

Cree® XLamp® CXA2520 LED



PRODUCT DESCRIPTION

The XLamp CXA2520 LED array expands Cree’s family of high-flux, multi-die arrays, offering high performance in an easy-to-use platform. With XLamp lighting-class reliability, the CXA2520’s uniform emitting surface enables both directional and non-directional lighting applications and luminaire designs. Available in 2-step and 4-step color consistency, and featuring a 19-mm optical source, the CXA2520 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
- 80 and 90 minimum CRI options
- Forward voltage: 36 V
- 85 °C binning and characterization
- Maximum drive current: 1250 mA
- 115° viewing angle, uniform chromaticity profile
- Top-side solder connections
- Thermocouple attach point
- NEMA SSL-3 2011 standard flux bins
- RoHS- and REACH-compliant
- UL-recognized component (E349212)



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CHARACTERISTICS

| Characteristics | Unit | Minimum | Typical | Maximum |
|--|---------|---------|---------|---------|
| Effective thermal resistance, junction to case | °C/W | | 0.8 | |
| Viewing angle (FWHM) | degrees | | 115 | |
| ESD classification (HBM per Mil-Std-883D) | | | Class 2 | |
| DC forward current | mA | | 550 | 1250 |
| Reverse current | mA | | | 0.1 |
| Forward voltage (@ 550 mA, 85 °C) | V | | 36 | |
| Forward voltage (@ 550 mA, 25 °C) | V | | 37 | 42 |
| LED junction temperature | °C | | | 150 |
| Temperature coefficient of voltage | mV/°C | | -21 | |

FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS ($I_f = 550 \text{ mA}$, $T_j = 85 \text{ °C}$)

The following tables provide order codes for XLamp CXA2520 LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 13).

| Color | CCT Range | Base Order Codes Min. Luminous Flux @ 550 mA | | | 2-Step Order Code | | 4-Step Order Code | |
|-----------|-----------|--|-------------------|--------------------|---------------------|--------------------------|---------------------|--------------------------|
| | | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Chromaticity Region | | Chromaticity Region | |
| EasyWhite | 5000K | Q4 | 2260 | 2560 | 50H | CXA2520-0000-000N00Q450H | 50F | CXA2520-0000-000N00Q450F |
| | | R2 | 2420 | 2741 | | CXA2520-0000-000N00R250H | | CXA2520-0000-000N00R250F |
| | 4000K | Q2 | 2100 | 2379 | 40H | CXA2520-0000-000N00Q240H | 40F | CXA2520-0000-000N00Q240F |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N00Q440H | | CXA2520-0000-000N00Q440F |
| | | R2 | 2420 | 2741 | | CXA2520-0000-000N00R240H | | CXA2520-0000-000N00R240F |
| | 3500K | P4 | 1965 | 2226 | 35H | CXA2520-0000-000N00P435H | 35F | CXA2520-0000-000N00P435F |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N00Q235H | | CXA2520-0000-000N00Q235F |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N00Q435H | | CXA2520-0000-000N00Q435F |
| | 3000K | P4 | 1965 | 2226 | 30H | CXA2520-0000-000N00P430H | 30F | CXA2520-0000-000N00P430F |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N00Q230H | | CXA2520-0000-000N00Q230F |
| | 2700K | P2 | 1830 | 2073 | 27H | CXA2520-0000-000N00P227H | 27F | CXA2520-0000-000N00P227F |
| | | P4 | 1965 | 2226 | | CXA2520-0000-000N00P427H | | CXA2520-0000-000N00P427F |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N00Q227H | | CXA2520-0000-000N00Q227F |

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.
- Minimum CRI for standard color temperatures 0E8, 27F, 27H, 0E7, 30F, 30H, 0E6, 35F, 35H is 80.
- Minimum CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 70.
- Typical CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 75.
- * Flux values @ 25 °C are calculated and for reference only.

