

# Cree® XLamp® CXA2520 LED



## PRODUCT DESCRIPTION

The XLamp CXA2520 LED array expands Cree’s family of high-flux, multi-die arrays, offering high performance in an easy-to-use platform. With XLamp lighting-class reliability, the CXA2520’s uniform emitting surface enables both directional and non-directional lighting applications and luminaire designs. Available in 2-step and 4-step color consistency, and featuring a 19-mm optical source, the CXA2520 brings new levels of flux and efficacy to this form factor.

## FEATURES

- Available in ANSI white bins as well as 4-step and 2-step EasyWhite bins at 2700 K, 3000 K, 3500 K, 4000 K and 5000 K CCT
- 80 and 90 minimum CRI options
- Forward voltage: 36 V
- 85 °C binning and characterization
- Maximum drive current: 1250 mA
- 115° viewing angle, uniform chromaticity profile
- Top-side solder connections
- Thermocouple attach point
- NEMA SSL-3 2011 standard flux bins
- RoHS- and REACH-compliant
- UL-recognized component (E349212)



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**CHARACTERISTICS**

Characteristics	Unit	Minimum	Typical	Maximum
Effective thermal resistance, junction to case	°C/W		0.8	
Viewing angle (FWHM)	degrees		115	
ESD classification (HBM per Mil-Std-883D)			Class 2	
DC forward current	mA		550	1250
Reverse current	mA			0.1
Forward voltage (@ 550 mA, 85 °C)	V		36	
Forward voltage (@ 550 mA, 25 °C)	V		37	42
LED junction temperature	°C			150
Temperature coefficient of voltage	mV/°C		-21	

**FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS ( $I_f = 550 \text{ mA}$ ,  $T_j = 85 \text{ °C}$ )**

The following tables provide order codes for XLamp CXA2520 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 13).

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 550 mA			2-Step Order Code		4-Step Order Code	
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
EasyWhite	5000K	Q4	2260	2560	50H	CXA2520-0000-000N00Q450H	50F	CXA2520-0000-000N00Q450F
		R2	2420	2741		CXA2520-0000-000N00R250H		CXA2520-0000-000N00R250F
	4000K	Q2	2100	2379	40H	CXA2520-0000-000N00Q240H	40F	CXA2520-0000-000N00Q240F
		Q4	2260	2560		CXA2520-0000-000N00Q440H		CXA2520-0000-000N00Q440F
		R2	2420	2741		CXA2520-0000-000N00R240H		CXA2520-0000-000N00R240F
	3500K	P4	1965	2226	35H	CXA2520-0000-000N00P435H	35F	CXA2520-0000-000N00P435F
		Q2	2100	2379		CXA2520-0000-000N00Q235H		CXA2520-0000-000N00Q235F
		Q4	2260	2560		CXA2520-0000-000N00Q435H		CXA2520-0000-000N00Q435F
	3000K	P4	1965	2226	30H	CXA2520-0000-000N00P430H	30F	CXA2520-0000-000N00P430F
		Q2	2100	2379		CXA2520-0000-000N00Q230H		CXA2520-0000-000N00Q230F
	2700K	P2	1830	2073	27H	CXA2520-0000-000N00P227H	27F	CXA2520-0000-000N00P227F
		P4	1965	2226		CXA2520-0000-000N00P427H		CXA2520-0000-000N00P427F
		Q2	2100	2379		CXA2520-0000-000N00Q227H		CXA2520-0000-000N00Q227F

**Notes:**

- Cree maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements.
- Minimum CRI for standard color temperatures 0E8, 27F, 27H, 0E7, 30F, 30H, 0E6, 35F, 35H is 80.
- Minimum CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 70.
- Typical CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 75.
- \* Flux values @ 25 °C are calculated and for reference only.

