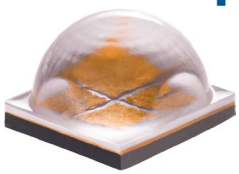
Cree® XLamp® XHP50 LEDs



PRODUCT DESCRIPTION

Powered by Cree's groundbreaking SC5 Technology™ Platform, the XLamp XHP50 LED is a member of Cree's Extreme High Power (XHP) class of LEDs that redefines lumen density and reliability to radically reduce system costs by up to 40 percent. At its maximum current, the XHP50 LED delivers twice the light output of the industry's brightest single-die LED, the XLamp XM-L2 LED, with similar lumens per watt and without increasing the package footprint. The XHP50 LED also achieves longer lifetime at higher operating temperatures than previous LED technology. The result is significantly lower thermal, mechanical and optical costs at the system level.

FEATURES

- Available in white
- Binned at 85 °C
- Configurable to 6 V or 12 V by PCB layout
- Maximum drive current: 3000 mA (6 V), 1500 mA (12 V)
- Low thermal resistance: 1.2 °C/W
- Wide viewing angle: 120°
- Unlimited floor life at ≤ 30 ºC/85% RH
- Reflow solderable - JEDEC J-STD-020C
- UL® recognized component (E349212)

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Durham, NC 27703
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CHARACTERISTICS

XHP50 LEDs are tested and binned in production in the 12-V configuration. See the Mechanical Dimensions section on page 26 for pad layout options.

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		1.2	
Viewing angle (FWHM)	degrees		120	
Temperature coefficient of voltage (6 V)*	mV/°C		-4.5	
Temperature coefficient of voltage (12 V)	mV/°C		-9	
ESD withstand voltage (HBM per Mil-Std-883D)	V			8000
DC forward current (6 V)*	mA			3000
DC forward current (12 V)	mA			1500
Reverse voltage	V			-5
Forward voltage (6 V, @ 1400 mA, 85 °C)*	V		5.75	6.3
Forward voltage (12 V, @ 700 mA, 85 °C)	V		11.5	12.6
LED junction temperature	°C			150

Note:

* Data for the 6-V configuration is calculated and for reference only.

FLUX CHARACTERISTICS, EASYWHITE® ORDER CODES AND BINS

The following table provides order codes for XLamp XHP50 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 23).

Binning condition: T_J = 85 °C; 12 V, I_F = 700 mA
Reference condition: T_J = 85 °C; 6 V, I_F = 1400 mA

Nominal CCT	CRI		Minimum Luminous Flux		2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm)	Group	Order Code	Group	Order Code	Group	Order Code
5000 K	70		J2	1040					50E	XHP50A-00-0000-0D0BJ250E
			H4	970						XHP50A-00-0000-0D0BH450E
	80		H4	970			50G	XHP50A-00-0000-0D0HH450G		
			H2	900				XHP50A-00-0000-0D0HH250G		
	90		F4	730			50G	XHP50A-00-0000-0D0UF450G		
			F2	680				XHP50A-00-0000-0D0UF250G		
4500 K	70		J2	1040					45E	XHP50A-00-0000-0D0BJ245E
			H4	970						XHP50A-00-0000-0D0BH445E
	80		H4	970			45G	XHP50A-00-0000-0D0HH445G		
			H2	900				XHP50A-00-0000-0D0HH245G		
	90		F4	730			45G	XHP50A-00-0000-0D0UF445G		
			F2	680				XHP50A-00-0000-0D0UF245G		

Notes:

- Cree 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 25).
- Cree XLamp XHP50 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, EASYWHITE® ORDER CODES AND BINS - CONTINUED

