

Cree® XLamp® CXA1304 LED



PRODUCT DESCRIPTION

The XLamp CXA1304 LED array expands Cree’s family of high-flux, multi-die arrays in a smaller, easy-to-use platform. With XLamp lighting-class reliability, the CXA1304’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 6-mm optical source, the CXA1304 brings new levels of flux and efficacy to this form factor.

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 70-, 80-, 90- and 93-minimum CRI options
- Forward voltage options: 9 V & 37 V
- 85 °C binning and characterization
- Maximum drive current: 1000 mA (9 V), 250 mA (37 V)
- 115° viewing angle, uniform chromaticity profile
- Top-side solder connections
- Thermocouple attach point
- NEMA SSL-3 2011 standard flux bins

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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 (9 V)	mA			1000*
DC forward current (37 V)	mA			250*
Reverse current (9 V, 37 V)	mA			0.1
Forward voltage (9 V, 400 mA, 85 °C)	V		9.3	
Forward voltage (9 V, 400 mA, 25 °C)	V			10.5
Forward voltage (37 V, 100 mA, 85 °C)	V		37	
Forward voltage (37 V, 100 mA, 25 °C)	V			42

* Refer to the Operating Limits section.

OPERATING LIMITS

The maximum current rating of the CXA1304 is dependent on the case temperature (T_c) when the LED has reached thermal equilibrium under steady-state operation. Please refer to the Mechanical Dimensions section on page 20 for the location of the T_c measurement point.



FLUX CHARACTERISTICS, EASYWHITE ORDER CODES AND BINS - 9 V ($I_F = 400 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)

The following tables provide order codes for XLamp CXA1304 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 20).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 400 mA			2-Step Order Code		4-Step Order Code	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
5000 K	70	75	B4	410	457	50H	CXA1304-0000-000C00B450H	50F	CXA1304-0000-000C00B450F
			C2	440	490		CXA1304-0000-000C00C250H		CXA1304-0000-000C00C250F
			C4	475	527		CXA1304-0000-000C00C450H		CXA1304-0000-000C00C450F
	80	---	B2	380	423	50H	CXA1304-0000-000C0HB250H	50F	CXA1304-0000-000C0HB250F
			B4	410	457		CXA1304-0000-000C0HB450H		CXA1304-0000-000C0HB450F
			C2	440	490		CXA1304-0000-000C0HC250H		CXA1304-0000-000C0HC250F
	90	95	A2	330	366	50H	CXA1304-0000-000C0UA250H	50F	CXA1304-0000-000C0UA250F
			A4	355	396		CXA1304-0000-000C0UA450H		CXA1304-0000-000C0UA450F
	4000 K	70	75	B2	380	423	40H	CXA1304-0000-000C00B240H	40F
B4				410	457	CXA1304-0000-000C00B440H		CXA1304-0000-000C00B440F	
C2				440	490	CXA1304-0000-000C00C240H		CXA1304-0000-000C00C240F	
80		---	A4	355	396	40H	CXA1304-0000-000C0HA440H	40F	CXA1304-0000-000C0HA440F
			B2	380	423		CXA1304-0000-000C0HB240H		CXA1304-0000-000C0HB240F
			B4	410	457		CXA1304-0000-000C0HB440H		CXA1304-0000-000C0HB440F
90		95	94	308	342	40H	CXA1304-0000-000C0U9440H	40F	CXA1304-0000-000C0U9440F
			A2	330	366		CXA1304-0000-000C0UA240H		CXA1304-0000-000C0UA240F
3500 K		80	---	A4	355	396	35H	CXA1304-0000-000C00A435H	35F
	B2			380	423	CXA1304-0000-000C00B235H		CXA1304-0000-000C0HB235F	
	B4			410	457	CXA1304-0000-000C00B435H		CXA1304-0000-000C00B435F	
	93	95	92	286	317	35H	CXA1304-0000-000C0Y9235H	35F	CXA1304-0000-000C0Y9235F
			94	308	342		CXA1304-0000-000C0Y9435H		CXA1304-0000-000C0Y9435F
	3000 K	80	---	A4	355	396	30H	CXA1304-0000-000C00A430H	30F
B2				380	423	CXA1304-0000-000C00B230H		CXA1304-0000-000C0HB230F	
93		95	84	268	297	30H	CXA1304-0000-000C0Y8430H	30F	CXA1304-0000-000C0Y8430F
			92	286	317		CXA1304-0000-000C0Y9230H		CXA1304-0000-000C0Y9230F

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, EASYWHITE ORDER CODES AND BINS - 9 V ($I_f = 400 \text{ mA}$, $T_j = 85 \text{ }^\circ\text{C}$)
 - CONTINUED**

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 400 mA			2-Step Order Code		4-Step Order Code	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
2700 K	80	---	A2	330	368	27H	CXA1304-0000-000C00A227H	27F	CXA1304-0000-000C0HA227F
			A4	355	396		CXA1304-0000-000C00A427H		CXA1304-0000-000C0HA427F
			B2	380	423		CXA1304-0000-000C00B227H		CXA1304-0000-000C0HB227F
	93	95	82	249	276	27H	CXA1304-0000-000C0Y8227H	27F	CXA1304-0000-000C0Y8227F
			84	268	297		CXA1304-0000-000C0Y8427H		CXA1304-0000-000C0Y8427F

