Cree® XLamp® CXA1310 LED

PRODUCT DESCRIPTION

The XLamp® CXA1310 LED is Cree's newest High Density (HD) LED array, featuring a 6-mm optical source and enabling lighting manufacturers to create a new generation of products that delivers the same intensity and light quality as 20-W ceramic metal halide (CMH) at up to 50 percent lower power. The new HD class of CXA arrays provide unrivaled lumen density that can reduce system cost for the next generation of LED spotlights.

The CX Family LED Design Guide provides basic information on the requirements to use the CXA1310 LED successfully in luminaire designs.

FEATURES

- Available in 4-step and 2-step EasyWhite® bins at 2700 K, 3000 K, 3500 K, 4000 K, 5000 K, 5700 K and 6500 K CCT
- Available in ANSI white bins at 4000 K, 5000 K, 5700 K and 6500 K CCT
- Available in 70-, 80- and 93-minimum CRI options
- Forward voltage options: 18-V class & 36-V class
- 85 °C binning and characterization
- Maximum drive current: 1050 mA (18 V), 525mA (36 V)
- 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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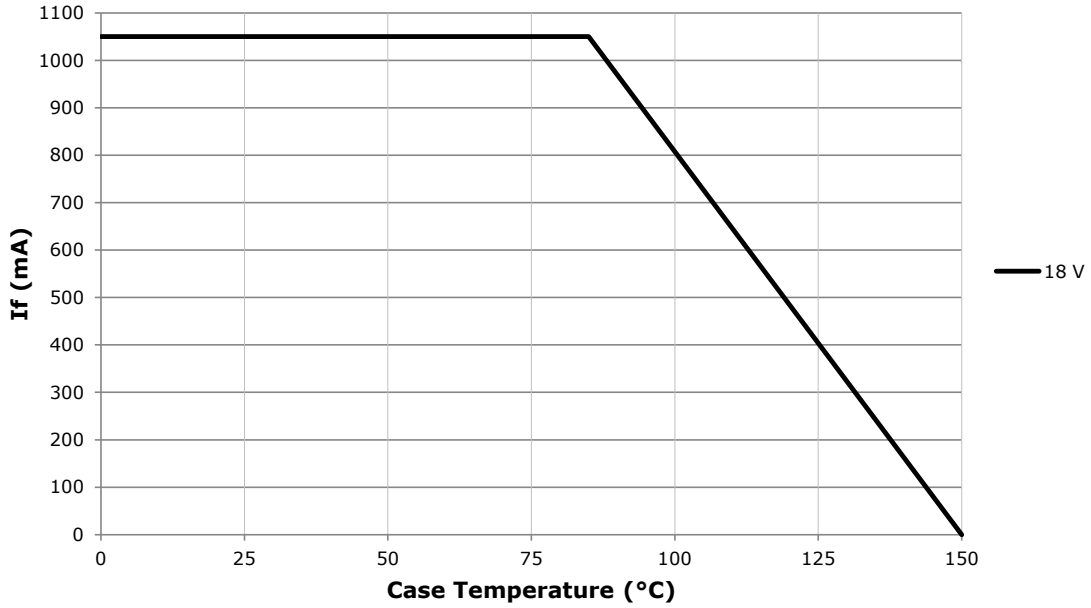
CHARACTERISTICS

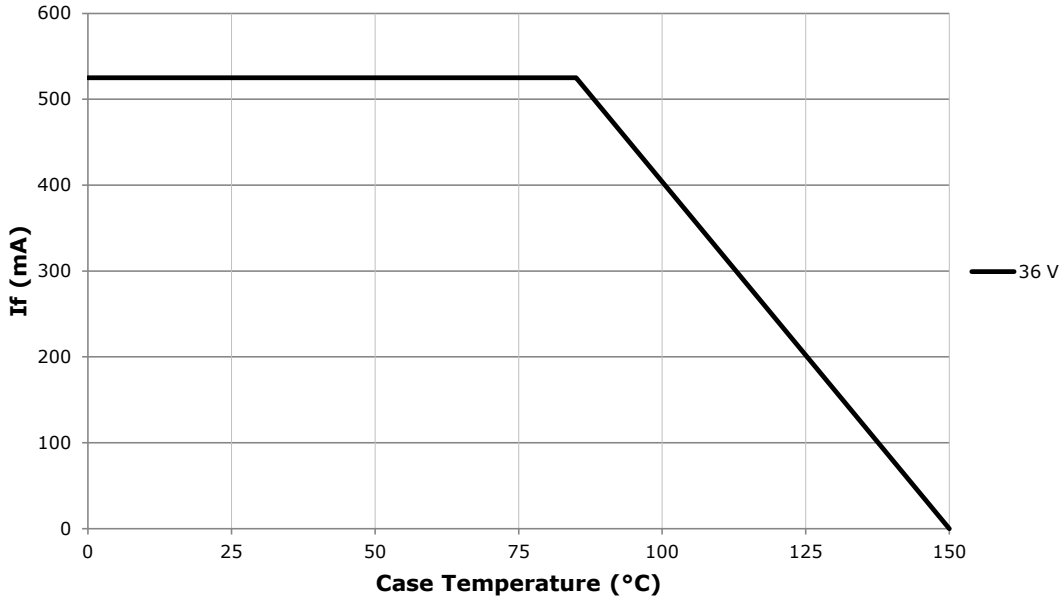
Characteristics	Unit	Minimum	Typical	Maximum
Viewing angle (FWHM)	degrees		115	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current (18 V)	mA			1050*
DC forward current (36 V)	mA			525*
Reverse current	mA			0.1
Forward voltage (18 V, @ 700 mA, 85 °C)	V		17.8	
Forward voltage (18 V, @ 700 mA, 25 °C)	V			21
Forward voltage (36 V, @ 350 mA, 85 °C)	V		35.6	
Forward voltage (36 V, @ 350 mA, 25 °C)	V			42

* Refer to the Operating Limits section.

OPERATING LIMITS

The maximum current rating of the CXA1310 is dependent on the case temperature (Tc) when the LED has reached thermal equilibrium under steady-state operation. The graphs shown below assume 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 18 for the location of the Tc measurement point.





FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 18 V (I_F = 700 mA, T_J = 85 °C)

The following table provides order codes for XLamp CXA1310 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 18).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 700 mA			2-Step		4-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region	Order Code	Chromaticity Region	Order Code
6500 K	70	75	K2	1200	1344			65F	CXA1310-0000-000F00K265F
			K4	1290	1445				CXA1310-0000-000F00K465F
	80	---	J4	1120	1255			65F	CXA1310-0000-000F0HJ465F
			K2	1200	1344				CXA1310-0000-000F0HK265F
5700 K	70	75	K2	1200	1344			57F	CXA1310-0000-000F00K257F
			K4	1290	1445				CXA1310-0000-000F00K457F
	80	---	J4	1120	1255			57F	CXA1310-0000-000F0HJ457F
			K2	1200	1344				CXA1310-0000-000F0HK257F
5000 K	70	75	K2	1200	1344	50H	CXA1310-0000-000F00K250H	50F	CXA1310-0000-000F00K250F
			K4	1290	1445		CXA1310-0000-000F00K450H		CXA1310-0000-000F00K450F
	80	---	J4	1120	1255	50H	CXA1310-0000-000F0HJ450H	50F	CXA1310-0000-000F0HJ450F
			K2	1200	1344		CXA1310-0000-000F0HK250H		CXA1310-0000-000F0HK250F
4000 K	70	75	J4	1120	1255	40H	CXA1310-0000-000F00J440H	40F	CXA1310-0000-000F00J440F
			K2	1200	1344		CXA1310-0000-000F00K240H		CXA1310-0000-000F00K240F
	80	---	J4	1120	1255	40H	CXA1310-0000-000F0HJ440H	40F	CXA1310-0000-000F0HJ440F
			K2	1200	1344		CXA1310-0000-000F0HK240H		CXA1310-0000-000F0HK240F
3500 K	80	---	J2	1040	1165	35H	CXA1310-0000-000F00J235H	35F	CXA1310-0000-000F00J235F
			J4	1120	1255		CXA1310-0000-000F00J435H		CXA1310-0000-000F00J435F
	93	95	G2	780	881	35H	CXA1310-0000-000F0YG235H	35F	CXA1310-0000-000F0YG235F
			G4	840	941		CXA1310-0000-000F0YG435H		CXA1310-0000-000F0YG435F
3000 K	80	---	J2	1040	1165	30H	CXA1310-0000-000F00J230H	30F	CXA1310-0000-000F00J230F
			J4	1120	1255		CXA1310-0000-000F00J430H		CXA1310-0000-000F00J430F
	93	95	G2	780	881	30H	CXA1310-0000-000F0YG230H	30H	CXA1310-0000-000F0YG230F
			G4	840	941		CXA1310-0000-000F0YG430H		CXA1310-0000-000F0YG430F

Notes

- 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 21).
- Cree XLamp CXA1310 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® ORDER CODES AND BINS - 18 V (I_F = 700 mA, T_J = 85 °C) - CONTINUED

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 700 mA			2-Step		4-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region	Order Code	Chromaticity Region	Order Code
2700 K	80	---	H4	970	1086	27H	CXA1310-0000-000F00H427H	27F	CXA1310-0000-000F00H427F
			J2	1040	1165		CXA1310-0000-000F00J227H		CXA1310-0000-000F00J227F
	93	95	F4	730	831	27H	CXA1310-0000-000F0YF427H	27F	CXA1310-0000-000F0YF427F
			G2	780	881		CXA1310-0000-000F0YG227H		CXA1310-0000-000F0YG227F

Notes

- 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 21).
- Cree XLamp CXA1310 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 - 18 V (I_F = 700 mA, T_J = 85 °C)

The following table provides order codes for XLamp CXA1310 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 18).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 700 mA			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
6500 K	70	75	K2	1200	1344	1A0, 1B0, 1C0, 1D0	CXA1310-0000-000F00K20E1
			K4	1290	1445		CXA1310-0000-000F00K40E1
	80	---	J4	1120	1255	1A0, 1B0, 1C0, 1D0	CXA1310-0000-000F0HJ40E1
			K2	1200	1344		CXA1310-0000-000F0HK20E1
5700 K	70	75	K2	1200	1344	2A0, 2B0, 2C0, 2D0	CXA1310-0000-000F00K20E2
			K4	1290	1445		CXA1310-0000-000F00K40E2
	80	---	J4	1120	1255	2A0, 2B0, 2C0, 2D0	CXA1310-0000-000F0HJ40E2
			K2	1200	1344		CXA1310-0000-000F0HK20E2
5000 K	70	75	K2	1200	1344	3A0, 3B0, 3C0, 3D0	CXA1310-0000-000F00K20E3
			K4	1290	1445		CXA1310-0000-000F00K40E3
	80	---	J4	1120	1255	3A0, 3B0, 3C0, 3D0	CXA1310-0000-000F0HJ40E3
			K2	1200	1344		CXA1310-0000-000F0HK20E3
4000 K	70	75	J4	1120	1255	5A0, 5B0, 5C0, 5D0	CXA1310-0000-000F00J40E5
			K2	1200	1344		CXA1310-0000-000F00K20E5
	80	---	J4	1120	1255	5A0, 5B0, 5C0, 5D0	CXA1310-0000-000F0HJ40E5
			K2	1200	1344		CXA1310-0000-000F0HK20E5

Notes

- 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 21).
- Cree XLamp CXA1310 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® ORDER CODES AND BINS - 36 V (I_F = 350 mA, T_J = 85 °C)

