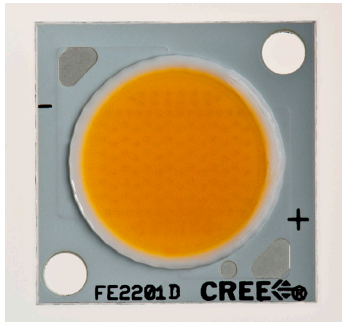


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Cree® XLamp® CXA2011 LED



PRODUCT DESCRIPTION

The Cree XLamp CXA2011 LED brings lighting-class reliability and performance to easy-to-use LED arrays. The XLamp CXA2011 expands Cree’s lighting-class leadership to multi-die, high flux arrays. With XLamp lighting-class reliability, a wide viewing angle, uniform light output, and industry-leading chromaticity binning in a 16 mm diameter optical source, the XLamp CXA2011 LED continues Cree’s history of segment-focused product innovation in LEDs for lighting applications.

The XLamp CXA2011 LED brings high performance and a smooth look to a wide range of lighting applications, including downlighting, recessed fixtures, can lights and retrofit bulbs.

FEATURES

- Available in ANSI white bins as well as 4-step and 2-step EasyWhite bins at 2,700K, 3,000K, 3,500K, 4,000K, 5000K CCT
- Forward Voltage: 40 V
- 85°C binning and characterization
- NEMA SSL-3 2011 standard flux bins
- Max drive current: 1000 mA
- 120° viewing angle, uniform chromaticity profile
- Top-side solder connections
- Thermocouple attach point
- Screw down attachment
- RoHS and REACH-compliant
- Unlimited shelf life at $\leq 30^{\circ}\text{C}/85\% \text{ RH}$

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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Effective thermal resistance, junction to thermo-couple attach point	°C/W		0.4	
Viewing angle (FWHM)	degrees		120	
ESD classification (HBM per Mil-Std-883D)			Class 2	
DC forward current	mA			1,000
Reverse current	mA		0.1	
Forward voltage (@ 270 mA, 85 °C)	V		40	
LED junction temperature	°C			150
Temperature coefficient of voltage	mV/°C		-3.5	

FLUX CHARACTERISTICS (I_F=270 MA, T_J=85°C)

The following tables provide several base order codes for XLamp CXA2011 LEDs. For additional order codes, as well as a complete description of the order code nomenclature, please reference Bin and Order Code Formats (p. 7) and Standard Order Codes and Bins (p. 8) of this document.

Color	CCT Range	Base Order Codes Min Luminous Flux (lm) @ 270 mA (T _J =85°C)		Order Code
		Min	Group	
White	5000 K	H0	900	CXA2011-0000-000P00H00E3
		J0	1040	CXA2011-0000-000P00J00E3
	4000 K	G0	780	CXA2011-0000-000P00G00E5
		H0	900	CXA2011-0000-000P00H00E5
	3500 K	G0	780	CXA2011-0000-000P00G00E6
		H0	900	CXA2011-0000-000P00H00E6
	3000 K	G0	780	CXA2011-0000-000P00G00E7
		H0	900	CXA2011-0000-000P00H00E7
	2700 K	F0	680	CXA2011-0000-000P00F00E8
		G0	780	CXA2011-0000-000P00G00E8

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements
- Minimum CRI for chromaticity kits 27F, 27H, 30F, 30H, 0E8, 0E7 is 80
- Minimum CRI for chromaticity kits 35F, 35H, 0E6 is 77
- Typical CRI for chromaticity kits 35F, 35H, 0E6 is 80
- Minimum CRI for chromaticity kits 40F, 40H, 50F, 50H, 0E5, 0E3 is 70
- Typical CRI for chromaticity kits 40F, 40H, 50F, 50H, 0E5, 0E3 is 75
- Cree Maintains a tolerance of ±2 on CRI measurements