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - 9 V ($I_F = 400 \text{ mA}$, $T_j = 85 \text{ }^\circ\text{C}$)

The following tables provide order codes for XLamp CXA1304 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 20).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 400 mA			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
5000 K	70	75	B4	410	457	3A0, 3B0, 3C0, 3D0	CXA1304-0000-000C00B40E3
			C2	440	490		CXA1304-0000-000C00C20E3
			C4	475	527		CXA1304-0000-000C00C40E3
	80	---	B2	380	423	3A0, 3B0, 3C0, 3D0	CXA1304-0000-000C0HB20E3
			B4	410	457		CXA1304-0000-000C0HB40E3
			C2	440	490		CXA1304-0000-000C0HC20E3
	90	95	A2	330	366	3A0, 3B0, 3C0, 3D0	CXA1304-0000-000C0UA20E3
			A4	355	396		CXA1304-0000-000C0UA40E3
	4000 K	70	75	B2	380	423	5A0, 5B0, 5C0, 5D0
B4				410	457	CXA1304-0000-000C00B40E5	
C2				440	490	CXA1304-0000-000C00C20E5	
80		---	A4	355	396	5A0, 5B0, 5C0, 5D0	CXA1304-0000-000C0HA40E5
			B2	380	423		CXA1304-0000-000C0HB20E5
			B4	410	457		CXA1304-0000-000C0HB40E5
90		95	94	308	342	5A0, 5B0, 5C0, 5D0	CXA1304-0000-000C0U940E5
			A2	330	366		CXA1304-0000-000C0UA20E5
3500 K		80	---	A4	355	396	6A0, 6B0, 6C0, 6D0
	B2			380	423	CXA1304-0000-000C0HB20E6	
	B4			410	457	CXA1304-0000-000C0HB40E6	
	93	95	92	286	317	6A0, 6B0, 6C0, 6D0	CXA1304-0000-000C0Y920E6
			94	308	342		CXA1304-0000-000C0Y940E6
	3000 K	80	---	A4	355	396	7A0, 7B0, 7C0, 7D0
B2				380	423	CXA1304-0000-000C0HB20E7	
93		95	84	268	297	7A0, 7B0, 7C0, 7D0	CXA1304-0000-000C0Y840E7
			92	286	317		CXA1304-0000-000C0Y920E7

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - 9 V ($I_F = 400 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)
 - CONTINUED**

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 400 mA			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
2700 K	80	---	A2	330	368	8A0, 8B0, 8C0, 8D0	CXA1304-0000-000C0HA20E8
			A4	355	396		CXA1304-0000-000C0HA40E8
			B2	380	423		CXA1304-0000-000C0HB20E8
	93	95	82	249	276	8A0, 8B0, 8C0, 8D0	CXA1304-0000-000C0Y820E8
			84	268	297		CXA1304-0000-000C0Y840E8

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, EASYWHITE ORDER CODES AND BINS - 37 V ($I_f = 100$ mA, $T_j = 85$ °C)

The following tables provide order codes for XLamp CXA1304 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 20).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 100 mA			2-Step Order Code		4-Step Order Code	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
5000 K	70	75	B4	410	457	50H	CXA1304-0000-000N00B450H	50F	CXA1304-0000-000N00B450F
			C2	440	490		CXA1304-0000-000N00C250H		CXA1304-0000-000N00C250F
			C4	475	527		CXA1304-0000-000N00C450H		CXA1304-0000-000N00C450F
	80	---	B2	380	423	50H	CXA1304-0000-000N0HB250H	50F	CXA1304-0000-000N0HB250F
			B4	410	457		CXA1304-0000-000N0HB450H		CXA1304-0000-000N0HB450F
			C2	440	490		CXA1304-0000-000N0HC250H		CXA1304-0000-000N0HC250F
	90	95	A2	330	366	50H	CXA1304-0000-000N0UA250H	50F	CXA1304-0000-000N0UA250F
			A4	355	396		CXA1304-0000-000N0UA450H		CXA1304-0000-000N0UA450F
	4000 K	70	75	B2	380	423	40H	CXA1304-0000-000N00B240H	40F
B4				410	457	CXA1304-0000-000N00B440H		CXA1304-0000-000N00B440F	
C2				440	490	CXA1304-0000-000N00C240H		CXA1304-0000-000N00C240F	
80		---	A4	355	396	40H	CXA1304-0000-000N0HA440H	40F	CXA1304-0000-000N0HA440F
			B2	380	423		CXA1304-0000-000N0HB240H		CXA1304-0000-000N0HB240F
			B4	410	457		CXA1304-0000-000N0HB440H		CXA1304-0000-000N0HB440F
90		95	94	308	342	40H	CXA1304-0000-000N0U9440H	40F	CXA1304-0000-000N0U9440F
			A2	330	366		CXA1304-0000-000N0UA240H		CXA1304-0000-000N0UA240F
3500 K		80	---	A4	355	396	35H	CXA1304-0000-000N00A435H	35F
	B2			380	423	CXA1304-0000-000N00B235H		CXA1304-0000-000N0HB235F	
	B4			410	457	CXA1304-0000-000N00B435H		CXA1304-0000-000N0HB435F	
	93	95	92	286	317	35H	CXA1304-0000-000N0Y9235H	35F	CXA1304-0000-000N0Y9235F
			94	308	342		CXA1304-0000-000N0Y9435H		CXA1304-0000-000N0Y9435F
	3000 K	80	---	A4	355	396	30H	CXA1304-0000-000N00A430H	30F
B2				380	423	CXA1304-0000-000N00B230H		CXA1304-0000-000N0HB230F	
93		95	84	268	297	30H	CXA1304-0000-000N0Y8430H	30F	CXA1304-0000-000N0Y8430F
			92	286	317		CXA1304-0000-000N0Y9230H		CXA1304-0000-000N0Y9230F

