Cree® XLamp® CXA1512 LED

PRODUCT DESCRIPTION

The XLamp® CXA1512 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 CXA1512's small, uniform emitting surface enables both directional and non-directional lighting applications including lamp retrofit and luminaire designs. Available in 2-step and 4-step color consistency, and featuring a 9-mm optical source, the CXA1512 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 CXA1512 LED successfully in luminaire designs.

FEATURES

- Available in ANSI white bins as well as 4-step and 2-step EasyWhite® bins at 2700 K, 3000 K, 3500 K, 4000 K and 5000 K CCT
- Available in ANSI white bins as well as 4-step EasyWhite bins at 5700 K and 6500 K CCT
- Available in 70-, 80-, 90- and 93-minimum CRI options
- Forward voltage options: 18-V class & 36-V class
- 85 °C binning and characterization
- Maximum drive current: 1200 mA (18 V), 600 mA (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			1200*
DC forward current (36 V)	mA			600*
Reverse current (18 V, 36 V)	mA			0.1
Forward voltage (18 V, @ 700 mA, 85 °C)	V		18.2	
Forward voltage (18 V, @ 700 mA, 25 °C)	V			21
Forward voltage (36 V, @ 350 mA, 85 °C)	V		36.4	
Forward voltage (36 V, @ 350 mA, 25 °C)	V			42

* Refer to the Operating Limits section.

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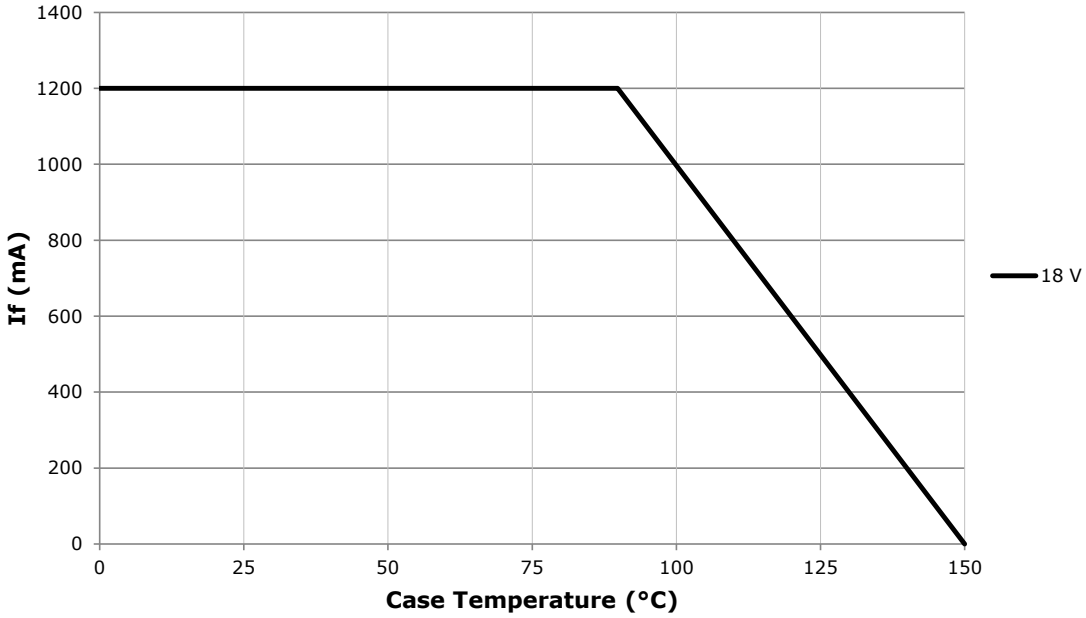
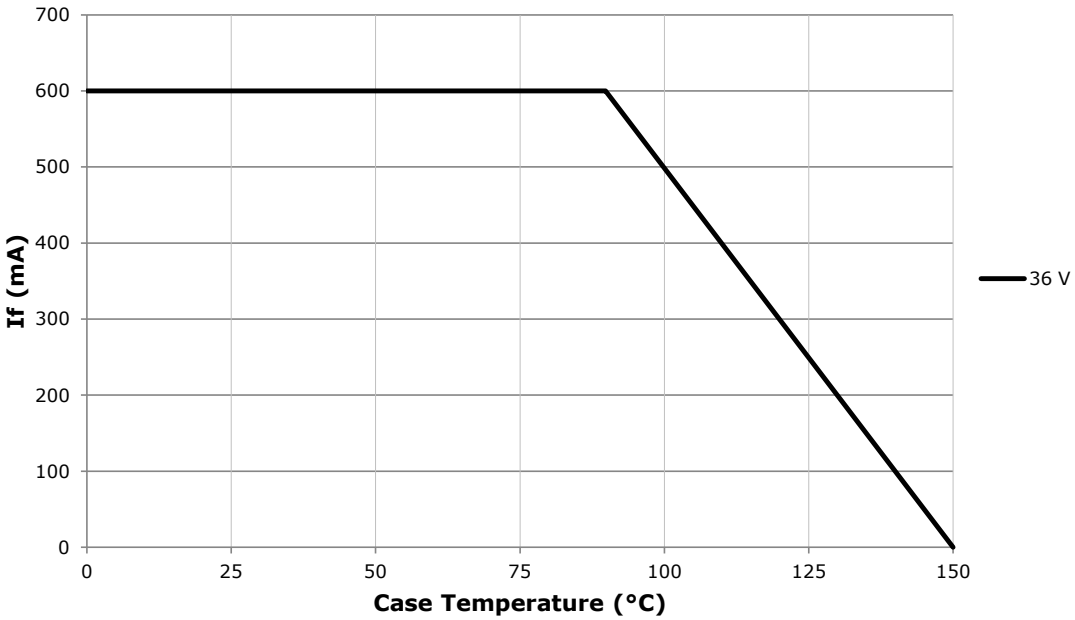
OPERATING LIMITS

The maximum current rating of the CXA1512 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 25 for the location of the Tc measurement point.





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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 CXA1512 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 25).

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	M2	1380	1563			65F	CXA1512-0000-000F00M265F
			M4	1485	1682				CXA1512-0000-000F00M465F
			N2	1590	1710				CXA1512-0000-000F00N265F
	80	---	K4	1290	1461			65F	CXA1512-0000-000F0HK465F
			M2	1380	1563				CXA1512-0000-000F0HM265F
			M4	1485	1685				CXA1512-0000-000F0HM465F
			N2	1590	1710				CXA1512-0000-000F0HN265F
5700 K	70	75	M2	1380	1563			57F	CXA1512-0000-000F00M257F
			M4	1485	1682				CXA1512-0000-000F00M457F
			N2	1590	1710				CXA1512-0000-000F00N257F
	80	---	K4	1290	1461			57F	CXA1512-0000-000F0HK457F
			M2	1380	1563				CXA1512-0000-000F0HM257F
			M4	1485	1682				CXA1512-0000-000F0HM457F
			N2	1590	1710				CXA1512-0000-000F0HN257F
5000 K	70	75	M2	1380	1563	50H	CXA1512-0000-000F00M250H	50F	CXA1512-0000-000F00M250F
			M4	1485	1682		CXA1512-0000-000F00M450H		CXA1512-0000-000F00M450F
			N2	1590	1710		CXA1512-0000-000F00N250H		CXA1512-0000-000F00N250F
	80	---	K4	1290	1461	50H	CXA1512-0000-000F0HK450H	50H	CXA1512-0000-000F0HK450F
			M2	1380	1563		CXA1512-0000-000F0HM250H		CXA1512-0000-000F0HM250F
			M4	1485	1682		CXA1512-0000-000F0HM450H		CXA1512-0000-000F0HM450F
			N2	1590	1710		CXA1512-0000-000F0HN250H		CXA1512-0000-000F0HN250F
	90	95	J4	1120	1269	50H	CXA1512-0000-000F0UJ450H	50F	CXA1512-0000-000F0UJ450F
			K2	1200	1359		CXA1512-0000-000F0UK250H		CXA1512-0000-000F0UK250F
			K4	1290	1461		CXA1512-0000-000F0UK450H		CXA1512-0000-000F0UK450F

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 28).
- Cree XLamp CXA1512 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.

