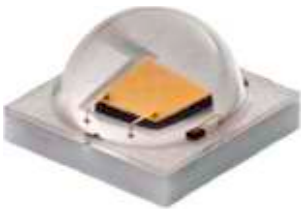
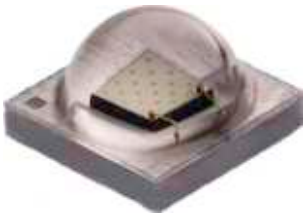
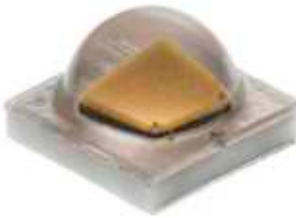
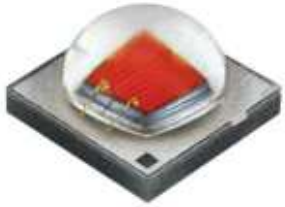
XLamp® XP-E2 LEDs

PRODUCT DESCRIPTION

The XLamp® XP-E2 LED builds on the unprecedented performance of the original XP-E by increasing lumen output up to 20% while providing a single die LED point source for precise optical control. The XP-E2 LED shares the same footprint as the original XP-E, providing a seamless upgrade path to more lumens and/or greater efficiency while shortening the design cycle for existing XP customers.

XLamp XP-E2 LEDs are the ideal choice for lighting applications where high light output and maximum efficacy are required, such as LED retrofit lamps, outdoor, portable, indoor directional, emergency vehicle or architectural.

The XP-E2 LED offers an S Line far red option. In this document, the term far red denotes the far red XP-E2 LED without regard to its efficacy. The terms far red and S Line far red are used when necessary to differentiate the performace of the XP-E2 S Line far red LED from the XP-E2 LED without the S Line option.

FEATURES

- Available in white, outdoor white, 80-CRI, 90-CRI white, royal blue, blue, green, PC amber, amber, red-orange, red, photo red, far red & S Line far red
- ANSI-compatible chromaticity bins
- White binned at 85 °C
- Maximum drive current: royal blue, blue 1.2 A, others 1.5 A
- Low thermal resistance: as low as 1.4 °C/W
- Wide viewing angle: 105°-140°
- Unlimited floor life at ≤ 30 °C/85% RH
- Reflow solderable - JEDEC J-STD-020C compatible
- Electrically neutral thermal path
- RoHS and REACH compliant
- UL® recognized component (E349212)

Cree LED / 4001 E. Hwy. 54, Suite 2000 / Durham, NC 27713 USA / +1.919.313.5330 / www.cree-led.com

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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point - white	°C/W		5.8	
Thermal resistance, junction to solder point - royal blue, blue	°C/W		5.7	
Thermal resistance, junction to solder point - green	°C/W		9	
Thermal resistance, junction to solder point - PC amber	°C/W		5.5	
Thermal resistance, junction to solder point - amber	°C/W		7.5	
Thermal resistance, junction to solder point - red-orange, red	°C/W		2.5	
Thermal resistance, junction to solder point - photo red	°C/W		2.5	
Thermal resistance, junction to solder point - far red	°C/W		1.4	
Thermal resistance, junction to solder point - S Line far red	°C/W		2.8	
Viewing angle (FWHM) - white	degrees		110	
Viewing angle (FWHM) - royal blue, blue, green	degrees		135	
Viewing angle (FWHM) - PC amber	degrees		105	
Viewing angle (FWHM) - amber, red-orange, red, photo red	degrees		130	
Viewing angle (FWHM) - far red	degrees		140	
Viewing angle (FWHM) - S Line far red	degrees		125	
Temperature coefficient of voltage - white	mV/°C		-1.5	
Temperature coefficient of voltage - royal blue	mV/°C		-1.5	
Temperature coefficient of voltage - blue	mV/°C		-1.9	
Temperature coefficient of voltage - green	mV/°C		-1.2	
Temperature coefficient of voltage - PC amber	mV/°C		-1.6	
Temperature coefficient of voltage - amber	mV/°C		-2.1	
Temperature coefficient of voltage - red-orange	mV/°C		-1.3	
Temperature coefficient of voltage - red	mV/°C		-1.4	
Temperature coefficient of voltage - photo red, far red, S Line far red	mV/°C		-1.3	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current - white, green, PC amber, amber, red-orange, red, photo red, far red	mA			1500
DC forward current - royal blue, blue	mA			1200
Reverse voltage - white, royal blue, blue, green, PC amber, amber, red-orange, red	V			1
Reverse voltage photo red, far red, S Line far red	V			10

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CHARACTERISTICS - CONTINUED

Characteristics	Unit	Minimum	Typical	Maximum
Forward voltage (@ 350 mA, 85 °C) - white	V		2.84	3.1
Forward voltage (@ 700 mA, 85 °C) - white	V		2.99	
Forward voltage (@ 1000 mA, 85 °C) - white	V		3.12	
Forward voltage (@ 350 mA, 25 °C) - royal blue	V		2.93	3.4
Forward voltage (@ 1000 mA, 25 °C) - royal blue	V		3.2	
Forward voltage (@ 350 mA, 25 °C) - blue	V		2.85	3.4
Forward voltage (@ 1000 mA, 25 °C) - blue	V		3.14	
Forward voltage (@ 350 mA, 25 °C) - green	V		2.7	3.25
Forward voltage (@ 1000 mA, 25 °C) - green	V		3.01	
Forward voltage (@ 350 mA, 25 °C) - PC amber	V		2.94	3.24
Forward voltage (@ 1000 mA, 25 °C) - PC amber	V		3.28	
Forward voltage (@ 350 mA, 25 °C) - amber	V		2.18	2.6
Forward voltage (@ 1000 mA, 25 °C) - amber	V		2.6	
Forward voltage (@ 350 mA, 25 °C) - red-orange	V		2.1	2.6
Forward voltage (@ 1000 mA, 25 °C) - red-orange	V		2.46	
Forward voltage (@ 350 mA, 25 °C) - red	V		2.08	2.6
Forward voltage (@ 1000 mA, 25 °C) - red	V		2.44	
Forward voltage (@ 350 mA, 25 °C) - photo red	V		2.09	2.2
Forward voltage (@ 1000 mA, 25 °C) - photo red	V		2.56	
Forward voltage (@ 350 mA, 25 °C) - far red, S Line far red	V		1.88	2.2
Forward voltage (@ 1000 mA, 25 °C) - far red, S Line far red	V		2.16	
LED junction temperature	°C			150

Note

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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - WHITE (T_J = 85 °C)

The following tables provide order codes for XLamp XP-E2 white LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 34). For definitions of the chromaticity kits, please see the Cree LED's Standard Chromaticity Kits section (page 33).

Chromaticity		Minimum Luminous Flux @ 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	70 CRI Typical
51	6200 K	S3	156	181	267	340	XPEBWT-L1-0000-00K51
		S2	148	172	254	323	XPEBWT-L1-0000-00J51
		R5	139	161	238	303	XPEBWT-L1-0000-00H51
53	6000 K	S3	156	181	267	340	XPEBWT-L1-0000-00K53
		S2	148	172	254	323	XPEBWT-L1-0000-00J53
		R5	139	161	238	303	XPEBWT-L1-0000-00H53
50	6200 K	S3	156	181	267	340	XPEBWT-L1-0000-00K50
		S2	148	172	254	323	XPEBWT-L1-0000-00J50
		R5	139	161	238	303	XPEBWT-L1-0000-00H50
E1	6500 K	S3	156	181	267	340	XPEBWT-L1-0000-00KE1
		S2	148	172	254	323	XPEBWT-L1-0000-00JE1
		R5	139	161	238	303	XPEBWT-L1-0000-00HE1
E2	5700 K	S3	156	181	267	340	XPEBWT-L1-0000-00KE2
		S2	148	172	254	323	XPEBWT-L1-0000-00JE2
		R5	139	161	238	303	XPEBWT-L1-0000-00HE2

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

** Calculated flux values at 700 mA and 1 A are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - WHITE (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux @ 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	70 CRI Typical	75 CRI Typical	80 CRI Minimum
E3	5000 K	S3	156	181	267	340	XPEBWT-01-0000-00KE3	XPEBWT-L1-0000-00KE3	
		S2	148	172	254	323	XPEBWT-01-0000-00JE3	XPEBWT-L1-0000-00JE3	
		R5	139	161	238	303	XPEBWT-01-0000-00HE3	XPEBWT-L1-0000-00HE3	
		R4	130	151	223	284		XPEBWT-L1-0000-00GE3	
F4	4750 K	S3	156	181	267	340		XPEBWT-L1-0000-00KF4	
		S2	148	172	254	323	XPEBWT-01-0000-00JF4	XPEBWT-L1-0000-00JF4	
		R5	139	161	238	303	XPEBWT-01-0000-00HF4	XPEBWT-L1-0000-00HF4	
		R4	130	151	223	284	XPEBWT-01-0000-00GF4	XPEBWT-L1-0000-00GF4	
E4	4500 K	S3	156	181	267	340		XPEBWT-L1-0000-00KE4	
		S2	148	172	254	323	XPEBWT-01-0000-00JE4	XPEBWT-L1-0000-00JE4	
		R5	139	161	238	303	XPEBWT-01-0000-00HE4	XPEBWT-L1-0000-00HE4	
		R4	130	151	223	284	XPEBWT-01-0000-00GE4	XPEBWT-L1-0000-00GE4	
F5	4250 K	S2	148	172	254	323	XPEBWT-01-0000-00JF5		
		R5	139	161	238	303	XPEBWT-01-0000-00HF5	XPEBWT-L1-0000-00HF5	
		R4	130	151	223	284	XPEBWT-01-0000-00GF5	XPEBWT-L1-0000-00GF5	
		R3	122	142	209	266		XPEBWT-L1-0000-00FF5	
E5	4000 K	S2	148	172	254	323	XPEBWT-01-0000-00JE5		
		R5	139	161	238	303	XPEBWT-01-0000-00HE5	XPEBWT-L1-0000-00HE5	XPEBWT-H1-0000-00HE5
		R4	130	151	223	284	XPEBWT-01-0000-00GE5	XPEBWT-L1-0000-00GE5	XPEBWT-H1-0000-00GE5
		R3	122	142	209	266		XPEBWT-L1-0000-00FE5	XPEBWT-H1-0000-00FE5
Z5	4000 K	R4	130	151	223	284		XPEBWT-L1-0000-00GZ5	XPEBWT-H1-0000-00GZ5
		R3	122	142	209	266		XPEBWT-L1-0000-00FZ5	XPEBWT-H1-0000-00FZ5
		R2	114	132	195	249		XPEBWT-L1-0000-00EZ5	XPEBWT-H1-0000-00EZ5

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

** Calculated flux values at 700 mA and 1 A are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - WHITE (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux @ 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	70 CRI Typical	80 CRI Typical	80 CRI Minimum	90 CRI Minimum
F6	3750 K	R5	139	161	238	303	XPEBWT-01-0000-00HF6			
		R4	130	151	223	284	XPEBWT-01-0000-00GF6	XPEBWT-L1-0000-00GF6	XPEBWT-H1-0000-00GF6	
		R3	122	142	209	266	XPEBWT-01-0000-00FF6	XPEBWT-L1-0000-00FF6	XPEBWT-H1-0000-00FF6	
		R2	114	132	195	249		XPEBWT-L1-0000-00EF6	XPEBWT-H1-0000-00EF6	
E6	3500 K	R5	139	161	238	303	XPEBWT-01-0000-00HE6			
		R4	130	151	223	284	XPEBWT-01-0000-00GE6	XPEBWT-L1-0000-00GE6	XPEBWT-H1-0000-00GE6	
		R3	122	142	209	266	XPEBWT-01-0000-00FE6	XPEBWT-L1-0000-00FE6	XPEBWT-H1-0000-00FE6	
		R2	114	132	195	249		XPEBWT-L1-0000-00EE6	XPEBWT-H1-0000-00EE6	
Z6	3500 K	R3	122	142	209	266		XPEBWT-L1-0000-00FZ6	XPEBWT-H1-0000-00FZ6	
		R2	114	132	195	249		XPEBWT-L1-0000-00EZ6	XPEBWT-H1-0000-00EZ6	
		Q5	107	124	183	233		XPEBWT-L1-0000-00DZ6	XPEBWT-H1-0000-00DZ6	
F7	3250 K	R5	139	161	238	303	XPEBWT-01-0000-00HF7			
		R4	130	151	223	284	XPEBWT-01-0000-00GF7	XPEBWT-L1-0000-00GF7	XPEBWT-H1-0000-00GF7	
		R3	122	142	209	266	XPEBWT-01-0000-00FF7	XPEBWT-L1-0000-00FF7	XPEBWT-H1-0000-00FF7	
		R2	114	132	195	249		XPEBWT-L1-0000-00EF7	XPEBWT-H1-0000-00EF7	

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

** Calculated flux values at 700 mA and 1 A are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - WHITE (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux @ 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	70 CRI Typical	80 CRI Typical	80 CRI Minimum	90 CRI Minimum
E7	3000 K	R5	139	161	238	303	XPEBWT-01-0000-00HE7			
		R4	130	151	223	284	XPEBWT-01-0000-00GE7	XPEBWT-L1-0000-00GE7	XPEBWT-H1-0000-00GE7	
		R3	122	142	209	266	XPEBWT-01-0000-00FE7	XPEBWT-L1-0000-00FE7	XPEBWT-H1-0000-00FE7	
		R2	114	132	195	249		XPEBWT-L1-0000-00EE7	XPEBWT-H1-0000-00EE7	
		Q5	107	124	183	233				XPEBWT-U1-0000-00DE7
		Q4	100	116	171	218				XPEBWT-U1-0000-00CE7
		Q3	93.9	109	161	205				XPEBWT-U1-0000-00BE7
Z7	3000 K	R3	122	142	209	266		XPEBWT-L1-0000-00FZ7	XPEBWT-H1-0000-00FZ7	
		R2	114	132	195	249		XPEBWT-L1-0000-00EZ7	XPEBWT-H1-0000-00EZ7	
		Q5	107	124	183	233		XPEBWT-L1-0000-00DZ7	XPEBWT-H1-0000-00DZ7	
		Q4	100	116	171	218				XPEBWT-U1-0000-00CZ7
		Q3	93.9	109	161	205				XPEBWT-U1-0000-00BZ7
		Q2	87.4	102	150	191				XPEBWT-U1-0000-00AZ7
F8	2850 K	R3	122	142	209	266		XPEBWT-L1-0000-00FF8	XPEBWT-H1-0000-00FF8	
		R2	114	132	195	249		XPEBWT-L1-0000-00EF8	XPEBWT-H1-0000-00EF8	
		Q5	107	124	183	233		XPEBWT-L1-0000-00DF8	XPEBWT-H1-0000-00DF8	
		Q4	100	116	171	218				XPEBWT-U1-0000-00CF8
		Q3	93.9	109	161	205				XPEBWT-U1-0000-00BF8
		Q2	87.4	102	150	191				XPEBWT-U1-0000-00AF8

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

** Calculated flux values at 700 mA and 1 A are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - WHITE (T_J = 85 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux @ 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	70 CRI Typical	80 CRI Typical	80 CRI Minimum	90 CRI Minimum
E8	2700 K	R3	122	142	209	266		XPEBWT-L1-0000-00FE8	XPEBWT-H1-0000-00FE8	
		R2	114	132	195	249		XPEBWT-L1-0000-00EE8	XPEBWT-H1-0000-00EE8	
		Q5	107	124	183	233		XPEBWT-L1-0000-00DE8	XPEBWT-H1-0000-00DE8	
		Q4	100	116	171	218				XPEBWT-U1-0000-00CE8
		Q3	93.9	109	161	205				XPEBWT-U1-0000-00BE8
		Q2	87.4	102	150	191				XPEBWT-U1-0000-00AE8
Z8	2700 K	R2	114	132	195	249		XPEBWT-L1-0000-00EZ8	XPEBWT-H1-0000-00EZ8	
		Q5	107	124	183	233		XPEBWT-L1-0000-00DZ8	XPEBWT-H1-0000-00DZ8	
		Q4	100	116	171	218		XPEBWT-L1-0000-00CZ8	XPEBWT-H1-0000-00CZ8	
		Q3	93.9	109	161	205				XPEBWT-U1-0000-00BZ8
		Q2	87.4	102	150	191				XPEBWT-U1-0000-00AZ8
		P4	80.6	93.6	138	176				XPEBWT-U1-0000-009Z8
EA	2200 K	Q2	87.4	102	150	191		XPEBWT-L1-0000-00AEA	XPEBWT-H1-0000-00AEA	
		P4	80.6	93.6	138	176		XPEBWT-L1-0000-009EA	XPEBWT-H1-0000-009EA	
		P3	73.9	85.8	127	161		XPEBWT-L1-0000-008EA	XPEBWT-H1-0000-008EA	
ZA	2200 K	Q2	87.4	102	150	191		XPEBWT-L1-0000-00AZA	XPEBWT-H1-0000-00AZA	
		P4	80.6	93.6	138	176		XPEBWT-L1-0000-009ZA	XPEBWT-H1-0000-009ZA	
		P3	73.9	85.8	127	161		XPEBWT-L1-0000-008ZA	XPEBWT-H1-0000-008ZA	

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

** Calculated flux values at 700 mA and 1 A are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - COLOR (T_J = 25 °C)

The following tables provide order codes for XLamp XP-E2 color LEDs. For a complete description of the order-code nomenclature, please see the Bin and Order Code Formats section (page 34).