The following table provides order codes for XLamp CXA1310 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 18).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 350 mA			2-Step		4-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region	Order Code	Chromaticity Region	Order Code
6500 K	70	75	K2	1200	1344			65F	CXA1310-0000-000N00K265F
			K4	1290	1445				CXA1310-0000-000N00K465F
	80	---	J4	1120	1255			65F	CXA1310-0000-000N0HJ465F
			K2	1200	1344				CXA1310-0000-000N0HK265F
5700 K	70	75	K2	1200	1344			57F	CXA1310-0000-000N00K257F
			K4	1290	1445				CXA1310-0000-000N00K457F
	80	---	J4	1120	1255			57F	CXA1310-0000-000N0HJ457F
			K2	1200	1344				CXA1310-0000-000N0HK257F
5000 K	70	75	K2	1200	1344	50H	CXA1310-0000-000N00K250H	50F	CXA1310-0000-000N00K250F
			K4	1290	1445		CXA1310-0000-000N00K450H		CXA1310-0000-000N00K450F
	80	---	J4	1120	1255	50H	CXA1310-0000-000N0HJ450H	50F	CXA1310-0000-000N0HJ450F
			K2	1200	1344		CXA1310-0000-000N0HK250H		CXA1310-0000-000N0HK250F
4000 K	70	75	J4	1120	1255	40H	CXA1310-0000-000N00J440H	40F	CXA1310-0000-000N00J440F
			K2	1200	1344		CXA1310-0000-000N00K240H		CXA1310-0000-000N00K240F
	80	---	J4	1120	1255	40H	CXA1310-0000-000N0HJ440H	40F	CXA1310-0000-000N0HJ440F
			K2	1200	1344		CXA1310-0000-000N0HK240H		CXA1310-0000-000N0HK240F
3500 K	80	---	J2	1040	1165	35H	CXA1310-0000-000N00J235H	35F	CXA1310-0000-000N00J235F
			J4	1120	1255		CXA1310-0000-000N00J435H		CXA1310-0000-000N00J435F
	93	95	G2	780	881	35H	CXA1310-0000-000N0YG235H	35F	CXA1310-0000-000N0YG235F
			G4	840	941		CXA1310-0000-000N0YG435H		CXA1310-0000-000N0YG435F
3000 K	80	---	J2	1040	1165	30H	CXA1310-0000-000N00J230H	30F	CXA1310-0000-000N00J230F
			J4	1120	1255		CXA1310-0000-000N00J430H		CXA1310-0000-000N00J430F
	93	95	G2	780	881	30H	CXA1310-0000-000N0YG230H	30H	CXA1310-0000-000N0YG230F
			G4	840	941		CXA1310-0000-000N0YG430H		CXA1310-0000-000N0YG430F

Notes

- 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 21).
- Cree XLamp CXA1310 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® ORDER CODES AND BINS - 18 V (I_F = 700 mA, T_J = 85 °C) - CONTINUED

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 350 mA			2-Step		4-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region	Order Code	Chromaticity Region	Order Code
2700 K	80	---	H4	970	1086	27H	CXA1310-0000-000N00H427H	27F	CXA1310-0000-000N00H427F
			J2	1040	1165		CXA1310-0000-000N00J227H		CXA1310-0000-000N00J227F
	93	95	F4	730	831	27H	CXA1310-0000-000N0YF427H	27F	CXA1310-0000-000N0YF427F
			G2	780	881		CXA1310-0000-000N0YG227H		CXA1310-0000-000N0YG227F

Notes

- 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 21).
- Cree XLamp CXA1310 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 - 36 V (I_F = 350 mA, T_J = 85 °C)

The following table provides order codes for XLamp CXA1310 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 18).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 350 mA			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
6500 K	70	75	K2	1200	1344	1A0, 1B0, 1C0, 1D0	CXA1310-0000-000N00K20E1
			K4	1290	1445		CXA1310-0000-000N00K40E1
	80	---	J4	1120	1255	1A0, 1B0, 1C0, 1D0	CXA1310-0000-000N0HJ40E1
			K2	1200	1344		CXA1310-0000-000N0HK20E1
5700 K	70	75	K2	1200	1344	2A0, 2B0, 2C0, 2D0	CXA1310-0000-000N00K20E2
			K4	1290	1445		CXA1310-0000-000N00K40E2
	80	---	J4	1120	1255	2A0, 2B0, 2C0, 2D0	CXA1310-0000-000N0HJ40E2
			K2	1200	1344		CXA1310-0000-000N0HK20E2
5000 K	70	75	K2	1200	1344	3A0, 3B0, 3C0, 3D0	CXA1310-0000-000N00K20E3
			K4	1290	1445		CXA1310-0000-000N00K40E3
	80	---	J4	1120	1255	3A0, 3B0, 3C0, 3D0	CXA1310-0000-000N0HJ40E3
			K2	1200	1344		CXA1310-0000-000N0HK20E3
4000 K	70	75	J4	1120	1255	5A0, 5B0, 5C0, 5D0	CXA1310-0000-000N00J40E5
			K2	1200	1344		CXA1310-0000-000N00K20E5
	80	---	J4	1120	1255	5A0, 5B0, 5C0, 5D0	CXA1310-0000-000N0HJ40E5
			K2	1200	1344		CXA1310-0000-000N0HK20E5

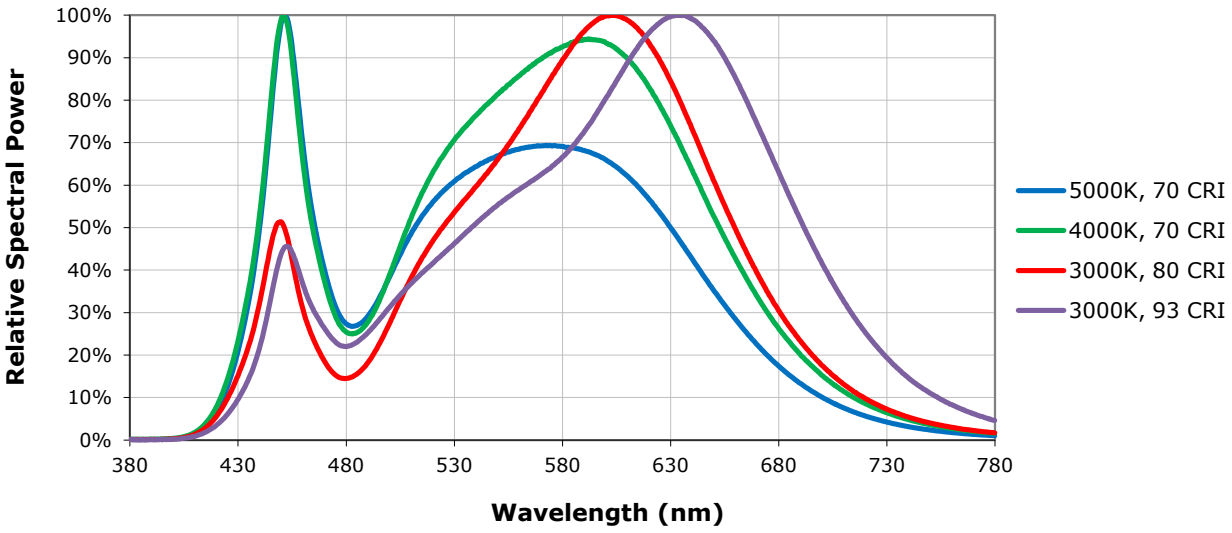
Notes

- 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 21).
- Cree XLamp CXA1310 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.

