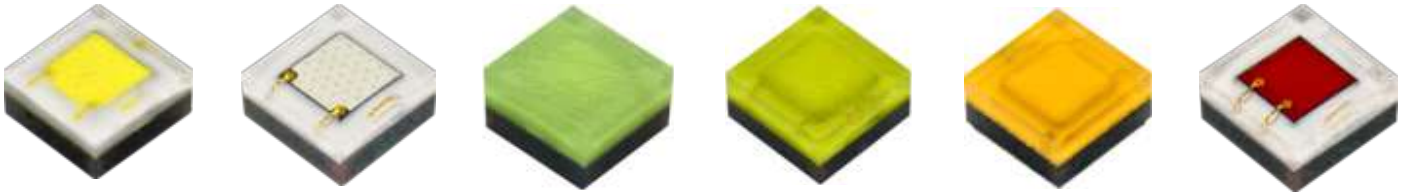
XLamp® XQ-E LEDs



XQ-E High Density LEDs



XQ-E High Intensity LEDs

PRODUCT DESCRIPTION

The XLamp® XQ-E LEDs are available in two versions: high density and high intensity. The XQ-E 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'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 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 70, 80, & 90 CRI white, royal blue, blue, PC blue, cyan, PC cyan, green, PC lime, PC amber, red-orange, red & high efficiency (HE) photo red
- Maximum drive current: 1.5 A (high density & high intensity)
- Reflow solderable - JEDEC J-STD-020C compatible
- Unlimited floor life at ≤ 30 °C/85% RH
- 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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XLAMP XQ-E LEDs - WHITE

CHARACTERISTICS - HIGH DENSITY WHITE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point - white	°C/W		3.5	
Thermal resistance, junction to solder point - 1800 K white	°C/W		4	
Viewing angle (FWHM) - white	degrees		110	
Viewing angle (FWHM) - 1800 K white	degrees		105	
Temperature coefficient of voltage - white, 1800 K white	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D) - white, 1800 K white			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 85 °C) - white, 1800 K white	V		2.8	3.25
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY WHITE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point - white	°C/W		3.5	
Thermal resistance, junction to solder point - 1800 K white	°C/W		4	
Viewing angle (FWHM) - white, 1800 K white	degrees		120	
Temperature coefficient of voltage - white, 1800 K white	mV/°C		-1.2	
ESD classification (HBM per Mil-Std-883D) - white, 1800 K white			Class 3B	
DC forward current	mA			1500
Reverse voltage	V			1
Forward voltage (@ 350 mA, 85 °C) - white, 1800 K white	V		2.75	3.25
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 - HIGH DENSITY WHITE (T_J = 85 °C)

The following tables provide order codes for XLamp XQ-E High Density white LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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 (5000 K – 8300 K)								
51	6200 K	S2	148	171	258	333	XQEAWT-00-0000-00000LJ51	XQEAWT-00-0000-00000BJ51
		R5	139	161	242	313	XQEAWT-00-0000-00000LH51	XQEAWT-00-0000-00000BH51
		R4	130	150	226	293	XQEAWT-00-0000-00000LG51	XQEAWT-00-0000-00000BG51
		R3	122	141	212	275	XQEAWT-00-0000-00000LF51	XQEAWT-00-0000-00000BF51
		R2	114	132	196	257	XQEAWT-00-0000-00000LE51	XQEAWT-00-0000-00000BE51
53	6000 K	S2	148	171	258	333	XQEAWT-00-0000-00000LJ53	XQEAWT-00-0000-00000BJ53
		R5	139	161	242	313	XQEAWT-00-0000-00000LH53	XQEAWT-00-0000-00000BH53
		R4	130	150	226	293	XQEAWT-00-0000-00000LG53	XQEAWT-00-0000-00000BG53
		R3	122	141	212	275	XQEAWT-00-0000-00000LF53	XQEAWT-00-0000-00000BF53
		R2	114	132	196	257	XQEAWT-00-0000-00000LE53	XQEAWT-00-0000-00000BE53
50	6200 K	S2	148	171	258	333	XQEAWT-00-0000-00000LJ50	XQEAWT-00-0000-00000BJ50
		R5	139	161	242	313	XQEAWT-00-0000-00000LH50	XQEAWT-00-0000-00000BH50
		R4	130	150	226	293	XQEAWT-00-0000-00000LG50	XQEAWT-00-0000-00000BG50
		R3	122	141	212	275	XQEAWT-00-0000-00000LF50	XQEAWT-00-0000-00000BF50
		R2	114	132	196	257	XQEAWT-00-0000-00000LE50	XQEAWT-00-0000-00000BE50
E1	6500 K	R5	139	161	242	313	XQEAWT-00-0000-00000LHE1	XQEAWT-00-0000-00000BHE1
		R4	130	150	226	293	XQEAWT-00-0000-00000LGE1	XQEAWT-00-0000-00000BGE1
		R3	122	141	212	275	XQEAWT-00-0000-00000LFE1	XQEAWT-00-0000-00000BFE1
		R2	114	132	196	257	XQEAWT-00-0000-00000LEE1	XQEAWT-00-0000-00000BEE1
E2	5700 K	S2	148	171	258	333	XQEAWT-00-0000-00000LJE2	XQEAWT-00-0000-00000BJE2
		R5	139	161	242	313	XQEAWT-00-0000-00000LHE2	XQEAWT-00-0000-00000BHE2
		R4	130	150	226	293	XQEAWT-00-0000-00000LGE2	XQEAWT-00-0000-00000BGE2
		R3	122	141	212	275	XQEAWT-00-0000-00000LFE2	XQEAWT-00-0000-00000BFE2
		R2	114	132	196	257	XQEAWT-00-0000-00000LEE2	XQEAWT-00-0000-00000BEE2

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH DENSITY 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	70 CRI Minimum	75 CRI Typical	80 CRI Minimum
ANSI Neutral White (3700 K – 5000 K)									
E3	5000 K	R4	130	150	224	288	XQEAWT-00-0000-00000BGE3		
		R3	122	141	210	270	XQEAWT-00-0000-00000BFE3	XQEAWT-00-0000-00000LFE3	
		R2	114	132	196	252	XQEAWT-00-0000-00000BEE3	XQEAWT-00-0000-00000LEE3	
		Q5	107	124	184	237		XQEAWT-00-0000-00000LDE3	
		Q4	100	116	172	221		XQEAWT-00-0000-00000LCE3	
F4	4750 K	R4	130	150	224	288	XQEAWT-00-0000-00000BGF4		
		R3	122	141	210	270	XQEAWT-00-0000-00000BFF4	XQEAWT-00-0000-00000LFF4	
		R2	114	132	196	252	XQEAWT-00-0000-00000BEF4	XQEAWT-00-0000-00000LEF4	
		Q5	107	124	184	237		XQEAWT-00-0000-00000LDF4	
		Q4	100	116	172	221		XQEAWT-00-0000-00000LCF4	
		Q3	93.9	109	162	208		XQEAWT-00-0000-00000LBF4	
E4	4500 K	R4	130	150	224	288	XQEAWT-00-0000-00000BGE4		
		R3	122	141	210	270	XQEAWT-00-0000-00000BFE4	XQEAWT-00-0000-00000LFE4	
		R2	114	132	196	252	XQEAWT-00-0000-00000BEE4	XQEAWT-00-0000-00000LEE4	
		Q5	107	124	184	237		XQEAWT-00-0000-00000LDE4	
		Q4	100	116	172	221		XQEAWT-00-0000-00000LCE4	
		Q3	93.9	109	162	208		XQEAWT-00-0000-00000LBE4	
F5	4250 K	R4	130	150	226	293	XQEAWT-00-0000-00000BGF5		
		R3	122	141	212	275	XQEAWT-00-0000-00000BFF5	XQEAWT-00-0000-00000LFF5	XQEAWT-00-0000-00000HFF5
		R2	114	132	196	257	XQEAWT-00-0000-00000BEF5	XQEAWT-00-0000-00000LEF5	XQEAWT-00-0000-00000HEF5
		Q5	107	124	184	241		XQEAWT-00-0000-00000LDF5	XQEAWT-00-0000-00000HDF5
		Q4	100	116	172	225		XQEAWT-00-0000-00000LCF5	XQEAWT-00-0000-00000HCF5
E5	4000 K	R4	130	150	226	293	XQEAWT-00-0000-00000BGE5		
		R3	122	141	212	275	XQEAWT-00-0000-00000BFE5	XQEAWT-00-0000-00000LFE5	XQEAWT-00-0000-00000HFE5
		R2	114	132	196	257	XQEAWT-00-0000-00000BEE5	XQEAWT-00-0000-00000LEE5	XQEAWT-00-0000-00000HEE5
		Q5	107	124	184	241		XQEAWT-00-0000-00000LDE5	XQEAWT-00-0000-00000HDE5
		Q4	100	116	172	225		XQEAWT-00-0000-00000LCE5	XQEAWT-00-0000-00000HCE5
		Q3	93.9	109	162	211			
		Q2	87.4	101	150	197			

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH DENSITY 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 Typical	80 CRI Minimum	90 CRI Minimum
ANSI Warm White (2700 K - 3750 K)									
F6	3750 K	R3	122	141	212	275	XQEAWT-00-0000-00000LFF6	XQEAWT-00-0000-00000HFF6	
		R2	114	132	196	257	XQEAWT-00-0000-00000LEF6	XQEAWT-00-0000-00000HEF6	
		Q5	107	124	184	237	XQEAWT-00-0000-00000LDF6	XQEAWT-00-0000-00000HDF6	
		Q4	100	116	172	225	XQEAWT-00-0000-00000LCF6	XQEAWT-00-0000-00000HCF6	XQEAWT-00-0000-00000UCF6
		Q3	93.9	109	162	211			XQEAWT-00-0000-00000UBF6
		Q2	87.4	101	150	197			XQEAWT-00-0000-00000UAF6
E6	3500 K	R3	122	141	212	275	XQEAWT-00-0000-00000LFE6	XQEAWT-00-0000-00000HFE6	
		R2	114	132	196	257	XQEAWT-00-0000-00000LEE6	XQEAWT-00-0000-00000HEE6	
		Q5	107	124	184	241	XQEAWT-00-0000-00000LDE6	XQEAWT-00-0000-00000HDE6	
		Q4	100	116	172	225	XQEAWT-00-0000-00000LCE6	XQEAWT-00-0000-00000HCE6	
		Q3	93.9	109	162	211			XQEAWT-00-0000-00000UBE6
		Q2	87.4	101	150	197			XQEAWT-00-0000-00000UAE6
		P4	80.6	93	139	181			XQEAWT-00-0000-00000U9E6
F7	3250 K	R3	122	141	212	275	XQEAWT-00-0000-00000LFF7	XQEAWT-00-0000-00000HFF7	
		R2	114	132	196	257	XQEAWT-00-0000-00000LEF7	XQEAWT-00-0000-00000HEF7	
		Q5	107	124	184	241	XQEAWT-00-0000-00000LDF7	XQEAWT-00-0000-00000HDF7	
		Q4	100	116	172	225	XQEAWT-00-0000-00000LCF7	XQEAWT-00-0000-00000HCF7	
		Q3	93.9	109	162	211			XQEAWT-00-0000-00000UBF7
		Q2	87.4	101	150	197			XQEAWT-00-0000-00000UAF7
		P4	80.6	93	139	181			XQEAWT-00-0000-00000U9F7
E7	3000 K	R3	122	141	212	275	XQEAWT-00-0000-00000LFE7	XQEAWT-00-0000-00000HFE7	
		R2	114	132	196	257	XQEAWT-00-0000-00000LEE7	XQEAWT-00-0000-00000HEE7	
		Q5	107	124	184	241	XQEAWT-00-0000-00000LDE7	XQEAWT-00-0000-00000HDE7	
		Q4	100	116	172	225	XQEAWT-00-0000-00000LCE7	XQEAWT-00-0000-00000HCE7	
		Q3	93.9	109	162	211	XQEAWT-00-0000-00000LBE7	XQEAWT-00-0000-00000HBE7	XQEAWT-00-0000-00000UBE7
		Q2	87.4	101	150	197			XQEAWT-00-0000-00000UAE7
		P4	80.6	93	139	181			XQEAWT-00-0000-00000U9E7
		P3	73.9	86	127	166			XQEAWT-00-0000-00000U8E7

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH DENSITY 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 Typical	80 CRI Minimum	90 CRI Minimum
ANSI Warm White (2700 K - 3750 K)									
F8	2850 K	R2	114	132	196	257	XQEAWT-00-0000-00000LEF8	XQEAWT-00-0000-00000HEF8	
		Q5	107	124	184	241	XQEAWT-00-0000-00000LDF8	XQEAWT-00-0000-00000HDF8	
		Q4	100	116	172	225	XQEAWT-00-0000-00000LCF8	XQEAWT-00-0000-00000HCF8	
		Q3	93.9	109	162	211	XQEAWT-00-0000-00000LBF8	XQEAWT-00-0000-00000HBF8	XQEAWT-00-0000-00000UBF8
		Q2	87.4	101	150	197			XQEAWT-00-0000-00000UAF8
		P4	80.6	93	139	181			XQEAWT-00-0000-00000U9F8
		P3	73.9	86	127	166			XQEAWT-00-0000-00000U8F8
		P2	67.2	78	116	151			XQEAWT-00-0000-00000U7F8
E8	2700 K	R2	114	132	196	257	XQEAWT-00-0000-00000LEE8	XQEAWT-00-0000-00000HEE8	
		Q5	107	124	184	241	XQEAWT-00-0000-00000LDE8	XQEAWT-00-0000-00000HDE8	
		Q4	100	116	172	225	XQEAWT-00-0000-00000LCE8	XQEAWT-00-0000-00000HCE8	
		Q3	93.9	109	162	211	XQEAWT-00-0000-00000LBE8	XQEAWT-00-0000-00000HBE8	
		Q2	87.4	101	150	197			XQEAWT-00-0000-00000UAE8
		P4	80.6	93	139	181			XQEAWT-00-0000-00000U9E8
		P3	73.9	86	127	166			XQEAWT-00-0000-00000U8E8
		P2	67.2	78	116	151			XQEAWT-00-0000-00000U7E8
EA	2200 K	Q3	93.9	109	162	211		XQEAWT-00-0000-00000HBEA	
		Q2	87.4	101	150	197		XQEAWT-00-0000-00000HAEA	

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
ANSI Warm White (1800 K)							
BE	1800 K	Q3	93.9	109	162	211	XQEAWT-00-0000-000000BBE
		Q2	87.4	101	150	197	XQEAWT-00-0000-000000ABE
		P4	80.6	93	139	181	XQEAWT-00-0000-0000009BE

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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

The following tables provide order codes for XLamp XQ-E High Intensity white LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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 (5000 K – 8300 K)								
51	6200 K	R5	139	161	242	313	XQEAWT-H0-0000-00000LH51	XQEAWT-H0-0000-00000BH51
		R4	130	150	226	293	XQEAWT-H0-0000-00000LG51	XQEAWT-H0-0000-00000BG51
		R3	122	141	212	275	XQEAWT-H0-0000-00000LF51	XQEAWT-H0-0000-00000BF51
		R2	114	132	196	257	XQEAWT-H0-0000-00000LE51	XQEAWT-H0-0000-00000BE51
53	6000 K	R5	139	161	242	313	XQEAWT-H0-0000-00000LH53	XQEAWT-H0-0000-00000BH53
		R4	130	150	226	293	XQEAWT-H0-0000-00000LG53	XQEAWT-H0-0000-00000BG53
		R3	122	141	212	275	XQEAWT-H0-0000-00000LF53	XQEAWT-H0-0000-00000BF53
		R2	114	132	196	257	XQEAWT-H0-0000-00000LE53	XQEAWT-H0-0000-00000BE53
50	6200 K	R5	139	161	242	313	XQEAWT-H0-0000-00000LH50	XQEAWT-H0-0000-00000BH50
		R4	130	150	226	293	XQEAWT-H0-0000-00000LG50	XQEAWT-H0-0000-00000BG50
		R3	122	141	212	275	XQEAWT-H0-0000-00000LF50	XQEAWT-H0-0000-00000BF50
		R2	114	132	196	257	XQEAWT-H0-0000-00000LE50	XQEAWT-H0-0000-00000BE50
E1	6500 K	R4	130	150	226	293	XQEAWT-H0-0000-00000LGE1	XQEAWT-H0-0000-00000BGE1
		R3	122	141	212	275	XQEAWT-H0-0000-00000LFE1	XQEAWT-H0-0000-00000BFE1
		R2	114	127	199	258	XQEAWT-H0-0000-00000LEE1	XQEAWT-H0-0000-00000BEE1
E2	5700 K	R5	139	161	242	313	XQEAWT-H0-0000-00000LHE2	XQEAWT-H0-0000-00000BHE2
		R4	130	150	226	293	XQEAWT-H0-0000-00000LGE2	XQEAWT-H0-0000-00000BGE2
		R3	122	141	212	275	XQEAWT-H0-0000-00000LFE2	XQEAWT-H0-0000-00000BFE2
		R2	114	132	196	257	XQEAWT-H0-0000-00000LEE2	XQEAWT-H0-0000-00000BEE2

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - 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	70 CRI Minimum	75 CRI Typical	80 CRI Minimum	90 CRI Minimum
ANSI Neutral White (3700 K – 5000 K)										
E3	5000 K	R5	139	161	242	313	XQEAWT-H0-0000-00000BHE3			
		R4	130	150	226	293	XQEAWT-H0-0000-00000BGE3			
		R3	122	141	212	275	XQEAWT-H0-0000-00000BFE3	XQEAWT-H0-0000-00000LFE3		
		R2	114	132	196	257	XQEAWT-H0-0000-00000BEE3	XQEAWT-H0-0000-00000LEE3		
		Q5	107	124	184	241		XQEAWT-H0-0000-00000LDE3		
F4	4750 K	R5	139	161	242	313	XQEAWT-H0-0000-00000BHF4			
		R4	130	150	226	293	XQEAWT-H0-0000-00000BGF4			
		R3	122	141	212	275	XQEAWT-H0-0000-00000BFF4	XQEAWT-H0-0000-00000LFF4		
		R2	114	132	196	257	XQEAWT-H0-0000-00000BEF4	XQEAWT-H0-0000-00000LEF4		
		Q5	107	124	184	241	XQEAWT-H0-0000-00000BDF4	XQEAWT-H0-0000-00000LDF4		
		Q4	100	116	172	225		XQEAWT-H0-0000-00000LCF4		
E4	4500 K	R5	139	161	242	313	XQEAWT-H0-0000-00000BHE4			
		R4	130	150	226	293	XQEAWT-H0-0000-00000BGE4			
		R3	122	141	212	275	XQEAWT-H0-0000-00000BFE4	XQEAWT-H0-0000-00000LFE4		
		R2	114	132	196	257	XQEAWT-H0-0000-00000B(EE4	XQEAWT-H0-0000-00000LEE4		
		Q5	107	124	184	241	XQEAWT-H0-0000-00000BDE4	XQEAWT-H0-0000-00000LDE4		
		Q4	100	116	172	225		XQEAWT-H0-0000-00000LCE4		

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - 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	70 CRI Minimum	75 CRI Typical	80 CRI Minimum	90 CRI Minimum
ANSI Neutral White (3700 K – 5000 K)										
F5	4250 K	R4	130	150	226	293	XQEAWT-H0-0000-00000BGF5			
		R3	122	141	212	275	XQEAWT-H0-0000-00000BFF5	XQEAWT-H0-0000-00000LFF5		
		R2	114	132	196	257	XQEAWT-H0-0000-00000BEF5	XQEAWT-H0-0000-00000LEF5		
		Q5	107	124	184	241	XQEAWT-H0-0000-00000BDF5	XQEAWT-H0-0000-00000LDF5		
		Q4	100	116	172	225		XQEAWT-H0-0000-00000LCF5		
E5	4000 K	R4	130	150	226	293	XQEAWT-H0-0000-00000BGE5			
		R3	122	141	212	275	XQEAWT-H0-0000-00000BFE5	XQEAWT-H0-0000-00000LFE5	XQEAWT-H0-0000-00000HFE5	
		R2	114	132	196	257	XQEAWT-H0-0000-00000BEE5	XQEAWT-H0-0000-00000LEE5	XQEAWT-H0-0000-00000HEE5	
		Q5	107	124	184	241	XQEAWT-H0-0000-00000BDE5	XQEAWT-H0-0000-00000LDE5	XQEAWT-H0-0000-00000HDE5	XQEAWT-H0-0000-00000UDE5
		Q4	100	116	172	225		XQEAWT-H0-0000-00000LCE5	XQEAWT-H0-0000-00000HCE5	XQEAWT-H0-0000-00000UCE5
		Q3	93.9	109	162	211				XQEAWT-H0-0000-00000UBE5
		Q2	87.4	101	150	197				XQEAWT-H0-0000-00000UAE5

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - 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 Typical	80 CRI Minimum	90 CRI Minimum
ANSI Warm White (2700 K - 3750 K)									
F6	3750 K	R3	122	141	212	275	XQEAWT-H0-0000-00000LFF6	XQEAWT-H0-0000-00000HFF6	
		R2	114	132	196	257	XQEAWT-H0-0000-00000LEF6	XQEAWT-H0-0000-00000HEF6	
		Q5	107	124	184	241	XQEAWT-H0-0000-00000LDF6	XQEAWT-H0-0000-00000HDF6	XQEAWT-H0-0000-00000UDF6
		Q4	100	116	172	225	XQEAWT-H0-0000-00000LCF6	XQEAWT-H0-0000-00000HCF6	XQEAWT-H0-0000-00000UCF6
		Q3	93.9	109	162	211	XQEAWT-H0-0000-00000LBF6	XQEAWT-H0-0000-00000HBF6	XQEAWT-H0-0000-00000UBF6
		Q2	87.4	101	150	197			XQEAWT-H0-0000-00000UAF6
E6	3500 K	R2	114	132	196	257	XQEAWT-H0-0000-00000LEE6	XQEAWT-H0-0000-00000HEE6	
		Q5	107	124	184	241	XQEAWT-H0-0000-00000LDE6	XQEAWT-H0-0000-00000HDE6	
		Q4	100	116	172	225	XQEAWT-H0-0000-00000LCE6	XQEAWT-H0-0000-00000HCE6	XQEAWT-H0-0000-00000UCE6
		Q3	93.9	109	162	211	XQEAWT-H0-0000-00000LBE6	XQEAWT-H0-0000-00000HBE6	XQEAWT-H0-0000-00000UBE6
		Q2	87.4	101	150	197			XQEAWT-H0-0000-00000UAE6
		P4	80.6	93	139	181			XQEAWT-H0-0000-00000U9E6
F7	3250 K	R2	114	132	196	257	XQEAWT-H0-0000-00000LEF7	XQEAWT-H0-0000-00000HEF7	
		Q5	107	124	184	241	XQEAWT-H0-0000-00000LDF7	XQEAWT-H0-0000-00000HDF7	
		Q4	100	116	172	225	XQEAWT-H0-0000-00000LCF7	XQEAWT-H0-0000-00000HCF7	
		Q3	93.9	109	162	211	XQEAWT-H0-0000-00000LBF7	XQEAWT-H0-0000-00000HBF7	XQEAWT-H0-0000-00000UBF7
		Q2	87.4	101	150	197			XQEAWT-H0-0000-00000UAF7
		P4	80.6	93	139	181			XQEAWT-H0-0000-00000U9F7
E7	3000 K	R2	114	132	196	257	XQEAWT-H0-0000-00000LEE7	XQEAWT-H0-0000-00000HEE7	
		Q5	107	124	184	241	XQEAWT-H0-0000-00000LDE7	XQEAWT-H0-0000-00000HDE7	
		Q4	100	116	172	225	XQEAWT-H0-0000-00000LCE7	XQEAWT-H0-0000-00000HCE7	
		Q3	93.9	109	162	211	XQEAWT-H0-0000-00000LBE7	XQEAWT-H0-0000-00000HBE7	XQEAWT-H0-0000-00000UBE7
		Q2	87.4	101	150	197			XQEAWT-H0-0000-00000UAE7
		P4	80.6	93	139	181			XQEAWT-H0-0000-00000U9E7
		P3	73.9	86	127	166			XQEAWT-H0-0000-00000U8E7

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - 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 Typical	80 CRI Minimum	90 CRI Minimum
ANSI Warm White (2700 K - 3750 K)									
F8	2850 K	Q4	100	111	175	226	XQEAWT-H0-0000-00000LCF8	XQEAWT-H0-0000-00000HCF8	
		Q3	93.9	105	164	213	XQEAWT-H0-0000-00000LBF8	XQEAWT-H0-0000-00000HBF8	XQEAWT-H0-0000-00000UBF8
		Q2	87.4	101	150	193			XQEAWT-H0-0000-00000UAF8
		P4	80.6	89.9	141	182			XQEAWT-H0-0000-00000U9F8
		P3	73.9	82.4	129	167			XQEAWT-H0-0000-00000U8F8
E8	2700 K	Q5	107	124	184	241		XQEAWT-H0-0000-00000HDE8	
		Q4	100	116	172	225	XQEAWT-H0-0000-00000LCE8	XQEAWT-H0-0000-00000HCE8	
		Q3	93.9	109	162	211	XQEAWT-H0-0000-00000LBE8	XQEAWT-H0-0000-00000HBE8	XQEAWT-H0-0000-00000UBE8
		Q2	87.4	101	150	197	XQEAWT-H0-0000-00000LAE8	XQEAWT-H0-0000-00000HAE8	XQEAWT-H0-0000-00000UAE8
		P4	80.6	93	139	181			XQEAWT-H0-0000-00000U9E8
		P3	73.9	86	127	166			XQEAWT-H0-0000-00000U8E8
EA	2200 K	P3	73.9	86	127	166		XQEAWT-H0-0000-00000H8EA	
		P2	67.2	78	117	152		XQEAWT-H0-0000-00000H7EA	

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
ANSI Warm White (1800 K)							
BE	1800 K	P4	80.6	93	139	181	XQEAWT-H0-0000-0000009BE
		P3	73.9	86	127	166	XQEAWT-H0-0000-0000008BE

Notes:

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- 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 111).
- 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.

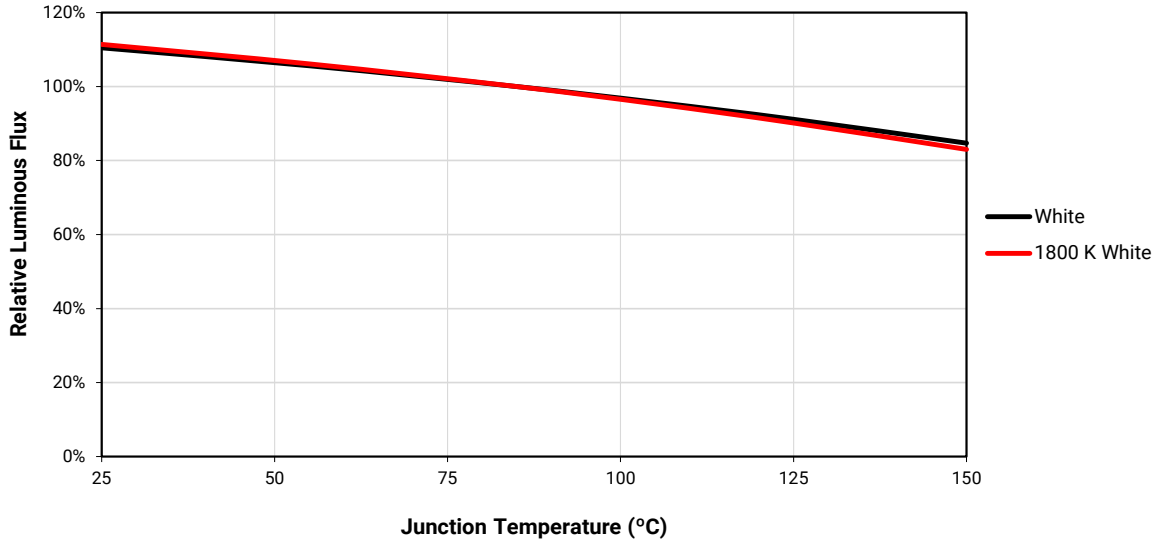
* Flux values @ 25 °C are calculated and for reference only.

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

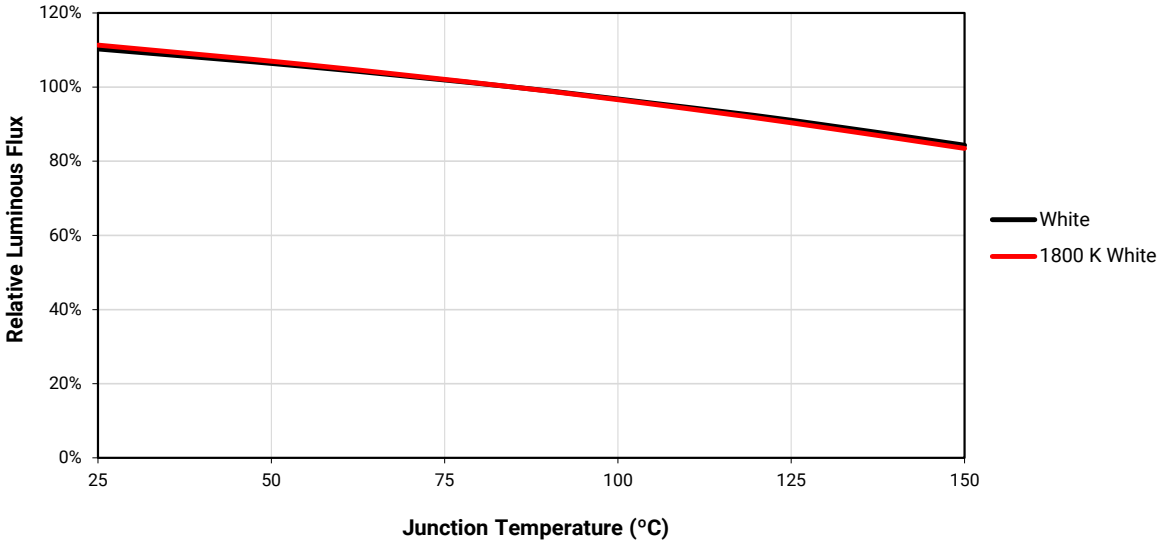
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - WHITE (I_F = 350 mA)

High Density



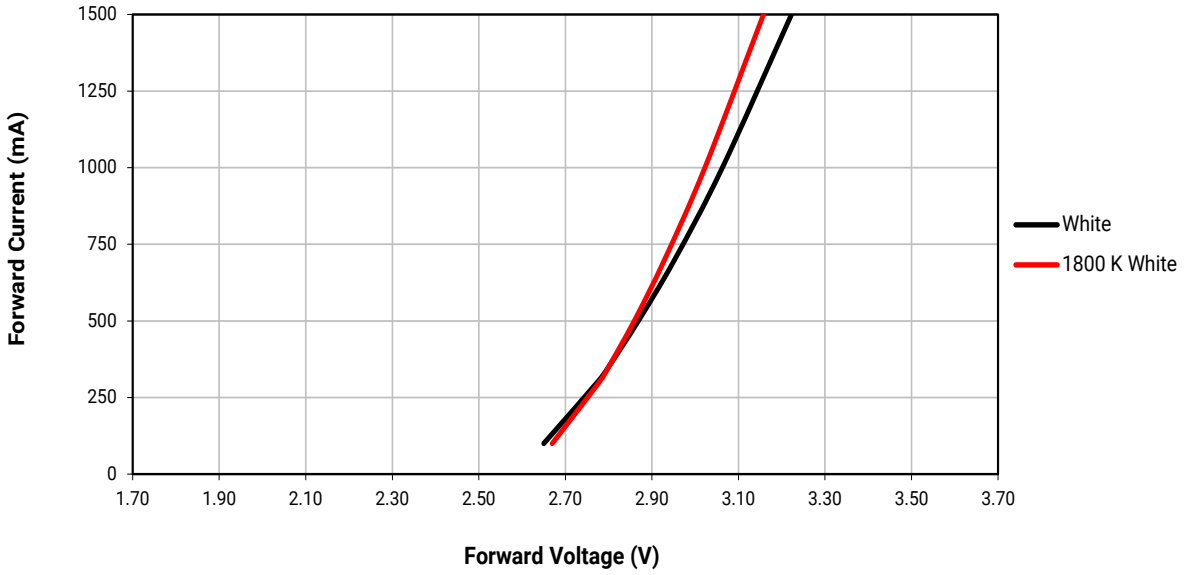
High Intensity



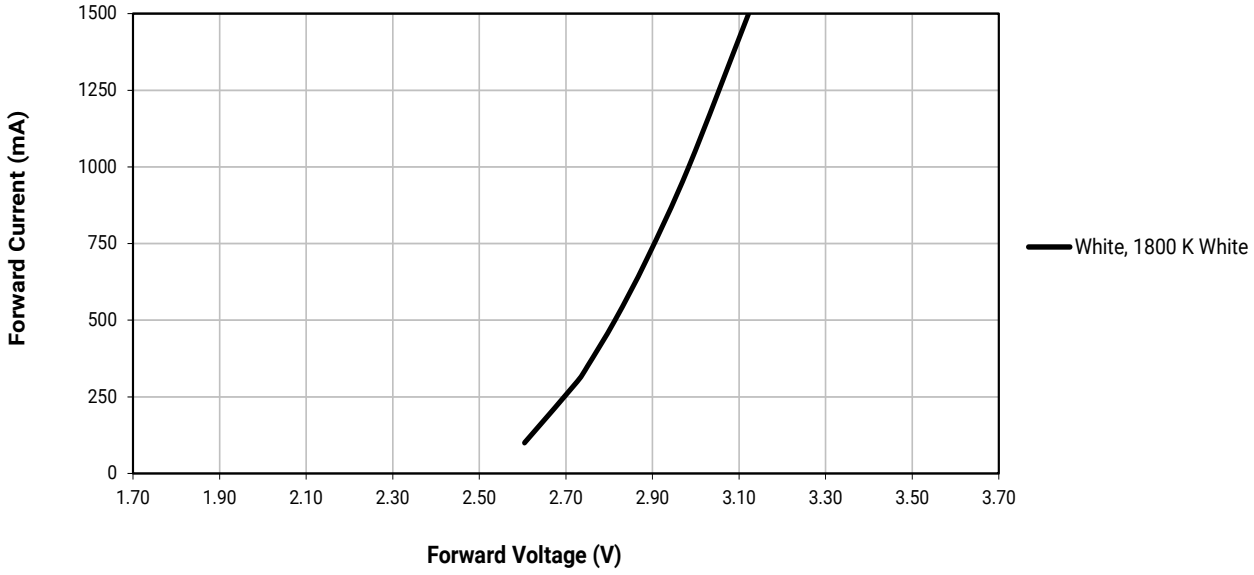
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ELECTRICAL CHARACTERISTICS - WHITE

High Density



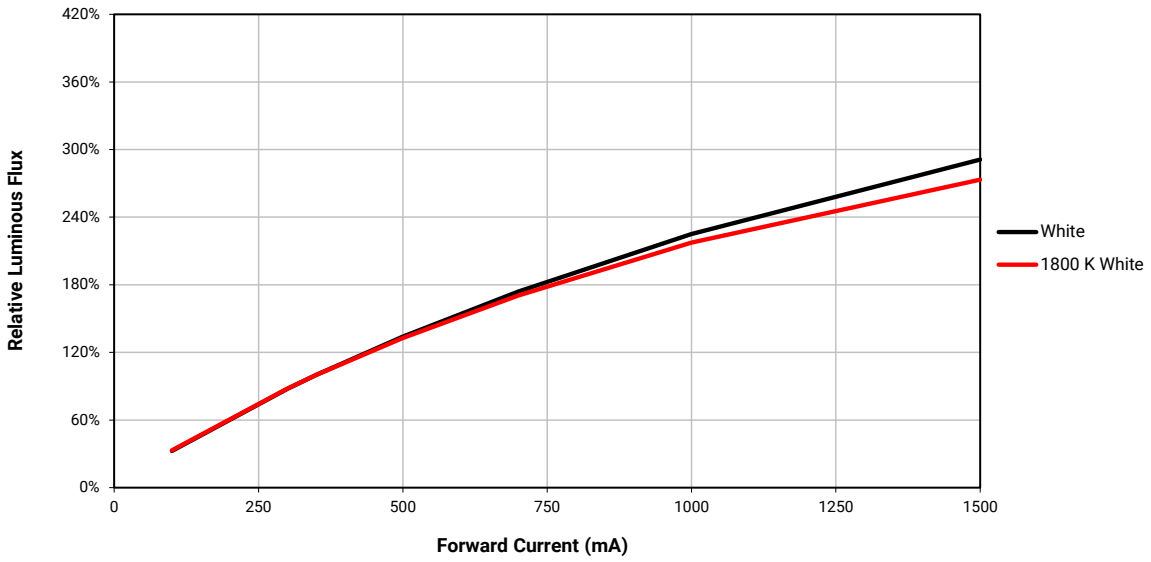
High Intensity



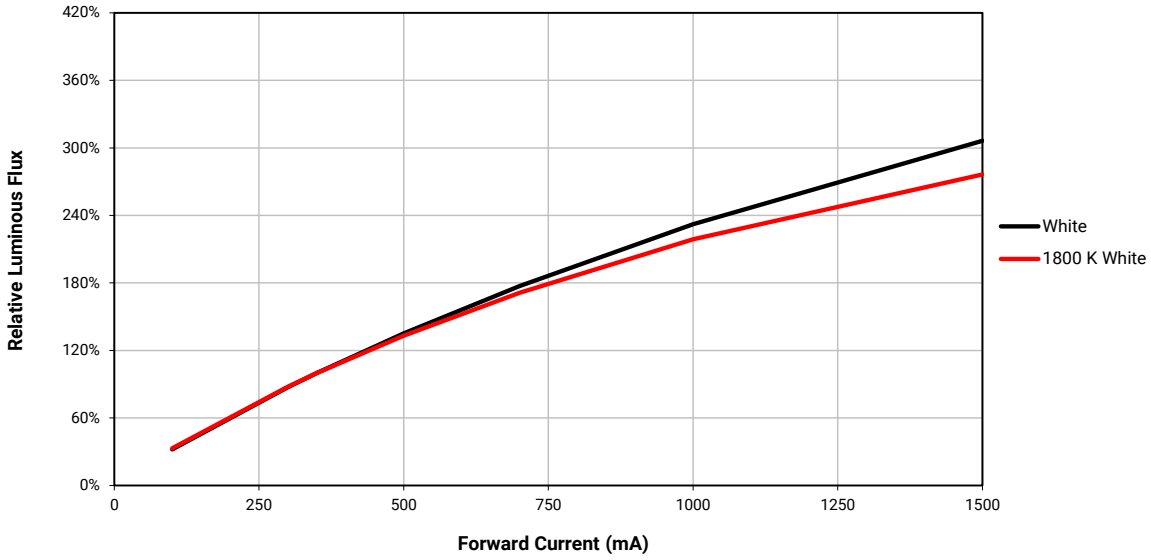
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RELATIVE FLUX VS. CURRENT - WHITE

High Density



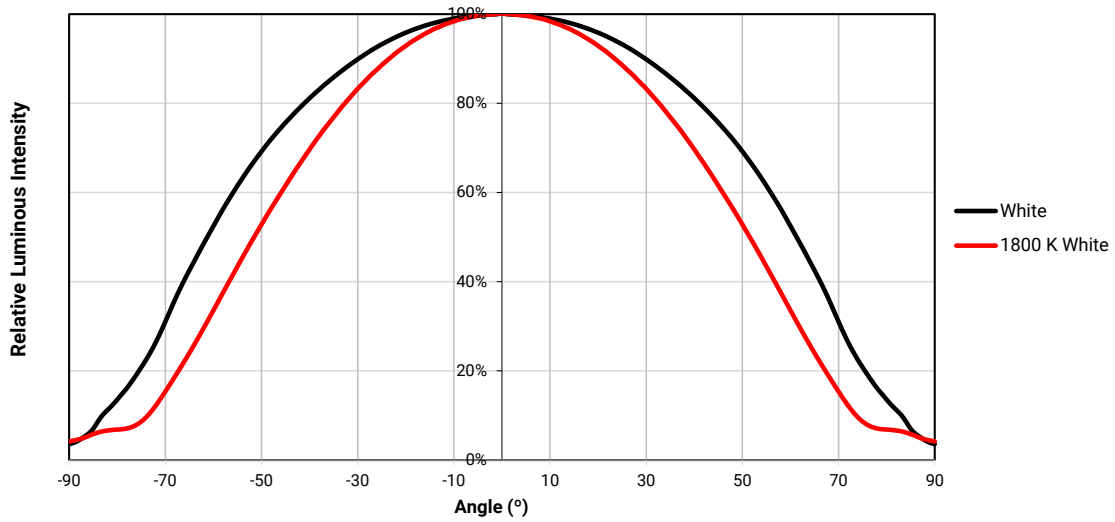
High Intensity



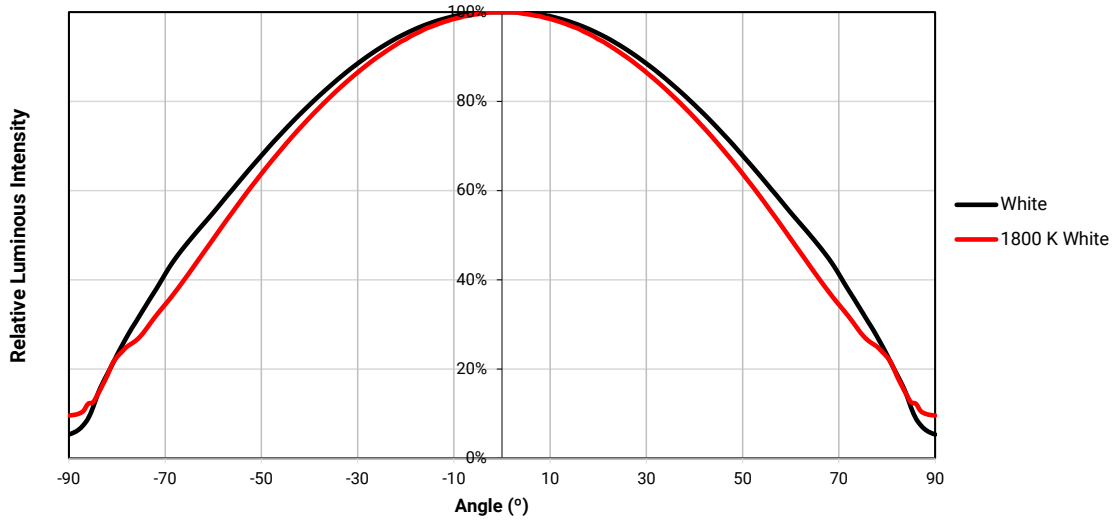
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TYPICAL SPATIAL DISTRIBUTION - WHITE

High Density



High Intensity



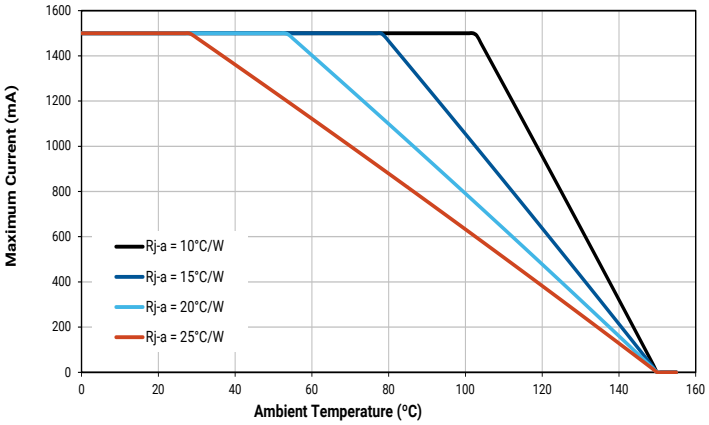
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THERMAL DESIGN - WHITE

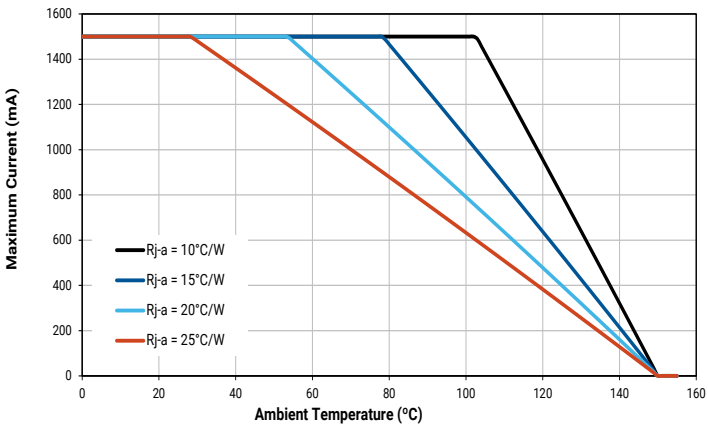
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.