Nominal CCT	CRI		Minimum Luminous Flux		2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm)	Group	Order Code	Group	Order Code	Group	Order Code
4000 K	70		J2	1040					40E	XHP50A-00-0000-0D0BJ240E
			H4	970						XHP50A-00-0000-0D0BH440E
	80		H2	900	40H	XHP50A-00-0000-0D0HH240H	40G	XHP50A-00-0000-0D0HH240G		
			G4	840		XHP50A-00-0000-0D0HG440H		XHP50A-00-0000-0D0HG440G		
	90		F4	730	40H	XHP50A-00-0000-0D0UF440H	40G	XHP50A-00-0000-0D0UF440G		
			F2	680		XHP50A-00-0000-0D0UF240H		XHP50A-00-0000-0D0UF240G		
3500 K	70		H4	970					35E	XHP50A-00-0000-0D0BH435E
			H2	900						XHP50A-00-0000-0D0BH235E
	80		H2	900	35H	XHP50A-00-0000-0D0HH235H	35G	XHP50A-00-0000-0D0HH235G		
			G4	840		XHP50A-00-0000-0D0HG435H		XHP50A-00-0000-0D0HG435G		
	90		F4	730	35H	XHP50A-00-0000-0D0UF435H	35G	XHP50A-00-0000-0D0UF435G		
			F2	680		XHP50A-00-0000-0D0UF235H		XHP50A-00-0000-0D0UF235G		
3000 K	70		H2	900					30E	XHP50A-00-0000-0D0BH230E
			G4	840						XHP50A-00-0000-0D0BG430E
	80		G4	840	30H	XHP50A-00-0000-0D0HG430H	30G	XHP50A-00-0000-0D0HG430G		
			G2	780		XHP50A-00-0000-0D0HG230H		XHP50A-00-0000-0D0HG230G		
	90		F2	680	30H	XHP50A-00-0000-0D0UF230H	30G	XHP50A-00-0000-0D0UF230G		
			E4	635		XHP50A-00-0000-0D0UE430H		XHP50A-00-0000-0D0UE430G		

Notes:

- Cree 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 25).
- Cree XLamp XHP50 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, EASYWHITE® ORDER CODES AND BINS - CONTINUED

Nominal CCT	CRI		Minimum Luminous Flux		2-Step		3-Step		5-Step	
	Min	Typ	Group	Flux (lm)	Group	Order Code	Group	Order Code	Group	Order Code
2700 K	80		G4	840	27H	XHP50A-00-0000-0D0HG427H	27G	XHP50A-00-0000-0D0HG427G		
			G2	780		XHP50A-00-0000-0D0HG227H		XHP50A-00-0000-0D0HG227G		
	90		F2	680	27H	XHP50A-00-0000-0D0UF227H	27G	XHP50A-00-0000-0D0UF227G		
			E4	635		XHP50A-00-0000-0D0UE427H		XHP50A-00-0000-0D0UE427G		

Notes:

- Cree 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 25).
- Cree XLamp XHP50 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, ANSI WHITE ORDER CODES AND BINS

The following table provides order codes for XLamp XHP50 LEDs. For a complete description of the order code nomenclature, please see the Bin and Order Code Formats section (page 23).

Binning condition: T_J = 85 °C; 12 V, I_F = 700 mA
Reference condition: T_J = 85 °C; 6 V, I_F = 1400 mA

