



THE DATASHEET OF HSMH-C680



XLamp® CXA3070 LED



PRODUCT DESCRIPTION

The XLamp® CXA3070 LED array expands Cree LED's family of high-flux, multi-die integrated arrays, offering high performance in an easy-to-use platform. With XLamp LED lighting-class reliability, the CXA3070's uniform emitting surface enables both directional and non-directional lighting applications and luminaire and lamp designs. Available in 2-step, 3-step and 4-step color consistency, and featuring a 23-mm optical source, the CXA3070 brings new levels of flux and efficacy to this form factor.

The [CX Family LED Design Guide](#) provides basic information on the requirements to use the CXA3070 LED successfully in luminaire designs.

FEATURES

- Available in 4-step, 3-step and 2-step EasyWhite® bins at 2700 K, 3000 K, 3500 K, 4000 K & 5000 K CCT and 4-step EasyWhite bins at 5700 K & 6500 K CCT
- Available in ANSI white bins at 5000 K, 5700 K & 6500 K CCT
- Available in 70-, 80-, 90- and 93-minimum CRI options
- Forward voltage option: 36-V class
- 85 °C binning and characterization
- Maximum drive current: 2800 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)

TABLE OF CONTENTS

Characteristics	2
Operating Limits.....	2
Flux Characteristics, EasyWhite® Order Codes and Bins	3
Flux Characteristics, ANSI White Order Codes and Bins	6
Relative Spectral Power Distribution	7
Electrical Characteristics.....	7
Relative Luminous Flux.....	8
Typical Spatial Distribution.....	9
Performance Groups - Brightness	9
Performance Groups - Chromaticity	10
EasyWhite® Bins Plotted on the 1931 CIE Color Space	13
ANSI White Bins Plotted on the 1931 CIE Color Space	13
Bin and Order Code Formats.....	14
Mechanical Dimensions	14
Thermal Design	15
Notes	16
Packaging.....	17



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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Viewing angle (FWHM)	degrees		115	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current	mA			2800*
Reverse current	mA			0.1
Forward voltage (@ 1900 mA, T _j = 85 °C)	V		36.2**	
Forward voltage (@ 1900 mA, T _j = 25 °C)	V			41**

* Refer to the Operating Limits section.

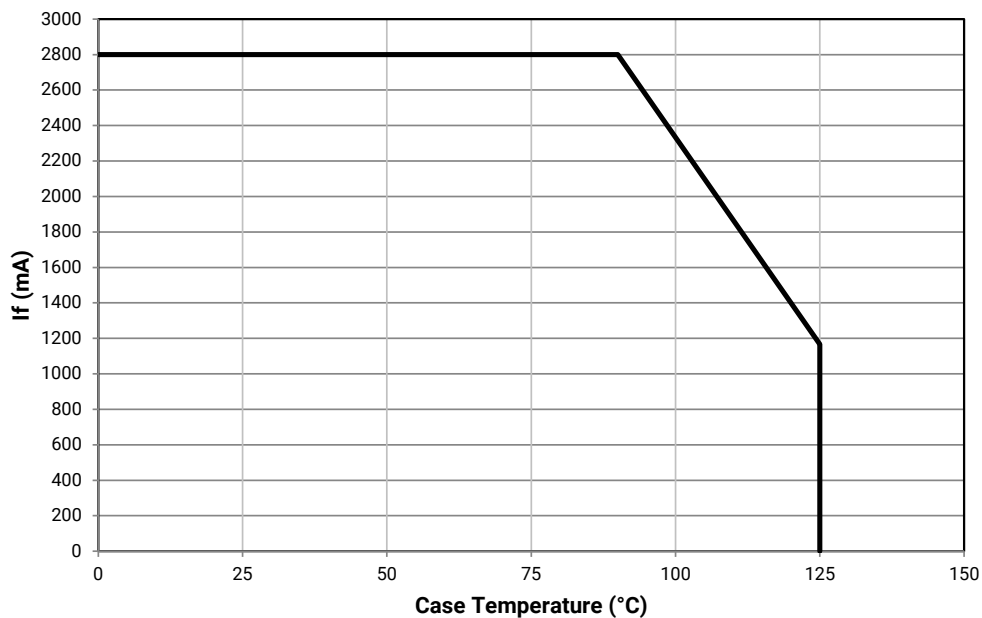
** For CXA3070 LEDs having order codes with a CXA3070-xxxx-xxxN0xxxxxx format, the forward voltage values are as follows:

Characteristics	Unit	Minimum	Typical	Maximum
Forward voltage (@ 1900 mA, T _j = 85 °C)	V		38.5	
Forward voltage (@ 1900 mA, T _j = 25 °C)	V			42

OPERATING LIMITS

The maximum current rating of the CXA3070 depends on the case temperature (T_c) when the LED has reached thermal equilibrium under steady-state operation. The graph shown below assumes that the system design employs good thermal management (thermal interface material and heat sink) and may vary when poor thermal management is employed. Please refer to the Mechanical Drawings section on page 14 for the location of the T_c measurement point.

Another important factor in good thermal management is the temperature of the Light Emitting Surface (LES). Cree LED recommends a maximum LES temperature of 135 °C to ensure optimal LED lifetime. Please refer to the Thermal Design section on page 15 for more information on LES temperature measurement.



FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS (I_F = 1900 mA, T_J = 85 °C)

The following table provides order codes for XLamp CXA3070 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 14).