High Density

White

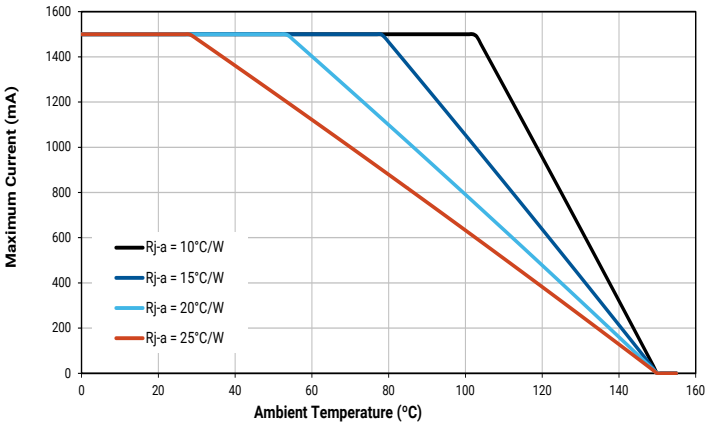


1800 K White

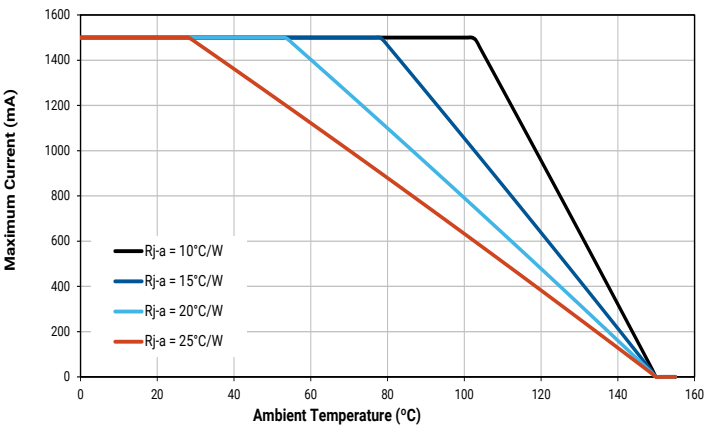


High Intensity

White



1800 K White



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XLAMP XQ-E LEDs - ROYAL BLUE

CHARACTERISTICS - HIGH DENSITY ROYAL BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
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		2.9	3.25
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY ROYAL BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		130	
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		2.8	3.25
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 - HIGH DENSITY ROYAL BLUE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density royal blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Royal Blue		Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (mW)		
01	450 - 465	37	625	2.37	XQEROY-00-0000-000000R01
		36	600	2.27	XQEROY-00-0000-000000Q01
		35	575	2.18	XQEROY-00-0000-000000P01
		34	550	2.08	XQEROY-00-0000-000000N01
		33	525	1.99	XQEROY-00-0000-000000M01
02	450 - 460	37	625	2.37	XQEROY-00-0000-000000R02
		36	600	2.27	XQEROY-00-0000-000000Q02
		35	575	2.18	XQEROY-00-0000-000000P02
		34	550	2.08	XQEROY-00-0000-000000N02
		33	525	1.99	XQEROY-00-0000-000000M02
03	455 - 465	35	575	2.18	XQEROY-00-0000-000000P03
		34	550	2.08	XQEROY-00-0000-000000N03
		33	525	1.99	XQEROY-00-0000-000000M03

Notes

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY ROYAL BLUE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity royal blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Royal Blue		Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (mW)		
01	450 - 465	37	625	2.36	XQEROY-H0-0000-000000R01
		36	600	2.27	XQEROY-H0-0000-000000Q01
		35	575	2.18	XQEROY-H0-0000-000000P01
		34	550	2.08	XQEROY-H0-0000-000000N01
		33	525	1.99	XQEROY-H0-0000-000000M01
02	450 - 460	36	600	2.27	XQEROY-H0-0000-000000Q02
		35	575	2.18	XQEROY-H0-0000-000000P02
		34	550	2.08	XQEROY-H0-0000-000000N02
		33	525	1.99	XQEROY-H0-0000-000000M02
03	455 - 465	35	575	2.18	XQEROY-H0-0000-000000P03
		34	550	2.08	XQEROY-H0-0000-000000N03
		33	525	1.99	XQEROY-H0-0000-000000M03

Notes

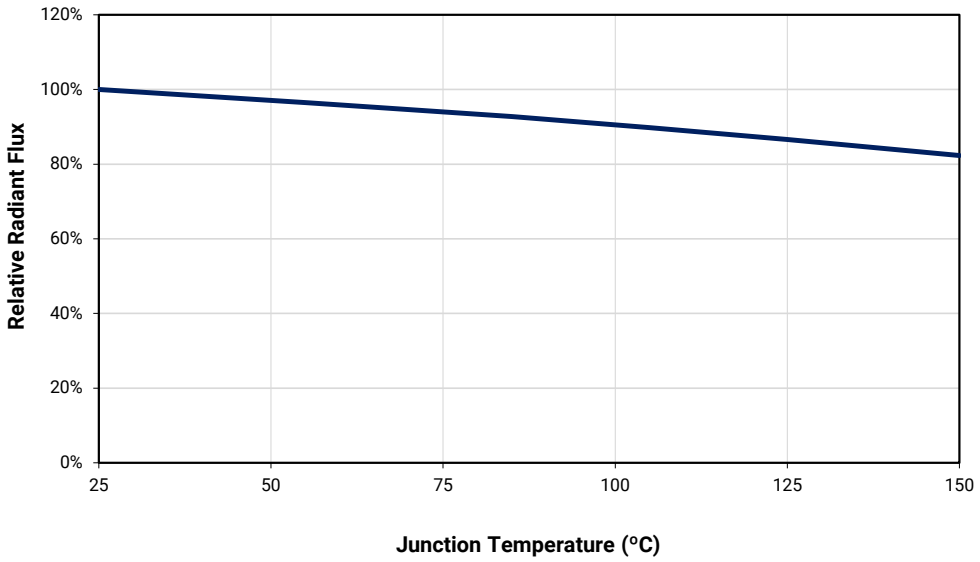
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

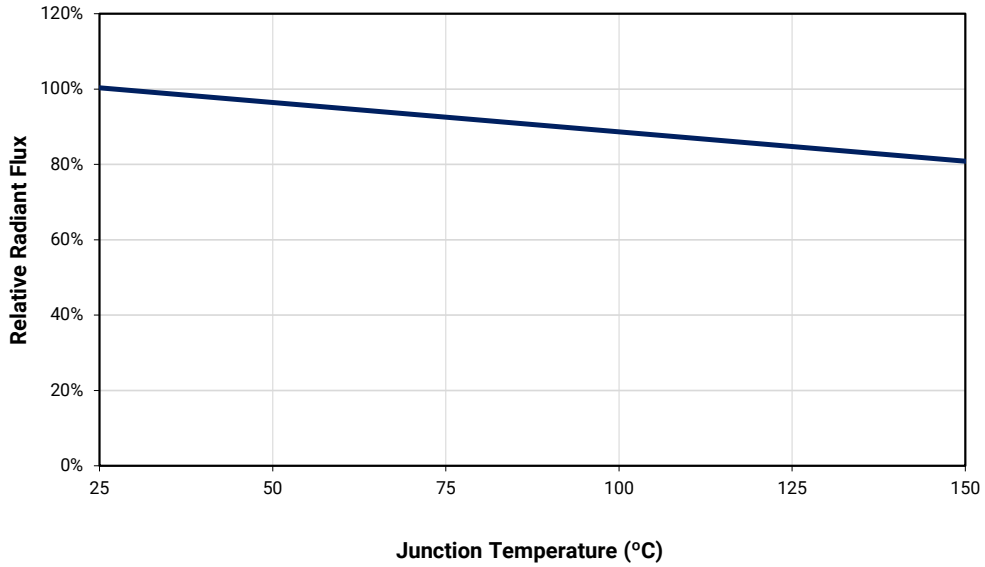
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - ROYAL BLUE (I_F = 350 mA)

High Density



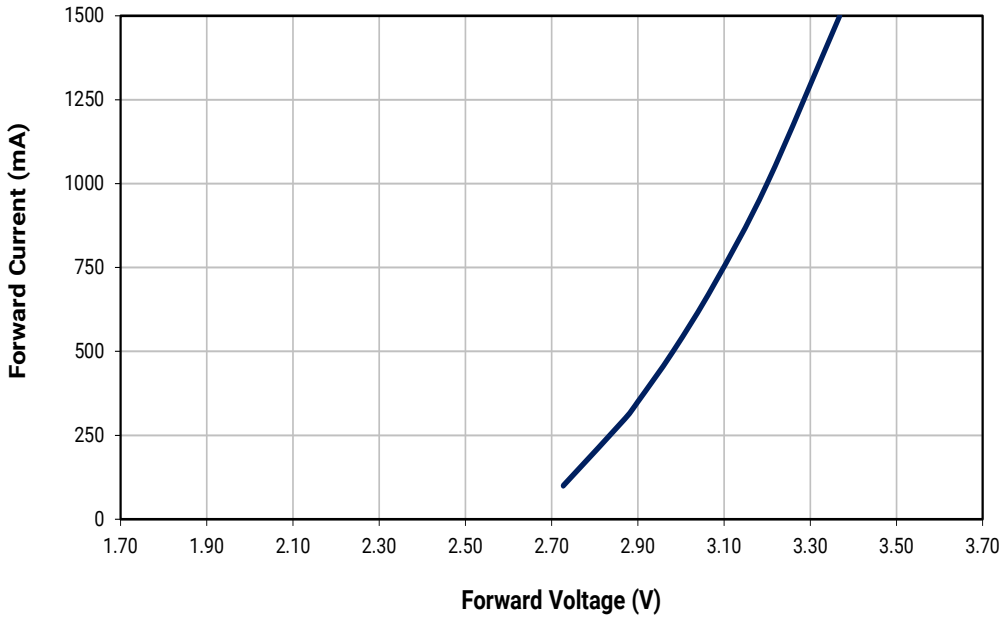
High Intensity



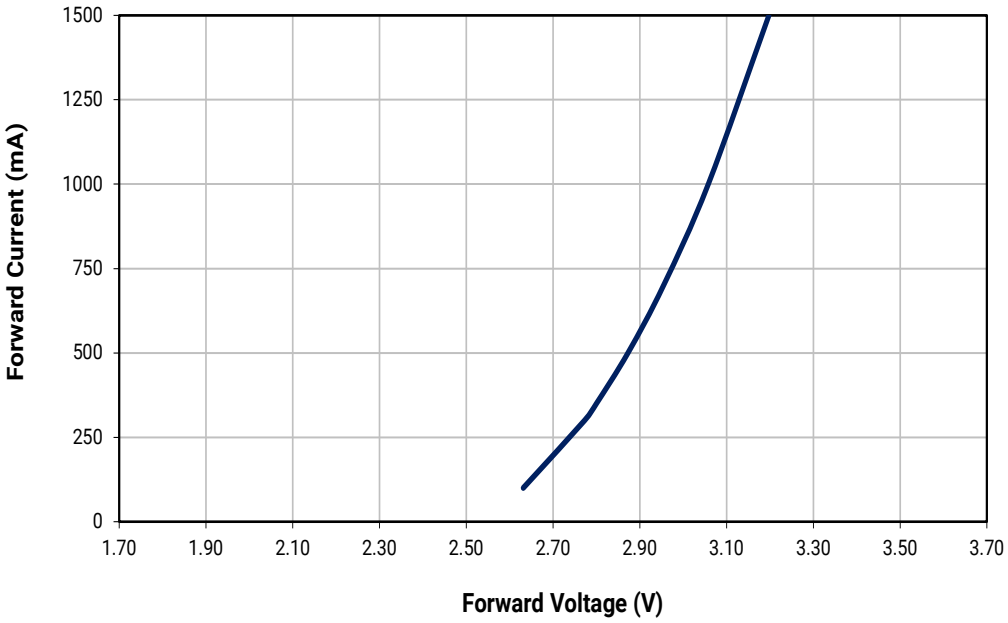
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ELECTRICAL CHARACTERISTICS - ROYAL BLUE

High Density



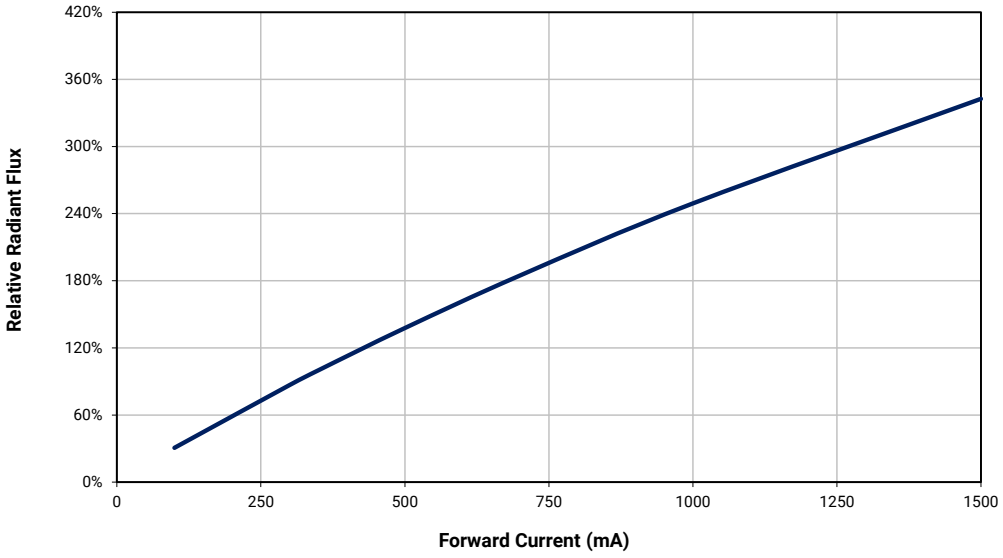
High Intensity



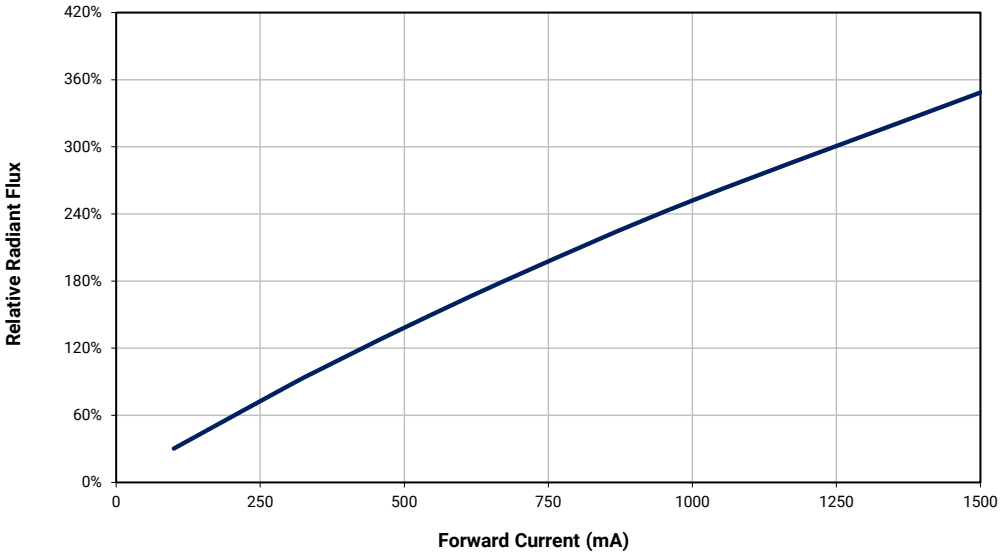
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RELATIVE FLUX VS. CURRENT - ROYAL BLUE

High Density



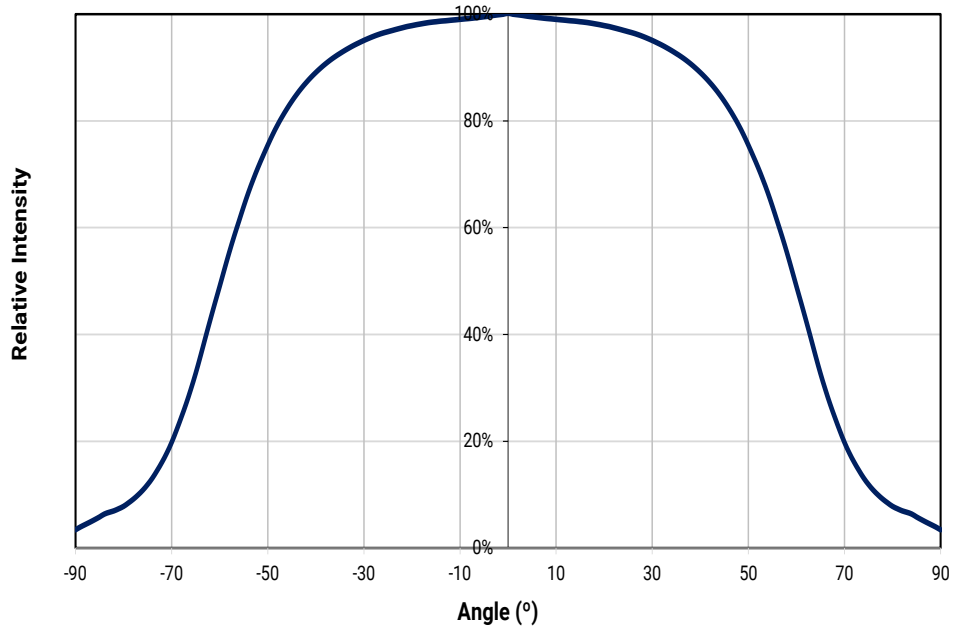
High Intensity



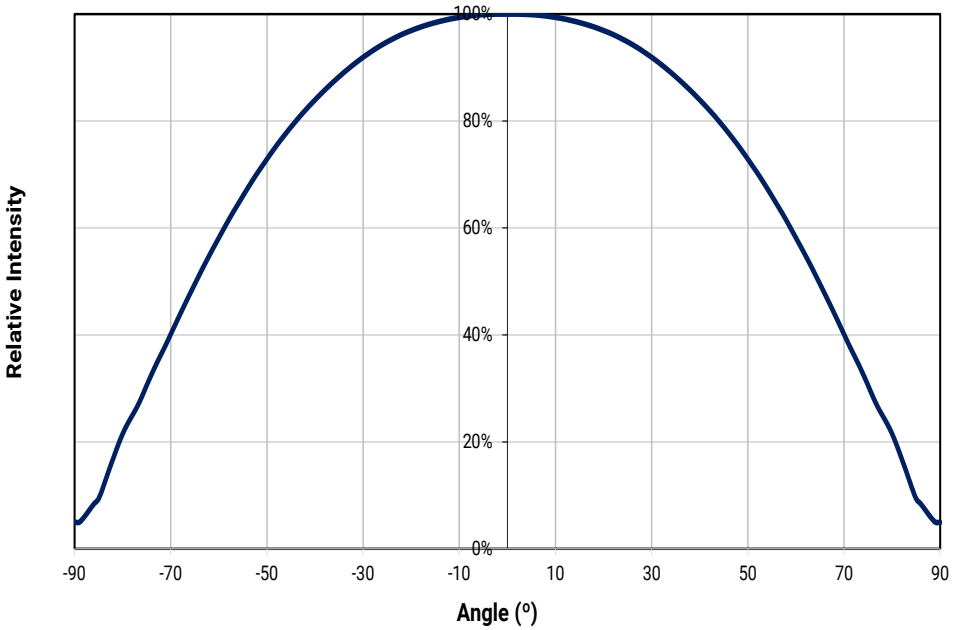
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TYPICAL SPATIAL DISTRIBUTION - ROYAL BLUE

High Density



High Intensity Color

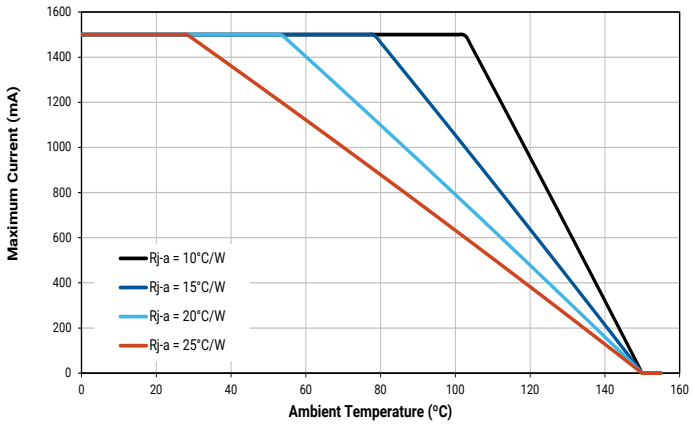


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THERMAL DESIGN - ROYAL BLUE

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



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XLAMP XQ-E LEDs - BLUE

CHARACTERISTICS - HIGH DENSITY BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
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	3.25
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		130	
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		2.75	3.25
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 - HIGH DENSITY BLUE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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-00-0000-000000301
			B3	465	B5	480	XQEBLU-00-0000-000000302
			B4	470	B5	480	XQEBLU-00-0000-000000305
	M2	39.8	B3	465	B6	485	XQEBLU-00-0000-000000201
			B3	465	B5	480	XQEBLU-00-0000-000000202
			B4	470	B5	480	XQEBLU-00-0000-000000205
	K3	35.2	B3	465	B6	485	XQEBLU-00-0000-000000Z01
			B3	465	B5	480	XQEBLU-00-0000-000000Z02
			B4	470	B5	480	XQEBLU-00-0000-000000Z05

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY BLUE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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-H0-0000-000000301
			B3	465	B5	480	XQEBLU-H0-0000-000000302
			B4	470	B5	480	XQEBLU-H0-0000-000000305
	M2	39.8	B3	465	B6	485	XQEBLU-H0-0000-000000201
			B3	465	B5	480	XQEBLU-H0-0000-000000202
			B4	470	B5	480	XQEBLU-H0-0000-000000205
	K3	35.2	B3	465	B6	485	XQEBLU-H0-0000-000000Z01
			B3	465	B5	480	XQEBLU-H0-0000-000000Z02
			B4	470	B5	480	XQEBLU-H0-0000-000000Z05
	K2	30.6	B3	465	B6	485	XQEBLU-H0-0000-000000Y01
			B3	465	B5	480	XQEBLU-H0-0000-000000Y02

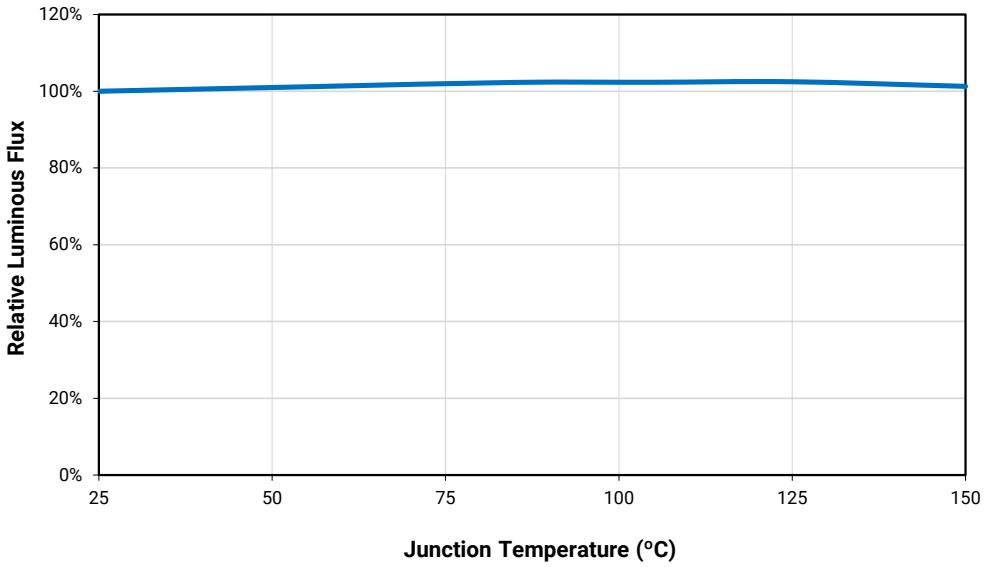
Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

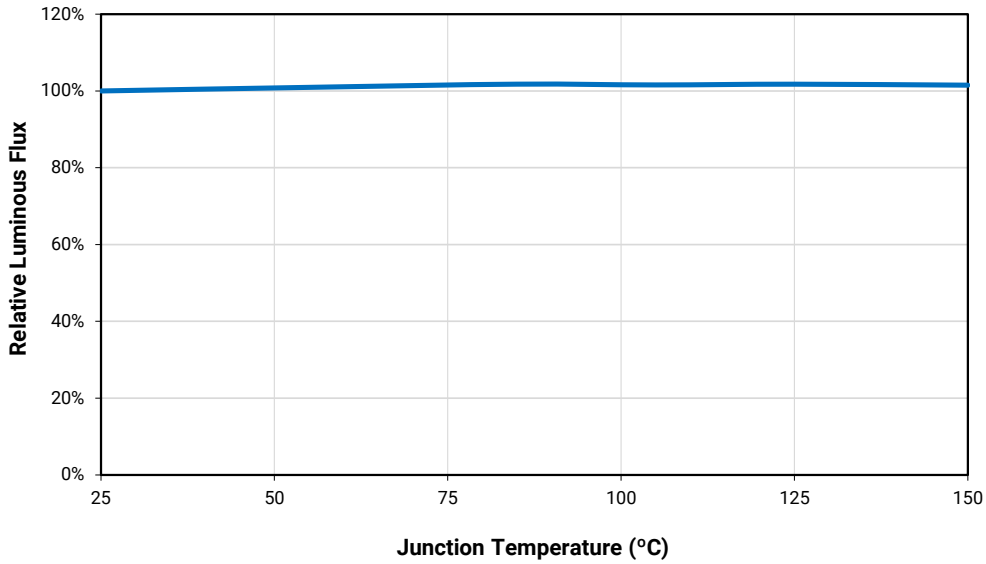
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - BLUE (I_F = 350 mA)

High Density



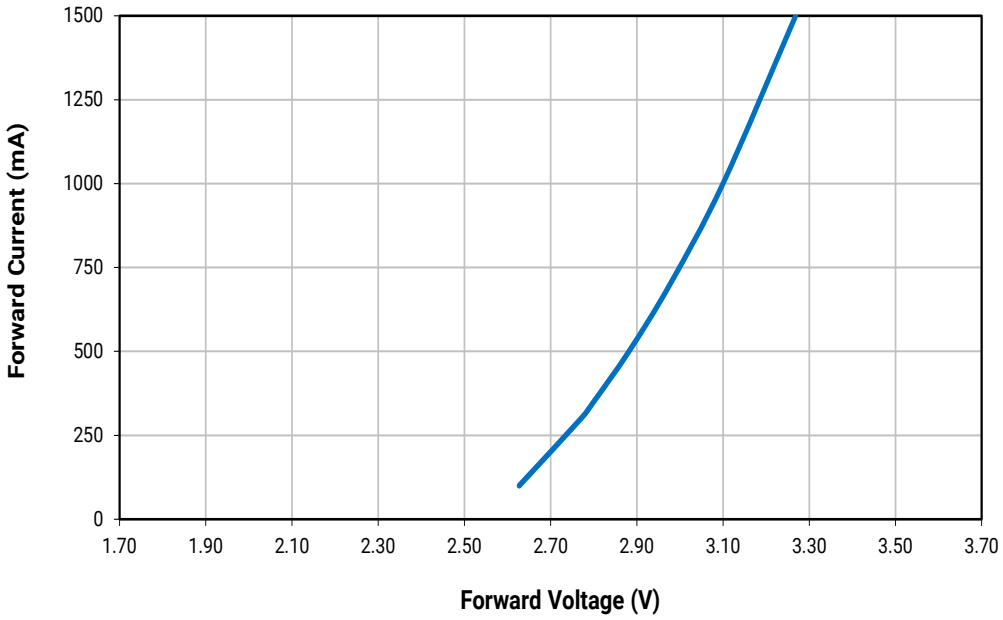
High Intensity



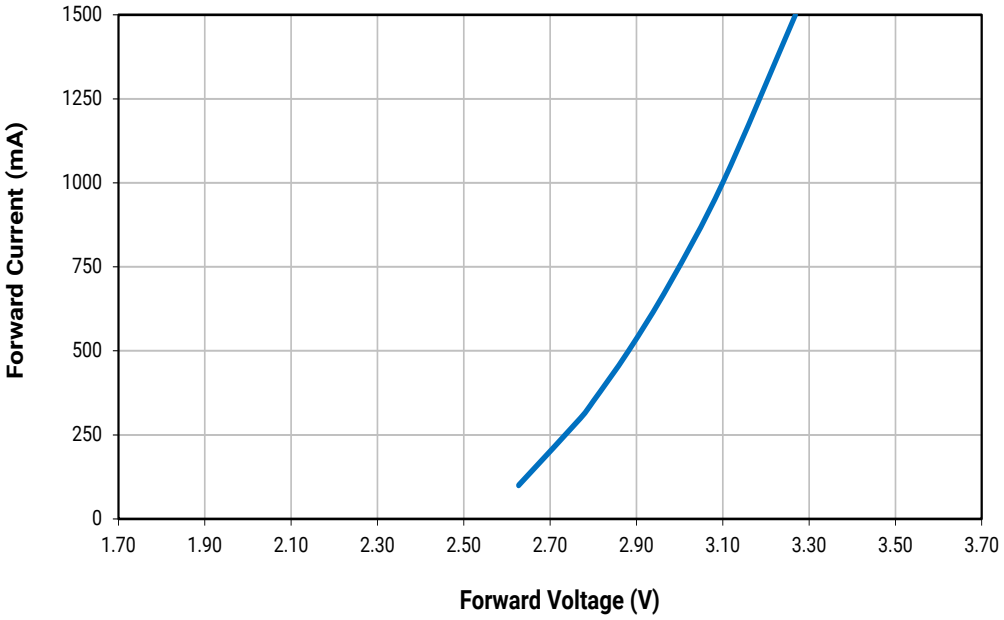
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ELECTRICAL CHARACTERISTICS - BLUE

High Density



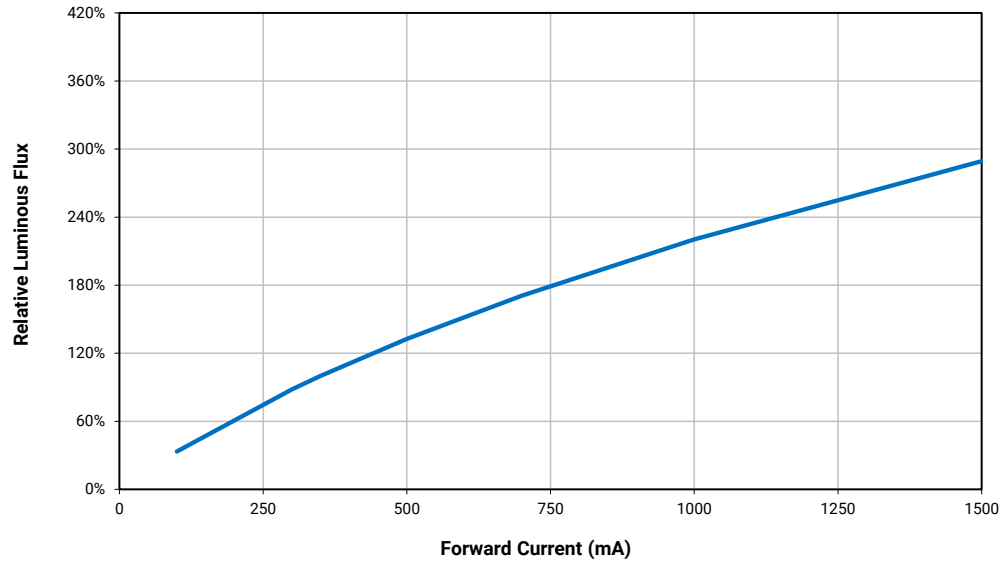
High Intensity



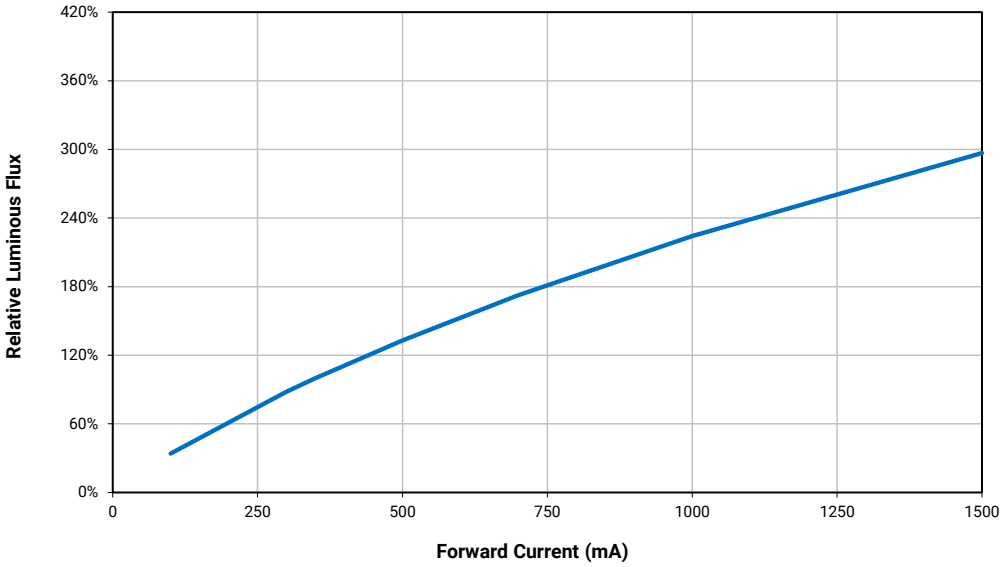
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RELATIVE FLUX VS. CURRENT - BLUE

High Density



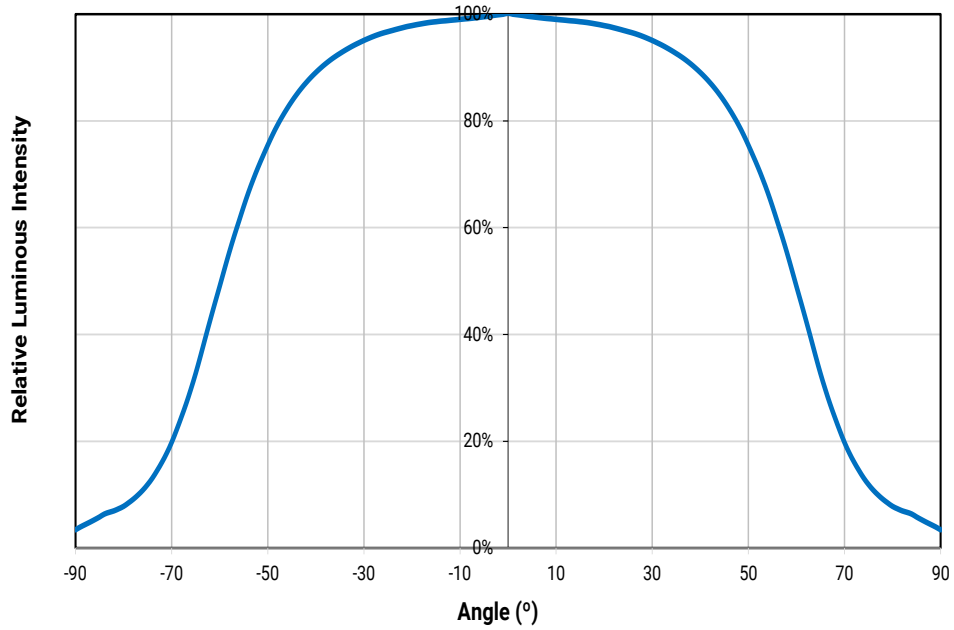
High Intensity



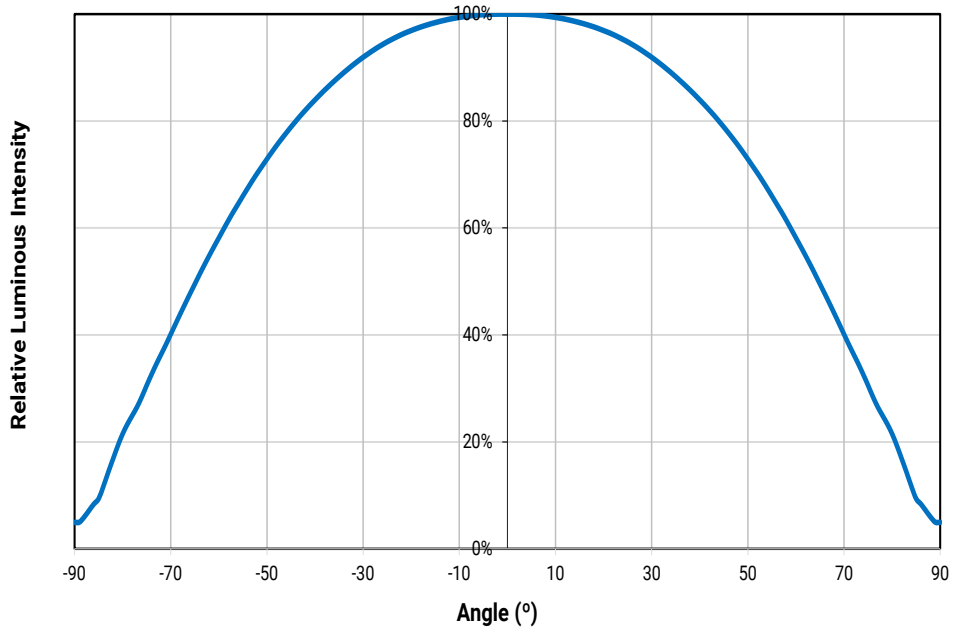
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TYPICAL SPATIAL DISTRIBUTION - BLUE

High Density



High Intensity

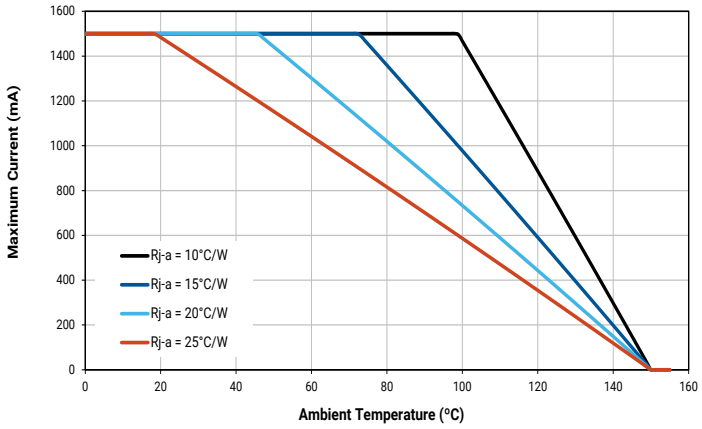


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THERMAL DESIGN - BLUE

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



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XLAMP XQ-E LEDs - PC BLUE

CHARACTERISTICS - HIGH INTENSITY PC BLUE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		130	
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		2.75	3.25
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.

