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 ≤ 30°C/85% RH

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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Effective thermal resistance, junction to case	°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	48
LED junction temperature	°C			150
Temperature coefficient of voltage	mV/°C		-35	

FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS (I_F=270 MA, T_J=85°C)

The following tables provide order codes for XLamp CXA2011 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (p. 10).

Color	CCT Range	Base Order Codes Min Luminous Flux @ 270 mA, 85° C		2-Step Order Code		4-Step Order Code	
		Group	Flux (lm)	Chromaticity Region		Chromaticity Region	
EasyWhite	5000K	H0	900	50H	CXA2011-0000-000P00H050H	50F	CXA2011-0000-000P00H050F
		J0	1040		CXA2011-0000-000P00J050H		CXA2011-0000-000P00J050F
	4000K	G0	780	40H	CXA2011-0000-000P00G040H	40F	CXA2011-0000-000P00G040F
		H0	900		CXA2011-0000-000P00H040H		CXA2011-0000-000P00H040F
	3500K	G0	780	35H	CXA2011-0000-000P00G035H	35F	CXA2011-0000-000P00G035F
		H0	900		CXA2011-0000-000P00H035H		CXA2011-0000-000P00H035F
	3000K	G0	780	30H	CXA2011-0000-000P00G030H	30F	CXA2011-0000-000P00G030F
		H0	900		CXA2011-0000-000P00H030H		CXA2011-0000-000P00H030F
	2700K	F0	680	27H	CXA2011-0000-000P00F027H	27F	CXA2011-0000-000P00F027F
		G0	780		CXA2011-0000-000P00G027H		CXA2011-0000-000P00G027F

Notes:
- Cree maintains a tolerance of ±7% on flux and power measurements and a tolerance of ±2 on CRI measurements.
- Minimum CRI for chromaticity kits 27F, 27H, 30F, 30H is 80 .
- Minimum CRI for chromaticity kits 35F, 35H is 77 and typical CRI is 80.
- Minimum CRI for chromaticity kits 40F, 40H, 50F, 50H is 70 and typical CRI is 75.

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Color	CCT Range	Base Order Codes Min Luminous Flux (lm) @ 270 mA, 85°C		Chromaticity Regions	Order Code
		Group	Flux (lm)		
ANSI White	5000K	H0	900	3A0, 3B0, 3C0, 3D0	CXA2011-0000-000P00H00E3
		J0	1040		CXA2011-0000-000P00J00E3
	4000K	G0	780	5A0, 5B0, 5C0, 5D0	CXA2011-0000-000P00G00E5
		H0	900		CXA2011-0000-000P00H00E5
	3500K	G0	780	6A0, 6B0, 6C0, 6D0	CXA2011-0000-000P00G00E6
		H0	900		CXA2011-0000-000P00H00E6
	3000K	G0	780	7A0, 7B0, 7C0, 7D0	CXA2011-0000-000P00G00E7
		H0	900		CXA2011-0000-000P00H00E7
	2700K	F0	680	8A0, 8B0, 8C0, 8D0	CXA2011-0000-000P00F00E8
		G0	780		CXA2011-0000-000P00G00E8

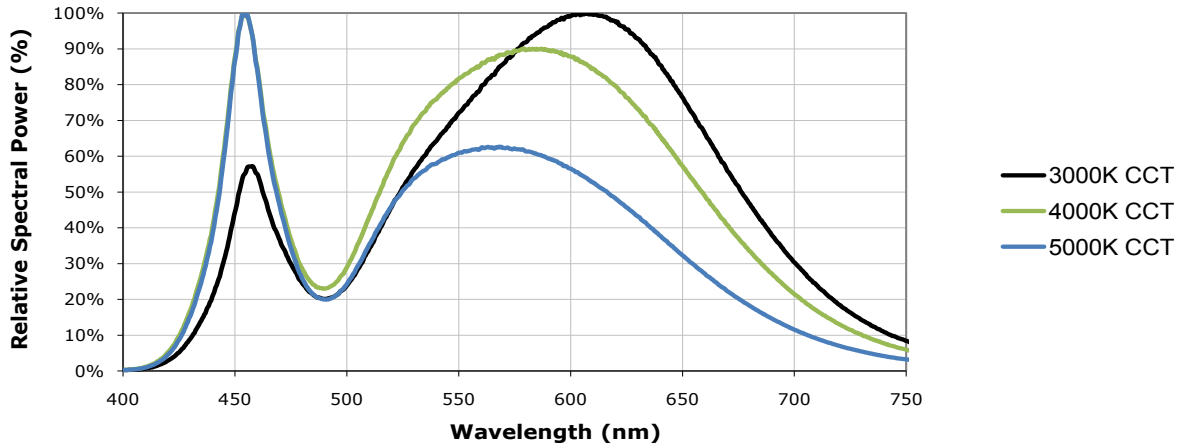
Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements and a tolerance of ±2 on CRI measurements.
- Minimum CRI for chromaticity kits 0E8, 0E7 is 80.
- Minimum CRI for chromaticity kit 0E6 is 77 and typical CRI for is 80.
- Minimum CRI for chromaticity kits 0E5, 0E3 is 70 and typical CRI is 75.