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		4-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
6500 K	70	75	Z4	7,945	8,851					65F	CXA3070-0000-000NT0Z465F
			AB	8,500	9,469		CXA3070-0000-000NT0AB65F				
			AD	9,000	10,026		CXA3070-0000-000NT0AD65F				
			BB	9,500	10,583		CXA3070-0000-000NT0BB65F				
	80	---	Z4	7,945	8,851					65F	CXA3070-0000-000NTHZ465F
			AB	8,500	9,469		CXA3070-0000-000NTHAB65F				
			AD	9,000	10,026		CXA3070-0000-000NTHAD65F				
5700 K	70	75	Z4	7,945	8,851					57F	CXA3070-0000-000NTHZ457F
			AB	8,500	9,469		CXA3070-0000-000NT0AB57F				
			AD	9,000	10,026		CXA3070-0000-000NT0AD57F				
			BB	9,500	10,583		CXA3070-0000-000NT0BB57F				
	80	---	Z4	7,945	8,851					57F	CXA3070-0000-000NTHZ457F
			AB	8,500	9,469		CXA3070-0000-000NTHAB57F				
			AD	9,000	10,026		CXA3070-0000-000NTHAD57F				

- Notes**
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 16).
 - CXA3070 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
 - * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS (I_F = 1900 mA, T_J = 85 °C) - CONTINUED

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		4-Step		
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code	
5000 K	70	75	Z4	7,945	8,851	50H	CXA3070-0000-000NT0Z450H			50F	CXA3070-0000-000NT0Z450F	
			AB	8,500	9,469		CXA3070-0000-000NT0AB50H				CXA3070-0000-000NT0AB50F	
			AD	9,000	10,026		CXA3070-0000-000NT0AD50H				CXA3070-0000-000NT0AD50F	
			BB	9,500	10,583		CXA3070-0000-000NT0BB50H				CXA3070-0000-000NT0BB50F	
	80	---	Z4	7,945	8,851	50H	CXA3070-0000-000NTHZ450H	50G	CXA3070-0000-000NTHZ450G	50F	CXA3070-0000-000NTHZ450F	
			AB	8,500	9,469		CXA3070-0000-000NTHAB50H		CXA3070-0000-000NTHAB50G		CXA3070-0000-000NTHAB50F	
			AD	9,000	10,026		CXA3070-0000-000NTHAD50H		CXA3070-0000-000NTHAD50G		CXA3070-0000-000NTHAD50F	
	90	95	Y2	6,430	7,163	50H	CXA3070-0000-000NTUY250H	50G	CXA3070-0000-000NTUY250G	50F	CXA3070-0000-000NTUY250F	
			Y4	6,910	7,698		CXA3070-0000-000NTUY450H		CXA3070-0000-000NTUY450G		CXA3070-0000-000NTUY450F	
			Z2	7,390	8,233		CXA3070-0000-000NTUZ250H		CXA3070-0000-000NTUZ250G		CXA3070-0000-000NTUZ250F	
	4000 K	70	75	Z2	7,390	8,233	40H	CXA3070-0000-000NT0Z240H			40F	CXA3070-0000-000NT0Z240F
				Z4	7,945	8,851		CXA3070-0000-000NT0Z440H				CXA3070-0000-000NT0Z440F
AB				8,500	9,469	CXA3070-0000-000NT0AB40H		CXA3070-0000-000NT0AB40F				
AD				9,000	10,026	CXA3070-0000-000NT0AD40H		CXA3070-0000-000NT0AD40F				
BB				9,500	10,583	CXA3070-0000-000NT0BB40H		CXA3070-0000-000NT0BB40F				
80		---	Z2	7,390	8,233	40H	CXA3070-0000-000NTHZ240H	40G	CXA3070-0000-000NTHZ240G	40F	CXA3070-0000-000NTHZ240F	
			Z4	7,945	8,851		CXA3070-0000-000NTHZ440H		CXA3070-0000-000NTHZ440G		CXA3070-0000-000NTHZ440F	
			AB	8,500	9,469		CXA3070-0000-000NTHAB40H		CXA3070-0000-000NTHAB40G		CXA3070-0000-000NTHAB40F	
			AD	9,000	10,026		CXA3070-0000-000NTHAD40H		CXA3070-0000-000NTHAD40G		CXA3070-0000-000NTHAD40F	
90		95	Y2	6,430	7,163	40H	CXA3070-0000-000NTUY240H	40G	CXA3070-0000-000NTUY240G	40F	CXA3070-0000-000NTUY240F	
			Y4	6,910	7,698		CXA3070-0000-000NTUY440H		CXA3070-0000-000NTUY440G		CXA3070-0000-000NTUY440F	

- Notes**
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 16).
 - CXA3070 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
 - * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS (I_F = 1900 mA, T_J = 85 °C) - CONTINUED

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		4-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
3500 K	80	---	Y4	6,910	7,698	35H	CXA3070-0000-000NT0Y435H	35G	CXA3070-0000-000NT0Y435G	35F	CXA3070-0000-000NT0Y435F
			Z2	7,390	8,233		CXA3070-0000-000NT0Z235H		CXA3070-0000-000NT0Z235G		CXA3070-0000-000NT0Z235F
			Z4	7,945	8,851		CXA3070-0000-000NT0Z435H		CXA3070-0000-000NT0Z435G		CXA3070-0000-000NT0Z435F
			AB	8,500	9,469		CXA3070-0000-000NT0AB35H		CXA3070-0000-000NT0AB35G		CXA3070-0000-000NT0AB35F
	93	95	X4	6,010	6,695	35H	CXA3070-0000-000NTYX435H	35G	CXA3070-0000-000NTYX435G	35F	CXA3070-0000-000NTYX435F
			Y2	6,430	7,163		CXA3070-0000-000NTYY235H		CXA3070-0000-000NTYY235G		CXA3070-0000-000NTYY235F
3000 K	80	---	Y4	6,910	7,698	30H	CXA3070-0000-000NT0Y430H	30G	CXA3070-0000-000NT0Y430G	30F	CXA3070-0000-000NT0Y430F
			Z2	7,390	8,233		CXA3070-0000-000NT0Z230H		CXA3070-0000-000NT0Z230G		CXA3070-0000-000NT0Z230F
			Z4	7,945	8,851		CXA3070-0000-000NT0Z430H		CXA3070-0000-000NT0Z430G		CXA3070-0000-000NT0Z430F
			AB	8,500	9,469		CXA3070-0000-000NT0AB30H		CXA3070-0000-000NT0AB30G		CXA3070-0000-000NT0AB30F
	93	95	X4	6,010	6,695	30H	CXA3070-0000-000NTYX430H	30G	CXA3070-0000-000NTYX430G	30F	CXA3070-0000-000NTYX430F
			Y2	6,430	7,163		CXA3070-0000-000NTYY230H		CXA3070-0000-000NTYY230G		CXA3070-0000-000NTYY230F
2700 K	80	---	Y2	6,430	7,163	27H	CXA3070-0000-000NT0Y227H	27G	CXA3070-0000-000NT0Y227G	27F	CXA3070-0000-000NT0Y227F
			Y4	6,910	7,698		CXA3070-0000-000NT0Y427H		CXA3070-0000-000NT0Y427G		CXA3070-0000-000NT0Y427F
			Z2	7,390	8,233		CXA3070-0000-000NT0Z227H		CXA3070-0000-000NT0Z227G		CXA3070-0000-000NT0Z227F
			Z4	7,945	8,851		CXA3070-0000-000NT0Z427H		CXA3070-0000-000NT0Z427G		CXA3070-0000-000NT0Z427F
	93	95	X2	5,590	6,227	27H	CXA3070-0000-000NTYX227H	27G	CXA3070-0000-000NTYX227G	27F	CXA3070-0000-000NTYX227F
			X4	6,010	6,695		CXA3070-0000-000NTYX427H		CXA3070-0000-000NTYX427G		CXA3070-0000-000NTYX427F

