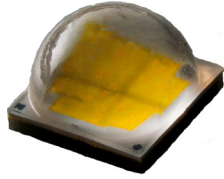
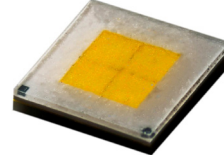


# XLamp® XHP50.3 LEDs



**XHP50.3 High Density**



**XHP50.3 High Intensity**

## PRODUCT DESCRIPTION

The XLamp XHP50.3 LEDs are the third generation of Extreme High Power LEDs that deliver the best lumen density, reliability and optical control available in their size. By leveraging the XHP family advantages, lighting manufacturers can significantly reduce their system cost by using fewer optics, PCBs and heat sinks than possible with standard LEDs.

The third generation XHP family LEDs deliver improved optical performance versus the previous generations, along with a new High Intensity version of the XHP50. The XHP50.3 High Intensity provides double the intensity for existing XHP50 designs.

XLamp XHP50.3 LEDs are optimized for outdoor and premium indoor lighting applications that require large amounts of light output from small luminaires, such as stadium, outdoor area and architectural spotlight.

## FEATURES

- Available in white, configurable to 3 V, 6 V or 12 V by PCB layout
- Available in 5-step EasyWhite® bins at 3000 K to 5000 K CCT, 3-step EasyWhite bins at 2700 K to 5000 K and 2-step EasyWhite bins at 2700 K to 4000 K CCT
- Available in ANSI white bins at 3000 K to 7000 K CCT
- Available in standard, 70-, 80-, and 90-minimum CRI options
- Binned at 85 °C
- Maximum drive current: 6000 mA (3 V), 3000 mA (6 V), 1500 mA (12 V)
- Low thermal resistance: 0.4 °C/W
- Wide viewing angle: 120°
- Unlimited floor life at ≤ 30 °C/85% RH
- Reflow solderable - JEDEC J-STD-020C
- RoHS and REACH compliant
- UL® recognized component (E349212)



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## CHARACTERISTICS

XHP50.3 LEDs are tested and binned in production in the 12-V configuration. See the Mechanical Dimensions section on page 39 for pad layout options.

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point <sup>◇</sup>	°C/W		0.4	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage (3 V)*	mV/°C		-1.4	
Temperature coefficient of voltage (6 V)*	mV/°C		-2.8	
Temperature coefficient of voltage (12 V)	mV/°C		-5.6	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current (3 V)*	mA			6000
DC forward current (6 V)*	mA			3000
DC forward current (12 V)	mA			1500
Reverse voltage (6V)	V			1
Forward voltage (3 V, @ 2800 mA, 85 °C)*	V		2.8	3.1
Forward voltage (6 V, @ 1400 mA, 85 °C)*	V		5.6	6.2
Forward voltage (12 V, @ 700 mA, 85 °C)	V		11.2	12.4
LED junction temperature	°C			150

### Notes:

- ◇ Thermal resistance measurement was performed per the JEDEC JESD51-14 standard.
- \* Data for the 3-V and 6-V configurations are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH DENSITY EASYWHITE® ORDER CODES AND BINS**

The following table provides order codes for XLamp XHP50.3 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 35).

Binning condition:  $T_j = 85\text{ }^\circ\text{C}$ ; 12 V,  $I_f = 700\text{ mA}$

Reference condition:  $T_j = 85\text{ }^\circ\text{C}$ ; 6 V,  $I_f = 1400\text{ mA}$

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
5000 K	70		K2	1200	1328					50E	XHP50D-00-0000-0D0BK250E
			J4	1120	1239						XHP50D-00-0000-0D0BJ450E
			J2	1040	1151						XHP50D-00-0000-0D0BJ250E
	80		J4	1120	1239			50G	XHP50D-00-0000-0D0HJ450G		
			J2	1040	1151				XHP50D-00-0000-0D0HJ250G		
			H4	970	1073				XHP50D-00-0000-0D0HH450G		
	90		J2	1040	1151			50G	XHP50D-00-0000-0D0UJ250G		
			H4	970	1073				XHP50D-00-0000-0D0UH450G		
			H2	900	996				XHP50D-00-0000-0D0UH250G		
			G4	840	930				XHP50D-00-0000-0D0UG450G		

**Notes**

- Cree LED maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, HIGH DENSITY EASYWHITE® ORDER CODES AND BINS - CONTINUED

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
4500 K	70		K2	1200	1328					45E	XHP50D-00-0000-0D0BK245E
			J4	1120	1239						XHP50D-00-0000-0D0BJ445E
			J2	1040	1151						XHP50D-00-0000-0D0BJ245E
	80		J4	1120	1239			45G	XHP50D-00-0000-0D0HJ445G		
			J2	1040	1151				XHP50D-00-0000-0D0HJ245G		
			H4	970	1073				XHP50D-00-0000-0D0HH5445G		
	90		H4	970	1073			45G	XHP50D-00-0000-0D0UH445G		
			H2	900	996				XHP50D-00-0000-0D0UH245G		
			G4	840	930				XHP50D-00-0000-0D0UG445G		
4000 K	70		K2	1200	1328					40E	XHP50D-00-0000-0D0BK240E
			J4	1120	1239						XHP50D-00-0000-0D0BJ440E
			J2	1040	1151						XHP50D-00-0000-0D0BJ240E
	80		J4	1120	1239	40H		40G	XHP50D-00-0000-0D0HJ440H		
			J2	1040	1151				XHP50D-00-0000-0D0HJ240H		
			H4	970	1073				XHP50D-00-0000-0D0HH440H		
	90		H4	970	1073	40H		40G	XHP50D-00-0000-0D0UH440H		
			H2	900	996				XHP50D-00-0000-0D0UH240H		
			G4	840	930				XHP50D-00-0000-0D0UG440H		

Notes

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

FLUX CHARACTERISTICS, HIGH DENSITY EASYWHITE® ORDER CODES AND BINS - CONTINUED

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step		
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code	
3500 K	70		K2	1200	1328					35E	XHP50D-00-0000-0D0BK235E	
			J4	1120	1239		XHP50D-00-0000-0D0BJ435E					
			J2	1040	1151		XHP50D-00-0000-0D0BJ235E					
	80		J2	1040	1151	35H	XHP50D-00-0000-0D0HJ235H	35G	XHP50D-00-0000-0D0HJ235G			
			H4	970	1073		XHP50D-00-0000-0D0HH435H		XHP50D-00-0000-0D0HH435G			
			H2	900	996		XHP50D-00-0000-0D0HH235H		XHP50D-00-0000-0D0HH235G			
	90		H4	970	1073	35H	XHP50D-00-0000-0D0UH435H	35G	XHP50D-00-0000-0D0UH435G			
			H2	900	996		XHP50D-00-0000-0D0UH235H		XHP50D-00-0000-0D0UH235G			
			G4	840	930		XHP50D-00-0000-0D0UGH435H		XHP50D-00-0000-0D0UG435G			
			G2	780	863		XHP50D-00-0000-0D0UG235H		XHP50D-00-0000-0D0UG235G			
	3000 K	70		J4	1120	1239					30E	XHP50D-00-0000-0D0BJ430E
				J2	1040	1151		XHP50D-00-0000-0D0BJ230E				
H4				970	1073	XHP50D-00-0000-0D0BH430E						
80			J2	1040	1151	30H	XHP50D-00-0000-0D0HJ230H	30G	XHP50D-00-0000-0D0HJ230G			
			H4	970	1073		XHP50D-00-0000-0D0HH430H		XHP50D-00-0000-0D0HH430G			
			H2	900	996		XHP50D-00-0000-0D0HH230H		XHP50D-00-0000-0D0HH230G			
90			H2	900	996	30H	XHP50D-00-0000-0D0UH230H	30G	XHP50D-00-0000-0D0UH230G			
			G4	840	930		XHP50D-00-0000-0D0UG430H		XHP50D-00-0000-0D0UG430G			
			G2	780	863		XHP50D-00-0000-0D0UG230H		XHP50D-00-0000-0D0UG230G			

Notes

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH DENSITY EASYWHITE® ORDER CODES AND BINS - CONTINUED**

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
2700 K	80		H4	970	1073	27H	XHP50D-00-0000-0D0HH427H	27G	XHP50D-00-0000-0D0HH427G		
			H2	900	996		XHP50D-00-0000-0D0HH227H		HP50D-00-0000-0D0HH227G		
			G4	840	930		XHP50D-00-0000-0D0HG427H		XHP50D-00-0000-0D0HG427G		
	90		G4	840	930	27H	XHP50D-00-0000-0D0UG427H	27G	XHP50D-00-0000-0D0UG427G		
			G2	780	863		XHP50D-00-0000-0D0UG227H		XHP50D-00-0000-0D0UG227G		
			F4	730	808		XHP50D-00-0000-0D0UF427H		XHP50D-00-0000-0D0UF427G		

**FLUX CHARACTERISTICS, HIGH DENSITY ANSI WHITE ORDER CODES AND BINS**

The following table provides order codes for XLamp XHP50.3 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 35).

Binning condition:  $T_j = 85\text{ °C}$ ;  $12\text{ V}$ ,  $I_f = 700\text{ mA}$   
 Reference condition:  $T_j = 85\text{ °C}$ ;  $6\text{ V}$ ,  $I_f = 1400\text{ mA}$   
 Reference condition:  $T_j = 85\text{ °C}$ ;  $3\text{ V}$ ,  $I_f = 2800\text{ mA}$

3-V XHP50.3 LEDs

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			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	J4	1120	1239	XHP50D-00-0000-0A00J40DT
6200 K	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U, 3A, 3B, 3R, 3S	0	68	J4	1120	1239	XHP50D-00-0000-0A00J4051

Notes

- Cree LED maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH DENSITY ANSI WHITE ORDER CODES AND BINS - CONTINUED**

6-V & 12-V XHP50.3 LEDs

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			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	K2	1200	1328	XHP50D-00-0000-0D00K20DT
				J4	1120	1239	XHP50D-00-0000-0D00J40DT
				J2	1040	1151	XHP50D-00-0000-0D00J20DT
		70		K2	1200	1328	XHP50D-00-0000-0D00BK20DT
				J4	1120	1239	XHP50D-00-0000-0D00BJ40DT
				J2	1040	1151	XHP50D-00-0000-0D00BJ20DT
		80		J4	1120	1239	XHP50D-00-0000-0D00HJ40DT
				J2	1040	1151	XHP50D-00-0000-0D00HJ20DT
				H4	970	1073	XHP50D-00-0000-0D00HH40DT
6500 K	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U	0	68	K2	1200	1328	XHP50D-00-0000-0D00K20CB
				J4	1120	1239	XHP50D-00-0000-0D00J40CB
				J2	1040	1151	XHP50D-00-0000-0D00J20CB
		70		K2	1200	1328	XHP50D-00-0000-0D00BK20CB
				J4	1120	1239	XHP50D-00-0000-0D00BJ40CB
				J2	1040	1151	XHP50D-00-0000-0D00BJ20CB
		80		J4	1120	1239	XHP50D-00-0000-0D00HJ40CB
				J2	1040	1151	XHP50D-00-0000-0D00HJ20CB
				H4	970	1073	XHP50D-00-0000-0D00HH40CB
6500 K	1A, 1B, 1C, 1D	0	68	K2	1200	1328	XHP50D-00-0000-0D00K20E1
				J4	1120	1239	XHP50D-00-0000-0D00J40E1
				J2	1040	1151	XHP50D-00-0000-0D00J20E1
		70		K2	1200	1328	XHP50D-00-0000-0D00BK20E1
				J4	1120	1239	XHP50D-00-0000-0D00BJ40E1
				J2	1040	1151	XHP50D-00-0000-0D00BJ20E1
		80		J4	1120	1239	XHP50D-00-0000-0D00HJ40E1
				J2	1040	1151	XHP50D-00-0000-0D00HJ20E1
				H4	970	1073	XHP50D-00-0000-0D00HH40E1

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.



**FLUX CHARACTERISTICS, HIGH DENSITY ANSI WHITE ORDER CODES AND BINS - CONTINUED**

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			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	K2	1200	1328	XHP50D-00-0000-0D00K20DV
				J4	1120	1239	XHP50D-00-0000-0D00J40DV
				J2	1040	1151	XHP50D-00-0000-0D00J20DV
		70		K2	1200	1328	XHP50D-00-0000-0D0BK20DV
				J4	1120	1239	XHP50D-00-0000-0D0BJ40DV
				J2	1040	1151	XHP50D-00-0000-0D0BJ20DV
		80		J4	1120	1239	XHP50D-00-0000-0D0HJ40DV
				J2	1040	1151	XHP50D-00-0000-0D0HJ20DV
				H4	970	1073	XHP50D-00-0000-0D0HH40DV
		90		J2	1040	1151	XHP50D-00-0000-0D0UJ20DV
				H4	970	1073	XHP50D-00-0000-0D0UH40DV
				H2	900	996	XHP50D-00-0000-0D0UH20DV
G4	840			930	XHP50D-00-0000-0D0UG40DV		
5700 K	2A, 2B, 2C, 2D	0	68	K2	1200	1328	XHP50D-00-0000-0D00K20E2
				J4	1120	1239	XHP50D-00-0000-0D00J40E2
				J2	1040	1151	XHP50D-00-0000-0D00J20E2
		70		K2	1200	1328	XHP50D-00-0000-0D0BK20E2
				J4	1120	1239	XHP50D-00-0000-0D0BJ40E2
				J2	1040	1151	XHP50D-00-0000-0D0BJ20E2
		80		J4	1120	1239	XHP50D-00-0000-0D0HJ40E2
				J2	1040	1151	XHP50D-00-0000-0D0HJ20E2
				H4	970	1073	XHP50D-00-0000-0D0HH40E2
		90		J2	1040	1151	XHP50D-00-0000-0D0UJ20E2
				H4	970	1073	XHP50D-00-0000-0D0UH40E2
				H2	900	996	XHP50D-00-0000-0D0UH20E2
G4	840			930	XHP50D-00-0000-0D0UG40E2		

