

PRELIMINARY

Cree® XLamp® CXA2540 LED



PRODUCT DESCRIPTION

The XLamp CXA2540 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 CXA2540’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 CXA2540 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-minimum CRI option
- Forward voltage: 37 V
- 85 °C binning and characterization
- Maximum drive current: 1700 mA
- 115° viewing angle, uniform chromaticity profile
- Top-side solder connections
- Thermocouple attach point
- NEMA SSL-3 2011 standard flux bins

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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Effective thermal resistance, junction to case	°C/W		0.7	
Viewing angle (FWHM)	degrees		115	
ESD classification (HBM per Mil-Std-883D)			Class 2	
DC forward current	mA		1100	1700
Reverse current	mA			0.1
Forward voltage (@ 1100 mA, 85 °C)	V		37	
Forward voltage (@ 1100 mA, 25 °C)	V			42
LED junction temperature	°C			150
Temperature coefficient of voltage	mV/°C		-15	

FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS ($I_f = 1100 \text{ mA}$, $T_j = 85 \text{ °C}$)

The following tables provide order codes for XLamp CXA2540 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 11).

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 1100 mA			2-Step Order Code		4-Step Order Code	
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
EasyWhite	5000K	V4	4545	5080	50H	CXA2540-0000-000N00V450H	50F	CXA2540-0000-000N00V450F
		W2	4860	5432		CXA2540-0000-000N00W250H		CXA2540-0000-000N00W250F
		W4	5225	5840		CXA2540-0000-000N00W450H		CXA2540-0000-000N00W450F
	4000K	V2	4230	4728	40H	CXA2540-0000-000N00V240H	40F	CXA2540-0000-000N00V240F
		V4	4545	5080		CXA2540-0000-000N00V440H		CXA2540-0000-000N00V440F
		W2	4860	5432		CXA2540-0000-000N00W240H		CXA2540-0000-000N00W240F
	3500K	U4	3955	4420	35H	CXA2540-0000-000N00U435H	35F	CXA2540-0000-000N00U435F
		V2	4230	4728		CXA2540-0000-000N00V235H		CXA2540-0000-000N00V235F
		V4	4545	5080		CXA2540-0000-000N00V435H		CXA2540-0000-000N00V435F
	3000K	U4	3955	4420	30H	CXA2540-0000-000N00U430H	30F	CXA2540-0000-000N00U430F
		V2	4230	4728		CXA2540-0000-000N00V230H		CXA2540-0000-000N00V230F
		V4	4545	5080		CXA2540-0000-000N00V430H		CXA2540-0000-000N00V430F
	2700K	U2	3680	4113	27H	CXA2540-0000-000N00U227H	27F	CXA2540-0000-000N00U227F
		U4	3955	4420		CXA2540-0000-000N00U427H		CXA2540-0000-000N00U427F
		V2	4230	4728		CXA2540-0000-000N00V227H		CXA2540-0000-000N00V227F

Notes:

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 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.

PRELIMINARY

FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS, 80 CRI ($I_f = 1100 \text{ mA}$, $T_j = 85 \text{ }^\circ\text{C}$)

The following tables provide order codes for XLamp CXA2540 80 CRI minimum LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 11).

Color	CCT Range	Base Order Codes Min. Luminous Flux @ 1100 mA			2-Step Order Code		4-Step Order Code	
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
EasyWhite	5000K	V2	4230	4728	50H	CXA2540-0000-000N0HV250H	50F	CXA2540-0000-000N0HV250F
		V4	4545	5080		CXA2540-0000-000N0HV450H		CXA2540-0000-000N0HV450F
		W2	4860	5432		CXA2540-0000-000N0HW250H		CXA2540-0000-000N0HW250F
	4000K	U4	3955	4420	40H	CXA2540-0000-000N0HU440H	40F	CXA2540-0000-000N0HU440F
		V2	4230	4728		CXA2540-0000-000N0HV240H		CXA2540-0000-000N0HV240F
		V4	4545	5080		CXA2540-0000-000N0HV440H		CXA2540-0000-000N0HV440F