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, EASYWHITE ORDER CODES AND BINS - 37 V ($I_f = 100 \text{ mA}$, $T_j = 85 \text{ }^\circ\text{C}$)
 - CONTINUED**

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 100 mA			2-Step Order Code		4-Step Order Code	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Chromaticity Region		Chromaticity Region	
2700 K	80	---	A2	330	368	27H	CXA1304-0000-000N00A227H	27F	CXA1304-0000-000N0HA227F
			A4	355	396		CXA1304-0000-000N00A427H		CXA1304-0000-000N0HA427F
			B2	380	423		CXA1304-0000-000N00B227H		CXA1304-0000-000N0HB227F
	93	95	82	249	276	27H	CXA1304-0000-000N0Y8227H	27F	CXA1304-0000-000N0Y8227F
			84	268	297		CXA1304-0000-000N0Y8427H		CXA1304-0000-000N0Y8427F

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - 37 V ($I_f = 100$ mA, $T_j = 85$ °C)

The following tables provide order codes for XLamp CXA1304 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 20).

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 100 mA			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
5000 K	70	75	B4	410	457	3A0, 3B0, 3C0, 3D0	CXA1304-0000-000N00B40E3
			C2	440	490		CXA1304-0000-000N00C20E3
			C4	475	527		CXA1304-0000-000N00C40E3
	80	---	B2	380	423	3A0, 3B0, 3C0, 3D0	CXA1304-0000-000N0HB20E3
			B4	410	457		CXA1304-0000-000N0HB40E3
			C2	440	490		CXA1304-0000-000N0HC20E3
	90	95	A2	330	366	3A0, 3B0, 3C0, 3D0	CXA1304-0000-000N0UA20E3
			A4	355	396		CXA1304-0000-000N0UA40E3
	4000 K	70	75	B2	380	423	5A0, 5B0, 5C0, 5D0
B4				410	457	CXA1304-0000-000N00B40E5	
C2				440	490	CXA1304-0000-000N00C20E5	
80		---	A4	355	396	5A0, 5B0, 5C0, 5D0	CXA1304-0000-000N0HA40E5
			B2	380	423		CXA1304-0000-000N0HB20E5
			B4	410	457		CXA1304-0000-000N0HB40E5
90		95	94	308	342	5A0, 5B0, 5C0, 5D0	CXA1304-0000-000N0U940E5
			A2	330	366		CXA1304-0000-000N0UA20E5
3500 K		80	---	A4	355	396	6A0, 6B0, 6C0, 6D0
	B2			380	423	CXA1304-0000-000N0HB20E6	
	B4			410	457	CXA1304-0000-000N0HB50E6	
	93	95	92	286	317	6A0, 6B0, 6C0, 6D0	CXA1304-0000-000N0Y920E6
			94	308	342		CXA1304-0000-000N0Y940E6
	3000 K	80	---	A4	355	396	7A0, 7B0, 7C0, 7D0
B2				380	423	CXA1304-0000-000N0HB20E7	
93		95	84	268	297	7A0, 7B0, 7C0, 7D0	CXA1304-0000-000N0Y840E7
			92	286	317		CXA1304-0000-000N0Y920E7

Notes

- Cree maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements.
- * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - 37 V ($I_f = 100$ mA, $T_j = 85$ °C) - CONTINUED

CCT Range	CRI		Base Order Codes Min. Luminous Flux @ 100 mA			Chromaticity Regions	Order Code
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*		
2700 K	80	---	A2	330	368	8A0, 8B0, 8C0, 8D0	CXA1304-0000-000N0HA20E8
			A4	355	396		CXA1304-0000-000N0HA40E8
			B2	380	423		CXA1304-0000-000N0HB20E8
	93	95	82	249	276	8A0, 8B0, 8C0, 8D0	CXA1304-0000-000N0Y820E8
			84	268	297		CXA1304-0000-000N0Y840E8

RELATIVE SPECTRAL POWER DISTRIBUTION (9 V, $I_F = 400$ mA; 37 V, $I_F = 100$ mA, $T_j = 85$ °C)

The following graph is the result of a series of pulsed measurements at 400 mA for the 9-V CXA1304 LED and 100 mA for the 37-V CXA1304 LED and $T_j = 85$ °C.



ELECTRICAL CHARACTERISTICS

The following graphs are 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 CXA1304 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 400 mA at $T_j = 85\text{ }^\circ\text{C}$ for the 9-V CXA1304 LED.