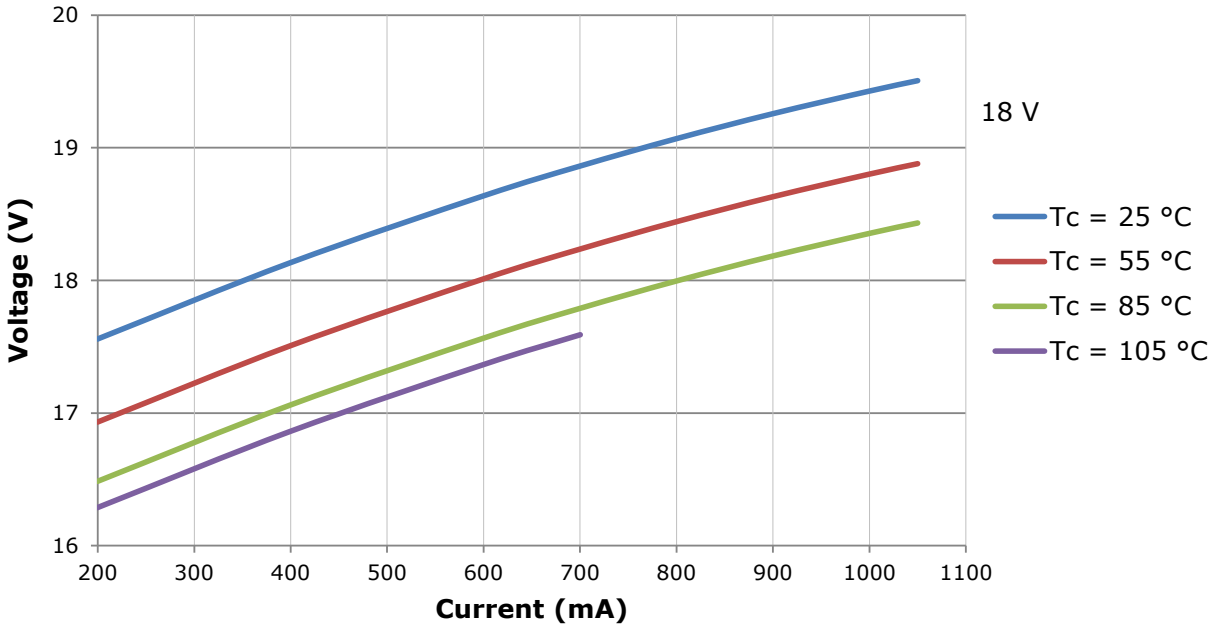
RELATIVE SPECTRAL POWER DISTRIBUTION (18 V, I_F = 700 mA; 36 V, I_F = 350 mA, T_J = 85 °C)

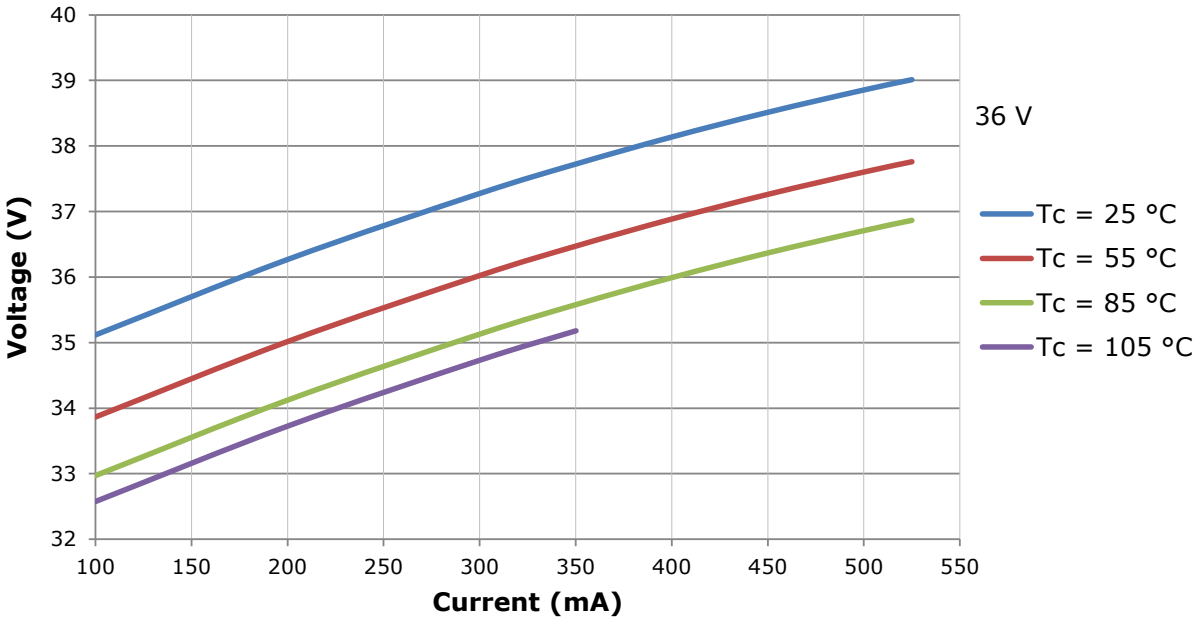
The following graph is the result of a series of pulsed measurements at 350 mA for the 18-V CXA1310 LED and 700 mA for the 36-V CXA1310 LED and T_J = 85 °C.



