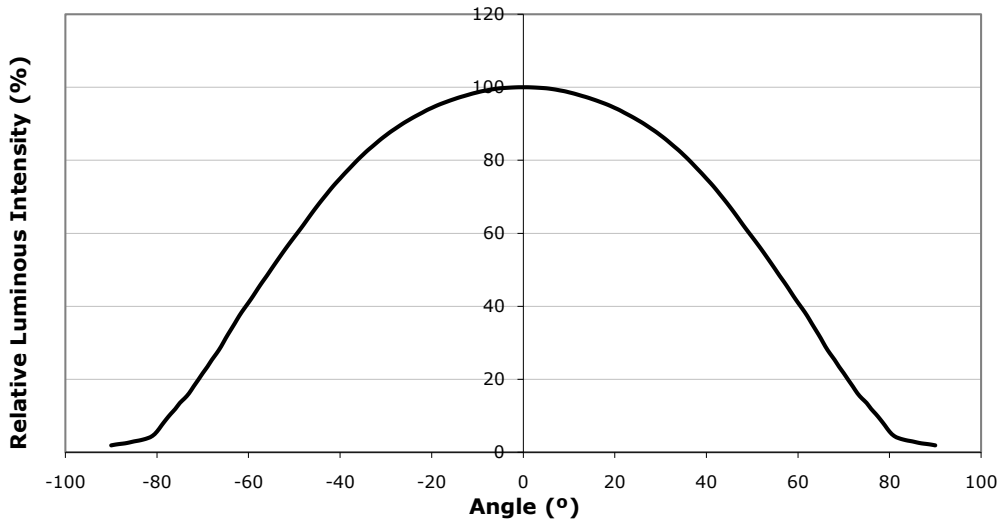
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 USA Tel: +1.919.313.5300
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Relative Flux vs. Current ($T_j = 25^\circ\text{C}$)



Typical Spatial Distribution



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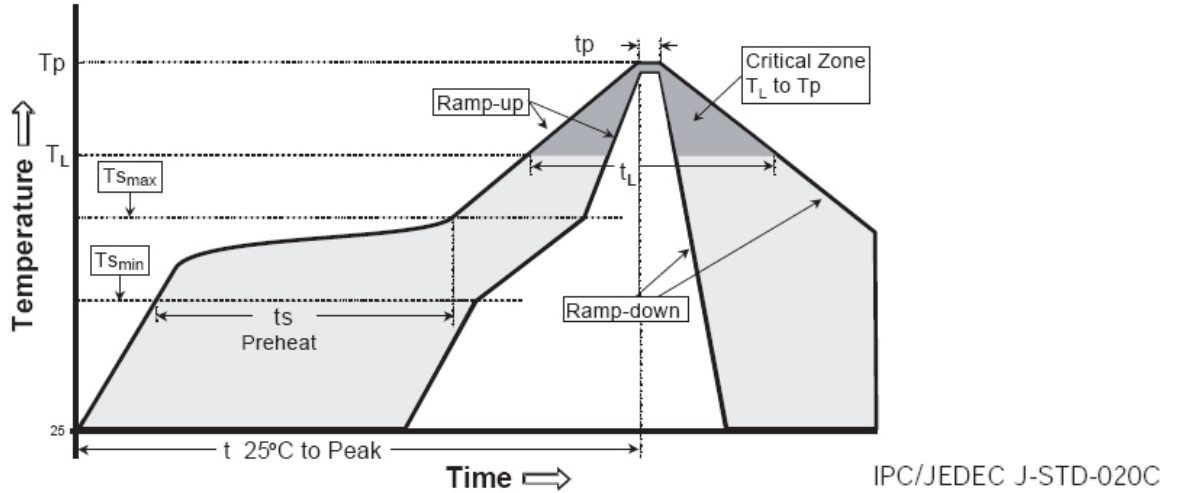
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USA Tel: +1.919.313.5300
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Reflow Soldering Characteristics

In testing, Cree has found XLamp XM-L 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 solder paste used.

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



Profile Feature	Lead-Based Solder	Lead-Free Solder
Average Ramp-Up Rate ($T_{s_{max}}$ to T_p)	3°C/second max.	3°C/second max.
Preheat: Temperature Min ($T_{s_{min}}$)	100°C	150°C
Preheat: Temperature Max ($T_{s_{max}}$)	150°C	200°C
Preheat: Time ($t_{s_{min}}$ to $t_{s_{max}}$)	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
Peak/Classification Temperature (T_p)	215°C	260°C
Time Within 5°C of Actual Peak Temperature (t_p)	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.