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 550 mA			Chromaticity Regions	Order Code
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
ANSI White	5000K	Q4	2260	2560	3A0, 3B0, 3C0, 3D0	CXA2520-0000-000N00Q40E3
		R2	2420	2741		CXA2520-0000-000N00R20E3
	4000K	Q2	2100	2379	5A0, 5B0, 5C0, 5D0	CXA2520-0000-000N00Q20E5
		Q4	2260	2560		CXA2520-0000-000N00Q40E5
		R2	2420	2741		CXA2520-0000-000N00R20E5
	3500K	P4	1965	2226	6A0, 6B0, 6C0, 6D0	CXA2520-0000-000N00P40E6
		Q2	2100	2379		CXA2520-0000-000N00Q20E6
		Q4	2260	2560		CXA2520-0000-000N00Q40E6
	3000K	P4	1965	2226	7A0, 7B0, 7C0, 7D0	CXA2520-0000-000N00P40E7
		Q2	2100	2379		CXA2520-0000-000N00Q20E7
	2700K	P2	1830	2073	8A0, 8B0, 8C0, 8D0	CXA2520-0000-000N00P20E8
		P4	1965	2226		CXA2520-0000-000N00P40E8
		Q2	2100	2379		CXA2520-0000-000N00Q20E8

**Notes:**

- Cree maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements.
- Minimum CRI for standard color temperatures 0E8, 27F, 27H, 0E7, 30F, 30H, 0E6, 35F, 35H is 80.
- Minimum CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 70.
- Typical CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 75.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS, 90 CRI ( $I_F = 550 \text{ mA}$ ,  $T_j = 85 \text{ }^\circ\text{C}$ )**

The following tables provide order codes for XLamp CXA2520 90 CRI minimum LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 13).

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 550 mA			2-Step Order Code		4-Step Order Code	
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
EasyWhite	3000K	M4	1485	1682	30H	CXA2520-0000-000N0UM430H	30F	CXA2520-0000-000N0UM430F
		N2	1590	1801		CXA2520-0000-000N0UN230H		CXA2520-0000-000N0UN230F
		N4	1710	1937		CXA2520-0000-000N0UN430H		CXA2520-0000-000N0UN430F
	2700K	M2	1380	1563	27H	CXA2520-0000-000N0UM227H	27F	CXA2520-0000-000N0UM227F
		M4	1485	1682		CXA2520-0000-000N0UM427H		CXA2520-0000-000N0UM427F
		N2	1590	1801		CXA2520-0000-000N0UN227H		CXA2520-0000-000N0UN227F

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 550 mA			Chromaticity Regions	Order Code
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
ANSI White	3000K	M4	1485	1682	7A0, 7B0, 7C0, 7D0	CXA2520-0000-000N0UM40E7
		N2	1590	1801		CXA2520-0000-000N0UN20E7
		N4	1710	1937		CXA2520-0000-000N0UN40E7
	2700K	M2	1380	1563	8A0, 8B0, 8C0, 8D0	CXA2520-0000-000N0UM20E8
		M4	1485	1682		CXA2520-0000-000N0UM40E8
		N2	1590	1801		CXA2520-0000-000N0UN20E8

**Notes:**

- Cree maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements.
- Minimum CRI for high CRI color temperatures 0E8, 27F, 27H, 0E7, 30F, 30H is 90.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS, 80 CRI ( $I_F = 550 \text{ mA}$ ,  $T_J = 85 \text{ }^\circ\text{C}$ )**

The following tables provide order codes for XLamp CXA2520 80 CRI minimum LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 13).