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Color	CCT Range	Base Order Codes Min Luminous Flux (lm) @ 270 mA (T _j =85°C)		Order Code
	Min	Group	Flux (lm)	
EasyWhite 4-Step	5000 K	H0	900	CXA2011-0000-000P00H050F
		J0	1040	CXA2011-0000-000P00J050F
	4000 K	G0	780	CXA2011-0000-000P00G040F
		H0	900	CXA2011-0000-000P00H040F
	3500 K	G0	780	CXA2011-0000-000P00G035F
		H0	900	CXA2011-0000-000P00H035F
	3000 K	G0	780	CXA2011-0000-000P00G030F
		H0	900	CXA2011-0000-000P00H030F
	2700 K	F0	680	CXA2011-0000-000P00F027F
		G0	780	CXA2011-0000-000P00G027F

Color	CCT Range	Base Order Codes Min Luminous Flux (lm) @ 270 mA (T _j =85°C)		Order Code
	Min	Group	Flux (lm)	
EasyWhite 2-Step	5000 K	H0	900	CXA2011-0000-000P00H050H
		J0	1040	CXA2011-0000-000P00J050H
	4000 K	G0	780	CXA2011-0000-000P00G040H
		H0	900	CXA2011-0000-000P00H040H
	3500 K	G0	780	CXA2011-0000-000P00G035H
		H0	900	CXA2011-0000-000P00H035H
	3000 K	G0	780	CXA2011-0000-000P00G030H
		H0	900	CXA2011-0000-000P00H030H
	2700 K	F0	680	CXA2011-0000-000P00F027H
		G0	780	CXA2011-0000-000P00G027H

Notes:

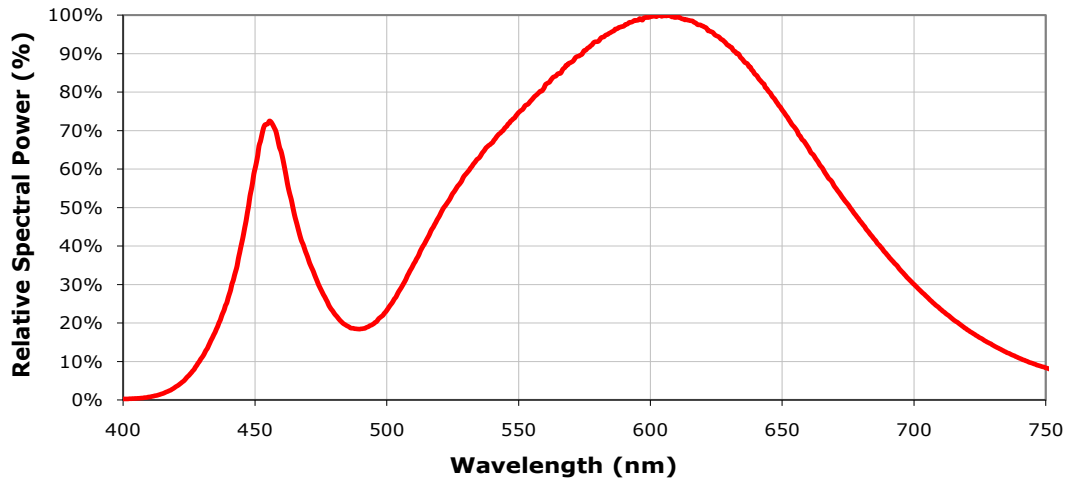
- Cree maintains a tolerance of ±7% on flux and power measurements
- Minimum CRI for chromaticity kits 27F, 27H, 30F, 30H, 0E8, 0E7 is 80
- Minimum CRI for chromaticity kits 35F, 35H, 0E6 is 77
- Typical CRI for chromaticity kits 35F, 35H, 0E6 is 80
- Minimum CRI for chromaticity kits 40F, 40H, 50F, 50H, 0E5, 0E3 is 70
- Typical CRI for chromaticity kits 40F, 40H, 50F, 50H, 0E5, 0E3 is 75
- Cree Maintains a tolerance of ±2 on CRI measurements