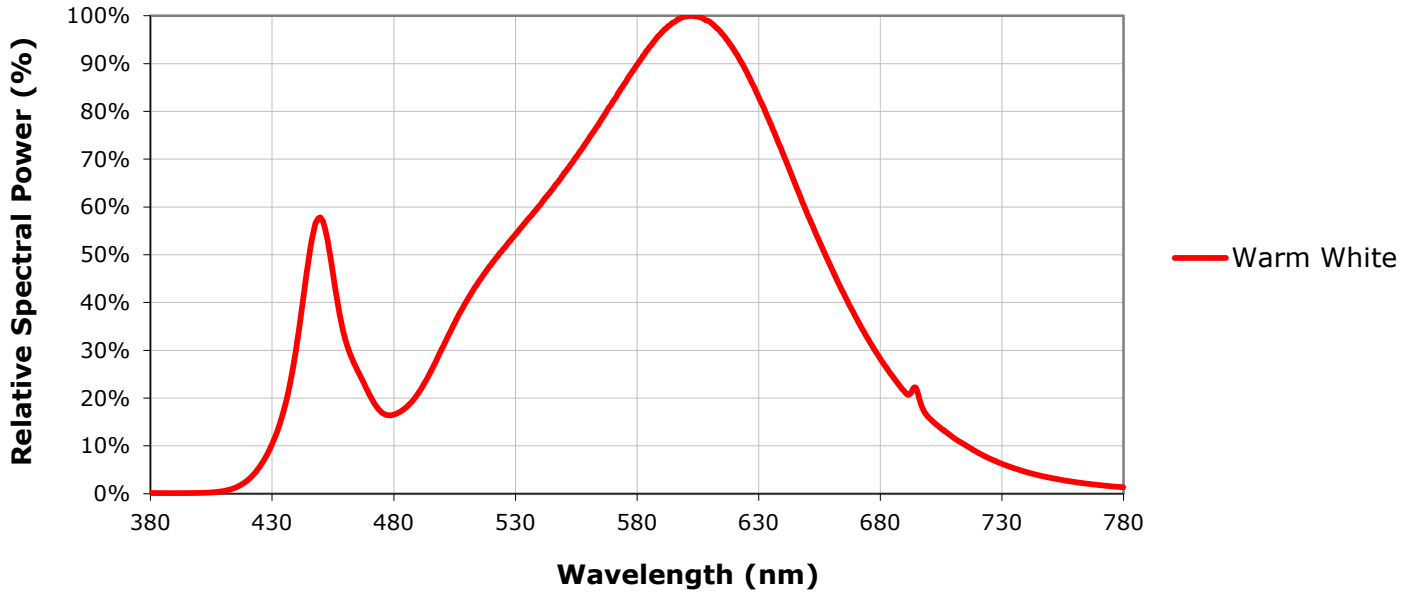
Color	CCT Range	Base Order Codes Min Luminous Flux @ 1100 mA			Chromaticity Regions	Order Code
		Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
ANSI White	5000K	V2	4230	4728	3A0, 3B0, 3C0, 3D0	CXA2540-0000-000N0HV20E3
		V4	4545	5080		CXA2540-0000-000N0HV40E3
		W2	4860	5432		CXA2540-0000-000N0HW20E3
	4000K	U4	3955	4420	5A0, 5B0, 5C0, 5D0	CXA2540-0000-000N0HU40E5
		V2	4230	4728		CXA2540-0000-000N0HV20E5
		V4	4545	5080		CXA2540-0000-000N0HV40E5

Notes:

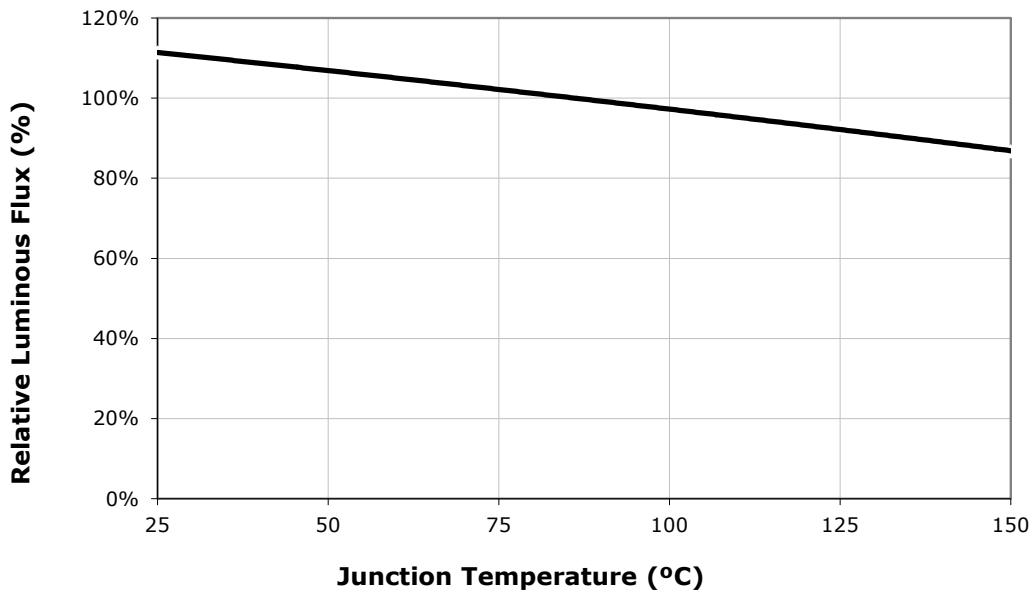
- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- Minimum CRI for high CRI color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 80.
- * Flux values @ 25 °C are calculated and for reference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