Notes

Moisture Sensitivity

In testing, Cree has found XLamp XM-L LEDs to have unlimited floor life in conditions $\leq 30^{\circ}\text{C}$ / 85% relative humidity (RH). Moisture testing included a 168 hour soak at 85°C / 85% RH followed by 3 reflow cycles, with visual and electrical inspections at each stage.

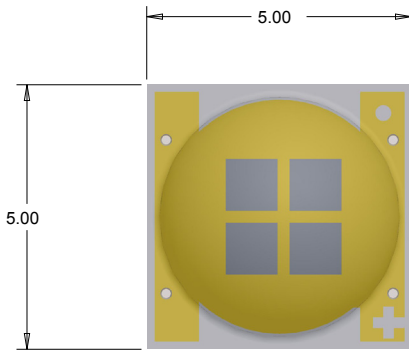
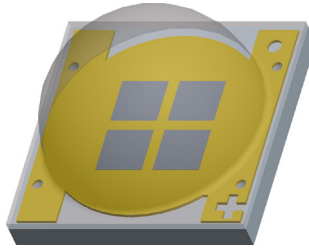
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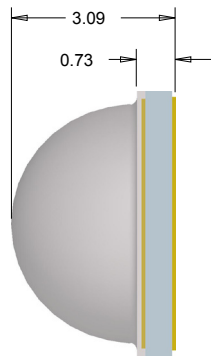
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Mechanical Dimensions

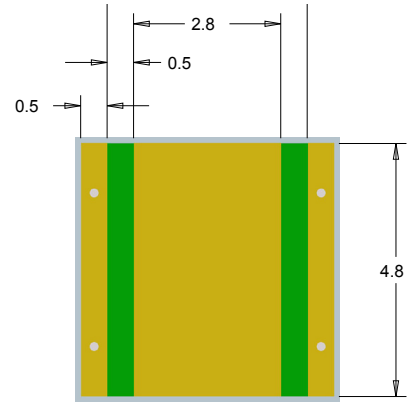
All measurements are $\pm .13$ mm unless otherwise indicated.