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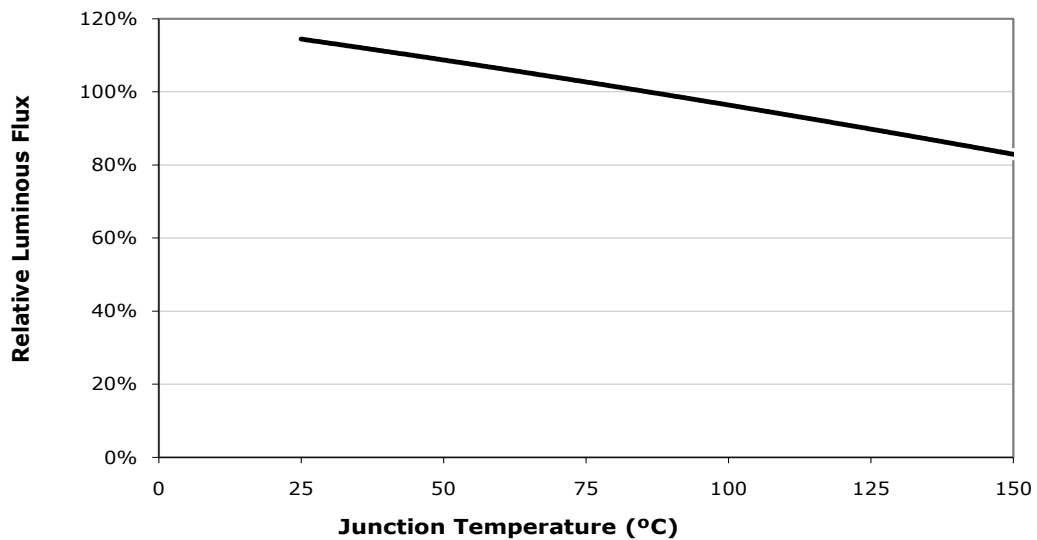
RELATIVE SPECTRAL POWER DISTRIBUTION ($I_f=270\text{ MA}$, $T_j=85^\circ\text{C}$, 3000K CCT)

The following graph represents typical spectral out of the XLamp CXA2011 LED.



RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE ($I_f=270\text{ MA}$)

The following graph represents typical performance of the XLamp CXA2011 LED.

