Cree® XLamp® CXA1830 LED



PRODUCT DESCRIPTION

The XLamp® CXA1830 LED array expands Cree's family of high-flux, multi-die arrays in a smaller, easy-to-use platform. With XLamp LED lighting-class reliability, the CXA1830's small, uniform emitting surface enables both directional and non-directional lighting applications including lamp retrofit and luminaire designs. Available in 2-step, 3-step and 4-step color consistency, and featuring a 14-mm optical source, the CXA1830 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 CXA1830 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 4000 K, 5000 K, 5700 K & 6500 K
- Available in 70-, 80-, 90- and 93-minimum CRI options
- Forward voltage option: 36-V class
- 85 °C binning and characterization
- Maximum drive current: 1400 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

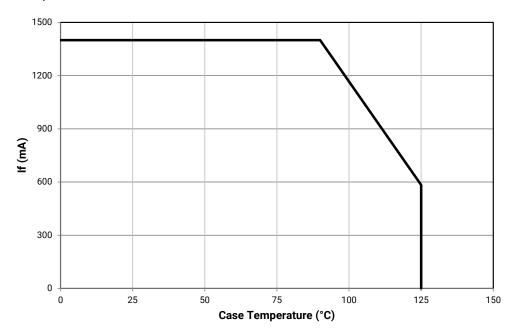
Characteristics	Unit	Minimum	Typical	Maximum
Viewing angle (FWHM)	degrees		115	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current	mA			1400*
Reverse current	mA			0.1
Forward voltage (800 mA, 85 °C)	V		36.4	
Forward voltage (800 mA, 25 °C)	V			42

^{*} Refer to the Operating Limits section.

OPERATING LIMITS

The maximum current rating of the CXA1830 depends on the case temperature (Tc) 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 Dimensions section on page 14 for the location of the Tc measurement point.

Another important factor in good thermal management is the temperature of the Light Emitting Surface (LES). Cree 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 $^{\circ}$ ORDER CODES AND BINS (I_F = 800 mA, T_J = 85 °C)

The following table provides order codes for XLamp CXA1830 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 14).

Nominal	С	RI	Minin	num Lumino	ous Flux		2-Step		3-Step		4-Step				
CCT	Min	Тур	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code				
			T4	3440	3887						CXA1830-0000- 000N00T465F				
	70 75	70 75	70 75	70 75	70 7	75	U2	3680	4158					65F	CXA1830-0000- 000N00U265F
6500 K			U4	3955	4424						CXA1830-0000- 000N00U465F				
	80		T4	3440	3887					65F	CXA1830-0000- 000N0HT465F				
	80		U2	3680	4158					00F	CXA1830-0000- 000N0HU265F				
			T4	3440	3887						CXA1830-0000- 000N00T457F				
	70	75	U2	3680	4158					57F	CXA1830-0000- 000N00U257F				
5700 K			U4	3955	4424						CXA1830-0000- 000N00U457F				
	80	80	80		T4	3440	3887					E7F	CXA1830-0000- 000N0HT457F		
	80		U2	3680	4158					57F	CXA1830-0000- 000N0HU257F				
			T4	3440	3887		CXA1830-0000- 000N00T450H				CXA1830-0000- 000N00T450F				
	70 75	U2	3680	4158	50H	CXA1830-0000- 000N00U250H			50F	CXA1830-0000- 000N00U250F					
			U4	3955	4424		CXA1830-0000- 000N00U450H				CXA1830-0000- 000N00U450F				
			T2	3200	3616		CXA1830-0000- 000N0HT250H				CXA1830-0000- 000N0HT250F				
5000 K	80		T4	3440	3887	50H	CXA1830-0000- 000N0HT450H	50G	CXA1830-0000- 000N0HT450G	50F	CXA1830-0000- 000N0HT450F				
			U2	3680	4158		CXA1830-0000- 000N0HU250H		CXA1830-0000- 000N0HU250G		CXA1830-0000- 000N0HU250F				
			R4	2600	2938		CXA1830-0000- 000N0UR450H		CXA1830-0000- 000N0UR450G		CXA1830-0000- 000N0UR450F				
	90 95	95	S2	2780	780 3141 50H	50H	CXA1830-0000- 000N0US250H	50G	CXA1830-0000- 000N0US250G	50F	CXA1830-0000- 000N0US250F				
			S4	2990	3379		CXA1830-0000- 000N0US450H		CXA1830-0000- 000N0US450G		CXA1830-0000- 000N0US450F				

