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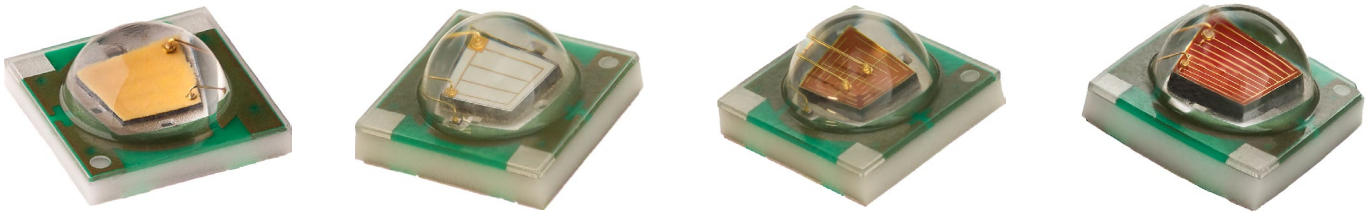
CLD-DS18 REV 25A

Cree® XLamp® XP-E LEDs



PRODUCT DESCRIPTION

The XLamp® XP-E LED combines the proven lighting-class performance and reliability of the XLamp XR-E LED in a package with 80% smaller footprint. The XLamp XP-E LED continues Cree's history of innovation in LEDs for lighting applications with wide viewing angle, symmetrical package, unlimited floor life and electrically neutral thermal path.

Cree XLamp LEDs bring high performance and quality of light to a wide range of lighting applications, including color-changing, portable and personal, outdoor, indoor-directional, transportation, stage and studio, commercial, horticulture and emergency-vehicle lighting.

FEATURES

- Available in white, 80-CRI, 85-CRI and 90-CRI white, royal blue, blue, green, amber, red-orange, red, High Efficiency (HE) photo red & far red
- Maximum drive current: up to 1 A
- Low thermal resistance: as low as 8 °C/W
- Maximum junction temperature: 150 °C
- Wide viewing angle: 115°-130°
- Unlimited floor life at ≤ 30 °C/85% RH
- Reflow solderable - JEDEC J-STD-020C compatible
- Electrically neutral thermal path
- RoHS and REACh compliant
- UL® recognized component (E349212)

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USA Tel: +1.919.313.5300

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CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point - white, royal blue, blue	°C/W		9	
Thermal resistance, junction to solder point - green	°C/W		15	
Thermal resistance, junction to solder point - amber	°C/W		10	
Thermal resistance, junction to solder point - red-orange, red, HE photo red, far red	°C/W		8	
Viewing angle (FWHM) - white	degrees		115	
Viewing angle (FWHM) - royal blue, blue, green, amber, red-orange, red, HE photo red, far red	degrees		130	
Temperature coefficient of voltage - white	mV/°C		-3.0	
Temperature coefficient of voltage - royal blue, blue	mV/°C		-3.3	
Temperature coefficient of voltage - green	mV/°C		-3.8	
Temperature coefficient of voltage - amber	mV/°C		-1.2	
Temperature coefficient of voltage - red-orange, red	mV/°C		-1.8	
Temperature coefficient of voltage - HE photo red	mV/°C		-1.6	
Temperature coefficient of voltage - far red	mV/°C		-1.0	
ESD withstand voltage (HBM per Mil-Std-883D) - white, royal blue, blue, green	V			8000
ESD classification (HBM per Mil-Std-883D) - amber, red-orange, red, HE photo red, far red			Class 2	
DC forward current - white, royal blue, blue, green, HE photo red, far red	mA			1000
DC forward current - amber	mA			500
DC forward current - red-orange, red	mA			700
Reverse voltage	V			5
Forward voltage (@ 350 mA) - white	V		3.05	3.9
Forward voltage (@ 350 mA) - royal blue, blue	V		3.1	3.9
Forward voltage (@ 350 mA) - green	V		3.3	3.9
Forward voltage (@ 350 mA) - amber, red-orange, red, HE photo red	V		2.1	2.5
Forward voltage (@ 350 mA) - far red	V		1.9	2.4
Forward voltage (@ 500 mA) - amber	V		2.3	
Forward voltage (@ 700 mA) - white	V		3.3	
Forward voltage (@ 700 mA) - red-orange, red, HE photo red	V		2.3	
Forward voltage (@ 700 mA) - far red	V		2.1	
Forward voltage (@ 1000 mA) - white, royal blue, blue	V		3.5	
Forward voltage (@ 1000 mA) - green	V		3.8	
Forward voltage (@ 1000 mA) - HE photo red	V		2.5	
Forward voltage (@ 1000 mA) - far red	V		2.25	
LED junction temperature	°C			150

FLUX CHARACTERISTICS - WHITE (T_J = 25 °C)

The following table provides order codes for XLamp XP-E white LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 38).

Minimum Luminous Flux (lm) @ 350 mA		Chromaticity Regions	Order Codes
Group	Flux (lm)		
Q4	100	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	XPEWHT-L1-0000-00C01
		WC, WD, WF, WG	XPEWHT-L1-0000-00C02
		WC, WD, WF, WG, WH, WJ, WN, WP	XPEWHT-L1-0000-00C03
Q5	107	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	XPEWHT-L1-0000-00D01
		WC, WD, WF, WG	XPEWHT-L1-0000-00D02
		WC, WD, WF, WG, WH, WJ, WN, WP	XPEWHT-L1-0000-00D03
R2	114	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	XPEWHT-L1-0000-00E01
		WC, WD, WF, WG	XPEWHT-L1-0000-00E02
		WC, WD, WF, WG, WH, WJ, WN, WP	XPEWHT-L1-0000-00E03
R3	122	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	XPEWHT-L1-0000-00F01
		WC, WD, WF, WG	XPEWHT-L1-0000-00F02
		WC, WD, WF, WG, WH, WJ, WN, WP	XPEWHT-L1-0000-00F03

Notes:

- Cree 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 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

FLUX CHARACTERISTICS - WHITE (T_J = 25 °C) - CONTINUED

The following tables provide order codes for XLamp XP-E white LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 38). For definitions of the chromaticity kits, please see the Cree's Standard Chromaticity Kits section (page 37).

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

Notes:

- Cree 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 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

FLUX CHARACTERISTICS - WHITE (T_J = 25 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes	
Kit	CCT	Code	Flux (lm)	75 CRI Typical	80 CRI Minimum
E3	5000 K	Q5	107	XPEWHT-L1-0000-00DE3	
		Q4	100	XPEWHT-L1-0000-00CE3	
		Q3	93.9	XPEWHT-L1-0000-00BE3	
F4	4750 K	Q5	107	XPEWHT-L1-0000-00DF4	
		Q4	100	XPEWHT-L1-0000-00CF4	
		Q3	93.9	XPEWHT-L1-0000-00BF4	
E4	4500 K	Q5	107	XPEWHT-L1-0000-00DE4	
		Q4	100	XPEWHT-L1-0000-00CE4	
		Q3	93.9	XPEWHT-L1-0000-00BE4	
F5	4250 K	Q5	107	XPEWHT-L1-0000-00DF5	
		Q4	100	XPEWHT-L1-0000-00CF5	
		Q3	93.9	XPEWHT-L1-0000-00BF5	
		Q2	87.4	XPEWHT-L1-0000-00AF5	
E5	4000 K	Q5	107	XPEWHT-L1-0000-00DE5	
		Q4	100	XPEWHT-L1-0000-00CE5	XPEWHT-H1-0000-00CE5
		Q3	93.9	XPEWHT-L1-0000-00BE5	XPEWHT-H1-0000-00BE5
		Q2	87.4	XPEWHT-L1-0000-00AE5	XPEWHT-H1-0000-00AE5
Z5	4000 K	Q4	100	XPEWHT-L1-0000-00CZ5	
		Q3	93.9	XPEWHT-L1-0000-00BZ5	XPEWHT-H1-0000-00BZ5
		Q2	87.4	XPEWHT-L1-0000-00AZ5	XPEWHT-H1-0000-00AZ5

Notes:

- Cree 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 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