- Notes
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 16).
 - CXA3070 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
 - * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS ($I_F = 1900 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)

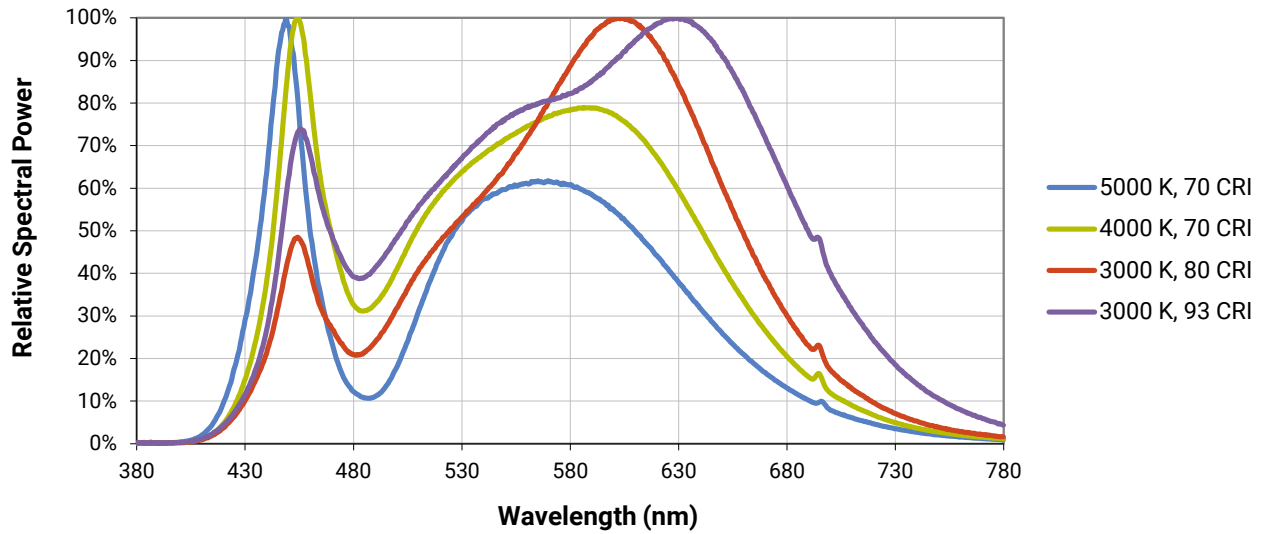
The following table provides order codes for XLamp CXA3070 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 14).

Nominal CCT	CRI		Minimum Luminous Flux			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
6500 K	70	75	Z4	7,945	8,851	1A0, 1B0, 1C0, 1D0, 65F	CXA3070-0000-000NT0Z40E1
			AB	8,500	9,469		CXA3070-0000-000NT0AB0E1
			AD	9,000	10,026		CXA3070-0000-000NT0AD0E1
			BB	9,500	10,583		CXA3070-0000-000NT0BB0E1
	80	---	Z4	7,945	8,851	1A0, 1B0, 1C0, 1D0, 65F	CXA3070-0000-000NTHZ40E1
			AB	8,500	9,469		CXA3070-0000-000NTHAB0E1
5700 K	70	75	Z4	7,945	8,851	2A0, 2B0, 2C0, 2D0, 57F	CXA3070-0000-000NT0Z40E2
			AB	8,500	9,469		CXA3070-0000-000NT0AB0E2
			AD	9,000	10,026		CXA3070-0000-000NT0AD0E2
			BB	9,500	10,583		CXA3070-0000-000NT0BB0E2
	80	---	Z4	7,945	8,851	2A0, 2B0, 2C0, 2D0, 57F	CXA3070-0000-000NTHZ40E2
			AB	8,500	9,469		CXA3070-0000-000NTHAB0E2
5000 K	70	75	Z4	7,945	8,851	3A0, 3B0, 3C0, 3D0, 50F	CXA3070-0000-000NT0Z40E3
			AB	8,500	9,469		CXA3070-0000-000NT0AB0E3
			AD	9,000	10,026		CXA3070-0000-000NT0AD0E3
			BB	9,500	10,583		CXA3070-0000-000NT0BB0E3
	80	---	Z4	7945	8,851	3A0, 3B0, 3C0, 3D0, 50F	CXA3070-0000-000NTHZ40E3
			AB	8500	9,469		CXA3070-0000-000NTHAB0E3
			AD	9000	10,026		CXA3070-0000-000NTHAD0E3

- Notes**
- Cree LED 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. See the Measurements section (page 16).
 - CXA3070 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
 - * Flux values @ 25 °C are calculated and for reference only.

