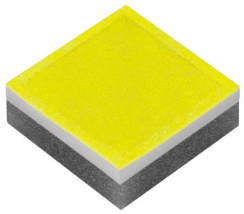
XLamp® XD16 Premium White LEDs



PRODUCT DESCRIPTION

The XLamp® XD16 LEDs are the industry's first Extreme Density LEDs, delivering up to 5½ times higher lumen density than Cree LED's previous generation of high-power LEDs. The ceramic based XD16 LED package addresses challenges with luminaire manufacturing, thermal design, optical design and reliability that have been experienced with competing LEDs.

XD16 LEDs are available in two versions: Standard and Premium White. The Standard version is optimized for tightly-packed arrays of multiple LEDs. The Premium White version upgrades the optical profile of the LED to work well with secondary optics and reduce cross talk between LEDs.

XLamp XD16 LEDs are optimized for all lighting applications that require extreme levels of lumen density, including indoor directional, portable and aftermarket automotive.

FEATURES

- Available in outdoor white and 70-, 80- and 90-CRI white
- ANSI-compatible chromaticity bins
- 3-step and 5-step options
- Binned at 85 °C
- Maximum drive current: 2 A
- Low thermal resistance: 1.8 °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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Cree LED / 4001 E. Hwy. 54, Suite 2000 / Durham, NC 27713 USA / +1.919.313.5330 / www.cree-led.com

CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point◊	°C/W		1.8	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.3	
DC forward current	mA			2000
Reverse voltage	V			1
Forward voltage (@ 350 mA, 85 °C)	V		2.73	3
LED junction temperature	°C			150

Notes:

◊ Thermal resistance measurement was performed per the JEDEC JESD51-14 standard. See the Thermal Resistance Measurement application note for more details.

FLUX CHARACTERISTICS (T_J = 85 °C)

The following table provides order codes for XLamp XD16 Premium White LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 32). For definitions of the chromaticity kits, please see the Standard Chromaticity Kits section (page 30).

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
DT	7000 K	S4	164	178	302	406	XD16AWT-P0-0000-000000LDT	XD16AWT-P0-0000-00000BLDT			
		S3	156	169	287	386	XD16AWT-P0-0000-000000KDT	XD16AWT-P0-0000-00000BKDT			
		S2	148	161	272	366	XD16AWT-P0-0000-000000JDT	XD16AWT-P0-0000-00000BJDT	XD16AWT-P0-0000-00000HJDT		
		R5	139	151	256	344	XD16AWT-P0-0000-000000HDT	XD16AWT-P0-0000-00000BHDT	XD16AWT-P0-0000-00000HHDT		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGDT		
		R3	122	132	225	302				XD16AWT-P0-0000-00000UFDT	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEDT	
E1	6500 K	S4	164	178	302	406	XD16AWT-P0-0000-000000LE1	XD16AWT-P0-0000-00000BLE1			
		S3	156	169	287	386	XD16AWT-P0-0000-000000KE1	XD16AWT-P0-0000-00000BKE1			
		S2	148	161	272	366	XD16AWT-P0-0000-000000JE1	XD16AWT-P0-0000-00000BJE1	XD16AWT-P0-0000-00000HJE1		
		R5	139	151	256	344	XD16AWT-P0-0000-000000HE1	XD16AWT-P0-0000-00000BHE1	XD16AWT-P0-0000-00000HHE1		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGE1		
		R3	122	132	225	302				XD16AWT-P0-0000-00000UFE1	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEE1	XD16AWT-P0-0000-00000ZEE1
		Q5	107	116	197	265					XD16AWT-P0-0000-00000ZDE1
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZCE1

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
1G	6500 K	R3	122	132	225	302				XD16AWT-P0-0000-00000UF1G	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE1G	XD16AWT-P0-0000-00000ZE1G
		Q5	107	116	197	265					XD16AWT-P0-0000-00000ZD1G
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZC1G
50	6200 K	S4	164	178	302	406	XD16AWT-P0-0000-000000L50				
		S3	156	169	287	386	XD16AWT-P0-0000-000000K50				
		S2	148	161	272	366	XD16AWT-P0-0000-000000J50		XD16AWT-P0-0000-00000HJ50		
		R5	139	151	256	344	XD16AWT-P0-0000-000000H50		XD16AWT-P0-0000-00000HH50		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG50		
DV	6000 K	S4	164	178	302	406	XD16AWT-P0-0000-000000LDV	XD16AWT-P0-0000-00000BLDV			
		S3	156	169	287	386	XD16AWT-P0-0000-000000KDV	XD16AWT-P0-0000-00000BKDV			
		S2	148	161	272	366	XD16AWT-P0-0000-000000JDV	XD16AWT-P0-0000-00000BJDV	XD16AWT-P0-0000-00000HJDV		
		R5	139	151	256	344	XD16AWT-P0-0000-000000HDV	XD16AWT-P0-0000-00000BHDV	XD16AWT-P0-0000-00000HHDV		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGDV		
		R3	122	132	225	302				XD16AWT-P0-0000-00000UFDV	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEDV	

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
E2	5700 K	S4	164	178	302	406	XD16AWT-P0-0000-000000LE2	XD16AWT-P0-0000-00000BLE2			
		S3	156	169	287	386	XD16AWT-P0-0000-000000KE2	XD16AWT-P0-0000-00000BKE2			
		S2	148	161	272	366	XD16AWT-P0-0000-000000JE2	XD16AWT-P0-0000-00000BJE2	XD16AWT-P0-0000-00000HJE2		
		R5	139	151	256	344	XD16AWT-P0-0000-000000HE2	XD16AWT-P0-0000-00000BHE2	XD16AWT-P0-0000-00000HHE2		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGE2		
		R3	122	132	225	302				XD16AWT-P0-0000-00000UFE2	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEE2	XD16AWT-P0-0000-00000ZEE2
		Q5	107	116	197	265					XD16AWT-P0-0000-00000ZDE2
2E	5700 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BL2E			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BK2E			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJ2E	XD16AWT-P0-0000-00000HJ2E		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BH2E	XD16AWT-P0-0000-00000HH2E		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG2E		
		R3	122	132	225	302				XD16AWT-P0-0000-00000UF2E	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE2E	
2G	5700 K	R3	122	132	225	302				XD16AWT-P0-0000-00000UF2G	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE2G	XD16AWT-P0-0000-00000ZE2G
		Q5	107	116	197	265					XD16AWT-P0-0000-00000ZD2G

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
3E	5000 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BL3E			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BK3E			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJ3E	XD16AWT-P0-0000-00000HJ3E		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BH3E	XD16AWT-P0-0000-00000HH3E		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG3E		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF3E	XD16AWT-P0-0000-00000UF3E	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE3E	
3G	5000 K	R3	122	132	225	302				XD16AWT-P0-0000-00000UF3G	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE3G	XD16AWT-P0-0000-00000ZE3G
		Q5	107	116	197	265					XD16AWT-P0-0000-00000ZD3G
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZC3G
E3	5000 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BLE3			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BKE3			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJE3	XD16AWT-P0-0000-00000HJE3		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHE3	XD16AWT-P0-0000-00000HHE3		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGE3		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFE3	XD16AWT-P0-0000-00000UFE3	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEE3	XD16AWT-P0-0000-00000ZEE3
		Q5	107	116	197	265					XD16AWT-P0-0000-00000ZDE3
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZCE3

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 34).
- XLamp XD16 Premuim White 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.

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** Flux values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
F4	4750K	S4	164	178	302	406		XD16AWT-P0-0000-00000BLF4			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BKF4			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJF4	XD16AWT-P0-0000-00000HJF4		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHF4	XD16AWT-P0-0000-00000HHF4		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGF4		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFF4	XD16AWT-P0-0000-00000UFF4	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEF4	
4E	4500K	S4	164	178	302	406		XD16AWT-P0-0000-00000BL4E			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BK4E			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJ4E	XD16AWT-P0-0000-00000HJ4E		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BH4E	XD16AWT-P0-0000-00000HH4E		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG4E		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF4E	XD16AWT-P0-0000-00000UF4E	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE4E	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD4E	
4G	4500K	R3	122	132	225	302				XD16AWT-P0-0000-00000UF4G	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE4G	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD4G	

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 34).
- XLamp XD16 Premuim White 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.

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** Flux values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
E4	4500 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BLE4			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BKE4			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJE4	XD16AWT-P0-0000-00000HJE4		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHE4	XD16AWT-P0-0000-00000HHE4		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGE4		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFE4	XD16AWT-P0-0000-00000UFE4	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEE4	XD16AWT-P0-0000-00000ZEE4
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDE4	XD16AWT-P0-0000-00000ZDE4
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZCE4
F5	4200 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BLF5			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BKF5			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJF5	XD16AWT-P0-0000-00000HJF5		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHF5	XD16AWT-P0-0000-00000HHF5		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGF5		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFF5	XD16AWT-P0-0000-00000UFF5	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEF5	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDF5	

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 34).
- XLamp XD16 Premuim White 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.

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** Flux values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
5E	4000 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BL5E			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BK5E			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJ5E	XD16AWT-P0-0000-00000HJ5E		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BH5E	XD16AWT-P0-0000-00000HH5E		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG5E		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF5E	XD16AWT-P0-0000-00000UF5E	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE5E	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD5E	
5G	4000 K	S2	148	161	272	366			XD16AWT-P0-0000-00000HJ5G		
		R5	139	151	256	344			XD16AWT-P0-0000-00000HH5G		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG5G		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF5G	XD16AWT-P0-0000-00000UF5G	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE5G	XD16AWT-P0-0000-00000ZE5G
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD5G	XD16AWT-P0-0000-00000ZD5G
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZC5G
5H	4000 K	R3	122	132	225	302				XD16AWT-P0-0000-00000UF5H	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE5H	XD16AWT-P0-0000-00000ZE5H
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD5H	XD16AWT-P0-0000-00000ZD5H
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZC5H

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 34).
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FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

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Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
E5	4000 K	S4	164	178	302	406		XD16AWT-P0-0000-00000BLE5			
		S3	156	169	287	386		XD16AWT-P0-0000-00000BKE5			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJE5	XD16AWT-P0-0000-00000HJE5		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHE5	XD16AWT-P0-0000-00000HHE5		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGE5		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFE5	XD16AWT-P0-0000-00000UFE5	
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEE5	XD16AWT-P0-0000-00000ZEE5
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDE5	XD16AWT-P0-0000-00000ZDE5
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZCE5
F6	3700 K	S3	156	169	287	386		XD16AWT-P0-0000-00000BKF6			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJF6	XD16AWT-P0-0000-00000HJF6		
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHF6	XD16AWT-P0-0000-00000HHF6		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGF6		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFF6		
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEF6	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDF6	

