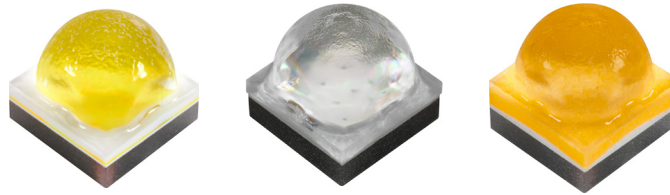
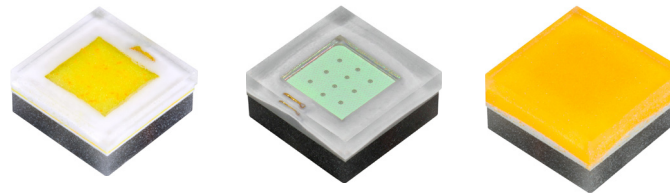


XLamp® XQ-E Plus LEDs



XQ-E Plus High Density LEDs



XQ-E Plus High Intensity LEDs

PRODUCT DESCRIPTION

The XLamp® XQ-E Plus LEDs are available in two versions: High Density and High Intensity. The XQ-E Plus High Density LED enables lighting manufacturers to significantly reduce the size and total cost of their LED luminaires versus similar performance 3.5-mm footprint LEDs, without sacrificing lumen output, efficacy or reliability. The XQ-E Plus's combination of optical symmetry, consistent design across all configurations and tiny 1.6 mm X 1.6 mm footprint simplifies manufacturing and design while providing excellent color mixing.

The new XQ-E Plus High Intensity LED uses an innovative primary optic design optimized to deliver maximum candela, especially through narrow-beam secondary optics.

FEATURES

- Cree LED's smallest lighting class LED: 1.6 mm X 1.6 mm
- Available in High Density & High Intensity versions for design flexibility
- Available in white, royal blue, blue, green, & PC amber
- Maximum drive current: 1.5 A (High Density & High Intensity)
- Reflow solderable - JEDEC J-STD-020C compatible
- Unlimited floor life at $\leq 30^{\circ}\text{C}/85\%\text{RH}$

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XLAMP XQ-E PLUS LEDs - WHITE

CHARACTERISTICS - HIGH DENSITY WHITE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point ^o	°C/W		2.7	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 85 °C)	V		2.75	3.1
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY WHITE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point ^o	°C/W		2.7	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 85 °C)	V		2.75	3.1
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.

FLUX CHARACTERISTICS - HIGH DENSITY WHITE ($T_j = 85^\circ\text{C}$)

The following tables provide order codes for XLamp XQ-E Plus High Density white LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

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
ANSI Cool White								
51	6200 K	S2	148	162	262	343	XQEAWT-00-0000-P00000J51	XQEAWT-00-0000-P0000BJ51
		R5	139	152	246	322	XQEAWT-00-0000-P00000H51	XQEAWT-00-0000-P0000BH51
		R4	130	142	230	301	XQEAWT-00-0000-P00000G51	XQEAWT-00-0000-P0000BG51
		R3	122	133	216	283	XQEAWT-00-0000-P00000F51	XQEAWT-00-0000-P0000BF51
53	6000 K	S2	148	162	262	343	XQEAWT-00-0000-P00000J53	XQEAWT-00-0000-P0000BJ53
		R5	139	152	246	322	XQEAWT-00-0000-P00000H53	XQEAWT-00-0000-P0000BH53
		R4	130	142	230	301	XQEAWT-00-0000-P00000G53	XQEAWT-00-0000-P0000BG53
		R3	122	133	216	283	XQEAWT-00-0000-P00000F53	XQEAWT-00-0000-P0000BF53
50	6200 K	S2	148	162	262	343	XQEAWT-00-0000-P00000J50	XQEAWT-00-0000-P0000BJ50
		R5	139	152	246	322	XQEAWT-00-0000-P00000H50	XQEAWT-00-0000-P0000BH50
		R4	130	142	230	301	XQEAWT-00-0000-P00000G50	XQEAWT-00-0000-P0000BG50
		R3	122	133	216	283	XQEAWT-00-0000-P00000F50	XQEAWT-00-0000-P0000BF50
E1	6500 K	R5	139	152	246	322	XQEAWT-00-0000-P00000HE1	XQEAWT-00-0000-P0000BHE1
		R4	130	142	230	301	XQEAWT-00-0000-P00000GE1	XQEAWT-00-0000-P0000BGE1
		R3	122	133	216	283	XQEAWT-00-0000-P00000FE1	XQEAWT-00-0000-P0000BFE1
F2	5750 K	S2	148	162	262	343	XQEAWT-00-0000-P00000JF2	
		R5	139	152	246	322	XQEAWT-00-0000-P00000HF2	
		R4	130	142	230	301	XQEAWT-00-0000-P00000GF2	
		R3	122	133	216	283	XQEAWT-00-0000-P00000FF2	
E2	5700 K	S2	148	162	262	343	XQEAWT-00-0000-P00000JE2	XQEAWT-00-0000-P0000BJE2
		R5	139	152	246	322	XQEAWT-00-0000-P00000HE2	XQEAWT-00-0000-P0000BHE2
		R4	130	142	230	301	XQEAWT-00-0000-P00000GE2	XQEAWT-00-0000-P0000BGE2
		R3	122	133	216	283	XQEAWT-00-0000-P00000FE2	XQEAWT-00-0000-P0000BFE2

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH DENSITY WHITE ($T_j = 85^\circ\text{C}$) - 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
ANSI Neutral White									
F3	5250 K	R5	139	152	246	322	XQEAWT-00-0000-P00000HF3		
		R4	130	142	230	301	XQEAWT-00-0000-P00000GF3		
		R3	122	133	216	283	XQEAWT-00-0000-P00000FF3		
E3	5000 K	R5	139	152	246	322	XQEAWT-00-0000-P00000HE3	XQEAWT-00-0000-P0000BHE3	
		R4	130	142	230	301	XQEAWT-00-0000-P00000GE3	XQEAWT-00-0000-P0000BGE3	
		R3	122	133	216	283	XQEAWT-00-0000-P00000FE3	XQEAWT-00-0000-P0000BFE3	
F4	4750 K	R5	139	152	246	322		XQEAWT-00-0000-P0000BHF4	
		R4	130	142	230	301		XQEAWT-00-0000-P0000BGF4	
		R3	122	133	216	283		XQEAWT-00-0000-P0000BFF4	
E4	4500 K	R5	139	152	246	322		XQEAWT-00-0000-P0000BHE4	
		R4	130	142	230	301		XQEAWT-00-0000-P0000BGE4	
		R3	122	133	216	283		XQEAWT-00-0000-P0000BFE4	
F5	4250 K	R5	139	152	246	322		XQEAWT-00-0000-P0000BHF5	
		R4	130	142	230	301		XQEAWT-00-0000-P0000BGF5	
		R3	122	133	216	283		XQEAWT-00-0000-P0000BFF5	XQEAWT-00-0000-P0000HFF5
		R2	114	125	202	264			XQEAWT-00-0000-P0000HEF5
		Q5	107	117	189	248			XQEAWT-00-0000-P0000HDF5
		Q4	100	109	177	232			XQEAWT-00-0000-P0000HCF5
E5	4000 K	R5	139	152	246	322		XQEAWT-00-0000-P0000BHE5	
		R4	130	142	230	301		XQEAWT-00-0000-P0000BGE5	
		R3	122	133	216	283		XQEAWT-00-0000-P0000BFE5	XQEAWT-00-0000-P0000HFE5
		R2	114	125	202	264			XQEAWT-00-0000-P0000HEE5
		Q5	107	117	189	248			XQEAWT-00-0000-P0000HDE5
		Q4	100	109	177	232			XQEAWT-00-0000-P0000HCE5

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25°C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH DENSITY WHITE ($T_J = 85^\circ\text{C}$) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**			
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	80 CRI Minimum	90 CRI Minimum
ANSI Warm White								
F6	3750 K	R3	122	133	216	283	XQEAWT-00-0000-P0000HFF6	
		R2	114	125	202	264	XQEAWT-00-0000-P0000HEF6	
		Q5	107	117	189	248	XQEAWT-00-0000-P0000HDF6	
		Q4	100	109	177	232	XQEAWT-00-0000-P0000HCF6	
E6	3500 K	R3	122	133	216	283	XQEAWT-00-0000-P0000HFE6	
		R2	114	125	202	264	XQEAWT-00-0000-P0000HEE6	
		Q5	107	117	189	248	XQEAWT-00-0000-P0000HDE6	
		Q4	100	109	177	232	XQEAWT-00-0000-P0000HCE6	
		Q3	93.9	103	166	218		XQEAWT-00-0000-P0000UBE6
		Q2	87.4	96	155	202		XQEAWT-00-0000-P0000UAE6
		P4	80.6	88	143	187		XQEAWT-00-0000-P0000U9E6
F7	3250 K	R3	122	133	216	283	XQEAWT-00-0000-P0000HFF7	
		R2	114	125	202	264	XQEAWT-00-0000-P0000HEF7	
		Q5	107	117	189	248	XQEAWT-00-0000-P0000HDF7	
		Q4	100	109	177	232	XQEAWT-00-0000-P0000HCF7	
		Q3	93.9	103	166	218		XQEAWT-00-0000-P0000UBF7
		Q2	87.4	96	155	202		XQEAWT-00-0000-P0000UAF7
		P4	80.6	88	143	187		XQEAWT-00-0000-P0000U9F7
E7	3000 K	R2	114	125	202	264	XQEAWT-00-0000-P0000HEE7	
		Q5	107	117	189	248	XQEAWT-00-0000-P0000HDE7	
		Q4	100	109	177	232	XQEAWT-00-0000-P0000HCE7	
		Q3	93.9	103	166	218		XQEAWT-00-0000-P0000UBE7
		Q2	87.4	96	155	202		XQEAWT-00-0000-P0000UAE7
		P4	80.6	88	143	187		XQEAWT-00-0000-P0000U9E7

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH DENSITY WHITE ($T_J = 85^\circ\text{C}$) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA			Calculated Minimum Luminous Flux (lm) @ 85 °C**			
Kit	CCT	Code	Flux (lm) @ 85 °C	Flux (lm) @ 25 °C*	700 mA	1.0 A	80 CRI Minimum	90 CRI Minimum
ANSI Warm White								
F8	2850 K	R2	114	125	202	264	XQEAWT-00-0000-P0000HEF8	
		Q5	107	117	189	248	XQEAWT-00-0000-P0000HDF8	
		Q4	100	109	177	232	XQEAWT-00-0000-P0000HCF8	
		Q3	93.9	103	166	218	XQEAWT-00-0000-P0000HBF8	XQEAWT-00-0000-P0000UBF8
		Q2	87.4	96	155	202		XQEAWT-00-0000-P0000UAF8
		P4	80.6	88	143	187		XQEAWT-00-0000-P0000U9F8
		P3	73.9	81	131	171		XQEAWT-00-0000-P0000U8F8
E8	2700 K	Q5	107	117	189	248	XQEAWT-00-0000-P0000HDE8	
		Q4	100	109	177	232	XQEAWT-00-0000-P0000HCE8	
		Q3	93.9	103	166	218	XQEAWT-00-0000-P0000HBE8	
		Q2	87.4	96	155	202		XQEAWT-00-0000-P0000UAE8
		P4	80.6	88	143	187		XQEAWT-00-0000-P0000U9E8
		P3	73.9	81	131	171		XQEAWT-00-0000-P0000U8E8

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH INTENSITY WHITE ($T_j = 85^\circ\text{C}$)

The following tables provide order codes for XLamp XQ-E Plus High Intensity white LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

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
ANSI Cool White								
51	6200 K	R4	130	142	230	301	XQEAWT-H0-0000-P00000G51	XQEAWT-H0-0000-P0000BG51
		R3	122	133	216	283	XQEAWT-H0-0000-P00000F51	XQEAWT-H0-0000-P0000BF51
		R2	114	125	202	264	XQEAWT-H0-0000-P00000E51	XQEAWT-H0-0000-P0000BE51
53	6000 K	R4	130	142	230	301	XQEAWT-H0-0000-P00000G53	XQEAWT-H0-0000-P0000BG53
		R3	122	133	216	283	XQEAWT-H0-0000-P00000F53	XQEAWT-H0-0000-P0000BF53
		R2	114	125	202	264	XQEAWT-H0-0000-P00000E53	XQEAWT-H0-0000-P0000BE53
50	6200 K	R4	130	142	230	301	XQEAWT-H0-0000-P00000G50	XQEAWT-H0-0000-P0000BG50
		R3	122	133	216	283	XQEAWT-H0-0000-P00000F50	XQEAWT-H0-0000-P0000BF50
		R2	114	125	202	264	XQEAWT-H0-0000-P00000E50	XQEAWT-H0-0000-P0000BE50
E1	6500 K	R4	130	142	230	301	XQEAWT-H0-0000-P00000GE1	XQEAWT-H0-0000-P0000BGE1
		R3	122	133	216	283	XQEAWT-H0-0000-P00000FE1	XQEAWT-H0-0000-P0000BFE1
		R2	114	125	202	264	XQEAWT-H0-0000-P00000EE1	XQEAWT-H0-0000-P0000BEE1
E2	5700 K	R4	130	142	230	301	XQEAWT-H0-0000-P00000GE2	XQEAWT-H0-0000-P0000BGE2
		R3	122	133	216	283	XQEAWT-H0-0000-P00000FE2	XQEAWT-H0-0000-P0000BFE2
		R2	114	125	202	264	XQEAWT-H0-0000-P00000EE2	XQEAWT-H0-0000-P0000BEE2

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH INTENSITY WHITE ($T_j = 85^\circ\text{C}$) - 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
ANSI Neutral White										
E3	5000 K	R4	130	142	230	301	XQEAWT-H0-0000-P0000GE3	XQEAWT-H0-0000-P0000BGE3		
		R3	122	133	216	283	XQEAWT-H0-0000-P0000FE3	XQEAWT-H0-0000-P0000BFE3		
		R2	114	125	202	264	XQEAWT-H0-0000-P0000EE3	XQEAWT-H0-0000-P0000BEE3		
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000DE3			
F4	4750 K	R3	122	133	216	283	XQEAWT-H0-0000-P0000FF4	XQEAWT-H0-0000-P0000BFF4		
		R2	114	125	202	264	XQEAWT-H0-0000-P0000EF4	XQEAWT-H0-0000-P0000BEF4		
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000DF4	XQEAWT-H0-0000-P0000BDF4		
E4	4500 K	R3	122	133	216	283	XQEAWT-H0-0000-P0000FE4	XQEAWT-H0-0000-P0000BFE4		
		R2	114	125	202	264	XQEAWT-H0-0000-P0000EE4	XQEAWT-H0-0000-P0000BEE4		
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000DE4	XQEAWT-H0-0000-P0000BDE4		
F5	4250 K	R3	122	133	216	283	XQEAWT-H0-0000-P0000FF5	XQEAWT-H0-0000-P0000BFF5		
		R2	114	125	202	264	XQEAWT-H0-0000-P0000EF5	XQEAWT-H0-0000-P0000BEF5		
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000DF5	XQEAWT-H0-0000-P0000BDF5		
E5	4000 K	R3	122	133	216	283	XQEAWT-H0-0000-P0000FE5	XQEAWT-H0-0000-P0000BFE5		
		R2	114	125	202	264	XQEAWT-H0-0000-P0000EE5	XQEAWT-H0-0000-P0000BEE5	XQEAWT-H0-0000-P0000HEE5	
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000DE5	XQEAWT-H0-0000-P0000BDE5	XQEAWT-H0-0000-P0000HDE5	XQEAWT-H0-0000-P0000UDE5
		Q4	100	109	177	232			XQEAWT-H0-0000-P0000HCE5	XQEAWT-H0-0000-P0000UCE5
		Q3	93.9	103	166	218				XQEAWT-H0-0000-P0000UBE5

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH INTENSITY WHITE (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	80 CRI Minimum	90 CRI Minimum
ANSI Warm White								
F6	3750 K	R2	114	125	202	264	XQEAWT-H0-0000-P0000HEF6	
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000HDF6	
		Q4	100	109	177	232	XQEAWT-H0-0000-P0000HCF6	
E6	3500 K	R2	114	125	202	264	XQEAWT-H0-0000-P0000HEE6	
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000HDE6	
		Q4	100	109	177	232	XQEAWT-H0-0000-P0000HCE6	XQEAWT-H0-0000-P0000UCE6
		Q3	93.9	103	166	218		XQEAWT-H0-0000-P0000UBE6
		Q2	87.4	96	155	202		XQEAWT-H0-0000-P0000UAE6
		P4	80.6	88	143	187		XQEAWT-H0-0000-P0000U9E6
F7	3250 K	R2	114	125	202	264	XQEAWT-H0-0000-P0000HEF7	
		Q5	107	117	189	248	XQEAWT-H0-0000-P0000HDF7	
		Q4	100	109	177	232	XQEAWT-H0-0000-P0000HCF7	
		Q3	93.9	103	166	218		XQEAWT-H0-0000-P0000UBF7
		Q2	87.4	96	155	202		XQEAWT-H0-0000-P0000UAF7
		P4	80.6	88	143	187		XQEAWT-H0-0000-P0000U9F7
E7	3000 K	Q5	107	117	189	248	XQEAWT-H0-0000-P0000HDE7	
		Q4	100	109	177	232	XQEAWT-H0-0000-P0000HCE7	
		Q3	93.9	103	166	218	XQEAWT-H0-0000-P0000HBE7	
		Q2	87.4	96	155	202		XQEAWT-H0-0000-P0000UAE7
		P4	80.6	88	143	187		XQEAWT-H0-0000-P0000U9E7
		P3	73.9	81	131	171		XQEAWT-H0-0000-P0000U8E7
		P2	67.2	74	119	156		XQEAWT-H0-0000-P0000U7E7
F8	2850 K	Q5	107	117	189	248	XQEAWT-H0-0000-P0000HDF8	
		Q4	100	109	177	232	XQEAWT-H0-0000-P0000HCF8	
		Q3	93.9	103	166	218	XQEAWT-H0-0000-P0000HBF8	
		Q2	87.4	96	155	202		XQEAWT-H0-0000-P0000UAF8
		P4	80.6	88	143	187		XQEAWT-H0-0000-P0000U9F8
		P3	73.9	81	131	171		XQEAWT-H0-0000-P0000U8F8
		P2	67.2	74	119	156		XQEAWT-H0-0000-P0000U7F8

Notes:

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

FLUX CHARACTERISTICS - HIGH INTENSITY WHITE ($T_j = 85^\circ\text{C}$) - 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	80 CRI Minimum	90 CRI Minimum
ANSI Warm White								
E8	2700 K	Q4	100	109	177	232	XQEAWT-H0-0000-P0000HCE8	
		Q3	93.9	103	166	218	XQEAWT-H0-0000-P0000HBE8	
		Q2	87.4	96	155	202	XQEAWT-H0-0000-P0000HAE8	
		P4	80.6	88	143	187		XQEAWT-H0-0000-P0000U9E8
		P3	73.9	81	131	171		XQEAWT-H0-0000-P0000U8E8
		P2	67.2	74	119	156		XQEAWT-H0-0000-P0000U7E8

Notes:

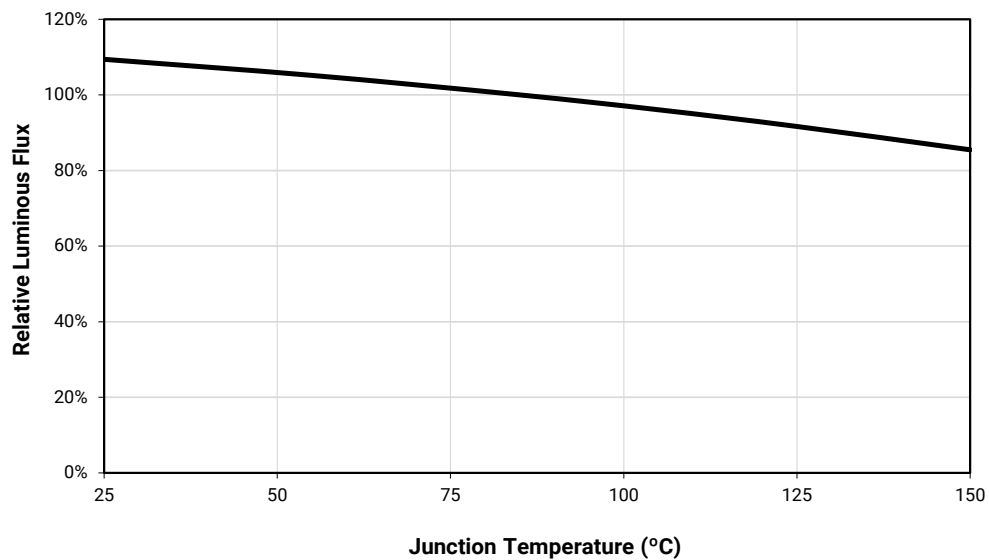
- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and ± 2 on CRI measurements. See the Measurements section (page 60).
- Typical CRI for Cool White (5000 K – 8300 K CCT) is 70.
- Typical CRI for Neutral White (3700 K – 5300 K CCT) is 75.
- Typical CRI for Warm White (2700 K – 3500 K CCT) is 80.
- Minimum CRI for 70-CRI White is 70.
- Minimum CRI for 80-CRI White is 80.
- Minimum CRI for 90-CRI White is 90.