Color	Minimum Radiant Flux @ 350 mA		Calculated Minimum PPF (µmol/s)*	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	DWL (nm)	Group	DWL (nm)	
Royal Blue	38	650	2.46	D3	450	D5	465	XPEBRY-L1-0000-00S01
				D3	450	D4	460	XPEBRY-L1-0000-00S02
				D4	455	D5	465	XPEBRY-L1-0000-00S03
	39	675	2.56	D3	450	D5	465	XPEBRY-L1-0000-00T01
				D3	450	D4	460	XPEBRY-L1-0000-00T02
	40	700	2.65	D3	450	D5	465	XPEBRY-L1-0000-00U01
				D3	450	D4	460	XPEBRY-L1-0000-00U02

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Blue	M2	39.8	B3	465	B6	485	XPEBBL-L1-0000-00201
			B3	465	B5	480	XPEBBL-L1-0000-00202
			B4	470	B5	480	XPEBBL-L1-0000-00205
	M3	45.7	B3	465	B6	485	XPEBBL-L1-0000-00301
			B3	465	B5	480	XPEBBL-L1-0000-00302
			B4	470	B5	480	XPEBBL-L1-0000-00305
	N2	51.7	B3	465	B6	485	XPEBBL-L1-0000-00401
			B3	465	B5	480	XPEBBL-L1-0000-00402
			B4	470	B5	480	XPEBBL-L1-0000-00405

Note:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements, ±2 on CRI measurements and ±1 on dominant wavelength measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

* Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - COLOR (T_J = 25 °C) - CONTINUED

Color	Minimum Luminous Flux (lm) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (lm)		Group	DWL (nm)	Group	DWL (nm)	
Green	S3	156	1.42	G2	520	G4	535	XPEBGR-L1-0000-00K01
				G2	520	G3	530	XPEBGR-L1-0000-00K02
				G3	525	G4	535	XPEBGR-L1-0000-00K03
	S4	164	1.49	G2	520	G4	535	XPEBGR-L1-0000-00L01
				G2	520	G3	530	XPEBGR-L1-0000-00L02
				G3	525	G4	535	XPEBGR-L1-0000-00L03
	S5	172	1.56	G2	520	G4	535	XPEBGR-L1-0000-00M01
				G2	520	G3	530	XPEBGR-L1-0000-00M02
				G3	525	G4	535	XPEBGR-L1-0000-00M03
	S6	180	1.63	G2	520	G4	535	XPEBGR-L1-0000-00N01
				G2	520	G3	530	XPEBGR-L1-0000-00N02
				G3	525	G4	535	XPEBGR-L1-0000-00N03

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	Q3	93.9	XPEBPA-L1-0000-00B01
		Q4	100	XPEBPA-L1-0000-00C01
		Q5	107	XPEBPA-L1-0000-00D01

Note:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements, ±2 on CRI measurements and ±1 on dominant wavelength measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

* Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

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ORDER CODES SUGGESTED FOR NEW DESIGNS - COLOR (T_J = 25 °C) - CONTINUED

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Amber	P4	80.6	A2	585	A3	595	XPEBAM-L1-0000-00901
			A2	585	A2	590	XPEBAM-L1-0000-00902
			A3	590	A3	595	XPEBAM-L1-0000-00903
	Q2	87.4	A2	585	A3	595	XPEBAM-L1-0000-00A01
			A2	585	A2	590	XPEBAM-L1-0000-00A02
			A3	590	A3	595	XPEBAM-L1-0000-00A03
	Q3	93.9	A2	585	A3	595	XPEBAM-L1-0000-00B01
			A2	585	A2	590	XPEBAM-L1-0000-00B02
			A3	590	A3	595	XPEBAM-L1-0000-00B03
	Q4	100	A2	585	A3	595	XPEBAM-L1-0000-00C01
			A3	590	A3	595	XPEBAM-L1-0000-00C03

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Red-Orange	Q4	100	O3	610	O4	620	XPEBRO-L1-0000-00C01
			O3	610	O3	615	XPEBRO-L1-0000-00C02
	Q5	107	O3	610	O4	620	XPEBRO-L1-0000-00D01
			O3	610	O3	615	XPEBRO-L1-0000-00D02
	R2	114	O3	610	O4	620	XPEBRO-L1-0000-00E01
			O3	610	O3	615	XPEBRO-L1-0000-00E02

Note:
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements, ±2 on CRI measurements and ±1 on dominant wavelength measurements. See the Measurements section (page 36).
- XLamp XP-E2 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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ORDER CODES SUGGESTED FOR NEW DESIGNS - COLOR (T_J = 25 °C) - CONTINUED

Color	Minimum Luminous Flux (lm) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (lm)		Group	DWL (nm)	Group	DWL (nm)	
Red	P2	67.2	1.75	R2	620	R3	630	XPEBRD-L1-0000-00701
				R2	620	R2	625	XPEBRD-L1-0000-00702
	P3	73.9	1.92	R2	620	R3	630	XPEBRD-L1-0000-00801
				R2	620	R2	625	XPEBRD-L1-0000-00802
	P4	80.6	2.10	R2	620	R3	630	XPEBRD-L1-0000-00901
				R2	620	R2	625	XPEBRD-L1-0000-00902

Color	Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Peak Wavelength (nm)				Color Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	PWL (nm)	Group	PWL (nm)	
Photo Red	30	450	2.5	P2	650	P5	670	XPEBPR-L1-0000-00D01
	31	475	2.57	P2	650	P5	670	XPEBPR-L1-0000-00E01
	32	500	2.71	P2	650	P5	670	XPEBPR-L1-0000-00F01

Color	Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PF_{FR} (µmol/s)*	Peak Wavelength (nm)				Color Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	PWL (nm)	Group	PWL (nm)	
Far Red	27	375	2.2	F2	720	F5	740	XPEBFR-L1-0000-00A01
	28	400	2.34	F2	720	F5	740	XPEBFR-L1-0000-00B01
	29	425	2.49	F2	720	F5	740	XPEBFR-L1-0000-00C01

Color	Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PF_{FR} (µmol/s)*	Peak Wavelength (nm)				Color Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	PWL (nm)	Group	PWL (nm)	
S Line Far Red	27	375	2.2	F2	720	F5	740	XPEBFR-LS-0000-00A01
	28	400	2.34	F2	720	F5	740	XPEBFR-LS-0000-00B01
	29	425	2.49	F2	720	F5	740	XPEBFR-LS-0000-00C01

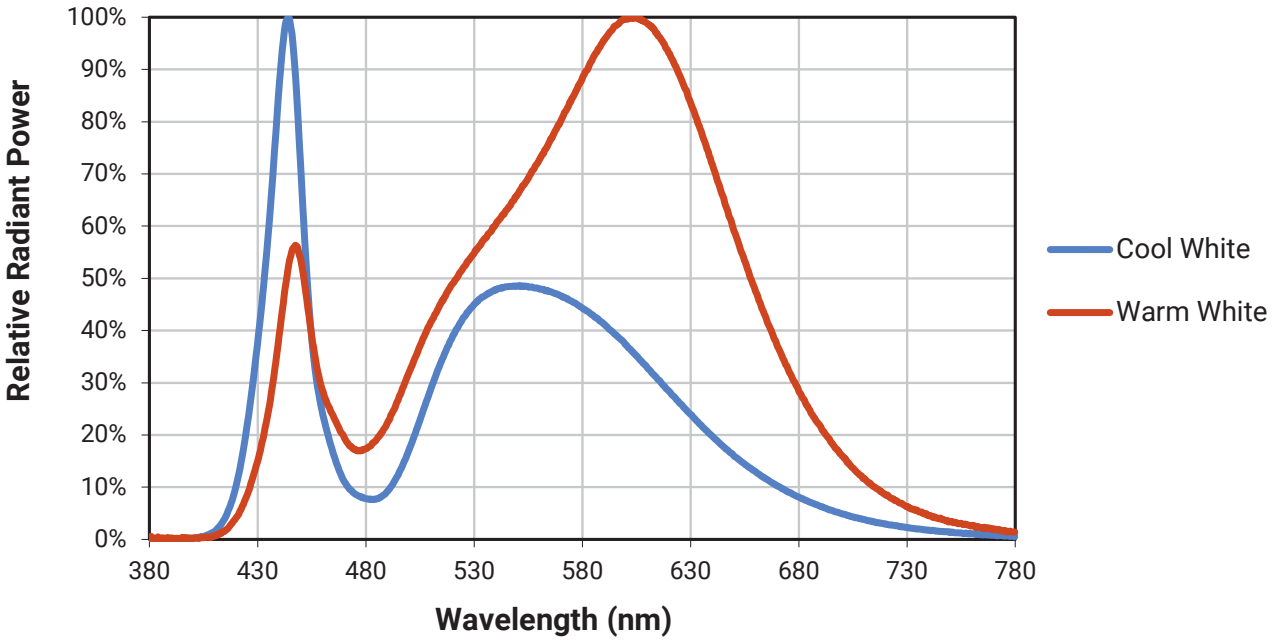
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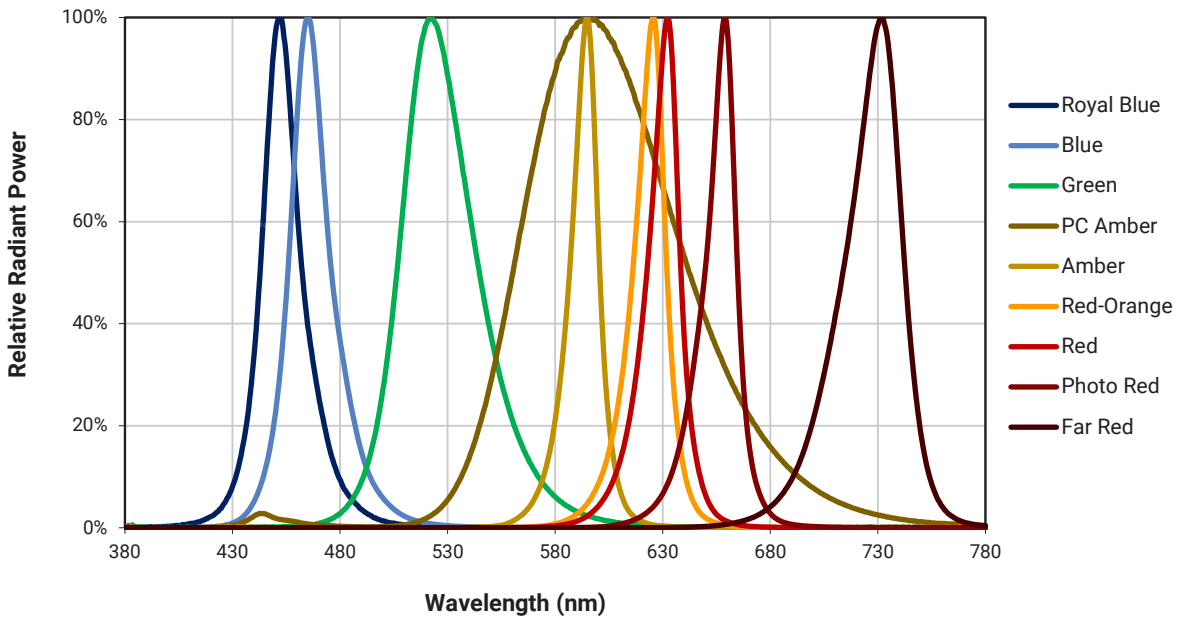
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 43.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements, ±2 on CRI measurements and ±1 on dominant wavelength measurements. See the Measurements section (page 36).
- XLamp XP-E2 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.

* Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

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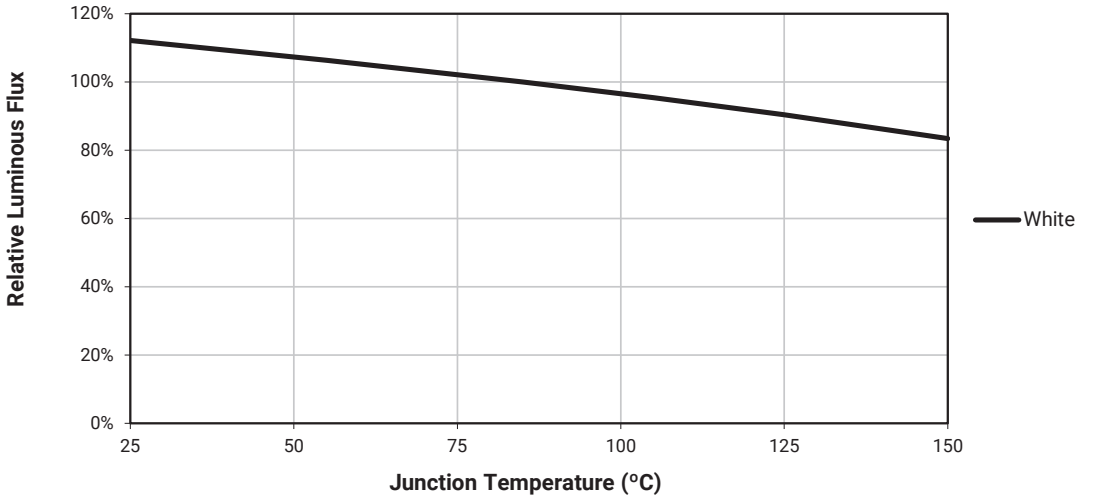
RELATIVE SPECTRAL POWER DISTRIBUTION

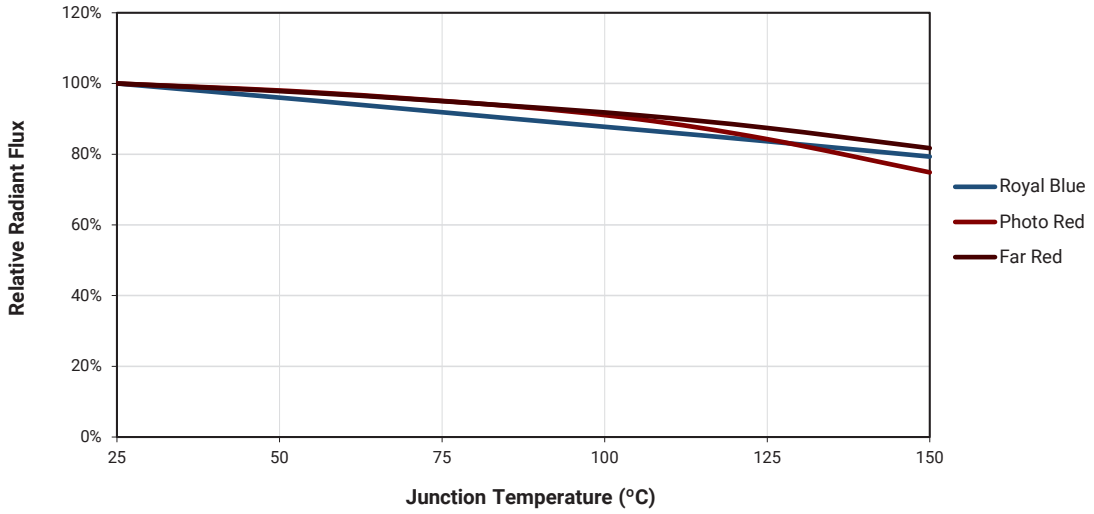


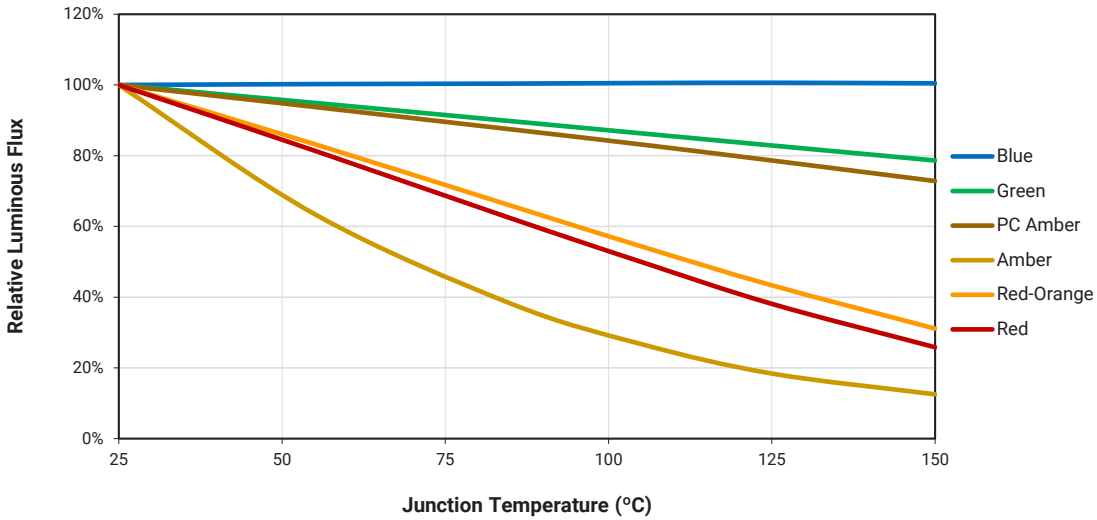


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RELATIVE FLUX VS. JUNCTION TEMPERATURE (I_F = 350 mA)

