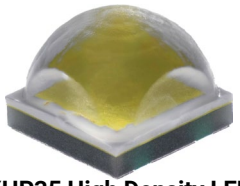
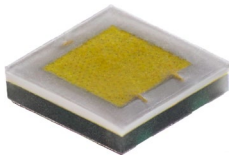
# Cree® XLamp® XHP35 LEDs



XHP35 High Density LED



XHP35 High Intensity LED

## PRODUCT DESCRIPTION

The XLamp® XHP35 LED brings the performance of Cree's Extreme High Power LEDs to the XP footprint, setting a new standard for performance delivered by a 3.45 x 3.45 mm LED. Leveraging the breakthrough 12-V monolithic power die built on Cree's innovative architecture and uniquely enabled by the SC5 Technology® Platform, the XHP35 LED allows the use of readily available cost--optimized drivers to unleash the capabilities of Cree's high-power LEDs. Available in both high-density and high-intensity versions, the XHP35 LED is application optimized to enable new designs and radically lower system costs.

## FEATURES

- Available in white in high-density and high-intensity versions for design flexibility
- XHP35 High Intensity LED is optimized to deliver maximum candela through secondary optics
- Available in 5-step EasyWhite® bins at 2700 K to 5700 K CCT and 3-step EasyWhite bins at 2700 K to 3500 K CCT
- Available in ANSI white bins at 2700 K to 7000 K CCT
- Available in standard, 70-, 80-, 85- and 90-minimum CRI options
- Binned at 85 °C
- Maximum drive current: 1050 mA
- Low thermal resistance: 1.8 °C/W
- Wide viewing angle: 115° for high intensity, 125° for high density
- Unlimited floor life at ≤ 30 ºC/85% RH
- Reflow solderable - JEDEC J-STD-020C
- RoHS and REACh compliant
- UL® recognized component (E349212)

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Cree, Inc.
4600 Silicon Drive
Durham, NC 27703
USA Tel: +1.919.313.5300

## CHARACTERISTICS

| Characteristics | Unit | Minimum | Typical | Maximum |
|---|---|---|---|---|
| Thermal resistance, junction to solder point | °C/W | | 1.8 | |
| Viewing angle (FWHM) - High Density | degrees | | 125 | |
| Viewing angle (FWHM) - High Intensity | degrees | | 115 | |
| Temperature coefficient of voltage | mV/°C | | -8 | |
| ESD withstand voltage (HBM per Mil-Std-883D) | V | | | 8000 |
| DC forward current | mA | | | 1050 |
| Reverse voltage | V | | | -5 |
| Forward voltage (@ 350 mA, 85 °C) | V | | 11.3 | 11.9 |
| LED junction temperature | °C | | | 150 |

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## FLUX CHARACTERISTICS, HIGH DENSITY EASYWHITE® ORDER CODES AND BINS ($T_J$ = 85 °C)

The following table provides order codes for XLamp XHP35 High Density LEDs. For a complete description of how the flux and chromaticity groups are reflected in the bin code and order code nomenclature, please see the Bin and Order Code Formats section (page 29).

| Nominal CCT | CRI | | Minimum Luminous Flux @350 mA | | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Group | Order Code | Group | Order Code |
| 5700 K | 70 | | E4 | 635 | 706 | | | 57E | XHP35A-00-0000-0D0BE457E |
| | | | E2 | 590 | 656 | | | | XHP35A-00-0000-0D0BE257E |
| | | | D4 | 550 | 612 | | | | XHP35A-00-0000-0D0BD457E |
| | 80 | | D4 | 550 | 612 | | | 57E | XHP35A-00-0000-0D0HD457E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0HD257E |
| | 90 | | C4 | 475 | 528 | | | 57E | XHP35A-00-0000-0D0UC457E |
| | | | C2 | 440 | 489 | | | | XHP35A-00-0000-0D0UC257E |
| | | | B4 | 410 | 456 | | | | XHP35A-00-0000-0D0UB457E |
| 5000 K | 70 | | E4 | 635 | 706 | | | 50E | XHP35A-00-0000-0D0BE450E |
| | | | E2 | 590 | 656 | | | | XHP35A-00-0000-0D0BE250E |
| | | | D4 | 550 | 612 | | | | XHP35A-00-0000-0D0BD450E |
| | 80 | | D4 | 550 | 612 | | | 50E | XHP35A-00-0000-0D0HD450E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0HD250E |
| | 90 | | C4 | 475 | 528 | | | 50E | XHP35A-00-0000-0D0UC450E |
| | | | C2 | 440 | 489 | | | | XHP35A-00-0000-0D0UC250E |
| | | | B4 | 410 | 456 | | | | XHP35A-00-0000-0D0UB450E |
| 4500 K | 70 | | E2 | 590 | 656 | | | 45E | XHP35A-00-0000-0D0BE245E |
| | | | D4 | 550 | 612 | | | | XHP35A-00-0000-0D0BD445E |
| | 80 | | D4 | 550 | 612 | | | 45E | XHP35A-00-0000-0D0HD445E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0HD245E |
| | 90 | | C2 | 440 | 489 | | | 45E | XHP35A-00-0000-0D0UC245E |
| | | | B4 | 410 | 456 | | | | XHP35A-00-0000-0D0UB445E |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH DENSITY EASYWHITE® ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nominal CCT | CRI | | Minimum Luminous Flux @350 mA | | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Group | Order Code | Group | Order Code |
| 4000 K | 70 | | E2 | 590 | 656 | | | 40E | XHP35A-00-0000-0D0BE240E |
| | | | D4 | 550 | 612 | | | | XHP35A-00-0000-0D0BD440E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0BD240E |
| | 80 | | D4 | 550 | 612 | | | 40E | XHP35A-00-0000-0D0HD440E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0HD240E |
| | 90 | | C2 | 440 | 489 | | | 40E | XHP35A-00-0000-0D0UC240E |
| | | | B4 | 410 | 456 | | | | XHP35A-00-0000-0D0UB440E |
| 3500 K | 70 | | E2 | 590 | 656 | | | 35E | XHP35A-00-0000-0D0BE235E |
| | | | D4 | 550 | 612 | | | | XHP35A-00-0000-0D0BD435E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0BD235E |
| | 80 | | D4 | 550 | 612 | 35G | XHP35A-00-0000-0D0HD435G | 35E | XHP35A-00-0000-0D0HD435E |
| | | | D2 | 510 | 567 | | XHP35A-00-0000-0D0HD235G | | XHP35A-00-0000-0D0HD235E |
| | | | C4 | 475 | 528 | | XHP35A-00-0000-0D0HC435G | | XHP35A-00-0000-0D0HC435E |
| | 90 | | C2 | 440 | 489 | 35G | XHP35A-00-0000-0D0UC235G | 35E | XHP35A-00-0000-0D0UC235E |
| | | | B4 | 410 | 456 | | XHP35A-00-0000-0D0UB435G | | XHP35A-00-0000-0D0UB435E |
| 3000 K | 70 | | D4 | 550 | 612 | | | 30E | XHP35A-00-0000-0D0BD430E |
| | | | D2 | 510 | 567 | | | | XHP35A-00-0000-0D0BD230E |
| | 80 | | D2 | 510 | 567 | 30G | XHP35A-00-0000-0D0HD230G | 30E | XHP35A-00-0000-0D0HD230E |
| | | | C4 | 475 | 528 | | XHP35A-00-0000-0D0HC430G | | XHP35A-00-0000-0D0HC430E |
| | 90 | | C2 | 440 | 489 | 30G | XHP35A-00-0000-0D0UC230G | 30E | XHP35A-00-0000-0D0UC230E |
| | | | B4 | 410 | 456 | | XHP35A-00-0000-0D0UB430G | | XHP35A-00-0000-0D0UB430E |
| | | | B2 | 380 | 423 | | XHP35A-00-0000-0D0UB230G | | XHP35A-00-0000-0D0UB230E |
| 2700 K | 80 | | C4 | 475 | 528 | 27G | XHP35A-00-0000-0D0HC427G | 27E | XHP35A-00-0000-0D0HC427E |
| | | | C2 | 440 | 489 | | XHP35A-00-0000-0D0HC227G | | XHP35A-00-0000-0D0HC227E |
| | 90 | | B4 | 410 | 456 | 27G | XHP35A-00-0000-0D0UB427G | 27E | XHP35A-00-0000-0D0UB427E |
| | | | B2 | 380 | 423 | | XHP35A-00-0000-0D0UB227G | | XHP35A-00-0000-0D0UB227E |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH DENSITY ANSI WHITE ORDER CODES AND BINS ($T_J$ = 85 °C)

The following table provides order codes for XLamp XHP35 High Density LEDs. For a complete description of how the flux and chromaticity groups are reflected in the bin code and order code nomenclature, please see the Bin and Order Code Formats section (page 29).

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 7000 K | 0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U | 0 | 68 | E4 | 635 | 706 | XHP35A-00-0000-0D00E40DT |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D00E20DT |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40DT |
| | | 70 | | E4 | 635 | 706 | XHP35A-00-0000-0D0BE40DT |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20DT |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40DT |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40DT |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20DT |
| | | 90 | | C4 | 475 | 528 | XHP35A-00-0000-0D0UC40DT |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20DT |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40DT |
| 6500 K | 1A, 1B, 1C, 1D | 0 | 68 | E4 | 635 | 706 | XHP35A-00-0000-0D00E40E1 |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D00E20E1 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40E1 |
| | | 70 | | E4 | 635 | 706 | XHP35A-00-0000-0D0BE40E1 |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20E1 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E1 |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40E1 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E1 |
| | | 90 | | C4 | 475 | 528 | XHP35A-00-0000-0D0UC40E1 |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E1 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E1 |
| 6000 K | 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U | 0 | 68 | E4 | 635 | 706 | XHP35A-00-0000-0D00E40DV |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D00E20DV |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40DV |
| | | 70 | | E4 | 635 | 706 | XHP35A-00-0000-0D0BE40DV |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20DV |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40DV |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40DV |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20DV |
| | | 90 | | C4 | 475 | 528 | XHP35A-00-0000-0D0UC40DV |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20DV |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40DV |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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, HIGH DENSITY ANSI ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 5700 K | 2A, 2B, 2C, 2D | 0 | 68 | E4 | 635 | 706 | XHP35A-00-0000-0D00E40E2 |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D00E20E2 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40E2 |
| | | 70 | | E4 | 635 | 706 | XHP35A-00-0000-0D0BE40E2 |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20E2 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E2 |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40E2 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E2 |
| | | 90 | | C4 | 475 | 528 | XHP35A-00-0000-0D0UC40E2 |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E2 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E2 |
| 5000 K | 3A, 3B, 3C, 3D | 0 | 68 | E4 | 635 | 706 | XHP35A-00-0000-0D00E40E3 |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D00E20E3 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40E3 |
| | | 70 | | E4 | 635 | 706 | XHP35A-00-0000-0D0BE40E3 |
| | | | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20E3 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E3 |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40E3 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E3 |
| | | 90 | | C4 | 475 | 528 | XHP35A-00-0000-0D0UC40E3 |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E3 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E3 |
| 4500 K | 4A, 4B, 4C, 4D | 0 | 68 | E2 | 590 | 656 | XHP35A-00-0000-0D00E20E4 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40E4 |
| | | 70 | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20E4 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E4 |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40E4 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E4 |
| | | 90 | | C4 | 475 | 528 | XHP35A-00-0000-0D0UC40E4 |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E4 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E4 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH DENSITY ANSI ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 4000 K | 5A, 5B, 5C, 5D | 0 | 68 | E2 | 590 | 656 | XHP35A-00-0000-0D00E20E5 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D00D40E5 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D00D20E5 |
| | | 70 | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20E5 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E5 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0BD20E5 |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40E5 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E5 |
| | | 90 | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E5 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E5 |
| 3500 K | 6A, 6B, 6C, 6D | 70 | | E2 | 590 | 656 | XHP35A-00-0000-0D0BE20E6 |
| | | | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E6 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0BD20E6 |
| | | 80 | | D4 | 550 | 612 | XHP35A-00-0000-0D0HD40E6 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E6 |
| | | | | C4 | 475 | 528 | XHP35A-00-0000-0D0HC40E6 |
| | | 90 | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E6 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E6 |
| 3000 K | 7A, 7B, 7C, 7D | 70 | | D4 | 550 | 612 | XHP35A-00-0000-0D0BD40E7 |
| | | | | D2 | 510 | 567 | XHP35A-00-0000-0D0BD20E7 |
| | | 80 | | D2 | 510 | 567 | XHP35A-00-0000-0D0HD20E7 |
| | | | | C4 | 475 | 528 | XHP35A-00-0000-0D0HC40E7 |
| | | 90 | | C2 | 440 | 489 | XHP35A-00-0000-0D0UC20E7 |
| | | | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E7 |
| | | | | B2 | 380 | 423 | XHP35A-00-0000-0D0UB20E7 |
| 2700 K | 8A, 8B, 8C, 8D | 80 | | C4 | 475 | 528 | XHP35A-00-0000-0D0HC40E8 |
| | | | | C2 | 440 | 489 | XHP35A-00-0000-0D0HC20E8 |
| | | 90 | | B4 | 410 | 456 | XHP35A-00-0000-0D0UB40E8 |
| | | | | B2 | 380 | 423 | XHP35A-00-0000-0D0UB20E8 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY EASYWHITE® ORDER CODES AND BINS ($T_J$ = 85 °C)