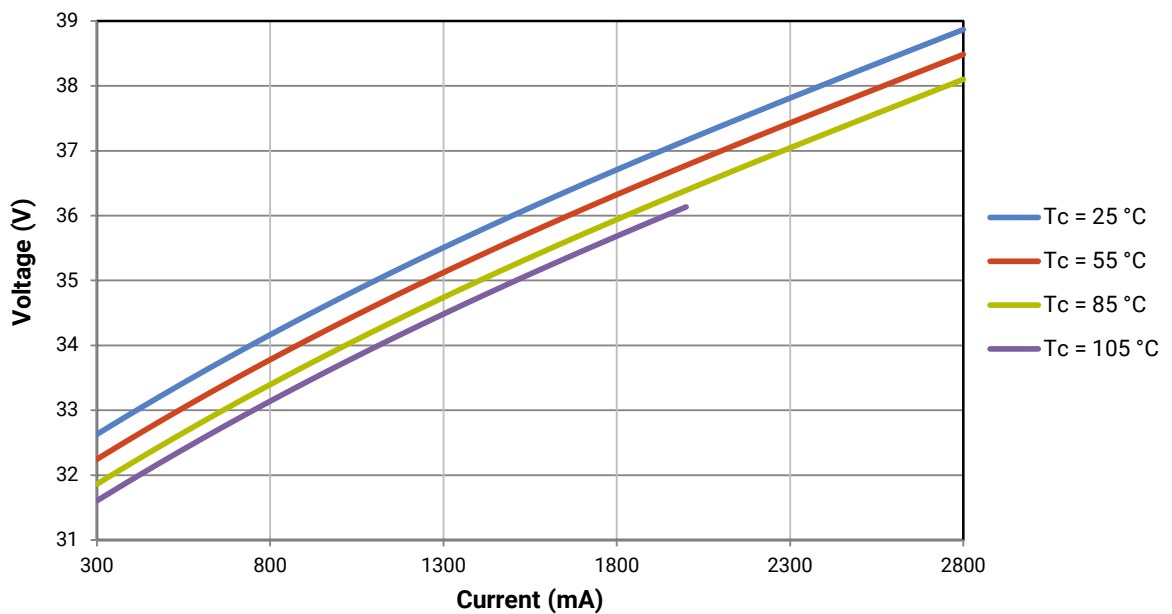
RELATIVE SPECTRAL POWER DISTRIBUTION

The following graph is the result of a series of pulsed measurements at 1900 mA and $T_j = 85^\circ\text{C}$.



ELECTRICAL CHARACTERISTICS

The following graph is the result of a series of steady-state measurements.

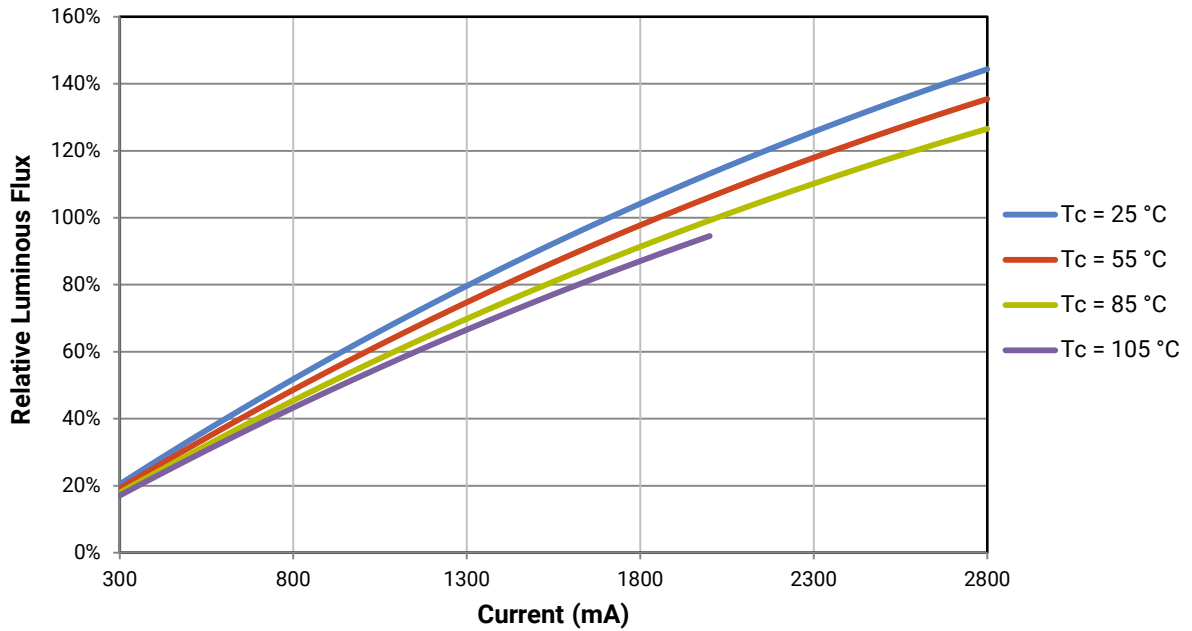


RELATIVE LUMINOUS FLUX

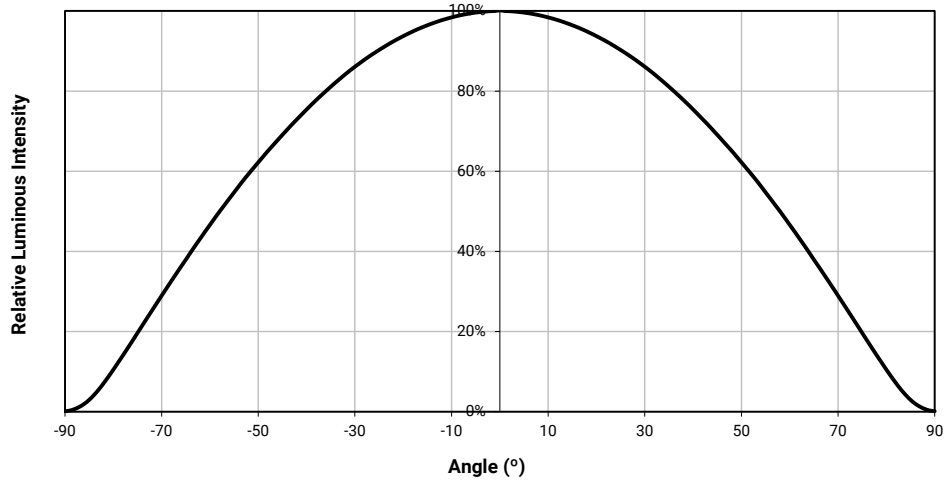
The relative luminous flux values provided below are the ratio of:

- Measurements of CXA3070 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 1900 mA at $T_j = 85\text{ }^\circ\text{C}$.