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY PC BLUE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity PC blue LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Blue	N4B & N5B	N2	51.7	XQEAPB-H0-0000-000000401
		M3	45.7	XQEAPB-H0-0000-000000301

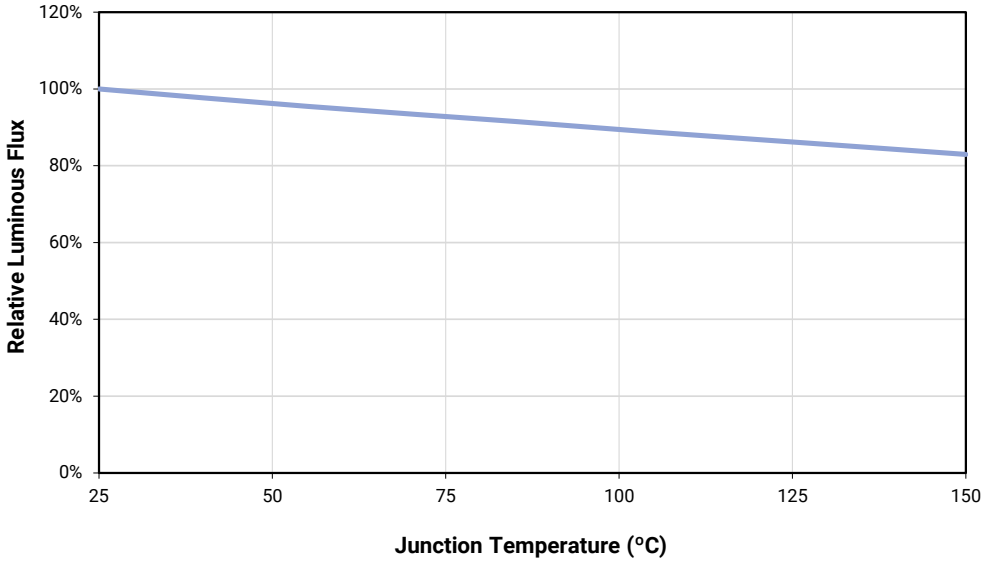
Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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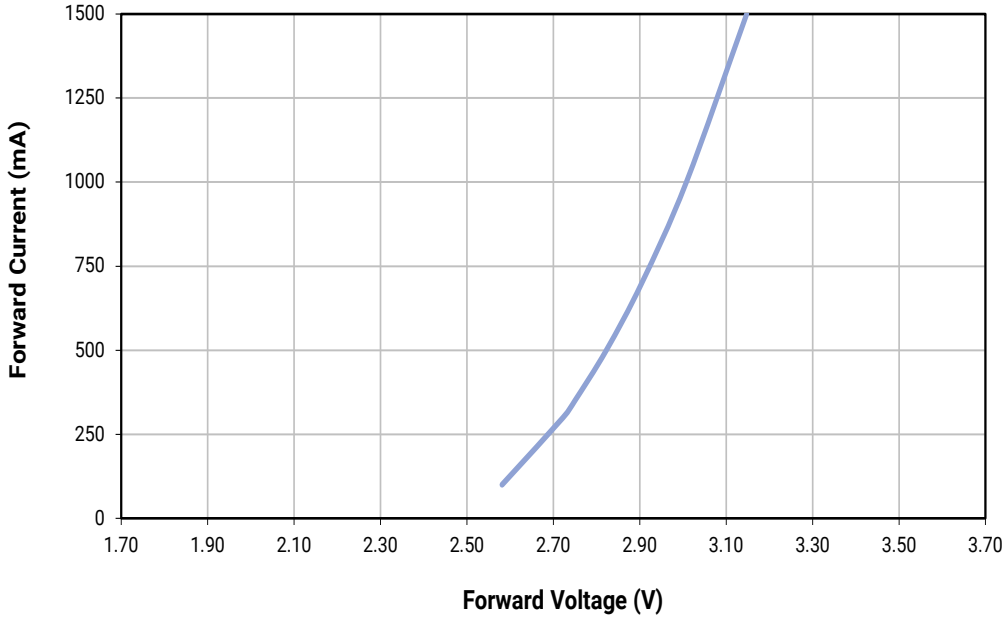
RELATIVE FLUX VS. JUNCTION TEMPERATURE - PC BLUE (I_F = 350 mA)

High Intensity



ELECTRICAL CHARACTERISTICS - PC BLUE

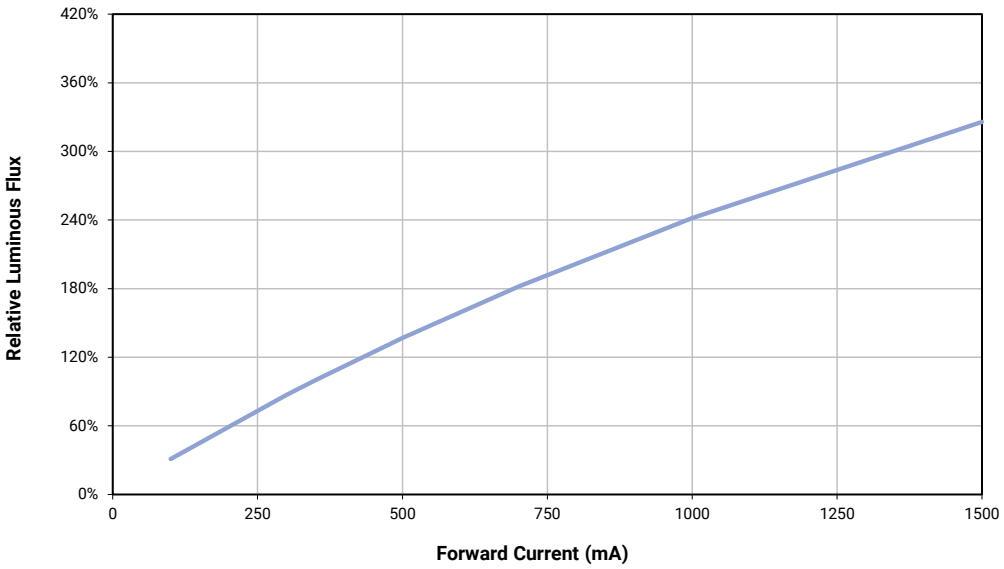
High Intensity



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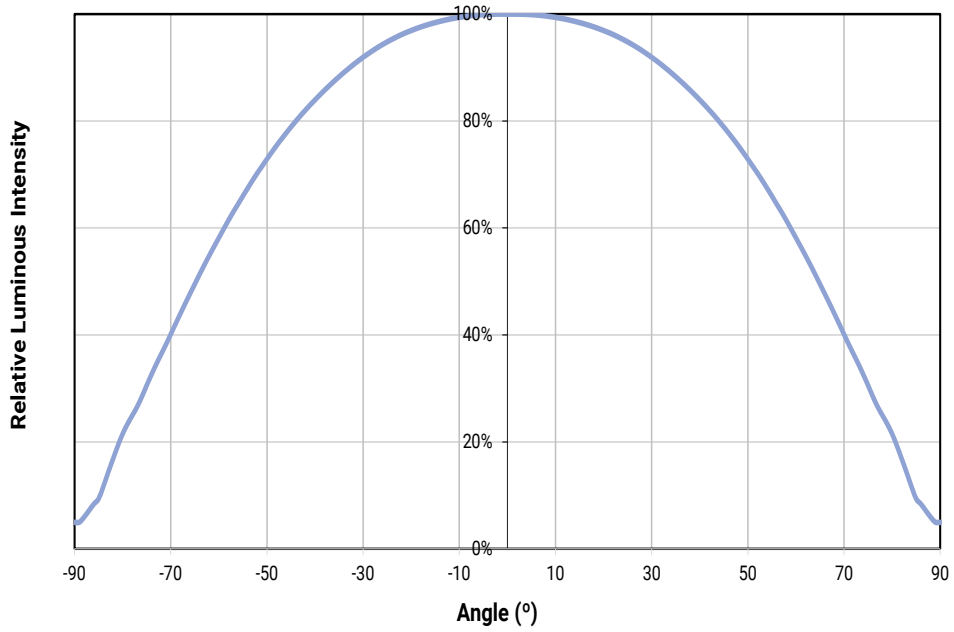
RELATIVE FLUX VS. CURRENT - PC BLUE

High Intensity



TYPICAL SPATIAL DISTRIBUTION - PC BLUE

High Intensity

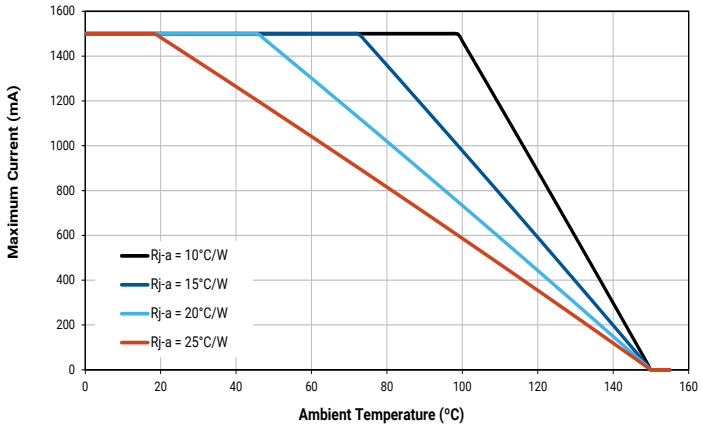


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THERMAL DESIGN - PC BLUE

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 Intensity



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XLAMP XQ-E LEDs - CYAN

CHARACTERISTICS - HIGH DENSITY CYAN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		4	
Viewing angle (FWHM)	degrees		130	
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		2.65	3.25
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY CYAN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		4	
Viewing angle (FWHM)	degrees		130	
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		2.65	3.25
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 - HIGH DENSITY CYAN (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density cyan LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Cyan		Minimum Luminous Flux (mW) @ 350 mA		Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (lm)	
01	490 - 510	Q5	107.0	XQEACY-00-0000-000000D01
		Q4	100.0	XQEACY-00-0000-000000C01
		Q3	93.9	XQEACY-00-0000-000000B01
		Q2	87.4	XQEACY-00-0000-000000A01
		P4	80.6	XQEACY-00-0000-000000901
		P3	73.9	XQEACY-00-0000-000000801
		P2	67.2	XQEACY-00-0000-000000701
02	490 - 505	Q4	100.0	XQEACY-00-0000-000000C02
		Q3	93.9	XQEACY-00-0000-000000B02
		Q2	87.4	XQEACY-00-0000-000000A02
		P4	80.6	XQEACY-00-0000-000000902
		P3	73.9	XQEACY-00-0000-000000802
		P2	67.2	XQEACY-00-0000-000000702
03	495 - 510	Q5	107.0	XQEACY-00-0000-000000D03
		Q4	100.0	XQEACY-00-0000-000000C03
		Q3	93.9	XQEACY-00-0000-000000B03
		Q2	87.4	XQEACY-00-0000-000000A03
		P4	80.6	XQEACY-00-0000-000000903
04	490 - 500	Q2	87.4	XQEACY-00-0000-000000A04
		P4	80.6	XQEACY-00-0000-000000904
		P3	73.9	XQEACY-00-0000-000000804
		P2	67.2	XQEACY-00-0000-000000704
05	495 - 505	Q4	100.0	XQEACY-00-0000-000000C05
		Q3	93.9	XQEACY-00-0000-000000B05
		Q2	87.4	XQEACY-00-0000-000000A05
		P4	80.6	XQEACY-00-0000-000000905
06	500 - 510	R2	114.0	XQEACY-00-0000-000000E06
		Q5	107.0	XQEACY-00-0000-000000D06
		Q4	100.0	XQEACY-00-0000-000000C06

Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY CYAN (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity cyan LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Cyan		Minimum Luminous Flux (mW) @ 350 mA		Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (lm)	
01	490 - 510	Q5	107.0	XQEACY-H0-0000-000000D01
		Q4	100.0	XQEACY-H0-0000-000000C01
		Q3	93.9	XQEACY-H0-0000-000000B01
		Q2	87.4	XQEACY-H0-0000-000000A01
		P4	80.6	XQEACY-H0-0000-000000901
		P3	73.9	XQEACY-H0-0000-000000801
		P2	67.2	XQEACY-H0-0000-000000701
02	490 - 505	Q4	100.0	XQEACY-H0-0000-000000C02
		Q3	93.9	XQEACY-H0-0000-000000B02
		Q2	87.4	XQEACY-H0-0000-000000A02
		P4	80.6	XQEACY-H0-0000-000000902
		P3	73.9	XQEACY-H0-0000-000000802
		P2	67.2	XQEACY-H0-0000-000000702
03	495 - 510	Q5	107.0	XQEACY-H0-0000-000000D03
		Q4	100.0	XQEACY-H0-0000-000000C03
		Q3	93.9	XQEACY-H0-0000-000000B03
		Q2	87.4	XQEACY-H0-0000-000000A03
		P4	80.6	XQEACY-H0-0000-000000903
04	490 - 500	Q2	87.4	XQEACY-H0-0000-000000A04
		P4	80.6	XQEACY-H0-0000-000000904
		P3	73.9	XQEACY-H0-0000-000000804
		P2	67.2	XQEACY-H0-0000-000000704
05	495 - 505	Q4	100.0	XQEACY-H0-0000-000000C05
		Q3	93.9	XQEACY-H0-0000-000000B05
		Q2	87.4	XQEACY-H0-0000-000000A05
		P4	80.6	XQEACY-H0-0000-000000905
06	500 - 510	Q5	107.0	XQEACY-H0-0000-000000D06
		Q4	100.0	XQEACY-H0-0000-000000C06
		Q3	93.9	XQEACY-H0-0000-000000B06

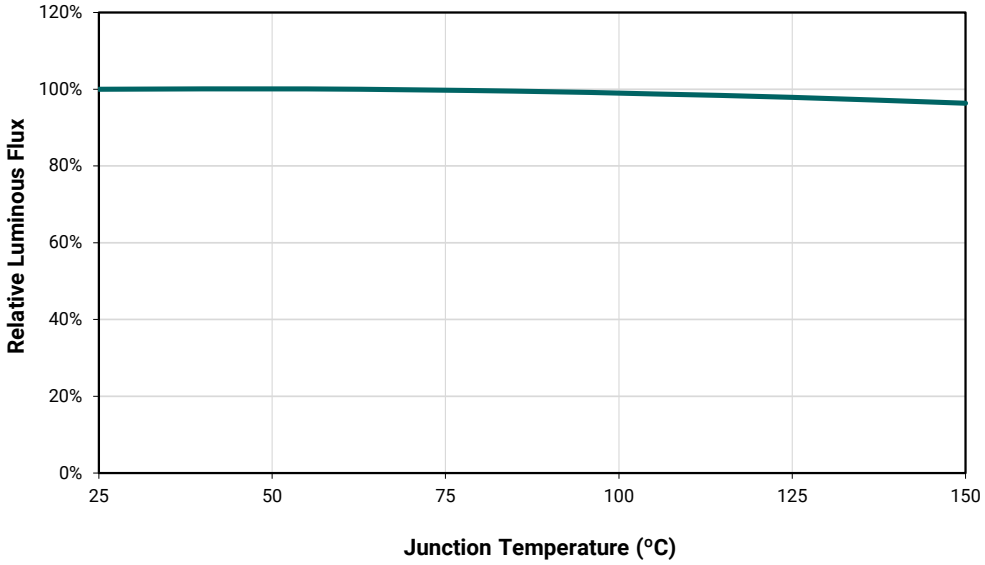
Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

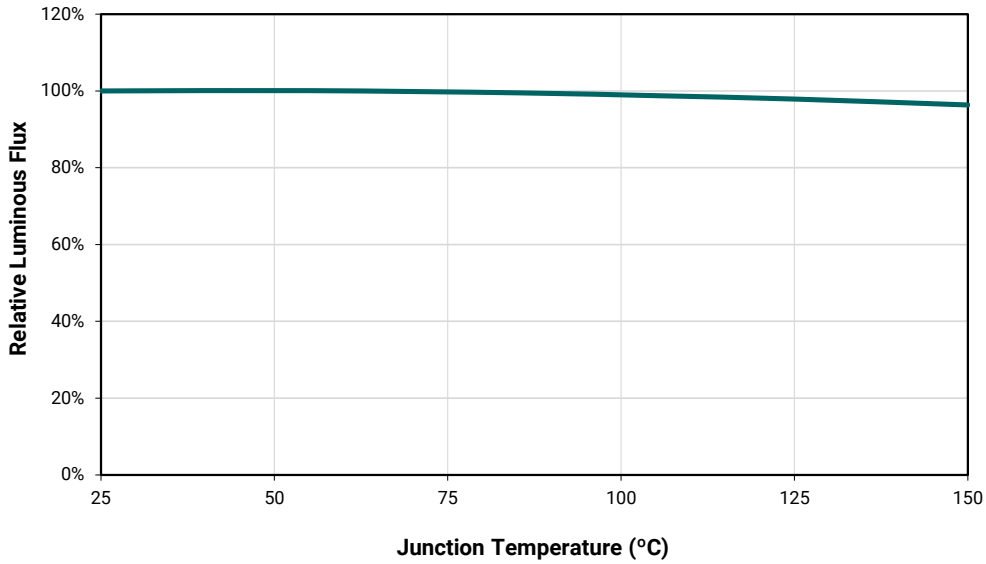
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - CYAN (I_F = 350 mA)

High Density



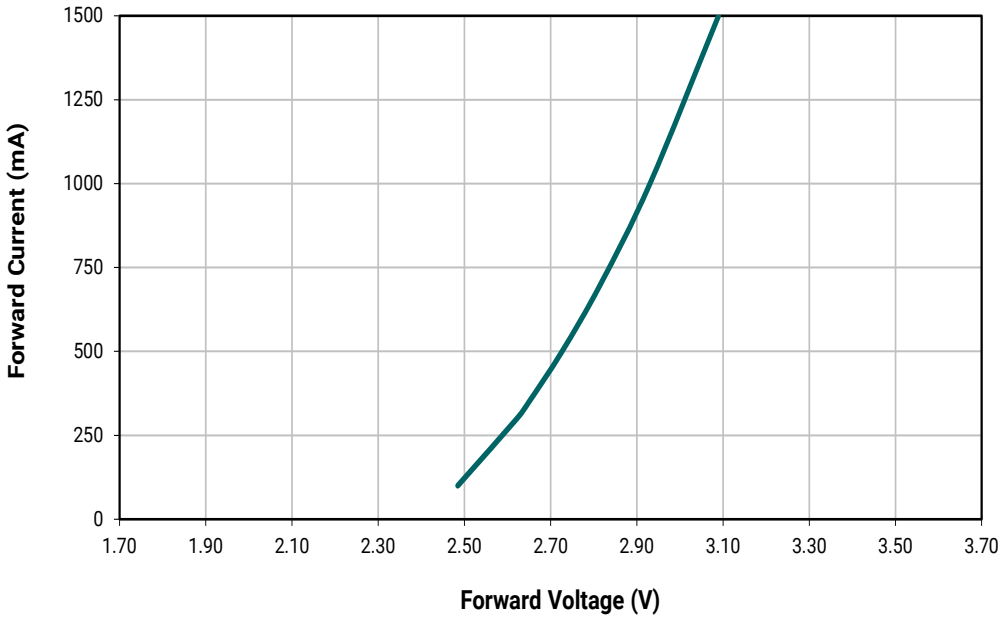
High Intensity



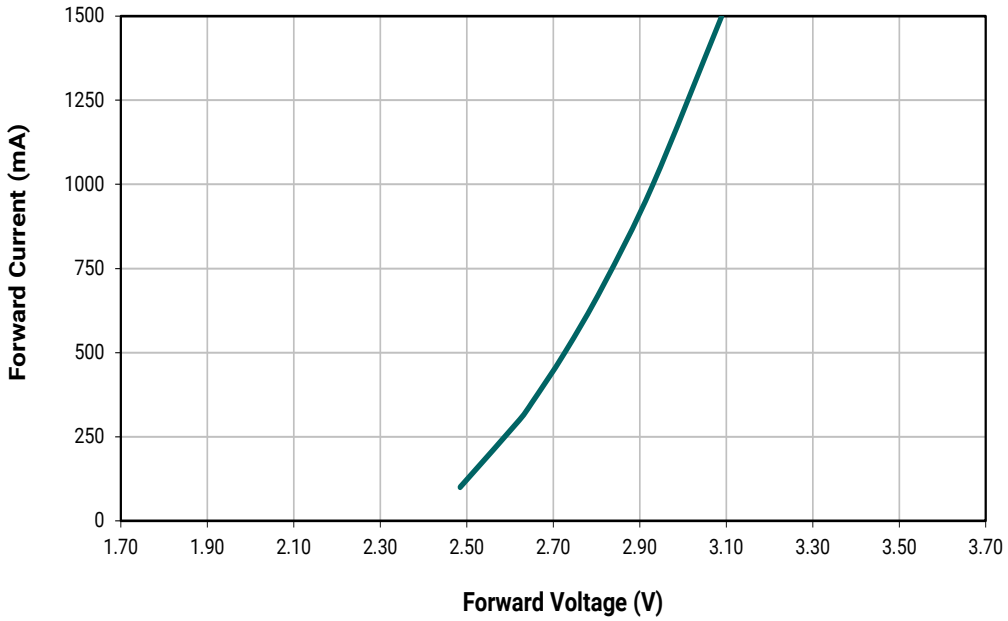
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ELECTRICAL CHARACTERISTICS - CYAN

High Density



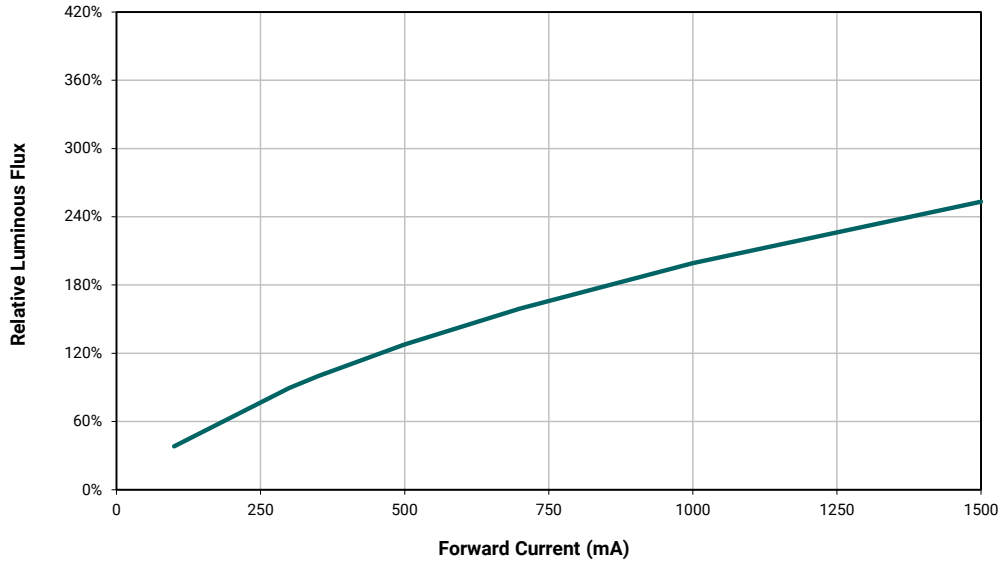
High Intensity



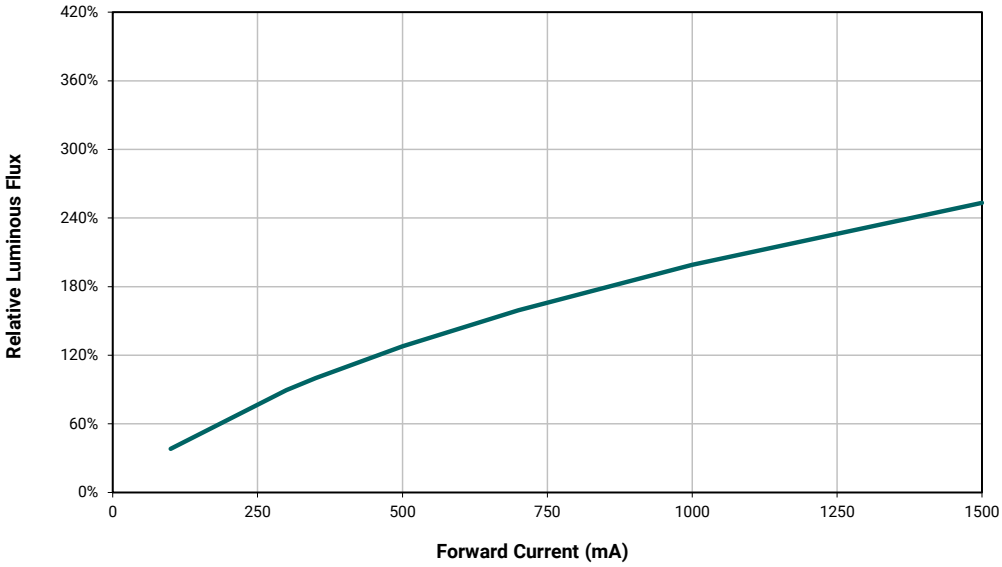
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RELATIVE FLUX VS. CURRENT - CYAN

High Density



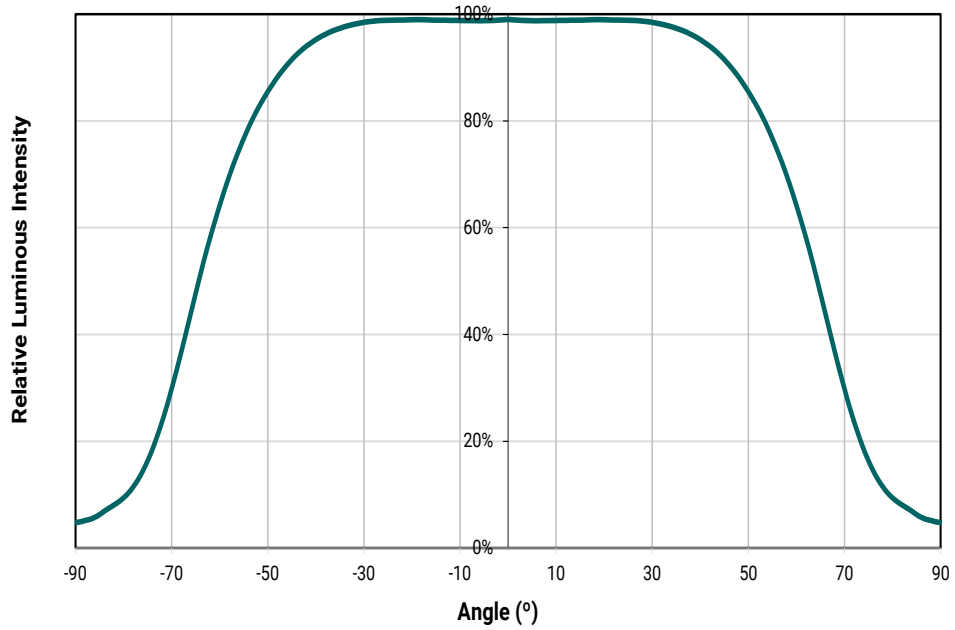
High Intensity



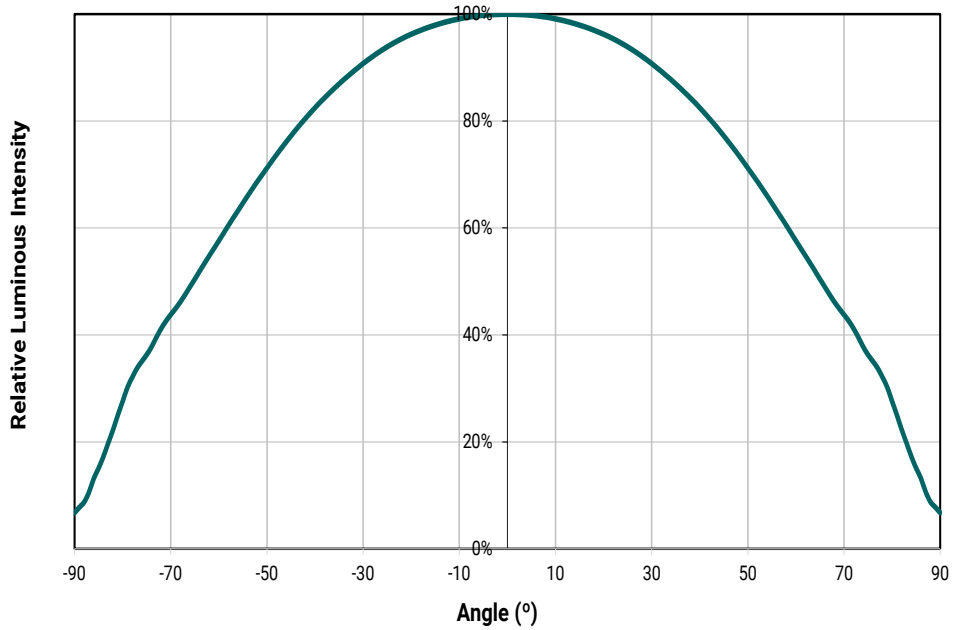
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TYPICAL SPATIAL DISTRIBUTION - CYAN

High Density



High Intensity

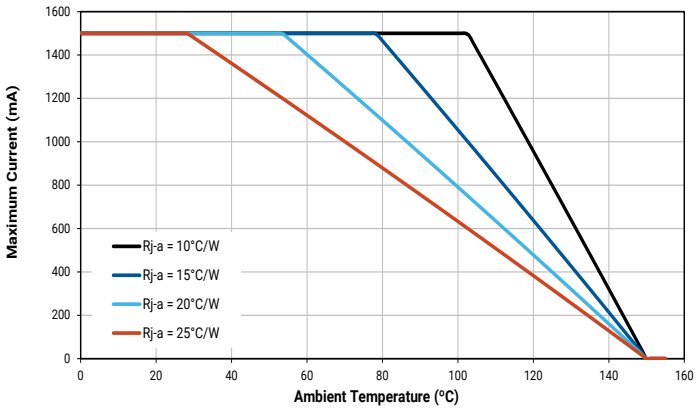


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THERMAL DESIGN - CYAN

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



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XLAMP XQ-E LEDs - PC CYAN

CHARACTERISTICS - HIGH DENSITY PC CYAN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		115	
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	3.25
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY PC CYAN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		130	
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		2.75	3.25
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 - HIGH DENSITY PC CYAN (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density PC cyan LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Cyan	PC0	Q5	107.0	XQEAPC-00-0000-000000D01
		Q4	100.0	XQEAPC-00-0000-000000C01
		Q3	93.9	XQEAPC-00-0000-000000B01

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY PC CYAN (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity PC cyan LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

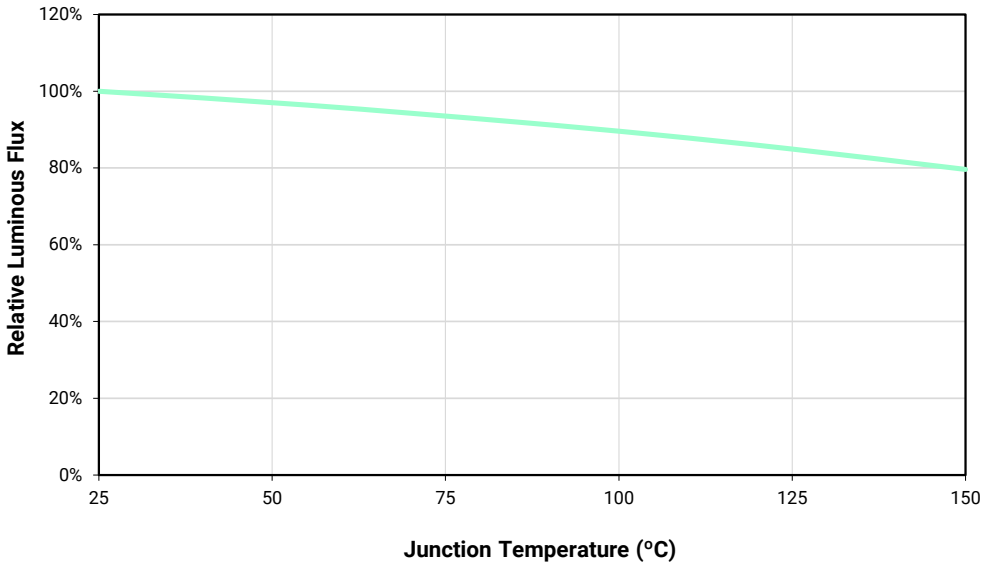
Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Cyan	PC0	Q4	100.0	XQEAPC-H0-0000-000000C01
		Q3	93.9	XQEAPC-H0-0000-000000B01
		Q2	87.4	XQEAPC-H0-0000-000000A01

Note
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

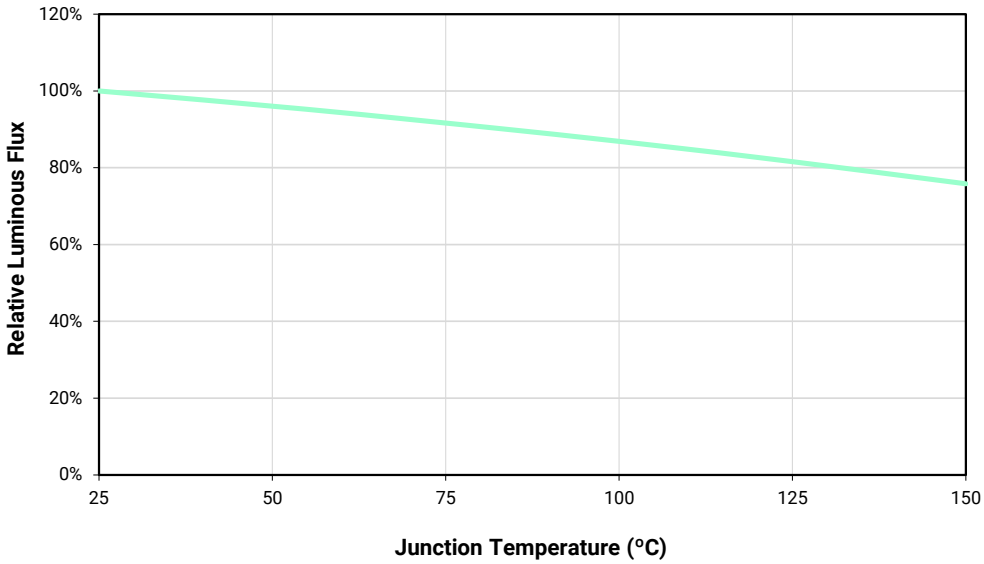
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - PC CYAN (I_F = 350 mA)