The following table provides order codes for XLamp XHP35 High Intensity LEDs. For a complete description of how the flux and chromaticity groups are reflected in the bin code and order code nomenclature, please see the Bin and Order Code Formats section (page 29).

| Nominal CCT | CRI | | Minimum Luminous Flux @350 mA | | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Group | Order Code | Group | Order Code |
| 5700 K | 70 | | D4 | 550 | 612 | | | 57E | XHP35A-H0-0000-0D0BD457E |
| | | | D2 | 510 | 567 | | | | XHP35A-H0-0000-0D0BD257E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0BC457E |
| | 80 | | D2 | 510 | 567 | | | 57E | XHP35A-H0-0000-0D0HD257E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0HC457E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0HC257E |
| | 90 | | C2 | 440 | 489 | | | 57E | XHP35A-H0-0000-0D0UC257E |
| | | | B4 | 410 | 456 | | | | XHP35A-H0-0000-0D0UB457E |
| | | | B2 | 380 | 423 | | | | XHP35A-H0-0000-0D0UB257E |
| | | | A4 | 355 | 395 | | | | XHP35A-H0-0000-0D0UA457E |
| 5000 K | 70 | | D4 | 550 | 612 | | | 50E | XHP35A-H0-0000-0D0BD450E |
| | | | D2 | 510 | 567 | | | | XHP35A-H0-0000-0D0BD250E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0BC450E |
| | 80 | | D2 | 510 | 567 | | | 50E | XHP35A-H0-0000-0D0HD250E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0HC450E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0HC250E |
| | 90 | | C2 | 440 | 489 | | | 50E | XHP35A-H0-0000-0D0UC250E |
| | | | B4 | 410 | 456 | | | | XHP35A-H0-0000-0D0UB450E |
| | | | B2 | 380 | 423 | | | | XHP35A-H0-0000-0D0UB250E |
| | | | A4 | 355 | 395 | | | | XHP35A-H0-0000-0D0UA450E |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY EASYWHITE® ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nominal CCT | CRI | | Minimum Luminous Flux @350 mA | | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Group | Order Code | Group | Order Code |
| 4500 K | 70 | | D4 | 550 | 612 | | | 45E | XHP35A-H0-0000-0D0BD445E |
| | | | D2 | 510 | 567 | | | | XHP35A-H0-0000-0D0BD245E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0BC445E |
| | 80 | | D2 | 510 | 567 | | | 45E | XHP35A-H0-0000-0D0HD245E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0HC445E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0HC245E |
| | 90 | | B4 | 410 | 456 | | | 45E | XHP35A-H0-0000-0D0UB445E |
| | | | B2 | 380 | 423 | | | | XHP35A-H0-0000-0D0UB245E |
| | | | A4 | 355 | 395 | | | | XHP35A-H0-0000-0D0UA445E |
| 4000 K | 70 | | D4 | 550 | 612 | | | 40E | XHP35A-H0-0000-0D0BD440E |
| | | | D2 | 510 | 567 | | | | XHP35A-H0-0000-0D0BD240E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0BC440E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0BC240E |
| | 80 | | C4 | 475 | 528 | | | 40E | XHP35A-H0-0000-0D0HC440E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0HC240E |
| | 90 | | B4 | 410 | 456 | | | 40E | XHP35A-H0-0000-0D0UB440E |
| | | | B2 | 380 | 423 | | | | XHP35A-H0-0000-0D0UB240E |
| | | | A4 | 355 | 395 | | | | XHP35A-H0-0000-0D0UA440E |
| 3500 K | 70 | | D2 | 510 | 567 | | | 35E | XHP35A-H0-0000-0D0BD235E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0BC435E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0BC235E |
| | 80 | | C4 | 475 | 528 | | XHP35A-H0-0000-0D0HC435G | 35E | XHP35A-H0-0000-0D0HC435E |
| | | | C2 | 440 | 489 | 35G | XHP35A-H0-0000-0D0HC235G | | XHP35A-H0-0000-0D0HC235E |
| | | | B4 | 410 | 456 | | XHP35A-H0-0000-0D0HB435G | | XHP35A-H0-0000-0D0HB435E |
| | 90 | | B2 | 380 | 423 | 35G | XHP35A-H0-0000-0D0UB235G | 35E | XHP35A-H0-0000-0D0UB235E |
| | | | A4 | 355 | 395 | | XHP35A-H0-0000-0D0UA435G | | XHP35A-H0-0000-0D0UA435E |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY EASYWHITE® ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nominal CCT | CRI | | Minimum Luminous Flux @350 mA | | | 3-Step | | 5-Step | |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | Group | Order Code | Group | Order Code |
| 3000 K | 70 | | D2 | 510 | 567 | | | 30E | XHP35A-H0-0000-0D0BD230E |
| | | | C4 | 475 | 528 | | | | XHP35A-H0-0000-0D0BC430E |
| | | | C2 | 440 | 489 | | | | XHP35A-H0-0000-0D0BC230E |
| | 80 | | C2 | 440 | 489 | 30G | XHP35A-H0-0000-0D0HC230G | 30E | XHP35A-H0-0000-0D0HC230E |
| | | | B4 | 410 | 456 | | XHP35A-H0-0000-0D0HB430G | | XHP35A-H0-0000-0D0HB430E |
| | 90 | | B2 | 380 | 423 | 30G | XHP35A-H0-0000-0D0UB230G | 30E | XHP35A-H0-0000-0D0UB230E |
| | | | A4 | 355 | 395 | | XHP35A-H0-0000-0D0UA430G | | XHP35A-H0-0000-0D0UA430E |
| | | | A2 | 330 | 367 | | XHP35A-H0-0000-0D0UA230G | | XHP35A-H0-0000-0D0UA230E |
| 2700 K | 80 | | C2 | 440 | 489 | 27G | XHP35A-H0-0000-0D0HC227G | 27E | XHP35A-H0-0000-0D0HC227E |
| | | | B4 | 410 | 456 | | XHP35A-H0-0000-0D0HB427G | | XHP35A-H0-0000-0D0HB427E |
| | | | B2 | 380 | 423 | | XHP35A-H0-0000-0D0HB227G | | XHP35A-H0-0000-0D0HB227E |
| | 90 | | A4 | 355 | 395 | 27G | XHP35A-H0-0000-0D0UA427G | 27E | XHP35A-H0-0000-0D0UA427E |
| | | | A2 | 330 | 367 | | XHP35A-H0-0000-0D0UA227G | | XHP35A-H0-0000-0D0UA227E |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY ANSI WHITE ORDER CODES AND BINS ($T_J$ = 85 °C)

The following table provides order codes for XLamp XHP35 High Intensity LEDs. For a complete description of how the flux and chromaticity groups are reflected in the bin code and order code nomenclature, please see the Bin and Order Code Formats section (page 29).

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 7000 K | 0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40DT |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20DT |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40DT |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40DT |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20DT |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40DT |
| | | 80 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0HD20DT |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40DT |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20DT |
| | | 90 | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40DT |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20DT |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40DT |
| 6500 K | 1A, 1B, 1C, 1D | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40E1 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20E1 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40E1 |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40E1 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E1 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E1 |
| | | 80 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0HD20E1 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40E1 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20E1 |
| | | 90 | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40E1 |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E1 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E1 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY ANSI ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 6000 K | 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40DV |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20DV |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40DV |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40DV |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20DV |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40DV |
| | | 80 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0HD20DV |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40DV |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20DV |
| | | 90 | | C2 | 440 | 489 | XHP35A-H0-0000-0D0UC20DV |
| | | | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40DV |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20DV |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40DV |
| 5700 K | 2A, 2B, 2C, 2D | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40E2 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20E2 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40E2 |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40E2 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E2 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E2 |
| | | 80 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0HD20E2 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40E2 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20E2 |
| | | 90 | | C2 | 440 | 489 | XHP35A-H0-0000-0D0UC20E2 |
| | | | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40E2 |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E2 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E2 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY ANSI ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 5000 K | 3A, 3B, 3C, 3D | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40E3 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20E3 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40E3 |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40E3 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E3 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E3 |
| | | 80 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0HD20E3 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40E3 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20E3 |
| | | 90 | | C2 | 440 | 489 | XHP35A-H0-0000-0D0UC20E3 |
| | | | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40E3 |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E3 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E3 |
| 4500 K | 4A, 4B, 4C, 4D | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40E4 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20E4 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40E4 |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40E4 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E4 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E4 |
| | | 80 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0HD20E4 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40E4 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20E4 |
| | | 90 | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40E4 |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E4 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E4 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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## FLUX CHARACTERISTICS, HIGH INTENSITY ANSI ORDER CODES AND BINS ($T_J$ = 85 °C) - CONTINUED

| Nomimal CCT | Chromaticity Regions | CRI | | Minimum Luminous Flux @ 350 mA | | | Order Code |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Group | Flux (lm) @ 85 °C | Flux (lm) @ 25 °C* | |
| 4000 K | 5A, 5B, 5C, 5D | 0 | 68 | D4 | 550 | 612 | XHP35A-H0-0000-0D00D40E5 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D00D20E5 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D00C40E5 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D00C20E5 |
| | | 70 | | D4 | 550 | 612 | XHP35A-H0-0000-0D0BD40E5 |
| | | | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E5 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E5 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0BC20E5 |
| | | 80 | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40E5 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20E5 |
| | | 90 | | B4 | 410 | 456 | XHP35A-H0-0000-0D0UB40E5 |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E5 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E5 |
| 3500 K | 6A, 6B, 6C, 6D | 70 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E6 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E6 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0BC20E6 |
| | | 80 | | C4 | 475 | 528 | XHP35A-H0-0000-0D0HC40E6 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0HC20E6 |
| | | | | B4 | 410 | 456 | XHP35A-H0-0000-0D0HB40E6 |
| | | 90 | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E6 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E6 |
| 3000 K | 7A, 7B, 7C, 7D | 70 | | D2 | 510 | 567 | XHP35A-H0-0000-0D0BD20E7 |
| | | | | C4 | 475 | 528 | XHP35A-H0-0000-0D0BC40E7 |
| | | | | C2 | 440 | 489 | XHP35A-H0-0000-0D0BC20E7 |
| | | 80 | | C2 | 420 | 489 | XHP35A-H0-0000-0D0HC20E7 |
| | | | | B4 | 410 | 456 | XHP35A-H0-0000-0D0HB40E7 |
| | | 90 | | B2 | 380 | 423 | XHP35A-H0-0000-0D0UB20E7 |
| | | | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E7 |
| | | | | A2 | 330 | 367 | XHP35A-H0-0000-0D0UA20E7 |
| 2700 K | 8A, 8B, 8C, 8D | 80 | | C2 | 420 | 489 | XHP35A-H0-0000-0D0HC20E8 |
| | | | | B4 | 410 | 456 | XHP35A-H0-0000-0D0HB40E8 |
| | | | | B2 | 380 | 423 | XHP35A-H0-0000-0D0HB20E8 |
| | | 90 | | A4 | 355 | 395 | XHP35A-H0-0000-0D0UA40E8 |
| | | | | A2 | 330 | 367 | XHP35A-H0-0000-0D0UA20E8 |

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 31).
- Cree XLamp XHP35 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 are for reference only.