| Color | CCT Range | Base Order Codes Min. Luminous Flux @ 550 mA | | | Chromaticity Regions | Order Code |
|------------|-----------|--|----------------------|-----------------------|----------------------|--------------------------|
| | | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | | |
| ANSI White | 5000K | Q4 | 2260 | 2560 | 3A0, 3B0, 3C0, 3D0 | CXA2520-0000-000N00Q40E3 |
| | | R2 | 2420 | 2741 | | CXA2520-0000-000N00R20E3 |
| | 4000K | Q2 | 2100 | 2379 | 5A0, 5B0, 5C0, 5D0 | CXA2520-0000-000N00Q20E5 |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N00Q40E5 |
| | | R2 | 2420 | 2741 | | CXA2520-0000-000N00R20E5 |
| | 3500K | P4 | 1965 | 2226 | 6A0, 6B0, 6C0, 6D0 | CXA2520-0000-000N00P40E6 |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N00Q20E6 |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N00Q40E6 |
| | 3000K | P4 | 1965 | 2226 | 7A0, 7B0, 7C0, 7D0 | CXA2520-0000-000N00P40E7 |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N00Q20E7 |
| | 2700K | P2 | 1830 | 2073 | 8A0, 8B0, 8C0, 8D0 | CXA2520-0000-000N00P20E8 |
| | | P4 | 1965 | 2226 | | CXA2520-0000-000N00P40E8 |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N00Q20E8 |

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.
- Minimum CRI for standard color temperatures 0E8, 27F, 27H, 0E7, 30F, 30H, 0E6, 35F, 35H is 80.
- Minimum CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 70.
- Typical CRI for standard color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 75.
- * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS, 90 CRI ($I_F = 550 \text{ mA}$, $T_j = 85 \text{ }^\circ\text{C}$)

The following tables provide order codes for XLamp CXA2520 90 CRI minimum LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 13).

| Color | CCT Range | Base Order Codes Min. Luminous Flux @ 550 mA | | | 2-Step Order Code | | 4-Step Order Code | |
|-----------|-----------|--|-------------------|--------------------|---------------------|--------------------------|---------------------|--------------------------|
| | | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Chromaticity Region | | Chromaticity Region | |
| EasyWhite | 3000K | M4 | 1485 | 1682 | 30H | CXA2520-0000-000N0UM430H | 30F | CXA2520-0000-000N0UM430F |
| | | N2 | 1590 | 1801 | | CXA2520-0000-000N0UN230H | | CXA2520-0000-000N0UN230F |
| | | N4 | 1710 | 1937 | | CXA2520-0000-000N0UN430H | | CXA2520-0000-000N0UN430F |
| | 2700K | M2 | 1380 | 1563 | 27H | CXA2520-0000-000N0UM227H | 27F | CXA2520-0000-000N0UM227F |
| | | M4 | 1485 | 1682 | | CXA2520-0000-000N0UM427H | | CXA2520-0000-000N0UM427F |
| | | N2 | 1590 | 1801 | | CXA2520-0000-000N0UN227H | | CXA2520-0000-000N0UN227F |

| Color | CCT Range | Base Order Codes Min. Luminous Flux @ 550 mA | | | Chromaticity Regions | Order Code |
|------------|-----------|--|-------------------|--------------------|----------------------|--------------------------|
| | | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | | |
| ANSI White | 3000K | M4 | 1485 | 1682 | 7A0, 7B0, 7C0, 7D0 | CXA2520-0000-000N0UM40E7 |
| | | N2 | 1590 | 1801 | | CXA2520-0000-000N0UN20E7 |
| | | N4 | 1710 | 1937 | | CXA2520-0000-000N0UN40E7 |
| | 2700K | M2 | 1380 | 1563 | 8A0, 8B0, 8C0, 8D0 | CXA2520-0000-000N0UM20E8 |
| | | M4 | 1485 | 1682 | | CXA2520-0000-000N0UM40E8 |
| | | N2 | 1590 | 1801 | | CXA2520-0000-000N0UN20E8 |

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.
- Minimum CRI for high CRI color temperatures 0E8, 27F, 27H, 0E7, 30F, 30H is 90.
- * Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, STANDARD ORDER CODES AND BINS, 80 CRI ($I_F = 550 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)

The following tables provide order codes for XLamp CXA2520 80 CRI minimum LEDs. For a complete description of the order code nomenclature, please reference Bin and Order Code Formats (page 13).

