# CREE 💠

# 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**

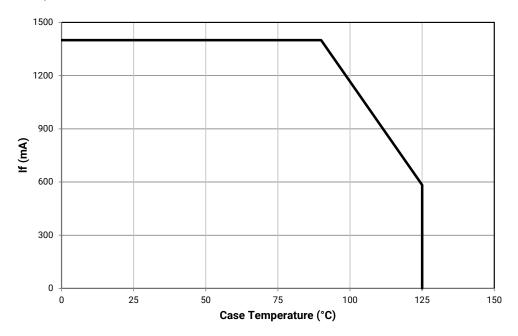
Characteristics	Unit	Minimum	Typical	Maximum
Viewing angle (FWHM)	degrees		115	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current	mA			1400*
Reverse current	mA			0.1
Forward voltage (800 mA, 85 °C)	V		36.4	
Forward voltage (800 mA, 25 °C)	V			42

<sup>\*</sup> 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<sub>F</sub> = 800 mA, T<sub>J</sub> = 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	
	70 75		T4	3440	3887						CXA1830-0000- 000N00T465F	
		70 75	70 75	75	U2	3680	4158					65F
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		T4	3440	3887					57F	CXA1830-0000- 000N0HT457F
	80		U2	3680	4158					5/F	CXA1830-0000- 000N0HU257F	
			T4	3440	3887		CXA1830-0000- 000N00T450H				CXA1830-0000- 000N00T450F	
	70 75	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	S2	2780	3141	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<sub>F</sub> = 800 mA, T<sub>I</sub> = 85 °C) - CONTINUED

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- 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	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		
			S4	2990	3379	35H	CXA1830-0000- 000N00S435H	35G			CXA1830-0000- 000N00S435F		
	80	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		
3300 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			Q4	2260	2554		CXA1830-0000- 000N0YQ430H				CXA1830-0000- 000N0YQ430F		
	93	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														
ССТ	Min	Тур	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code												
	80		S2	2780	3141		CXA1830-0000- 000N00S227H				CXA1830-0000- 000N00S227F												
		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	T2 3200	3616		CXA1830-0000- 000N00T227H		CXA1830-0000- 000N00T227G		CXA1830-0000- 000N00T227F												
2700 K	93 95	93 95	93 95	93 95	93 95	93 95									Q2	2100	2373		CXA1830-0000- 000N0YQ227H				CXA1830-0000- 000N0YQ227F
							95	Q4	2260	2554	27H	CXA1830-0000- 000N0YQ427H	27G	CXA1830-0000- 000N0YQ427G	27F	CXA1830-0000- 000N0YQ427F							
								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 ( $I_F = 800 \text{ mA}$ , $T_I = 85 ^{\circ}\text{C}$ )

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).

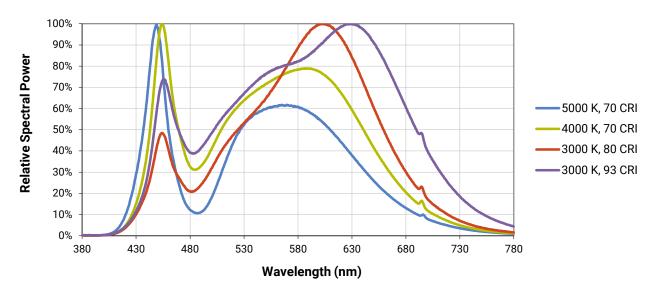
Nominal	Cl	RI	М	inimum Luminous	Flux					
CCT	Min	Тур	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Regions	Order Code			
			T4	3440	3887		CXA1830-0000-000N00T40E1			
	70	75	U2	3680	4158	1A0, 1B0, 1C0, 1D0, 65F	CXA1830-0000-000N00U20E1			
6500 K			U4	3955	4424		CXA1830-0000-000N00U40E1			
	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	2A0, 2B0, 2C0, 2D0, 57F	CXA1830-0000-000N0HT40E2			
	80		U2	3680	4158	ZAU, ZBU, ZGU, ZDU, 37F	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			
3000 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	K 70	0 K 70	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.



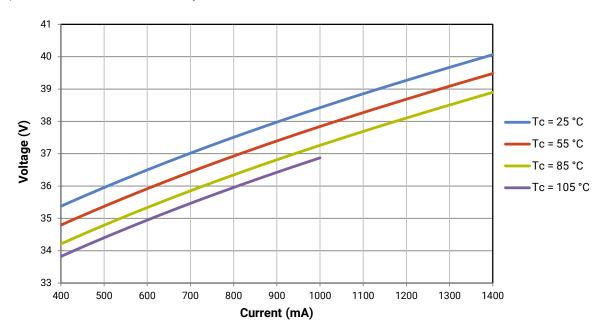
## **RELATIVE SPECTRAL POWER DISTRIBUTION**

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.