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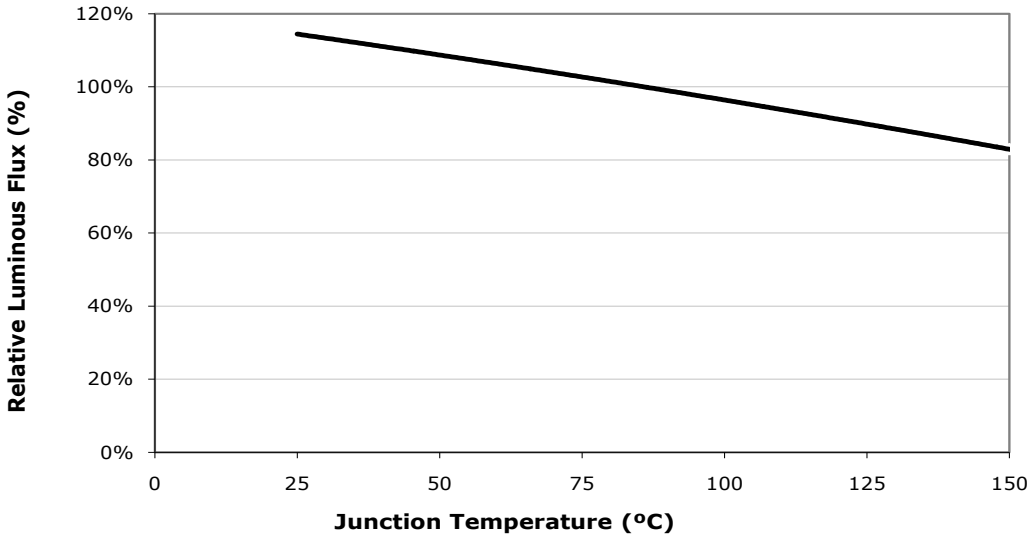
RELATIVE SPECTRAL POWER DISTRIBUTION (I_F=270 MA, T_J=85°C)

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



RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE (I_F=270 MA)

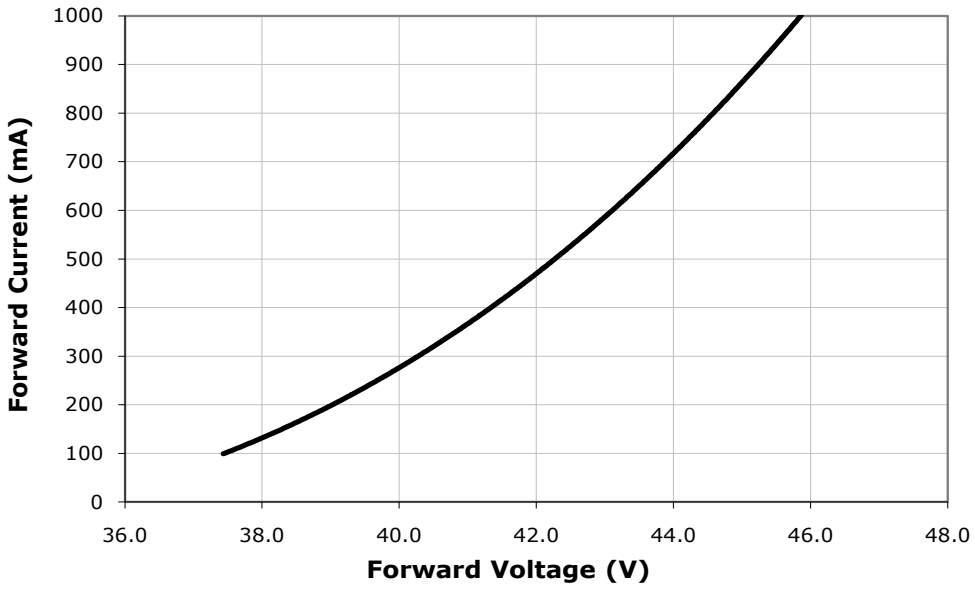
The following graph represents typical performance of the XLamp CXA2011 LED.