* Flux values @ 25 °C are calculated and for reference only.

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

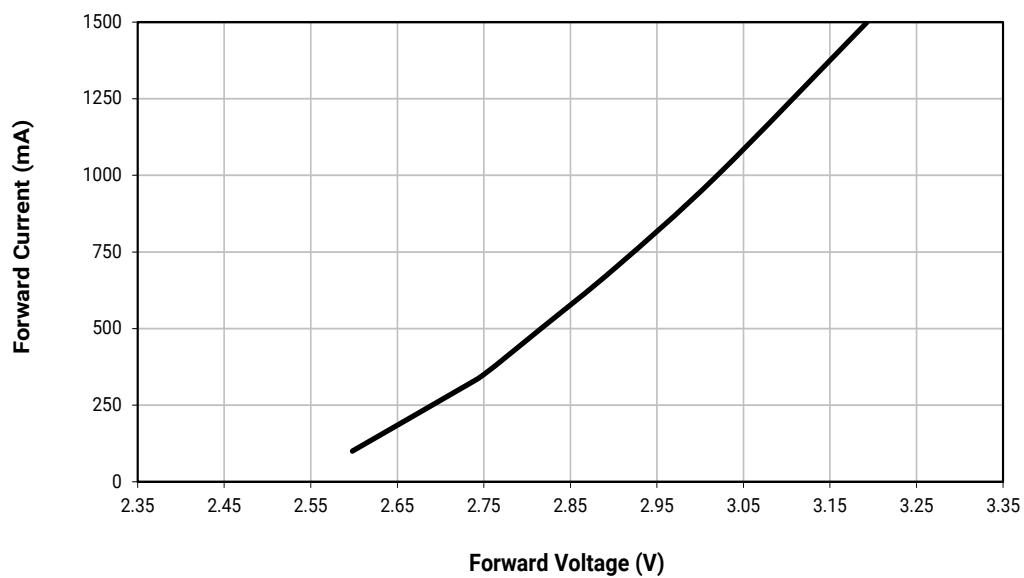
RELATIVE FLUX VS. JUNCTION TEMPERATURE - WHITE ($I_F = 350$ mA)

High Density & High Intensity



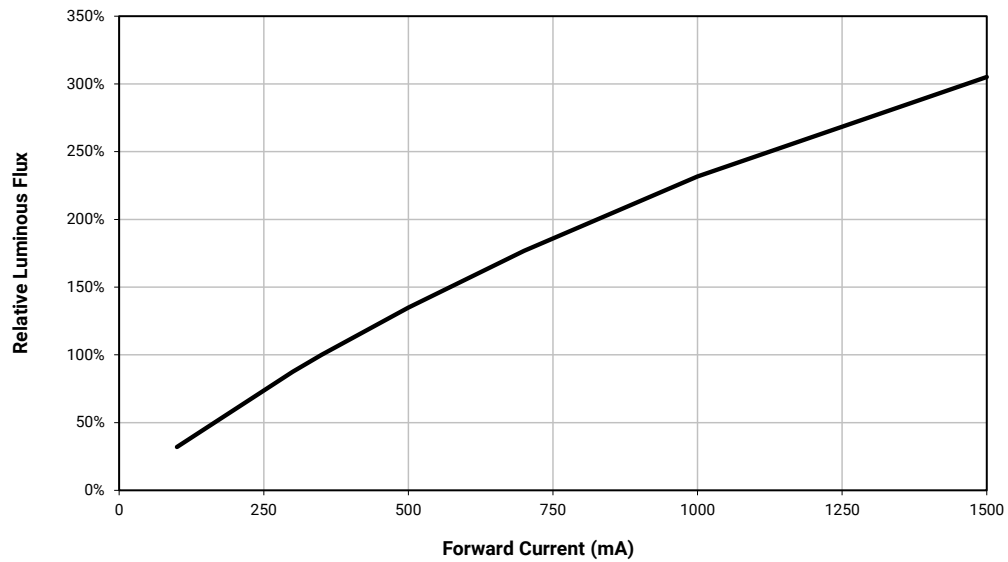
ELECTRICAL CHARACTERISTICS - WHITE

High Density & High Intensity



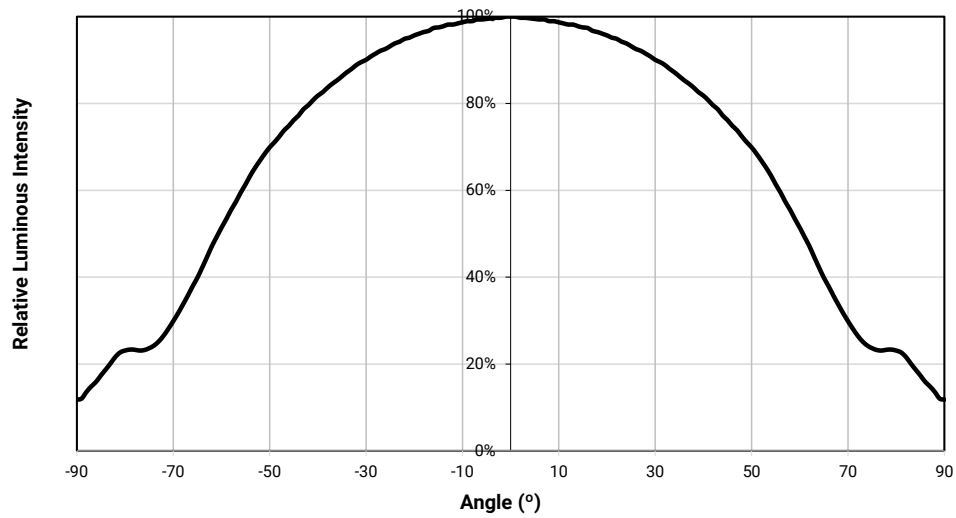
RELATIVE FLUX VS. CURRENT - WHITE

High Density & High Intensity

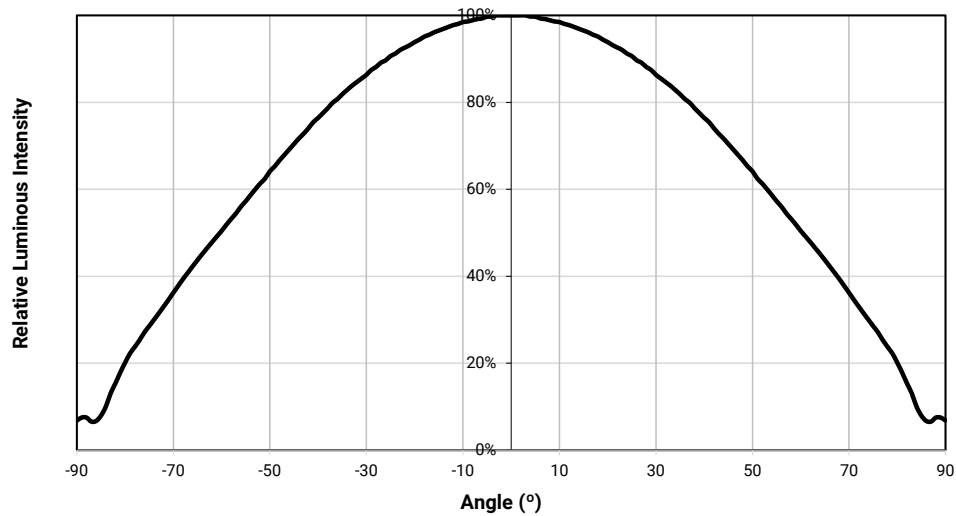


TYPICAL SPATIAL DISTRIBUTION - WHITE

High Density



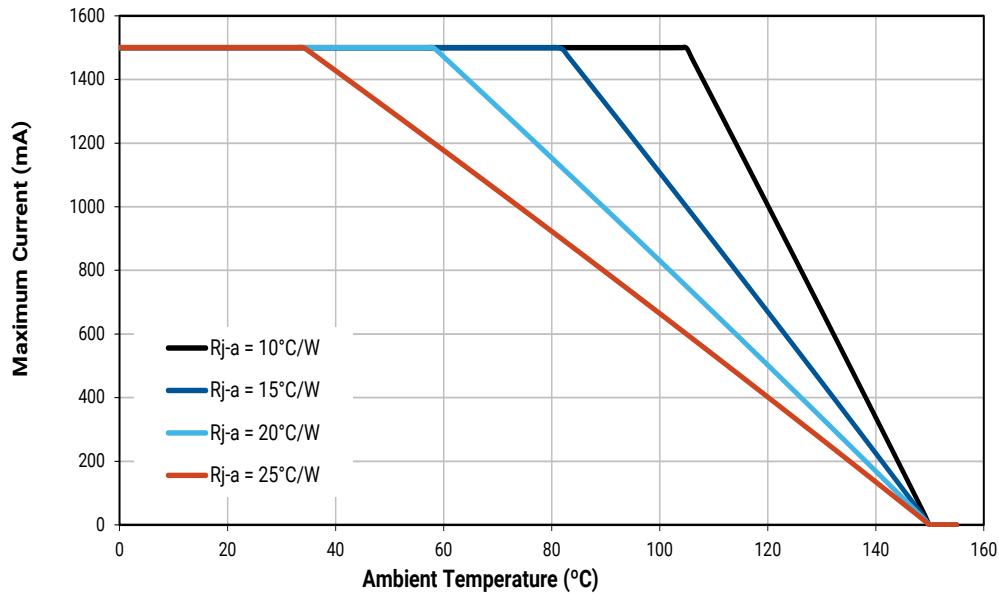
High Intensity



THERMAL DESIGN - WHITE

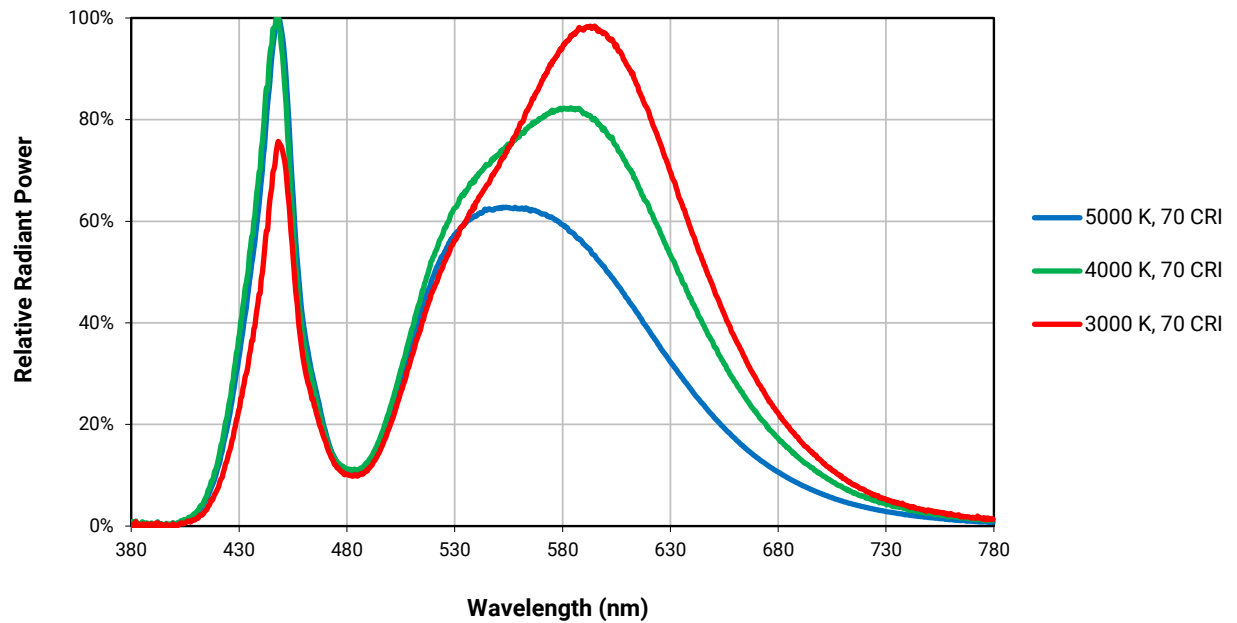
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

High Density & High Intensity



RELATIVE SPECTRAL POWER DISTRIBUTION - WHITE

High Density & High Intensity



XLAMP XQ-E PLUS LEDs - ROYAL BLUE

CHARACTERISTICS - HIGH DENSITY ROYAL BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point ^o	°C/W		2.2	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.85	3.2
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY ROYAL BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point ^o	°C/W		2.2	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD withstand voltage (HBM per Mil-Std-883D)	V		Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.85	3.2
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.

FLUX CHARACTERISTICS - HIGH DENSITY ROYAL BLUE ($T_j = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Density royal blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

Royal Blue		Minimum Radiant Flux (mW) @ 350 mA		Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (mW)	
01	450 - 465	39	675	XQEROY-00-0000-P00000T01
		38	650	XQEROY-00-0000-P00000S01
		37	625	XQEROY-00-0000-P00000R01
		36	600	XQEROY-00-0000-P00000Q01
		35	575	XQEROY-00-0000-P00000P01
02	450 - 460	37	625	XQEROY-00-0000-P00000R02
		36	600	XQEROY-00-0000-P00000Q02
		35	575	XQEROY-00-0000-P00000P02
03	455 - 465	35	575	XQEROY-00-0000-P00000P03

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

FLUX CHARACTERISTICS - HIGH INTENSITY ROYAL BLUE ($T_j = 25^\circ\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Intensity royal blue LEDs. For a complete description of the order code nomenclature, please consult the Bin and Order Code Formats section (page 58).