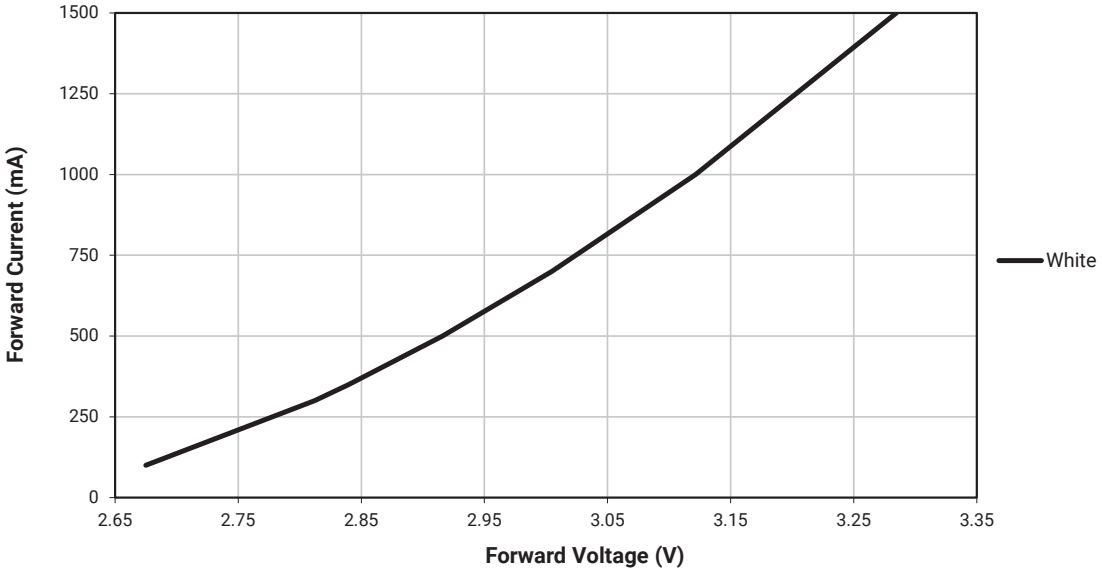




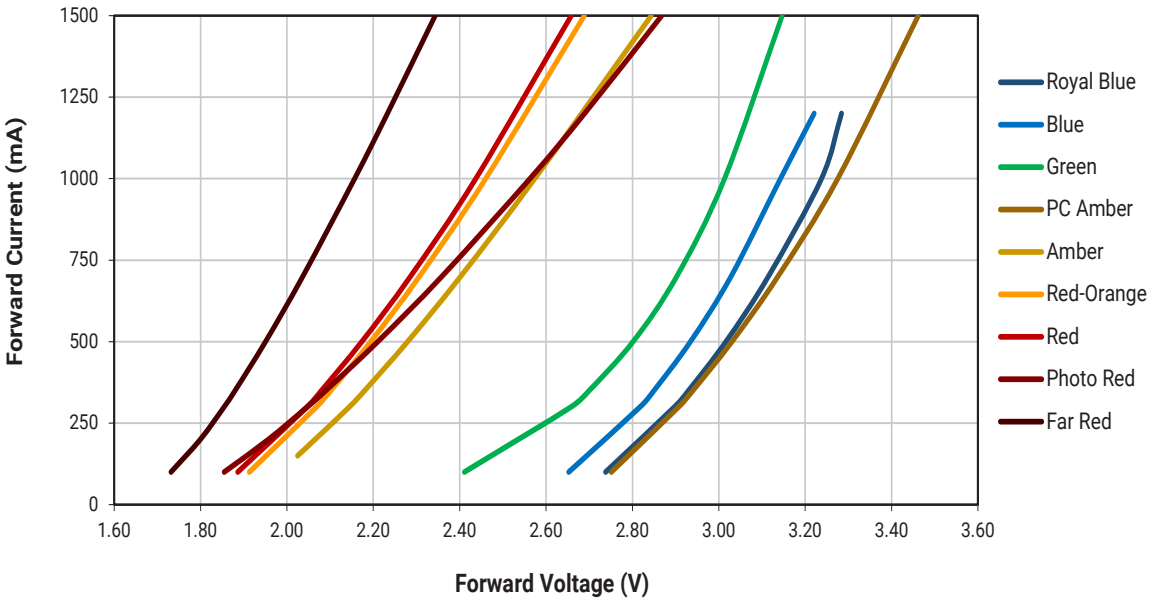


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ELECTRICAL CHARACTERISTICS - WHITE (T_J = 85 °C)

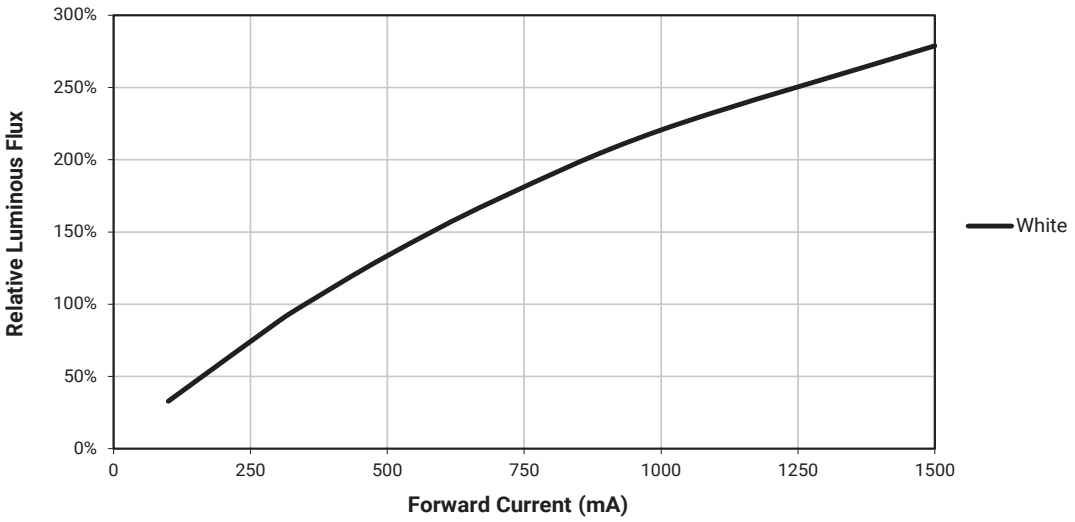


ELECTRICAL CHARACTERISTICS - COLOR (T_J = 25 °C)

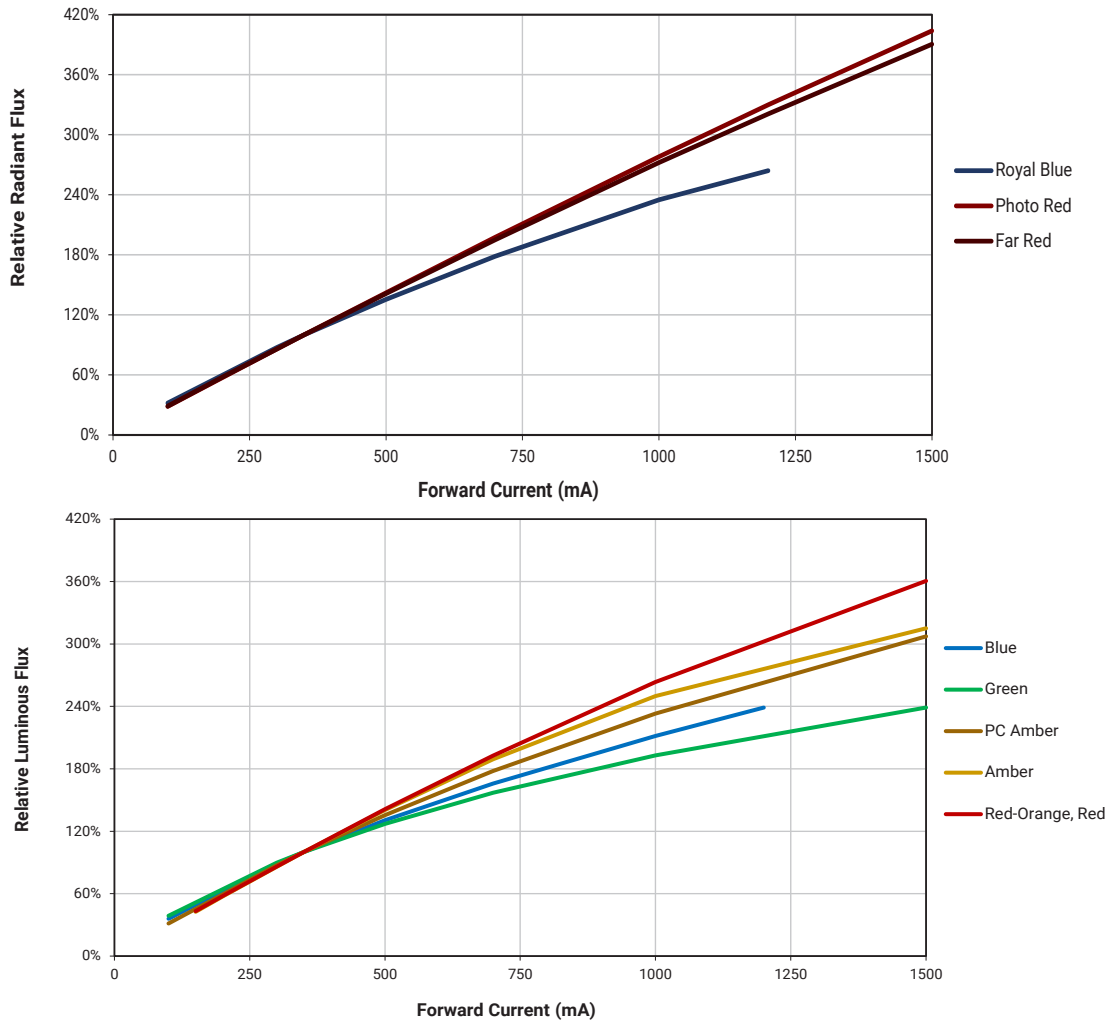


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RELATIVE FLUX VS. CURRENT - WHITE (T_J = 85 °C)

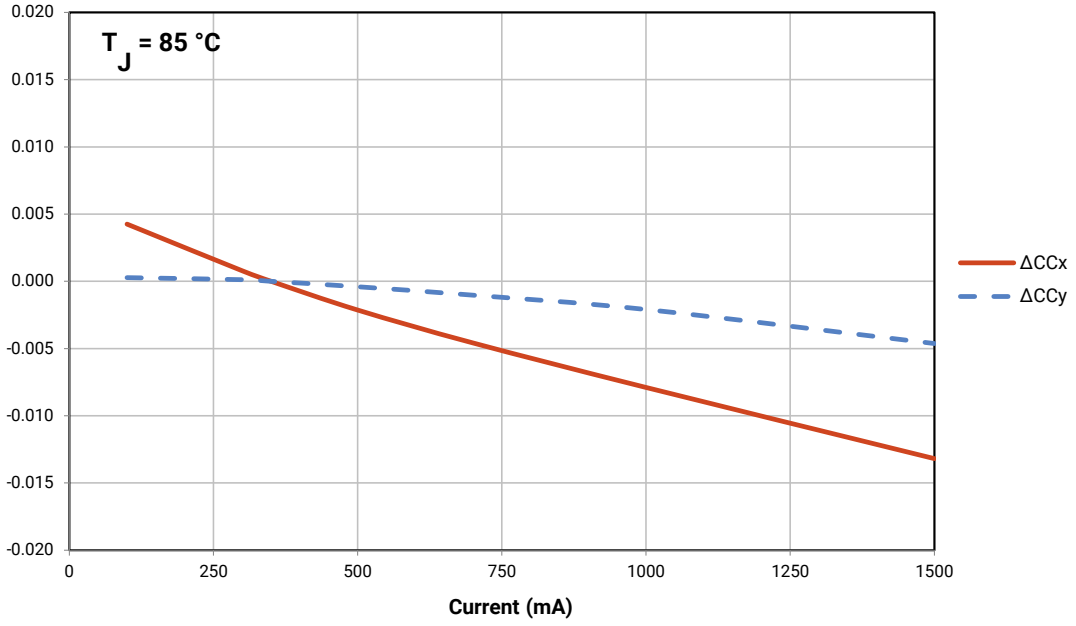


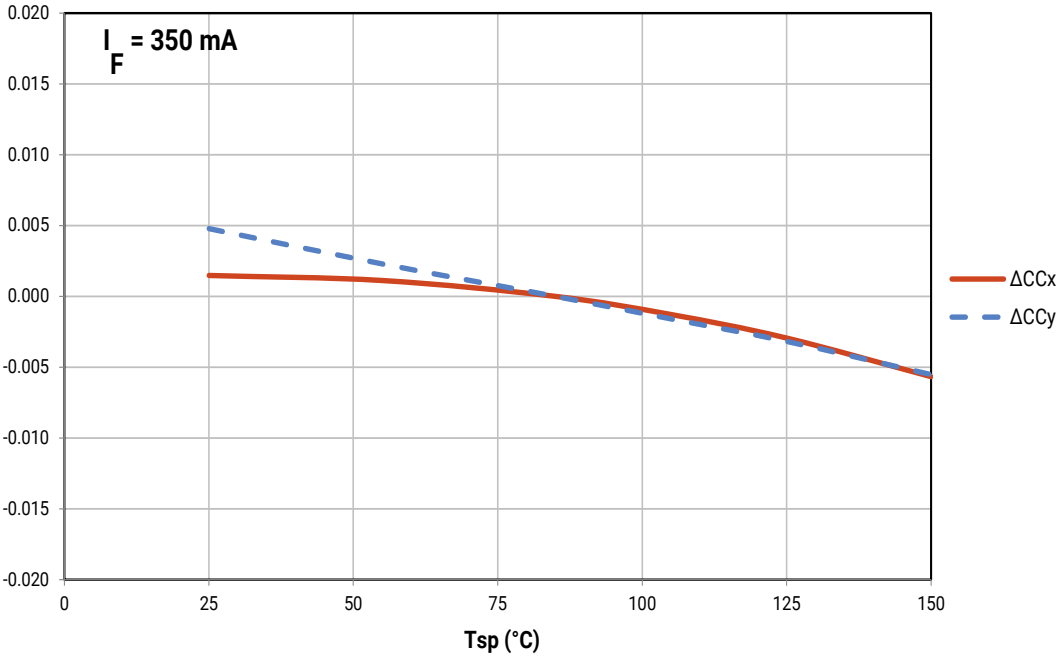
RELATIVE FLUX VS. CURRENT - COLOR (T_J = 25 °C)



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RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE - WARM WHITE*

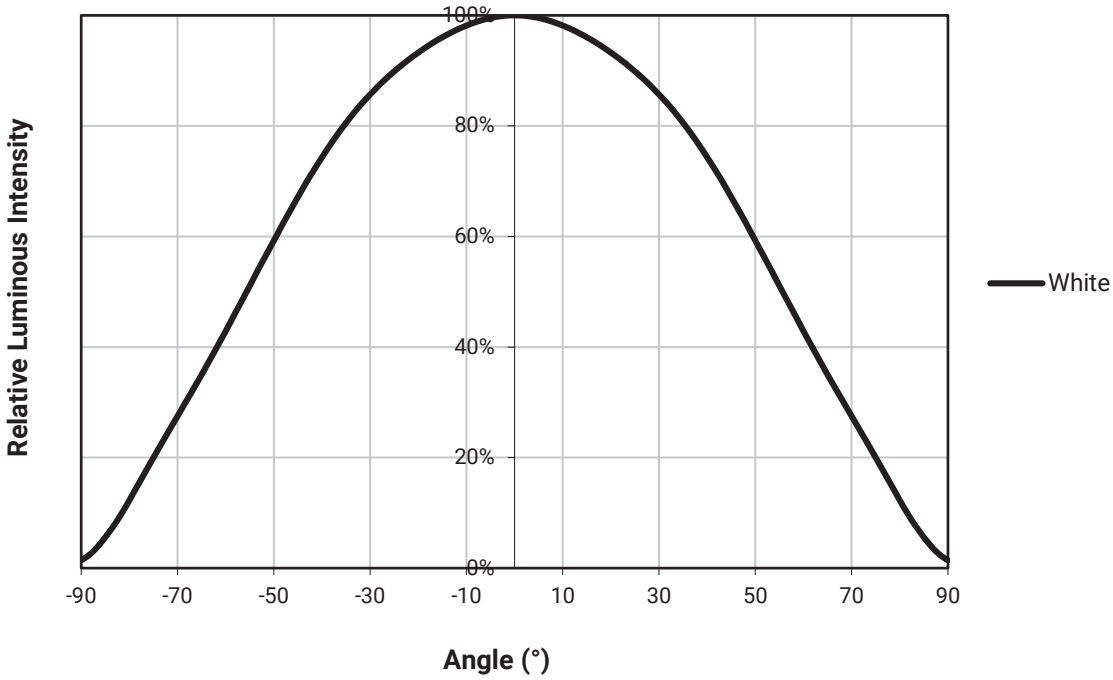


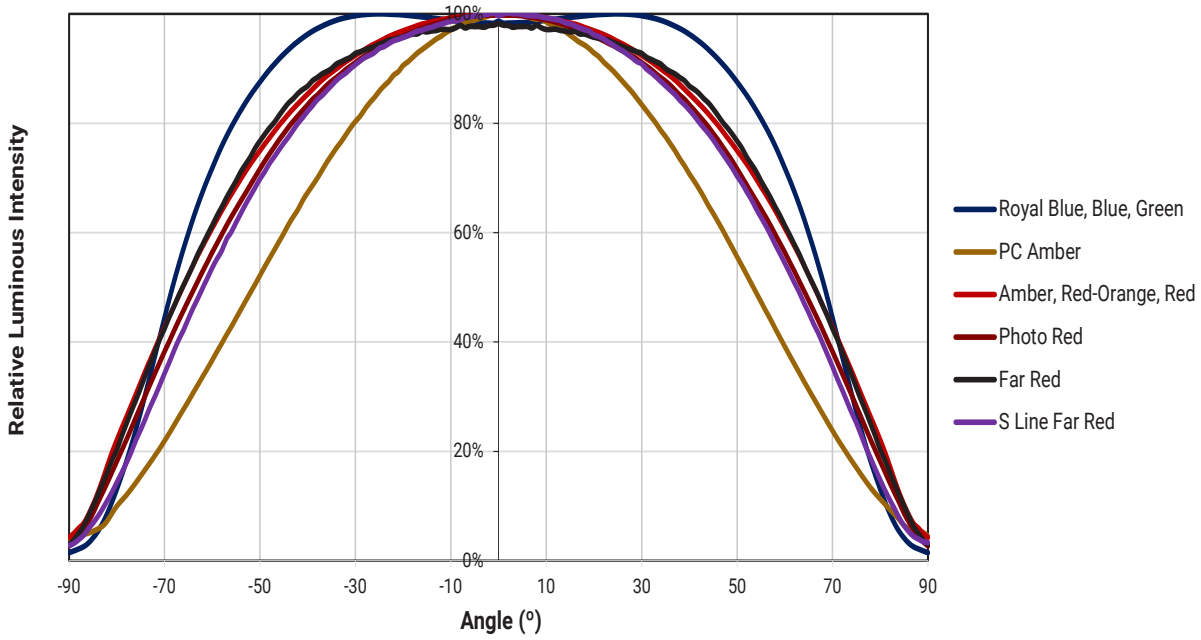


* Warm White XLamp XP-E2 LEDs have a typical CRI of 80.