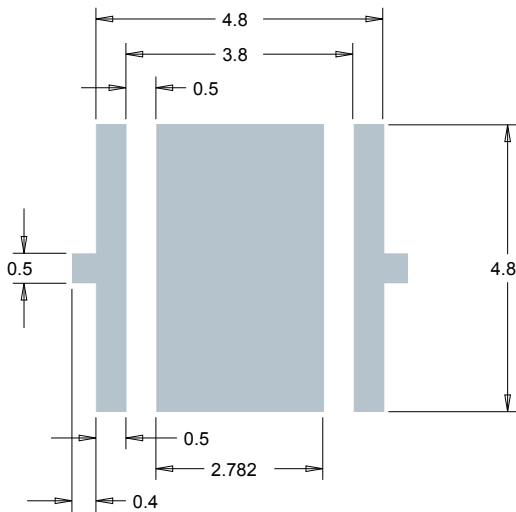
Top View



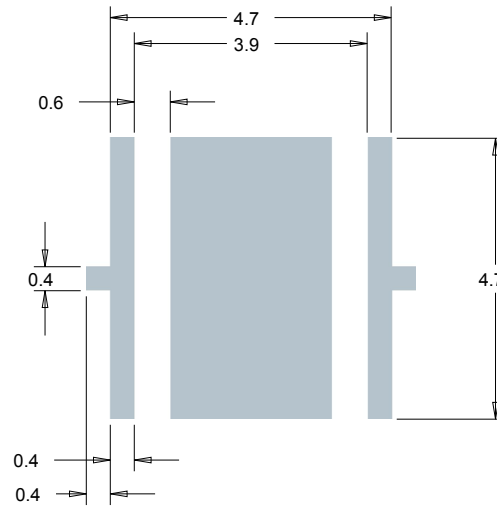
Side View



Bottom View



Recommended PCB Solder Pad



**Recommended Stencil Pattern
(Shaded Area Is Open)**

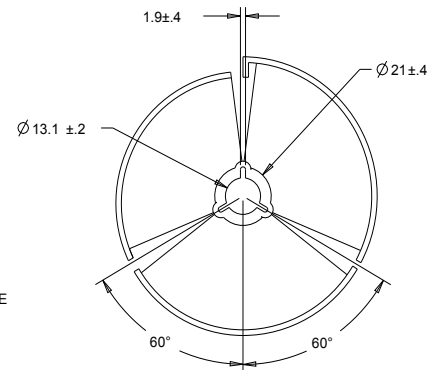
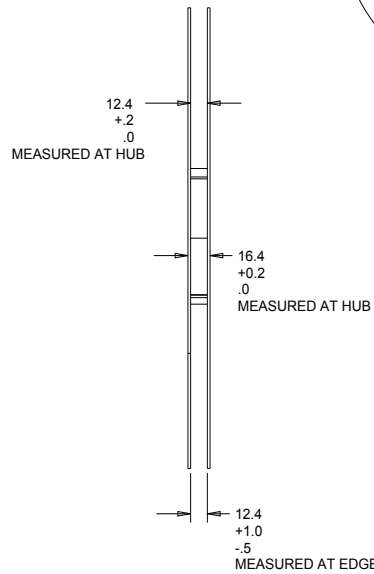
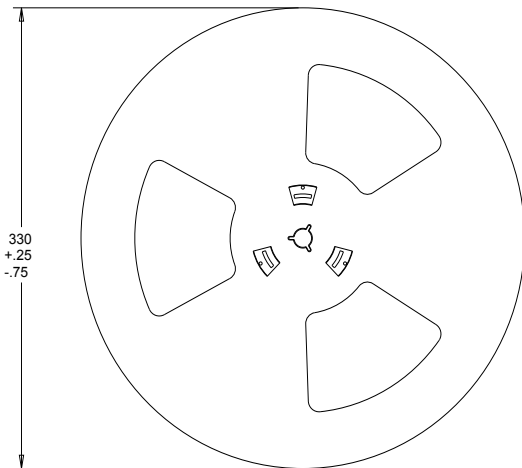
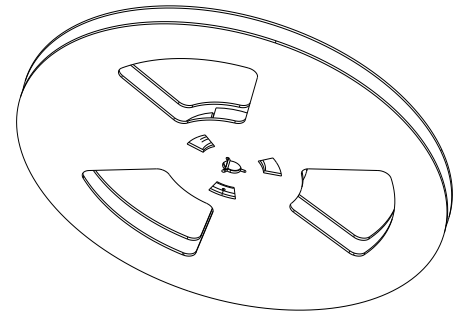
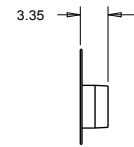
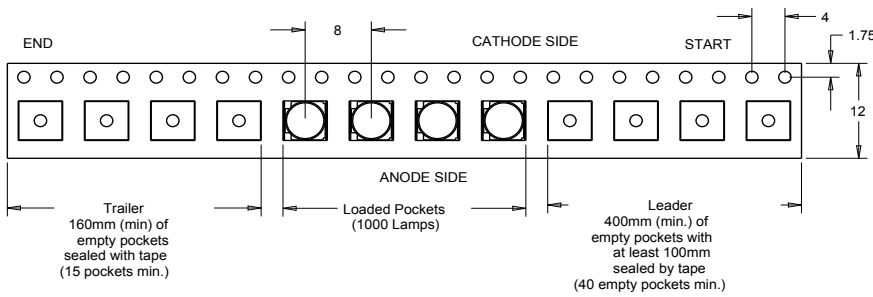
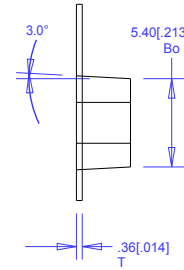
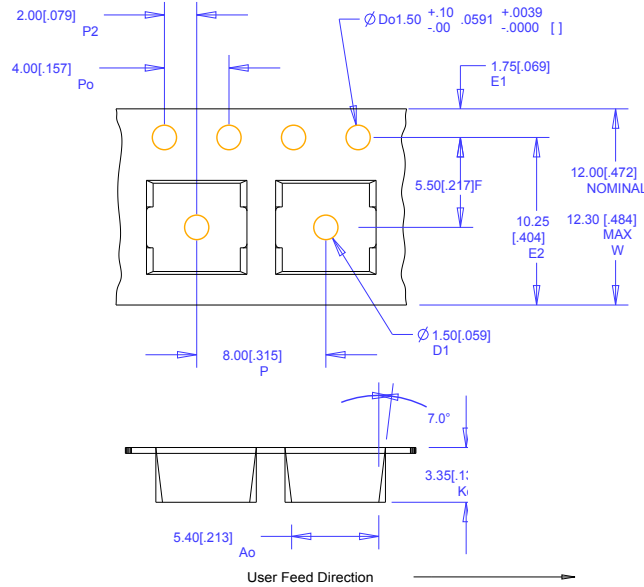
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Tape and Reel

All dimensions in mm.