ELECTRICAL CHARACTERISTICS

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



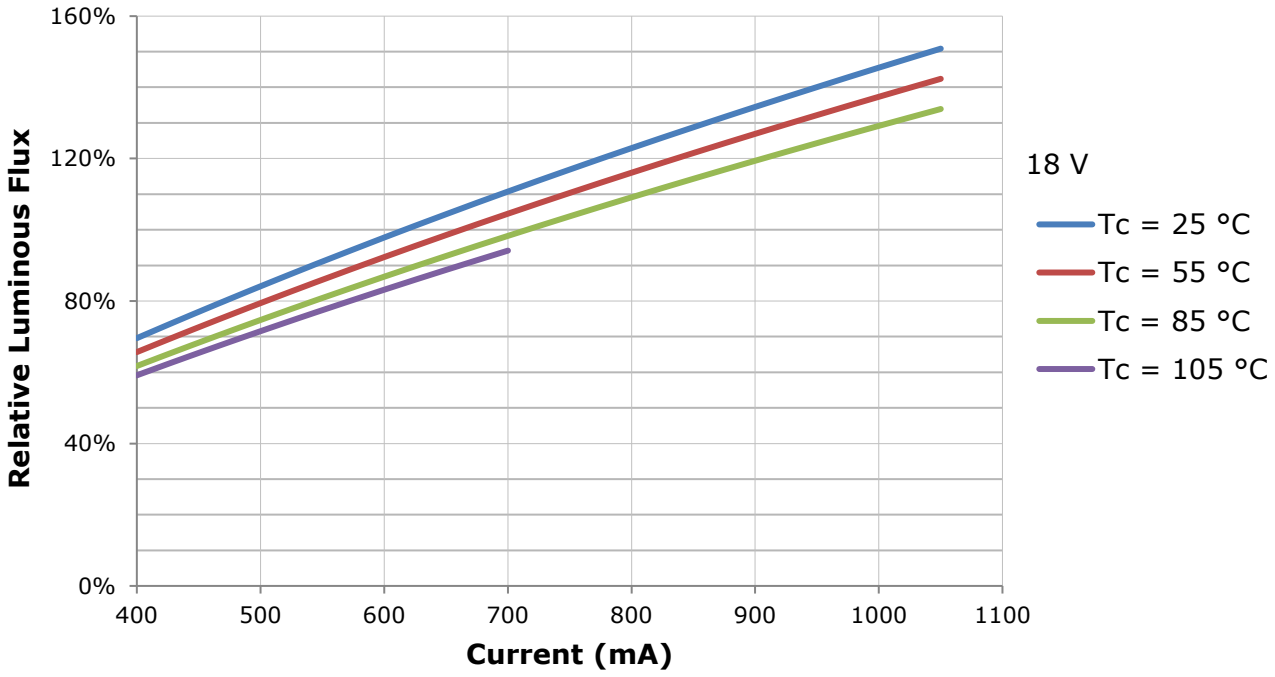


RELATIVE LUMINOUS FLUX

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

- Measurements of CXA1310 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 700 mA at T_J = 85 °C for the 18-V CXA1310 LED.

For example, at steady-state operation of Tc = 55 °C, I_F = 500 mA, the relative luminous flux ratio is 80% in the chart below. A CXA1310 LED that measures 1200 lm during binning will deliver 960 lm (1200 * 0.8) at steady-state operation of Tc = 55 °C, I_F = 500 mA.