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TYPICAL SPATIAL DISTRIBUTION



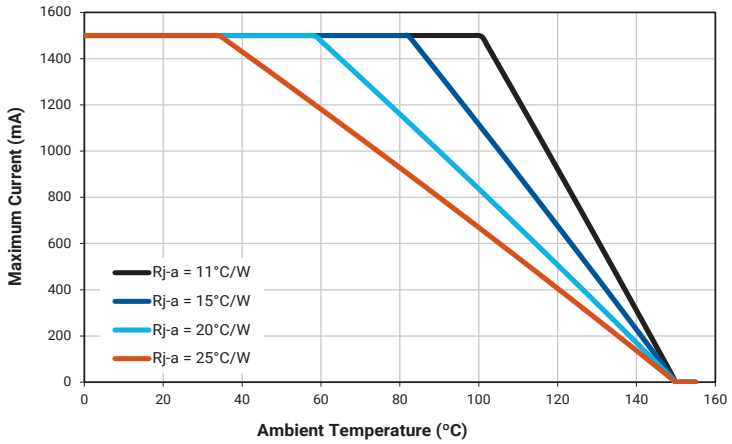


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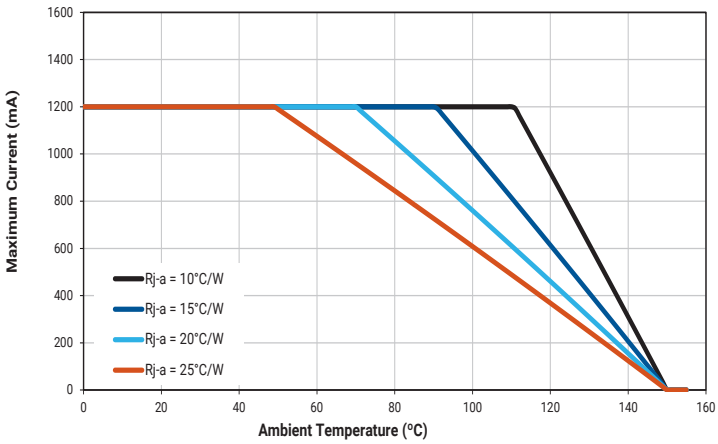
THERMAL DESIGN

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

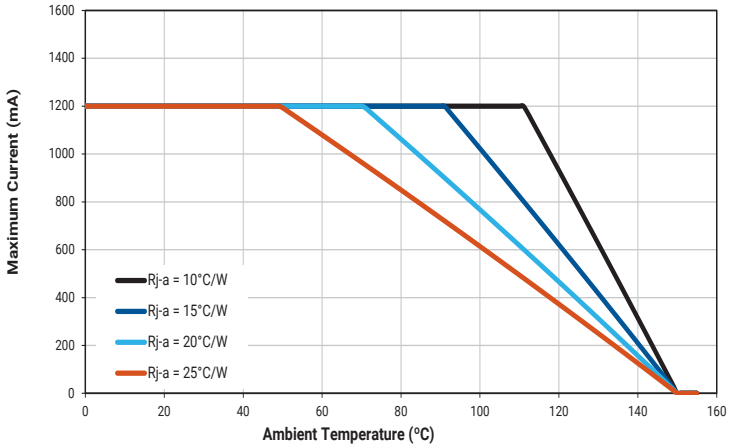
White



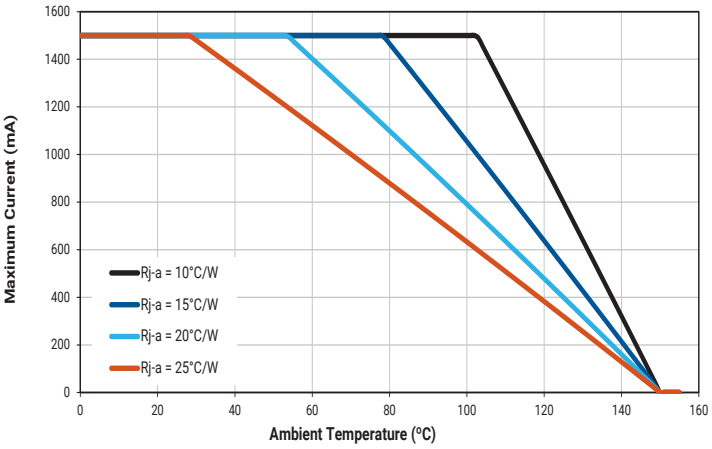
Royal Blue



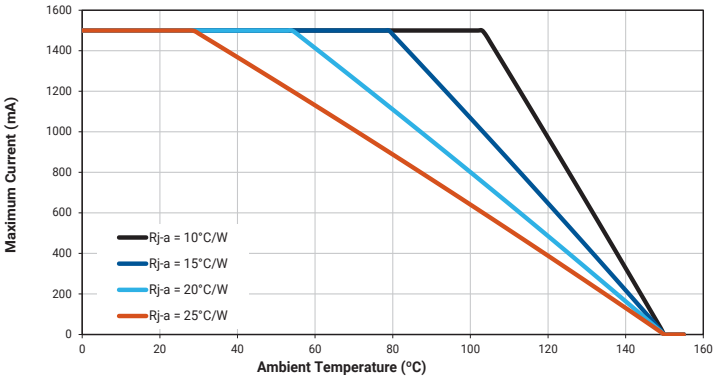
Blue



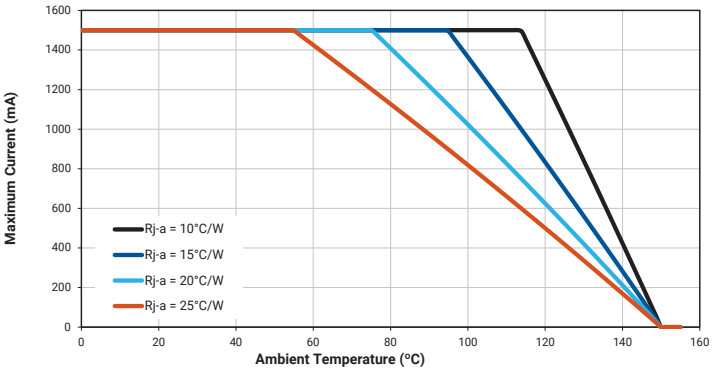
Green



PC Amber



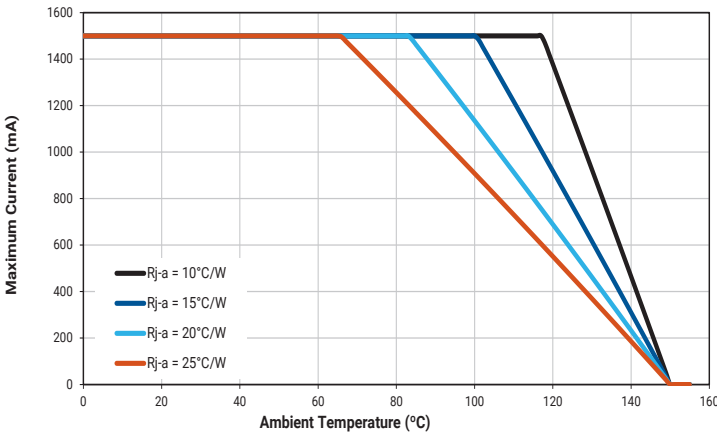
Amber



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THERMAL DESIGN - CONTINUED

Red-Orange



Red

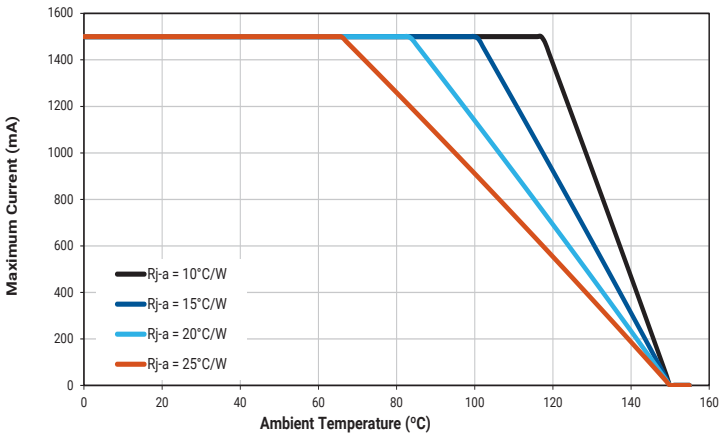
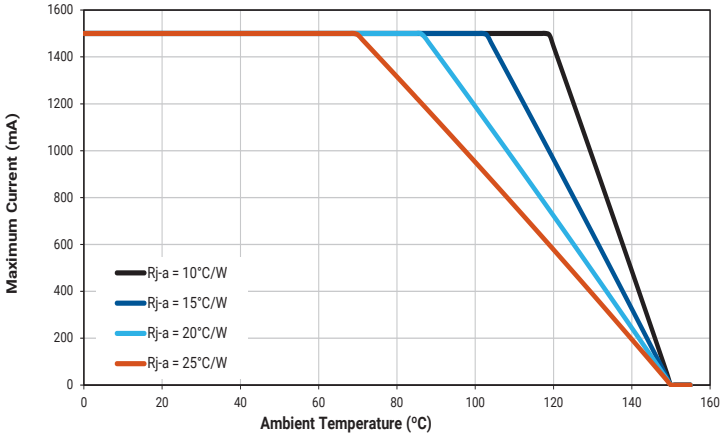
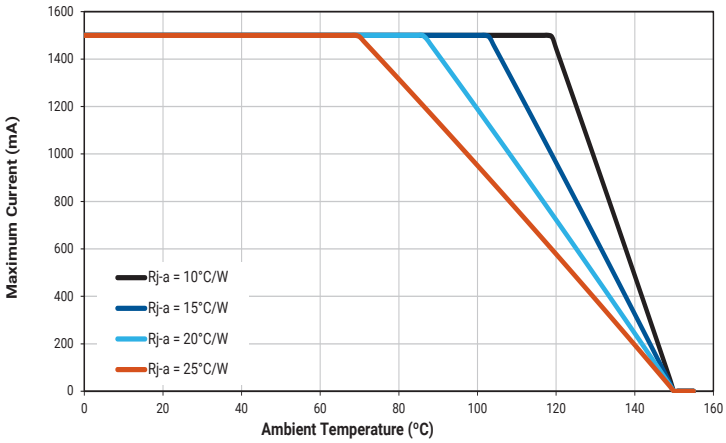


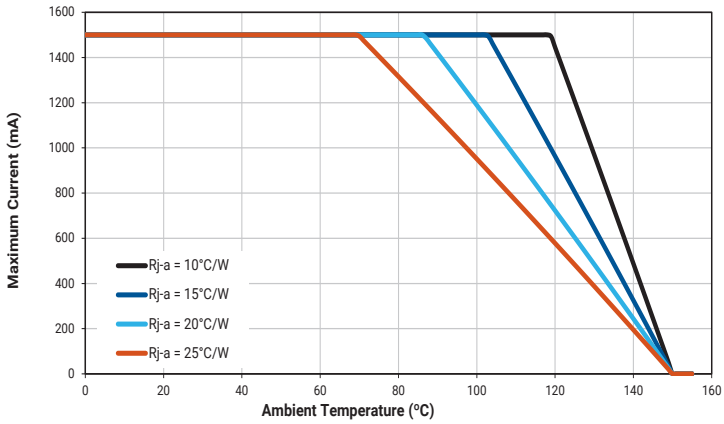
Photo Red



Far Red



S Line Far Red



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PERFORMANCE GROUPS - LUMINOUS FLUX

XLamp XP-E2 LEDs (except royal blue, photo red and far red) are tested for luminous flux and placed into one of the following luminous-flux groups:

Group Code	Minimum Luminous Flux (lm) @ 350 mA	Maximum Luminous Flux (lm) @ 350 mA
K2	30.6	35.2
K3	35.2	39.8
M2	39.8	45.7
M3	45.7	51.7
N2	51.7	56.8
N3	56.8	62.0
N4	62.0	67.2
P2	67.2	73.9
P3	73.9	80.6
P4	80.6	87.4
Q2	87.4	93.9
Q3	93.9	100
Q4	100	107
Q5	107	114
R2	114	122
R3	122	130
R4	130	139
R5	139	148
S2	148	156
S3	156	164
S4	164	172
S5	172	180
S6	180	188

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PERFORMANCE GROUPS - RADIANT FLUX (T_J = 25 °C)

XLamp XP-E2 royal blue LEDs are tested for radiant flux and placed into one the following bins:

Group	Minimum Radiant Flux (mW) @ 350 mA	Maximum Radiant Flux (mW) @ 350 mA
36	600	625
37	625	650
38	650	675
39	675	700
40	700	725

XLamp XP-E2 photo red LEDs are tested for radiant flux and placed into one the following bins:

Group	Minimum Radiant Flux (mW) @ 350 mA	Maximum Radiant Flux (mW) @ 350 mA
29	425	450
30	450	475
31	475	500
32	500	525

XLamp XP-E2 far red LEDs are tested for radiant flux and sorted into one of the following radiant-flux bins:

Group	Minimum Radiant Flux (mW) @ 350 mA	Maximum Radiant Flux (mW) @ 350 mA
26	350	375
27	375	400
28	400	425
29	425	450

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PERFORMANCE GROUPS - CHROMATICITY

White XLamp XP-E2 LEDs are tested for chromaticity and placed into one of the regions defined by the bounding coordinates on the following pages.