PRELIMINARY

RELATIVE SPECTRAL POWER DISTRIBUTION ($I_F = 1100 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)

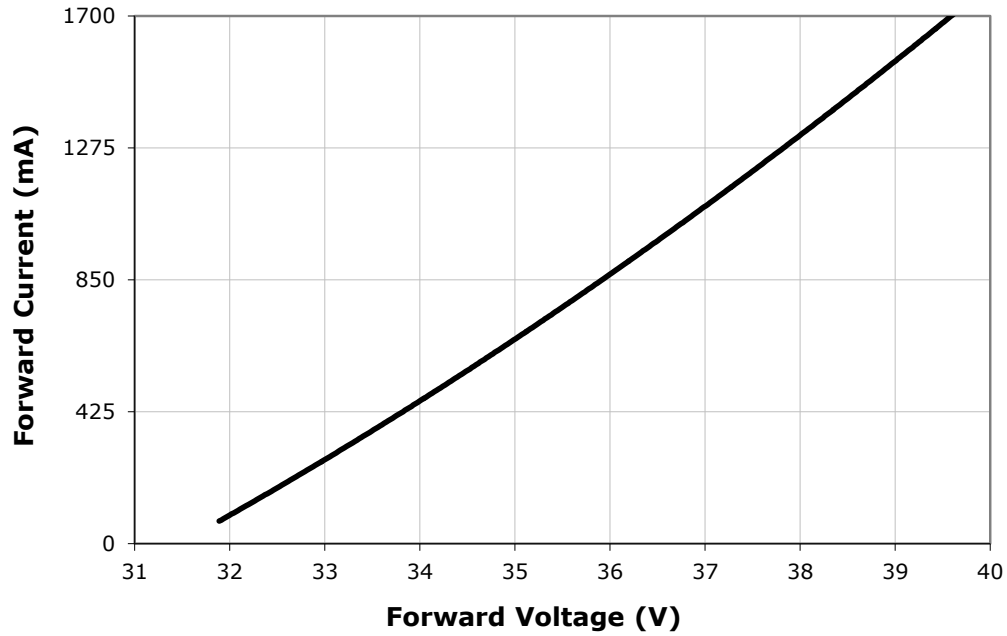


RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE ($I_F = 1100 \text{ mA}$)