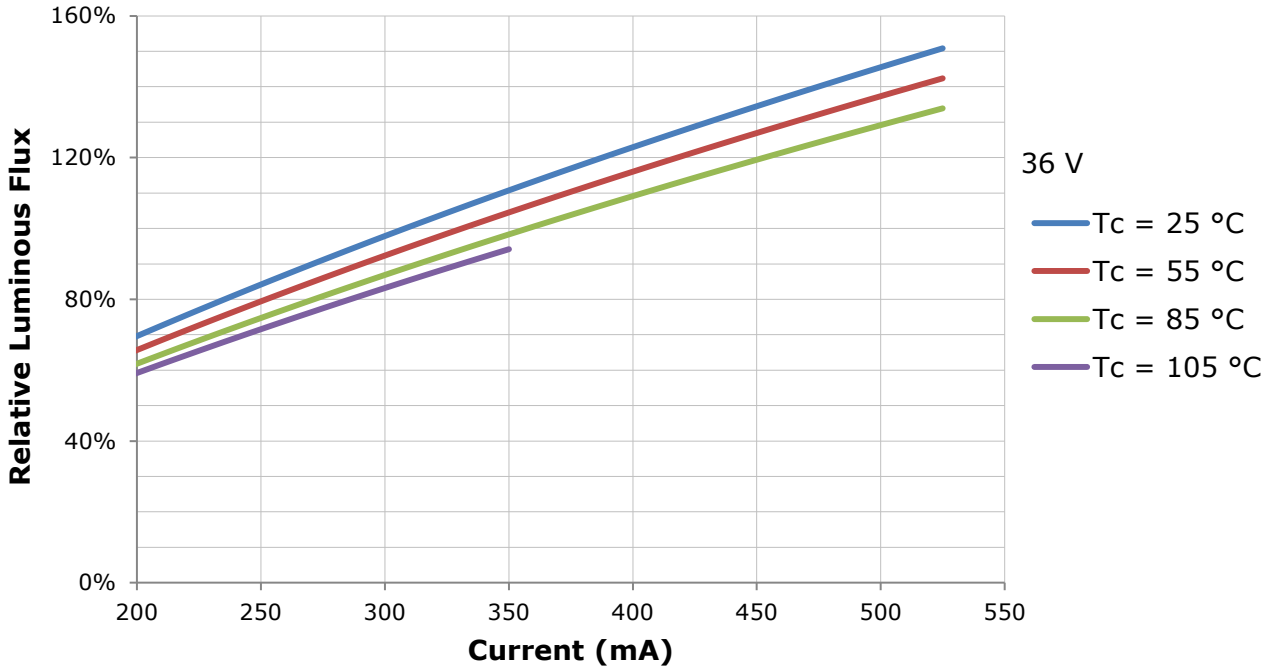


RELATIVE LUMINOUS FLUX - CONTINUED

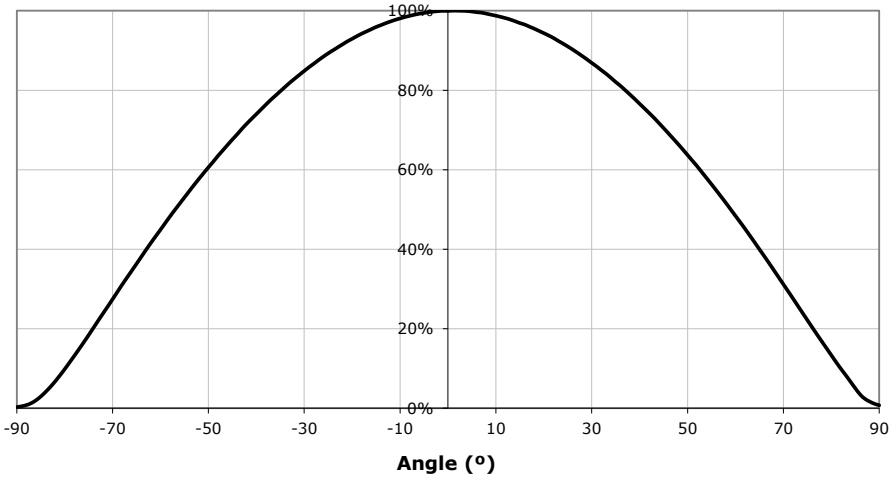
The relative luminous flux values provided below are the ratio of:

- Measurements of CXA1310 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 350 mA at T_J = 85 °C for the 36-V CXA1310 LED.

For example, at steady-state operation of Tc = 55 °C, I_F = 250 mA, the relative luminous flux ratio is 80% in the chart below. A CXA1310 LED that measures 1200 lm during binning will deliver 960 lm (1200 * 0.8) at steady-state operation of Tc = 55 °C, I_F = 250 mA.



TYPICAL SPATIAL DISTRIBUTION



PERFORMANCE GROUPS - BRIGHTNESS (18 V, I_F = 700 mA; 36 V, I_F = 350 mA, T_J = 85 °C)

XLamp CXA1310 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Min. Luminous Flux	Max. Luminous Flux
F4	730	780
G2	780	840
G4	840	900
H2	900	970
H4	970	1040
J2	1040	1120
J4	1120	1200
K2	1200	1290
K4	1290	1380
M2	1380	1485

PERFORMANCE GROUPS - CHROMATICITY (T_J = 85 °C)

XLamp CXA1310 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**
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

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

PERFORMANCE GROUPS - CHROMATICITY (T_J = 85 °C) - CONTINUED

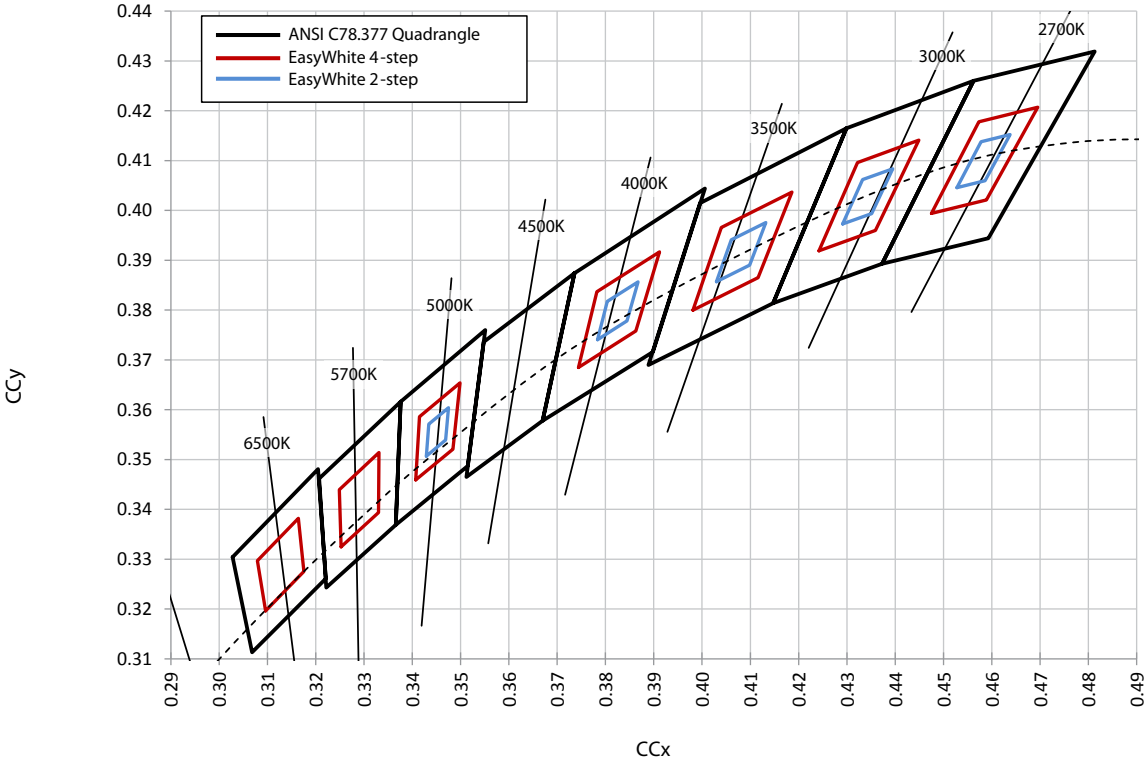
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E1	6500 K	1A0	0.3048	0.3207
			0.3130	0.3290
			0.3144	0.3186
			0.3068	0.3113
		1B0	0.3028	0.3304
			0.3115	0.3391
			0.3130	0.3290
			0.3048	0.3207
		1C0	0.3115	0.3391
			0.3205	0.3481
			0.3213	0.3373
			0.3130	0.3290
		1D0	0.3130	0.3290
			0.3213	0.3373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