- Cree 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).
- Cree XLamp CXA1830 LED order codes specify only a minimum flux bin and not a maximum. Cree 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 $^{\circ}$ ORDER CODES AND BINS (I $_{\rm F}$ = 800 mA, T $_{\rm I}$ = 85 °C) - CONTINUED

Nominal	С	RI	Minin	num Lumino	ous Flux		2-Step	2-Step		4-Step		
CCT	Min	Тур	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code	
			T4	3440	3887		CXA1830-0000- 000N00T440H				CXA1830-0000- 000N00T440F	
	70	75	U2	3680	4158	40H	CXA1830-0000- 000N00U240H			40F	CXA1830-0000- 000N00U240F	
			U4	3955	4424		CXA1830-0000- 000N00U440H				CXA1830-0000- 000N00U440F	
			T2	3200	3616		CXA1830-0000- 000N0HT240H				CXA1830-0000- 000N0HT240F	
4000 K	80		T4	3440	3887	40H	CXA1830-0000- 000N0HT440H	40G	CXA1830-0000- 000N0HT440G	40F	CXA1830-0000- 000N0HT440F	
			U2	3680	4158		CXA1830-0000- 000N0HU240H		CXA1830-0000- 000N0HU240G		CXA1830-0000- 000N0HU240F	
			R4	2600	2938	CXA1830-0000- 000N0UR440H				CXA1830-0000- 000N0UR440F		
	90 95	90 95	90 95	S2	2780	3141	40H	CXA1830-0000- 000N0US240H	40G	CXA1830-0000- 000N0US240G	40F	CXA1830-0000- 000N0US240F
			S4	2990	3379		CXA1830-0000- 000N0US440H		CXA1830-0000- 000N0US440G		CXA1830-0000- 000N0US440F	
	80		S4	2990	3379	35H	CXA1830-0000- 000N00S435H	35G			CXA1830-0000- 000N00S435F	
		80	T2	3200	3616		CXA1830-0000- 000N00T235H		CXA1830-0000- 000N00T235G	35F	CXA1830-0000- 000N00T235F	
3500 K			T4	3440	3887		CXA1830-0000- 000N00T435H		CXA1830-0000- 000N00T435G		CXA1830-0000- 000N00T435F	
3500 K			R2	2420	2735		CXA1830-0000- 000N0YR235H				CXA1830-0000- 000N0YR235F	
	93	95	R4	2600	2938	35H	CXA1830-0000- 000N0YR435H	35G	CXA1830-0000- 000N0YR435G	35F	CXA1830-0000- 000N0YR435F	
			S2	2780	3141		CXA1830-0000- 000N0YS235H		CXA1830-0000- 000N0YS235G		CXA1830-0000- 000N0YS235F	
			S4	2990	3379		CXA1830-0000- 000N00S430H				CXA1830-0000- 000N00S430F	
	80		T2	3200	3616	30H	CXA1830-0000- 000N00T230H	30G	CXA1830-0000- 000N00T230G	30F	CXA1830-0000- 000N00T230F	
3000 K			T4	3440	3887		CXA1830-0000- 000N00T430H		CXA1830-0000- 000N00T430G		CXA1830-0000- 000N00T430F	
3000 K	93		Q4	2260	2554		CXA1830-0000- 000N0YQ430H				CXA1830-0000- 000N0YQ430F	
		93 95	R2	2420	2735	30H	CXA1830-0000- 000N0YR230H	30G	CXA1830-0000- 000N0YR230G	30F	CXA1830-0000- 000N0YR230F	
			R4	2600	2938		CXA1830-0000- 000N0YR430H		CXA1830-0000- 000N0YR430G		CXA1830-0000- 000N0YR430F	

- Cree 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).
- Cree XLamp CXA1830 LED order codes specify only a minimum flux bin and not a maximum. Cree 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 $^{\circ}$ ORDER CODES AND BINS (I $_{\rm F}$ = 800 mA, T $_{\rm I}$ = 85 °C) - CONTINUED