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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
4000 K	70	75	K4	1290	1461	40H	CXA1512-0000-000F00K440H	40F	CXA1512-0000-000F00K440F
			M2	1380	1563		CXA1512-0000-000F00M240H		CXA1512-0000-000F00M240F
			M4	1485	1682		CXA1512-0000-000F00M440H		CXA1512-0000-000F00M440F
			N2	1590	1710		CXA1512-0000-000F00N240H		CXA1512-0000-000F00N240F
	80	---	K2	1200	1359	40H	CXA1512-0000-000F0HK240H	40F	CXA1512-0000-000F0HK240F
			K4	1290	1461		CXA1512-0000-000F0HK440H		CXA1512-0000-000F0HK440F
			M2	1380	1563		CXA1512-0000-000F0HM240H		CXA1512-0000-000F0HM240F
			M4	1485	1682		CXA1512-0000-000F0HM440H		CXA1512-0000-000F0HM440F
	90	95	J2	1040	1178	40H	CXA1512-0000-000F0UJ240H	40F	CXA1512-0000-000F0UJ240F
			J4	1120	1269		CXA1512-0000-000F0UJ440H		CXA1512-0000-000F0UJ440F
			K2	1200	1359		CXA1512-0000-000F0UK240H		CXA1512-0000-000F0UK240F
3500 K	80	---	K2	1200	1359	35H	CXA1512-0000-000F00K235H	35F	CXA1512-0000-000F00K235F
			K4	1290	1461		CXA1512-0000-000F00K435H		CXA1512-0000-000F00K435F
			M2	1380	1563		CXA1512-0000-000F00M235H		CXA1512-0000-000F00M235F
			M4	1485	1682		CXA1512-0000-000F00M435H		CXA1512-0000-000F00M435F
	93	95	H4	970	1099	35H	CXA1512-0000-000F0YH435H	35F	CXA1512-0000-000F0YH435F
			J2	1040	1178		CXA1512-0000-000F0YJ235H		CXA1512-0000-000F0YJ235F
			J4	1120	1269		CXA1512-0000-000F0YJ435H		CXA1512-0000-000F0YJ435F
3000 K	80	---	K2	1200	1359	30H	CXA1512-0000-000F00K230H	30F	CXA1512-0000-000F00K230F
			K4	1290	1461		CXA1512-0000-000F00K430H		CXA1512-0000-000F00K430F
			M2	1380	1563		CXA1512-0000-000F00M230H		CXA1512-0000-000F00M230F
			M4	1485	1682		CXA1512-0000-000F00M430H		CXA1512-0000-000F00M430F
	93	95	H2	900	1019	30H	CXA1512-0000-000F0YH230H	30F	CXA1512-0000-000F0YH230F
			H4	970	1099		CXA1512-0000-000F0YH430H		CXA1512-0000-000F0YH430F
			J2	1040	1178		CXA1512-0000-000F0YJ230H		CXA1512-0000-000F0YJ230F
			J4	1120	1269		CXA1512-0000-000F0YJ430H		CXA1512-0000-000F0YJ430F

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 28).
- Cree XLamp CXA1512 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.

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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	---	J4	1120	1269	27H	CXA1512-0000-000F00J427H	27F	CXA1512-0000-000F00J427F
			K2	1200	1359		CXA1512-0000-000F00K227H		CXA1512-0000-000F00K227F
			K4	1290	1461		CXA1512-0000-000F00K427H		CXA1512-0000-000F00K427F
			M2	1380	1563		CXA1512-0000-000F00M227H		CXA1512-0000-000F00M227F
	93	95	G4	840	952	27H	CXA1512-0000-000F0YG427H	27F	CXA1512-0000-000F0YG427F
			H2	900	1019		CXA1512-0000-000F0YH227H		CXA1512-0000-000F0YH227F
			H4	970	1099		CXA1512-0000-000F0YH427H		CXA1512-0000-000F0YH427F
			J2	1040	1178		CXA1512-0000-000F0YJ227H		CXA1512-0000-000F0YJ227F

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 28).
- Cree XLamp CXA1512 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.

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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 CXA1512 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 25).

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	M2	1380	1563	1A0, 1B0, 1C0, 1D0	CXA1512-0000-000F00M20E1
			M4	1485	1685		CXA1512-0000-000F00M40E1
			N2	1590	1710		CXA1512-0000-000F00N20E1
	80	---	K4	1290	1461	1A0, 1B0, 1C0, 1D0	CXA1512-0000-000F0HK40E1
			M2	1380	1563		CXA1512-0000-000F0HM20E1
			M4	1485	1685		CXA1512-0000-000F0HM40E1
			N2	1590	1710		CXA1512-0000-000F0HN20E1
5700 K	70	75	M2	1380	1563	2A0, 2B0, 2C0, 1D0	CXA1512-0000-000F00M20E2
			M4	1485	1685		CXA1512-0000-000F00M40E2
			N2	1590	1710		CXA1512-0000-000F00N20E2
	80	---	K4	1290	1461	2A0, 2B0, 2C0, 1D0	CXA1512-0000-000F0HK40E2
			M2	1380	1563		CXA1512-0000-000F0HM20E2
			M4	1485	1685		CXA1512-0000-000F0HM40E2
			N2	1590	1710		CXA1512-0000-000F0HN20E2
5000 K	70	75	M2	1380	1563	3A0, 3B0, 3C0, 3D0	CXA1512-0000-000F00M20E3
			M4	1485	1685		CXA1512-0000-000F00M40E3
			N2	1590	1710		CXA1512-0000-000F00N20E3
	80	---	K4	1290	1461	3A0, 3B0, 3C0, 3D0	CXA1512-0000-000F0HK40E3
			M2	1380	1563		CXA1512-0000-000F0HM20E3
			M4	1485	1685		CXA1512-0000-000F0HM40E3
			N2	1590	1710		CXA1512-0000-000F0HN20E3
	90	95	J4	1120	1269	3A0, 3B0, 3C0, 3D0	CXA1512-0000-000F0UJ40E3
			K2	1200	1359		CXA1512-0000-000F0UK20E3
			K4	1290	1461		CXA1512-0000-000F0UK40E3

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 28).
- Cree XLamp CXA1512 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.

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FLUX CHARACTERISTICS, ANSI WHITE 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			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
4000 K	70	75	K4	1290	1461	5A0, 5B0, 5C0, 5D0	CXA1512-0000-000F00K40E5
			M2	1380	1563		CXA1512-0000-000F00M20E5
			M4	1485	1685		CXA1512-0000-000F00M40E5
			N2	1590	1710		CXA1512-0000-000F00N20E5
	80	---	K2	1200	1359	5A0, 5B0, 5C0, 5D0	CXA1512-0000-000F0HK20E5
			K4	1290	1461		CXA1512-0000-000F0HK40E5
			M2	1380	1563		CXA1512-0000-000F0HM20E5
			M4	1485	1682		CXA1512-0000-000F0HM40E5
	90	95	J2	1040	1178	5A0, 5B0, 5C0, 5D0	CXA1512-0000-000F0UJ20E5
			J4	1120	1269		CXA1512-0000-000F0UJ40E5
			K2	1200	1359		CXA1512-0000-000F0UK20E5
3500 K	80	---	K2	1200	1359	6A0, 6B0, 6C0, 6D0	CXA1512-0000-000F00K20E6
			K4	1290	1461		CXA1512-0000-000F00K40E6
			M2	1380	1563		CXA1512-0000-000F00M20E6
			M4	1485	1682		CXA1512-0000-000F00M40E6
	93	95	H4	970	1099	6A0, 6B0, 6C0, 6D0	CXA1512-0000-000F0YH40E6
			J2	1040	1178		CXA1512-0000-000F0YJ20E6
			J4	1120	1269		CXA1512-0000-000F0YJ40E6
3000 K	80	---	K2	1200	1359	7A0, 7B0, 7C0, 7D0	CXA1512-0000-000F00K20E7
			K4	1290	1461		CXA1512-0000-000F00K40E7
			M2	1380	1563		CXA1512-0000-000F00M20E7
			M4	1485	1682		CXA1512-0000-000F00M40E7
	93	95	H2	900	1019	7A0, 7B0, 7C0, 7D0	CXA1512-0000-000F0YH20E7
			H4	970	1099		CXA1512-0000-000F0YH40E7
			J2	1040	1178		CXA1512-0000-000F0YJ20E7
			J4	1120	1269		CXA1512-0000-000F0YJ40E7

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 28).
- Cree XLamp CXA1512 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.

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FLUX CHARACTERISTICS, ANSI WHITE 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			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
2700 K	80	---	J4	1120	1269	8A0, 8B0, 8C0, 8D0	CXA1512-0000-000F00J40E8
			K2	1200	1359		CXA1512-0000-000F00K20E8
			K4	1290	1461		CXA1512-0000-000F00K40E8
			M2	1380	1563		CXA1512-0000-000F00M20E8
	93	95	G4	840	952	8A0, 8B0, 8C0, 8D0	CXA1512-0000-000F0YG40E8
			H2	900	1019		CXA1512-0000-000F0YH20E8
			H4	970	1099		CXA1512-0000-000F0YH40E8
			J2	1040	1178		CXA1512-0000-000F0YJ20E8

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 28).
- Cree XLamp CXA1512 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.