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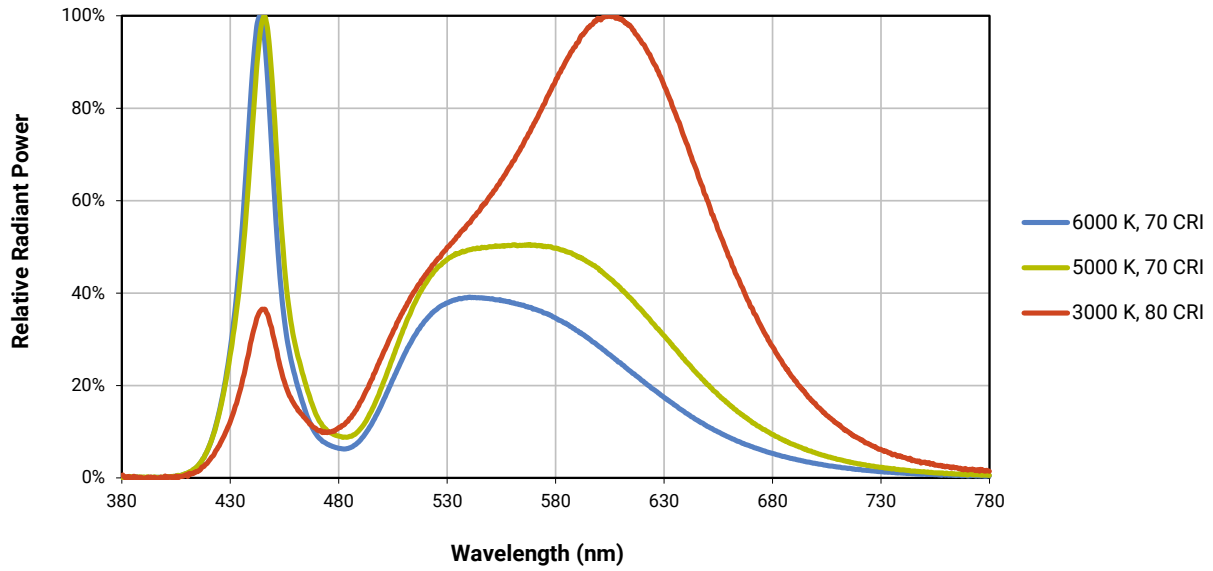
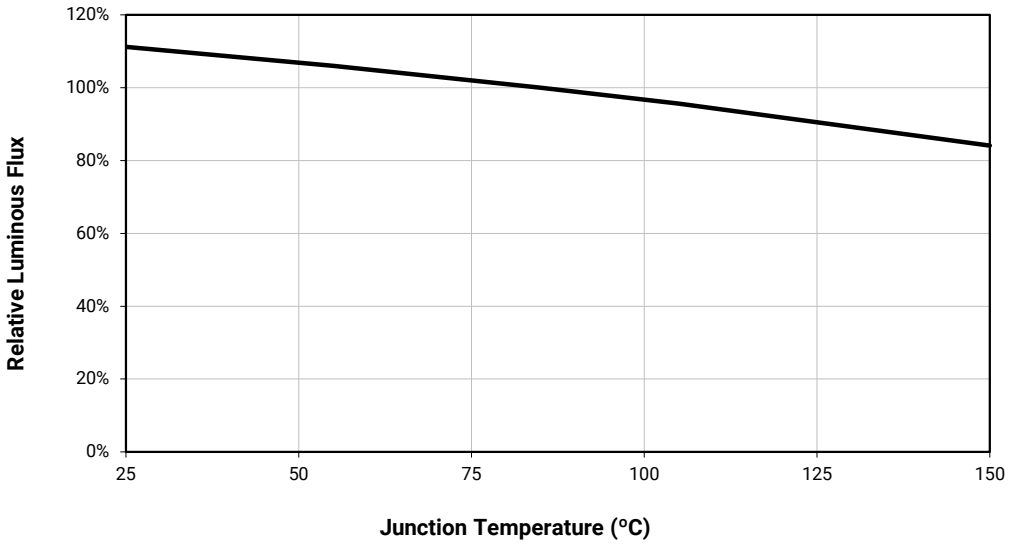
## RELATIVE SPECTRAL POWER DISTRIBUTION




## RELATIVE FLUX VS. JUNCTION TEMPERATURE ($I_F$ = 350 mA)

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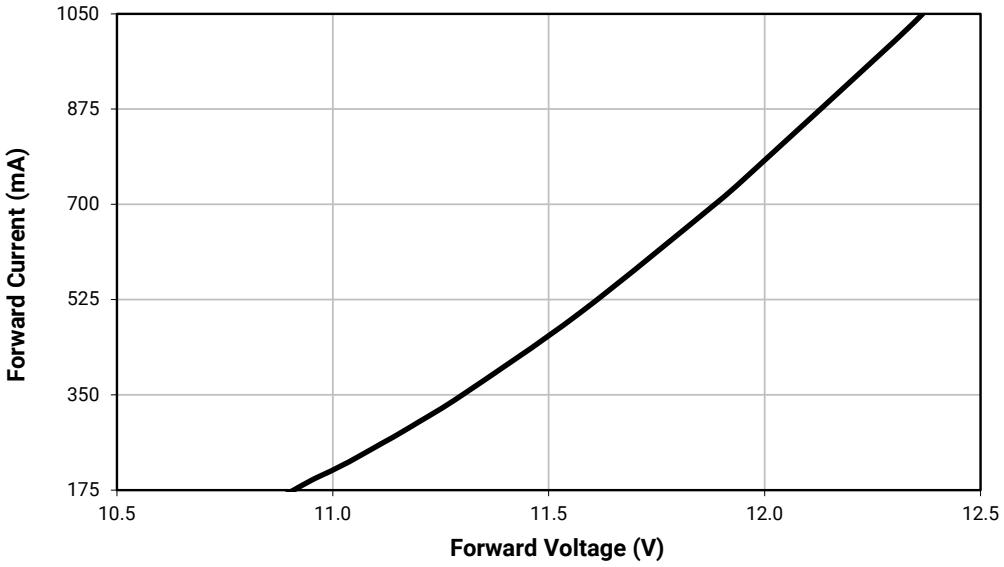
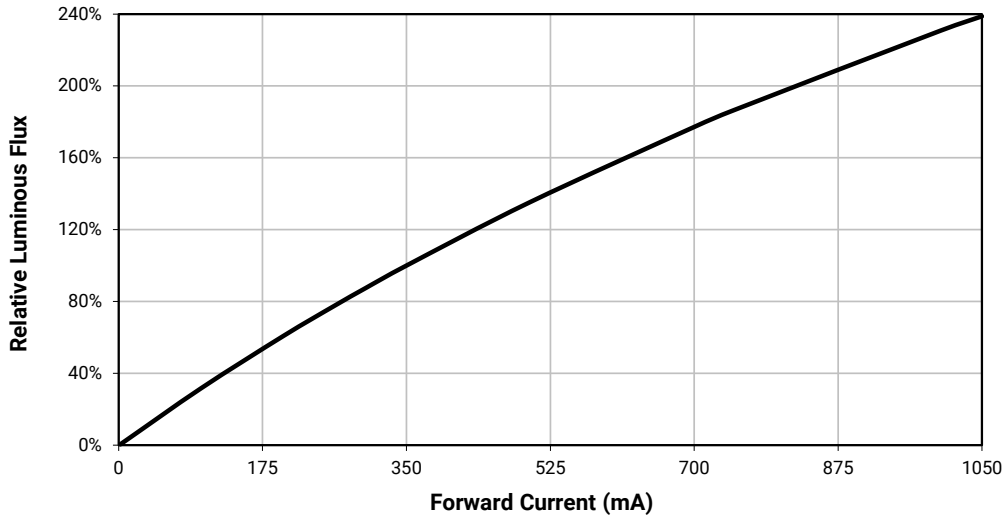
## ELECTRICAL CHARACTERISTICS ($T_J$ = 85 °C)




## RELATIVE FLUX VS. CURRENT ($T_J$ = 85 °C)

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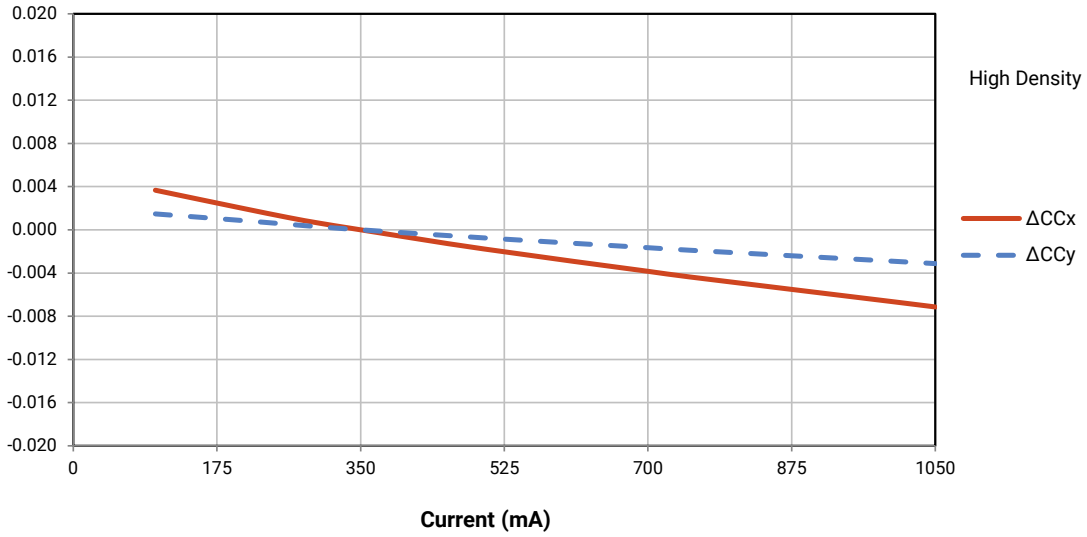
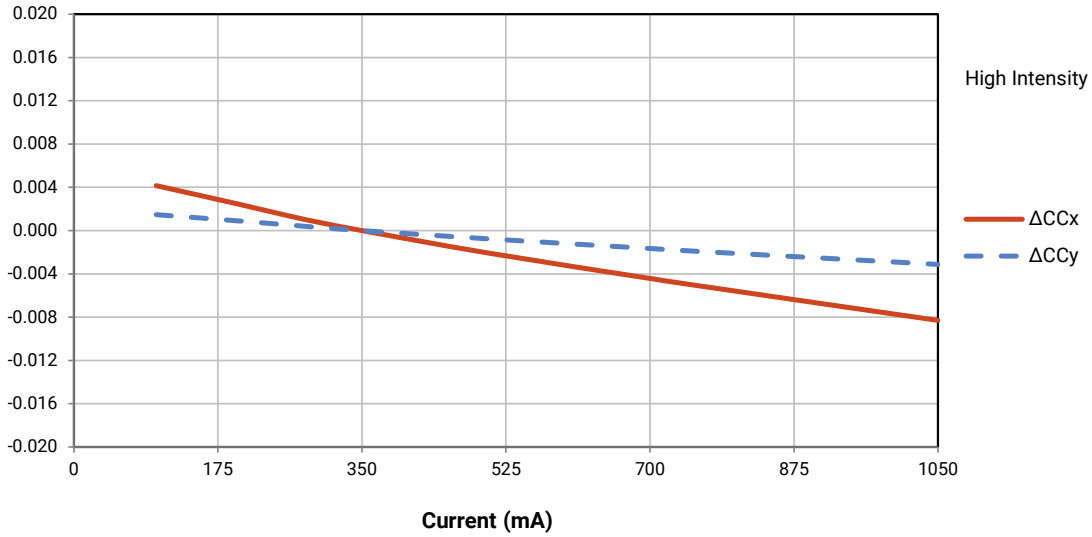
## RELATIVE CHROMATICITY VS. CURRENT (WARM WHITE)