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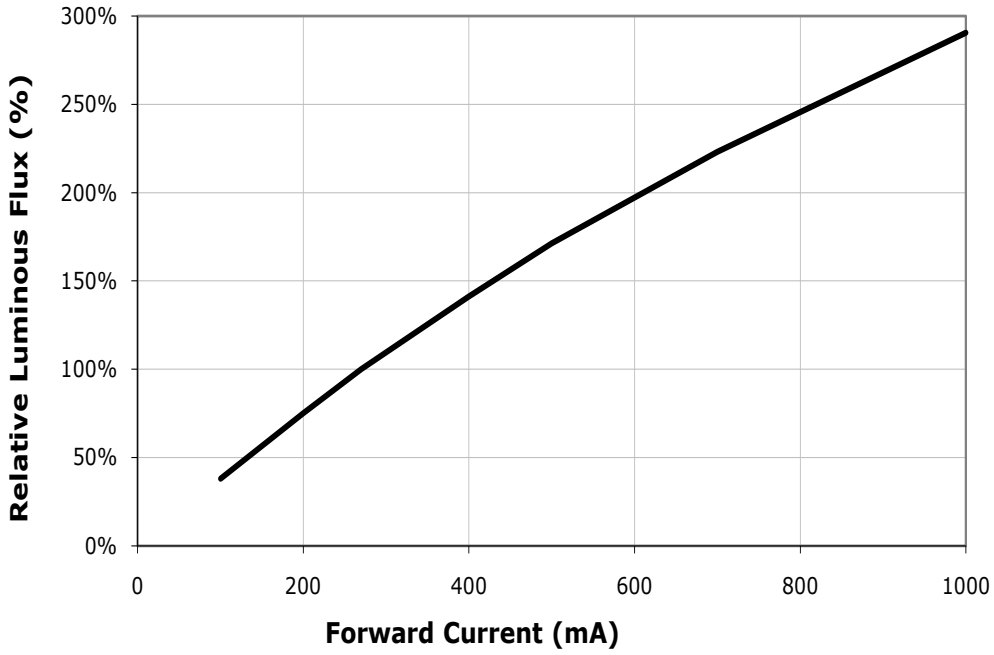
ELECTRICAL CHARACTERISTICS (T_J=85°C)

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



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

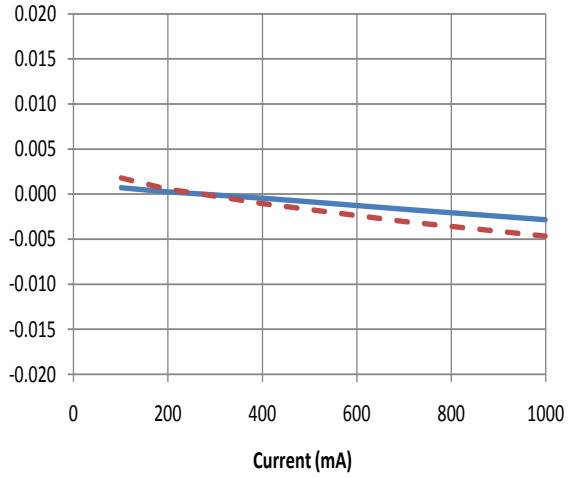
The following graph represents typical performance of the XLamp CXA2011 LED.