FLUX CHARACTERISTICS - WHITE (T_J = 25 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes			
Kit	CCT	Code	Flux (lm)	80 CRI Typical	80 CRI Minimum	85 CRI Minimum	90 CRI Minimum
F6	3750 K	Q4	100	XPEWHT-L1-0000-00CF6			
		Q3	93.9	XPEWHT-L1-0000-00BF6	XPEWHT-H1-0000-00BF6		
		Q2	87.4	XPEWHT-L1-0000-00AF6	XPEWHT-H1-0000-00AF6		
		P4	80.6	XPEWHT-L1-0000-009F6	XPEWHT-H1-0000-009F6		
E6	3500 K	Q4	100	XPEWHT-L1-0000-00CE6			
		Q3	93.9	XPEWHT-L1-0000-00BE6	XPEWHT-H1-0000-00BE6		
		Q2	87.4	XPEWHT-L1-0000-00AE6	XPEWHT-H1-0000-00AE6		
		P4	80.6	XPEWHT-L1-0000-009E6	XPEWHT-H1-0000-009E6		
Z6	3500 K	Q3	93.9	XPEWHT-L1-0000-00BZ6			
		Q2	87.4	XPEWHT-L1-0000-00AZ6	XPEWHT-H1-0000-00AZ6		
		P4	80.6	XPEWHT-L1-0000-009Z6	XPEWHT-H1-0000-009Z6		
F7	3250 K	Q3	93.9	XPEWHT-L1-0000-00BF7			
		Q2	87.4	XPEWHT-L1-0000-00AF7	XPEWHT-H1-0000-00AF7		
		P4	80.6	XPEWHT-L1-0000-009F7	XPEWHT-H1-0000-009F7		
E7	3000 K	Q3	93.9	XPEWHT-L1-0000-00BE7			
		Q2	87.4	XPEWHT-L1-0000-00AE7	XPEWHT-H1-0000-00AE7		
		P4	80.6	XPEWHT-L1-0000-009E7	XPEWHT-H1-0000-009E7	XPEWHT-P1-0000-009E7	
		P3	73.9			XPEWHT-P1-0000-008E7	XPEWHT-U1-0000-008E7
		P2	67.2			XPEWHT-P1-0000-007E7	XPEWHT-U1-0000-007E7
		N4	62			XPEWHT-P1-0000-006E7	XPEWHT-U1-0000-006E7
Z7	3000 K	Q2	87.4	XPEWHT-L1-0000-00AZ7	XPEWHT-H1-0000-00AZ7		
		P4	80.6	XPEWHT-L1-0000-009Z7	XPEWHT-H1-0000-009Z7		
		P3	73.9			XPEWHT-P1-0000-008Z7	
		P2	67.2			XPEWHT-P1-0000-007Z7	XPEWHT-U1-0000-007Z7
		N4	62			XPEWHT-P1-0000-006Z7	XPEWHT-U1-0000-006Z7
F8	2850 K	Q2	87.4	XPEWHT-L1-0000-00AF8			
		P4	80.6	XPEWHT-L1-0000-009F8	XPEWHT-H1-0000-009F8		
		P3	73.9	XPEWHT-L1-0000-008F8	XPEWHT-H1-0000-008F8	XPEWHT-P1-0000-008F8	
		P2	67.2			XPEWHT-P1-0000-007F8	XPEWHT-U1-0000-007F8
		N4	62			XPEWHT-P1-0000-006F8	XPEWHT-U1-0000-006F8
		N3	56.8			XPEWHT-P1-0000-005F8	XPEWHT-U1-0000-005F8

Notes:

- Cree 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 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

FLUX CHARACTERISTICS - WHITE (T_J = 25 °C) - CONTINUED

Chromaticity		Minimum Luminous Flux (lm) @ 350 mA		Order Codes			
Kit	CCT	Code	Flux (lm)	80 CRI Typical	80 CRI Minimum	85 CRI Minimum	90 CRI Minimum
E8	2700 K	Q2	87.4	XPEWHT-L1-0000-00AE8			
		P4	80.6	XPEWHT-L1-0000-009E8	XPEWHT-H1-0000-009E8		
		P3	73.9	XPEWHT-L1-0000-008E8	XPEWHT-H1-0000-008E8	XPEWHT-P1-0000-008E8	
		P2	67.2			XPEWHT-P1-0000-007E8	XPEWHT-U1-0000-007E8
		N4	62			XPEWHT-P1-0000-006E8	XPEWHT-U1-0000-006E8
		N3	56.8			XPEWHT-P1-0000-005E8	XPEWHT-U1-0000-005E8
Z8	2700 K	P4	80.6	XPEWHT-L1-0000-009Z8	XPEWHT-H1-0000-009Z8		
		P3	73.9	XPEWHT-L1-0000-008Z8	XPEWHT-H1-0000-008Z8		
		P2	67.2			XPEWHT-P1-0000-007Z8	
		N4	62			XPEWHT-P1-0000-006Z8	XPEWHT-U1-0000-006Z8
		N3	56.8			XPEWHT-P1-0000-005Z8	XPEWHT-U1-0000-005Z8

Notes:

- Cree 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 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.

FLUX CHARACTERISTICS - COLOR (T_J = 25 °C)

The following tables provide order codes for XLamp XP-E color LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 38).

Color	Minimum Radiant Flux (mW) @ 350 mA		Calculated Minimum PPF (µmol/s)	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (mW)		Group	DWL (nm)	Group	DWL (nm)	
Royal Blue	14	350	1.33	D3	450	D5	465	XPEROY-L1-0000-00901
				D3	450	D4	460	XPEROY-L1-0000-00902
				D4	455	D5	465	XPEROY-L1-0000-00903
	15	425	1.61	D3	450	D5	465	XPEROY-L1-0000-00A01
				D3	450	D4	460	XPEROY-L1-0000-00A02
				D4	455	D5	465	XPEROY-L1-0000-00A03
	16	500	1.90	D3	450	D5	465	XPEROY-L1-0000-00B01
				D3	450	D4	460	XPEROY-L1-0000-00B02

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	XPEBLU-L1-0000-00Y01
			B3	465	B5	480	XPEBLU-L1-0000-00Y02
			B4	470	B5	480	XPEBLU-L1-0000-00Y05
	K3	35.2	B3	465	B6	485	XPEBLU-L1-0000-00Z01
			B3	465	B5	480	XPEBLU-L1-0000-00Z02
			B4	470	B5	480	XPEBLU-L1-0000-00Z05
	M2	39.8	B3	465	B6	485	XPEBLU-L1-0000-00201
			B3	465	B5	480	XPEBLU-L1-0000-00202
			B4	470	B5	480	XPEBLU-L1-0000-00205

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, and ±1 nm on dominant wavelength measurements. See the Measurements section (page 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

FLUX CHARACTERISTICS - COLOR (T_J = 25 °C) - CONTINUED

Color	Minimum Luminous Flux (lm)@ 350 mA		Calculated Minimum PPF (µmol/s)	Dominant Wavelength (nm)				Order Codes
				Minimum		Maximum		
	Group	Flux (lm)		Group	DWL (nm)	Group	DWL (nm)	
Green	P4	80.6	0.74	G2	520	G4	535	XPEGRN-L1-0000-00901
				G2	520	G3	530	XPEGRN-L1-0000-00902
				G3	525	G4	535	XPEGRN-L1-0000-00903
	Q2	87.4	0.80	G2	520	G4	535	XPEGRN-L1-0000-00A01
				G2	520	G3	530	XPEGRN-L1-0000-00A02
				G3	525	G4	535	XPEGRN-L1-0000-00A03
	Q3	93.9	0.86	G2	520	G4	535	XPEGRN-L1-0000-00B01
				G2	520	G3	530	XPEGRN-L1-0000-00B02
				G3	525	G4	535	XPEGRN-L1-0000-00B03
	Q4	100	0.91	G2	520	G4	535	XPEGRN-L1-0000-00C01
				G2	520	G3	530	XPEGRN-L1-0000-00C02
				G3	525	G4	535	XPEGRN-L1-0000-00C03
	Q5	107	0.98	G2	520	G4	535	XPEGRN-L1-0000-00D01
				G2	520	G3	530	XPEGRN-L1-0000-00D02
				G3	525	G4	535	XPEGRN-L1-0000-00D03
	R2	114	1.04	G2	520	G4	535	XPEGRN-L1-0000-00E01
				G2	520	G3	530	XPEGRN-L1-0000-00E02
				G3	525	G4	535	XPEGRN-L1-0000-00E03
	R3	122	1.11	G2	520	G4	535	XPEGRN-L1-0000-00F01
				G2	520	G3	530	XPEGRN-L1-0000-00F02

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, and ±1 nm on dominant wavelength measurements. See the Measurements section (page 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

FLUX CHARACTERISTICS - COLOR (T_J = 25 °C) - CONTINUED

Color	Minimum Luminous Flux (lm)@ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Amber	M3	45.7	A2	585	A3	595	XPEAMB-L1-0000-00301
			A3	590	A3	595	XPEAMB-L1-0000-00303
	N2	51.7	A2	585	A3	595	XPEAMB-L1-0000-00401
			A3	590	A3	595	XPEAMB-L1-0000-00403
	N3	56.8	A2	585	A3	595	XPEAMB-L1-0000-00501
			A3	590	A3	595	XPEAMB-L1-0000-00503
	N4	62.0	A2	585	A3	595	XPEAMB-L1-0000-00601
			A3	590	A3	595	XPEAMB-L1-0000-00603
	P2	67.2	A2	585	A3	595	XPEAMB-L1-0000-00701
			A3	590	A3	595	XPEAMB-L1-0000-00703
	P3	73.9	A2	585	A3	595	XPEAMB-L1-0000-00801
			A3	590	A3	595	XPEAMB-L1-0000-00803
	P4	80.6	A2	585	A3	595	XPEAMB-L1-0000-00901
			A3	590	A3	595	XPEAMB-L1-0000-00903