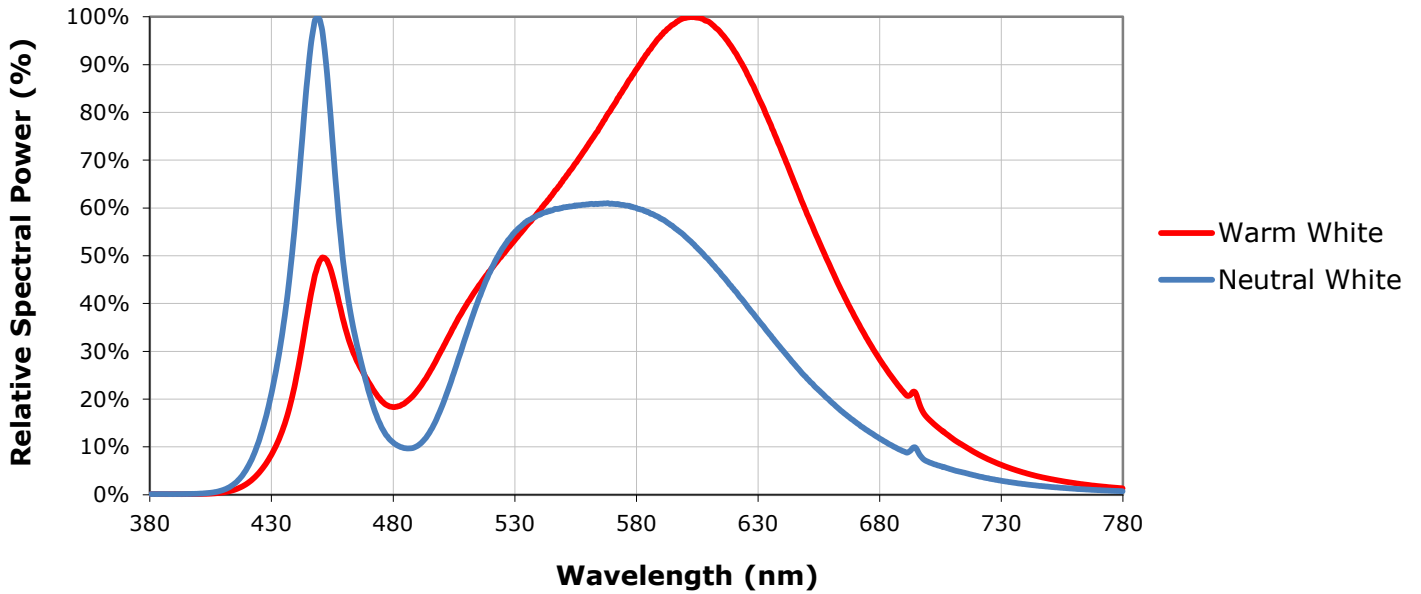
Color	CCT Range	Base Order Codes Min. Luminous Flux @ 550 mA			2-Step Order Code		4-Step Order Code	
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
EasyWhite	5000K	P4	1965	2226	50H	CXA2520-0000-000N0HP450H	50F	CXA2520-0000-000N0HP450F
		Q2	2100	2379		CXA2520-0000-000N0HQ250H		CXA2520-0000-000N0HQ250F
		Q4	2260	2560		CXA2520-0000-000N0HQ450H		CXA2520-0000-000N0HQ450F
	4000K	P4	1965	2226	40H	CXA2520-0000-000N0HP440H	40F	CXA2520-0000-000N0HP440F
		Q2	2100	2379		CXA2520-0000-000N0HQ240H		CXA2520-0000-000N0HQ240F
		Q4	2260	2560		CXA2520-0000-000N0HQ440H		CXA2520-0000-000N0HQ440F

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 550 mA			Chromaticity Regions	Order Code
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
ANSI White	5000K	P4	1965	2226	3A0, 3B0, 3C0, 3D0	CXA2520-0000-000N0HP40E3
		Q2	2100	2379		CXA2520-0000-000N0HQ20E3
		Q4	2260	2560		CXA2520-0000-000N0HQ40E3
	4000K	P4	1965	2226	5A0, 5B0, 5C0, 5D0	CXA2520-0000-000N0HP40E5
		Q2	2100	2379		CXA2520-0000-000N0HQ20E5
		Q4	2260	2560		CXA2520-0000-000N0HQ40E5