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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 CXA1512 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 25).

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	M2	1380	1563			65F	CXA1512-0000-000N00M265F
			M4	1485	1682				CXA1512-0000-000N00M465F
			N2	1590	1710				CXA1512-0000-000N00N265F
	80	---	K4	1290	1461			65F	CXA1512-0000-000N0HK465F
			M2	1380	1563				CXA1512-0000-000N0HM265F
			M4	1485	1682				CXA1512-0000-000N0HM465F
			N2	1590	1710				CXA1512-0000-000N0HN265F
5700 K	70	75	M2	1380	1563			57F	CXA1512-0000-000N00M257F
			M4	1485	1682				CXA1512-0000-000N00M457F
			N2	1590	1710				CXA1512-0000-000N00N257F
	80	---	K4	1290	1461			57F	CXA1512-0000-000N0HK457F
			M2	1380	1563				CXA1512-0000-000N0HM257F
			M4	1485	1682				CXA1512-0000-000N0HM457F
			N2	1590	1710				CXA1512-0000-000N0HN257F
5000 K	70	75	M2	1380	1563	50H	CXA1512-0000-000N00M250H	50F	CXA1512-0000-000N00M250F
			M4	1485	1682		CXA1512-0000-000N00M450H		CXA1512-0000-000N00M450F
			N2	1590	1710		CXA1512-0000-000N00N250H		CXA1512-0000-000N00N250F
	80	---	K4	1290	1461	50H	CXA1512-0000-000N0HK450H	50H	CXA1512-0000-000N0HK450F
			M2	1380	1563		CXA1512-0000-000N0HM250H		CXA1512-0000-000N0HM250F
			M4	1485	1682		CXA1512-0000-000N0HM450H		CXA1512-0000-000N0HM450F
			N2	1590	1710		CXA1512-0000-000N0HN250H		CXA1512-0000-000N0HN250F
	90	95	J4	1120	1269	50H	CXA1512-0000-000N0UJ450H	50F	CXA1512-0000-000N0UJ450F
			K2	1200	1359		CXA1512-0000-000N0UK250H		CXA1512-0000-000N0UK250F
			K4	1290	1461		CXA1512-0000-000N0UK450H		CXA1512-0000-000N0UK450F

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 28).
- Cree XLamp CXA1512 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.

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FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 36 V (I_F = 350 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
4000 K	70	75	K4	1290	1461	40H	CXA1512-0000-000N00K440H	40F	CXA1512-0000-000N00K440F
			M2	1380	1563		CXA1512-0000-000N00M240H		CXA1512-0000-000N00M240F
			M4	1485	1682		CXA1512-0000-000N00M440H		CXA1512-0000-000N00M440F
			N2	1590	1710		CXA1512-0000-000N00N240H		CXA1512-0000-000N00N240F
	80	---	K2	1200	1359	40H	CXA1512-0000-000N0HK240H	40F	CXA1512-0000-000N0HK240F
			K4	1290	1461		CXA1512-0000-000N0HK440H		CXA1512-0000-000N0HK440F
			M2	1380	1563		CXA1512-0000-000N0HM240H		CXA1512-0000-000N0HM240F
			M4	1485	1682		CXA1512-0000-000N0HM440H		CXA1512-0000-000N0HM440F
	90	95	J2	1040	1178	40H	CXA1512-0000-000N0UJ240H	40F	CXA1512-0000-000N0UJ240F
			J4	1120	1269		CXA1512-0000-000N0UJ440H		CXA1512-0000-000N0UJ440F
			K2	1200	1359		CXA1512-0000-000N0UK240H		CXA1512-0000-000N0UK240F
3500 K	80	---	K2	1200	1359	35H	CXA1512-0000-000N00K235H	35F	CXA1512-0000-000N00K235F
			K4	1290	1461		CXA1512-0000-000N00K435H		CXA1512-0000-000N00K435F
			M2	1380	1563		CXA1512-0000-000N00M235H		CXA1512-0000-000N00M235F
			M4	1485	1682		CXA1512-0000-000N00M435H		CXA1512-0000-000N00M435F
	93	95	H4	970	1099	35H	CXA1512-0000-000N0YH435H	35F	CXA1512-0000-000N0YH435F
			J2	1040	1178		CXA1512-0000-000N0YJ235H		CXA1512-0000-000N0YJ235F
			J4	1120	1269		CXA1512-0000-000N0YJ435H		CXA1512-0000-000N0YJ435F

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 28).
- Cree XLamp CXA1512 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.

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FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS - 36 V (I_F = 350 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
3000 K	80	---	K2	1200	1359	30H	CXA1512-0000-000N00K230H	30F	CXA1512-0000-000N00K230F
			K4	1290	1461		CXA1512-0000-000N00K430H		CXA1512-0000-000N00K430F
			M2	1380	1563		CXA1512-0000-000N00M230H		CXA1512-0000-000N00M230F
			M4	1485	1682		CXA1512-0000-000N00M430H		CXA1512-0000-000N00M430F
	90	---	H2	900	1019	30H	CXA1512-0000-000N0UH230H	30F	CXA1512-0000-000N0UH230F
			H4	970	1099		CXA1512-0000-000N0UH430H		CXA1512-0000-000N0UH430F
			J2	1040	1178		CXA1512-0000-000N0UJ230H		CXA1512-0000-000N0UJ230F
	93	95	H2	900	1019	30H	CXA1512-0000-000N0YH230H	30F	CXA1512-0000-000N0YH230F
			H4	970	1099		CXA1512-0000-000N0YH430H		CXA1512-0000-000N0YH430F
			J2	1040	1178		CXA1512-0000-000N0YJ230H		CXA1512-0000-000N0YJ230F
			J4	1120	1269		CXA1512-0000-000N0YJ430H		CXA1512-0000-000N0YJ430F
2700 K	80	---	J4	1120	1269	27H	CXA1512-0000-000N00J427H	27F	CXA1512-0000-000N00J427F
			K2	1200	1359		CXA1512-0000-000N00K227H		CXA1512-0000-000N00K227F
			K4	1290	1461		CXA1512-0000-000N00K427H		CXA1512-0000-000N00K427F
			M2	1380	1563		CXA1512-0000-000N00M227H		CXA1512-0000-000N00M227F
	90	---	G4	840	952	27H	CXA1512-0000-000N0UG427H	27F	CXA1512-0000-000N0UG427F
			H2	900	1019		CXA1512-0000-000N0UH227H		CXA1512-0000-000N0UH227F
			H4	970	1099		CXA1512-0000-000N0UH427H		CXA1512-0000-000N0UH427F
	93	95	G4	840	952	27H	CXA1512-0000-000N0YG427H	27F	CXA1512-0000-000N0YG427F
			H2	900	1019		CXA1512-0000-000N0YH227H		CXA1512-0000-000N0YH227F
			H4	970	1099		CXA1512-0000-000N0YH427H		CXA1512-0000-000N0YH427F
			J2	1040	1178		CXA1512-0000-000N0YJ227H		CXA1512-0000-000N0YJ227F

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 28).
- Cree XLamp CXA1512 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.

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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 CXA1512 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 25).

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	M2	1380	1563	1A0, 1B0, 1C0, 1D0	CXA1512-0000-000N00M20E1
			M4	1485	1685		CXA1512-0000-000N00M40E1
			N2	1590	1710		CXA1512-0000-000N00N20E1
	80	---	K4	1290	1461	1A0, 1B0, 1C0, 1D0	CXA1512-0000-000N0HK40E1
			M2	1380	1563		CXA1512-0000-000N0HM20E1
			M4	1485	1682		CXA1512-0000-000N0HM40E1
			N2	1590	1710		CXA1512-0000-000N0HN20E1
5700 K	70	75	M2	1380	1563	2A0, 2B0, 2C0, 1D0	CXA1512-0000-000N00M20E2
			M4	1485	1685		CXA1512-0000-000N00M40E2
			N2	1590	1710		CXA1512-0000-000N00N20E2
	80	---	K4	1290	1461	2A0, 2B0, 2C0, 1D0	CXA1512-0000-000N0HK40E2
			M2	1380	1563		CXA1512-0000-000N0HM20E2
			M4	1485	1682		CXA1512-0000-000N0HM40E2
			N2	1590	1710		CXA1512-0000-000N0HN20E2
5000 K	70	75	M2	1380	1563	3A0, 3B0, 3C0, 3D0	CXA1512-0000-000N00M20E3
			M4	1485	1685		CXA1512-0000-000N00M40E3
			N2	1590	1710		CXA1512-0000-000N00N20E3
	80	---	K4	1290	1461	3A0, 3B0, 3C0, 3D0	CXA1512-0000-000N0HK40E3
			M2	1380	1563		CXA1512-0000-000N0HM20E3
			M4	1485	1682		CXA1512-0000-000N0HM40E3
			N2	1590	1710		CXA1512-0000-000N0HN20E3
	90	95	J4	1120	1269	3A0, 3B0, 3C0, 3D0	CXA1512-0000-000N0UJ40E3
			K2	1200	1359		CXA1512-0000-000N0UK20E3
			K4	1290	1461		CXA1512-0000-000N0UK40E3

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 28).
- Cree XLamp CXA1512 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.