For example, at steady-state operation of $T_c = 25\text{ }^\circ\text{C}$, $I_f = 1300\text{ mA}$, the relative luminous flux ratio is 80% in the chart below. A CXA3070 LED that measures 8500 lm during binning will deliver 6800 lm ($8500 \cdot 0.8$) at steady-state operation of $T_c = 25\text{ }^\circ\text{C}$, $I_f = 1300\text{ mA}$.



TYPICAL SPATIAL DISTRIBUTION



PERFORMANCE GROUPS - BRIGHTNESS ($I_F = 1900 \text{ mA}$, $T_J = 85 \text{ °C}$)

XLamp CXA3070 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Minimum Luminous Flux	Maximum Luminous Flux
X2	5590	6010
X4	6010	6430
Y2	6430	6910
Y4	6910	7390
Z2	7390	7945
Z4	7945	8500
AB	8500	9000
AD	9000	9500
BB	9500	10,000
BD	10,000	11,000
CB	11,000	12,000

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

XLamp CXA3070 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

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

EasyWhite Color Temperatures – 3-Step Ellipse						
Bin Code	CCT	Center Point		Major Axis	Minor Axis	Rotation Angle (°)
		x	y	a	b	
50G	5000 K	0.3447	0.3553	0.00840	0.00312	65.0
40G	4000 K	0.3818	0.3797	0.00939	0.00402	53.7
35G	3500 K	0.4073	0.3917	0.00927	0.00414	54.0
30G	3000 K	0.4338	0.4030	0.00834	0.00408	53.2
27G	2700 K	0.4577	0.4099	0.00834	0.00420	48.5

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

EasyWhite Color Temperatures – 4-Step			
Code	CCT	x	y
65F	6500 K	0.3097	0.3196
		0.3079	0.3297
		0.3164	0.3382
		0.3176	0.3275
57F	5700 K	0.3253	0.3325
		0.3249	0.3439
		0.3331	0.3514
		0.3330	0.3393
50F	5000 K	0.3407	0.3459
		0.3415	0.3586
		0.3499	0.3654
		0.3484	0.3521
40F	4000 K	0.3744	0.3685
		0.3782	0.3837
		0.3912	0.3917
		0.3863	0.3758
35F	3500 K	0.3981	0.3800
		0.4040	0.3966
		0.4186	0.4037
		0.4116	0.3865
30F	3000 K	0.4242	0.3919
		0.4322	0.4096
		0.4449	0.4141
		0.4359	0.3960
27F	2700 K	0.4475	0.3994
		0.4573	0.4178
		0.4695	0.4207
		0.4589	0.4021

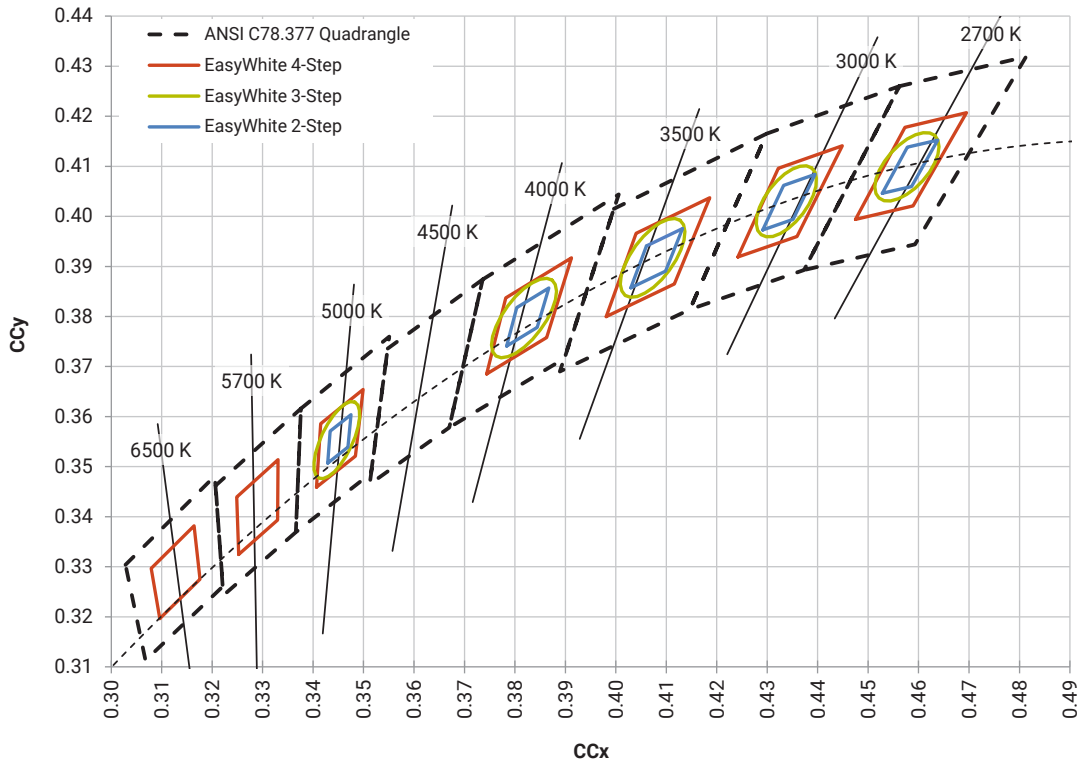
PERFORMANCE GROUPS - CHROMATICITY ($T_j = 85\text{ }^\circ\text{C}$) - CONTINUED