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, and ±1 nm on dominant wavelength measurements. See the Measurements section (page 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

FLUX CHARACTERISTICS - COLOR (T_J = 25 °C) - CONTINUED

Color	Minimum Luminous Flux (lm)@ 350 mA		Dominant Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
Red-Orange	N3	56.8	O3	610	O4	620	XPERDO-L1-0000-00501
			O3	610	O3	615	XPERDO-L1-0000-00502
			O4	615	O4	620	XPERDO-L1-0000-00503
	N4	62.0	O3	610	O4	620	XPERDO-L1-0000-00601
			O3	610	O3	615	XPERDO-L1-0000-00602
			O4	615	O4	620	XPERDO-L1-0000-00603
	P2	67.2	O3	610	O4	620	XPERDO-L1-0000-00701
			O3	610	O3	615	XPERDO-L1-0000-00702
			O4	615	O4	620	XPERDO-L1-0000-00703
	P3	73.9	O3	610	O4	620	XPERDO-L1-0000-00801
			O3	610	O3	615	XPERDO-L1-0000-00802
			O4	615	O4	620	XPERDO-L1-0000-00803
	P4	80.6	O3	610	O4	620	XPERDO-L1-0000-00901
			O3	610	O3	615	XPERDO-L1-0000-00902
			O4	615	O4	620	XPERDO-L1-0000-00903
	Q2	87.4	O3	610	O4	620	XPERDO-L1-0000-00A01
			O3	610	O3	615	XPERDO-L1-0000-00A02
			O4	615	O4	620	XPERDO-L1-0000-00A03

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	M3	45.7	1.19	R2	620	R3	630	XPERED-L1-0000-00301
				R2	620	R2	625	XPERED-L1-0000-00302
	N2	51.7	1.35	R2	620	R3	630	XPERED-L1-0000-00401
				R2	620	R2	625	XPERED-L1-0000-00402
	N3	56.8	1.48	R2	620	R3	630	XPERED-L1-0000-00501
				R2	620	R2	625	XPERED-L1-0000-00502
	N4	62	1.61	R2	620	R3	630	XPERED-L1-0000-00601
				R2	620	R2	625	XPERED-L1-0000-00602
	P2	67.2	1.75	R2	620	R3	630	XPERED-L1-0000-00701
				R2	620	R2	625	XPERED-L1-0000-00702
	P3	73.9	1.92	R2	620	R3	630	XPERED-L1-0000-00801
				R2	620	R2	625	XPERED-L1-0000-00802

Notes:

- Cree maintains a tolerance of ±7% on flux and power measurements, and ±1 nm on dominant wavelength measurements. See the Measurements section (page 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

FLUX CHARACTERISTICS - COLOR (T_J = 25 °C) - CONTINUED

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	XPEEPR-L1-0000-00901
	27	375	2.06	P2	650	P5	670	XPEEPR-L1-0000-00A01
	28	400	2.20	P2	650	P5	670	XPEEPR-L1-0000-00B01
	29	425	2.34	P2	650	P5	670	XPEEPR-L1-0000-00C01

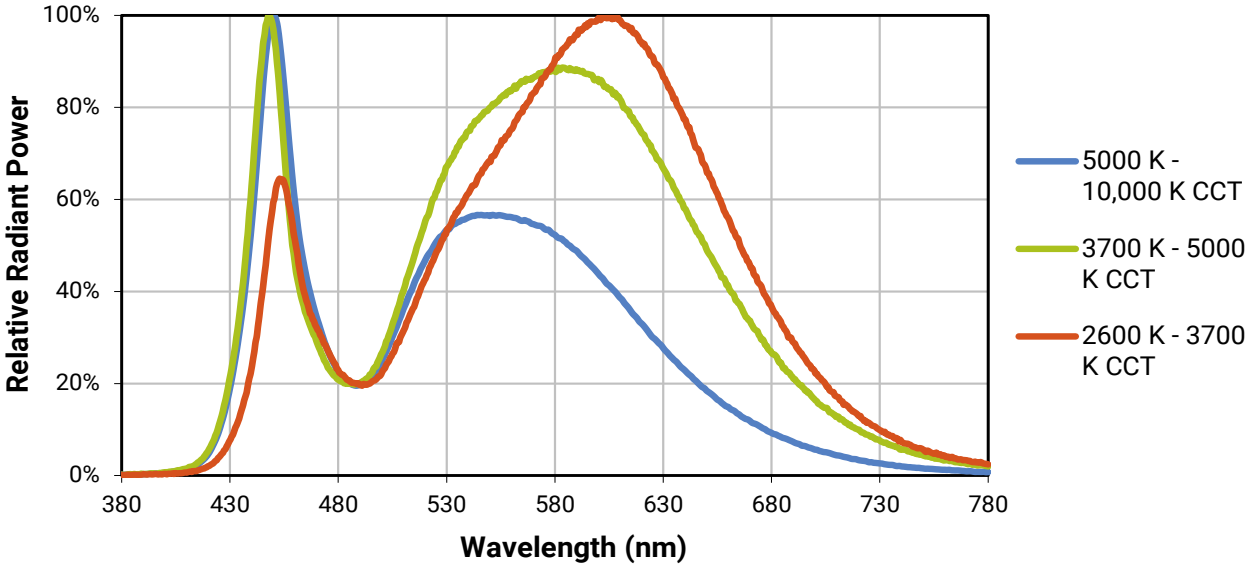
Color	Minimum Radiant Flux (mW)@ 350 mA		Peak Wavelength (nm)				Order Codes
			Minimum		Maximum		
	Group	Flux (mW)	Group	PWL (nm)	Group	PWL (nm)	
Far Red	10	175	F2	720	F5	740	XPEFAR-L1-0000-00501
	11	210	F2	720	F5	740	XPEFAR-L1-0000-00601
	12	250	F2	720	F5	740	XPEFAR-L1-0000-00701

Notes:

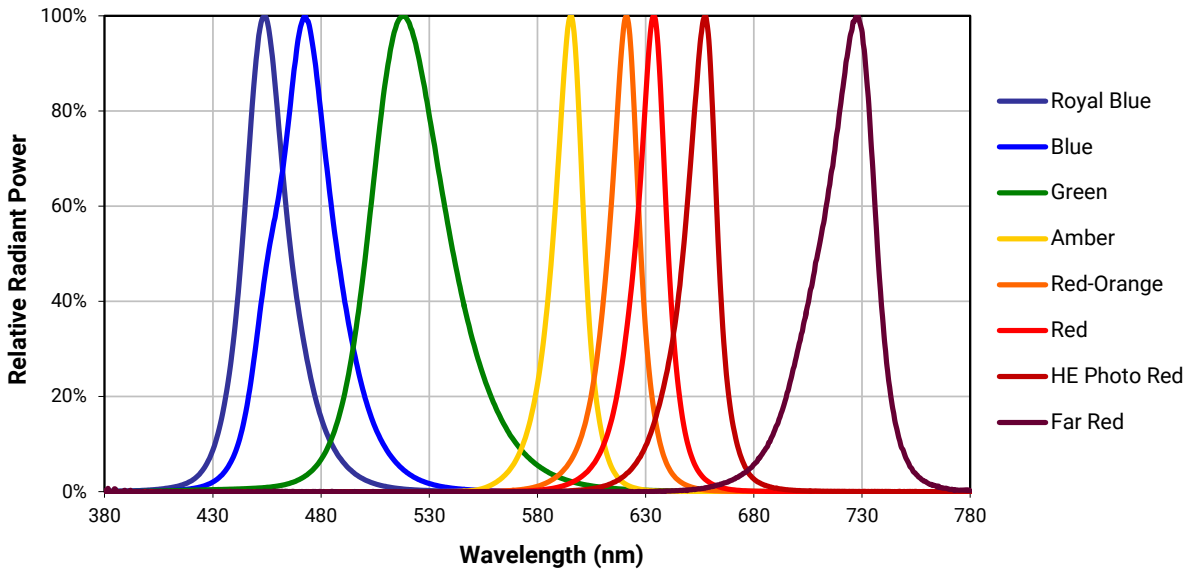
- Cree maintains a tolerance of ±7% on flux and power measurements, and ±1 nm on dominant wavelength measurements. See the Measurements section (page 40).
- Cree XLamp XP-E LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity bin restrictions specified by the order code.
- Calculated Photosynthetic Photon Flux (PPF) values are for reference only.