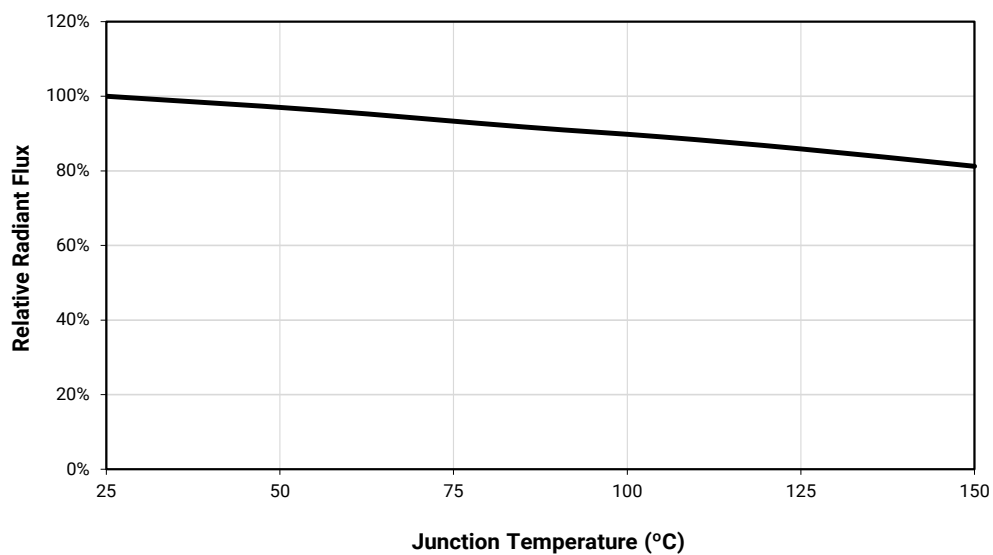
Royal Blue		Minimum Radiant Flux (mW) @ 350 mA		Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (mW)	
01	450 - 465	37	625	XQEROY-H0-0000-P00000R01
		36	600	XQEROY-H0-0000-P00000Q01
		35	575	XQEROY-H0-0000-P00000P01
		34	550	XQEROY-H0-0000-P00000N01
		33	525	XQEROY-H0-0000-P00000M01
02	450 - 460	36	600	XQEROY-H0-0000-P00000Q02
		35	575	XQEROY-H0-0000-P00000P02
		34	550	XQEROY-H0-0000-P00000N02
		33	525	XQEROY-H0-0000-P00000M02
03	455 - 465	35	575	XQEROY-H0-0000-P00000P03
		34	550	XQEROY-H0-0000-P00000N03
		33	525	XQEROY-H0-0000-P00000M03

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

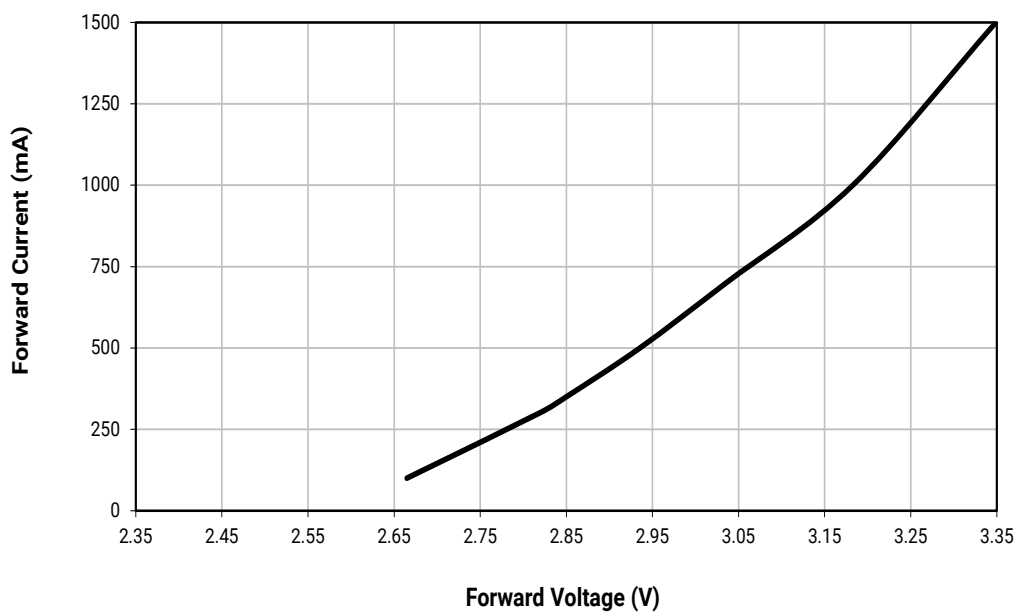
RELATIVE FLUX VS. JUNCTION TEMPERATURE - ROYAL BLUE ($I_F = 350$ mA)

High Density & High Intensity



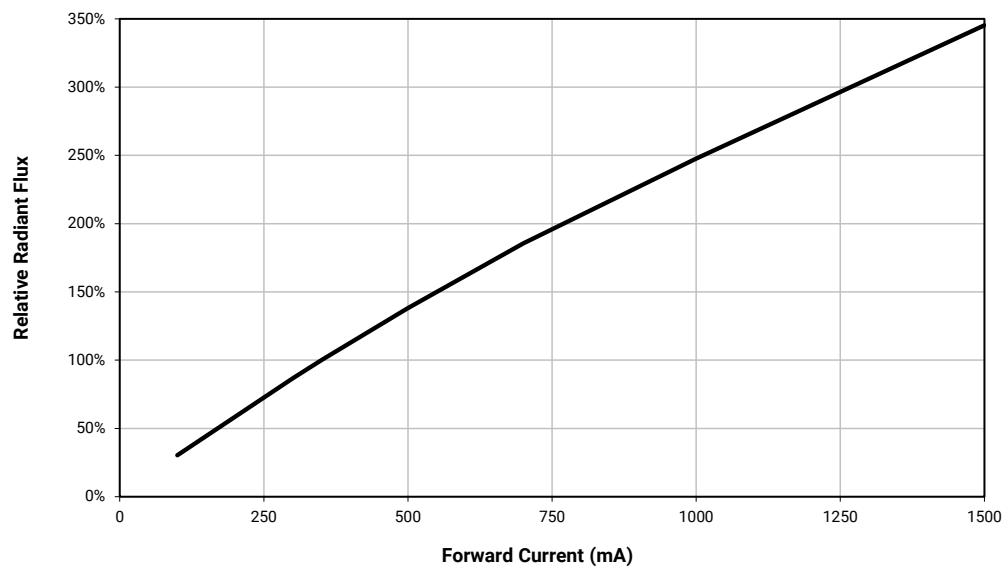
ELECTRICAL CHARACTERISTICS - ROYAL BLUE

High Density & High Intensity



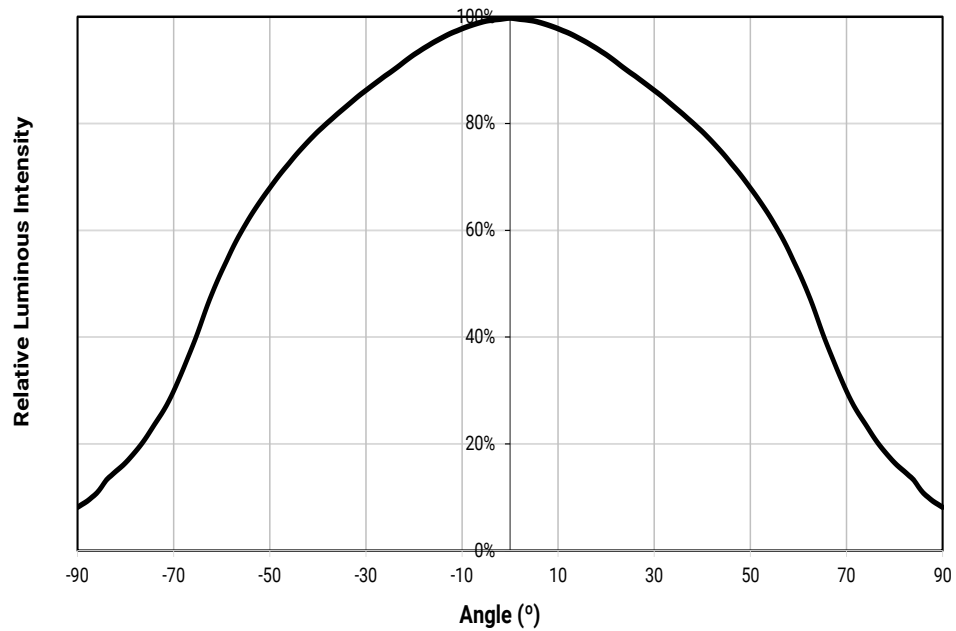
RELATIVE FLUX VS. CURRENT - ROYAL BLUE

High Density & High Intensity

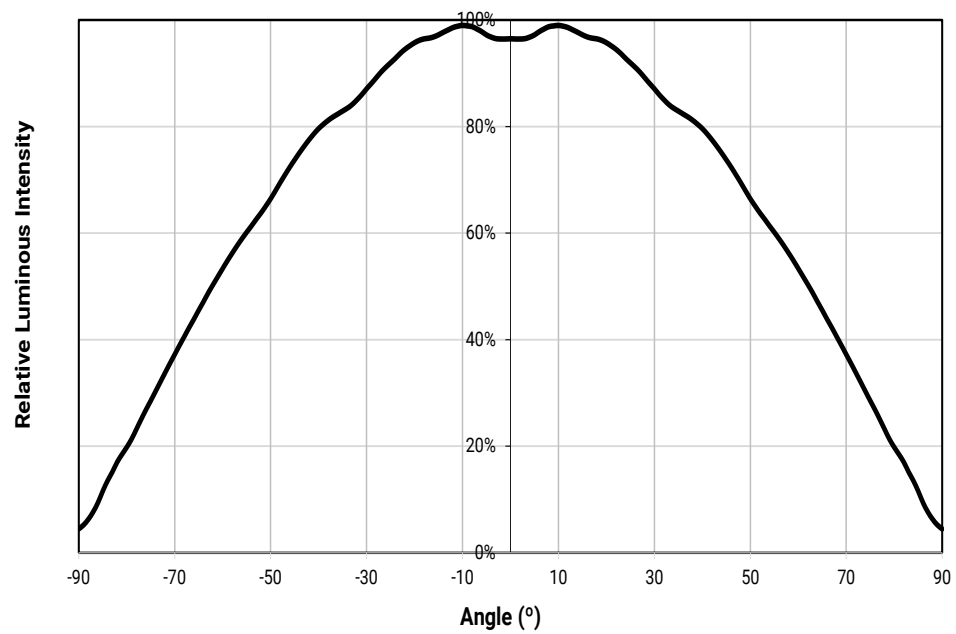


TYPICAL SPATIAL DISTRIBUTION - ROYAL BLUE

High Density



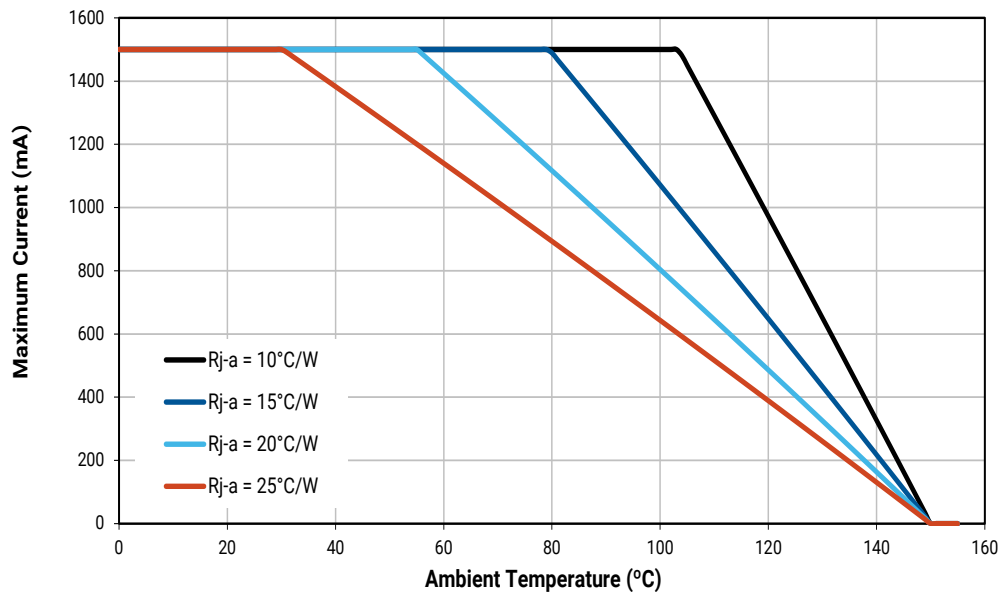
High Intensity



THERMAL DESIGN - ROYAL BLUE

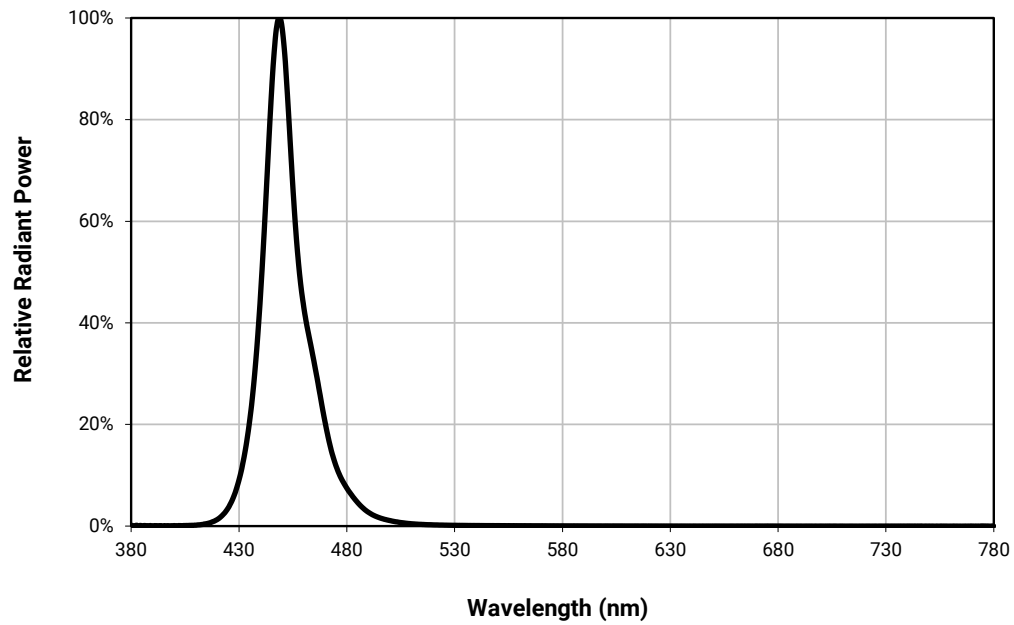
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

High Density & High Intensity



RELATIVE SPECTRAL POWER DISTRIBUTION - ROYAL BLUE

High Density & High Intensity



XLAMP XQ-E PLUS LEDs - BLUE

CHARACTERISTICS - HIGH DENSITY BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point [∘]	°C/W		2.2	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.8	3.2
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point [∘]	°C/W		2.2	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.8	3.2
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.

FLUX CHARACTERISTICS - HIGH DENSITY BLUE ($T_j = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Density blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Blue	M3	45.7	B3	465	B6	485	XQEBLU-00-0000-P00000301
			B3	465	B5	480	XQEBLU-00-0000-P00000302
			B4	470	B5	480	XQEBLU-00-0000-P00000305
	M2	39.8	B3	465	B6	485	XQEBLU-00-0000-P00000201
			B3	465	B5	480	XQEBLU-00-0000-P00000202
			B4	470	B5	480	XQEBLU-00-0000-P00000205
	K3	35.2	B3	465	B6	485	XQEBLU-00-0000-P00000Z01
			B3	465	B5	480	XQEBLU-00-0000-P00000Z02
			B4	470	B5	480	XQEBLU-00-0000-P00000Z05
	K2	30.6	B3	465	B6	485	XQEBLU-00-0000-P00000Y01
			B3	465	B5	480	XQEBLU-00-0000-P00000Y02
			B4	470	B5	480	XQEBLU-00-0000-P00000Y05

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

FLUX CHARACTERISTICS - HIGH INTENSITY BLUE ($T_j = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Intensity blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

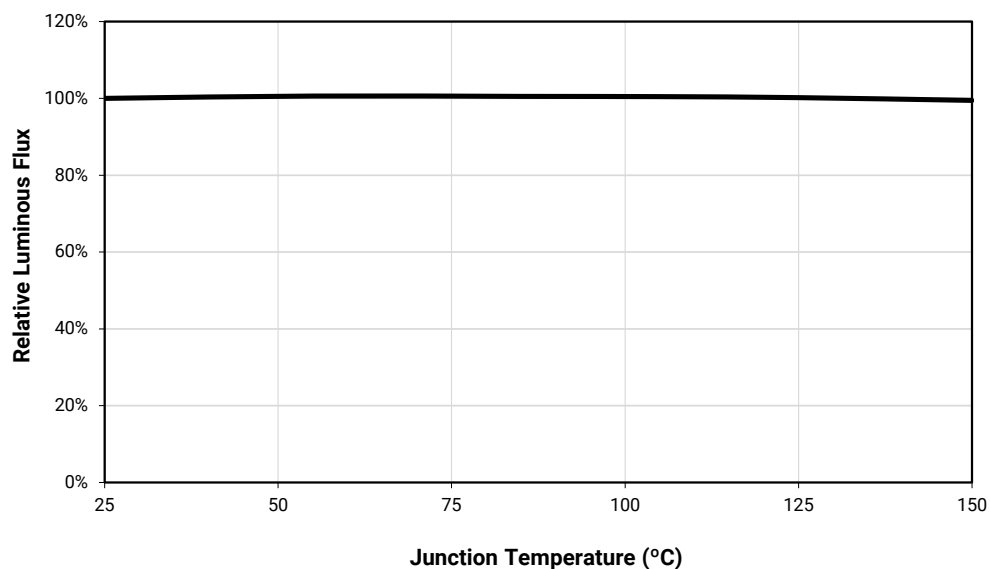
Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Blue	M3	45.7	B3	465	B6	485	XQEBLU-H0-0000-P00000301
			B3	465	B5	480	XQEBLU-H0-0000-P00000302
			B4	470	B5	480	XQEBLU-H0-0000-P00000305
	M2	39.8	B3	465	B6	485	XQEBLU-H0-0000-P00000201
			B3	465	B5	480	XQEBLU-H0-0000-P00000202
			B4	470	B5	480	XQEBLU-H0-0000-P00000205
	K3	35.2	B3	465	B6	485	XQEBLU-H0-0000-P00000Z01
			B3	465	B5	480	XQEBLU-H0-0000-P00000Z02
			B4	470	B5	480	XQEBLU-H0-0000-P00000Z05
	K2	30.6	B3	465	B6	485	XQEBLU-H0-0000-P00000Y01
			B3	465	B5	480	XQEBLU-H0-0000-P00000Y02
			B4	470	B5	480	XQEBLU-H0-0000-P00000Y05

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

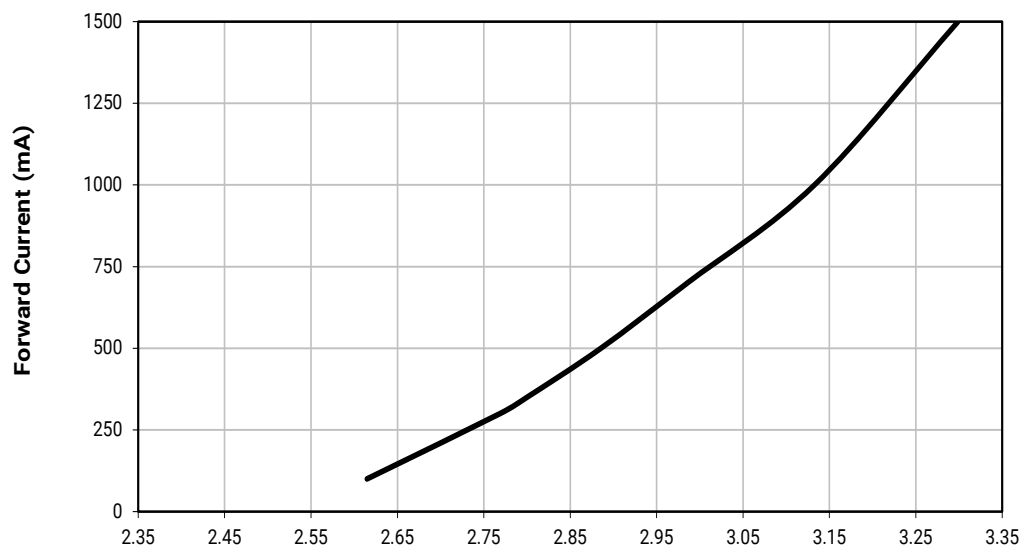
RELATIVE FLUX VS. JUNCTION TEMPERATURE - BLUE ($I_F = 350$ mA)