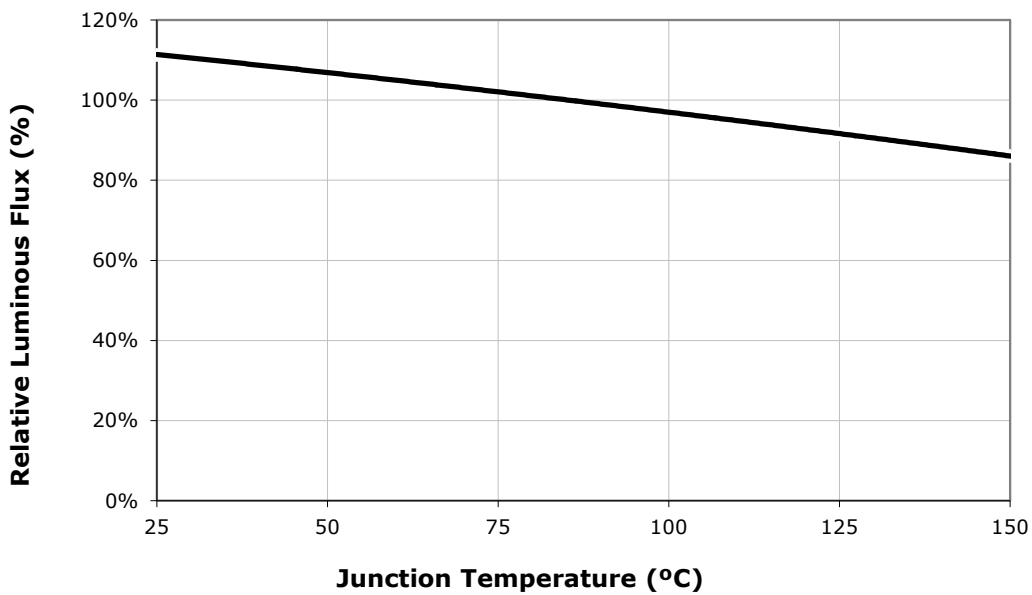
**Notes:**

- Cree maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements.
- Minimum CRI for high CRI color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 80.
- \* Flux values @ 25 °C are calculated and for reference only.

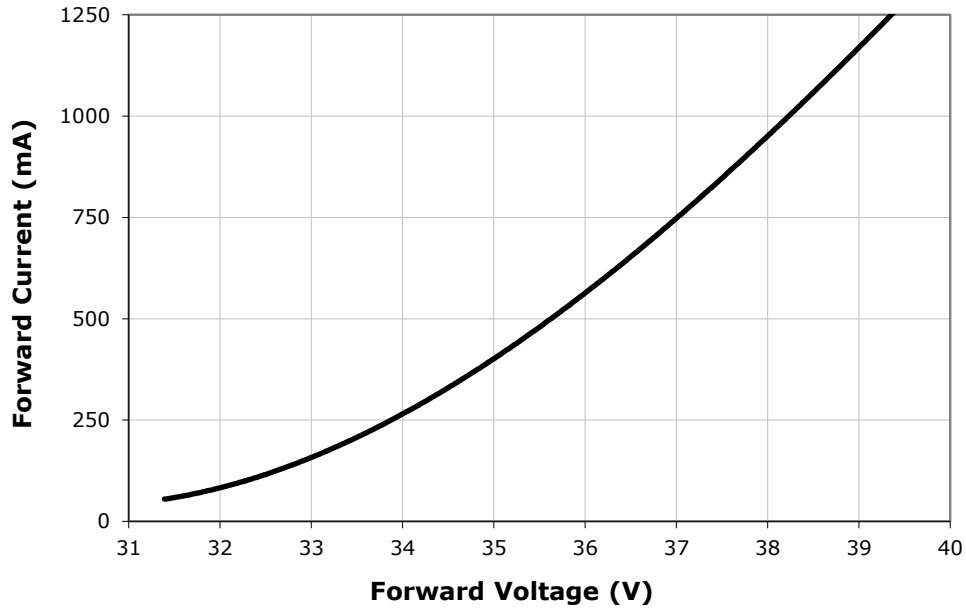
**RELATIVE SPECTRAL POWER DISTRIBUTION ( $I_F = 550 \text{ mA}$ ,  $T_J = 85 \text{ }^\circ\text{C}$ )**