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FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - 36 V (I_F = 350 mA, T_J = 85 °C) - CONTINUED

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*		
4000 K	70	75	K4	1290	1461	5A0, 5B0, 5C0, 5D0	CXA1512-0000-000N00K40E5
			M2	1380	1563		CXA1512-0000-000N00M20E5
			M4	1485	1685		CXA1512-0000-000N00M40E5
			N2	1590	1710		CXA1512-0000-000N00N20E5
	80	---	K2	1200	1359	5A0, 5B0, 5C0, 5D0	CXA1512-0000-000N0HK20E5
			K4	1290	1461		CXA1512-0000-000N0HK40E5
			M2	1380	1563		CXA1512-0000-000N0HM20E5
			M4	1485	1682		CXA1512-0000-000N0HM40E5
	90	95	J2	1040	1178	5A0, 5B0, 5C0, 5D0	CXA1512-0000-000N0UJ20E5
			J4	1120	1269		CXA1512-0000-000N0UJ40E5
			K2	1200	1359		CXA1512-0000-000N0UK20E5
3500 K	80	---	K2	1200	1359	6A0, 6B0, 6C0, 6D0	CXA1512-0000-000N00K20E6
			K4	1290	1461		CXA1512-0000-000N00K40E6
			M2	1380	1563		CXA1512-0000-000N00M20E6
			M4	1485	1682		CXA1512-0000-000N00M40E6
	93	95	H4	970	1099	6A0, 6B0, 6C0, 6D0	CXA1512-0000-000N0YH40E6
			J2	1040	1178		CXA1512-0000-000N0YJ20E6
			J4	1120	1269		CXA1512-0000-000N0YJ40E6

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 28).
- Cree XLamp CXA1512 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.

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FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - 36 V (I_F = 350 mA, T_J = 85 °C) - CONTINUED

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*		
3000 K	80	---	K2	1200	1359	7A0, 7B0, 7C0, 7D0	CXA1512-0000-000N00K20E7
			K4	1290	1461		CXA1512-0000-000N00K40E7
			M2	1380	1563		CXA1512-0000-000N00M20E7
			M4	1485	1682		CXA1512-0000-000N00M40E7
	90	---	H2	900	1019	7A0, 7B0, 7C0, 7D0	CXA1512-0000-000N0UH20E7
			H4	970	1099		CXA1512-0000-000N0UH40E7
			J2	1040	1178		CXA1512-0000-000N0UJ20E7
	93	95	H2	900	1019	7A0, 7B0, 7C0, 7D0	CXA1512-0000-000N0YH20E7
			H4	970	1099		CXA1512-0000-000N0YH40E7
			J2	1040	1178		CXA1512-0000-000N0YJ20E7
			J4	1120	1269		CXA1512-0000-000N0YJ40E7
2700 K	80	---	J4	1120	1269	8A0, 8B0, 8C0, 8D0	CXA1512-0000-000N00J40E8
			K2	1200	1359		CXA1512-0000-000N00K20E8
			K4	1290	1461		CXA1512-0000-000N00K40E8
			M2	1380	1563		CXA1512-0000-000N00M20E8
	90	---	G4	840	952	8A0, 8B0, 8C0, 8D0	CXA1512-0000-000N0UG40E8
			H2	900	1019		CXA1512-0000-000N0UH20E8
			H4	970	1099		CXA1512-0000-000N0UH40E8
	93	95	G4	840	952	8A0, 8B0, 8C0, 8D0	CXA1512-0000-000N0YG40E8
			H2	900	1019		CXA1512-0000-000N0YH20E8
			H4	970	1099		CXA1512-0000-000N0YH40E8
			J2	1040	1178		CXA1512-0000-000N0YJ20E8

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 28).
- Cree XLamp CXA1512 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.

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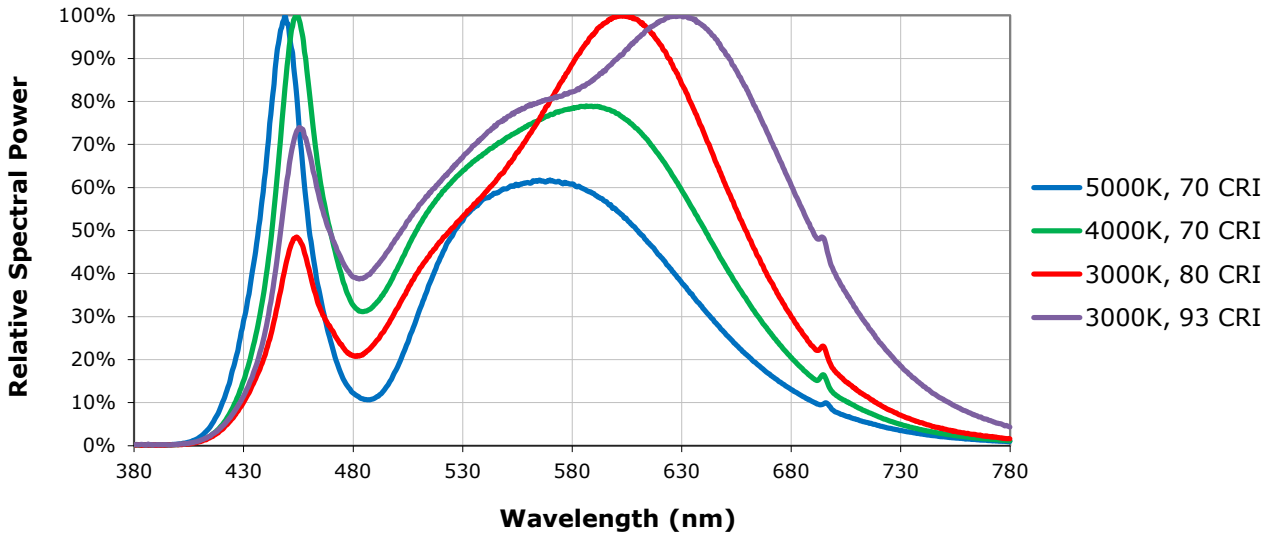
RELATIVE SPECTRAL POWER DISTRIBUTION

The following graph is the result of a series of pulsed measurements at 700 mA for the 18-V CXA1512 LED and 350 mA for the 36-V CXA1512 LED and T_J = 85 °C.