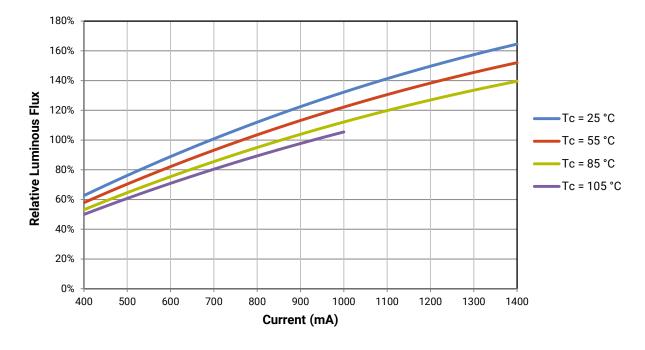


### **RELATIVE LUMINOUS FLUX**

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

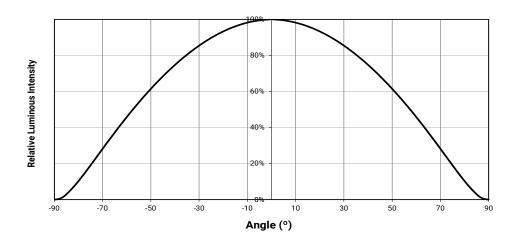
- · Measurements of CXA1830 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 800 mA at T<sub>1</sub> = 85 °C.

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<sub>E</sub> = 800 mA, T<sub>i</sub> = 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 (T<sub>1</sub> = 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	ССТ	х	у					
		0.3429	0.3507					
50H	5000 K	0.3434	0.3571					
SUFI	5000 K	0.3475	0.3604					
		0.3469	0.3539					
		0.3784	0.3741					
40H	4000 K	0.3804	0.3818					
40H	4000 K	0.3867	0.3857					
		0.3844	0.3778					
		0.4030	0.3857					
35H	3500 K	0.4061	0.3941					
3311		0.4132	0.3976					
		0.4099	0.3890					
		0.4291	0.3973					
30H	3000 K	0.4333	0.4062					
3011	3000 K	0.4395	0.4084					
		0.4351	0.3994					
		0.4528	0.4046					
27H	2700 K	0.4578	0.4138					
2/П	2700 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			
Bin Code	CCI	х	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	ССТ	х	у				
		0.3097	0.3196				
	6 F00 16	0.3079	0.3297				
65F	6500 K	0.3164	0.3382				
		0.3176	0.3275				
		0.3253	0.3325				
F7F	5700 I/	0.3249	0.3439				
57F	5700 K	0.3331	0.3514				
		0.3330	0.3393				
		0.3407	0.3459				
50F	5000 K	0.3415	0.3586				
SUF	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 ( $T_J = 85$ °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				
		1B0	0.3028	0.3304				
	6500 W		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				

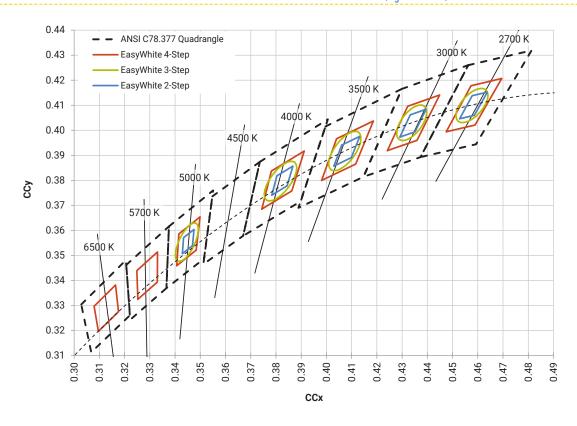
	ANSI White Bins								
Code	сст	Bin Code	х	у					
		2A0	0.3215	0.3350					
			0.3290	0.3417					
			0.3290	0.3300					
			0.3222	0.3243					
		2B0	0.3207	0.3462					
	F700 W		0.3290	0.3538					
			0.3290	0.3417					
050			0.3215	0.3350					
0E2	5700 K	000	0.3290	0.3538					
			0.3376	0.3616					
		2C0	0.3371	0.3490					
			0.3290	0.3417					
			0.3290	0.3417					
		2D0	0.3371	0.3490					
		200	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		