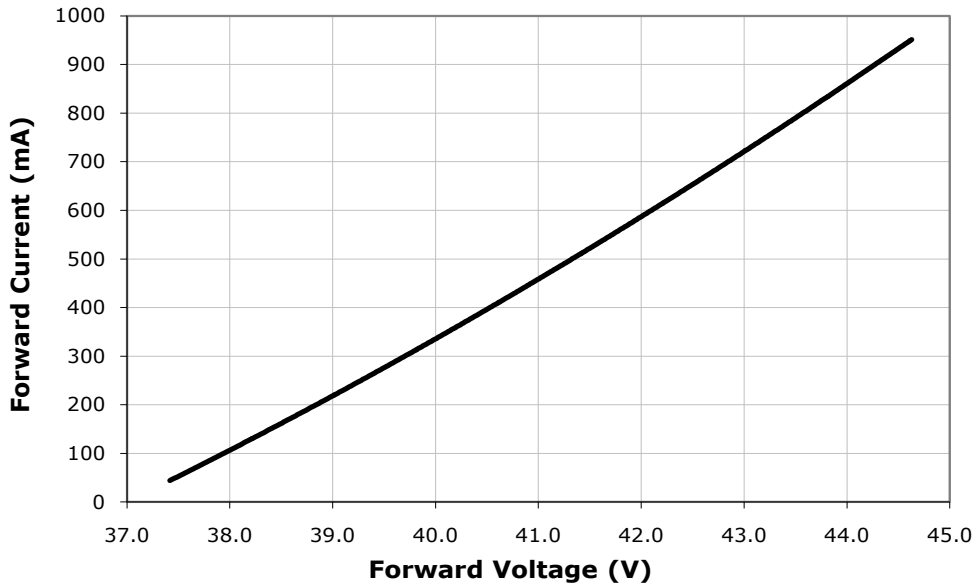


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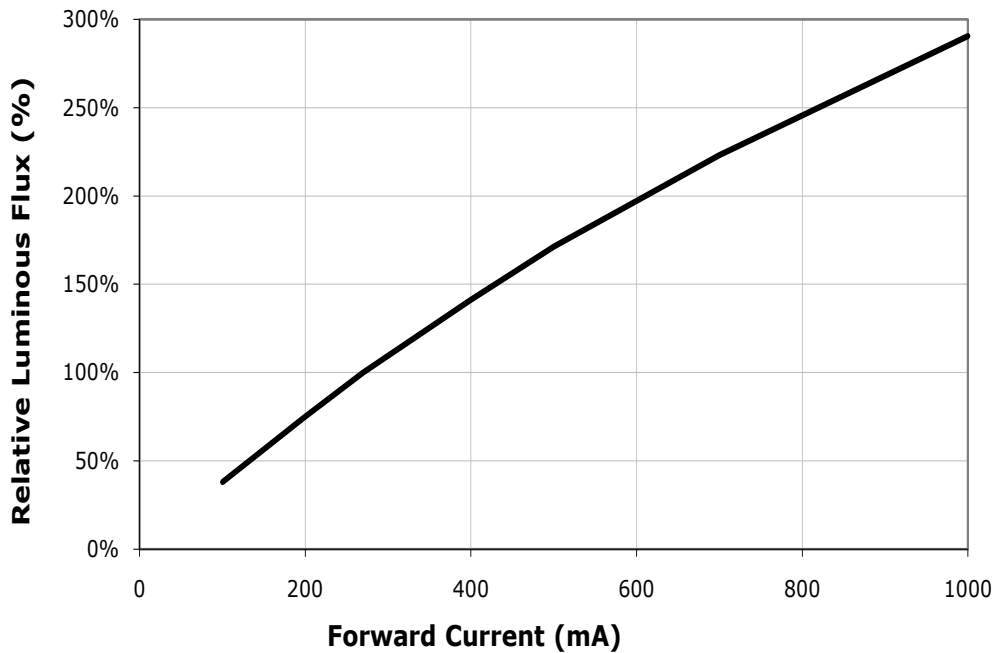
ELECTRICAL CHARACTERISTICS (T_j=85°C)

The following graph represents typical electrical characteristics of the XLamp CXA2011 LED.



RELATIVE LUMINOUS FLUX VS. CURRENT (T_j=85°C)

The following graph represents typical performance of the XLamp CXA2011 LED.