RELATIVE SPECTRAL POWER DISTRIBUTION

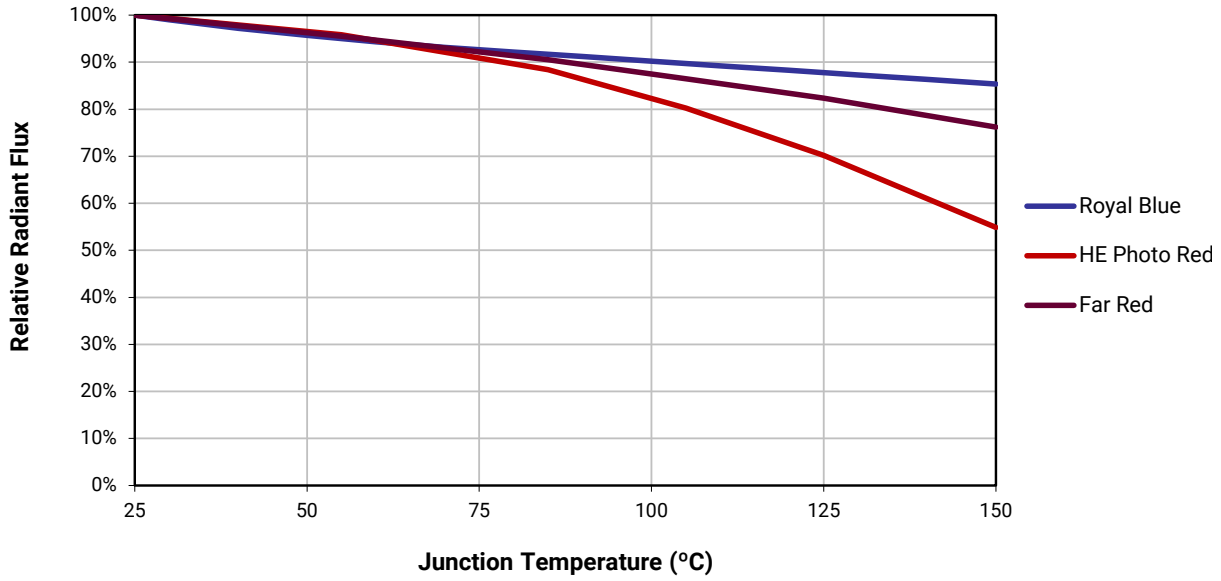
White

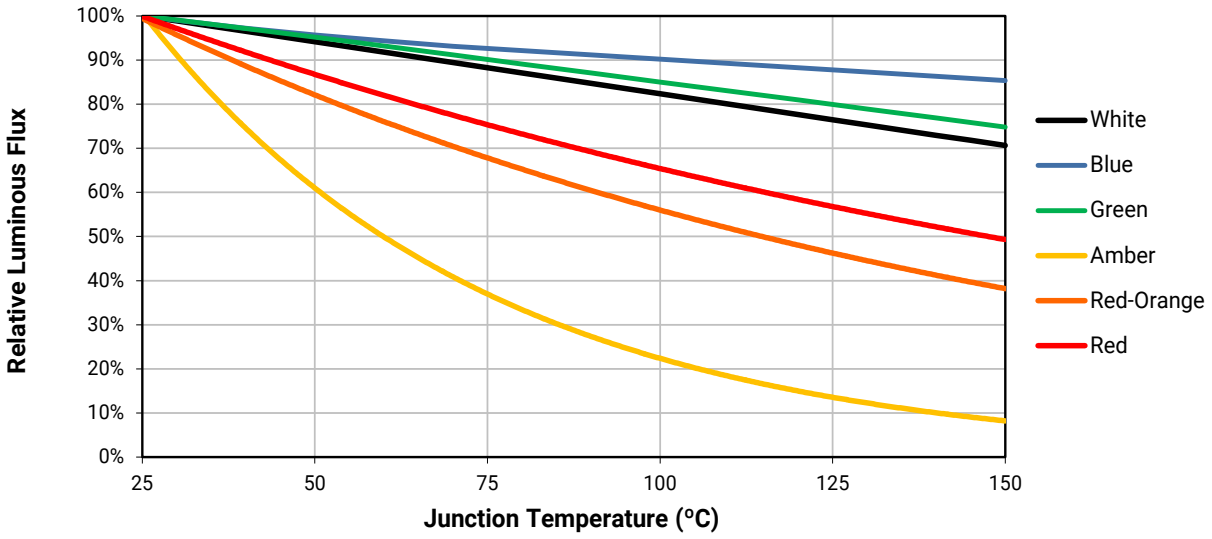


Color

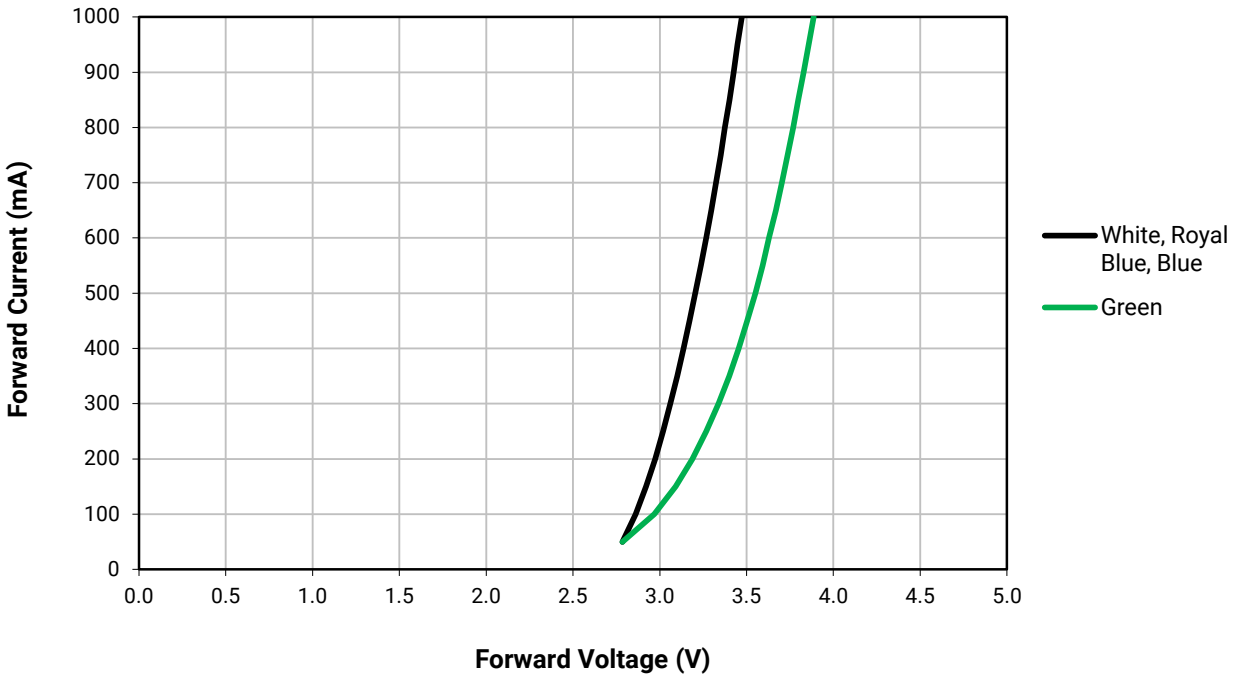


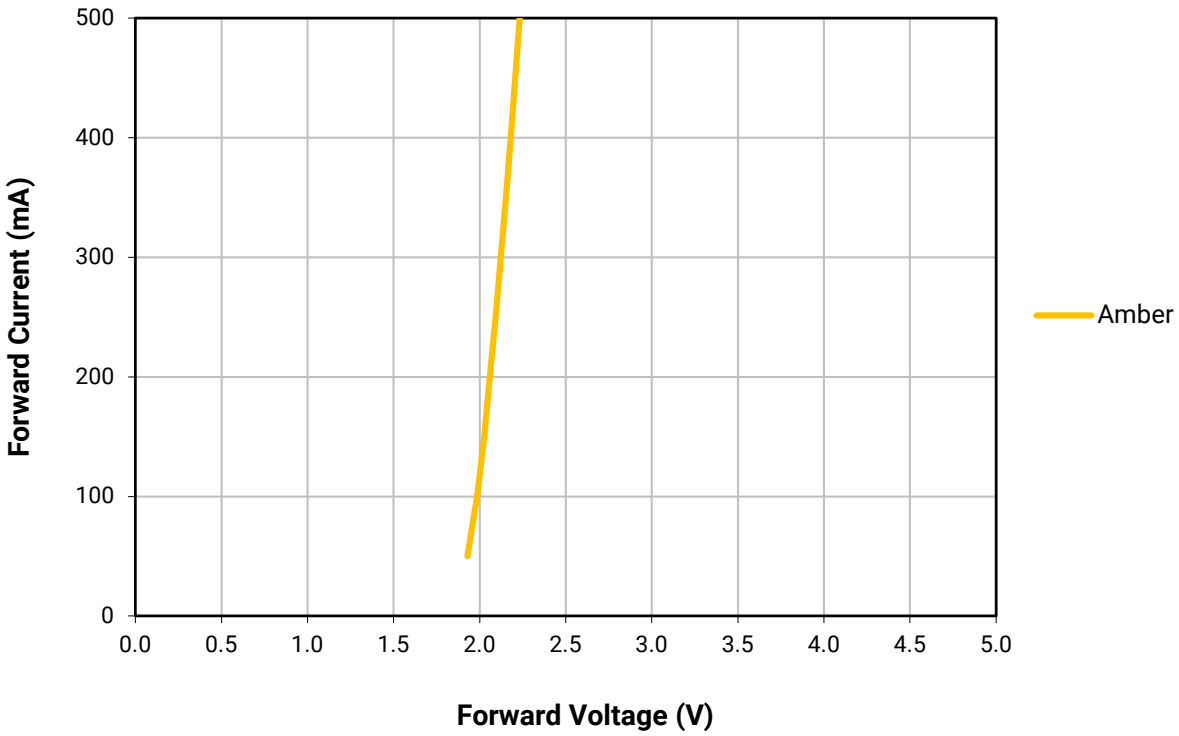