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
6E	3500 K	S3	156	169	287	386		XD16AWT-P0-0000-00000BK6E			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJ6E			
		R5	139	151	256	344		XD16AWT-P0-0000-00000BH6E	XD16AWT-P0-0000-00000HH6E		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG6E		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF6E		
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE6E	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD6E	
6G	3500 K	R5	139	151	256	344			XD16AWT-P0-0000-00000HH6G		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG6G		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF6G		
		R2	114	124	210	282				XD16AWT-P0-0000-00000UE6G	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD6G	
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZC6G
		Q3	93.9	102	173	232					XD16AWT-P0-0000-00000ZB6G
		Q2	87.4	95	161	216					XD16AWT-P0-0000-00000ZA6G
6H	3500 K	R2	114	124	210	282				XD16AWT-P0-0000-00000UE6H	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD6H	
		Q4	100	109	184	247					XD16AWT-P0-0000-00000ZC6H
		Q3	93.9	102	173	232					XD16AWT-P0-0000-00000ZB6H
		Q2	87.4	95	161	216					XD16AWT-P0-0000-00000ZA6H

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
E6	3500 K	S3	156	169	287	386		XD16AWT-P0-0000-00000BKE6			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJE6			
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHE6	XD16AWT-P0-0000-00000HHE6		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGE6		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFE6		
		R2	114	124	210	282				XD16AWT-P0-0000-00000UEE6	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDE6	
F7	3200 K	S3	156	169	287	386		XD16AWT-P0-0000-00000BKF7			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJF7			
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHF7	XD16AWT-P0-0000-00000HHF7		
		R4	130	141	239	322		XD16AWT-P0-0000-00000BGF7	XD16AWT-P0-0000-00000HGF7		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFF7		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HEF7	XD16AWT-P0-0000-00000UEF7	
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDF7	

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
7E	3000 K	S3	156	169	287	386		XD16AWT-P0-0000-00000BK7E			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJ7E			
		R5	139	151	256	344		XD16AWT-P0-0000-00000BH7E	XD16AWT-P0-0000-00000HH7E		
		R4	130	141	239	322		XD16AWT-P0-0000-00000BG7E	XD16AWT-P0-0000-00000HG7E		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF7E		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HE7E		
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD7E	
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UC7E	
7G	3000 K	R5	139	151	256	344			XD16AWT-P0-0000-00000HH7G		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HG7G		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF7G		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HE7G		
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UD7G	
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UC7G	XD16AWT-P0-0000-00000ZC7G
		Q3	93.9	102	173	232					XD16AWT-P0-0000-00000ZB7G
		Q2	87.4	95	161	216					XD16AWT-P0-0000-00000ZA7G
7H	3000 K	Q5	107	116	197	265				XD16AWT-P0-0000-00000UD7H	
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UC7H	XD16AWT-P0-0000-00000ZC7H
		Q3	93.9	102	173	232					XD16AWT-P0-0000-00000ZB7H
		Q2	87.4	95	161	216					XD16AWT-P0-0000-00000ZA7H

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
E7	3000 K	S3	156	169	287	386		XD16AWT-P0-0000-00000BKE7			
		S2	148	161	272	366		XD16AWT-P0-0000-00000BJE7			
		R5	139	151	256	344		XD16AWT-P0-0000-00000BHE7	XD16AWT-P0-0000-00000HHE7		
		R4	130	141	239	322		XD16AWT-P0-0000-00000BGE7	XD16AWT-P0-0000-00000HGE7		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFE7		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HEE7		
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDE7	
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UCE7	
F8	2850 K	R5	139	151	256	344			XD16AWT-P0-0000-00000HHF8		
		R4	130	141	239	322			XD16AWT-P0-0000-00000HGF8		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFF8		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HEF8		
		Q5	107	116	197	265				XD16AWT-P0-0000-00000UDF8	
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UCF8	
		Q3	93.9	102	173	232				XD16AWT-P0-0000-00000UBF8	
8E	2700 K	R4	130	141	239	322			XD16AWT-P0-0000-00000HG8E		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF8E		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HE8E		
		Q5	107	116	197	265					
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UC8E	
		Q3	93.9	102	173	232				XD16AWT-P0-0000-00000UB8E	

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
8G	2700 K	R4	130	141	239	322			XD16AWT-P0-0000-00000HG8G		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HF8G		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HE8G		
		Q5	107	116	197	265					
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UC8G	
		Q3	93.9	102	173	232				XD16AWT-P0-0000-00000UB8G	XD16AWT-P0-0000-00000ZB8G
		Q2	87.4	95	161	216					XD16AWT-P0-0000-00000ZA8G
8H	2700 K	Q4	100	109	184	247				XD16AWT-P0-0000-00000UC8H	
		Q3	93.9	102	173	232				XD16AWT-P0-0000-00000UB8H	XD16AWT-P0-0000-00000ZB8H
		Q2	87.4	95	161	216					XD16AWT-P0-0000-00000ZA8H
E8	2700K	R4	130	141	239	322			XD16AWT-P0-0000-00000HGE8		
		R3	122	132	225	302			XD16AWT-P0-0000-00000HFE8		
		R2	114	124	210	282			XD16AWT-P0-0000-00000HEE8		
		Q5	107	116	197	265					
		Q4	100	109	184	247				XD16AWT-P0-0000-00000UCE8	
		Q3	93.9	102	173	232				XD16AWT-P0-0000-00000UBE8	
AG	2200 K	Q5	107	116	197	265			XD16AWT-P0-0000-00000HDAG		
		Q4	100	109	184	247			XD16AWT-P0-0000-00000HCAG		
		Q3	93.9	102	173	232					
		Q2	87.4	95	161	216				XD16AWT-P0-0000-00000UAAG	
		P4	80.6	87	148	199				XD16AWT-P0-0000-00000U9AG	

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 34).
- XLamp XD16 Premuim White 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 values @ 700 mA and 1.0 A are calculated and for reference only.

FLUX CHARACTERISTICS (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	No Minimum CRI	70 CRI Minimum	80 CRI Minimum	90 CRI Minimum	95 CRI Minimum
EA	2200 K	Q5	107	116	197	265			XD16AWT-P0-0000-00000HDEA		
		Q4	100	109	184	247			XD16AWT-P0-0000-00000HCEA		
		Q3	93.9	102	173	232					
		Q2	87.4	95	161	216				XD16AWT-P0-0000-00000UAEA	
		P4	80.6	87	148	199				XD16AWT-P0-0000-00000U9EA	

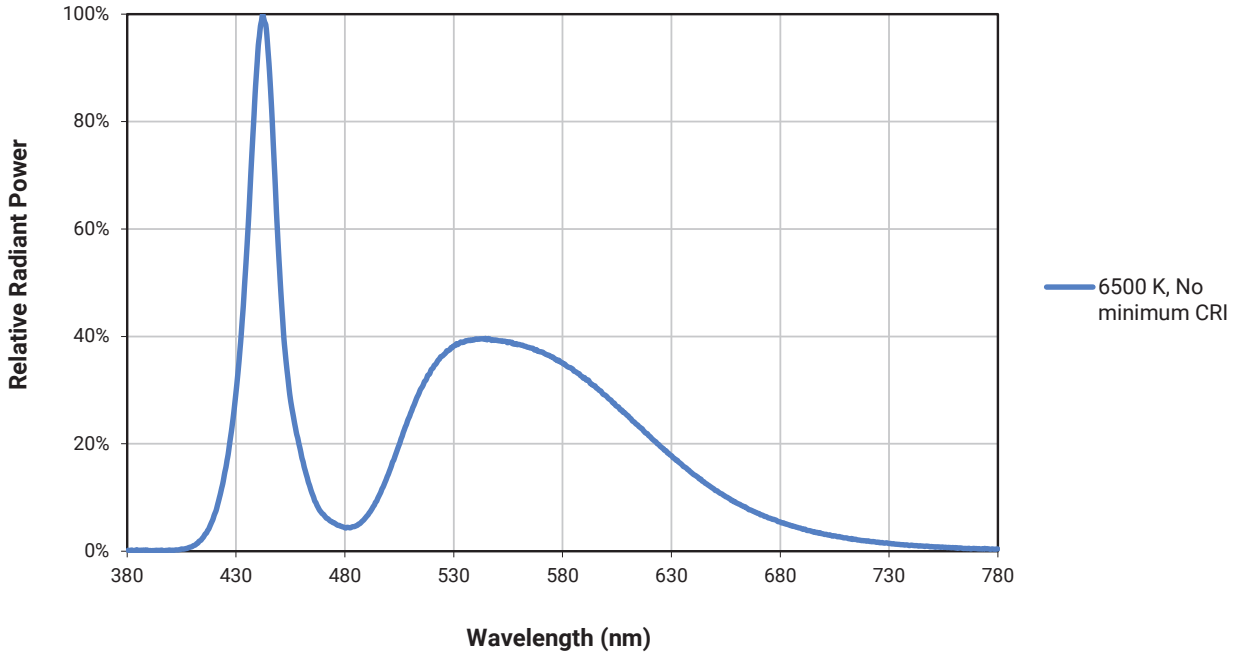
Notes

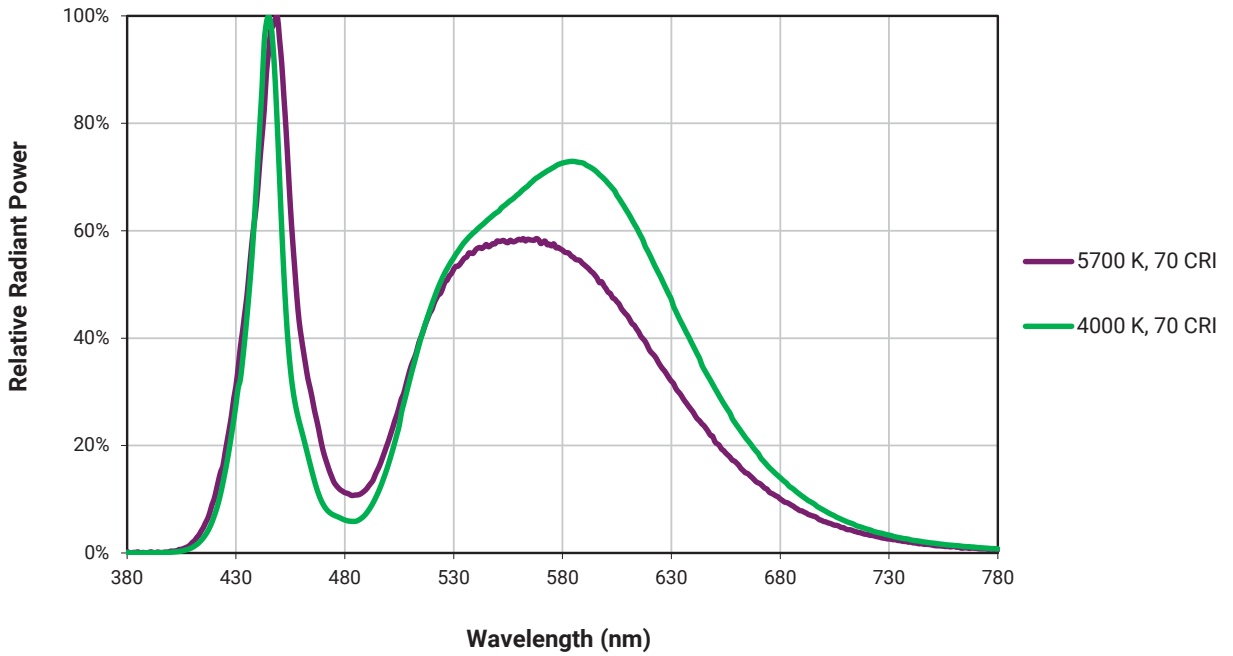
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 34).
- XLamp XD16 Premuim White LED order codes specify only a minimum flux bin and not a maximum. Cree 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.