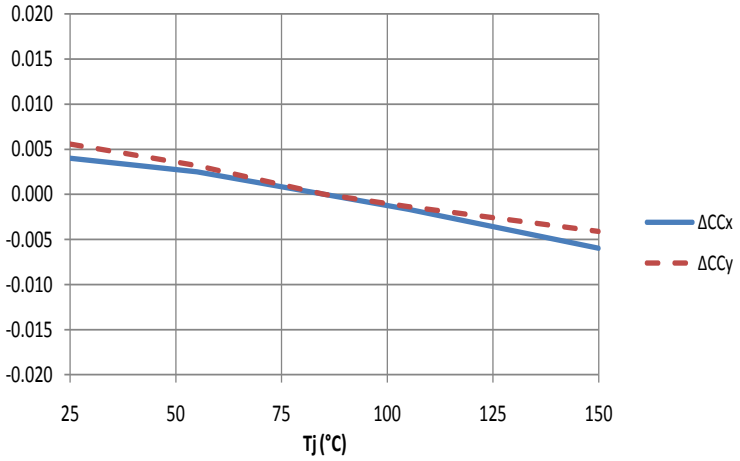


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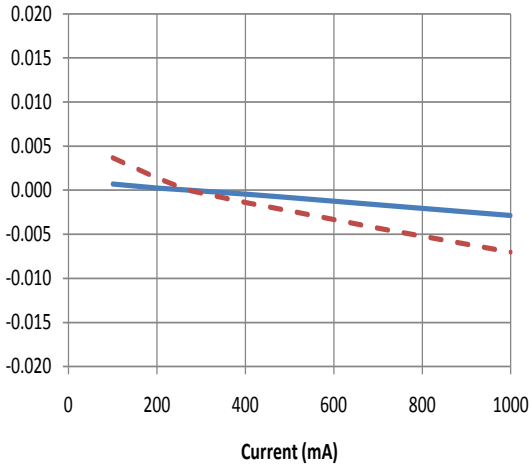
RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE

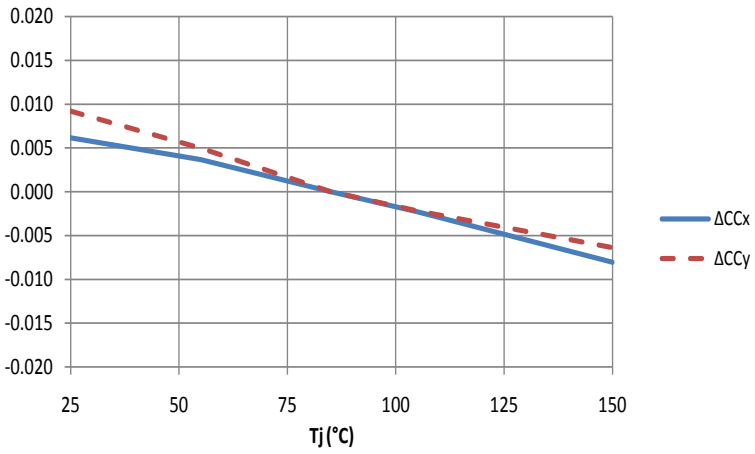
The following graphs represent typical chromaticity vs current and temperature for the XLamp CXA2011 at **3000K** CCT





The following graphs represent typical chromaticity vs current and temperature for the XLamp CXA2011 at **5000K** CCT