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH DENSITY ANSI WHITE ORDER CODES AND BINS - CONTINUED**

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			Order Code
		Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	
5000 K	3A, 3B, 3C, 3D	0	68	K2	1200	1328	XHP50D-00-0000-0D00K20E3
				J4	1120	1239	XHP50D-00-0000-0D00J40E3
				J2	1040	1151	XHP50D-00-0000-0D00J20E3
		70		K2	1200	1328	XHP50D-00-0000-0D0BK20E3
				J4	1120	1239	XHP50D-00-0000-0D0BJ40E3
				J2	1040	1151	XHP50D-00-0000-0D0BJ20E3
		80		J4	1120	1239	XHP50D-00-0000-0D0HJ40E3
				J2	1040	1151	XHP50D-00-0000-0D0HJ20E3
				H4	970	1073	XHP50D-00-0000-0D0HH40E3
		90		J2	1040	1151	XHP50D-00-0000-0D0UJ20E3
				H4	970	1073	XHP50D-00-0000-0D0UH40E3
				H2	900	996	XHP50D-00-0000-0D0UH20E3
G4	840			930	XHP50D-00-0000-0D0UG40E3		
4500 K	4A, 4B, 4C, 4D	0	68	K2	1200	1328	XHP50D-00-0000-0D00K20E4
				J4	1120	1239	XHP50D-00-0000-0D00J40E4
				J2	1040	1151	XHP50D-00-0000-0D00J20E4
		70		K2	1200	1328	XHP50D-00-0000-0D0BK20E4
				J4	1120	1239	XHP50D-00-0000-0D0BJ40E4
				J2	1040	1151	XHP50D-00-0000-0D0BJ20E4
		80		J4	1120	1239	XHP50D-00-0000-0D0HJ40E4
				J2	1040	1151	XHP50D-00-0000-0D0HJ20E4
				H4	970	1073	XHP50D-00-0000-0D0HH40E4
		90		H4	970	1073	XHP50D-00-0000-0D0UH40E4
				H2	900	996	XHP50D-00-0000-0D0UH20E4
				G4	840	930	XHP50D-00-0000-0D0UG40E4

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH DENSITY ANSI WHITE ORDER CODES AND BINS - CONTINUED**

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			Order Code
		Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	
4000 K	5A, 5B, 5C, 5D	0	68	K2	1200	1328	XHP50D-00-0000-0D00K20E5
				J4	1120	1239	XHP50D-00-0000-0D00J40E5
				J2	1040	1151	XHP50D-00-0000-0D00J20E5
		70		K2	1200	1328	XHP50D-00-0000-0D0BK20E5
				J4	1120	1239	XHP50D-00-0000-0D0BJ40E5
				J2	1040	1151	XHP50D-00-0000-0D0BJ20E5
		80		J4	1120	1239	XHP50D-00-0000-0D0HJ40E5
				J2	1040	1151	XHP50D-00-0000-0D0HJ20E5
				H4	970	1073	XHP50D-00-0000-0D0HH40E5
		90		H4	970	1073	XHP50D-00-0000-0D0UH40E5
				H2	900	996	XHP50D-00-0000-0D0UH20E5
				G4	840	930	XHP50D-00-0000-0D0UG40E5
3500 K	6A, 6B, 6C, 6D	70		K2	1200	1328	XHP50D-00-0000-0D0BK20E6
				J4	1120	1239	XHP50D-00-0000-0D0BJ40E6
				J2	1040	1151	XHP50D-00-0000-0D0BJ20E6
3000 K	7A, 7B, 7C, 7D	70		J4	1120	1239	XHP50D-00-0000-0D0BJ40E7
				J2	1040	1151	XHP50D-00-0000-0D0BJ20E7
				H4	970	1073	XHP50D-00-0000-0D0BH40E7

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH INTENSITY EASYWHITE® ORDER CODES AND BINS (T<sub>j</sub> = 85 °C)**

The following table provides order codes for XLamp XHP50.3 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 35).

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
5000 K	70		J4	1120	1239					50E	XHP50D-H0-0000-0D0BJ450E
			J2	1040	1151				XHP50D-H0-0000-0D0BJ250E		
			H4	970	1073				XHP50D-H0-0000-0D0BH450E		
	80		J2	1040	1151			50G	XHP50D-H0-0000-0D0HJ250G		
			H4	970	1073				XHP50D-H0-0000-0D0HH450G		
			H2	900	996				XHP50D-H0-0000-0D0HH250G		
	90		H2	900	996			50G	XHP50D-H0-0000-0D0UH250G		
			G4	840	930				XHP50D-H0-0000-0D0UG450G		
	4500 K	70		J4	1120	1239					45E
J2				1040	1151				XHP50D-H0-0000-0D0BJ245E		
H4				970	1073				XHP50D-H0-0000-0D0BH445E		
80			J2	1040	1151			45G	XHP50D-H0-0000-0D0HJ245G		
			H4	970	1073				XHP50D-H0-0000-0D0HH445G		
			H2	900	996				XHP50D-H0-0000-0D0HH245G		
90			H2	900	996			45G	XHP50D-H0-0000-0D0UH245G		
			G4	840	930				XHP50D-H0-0000-0D0UG445G		

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH INTENSITY EASYWHITE® ORDER CODES AND BINS (T<sub>J</sub> = 85 °C)**

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
4000 K	70		J4	1120	1239					40E	XHP50D-H0-0000-0D0BJ440E
			J2	1040	1151		XHP50D-H0-0000-0D0BJ240E				
			H4	970	1073		XHP50D-H0-0000-0D0BH440E				
	80		J2	1040	1151	40H	XHP50D-H0-0000-0D0HJ240H	40G	XHP50D-H0-0000-0D0HJ240G		
			H4	970	1073		XHP50D-H0-0000-0D0HH440H		XHP50D-H0-0000-0D0HH440G		
			H2	900	996		XHP50D-H0-0000-0D0HH240H		XHP50D-H0-0000-0D0HH240G		
	90		H2	900	996	40H	XHP50D-H0-0000-0D0UH240H	40G	XHP50D-H0-0000-0D0UH240G		
			G4	840	930		XHP50D-H0-0000-0D0UG440H		XHP50D-H0-0000-0D0UG440G		
			G2	780	863		XHP50D-H0-0000-0D0UG240H		XHP50D-H0-0000-0D0UG240G		
3500 K	70		J4	1120	1239					35E	XHP50D-H0-0000-0D0BJ435E
			J2	1040	1151		XHP50D-H0-0000-0D0BJ235E				
			H4	970	1073		XHP50D-H0-0000-0D0BH435E				
	80		H4	970	1073	35H	XHP50D-H0-0000-0D0HH435H	35G	XHP50D-H0-0000-0D0HH435G		
			H2	900	996		XHP50D-H0-0000-0D0HH235H		XHP50D-H0-0000-0D0HH235G		
			G4	840	930		XHP50D-H0-0000-0D0HG435H		XHP50D-H0-0000-0D0HG435G		
	90		G4	840	930	35H	XHP50D-H0-0000-0D0UG435H	35G	XHP50D-H0-0000-0D0UG435G		
			G2	780	863		XHP50D-H0-0000-0D0UG235H		XHP50D-H0-0000-0D0UG235G		
			F4	730	808		XHP50D-H0-0000-0D0UF435H		XHP50D-H0-0000-0D0UF435G		

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH INTENSITY EASYWHITE® ORDER CODES AND BINS (T<sub>J</sub> = 85 °C)**

Nominal CCT	CRI		Minimum Luminous Flux			2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	Group	Order Code	Group	Order Code	Group	Order Code
3000 K	70		J2	1040	1151					30E	XHP50D-H0-0000-0D0BJ230E
			H4	970	1073						XHP50D-H0-0000-0D0BH430E
			H2	900	996						XHP50D-H0-0000-0D0BH230E
	80		H4	970	1073	30H	XHP50D-H0-0000-0D0HH430H	30G	XHP50D-H0-0000-0D0HH430G		
			H2	900	996		XHP50D-H0-0000-0D0HH230H		XHP50D-H0-0000-0D0HH230G		
			G4	840	930		XHP50D-H0-0000-0D0HG430H		XHP50D-H0-0000-0D0HG430G		
	90		G4	840	930	30H	XHP50D-H0-0000-0D0UG430H	30G	XHP50D-H0-0000-0D0UG430G		
			G2	780	863		XHP50D-H0-0000-0D0UG230H		XHP50D-H0-0000-0D0UG230G		
			F4	730	808		XHP50D-H0-0000-0D0UF430H		XHP50D-H0-0000-0D0UF430G		
2700 K	80		H4	970	1073	27H	XHP50D-H0-0000-0D0HH427H	27G	XHP50D-H0-0000-0D0HH427G		
			H2	900	996		XHP50D-H0-0000-0D0HH227H		HP50D-H0-0000-0D0HH227G		
			G4	840	930		XHP50D-H0-0000-0D0HG427H		XHP50D-H0-0000-0D0HG427G		
	90		G2	780	863	27H	XHP50D-H0-0000-0D0UG227H	27G	XHP50D-H0-0000-0D0UG227G		
			F4	730	808		XHP50D-H0-0000-0D0UF427H		XHP50D-H0-0000-0D0UF427G		
			F2	680	753		XHP50D-H0-0000-0D0UF227H		XHP50D-H0-0000-0D0UF227G		

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH INTENSITY ANSI WHITE ORDER CODES AND BINS (T<sub>J</sub> = 85 °C)**

The following table provides order codes for XLamp XHP50.3 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 35).

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			Order Code	
		Min	Typ	Group	Flux l(m) @ 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	J4	1120	1239	XHP50D-H0-0000-0D00J40DT	
				J2	1040	1151	XHP50D-H0-0000-0D00J20DT	
				H4	970	1073	XHP50D-H0-0000-0D00H40DT	
		70			J4	1120	1239	XHP50D-H0-0000-0D0BJ40DT
					J2	1040	1151	XHP50D-H0-0000-0D0BJ20DT
					H4	970	1073	XHP50D-H0-0000-0D0BH40DT
		80			J2	1040	1151	XHP50D-H0-0000-0D0HJ20DT
					H4	970	1073	XHP50D-H0-0000-0D0HH40DT
					H2	900	996	XHP50D-H0-0000-0D0HH20DT
6500 K	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U	0	68	J4	1120	1239	XHP50D-H0-0000-0D00J40CB	
				J2	1040	1151	XHP50D-H0-0000-0D00J20CB	
				H4	970	1073	XHP50D-H0-0000-0D00H40CB	
		70			J4	1120	1239	XHP50D-H0-0000-0D0BJ40CB
					J2	1040	1151	XHP50D-H0-0000-0D0BJ20CB
					H4	970	1073	XHP50D-H0-0000-0D0BH40CB
		80			J2	1040	1151	XHP50D-H0-0000-0D0HJ20CB
					H4	970	1073	XHP50D-H0-0000-0D0HH40CB
					H2	900	996	XHP50D-H0-0000-0D0HH20CB
6500 K	1A, 1B, 1C, 1D	0	68	J4	1120	1239	XHP50D-H0-0000-0D00J40E1	
				J2	1040	1151	XHP50D-H0-0000-0D00J20E1	
				H4	970	1073	XHP50D-H0-0000-0D00H40E1	
		70			J4	1120	1239	XHP50D-H0-0000-0D0BJ40E1
					J2	1040	1151	XHP50D-H0-0000-0D0BJ20E1
					H4	970	1073	XHP50D-H0-0000-0D0BH40E1
		80			J2	1040	1151	XHP50D-H0-0000-0D0HJ20E1
					H4	970	1073	XHP50D-H0-0000-0D0HH40E1
					H2	900	996	XHP50D-H0-0000-0D0HH20E1

**Notes**

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

**FLUX CHARACTERISTICS, HIGH INTENSITY ANSI WHITE ORDER CODES AND BINS ( $T_j = 85\text{ }^\circ\text{C}$ )**

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			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	J4	1120	1239	XHP50D-H0-0000-0D00J40DV		
				J2	1040	1151	XHP50D-H0-0000-0D00J20DV		
				H4	970	1073	XHP50D-H0-0000-0D00H40DV		
		70				J4	1120	1239	XHP50D-H0-0000-0D00BJ40DV
						J2	1040	1151	XHP50D-H0-0000-0D00BJ20DV
						H4	970	1073	XHP50D-H0-0000-0D00BH40DV
		80				J2	1040	1151	XHP50D-H0-0000-0D00HJ20DV
						H4	970	1073	XHP50D-H0-0000-0D00HH40DV
						H2	900	996	XHP50D-H0-0000-0D00HH20DV
		90				H2	900	996	XHP50D-H0-0000-0D00UH20DV
						G4	840	930	XHP50D-H0-0000-0D00UG40DV
		5700 K	2A, 2B, 2C, 2D	0	68	J4	1120	1239	XHP50D-H0-0000-0D00J40E2
J2	1040					1151	XHP50D-H0-0000-0D00J20E2		
H4	970					1073	XHP50D-H0-0000-0D00H40E2		
70						J4	1120	1239	XHP50D-H0-0000-0D00BJ40E2
						J2	1040	1151	XHP50D-H0-0000-0D00BJ20E2
						H4	970	1073	XHP50D-H0-0000-0D00BH40E2
80						J2	1040	1151	XHP50D-H0-0000-0D00HJ20E2
						H4	970	1073	XHP50D-H0-0000-0D00HH40E2
						H2	900	996	XHP50D-H0-0000-0D00HH20E2
90						H2	900	996	XHP50D-H0-0000-0D00UH20E2
						G4	840	930	XHP50D-H0-0000-0D00UG40E2
5000 K	3A, 3B, 3C, 3D			0	68	J4	1120	1239	XHP50D-H0-0000-0D00J40E3
		J2	1040			1151	XHP50D-H0-0000-0D00J20E3		
		H4	970			1073	XHP50D-H0-0000-0D00H40E3		
		70				J4	1120	1239	XHP50D-H0-0000-0D00BJ40E3
						J2	1040	1151	XHP50D-H0-0000-0D00BJ20E3
						H4	970	1073	XHP50D-H0-0000-0D00BH40E3
		80				J2	1040	1151	XHP50D-H0-0000-0D00HJ20E3
						H4	970	1073	XHP50D-H0-0000-0D00HH40E3
						H2	900	996	XHP50D-H0-0000-0D00HH20E3
		90				H2	900	996	XHP50D-H0-0000-0D00UH20E3
						G4	840	930	XHP50D-H0-0000-0D00UG40E3

**Notes**

- Cree LED maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.