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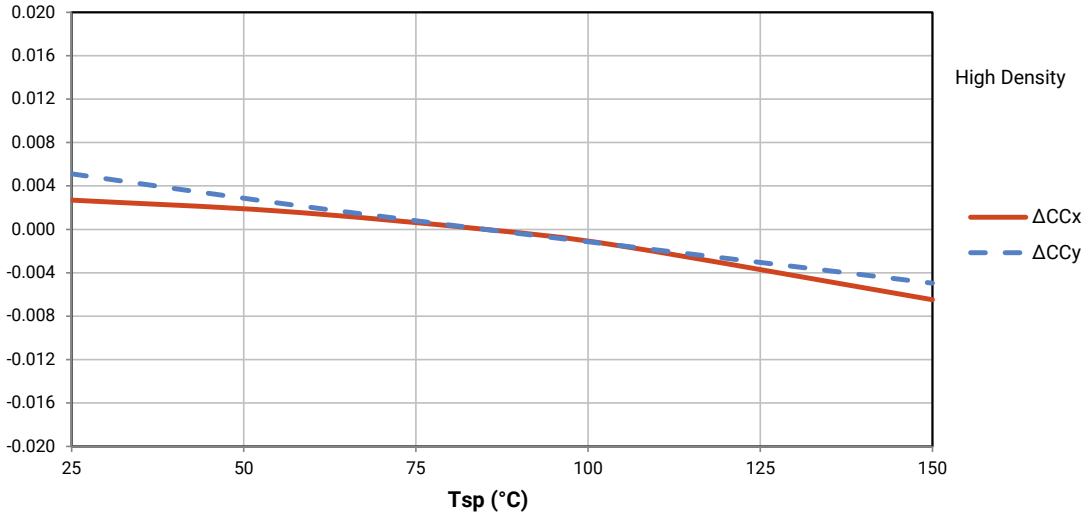
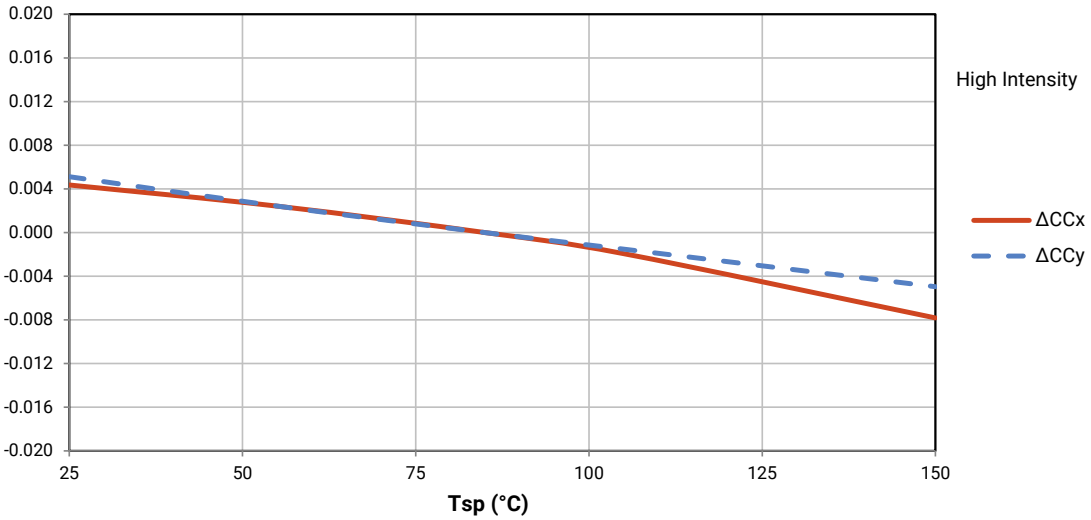
## RELATIVE CHROMATICITY VS. TEMPERATURE (WARM WHITE)

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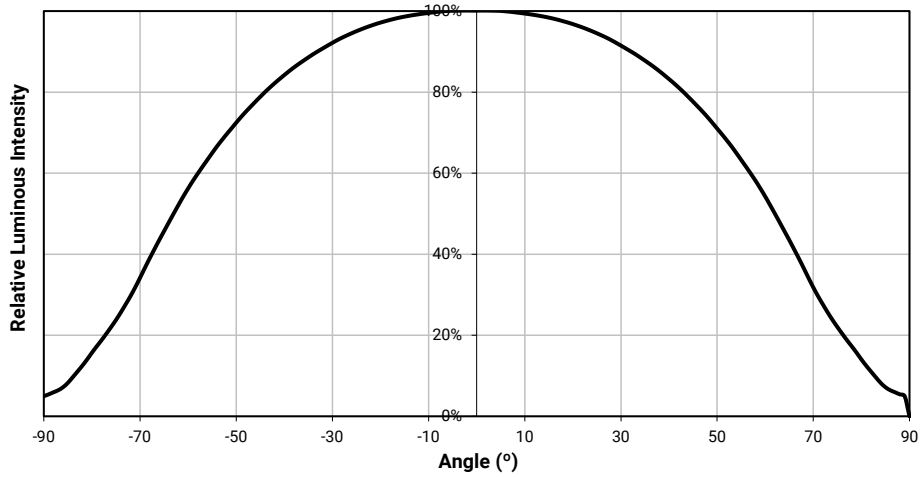
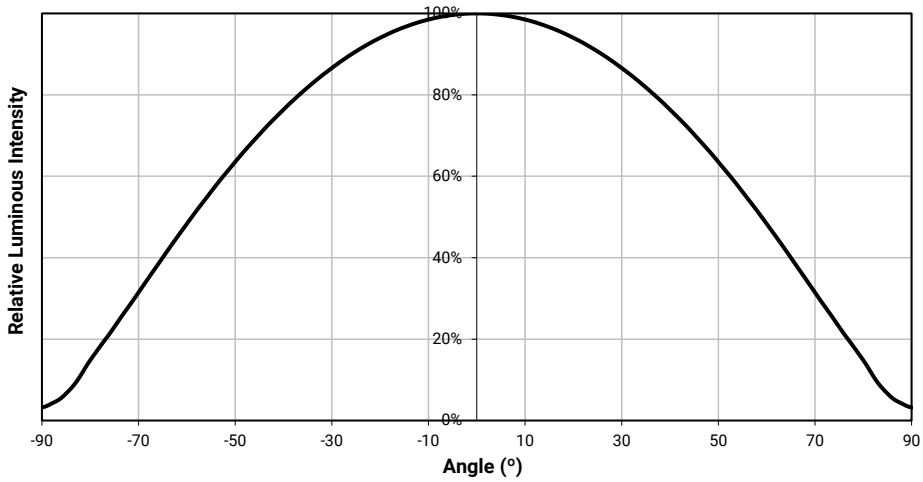



High Density




High Intensity

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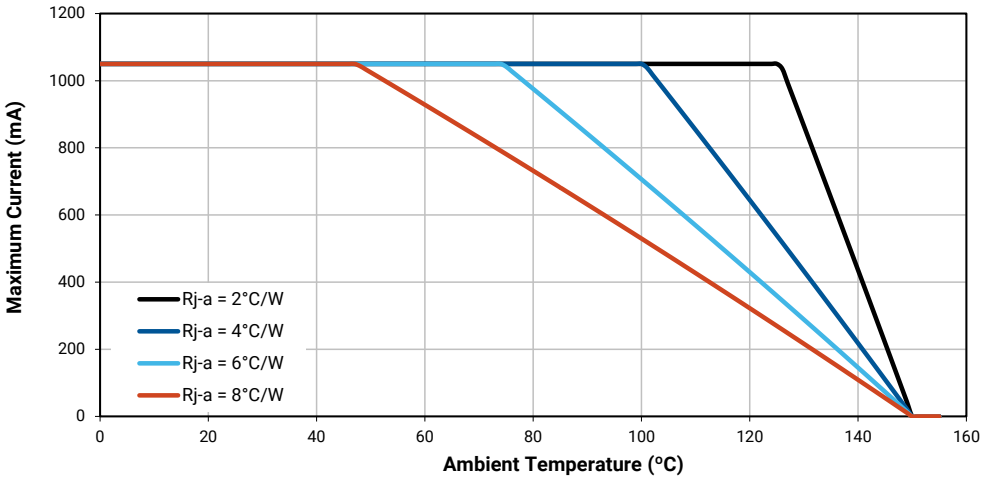
## THERMAL DESIGN

The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.




## PERFORMANCE GROUPS – LUMINOUS FLUX ($T_J$ = 85 °C)

XLamp XHP35 LEDs are tested for luminous flux and placed into one of the following luminous-flux groups.

| Group Code | Minimum Luminous Flux | Maximum Luminous Flux |
|---|---|---|
| A2 | 330 | 355 |
| A4 | 355 | 380 |
| B2 | 380 | 410 |
| B4 | 410 | 440 |
| C2 | 440 | 475 |
| C4 | 475 | 510 |
| D2 | 510 | 550 |
| D4 | 550 | 590 |
| E2 | 590 | 635 |
| E4 | 635 | 680 |
| F2 | 680 | 730 |

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## PERFORMANCE GROUPS – CHROMATICITY

XLamp XHP35 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

| EasyWhite Color Temperatures – 3-Step Ellipse | | | | | | |
|---|---|---|---|---|---|---|
| Bin Code | CCT | Center Point | | Major Axis | Minor Axis | Rotation Angle (°) |
| | | x | y | a | b | |
| 35G | 3500 K | 0.4073 | 0.3917 | 0.00927 | 0.00414 | 54.0 |
| 30G | 3000 K | 0.4338 | 0.4030 | 0.00834 | 0.00408 | 53.2 |
| 27G | 2700 K | 0.4577 | 0.4099 | 0.00834 | 0.00420 | 48.5 |

| EasyWhite Color Temperatures – 5-Step Ellipse | | | | | | |
|---|---|---|---|---|---|---|
| Bin Code | CCT | Center Point | | Major Axis | Minor Axis | Rotation Angle (°) |
| | | x | y | a | b | |
| 57E | 5700 K | 0.3287 | 0.3417 | 0.01230 | 0.00600 | 72.0 |
| 50E | 5000 K | 0.3447 | 0.3553 | 0.01400 | 0.00520 | 65.0 |
| 45E | 4500 K | 0.3611 | 0.3658 | 0.01420 | 0.00550 | 61.5 |
| 40E | 4000 K | 0.3818 | 0.3797 | 0.01565 | 0.00670 | 53.7 |
| 35E | 3500 K | 0.4073 | 0.3917 | 0.01545 | 0.00690 | 54.0 |
| 30E | 3000 K | 0.4338 | 0.4030 | 0.01390 | 0.00680 | 53.2 |
| 27E | 2700 K | 0.4577 | 0.4099 | 0.01350 | 0.00700 | 48.5 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 7000 K | 0A0 | 0.2950 | 0.2970 |
| | | 0.2920 | 0.3060 |
| | | 0.2984 | 0.3133 |
| | | 0.3009 | 0.3042 |
| | 0B0 | 0.2920 | 0.3060 |
| | | 0.2895 | 0.3135 |
| | | 0.2962 | 0.3220 |
| | | 0.2984 | 0.3133 |
| | 0C0 | 0.2984 | 0.3133 |
| | | 0.2962 | 0.3220 |
| | | 0.3028 | 0.3304 |
| | | 0.3048 | 0.3207 |
| | 0D0 | 0.2984 | 0.3133 |
| | | 0.3048 | 0.3207 |
| | | 0.3068 | 0.3113 |
| | | 0.3009 | 0.3042 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 7000 K | 0R0 | 0.2980 | 0.2880 |
| | | 0.2950 | 0.2970 |
| | | 0.3009 | 0.3042 |
| | | 0.3037 | 0.2937 |
| | 0S0 | 0.2895 | 0.3135 |
| | | 0.2870 | 0.3210 |
| | | 0.2937 | 0.3312 |
| | | 0.2962 | 0.3220 |
| | 0T0 | 0.2962 | 0.3220 |
| | | 0.2937 | 0.3312 |
| | | 0.3005 | 0.3415 |
| | | 0.3028 | 0.3304 |
| | 0U0 | 0.3037 | 0.2937 |
| | | 0.3009 | 0.3042 |
| | | 0.3068 | 0.3113 |
| | | 0.3093 | 0.2993 |

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## PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 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 | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 6500 K | 1R0 | 0.3068 | 0.3113 |
| | | 0.3144 | 0.3186 |
| | | 0.3161 | 0.3059 |
| | | 0.3093 | 0.2993 |
| | 1S0 | 0.3005 | 0.3415 |
| | | 0.3099 | 0.3509 |
| | | 0.3115 | 0.3391 |
| | | 0.3028 | 0.3304 |
| | 1T0 | 0.3099 | 0.3509 |
| | | 0.3196 | 0.3602 |
| | | 0.3205 | 0.3481 |
| | | 0.3115 | 0.3391 |
| | 1U0 | 0.3144 | 0.3186 |
| | | 0.3221 | 0.3261 |
| | | 0.3231 | 0.3120 |
| | | 0.3161 | 0.3059 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 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 | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 5700 K | 2R0 | 0.3222 | 0.3243 |
| | | 0.3290 | 0.3300 |
| | | 0.3290 | 0.3180 |
| | | 0.3231 | 0.3120 |
| | 2S0 | 0.3196 | 0.3602 |
| | | 0.3290 | 0.3690 |
| | | 0.3290 | 0.3538 |
| | | 0.3207 | 0.3462 |
| | 2T0 | 0.3290 | 0.3690 |
| | | 0.3381 | 0.3762 |
| | | 0.3376 | 0.3616 |
| | | 0.3290 | 0.3538 |
| | 2U0 | 0.3290 | 0.3300 |
| | | 0.3366 | 0.3369 |
| | | 0.3361 | 0.3245 |
| | | 0.3290 | 0.3180 |