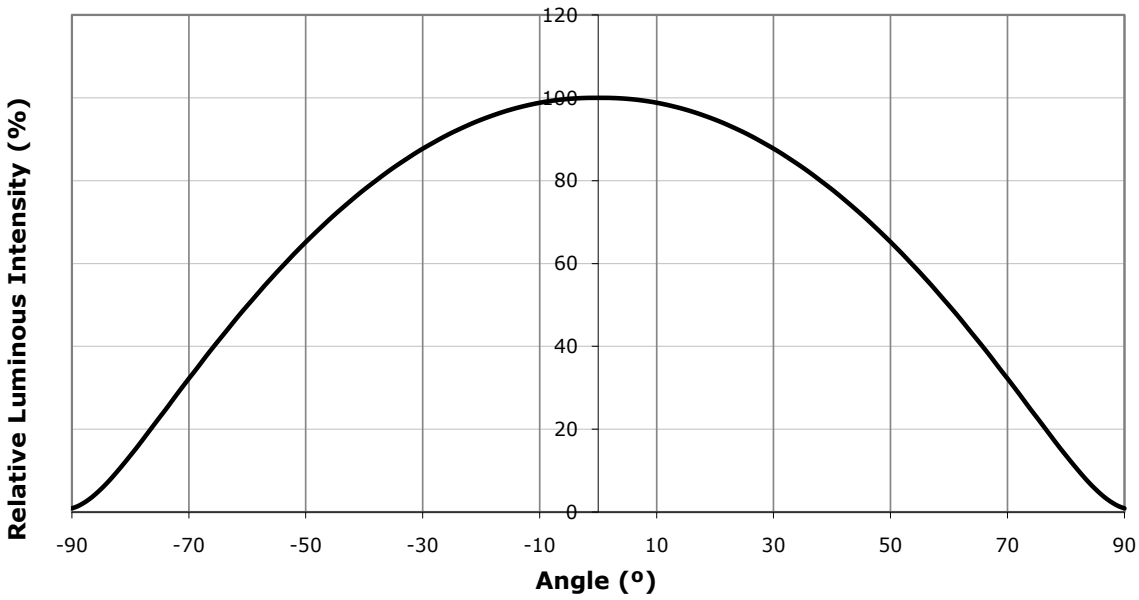




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TYPICAL SPATIAL DISTRIBUTION

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



PERFORMANCE GROUPS - BRIGHTNESS (I_F=270 MA, T_J=85°C)

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

Group Code	Min. Luminous Flux @ 270 mA, T_j=85°C	Max. Luminous Flux @ 270 mA, T_j=85°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

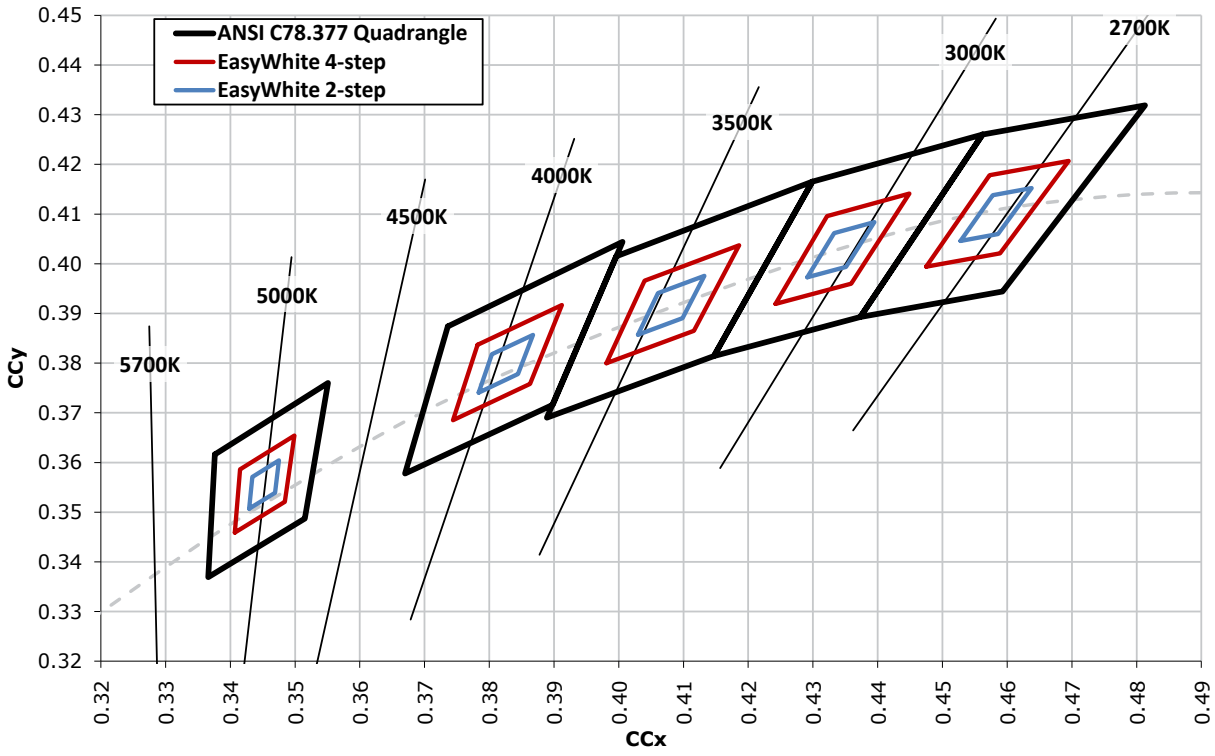
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E6	3500K	6A0	.3889	.3690
			.3941	.3848
			.4080	.3916
			.4017	.3751
		6B0	.3941	.3848
			.3996	.4015
			.4146	.4089
			.4080	.3916
		6C0	.4080	.3916
			.4146	.4089
			.4299	.4165
			.4221	.3984
		6D0	.4017	.3751
			.4080	.3916
			.4221	.3984
			.4147	.3814

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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