Using the 9-V CXA1304 LED as an example, at steady-state operation of $T_c = 55\text{ }^\circ\text{C}$, $I_f = 700\text{ mA}$, the relative luminous flux ratio is 160% in the chart below. A 9-V CXA1304 LED that measures 380 lm during binning will deliver 608 lm ($380 * 1.6$) at steady-state operation of $T_c = 55\text{ }^\circ\text{C}$, $I_f = 700\text{ mA}$.



RELATIVE LUMINOUS FLUX - CONTINUED

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

- Measurements of CXA1304 at steady-state operation at the given conditions, divided by
- Flux measured during binning, which is a pulsed measurement at 100 mA at $T_j = 85\text{ }^\circ\text{C}$ for the 37-V CXA1304 LED.

Using the 37-V CXA1304 LED as an example, at steady-state operation of $T_c = 55\text{ }^\circ\text{C}$, $I_f = 175\text{ mA}$, the relative luminous flux ratio is 160% in the chart below. A 37-V CXA1304 LED that measures 380 lm during binning will deliver 608 lm ($380 * 1.6$) at steady-state operation of $T_c = 55\text{ }^\circ\text{C}$, $I_f = 175\text{ mA}$.



TYPICAL SPATIAL DISTRIBUTION



PERFORMANCE GROUPS - BRIGHTNESS (9 V, I_F = 400 mA; 37 V, I_F = 100 mA, T_J = 85 °C)

XLamp CXA1304 LEDs are tested for luminous flux and placed into one of the following bins.

Group Code	Min. Luminous Flux	Max. Luminous Flux
82	249	268
84	268	286
92	286	308
94	308	330
A2	330	355
A4	355	380
B2	380	410
B4	410	440
C2	440	475
C4	475	510

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

XLamp CXA1304 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
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
		0.4589C	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

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

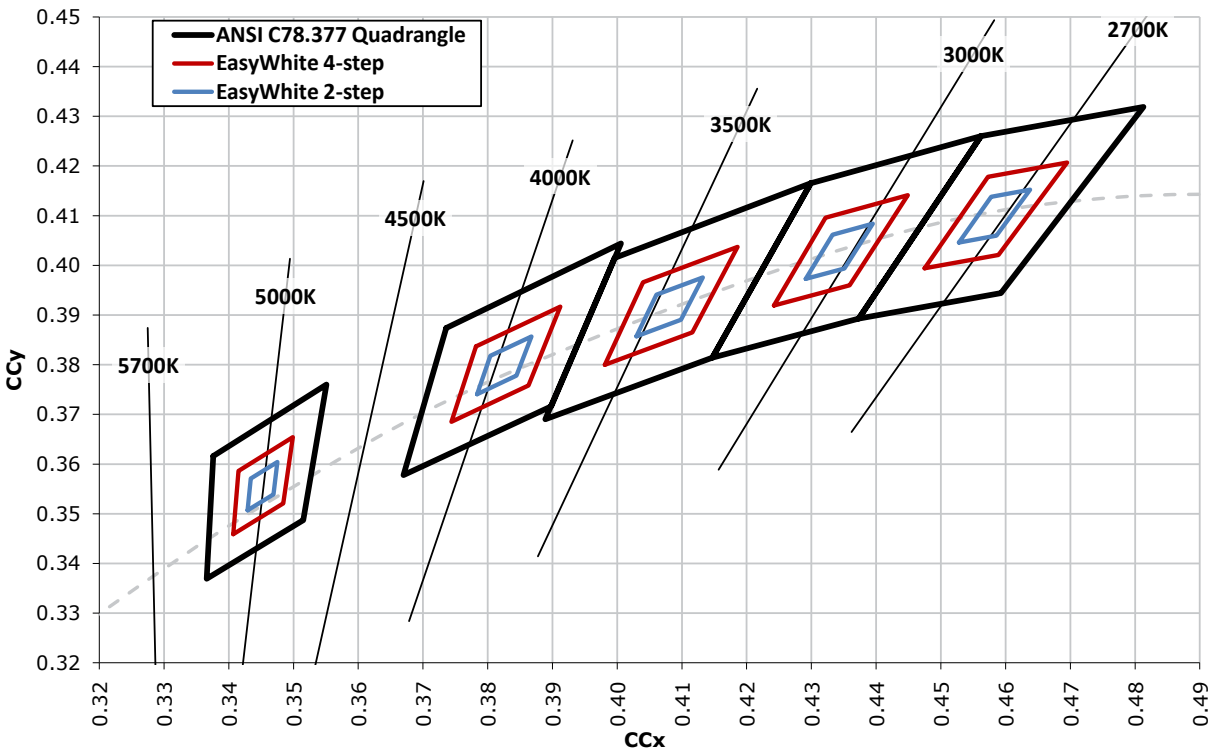
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E5	4000 K	5A0	.3670	.3578
			.3702	.3722
			.3825	.3798
			.3783	.3646
		5B0	.3702	.3722
			.3736	.3874
			.3869	.3958
			.3825	.3798
		5C0	.3825	.3798
			.3869	.3958
			.4006	.4044
			.3950	.3875
		5D0	.3783	.3646
			.3825	.3798
			.3950	.3875
			.3898	.3716