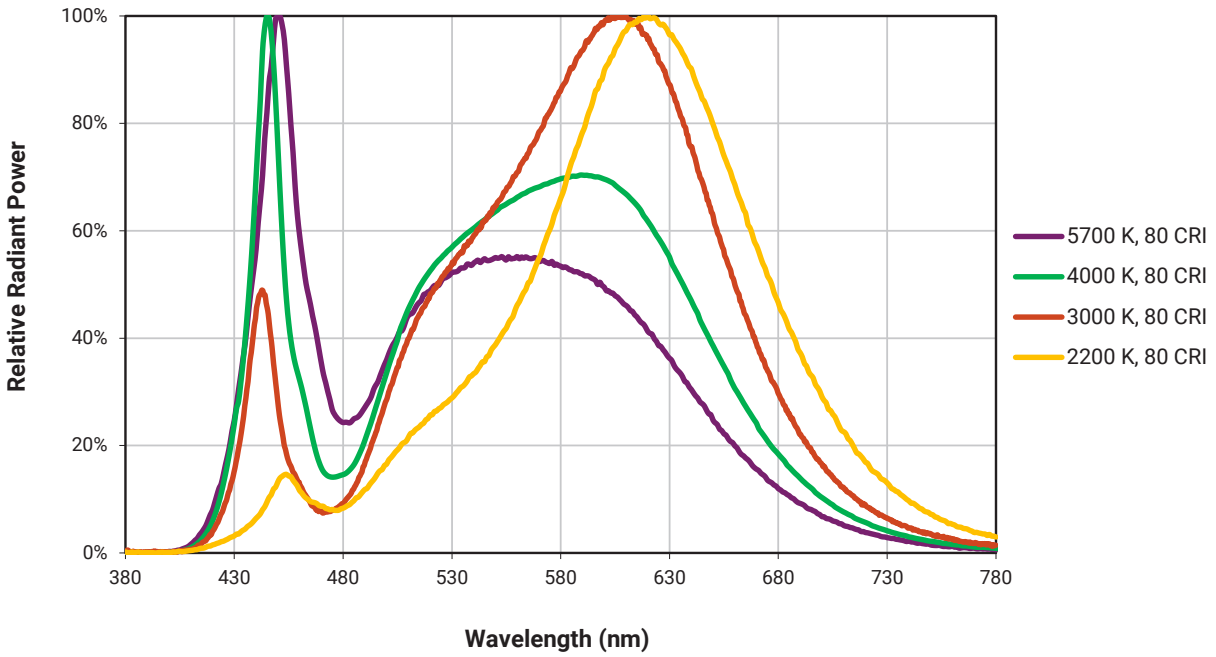
** Flux values @ 700 mA and 1.0 A are calculated and for reference only.