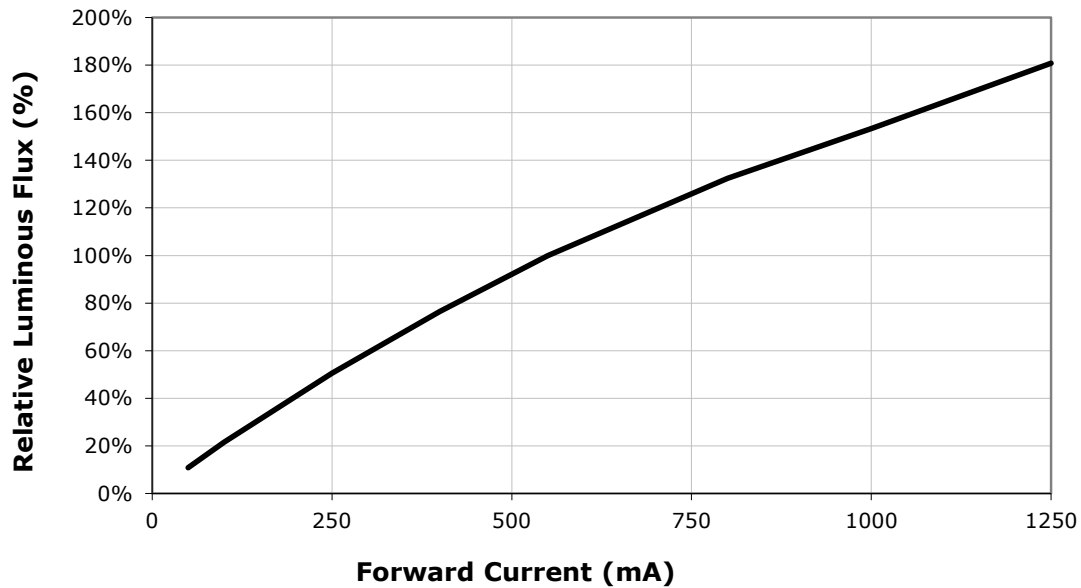
**RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE ( $I_F = 550 \text{ mA}$ )**



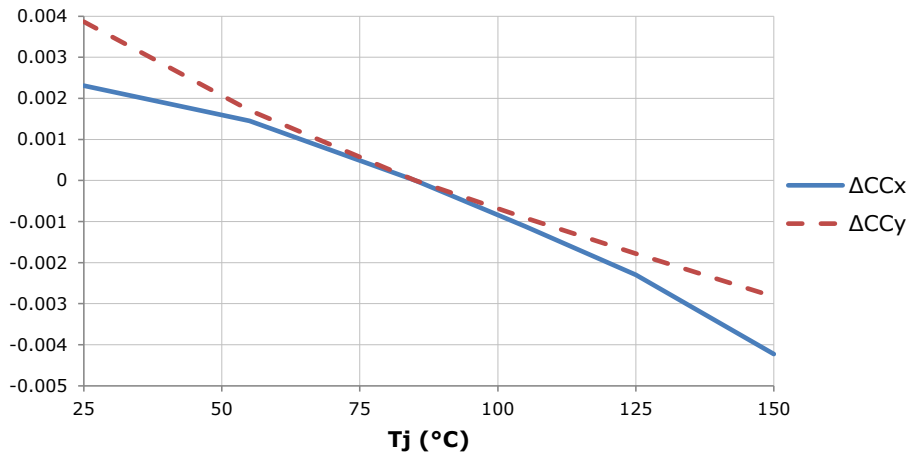
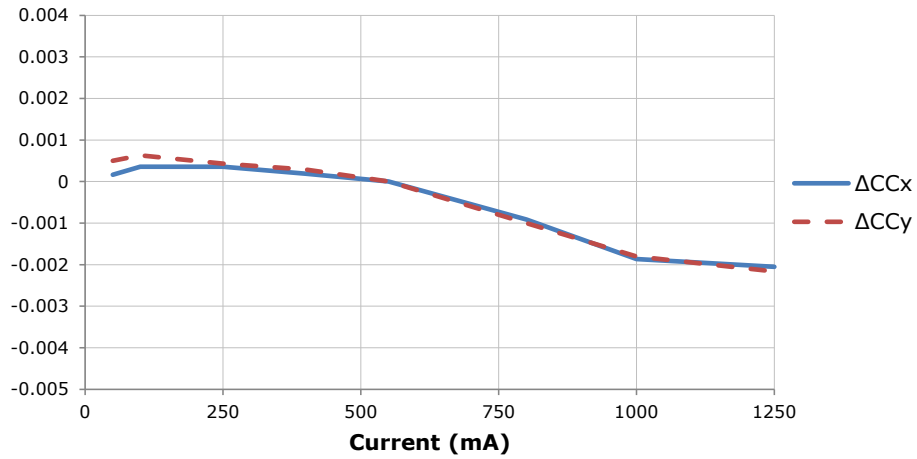
**ELECTRICAL CHARACTERISTICS ( $T_j = 85\text{ }^\circ\text{C}$ )**