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

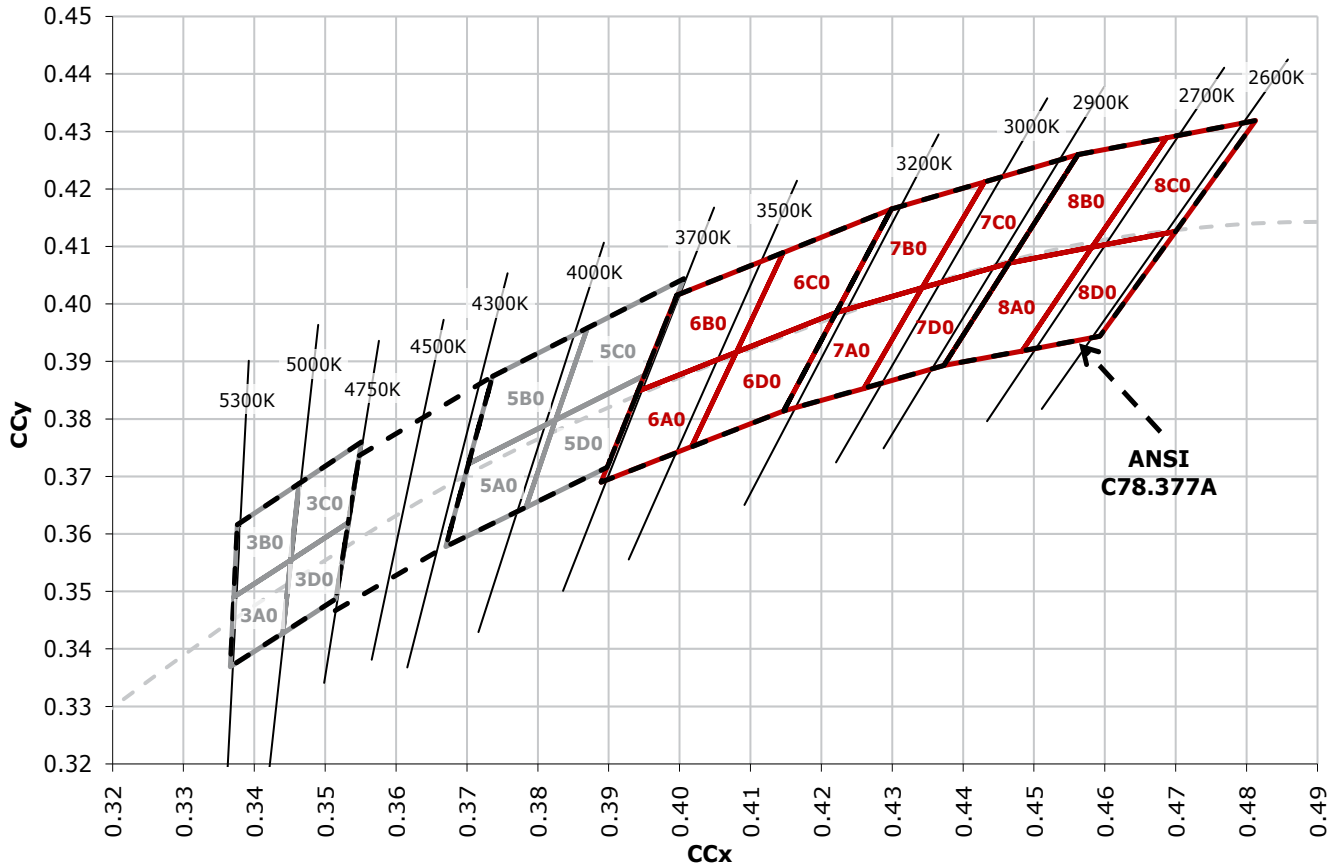
ANSI White Bins				
Code	CCT	Bin Code	x	y
0E7	3000 K	7A0	.4147	.3814
			.4221	.3984
			.4342	.4028
			.4259	.3853
		7B0	.4221	.3984
			.4299	.4165
			.4430	.4212
			.4342	.4028
		7C0	.4342	.4028
			.4430	.4212
			.4562	.4260
			.4465	.4071
		7D0	.4259	.3853
			.4342	.4028
			.4465	.4071
			.4373	.3893

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)