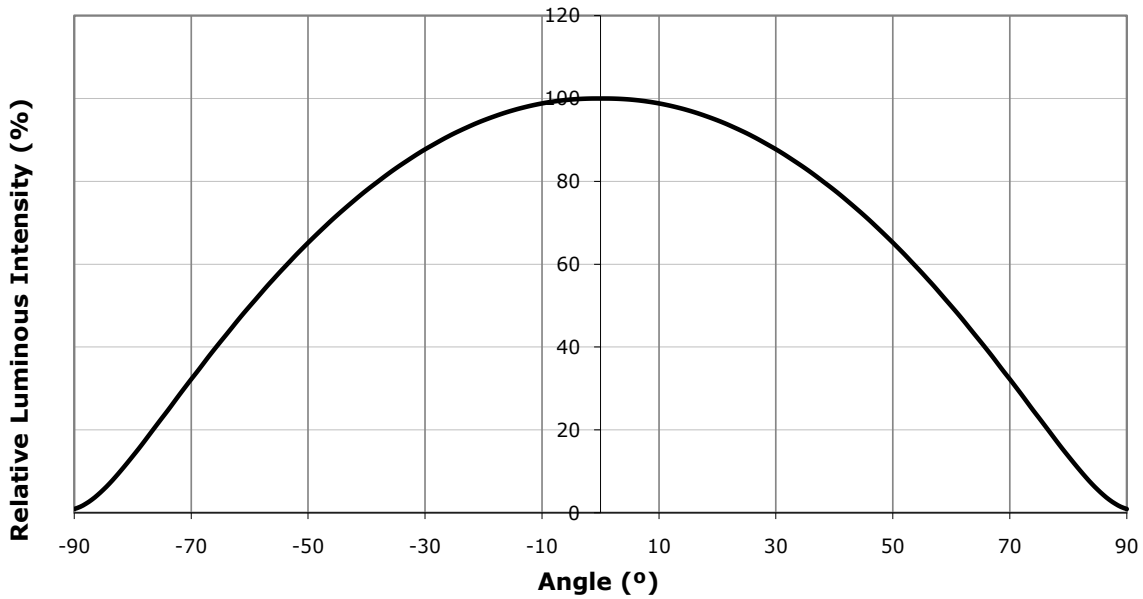


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TYPICAL SPATIAL DISTRIBUTION

The following graph represents the typical spatial distribution of the XLamp CXA2011 LED.



PERFORMANCE GROUPS - BRIGHTNESS ($I_F=270\text{ MA}$, $T_J=85^\circ\text{C}$)

XLamp CXA2011 LEDs are tested for luminosity and placed into one of the following bins.

Group Code	Min. Luminous Flux @ 270 mA, $T_J=85^\circ\text{C}$	Max. Luminous Flux @ 270 mA, $T_J=85^\circ\text{C}$
E0	590	680
F0	680	780
G0	780	900
H0	900	1040
J0	1040	1200
K0	1200	1380

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PERFORMANCE GROUPS - CHROMATICITY (T_J=85°C)

XLamp CXA2011 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

EasyWhite Color Temperatures - 4-Step			
Code	CCT	x	y
50F	5000K	0.3407	0.3459
		0.3415	0.3586
		0.3499	0.3654
		0.3484	0.3521
40F	4000K	0.3744	0.3685
		0.3782	0.3837
		0.3912	0.3917
		0.3863	0.3758
35F	3500K	0.3981	0.3800
		0.4040	0.3966
		0.4186	0.4037
		0.4116	0.3865
30F	3000K	0.4242	0.3919
		0.4322	0.4096
		0.4449	0.4141
		0.4359	0.3960
27F	2700K	0.4475	0.3994
		0.4573	0.4178
		0.4695	0.4207
		0.4586	0.4060

EasyWhite Color Temperatures - 2-Step			
Code	CCT	x	y
50H	5000K	0.3429	0.3507
		0.3434	0.3571
		0.3475	0.3604
		0.3469	0.3539
40H	4000K	0.3784	0.3741
		0.3804	0.3818
		0.3867	0.3857
		0.3844	0.3778
35H	3500K	0.4030	0.3857
		0.4061	0.3941
		0.4132	0.3976
		0.4099	0.3890
30H	3000K	0.4291	0.3973
		0.4333	0.4062
		0.4395	0.4084
		0.4351	0.3994
27H	2700K	0.4528	0.4046
		0.4578	0.4138
		0.4638	0.4152
		0.4586	0.4060

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E3	5000K	3A0	.3371	.3490
			.3451	.3554
			.3440	.3427
			.3366	.3369
		3B0	.3376	.3616
			.3463	.3687
			.3451	.3554
			.3371	.3490
		3C0	.3463	.3687
			.3551	.3760
			.3533	.3620
			.3451	.3554
		3D0	.3451	.3554
			.3533	.3620
			.3515	.3487
			.3440	.3427

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E5	4000K	5A0	.3670	.3578
			.3702	.3722
			.3825	.3798
			.3783	.3646
		5B0	.3702	.3722
			.3736	.3874
			.3869	.3958
			.3825	.3798
		5C0	.3825	.3798
			.3869	.3958
			.4006	.4044
			.3950	.3875
		5D0	.3783	.3646
			.3825	.3798
			.3950	.3875
			.3898	.3716