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E1	6500 K	1A0	0.3048	0.3207
			0.3130	0.3290
			0.3144	0.3186
			0.3068	0.3113
		1B0	0.3028	0.3304
			0.3115	0.3391
			0.3130	0.3290
			0.3048	0.3207
		1C0	0.3115	0.3391
			0.3205	0.3481
			0.3213	0.3373
			0.3130	0.3290
		1D0	0.3130	0.3290
			0.3213	0.3373
			0.3221	0.3261
			0.3144	0.3186

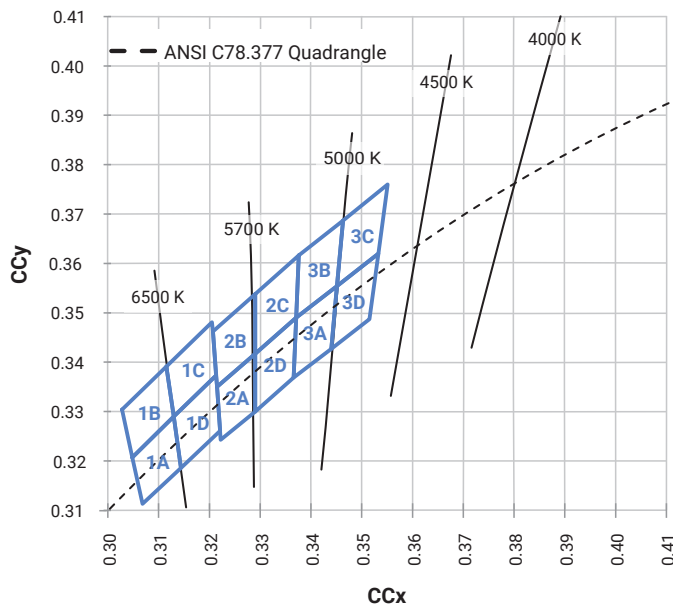
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E2	5700 K	2A0	0.3215	0.3350
			0.3290	0.3417
			0.3290	0.3300
			0.3222	0.3243
		2B0	0.3207	0.3462
			0.3290	0.3538
			0.3290	0.3417
			0.3215	0.3350
		2C0	0.3290	0.3538
			0.3376	0.3616
			0.3371	0.3490
			0.3290	0.3417
		2D0	0.3290	0.3417
			0.3371	0.3490
			0.3366	0.3369
			0.3290	0.3300

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E3	5000 K	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

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

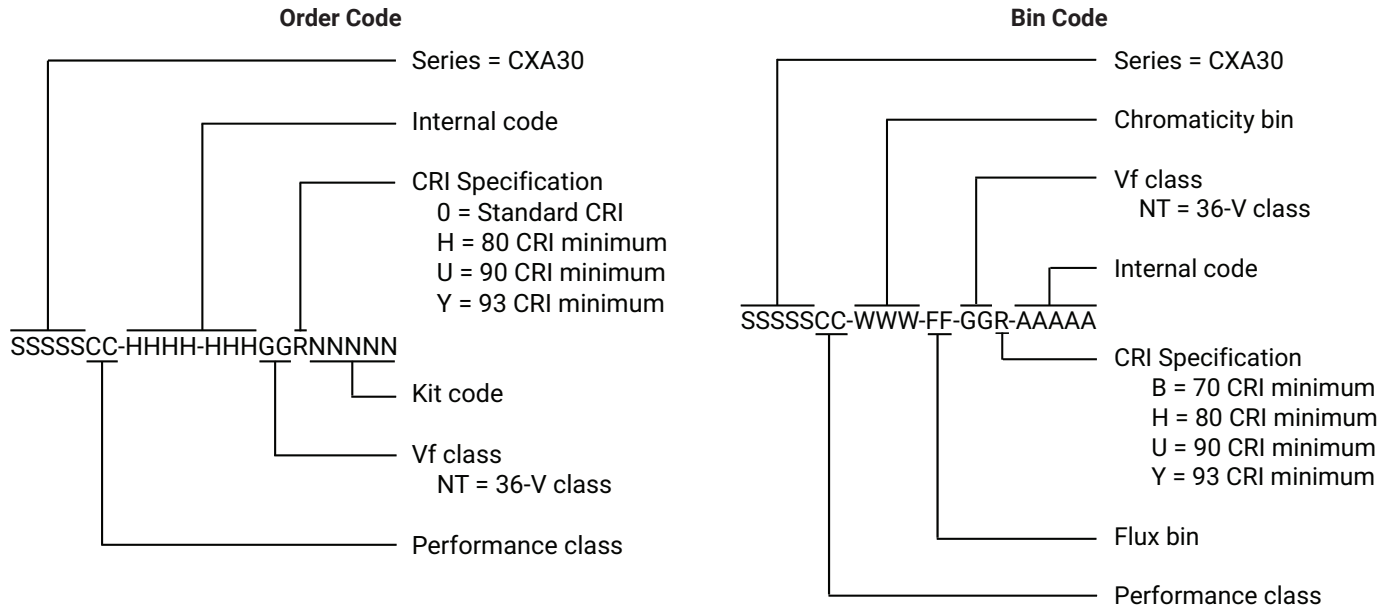


ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE ($T_j = 85^\circ\text{C}$)