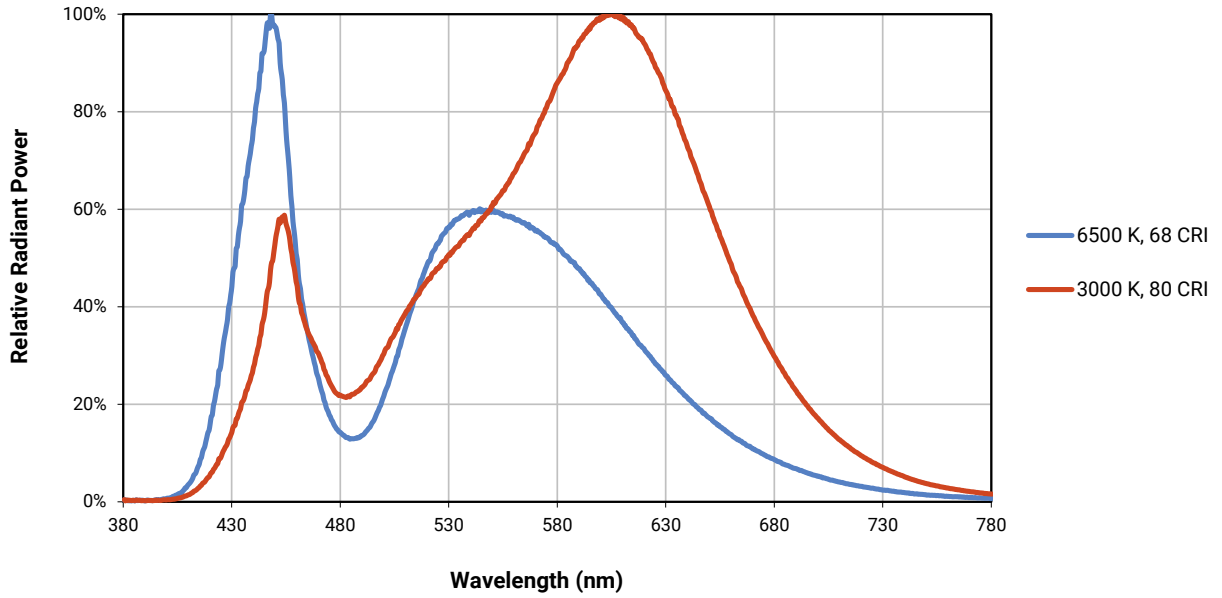
**FLUX CHARACTERISTICS, HIGH INTENSITY ANSI WHITE ORDER CODES AND BINS ( $T_j = 85\text{ }^\circ\text{C}$ )**

Nominal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux			Order Code		
		Min	Typ	Group	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*			
4500 K	4A, 4B, 4C, 4D	0	68	J4	1120	1239	XHP50D-H0-0000-0D00J40E4		
				J2	1040	1151	XHP50D-H0-0000-0D00J20E4		
				H4	970	1073	XHP50D-H0-0000-0D00H40E4		
		70		J4	1120	1239	XHP50D-H0-0000-0D00J40E4		
				J2	1040	1151	XHP50D-H0-0000-0D00J20E4		
				H4	970	1073	XHP50D-H0-0000-0D00H40E4		
		80		J2	1040	1151	XHP50D-H0-0000-0D00J20E4		
				H4	970	1073	XHP50D-H0-0000-0D00H40E4		
				H2	900	996	XHP50D-H0-0000-0D00H20E4		
		90		H2	900	996	XHP50D-H0-0000-0D00H20E4		
				G4	840	930	XHP50D-H0-0000-0D00G40E4		
4000 K	5A, 5B, 5C, 5D	0	68	J4	1120	1239	XHP50D-H0-0000-0D00J40E5		
				J2	1040	1151	XHP50D-H0-0000-0D00J20E5		
				H4	970	1073	XHP50D-H0-0000-0D00H40E5		
		70		J4	1120	1239	XHP50D-H0-0000-0D00J40E5		
				J2	1040	1151	XHP50D-H0-0000-0D00J20E5		
				H4	970	1073	XHP50D-H0-0000-0D00H40E5		
		80		J2	1040	1151	XHP50D-H0-0000-0D00J20E5		
				H4	970	1073	XHP50D-H0-0000-0D00H40E5		
				H2	900	996	XHP50D-H0-0000-0D00H20E5		
		90		H2	900	996	XHP50D-H0-0000-0D00H20E5		
				G4	840	930	XHP50D-H0-0000-0D00G40E5		
				G2	780	863	XHP50D-H0-0000-0D00G20E5		
		3500 K	6A, 6B, 6C, 6D	70		J4	1120	1239	XHP50D-H0-0000-0D00J40E6
						J2	1040	1151	XHP50D-H0-0000-0D00J20E6
						H4	970	1073	XHP50D-H0-0000-0D00H40E6
3000 K	7A, 7B, 7C, 7D	70		J2	1040	1151	XHP50D-H0-0000-0D00J20E7		
				H4	970	1073	XHP50D-H0-0000-0D00H40E7		
				H2	900	996	XHP50D-H0-0000-0D00H20E7		

**Notes**

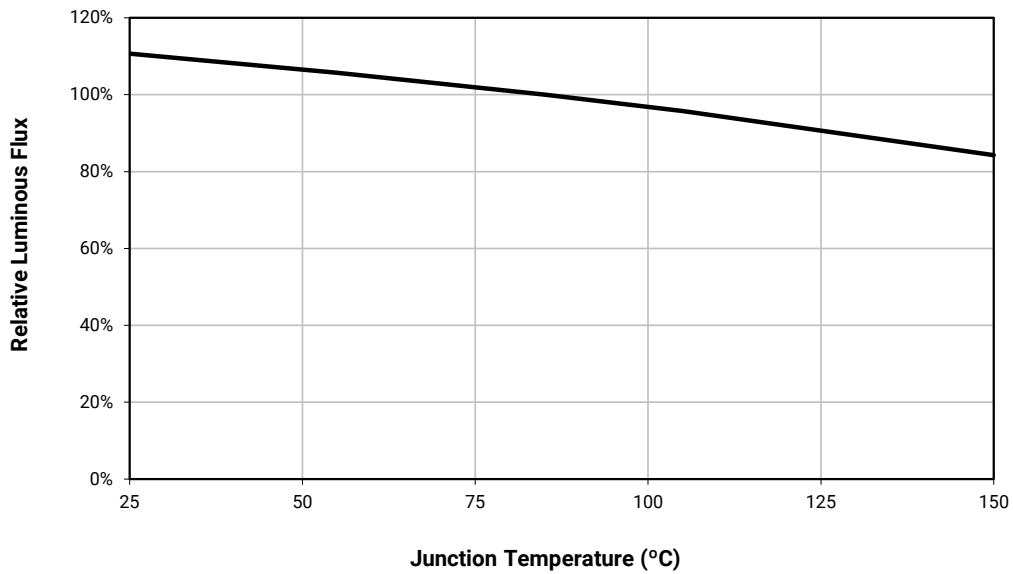
- Cree LED maintains a tolerance of  $\pm 7\%$  on flux and power measurements,  $\pm 0.005$  on chromaticity (CCx, CCy) measurements and a tolerance of  $\pm 2$  on CRI measurements. See the Measurements section (page 37).
- XLamp XHP50.3 LED order codes specify only a minimum flux bin and not a maximum. Cree LED may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- \* Flux values @ 25 °C are calculated and for reference only.

RELATIVE SPECTRAL POWER DISTRIBUTION

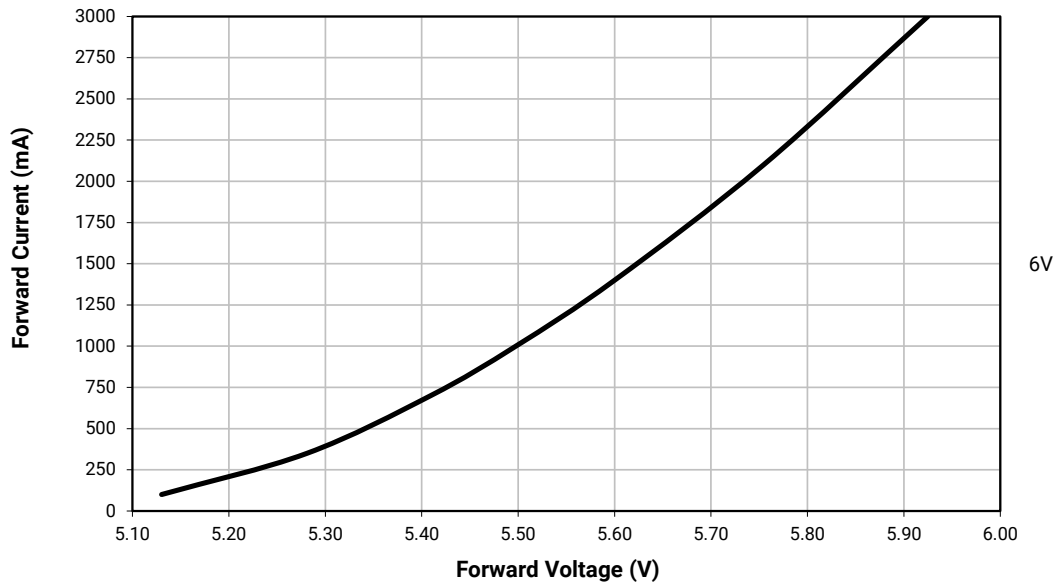
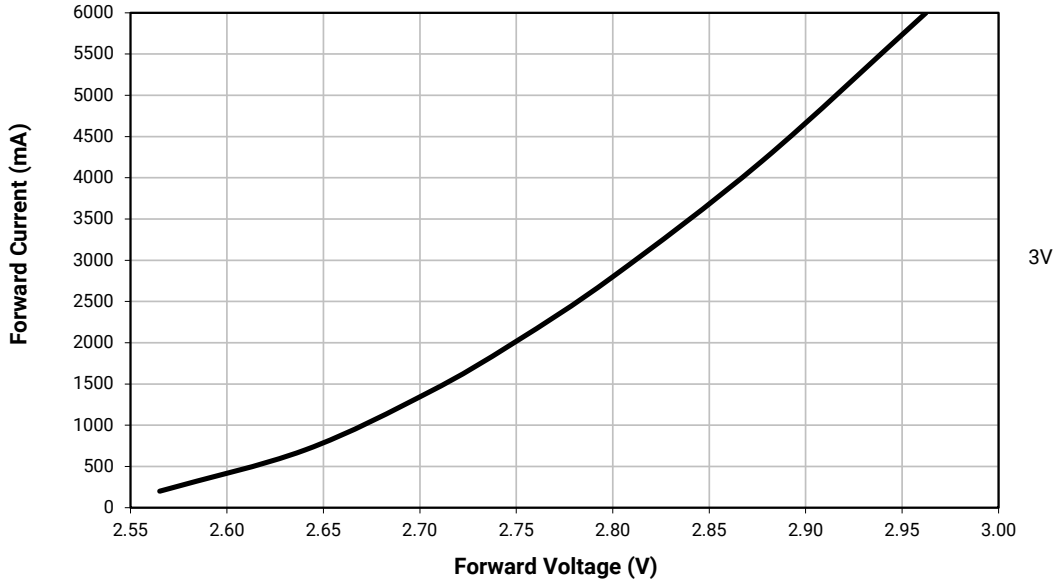


RELATIVE FLUX VS. JUNCTION TEMPERATURE

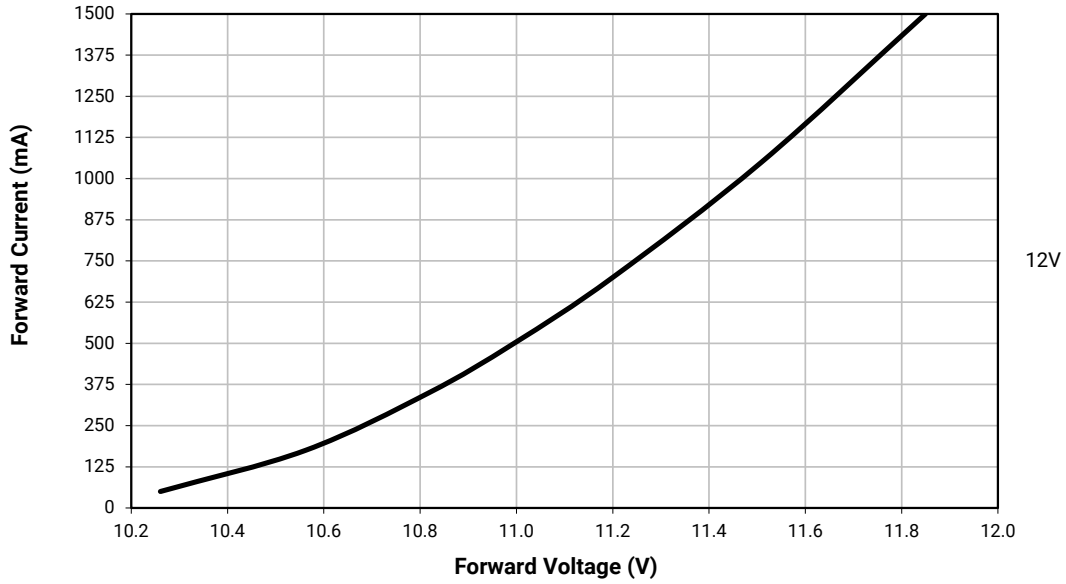
Reference condition: 3-V,  $I_F = 2800$  mA; 6 V,  $I_F = 1400$  mA; 12 V,  $I_F = 700$  mA



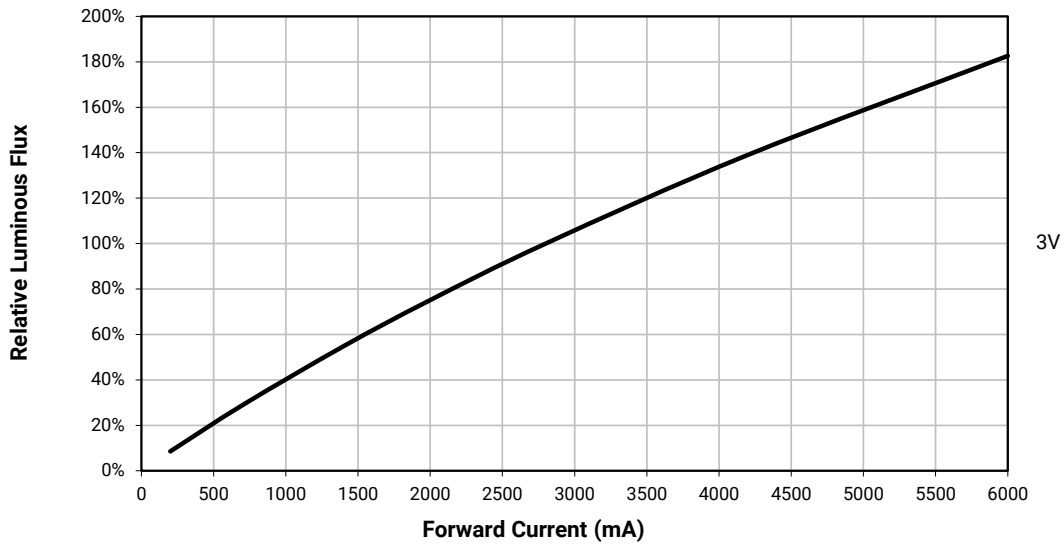
ELECTRICAL CHARACTERISTICS ( $T_j = 85\text{ }^\circ\text{C}$ )