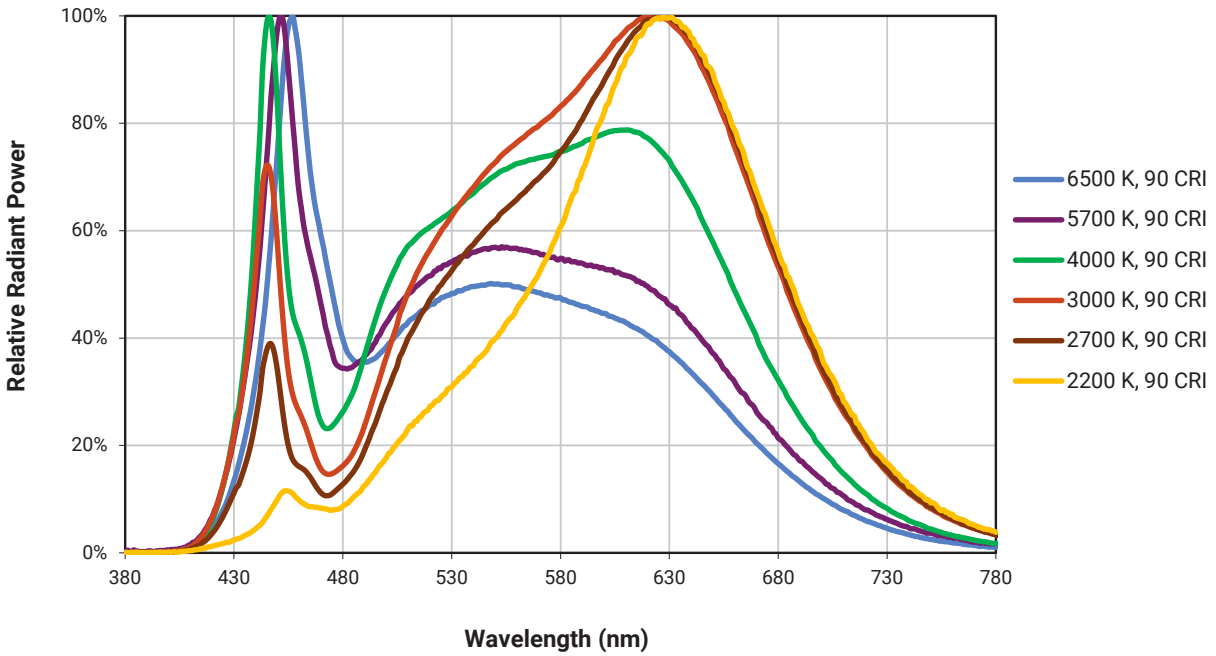
RELATIVE SPECTRAL POWER DISTRIBUTION



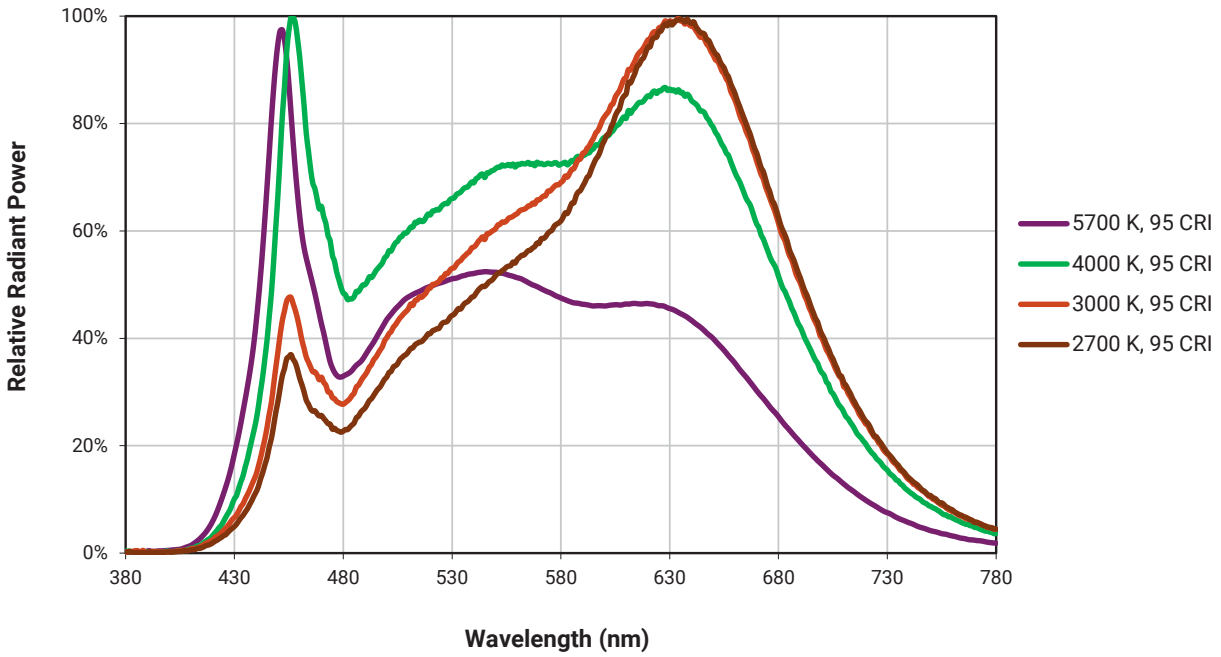


RELATIVE SPECTRAL POWER DISTRIBUTION - CONTINUED

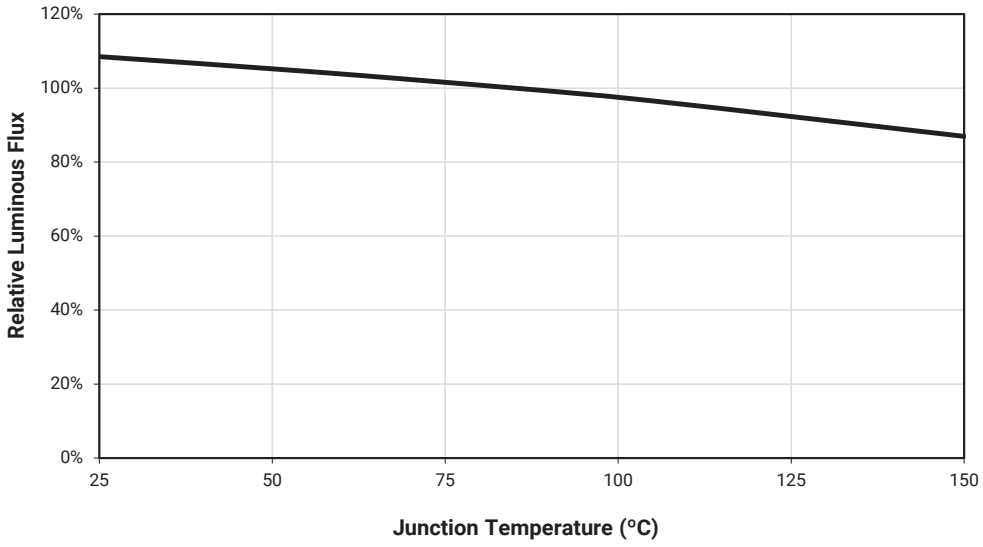




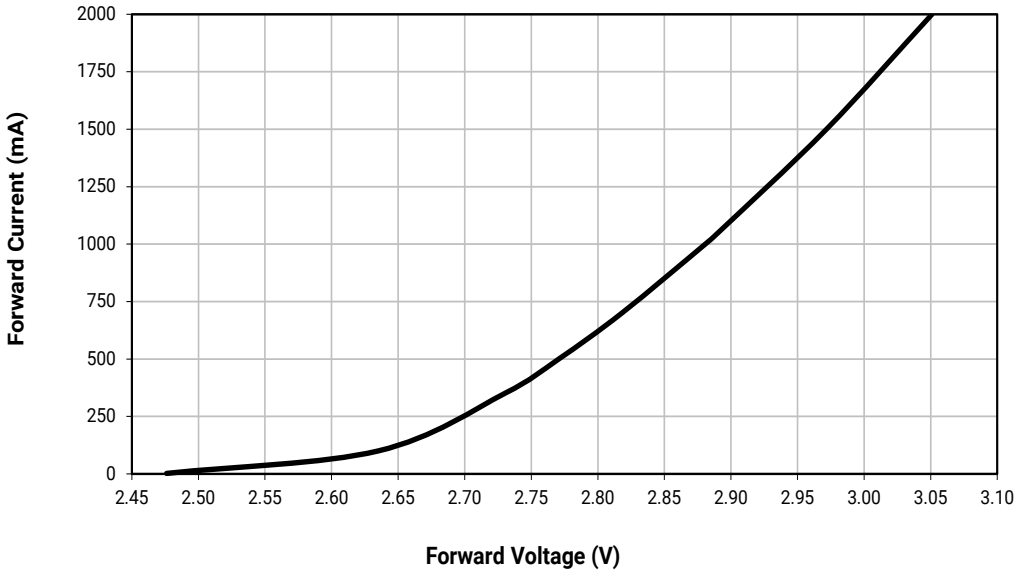
RELATIVE SPECTRAL POWER DISTRIBUTION - CONTINUED



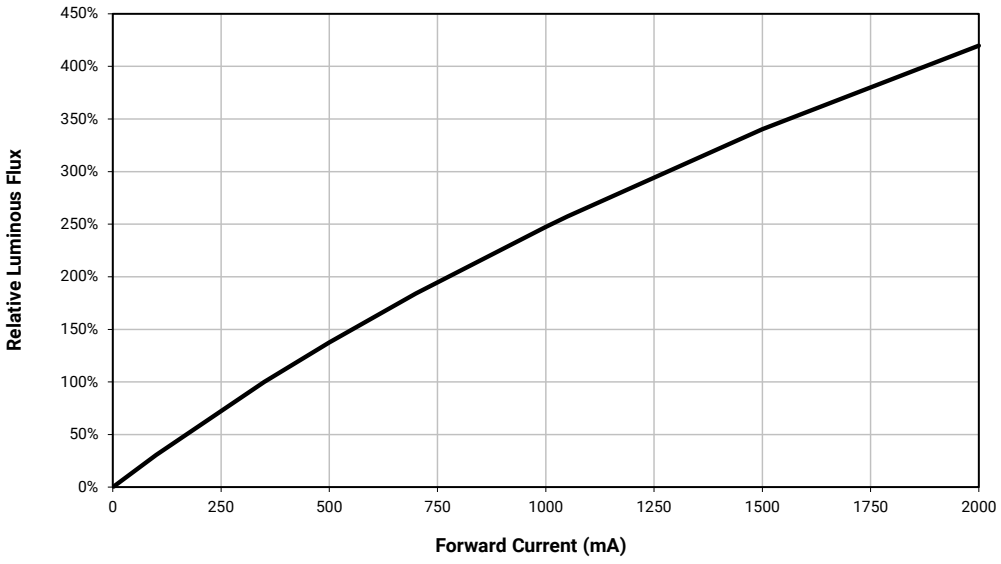
RELATIVE FLUX VS. JUNCTION TEMPERATURE (I_F = 350 mA)



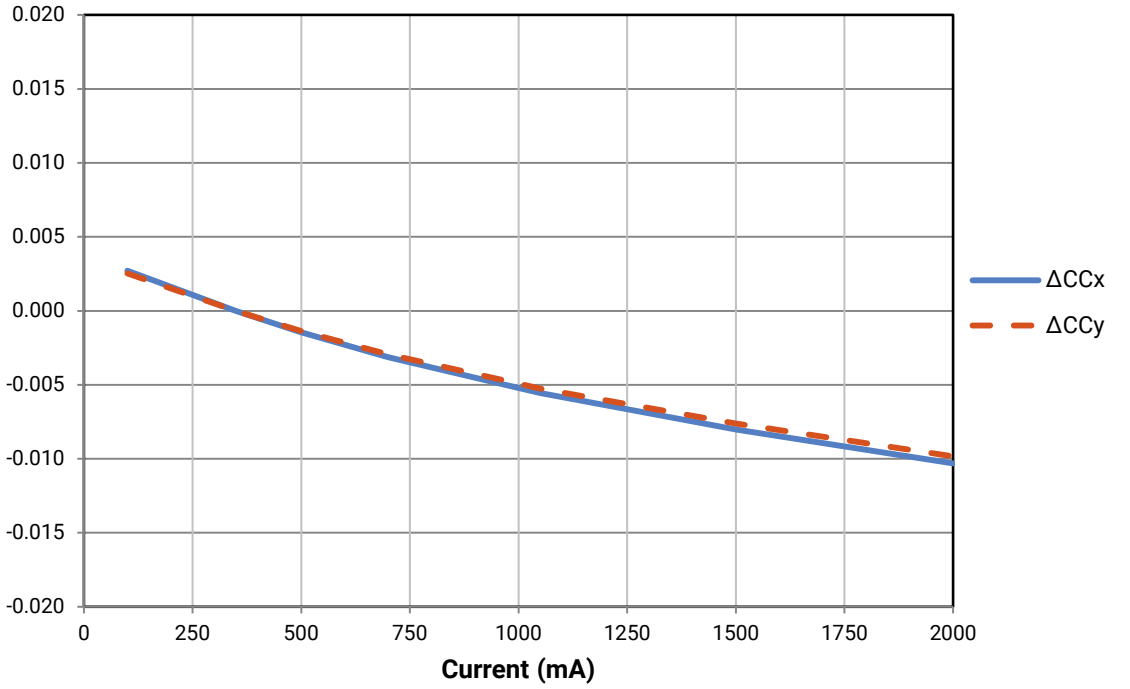
ELECTRICAL CHARACTERISTICS (T_J = 85 °C)

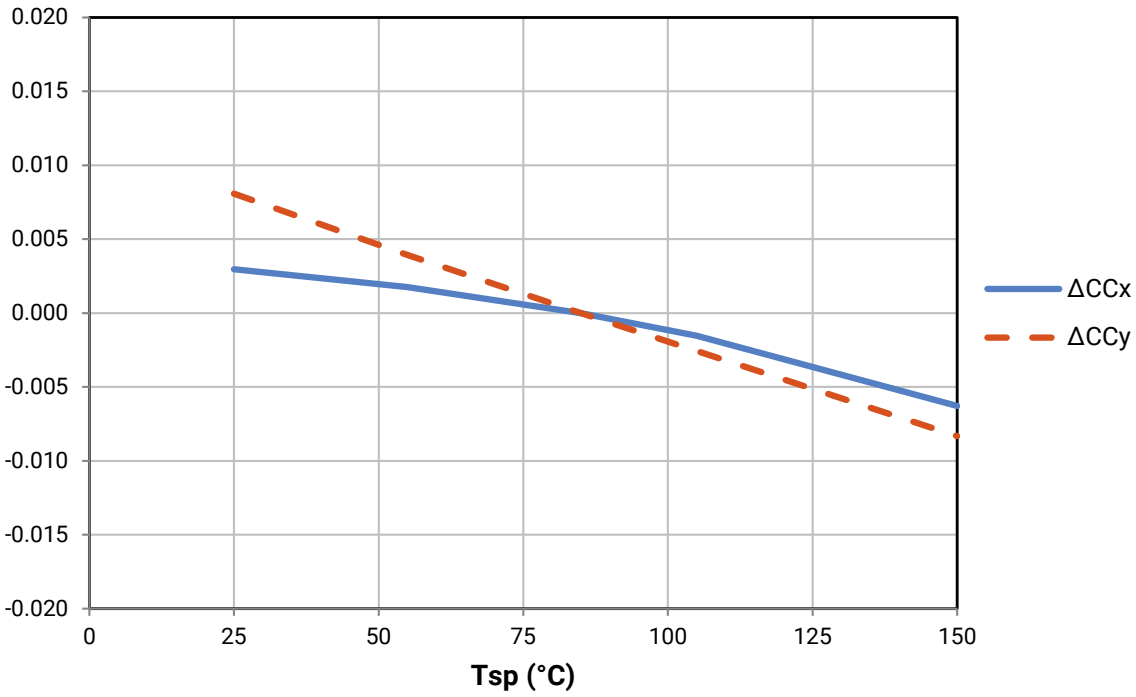


RELATIVE FLUX VS. CURRENT (T_J = 85 °C)

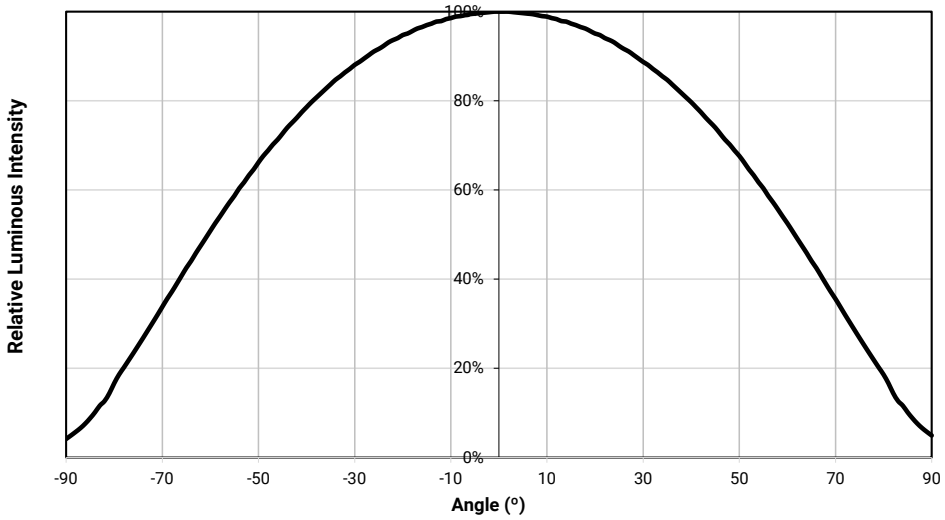


RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE



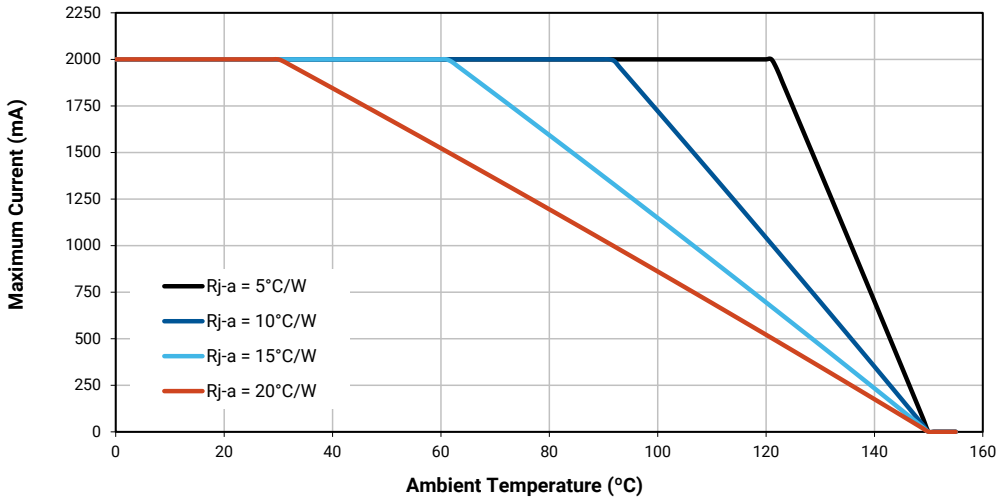


TYPICAL SPATIAL DISTRIBUTION



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 XD16 Premium White LEDs are tested for luminous flux and placed into one of the following luminous-flux groups. The group codes, with a zero appended, are used in the bin code "Luminous flux group." The flux groups are used in the order code "Minimum luminous flux group code."