High Density



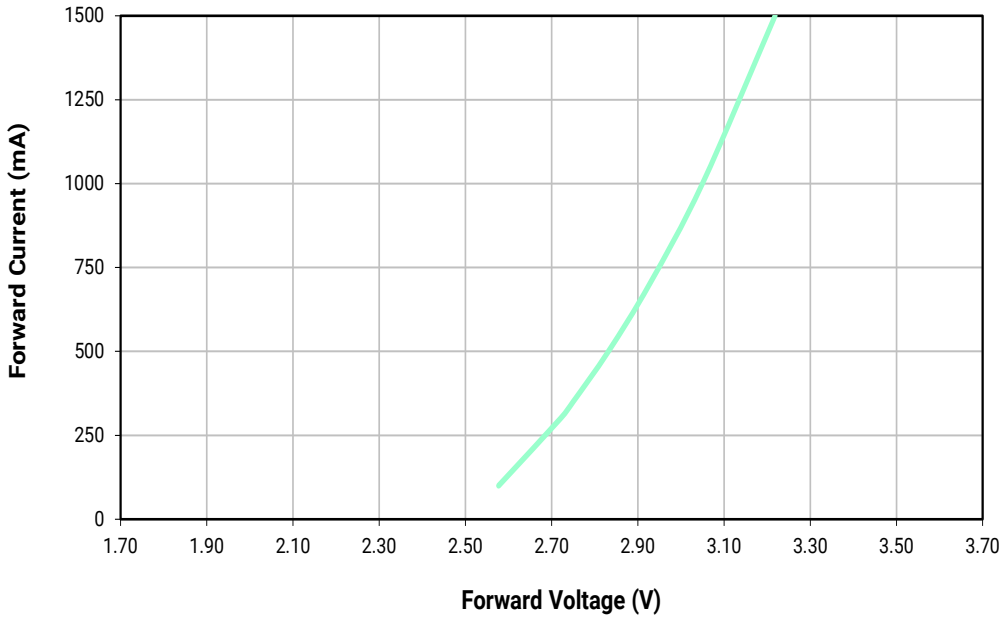
High Intensity



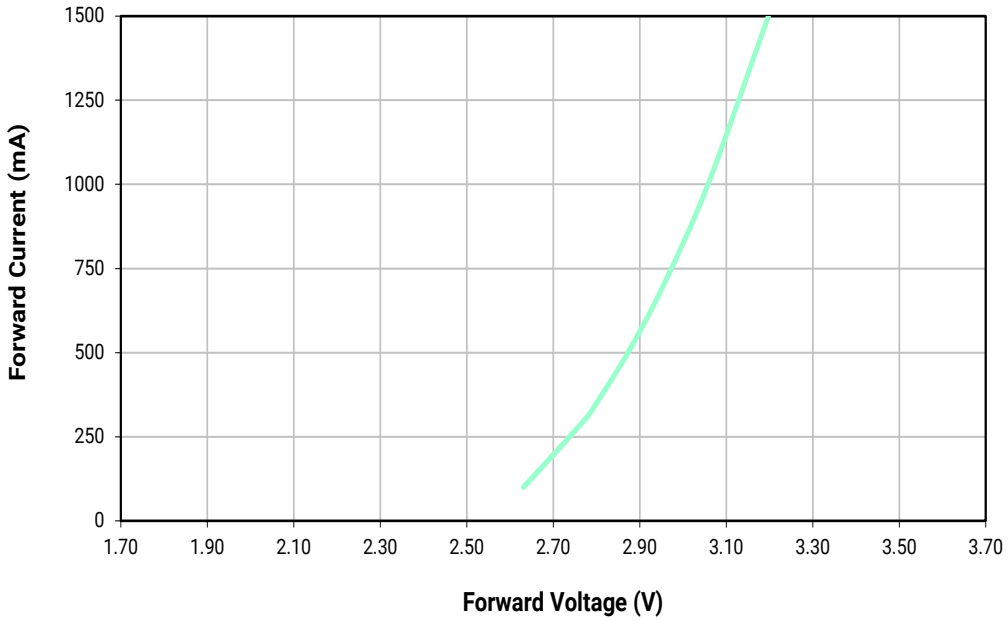
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ELECTRICAL CHARACTERISTICS - PC CYAN

High Density



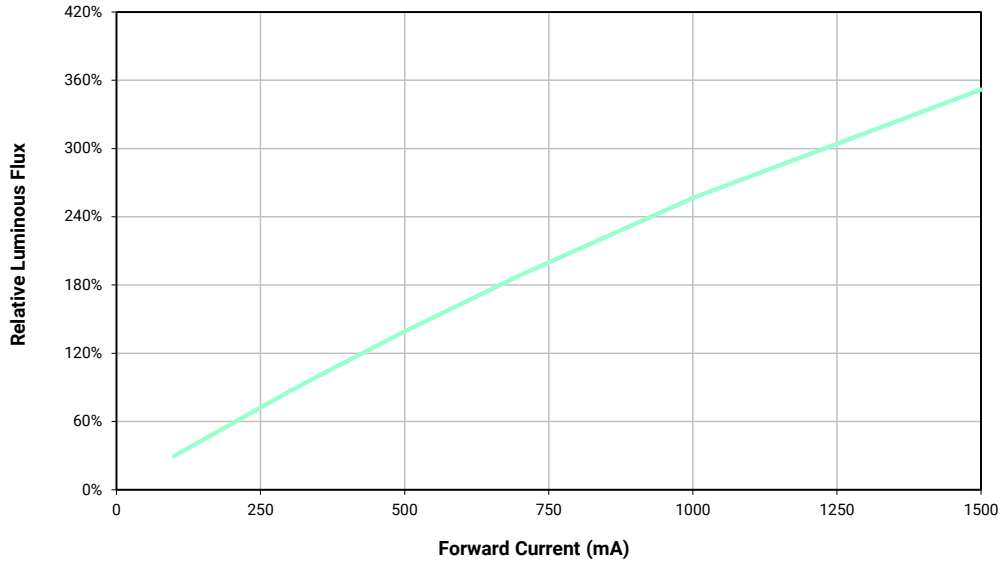
High Intensity



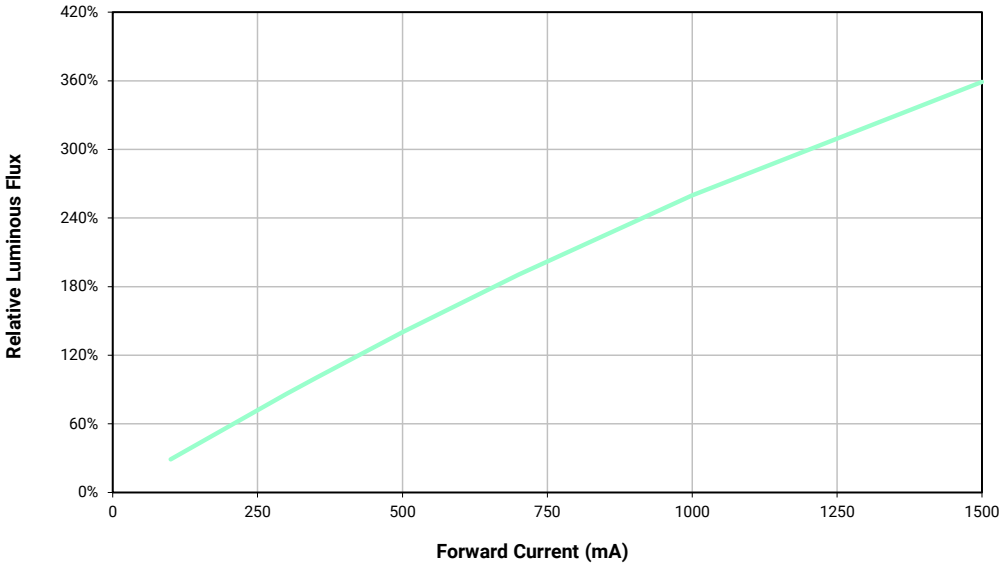
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RELATIVE FLUX VS. CURRENT - PC CYAN

High Density



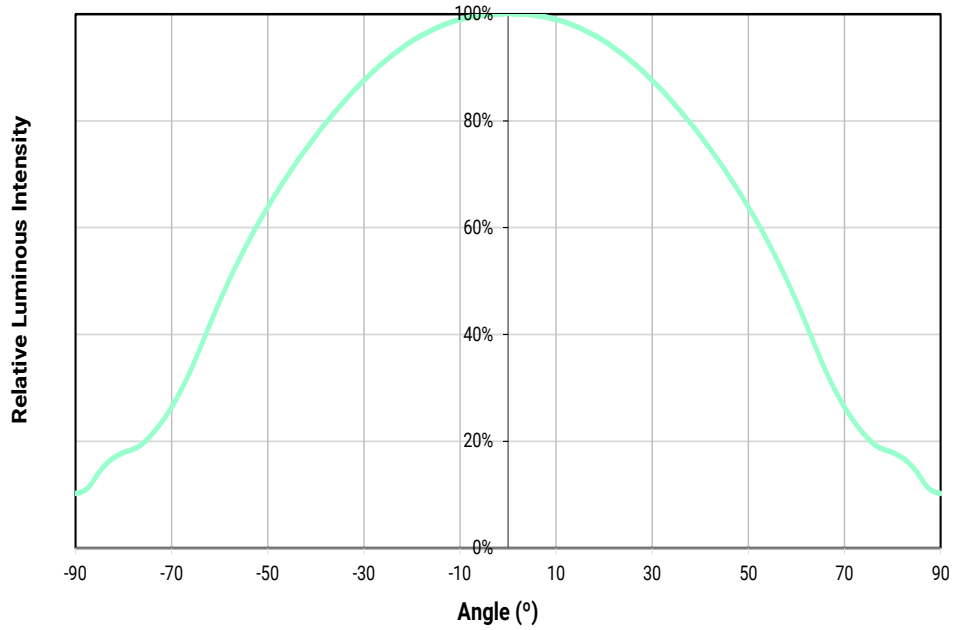
High Intensity



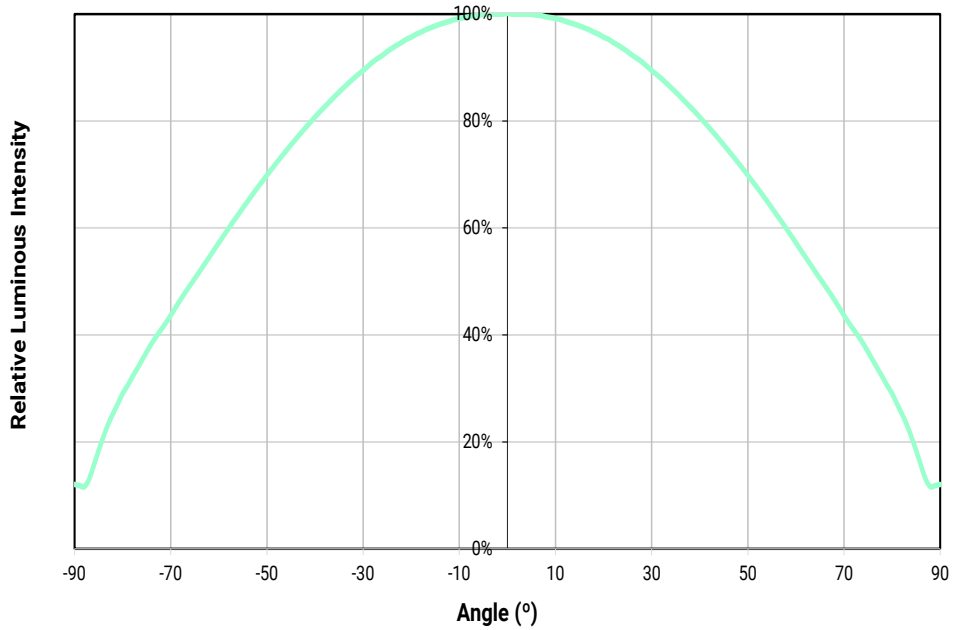
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TYPICAL SPATIAL DISTRIBUTION - PC CYAN

High Density



High Intensity

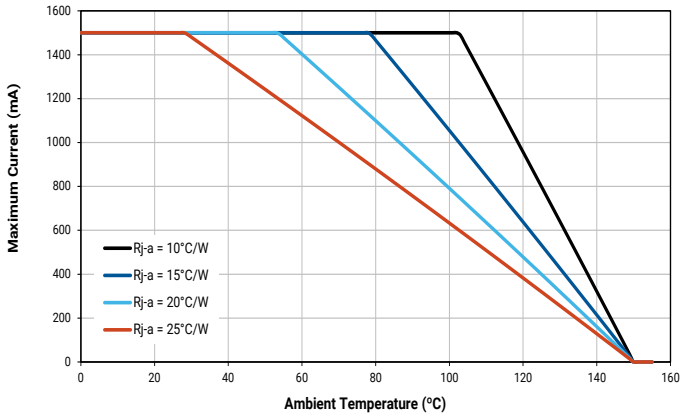


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THERMAL DESIGN - PC CYAN

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



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XLAMP XQ-E LEDs - GREEN

CHARACTERISTICS - HIGH DENSITY GREEN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		5	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.1	
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		2.65	3.5
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY GREEN

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		5	
Viewing angle (FWHM)	degrees		130	
Temperature coefficient of voltage	mV/°C		-1.1	
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	3.5
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 - HIGH DENSITY GREEN (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density green LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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	1.53	G2	520	G4	535	XQEGRN-00-0000-000000K01
				G2	520	G3	530	XQEGRN-00-0000-000000K02
				G3	525	G4	535	XQEGRN-00-0000-000000K03
	S2	148	1.45	G2	520	G4	535	XQEGRN-00-0000-000000J01
				G2	520	G3	530	XQEGRN-00-0000-000000J02
				G3	525	G4	535	XQEGRN-00-0000-000000J03
	R5	139	1.36	G2	520	G4	535	XQEGRN-00-0000-000000H01
				G2	520	G3	530	XQEGRN-00-0000-000000H02
				G3	525	G4	535	XQEGRN-00-0000-000000H03
	R4	130	1.27	G2	520	G4	535	XQEGRN-00-0000-000000G01
				G2	520	G3	530	XQEGRN-00-0000-000000G02
				G3	525	G4	535	XQEGRN-00-0000-000000G03

Notes

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

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ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY GREEN (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity green LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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	1.53	G2	520	G4	535	XQEGRN-H0-0000-000000K01
				G2	520	G3	530	XQEGRN-H0-0000-000000K02
				G3	525	G4	535	XQEGRN-H0-0000-000000K03
	S2	148	1.45	G2	520	G4	535	XQEGRN-H0-0000-000000J01
				G2	520	G3	530	XQEGRN-H0-0000-000000J02
				G3	525	G4	535	XQEGRN-H0-0000-000000J03
	R5	139	1.36	G2	520	G4	535	XQEGRN-H0-0000-000000H01
				G2	520	G3	530	XQEGRN-H0-0000-000000H02
				G3	525	G4	535	XQEGRN-H0-0000-000000H03
	R4	130	1.27	G2	520	G4	535	XQEGRN-H0-0000-000000G01
				G2	520	G3	530	XQEGRN-H0-0000-000000G02
				G3	525	G4	535	XQEGRN-H0-0000-000000G03

Notes

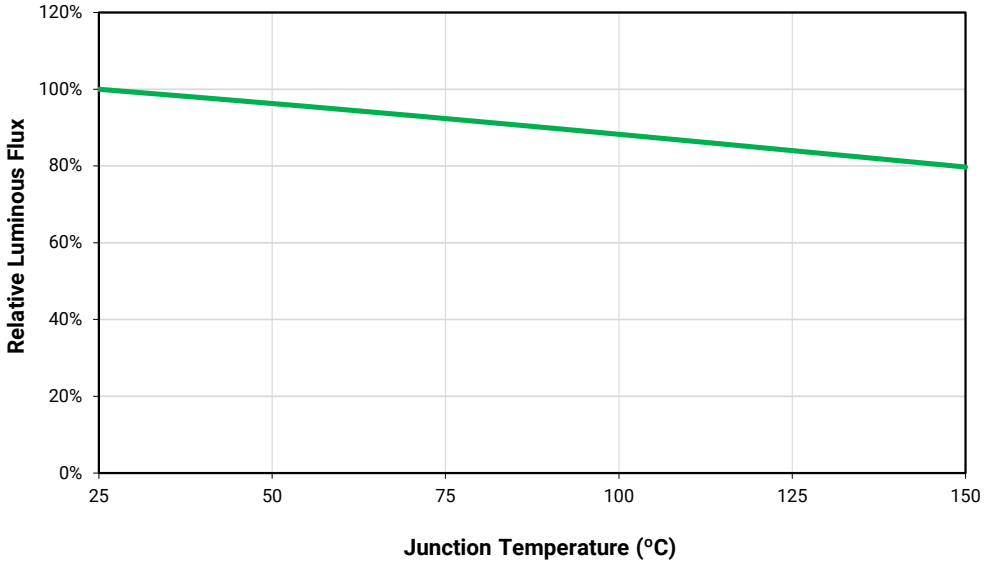
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

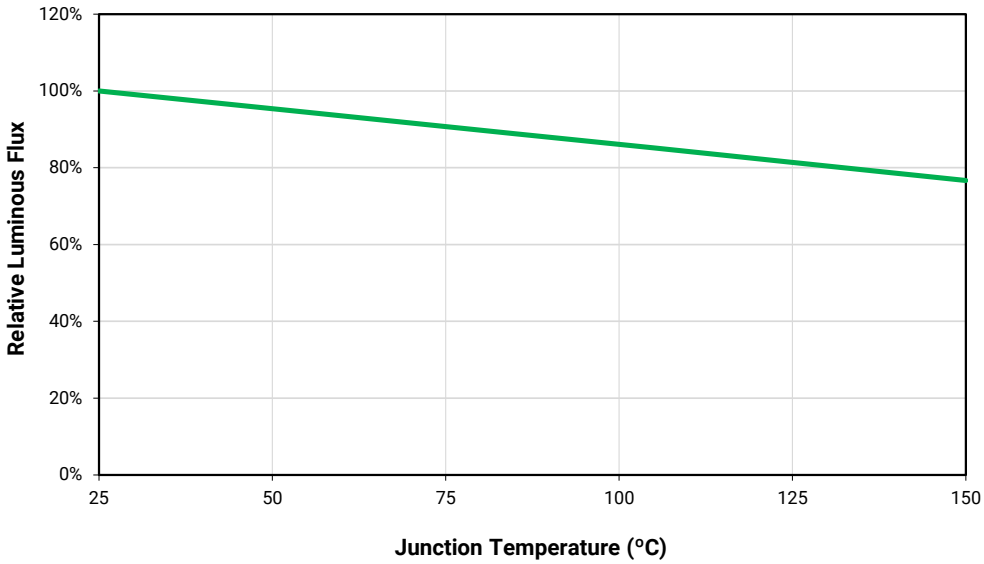
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - GREEN (I_F = 350 mA)

High Density



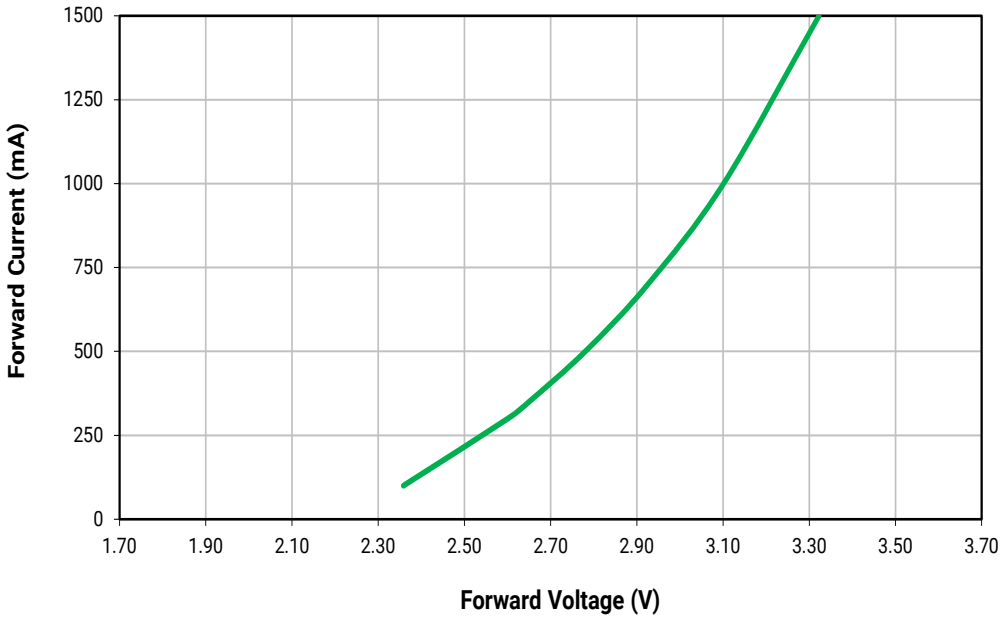
High Intensity



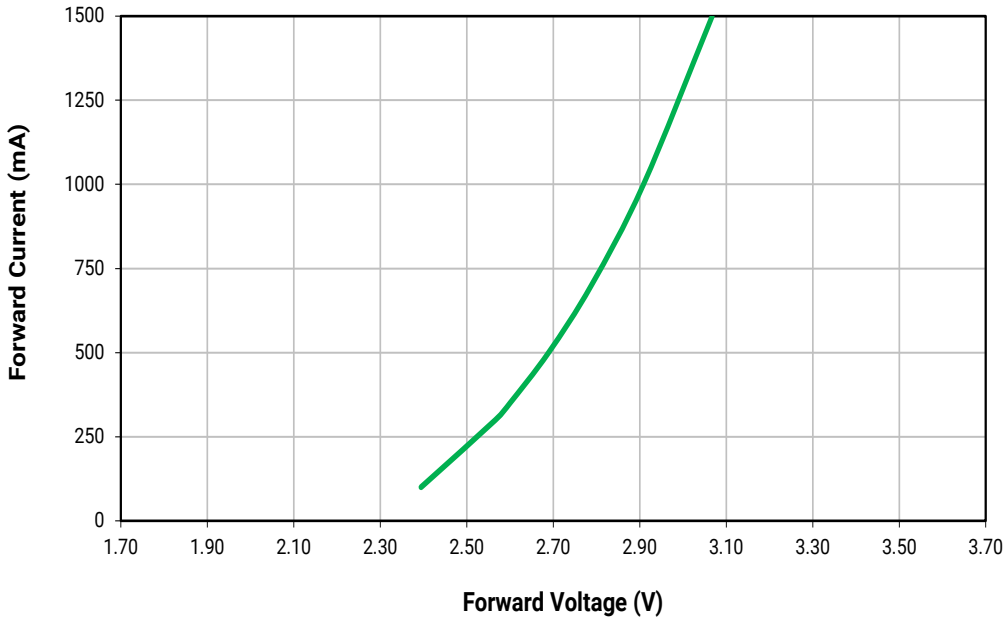
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ELECTRICAL CHARACTERISTICS - GREEN

High Density



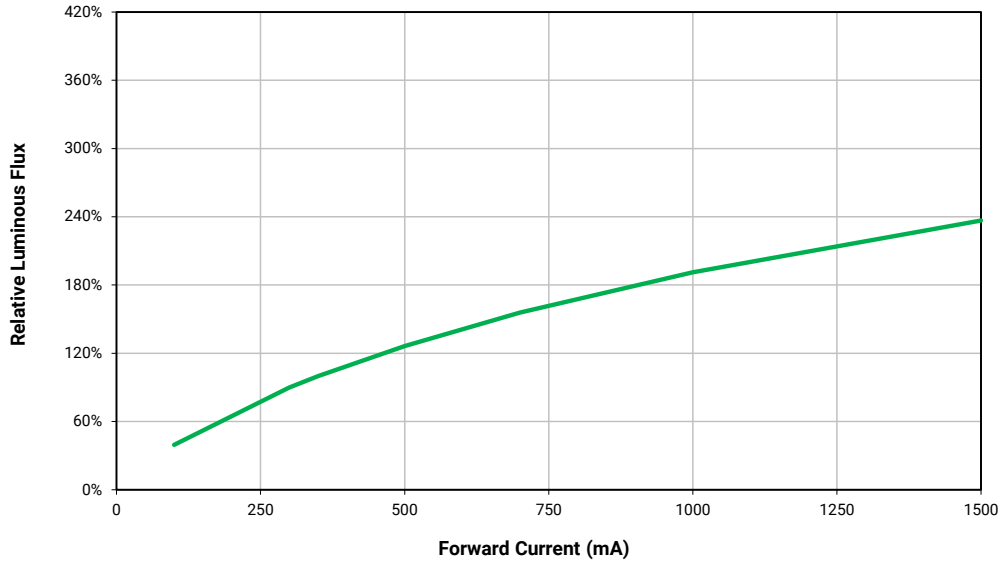
High Intensity



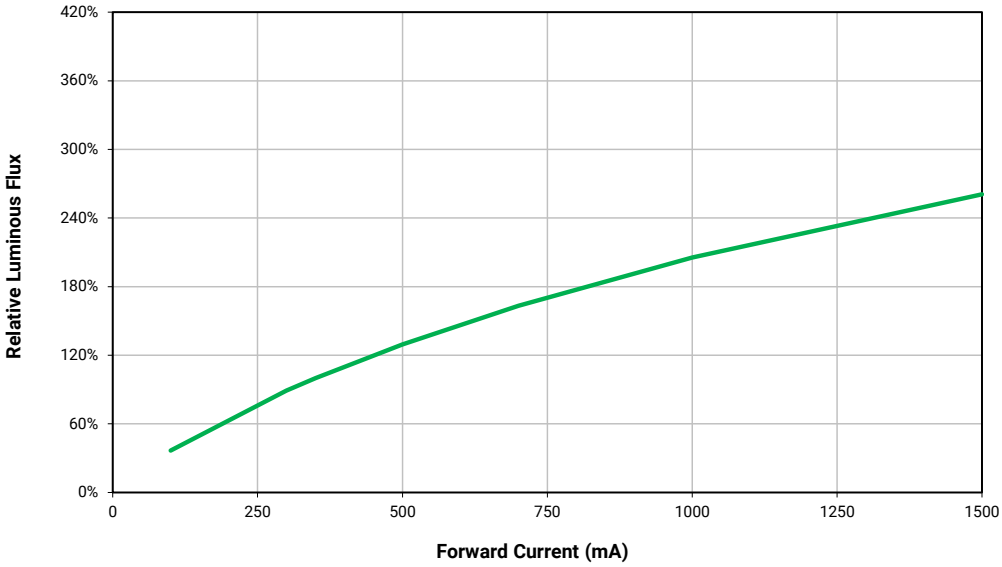
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RELATIVE FLUX VS. CURRENT - GREEN

High Density



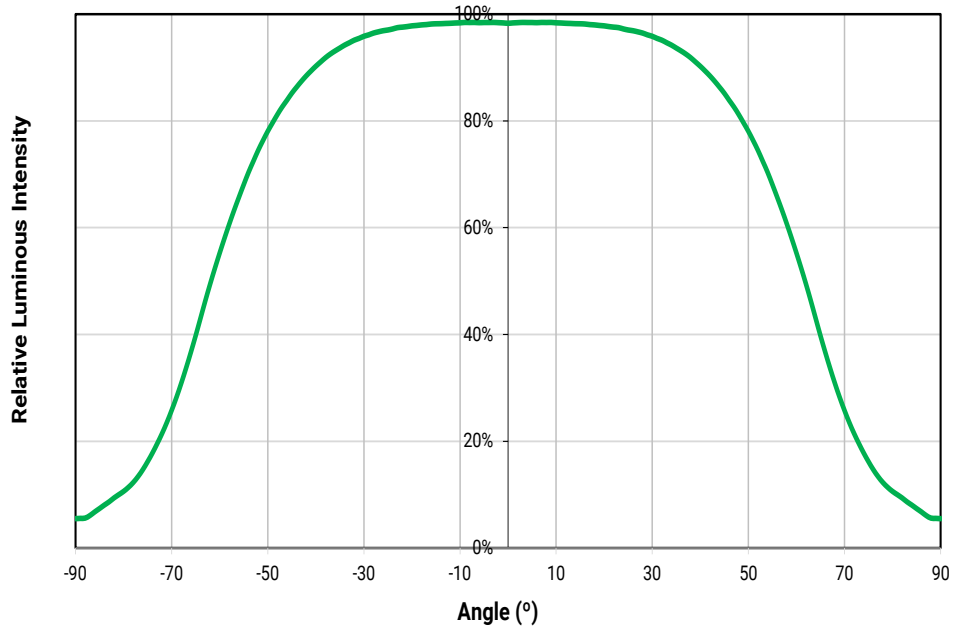
High Intensity



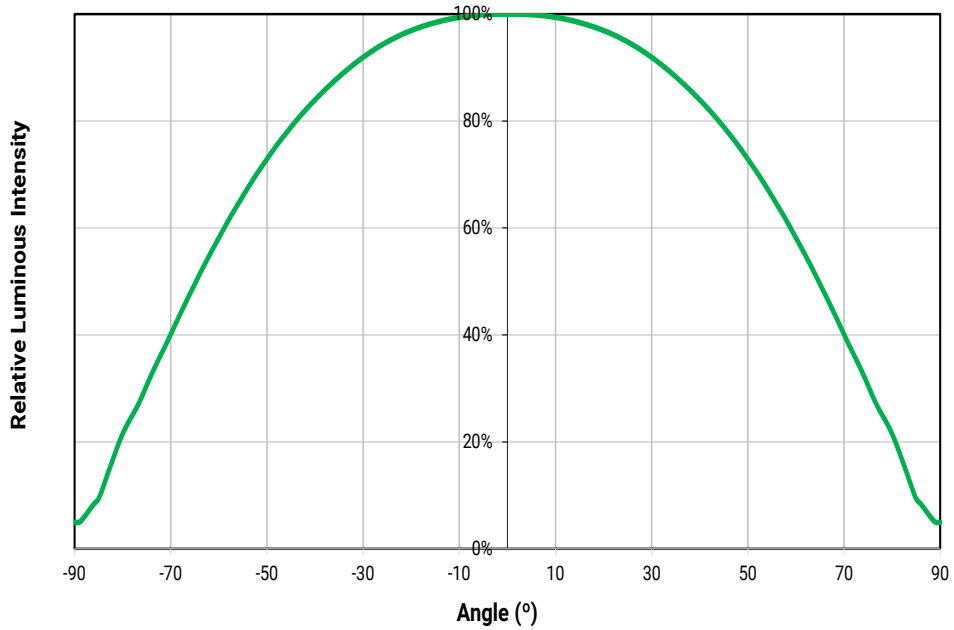
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TYPICAL SPATIAL DISTRIBUTION - GREEN

High Density



High Intensity

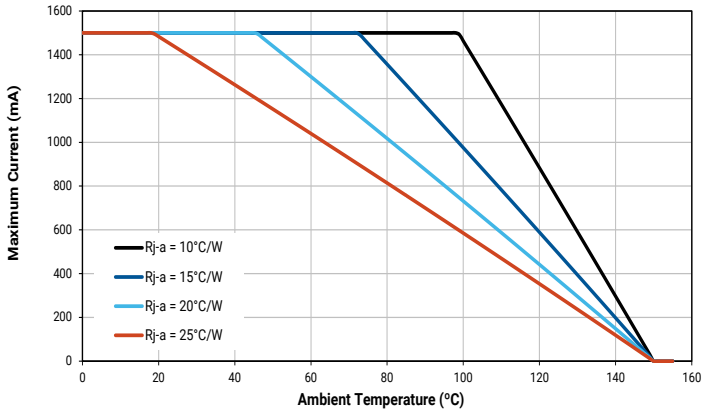


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THERMAL DESIGN - GREEN

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



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XLAMP XQ-E LEDs - PC LIME

CHARACTERISTICS - HIGH DENSITY PC LIME

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		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	V		2.8	3.25
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY PC LIME

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		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		2.75	3.25
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 - HIGH DENSITY PC LIME (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density PC lime LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Lime	PL3 & PL4	S4	164	XQEAPL-00-0000-000000L01
		S3	156	XQEAPL-00-0000-000000K01
		S2	148	XQEAPL-00-0000-000000J01
		R5	139	XQEAPL-00-0000-000000H01
		R4	130	XQEAPL-00-0000-000000G01
	PL3	S4	164	XQEAPL-00-0000-000000L02
		S3	156	XQEAPL-00-0000-000000K02
		S2	148	XQEAPL-00-0000-000000J02
	PL4	R5	139	XQEAPL-00-0000-000000H03
		R4	130	XQEAPL-00-0000-000000G03

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY PC LIME (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity PC lime LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Lime	PL3 & PL4	S4	164	XQEAPL-H0-0000-000000L01
		S3	156	XQEAPL-H0-0000-000000K01
		S2	148	XQEAPL-H0-0000-000000J01
		R5	139	XQEAPL-H0-0000-000000H01
		R4	130	XQEAPL-H0-0000-000000G01
	PL3	S4	164	XQEAPL-H0-0000-000000L02
		S3	156	XQEAPL-H0-0000-000000K02
		S2	148	XQEAPL-H0-0000-000000J02
	PL4	R5	139	XQEAPL-H0-0000-000000H03
		R4	130	XQEAPL-H0-0000-000000G03

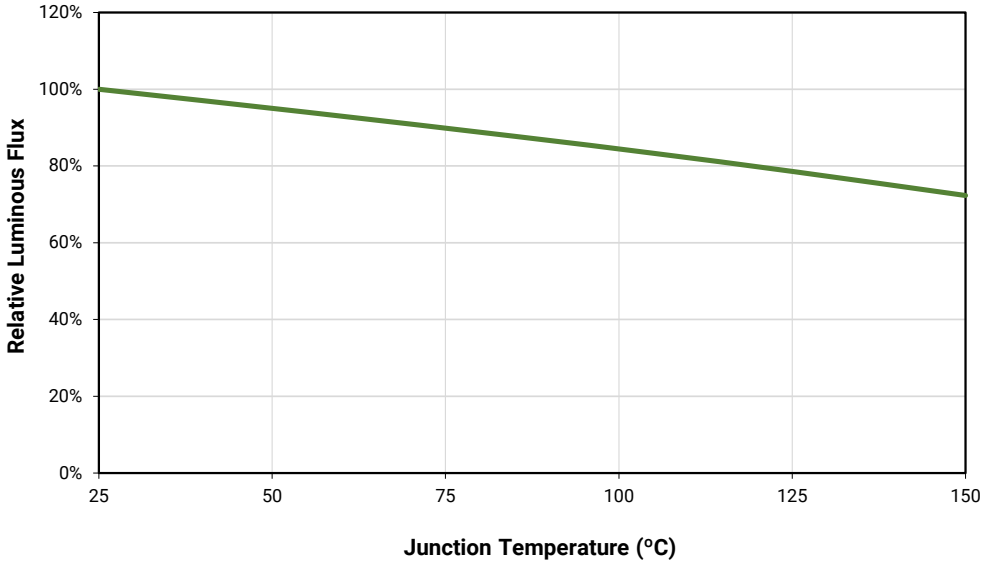
Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

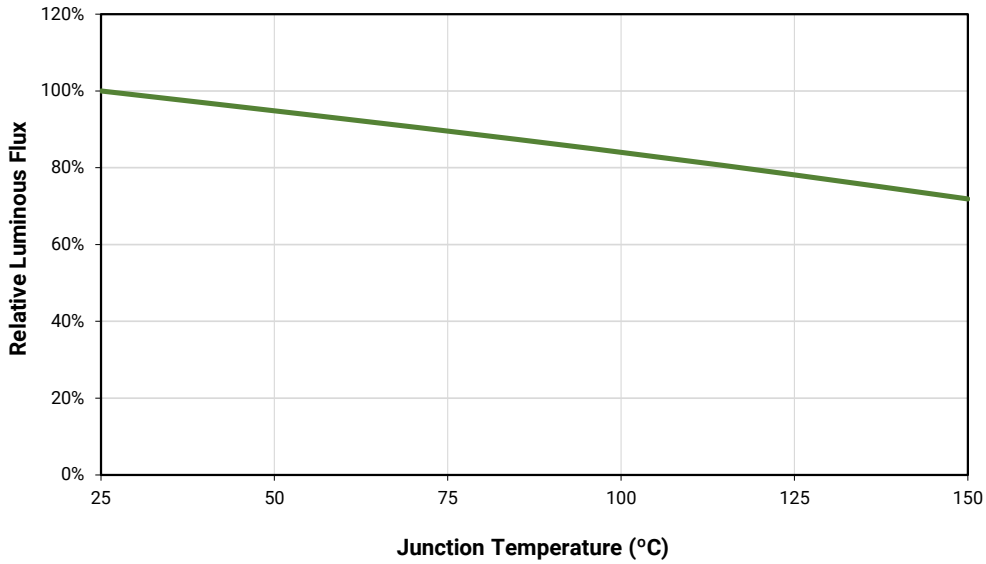
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - PC LIME (I_F = 350 mA)