High Density & High Intensity



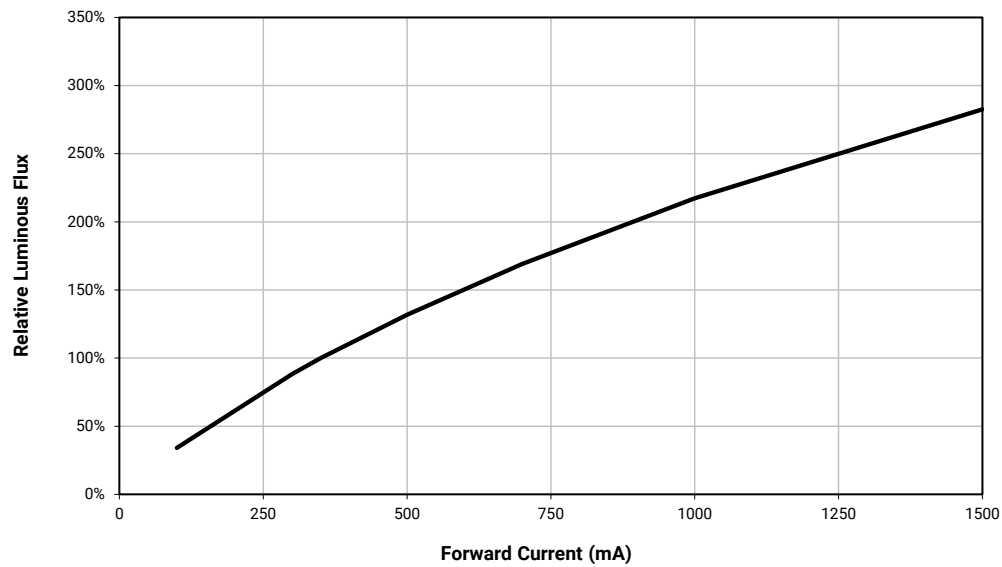
ELECTRICAL CHARACTERISTICS - BLUE

High Density & High Intensity



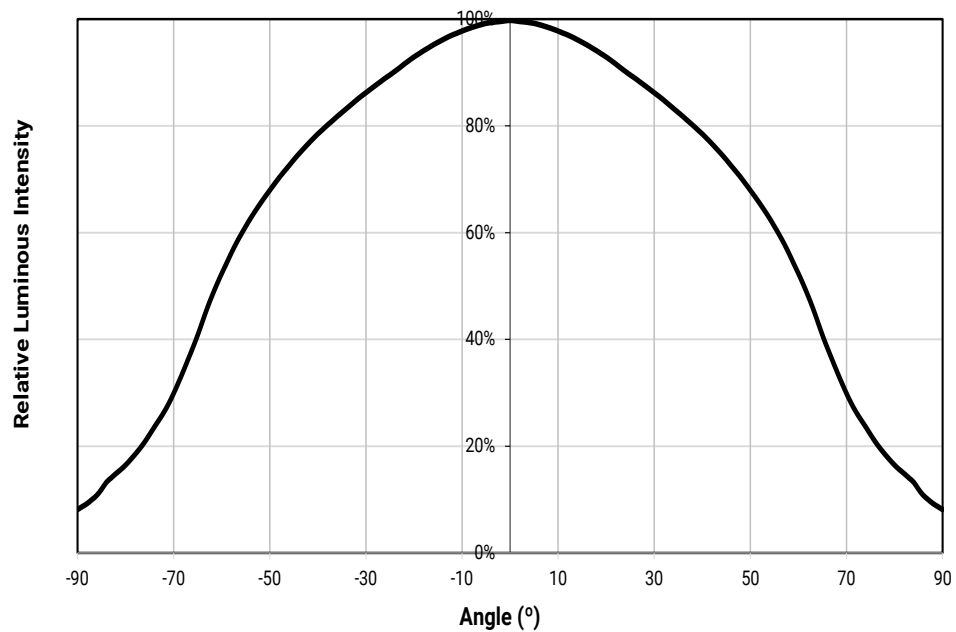
RELATIVE FLUX VS. CURRENT - BLUE

High Density & High Intensity

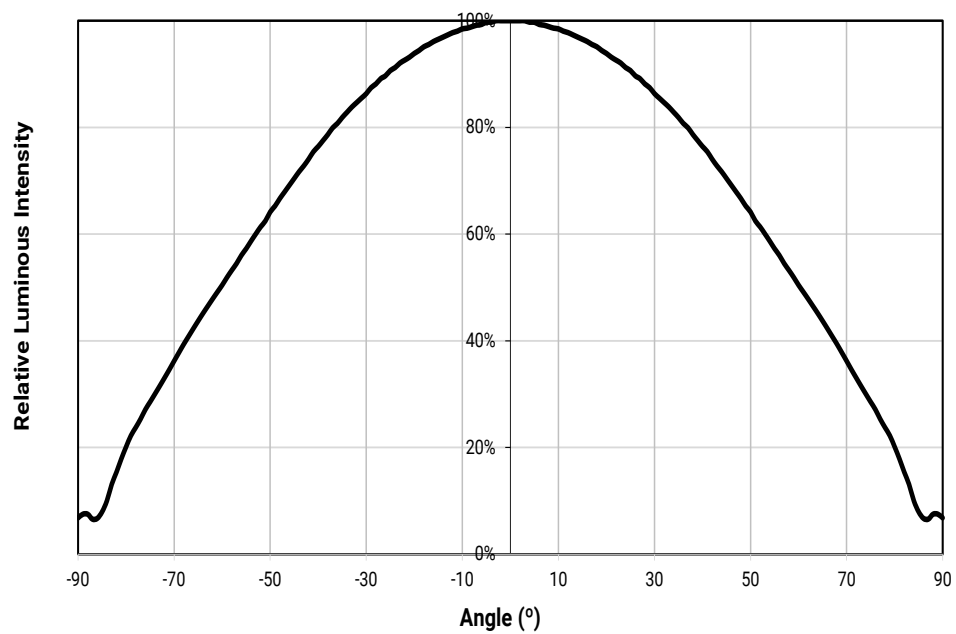


TYPICAL SPATIAL DISTRIBUTION - BLUE

High Density



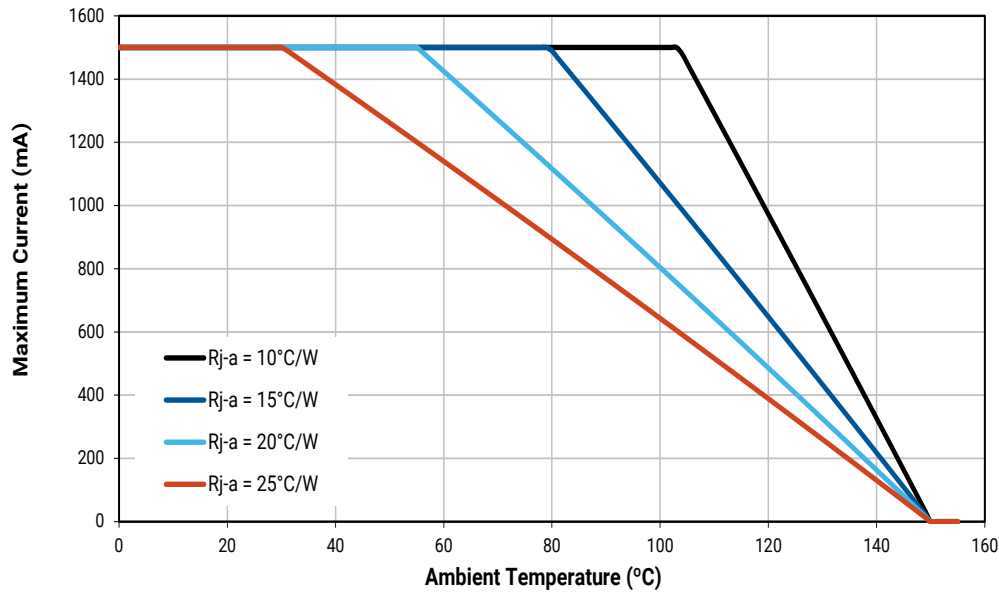
High Intensity



THERMAL DESIGN - BLUE

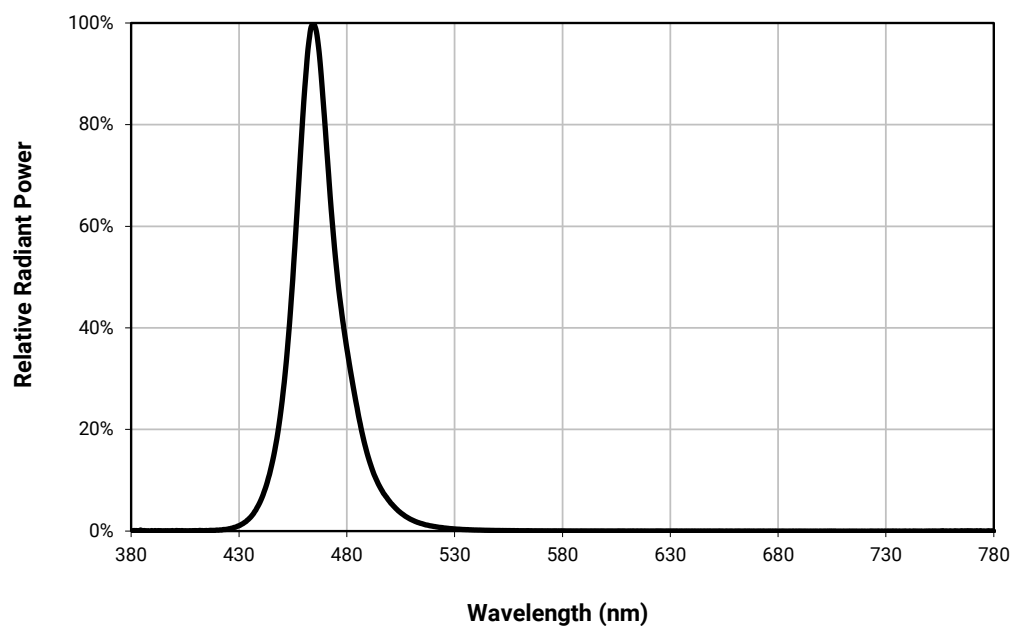
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

High Density & High Intensity



RELATIVE SPECTRAL POWER DISTRIBUTION - BLUE

High Density & High Intensity



XLAMP XQ-E PLUS LEDs - GREEN

CHARACTERISTICS - HIGH DENSITY GREEN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point ^o	°C/W		2.5	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.0	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.6	3.2
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY GREEN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point ^o	°C/W		2.5	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.0	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.6	3.2
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.

FLUX CHARACTERISTICS - HIGH DENSITY GREEN ($T_J = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Density green LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Green	S3	156	G2	520	G4	535	XQEGRN-00-0000-P00000K01
			G2	520	G3	530	XQEGRN-00-0000-P00000K02
			G3	525	G4	535	XQEGRN-00-0000-P00000K03
	S2	148	G2	520	G4	535	XQEGRN-00-0000-P00000J01
			G2	520	G3	530	XQEGRN-00-0000-P00000J02
			G3	525	G4	535	XQEGRN-00-0000-P00000J03
	R5	139	G2	520	G4	535	XQEGRN-00-0000-P00000H01
			G2	520	G3	530	XQEGRN-00-0000-P00000H02
			G3	525	G4	535	XQEGRN-00-0000-P00000H03
	R4	130	G2	520	G4	535	XQEGRN-00-0000-P00000G01
			G2	520	G3	530	XQEGRN-00-0000-P00000G02
			G3	525	G4	535	XQEGRN-00-0000-P00000G03

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

FLUX CHARACTERISTICS - HIGH INTENSITY GREEN ($T_j = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Intensity green LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

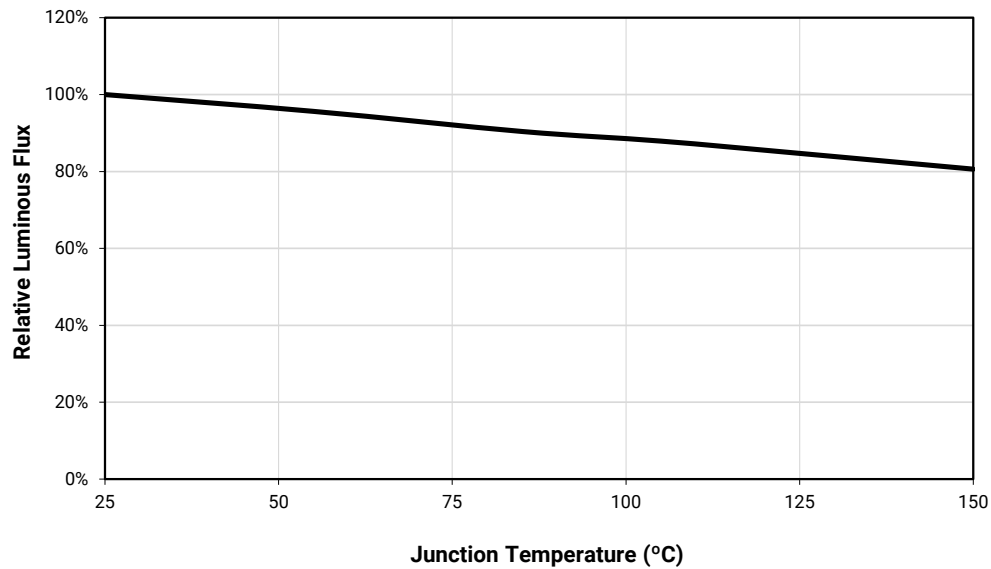
Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Green	S3	156	G2	520	G4	535	XQEGRN-H0-0000-P00000K01
			G2	520	G3	530	XQEGRN-H0-0000-P00000K02
			G3	525	G4	535	XQEGRN-H0-0000-P00000K03
	S2	148	G2	520	G4	535	XQEGRN-H0-0000-P00000J01
			G2	520	G3	530	XQEGRN-H0-0000-P00000J02
			G3	525	G4	535	XQEGRN-H0-0000-P00000J03
	R5	139	G2	520	G4	535	XQEGRN-H0-0000-P00000H01
			G2	520	G3	530	XQEGRN-H0-0000-P00000H02
			G3	525	G4	535	XQEGRN-H0-0000-P00000H03
	R4	130	G2	520	G4	535	XQEGRN-H0-0000-P00000G01
			G2	520	G3	530	XQEGRN-H0-0000-P00000G02
			G3	525	G4	535	XQEGRN-H0-0000-P00000G03

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

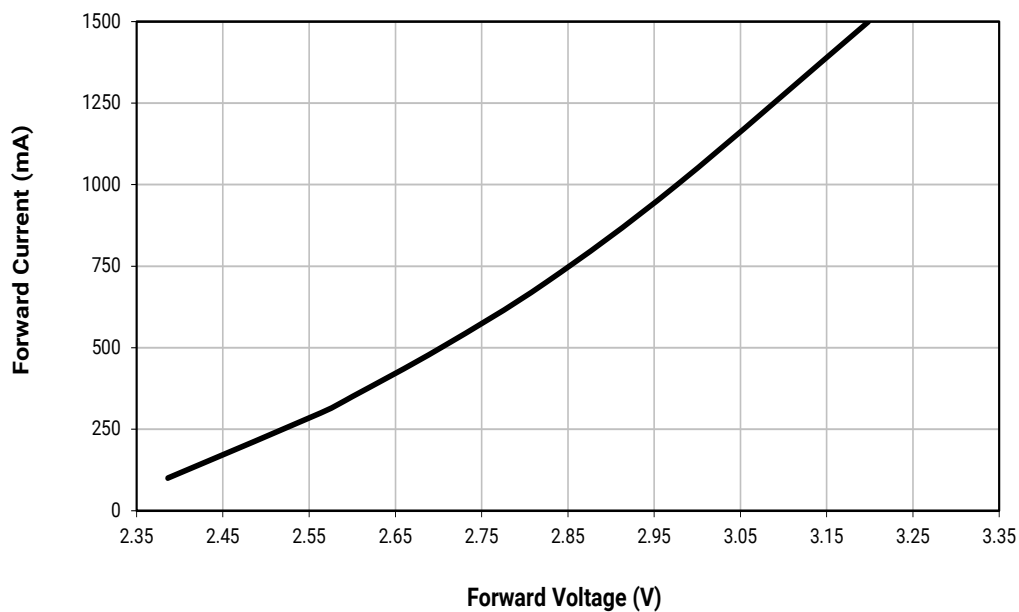
RELATIVE FLUX VS. JUNCTION TEMPERATURE - GREEN ($I_F = 350$ mA)