RELATIVE FLUX VS. JUNCTION TEMPERATURE (I_F = 350 mA)



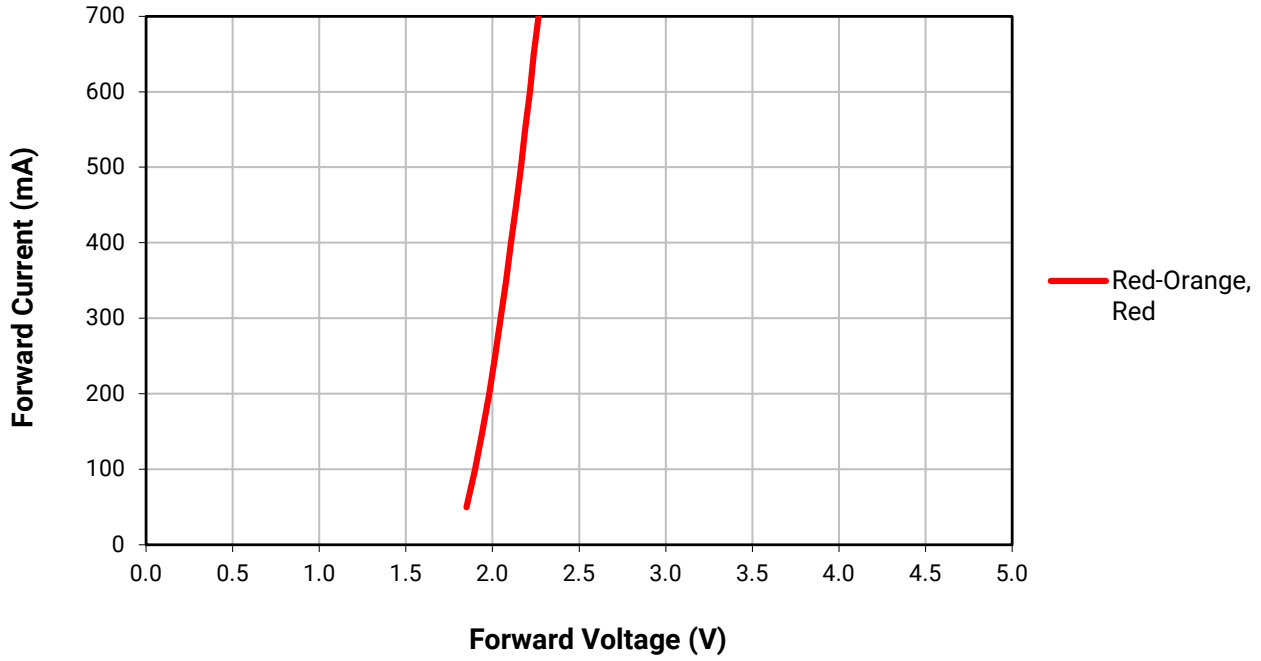


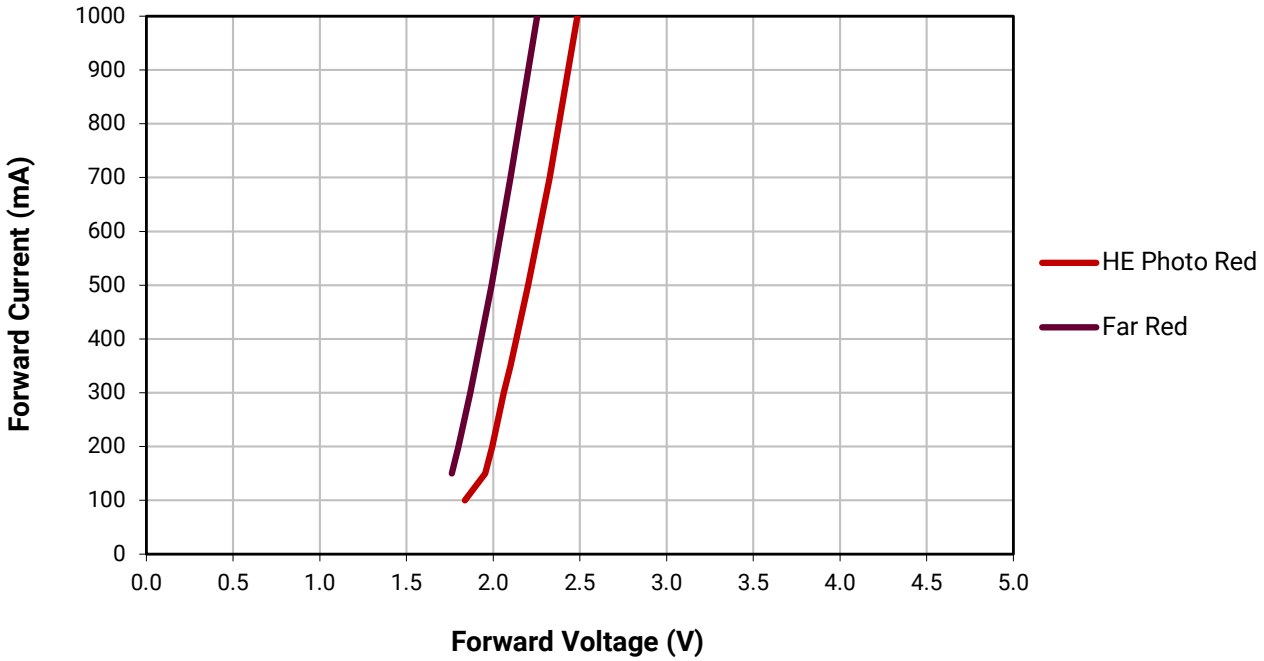
ELECTRICAL CHARACTERISTICS (T_J = 25 °C)