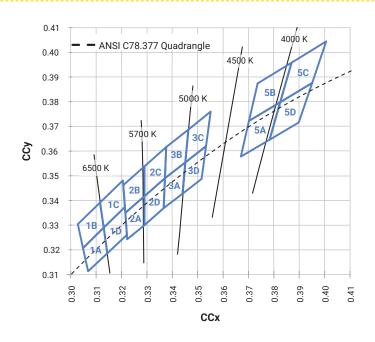
ANSI White Bins						
Code	сст	Bin Code	х	у		
0E5	4000 K	5A0	.3670	.3578		
			.3702	.3722		
			.3825	.3798		
			.3783	.3646		
		5B0	.3702	.3722		
			.3736	.3874		
			.3869	.3958		
			.3825	.3798		
		5C0	.3825	.3798		
			.3869	.3958		
			.4006	.4044		
			.3950	.3875		
		5D0	.3783	.3646		
			.3825	.3798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

# CREE 💠

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



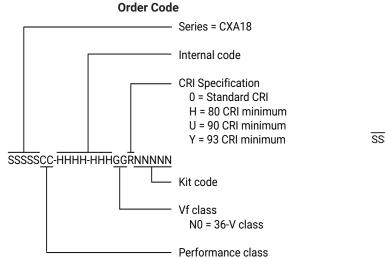
## CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE (T, = 85 °C)

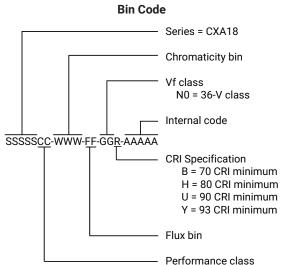




### **BIN AND ORDER CODE FORMATS**

Bin codes and order codes are configured as follows:





## **MECHANICAL DIMENSIONS**

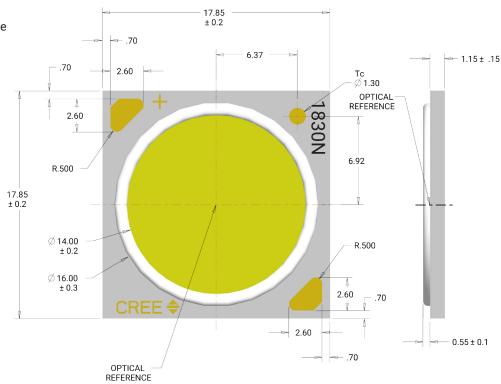
Dimensions are in mm.

Tolerances unless otherwise specified: ±.13

x° ±1°

### Meaning of 1830N

1830N = 36-V CXA1830





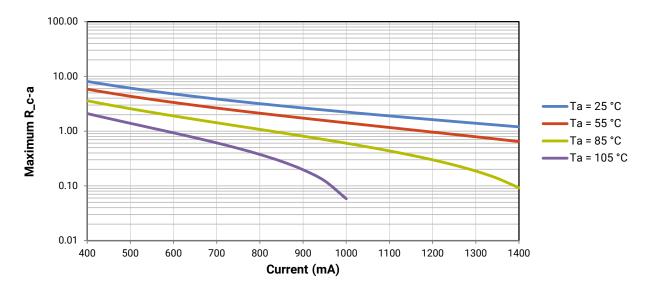
#### THERMAL DESIGN

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 Design 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**

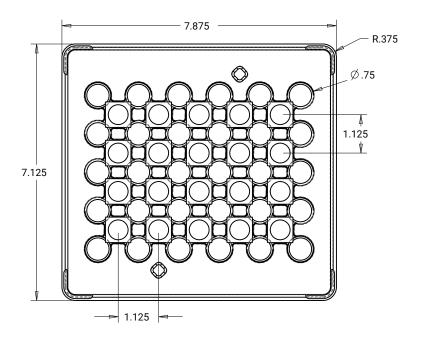
WARNING: Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the LED Eye Safety application note.



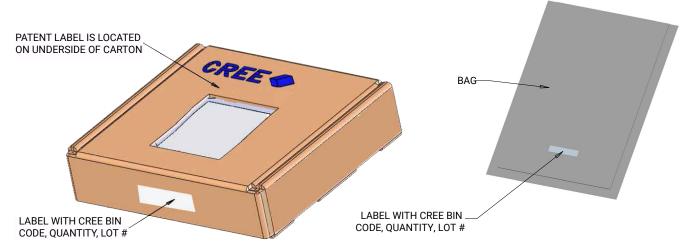
## **PACKAGING**

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









Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

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Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России, а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

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С нами вы становитесь еще успешнее!

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