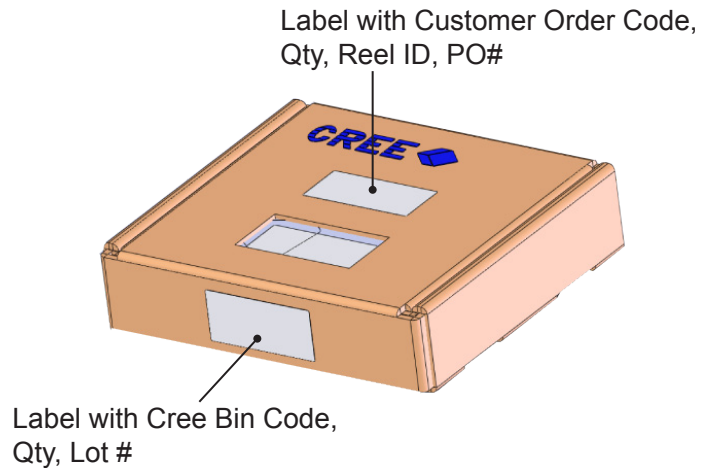
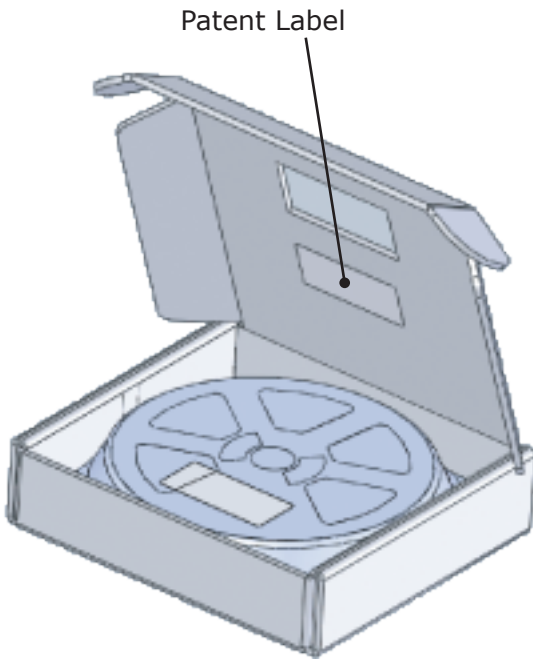
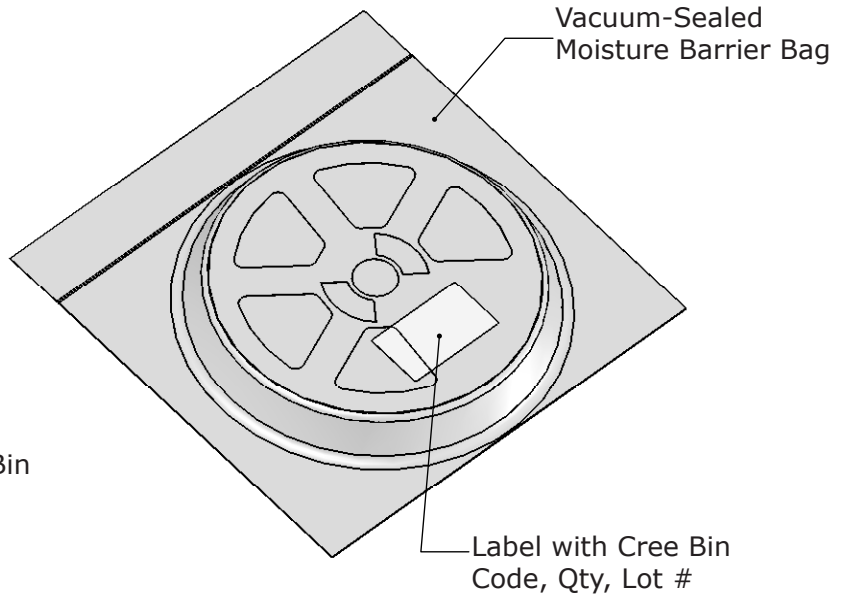
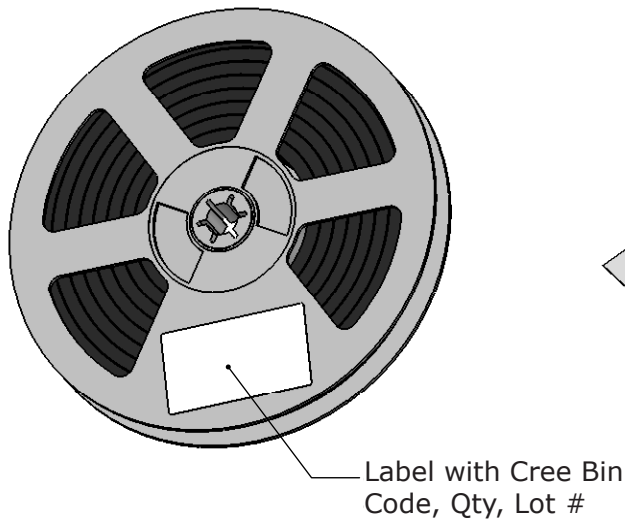
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Packaging

All dimensions in mm.



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