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## PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 5000 K | 3A0 | 0.3371 | 0.3490 |
| | | 0.3451 | 0.3554 |
| | | 0.3440 | 0.3427 |
| | | 0.3366 | 0.3369 |
| | 3B0 | 0.3376 | 0.3616 |
| | | 0.3463 | 0.3687 |
| | | 0.3451 | 0.3554 |
| | | 0.3371 | 0.3490 |
| | 3C0 | 0.3463 | 0.3687 |
| | | 0.3551 | 0.3760 |
| | | 0.3533 | 0.3620 |
| | | 0.3451 | 0.3554 |
| | 3D0 | 0.3451 | 0.3554 |
| | | 0.3533 | 0.3620 |
| | | 0.3515 | 0.3487 |
| | | 0.3440 | 0.3427 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 4500 K | 4A0 | 0.3530 | 0.3597 |
| | | 0.3615 | 0.3659 |
| | | 0.3512 | 0.3465 |
| | | 0.3515 | 0.3487 |
| | 4B0 | 0.3548 | 0.3736 |
| | | 0.3641 | 0.3804 |
| | | 0.3530 | 0.3597 |
| | | 0.3533 | 0.3620 |
| | 4C0 | 0.3641 | 0.3804 |
| | | 0.3736 | 0.3874 |
| | | 0.3702 | 0.3722 |
| | | 0.3615 | 0.3659 |
| | 4D0 | 0.3615 | 0.3659 |
| | | 0.3702 | 0.3722 |
| | | 0.3670 | 0.3578 |
| | | 0.3590 | 0.3521 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 4000 K | 5A0 | 0.3670 | 0.3578 |
| | | 0.3702 | 0.3722 |
| | | 0.3825 | 0.3798 |
| | | 0.3783 | .3646 |
| | 5B0 | 0.3702 | 0.3722 |
| | | 0.3736 | 0.3874 |
| | | 0.3869 | 0.3958 |
| | | 0.3825 | 0.3798 |
| | 5C0 | 0.3825 | 0.3798 |
| | | 0.3869 | 0.3958 |
| | | .04006 | 0.4044 |
| | | 0.3950 | 0.3875 |
| | 5D0 | 0.3783 | 0.3646 |
| | | 0.3825 | 0.3798 |
| | | 0.3950 | 0.3875 |
| | | 0.3898 | 0.3716 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 3500 K | 6A0 | 0.3889 | 0.3690 |
| | | 0.3941 | 0.3848 |
| | | 0.4080 | 0.3916 |
| | | 0.4017 | 0.3751 |
| | 6B0 | 0.3941 | 0.3848 |
| | | 0.3996 | 0.4015 |
| | | .04146 | 0.4089 |
| | | .04080 | 0.3916 |
| | 6C0 | 0.4080 | 0.3916 |
| | | 0.4146 | 0.4089 |
| | | 0.4299 | 0.4165 |
| | | 0.4221 | 0.3984 |
| | 6D0 | 0.4017 | 0.3751 |
| | | 0.4080 | 0.3916 |
| | | 0.4221 | 0.3984 |
| | | 0.4147 | 0.3814 |

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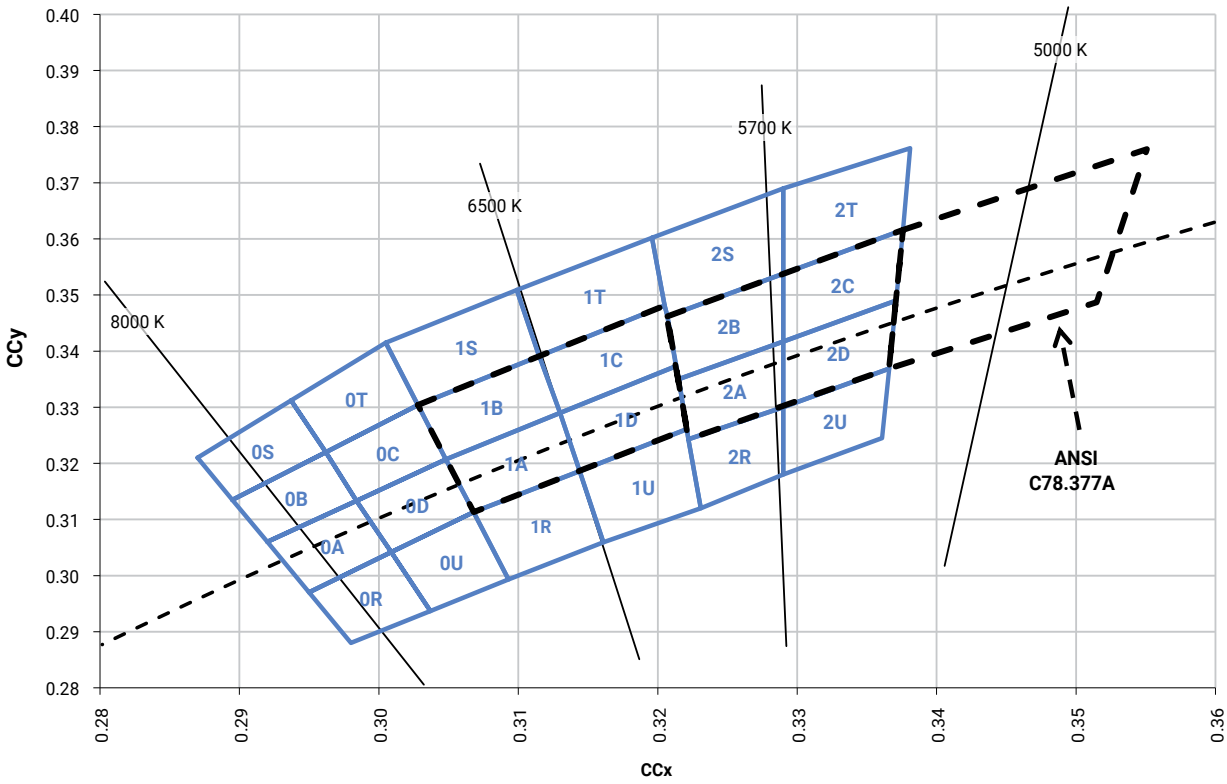
## PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 3000 K | 7A0 | 0.4147 | 0.3814 |
| | | 0.4221 | 0.3984 |
| | | 0.4342 | 0.4028 |
| | | 0.4259 | 0.3853 |
| | 7B0 | 0.4221 | 0.3984 |
| | | 0.4299 | 0.4165 |
| | | 0.4430 | 0.4212 |
| | | 0.4342 | .04028 |
| | 7C0 | 0.4342 | 0.4028 |
| | | 0.4430 | 0.4212 |
| | | 0.4562 | 0.4260 |
| | | 0.4465 | 0.4071 |
| | 7D0 | 0.4259 | 0.3853 |
| | | 0.4342 | 0.4028 |
| | | 0.4465 | 0.4071 |
| | | 0.4373 | 0.3893 |

| ANSI White Bins | | | |
|---|---|---|---|
| CCT | Bin Code | x | y |
| 2700 K | 8A0 | 0.4373 | 0.3893 |
| | | 0.4465 | 0.4071 |
| | | 0.4582 | 0.4099 |
| | | 0.4483 | 0.3919 |
| | 8B0 | 0.4465 | .04071 |
| | | 0.4562 | 0.4260 |
| | | 0.4687 | 0.4289 |
| | | .04582 | 0.4099 |
| | 8C0 | 0.4582 | 0.4099 |
| | | 0.4687 | 0.4289 |
| | | 0.4813 | 0.4319 |
| | | 0.4700 | 0.4126 |
| | 8D0 | 0.4483 | 0.3919 |
| | | 0.4582 | 0.4099 |
| | | 0.4700 | 0.4126 |
| | | 0.4593 | 0.3944 |

## CREE'S EASYWHITE® CHROMATICITY REGIONS PLOTTED ON THE 1931 CIE CURVE

ANSI Cool White

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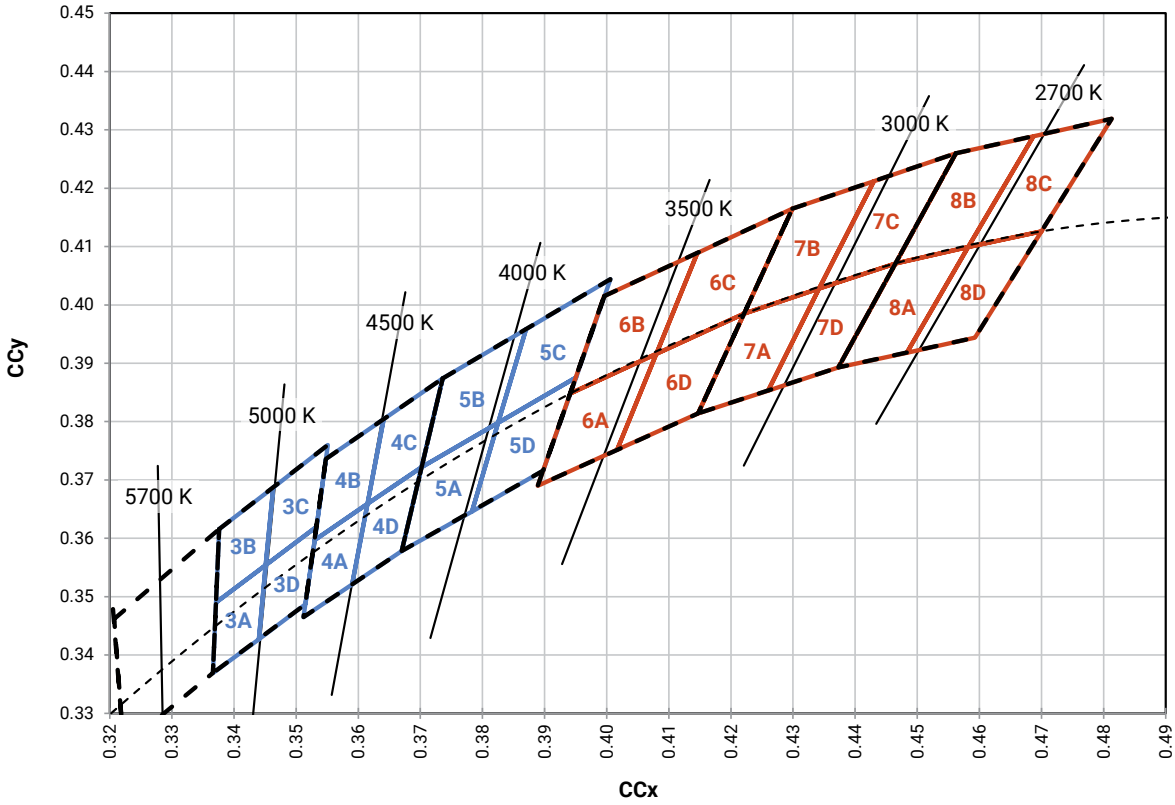
## CREE'S EASYWHITE® CHROMATICITY REGIONS PLOTTED ON THE 1931 CIE CURVE - CONTINUED