Group Code	Flux Group	Minimum Luminous Flux (lm) @ 350 mA	Maximum Luminous Flux (lm) @ 350 mA
P4	9	80.6	87.4
Q2	A	87.4	93.9
Q3	B	93.9	100
Q4	C	100	107
Q5	D	107	114
R2	E	114	122
R3	F	122	130
R4	G	130	139
R5	H	139	148
S2	J	148	156
S3	K	156	164
S4	L	164	172
S5	M	172	180

PERFORMANCE GROUPS - CHROMATICITY

XLamp XD16 Premium White LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

Region	x	y	Region	x	y	Region	x	y	Region	x	y
0A	0.2950	0.2970	0B	0.2920	0.3060	0C	0.2984	0.3133	0D	0.2984	0.3133
	0.2920	0.3060		0.2895	0.3135		0.2962	0.3220		0.3048	0.3207
	0.2984	0.3133		0.2962	0.3220		0.3028	0.3304		0.3068	0.3113
	0.3009	0.3042		0.2984	0.3133		0.3048	0.3207		0.3009	0.3042
0R	0.2980	0.2880	0S	0.2895	0.3135	0T	0.2962	0.3220	0U	0.3037	0.2937
	0.2950	0.2970		0.2870	0.3210		0.2937	0.3312		0.3009	0.3042
	0.3009	0.3042		0.2937	0.3312		0.3005	0.3415		0.3068	0.3113
	0.3037	0.2937		0.2962	0.3220		0.3028	0.3304		0.3093	0.2993
1A	0.3048	0.3207	1B	0.3028	0.3304	1C	0.3115	0.3391	1D	0.3130	0.3290
	0.3130	0.3290		0.3115	0.3391		0.3205	0.3481		0.3213	0.3373
	0.3144	0.3186		0.3130	0.3290		0.3213	0.3373		0.3221	0.3261
	0.3068	0.3113		0.3048	0.3207		0.3130	0.3290		0.3144	0.3186

PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
1R	0.3068	0.3113	1S	0.3005	0.3415	1T	0.3099	0.3509	1U	0.3144	0.3186
	0.3144	0.3186		0.3099	0.3509		0.3196	0.3602		0.3221	0.3261
	0.3161	0.3059		0.3115	0.3391		0.3205	0.3481		0.3231	0.3120
	0.3093	0.2993		0.3028	0.3304		0.3115	0.3391		0.3161	0.3059
2A	0.3215	0.3350	2B	0.3207	0.3462	2C	0.3290	0.3538	2D	0.3290	0.3417
	0.3290	0.3417		0.3290	0.3538		0.3376	0.3616		0.3371	0.3490
	0.3290	0.3300		0.3290	0.3417		0.3371	0.3490		0.3366	0.3369
	0.3222	0.3243		0.3215	0.3350		0.3290	0.3417		0.3290	0.3300
2R	0.3222	0.3243	2S	0.3196	0.3602	2T	0.3290	0.3690	2U	0.3290	0.3300
	0.3290	0.3300		0.3290	0.3690		0.3381	0.3762		0.3366	0.3369
	0.3290	0.3180		0.3290	0.3538		0.3376	0.3616		0.3361	0.3245
	0.3231	0.3120		0.3207	0.3462		0.3290	0.3538		0.3290	0.3180
3A	0.3371	0.3490	3B	0.3376	0.3616	3C	0.3463	0.3687	3D	0.3451	0.3554
	0.3451	0.3554		0.3463	0.3687		0.3551	0.3760		0.3533	0.3620
	0.3440	0.3427		0.3451	0.3554		0.3533	0.3620		0.3515	0.3487
	0.3366	0.3369		0.3371	0.3490		0.3451	0.3554		0.3440	0.3427
4A	0.3530	0.3597	4B	0.3548	0.3736	4C	0.3641	0.3804	4D	0.3615	0.3659
	0.3615	0.3659		0.3641	0.3804		0.3736	0.3874		0.3702	0.3722
	0.3590	0.3521		0.3615	0.3659		0.3702	0.3722		0.3670	0.3578
	0.3512	0.3465		0.3530	0.3597		0.3615	0.3659		0.3590	0.3521
5A	0.3670	0.3578	5B	0.3702	0.3722	5C	0.3825	0.3798	5D	0.3783	0.3646
	0.3702	0.3722		0.3736	0.3874		0.3869	0.3958		0.3825	0.3798
	0.3825	0.3798		0.3869	0.3958		0.4006	0.4044		0.3950	0.3875
	0.3783	0.3646		0.3825	0.3798		0.3950	0.3875		0.3898	0.3716
6A	0.3889	0.3690	6B	0.3941	0.3848	6C	0.4080	0.3916	6D	0.4017	0.3751
	0.3941	0.3848		0.3996	0.4015		0.4146	0.4089		0.4080	0.3916
	0.4080	0.3916		0.4146	0.4089		0.4299	0.4165		0.4221	0.3984
	0.4017	0.3751		0.4080	0.3916		0.4221	0.3984		0.4147	0.3814
7A	0.4221	0.3985	7B	0.4299	0.4165	7C	0.4430	0.4212	7D	0.4342	0.4028
	0.4342	0.4028		0.443	0.4212		0.4562	0.4260		0.4465	0.4071
	0.426	0.3853		0.4342	0.4028		0.4465	0.4071		0.4373	0.3893
	0.4147	0.3814		0.4221	0.3985		0.4342	0.4028		0.4260	0.3853
8A	0.4465	0.4071	8B	0.4562	0.4260	8C	0.4687	0.4289	8D	0.4582	0.4099
	0.4582	0.4099		0.4687	0.4289		0.4813	0.4319		0.4700	0.4126
	0.4483	0.3918		0.4582	0.4099		0.4700	0.4126		0.4593	0.3944
	0.4373	0.3893		0.4465	0.4071		0.4582	0.4099		0.4483	0.3918

PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

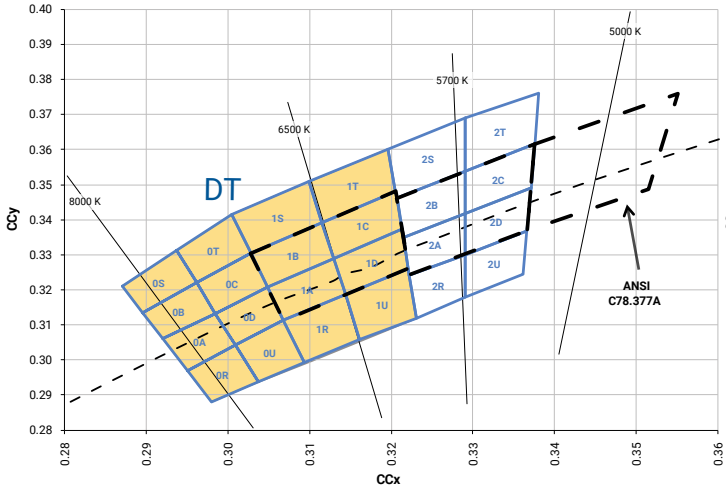
EasyWhite Color Temperatures – 2-Step			
Code	CCT	x	y
5H	4000 K	0.3777	0.3739
		0.3797	0.3816
		0.3861	0.3855
		0.3838	0.3777
6H	3500 K	0.4022	0.3858
		0.4053	0.3942
		0.4125	0.3977
		0.4091	0.3891
7H	3000 K	0.4287	0.3975
		0.4328	0.4064
		0.4390	0.4086
		0.4347	0.3996
8H	2700 K	0.4524	0.4048
		0.4574	0.4140
		0.4633	0.4154
		0.4581	0.4062

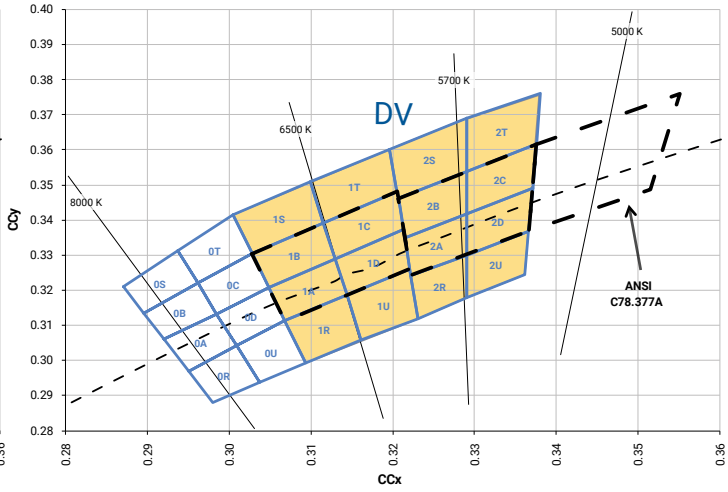
EasyWhite Color Temperatures – 3-Step Ellipse						
Bin Code	CCT	Center Point		Major Axis	Minor Axis	Rotation Angle (°)
		x	y	a	b	
1G	6500 K	0.3123	0.3282	0.00666	0.00330	61.0
2G	5700 K	0.3287	0.3417	0.00738	0.00360	72.0
3G	5000 K	0.3447	0.3553	0.00840	0.00312	65.0
4G	4500 K	0.3613	0.3670	0.01260	0.00563	57.6
5G	4000 K	0.3818	0.3797	0.00939	0.00402	53.7
6G	3500 K	0.4073	0.3917	0.00927	0.00414	54.0
7G	3000 K	0.4338	0.4030	0.00834	0.00408	53.2
8G	2700 K	0.4577	0.4099	0.00834	0.00420	48.5
AG	2200 K	0.5066	0.4158	0.00980	0.00480	45.5

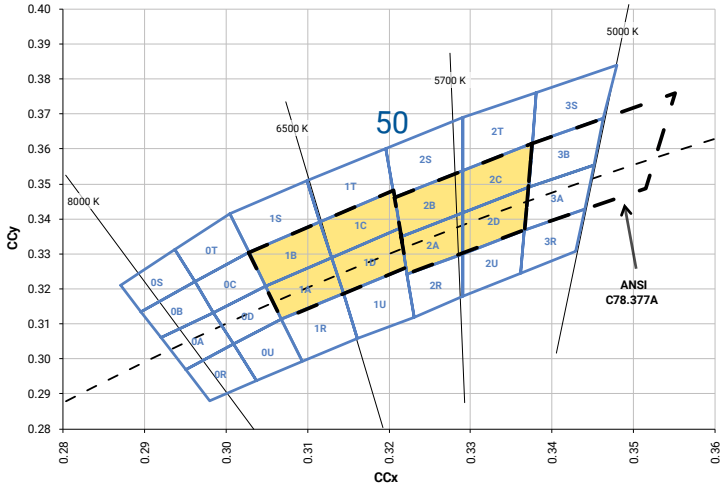
PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