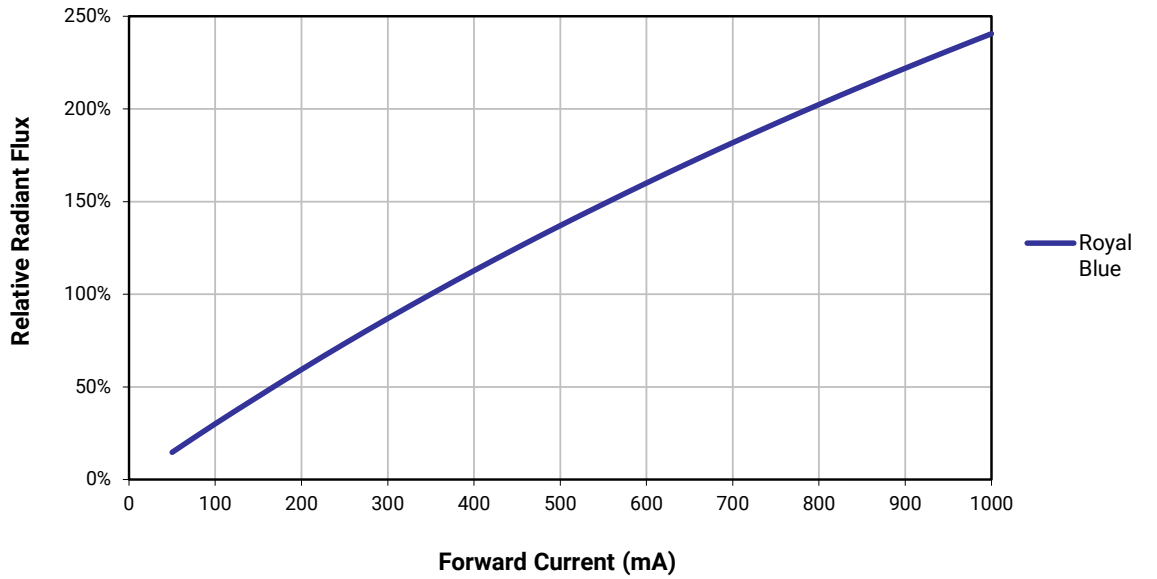


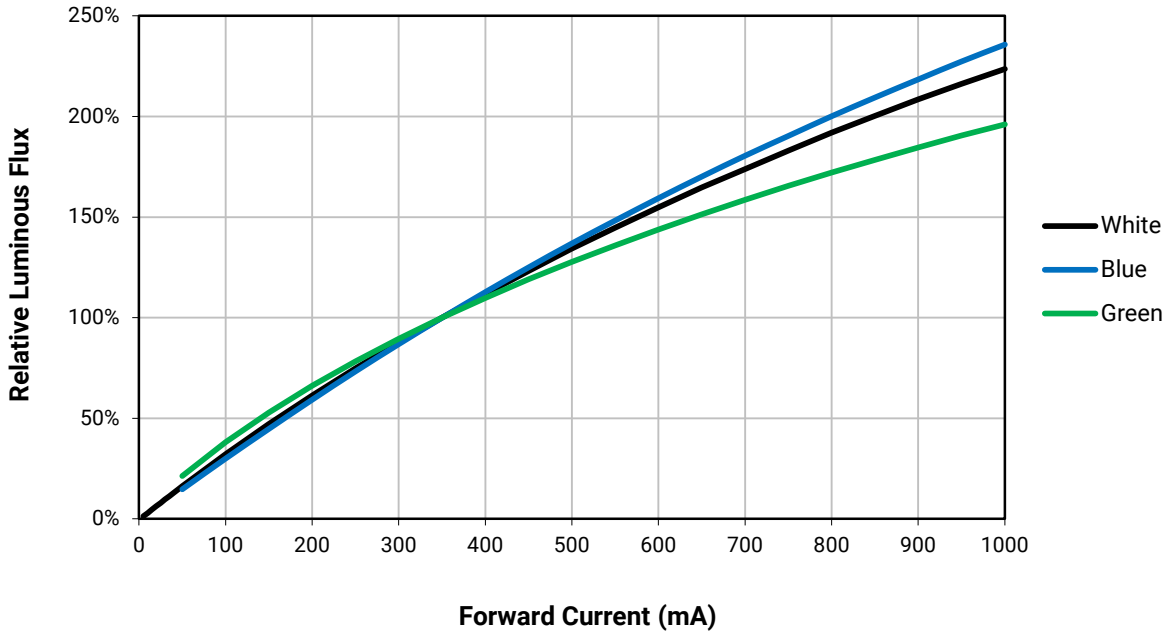
ELECTRICAL CHARACTERISTICS (T_J = 25 °C) - CONTINUED



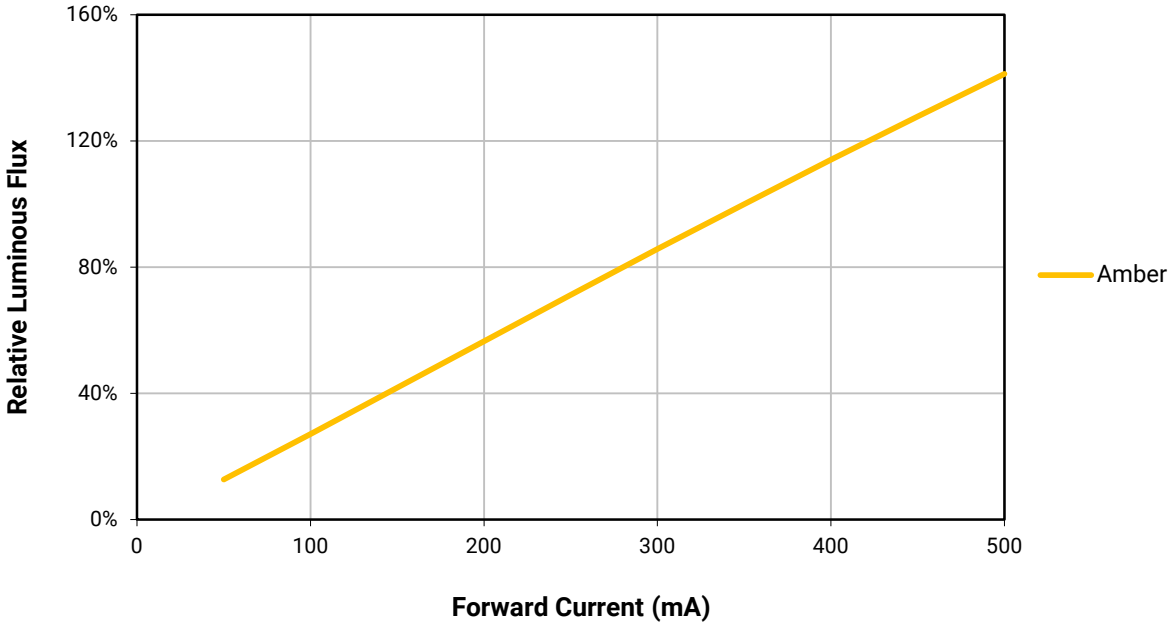


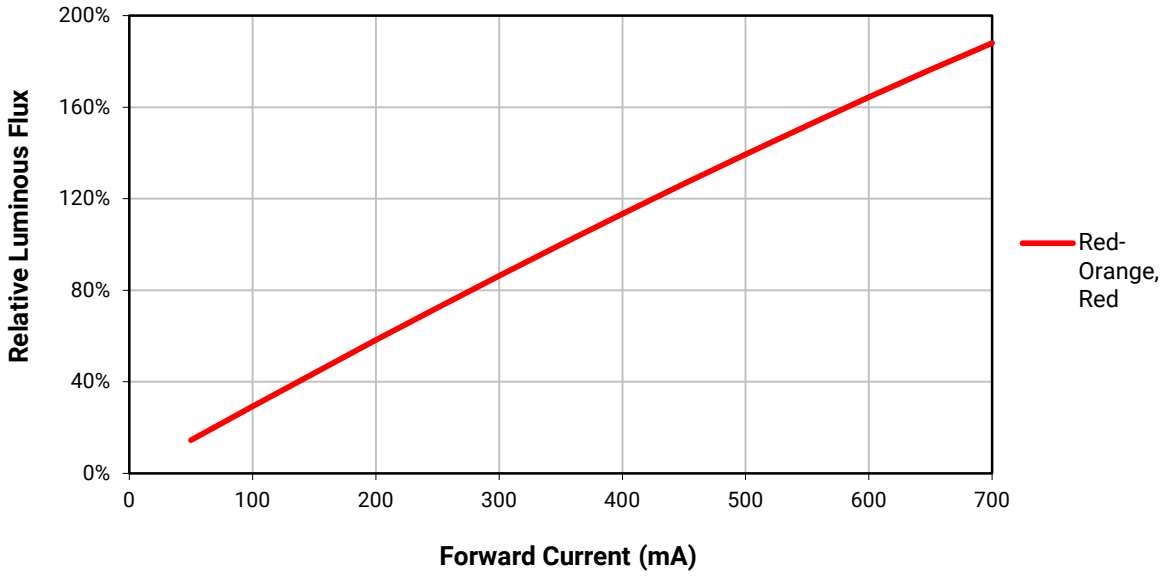
RELATIVE FLUX VS. CURRENT (T_J = 25 °C)