BIN AND ORDER CODE FORMATS

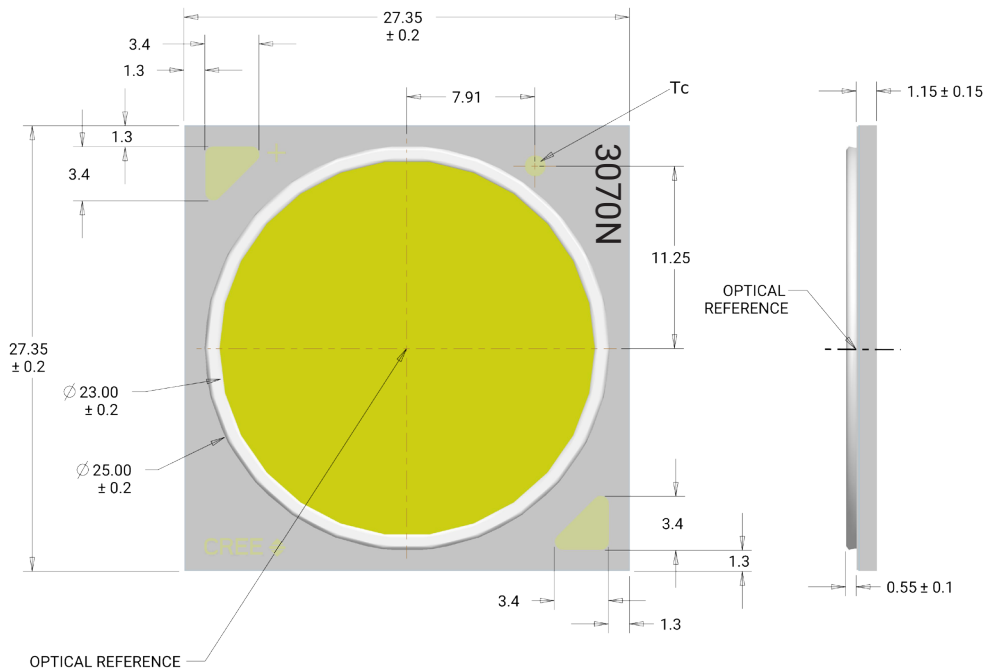
Bin codes and order codes are configured as follows:



MECHANICAL DIMENSIONS

Dimensions are in mm.
 Tolerances unless otherwise specified: ± 0.13
 $\alpha^\circ \pm 1^\circ$

Meaning of 3070N
 3070N = 36-V CXA3070



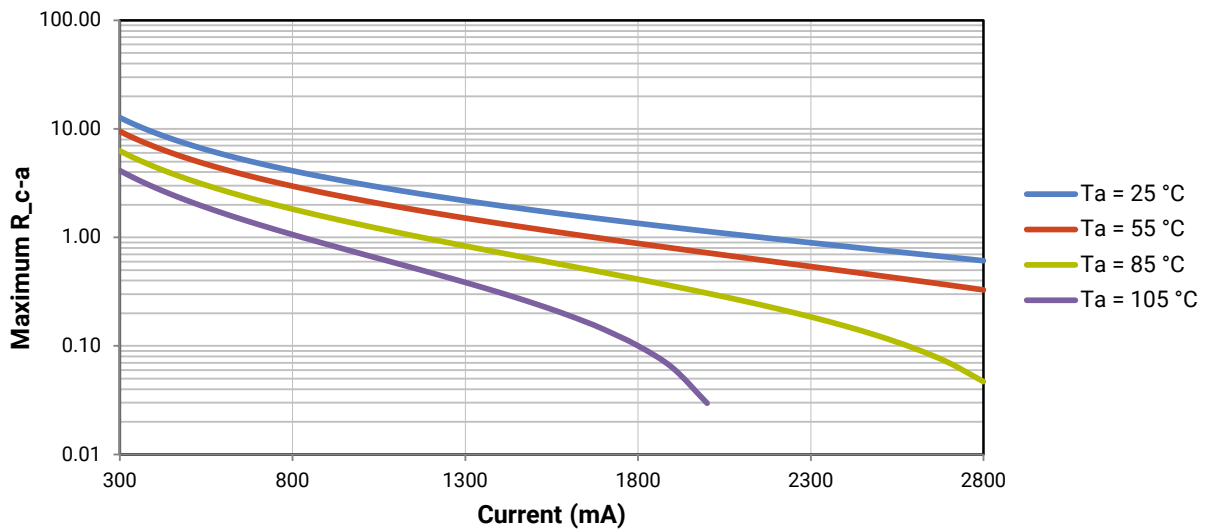
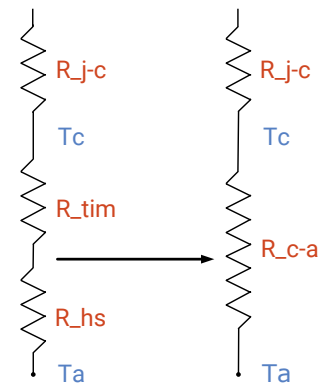
THERMAL DESIGN

The CXA family of LED arrays can include over a hundred different LED die inside one package, and thus over a hundred different junction temperatures (T_j). Cree LED has intentionally removed junction-temperature-based operating limits and replaced the commonplace maximum T_j calculations with maximum ratings based on forward current (I_f) and case temperature (T_c). No additional calculations are required to ensure that the CXA LED is being operated within its designed limits. LES temperature measurement provides additional verification of good thermal design. Please refer to page 2 for the Operating Limit specifications.

There is no need to calculate for T_j inside the package, as the thermal management design process, specifically from T_{sp} to ambient (T_a), remains identical to any other LED component. For more information on thermal management of XLamp LEDs, please refer to the [Thermal Management application note](#). For CXA soldering recommendations and more information on thermal interface materials (TIM), LES temperature measurement, and connection methods, please refer to the [XLamp CX Family LEDs soldering and handling document](#). The [CX Family LED Design Guide](#) provides basic information on the requirements to use XLamp CXA LEDs successfully in luminaire designs.

To keep the CXA3070 LED at or below the maximum rated T_c , the case to ambient temperature thermal resistance (R_{c-a}) must be at or below the maximum R_{c-a} value shown on the following graph, depending on the operating environment. The y-axis in the graph is a base 10 logarithmic scale.

As the figure at right shows, the R_{c-a} value is the sum of the thermal resistance of the TIM (R_{tim}) plus the thermal resistance of the heat sink (R_{hs}).



NOTES

Measurements

The luminous flux, radiant power, chromaticity, forward voltage and CRI measurements in this document are binning specifications only and solely represent product measurements as of the date of shipment. These measurements will change over time based on a number of factors that are not within Cree LED's control and are not intended or provided as operational specifications for the products. Calculated values are provided for informational purposes only and are not intended or provided as specifications.