ANSI Neutral White and ANSI Warm White

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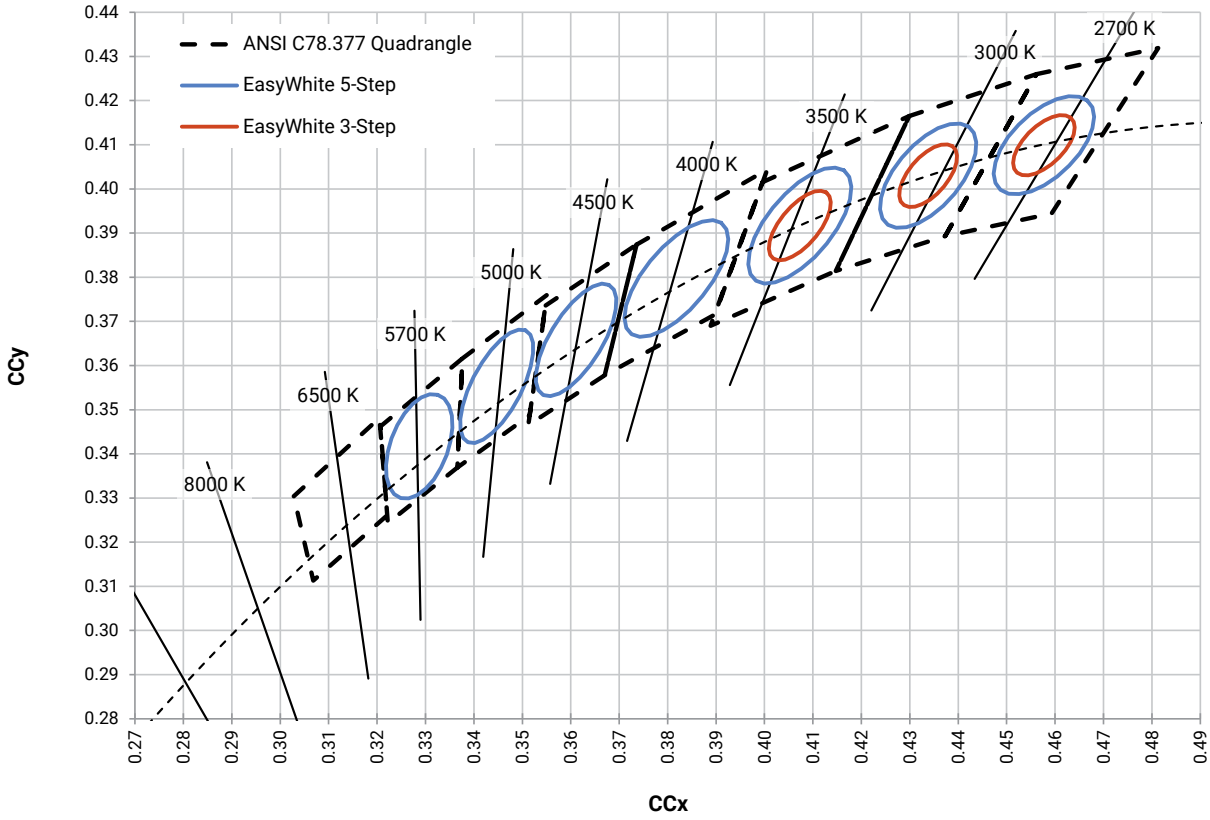
## CREE'S EASYWHITE® CHROMATICITY REGIONS PLOTTED ON THE 1931 CIE CURVE - CONTINUED

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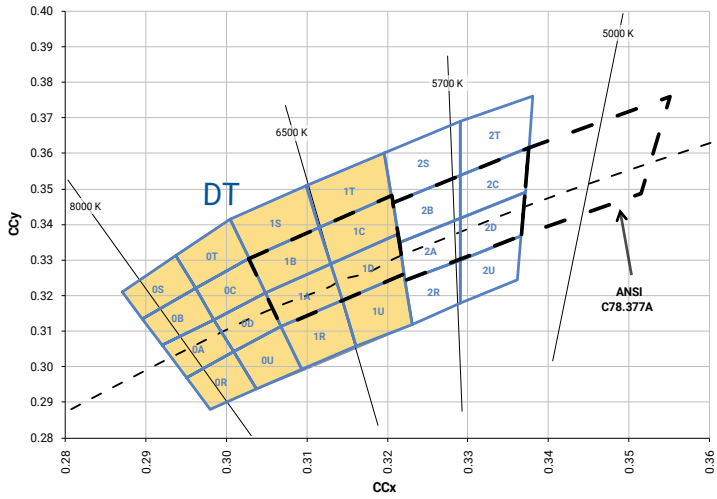
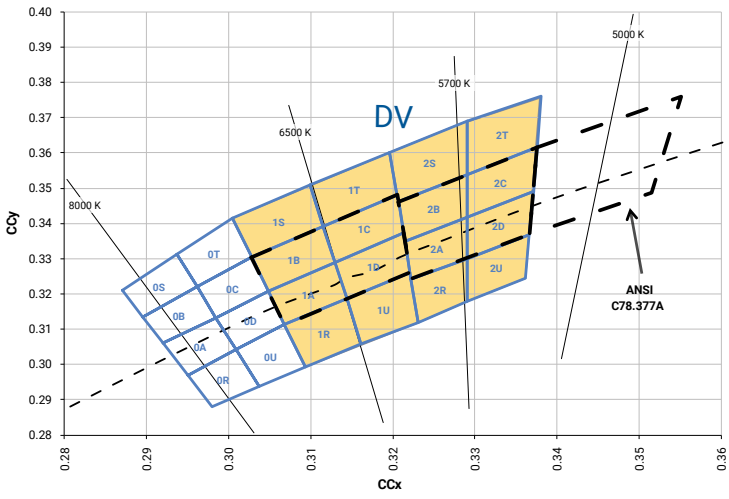
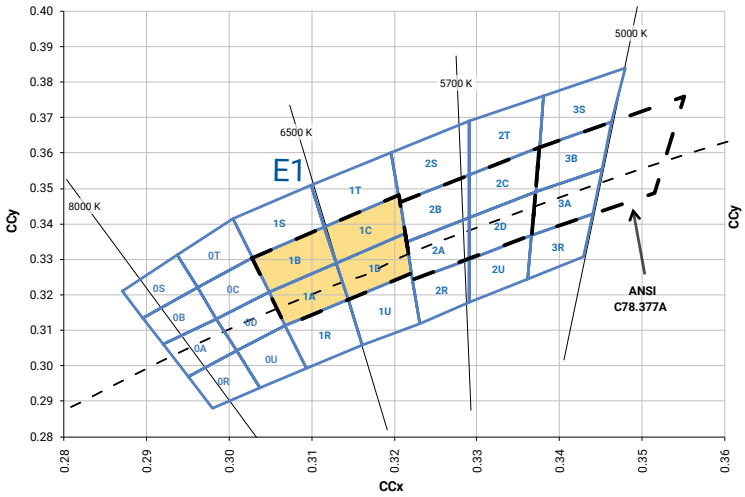
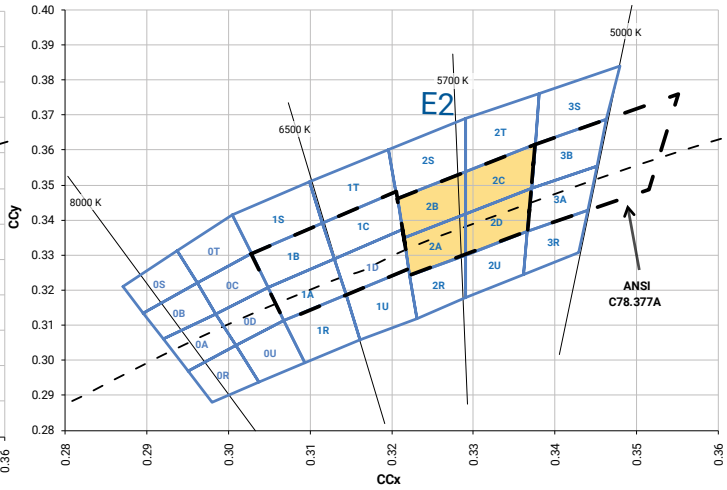
## CREE'S STANDARD COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS

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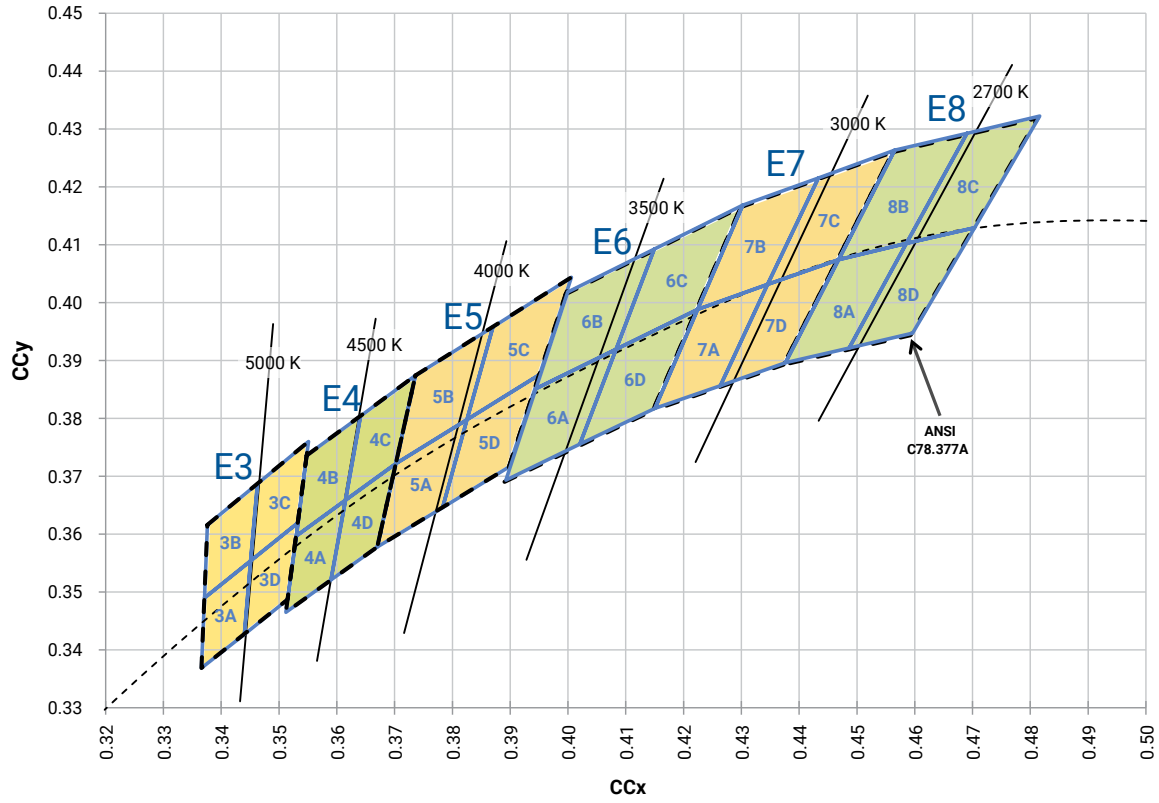
## CREE'S STANDARD WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS

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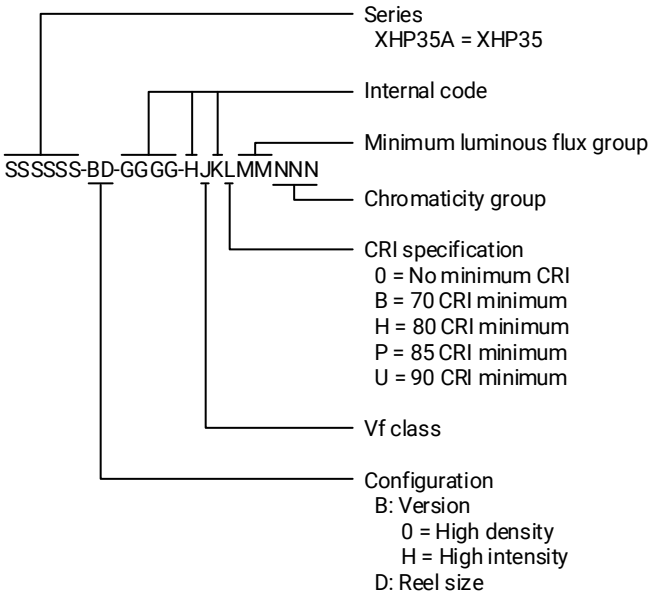
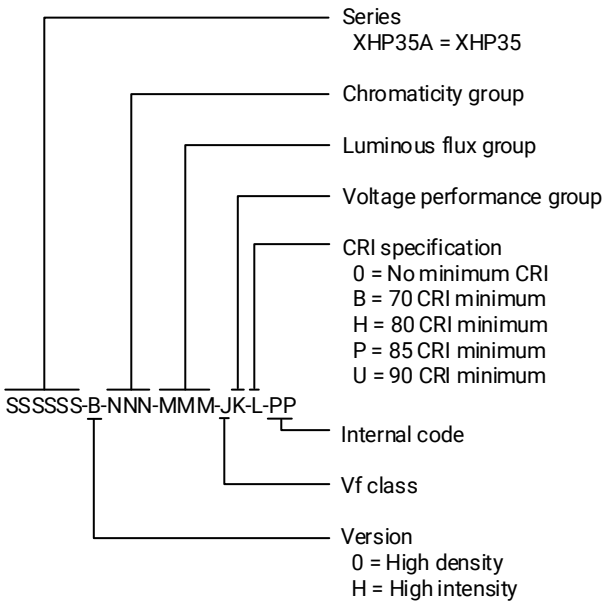
## BIN AND ORDER CODE FORMATS