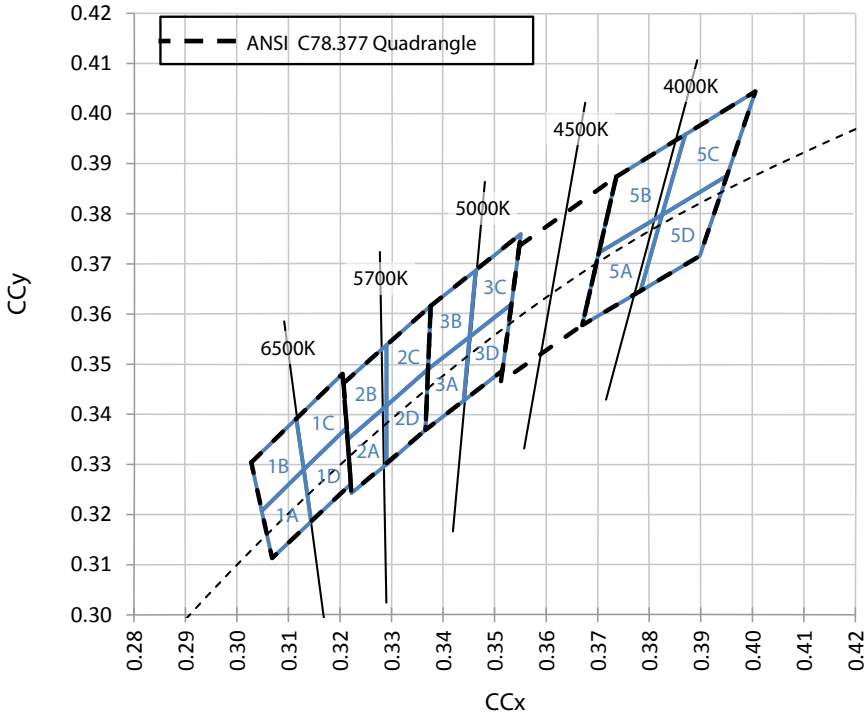
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E3	5000K	3A0	.3371	.3490
			.3451	.3554
			.3440	.3427
			.3366	.3369
		3B0	.3376	.3616
			.3463	.3687
			.3451	.3554
			.3371	.3490
		3C0	.3463	.3687
			.3551	.3760
			.3533	.3620
			.3451	.3554
		3D0	.3451	.3554
			.3533	.3620
			.3515	.3487
			.3440	.3427

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

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



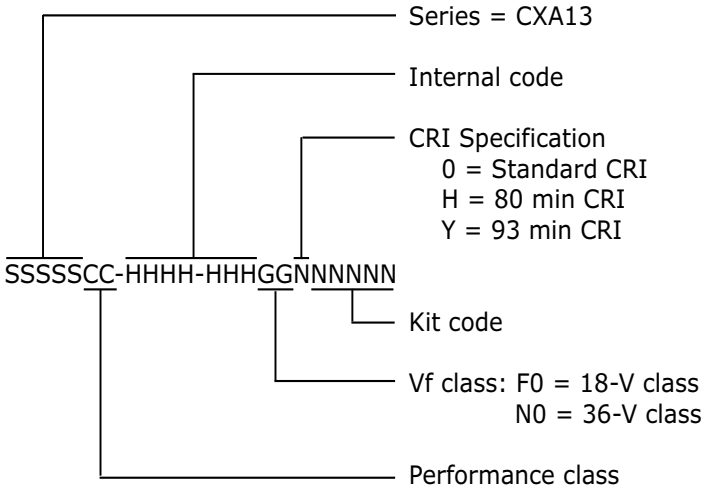
CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE (T_J = 85 °C)



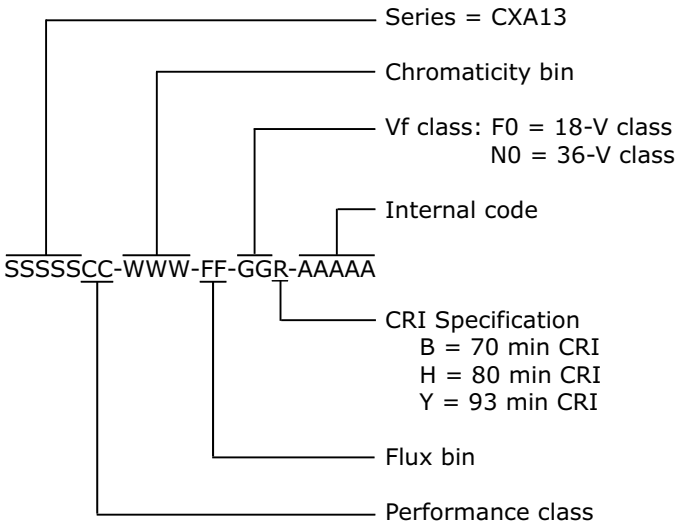
BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:

Order Code

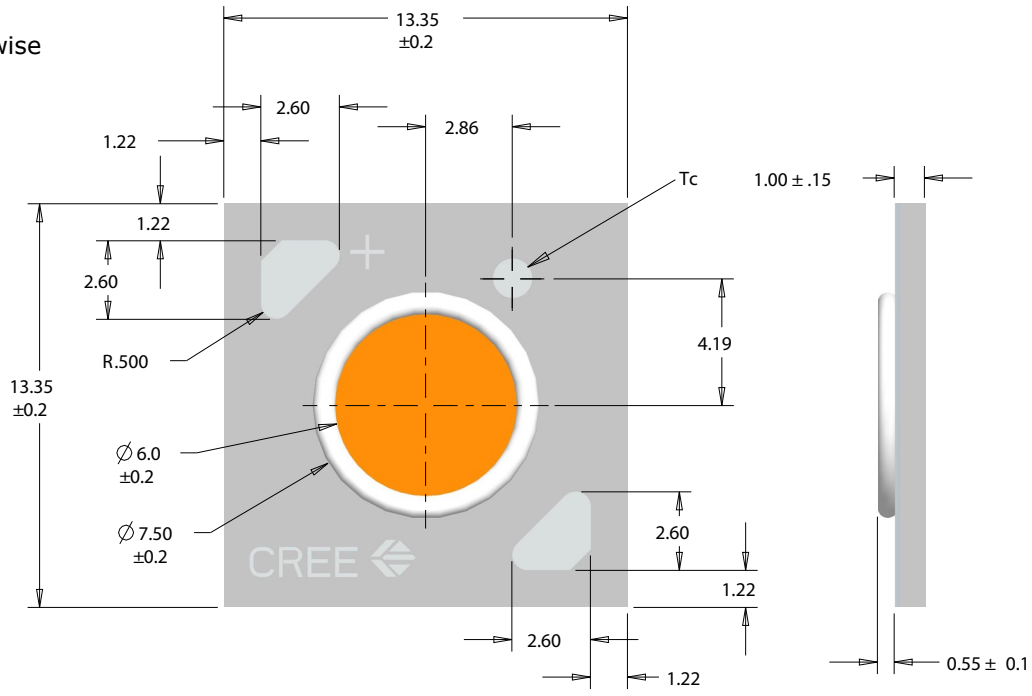


Bin Code



MECHANICAL DIMENSIONS

Dimensions are in mm.
Tolerances unless otherwise specified: ±.13
x° ±1°



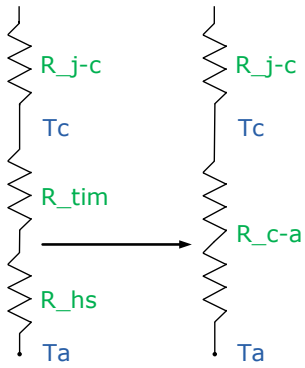
THERMAL DESIGN

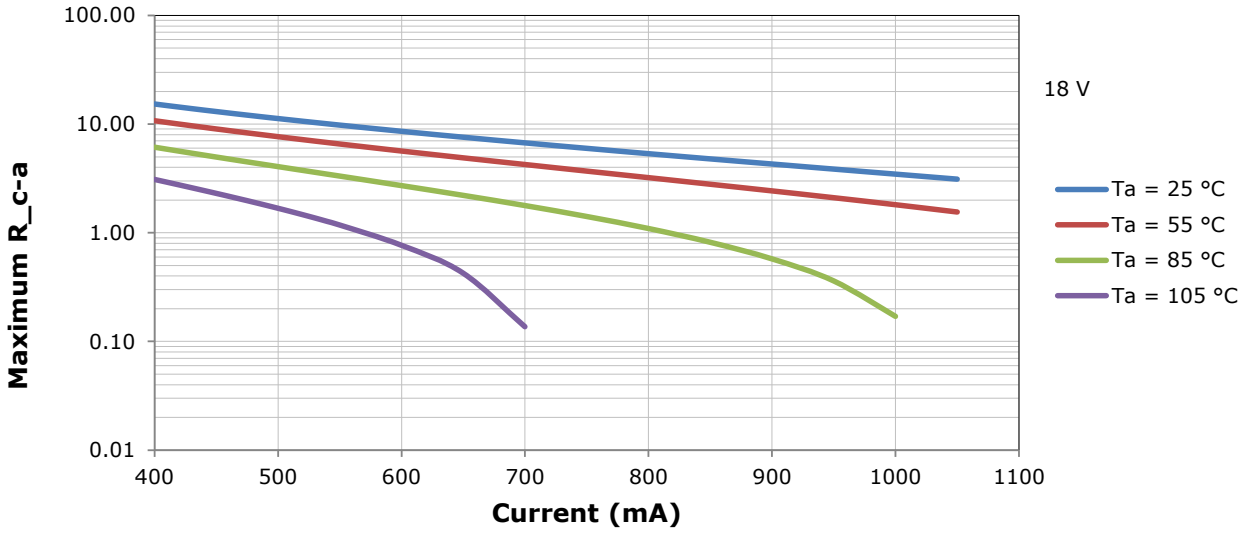
The CXA family of LED arrays can include over a hundred different LED die inside one package, and thus over a hundred different junction temperatures (T_J). Cree has intentionally removed junction-temperature-based operating limits and replaced the commonplace maximum T_J calculations with maximum ratings based on forward current (I_F) and case temperature (Tc). No additional calculations are required to ensure the CXA LED is being operated within its designed limits. Please refer to page 2 for the Operating Limit specification.

There is no need to calculate for T_J inside the package, as the thermal management design process, specifically from solder point (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) 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.

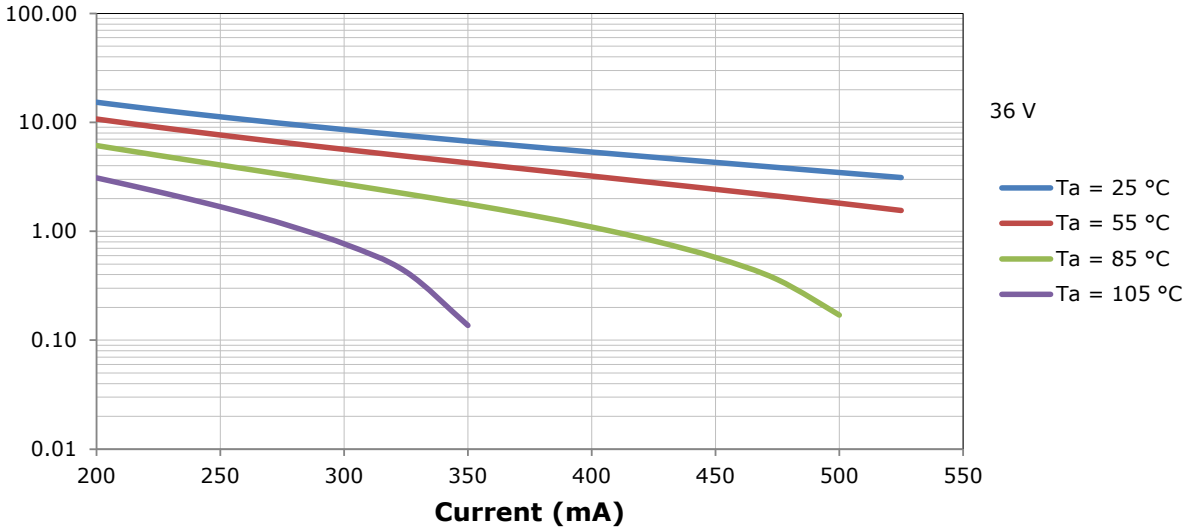
To keep the CXA1310 LED at or below the maximum rated Tc, the case to ambient temperature thermal resistance (R_c-a) must be at or below the maximum R_c-a value shown on the following graphs, depending on the operating environment. The y-axis in the graph is a base 10 logarithmic scale.

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).





THERMAL DESIGN - CONTINUED



NOTES

Measurements

The luminous flux, radiant power, chromaticity 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 as specifications.

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 Documentation sections of www.cree.com.

REACh Compliance

REACh substances of 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 Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

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

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 CXA1310 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: ±.13
x° ±1°