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
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
3R	0.3366	0.3369	3S	0.3381	0.3762						
	0.3440	0.3428		0.3480	0.3840						
	0.3429	0.3307		0.3463	0.3687						
	0.3361	0.3245		0.3376	0.3616						
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

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PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
5A1	0.3670	0.3578	5A2	0.3686	0.3649	5A3	0.3744	0.3685	5A4	0.3726	0.3612
	0.3686	0.3649		0.3702	0.3722		0.3763	0.3760		0.3744	0.3685
	0.3744	0.3685		0.3763	0.3760		0.3825	0.3798		0.3804	0.3721
	0.3726	0.3612		0.3744	0.3685		0.3804	0.3721		0.3783	0.3646
5B1	0.3702	0.3722	5B2	0.3719	0.3797	5B3	0.3782	0.3837	5B4	0.3763	0.3760
	0.3719	0.3797		0.3736	0.3874		0.3802	0.3916		0.3782	0.3837
	0.3782	0.3837		0.3802	0.3916		0.3869	0.3958		0.3847	0.3877
	0.3763	0.3760		0.3782	0.3837		0.3847	0.3877		0.3825	0.3798
5C1	0.3825	0.3798	5C2	0.3847	0.3877	5C3	0.3912	0.3917	5C4	0.3887	0.3836
	0.3847	0.3877		0.3869	0.3958		0.3937	0.4001		0.3912	0.3917
	0.3912	0.3917		0.3937	0.4001		0.4006	0.4044		0.3978	0.3958
	0.3887	0.3836		0.3912	0.3917		0.3978	0.3958		0.3950	0.3875
5D1	0.3783	0.3646	5D2	0.3804	0.3721	5D3	0.3863	0.3758	5D4	0.3840	0.3681
	0.3804	0.3721		0.3825	0.3798		0.3887	0.3836		0.3863	0.3758
	0.3863	0.3758		0.3887	0.3836		0.3950	0.3875		0.3924	0.3794
	0.3840	0.3681		0.3863	0.3758		0.3924	0.3794		0.3898	0.3716
6A1	0.3889	0.3690	6A2	0.3915	0.3768	6A3	0.3981	0.3800	6A4	0.3953	0.3720
	0.3915	0.3768		0.3941	0.3848		0.4010	0.3882		0.3981	0.3800
	0.3981	0.3800		0.4010	0.3882		0.4080	0.3916		0.4048	0.3832
	0.3953	0.3720		0.3981	0.3800		0.4048	0.3832		0.4017	0.3751
6B1	0.3941	0.3848	6B2	0.3968	0.3930	6B3	0.4040	0.3966	6B4	0.4010	0.3882
	0.3968	0.3930		0.3996	0.4015		0.4071	0.4052		0.4040	0.3966
	0.4040	0.3966		0.4071	0.4052		0.4146	0.4089		0.4113	0.4001
	0.4010	0.3882		0.4040	0.3966		0.4113	0.4001		0.4080	0.3916
6C1	0.4080	0.3916	6C2	0.4113	0.4001	6C3	0.4186	0.4037	6C4	0.4150	0.3950
	0.4113	0.4001		0.4146	0.4089		0.4222	0.4127		0.4186	0.4037
	0.4186	0.4037		0.4222	0.4127		0.4299	0.4165		0.4259	0.4073
	0.4150	0.3950		0.4186	0.4037		0.4259	0.4073		0.4221	0.3984
6D1	0.4017	0.3751	6D2	0.4048	0.3832	6D3	0.4116	0.3865	6D4	0.4082	0.3782
	0.4048	0.3832		0.4080	0.3916		0.4150	0.3950		0.4116	0.3865
	0.4116	0.3865		0.4150	0.3950		0.4221	0.3984		0.4183	0.3898
	0.4082	0.3782		0.4116	0.3865		0.4183	0.3898		0.4147	0.3814
7A1	0.4147	0.3814	7A2	0.4183	0.3898	7A3	0.4242	0.3919	7A4	0.4203	0.3833
	0.4183	0.3898		0.4221	0.3984		0.4281	0.4006		0.4242	0.3919
	0.4242	0.3919		0.4281	0.4006		0.4342	0.4028		0.4300	0.3939
	0.4203	0.3833		0.4242	0.3919		0.4300	0.3939		0.4259	0.3853
7B1	0.4221	0.3984	7B2	0.4259	0.4073	7B3	0.4322	0.4096	7B4	0.4281	0.4006
	0.4259	0.4073		0.4299	0.4165		0.4364	0.4188		0.4322	0.4096
	0.4322	0.4096		0.4364	0.4188		0.4430	0.4212		0.4385	0.4119
	0.4281	0.4006		0.4322	0.4096		0.4385	0.4119		0.4342	0.4028

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PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
7C1	0.4342	0.4028	7C2	0.4385	0.4119	7C3	0.4449	0.4141	7C4	0.4403	0.4049
	0.4385	0.4119		0.4430	0.4212		0.4496	0.4236		0.4449	0.4141
	0.4449	0.4141		0.4496	0.4236		0.4562	0.4260		0.4513	0.4164
	0.4403	0.4049		0.4449	0.4141		0.4513	0.4164		0.4465	0.4071
7D1	0.4259	0.3853	7D2	0.4300	0.3939	7D3	0.4359	0.3960	7D4	0.4316	0.3873
	0.4300	0.3939		0.4342	0.4028		0.4403	0.4049		0.4359	0.3960
	0.4359	0.3960		0.4403	0.4049		0.4465	0.4071		0.4418	0.3981
	0.4316	0.3873		0.4359	0.3960		0.4418	0.3981		0.4373	0.3893
8A1	0.4373	0.3893	8A2	0.4418	0.3981	8A3	0.4475	0.3994	8A4	0.4428	0.3906
	0.4418	0.3981		0.4465	0.4071		0.4523	0.4085		0.4475	0.3994
	0.4475	0.3994		0.4523	0.4085		0.4582	0.4099		0.4532	0.4008
	0.4428	0.3906		0.4475	0.3994		0.4532	0.4008		0.4483	0.3919
8B1	0.4465	0.4071	8B2	0.4513	0.4164	8B3	0.4573	0.4178	8B4	0.4523	0.4085
	0.4513	0.4164		0.4562	0.4260		0.4624	0.4274		0.4573	0.4178
	0.4573	0.4178		0.4624	0.4274		0.4687	0.4289		0.4634	0.4193
	0.4523	0.4085		0.4573	0.4178		0.4634	0.4193		0.4582	0.4099
8C1	0.4582	0.4099	8C2	0.4634	0.4193	8C3	0.4695	0.4207	8C4	0.4641	0.4112
	0.4634	0.4193		0.4687	0.4289		0.4750	0.4304		0.4695	0.4207
	0.4695	0.4207		0.4750	0.4304		0.4813	0.4319		0.4756	0.4221
	0.4641	0.4112		0.4695	0.4207		0.4756	0.4221		0.4700	0.4126
8D1	0.4483	0.3919	8D2	0.4532	0.4008	8D3	0.4589	0.4021	8D4	0.4538	0.3931
	0.4532	0.4008		0.4582	0.4099		0.4641	0.4112		0.4589	0.4021
	0.4589	0.4021		0.4641	0.4112		0.4700	0.4126		0.4646	0.4034
	0.4538	0.3931		0.4589	0.4021		0.4646	0.4034		0.4593	0.3944
AA1	0.4822	0.3973	AA2	0.4884	0.4067	AA3	0.4942	0.4066	AA4	0.4879	0.3972
	0.4884	0.4067		0.4946	0.4162		0.5006	0.4160		0.4942	0.4066
	0.4942	0.4066		0.5006	0.4160		0.5066	0.4158		0.5001	0.4064
	0.4879	0.3972		0.4942	0.4066		0.5001	0.4064		0.4936	0.3970
AB1	0.4946	0.4162	AB2	0.5008	0.4256	AB3	0.5069	0.4254	AB4	0.5006	0.4160
	0.5008	0.4256		0.5070	0.4350		0.5133	0.4348		0.5069	0.4254
	0.5069	0.4254		0.5133	0.4348		0.5196	0.4346		0.5131	0.4252
	0.5006	0.4160		0.5069	0.4254		0.5131	0.4252		0.5066	0.4158
AC1	0.5066	0.4158	AC2	0.5131	0.4252	AC3	0.5192	0.4250	AC4	0.5126	0.4156
	0.5131	0.4252		0.5196	0.4346		0.5258	0.4343		0.5192	0.4250
	0.5192	0.4250		0.5258	0.4343		0.5321	0.4341		0.5253	0.4248
	0.5126	0.4156		0.5192	0.4250		0.5253	0.4248		0.5186	0.4154
AD1	0.4936	0.3970	AD2	0.5001	0.4064	AD3	0.5059	0.4062	AD4	0.4993	0.3969
	0.5001	0.4064		0.5066	0.4158		0.5126	0.4156		0.5059	0.4062
	0.5059	0.4062		0.5126	0.4156		0.5186	0.4154		0.5118	0.4061
	0.4993	0.3969		0.5059	0.4062		0.5118	0.4061		0.5050	0.3967

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PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

XLamp XP-E2 PC amber LEDs are placed into the region defined by the following bounding coordinates.

Region	x	y
Y2	0.5469	0.4249
	0.5700	0.4100
	0.5900	0.4100
	0.5610	0.4390

PERFORMANCE GROUPS - DOMINANT WAVELENGTH

Color XLamp XP-E2 LEDs are tested for dominant wavelength (DWL) and sorted into one of the DWL bins defined below.

Color	DWL Group	Minimum DWL (nm) @ 350 mA	Maximum DWL (nm) @ 350 mA
Royal Blue	D3	450	455
	D4	455	460
	D5	460	465
Blue	B3	465	470
	B4	470	475
	B5	475	480
	B6	480	485
Green	G2	520	525
	G3	525	530
	G4	530	535
Amber	A2	585	590
	A3	590	595
Red-Orange	O3	610	615
	O4	615	620
Red	R2	620	625
	R3	625	630

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PERFORMANCE GROUPS - PEAK WAVELENGTH

Photo red and far red XLamp XP-E2 LEDs are tested for peak wavelength (PWL) and sorted into one of the PWL bins defined below.

Color	PWL Group	Minimum PWL (nm) @ 350 mA	Maximum PWL (nm) @ 350 mA
Photo Red	P2	650	655
	P3	655	660
	P4	660	665
	P5	665	670
Far Red	F2	720	725
	F3	725	730
	F4	730	735
	F5	735	740

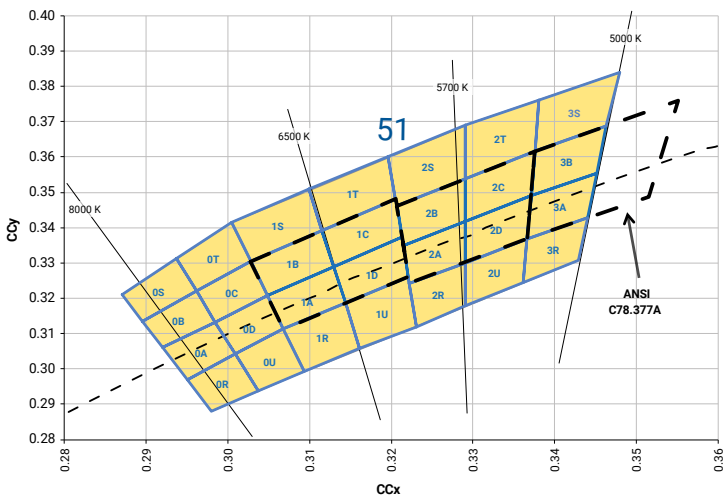
PERFORMANCE GROUPS - FORWARD VOLTAGE

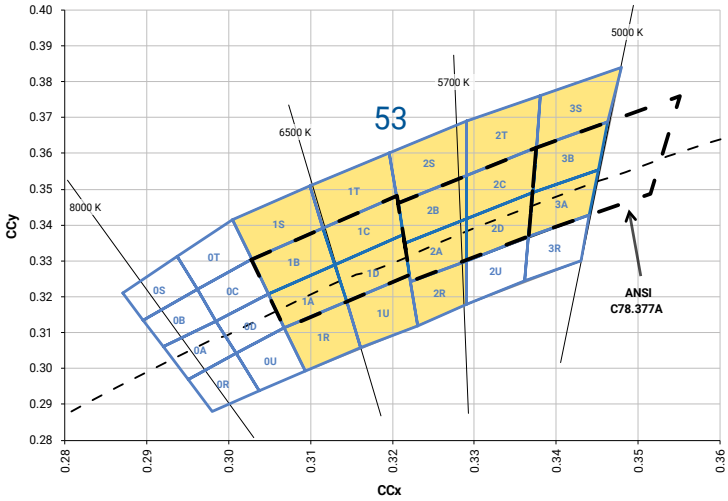
Amber, red-orange, red, photo red and far red XLamp XP-E2 LEDs are tested for forward voltage and sorted into one of the forward voltage bins defined below.

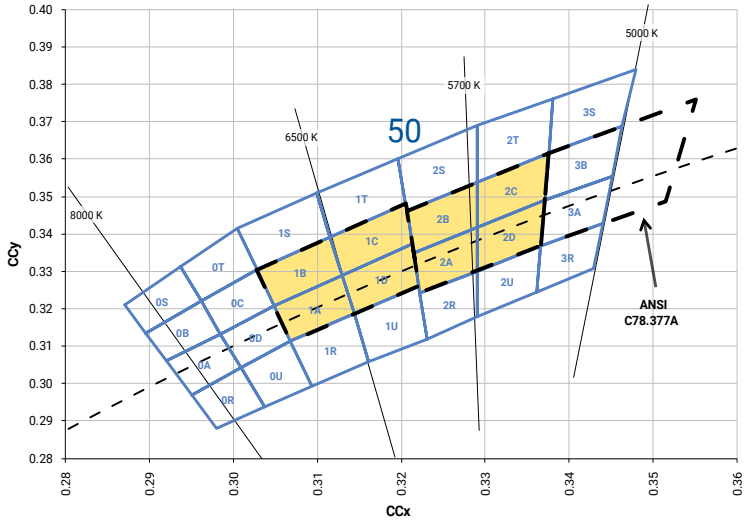
Forward Voltage Group	Minimum Forward Voltage (V) @ 350 mA	Maximum Forward Voltage (V) @ 350 mA
A	1.5	1.75
B	1.75	2.0
C	2.0	2.25
D	2.25	2.5
E	2.5	2.6

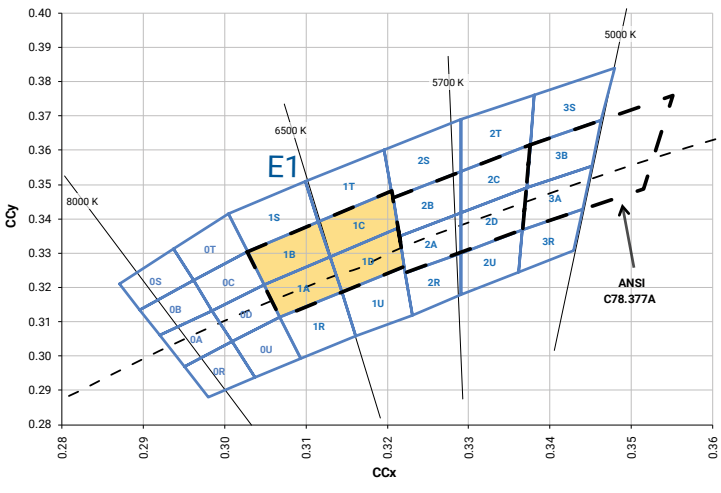
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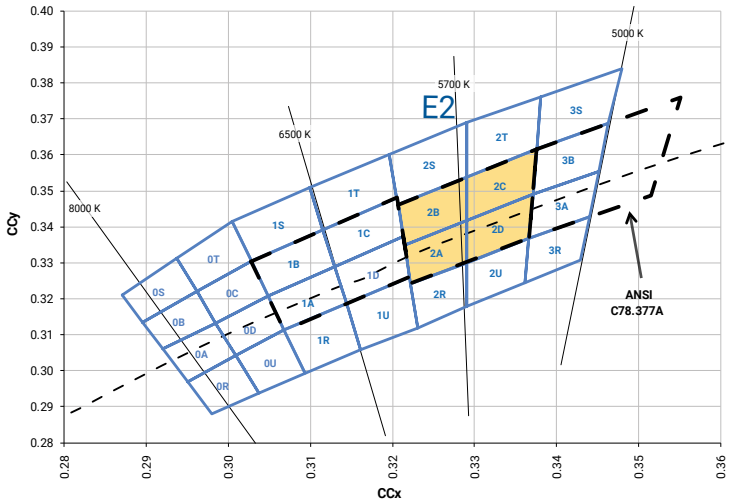
STANDARD COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS





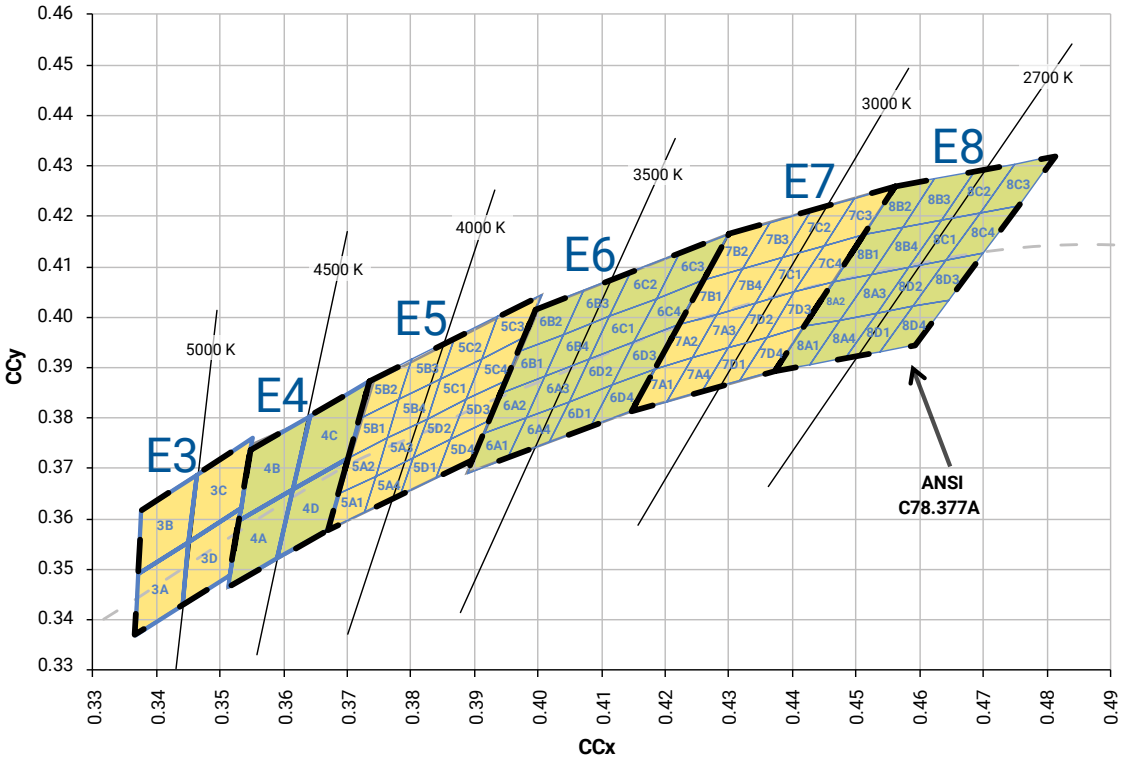


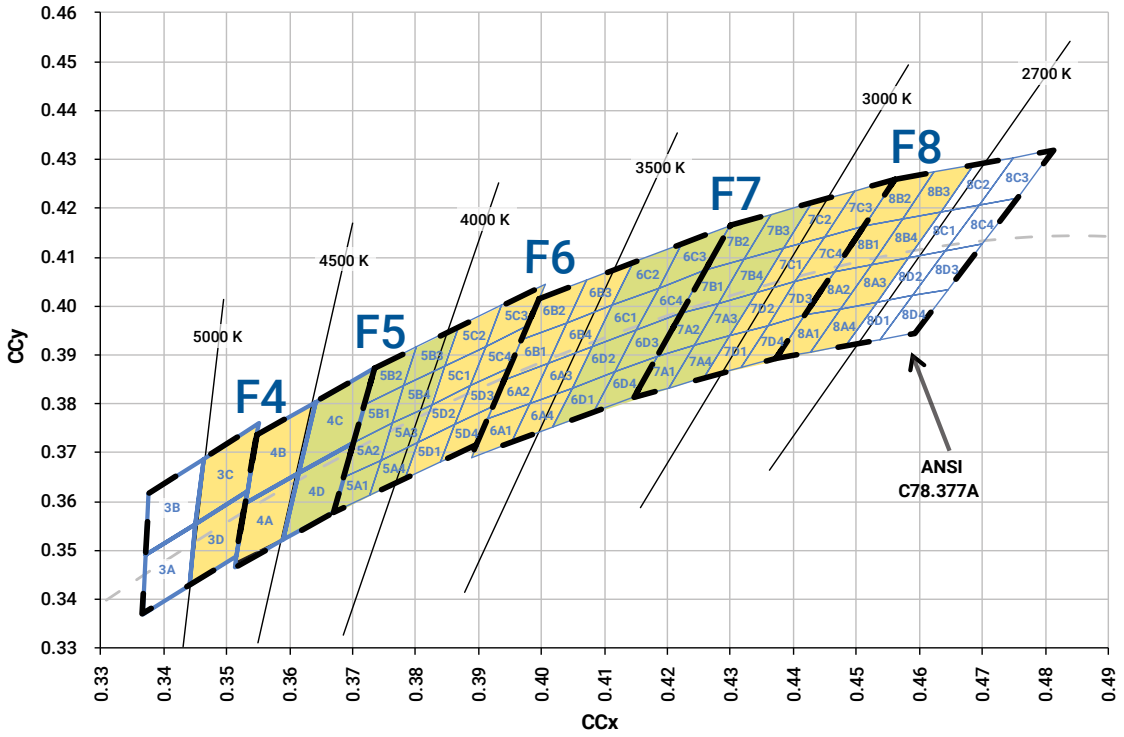




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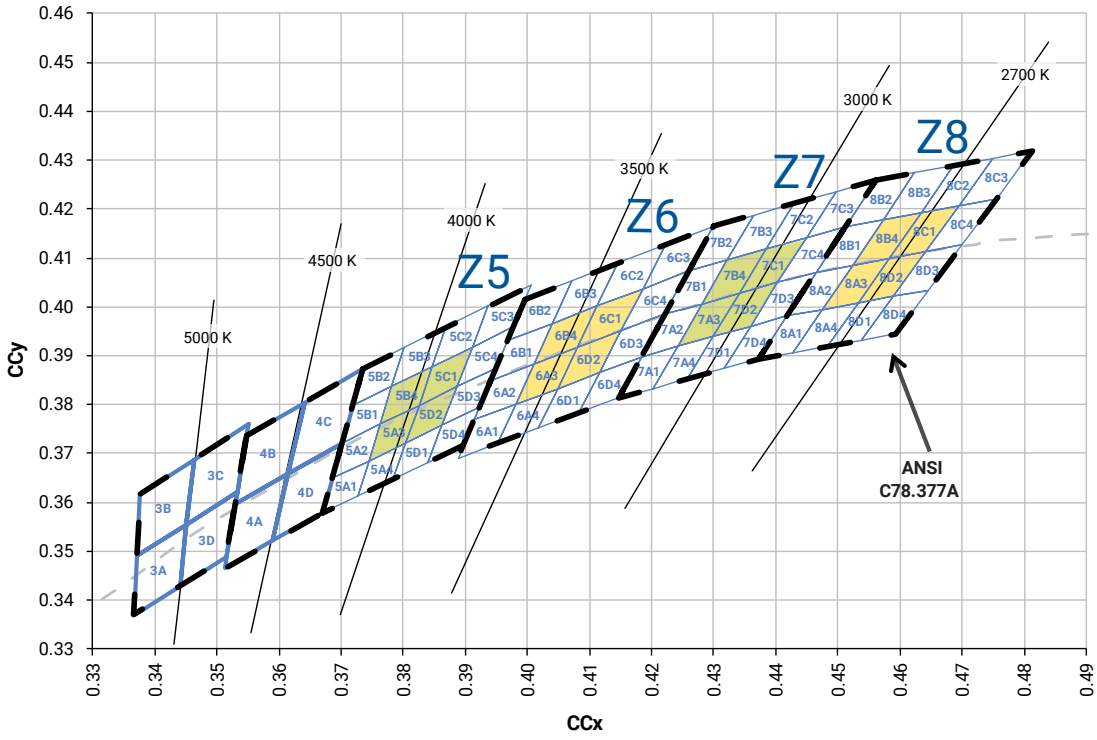
STANDARD WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



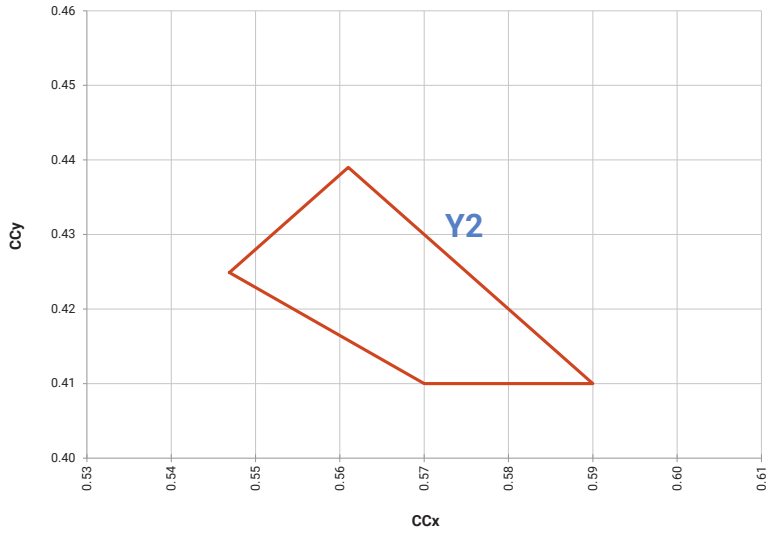


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STANDARD WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS - CONTINUED

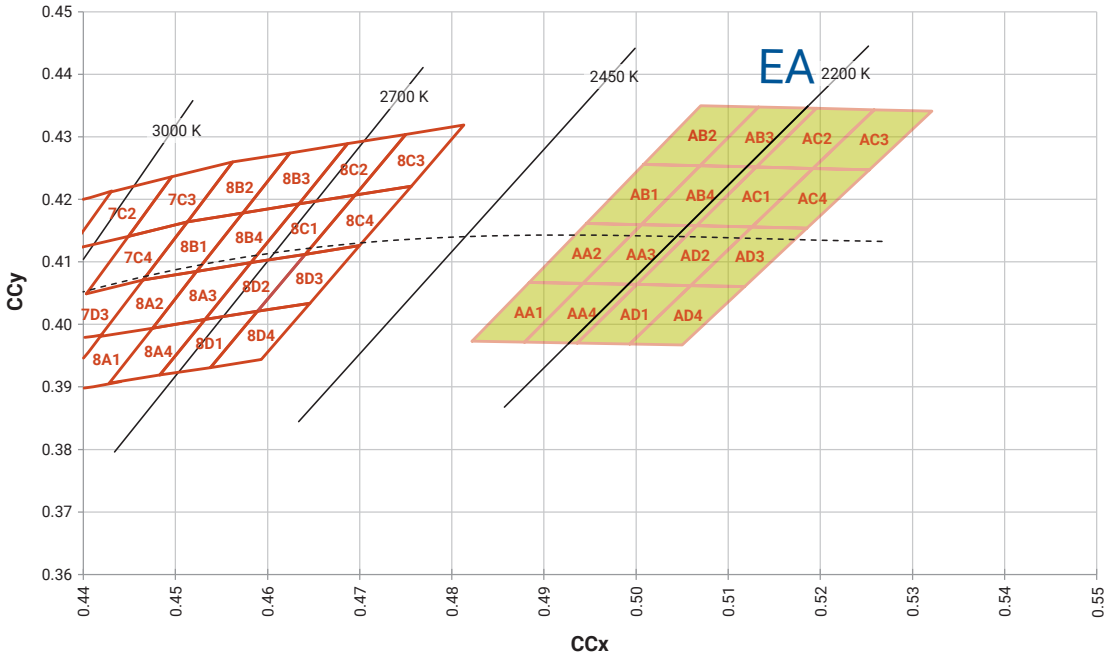


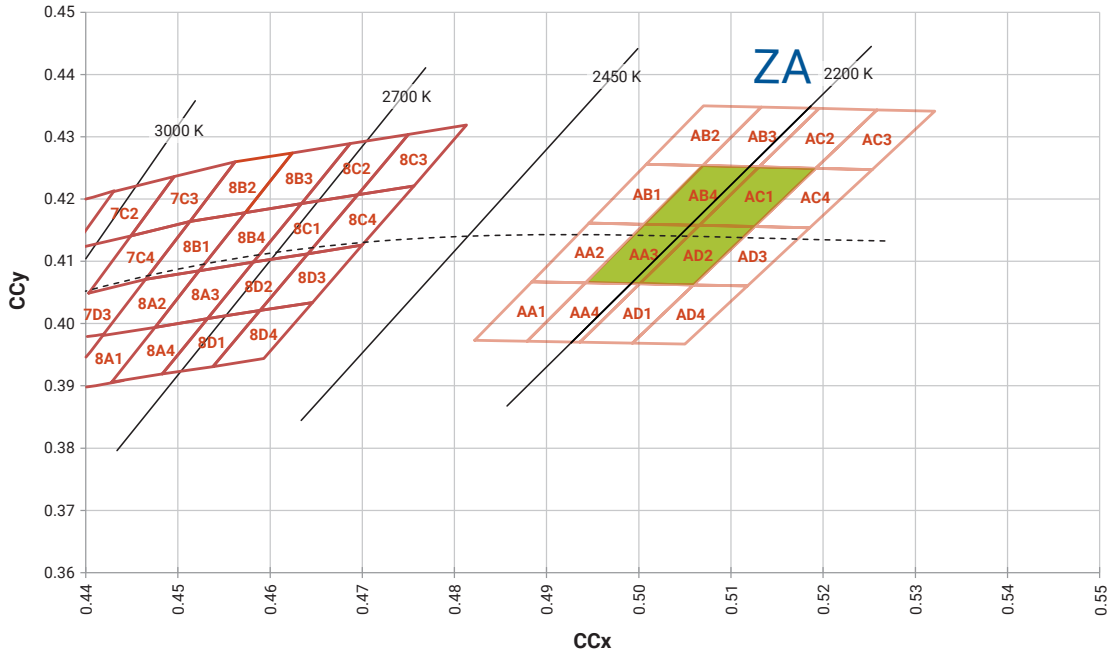
PC AMBER KIT PLOTTED ON THE 1931 CIE CURVE



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2200 K CCT WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS





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STANDARD CHROMATICITY KITS

The following table provides the chromaticity bins associated with chromaticity kits.

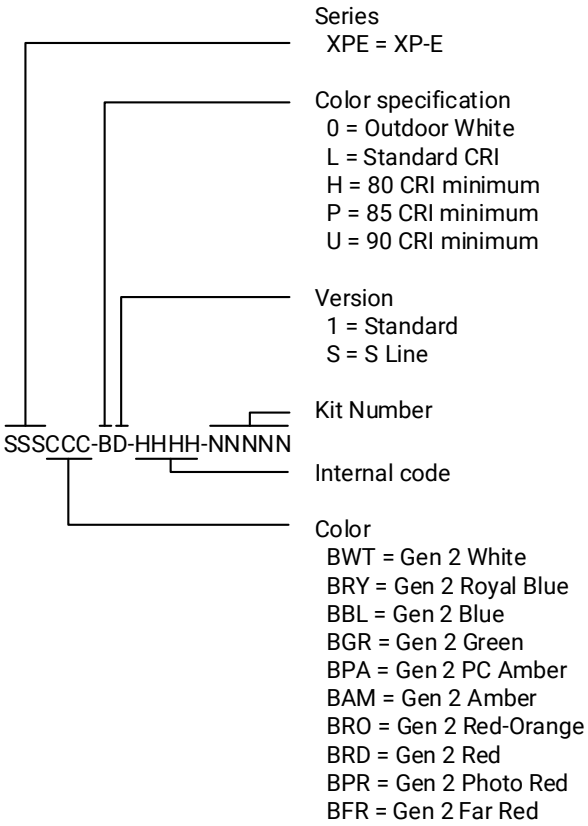
Color	CCT	Kit	Chromaticity Bins
Cool White	6200 K	51	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U, 3A, 3B, 3R, 3S
	6000 K	53	1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 3A, 3B, 3S
	6200 K	50	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D
	6500 K	E1	1A, 1B, 1C, 1D
	5700 K	E2	2A, 2B, 2C, 2D
Neutral White	5000 K	E3	3A, 3B, 3C, 3D
	4750 K	F4	3C, 3D, 4A, 4B
	4500 K	E4	4A, 4B, 4C, 4D
	4250 K	F5	4C, 4D, 5A1, 5A2, 5A3, 5A4, 5B1, 5B2, 5B3, 5B4
	4000 K	E5	5A1, 5A2, 5A3, 5A4, 5B1, 5B2, 5B3, 5B4, 5C1, 5C2, 5C3, 5C4, 5D1, 5D2, 5D3, 5D4
	4000 K	Z5	5A3, 5B4, 5C1, 5D2
Warm White	3750 K	F6	5C1, 5C2, 5C3, 5C4, 5D1, 5D2, 5D3, 5D4, 6A1, 6A2, 6A3, 6A4, 6B1, 6B2, 6B3, 6B4
	3500 K	E6	6A1, 6A2, 6A3, 6A4, 6B1, 6B2, 6B3, 6B4, 6C1, 6C2, 6C3, 6C4, 6D1, 6D2, 6D3, 6D4
	3500 K	Z6	6A3, 6B4, 6C1, 6D2
	3250 K	F7	6C1, 6C2, 6C3, 6C4, 6D1, 6D2, 6D3, 6D4, 7A1, 7A2, 7A3, 7A4, 7B1, 7B2, 7B3, 7B4
	3000 K	E7	7A1, 7A2, 7A3, 7A4, 7B1, 7B2, 7B3, 7B4, 7C1, 7C2, 7C3, 7C4, 7D1, 7D2, 7D3, 7D4
	3000 K	Z7	7A3, 7B4, 7C1, 7D2
	2850 K	F8	7C1, 7C2, 7C3, 7C4, 7D1, 7D2, 7D3, 7D4, 8A1, 8A2, 8A3, 8A4, 8B1, 8B2, 8B3, 8B4
	2700 K	E8	8A1, 8A2, 8A3, 8A4, 8B1, 8B2, 8B3, 8B4, 8C1, 8C2, 8C3, 8C4, 8D1, 8D2, 8D3, 8D4
	2700 K	Z8	8A3, 8B4, 8C1, 8D2
	2200 K	EA	AA1, AA2, AA3, AA4, AB1, AB2, AB3, AB4, AC1, AC2, AC3, AC4, AD1, AD2, AD3, AD4
	2200 K	ZA	AA3, AB4, AC1, AD2