High Density & High Intensity



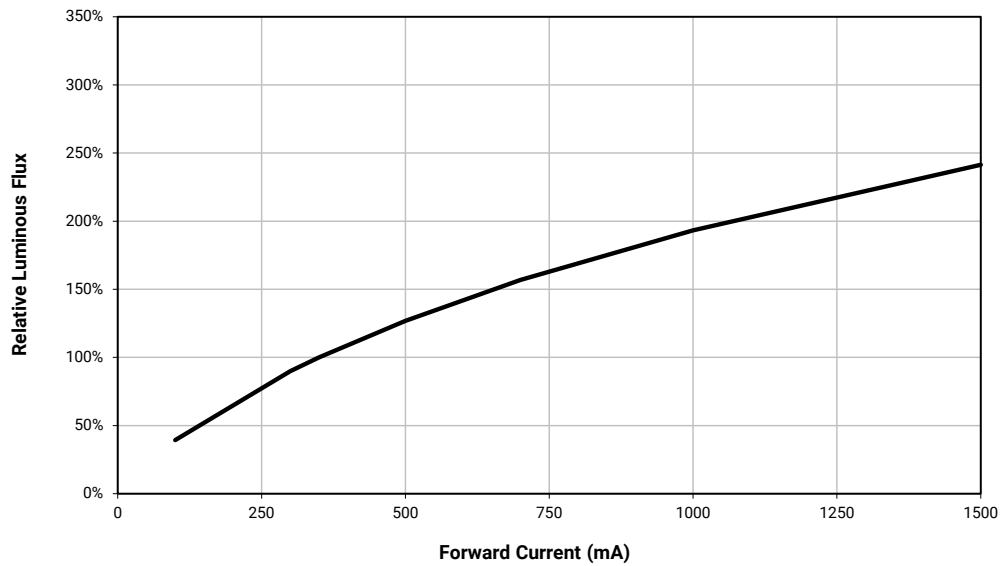
ELECTRICAL CHARACTERISTICS - GREEN

High Density & High Intensity



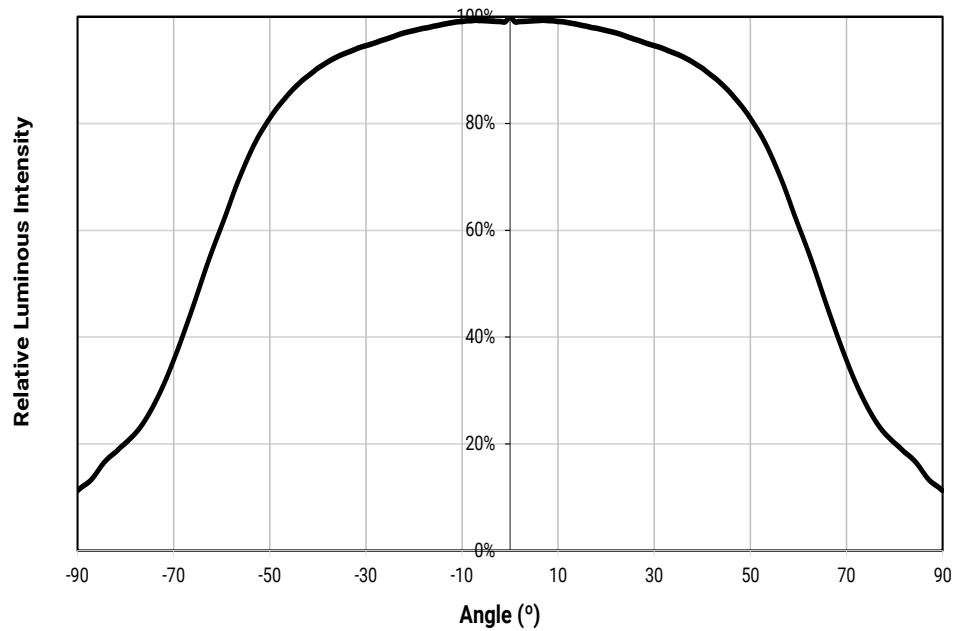
RELATIVE FLUX VS. CURRENT - GREEN

High Density & High Intensity

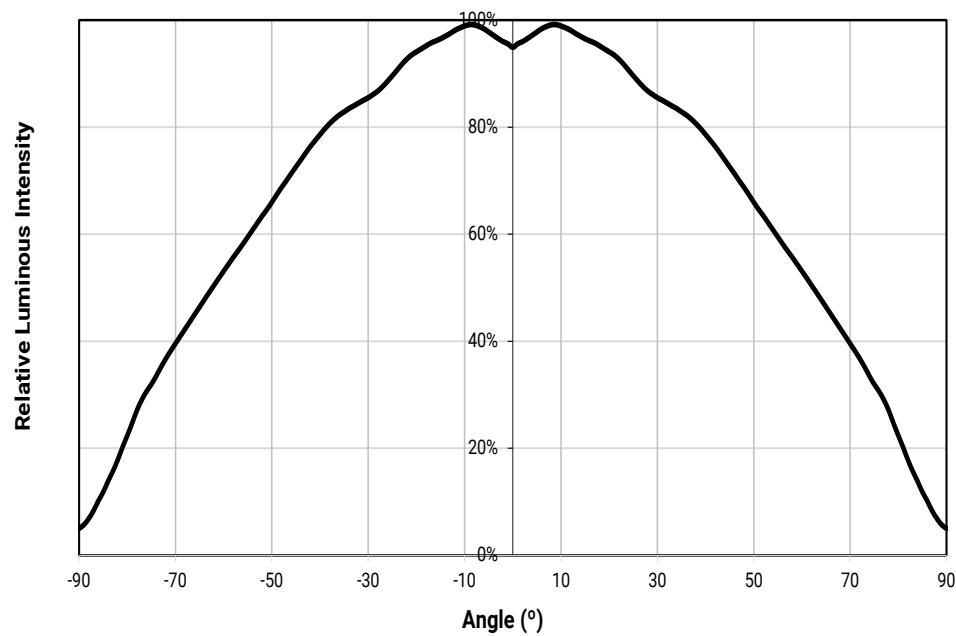


TYPICAL SPATIAL DISTRIBUTION - GREEN

High Density



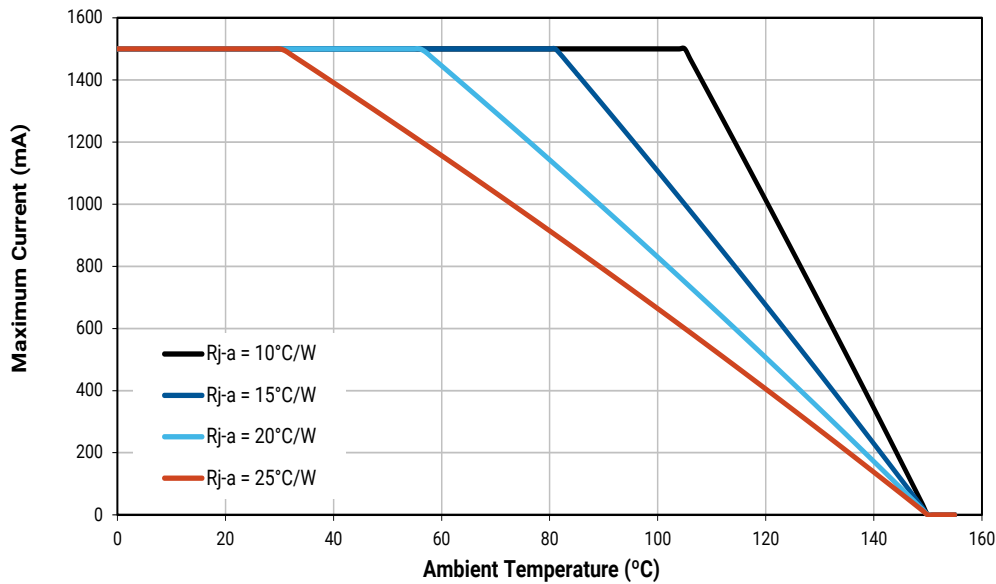
High Intensity



THERMAL DESIGN - GREEN

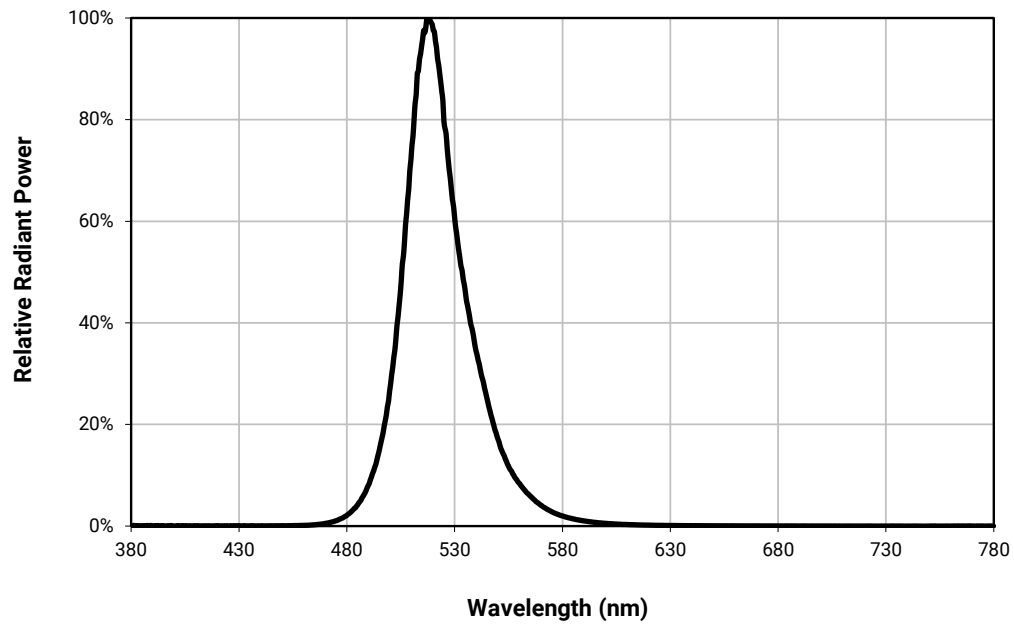
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

High Density & High Intensity



RELATIVE SPECTRAL POWER DISTRIBUTION - GREEN

High Density & High Intensity



XLAMP XQ-E PLUS LEDS - PC AMBER

CHARACTERISTICS - HIGH DENSITY PC AMBER

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3.3	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.85	3.2
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY PC AMBER

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3.3	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D)			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 25 °C)	V		2.85	3.2
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.

FLUX CHARACTERISTICS - HIGH DENSITY PC AMBER ($T_j = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Density PC amber LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	Q4	100	XQEAPA-00-0000-P00000C01
		Q3	93.9	XQEAPA-00-0000-P00000B01
		Q2	87.4	XQEAPA-00-0000-P00000A01
		P4	80.6	XQEAPA-00-0000-P00000901

FLUX CHARACTERISTICS - HIGH INTENSITY PC AMBER ($T_j = 25\text{ }^{\circ}\text{C}$)

The following table provides order codes for XLamp XQ-E Plus High Intensity PC amber LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 58).

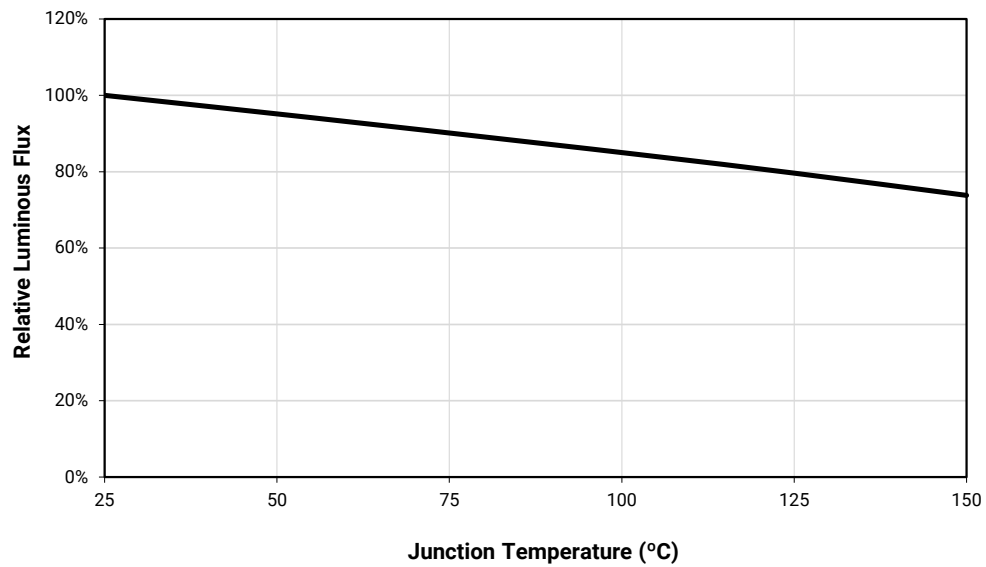
Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	Q3	93.9	XQEAPA-H0-0000-P00000B01
		Q2	87.4	XQEAPA-H0-0000-P00000A01
		P4	80.6	XQEAPA-H0-0000-P00000901

Note

- Cree LED maintains a tolerance of $\pm 7\%$ on flux and power measurements, ± 0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ± 2 on CRI measurements. See the Measurements section (page 60).

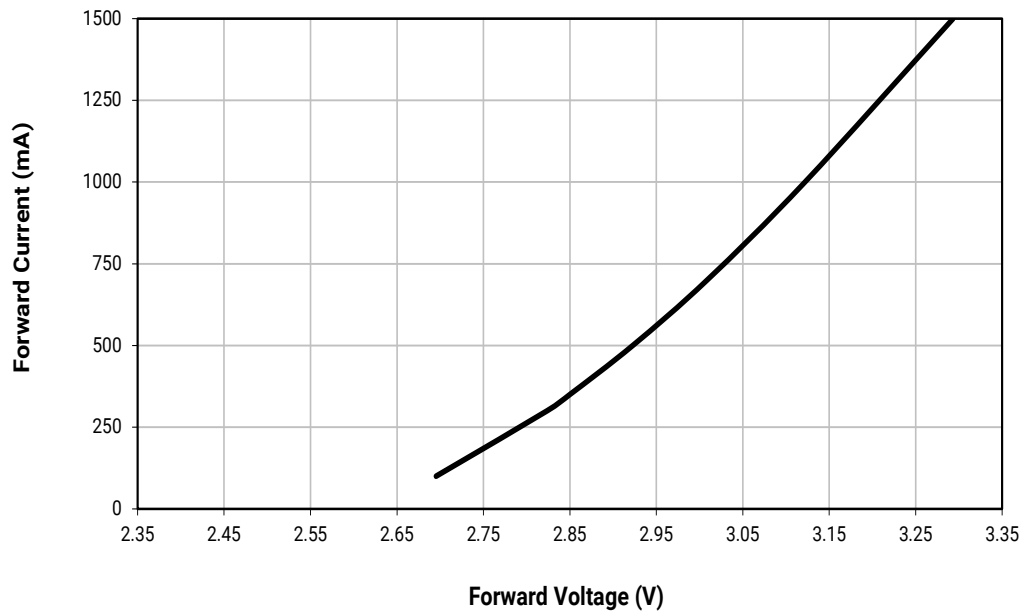
RELATIVE FLUX VS. JUNCTION TEMPERATURE - PC AMBER ($I_F = 350$ mA)