**RELATIVE LUMINOUS FLUX VS. CURRENT ( $T_j = 85\text{ }^\circ\text{C}$ )**

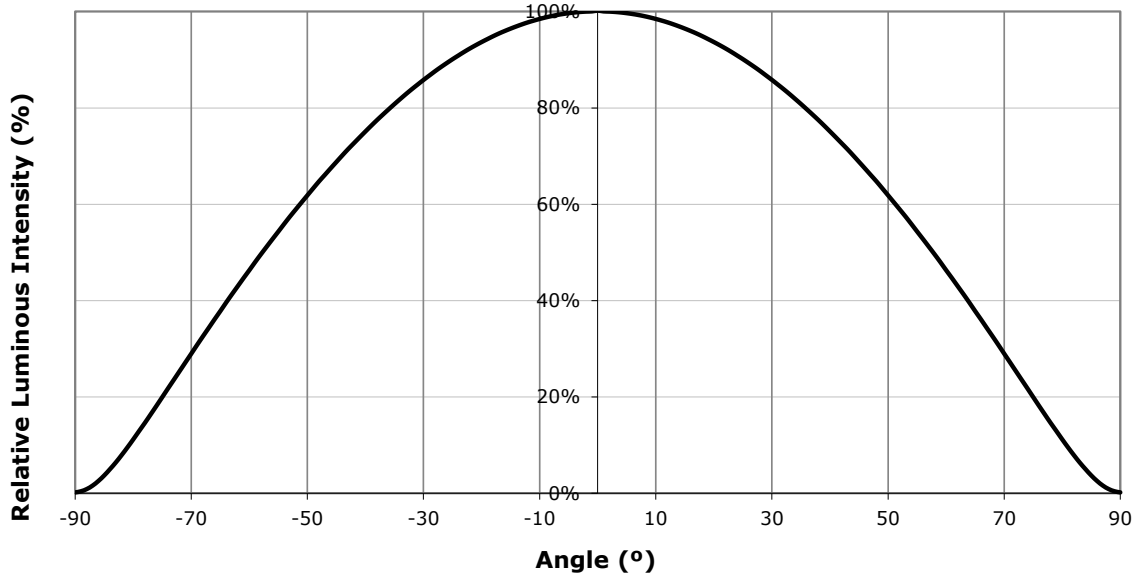


**RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE (3000K, 80 CRI)**





**TYPICAL SPATIAL DISTRIBUTION**



**PERFORMANCE GROUPS - BRIGHTNESS ( $I_f = 550 \text{ mA}$ ,  $T_j = 85 \text{ °C}$ )**

XLamp CXA2520 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Min. Luminous Flux @ 550 mA	Max. Luminous Flux @ 550 mA
M2	1380	1485
M4	1485	1590
N2	1590	1710
N4	1710	1830
P2	1830	1965
P4	1965	2100
Q2	2100	2260
Q4	2260	2420
R2	2420	2600