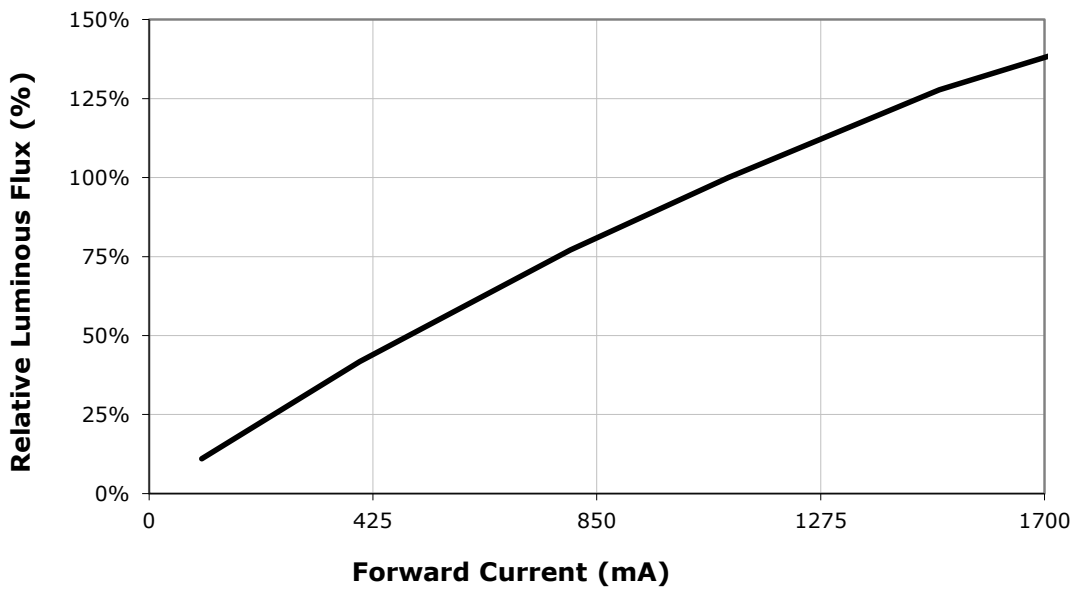


PRELIMINARY

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

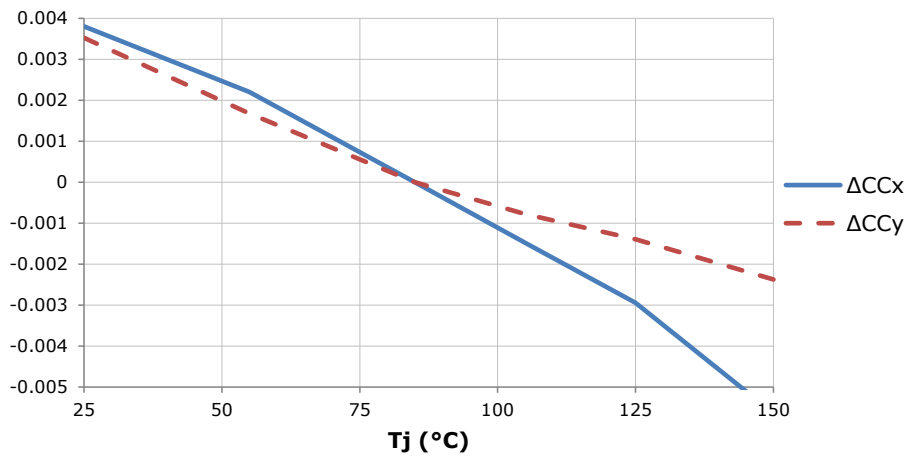
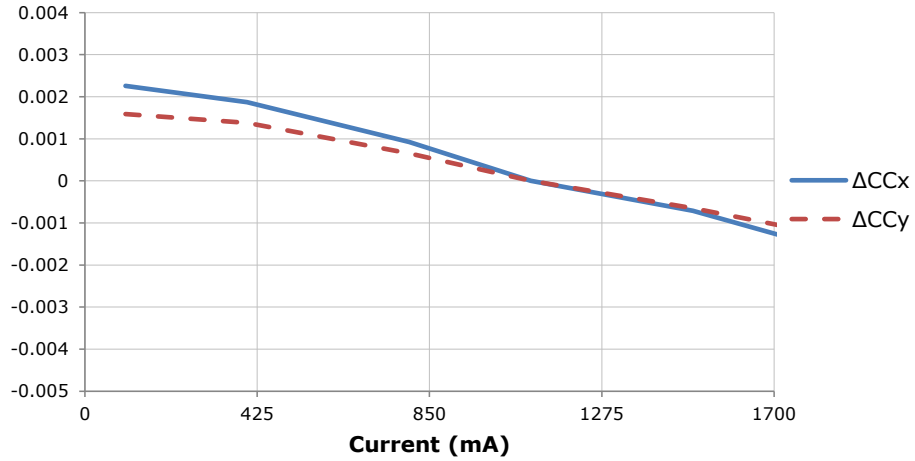


RELATIVE LUMINOUS FLUX VS. CURRENT ($T_j = 85\text{ }^\circ\text{C}$)