High Density & High Intensity

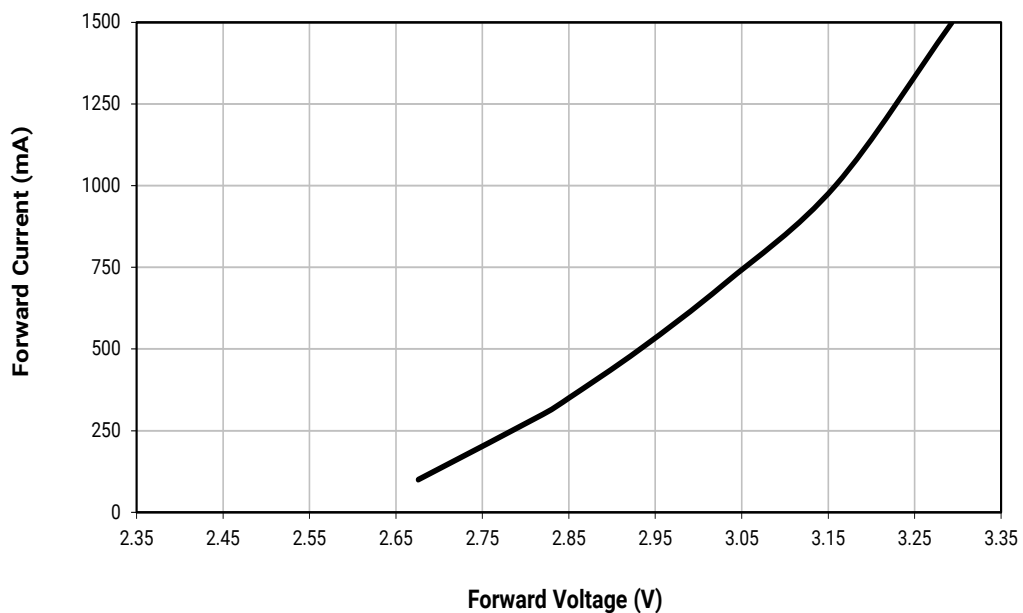


ELECTRICAL CHARACTERISTICS - PC AMBER

High Density

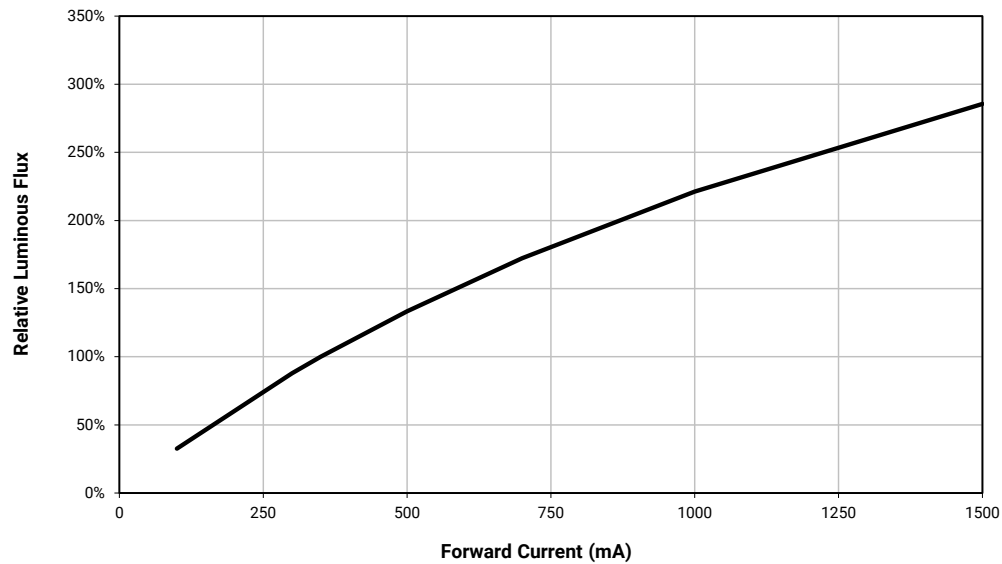


High Intensity



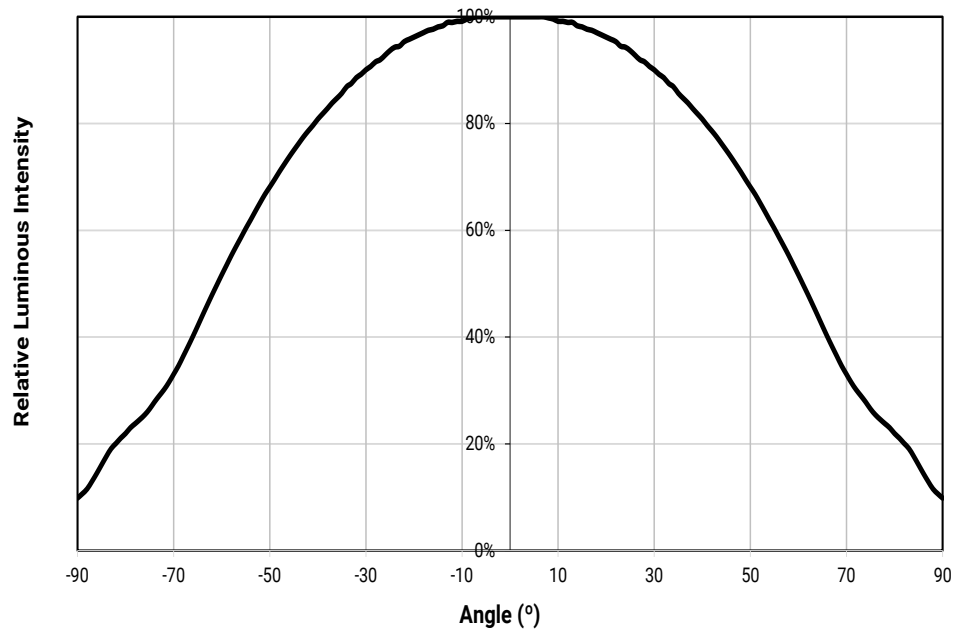
RELATIVE FLUX VS. CURRENT - PC AMBER

High Density & High Intensity

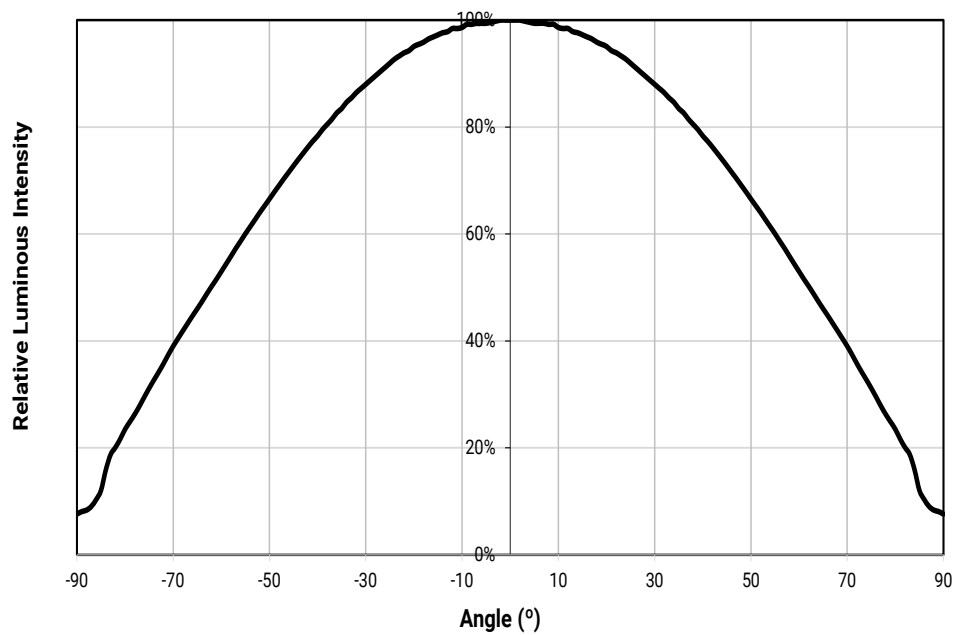


TYPICAL SPATIAL DISTRIBUTION - PC AMBER

High Density



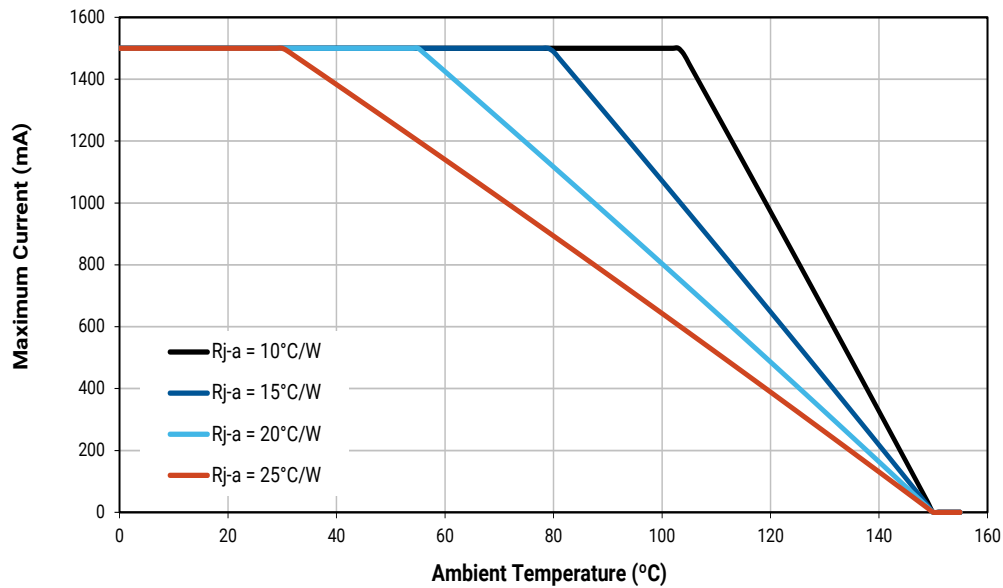
High Intensity



THERMAL DESIGN - PC AMBER

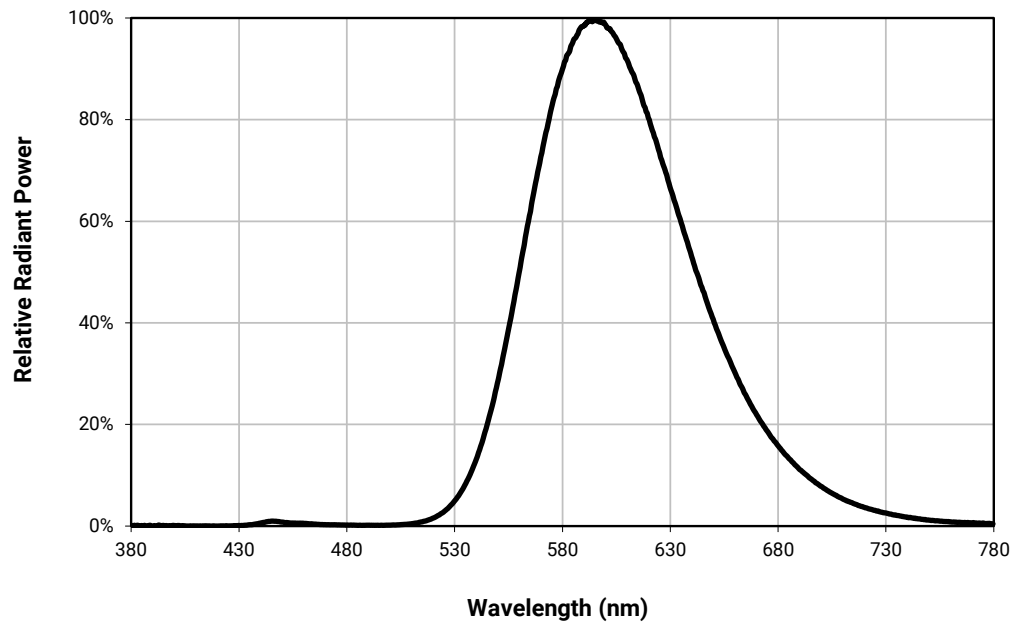
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

High Density & High Intensity



RELATIVE SPECTRAL POWER DISTRIBUTION - PC AMBER

High Density & High Intensity



PERFORMANCE GROUPS - LUMINOUS FLUX

XLamp XQ-E Plus white LEDs are tested for luminous flux and placed into one of the following luminous-flux groups. These group codes, with a 0 appended, are used in the Bin Code “Luminous flux group.”

Group Code	Minimum Luminous Flux (lm)	Maximum Luminous Flux (lm)
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

PERFORMANCE GROUPS - RADIANT FLUX ($T_j = 25\text{ }^{\circ}\text{C}$)

XLamp XQ-E Plus 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
33	525	550
34	550	575
35	575	600
36	600	625
37	625	650
38	650	675
39	675	700

PERFORMANCE GROUPS - DOMINANT WAVELENGTH

XLamp XQ-E Plus color 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	D36	450	452.5
	D37	452.5	455
	D46	455	457.5
	D47	457.5	460
	D56	460	462.5
	D57	462.5	465
Blue	B3	465	470
	B4	470	475
	B5	475	480
	B6	480	485
Green	G2	520	525
	G3	525	530
	G4	530	535

PERFORMANCE GROUPS - CHROMATICITY

XLamp XQ-E Plus white LEDs are tested for luminous flux and placed into one of the following chromaticity groups. These group codes are used in the Bin Code "Chromaticity bin." Two-digit group codes are appended with a 0.

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

PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
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	3T	0.3480	0.3840	3U	0.3440	0.3428
	0.3440	0.3428		0.3480	0.3840		0.3571	0.3907		0.3515	0.3487
	0.3429	0.3307		0.3463	0.3687		0.3551	0.3760		0.3495	0.3339
	0.3361	0.3245		0.3376	0.3616		0.3463	0.3687		0.3429	0.3307
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
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

PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
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
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

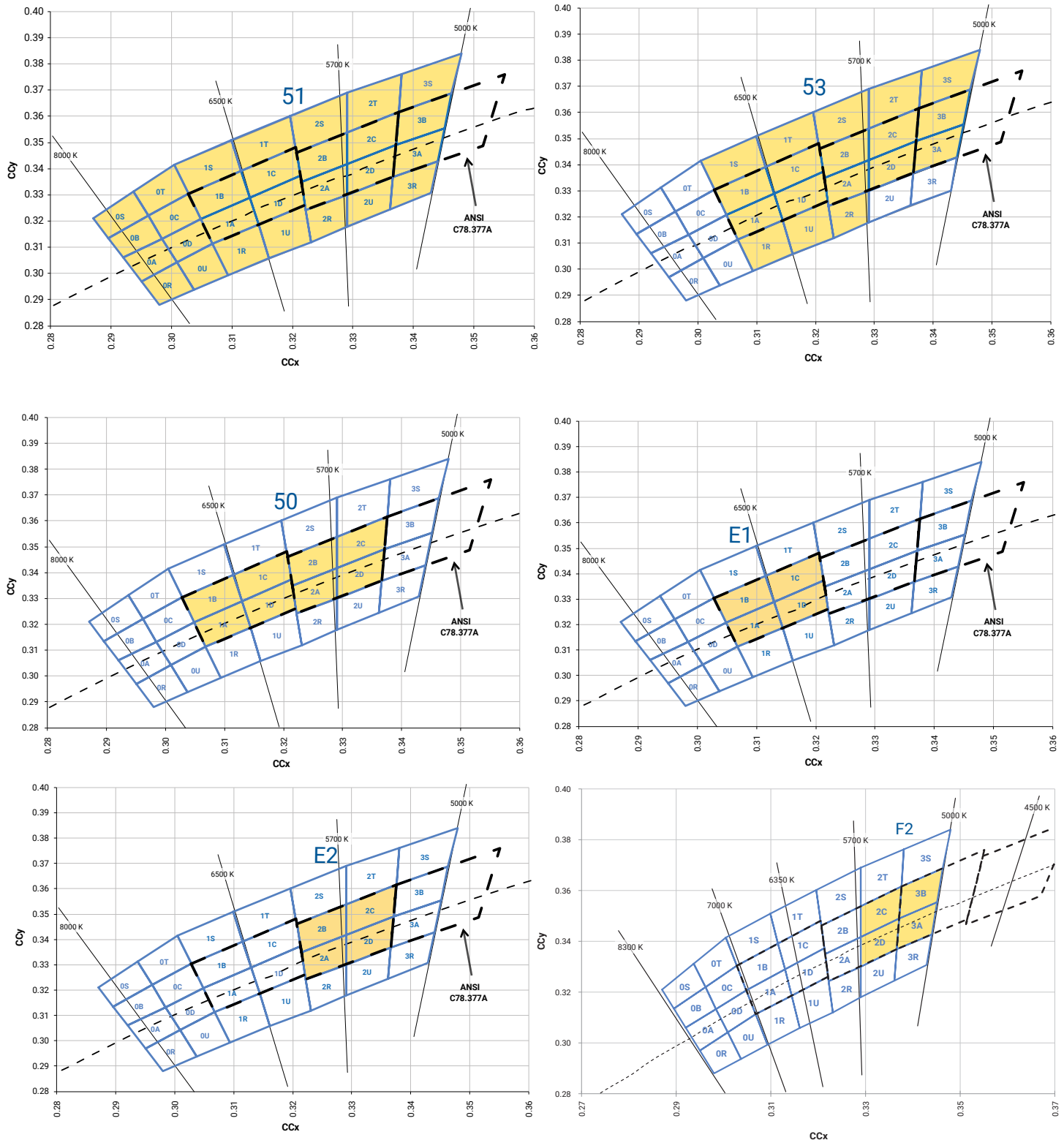
PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
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

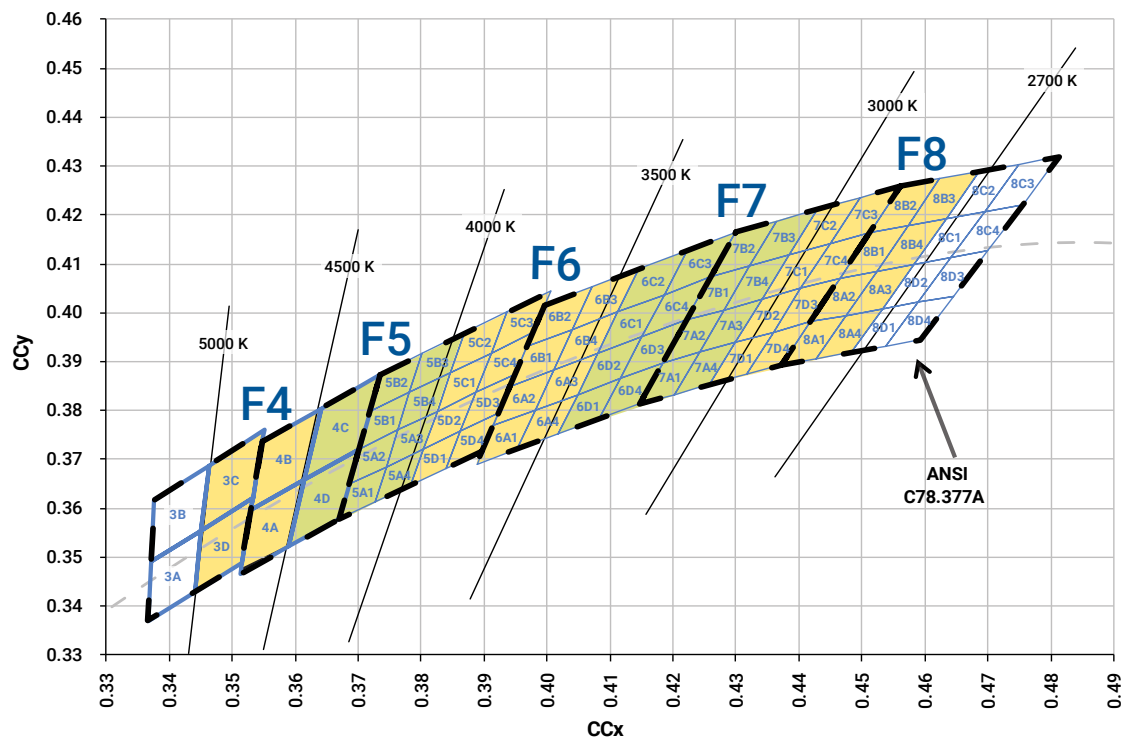
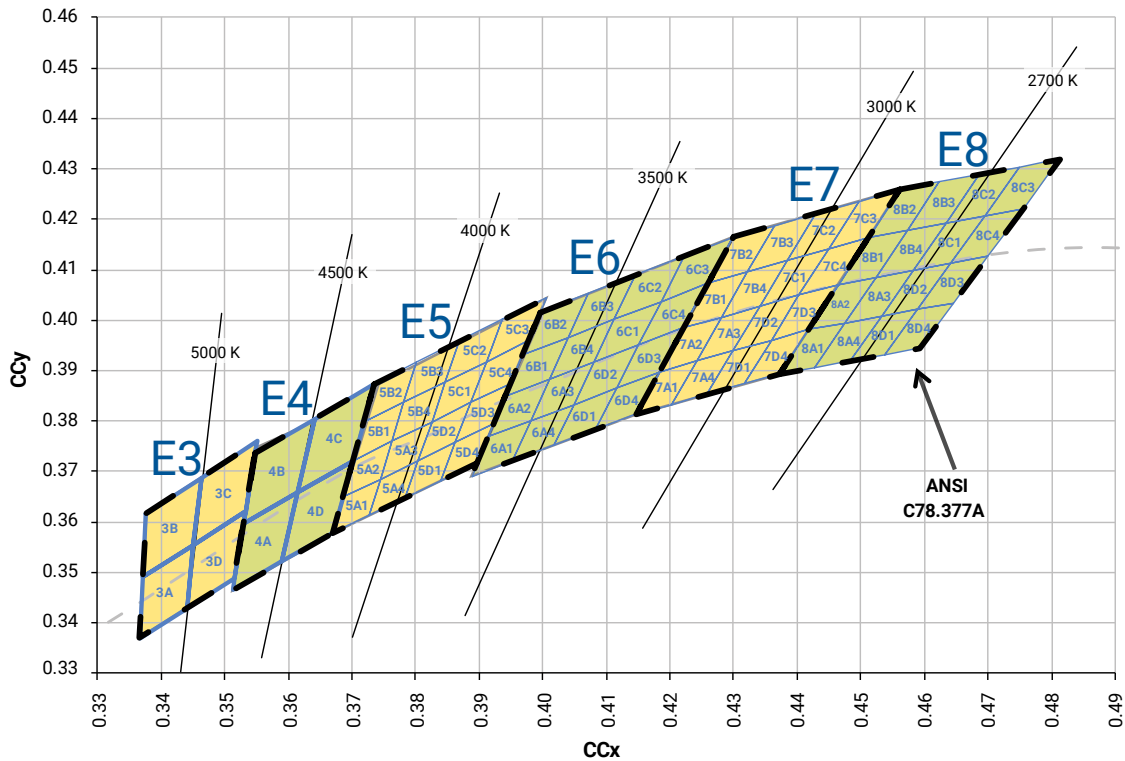
XLamp XQ-E Plus PC amber LEDs are placed into the region defined by the following bounding coordinates.