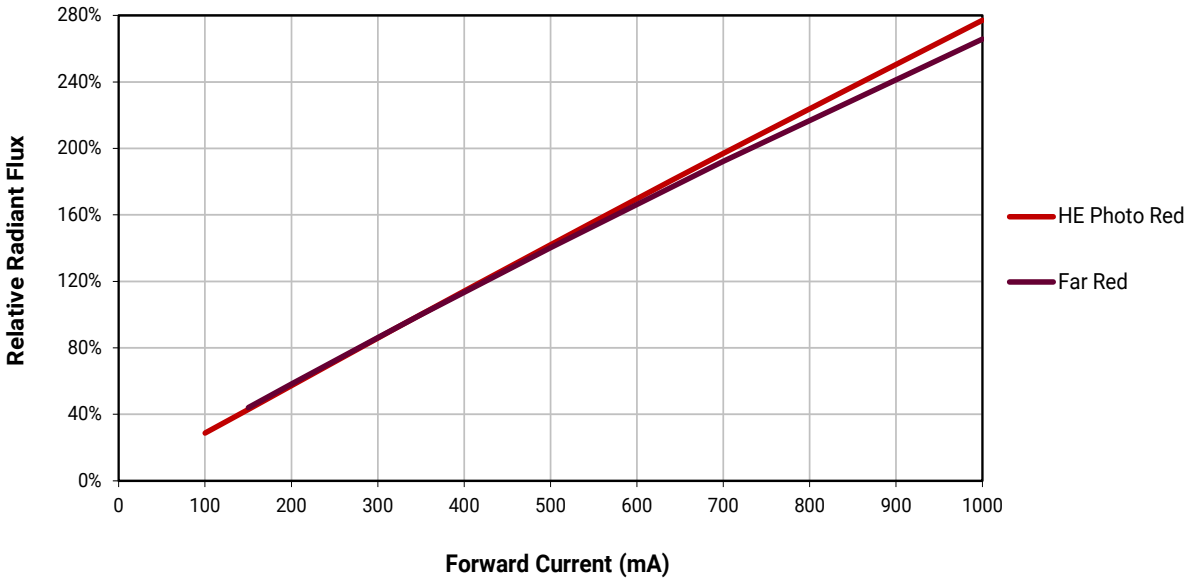


RELATIVE FLUX VS. CURRENT (T_J = 25 °C) - CONTINUED

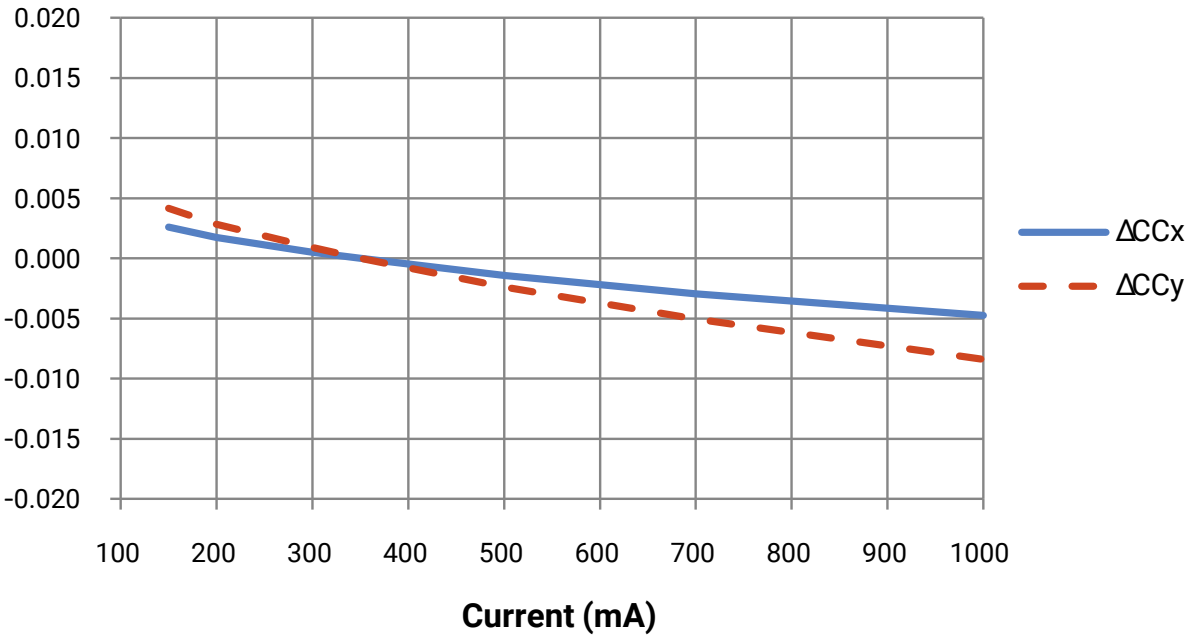


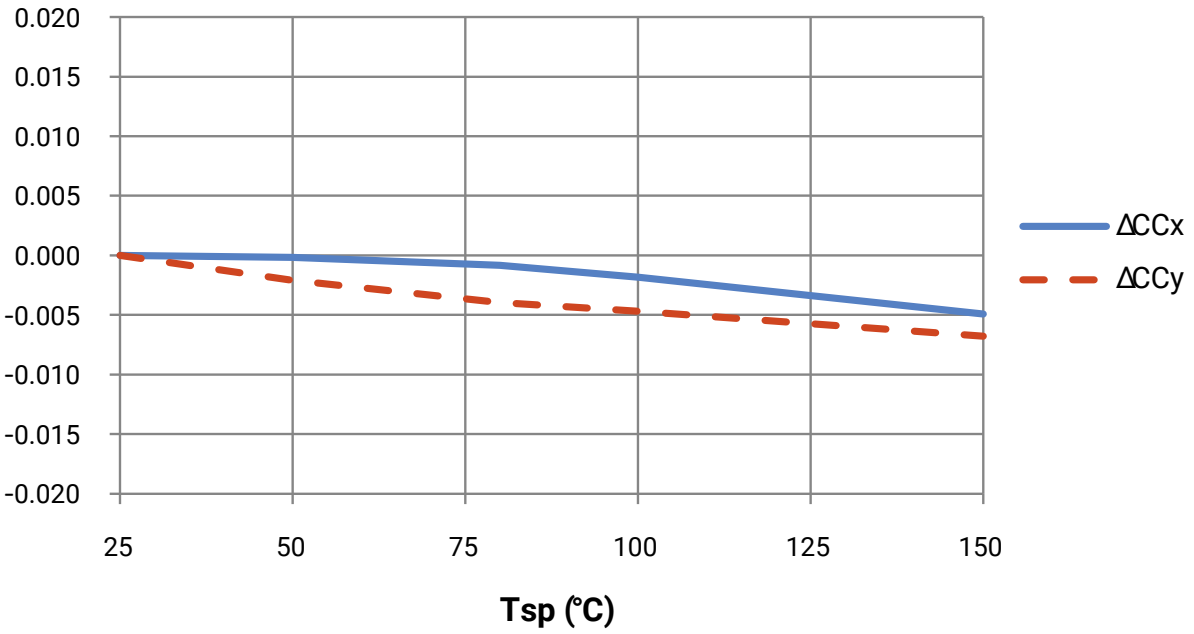


RELATIVE FLUX VS. CURRENT (T_J = 25 °C) - CONTINUED

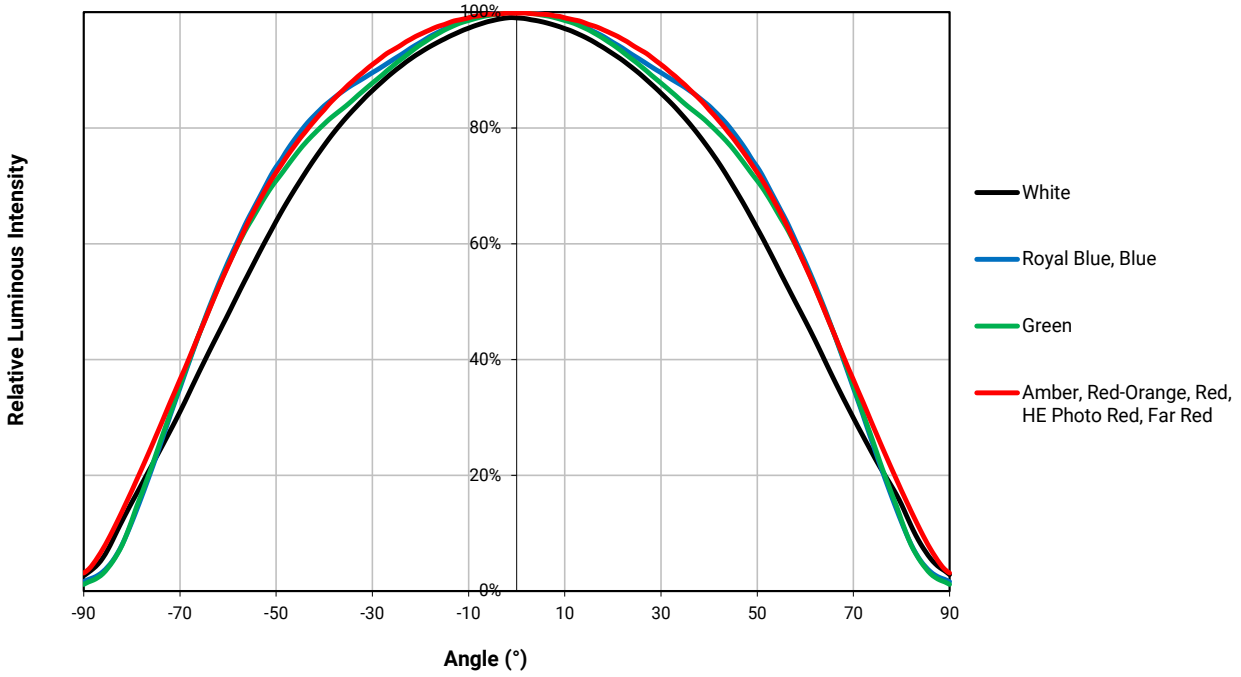


RELATIVE CHROMATICITY VS. CURRENT AND TEMPERATURE - WARM WHITE



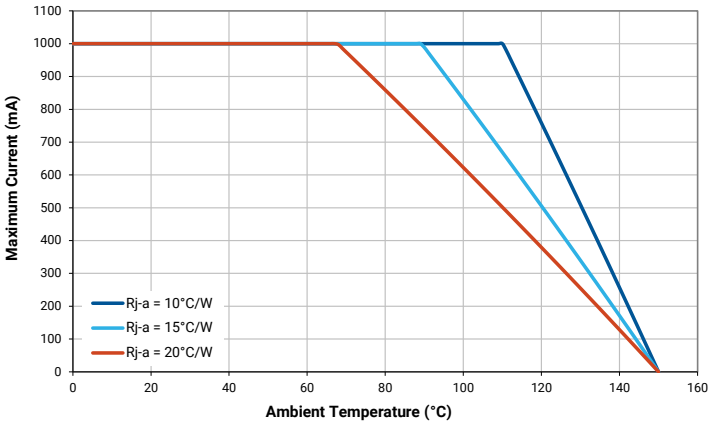


TYPICAL SPATIAL DISTRIBUTION

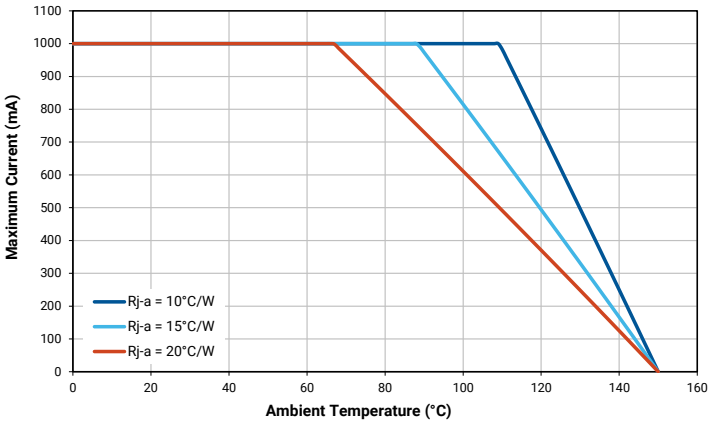


THERMAL DESIGN

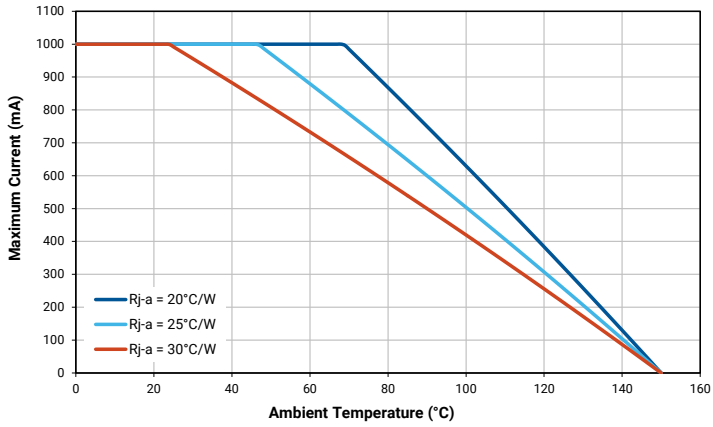
The maximum forward current is determined by the thermal resistance between the LED junction and ambient. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.



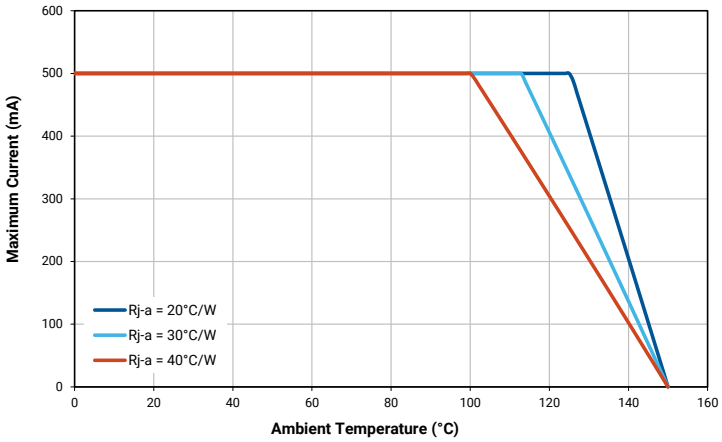
White



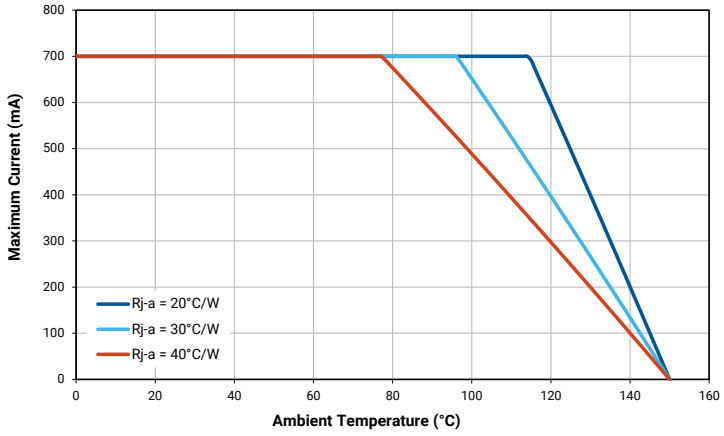
Royal Blue, Blue



Green

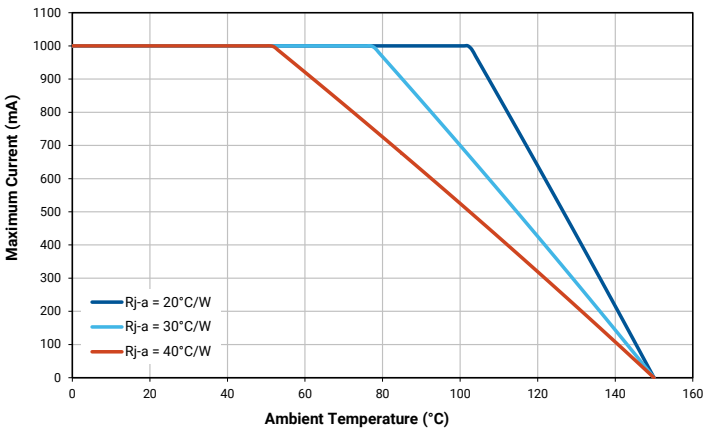


Amber