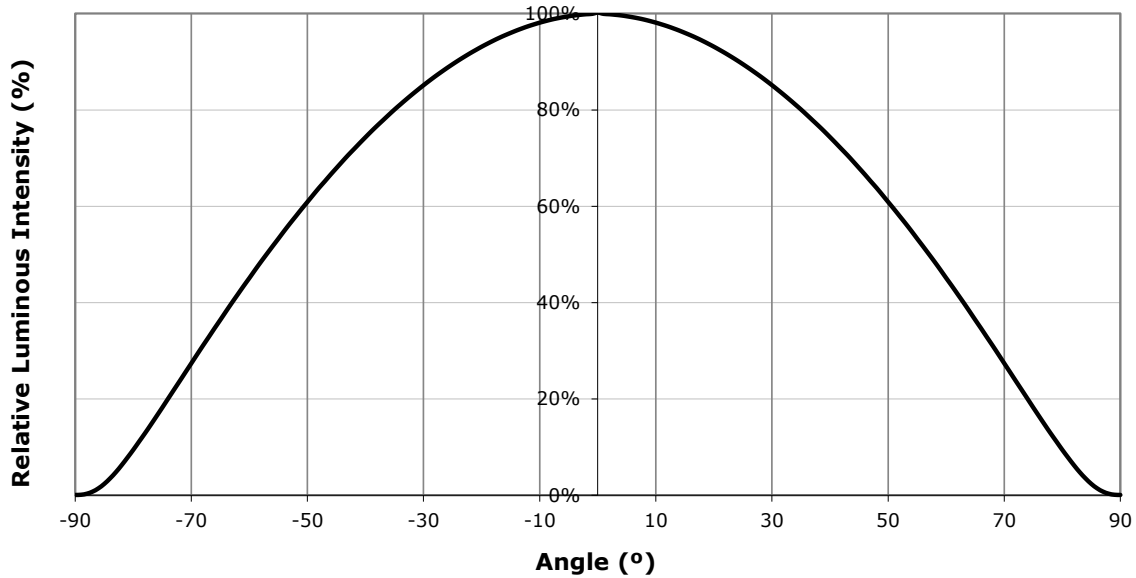
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RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE (3000 K, 80 CRI)



PRELIMINARY

TYPICAL SPATIAL DISTRIBUTION



PERFORMANCE GROUPS - BRIGHTNESS ($I_f = 1100 \text{ mA}$, $T_j = 85 \text{ °C}$)

XLamp CXA2540 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Min. Luminous Flux @ 1100 mA	Max. Luminous Flux @ 1100 mA
Q2	2100	2260
Q4	2260	2420
R2	2420	2600
R4	2600	2780
S2	2780	2990
S4	2990	3200
T2	3200	3440
V4	3440	3680
U2	3680	3955
U4	3955	4230
V2	4230	4545
V4	4545	4860
W2	4860	5225
W4	5225	5590
X2	5590	6010
X4	6010	6430

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

XLamp CXA2540 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
		0.4589	0.4021

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

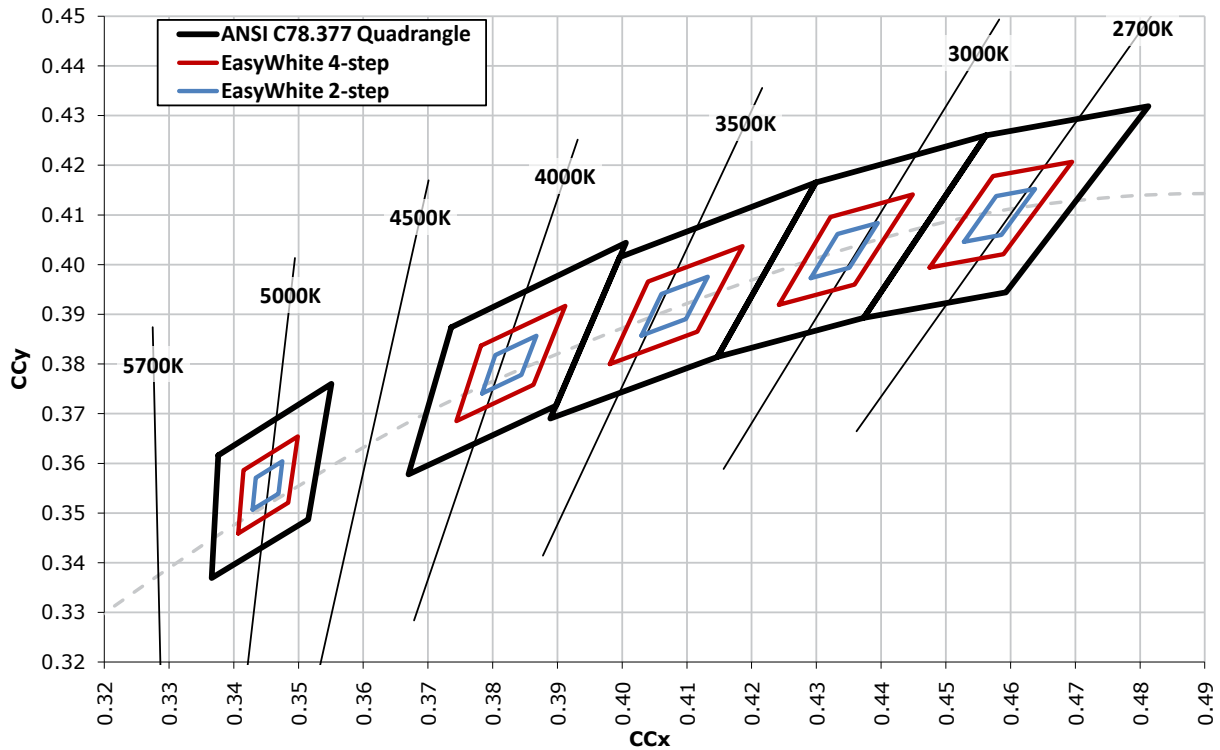
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E5	4000K	5A0	.3670	.3578
			.3702	.3722
			.3825	.3798
			.3783	.3646
		5B0	.3702	.3722
			.3736	.3874
			.3869	.3958
			.3825	.3798
		5C0	.3825	.3798
			.3869	.3958
			.4006	.4044
			.3950	.3875
		5D0	.3783	.3646
			.3825	.3798
			.3950	.3875
			.3898	.3716