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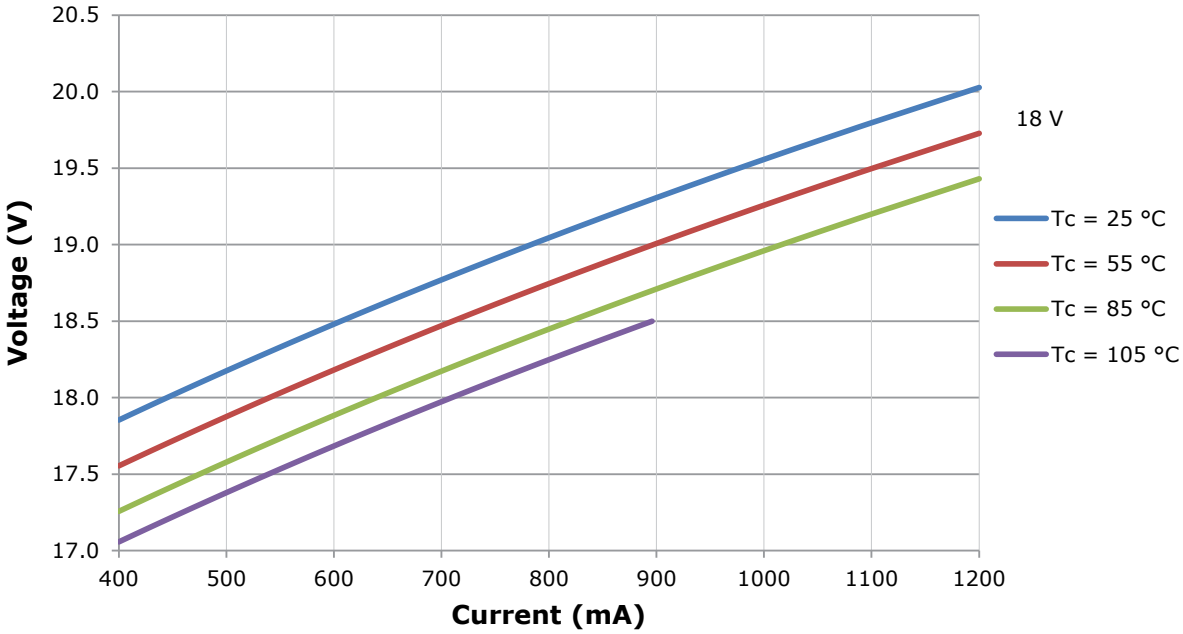
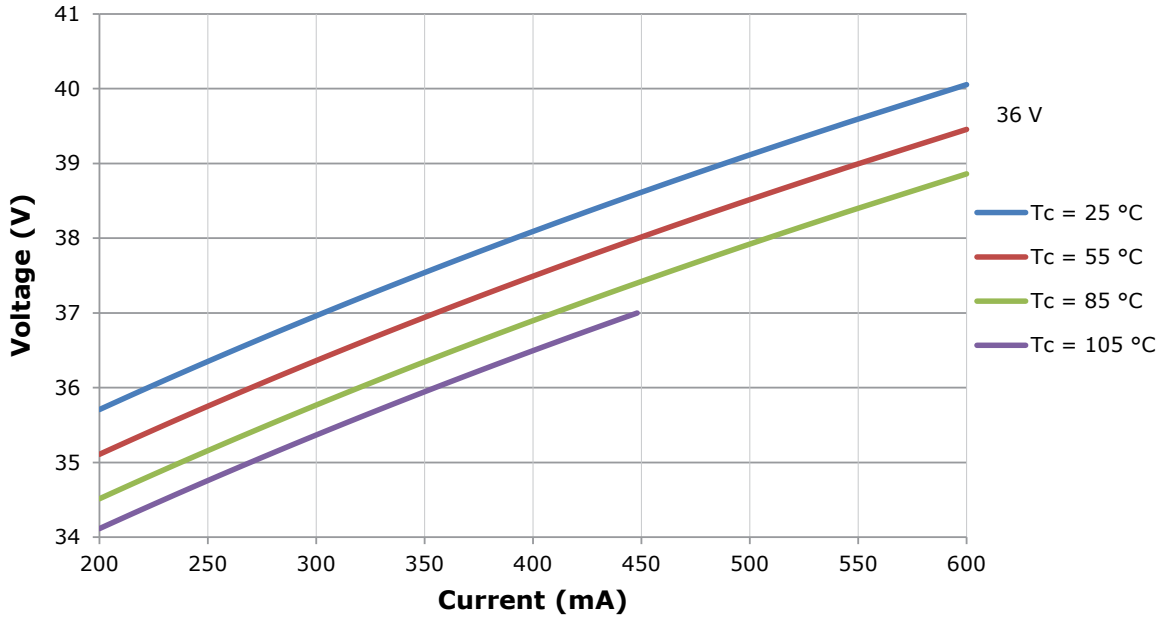
ELECTRICAL CHARACTERISTICS

The following graphs are the result of a series of steady-state measurements.





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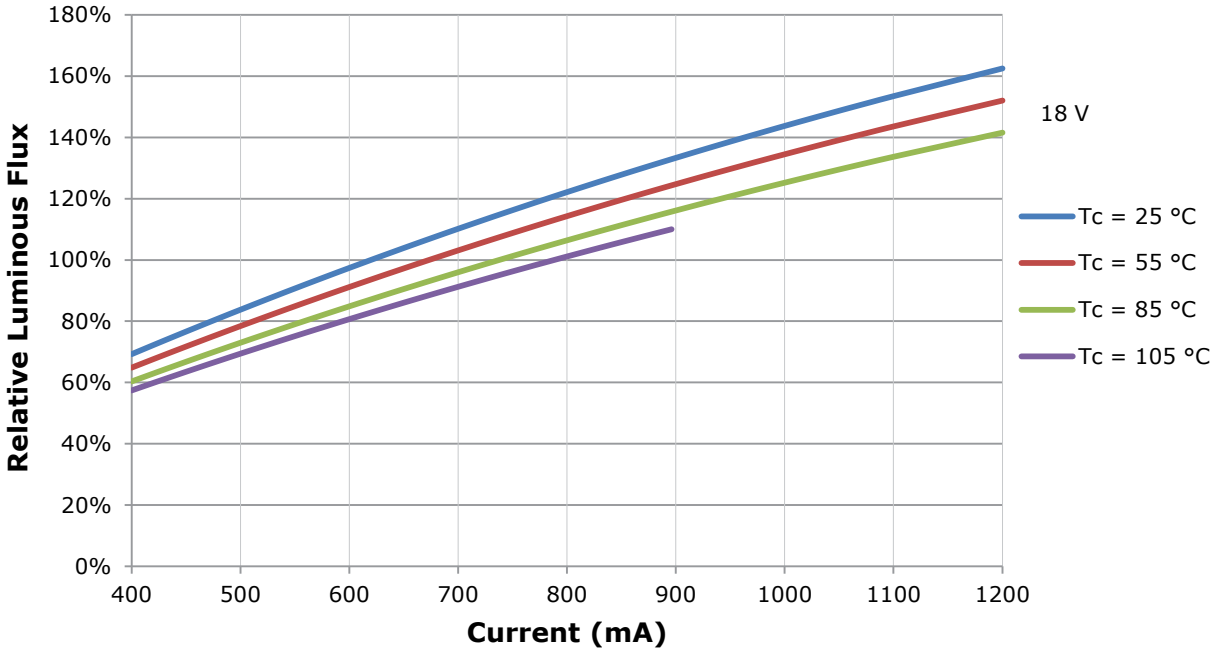
RELATIVE LUMINOUS FLUX

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

- Measurements of CXA1512 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 CXA1512 LED.

Using the 18-V CXA1512 LED as an example, at steady-state operation of Tc = 105 °C, I_F = 600 mA, the relative luminous flux ratio is 80% in the chart below. A CXA1512 LED that measures 1200 lm during binning will deliver 960 lm (1200 * 0.8) at steady-state operation of Tc = 105 °C, I_F = 600 mA.



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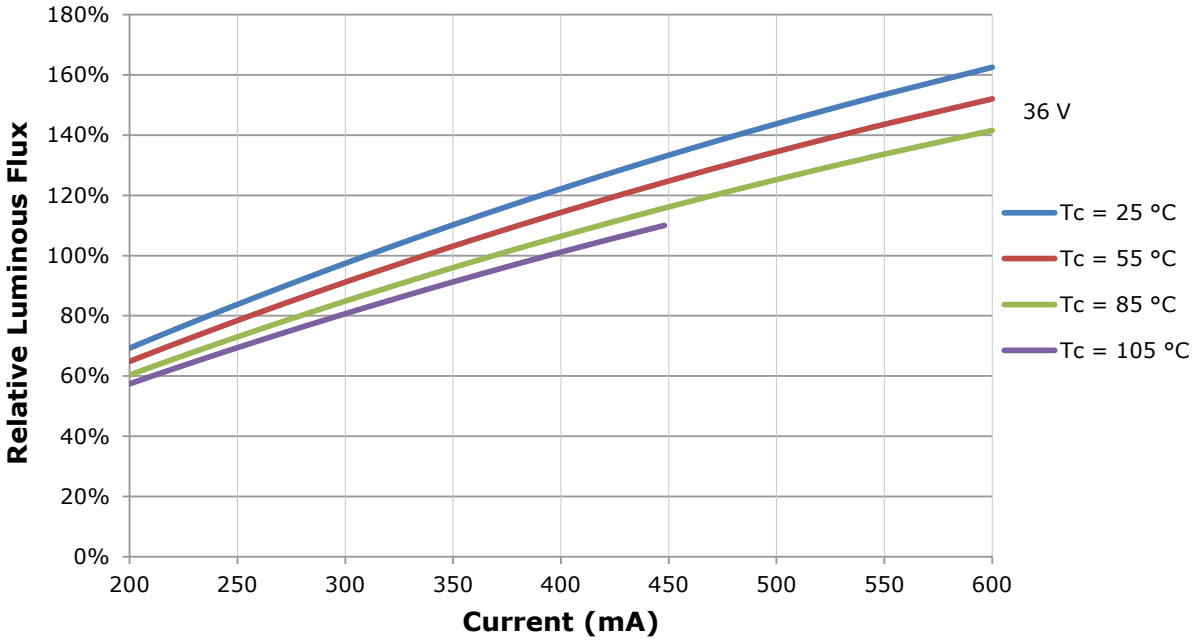
RELATIVE LUMINOUS FLUX - CONTINUED

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

- Measurements of CXA1512 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 CXA1512 LED.