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

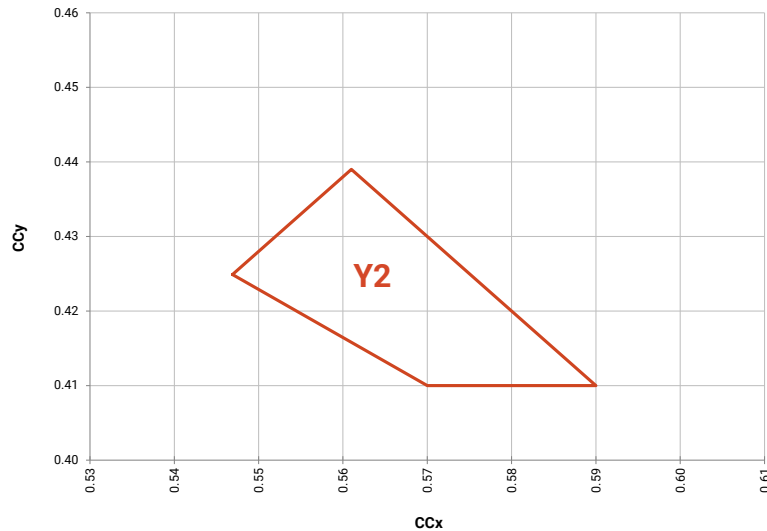
STANDARD COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



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



PC AMBER KIT PLOTTED ON THE 1931 CIE CURVE



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
	5750 K	F2	2C, 2D, 3A, 3B
	5700 K	E2	2A, 2B, 2C, 2D
Neutral White	5250 K	F3	
	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
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
	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
	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

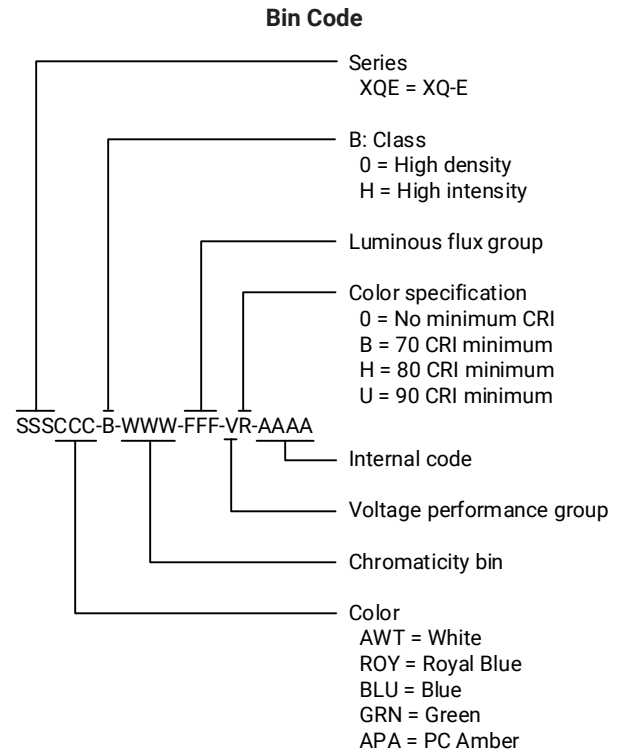
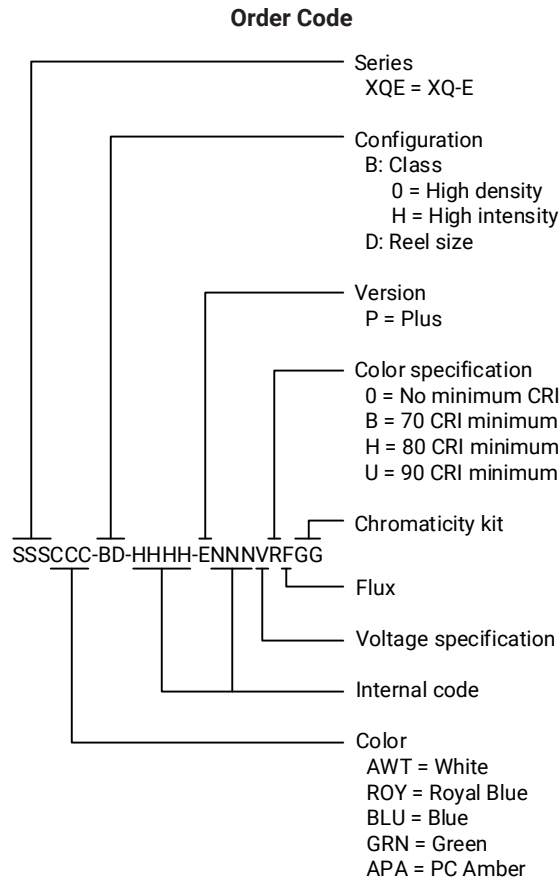
STANDARD CHROMATICITY KITS

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
	5750 K	F2	2C, 2D, 3A, 3B
	5700 K	E2	2A, 2B, 2C, 2D
Neutral White	5250 K	F3	
	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
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
	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
	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

BIN AND ORDER CODE FORMATS

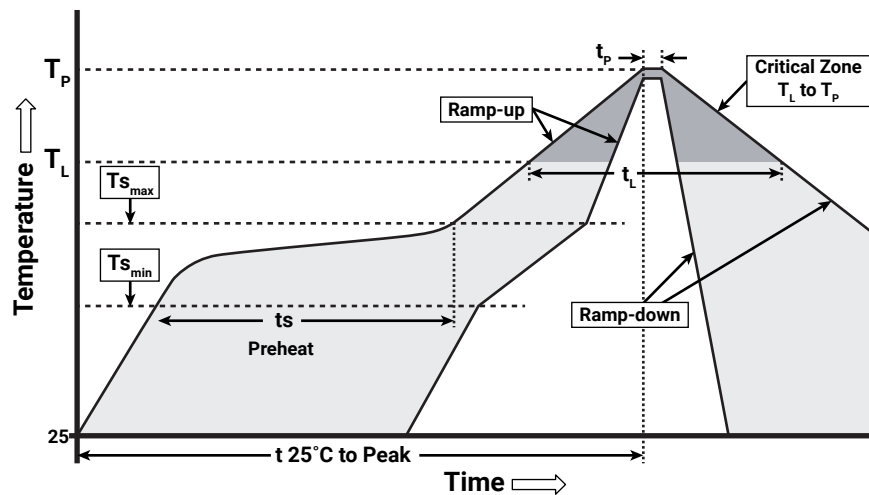
Bin codes and order codes for XQ-E Plus LEDs are configured in the following manner:



REFLOW SOLDERING CHARACTERISTICS

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

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



IPC/JEDEC J-STD-020C

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

Note: All temperatures refer to 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

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 XQ-E Plus LEDs may be stored as MSL 1 per JEDEC J-STD-033, meaning they have unlimited floor life in conditions of $\leq 30^{\circ}\text{C}/85\%$ relative humidity (RH). Regardless of storage condition, Cree LED recommends sealing any unsoldered LEDs in the original MBP.

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.

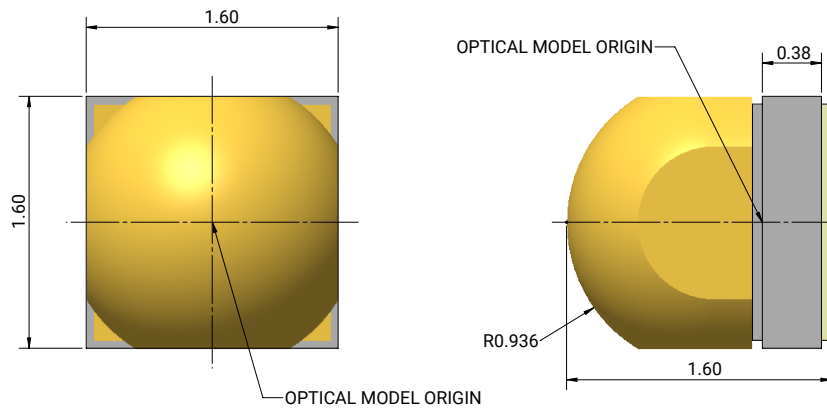
All dimensions in mm.

Measurement tolerances unless indicated otherwise: ± 1.3 mm

High Density White and Colors (except PC Amber)

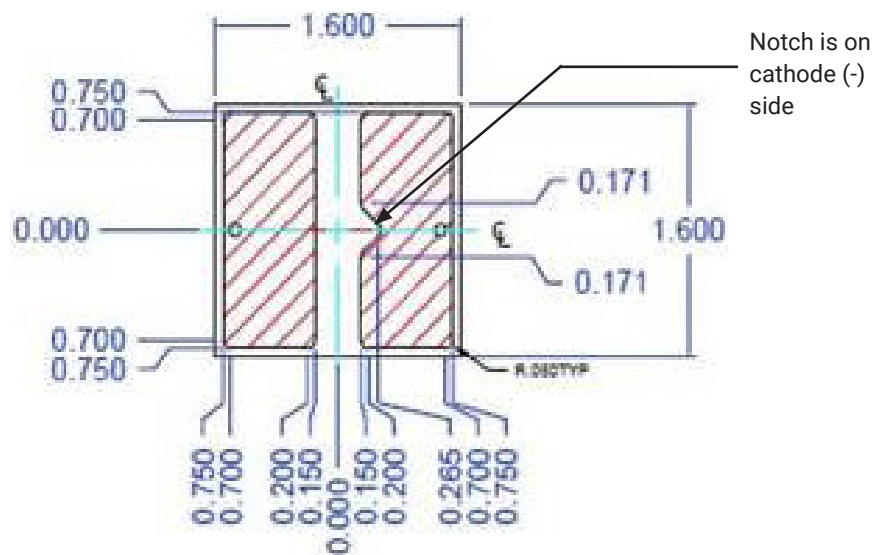
XQExxx-0x-xxxx-Pxxxxxxxx

↑↑ XQ-E Plus High Density



Top View

Side View



Bottom View

MECHANICAL DIMENSIONS - CONTINUED

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

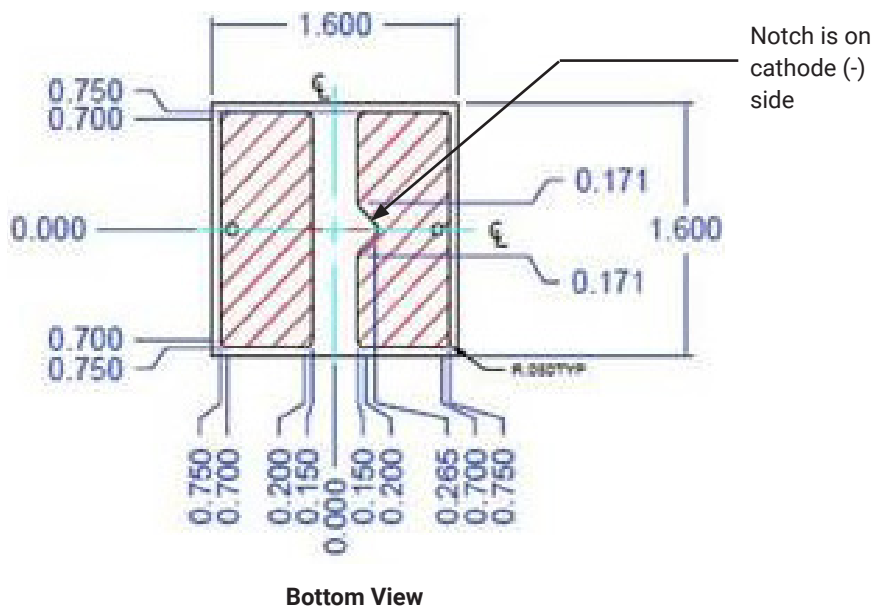
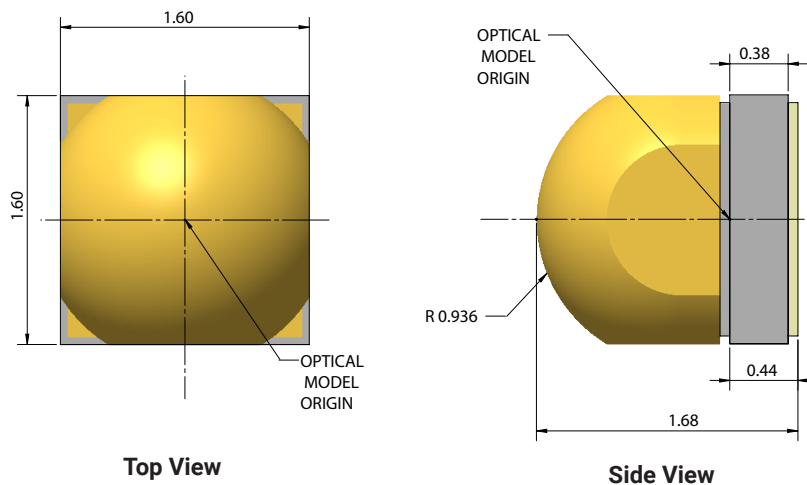
All dimensions in mm.

Measurement tolerances unless indicated otherwise: ± 0.13 mm

High Density PC Amber

XQExxx-0x-xxxx-Pxxxxxxxxx

XQ-E Plus High Density

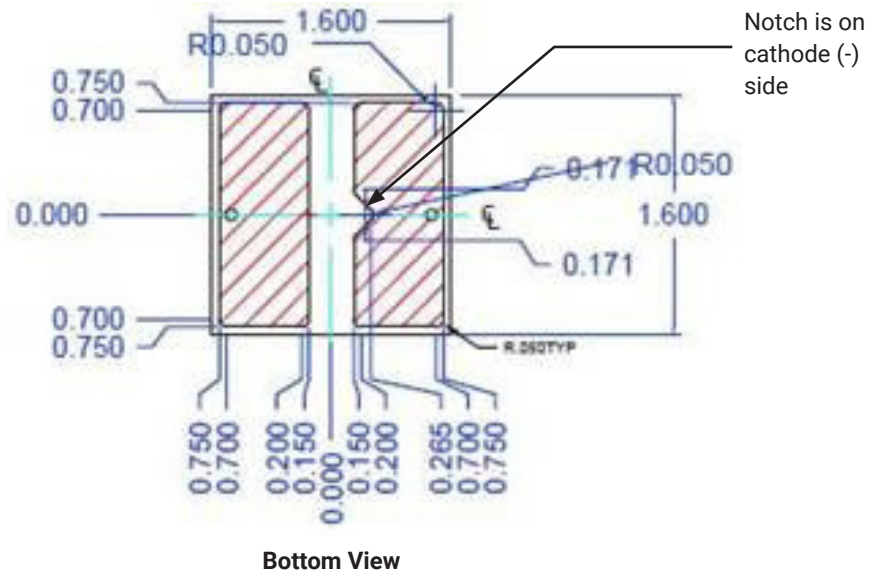
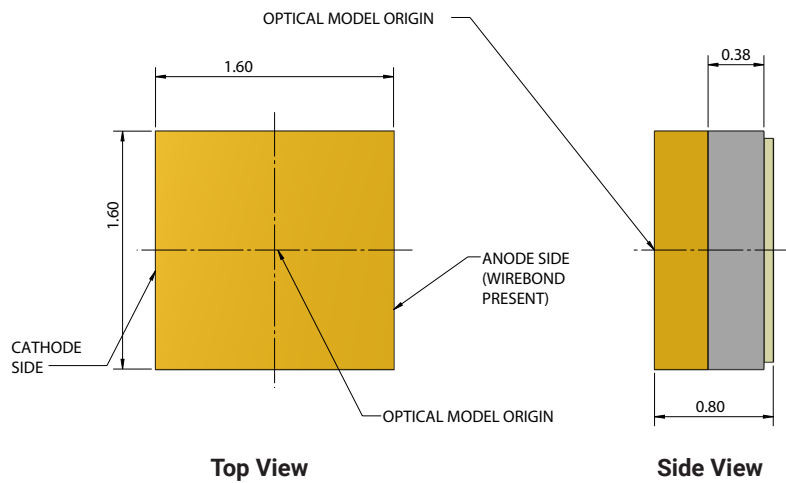


MECHANICAL DIMENSIONS - CONTINUED

High Intensity White and Colors (except PC Amber)

XQExxx-Hx-xxxx-Pxxxxxxxxx

XQ-E Plus High Intensity

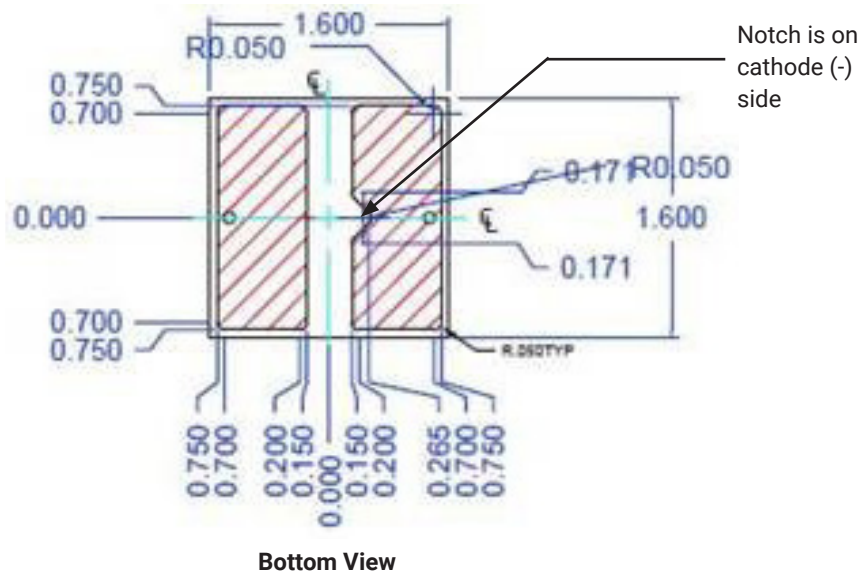
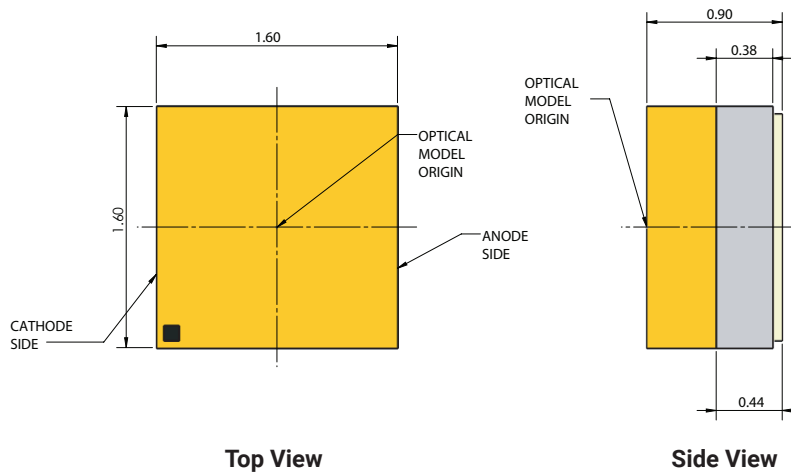