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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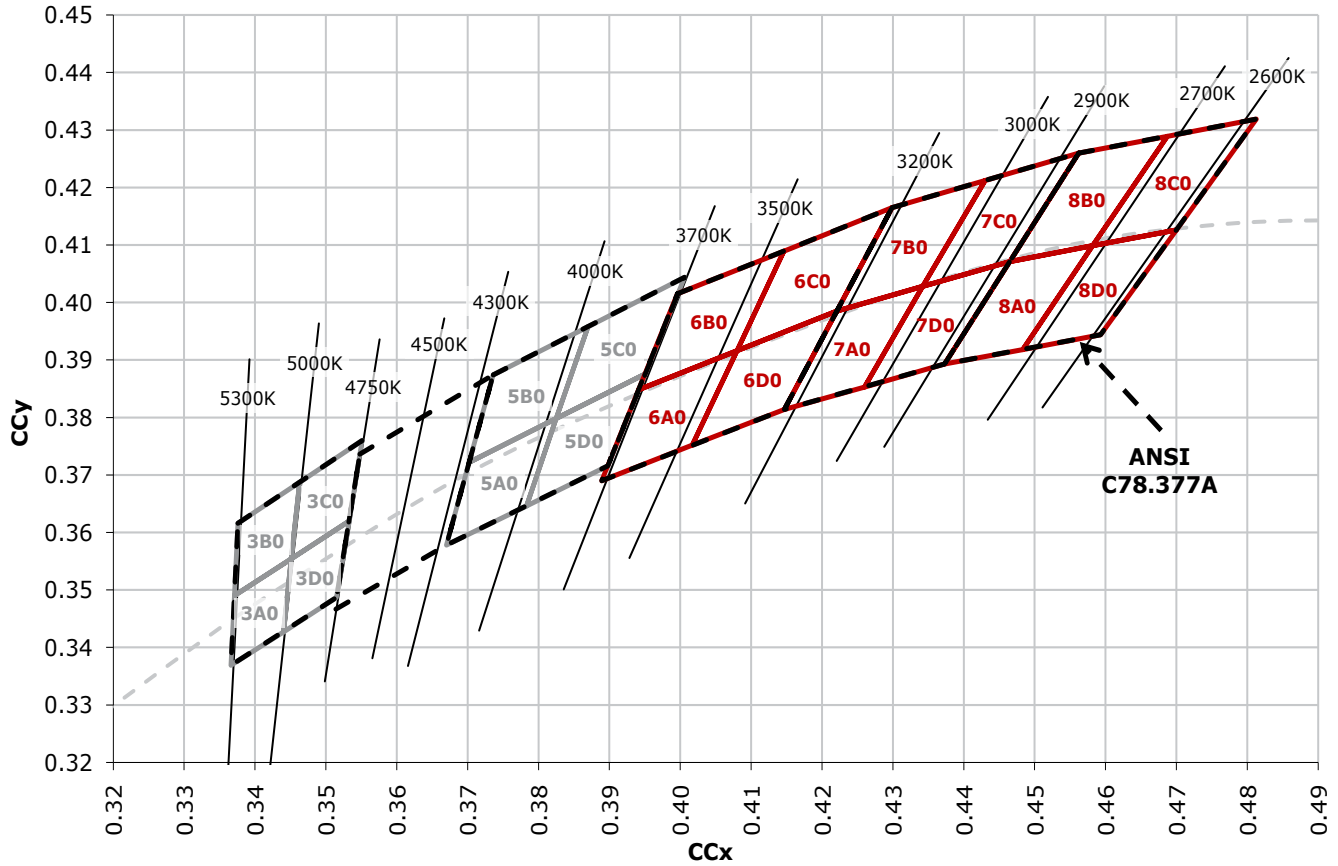
ANSI White Bins					ANSI White Bins				
Code	CCT	Bin Code	x	y	Code	CCT	Bin Code	x	y
0E7	3000K	7A0	.4147	.3814	0E8	2700K	8A0	.4373	.3893
			.4221	.3984				.4465	.4071
			.4342	.4028				.4582	.4099
			.4259	.3853				.4483	.3919
		7B0	.4221	.3984			8B0	.4465	.4071
			.4299	.4165				.4562	.4260
			.4430	.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 CIE 1931 COLOR SPACE (T_j = 85 °C)