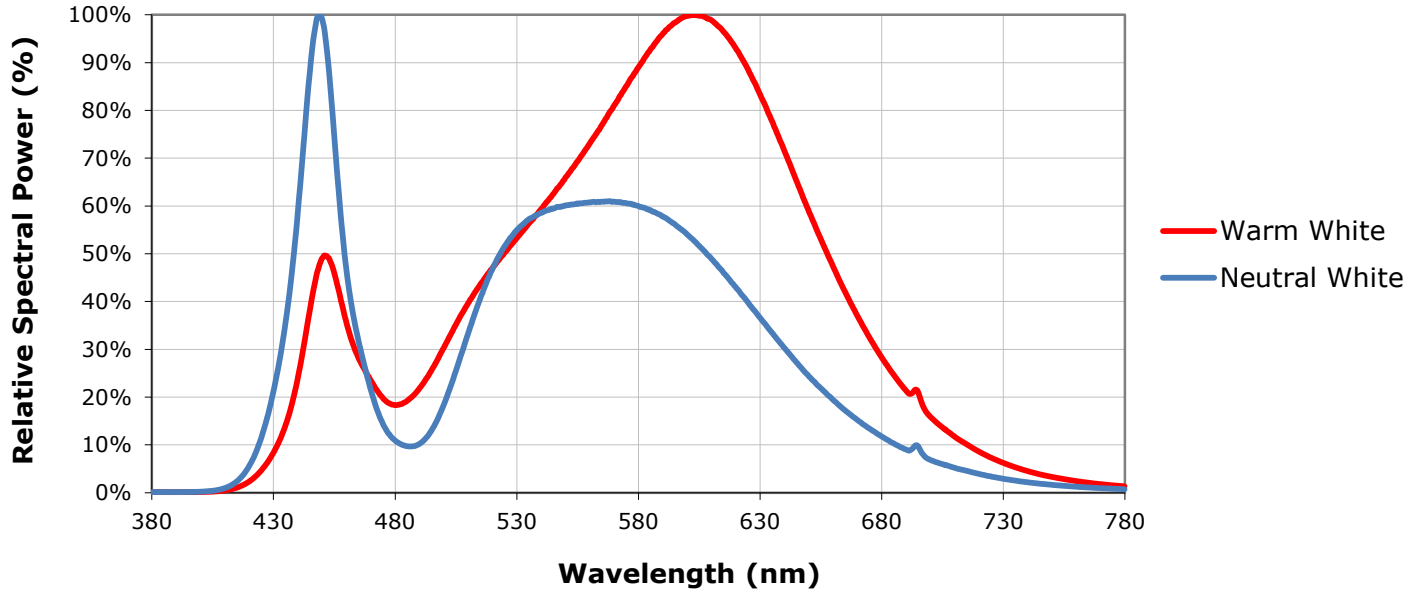
| Color | CCT Range | Base Order Codes Min. Luminous Flux @ 550 mA | | | 2-Step Order Code | | 4-Step Order Code | |
|-----------|-----------|--|-------------------|--------------------|---------------------|--------------------------|---------------------|--------------------------|
| | | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Chromaticity Region | | Chromaticity Region | |
| EasyWhite | 5000K | P4 | 1965 | 2226 | 50H | CXA2520-0000-000N0HP450H | 50F | CXA2520-0000-000N0HP450F |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N0HQ250H | | CXA2520-0000-000N0HQ250F |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N0HQ450H | | CXA2520-0000-000N0HQ450F |
| | 4000K | P4 | 1965 | 2226 | 40H | CXA2520-0000-000N0HP440H | 40F | CXA2520-0000-000N0HP440F |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N0HQ240H | | CXA2520-0000-000N0HQ240F |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N0HQ440H | | CXA2520-0000-000N0HQ440F |

| Color | CCT Range | Base Order Codes Min. Luminous Flux @ 550 mA | | | Chromaticity Regions | Order Code |
|------------|-----------|--|-------------------|--------------------|----------------------|--------------------------|
| | | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | | |
| ANSI White | 5000K | P4 | 1965 | 2226 | 3A0, 3B0, 3C0, 3D0 | CXA2520-0000-000N0HP40E3 |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N0HQ20E3 |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N0HQ40E3 |
| | 4000K | P4 | 1965 | 2226 | 5A0, 5B0, 5C0, 5D0 | CXA2520-0000-000N0HP40E5 |
| | | Q2 | 2100 | 2379 | | CXA2520-0000-000N0HQ20E5 |
| | | Q4 | 2260 | 2560 | | CXA2520-0000-000N0HQ40E5 |