Pre-Release Qualification Testing

Please read the [LED Reliability Overview](#) for details of the qualification process Cree LED applies to ensure long-term reliability for XLamp LEDs and details of Cree LED's pre-release qualification testing for XLamp LEDs.

Lumen Maintenance

Cree LED 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](#).

Please read the [Long-Term Lumen Maintenance application note](#) for more details on Cree LED's lumen maintenance testing and forecasting. Please read the [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 RoHS 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 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree LED representative or from the [Product Ecology](#) section of the Cree LED website.

REACH Compliance

REACH substances of very high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Cree LED representative to insure you get the most up-to-date REACH Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

UL® Recognized Component

This product meets the requirements to be considered a UL Recognized Component with Level 4 enclosure consideration. The LED package or a portion thereof has been investigated as a fire and electrical enclosure per ANSI/UL 8750.

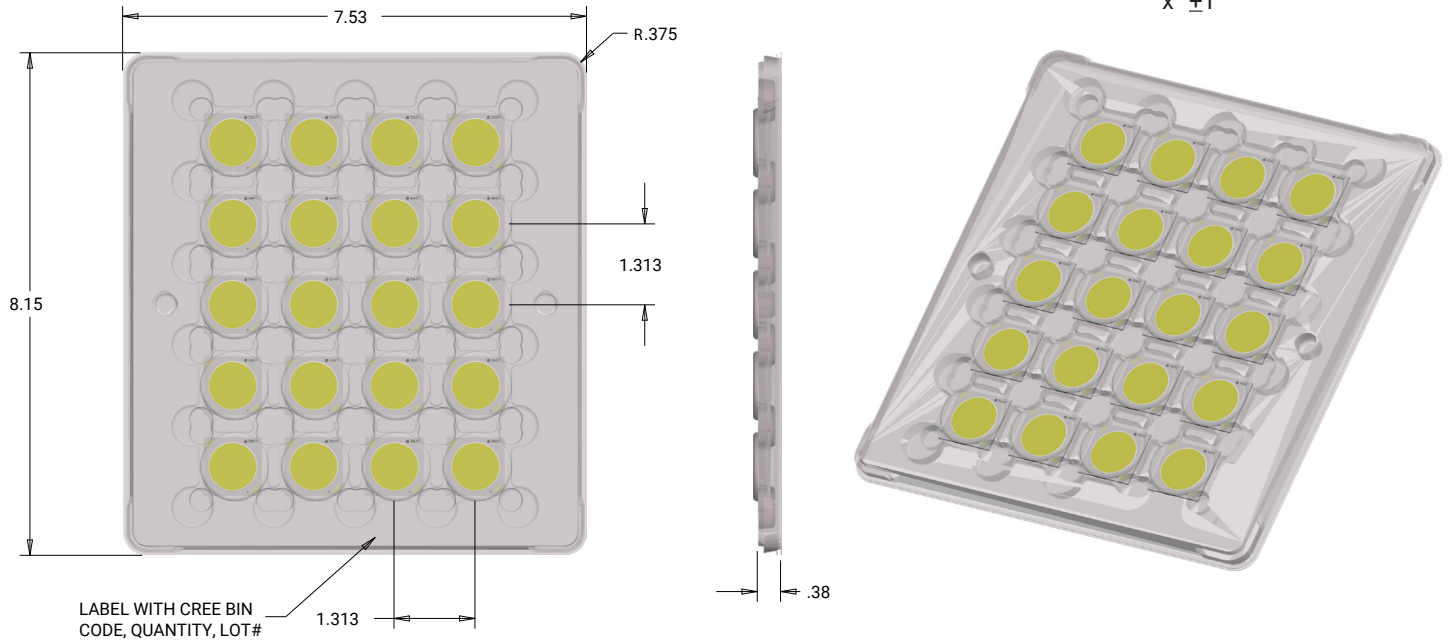
Vision Advisory

WARNING: Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the [LED Eye Safety application note](#).

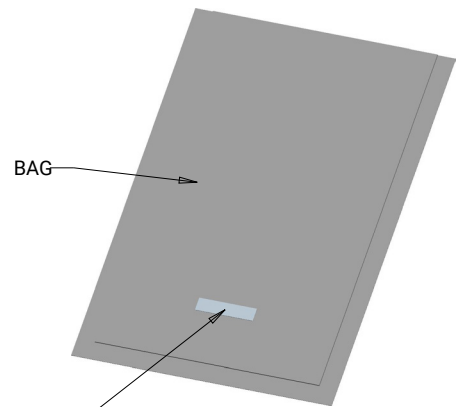
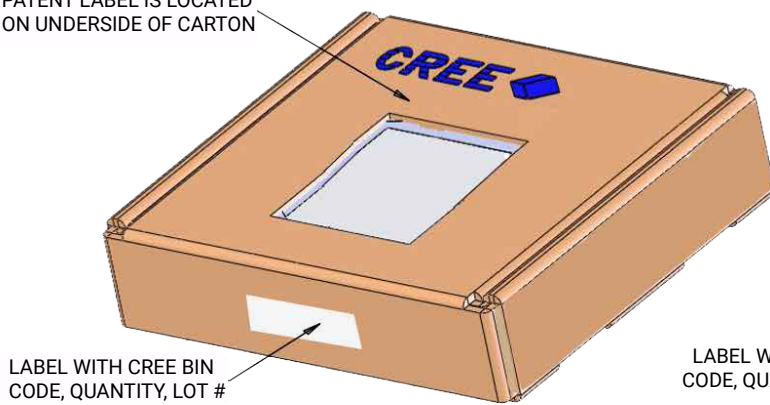
PACKAGING

CXA3070 LEDs are packaged in trays of 20. Five trays are sealed in an anti-static bag and placed inside a carton, for a total of 100 LEDs per carton. Each carton contains 100 LEDs from the same performance bin.

Dimensions are in inches.
Tolerances: $\pm .13$
 $x^\circ \pm 1^\circ$



PATENT LABEL IS LOCATED ON UNDERSIDE OF CARTON



LABEL WITH CREE BIN CODE, QUANTITY, LOT #

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