High Density



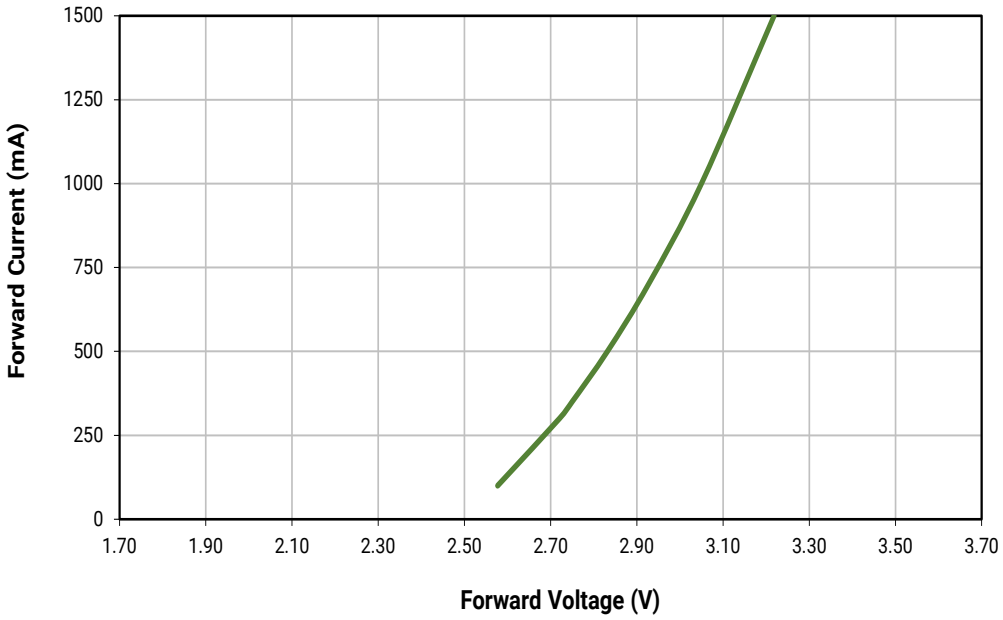
High Intensity



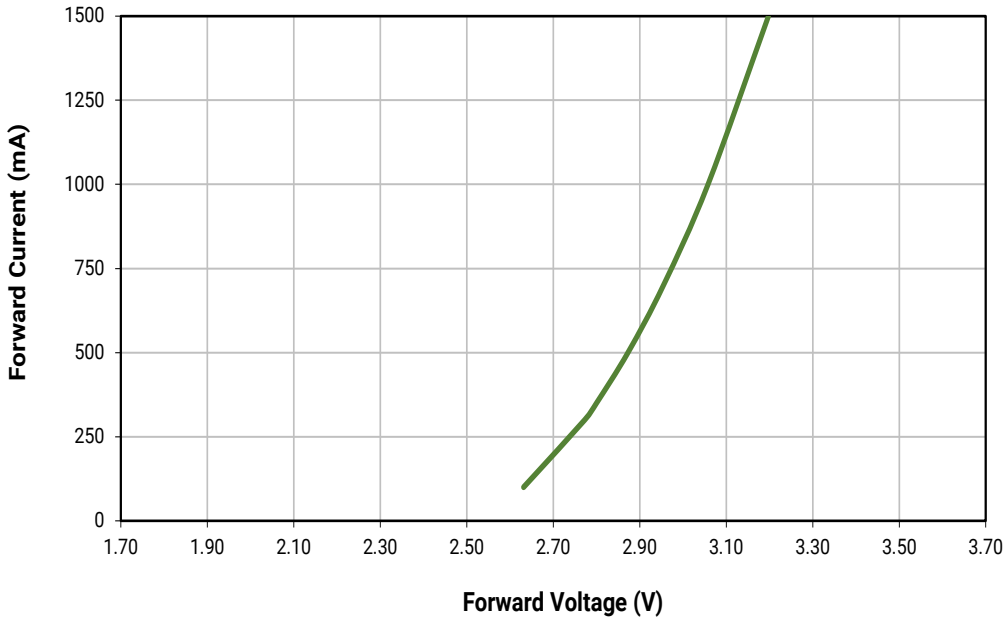
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ELECTRICAL CHARACTERISTICS - PC LIME

High Density



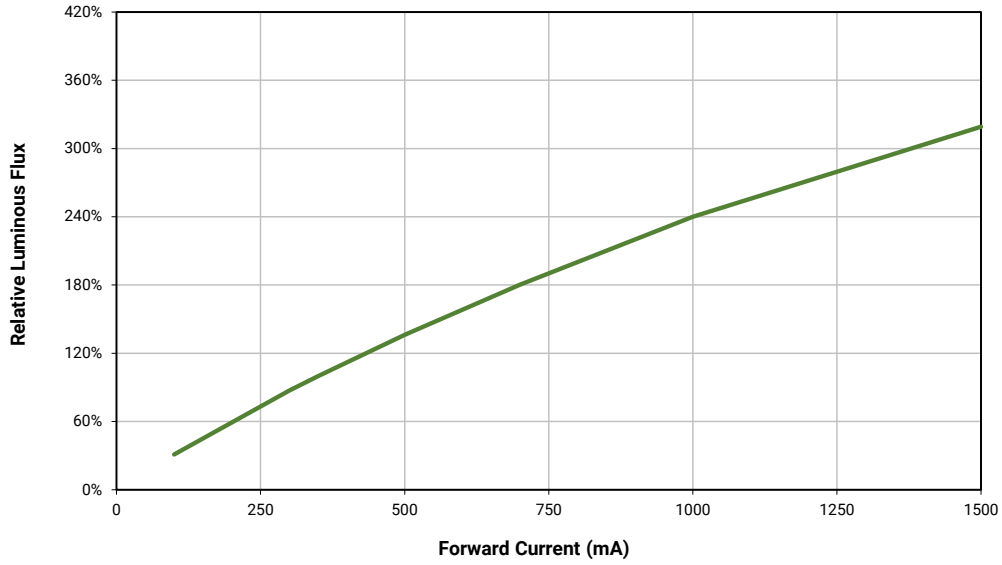
High Intensity



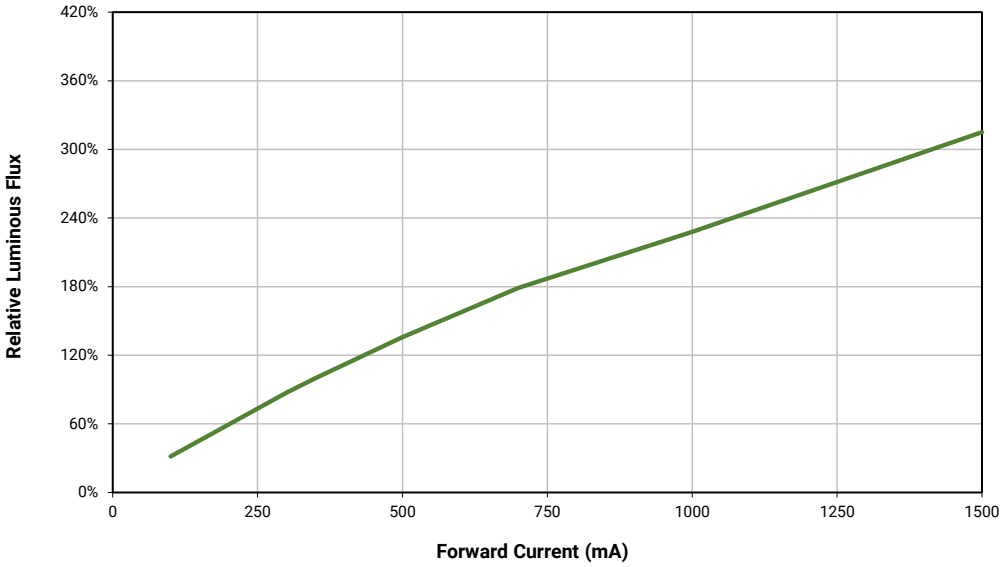
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RELATIVE FLUX VS. CURRENT - PC LIME

High Density



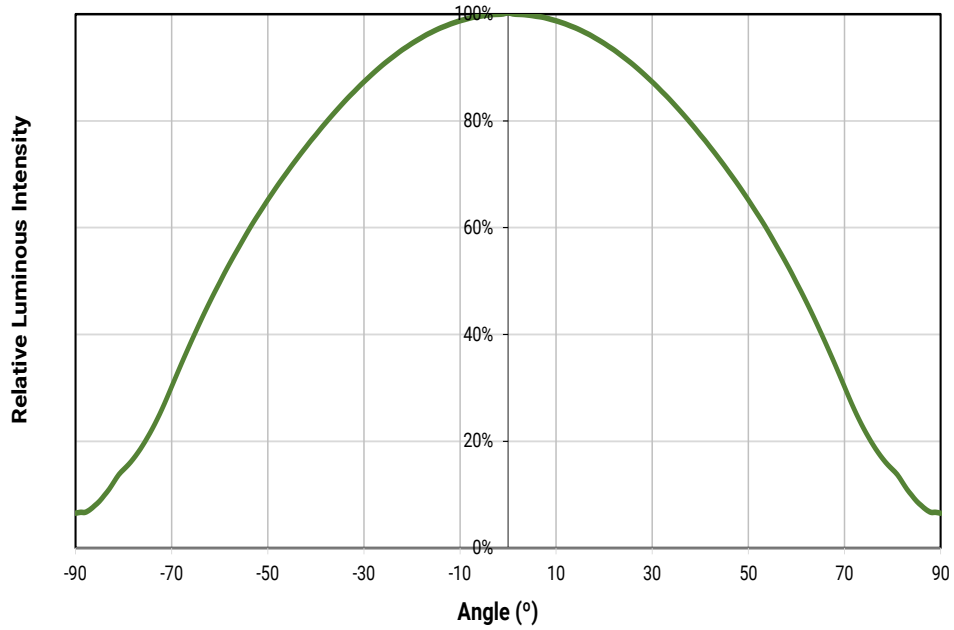
High Intensity



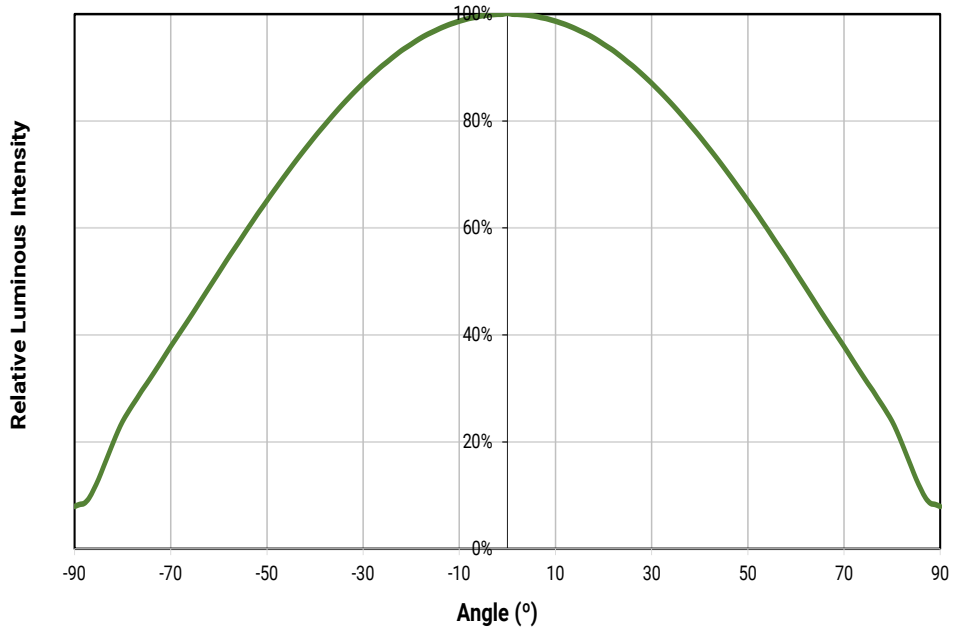
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TYPICAL SPATIAL DISTRIBUTION - PC LIME

High Density



High Intensity

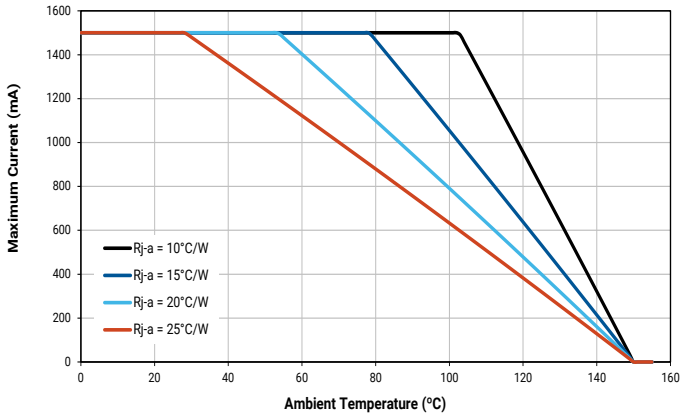


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THERMAL DESIGN - PC LIME

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



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XLAMP XQ-E LEDs - PC AMBER

CHARACTERISTICS - HIGH DENSITY PC AMBER

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		4	
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		2.9	3.6
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY PC AMBER

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		4	
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		2.9	3.6
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 - HIGH DENSITY PC AMBER (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density PC amber LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	Q4	100.0	XQEAPA-00-0000-000000C01
		Q3	93.9	XQEAPA-00-0000-000000B01
		Q2	87.4	XQEAPA-00-0000-000000A01
		P4	80.6	XQEAPA-00-0000-000000901

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY PC AMBER (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity PC amber LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

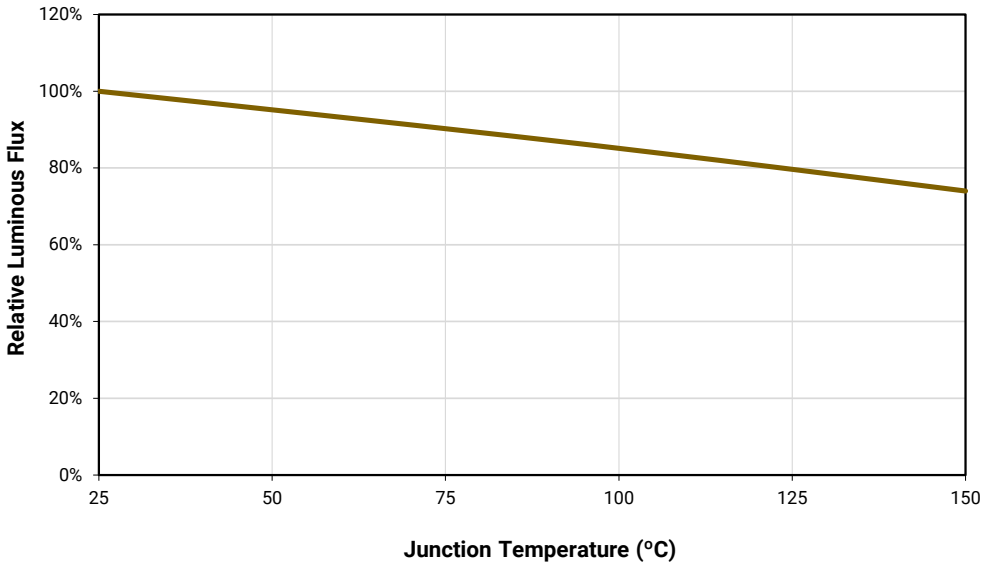
Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	Q3	93.9	XQEAPA-H0-0000-000000B01
		Q2	87.4	XQEAPA-H0-0000-000000A01
		P4	80.6	XQEAPA-H0-0000-000000901

Note
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

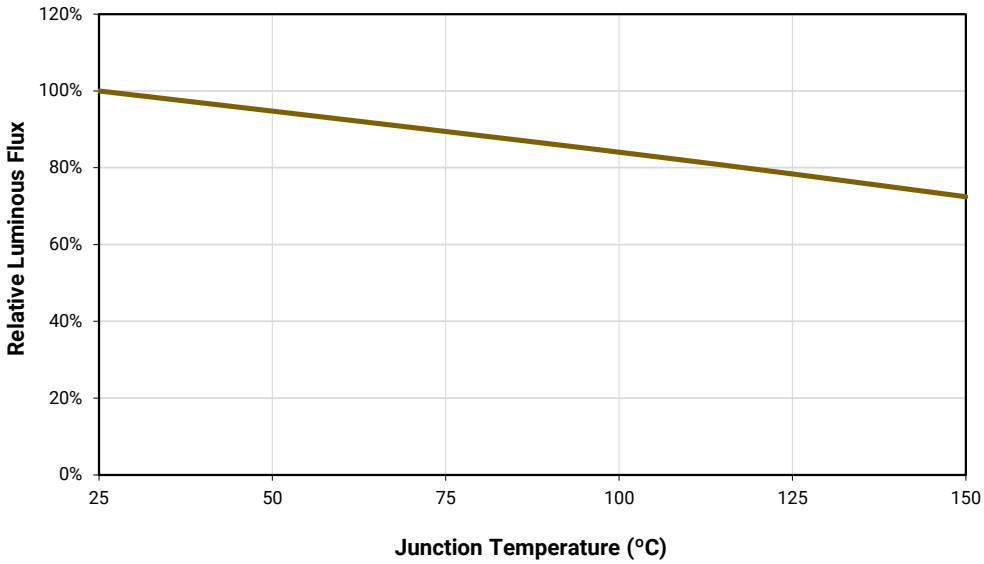
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - PC AMBER (I_F = 350 mA)

High Density



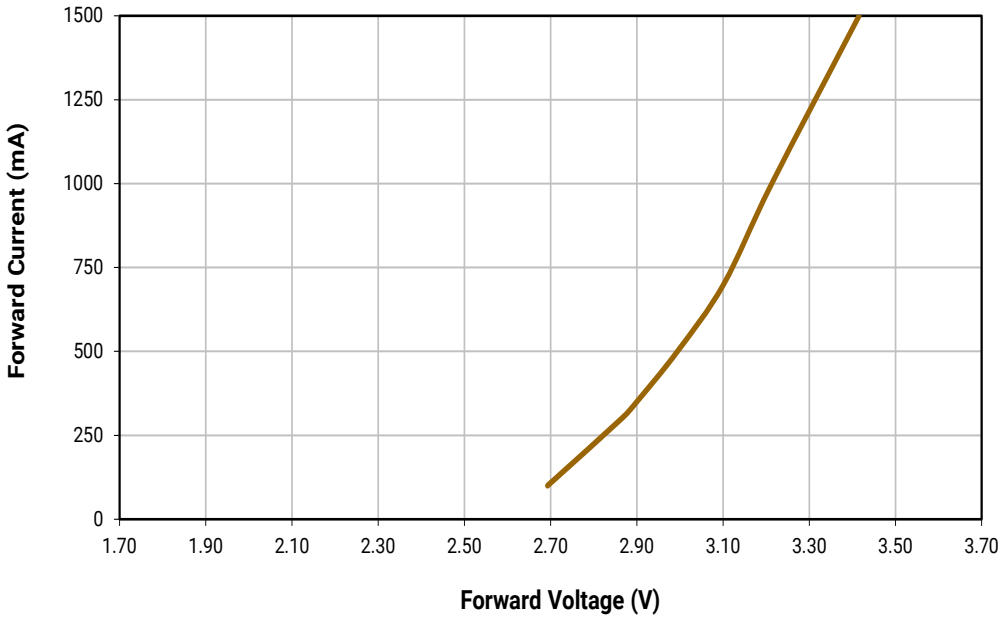
High Intensity



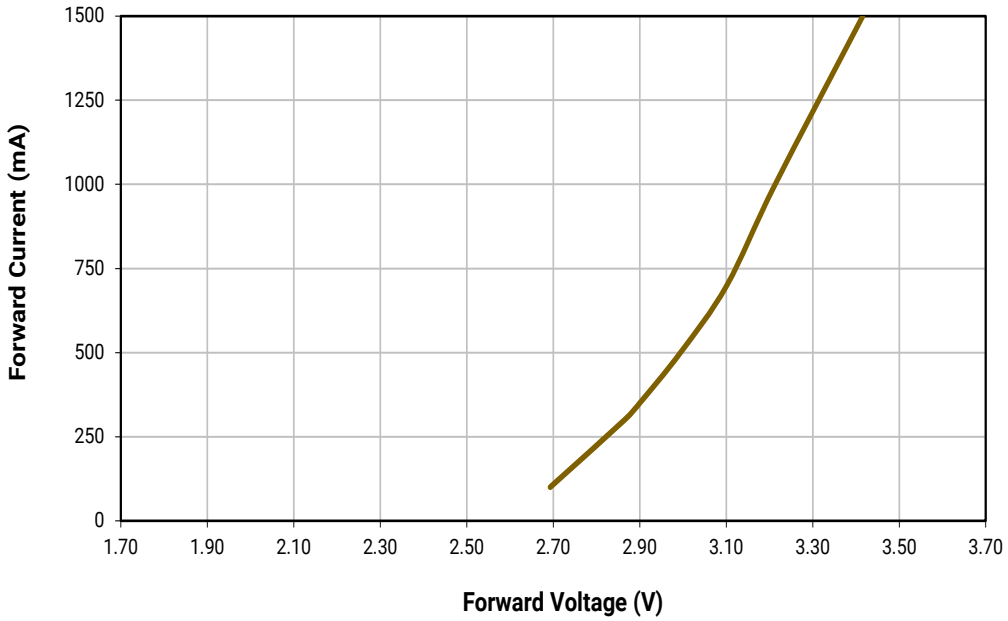
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ELECTRICAL CHARACTERISTICS - PC AMBER

High Density



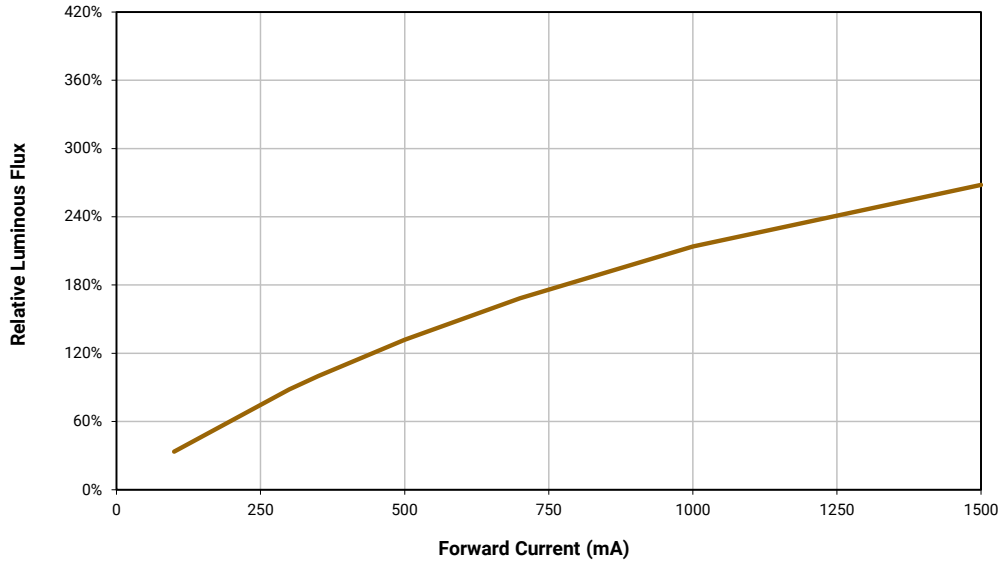
High Intensity



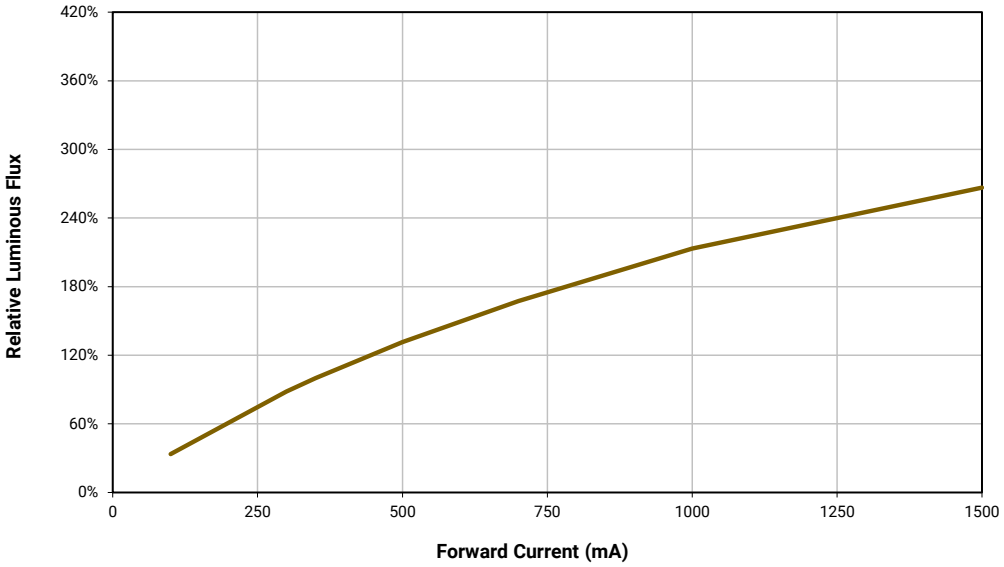
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RELATIVE FLUX VS. CURRENT - PC AMBER

High Density



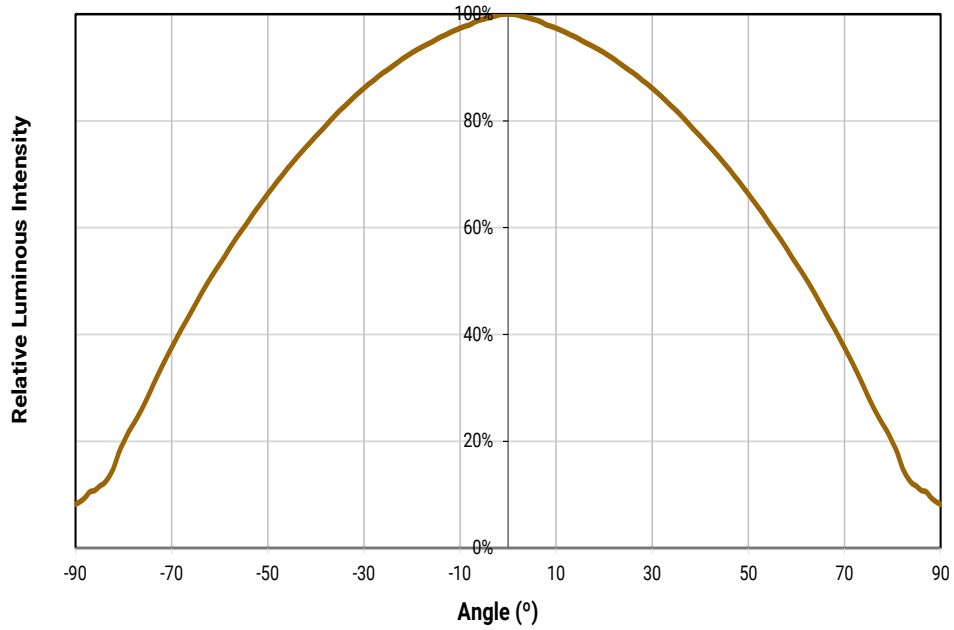
High Intensity



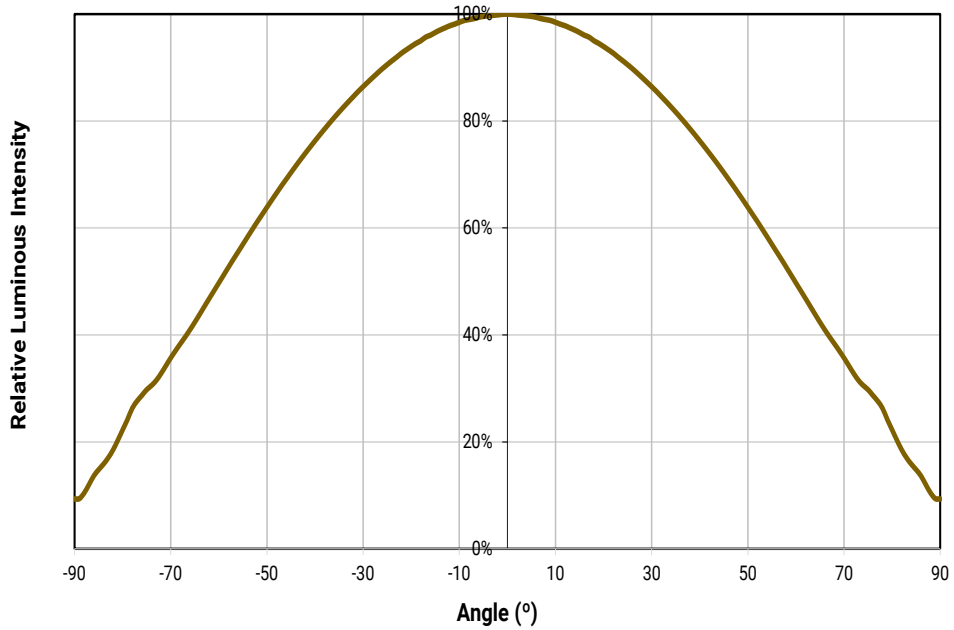
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TYPICAL SPATIAL DISTRIBUTION - PC AMBER

High Density



High Intensity

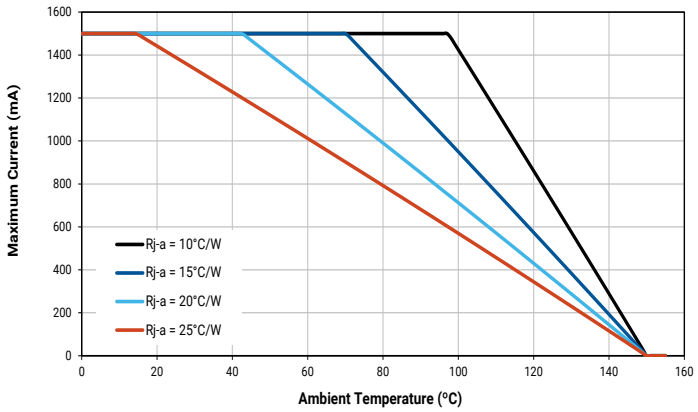


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THERMAL DESIGN - PC AMBER

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



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XLAMP XQ-E LEDs - RED-ORANGE

CHARACTERISTICS - HIGH DENSITY RED-ORANGE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		2.1	
Viewing angle (FWHM)	degrees		130	
Temperature coefficient of voltage	mV/°C		-1.3	
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		2.1	2.6
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY RED-ORANGE

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.8	
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		2.2	2.6
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 - HIGH DENSITY RED-ORANGE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density red-orange LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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	Q3	93.9	O3	610	O4	620	XQERDO-00-0000-000000B01
			O3	610	O3	615	XQERDO-00-0000-000000B02
	Q2	87.4	O3	610	O4	620	XQERDO-00-0000-000000A01
			O3	610	O3	615	XQERDO-00-0000-000000A02
	P4	80.6	O3	610	O4	620	XQERDO-00-0000-000000901
			O3	610	O3	615	XQERDO-00-0000-000000902

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY RED-ORANGE (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity red-orange LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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	P3	73.9	O3	610	O4	620	XQERDO-H0-0000-000000801
			O3	610	O3	615	XQERDO-H0-0000-000000802
	P2	67.2	O3	610	O4	620	XQERDO-H0-0000-000000701
			O3	610	O3	615	XQERDO-H0-0000-000000702
			O4	615	O4	620	XQERDO-H0-0000-000000703
	N4	62	O3	610	O4	620	XQERDO-H0-0000-000000601
			O3	610	O3	615	XQERDO-H0-0000-000000602
			O4	615	O4	620	XQERDO-H0-0000-000000603

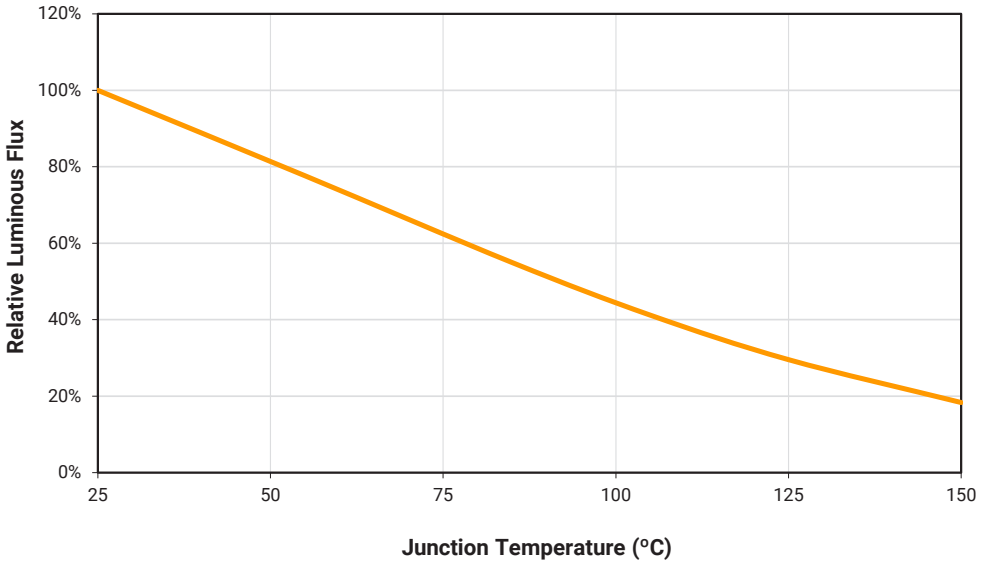
Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

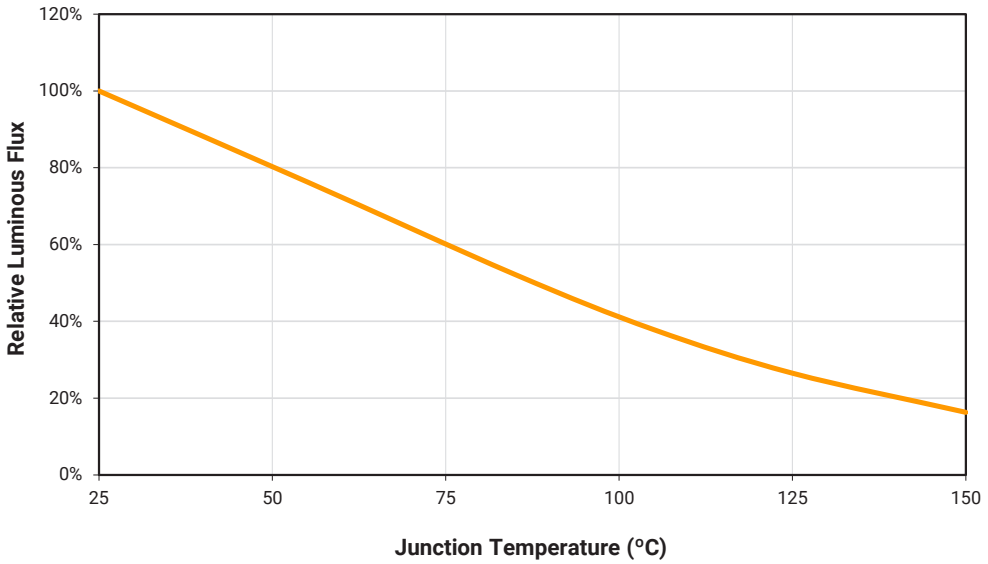
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - RED-ORANGE (I_F = 350 mA)

High Density



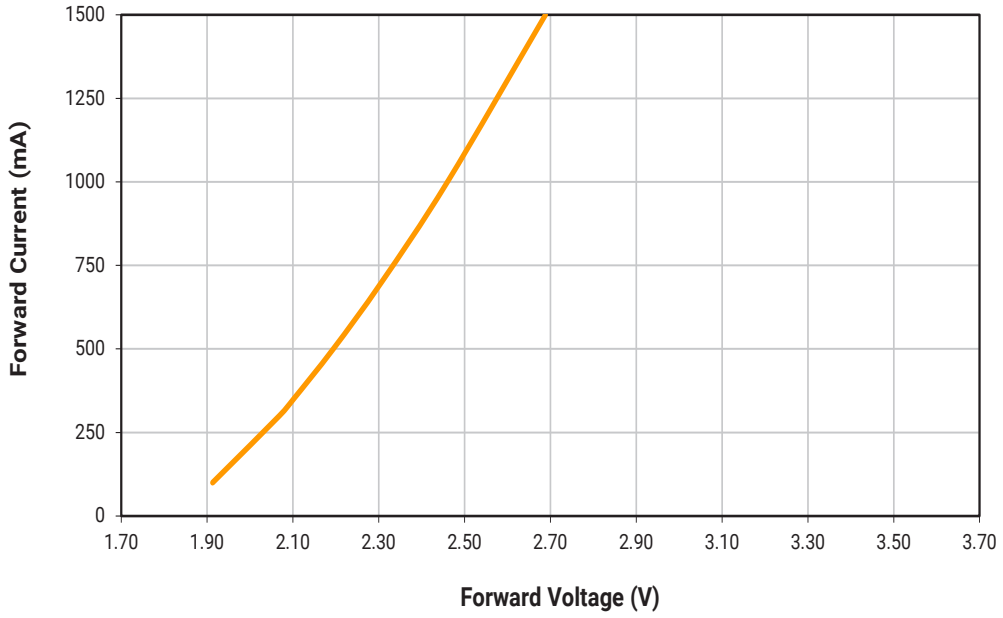
High Intensity



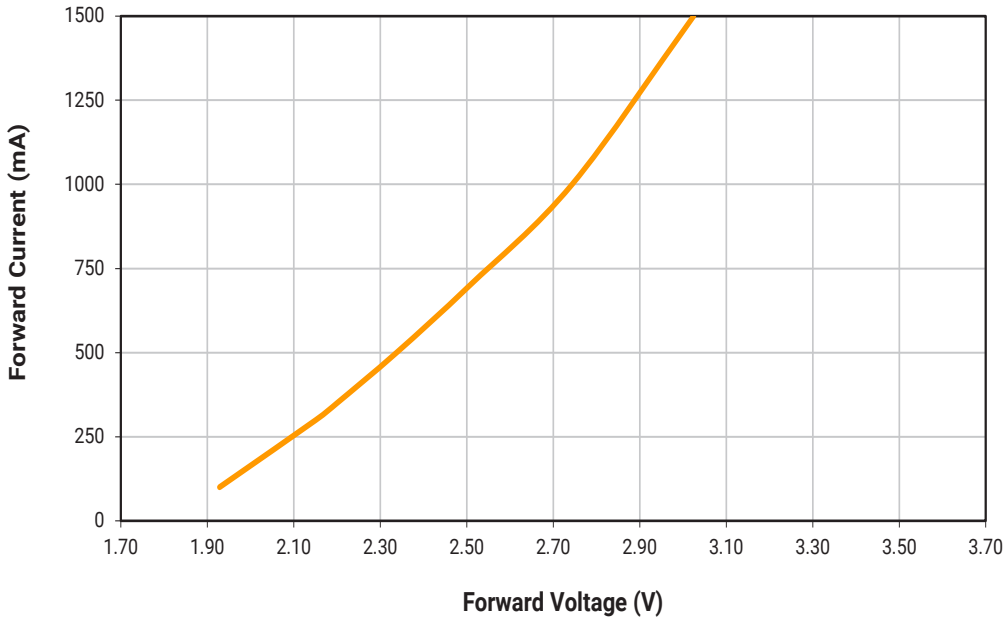
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ELECTRICAL CHARACTERISTICS - RED-ORANGE