Nominal	Nominal CRI		Minimum Luminous Flux			2-Step		3-Step	4-Step																	
CCT	Min	Тур	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code															
	S2 80 S4 T2	2780	3141		CXA1830-0000- 000N00S227H				CXA1830-0000- 000N00S227F																	
		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80		S4	2990	3379	27H	CXA1830-0000- 000N00S427H	27G	CXA1830-0000- 000N00S427G	27F	CXA1830-0000- 000N00S427F
2700 K			T2	3200	3616		CXA1830-0000- 000N00T227H		CXA1830-0000- 000N00T227G		CXA1830-0000- 000N00T227F															
2700 K	93 95	93 95	93 95	93 95							Q2	2100	2373		CXA1830-0000- 000N0YQ227H				CXA1830-0000- 000N0YQ227F							
					93 95 Q4 2260 2554 27H	CXA1830-0000- 000N0YQ427H	27G	CXA1830-0000- 000N0YQ427G	27F	CXA1830-0000- 000N0YQ427F																
								R2			R2	2420	2735		CXA1830-0000- 000N0YR227H		CXA1830-0000- 000N0YR227G		CXA1830-0000- 000N0YR227F							

- Cree 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).
- Cree XLamp CXA1830 LED order codes specify only a minimum flux bin and not a maximum. Cree 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 ($I_F = 800 \text{ mA}$, $T_J = 85 ^{\circ}\text{C}$)

The following table provides order codes for XLamp CXA1830 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 14).

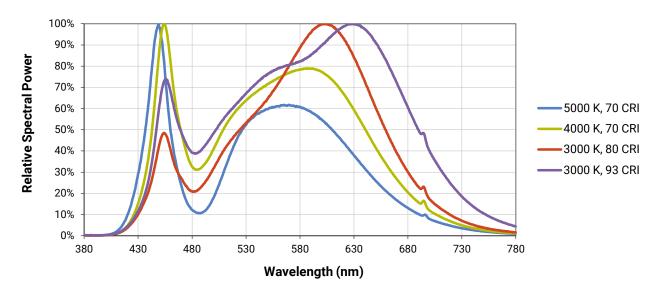
Nominal	C	RI	М	inimum Luminous	Flux		
CCT	Min	Тур	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Regions	Order Code
			T4	3440	3887		CXA1830-0000-000N00T40E1
	70	75	U2	3680	4158	1A0, 1B0, 1C0, 1D0, 65F	CXA1830-0000-000N00U20E1
6500 K			U4	3955	4424		CXA1830-0000-000N00U40E1
	80		T4	3440	3887	1A0, 1B0, 1C0, 1D0, 65F	CXA1830-0000-000N0HT40E1
	80		U2	3680	4158	TAU, TBU, TCU, TDU, 03F	CXA1830-0000-000N0HU20E1
			T4	3440	3887		CXA1830-0000-000N00T40E2
	70	75	U2	3680	4158	2A0, 2B0, 2C0, 2D0, 57F	CXA1830-0000-000N00U20E2
5700 K			U4	3955	4424		CXA1830-0000-000N00U40E2
	80		T4	3440	3887	240 200 200 200 575	CXA1830-0000-000N0HT40E2
	80		U2	3680	4158	2A0, 2B0, 2C0, 2D0, 57F	CXA1830-0000-000N0HU20E2
			T4	3440	3887		CXA1830-0000-000N00T40E3
	70	75	U2	3680	4158	3A0, 3B0, 3C0, 3D0, 50F	CXA1830-0000-000N00U20E3
5000 K			U4	3955	4424		CXA1830-0000-000N00U40E3
5000 K			T2	3200	3616		CXA1830-0000-000N0HT20E3
	80		T4	3440	3887	3A0, 3B0, 3C0, 3D0, 50F	CXA1830-0000-000N0HT40E3
			U2	3680	4158		CXA1830-0000-000N0HU20E3
			T4	3440	3887		CXA1830-0000-000N00T40E5
4000 K	70	75	U2	3680	4158	5A0, 5B0, 5C0, 5D0, 40F	CXA1830-0000-000N00U20E5
			U4	3955	4424		CXA1830-0000-000N00U40E5

- Cree 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).
- Cree XLamp CXA1830 LED order codes specify only a minimum flux bin and not a maximum. Cree 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.