Bin codes and order codes for XHP35 LEDs are configured in the following manner:

**Order Code**




**Bin Code**

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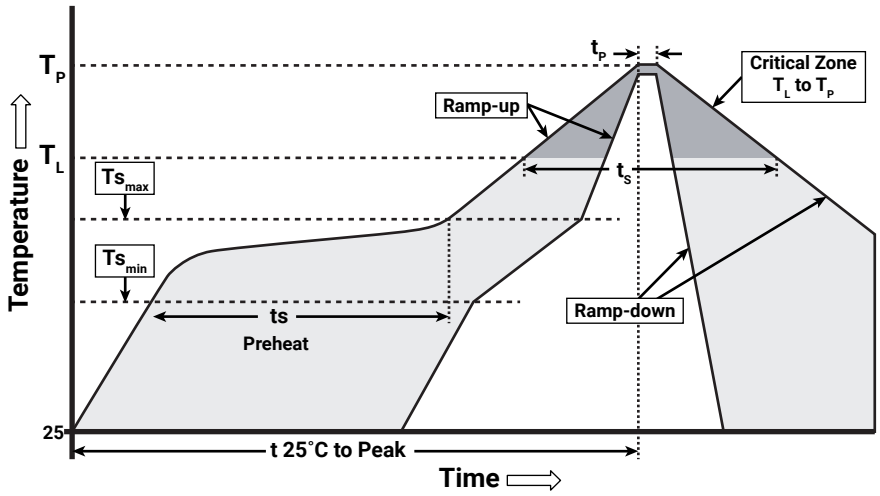
## REFLOW SOLDERING CHARACTERISTICS

In testing, Cree has found XLamp XHP35 LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, Cree recommends that users follow the recommended soldering profile provided by the manufacturer of the solder paste used, and therefore it is the lamp or luminaire manufacturer's responsibility to determine applicable soldering requirements.

Note that this general guideline may not apply to all PCB designs and configurations of reflow soldering equipment.




IPC/JEDEC J-STD-020C

| Profile Feature | Lead-Free Solder |
|---|---|
| Average Ramp-Up Rate ($Ts_{max}$ to $T_p$) | 1.2 °C/second |
| Preheat: Temperature Min ($Ts_{min}$) | 120 °C |
| Preheat: Temperature Max ($Ts_{max}$) | 170 °C |
| Preheat: Time ($ts_{min}$ to $ts_{max}$) | 65-150 seconds |
| Time Maintained Above: Temperature ($T_L$) | 217 °C |
| Time Maintained Above: Time ($t_L$) | 45-90 seconds |
| Peak/Classification Temperature (Tp) | 235 - 245 °C |
| Time Within 5 °C of Actual Peak Temperature (tp) | 20-40 seconds |
| Ramp-Down Rate | 1 - 6 °C/second |
| Time 25 °C to Peak Temperature | 4 minutes max. |

Note: All temperatures refer to the topside of the package, measured on the package body surface.

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## NOTES

### Measurements

The luminous flux, radiant power, chromaticity, forward voltage and CRI measurements in this document are binning specifications only and solely represent product measurements as of the date of shipment. These measurements will change over time based on a number of factors that are not within Cree's control and are not intended or provided as operational specifications for the products. Calculated values are provided for informational purposes only and are not intended or provided as specifications.

### Pre-Release Qualification Testing

Please read the LED Reliability Overview for details of the qualification process Cree applies to ensure long-term reliability for XLamp LEDs and details of Cree's pre-release qualification testing for XLamp LEDs.

### Lumen Maintenance

Cree now uses standardized IES LM-80-08 and TM-21-11 methods for collecting long-term data and extrapolating LED lumen maintenance. For information on the specific LM-80 data sets available for this LED, refer to the public LM-80 results document.

Please read the Long-Term Lumen Maintenance application note for more details on Cree's lumen maintenance testing and forecasting. Please read the Thermal Management application note for details on how thermal design, ambient temperature, and drive current affect the LED junction temperature.

### Moisture Sensitivity

Cree recommends keeping XLamp LEDs in the provided, resealable moisture-barrier packaging (MBP) until immediately prior to soldering. Unopened MBPs that contain XLamp LEDs do not need special storage for moisture sensitivity.

Once the MBP is opened, XLamp XHP35 LEDs may be stored as MSL 1 per JEDEC J-STD-033, meaning they have unlimited floor life in conditions of ≤ 30 ºC/85% relative humidity (RH). Regardless of the storage condition, Cree recommends sealing any unsoldered LEDs in the original MBP.

### RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree representative or from the Product Ecology section of the Cree website.

### REACh Compliance

REACh substances of very high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Cree representative to insure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

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## NOTES - CONTINUED

### UL® Recognized Component

This product meets the requirements to be considered a UL Recognized Component with Level 4 enclosure consideration. The LED package or a portion thereof has been investigated as a fire and electrical enclosure per ANSI/UL 8750.

### Vision Advisory

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

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## MECHANICAL DIMENSIONS

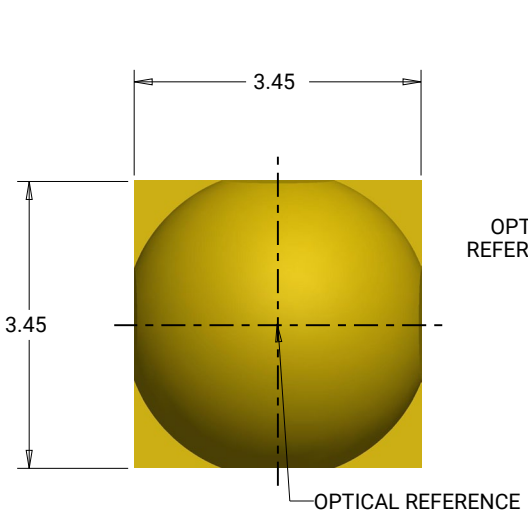
Thermal vias, if present, are not shown on these drawings.

All dimensions are ±.13 mm unless otherwise indicated.

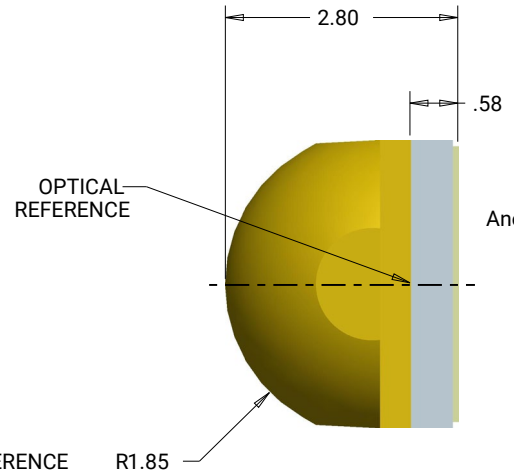
### XHP35 High Density

XHP35A-**0**x-xxxx-xxxxxxxxx

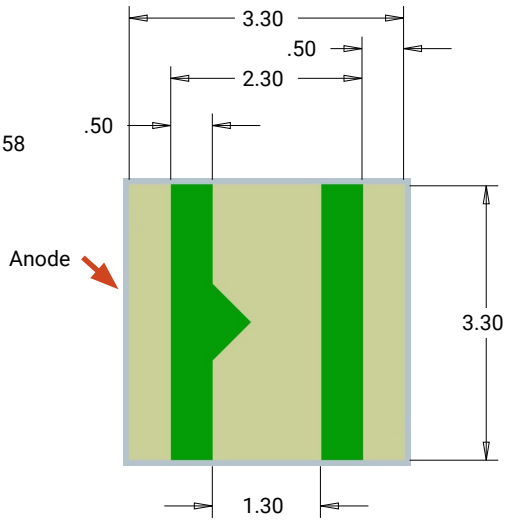
XHP35 High Density




Top View




Side View

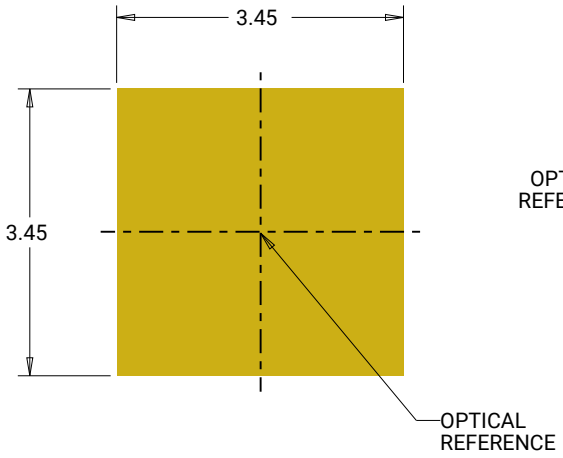



Bottom View

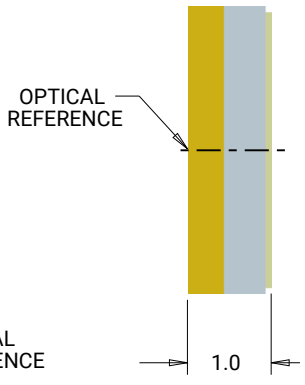
### XHP35 High Intensity

XHP35A-**H**x-xxxx-xxxxxxxxx

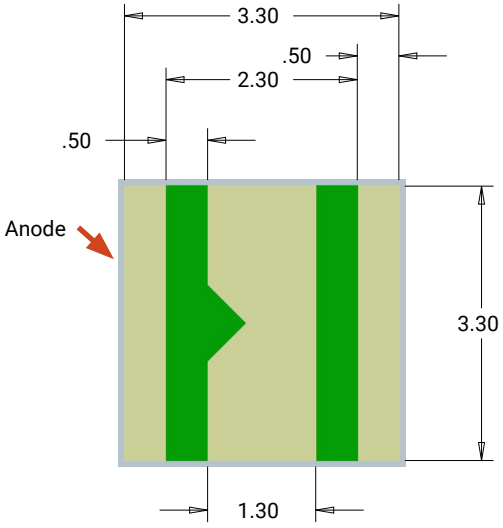
XHP35 High Intensity




Top View




Side View




Bottom View

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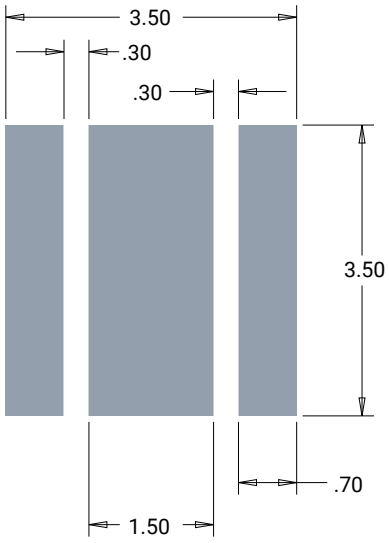
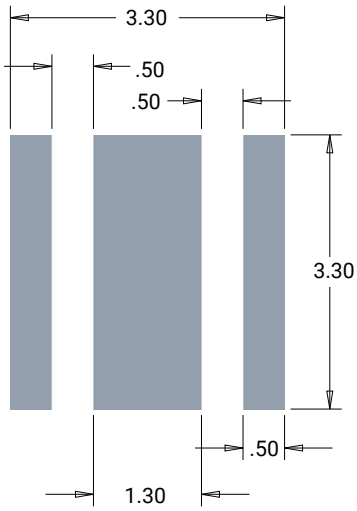
## MECHANICAL DIMENSIONS - CONTINUED

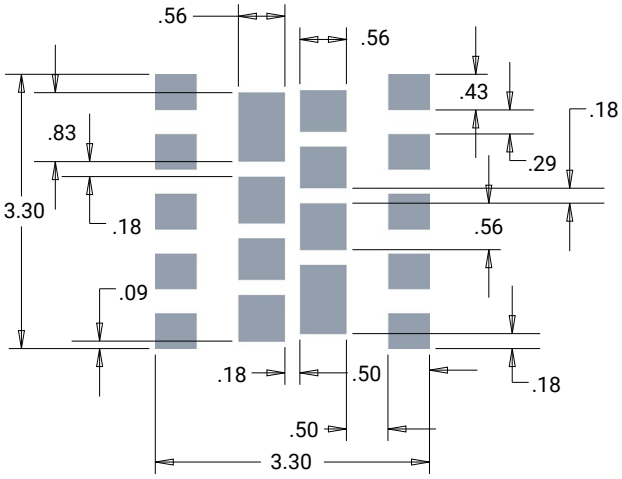
### XHP35 High Density and XHP35 High Intensity




**Recommended Copper Layout**




**Recommended Solder Pad (Solder Resist Pattern)**




**Recommended Stencil Openings***

Notes:

- Cree recommends using thermal pad kickouts to maximize component thermal performance.
- Cree recommends using white solder mask material to minimize system optical loss.