**PERFORMANCE GROUPS - CHROMATICITY ( $T_j = 85\text{ }^\circ\text{C}$ )**

XLamp CXA2520 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

ANSI White Bins					ANSI White Bins				
Code	CCT	Bin Code	x	y	Code	CCT	Bin Code	x	y
0E7	3000K	7A0	.4147	.3814	0E8	2700K	8A0	.4373	.3893
			.4221	.3984				.4465	.4071
			.4342	.4028				.4582	.4099
			.4259	.3853				.4483	.3919
		7B0	.4221	.3984			8B0	.4465	.4071
			.4299	.4165				.4562	.4260
			.4430	.4212				.4687	.4289
			.4342	.4028				.4582	.4099
		7C0	.4342	.4028			8C0	.4582	.4099
			.4430	.4212				.4687	.4289
			.4562	.4260				.4813	.4319
			.4465	.4071				.4700	.4126
		7D0	.4259	.3853			8D0	.4483	.3919
			.4342	.4028				.4582	.4099
			.4465	.4071				.4700	.4126
			.4373	.3893				.4593	.3944

**CREE EASYWHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE ( $T_j = 85^\circ\text{C}$ )**



**CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE ( $T_j = 85^\circ\text{C}$ )**



### BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:



### MECHANICAL DIMENSIONS

Dimensions are in mm.

Tolerances unless otherwise

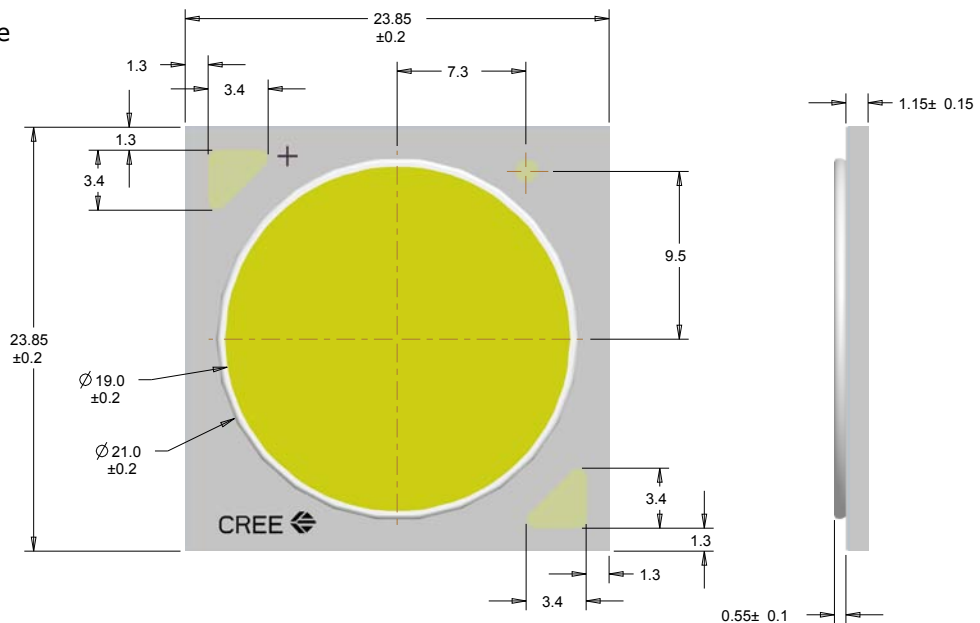
specified:

.x ± .10

.xx ± .03

.xxx ± .010

x° ± 1° x ± .10



## NOTES

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### **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](http://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/XRE\\_lumen\\_maintenance](http://www.cree.com/xlamp_app_notes/XRE_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](http://www.cree.com/xlamp_app_notes/thermal_management) 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.

### **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**

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

**PACKAGING**

Cree CXA2520 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.

Dimensions are in mm.  
 Tolerances unless otherwise specified:  
 .x ± .10  
 .xx ± .03  
 .xxx ± .010  
 x° ± 1°