Using the 36-V CXA1512 LED as an example, at steady-state operation of Tc = 105 °C, I_F = 300 mA, the relative luminous flux ratio is 80% in the chart below. A CXA1512 LED that measures 1200 lm during binning will deliver 960 lm (1200 * 0.8) at steady-state operation of Tc = 105 °C, I_F = 300 mA.



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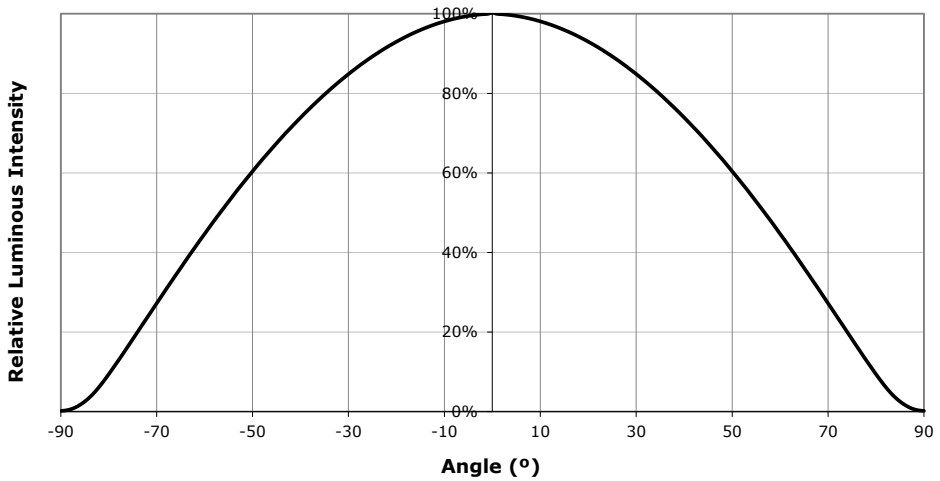
TYPICAL SPATIAL DISTRIBUTION



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

XLamp CXA1512 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Min. Luminous Flux	Max. Luminous Flux
G4	840	900
H2	900	970
H4	970	1040
J2	1040	1120
J4	1120	1200
K2	1200	1290
K4	1290	1380
M2	1380	1485
M4	1485	1590
N2	1590	1710
N4	1710	1830

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PERFORMANCE GROUPS - CHROMATICITY (T_J = 85 °C)

XLamp CXA1512 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	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

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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	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	CCT	Bin Code	x	y
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

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E6	3500 K	6A0	.3889	.3690
			.3941	.3848
			.4080	.3916
			.4017	.3751
		6B0	.3941	.3848
			.3996	.4015
			.4146	.4089
			.4080	.3916
		6C0	.4080	.3916
			.4146	.4089
			.4299	.4165
			.4221	.3984
		6D0	.4017	.3751
			.4080	.3916
			.4221	.3984
			.4147	.3814

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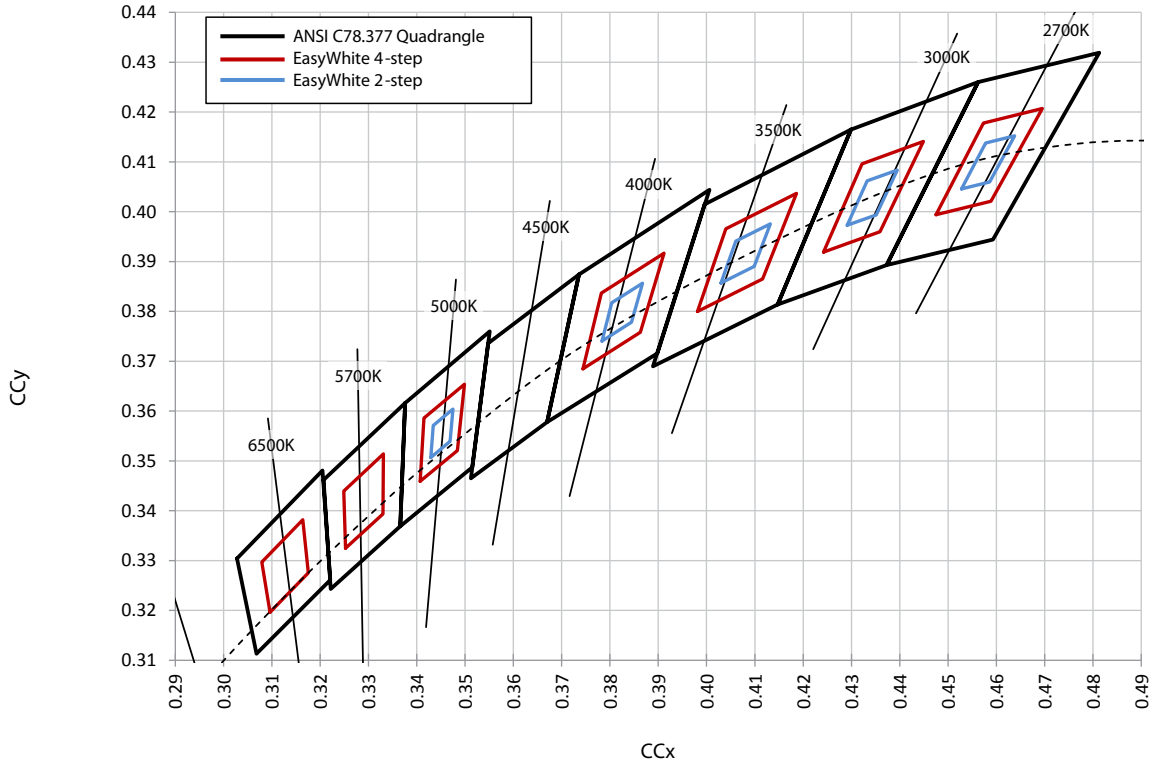
PERFORMANCE GROUPS - CHROMATICITY (T_J = 85 °C) - CONTINUED

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E7	3000 K	7A0	.4147	.3814
			.4221	.3984
			.4342	.4028
			.4259	.3853
		7B0	.4221	.3984
			.4299	.4165
			.4430	.4212
			.4342	.4028
		7C0	.4342	.4028
			.4430	.4212
			.4562	.4260
			.4465	.4071
		7D0	.4259	.3853
			.4342	.4028
			.4465	.4071
			.4373	.3893

ANSI White Bins				
Code	CCT	Bin Code	x	y
0E8	2700 K	8A0	.4373	.3893
			.4465	.4071
			.4582	.4099
			.4483	.3919
		8B0	.4465	.4071
			.4562	.4260
			.4687	.4289
			.4582	.4099
		8C0	.4582	.4099
			.4687	.4289
			.4813	.4319
			.4700	.4126
		8D0	.4483	.3919
			.4582	.4099
			.4700	.4126
			.4593	.3944