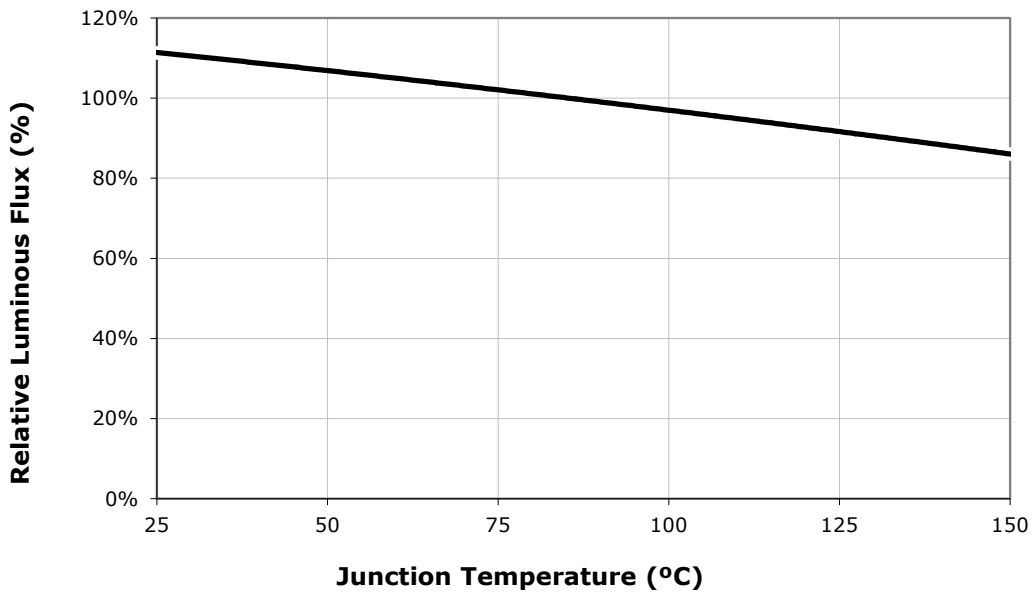
Notes:

- 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.
- Minimum CRI for high CRI color temperatures 0E5, 40F, 40H, 0E3, 50F, 50H is 80.
- * Flux values @ 25 °C are calculated and for reference only.

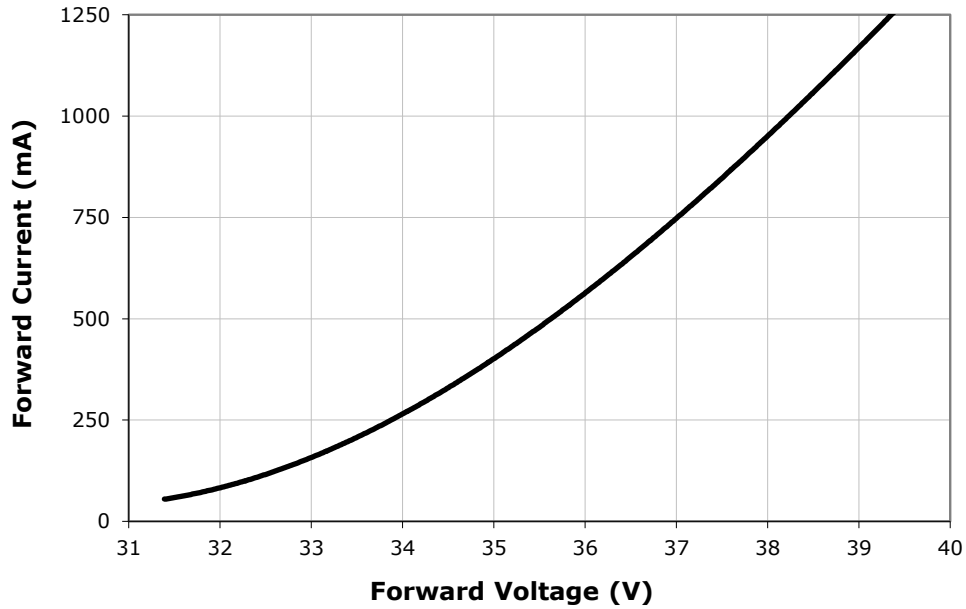
RELATIVE SPECTRAL POWER DISTRIBUTION ($I_F = 550 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)