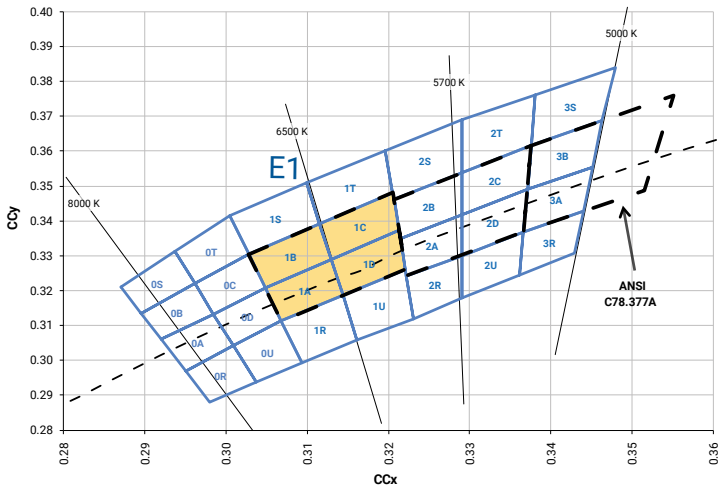
EasyWhite Color Temperatures – 5-Step Ellipse						
Bin Code	CCT	Center Point		Major Axis	Minor Axis	Rotation Angle (°)
		x	y	a	b	
2E	5700 K	0.3287	0.3417	0.01230	0.00600	72.0
3E	5000 K	0.3447	0.3553	0.01400	0.00520	65.0
4E	4500 K	0.3611	0.3658	0.01420	0.00550	61.5
5E	4000 K	0.3818	0.3797	0.01565	0.00670	53.7
6E	3500 K	0.4073	0.3917	0.01545	0.00690	54.0
7E	3000 K	0.4338	0.4030	0.01390	0.00680	53.2
8E	2700 K	0.4577	0.4099	0.01350	0.00700	48.5

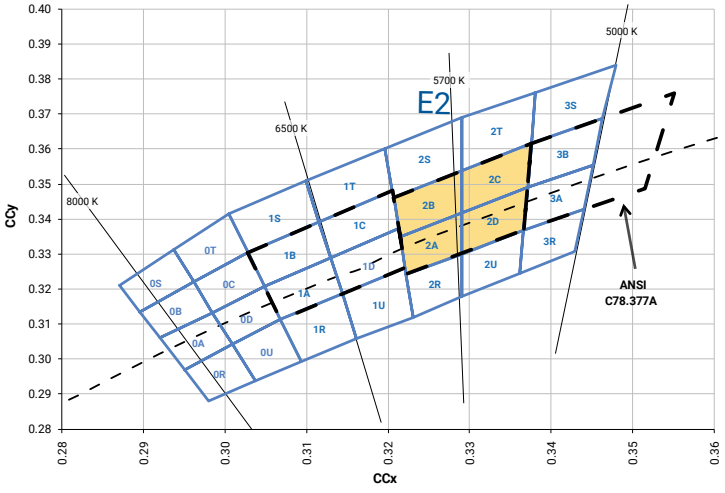
COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