MECHANICAL DIMENSIONS - CONTINUED

High Intensity PC Amber

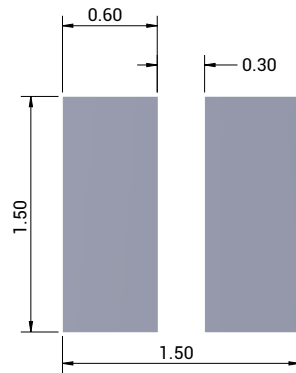
XQExxx-Hx-xxxx-Pxxxxxxxxx

XQ-E Plus High Intensity

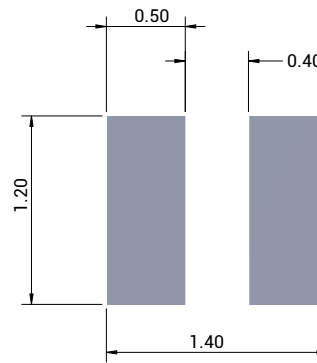


MECHANICAL DIMENSIONS - CONTINUED

High Density & High Intensity



Recommended Solder Pad



Recommended Stencil Opening

TAPE AND REEL

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

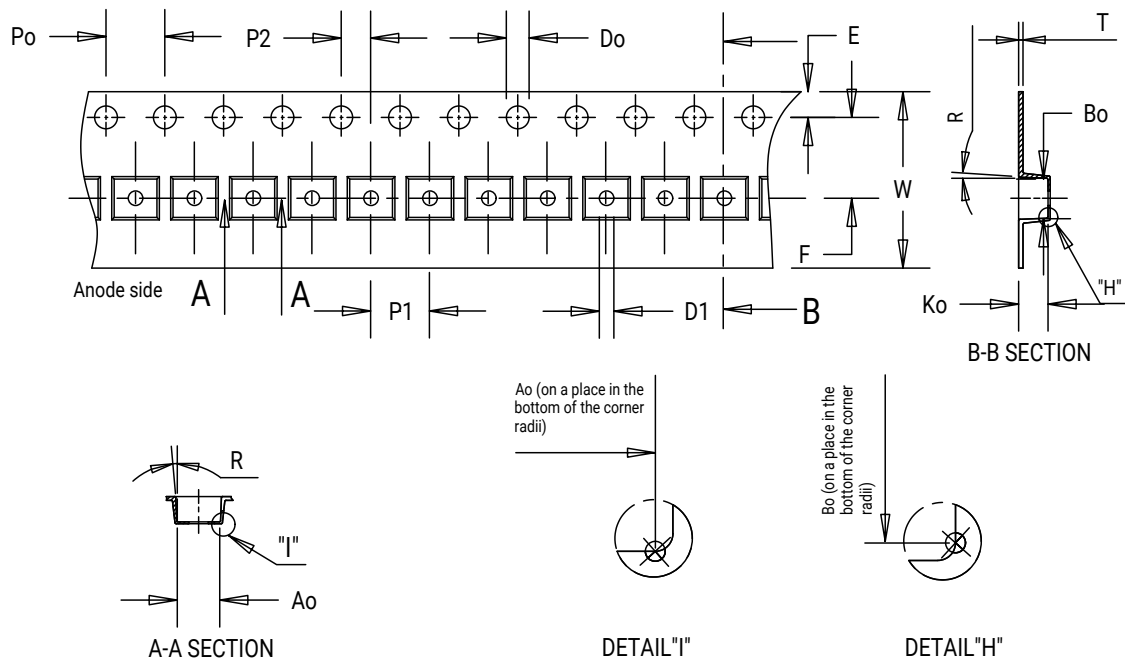
Except as noted, all dimensions in mm.

Measurement tolerances unless indicated otherwise: .xx = ± 0.15 mm

High Density White and Colors (except PC Amber)

XQExxx-0x-xxxx-Pxxxxxxxxx

XQ-E Plus High Density



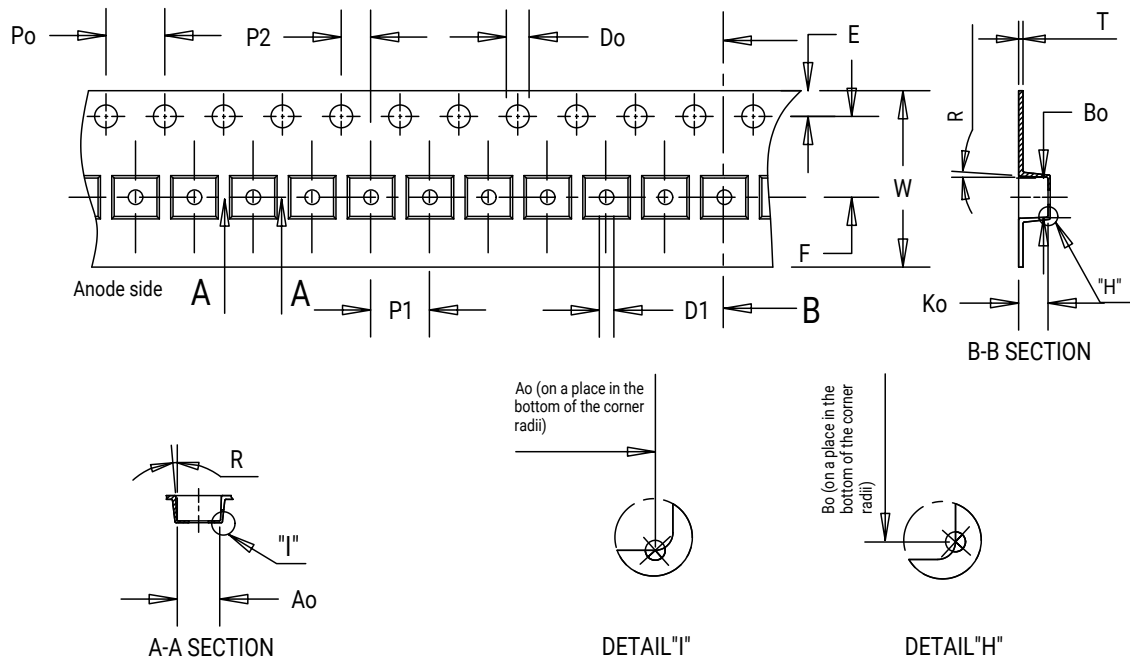
Item	Ao	Bo	Ko	Po	P1	P2	T	E	F	Do	D1	W	R
Dim.	1.85	1.85	1.55	4.00	4.00	2.00	0.30 ± 0.05	1.75	3.50	1.50 ^{+0.10} ₀	0.80 ± 0.05	8.00 ^{+0.30} _{-0.10}	5°

TAPE AND REEL - CONTINUED

High Density PC Amber

XQExxx-0x-xxxx-Pxxxxxxxxx

XQ-E Plus High Density



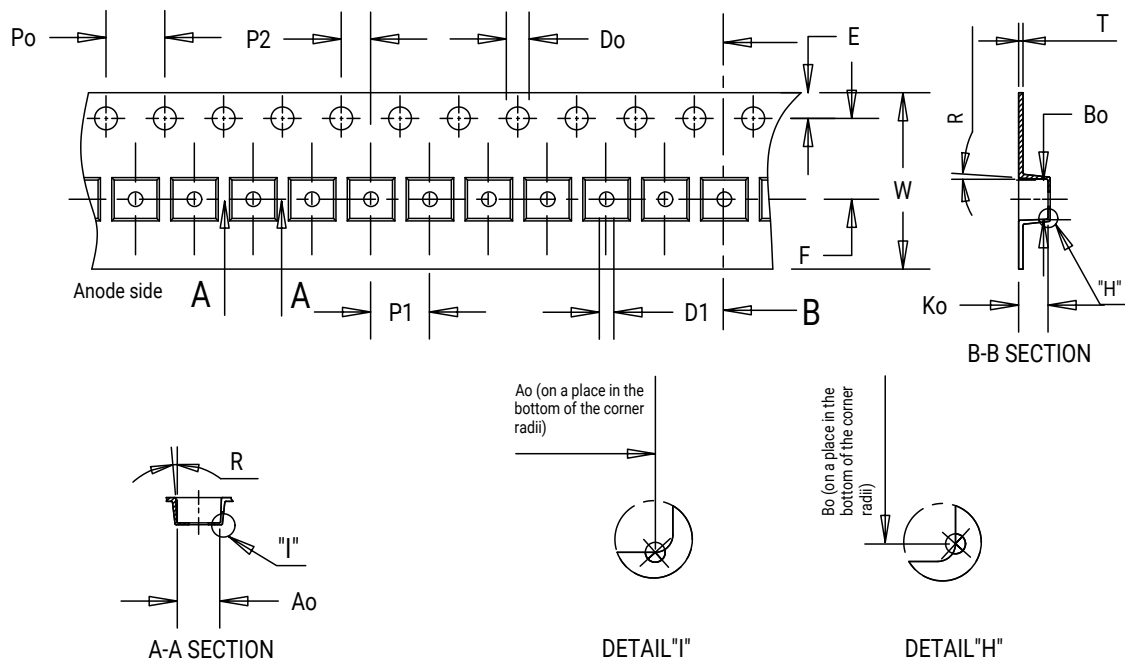
Item	Ao	Bo	Ko	Po	P1	P2	T	E	F	Do	D1	W	R
Dim.	1.85	1.85	1.80	4.00	4.00	2.00	0.35 ±0.05	1.75	3.50 ±0.05	1.50 ^{+0.10} ₀	0.80 ±0.05	8.00 ^{+0.30} _{-0.10}	5°

TAPE AND REEL - CONTINUED

High Intensity

XQExxx-Hx-xxxx-Pxxxxxxxxx

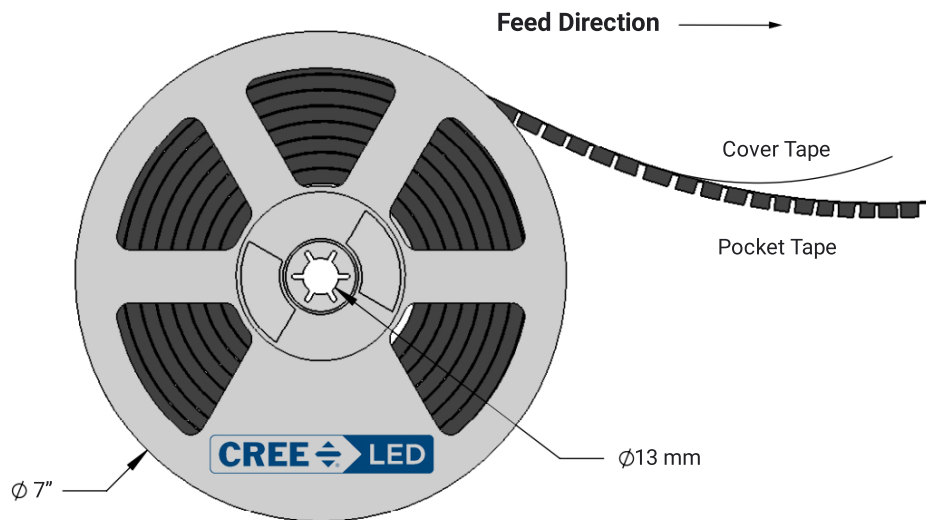
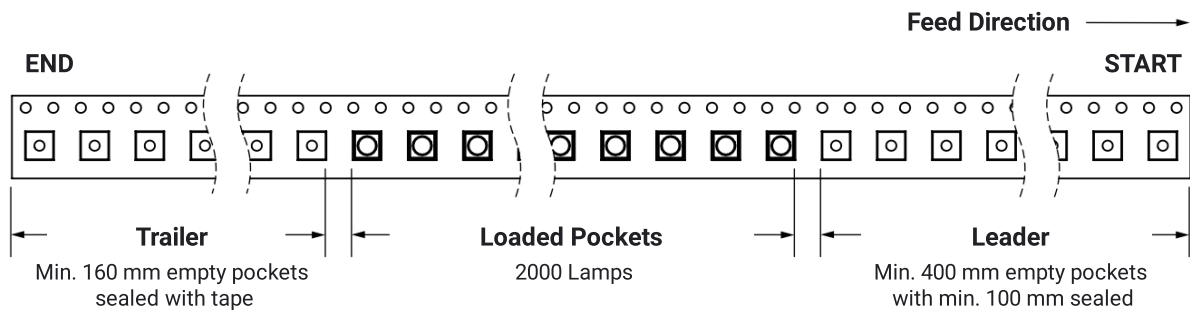
XQ-E Plus High Intensity



Item	Ao	Bo	Ko	Po	P1	P2	T	E	F	Do	D1	W	R
Dim.	1.85	1.85	1.20	4.00	4.00	2.00	0.30	1.75	3.50	1.50	1.00	8.00	3°

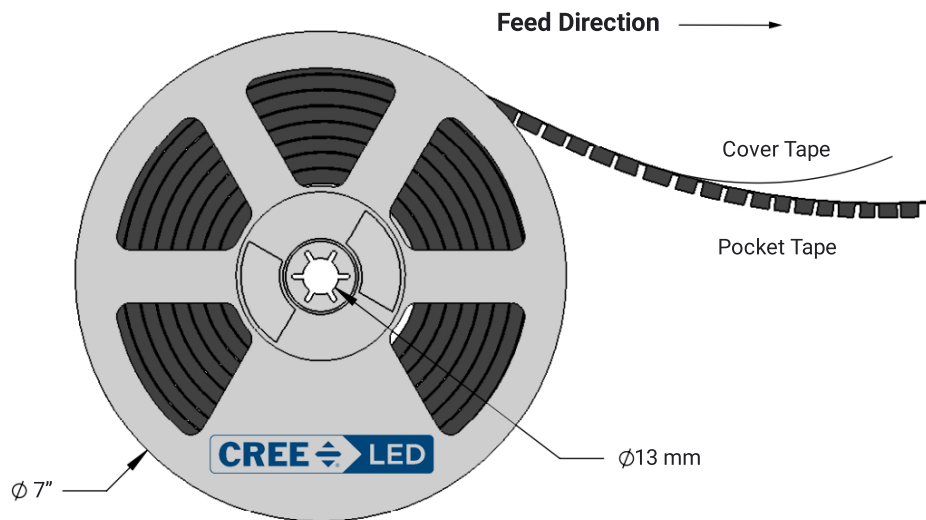
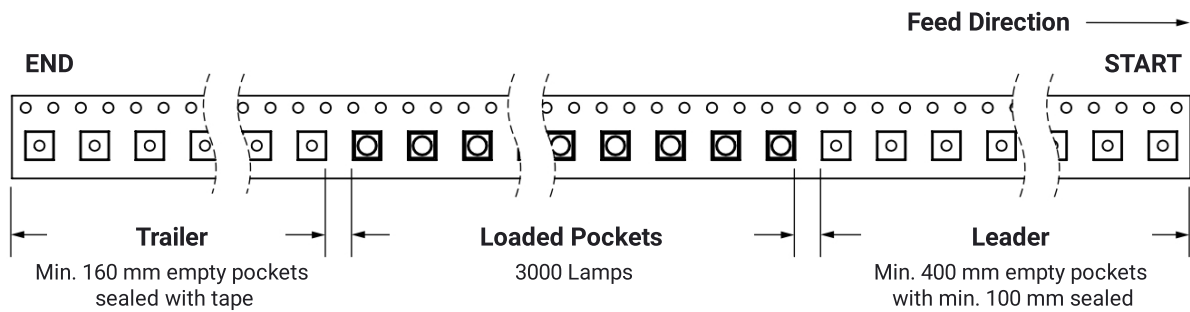
TAPE AND REEL - CONTINUED

High Density



TAPE AND REEL - CONTINUED

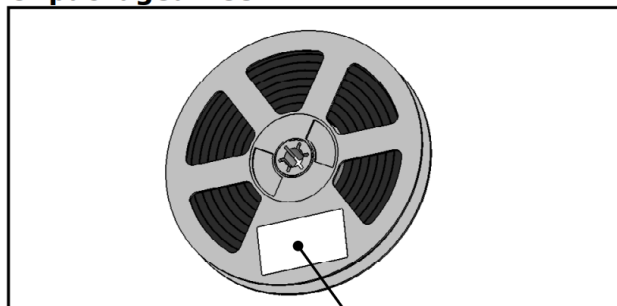
High Intensity



PACKAGING

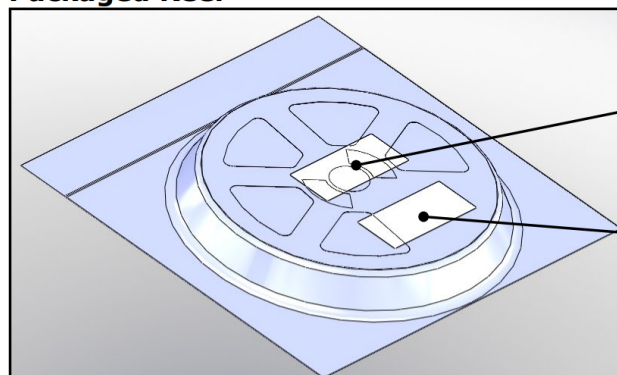
The diagrams below show the packaging and labels Cree LED uses to ship XLamp XQ-E Plus LEDs. XLamp XQ-E Plus LEDs are shipped in tape loaded on a reel. Each box contains only one reel in a moisture barrier bag.

Unpackaged Reel



Label with Cree LED Bin Code, Quantity, Reel ID

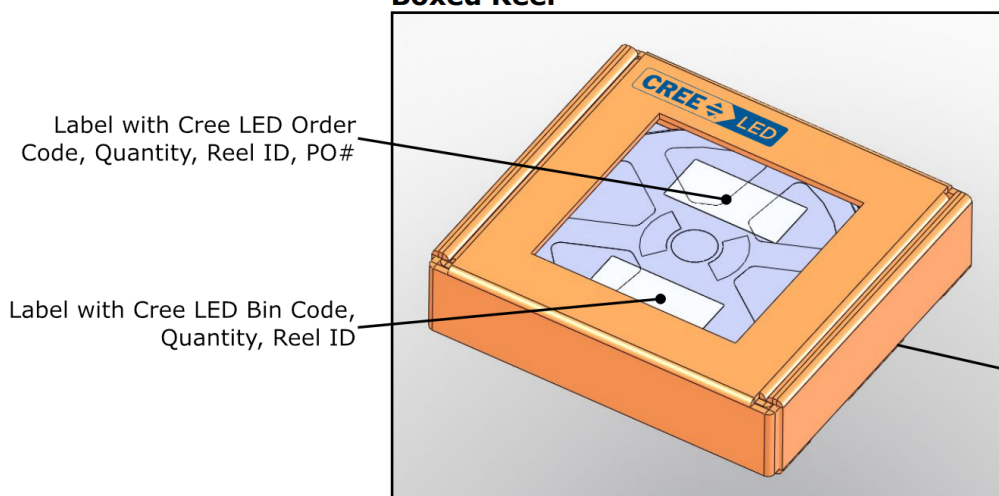
Packaged Reel



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

Label with Cree LED Bin Code, Quantity, Reel ID

Boxed Reel



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

Label with Cree LED Bin Code, Quantity, Reel ID

Patent Label (on bottom of box)