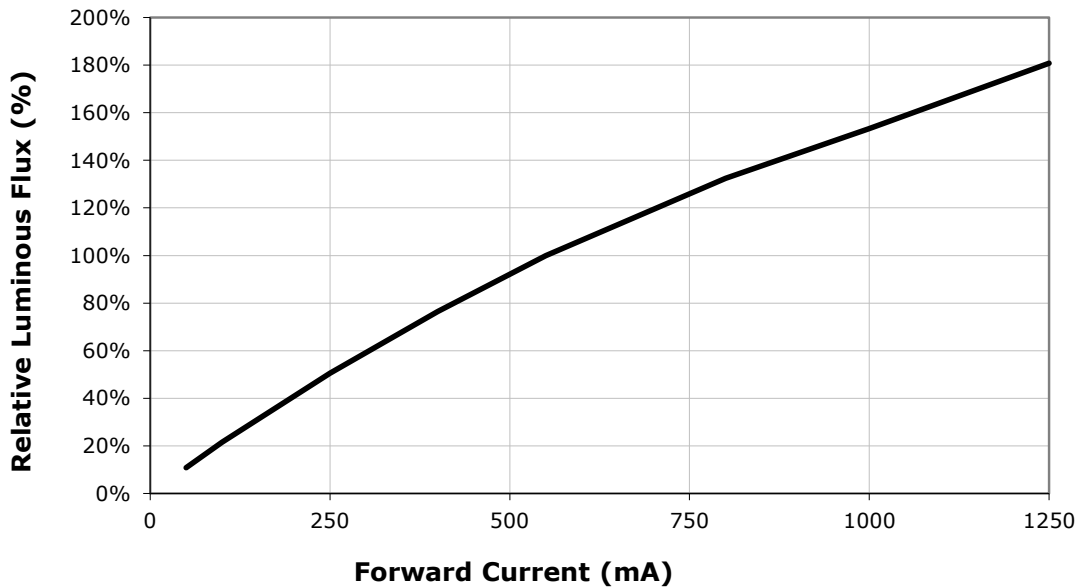
RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE ($I_F = 550 \text{ mA}$)



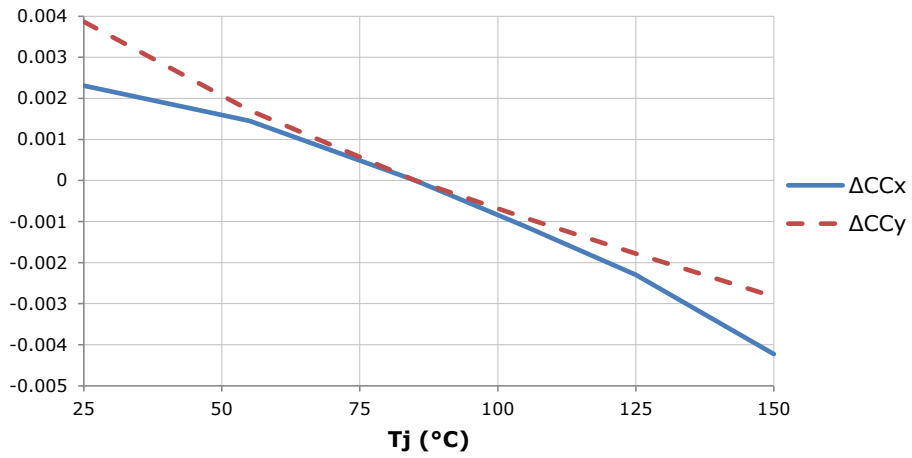
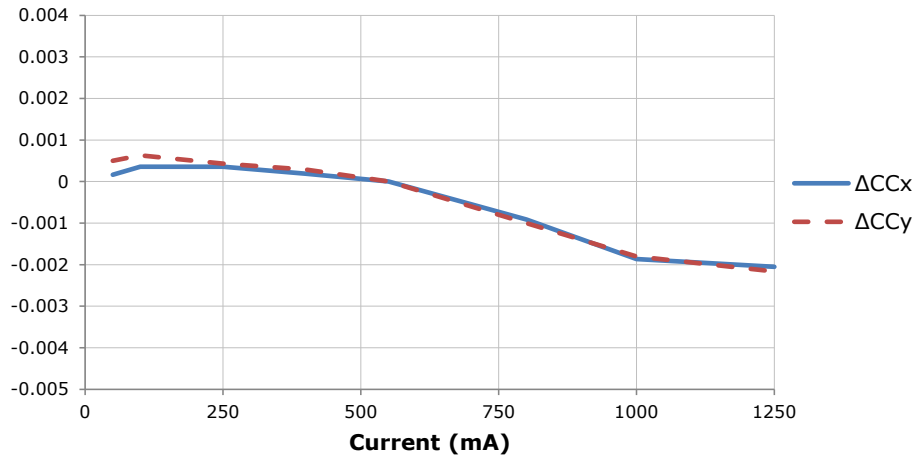
ELECTRICAL CHARACTERISTICS ($T_j = 85\text{ }^\circ\text{C}$)