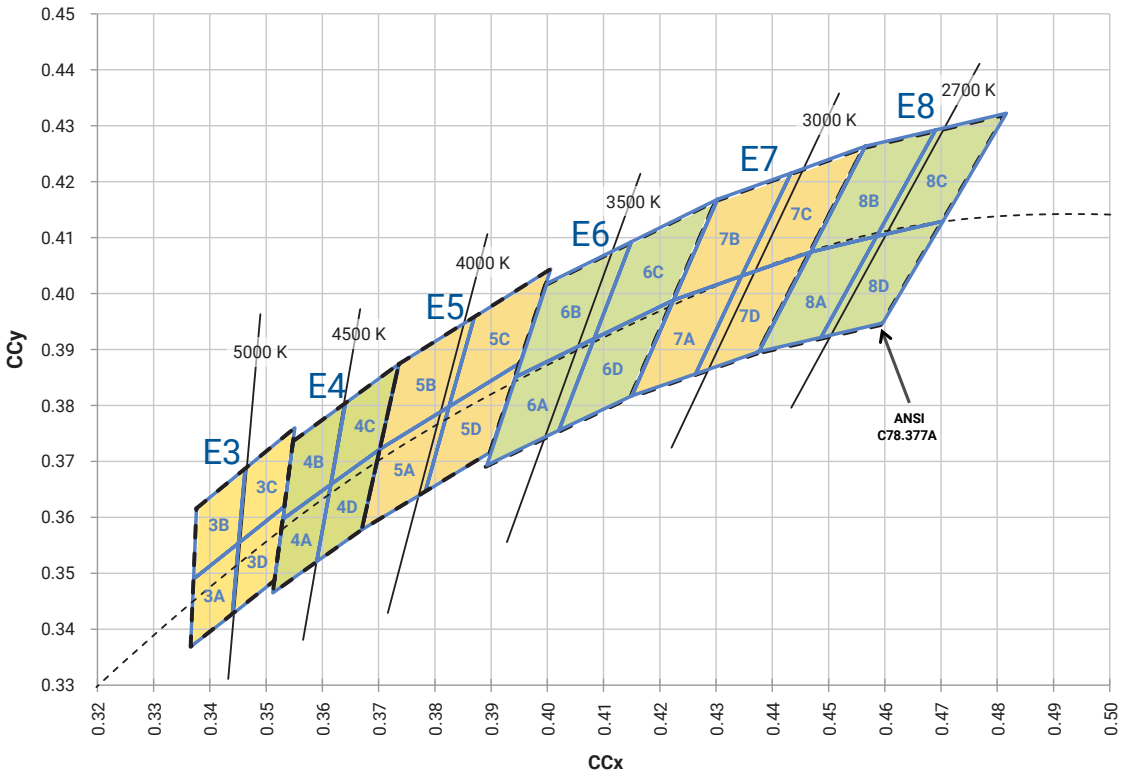


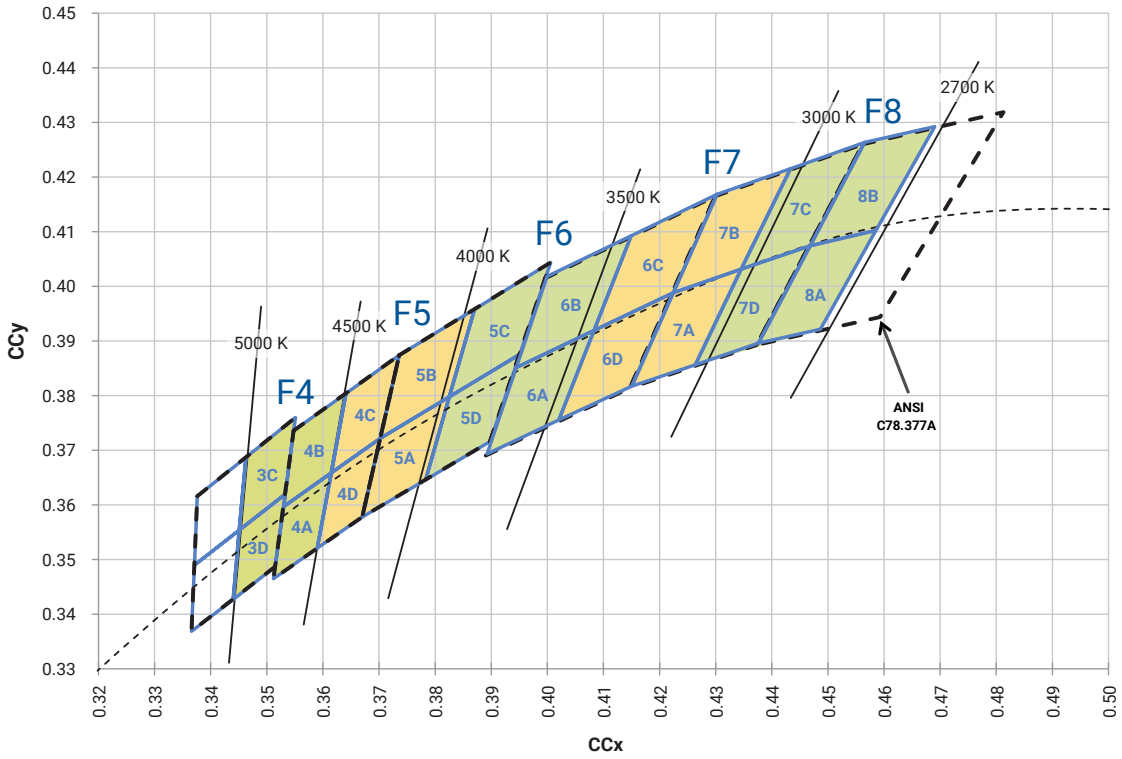




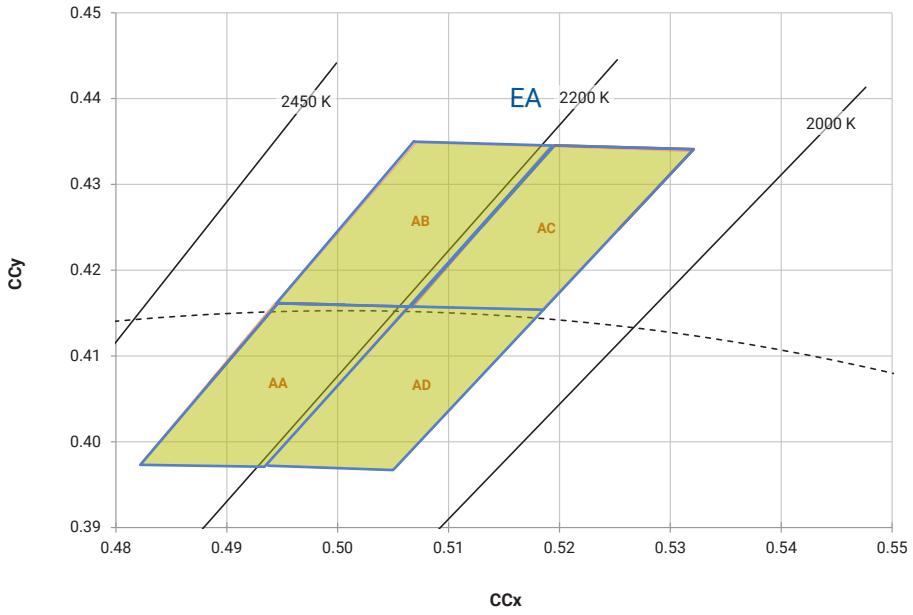


WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS

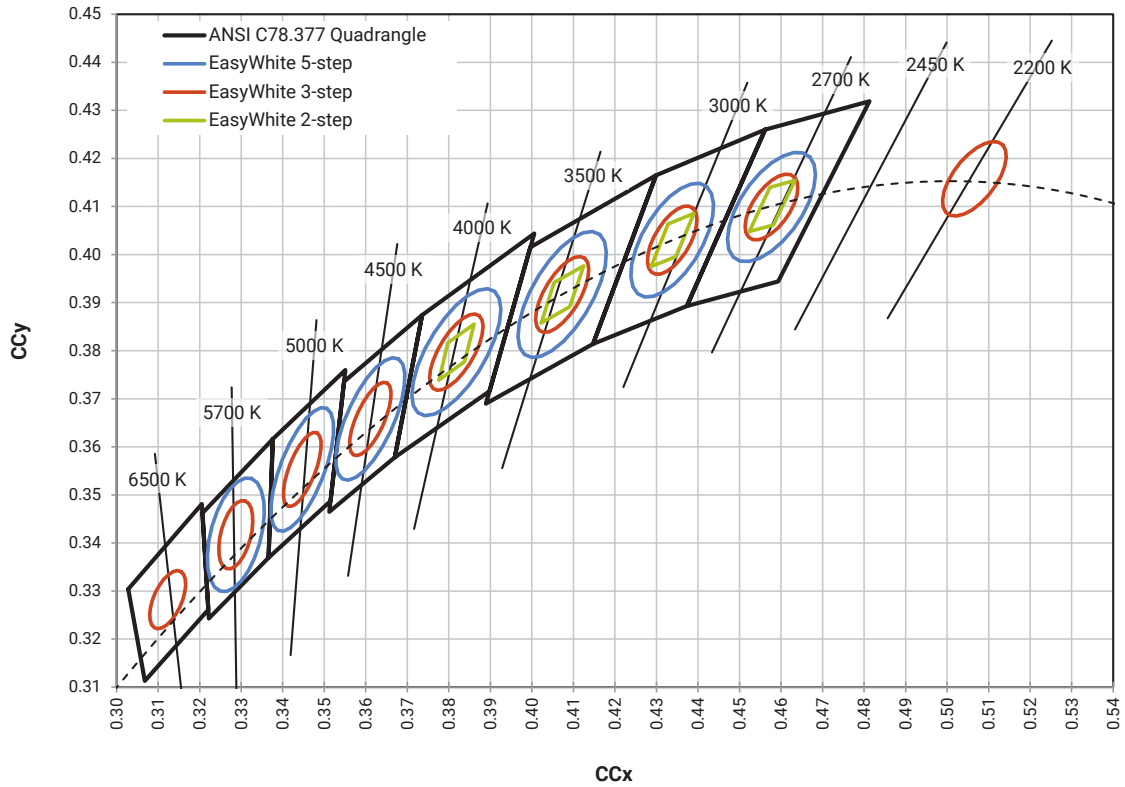




WARM WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



EASYWHITE® WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



STANDARD CHROMATICITY KITS

The following table provides the chromaticity bins associated with chromaticity kits for XD16 Premium White LEDs.

Color	CCT	Kit	Chromaticity Bins
Cool White	7000 K	DT	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U
	6500 K	E1	1A, 1B, 1C, 1D
	6500 K	1G	65G
	6200 K	50	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D
	6000 K	DV	1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U
	5700 K	E2	2A, 2B, 2C, 2D
	5700 K	2E	57E
	5700 K	2G	57G
Neutral White	5000 K	3E	50E
	5000 K	3G	50G
	5000 K	E3	3A, 3B, 3C, 3D
	4750 K	F4	3C, 3D, 4A, 4B
	4500 K	4E	45E
	4500 K	4G	45G
	4500 K	E4	4A, 4B, 4C, 4D
	4250 K	F5	4C, 4D, 5A, 5B
	4000 K	5E	40E, 40G
	4000 K	5G	40G
	4000 K	5H	40H
	4000 K	E5	5A 5B, 5C, 5D

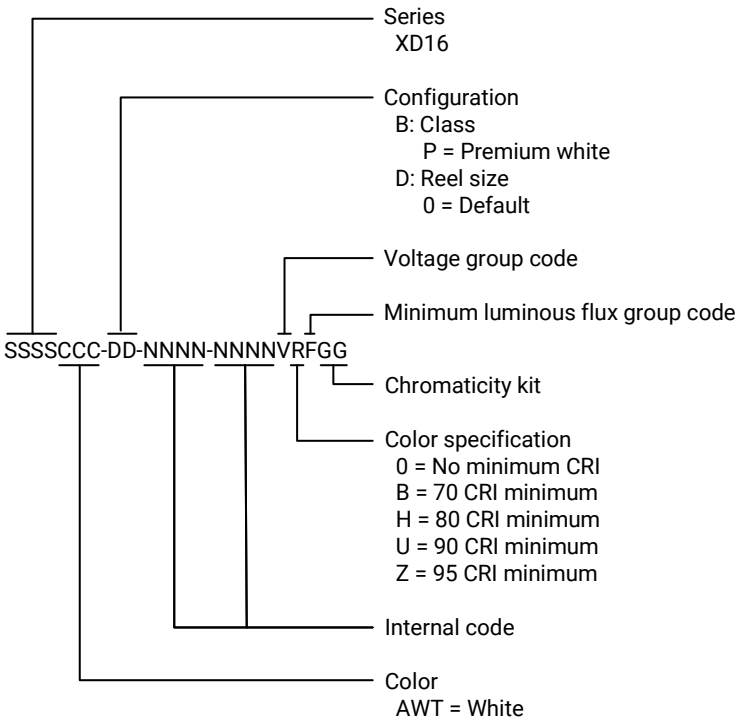
STANDARD CHROMATICITY KITS - CONTINUED

Color	CCT	Kit	Chromaticity Bins
Warm White	3750 K	F6	5C, 5D, 6A, 6B
	3500 K	6E	35E, 35G
	3500 K	6G	35G
	3500 K	6H	35H
	3500 K	E6	6A, 6B, 6C, 6D
	3250 K	F7	6C, 6D, 7A, 7B
	3000 K	7E	30E, 30G
	3000 K	7G	30G
	3000 K	7H	30H
	3000 K	E7	7A, 7B, 7C, 7D
	2850 K	F8	7C, 7D, 8A, 8B
	2700 K	8E	27E, 27G
	2700 K	8G	27G
	2700 K	8H	27H
	2700 K	E8	8A, 8B, 8C, 8D
	2200 K	AG	22G
	2200 K	EA	AA, AB, AC, AD

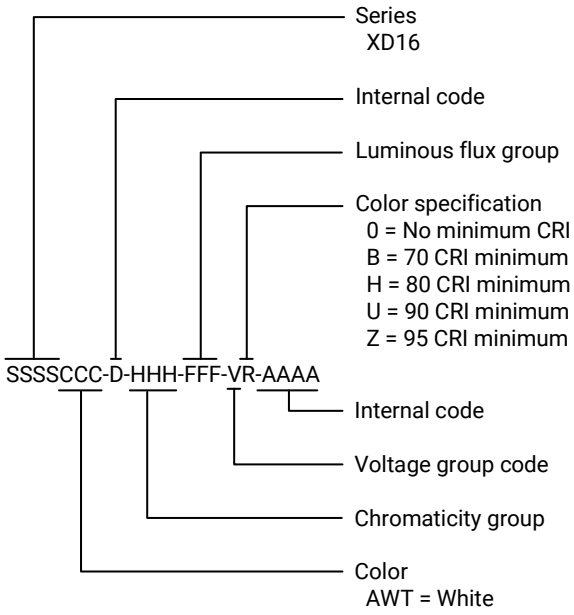
BIN AND ORDER CODE FORMATS

Bin codes and order codes for XD16 Premium White LEDs are configured in the following manner:

Order Code



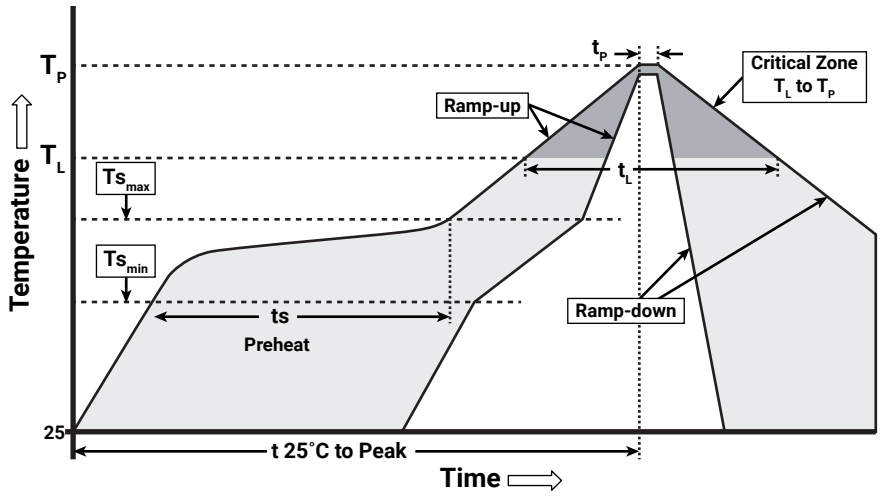
Bin Code



REFLOW SOLDERING CHARACTERISTICS

In testing, Cree LED has found XLamp XD16 Premium White 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 (Ts_{max} to Tp)	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 topside of the package, measured on the package body surface.

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 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 XD16 Premium White 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 XD16 Premium White 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 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

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 not been investigated as a fire enclosure or 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.

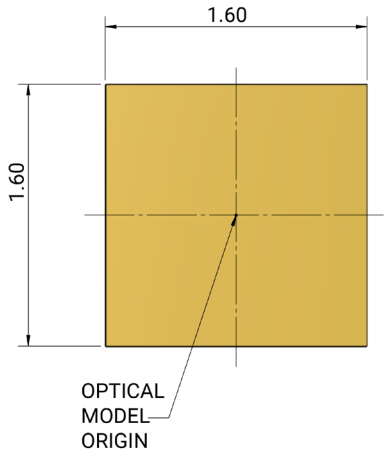
MECHANICAL DIMENSIONS

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

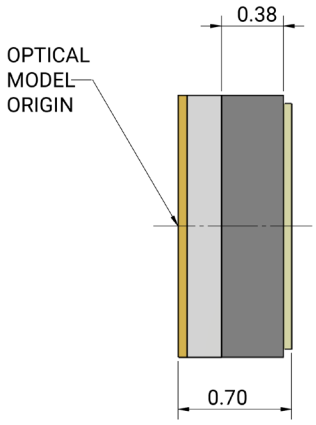
All dimensions in mm.