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E6	3500K	6A0	.3889	.3690
			.3941	.3848
			.4080	.3916
			.4017	.3751
		6B0	.3941	.3848
			.3996	.4015
			.4146	.4089
			.4080	.3916
		6C0	.4080	.3916
			.4146	.4089
			.4299	.4165
			.4221	.3984
		6D0	.4017	.3751
			.4080	.3916
			.4221	.3984
			.4147	.3814

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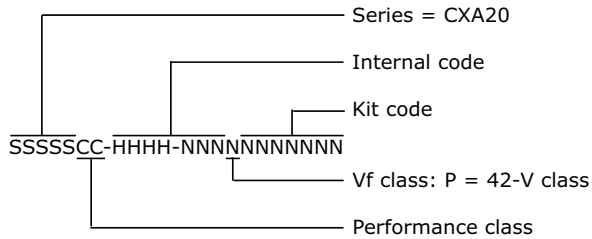
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E7	3000K	7A0	.4147	.3814
			.4221	.3984
			.4342	.4028
			.4259	.3853
		7B0	.4221	.3984
			.4299	.4165
			.4430	.4212
			.4342	.4028
		7C0	.4342	.4028
			.4430	.4212
			.4562	.4260
			.4465	.4071
		7D0	.4259	.3853
			.4342	.4028
			.4465	.4071
			.4373	.3893

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E8	2700K	8A0	.4373	.3893
			.4465	.4071
			.4582	.4099
			.4483	.3919
		8B0	.4465	.4071
			.4562	.4260
			.4687	.4289
			.4582	.4099
		8C0	.4582	.4099
			.4687	.4289
			.4813	.4319
			.4700	.4126
		8D0	.4483	.3919
			.4582	.4099
			.4700	.4126
			.4593	.3944

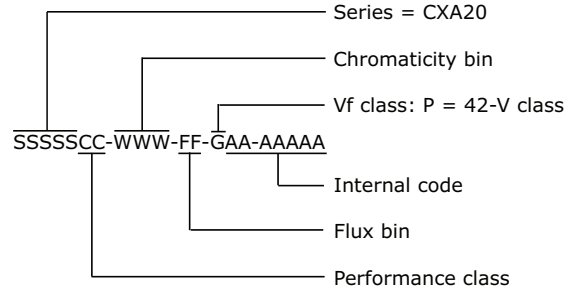
BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:

Order Code



Bin Code



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STANDARD ORDER CODES AND BINS

The following table lists standard kit numbers and performance bins. Kit numbers completely describe an order code's chromaticity regions and luminous flux range.

XLamp MT-G EasyWhite LED Standard Order Codes			
Min. Luminous Flux (lm) @ 270 mA, T _j =85°C		Chromaticity Regions	Order Code
Group	Flux (lm)		
F0	680	0E8	CXA2011-0000-000P00F00E8
		27F	CXA2011-0000-000P00F027F
		27H	CXA2011-0000-000P00F027H
G0	780	0E8	CXA2011-0000-000P00G00E8
		27F	CXA2011-0000-000P00G027F
		27H	CXA2011-0000-000P00G027H
		0E7	CXA2011-0000-000P00G00E7
		30F	CXA2011-0000-000P00G030F
		30H	CXA2011-0000-000P00G030H
		0E6	CXA2011-0000-000P00G00E6
		35F	CXA2011-0000-000P00G035F
		35H	CXA2011-0000-000P00G035H
		0E5	CXA2011-0000-000P00G00E5
		40F	CXA2011-0000-000P00G040F
		40H	CXA2011-0000-000P00G040H
H0	900	0E7	CXA2011-0000-000P00H00E7
		30F	CXA2011-0000-000P00H030F
		30H	CXA2011-0000-000P00H030H
		0E6	CXA2011-0000-000P00H00E6
		35F	CXA2011-0000-000P00H035F
		35H	CXA2011-0000-000P00H035H
		0E5	CXA2011-0000-000P00H00E5
		40F	CXA2011-0000-000P00H040F
		40H	CXA2011-0000-000P00H040H
		0E3	CXA2011-0000-000P00H00E3
		50F	CXA2011-0000-000P00H050F
		50H	CXA2011-0000-000P00H050H
J0	1040	0E3	CXA2011-0000-000P00J00E3
		50F	CXA2011-0000-000P00H050F
		50H	CXA2011-0000-000P00H050H