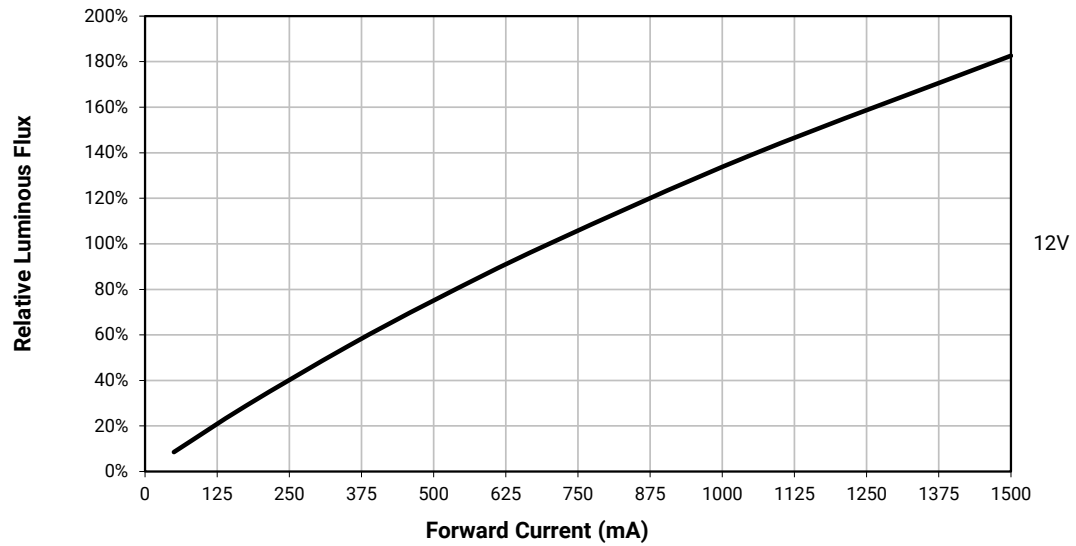
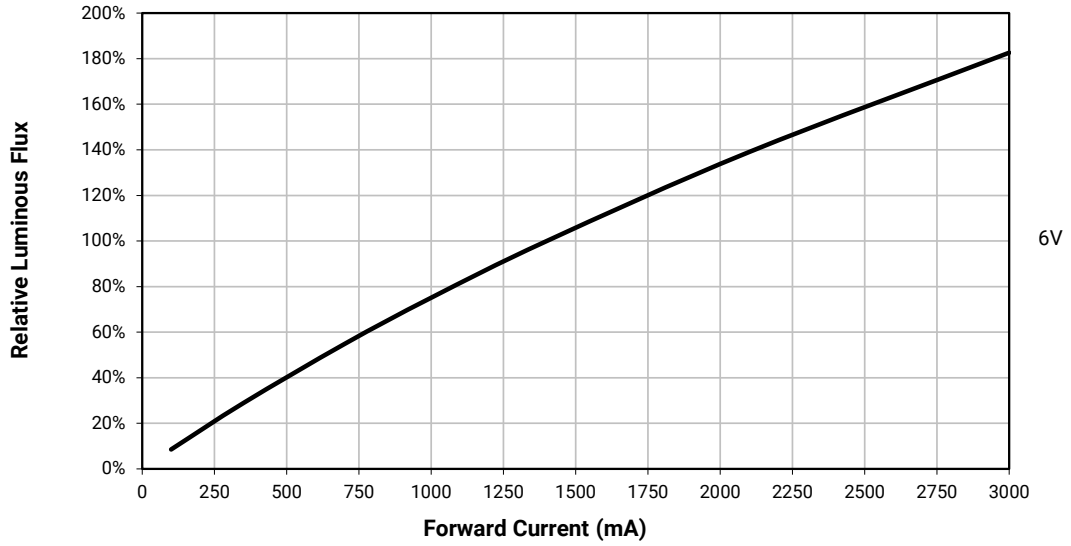
**ELECTRICAL CHARACTERISTICS ( $T_j = 85^\circ\text{C}$ ) - CONTINUED**



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

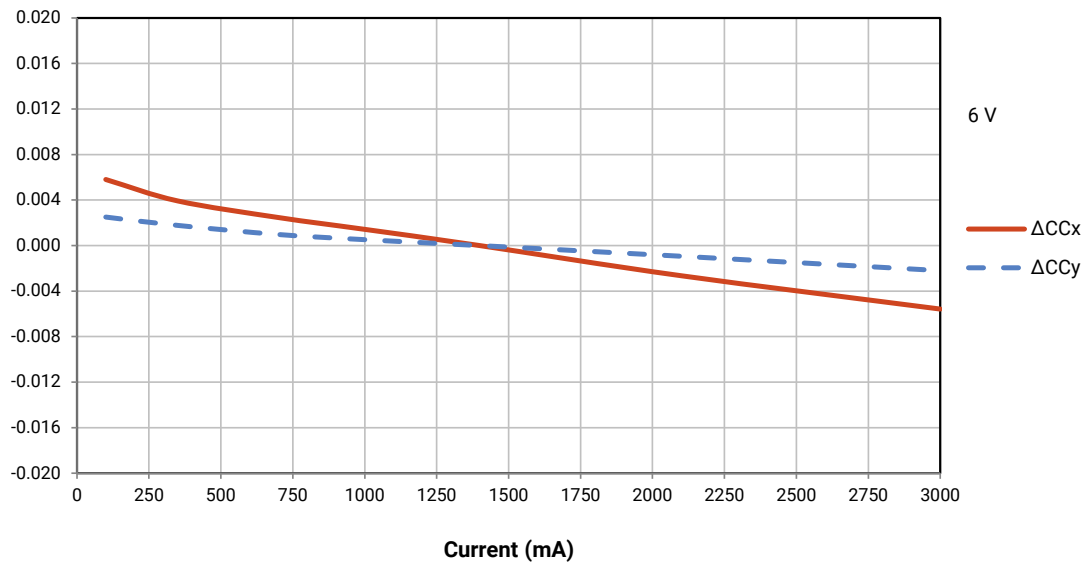
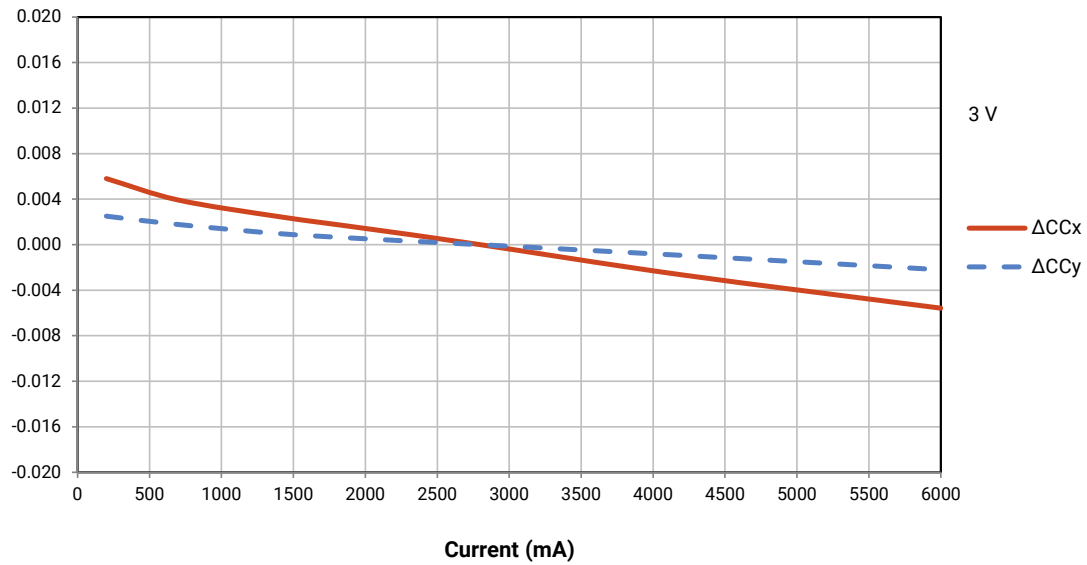