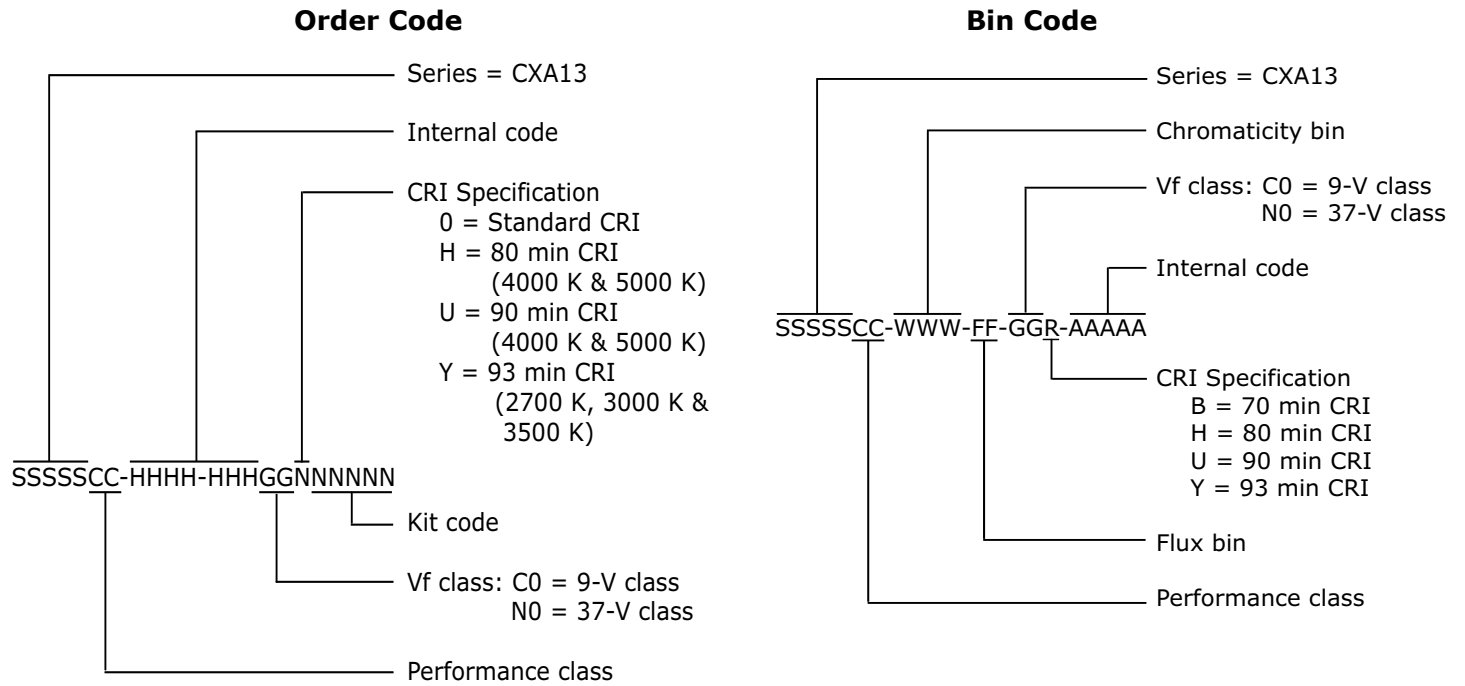


CREE ANSI WHITE BINS PLOTTED ON THE 1931 CIE COLOR SPACE ($T_j = 85^\circ\text{C}$)



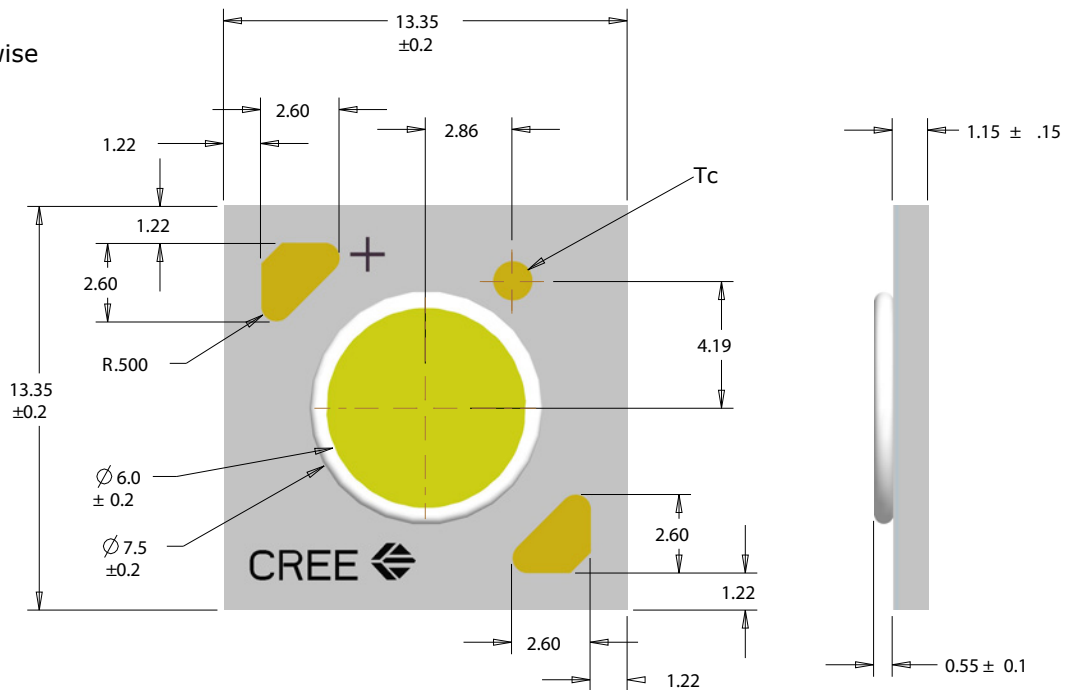
BIN AND ORDER CODE FORMATS

Bin codes and order codes are configured as follows:



MECHANICAL DIMENSIONS

Dimensions are in mm.
 Tolerances unless otherwise specified:
 .x ± .10
 .xx ± .03
 .xxx ± .010
 x° ± 1°



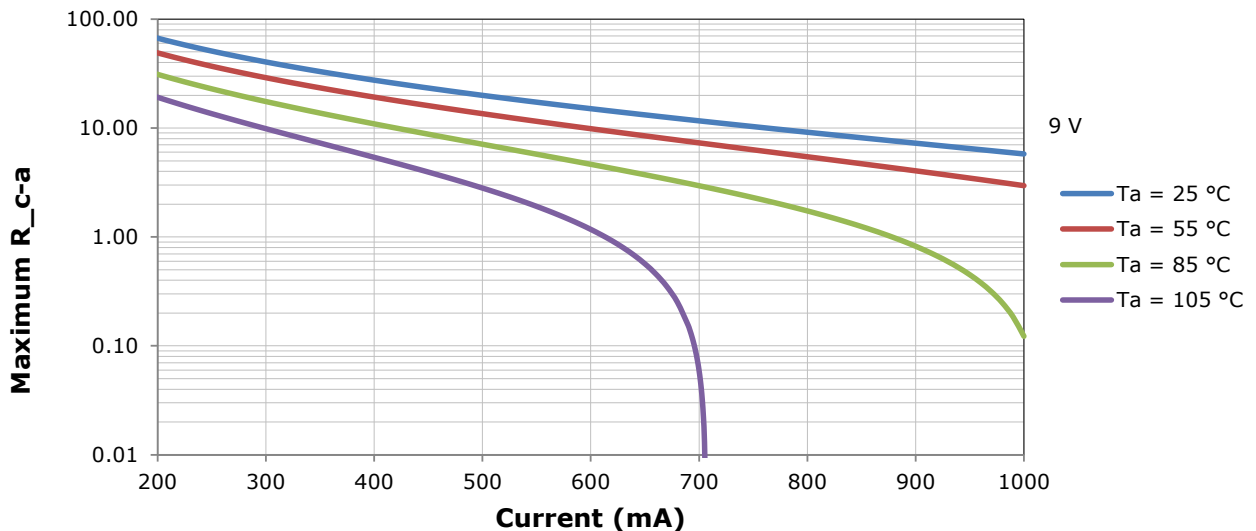
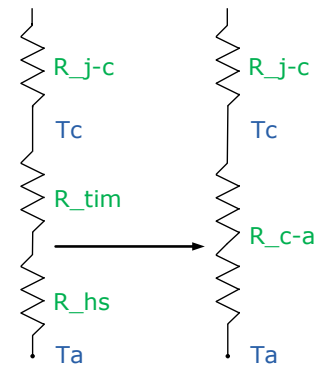
THERMAL DESIGN

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 (T_c). 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.

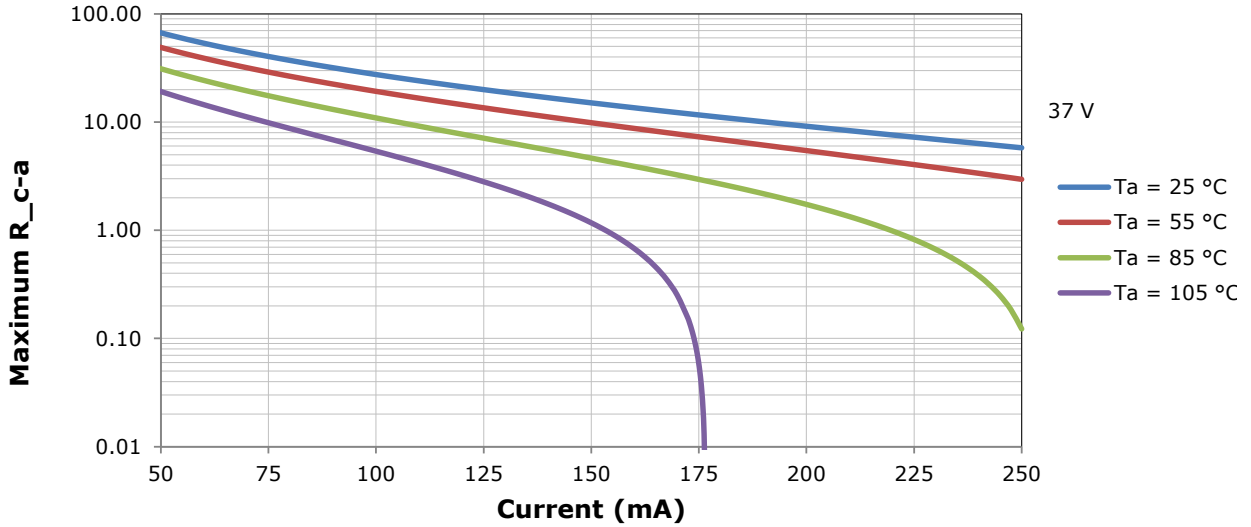
Cree has measured the temperature at the bottom of the package, commonly referred to as the solder point (T_{sp}), and found this value to be equivalent to the temperature at the T_c location at the top of the package once the LED has reached thermal equilibrium. There is no need to calculate for T_j 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 XLamp Thermal Management application note at www.cree.com/xlamp_app_notes/thermal_management. For CXA soldering recommendations and more information on thermal interface materials (TIM) and connection methods, please refer to the Cree XLamp CXA Family LEDs soldering and handling document at www.cree.com/xlamp_app_notes/CXA_SH.