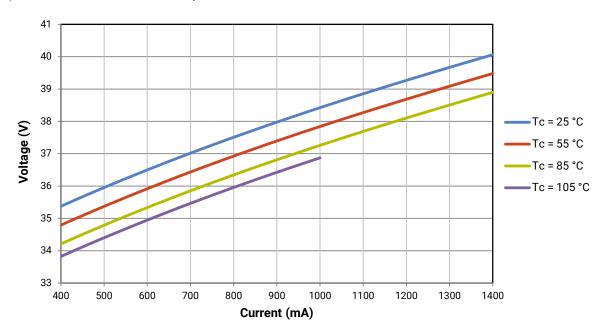
RELATIVE SPECTRAL POWER DISTRIBUTION

The following graph is the result of a series of pulsed measurements at 800 mA and T_1 = 85 °C.



ELECTRICAL CHARACTERISTICS

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



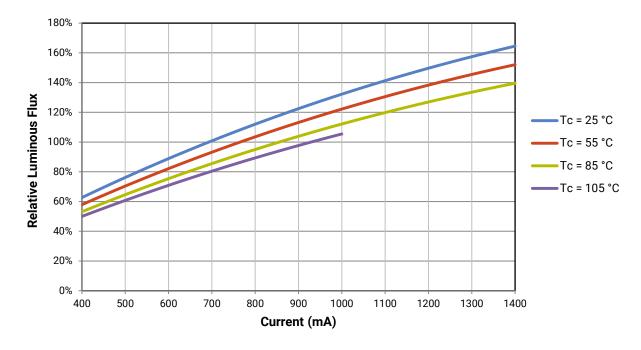


RELATIVE LUMINOUS FLUX

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

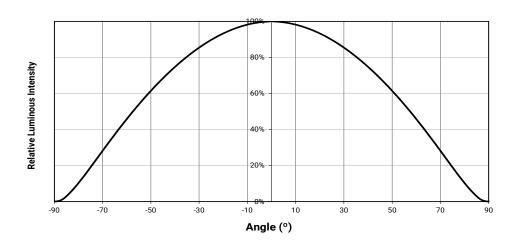
- · Measurements of CXA1830 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 800 mA at T₁ = 85 °C.

For example, at steady-state operation of Tc = 25 °C, I_F = 1100 mA, the relative luminous flux ratio is 140% in the chart below. A CXA1830 LED that measures 2100 lm during binning will deliver 2940 lm (2100 * 1.4) at steady-state operation of Tc = 25 °C, I_F = 1100 mA.





TYPICAL SPATIAL DISTRIBUTION



PERFORMANCE GROUPS - BRIGHTNESS (I_E = 800 mA, T_i = 85 °C)

XLamp CXA1830 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Minimum Luminous Flux	Maximum Luminous Flux
Q2	2100	2260
Q4	2260	2420
R2	2420	2600
R4	2600	2780
S2	2780	2990
S4	2990	3200
T2	3200	3440
T4	3440	3680
U2	3680	3955
U4	3955	4230
V2	4230	4545



PERFORMANCE GROUPS - CHROMATICITY (T₁ = 85 °C)

XLamp CXA1830 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

EasyV	EasyWhite Color Temperatures – 2-Step								
Code	CCT	х	у						
		0.3429	0.3507						
50H	5000 K	0.3434	0.3571						
эин	5000 K	0.3475	0.3604						
		0.3469	0.3539						
		0.3784	0.3741						
40H	4000 K	0.3804	0.3818						
4 0П	4000 K	0.3867	0.3857						
		0.3844	0.3778						
		0.4030	0.3857						
35H	3500 K	0.4061	0.3941						
3511		0.4132	0.3976						
		0.4099	0.3890						
		0.4291	0.3973						
30H	3000 K	0.4333	0.4062						
зип	3000 K	0.4395	0.4084						
		0.4351	0.3994						
		0.4528	0.4046						
27H	2700 K	0.4578	0.4138						
2/П	2/00 K	0.4638	0.4152						
		0.4586	0.4060						

	EasyWhite Color Temperatures - 3-Step Ellipse								
Bin Code	сст	Cente	r Point	Major Axis	Minor Axis	Rotation Angle			
Bill Code	CCI	x	у	а	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 ($T_J = 85$ °C) - CONTINUED