RELATIVE FLUX VS. CURRENT ( $T_j = 85\text{ }^\circ\text{C}$ ) - CONTINUED

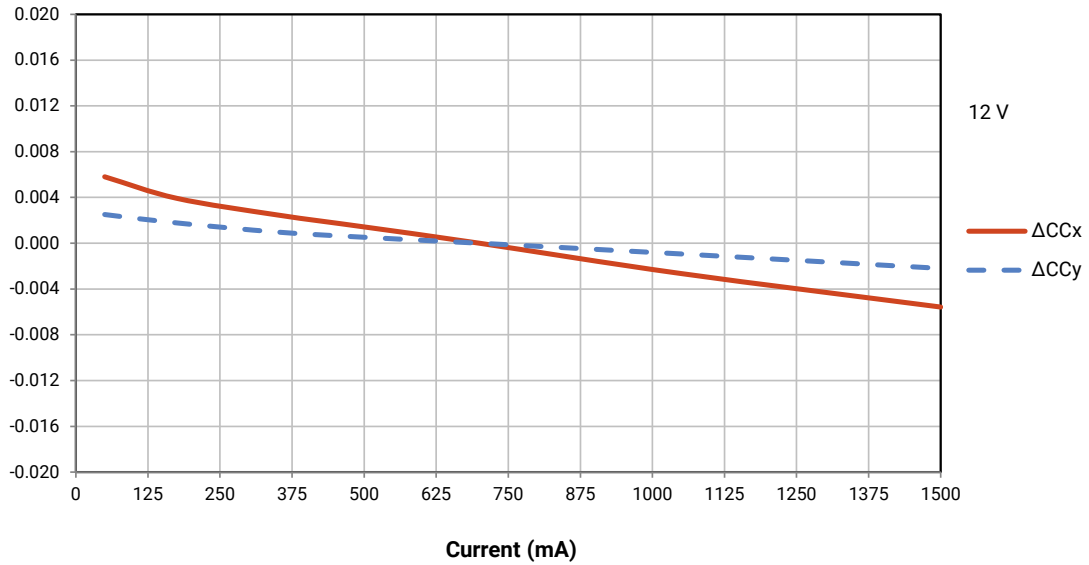


## RELATIVE CHROMATICITY VS CURRENT (WARM WHITE)

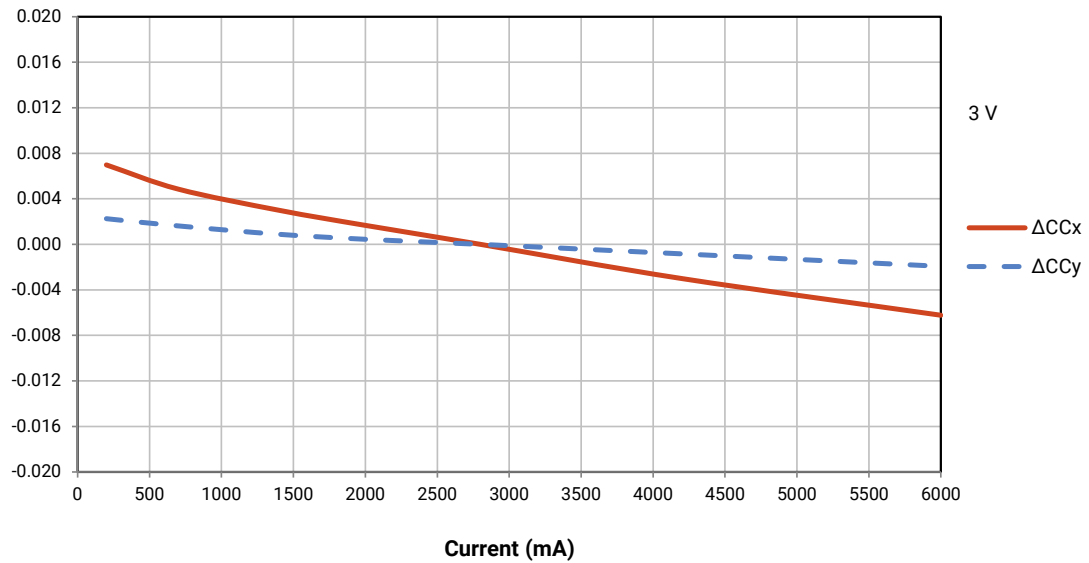
### XHP50.3 High Density



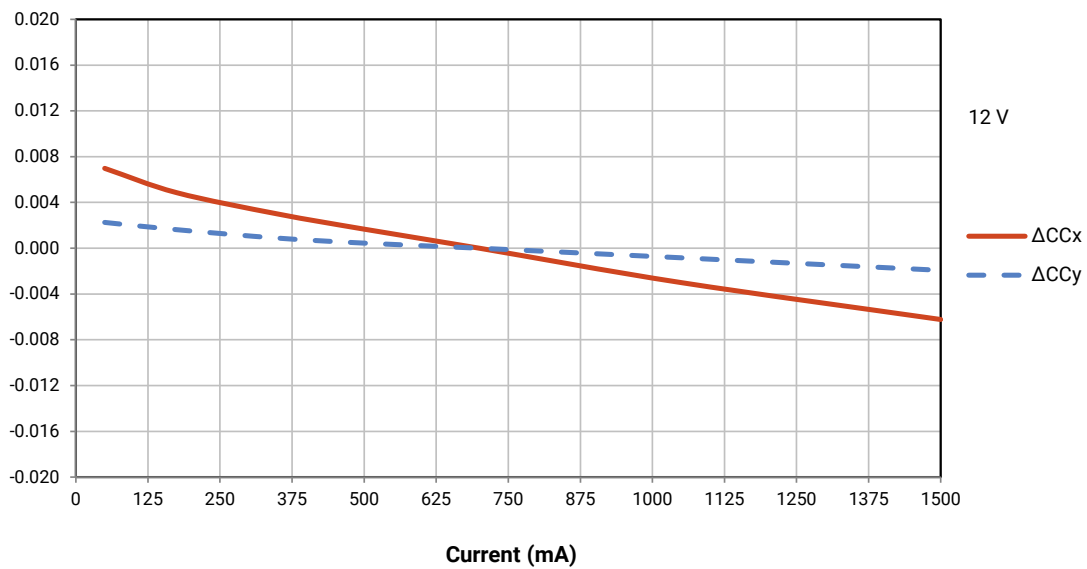
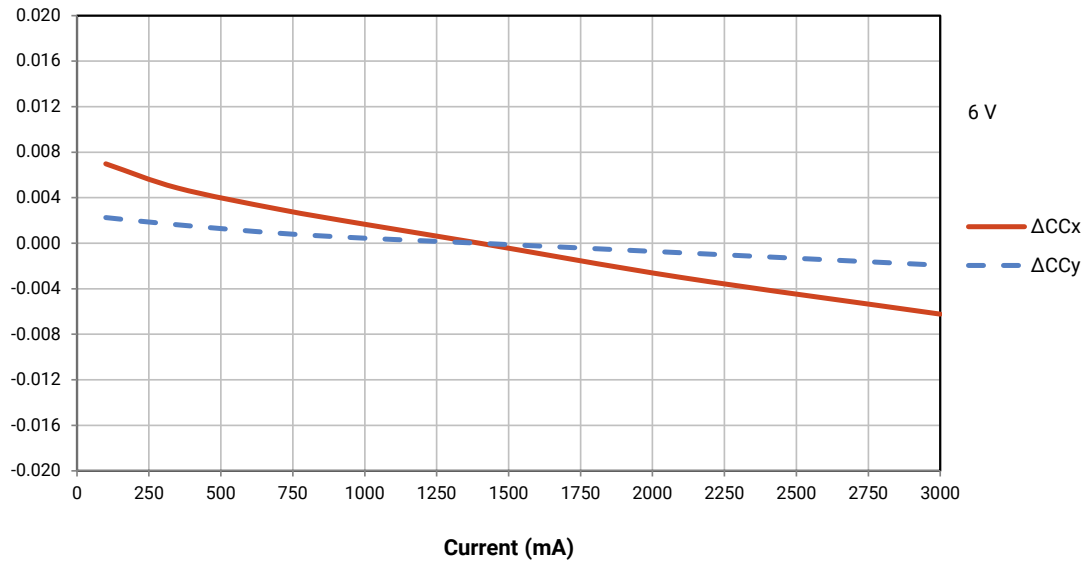
RELATIVE CHROMATICITY VS CURRENT (WARM WHITE) - CONTINUED



XHP50.3 High Intensity



RELATIVE CHROMATICITY VS CURRENT (WARM WHITE) - CONTINUED

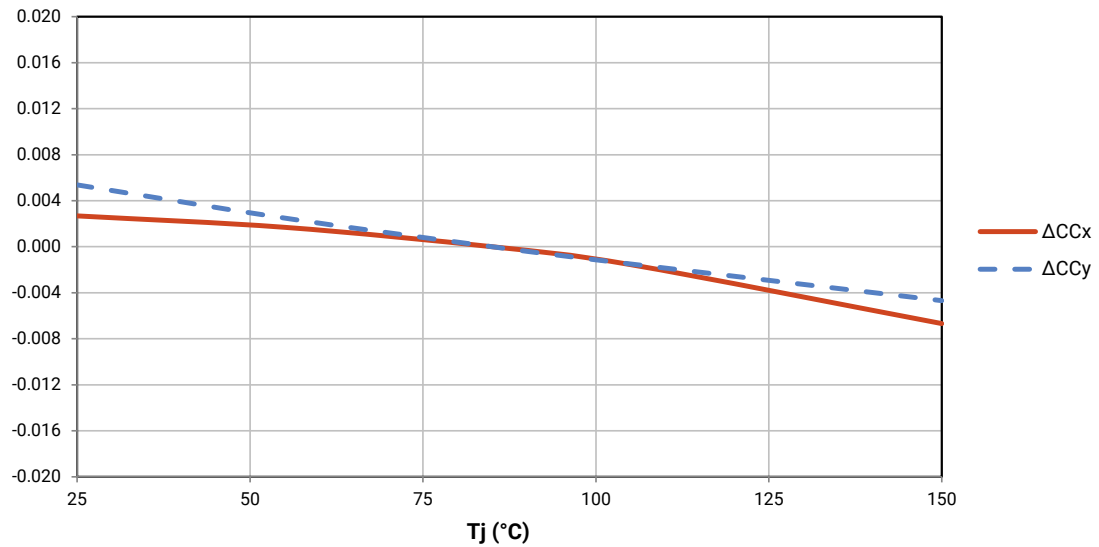




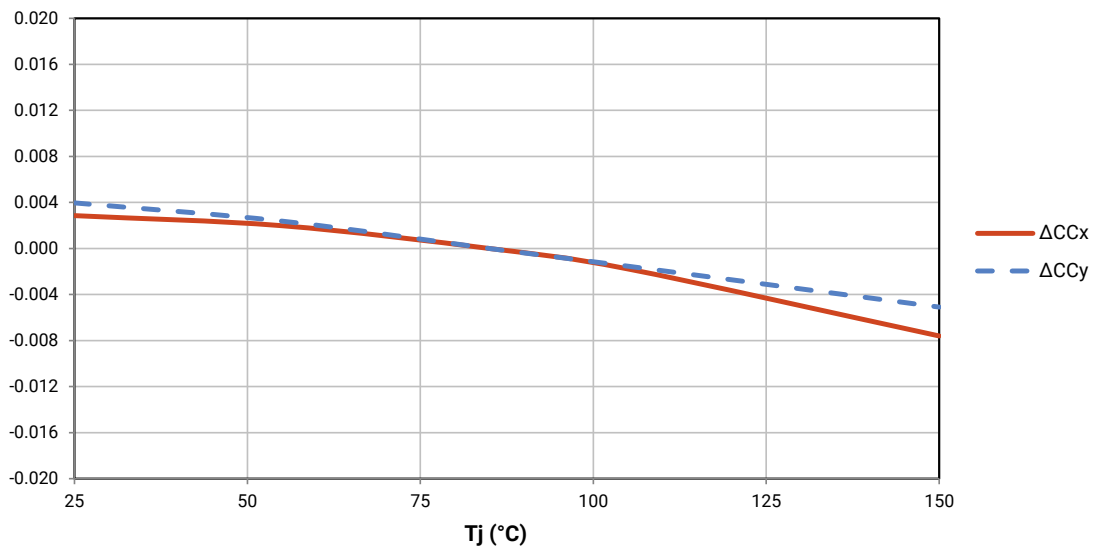
## RELATIVE CHROMATICITY VS TEMPERATURE (WARM WHITE)

Reference condition: 3 V,  $I_F = 2800$  mA; 6 V,  $I_F = 1400$  mA; 12 V,  $I_F = 700$  mA

### XHP50.3 Hgh Density



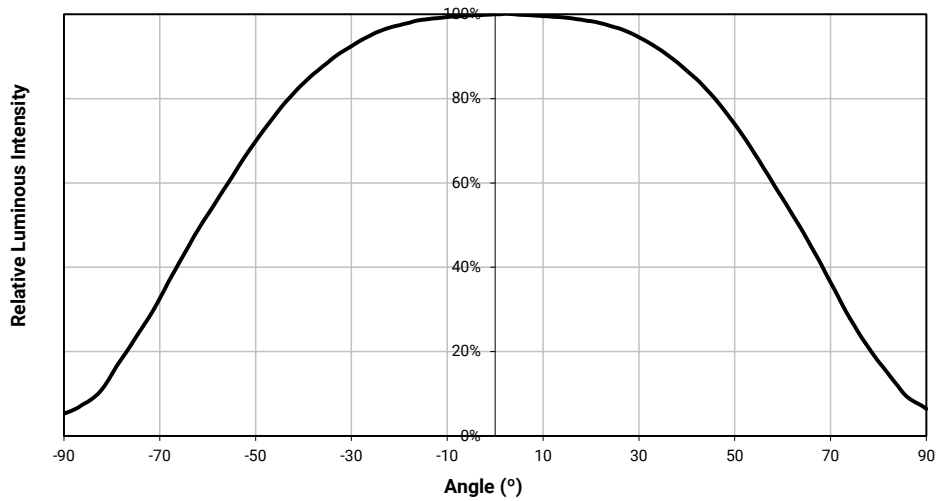
### XHP50.3 Hgh Intensity



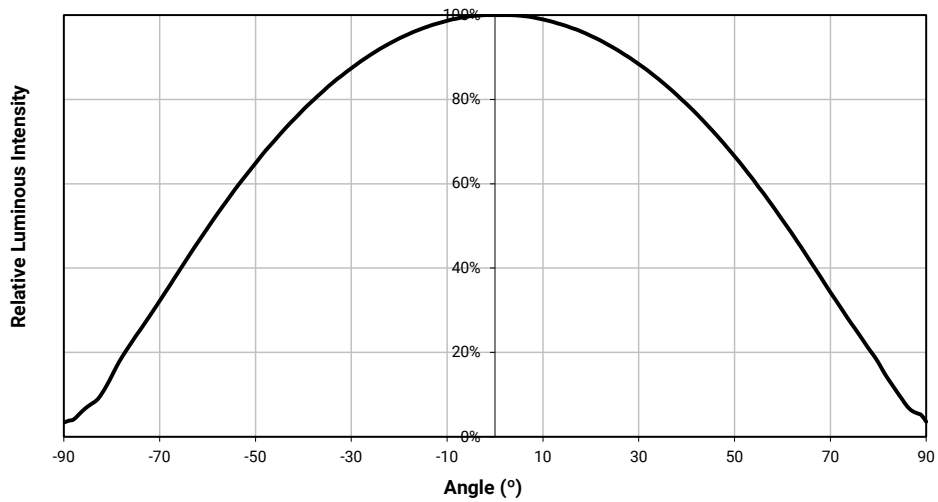
## TYPICAL SPATIAL DISTRIBUTION

Reference condition:  $T_j = 85\text{ }^\circ\text{C}$ ; 3 V,  $I_f = 2800\text{ mA}$ ; 6 V,  $I_f = 1400\text{ mA}$ ; 12 V,  $I_f = 700\text{ mA}$

### XHP50.3 High Density

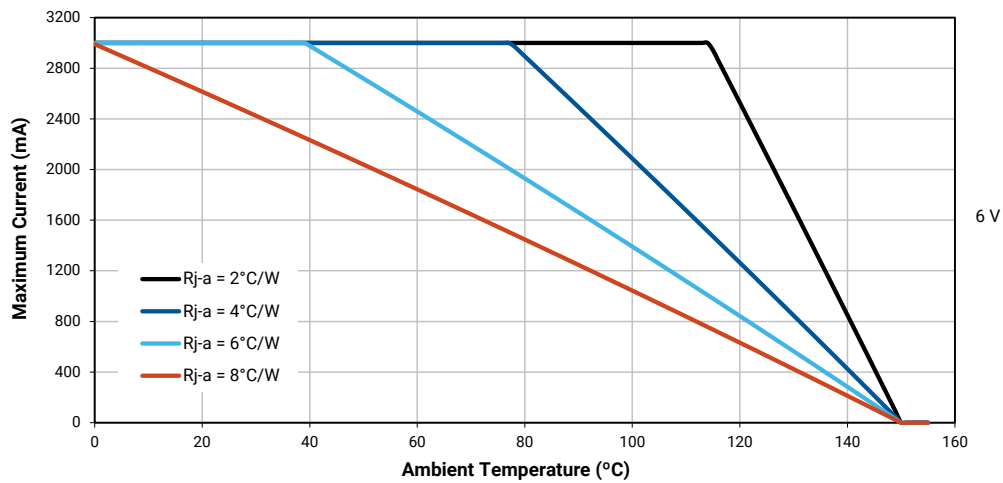
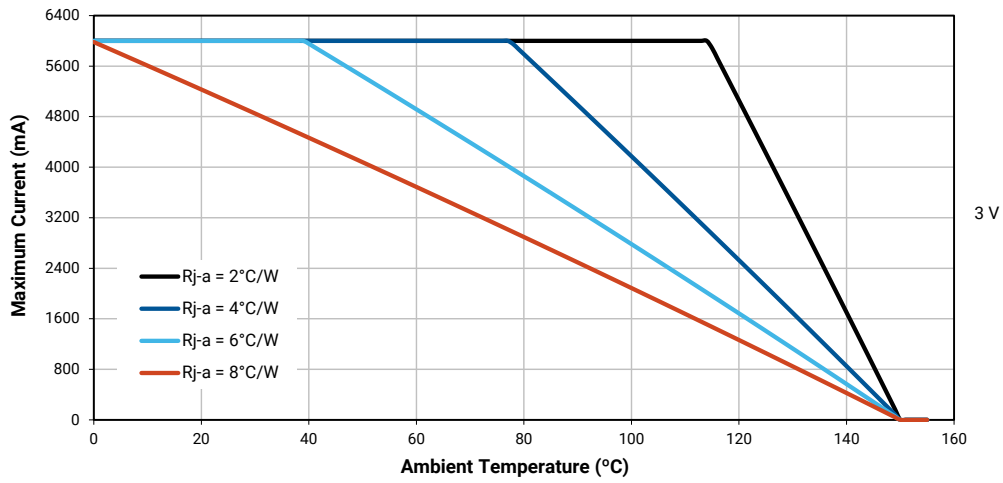


### XHP50.3 High Intensity

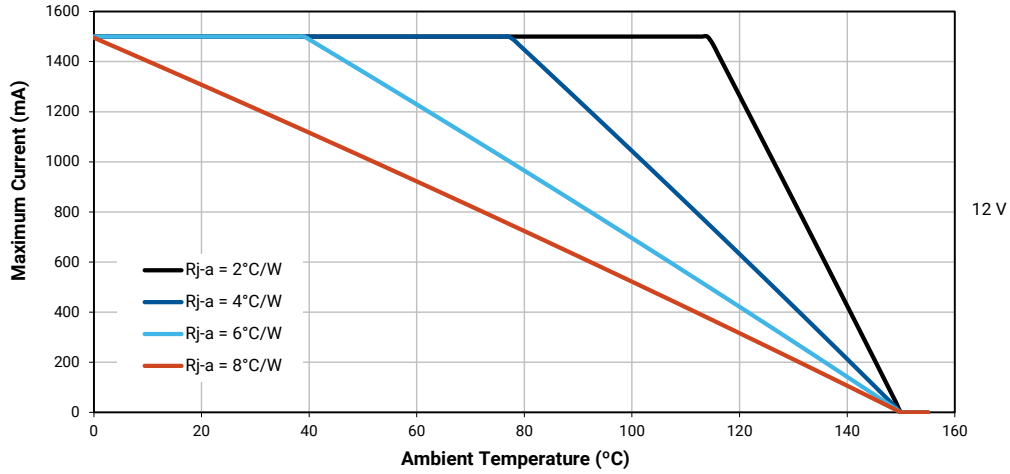


## THERMAL DESIGN

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.