Measurement tolerances unless indicated otherwise: ±.13 mm

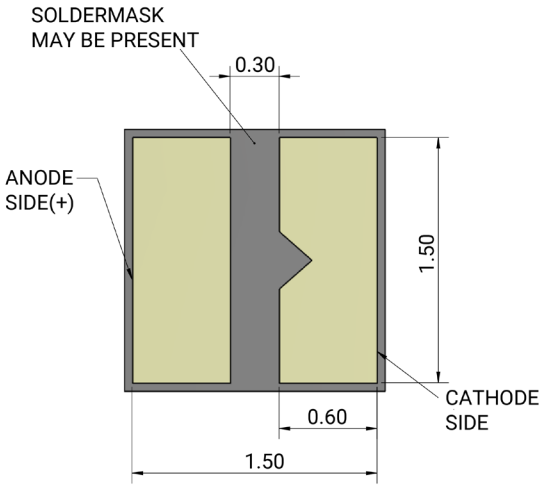
XD16 Premium White 7000 K—2700 K



Top View

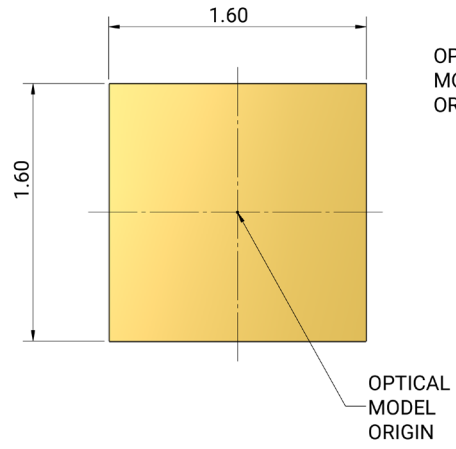


Side View

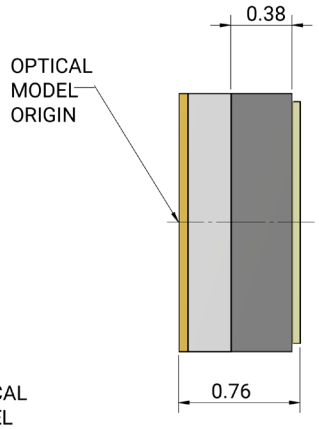


Bottom View

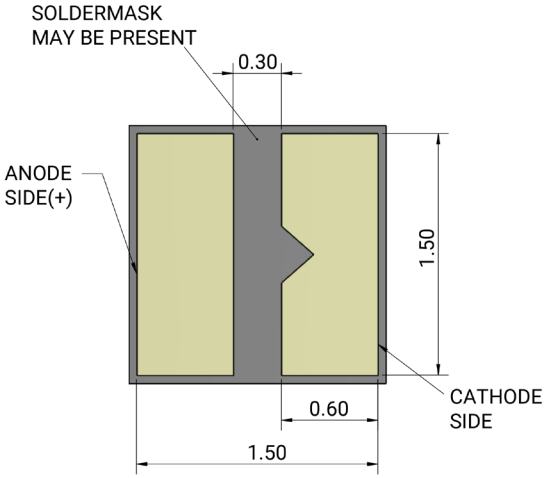
XD16 Premium White 2200 K



Top View



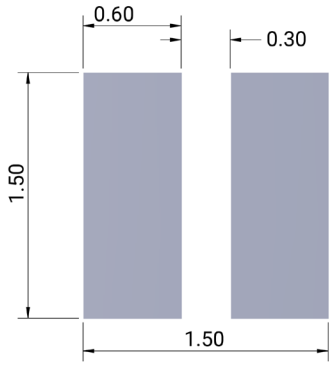
Side View



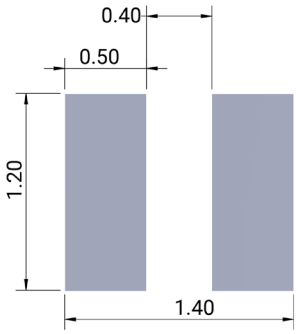
Bottom View

MECHANICAL DIMENSIONS - CONTINUED

XD16 Premium White 7000 K—2200 K



Recommended PC Footprint



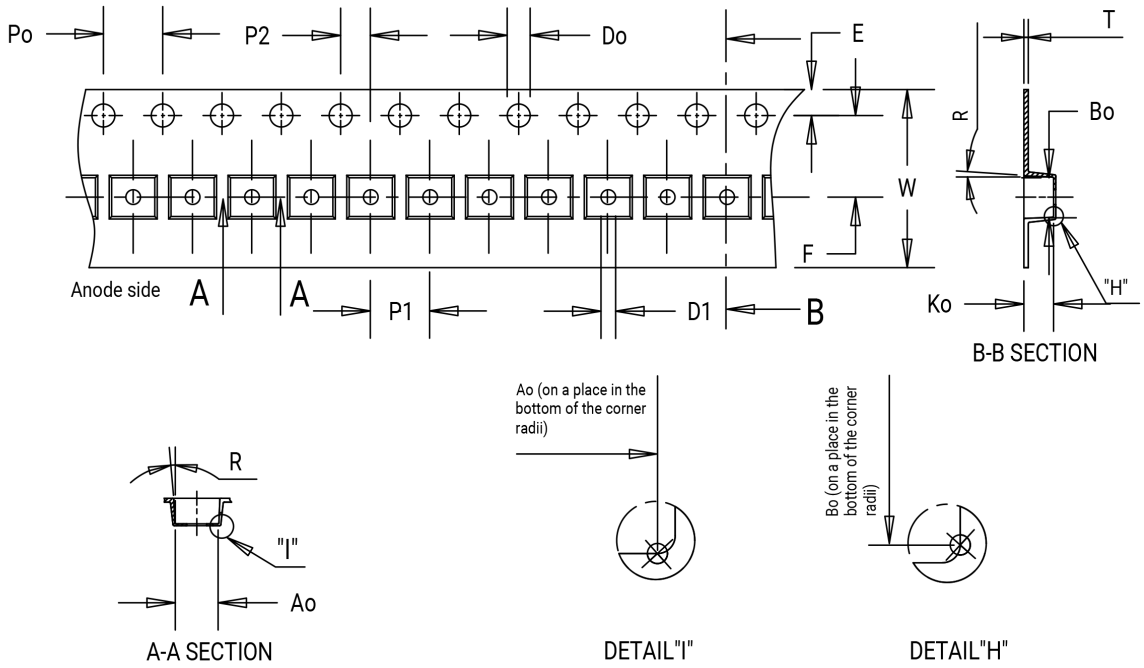
Recommended Stencil Opening

TAPE AND REEL

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

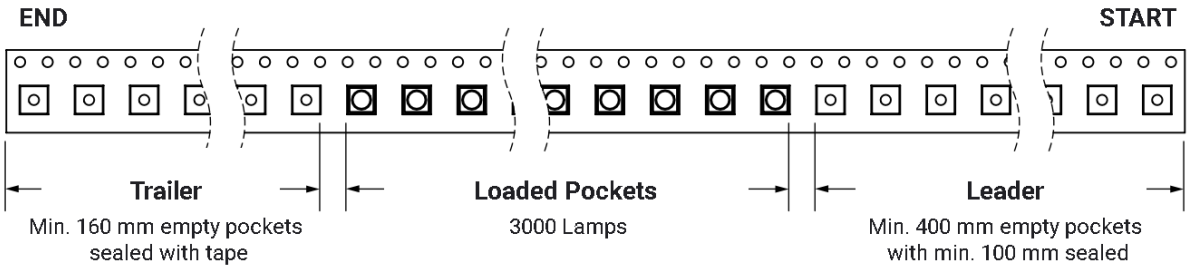
All dimensions in mm

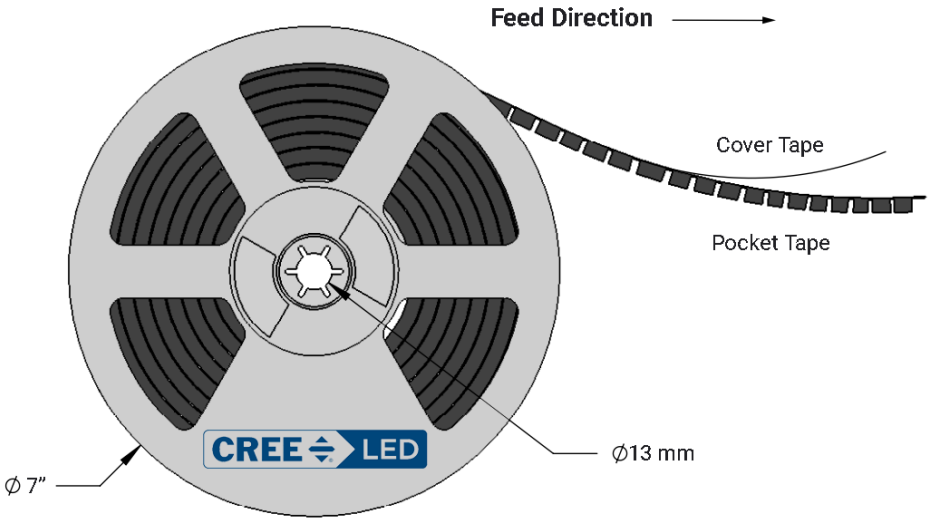
All dimensions are ±.13 mm unless otherwise indicated.



Item	Ao	Bo	Ko	Po	P1	P2	T	E	F	Do	D1	W	R
Dim.	1.85	1.85	1.00	4.00	4.00	2.00	0.30	1.75	3.50	1.50	1.00	12.00	5°

TAPE AND REEL - CONTINUED

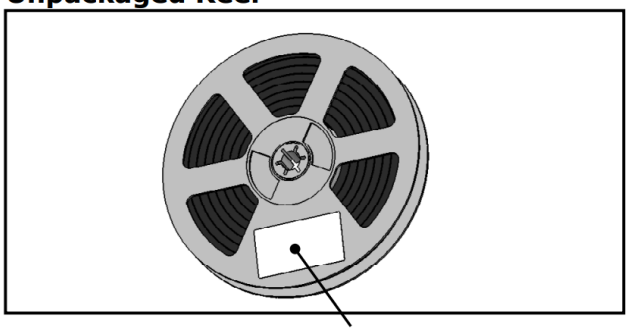




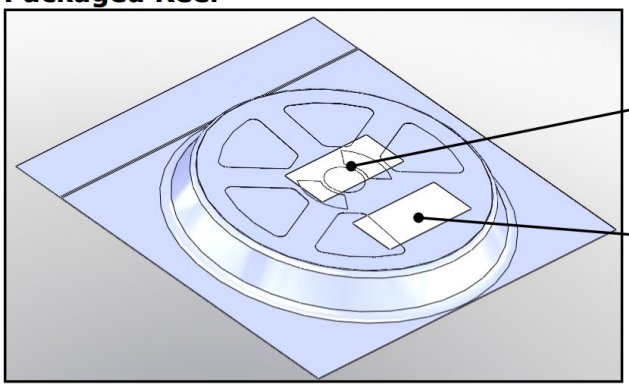
PACKAGING

The diagrams below show the packaging and labels Cree LED uses to ship XLamp XD16 Premium White LEDs. XLamp XD16 Premium White LEDs are shipped in tape loaded on a reel. Each box contains only one reel in a moisture barrier bag.

Unpackaged Reel



Packaged Reel



Boxed Reel