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



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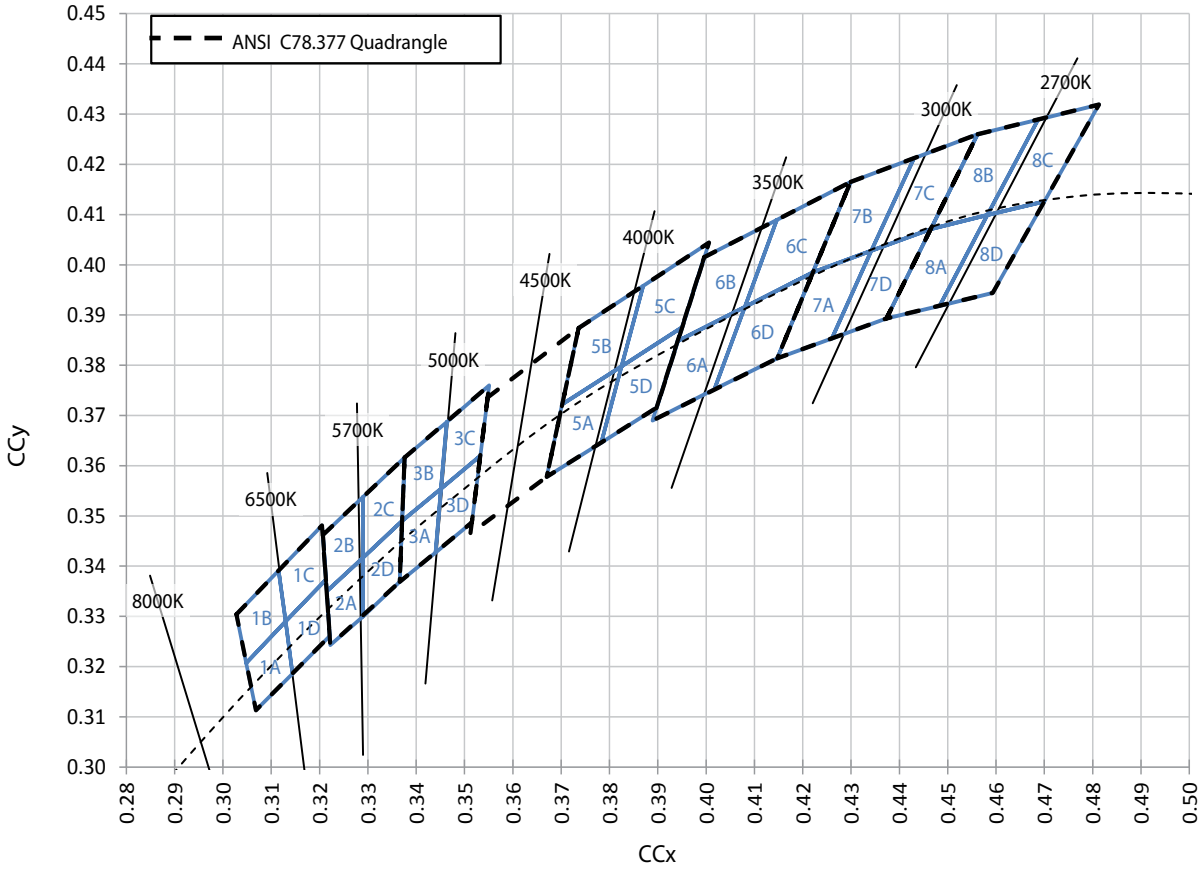
CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE (T_J = 85 °C)



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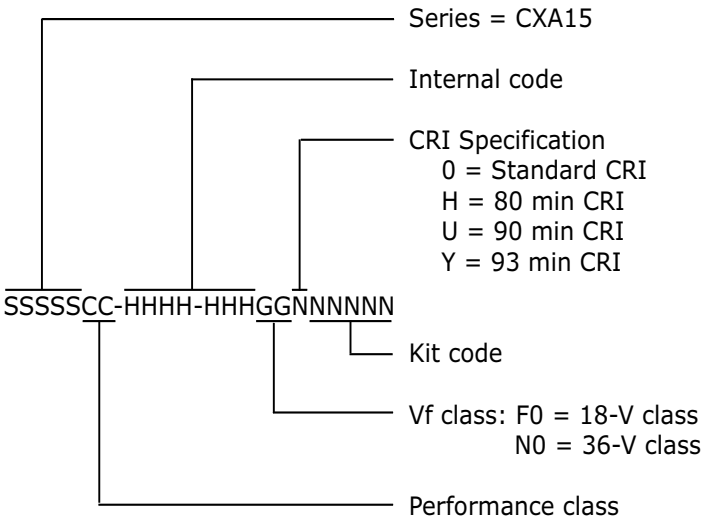
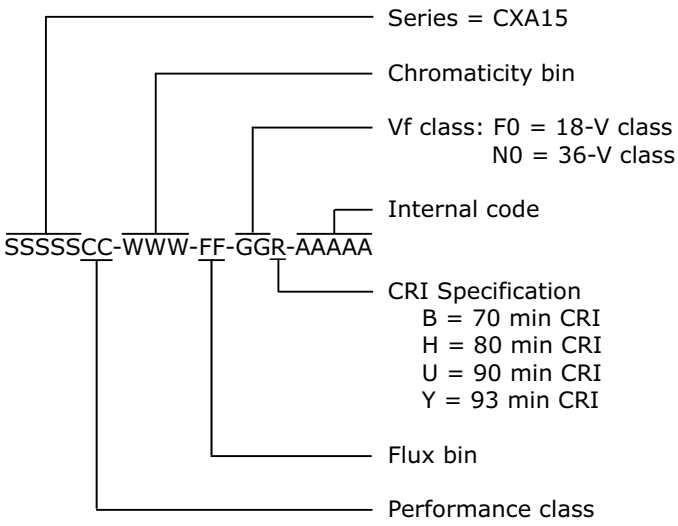
BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:

Order Code



Bin Code

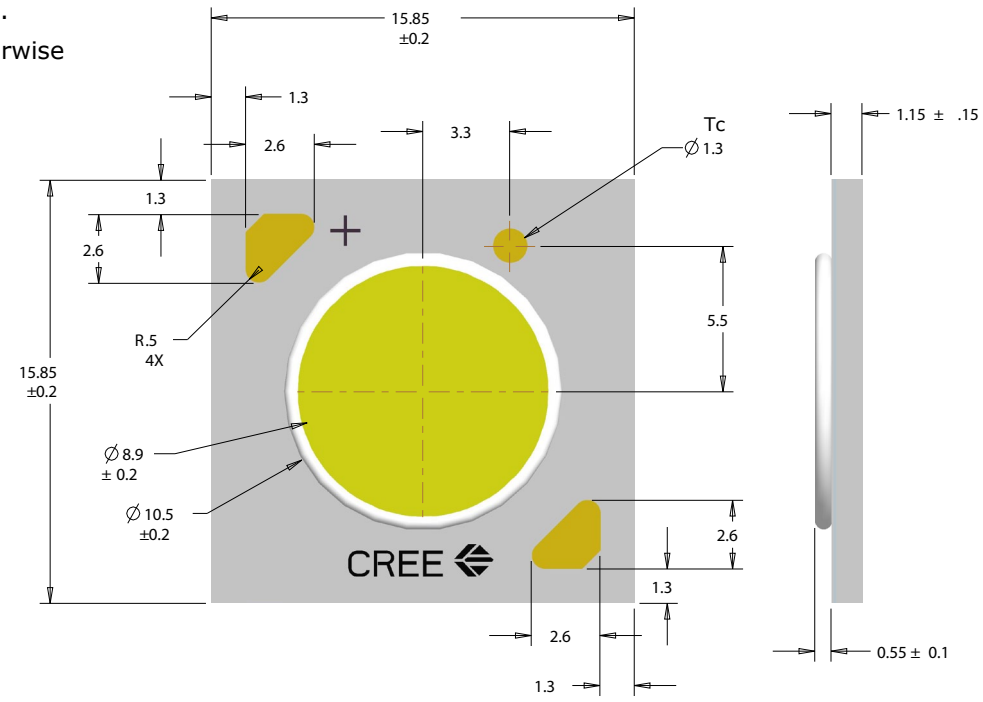


MECHANICAL DIMENSIONS

Dimensions are in mm.

Tolerances unless otherwise specified: ±.13

x° ±1°



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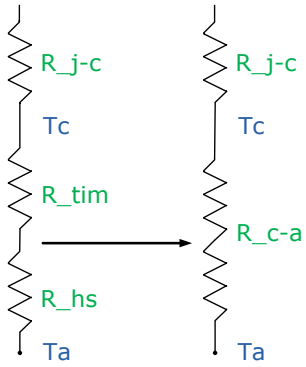
THERMAL DESIGN