PRELIMINARY

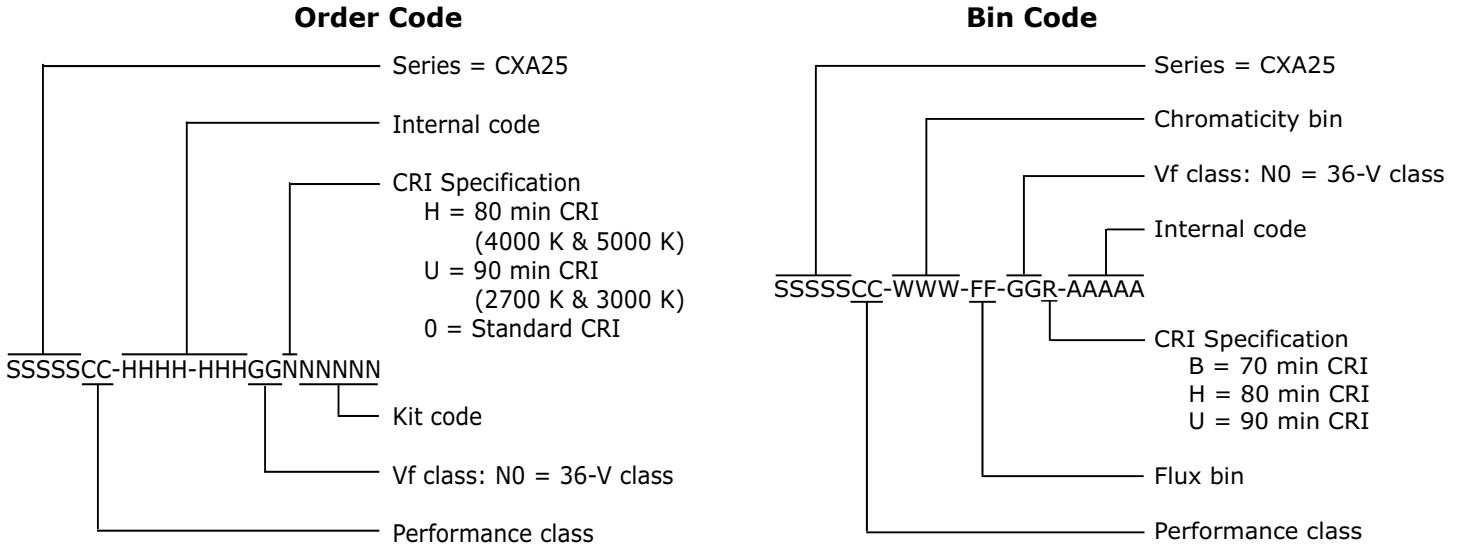
CREE ANSI WHITE BINS PLOTTED ON THE CIE 1931 COLOR SPACE ($T_j = 85^\circ\text{C}$)



PRELIMINARY

BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:



MECHANICAL DIMENSIONS

Dimensions are in mm.