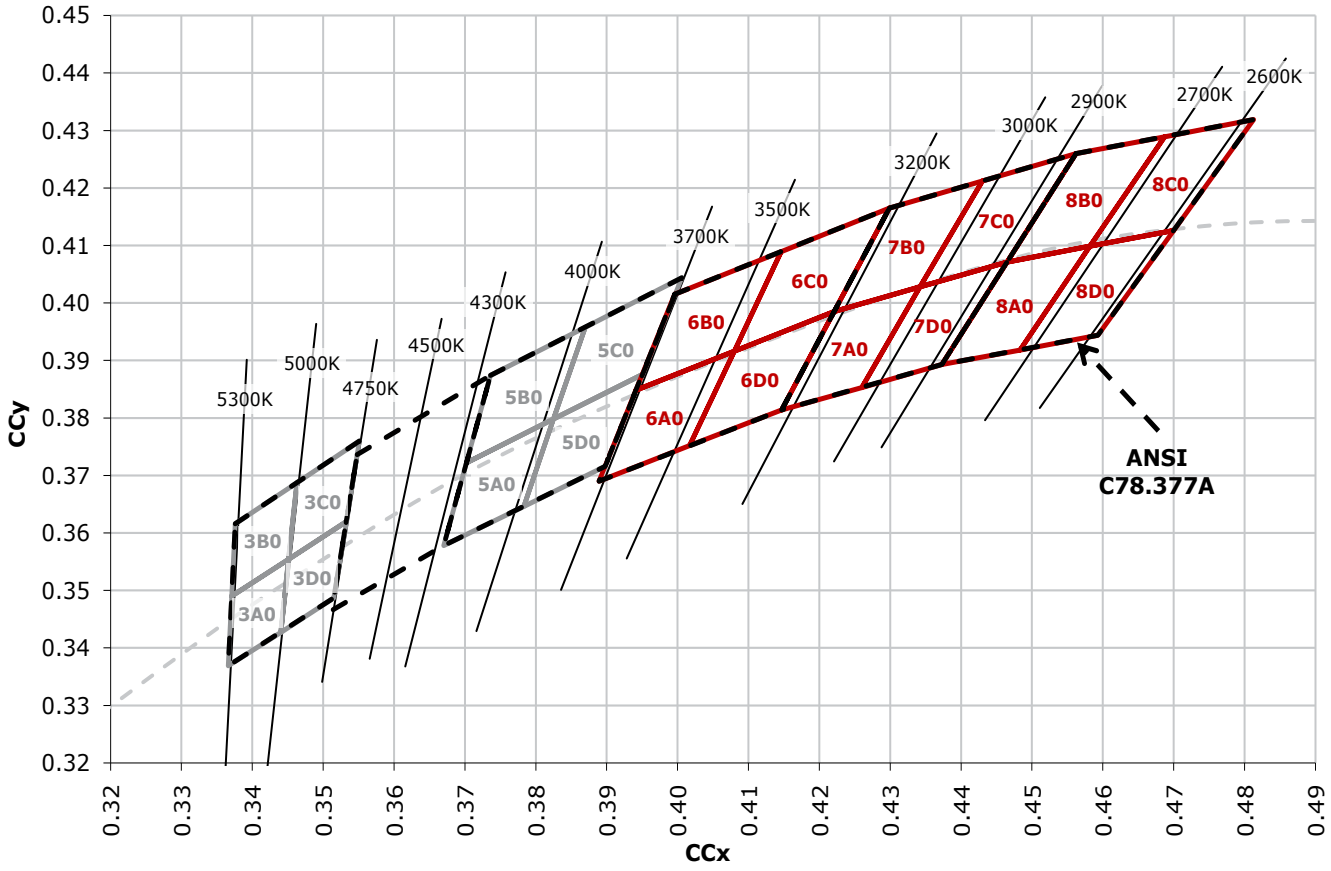
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E8	2700K	8A0	.4373	.3893
			.4465	.4071
			.4582	.4099
			.4483	.3919
		8B0	.4465	.4071
			.4562	.4260
			.4687	.4289
			.4582	.4099
		8C0	.4582	.4099
			.4687	.4289
			.4813	.4319
			.4700	.4126
		8D0	.4483	.3919
			.4582	.4099
			.4700	.4126
			.4593	.3944

CREE EASYWHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE (T_j=85°C)