EasyWhite Color Temperatures – 4-Step							
Code	CCT	х	у				
		0.3097	0.3196				
655	(F00 K	0.3079	0.3297				
65F	6500 K	0.3164	0.3382				
		0.3176	0.3275				
		0.3253	0.3325				
F7F	F700 K	0.3249	0.3439				
57F	5700 K	0.3331	0.3514				
		0.3330	0.3393				
		0.3407	0.3459				
505	E000 I/	0.3415	0.3586				
50F	5000 K	0.3499	0.3654				
		0.3484	0.3521				
		0.3744	0.3685				
40F	4000 K	0.3782	0.3837				
40F		0.3912	0.3917				
		0.3863	0.3758				
		0.3981	0.3800				
35F	3500 K	0.4040	0.3966				
335	3300 K	0.4186	0.4037				
		0.4116	0.3865				
		0.4242	0.3919				
30F	3000 K	0.4322	0.4096				
301	3000 K	0.4449	0.4141				
		0.4359	0.3960				
		0.4475	0.3994				
27F	2700 K	0.4573	0.4178				
2/F	2/00 K	0.4695	0.4207				
		0.4589	0.4021				



PERFORMANCE GROUPS - CHROMATICITY (T, = 85 °C) - CONTINUED

	ANSI White Bins								
Code	ССТ	Bin Code	х	у					
		1A0	0.3048	0.3207					
			0.3130	0.3290					
			0.3144	0.3186					
			0.3068	0.3113					
	4500 V	1B0	0.3028	0.3304					
			0.3115	0.3391					
			0.3130	0.3290					
051			0.3048	0.3207					
0E1	6500 K	100	0.3115	0.3391					
			0.3205	0.3481					
		1C0	0.3213	0.3373					
			0.3130	0.3290					
			0.3130	0.3290					
		100	0.3213	0.3373					
		1D0	0.3221	0.3261					
			0.3144	0.3186					

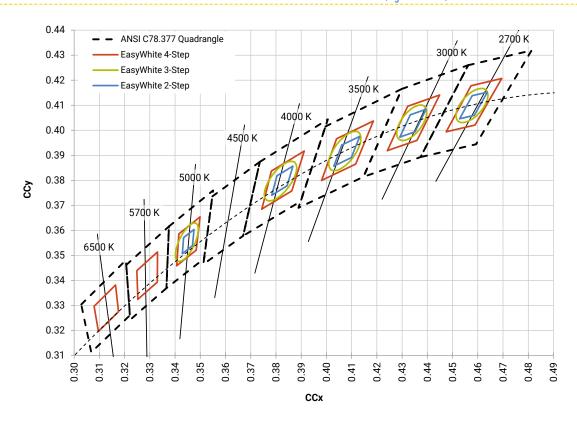
	ANSI White Bins								
Code	сст	Bin Code	х	у					
			0.3215	0.3350					
		2A0	0.3290	0.3417					
			0.3290	0.3300					
			0.3222	0.3243					
		2B0	0.3207	0.3462					
	5700 K		0.3290	0.3538					
			0.3290	0.3417					
050			0.3215	0.3350					
0E2		000	0.3290	0.3538					
			0.3376	0.3616					
		2C0	0.3371	0.3490					
			0.3290	0.3417					
			0.3290	0.3417					
		000	0.3371	0.3490					
		2D0	0.3366	0.3369					
			0.3290	0.3300					

ANSI White Bins						
Code	ССТ	Bin Code	х	у		
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		

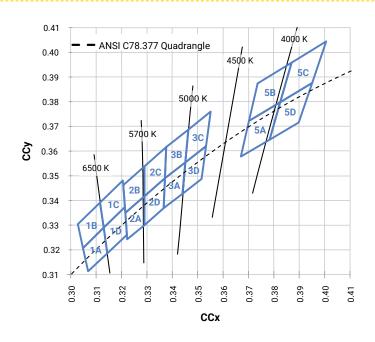
ANSI White Bins						
Code	ССТ	Bin Code	х	у		
0E5	4000 K	5A0	.3670	.3578		
			.3702	.3722		
			.3825	.3798		
			.3783	.3646		
		5B0	.3702	.3722		
			.3736	.3874		
			.3869	.3958		
			.3825	.3798		
		5C0	.3825	.3798		
			.3869	.3958		
			.4006	.4044		
			.3950	.3875		
		5D0	.3783	.3646		
			.3825	.3798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