* This stencil has been tested and optimized for the avoidance of voiding when using ALPHA® LUMET® P30 Maxrel solder paste. For other solder pastes, a “window pane” design for the thermal pad stencil may result in a lower voiding percentage. Contact your local Cree Field Applications Engineer for consultation regarding your specific application.

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## TAPE AND REEL

All Cree carrier tapes conform to EIA-481D, Automated Component Handling Systems Standard.

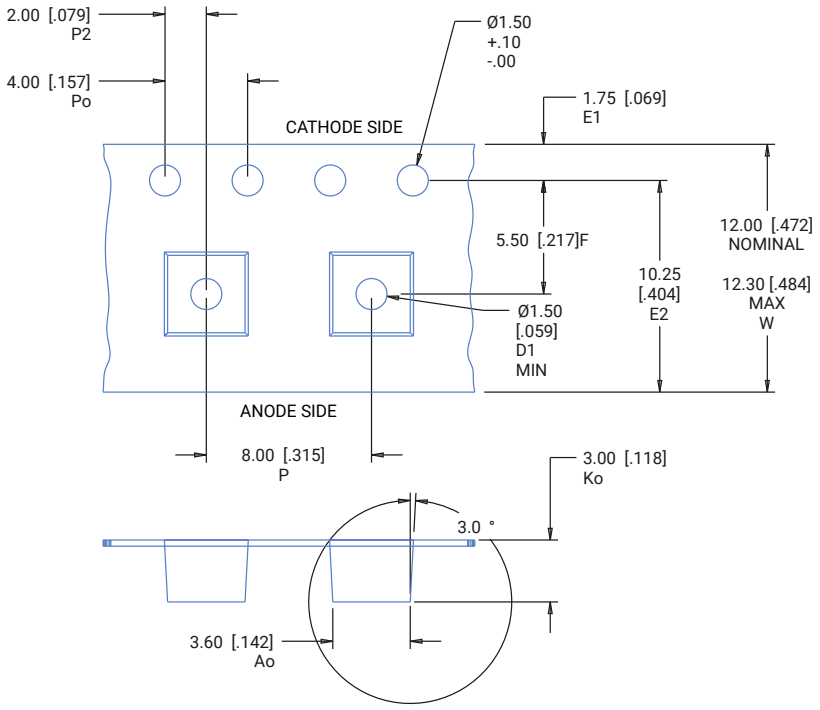
Except as noted, all dimensions in mm [inches]

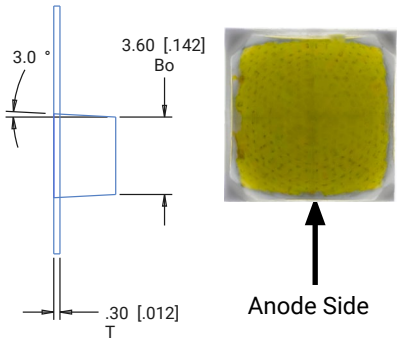
### XHP35 High Density

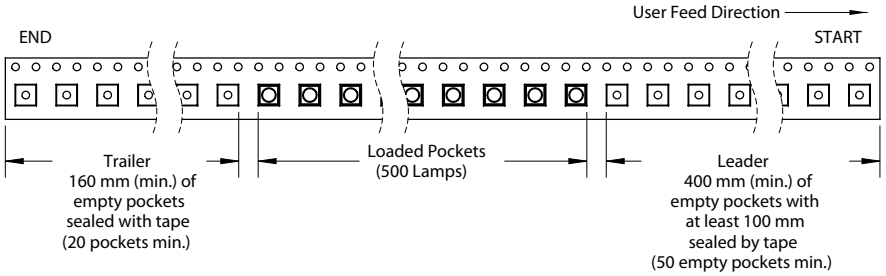
XHP35A-**0**x-xxxx-xxxxxxxxx

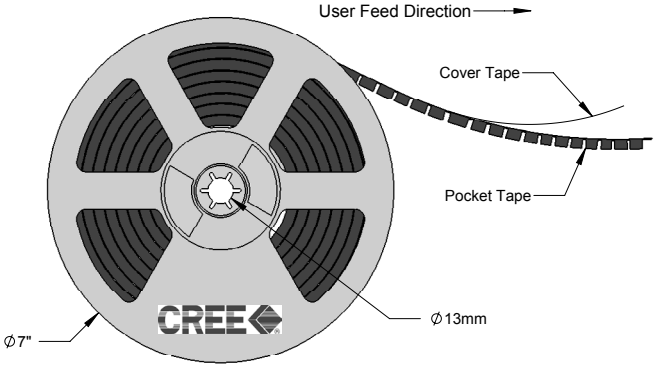
XHP35 High Density

| POCKET SIZE | |
|---|---|
| Ao - | 3.60 mm [.142"] |
| Bo - | 3.60 mm [.142"] |
| Ko - | 3.00 mm [.118"] |

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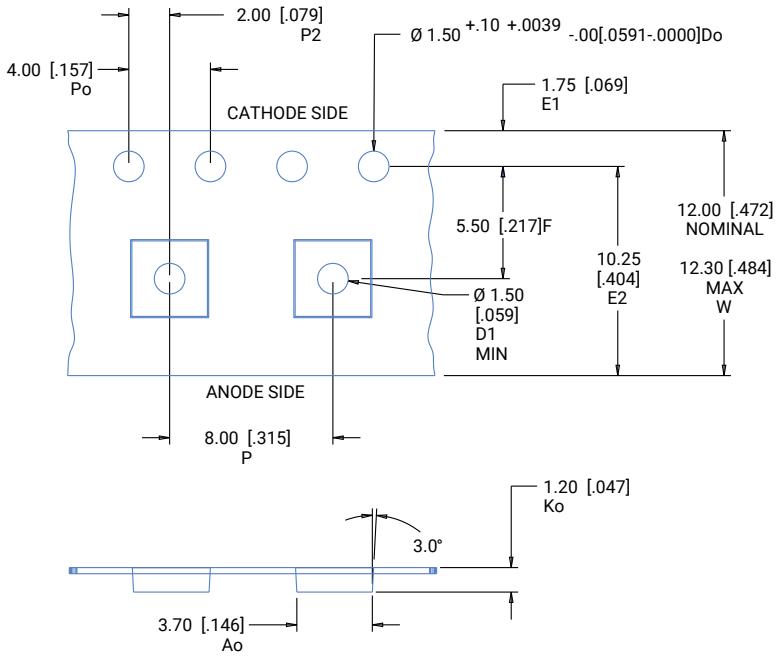
## TAPE AND REEL - CONTINUED

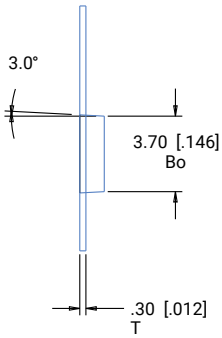
### XHP35 High Intensity

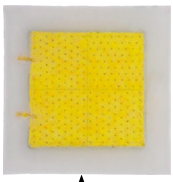
XHP35A-Hx-xxxx-xxxxxxxxx

XHP35 High Intensity

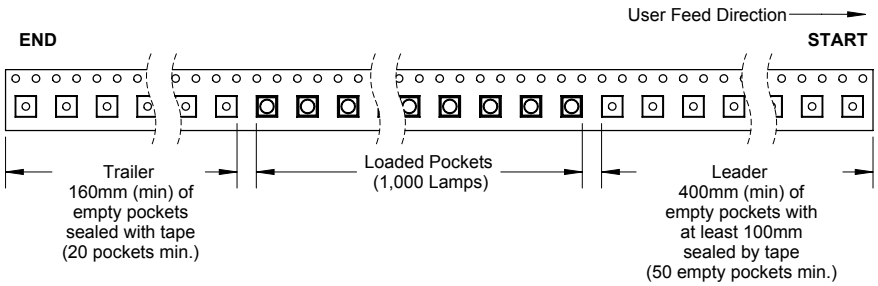
| POCKET SIZE | |
|---|---|
| Ao - | 3.70 mm [.146"] |
| Bo - | 3.70 mm [.146"] |
| Ko - | 1.20 mm [.047"] |

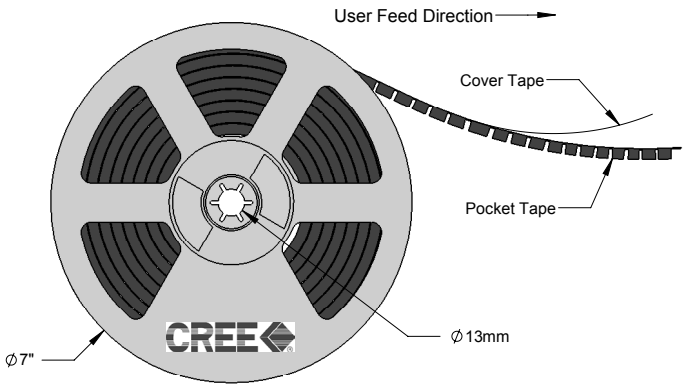


Anode Side

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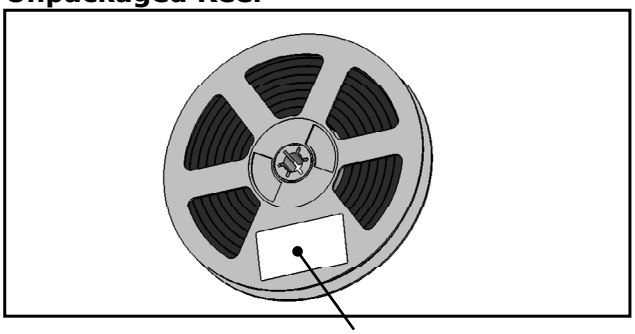
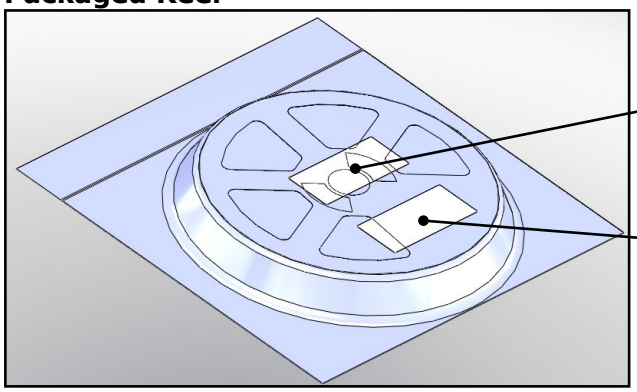
## PACKAGING

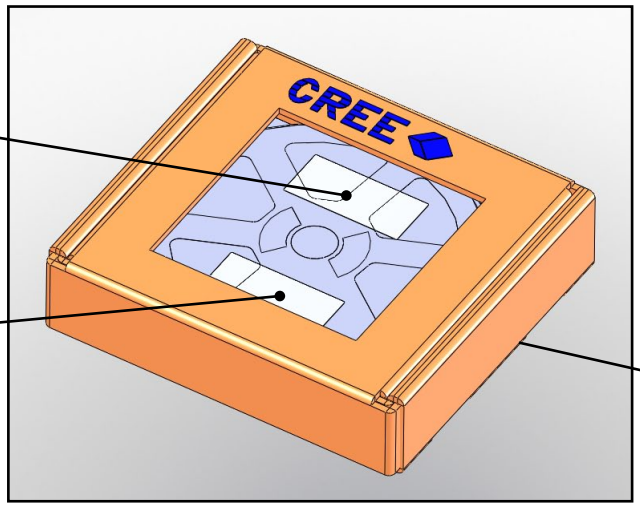
**Unpackaged Reel**




**Packaged Reel**




**Boxed Reel**

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**Офис по работе с юридическими лицами:**

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9