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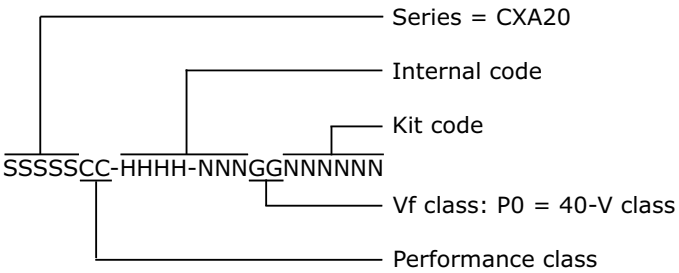
CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE (T_J=85°C)



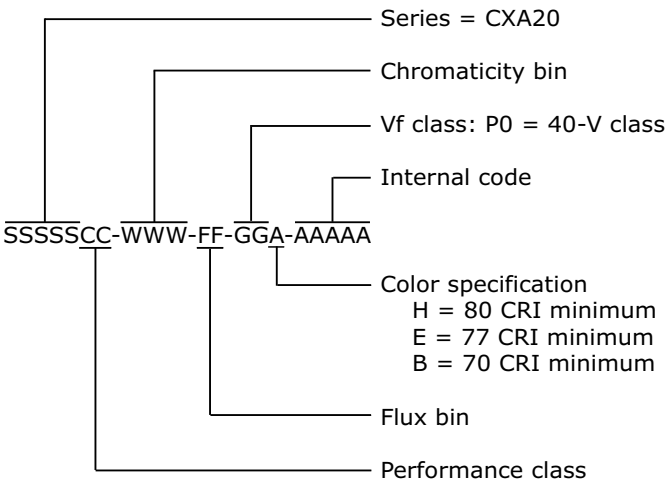
BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:

Order Code



Bin Code



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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.