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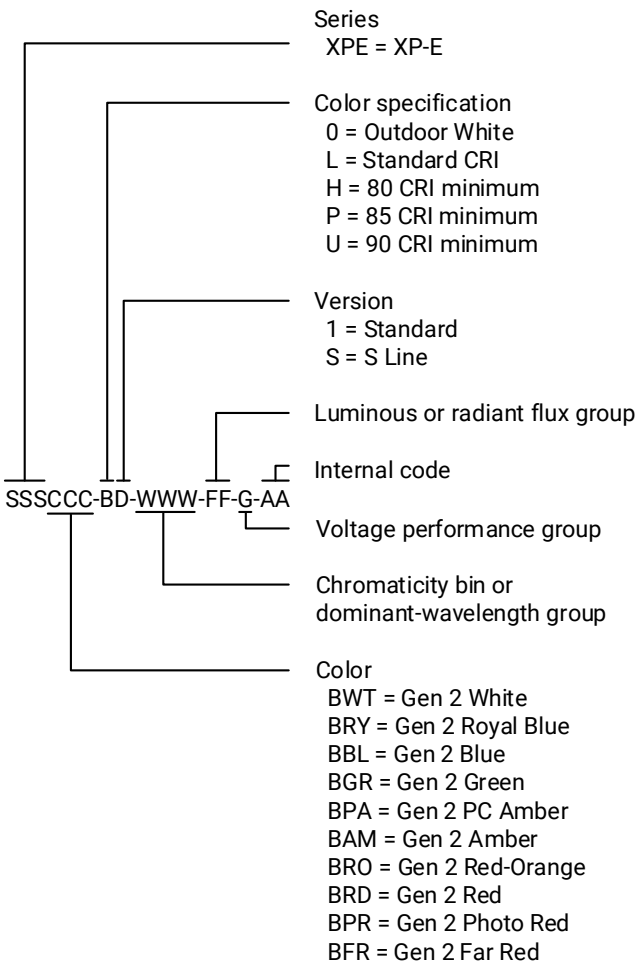
BIN AND ORDER CODE FORMATS

XP-E2 bin codes and order codes are configured in the following manner:

Order Code



Bin Code

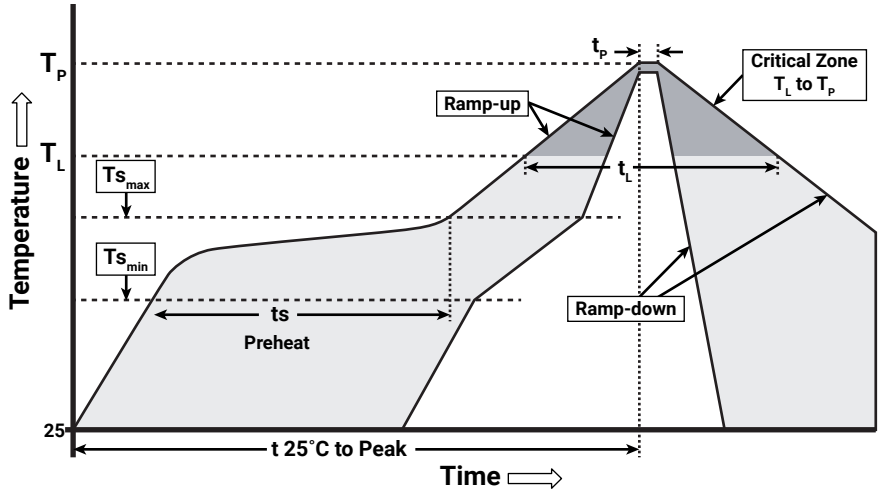


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REFLOW SOLDERING CHARACTERISTICS

In testing, Cree LED has found XLamp XP-E2 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.

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NOTES

Measurements

The luminous flux, radiant power, chromaticity, forward voltage and CRI measurements in this document are binning specifications only and solely represent product measurements as of the date of shipment. These measurements will change over time based on a number of factors that are not within Cree 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.

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 XP-E2 LEDs may be stored as MSL 1 per JEDEC J-STD-033, meaning they have unlimited floor life in conditions of ≤ 30 ºC/85% relative humidity (RH). Regardless of the storage condition, Cree 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.

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NOTES - CONTINUED

UL® Recognized Component

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

Vision Advisory

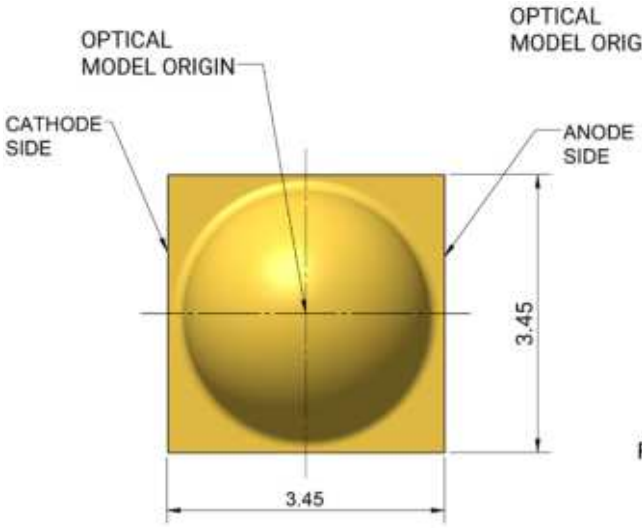
WARNING: Do not look at an exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the LED Eye Safety application note.

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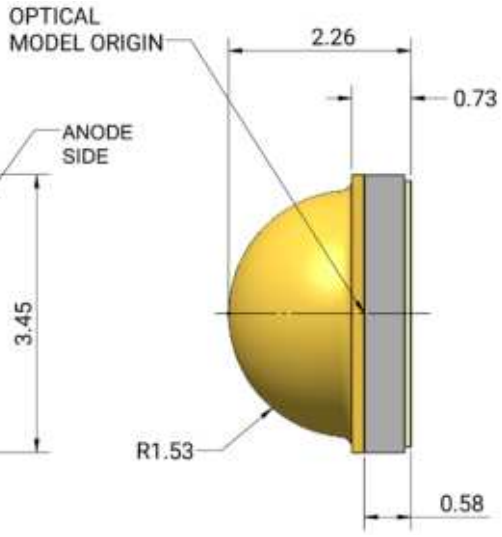
MECHANICAL DIMENSIONS

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

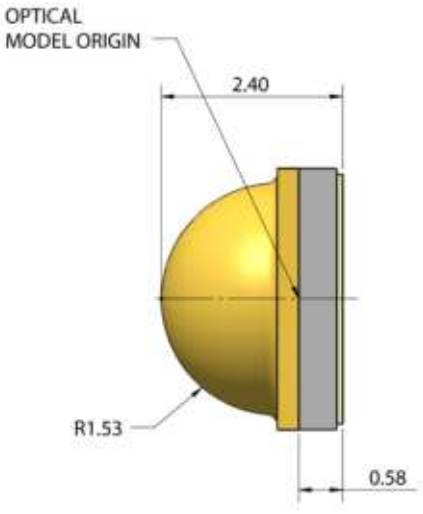
All measurements are ±.13 mm unless otherwise indicated.



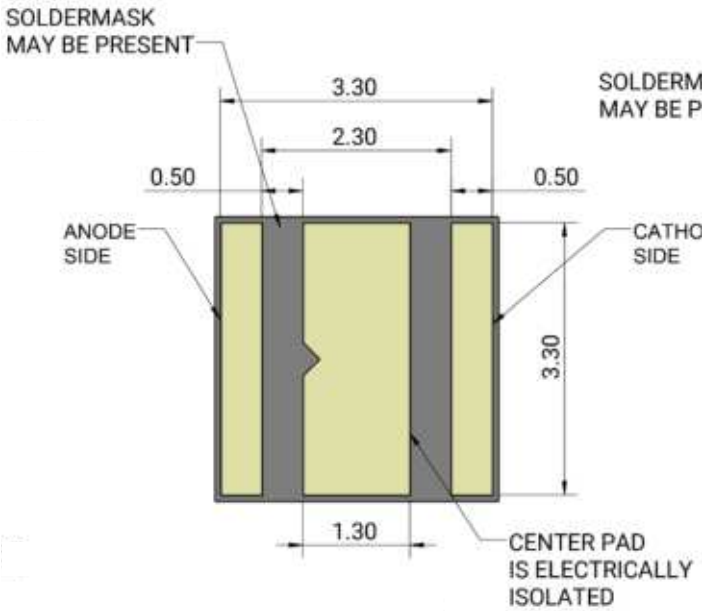
Top View



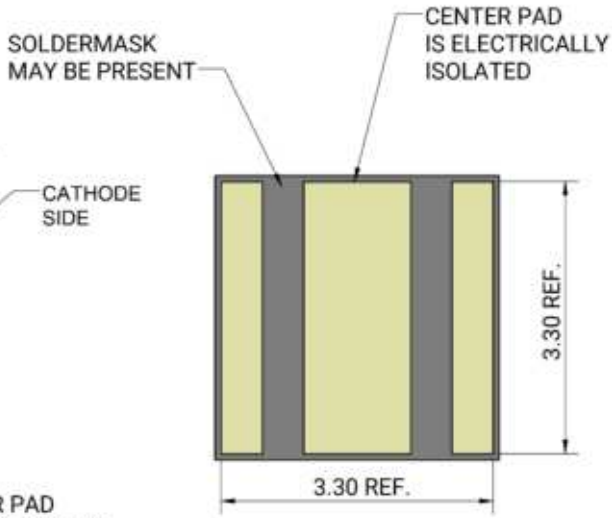
Side View



Side View - PC Amber



Bottom View



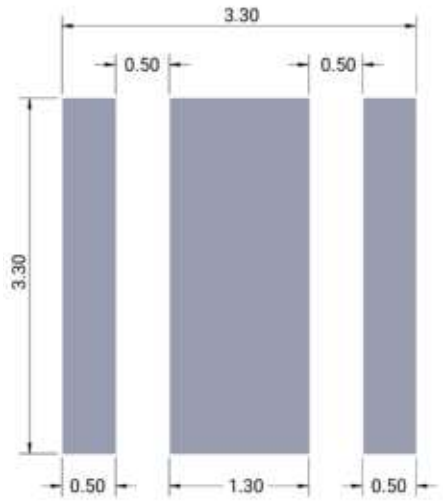
Alternate Bottom View

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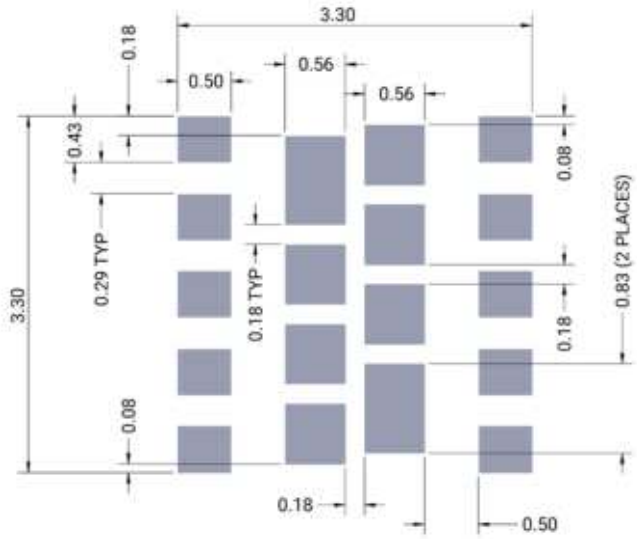
MECHANICAL DIMENSIONS - CONTINUED

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

All measurements are ±.13 mm unless otherwise indicated.



Recommended PCB Footprint



Recommended Stencil Opening

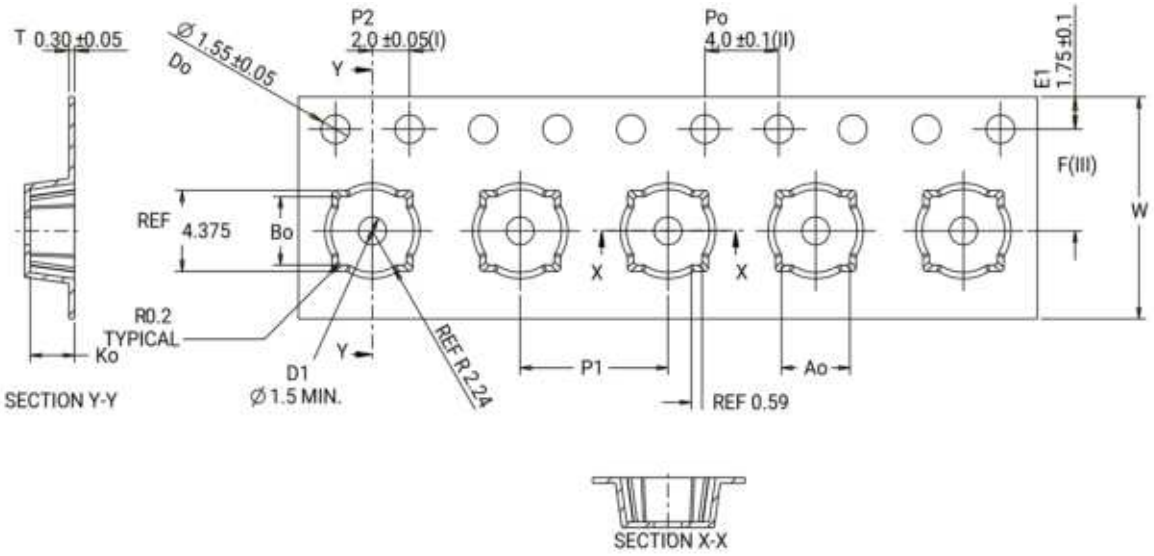
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TAPE AND REEL

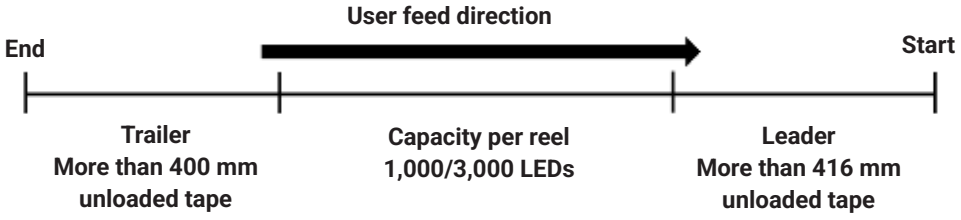
All Cree LED carrier tapes conform to EIA-481D, Automated Component Handling Systems Standard.

All dimensions in mm.

All measurements are ±.25 mm unless otherwise indicated.



Item	Ao	Bo	Ko	P1	F	W
Dimension	3.70±0.1	3.70±0.1	2.40+0.0 -0.1	8.00±0.1	5.50±0.1	12.00+0.3 -0.1

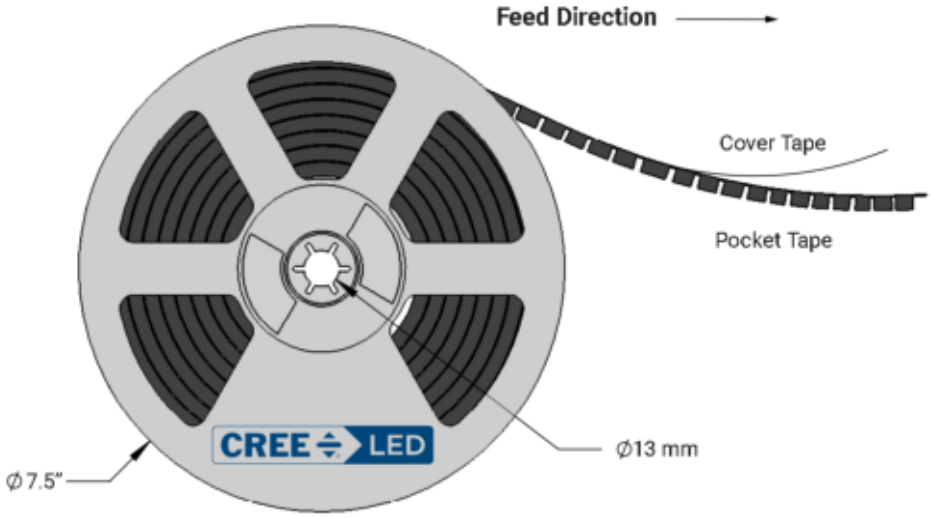


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TAPE AND REEL - CONTINUED

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

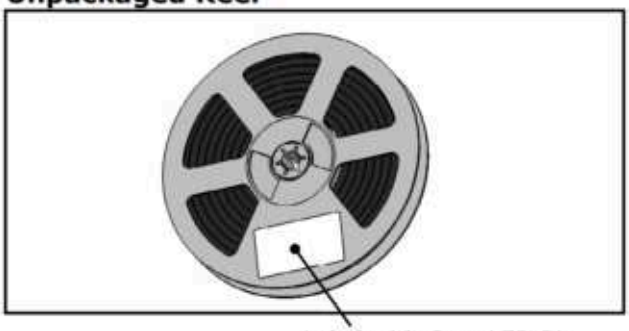
All dimensions in mm.