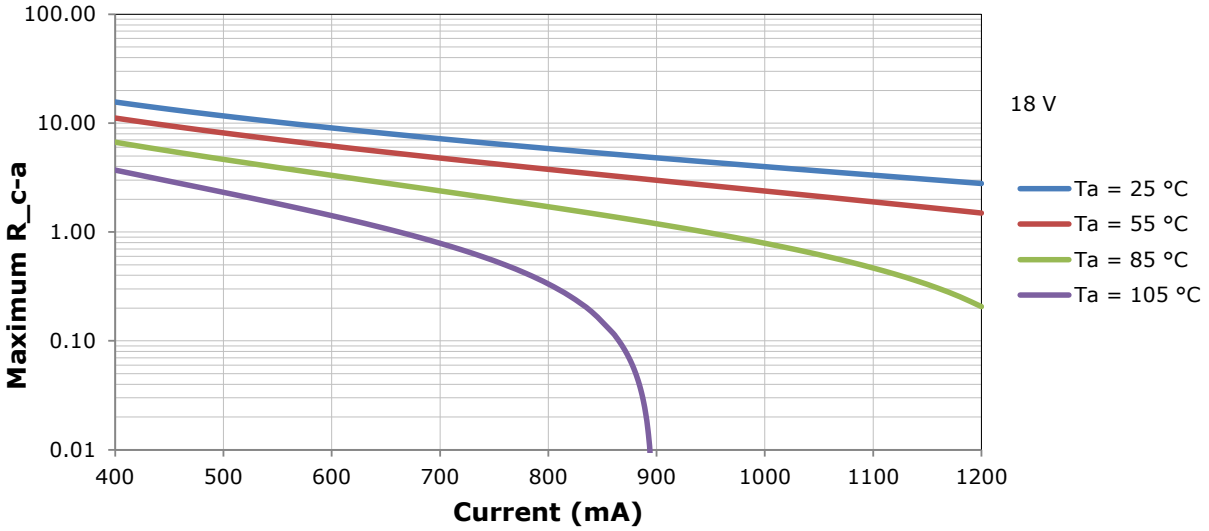
The CXA family of LED arrays can include over a hundred different LED die inside one package, and thus over a hundred different junction temperatures (T_J). Cree has intentionally removed junction-temperature-based operating limits and replaced the commonplace maximum T_J calculations with maximum ratings 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 3 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 CXA1512 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 graphs 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).





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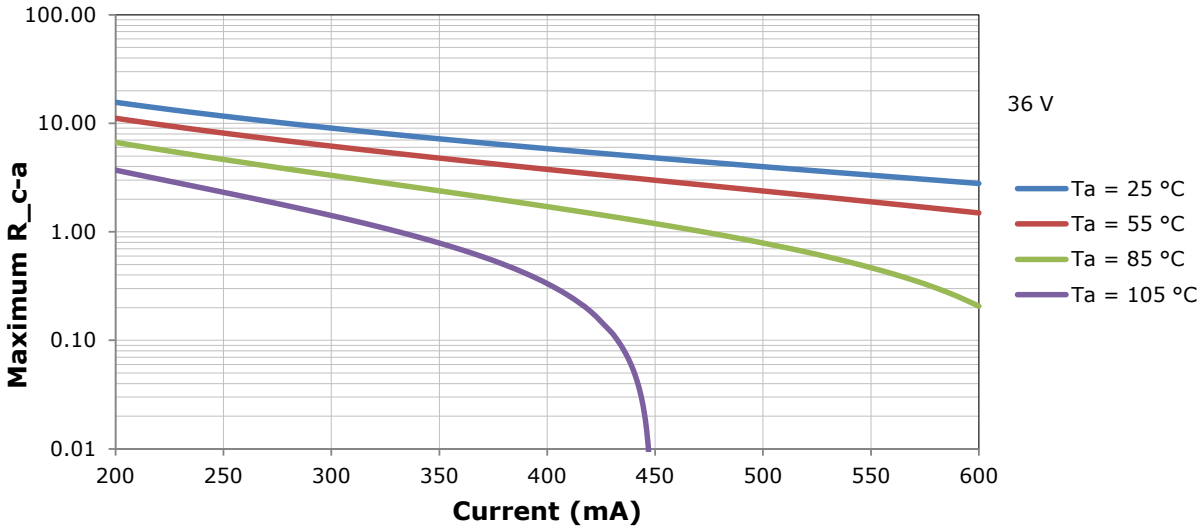
THERMAL DESIGN - CONTINUED



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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 SVHC 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.

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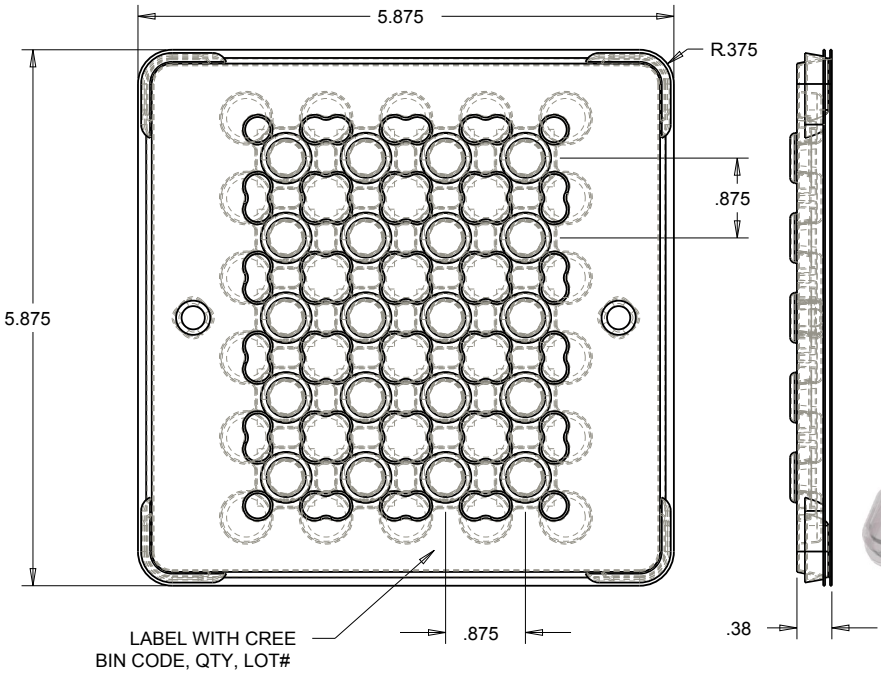
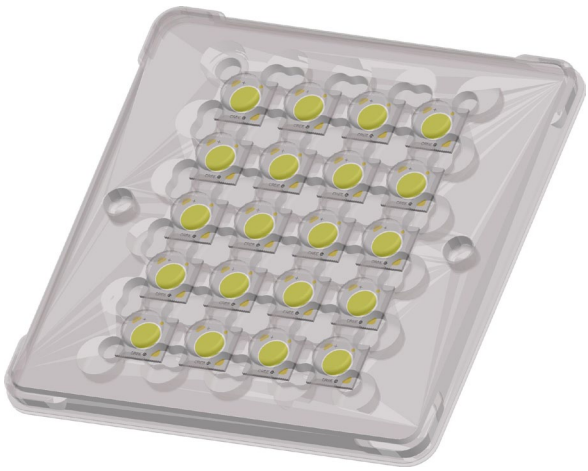
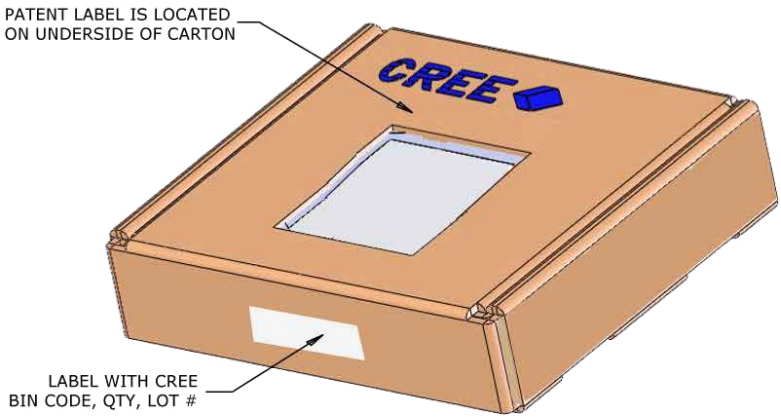
PACKAGING

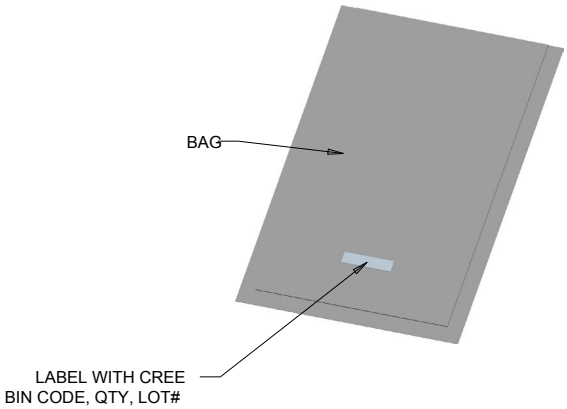
Cree CXA1512 LEDs are packaged in trays of 20. Five trays are sealed in an anti-static bag and placed inside a carton, for a total of 100 LEDs per carton. Each carton contains 100 LEDs from the same performance bin.

Dimensions are in inches.
Tolerances: ±.13
x° ±1°









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