THERMAL DESIGN - CONTINUED



PERFORMANCE GROUPS – LUMINOUS FLUX (T<sub>j</sub> = 85 °C)

XLamp XHP50.3 LEDs are tested for luminous flux and placed into one of the following luminous-flux groups.

Group Code	Minimum Luminous Flux	Maximum Luminous Flux
F2	680	730
F4	730	780
G2	780	840
G4	840	900
H2	900	970
H4	970	1040
J2	1040	1120
J4	1120	1200
K2	1200	1290
K4	1290	1380

**PERFORMANCE GROUPS – CHROMATICITY**

XLamp XHP50.3 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

EasyWhite Color Temperatures – 2-Step			
Bin Code	CCT	x	y
40H	4000 K	0.3777	0.3739
		0.3797	0.3816
		0.3861	0.3855
		0.3838	0.3777
35H	3500 K	0.4022	0.3858
		0.4053	0.3942
		0.4125	0.3977
		0.4091	0.3891
30H	3000 K	0.4287	0.3975
		0.4328	0.4064
		0.4390	0.4086
		0.4347	0.3996
27H	2700 K	0.4524	0.4048
		0.4574	0.4140
		0.4633	0.4154
		0.4581	0.4062

EasyWhite Color Temperatures – 3-Step Ellipse						
Bin Code	CCT	Center Point		Major Axis	Minor Axis	Rotation Angle (°)
		x	y	a	b	
50G	5000 K	0.3447	0.3553	0.00840	0.00312	65.0
45G	4500 K	0.3611	0.3658	0.00852	0.00330	61.5
40G	4000 K	0.3818	0.3797	0.00939	0.00402	53.7
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	
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

PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

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

ANSI White Bins			
CCT	Bin Code	x	y
7000 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
7000 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
6000 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
6000 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

PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

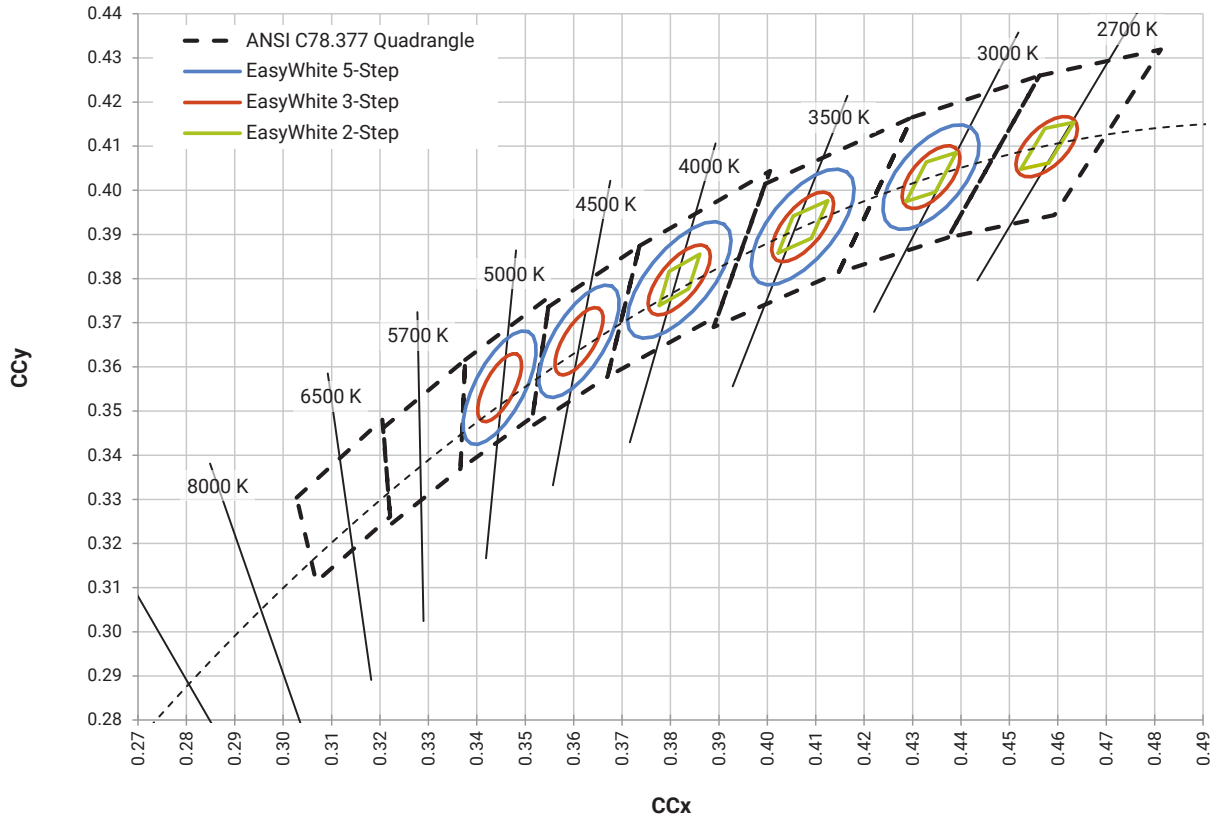
ANSI White Bins				ANSI White Bins			
CCT	Bin Code	x	y	CCT	Bin Code	x	y
5000 K	3A0	0.3371	0.3490	4500 K	4A0	0.3530	0.3597
		0.3451	0.3554			0.3615	0.3659
		0.3440	0.3427			0.3512	0.3465
		0.3366	0.3369			0.3515	0.3487
	3B0	0.3376	0.3616		4B0	0.3548	0.3736
		0.3463	0.3687			0.3641	0.3804
		0.3451	0.3554			0.3530	0.3597
		0.3371	0.3490			0.3533	0.362
	3C0	0.3463	0.3687		4C0	0.3641	0.3804
		0.3551	0.3760			0.3736	0.3874
		0.3533	0.3620			0.3702	0.3722
		0.3451	0.3554			0.3615	0.3659
	3D0	0.3451	0.3554		4D0	0.3615	0.3659
		0.3533	0.3620			0.3702	0.3722
		0.3515	0.3487			0.3670	0.3578
		0.3440	0.3427			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	0.3646
	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
		0.4006	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
		0.4146	0.4089
		0.4080	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

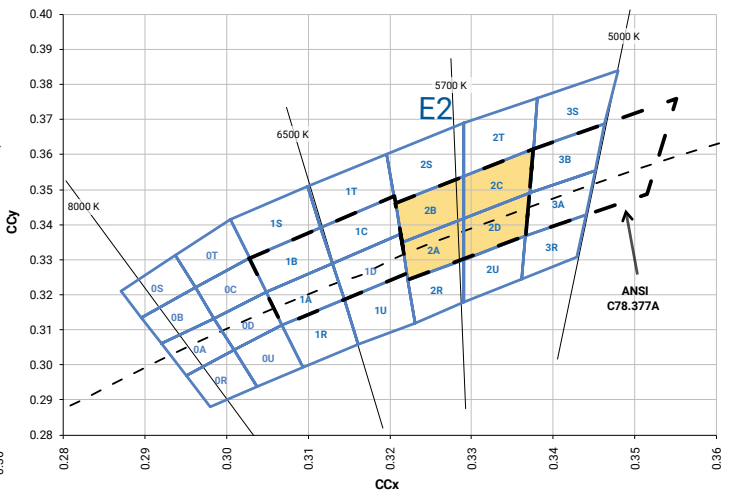
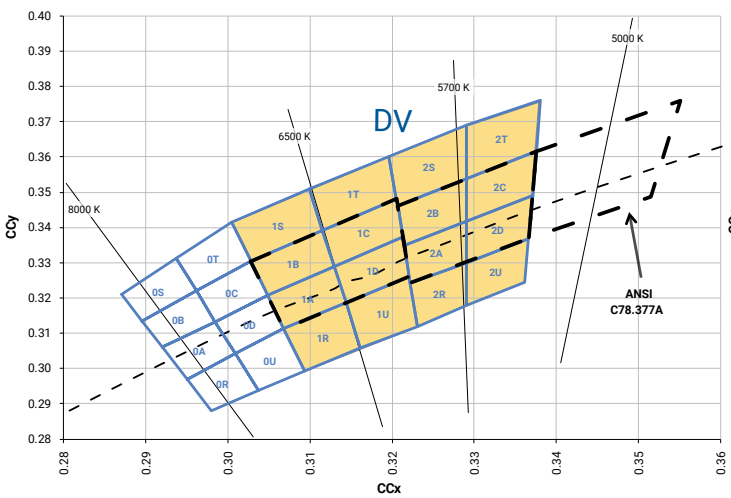
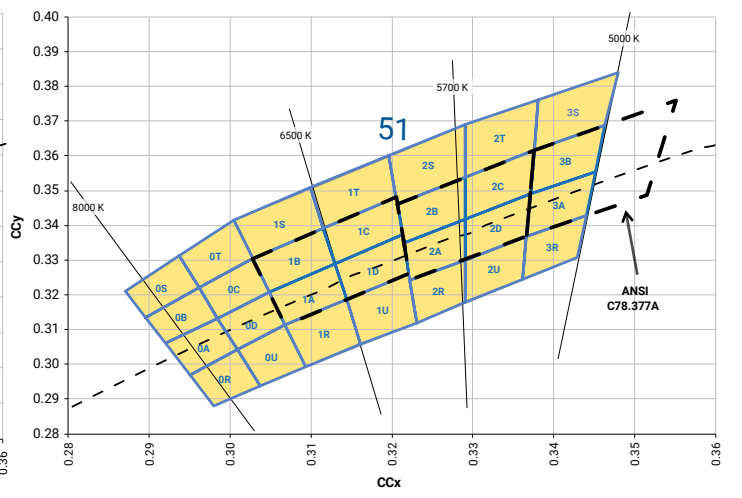
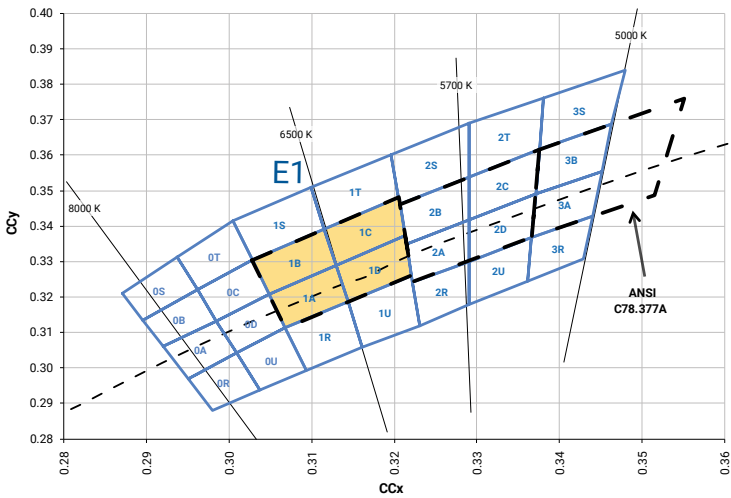
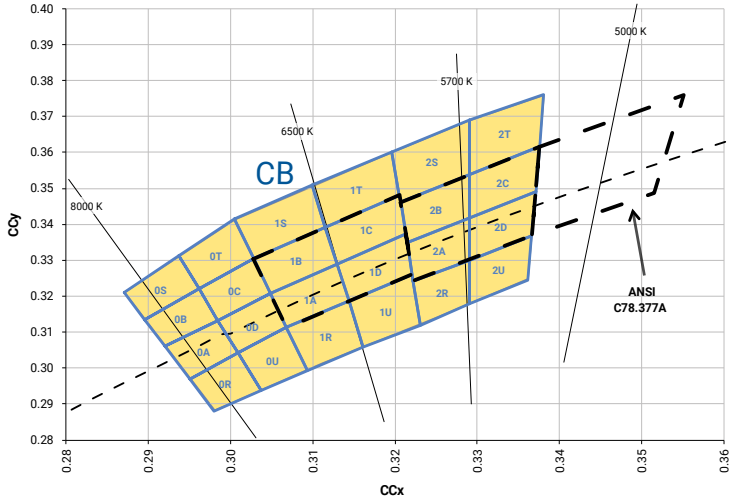
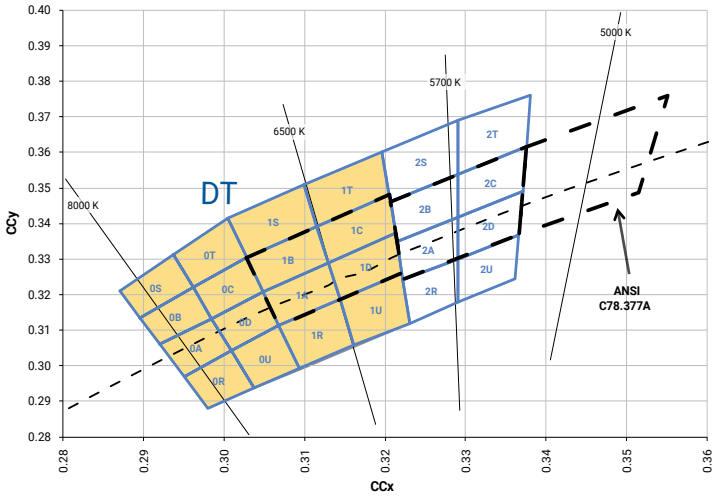
ANSI White Bins			
CCT	Bin Code	x	y
3000 K	7A0	0.4147	0.3814
		0.4221	0.3984
		0.4342	0.4028
		0.4259	0.3853
	7B0	0.4221	0.3984
		0.4299	0.4165
		0.4430	0.4212
		0.4342	0.4028
	7C0	0.4342	0.4028
		0.4430	0.4212
		0.4562	0.4260
		0.4465	0.4071
	7D0	0.4259	0.3853
		0.4342	0.4028
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EASYWHITE® CHROMATICITY REGIONS PLOTTED ON THE 1931 CIE CURVE