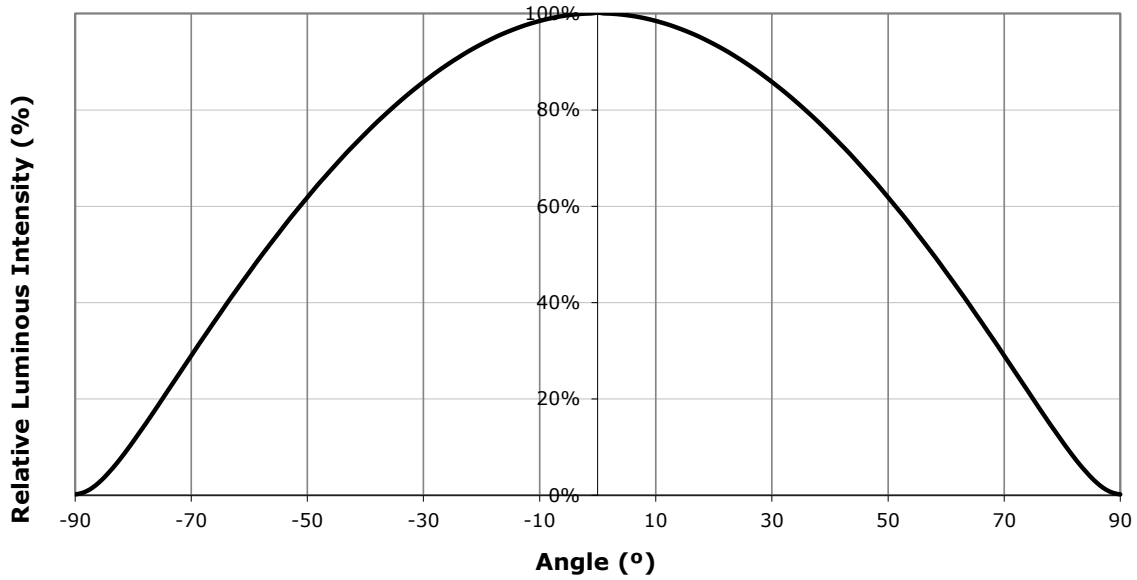
RELATIVE LUMINOUS FLUX VS. CURRENT ($T_j = 85\text{ }^\circ\text{C}$)



RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE (3000K, 80 CRI)



TYPICAL SPATIAL DISTRIBUTION



PERFORMANCE GROUPS - BRIGHTNESS ($I_f = 550\text{ mA}$, $T_j = 85\text{ °C}$)

XLamp CXA2520 LEDs are tested for luminous flux and placed into one of the following bins.

| Group Code | Min. Luminous Flux @ 550 mA | Max. Luminous Flux @ 550 mA |
|------------|-----------------------------|-----------------------------|
| M2 | 1380 | 1485 |
| M4 | 1485 | 1590 |
| N2 | 1590 | 1710 |
| N4 | 1710 | 1830 |
| P2 | 1830 | 1965 |
| P4 | 1965 | 2100 |
| Q2 | 2100 | 2260 |
| Q4 | 2260 | 2420 |
| R2 | 2420 | 2600 |

PERFORMANCE GROUPS - CHROMATICITY (T_j = 85 °C)

XLamp CXA2520 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 | 5000K | 0.3407 | 0.3459 |
| | | 0.3415 | 0.3586 |
| | | 0.3499 | 0.3654 |
| | | 0.3484 | 0.3521 |
| 40F | 4000K | 0.3744 | 0.3685 |
| | | 0.3782 | 0.3837 |
| | | 0.3912 | 0.3917 |
| | | 0.3863 | 0.3758 |
| 35F | 3500K | 0.3981 | 0.3800 |
| | | 0.4040 | 0.3966 |
| | | 0.4186 | 0.4037 |
| | | 0.4116 | 0.3865 |
| 30F | 3000K | 0.4242 | 0.3919 |
| | | 0.4322 | 0.4096 |
| | | 0.4449 | 0.4141 |
| | | 0.4359 | 0.3960 |
| 27F | 2700K | 0.4475 | 0.3994 |
| | | 0.4573 | 0.4178 |
| | | 0.4695 | 0.4207 |
| | | 0.4586 | 0.4060 |