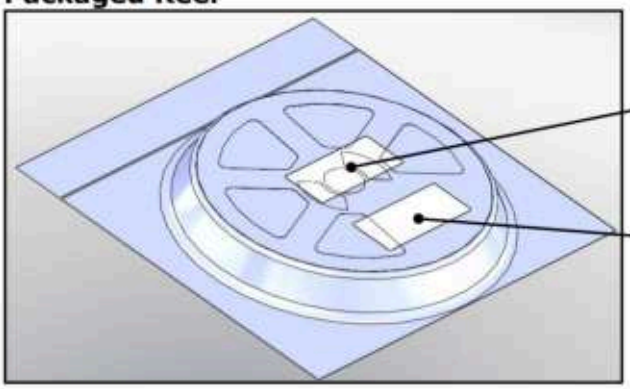
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PACKAGING

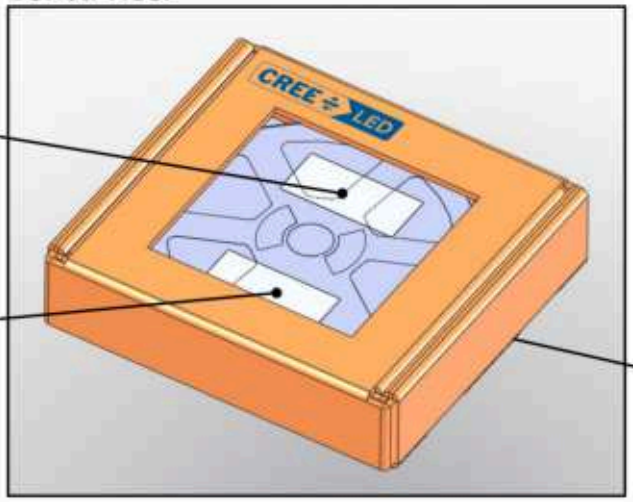
Unpackaged Reel



Packaged Reel



Boxed Reel



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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS

The following order codes are active and valid order codes, but higher performance options are also available. Please see page 5 for order codes of XLamp XP-E2 white LEDs that could serve as alternatives for the order codes set forth below.

Chromaticity		Minimum Luminous Flux @ 350 mA		Order Codes
Kit	CCT	Code	Flux (lm) @ 85 °C	70 CRI Typical
51	6200 K	R4	130	XPEBWT-L1-0000-00G51
		R3	122	XPEBWT-L1-0000-00F51
		R2	114	XPEBWT-L1-0000-00E51
		Q5	107	XPEBWT-L1-0000-00D51
		Q4	100	XPEBWT-L1-0000-00C51
53	6000 K	R4	130	XPEBWT-L1-0000-00G53
		R3	122	XPEBWT-L1-0000-00F53
		R2	114	XPEBWT-L1-0000-00E53
		Q5	107	XPEBWT-L1-0000-00D53
		Q4	100	XPEBWT-L1-0000-00C53
50	6200 K	R4	130	XPEBWT-L1-0000-00G50
		R3	122	XPEBWT-L1-0000-00F50
		R2	114	XPEBWT-L1-0000-00E50
		Q5	107	XPEBWT-L1-0000-00D50
		Q4	100	XPEBWT-L1-0000-00C50
E1	6500 K	R4	130	XPEBWT-L1-0000-00GE1
		R3	122	XPEBWT-L1-0000-00FE1
		R2	114	XPEBWT-L1-0000-00EE1
		Q5	107	XPEBWT-L1-0000-00DE1
		Q4	100	XPEBWT-L1-0000-00CE1
E2	5700 K	R4	130	XPEBWT-L1-0000-00GE2
		R3	122	XPEBWT-L1-0000-00FE2
		R2	114	XPEBWT-L1-0000-00EE2
		Q5	107	XPEBWT-L1-0000-00DE2
		Q4	100	XPEBWT-L1-0000-00CE2

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

The following order codes are active and valid order codes, but higher performance options are also available. Please see page 6 for order codes of XLamp XP-E2 white LEDs that could serve as alternatives for the order codes set forth below.

Chromaticity		Minimum Luminous Flux @ 350 mA		Order Codes		
Kit	CCT	Code	Flux (lm) @ 85 °C	70 CRI Typical	75 CRI Typical	80 CRI Minimum
E3	5000 K	R4	130	XPEBWT-01-0000-00GE3		
		R3	122	XPEBWT-01-0000-00FE3	XPEBWT-L1-0000-00FE3	
		R2	114	XPEBWT-01-0000-00EE3	XPEBWT-L1-0000-00EE3	
		Q5	107		XPEBWT-L1-0000-00DE3	
		Q4	100		XPEBWT-L1-0000-00CE3	
F4	4750 K	R3	122	XPEBWT-01-0000-00FF4	XPEBWT-L1-0000-00FF4	
		R2	114	XPEBWT-01-0000-00EF4	XPEBWT-L1-0000-00EF4	
		Q5	107		XPEBWT-L1-0000-00DF4	
		Q4	100		XPEBWT-L1-0000-00CF4	
E4	4500 K	R3	122	XPEBWT-01-0000-00FE4	XPEBWT-L1-0000-00FE4	
		R2	114	XPEBWT-01-0000-00EE4	XPEBWT-L1-0000-00EE4	
		Q5	107		XPEBWT-L1-0000-00DE4	
		Q4	100		XPEBWT-L1-0000-00CE4	
F5	4250 K	R3	122	XPEBWT-01-0000-00FF5		
		R2	114	XPEBWT-01-0000-00EF5	XPEBWT-L1-0000-00EF5	
		Q5	107	XPEBWT-01-0000-00DF5	XPEBWT-L1-0000-00DF5	
		Q4	100		XPEBWT-L1-0000-00CF5	
		Q3	93.9		XPEBWT-L1-0000-00BF5	
E5	4000 K	R3	122	XPEBWT-01-0000-00FE5		
		R2	114	XPEBWT-01-0000-00EE5	XPEBWT-L1-0000-00EE5	XPEBWT-H1-0000-00EE5
		Q5	107	XPEBWT-01-0000-00DE5	XPEBWT-L1-0000-00DE5	XPEBWT-H1-0000-00DE5
		Q4	100		XPEBWT-L1-0000-00CE5	XPEBWT-H1-0000-00CE5
		Q3	93.9		XPEBWT-L1-0000-00BE5	XPEBWT-H1-0000-00BE5
Z5	4000 K	Q5	107		XPEBWT-L1-0000-00DZ5	XPEBWT-H1-0000-00DZ5
		Q4	100		XPEBWT-L1-0000-00CZ5	XPEBWT-H1-0000-00CZ5
		Q3	93.9		XPEBWT-L1-0000-00BZ5	XPEBWT-H1-0000-00BZ5

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

The following order codes are active and valid order codes, but higher performance options are also available. Please see page 7 - page 9 for order codes of XLamp XP-E2 white LEDs that could serve as alternatives for the order codes set forth below.

Chromaticity		Minimum Luminous Flux @ 350 mA		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	70 CRI Typical	80 CRI Typical	80 CRI Minimum	85 CRI Minimum	90 CRI Minimum
F6	3750 K	R2	114	XPEBWT-01-0000-00EF6				
		Q5	107	XPEBWT-01-0000-00DF6	XPEBWT-L1-0000-00DF6	XPEBWT-H1-0000-00DF6		
		Q4	100		XPEBWT-L1-0000-00CF6	XPEBWT-H1-0000-00CF6		
		Q3	93.9		XPEBWT-L1-0000-00BF6	XPEBWT-H1-0000-00BF6		
		Q2	87.4		XPEBWT-L1-0000-00AF6	XPEBWT-H1-0000-00AF6		
E6	3500 K	R2	114	XPEBWT-01-0000-00EE6				
		Q5	107	XPEBWT-01-0000-00DE6	XPEBWT-L1-0000-00DE6	XPEBWT-H1-0000-00DE6		
		Q4	100		XPEBWT-L1-0000-00CE6	XPEBWT-H1-0000-00CE6		
		Q3	93.9		XPEBWT-L1-0000-00BE6	XPEBWT-H1-0000-00BE6		
		Q2	87.4		XPEBWT-L1-0000-00AE6	XPEBWT-H1-0000-00AE6		
Z6	3500 K	Q4	100		XPEBWT-L1-0000-00CZ6	XPEBWT-H1-0000-00CZ6		
		Q3	93.9		XPEBWT-L1-0000-00BZ6	XPEBWT-H1-0000-00BZ6		
		Q2	87.4		XPEBWT-L1-0000-00AZ6	XPEBWT-H1-0000-00AZ6		
F7	3250 K	R2	114	XPEBWT-01-0000-00EF7				
		Q5	107	XPEBWT-01-0000-00DF7	XPEBWT-L1-0000-00DF7	XPEBWT-H1-0000-00DF7		
		Q4	100		XPEBWT-L1-0000-00CF7	XPEBWT-H1-0000-00CF7		
		Q3	93.9		XPEBWT-L1-0000-00BF7	XPEBWT-H1-0000-00BF7		
		Q2	87.4		XPEBWT-L1-0000-00AF7	XPEBWT-H1-0000-00AF7		
E7	3000 K	R2	114	XPEBWT-01-0000-00EE7				
		Q5	107	XPEBWT-01-0000-00DE7	XPEBWT-L1-0000-00DE7	XPEBWT-H1-0000-00DE7		
		Q4	100		XPEBWT-L1-0000-00CE7	XPEBWT-H1-0000-00CE7		
		Q3	93.9		XPEBWT-L1-0000-00BE7	XPEBWT-H1-0000-00BE7		
		Q2	87.4		XPEBWT-L1-0000-00AE7	XPEBWT-H1-0000-00AE7	XPEBWT-P1-0000-00AE7	XPEBWT-U1-0000-00AE7
		P4	80.6				XPEBWT-P1-0000-009E7	XPEBWT-U1-0000-009E7
		P3	73.9				XPEBWT-P1-0000-008E7	XPEBWT-U1-0000-008E7
		P2	67.2				XPEBWT-P1-0000-007E7	XPEBWT-U1-0000-007E7
Z7	3000 K	Q4	100		XPEBWT-L1-0000-00CZ7	XPEBWT-H1-0000-00CZ7		
		Q3	93.9		XPEBWT-L1-0000-00BZ7	XPEBWT-H1-0000-00BZ7		
		Q2	87.4		XPEBWT-L1-0000-00AZ7	XPEBWT-H1-0000-00AZ7	XPEBWT-P1-0000-00AZ7	
		P4	80.6				XPEBWT-P1-0000-009Z7	XPEBWT-U1-0000-009Z7
		P3	73.9				XPEBWT-P1-0000-008Z7	XPEBWT-U1-0000-008Z7
		P2	67.2				XPEBWT-P1-0000-007Z7	XPEBWT-U1-0000-007Z7

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

Chromaticity		Minimum Luminous Flux @ 350 mA		Order Codes				
Kit	CCT	Code	Flux (lm) @ 85 °C	70 CRI Typical	80 CRI Typical	80 CRI Minimum	85 CRI Minimum	90 CRI Minimum
F8	2850 K	Q4	100		XPEBWT-L1-0000-00CF8	XPEBWT-H1-0000-00CF8		
		Q3	93.9		XPEBWT-L1-0000-00BF8	XPEBWT-H1-0000-00BF8		
		Q2	87.4		XPEBWT-L1-0000-00AF8	XPEBWT-H1-0000-00AF8	XPEBWT-P1-0000-00AF8	
		P4	80.6		XPEBWT-L1-0000-009F8	XPEBWT-H1-0000-009F8	XPEBWT-P1-0000-009F8	XPEBWT-U1-0000-009F8
		P3	73.9				XPEBWT-P1-0000-008F8	XPEBWT-U1-0000-008F8
		P2	67.2				XPEBWT-P1-0000-007F8	XPEBWT-U1-0000-007F8
		N4	62				XPEBWT-P1-0000-006F8	XPEBWT-U1-0000-006F8
E8	2700 K	Q4	100		XPEBWT-L1-0000-00CE8	XPEBWT-H1-0000-00CE8		
		Q3	93.9		XPEBWT-L1-0000-00BE8	XPEBWT-H1-0000-00BE8		
		Q2	87.4		XPEBWT-L1-0000-00AE8	XPEBWT-H1-0000-00AE8		
		P4	80.6		XPEBWT-L1-0000-009E8	XPEBWT-H1-0000-009E8	XPEBWT-P1-0000-009E8	XPEBWT-U1-0000-009E8
		P3	73.9				XPEBWT-P1-0000-008E8	XPEBWT-U1-0000-008E8
		P2	67.2				XPEBWT-P1-0000-007E8	XPEBWT-U1-0000-007E8
		N4	62				XPEBWT-P1-0000-006E8	XPEBWT-U1-0000-006E8
Z8	2700 K	Q3	93.9		XPEBWT-L1-0000-00BZ8	XPEBWT-H1-0000-00BZ8		
		Q2	87.4		XPEBWT-L1-0000-00AZ8	XPEBWT-H1-0000-00AZ8		
		P4	80.6		XPEBWT-L1-0000-009Z8	XPEBWT-H1-0000-009Z8	XPEBWT-P1-0000-009Z8	
		P3	73.9				XPEBWT-P1-0000-008Z8	XPEBWT-U1-0000-008Z8
		P2	67.2				XPEBWT-P1-0000-007Z8	XPEBWT-U1-0000-007Z8
		N4	62				XPEBWT-P1-0000-006Z8	XPEBWT-U1-0000-006Z8
EA	2200 K	P2	67.2		XPEBWT-L1-0000-007EA	XPEBWT-H1-0000-007EA		
		N4	62		XPEBWT-L1-0000-006EA	XPEBWT-H1-0000-006EA		
ZA	2200 K	P2	67.2		XPEBWT-L1-0000-007ZA	XPEBWT-H1-0000-007ZA		
		N4	62		XPEBWT-L1-0000-006ZA	XPEBWT-H1-0000-006ZA		

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

The following order codes are active and valid order codes, but higher performance options are also available. Please see page 10 - page 11 for order codes of XLamp XP-E2 color LEDs that could serve as alternatives for the order codes set forth below.

Color	Minimum Radiant Flux @ 350 mA		Calculated Minimum PPF (µmol/s)*	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	DWL (nm)	Group	DWL (nm)	
Royal Blue	34	550	2.08	D3	450	D5	465	XPEBRY-L1-0000-00N01
				D3	450	D4	460	XPEBRY-L1-0000-00N02
				D4	455	D5	465	XPEBRY-L1-0000-00N03
	35	575	2.18	D3	450	D5	465	XPEBRY-L1-0000-00P01
				D3	450	D4	460	XPEBRY-L1-0000-00P02
				D4	455	D5	465	XPEBRY-L1-0000-00P03
	36	600	2.27	D3	450	D5	465	XPEBRY-L1-0000-00Q01
				D3	450	D4	460	XPEBRY-L1-0000-00Q02
				D4	455	D5	465	XPEBRY-L1-0000-00Q03
	37	625	2.37	D3	450	D5	465	XPEBRY-L1-0000-00R01
				D3	450	D4	460	XPEBRY-L1-0000-00R02
				D4	455	D5	465	XPEBRY-L1-0000-00R03

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Blue	K3	35.2	B3	465	B6	485	XPEBBL-L1-0000-00Z01
			B3	465	B5	480	XPEBBL-L1-0000-00Z02
			B4	470	B5	480	XPEBBL-L1-0000-00Z05

Color	Minimum Luminous Flux (lm) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (lm)		Group	DWL (nm)	Group	DWL (nm)	
Green	S2	148	1.34	G2	520	G4	535	XPEBGR-L1-0000-00J01
				G2	520	G3	530	XPEBGR-L1-0000-00J02
				G3	525	G4	535	XPEBGR-L1-0000-00J03

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

* Calculated Photosynthetic Photon Flux (PPF) and Far-Red Photon Flux (PF_{FR}) values are for reference only.

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

The following order codes are active and valid order codes, but higher performance options are also available. Please see page 12 - page 13 for order codes of XLamp XP-E2 color LEDs that could serve as alternatives for the order codes set forth below.

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	Q2	87.4	XPEBPA-L1-0000-00A01

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Amber	P3	73.9	A2	585	A3	595	XPEBAM-L1-0000-00801
			A2	585	A2	590	XPEBAM-L1-0000-00802
			A3	590	A3	595	XPEBAM-L1-0000-00803

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Red-Orange	Q2	87.4	O3	610	O4	620	XPEBRO-L1-0000-00A01
			O3	610	O3	615	XPEBRO-L1-0000-00A02
	Q3	93.9	O3	610	O4	620	XPEBRO-L1-0000-00B01
			O4	615	O4	620	XPEBRO-L1-0000-00B02

Color	Minimum Luminous Flux (lm) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (lm)		Group	DWL (nm)	Group	DWL (nm)	
Red	N3	56.8	1.48	R2	620	R3	630	XPEBRD-L1-0000-00501
				R2	620	R2	625	XPEBRD-L1-0000-00502
	N4	62	1.61	R2	620	R3	630	XPEBRD-L1-0000-00601
				R2	620	R2	625	XPEBRD-L1-0000-00602

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

The following order codes are active and valid order codes, but higher performance options are also available. Please see page 13 for order codes of XLamp XP-E2 color LEDs that could serve as alternatives for the order codes set forth below.

Color	Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Peak Wavelength (nm)				Color Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	PWL (nm)	Group	PWL (nm)	
Photo Red	*29*	*425*	*2.3*	*P2*	*650*	*P5*	*670*	*XPEBPR-L1-0000-00C01*

Color	Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PF_{FR} (µmol/s)*	Peak Wavelength (nm)				Color Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	PWL (nm)	Group	PWL (nm)	
Far Red	*26*	*350*	*2.0*	*F2*	*720*	*F5*	*740*	*XPEBFR-L1-0000-00901*

Note:

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 36).

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