High Density



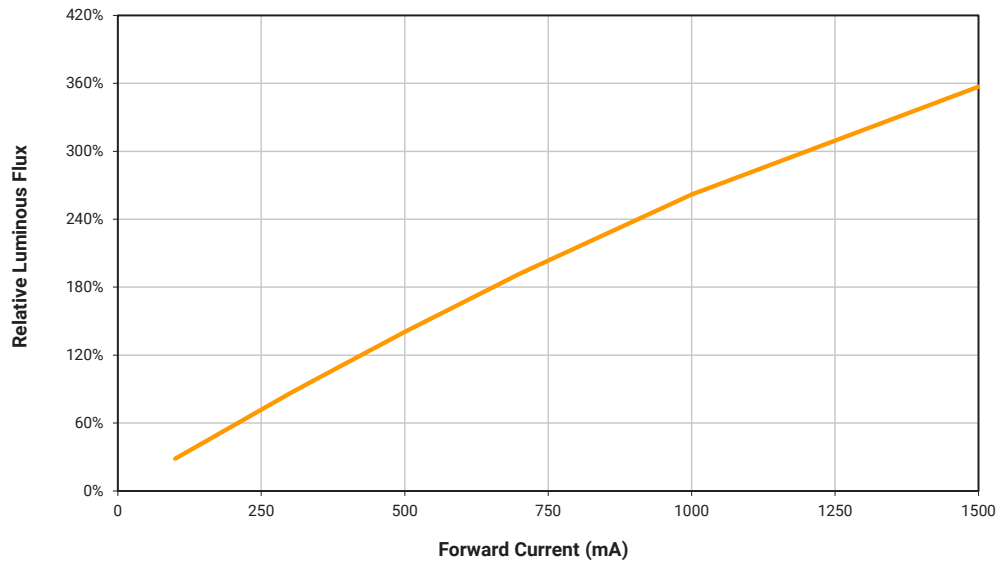
High Intensity



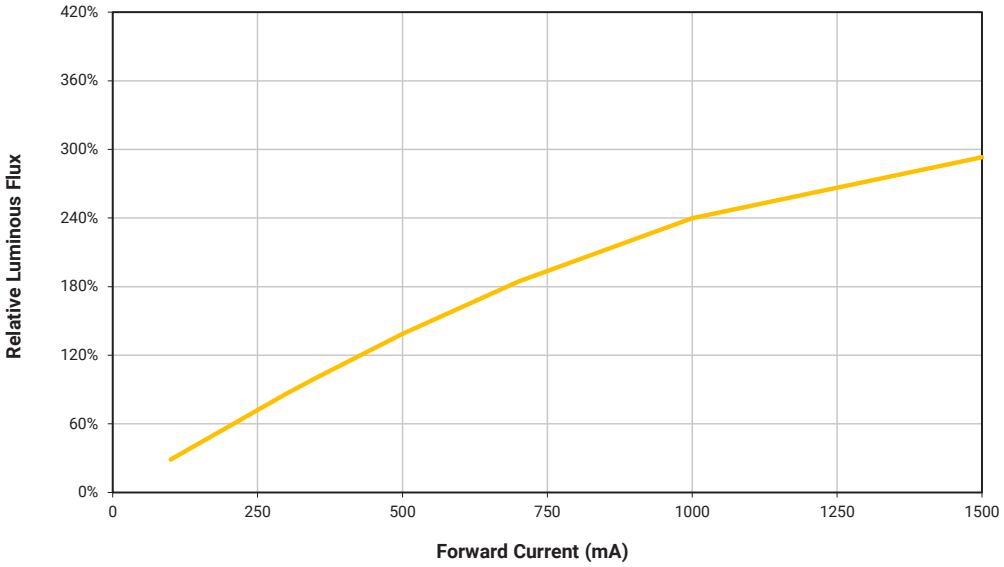
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RELATIVE FLUX VS. CURRENT - RED-ORANGE

High Density



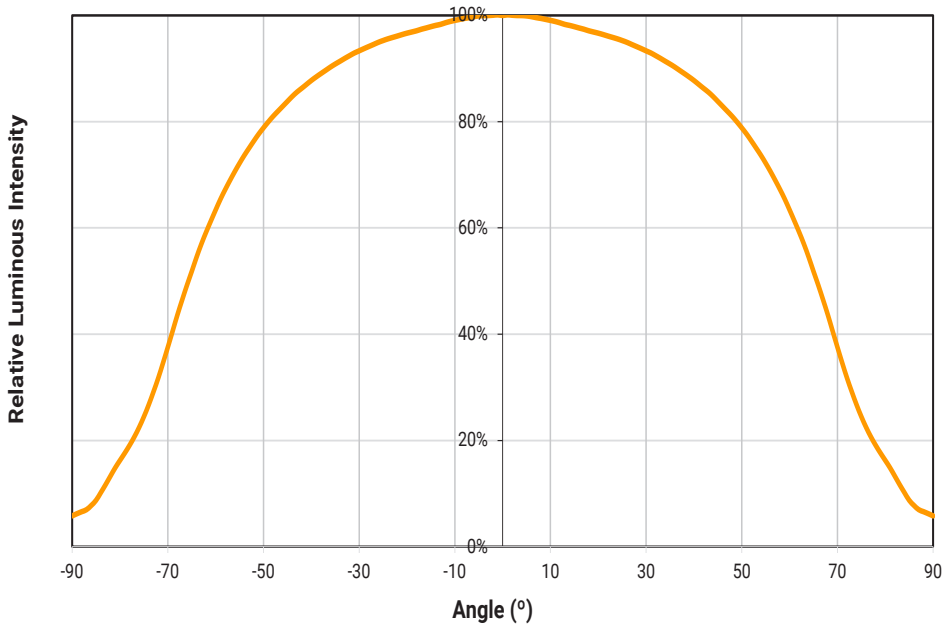
High Intensity



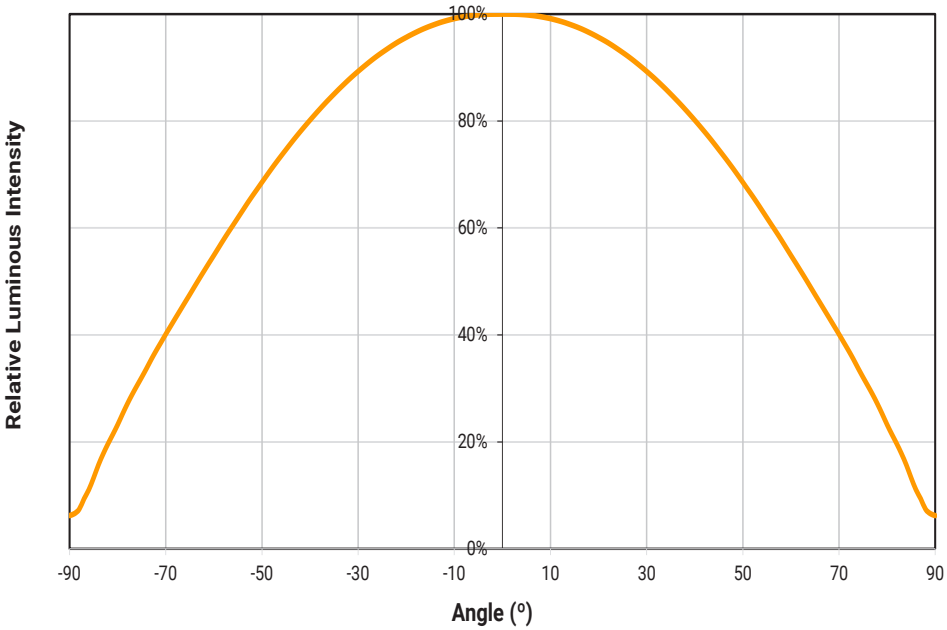
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TYPICAL SPATIAL DISTRIBUTION - RED-ORANGE

High Density



High Intensity

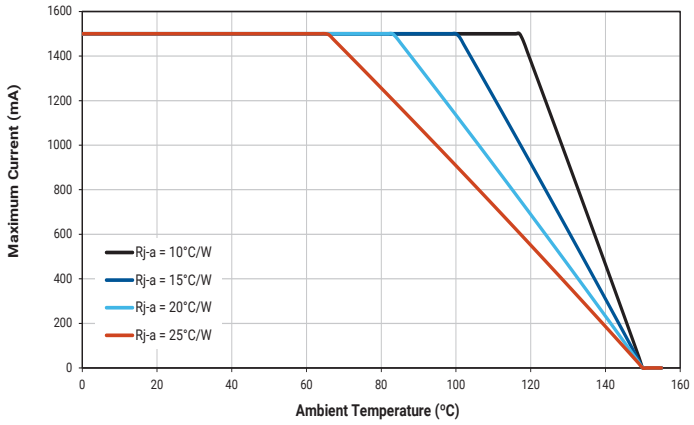


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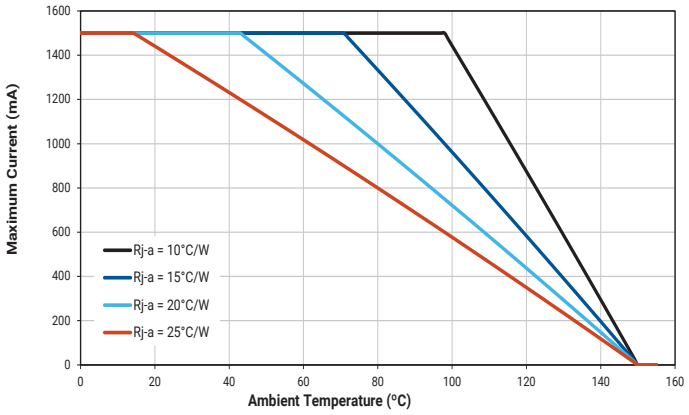
THERMAL DESIGN - RED-ORANGE

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



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XLAMP XQ-E LEDs - RED

CHARACTERISTICS - HIGH DENSITY RED

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		2.1	
Viewing angle (FWHM)	degrees		130	
Temperature coefficient of voltage	mV/°C		-1.4	
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		2.1	2.6
LED junction temperature	°C			150

CHARACTERISTICS - HIGH INTENSITY RED

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		3	
Viewing angle (FWHM)	degrees		125	
Temperature coefficient of voltage	mV/°C		-1.8	
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		2.2	2.6
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 - HIGH DENSITY RED (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density red LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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	P3	73.9	1.92	R2	620	R3	630	XQERED-00-0000-000000801
				R2	620	R2	625	XQERED-00-0000-000000802
	P2	67.2	1.75	R2	620	R3	630	XQERED-00-0000-000000701
				R2	620	R2	625	XQERED-00-0000-000000702
	N4	62	1.61	R2	620	R3	630	XQERED-00-0000-000000601
				R2	620	R2	625	XQERED-00-0000-000000602

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH INTENSITY RED (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Intensity red LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

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	1.50	R2	620	R3	630	XQERED-H0-0000-000000501
	N2	51.7	1.35	R2	620	R3	630	XQERED-H0-0000-000000401
				R2	620	R2	625	XQERED-H0-0000-000000402
	M3	45.7	1.19	R2	620	R3	630	XQERED-H0-0000-000000301
				R2	620	R2	625	XQERED-H0-0000-000000302
	M2	39.8	1.04	R2	620	R3	630	XQERED-H0-0000-000000201
				R2	620	R2	625	XQERED-H0-0000-000000202

Notes

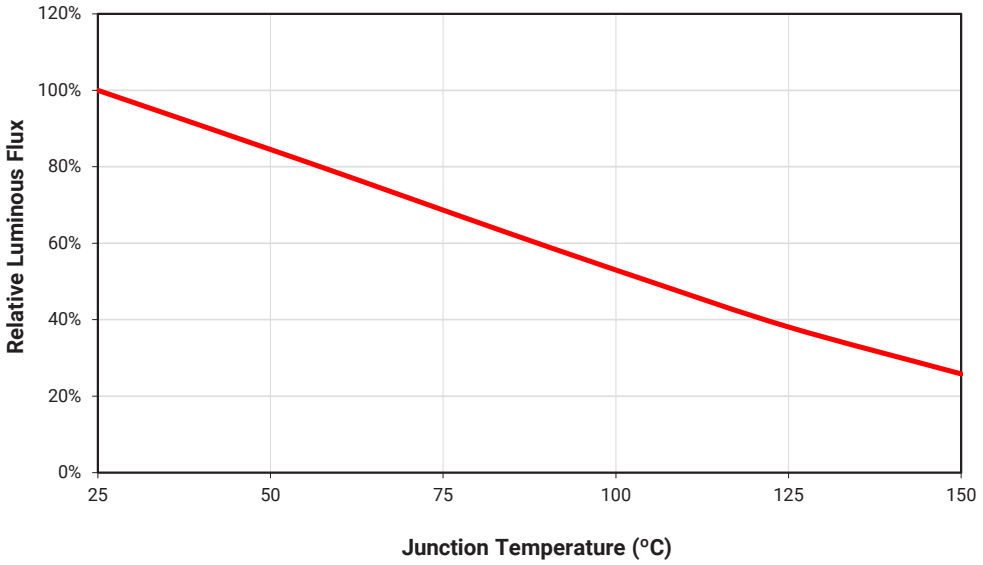
- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123 .
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

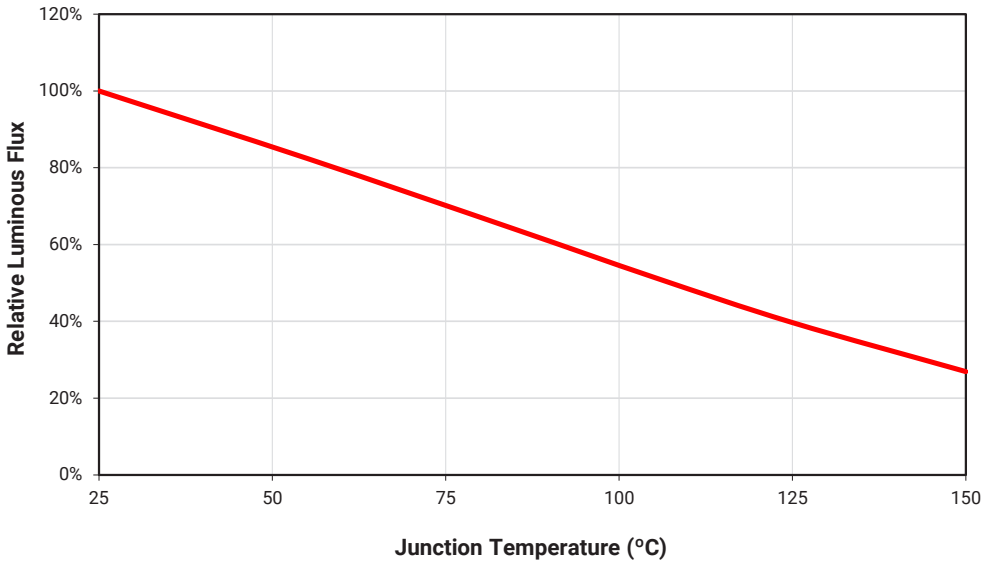
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RELATIVE FLUX VS. JUNCTION TEMPERATURE - RED (I_F = 350 mA)

High Density



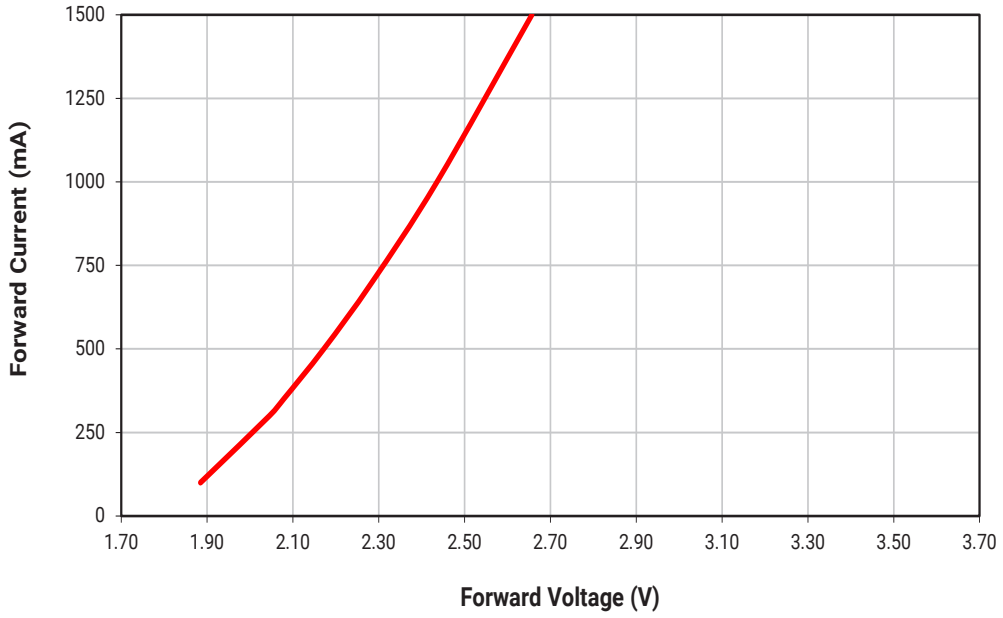
High Intensity



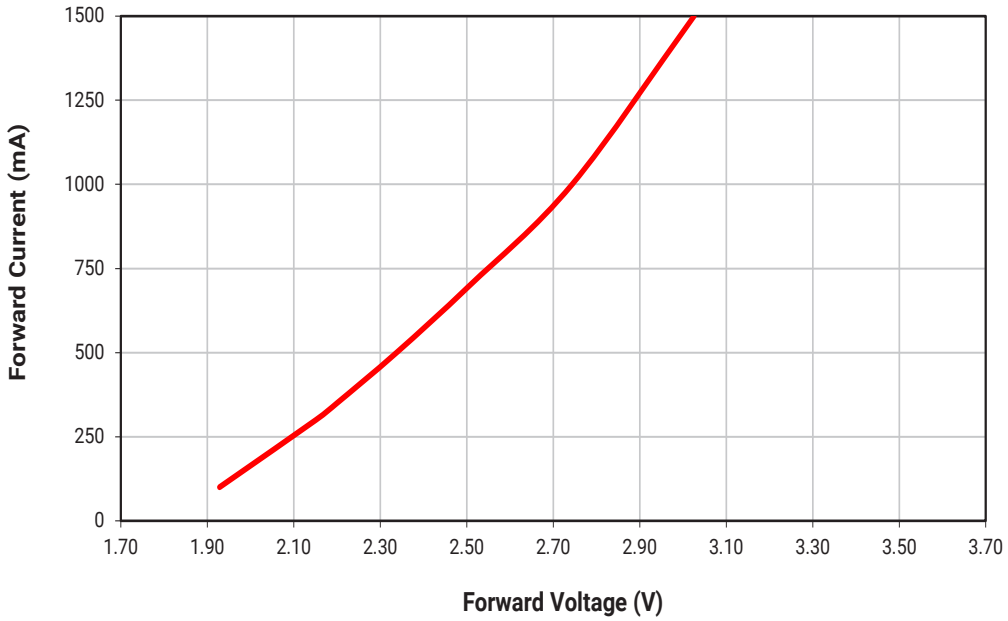
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ELECTRICAL CHARACTERISTICS - RED

High Density



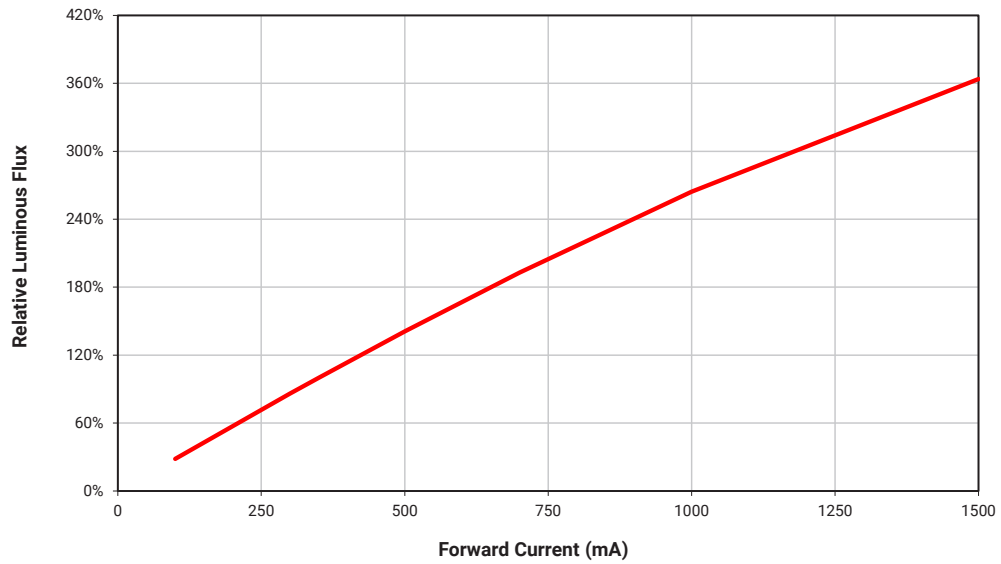
High Intensity



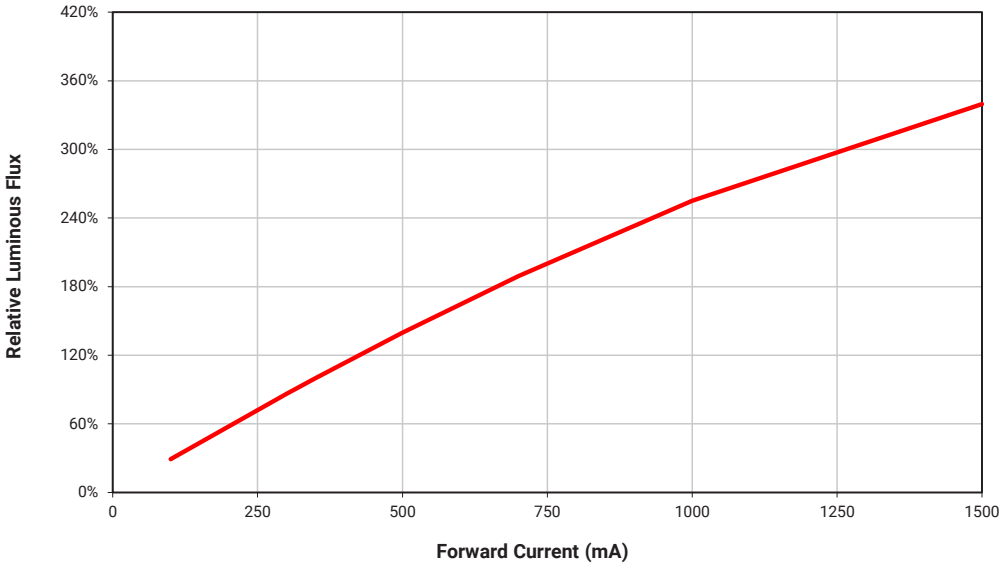
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RELATIVE FLUX VS. CURRENT - RED

High Density



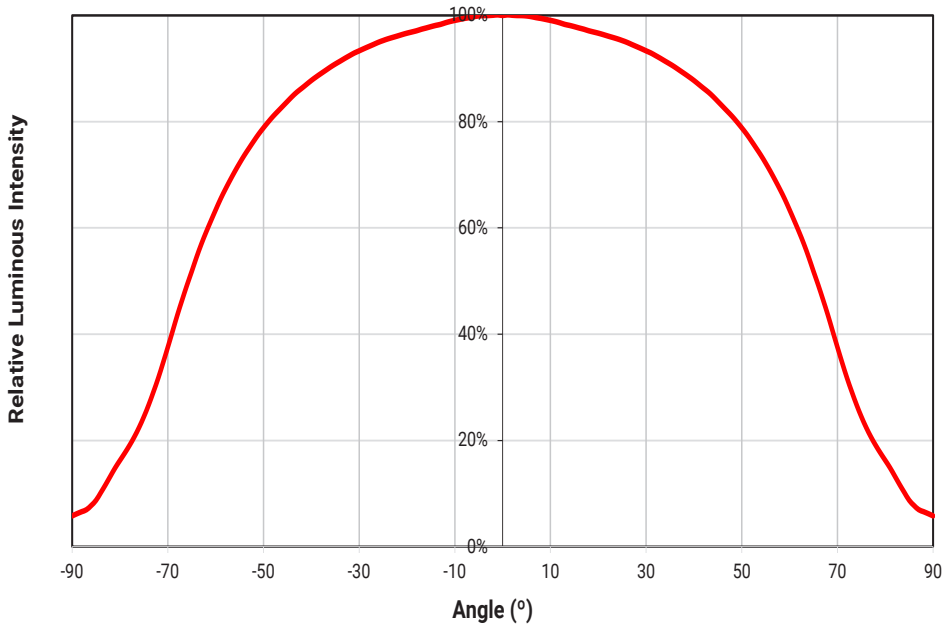
High Intensity



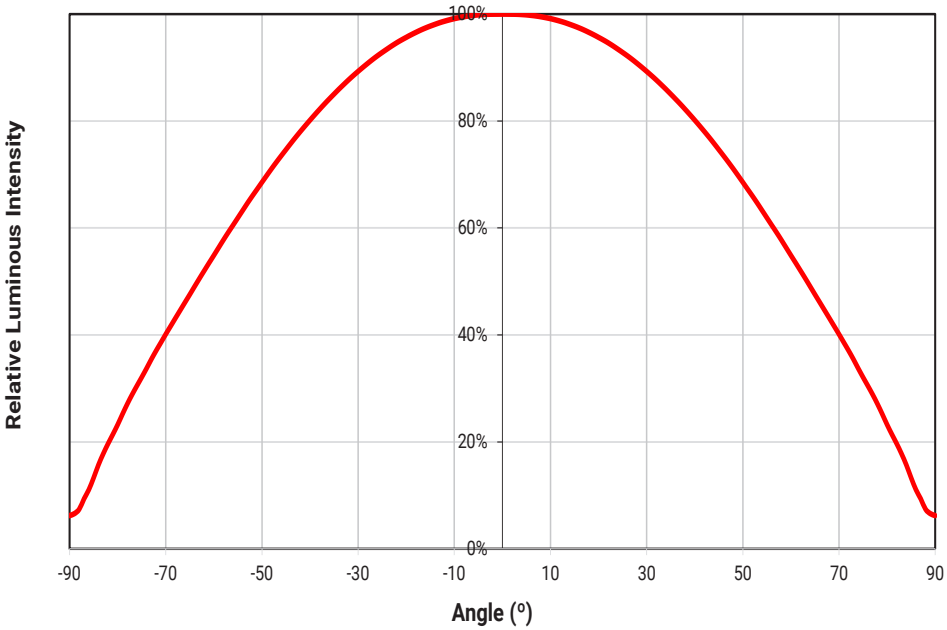
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TYPICAL SPATIAL DISTRIBUTION - RED

High Density



High Intensity

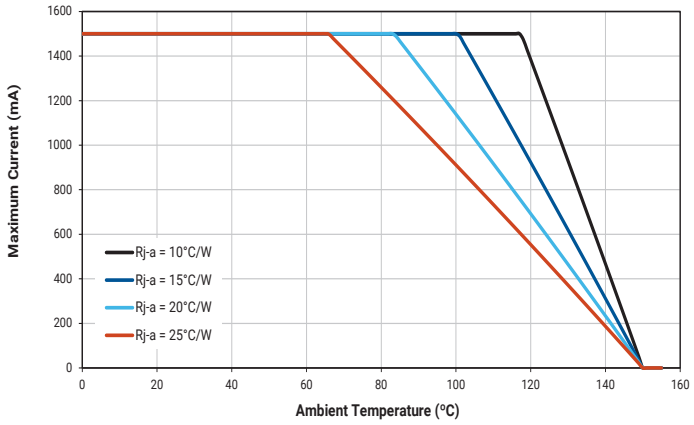


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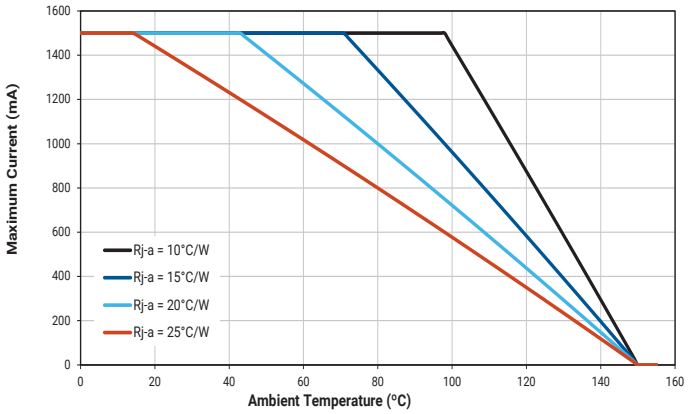
THERMAL DESIGN - RED

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



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XLAMP XQ-E LEDs - HE PHOTO RED

CHARACTERISTICS - HIGH DENSITY HE PHOTO RED

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		2	
Viewing angle (FWHM)	degrees		130	
Temperature coefficient of voltage	mV/°C		-1.6	
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		2.0	2.4
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.

ORDER CODES SUGGESTED FOR NEW DESIGNS - HIGH DENSITY HE PHOTO RED (T_J = 25 °C)

The following table provides order codes for XLamp XQ-E High Density HE photo-red LEDs. For a complete description of the order-code nomenclature, please consult the Bin and Order Code Formats section (page 109).

Color	Minimum Radiant Flux (mW)@ 350 mA		Calculated Minimum PPF (µmol/s)*	Peak Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	PWL (nm)	Group	PWL (nm)	
HE Photo Red	26	350	1.93	P2	650	P5	670	XQEEPR-00-0000-000000901
	27	375	2.06	P2	650	P5	670	XQEEPR-00-0000-000000A01
	28	400	2.20	P2	650	P5	670	XQEEPR-00-0000-000000B01

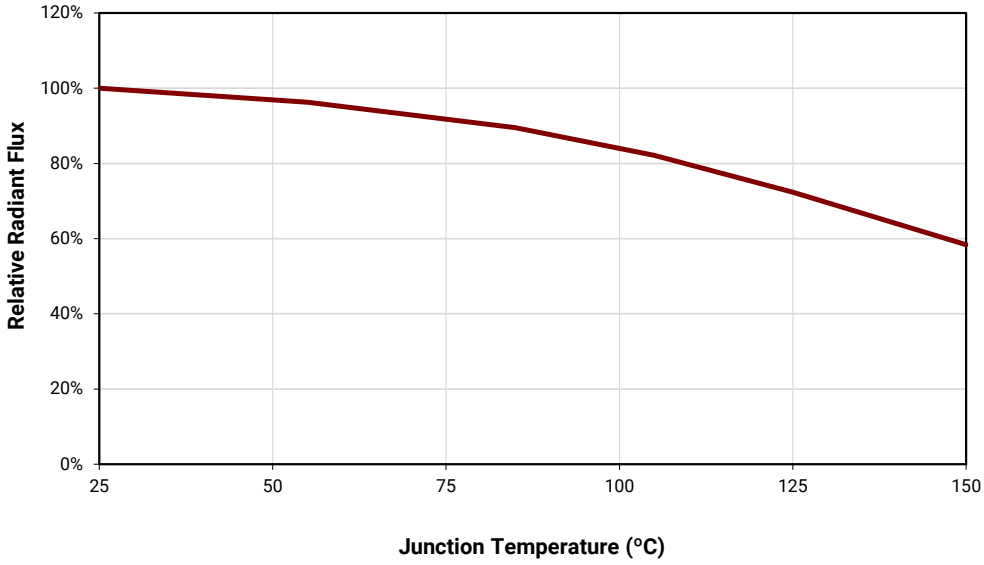
Note

- For additional order codes NOT recommended for new designs please see the Appendix section starting on page 123.
- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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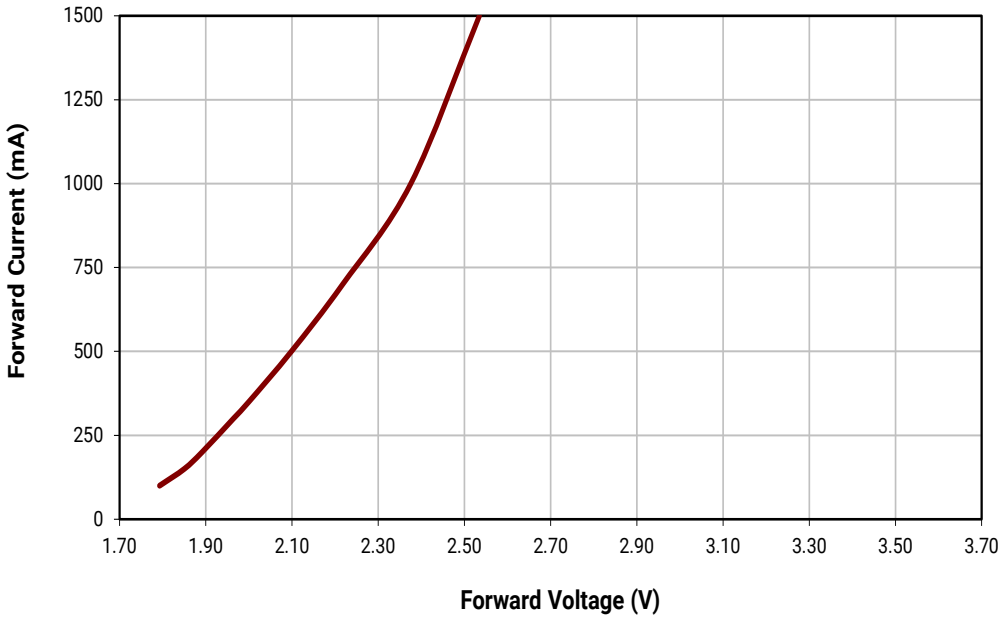
RELATIVE FLUX VS. JUNCTION TEMPERATURE - HE PHOTO RED (I_F = 350 mA)

High Density



ELECTRICAL CHARACTERISTICS - HE PHOTO RED

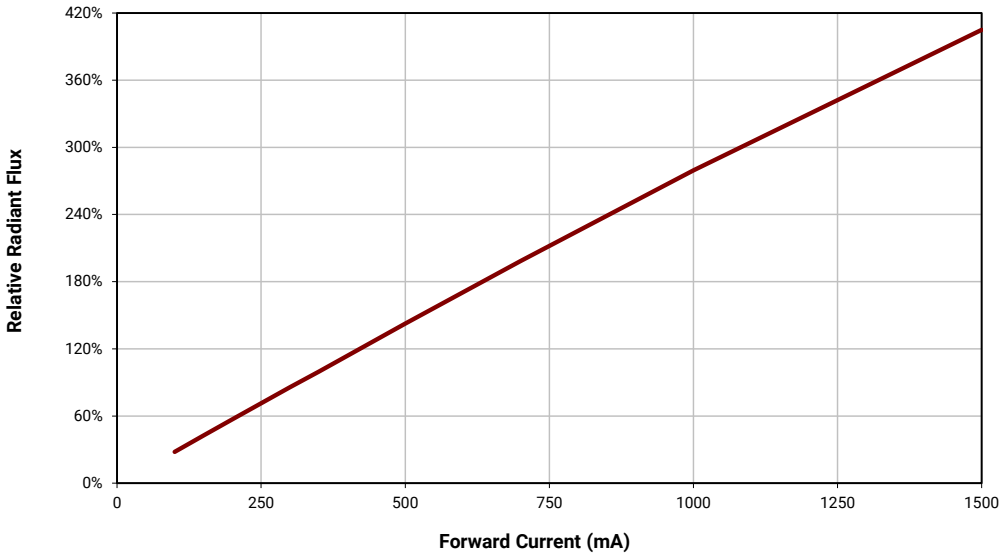
High Density



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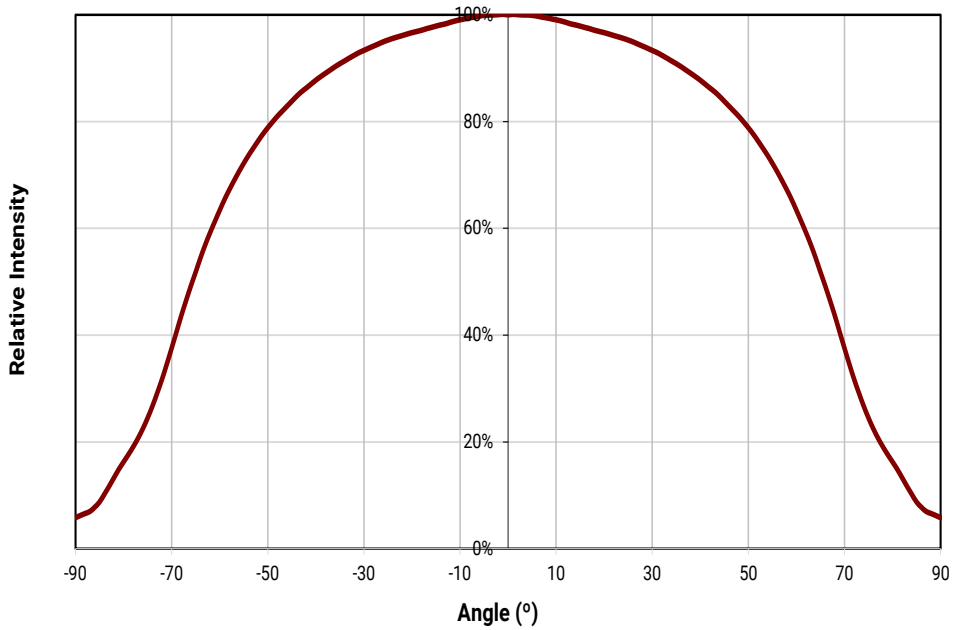
RELATIVE FLUX VS. CURRENT - HE PHOTO RED

High Density



TYPICAL SPATIAL DISTRIBUTION - HE PHOTO RED

High Density

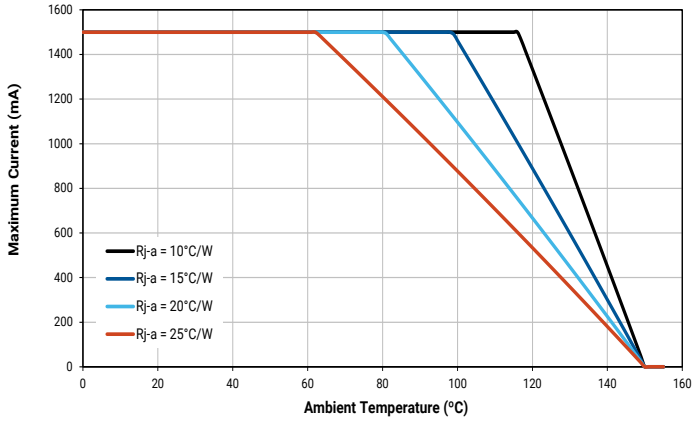


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THERMAL DESIGN - HE PHOTO RED

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.