Nomimal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux		Order Code
		Min	Typ	Group	Flux (lm)	
7000 K	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U	0	68	J4	1120	XHP50A-00-0000-0D00J40DT
				J2	1040	XHP50A-00-0000-0D00J20DT
		70		J4	1120	XHP50A-00-0000-0D0BJ40DT
				J2	1040	XHP50A-00-0000-0D0BJ20DT
		80		H4	970	XHP50A-00-0000-0D0HH40DT
				H2	900	XHP50A-00-0000-0D0HH20DT
		90		G2	780	XHP50A-00-0000-0D0UG20DT
				F4	730	XHP50A-00-0000-0D0UF40DT
6500 K	0A, 0B, 0C, 0D, 0R, 0S, 0T, 0U, 1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U	0	68	J4	1120	XHP50A-00-0000-0D00J40CB
				J2	1040	XHP50A-00-0000-0D00J20CB
		70		J4	1120	XHP50A-00-0000-0D0BJ40CB
				J2	1040	XHP50A-00-0000-0D0BJ20CB
		80		H4	970	XHP50A-00-0000-0D0HH40CB
				H2	900	XHP50A-00-0000-0D0HH20CB
		90		G2	780	XHP50A-00-0000-0D0UG20CB
				F4	730	XHP50A-00-0000-0D0UF40CB
6500 K	1A, 1B, 1C, 1D	0	68	J4	1120	XHP50A-00-0000-0D00J40E1
				J2	1040	XHP50A-00-0000-0D00J20E1
		70		J4	1120	XHP50A-00-0000-0D0BJ40E1
				J2	1040	XHP50A-00-0000-0D0BJ20E1
		80		H4	970	XHP50A-00-0000-0D0HH40E1
				H2	900	XHP50A-00-0000-0D0HH20E1
		90		G2	780	XHP50A-00-0000-0D0UG20E1
				F4	730	XHP50A-00-0000-0D0UF40E1

Notes:
- Cree 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 25).
- Cree XLamp XHP50 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, ANSI WHITE ORDER CODES AND BINS - CONTINUED

Nomimal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux		Order Code
		Min	Typ	Group	Flux (lm)	
6000 K	1A, 1B, 1C, 1D, 1R, 1S, 1T, 1U, 2A, 2B, 2C, 2D, 2R, 2S, 2T, 2U	0	68	J4	1120	XHP50A-00-0000-0D00J40DV
				J2	1040	XHP50A-00-0000-0D00J20DV
		70		J4	1120	XHP50A-00-0000-0D0BJ40DV
				J2	1040	XHP50A-00-0000-0D0BJ20DV
		80		H4	970	XHP50A-00-0000-0D0HH40DV
				H2	900	XHP50A-00-0000-0D0HH20DV
		90		G2	780	XHP50A-00-0000-0D0UG20DV
				F4	730	XHP50A-00-0000-0D0UF40DV
5700 K	2A, 2B, 2C, 2D	0	68	J4	1120	XHP50A-00-0000-0D00J40E2
				J2	1040	XHP50A-00-0000-0D00J20E2
		70		J4	1120	XHP50A-00-0000-0D0BJ40E2
				J2	1040	XHP50A-00-0000-0D0BJ20E2
		80		H4	970	XHP50A-00-0000-0D0HH40E2
				H2	900	XHP50A-00-0000-0D0HH20E2
		90		G2	780	XHP50A-00-0000-0D0UG20E2
				F4	730	XHP50A-00-0000-0D0UF40E2
5000 K	3A, 3B, 3C, 3D	0	68	J2	1040	XHP50A-00-0000-0D00J20E3
				H4	970	XHP50A-00-0000-0D00H40E3
		70		J2	1040	XHP50A-00-0000-0D0BJ20E3
				H4	970	XHP50A-00-0000-0D0BH40E3
		80		H4	970	XHP50A-00-0000-0D0HH40E3
				H2	900	XHP50A-00-0000-0D0HH20E3
		90		F4	730	XHP50A-00-0000-0D0UF40E3
				F2	680	XHP50A-00-0000-0D0UF20E3
4500 K	4A, 4B, 4C, 4D	0	68	J2	1040	XHP50A-00-0000-0D00J20E4
				H4	970	XHP50A-00-0000-0D00H40E4
		70		J2	1040	XHP50A-00-0000-0D0BJ20E4
				H4	970	XHP50A-00-0000-0D0BH40E4
		80		H2	900	XHP50A-00-0000-0D0HH20E4
				G4	840	XHP50A-00-0000-0D0HG40E4
		90		F4	730	XHP50A-00-0000-0D0UF40E4
				F2	680	XHP50A-00-0000-0D0UF20E4

Notes:

- Cree 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 25).
- Cree XLamp XHP50 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.