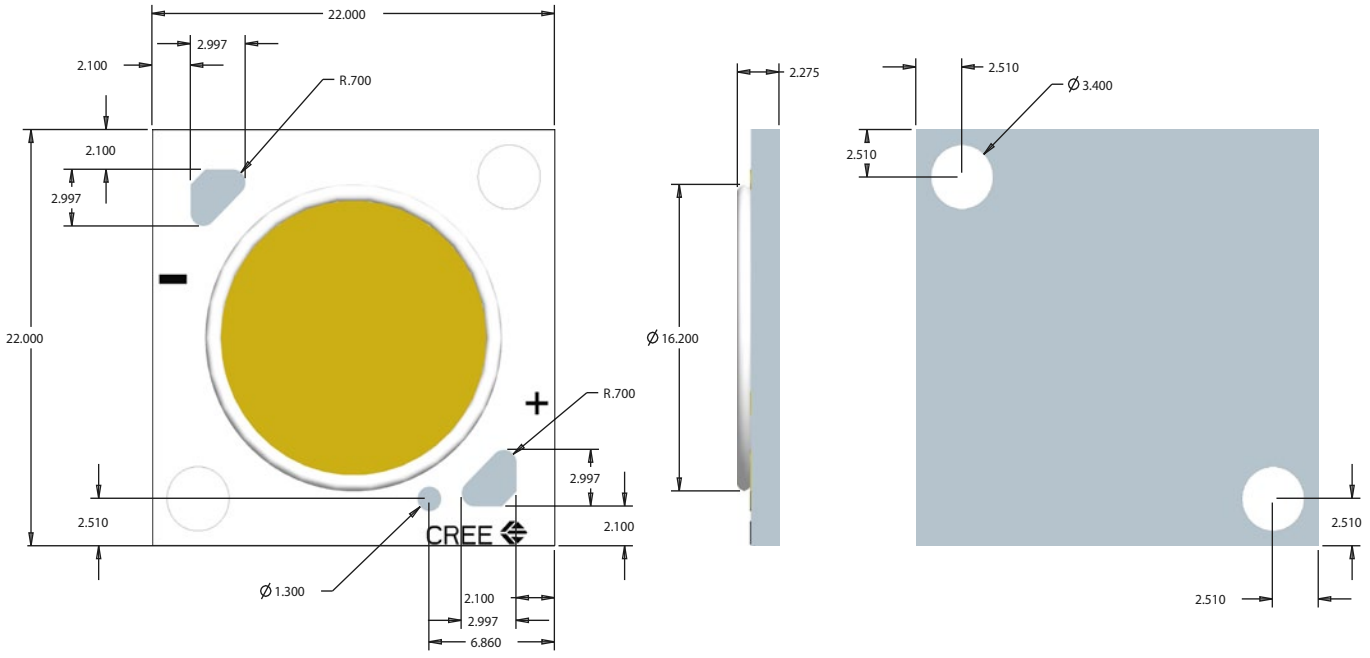
RoHS Compliance

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

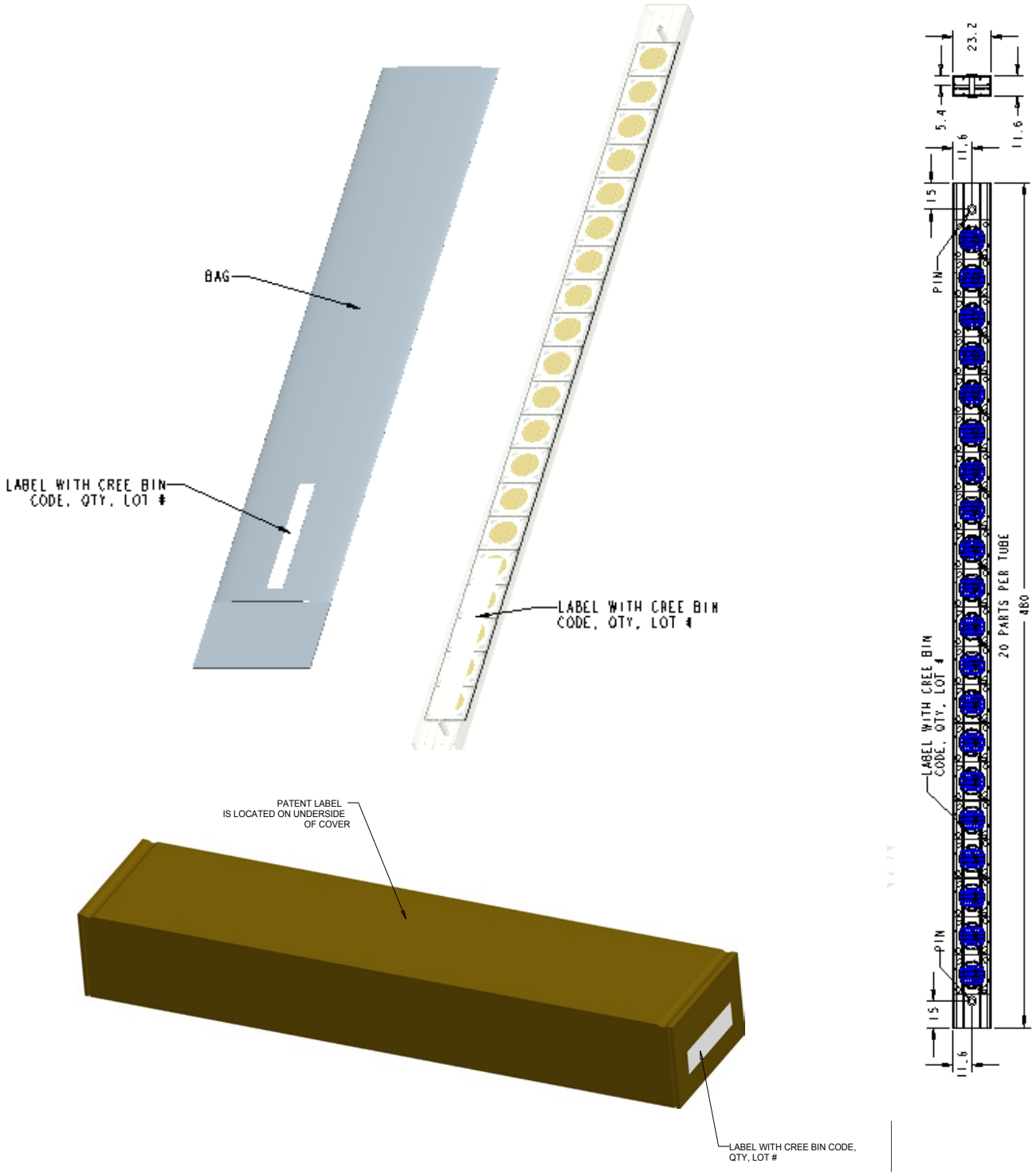


All measurements are ±.13 mm unless otherwise indicated.

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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 of the same performance bin.



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