| 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 |

| 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 |

| ANSI White Bins | | | | |
|-----------------|-------|----------|-------|-------|
| Code | CCT | Bin Code | x | y |
| 0E6 | 3500K | 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 | | | | | ANSI White Bins | | | | |
|-----------------|-------|----------|-------|-------|-----------------|-------|----------|-------|-------|
| Code | CCT | Bin Code | x | y | Code | CCT | Bin Code | x | y |
| 0E7 | 3000K | 7A0 | .4147 | .3814 | 0E8 | 2700K | 8A0 | .4373 | .3893 |
| | | | .4221 | .3984 | | | | .4465 | .4071 |
| | | | .4342 | .4028 | | | | .4582 | .4099 |
| | | | .4259 | .3853 | | | | .4483 | .3919 |
| | | 7B0 | .4221 | .3984 | | | 8B0 | .4465 | .4071 |
| | | | .4299 | .4165 | | | | .4562 | .4260 |
| | | | .4430 | .4212 | | | | .4687 | .4289 |
| | | | .4342 | .4028 | | | | .4582 | .4099 |
| | | 7C0 | .4342 | .4028 | | | 8C0 | .4582 | .4099 |
| | | | .4430 | .4212 | | | | .4687 | .4289 |
| | | | .4562 | .4260 | | | | .4813 | .4319 |
| | | | .4465 | .4071 | | | | .4700 | .4126 |
| | | 7D0 | .4259 | .3853 | | | 8D0 | .4483 | .3919 |
| | | | .4342 | .4028 | | | | .4582 | .4099 |
| | | | .4465 | .4071 | | | | .4700 | .4126 |
| | | | .4373 | .3893 | | | | .4593 | .3944 |

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



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

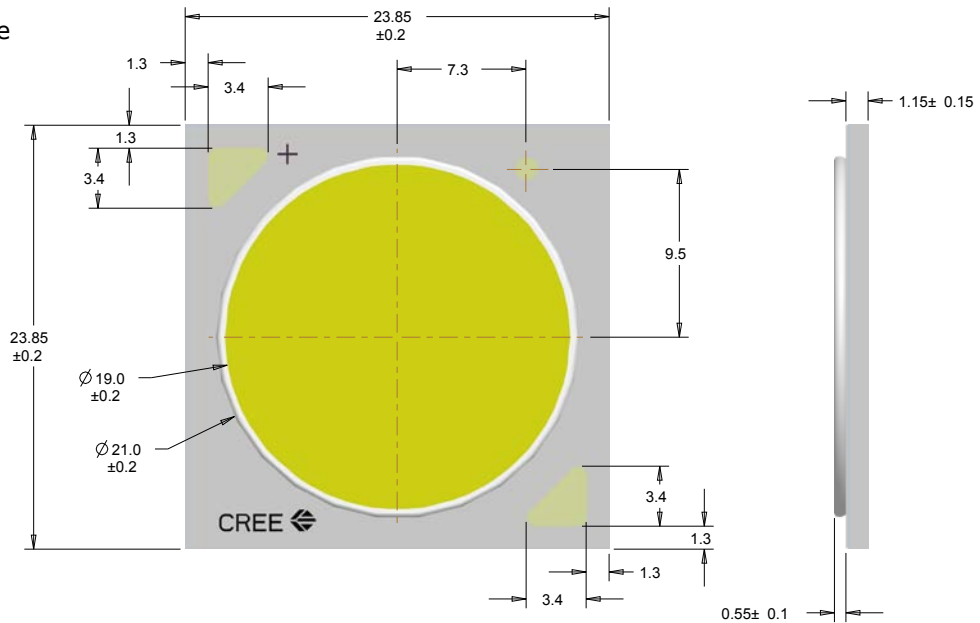
specified:

.x ± .10

.xx ± .03

.xxx ± .010

x° ± 1° x ± .10



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/XRE_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.

RoHS Compliance

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise 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 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), as amended through April 21, 2006.

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 Claim

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

PACKAGING

Cree CXA2520 LEDs are packaged in tubes of 20, which are then combined in boxes of 5 tubes, or 100 LEDs. Boxes of 100 LEDs are of the same performance bin.

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