To keep the CXA1304 LED at or below the maximum rated T_c , the case to ambient temperature thermal resistance (R_{c-a}) must be at or below the maximum R_{c-a} value shown on the following graphs, depending on the operating environment. The y-axis in each 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

Lumen Maintenance Projections

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 at www.cree.com/xlamp_app_notes/LM80_results.

Please read the XLamp Long-Term Lumen Maintenance application note at www.cree.com/xlamp_app_notes/lumen_maintenance for more details on Cree’s lumen maintenance testing and forecasting. Please read the XLamp Thermal Management application note at www.cree.com/xlamp_app_notes/thermal_management for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

Vision Advisory Claim

Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.

PACKAGING

Cree CXA1304 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.

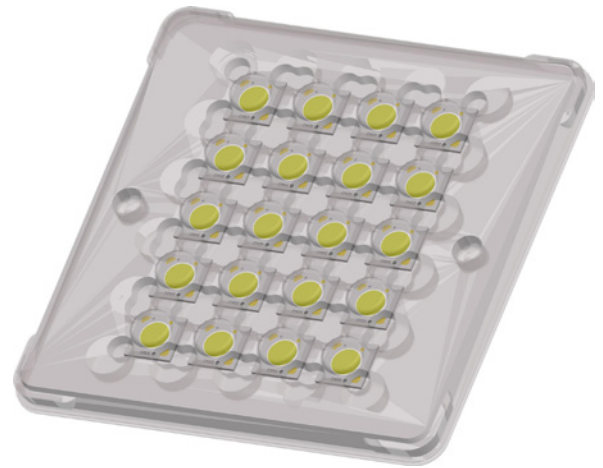
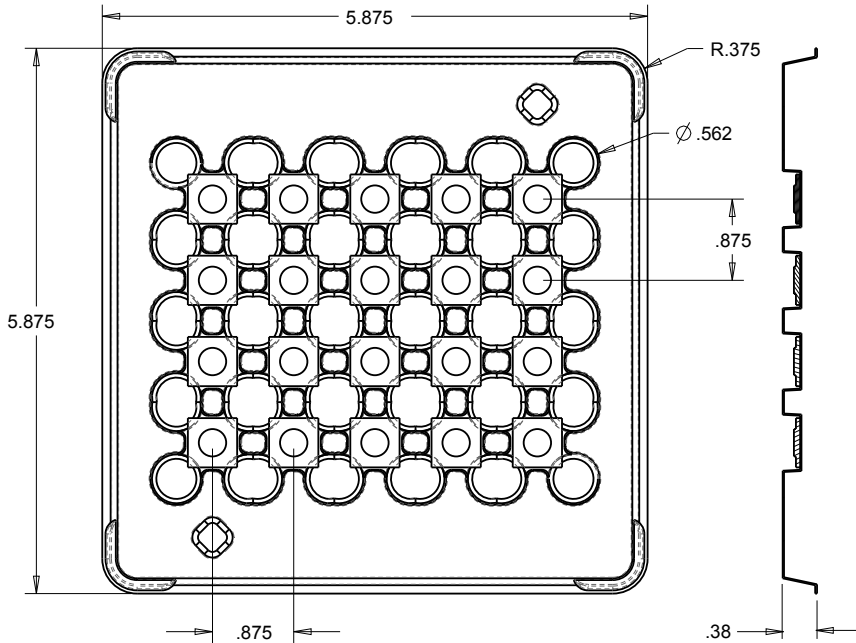
Tolerances:

.x ± .1

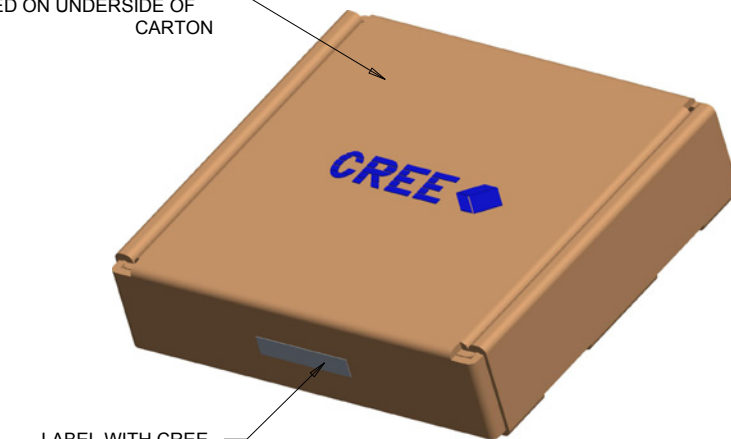
.xx ± .05

.xxx ± .005

x° ± 1°



PATENT LABEL IS LOCATED ON UNDERSIDE OF CARTON



LABEL WITH CREE BIN CODE, QTY, LOT#

BAG

LABEL WITH CREE BIN CODE, QTY, LOT#