NOTES

Lumen Maintenance Projections

Please read the XLamp Long-Term Lumen Maintenance application note for more details on Cree’s lumen maintenance testing and forecasting. Please read the XLamp Thermal Management application note for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

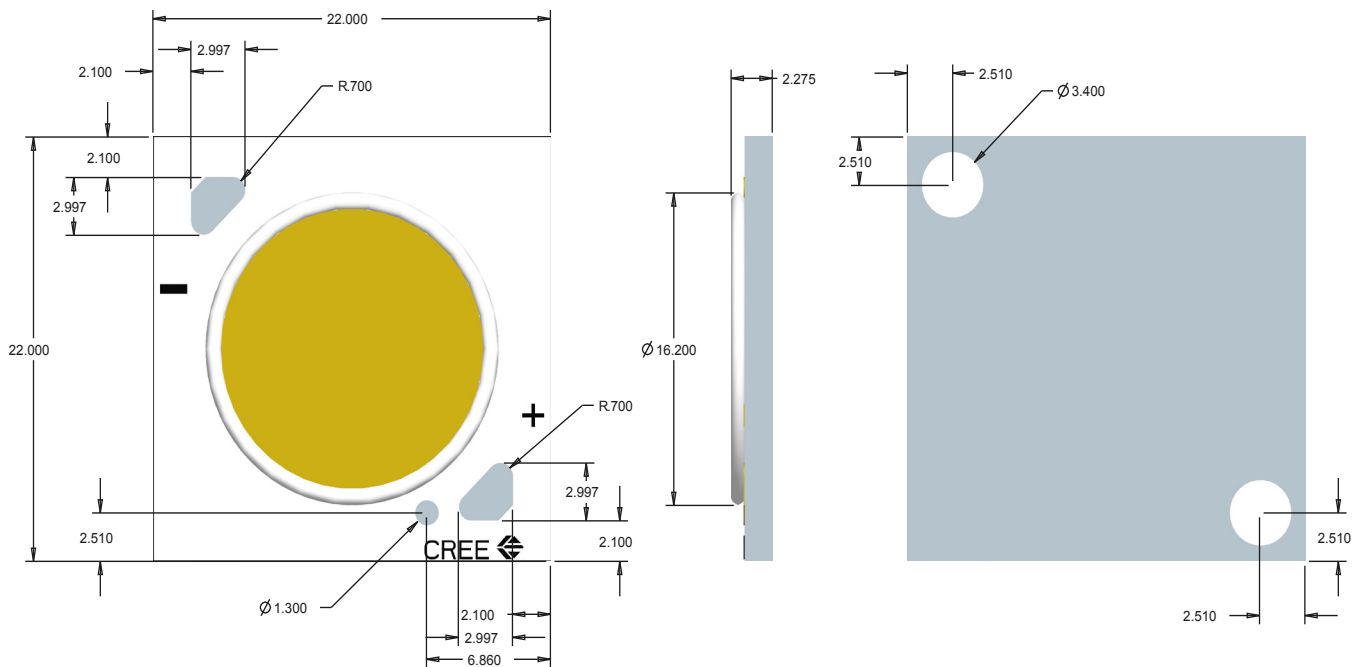
RoHS Compliance

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 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), 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.

MECHANICAL DIMENSIONS (T_A = 25°C)



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All measurements are ± 0.13 mm unless otherwise indicated.

PACKAGING

Cree CXA2011 LEDs are packaged in tubes of 20, which are then combined in boxes of 5 tubes, or 100 LEDs. Boxes of 100 LEDs are all from the same performance bins.