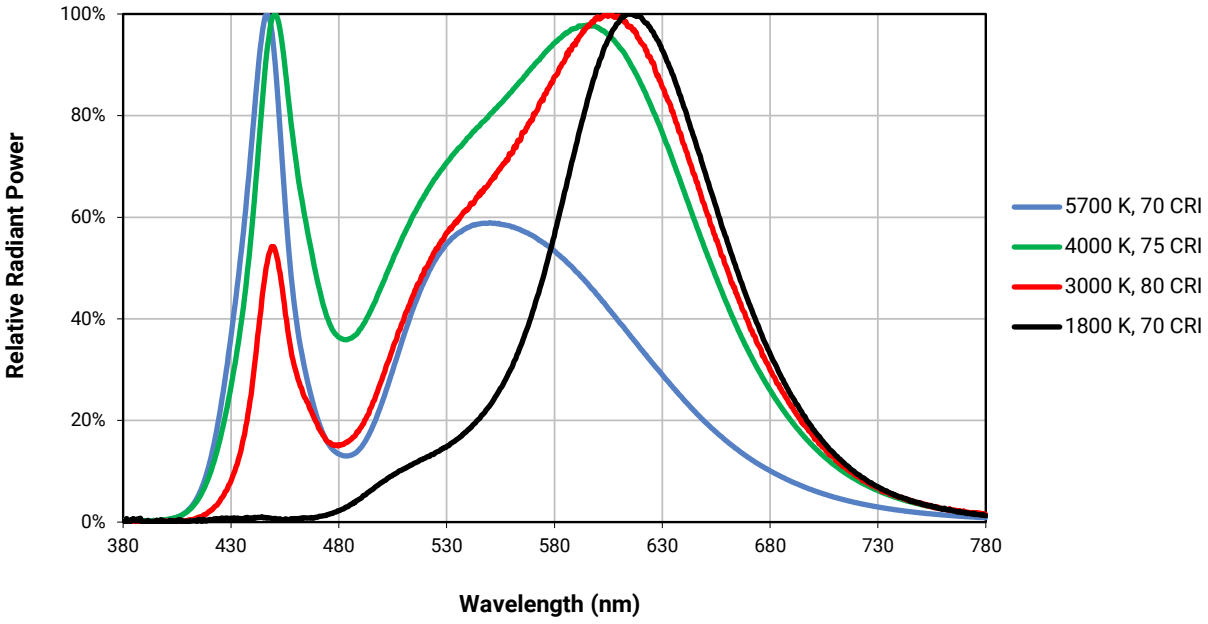
High Density



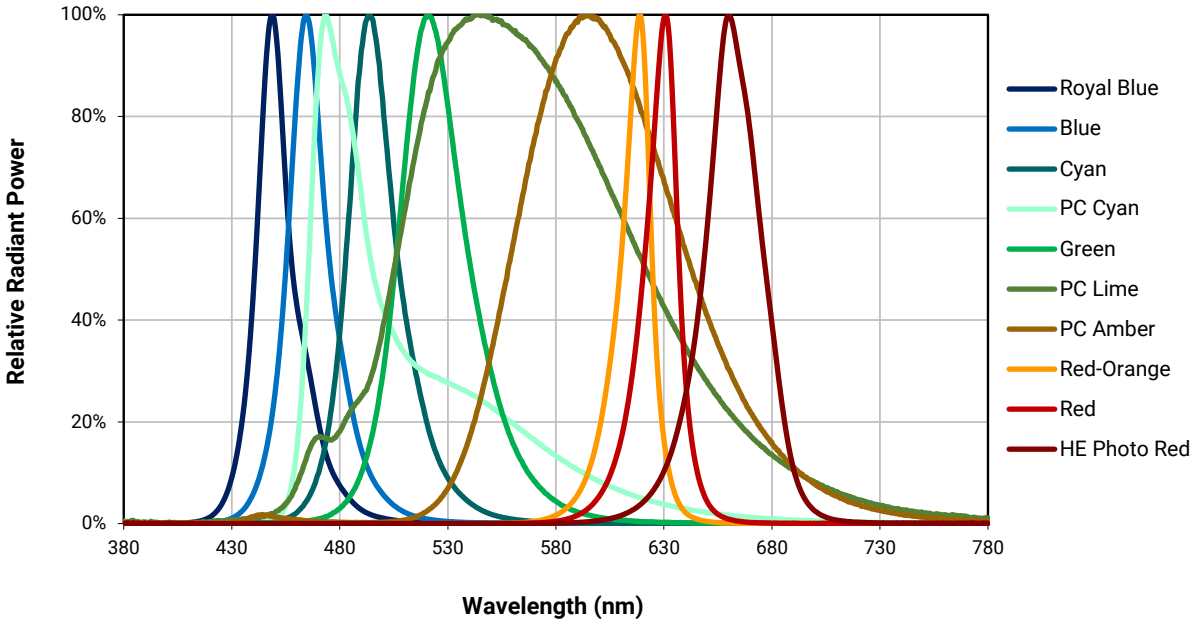
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RELATIVE SPECTRAL POWER DISTRIBUTION

High Density White



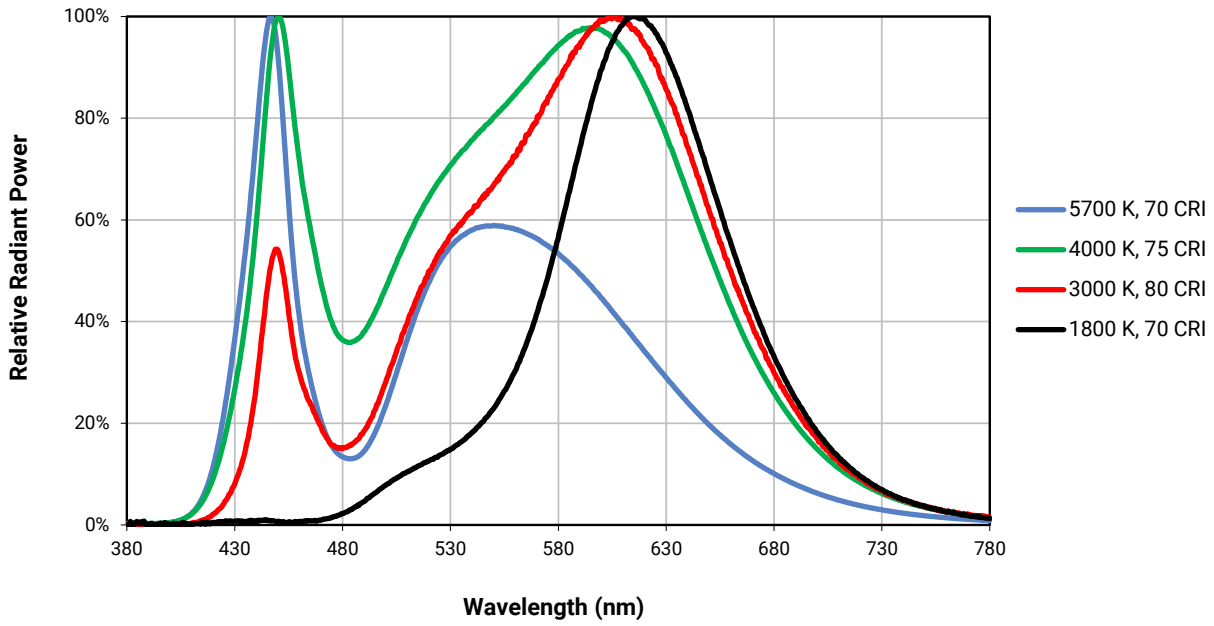
High Density Color



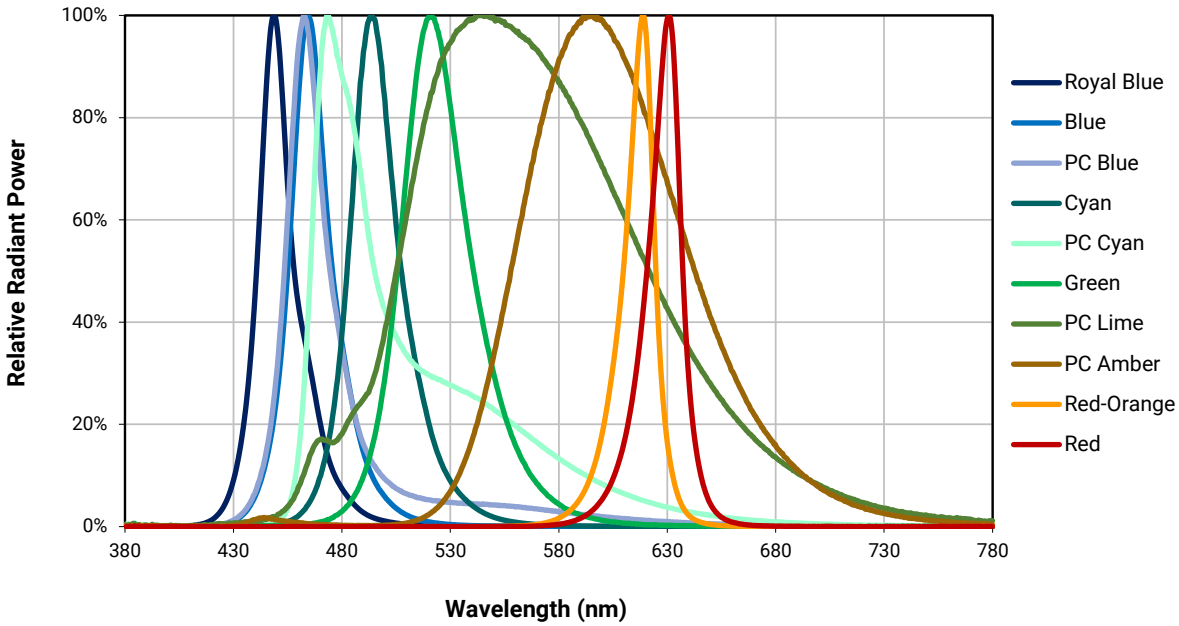
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RELATIVE SPECTRAL POWER DISTRIBUTION - CONTINUED

High Intensity White



High Intensity Color



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PERFORMANCE GROUPS – LUMINOUS FLUX

XLamp XQ-E 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)
F2	10.7	12.3
F3	12.3	13.9
G2	13.9	15.8
G3	15.8	18.1
H0	18.1	23.5
H2	18.1	20.6
H3	20.6	23.5
J2	23.5	26.8
J3	26.8	30.6
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
N4	62	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

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

XLamp XQ-E royal blue and HE 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
26	350	375
27	375	400
28	400	425
29	425	450
30	450	475
31	475	500
32	500	525
33	525	550
34	550	575
35	575	600
36	600	625
37	625	650
38	650	675

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PERFORMANCE GROUPS – DOMINANT WAVELENGTH

XLamp XQ family 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
Cyan	C2	490	495
	C3	495	500
	C4	500	505
	C5	505	510
Green	G2	520	525
	G3	525	530
	G4	530	535
Red-Orange	O3	610	615
	O4	615	620
Red	R2	620	625
	R3	625	630

PERFORMANCE GROUPS – PEAK WAVELENGTH

XLamp XQ-E HE photo red 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
HE Photo Red	P2	650	655
	P3	655	660
	P4	660	665
	P5	665	670

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PERFORMANCE GROUPS – FORWARD VOLTAGE

XLamp XQ-E red-orange, red and HE photo red LEDs are tested for forward voltage and sorted into one of the forward voltage bins defined below.

Forward Voltage Group	Minimum Forward Voltage @ 350 mA	Maximum Forward Voltage @ 350 mA
B	1.75	2.0
C	2.0	2.25
D	2.25	2.5
E	2.5	2.6

PERFORMANCE GROUPS – CHROMATICITY

XLamp XQ Family 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
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

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PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

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

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PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

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

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PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

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

XLamp XQ-E 1800 K White LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

EasyWhite Color Temperatures – 5-Step Ellipse						
Bin Code	CCT	Center Point		Major Axis	Minor Axis	Rotation Angle (°)
		x	y	a	b	
BE	1800 K	0.5492	0.4082	0.01546	0.00683	50.0

XLamp XQ-E High Intensity PC blue LEDs are placed into the regions defined by the following bounding coordinates.

Region	x	y	Region	x	y
N4B	0.1379	0.0915	N5B	0.1312	0.1106
	0.1562	0.1142		0.1527	0.1343
	0.1598	0.0922		0.1562	0.1142
	0.1447	0.0712		0.1379	0.0915

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

Region	x	y
PC0	0.2348	0.4478
	0.2574	0.4320
	0.2270	0.3533
	0.1983	0.3646

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PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

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

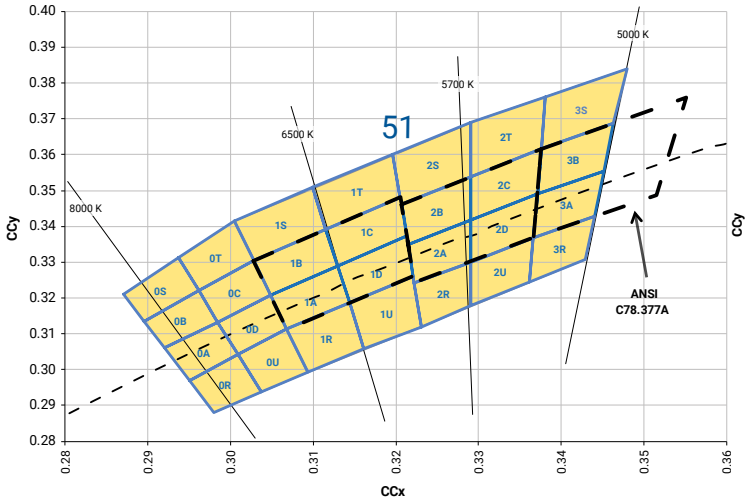
Region	x	y
PL3	0.3972	0.4986
	0.3832	0.5082
	0.4004	0.5420
	0.4143	0.5309
PL4	0.4004	0.5420
	0.4143	0.5309
	0.4327	0.5655
	0.4191	0.5790

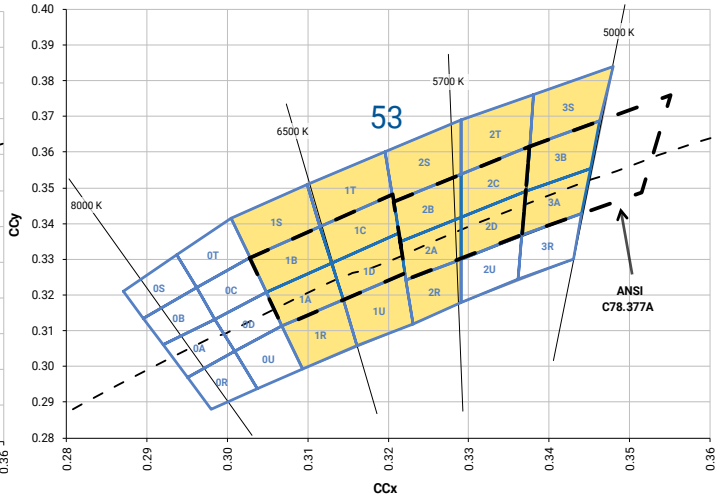
XLamp XQ-E PC amber LEDs are placed into the region defined by the following bounding coordinates.

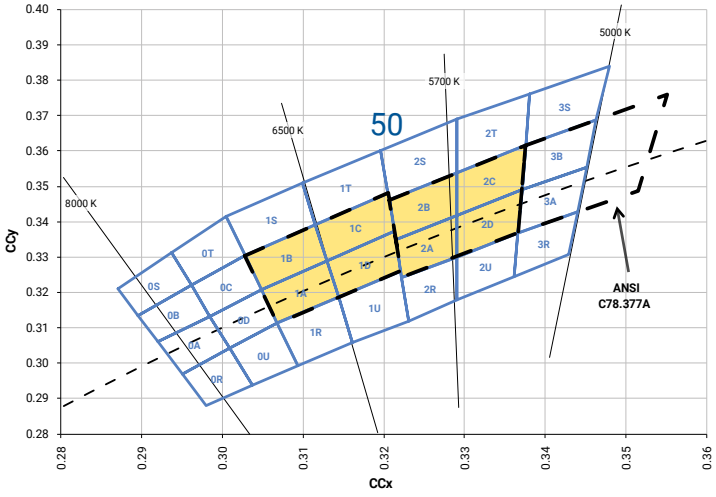
Region	x	y
Y2	0.5469	0.4249
	0.5700	0.4100
	0.5900	0.4100
	0.5610	0.4390

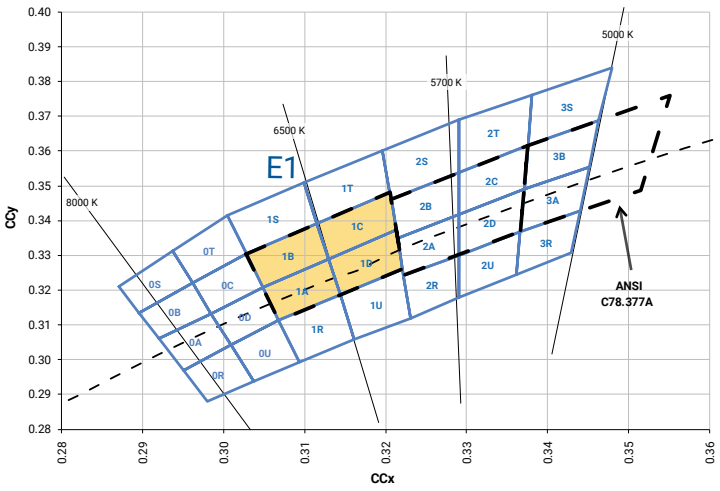
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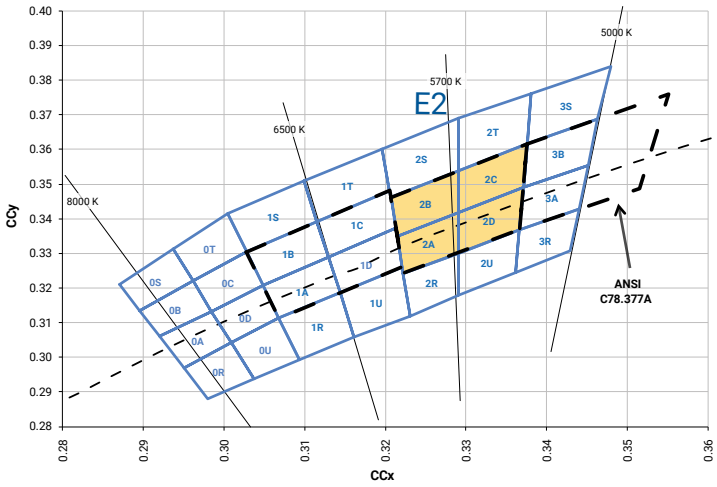
STANDARD COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS





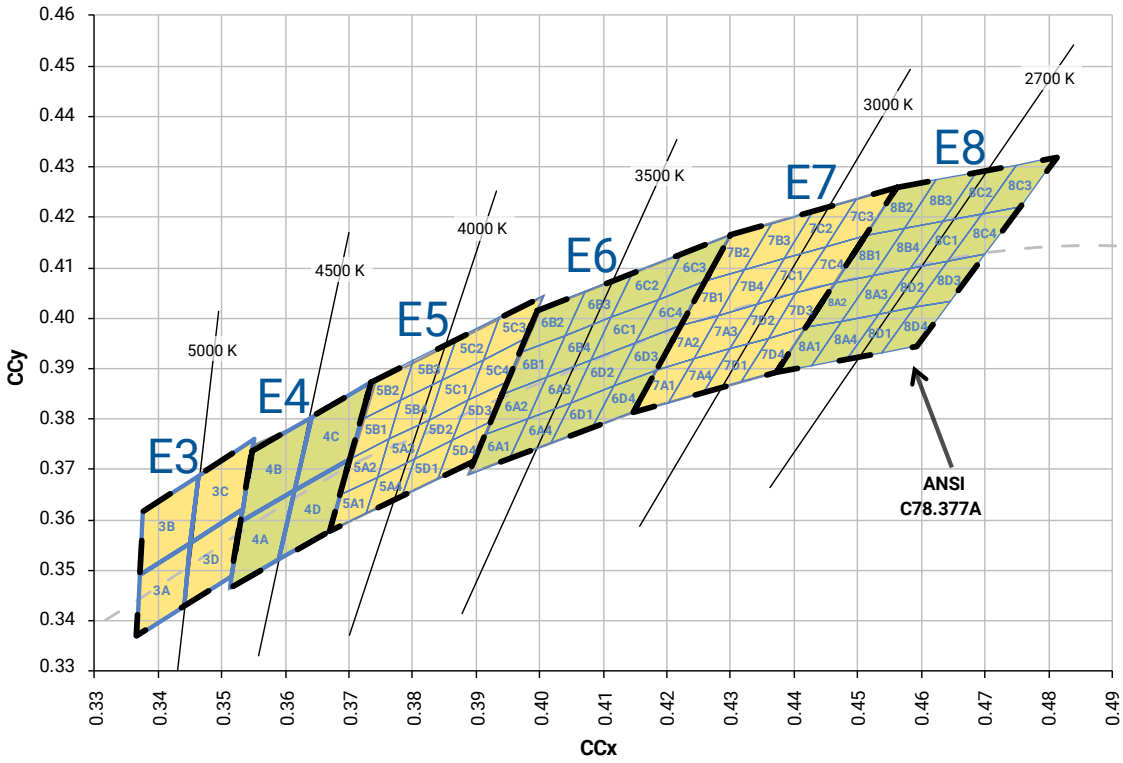


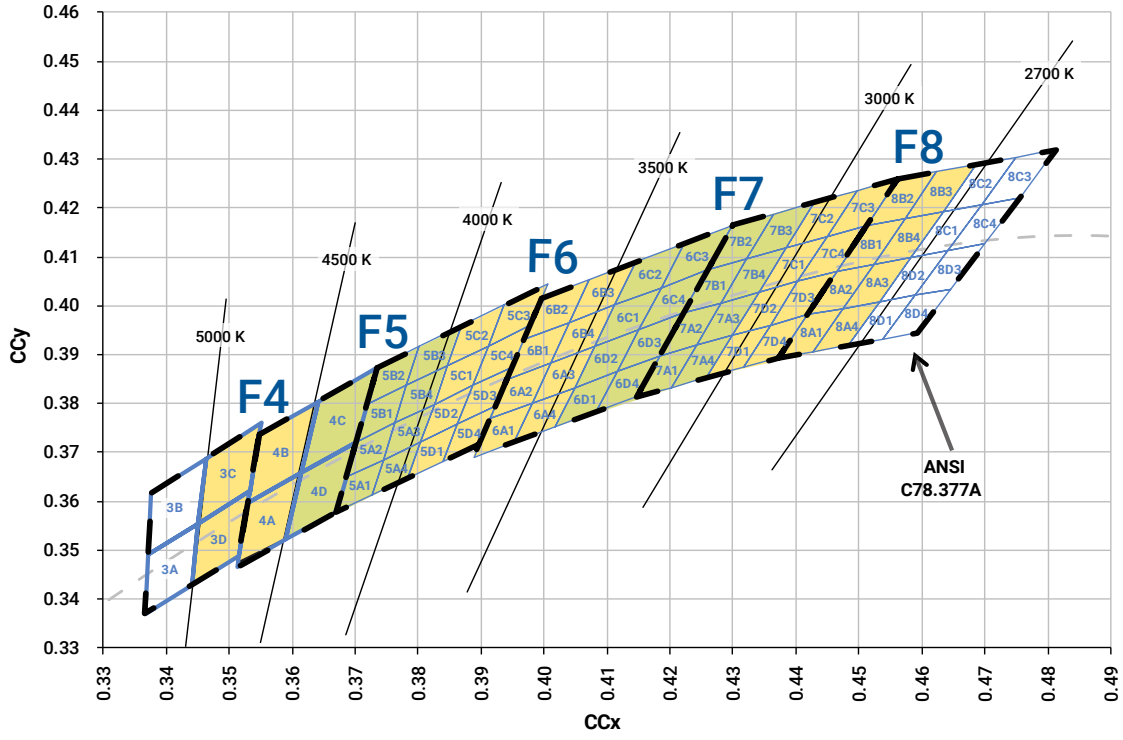




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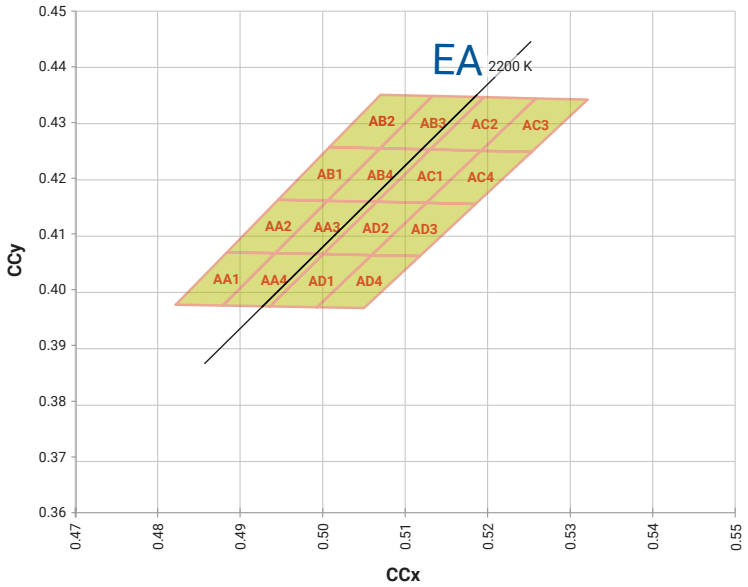
STANDARD WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS





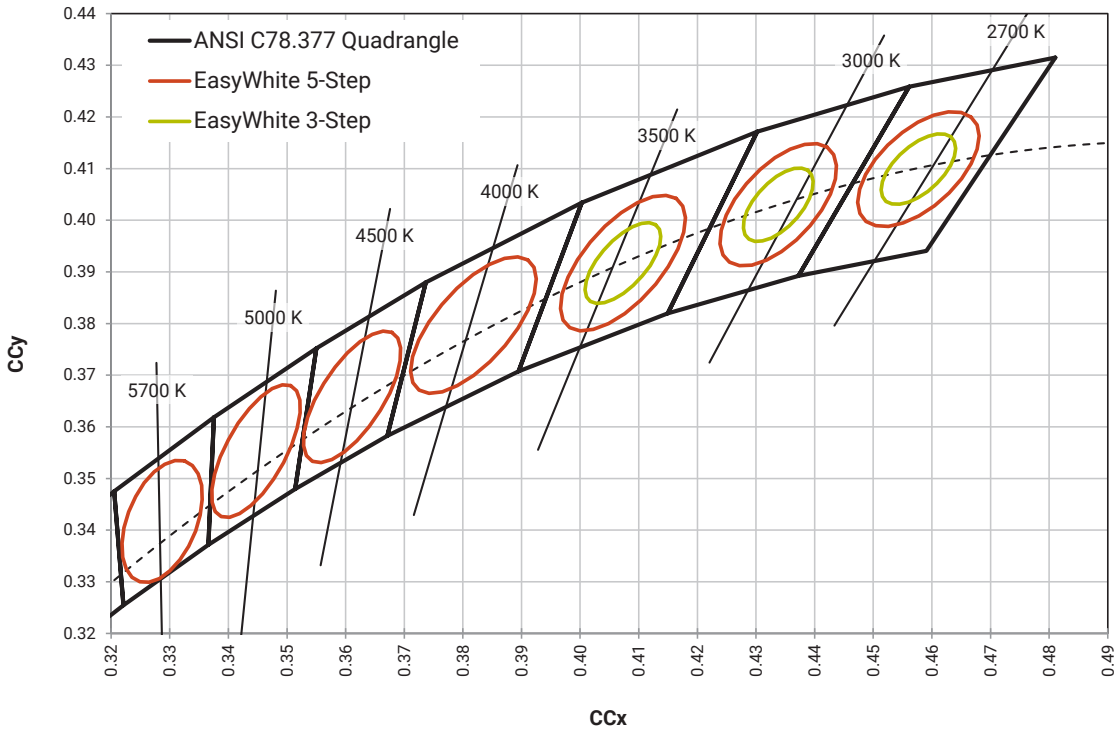
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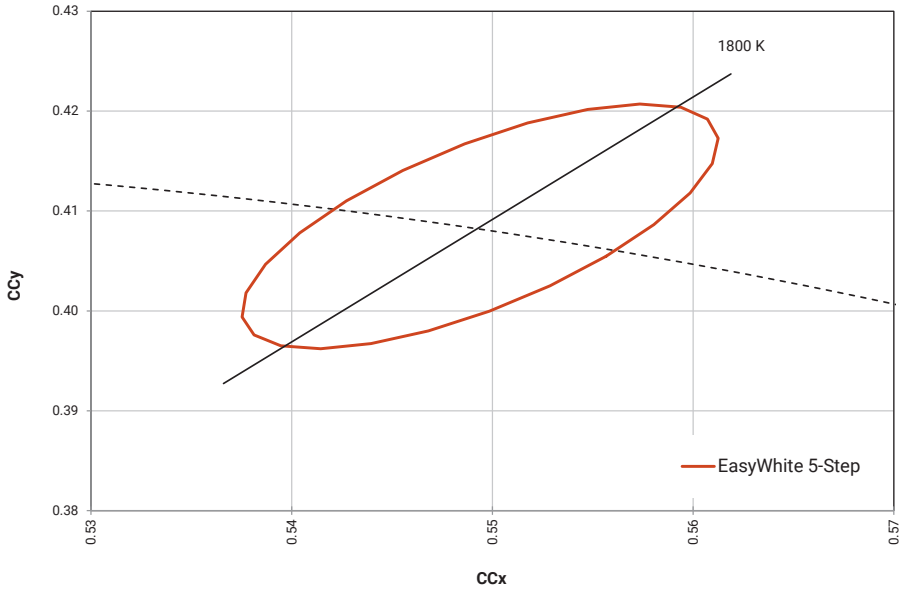
STANDARD WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS - CONTINUED



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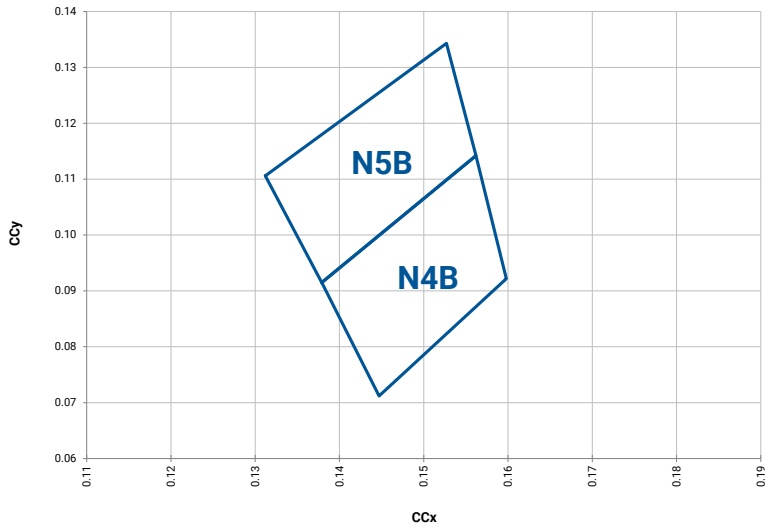
EASYWHITE® WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



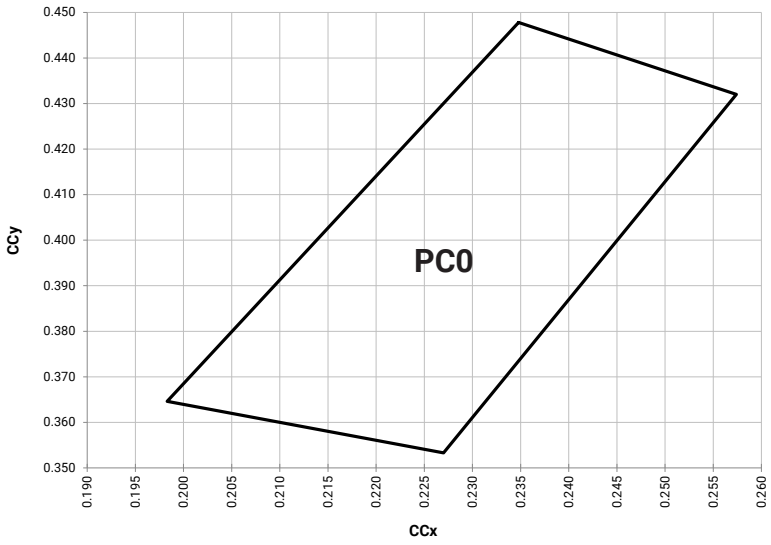


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PC BLUE KITS PLOTTED ON THE 1931 CIE CURVE

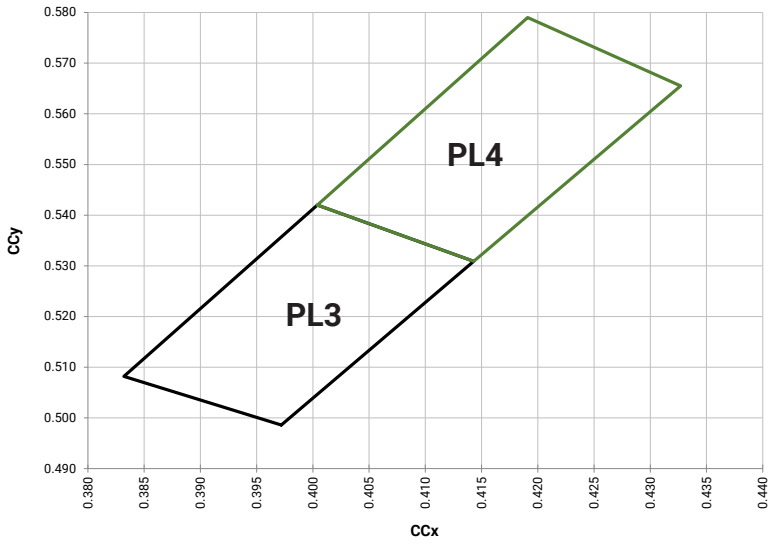


PC CYAN KIT PLOTTED ON THE 1931 CIE CURVE

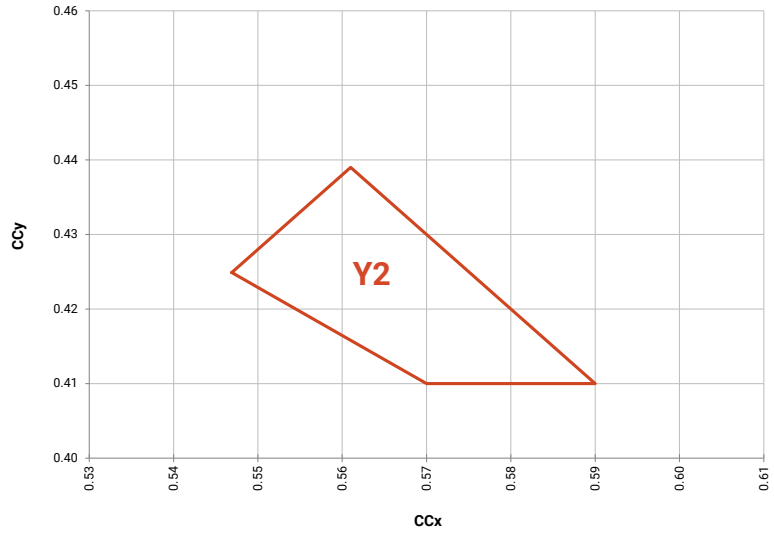


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PC LIME KITS PLOTTED ON THE 1931 CIE CURVE



PC AMBER KIT PLOTTED ON THE 1931 CIE CURVE



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STANDARD CHROMATICITY KITS

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

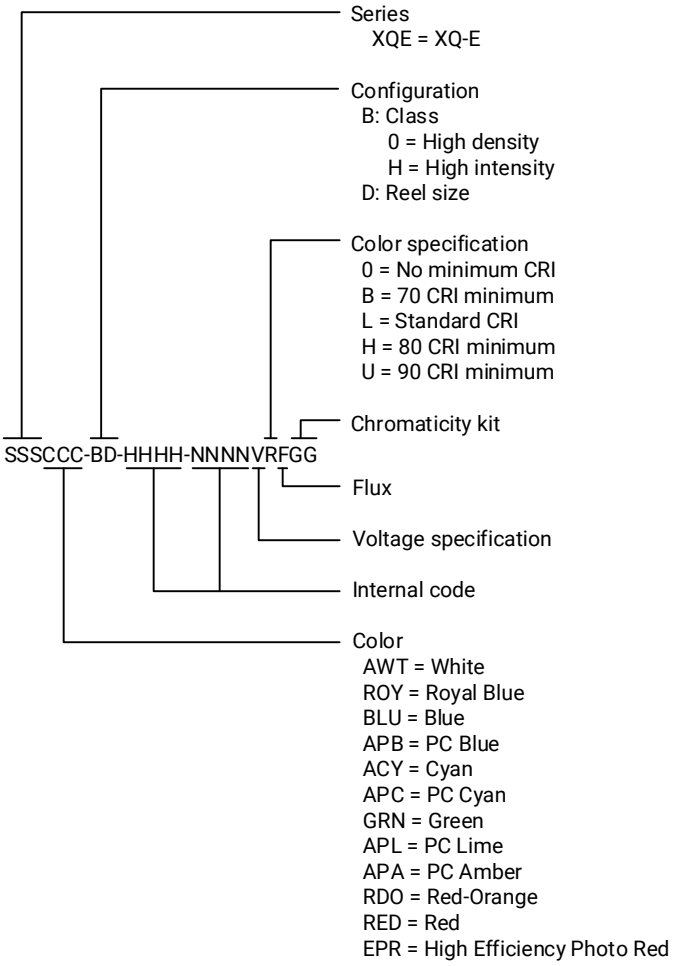
Color	CCT	Kit	Chromaticity Bins
Cool White	6200 K	51	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U, 3A, 3B, 3R, 3S
	6000 K	53	1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 3A, 3B, 3S
	6200 K	50	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D
	6500 K	E1	1A, 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
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
	2200 K	EA	AA1, AA2, AA3, AA4, AB1, AB2, AB3, AB4, AC1, AC2, AC3, AC4, AD1, AD2, AD3, AD4

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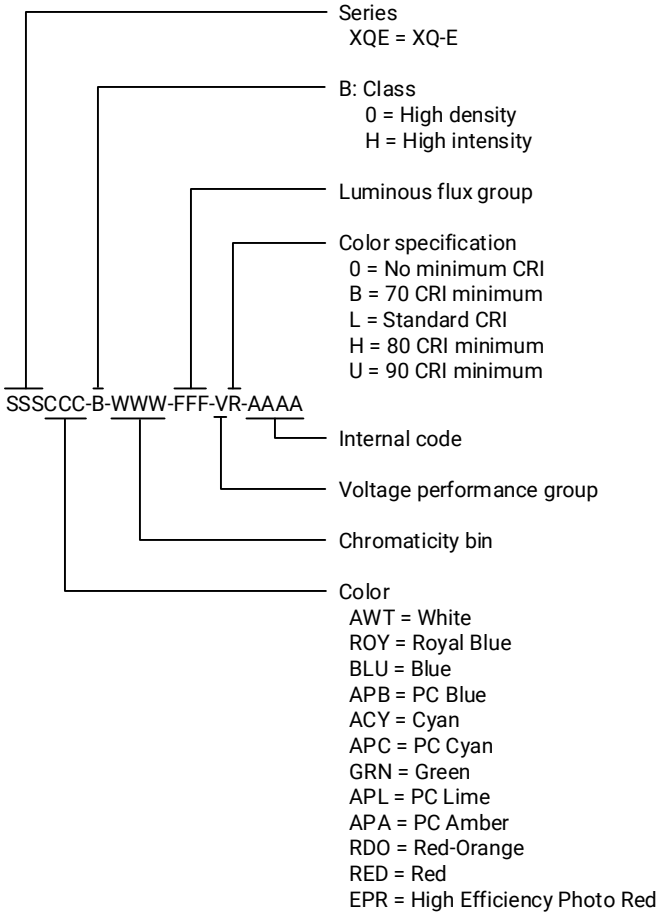
BIN AND ORDER CODE FORMATS

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

Order Code



Bin Code

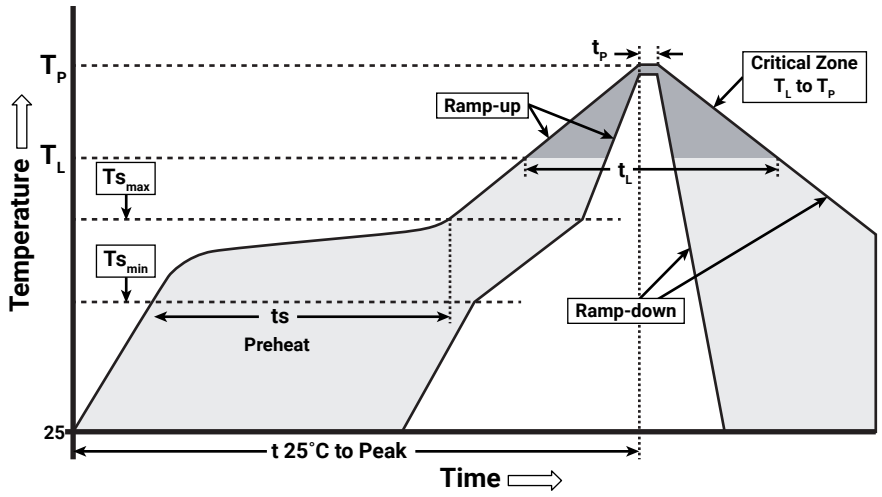


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REFLOW SOLDERING CHARACTERISTICS

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

RoHS Compliance

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

REACH Compliance

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

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NOTES - CONTINUED

UL® Recognized Component

This product meets the requirements to be considered a UL Recognized Component with Level 1 enclosure consideration. The LED package or a portion thereof has not been investigated as a fire enclosure or a fire and electrical enclosure per ANSI/UL 8750.