CREE 💠

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



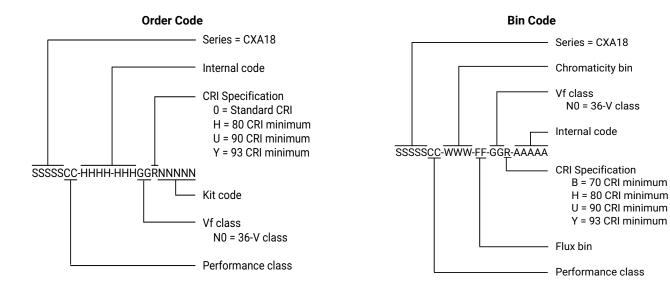
CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE (T, = 85 °C)





BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:

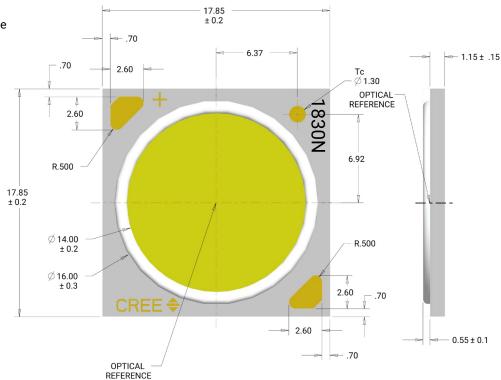


MECHANICAL DIMENSIONS

Dimensions are in mm. Tolerances unless otherwise specified: \pm .13 $x^{\circ} \pm 1^{\circ}$

Meaning of 1830N

1830N = 36-V CXA1830





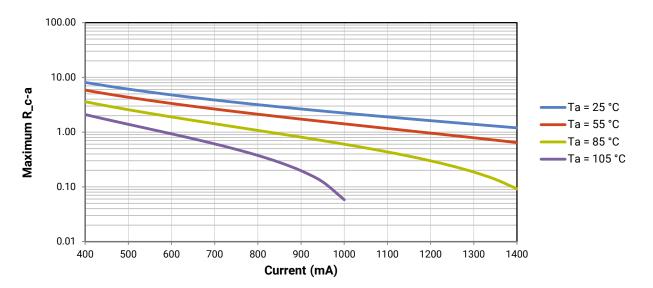
THERMAL DESIGN

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 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 Cree 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 Cree XLamp CX Family LEDs soldering and handling document. The CX Family LED besign Guide provides basic information on the requirements to use Cree XLamp CXA LEDs successfully in luminaire designs.

To keep the CXA1830 LED at or below the maximum rated Tc, 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_t im) plus the thermal resistance of the heat sink (R_t).





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'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 applies to ensure long-term reliability for XLamp LEDs and details of Cree's pre-release qualification testing for XLamp LEDs.

Lumen Maintenance

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.

Please read the Long-Term Lumen Maintenance application note for more details on Cree'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 representative or from the Product Ecology section of the Cree 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 representative to insure you get the most up-to-date REACh SVHC 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

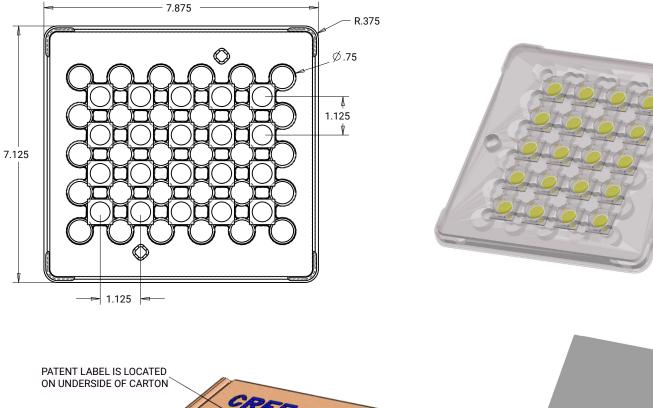
WARNING: Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the LED Eye Safety application note.



PACKAGING

Cree CXA1830 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 $x^{\circ} \pm 1^{\circ}$





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