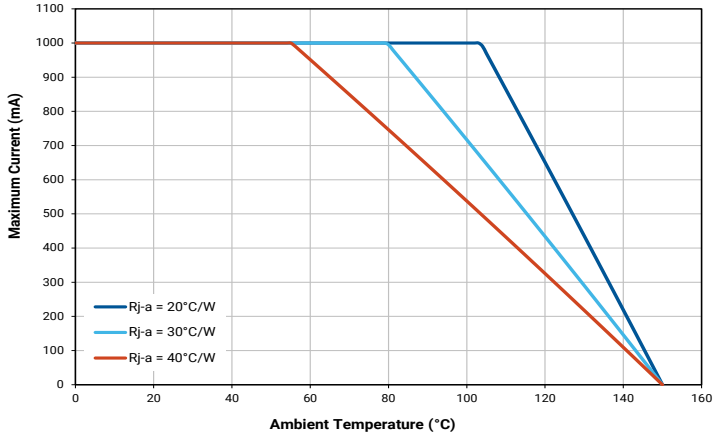


Red-Orange, Red

THERMAL DESIGN - CONTINUED



HE Photo Red



Far Red

PERFORMANCE GROUPS - LUMINOUS FLUX

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

Group Code	Minimum Luminous Flux (lm) @ 350 mA	Maximum Luminous Flux (lm) @ 350 mA
N3	56.8	62.0
N4	62.0	67.2
P2	67.2	73.9
P3	73.9	80.6
P4	80.6	87.4
Q2	87.4	93.9
Q3	93.9	100
Q4	100	107
Q5	107	114
R2	114	122
R3	122	130
R4	130	139

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

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

Group	Minimum Radiant Flux (mW) @ 350 mA	Maximum Radiant Flux (mW) @ 350 mA
10	175	210
11	210	250
12	250	300
13	300	350
14	350	425
15	425	500
16	500	600

XLamp XP-E HE photo red LEDs are tested for radiant flux and sorted into one of the following radiant-flux bins:

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