Vision Advisory

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

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MECHANICAL DIMENSIONS

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

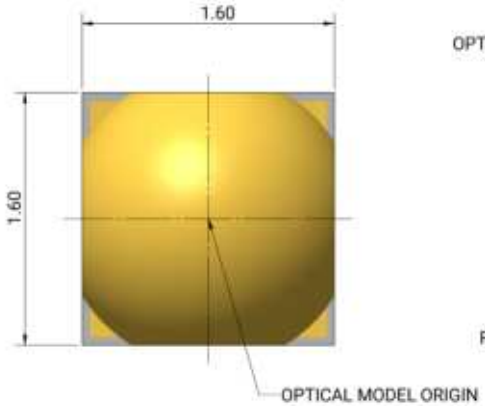
All dimensions in mm.

Measurement tolerances unless indicated otherwise: ±.13 mm

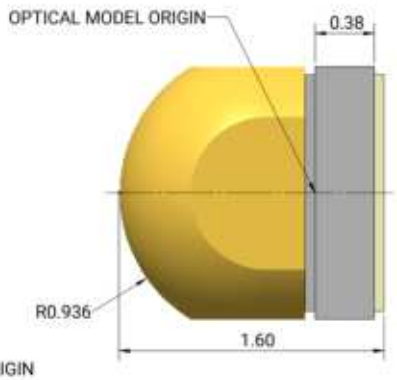
High Density White (except 1800 K white) and Colors (except PC Cyan, PC Lime, PC Amber)

XQExxx-**0**x-xxxx-xxxxxxxxx

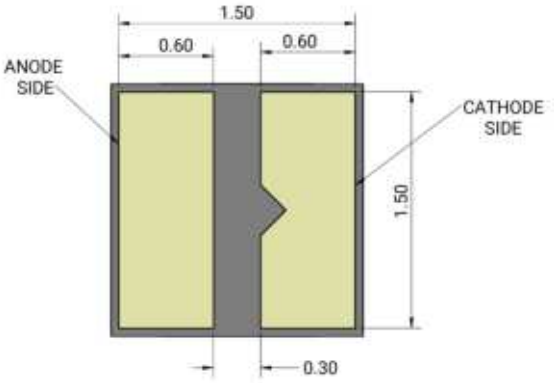
XQ-E High Density



Top View



Side View

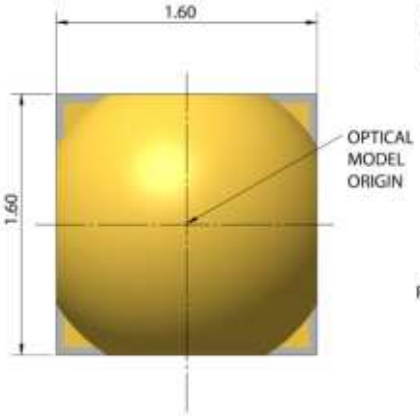


Bottom View

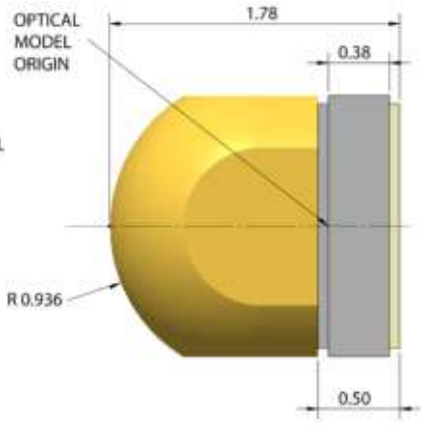
High Density PC Cyan, PC Lime

XQExxx-**0**x-xxxx-xxxxxxxxx

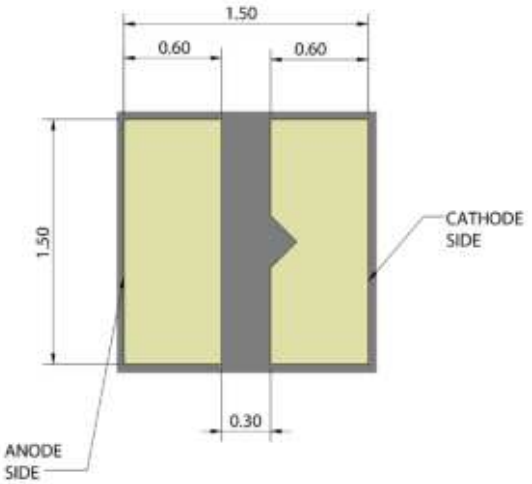
XQ-E High Density



Top View



Side View



Bottom View

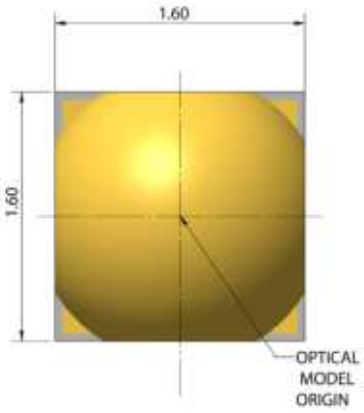
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MECHANICAL DIMENSIONS - CONTINUED

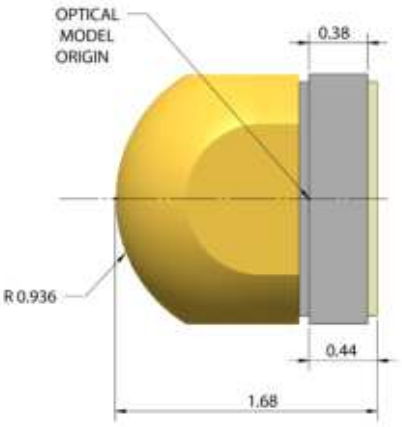
High Density 1800 K White, PC Amber

XQExxx-**0**x-xxxx-xxxxxxxxx

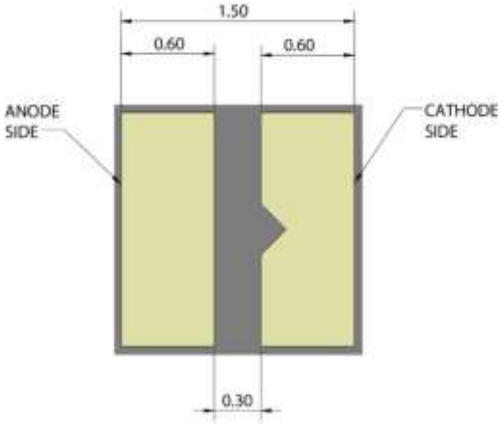
XQ-E High Density



Top View



Side View



Bottom View

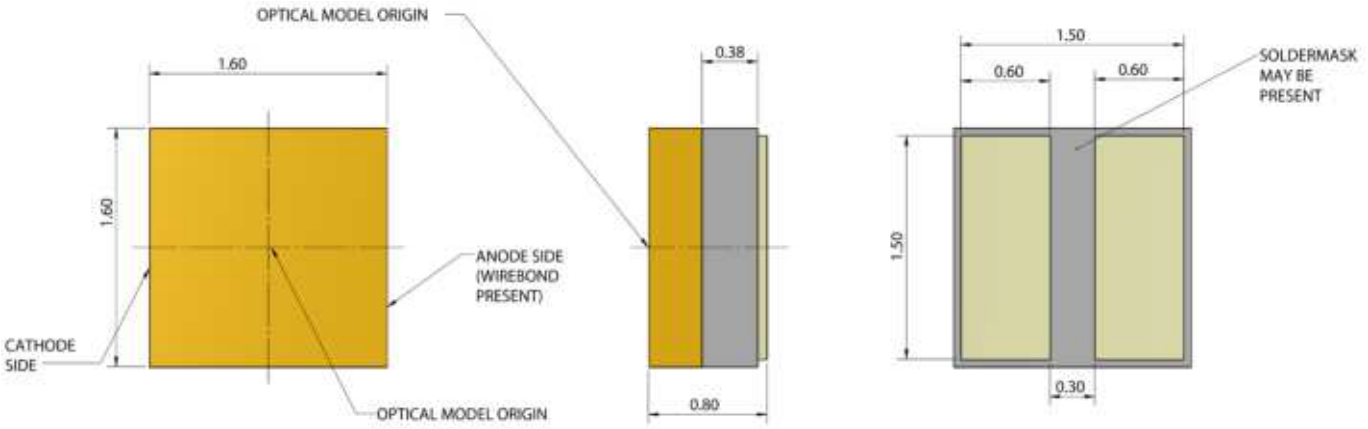
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MECHANICAL DIMENSIONS - CONTINUED

High Intensity White (except 1800 K White) and Colors (except PC Cyan, PC Lime, PC Amber)

XQExxx-**H**x-xxxx-xxxxxxxxx

XQ-E High Intensity

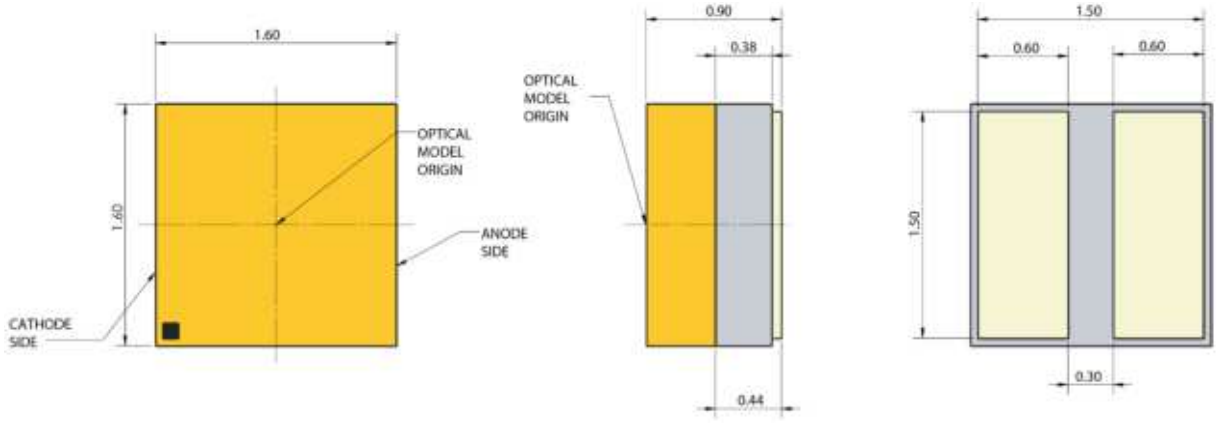


Top View **Side View** **Bottom View**

High Intensity 1800 K White, PC Cyan, PC Lime, PC Amber

XQExxx-**H**x-xxxx-xxxxxxxxx

XQ-E High Intensity

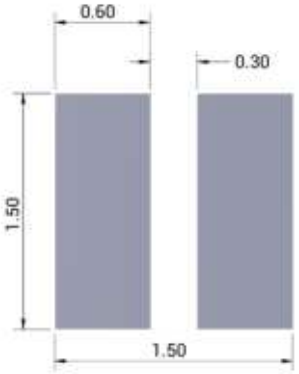


Top View **Side View** **Bottom View**

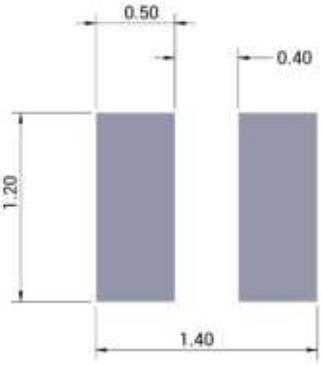
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MECHANICAL DIMENSIONS - CONTINUED

High Density & High Intensity



Recommended Solder Pad



Recommended Stencil Opening

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TAPE AND REEL

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

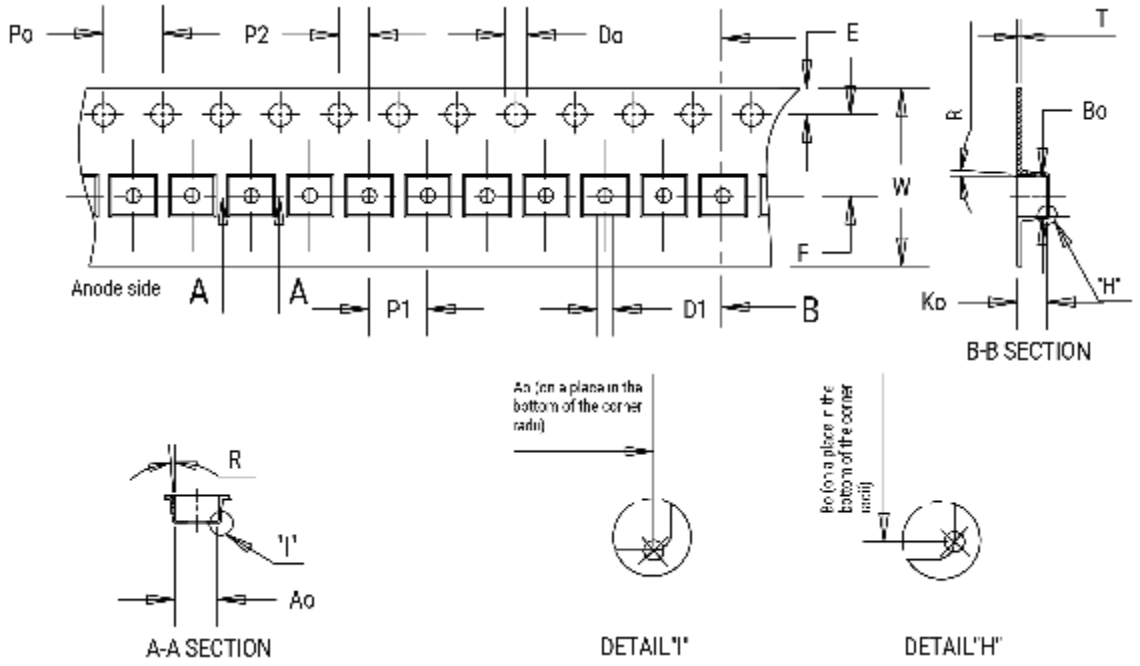
Except as noted, all dimensions in mm.

Measurement tolerances unless indicated otherwise: .xx = ±.15 mm

High Density White (except 1800 K White) and Colors (except PC Cyan, PC Lime, PC Amber)

XQExxx-**0**x-xxxx-xxxxxxxxx

↑ XQ-E 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°

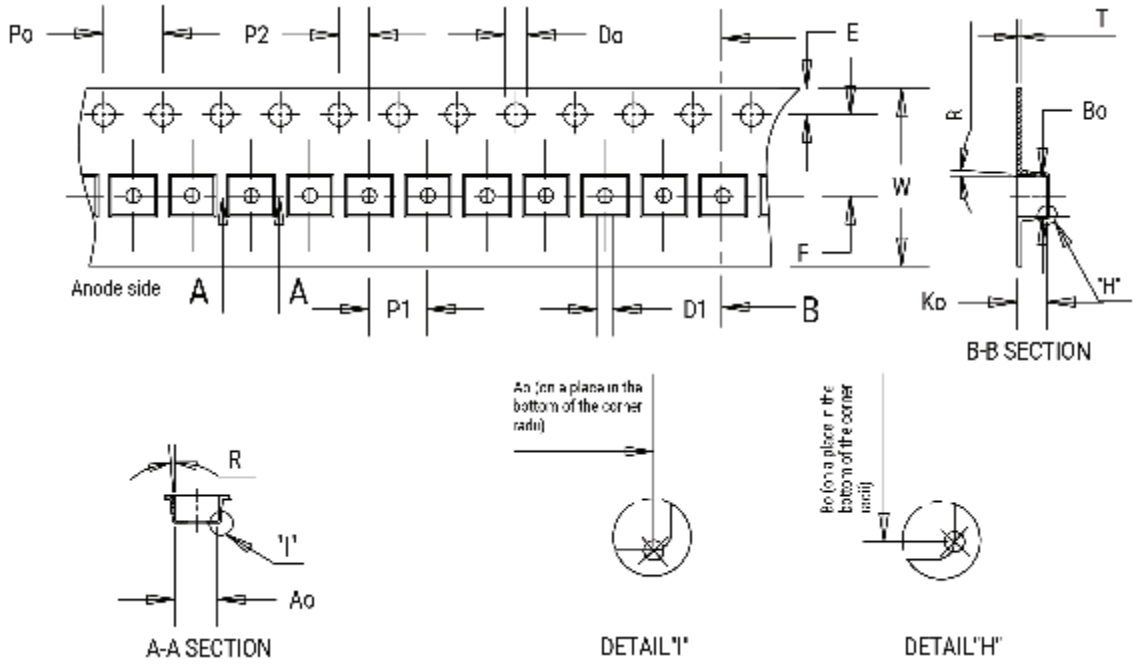
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TAPE AND REEL - CONTINUED

High Density 1800 K White, PC Cyan, PC Lime, PC Amber

XQExxx-**0**x-xxxx-xxxxxxxxx

└ XQ-E 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°

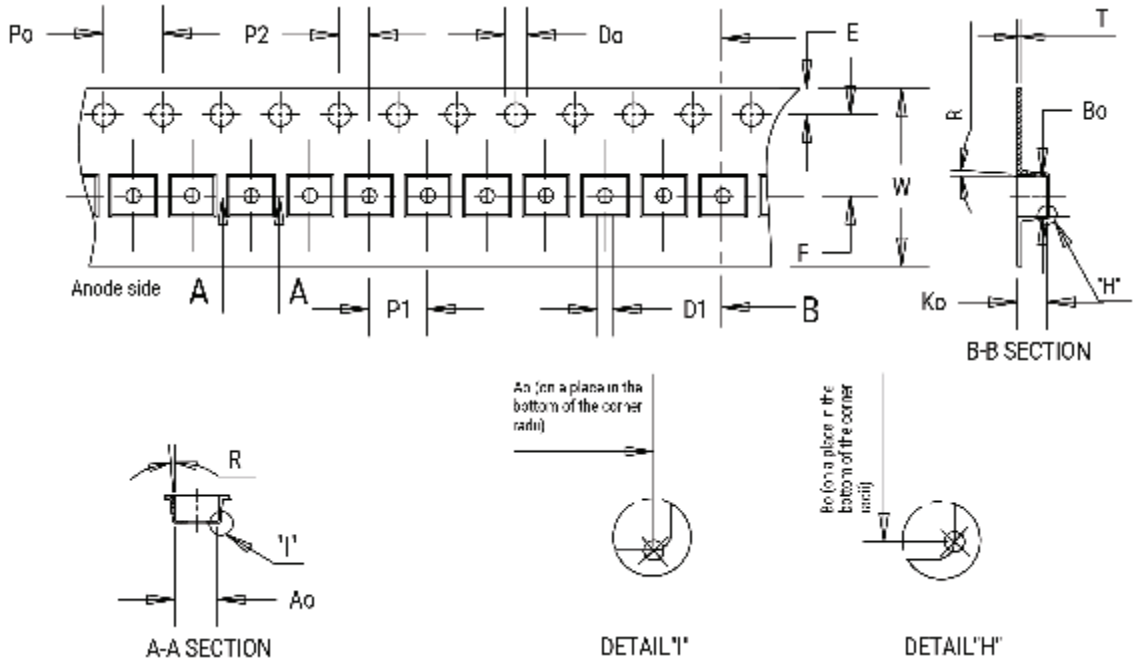
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TAPE AND REEL - CONTINUED

High Intensity

XQExxx-**H**x-xxxx-xxxxxxxxx

XQ-E High Intensity

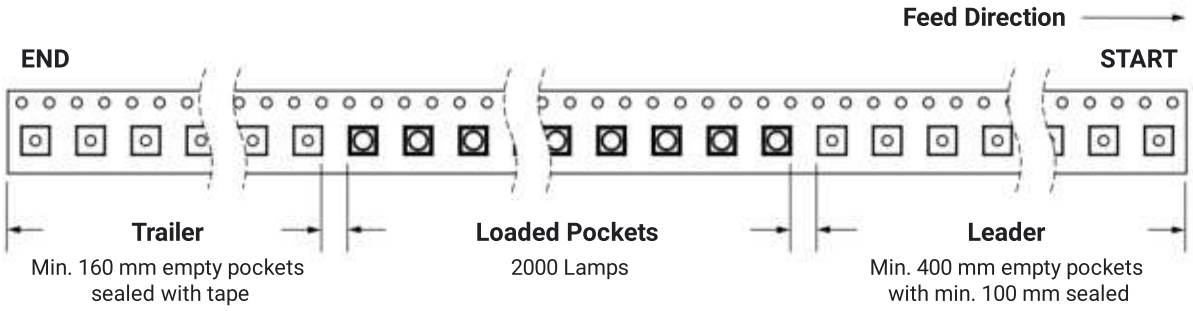


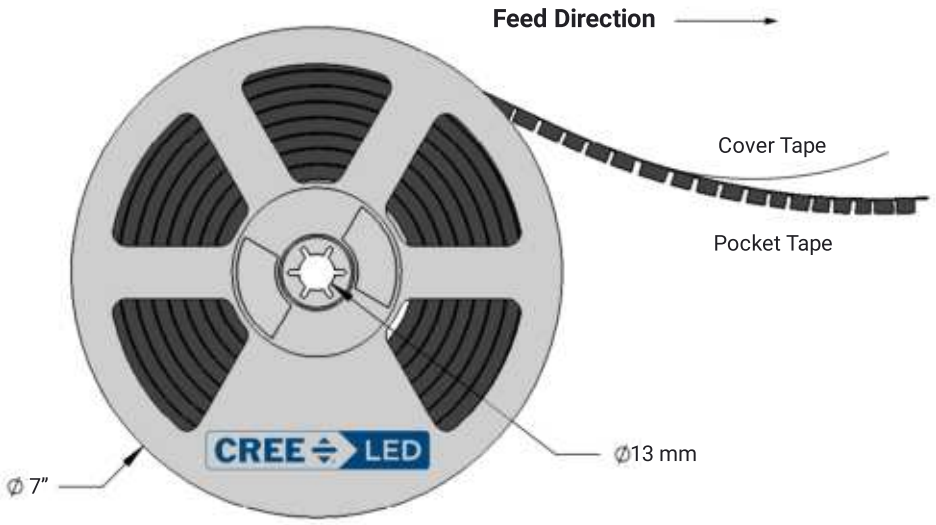
Item	Ao	Bo	Ko	Po	P1	P2	T	E	F	Do	D1	W	R
Dim.	1.85	1.85	1.20	4.00	4.00	2.00	0.30	1.75	3.50	1.50	1.00	8.00	3°

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TAPE AND REEL - CONTINUED

High Density

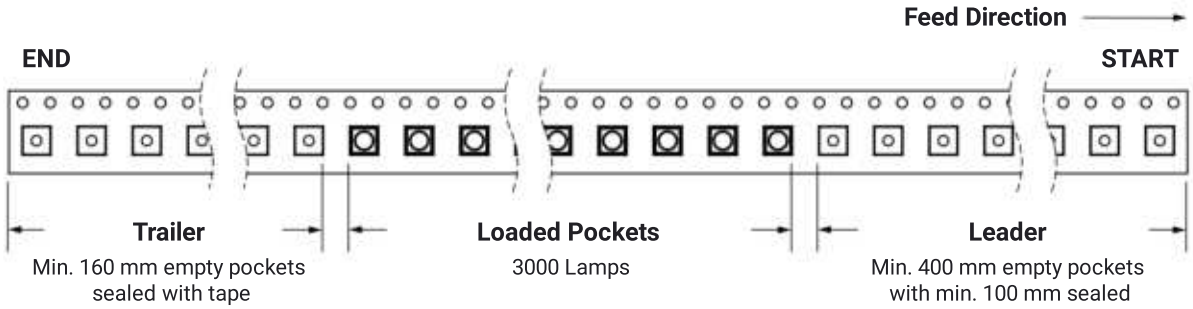


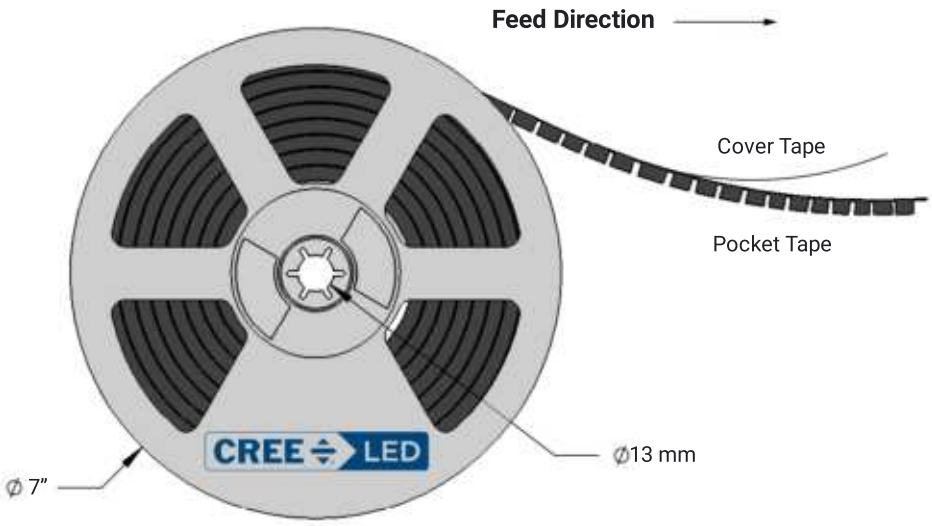


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TAPE AND REEL - CONTINUED

High Intensity



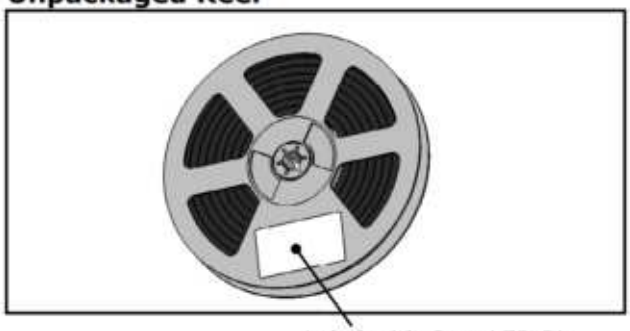


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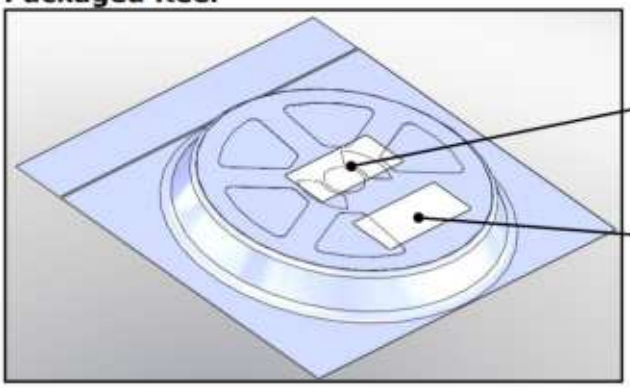
PACKAGING

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

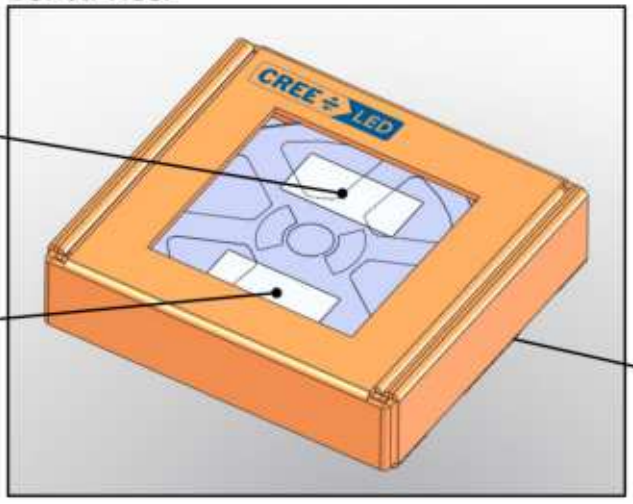
Unpackaged Reel



Packaged Reel



Boxed Reel



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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 3 - page 7 for order codes of XLamp XQ-E High Density white LEDs that could serve as alternatives for the order codes set forth below.

XQ-E High Density ANSI Cool White, T_J = 85 °C

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes	
Kit	CCT	Code	Flux (lm)	No Minimum CRI	70 CRI Minimum
ANSI Cool White (5000 K – 8300 K)					
51	6200 K	Q5	107	XQEAWT-00-0000-00000LD51	XQEAWT-00-0000-00000BD51
53	6000 K	Q5	107	XQEAWT-00-0000-00000LD53	XQEAWT-00-0000-00000BD53
50	6200 K	Q5	107	XQEAWT-00-0000-00000LD50	XQEAWT-00-0000-00000BD50
E1	6500 K	Q5	107	XQEAWT-00-0000-00000LDE1	XQEAWT-00-0000-00000BDE1
E2	5700 K	Q5	107	XQEAWT-00-0000-00000LDE2	XQEAWT-00-0000-00000BDE2

XQ-E High Density Neutral White, T_J = 85 °C

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes		
Kit	CCT	Code	Flux (lm)	70 CRI Minimum	75 CRI Typical	80 CRI Minimum
ANSI Neutral White (3700 K – 5000 K)						
E3	5000 K	Q5	107	XQEAWT-00-0000-00000BDE3		
F4	4750 K	Q5	107	XQEAWT-00-0000-00000BDF4		
		Q4	100	XQEAWT-00-0000-00000BCF4		
E4	4500 K	Q5	107	XQEAWT-00-0000-00000BDE4		
		Q4	100	XQEAWT-00-0000-00000BCE4		
F5	4250 K	Q5	107	XQEAWT-00-0000-00000BDF5		
		Q4	100			
		Q3	93.9		XQEAWT-00-0000-00000LBF5	XQEAWT-00-0000-00000HBF5
E5	4000 K	Q5	107	XQEAWT-00-0000-00000BDE5		
		Q4	100			
		Q3	93.9		XQEAWT-00-0000-00000LBE5	XQEAWT-00-0000-00000HBE5

Note

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

XQ-E High Density Warm White, T_J = 85 °C

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes		
Kit	CCT	Code	Flux (lm)	80 CRI Typical	80 CRI Minimum	90 CRI Minimum
ANSI Warm White (2700 K - 3750 K)						
F6	3750 K	Q3	93.9	XQEAWT-00-0000-00000LBF6	XQEAWT-00-0000-00000HBF6	
		Q2	87.4	XQEAWT-00-0000-00000LAF6	XQEAWT-00-0000-00000HAF6	
E6	3500 K	Q3	93.9	XQEAWT-00-0000-00000LBE6	XQEAWT-00-0000-00000HBE6	
		Q2	87.4	XQEAWT-00-0000-00000LAE6	XQEAWT-00-0000-00000HAE6	
F7	3250 K	Q3	93.9	XQEAWT-00-0000-00000LBF7	XQEAWT-00-0000-00000HBF7	
		Q2	87.4	XQEAWT-00-0000-00000LAF7	XQEAWT-00-0000-00000HAF7	
		P4	80.6	XQEAWT-00-0000-00000L9F7	XQEAWT-00-0000-00000H9F7	
E7	3000 K	Q2	87.4	XQEAWT-00-0000-00000LAE7	XQEAWT-00-0000-00000HAE7	
		P4	80.6	XQEAWT-00-0000-00000L9E7	XQEAWT-00-0000-00000H9E7	
		P3	73.9			
		P2	67.2			XQEAWT-00-0000-00000U7E7
		N4	62			XQEAWT-00-0000-00000U6E7
F8	2850 K	Q2	87.4	XQEAWT-00-0000-00000LAF8	XQEAWT-00-0000-00000HAF8	
		P4	80.6	XQEAWT-00-0000-00000L9F8	XQEAWT-00-0000-00000H9F8	
		P3	73.9			
		P2	67.2			
		N4	62			XQEAWT-00-0000-00000U6F8
		N3	56.8			XQEAWT-00-0000-00000U5F8
E8	2700 K	Q2	87.4	XQEAWT-00-0000-00000LAE8	XQEAWT-00-0000-00000HAE8	
		P4	80.6	XQEAWT-00-0000-00000L9E8	XQEAWT-00-0000-00000H9E8	
		P3	73.9			
		P2	67.2			
		N4	62			XQEAWT-00-0000-00000U6E8
		N3	56.8			XQEAWT-00-0000-00000U5E8

Note

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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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 19 - page 82 for order codes of XLamp XQ-E High Density color LEDs that could serve as alternatives for the order codes set forth below.

XQ-E High Density Color, T_J = 25 °C

Royal Blue		Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PPF (µmol/s)*	Order Codes
Kit	Dominant Wavelength (nm)	Code	Flux (mW)		
01	450 - 465	32	500	1.90	XQEROY-00-0000-000000L01
		31	475	1.80	XQEROY-00-0000-000000K01
		30	450	1.71	XQEROY-00-0000-000000J01
02	450 - 460	32	500	1.90	XQEROY-00-0000-000000L02
		31	475	1.80	XQEROY-00-0000-000000K02
		30	450	1.71	XQEROY-00-0000-000000J02
03	455 - 465	32	500	1.90	XQEROY-00-0000-000000L03
		31	475	1.80	XQEROY-00-0000-000000K03
		30	450	1.71	XQEROY-00-0000-000000J03

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Blue	K2	30.6	B3	465	B6	485	XQEBLU-00-0000-000000Y01
			B3	465	B5	480	XQEBLU-00-0000-000000Y02
			B4	470	B5	480	XQEBLU-00-0000-000000Y05

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	Q5	107	0.98	G2	520	G4	535	XQEGRN-00-0000-000000D01
				G2	520	G3	530	XQEGRN-00-0000-000000D02
				G3	525	G4	535	XQEGRN-00-0000-000000D03
	Q4	100	0.91	G2	520	G4	535	XQEGRN-00-0000-000000C01
				G2	520	G3	530	XQEGRN-00-0000-000000C02
				G3	525	G4	535	XQEGRN-00-0000-000000C03
	Q3	93.9	0.86	G2	520	G4	535	XQEGRN-00-0000-000000B01
				G2	520	G3	530	XQEGRN-00-0000-000000B02
				G3	525	G4	535	XQEGRN-00-0000-000000B03

Notes

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

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APPENDIX - ORDER CODES NOT FOR NEW DESIGNS - CONTINUED

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Amber	Y2	P2	67.2	XQEAPA-00-0000-000000701

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	P3	73.9	O3	610	O4	620	XQERDO-00-0000-000000801
			O3	610	O3	615	XQERDO-00-0000-000000802
			O4	615	O4	620	XQERDO-00-0000-000000803
	P2	67.2	O3	610	O4	620	XQERDO-00-0000-000000701
			O3	610	O3	615	XQERDO-00-0000-000000702
			O4	615	O4	620	XQERDO-00-0000-000000703

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	XQERED-00-0000-000000501
				R2	620	R2	625	XQERED-00-0000-000000502

Notes

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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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 8 for order codes of XLamp XQ-E High Intensity white LEDs that could serve as alternatives for the order codes set forth below.

XQ-E High Intensity Warm White, T_J = 85 °C

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes		
Kit	CCT	Code	Flux (lm)	80 CRI Typical	80 CRI Minimum	90 CRI Minimum
ANSI Warm White (2700 K - 3750 K)						
E7	*3000 K*	*P2*	*67.2*			*XQEAWT-H0-0000-00000U7E7*
F8	*2850 K*	*P2*	*67.2*			*XQEAWT-H0-0000-00000U7F8*
E8	*2700 K*	*P2*	*67.2*			*XQEAWT-H0-0000-00000U7E8*

Note

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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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 27 - page 54 for order codes of XLamp XQ-E High Intensity color LEDs that could serve as alternatives for the order codes set forth below.

XQ-E High Intensity Color, T_J = 85 °C

Color	Minimum Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Blue	*K2*	*30.6*	*B4*	*470*	*B5*	*480*	*XQEBLU-H0-0000-000000Y05*

Color	Color Bin	Minimum Luminous Flux (lm) @ 350 mA		Order Codes
		Group	Flux (lm)	
PC Blue	*N4B & N5B*	*M2*	*39.8*	*XQEAPB-H0-0000-000000201*

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	*R2*	*114*	*1.11*	*G2*	*520*	*G4*	*535*	*XQEGRN-H0-0000-000000E01*
	Q5	*107*	*0.98*	*G2*	*520*	*G4*	*535*	*XQEGRN-H0-0000-000000D01*
				G2	*520*	*G3*	*530*	*XQEGRN-H0-0000-000000D02*
				G3	*525*	*G4*	*535*	*XQEGRN-H0-0000-000000D03*
	Q4	*100*	*0.91*	*G2*	*520*	*G4*	*535*	*XQEGRN-H0-0000-000000C01*
				G2	*520*	*G3*	*530*	*XQEGRN-H0-0000-000000C02*
				G3	*525*	*G4*	*535*	*XQEGRN-H0-0000-000000C03*
	Q3	*93.9*	*0.86*	*G2*	*520*	*G4*	*535*	*XQEGRN-H0-0000-000000B01*
				G2	*520*	*G3*	*530*	*XQEGRN-H0-0000-000000B02*
				G3	*525*	*G4*	*535*	*XQEGRN-H0-0000-000000B03*
	Q2	*87.4*	*0.80*	*G2*	*520*	*G4*	*535*	*XQEGRN-H0-0000-000000A01*
				G2	*520*	*G3*	*530*	*XQEGRN-H0-0000-000000A02*
				G3	*525*	*G4*	*535*	*XQEGRN-H0-0000-000000A03*
	P4	*80.6*	*074*	*G2*	*520*	*G4*	*535*	*XQEGRN-H0-0000-000000901*
				G2	*520*	*G3*	*530*	*XQEGRN-H0-0000-000000902*
				G3	*525*	*G4*	*535*	*XQEGRN-H0-0000-000000903*

Notes

- Cree LED maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and a tolerance of ±2 on CRI measurements. See the Measurements section (page 111).

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

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