Tolerances unless otherwise

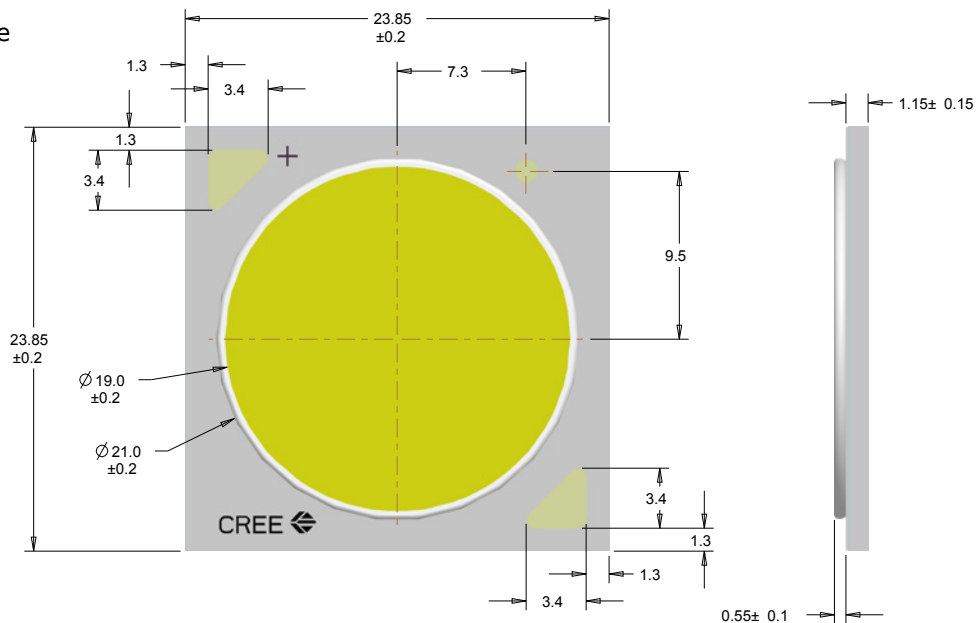
specified:

.x ± .10

.xx ± .03

.xxx ± .010

x° ± 1° x ± .10



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NOTES

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.

Please read the XLamp Long-Term Lumen Maintenance application note at www.cree.com/xlamp_app_notes/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 for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

Vision Advisory Claim

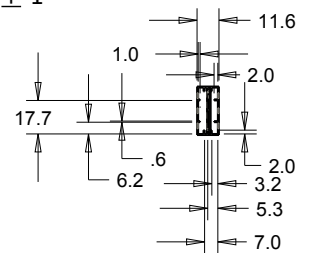
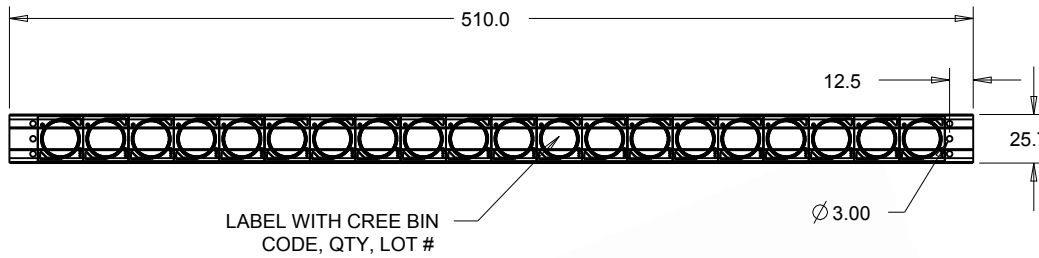
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.

PRELIMINARY

PACKAGING

Cree CXA2540 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.

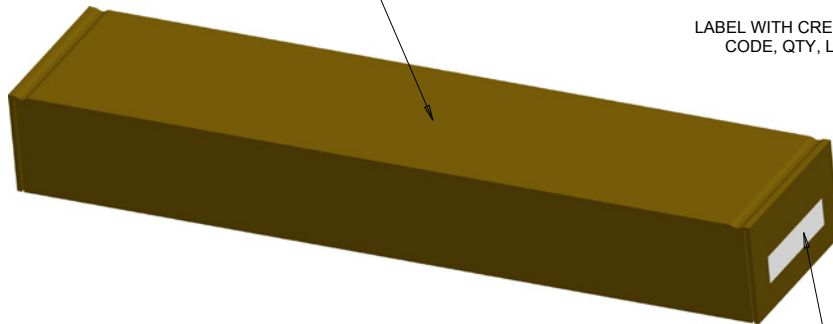
Dimensions are in mm.
Tolerances unless otherwise specified:
.x ± .10
.xx ± .03
.xxx ± .010
x° ± 1°



BAG

PATENT LABEL IS LOCATED ON UNDERSIDE OF COVER

LABEL WITH CREE BIN CODE, QTY, LOT #



LABEL WITH CREE BIN CODE, QTY, LOT #