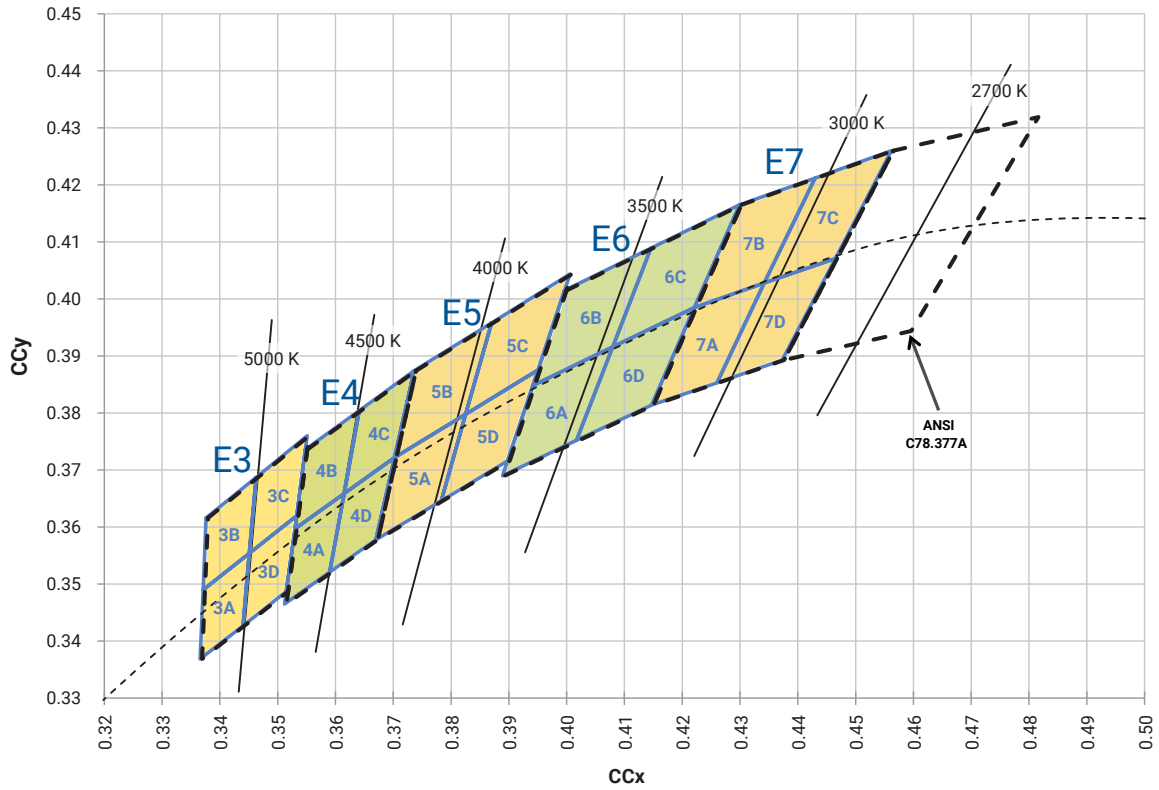




ANSI COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS

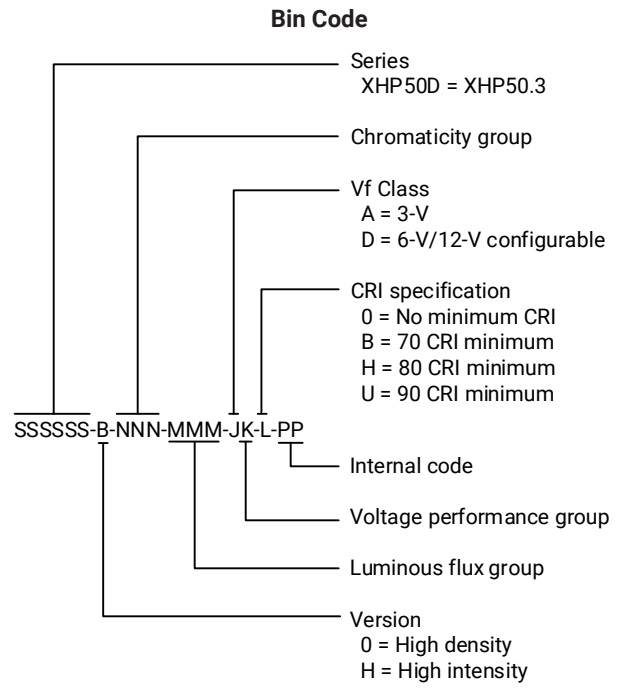
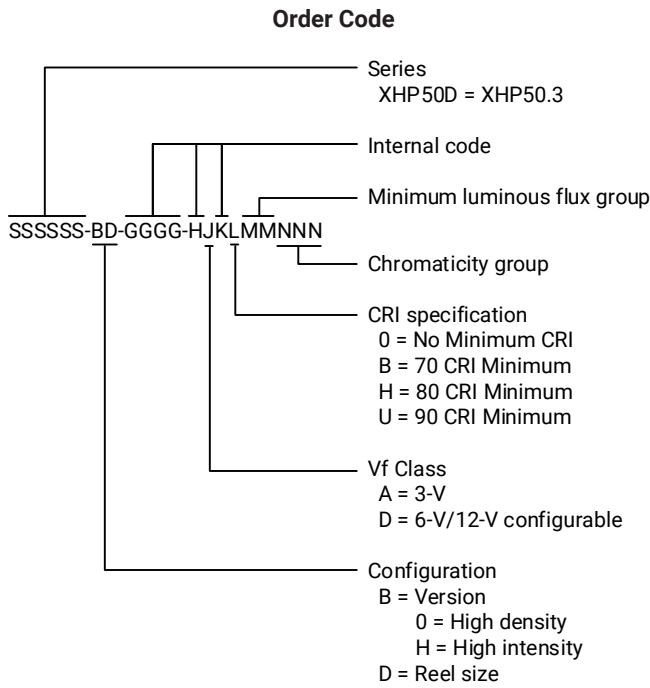


ANSI WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



## BIN AND ORDER CODE FORMATS

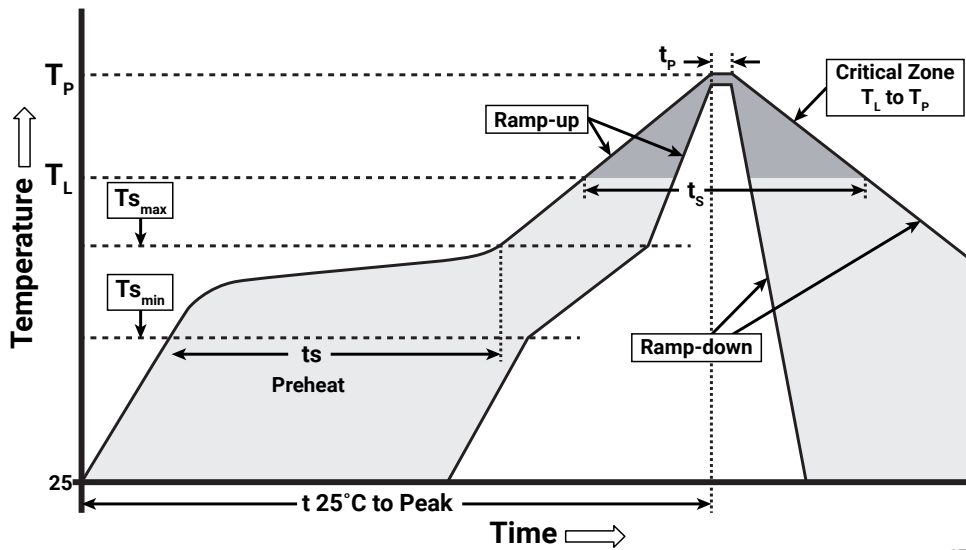
Bin codes and order codes for XHP50.3 LEDs are configured in the following manner:



## REFLOW SOLDERING CHARACTERISTICS

In testing, Cree LED has found XLamp XHP50.3 LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, Cree LED 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 ( $T_{s_{max}}$ to $T_P$ )	1.2 °C/second
Preheat: Temperature Min ( $T_{s_{min}}$ )	120 °C
Preheat: Temperature Max ( $T_{s_{max}}$ )	170 °C
Preheat: Time ( $t_{s_{min}}$ to $t_{s_{max}}$ )	65-150 seconds
Time Maintained Above: Temperature ( $T_L$ )	217 °C
Time Maintained Above: Time ( $t_t$ )	45-90 seconds
Peak/Classification Temperature ( $T_P$ )	235 - 245 °C
Time Within 5 °C of Actual Peak Temperature ( $t_p$ )	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.

## NOTES

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### 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 LED'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 LED applies to ensure long-term reliability for XLamp LEDs and details of Cree LED's pre-release qualification testing for XLamp LEDs. Cree LED did not perform Room Temperature Operating Life (RTOL) testing on the XHP50.3 LED.

### Lumen Maintenance

Cree LED 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 LED'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 LED 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 XHP50.3 LEDs may be stored as MSL 1 per JEDEC J-STD-033, meaning they have unlimited floor life in conditions of  $\leq 30$  °C/85% relative humidity (RH). Regardless of the storage condition, Cree LED 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 LED representative or from the [Product Ecology](#) section of the Cree LED 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 LED 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.

## NOTES - CONTINUED

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### **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**

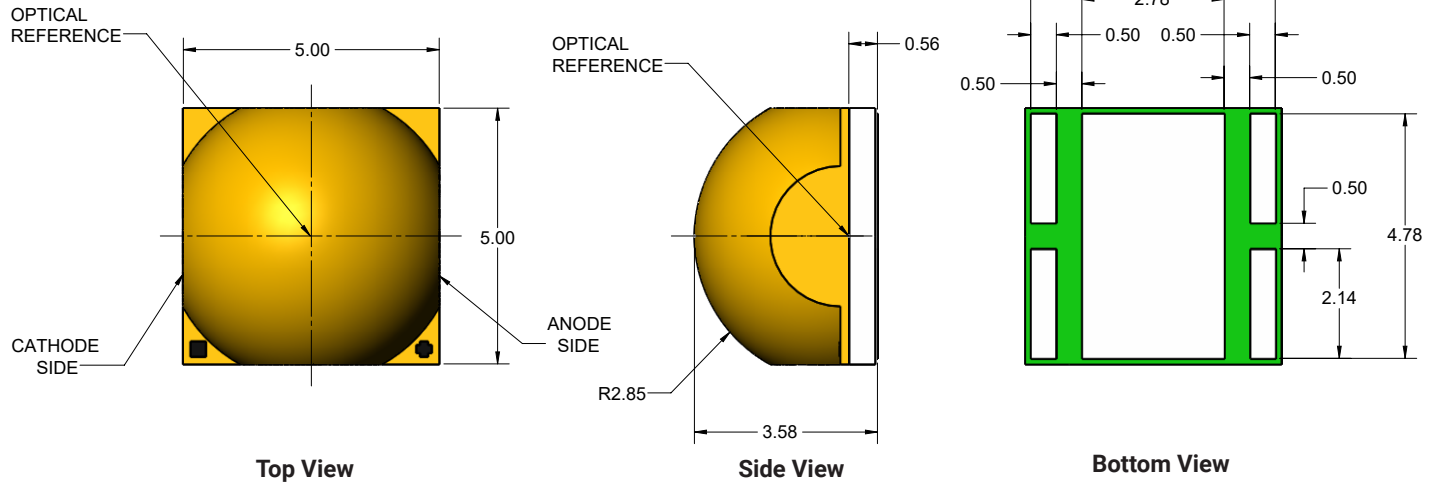
WARNING: Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the [LED Eye Safety application note](#).

MECHANICAL DIMENSIONS

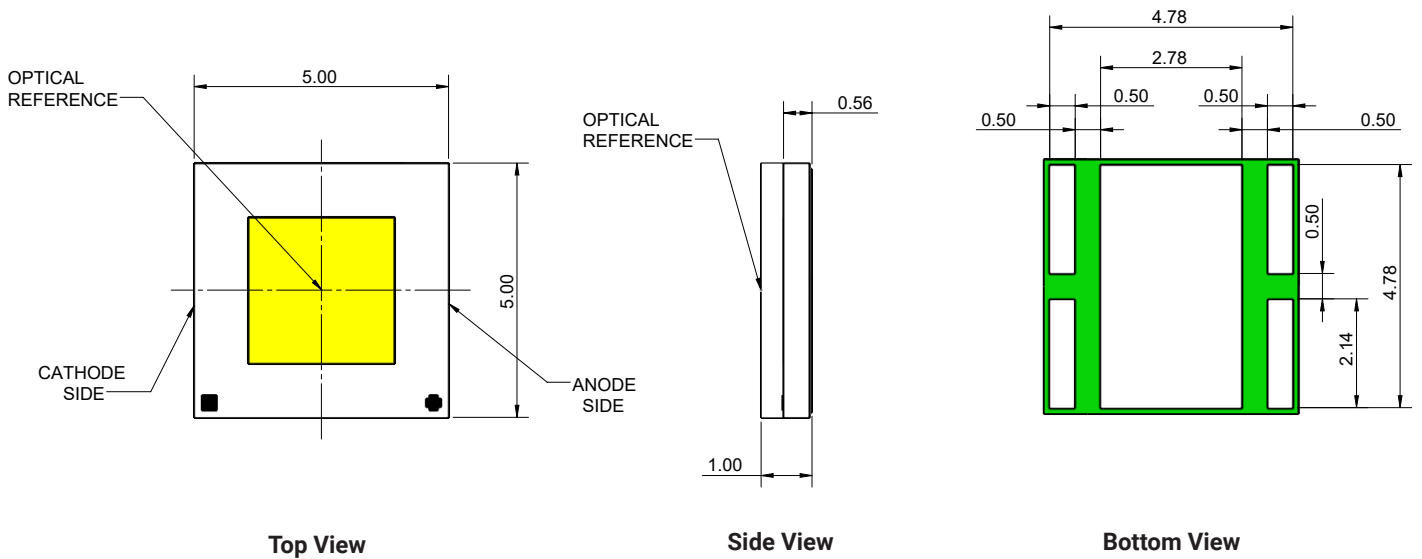
Thermal vias, if present, are not shown on these drawings.

All dimensions are ±.13 mm unless otherwise indicated.

XHP50.3 High Density

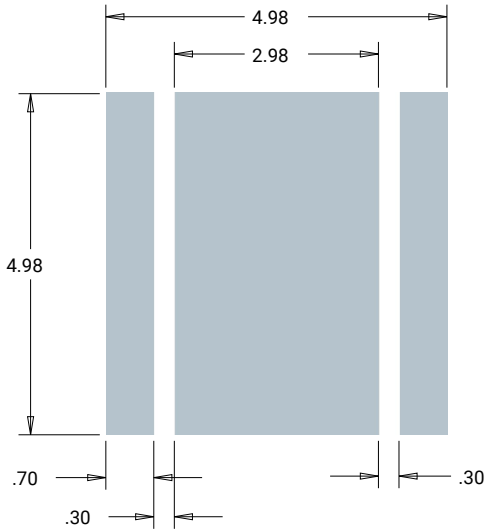


XHP50.3 High Intensity

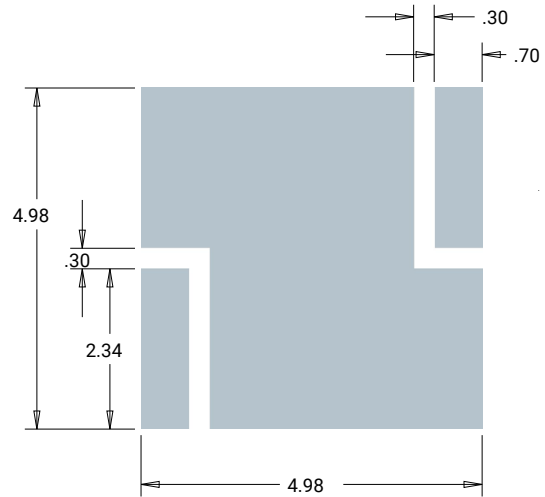


**MECHANICAL DIMENSIONS - CONTINUED**

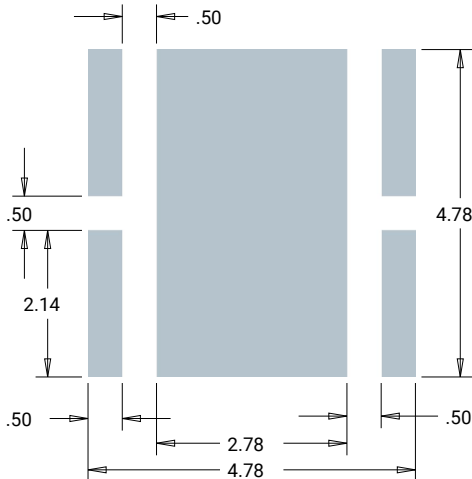
**XHP50.3 High Density & High Intensity**



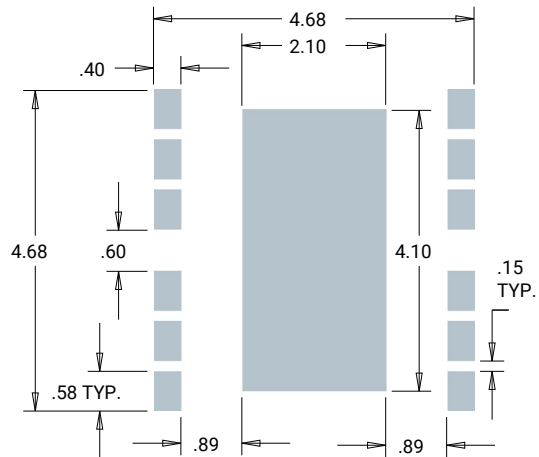
**Recommended PCB Solder Pad  
3 V or 6 V Configuration  
Depending on Vf Class  
(thermal pad is electrically isolated)**



**Recommended PCB Solder Pad  
12 V Configuration  
(thermal pad is connected to anode and cathode  
and is not electrically isolated)**



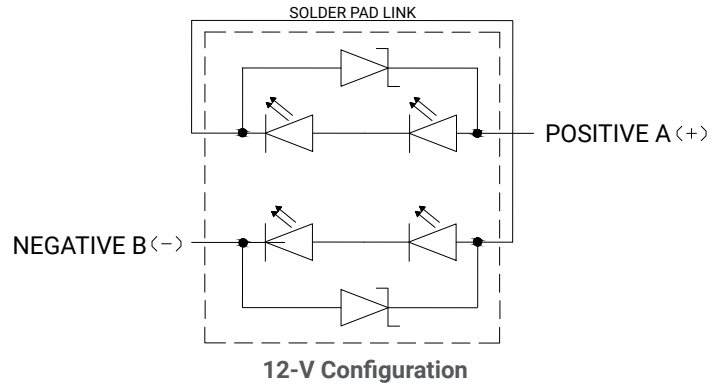
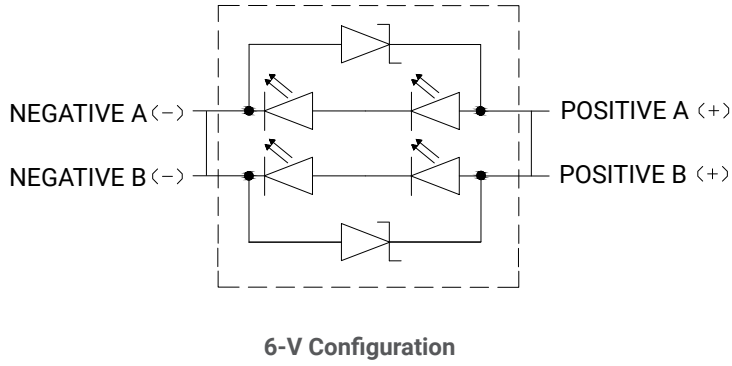
**Recommended Solder Resist Pattern  
6 V & 12 V Configurations**



**Recommended Stencil Pattern  
6 V & 12 V Configurations  
(shaded area is open)**



## ELECTRICAL CONFIGURATION

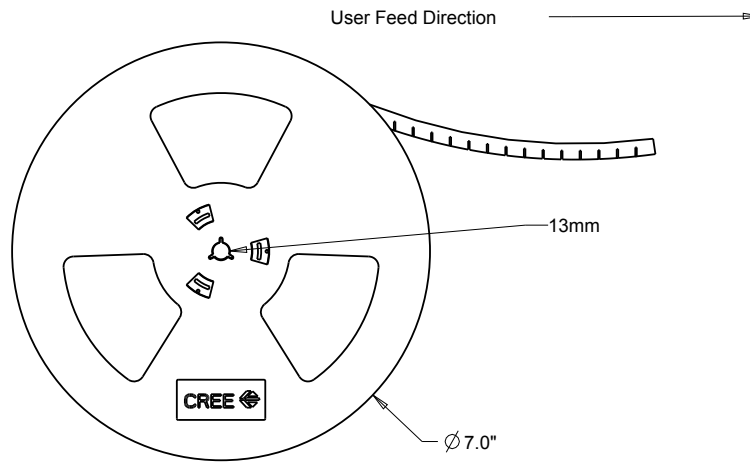
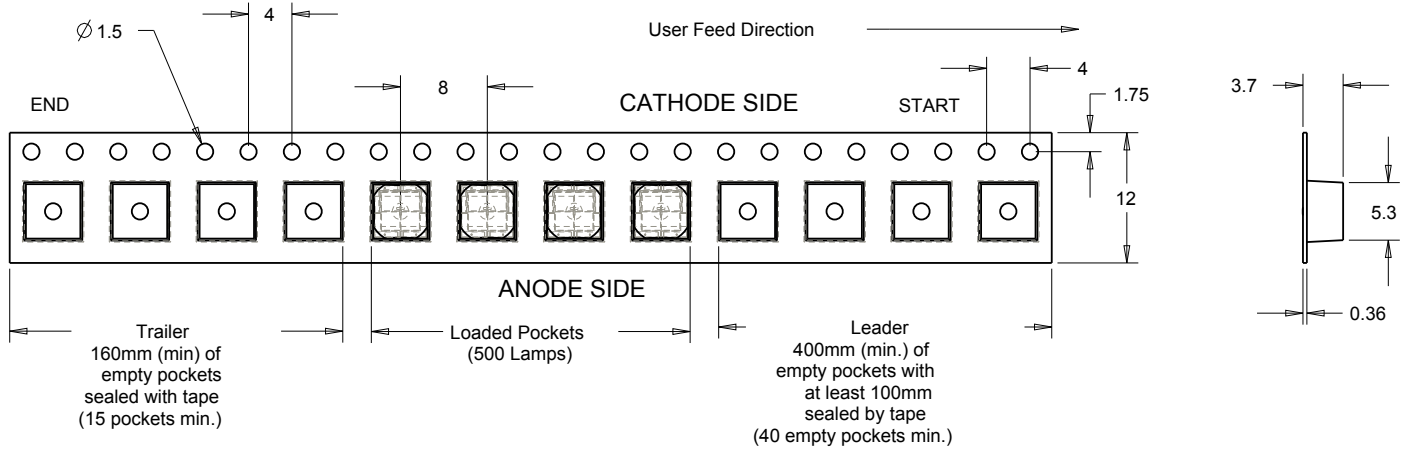


**TAPE AND REEL**

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

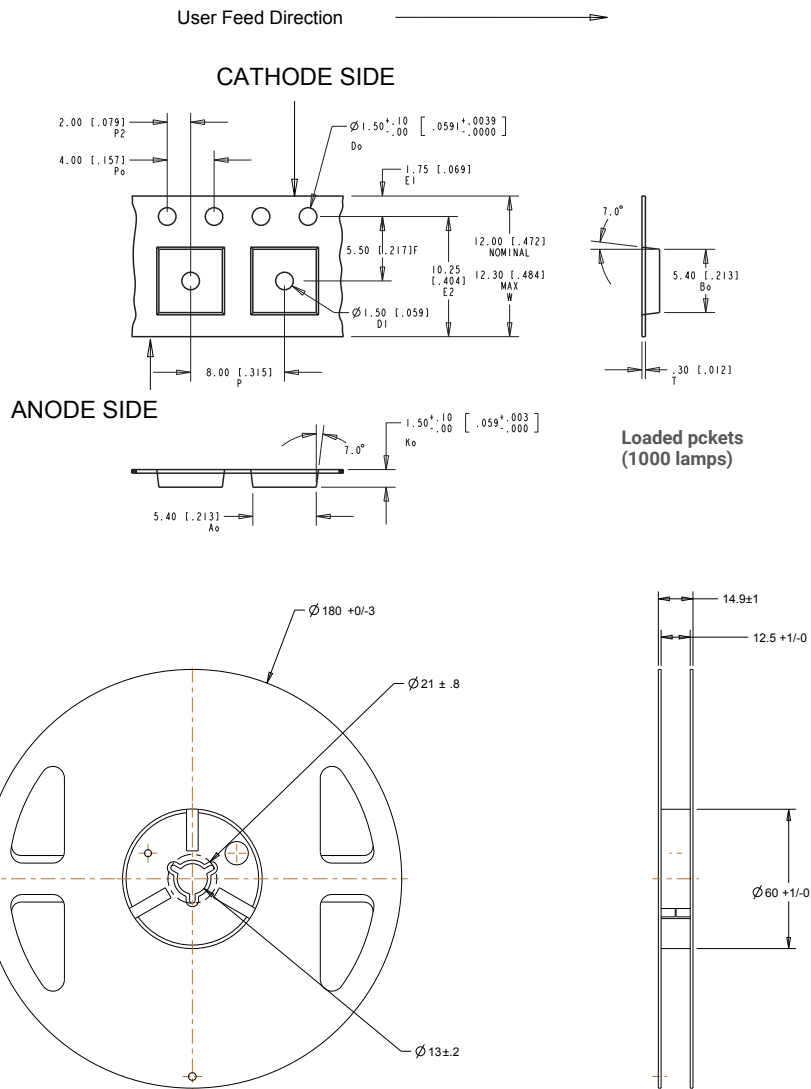
All dimensions are ±.13 mm unless otherwise indicated.

**XHP50.3 High Density**



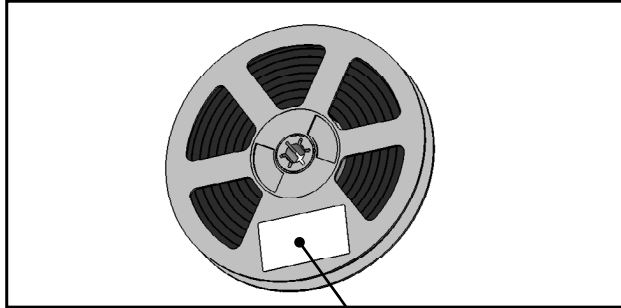
TAPE AND REEL - CONTINUED

XHP50.3 High Intensity



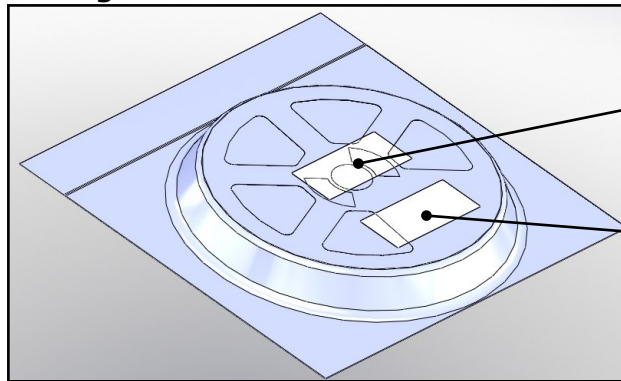
## PACKAGING

### Unpackaged Reel



Label with Cree Bin Code,  
Quantity, Reel ID

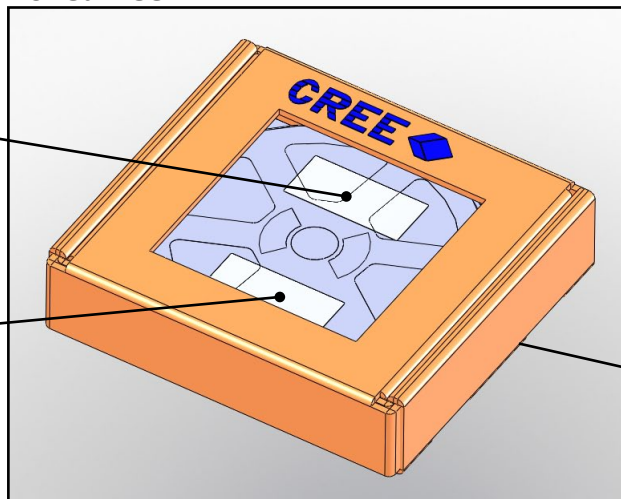
### Packaged Reel



Label with Cree Order Code,  
Quantity, Reel ID, PO #

Label with Cree Bin Code,  
Quantity, Reel ID

### Boxed Reel



Label with Cree Order Code,  
Quantity, Reel ID, PO #

Label with Cree Bin Code,  
Quantity, Reel ID

Patent Label  
(on bottom of box)