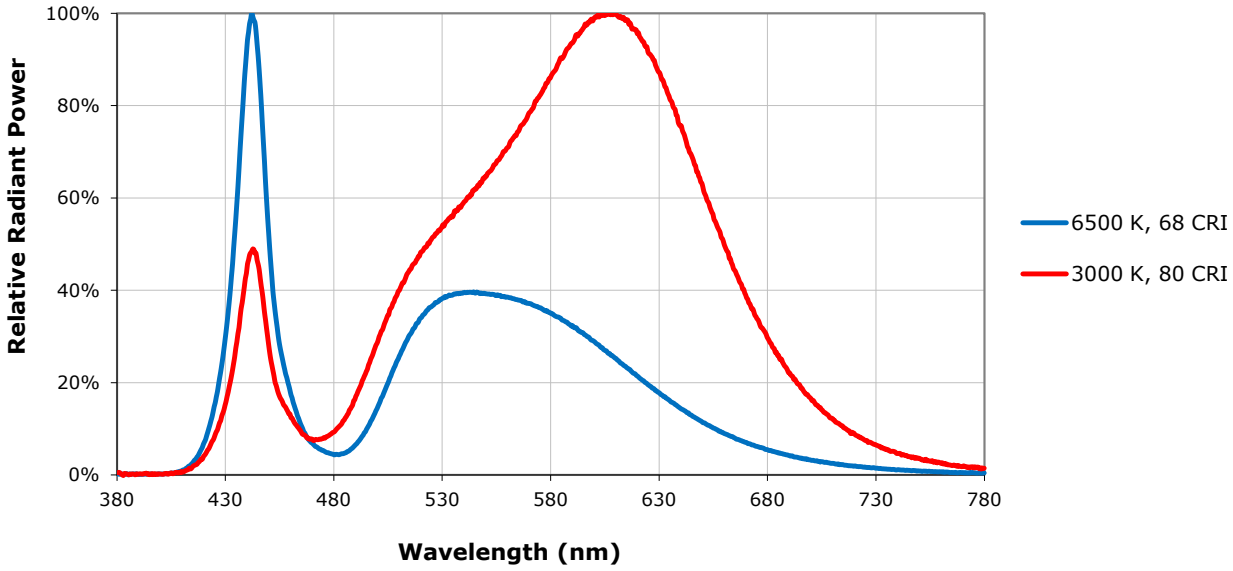
FLUX CHARACTERISTICS, ANSI WHITE ORDER CODES AND BINS - CONTINUED

Nomimal CCT	Chromaticity Regions	CRI		Minimum Luminous Flux		Order Code
		Min	Typ	Group	Flux (lm)	
4000 K	5A, 5B, 5C, 5D	0	68	J2	1040	XHP50A-00-0000-0D00J20E5
				H4	970	XHP50A-00-0000-0D00H40E5
		70		J2	1040	XHP50A-00-0000-0D0BJ20E5
				H4	970	XHP50A-00-0000-0D0BH40E5
		80		H2	900	XHP50A-00-0000-0D0HH20E5
				G4	840	XHP50A-00-0000-0D0HG40E5
		90		F4	730	XHP50A-00-0000-0D0UF40E5
				F2	680	XHP50A-00-0000-0D0UF20E5
3500 K	6A, 6B, 6C, 6D	70		H4	970	XHP50A-00-0000-0D0BH40E6
				H2	900	XHP50A-00-0000-0D0BH20E6
3000 K	7A, 7B, 7C, 7D	70		H2	900	XHP50A-00-0000-0D0BH20E7
				G4	840	XHP50A-00-0000-0D0BG40E7

Notes:

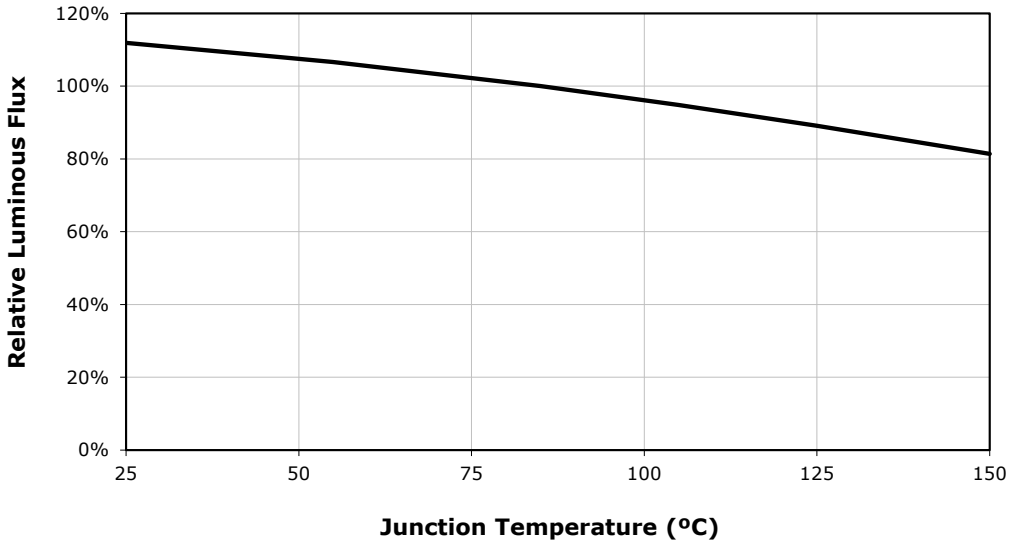
- Cree maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity (CCx, CCy) measurements and ±2 on CRI measurements. See the Measurements section (page 25).
- Cree XLamp XHP50 LED order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins 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.

RELATIVE SPECTRAL POWER DISTRIBUTION

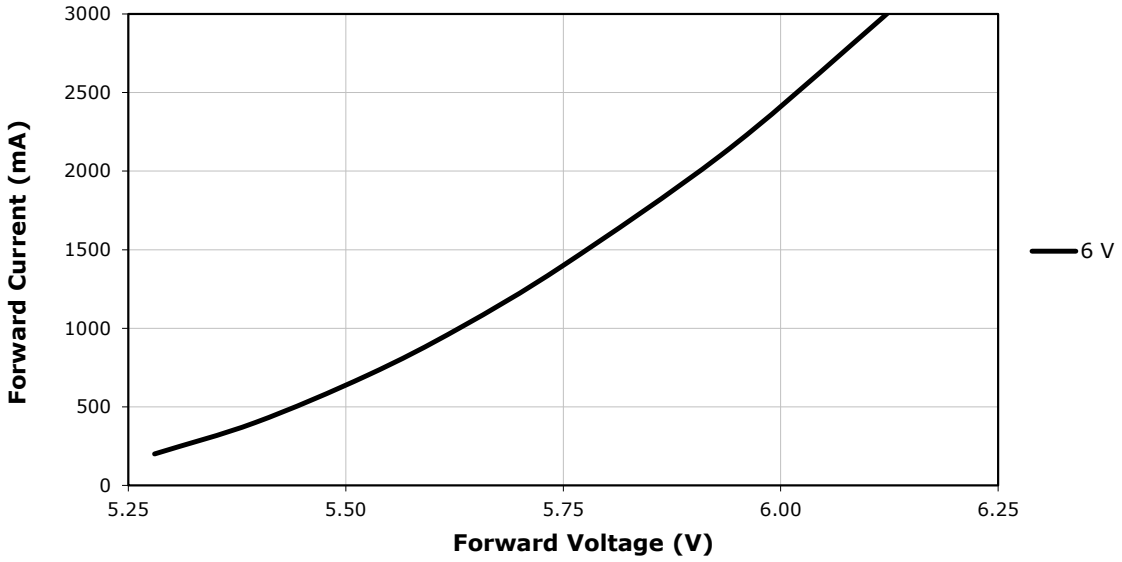


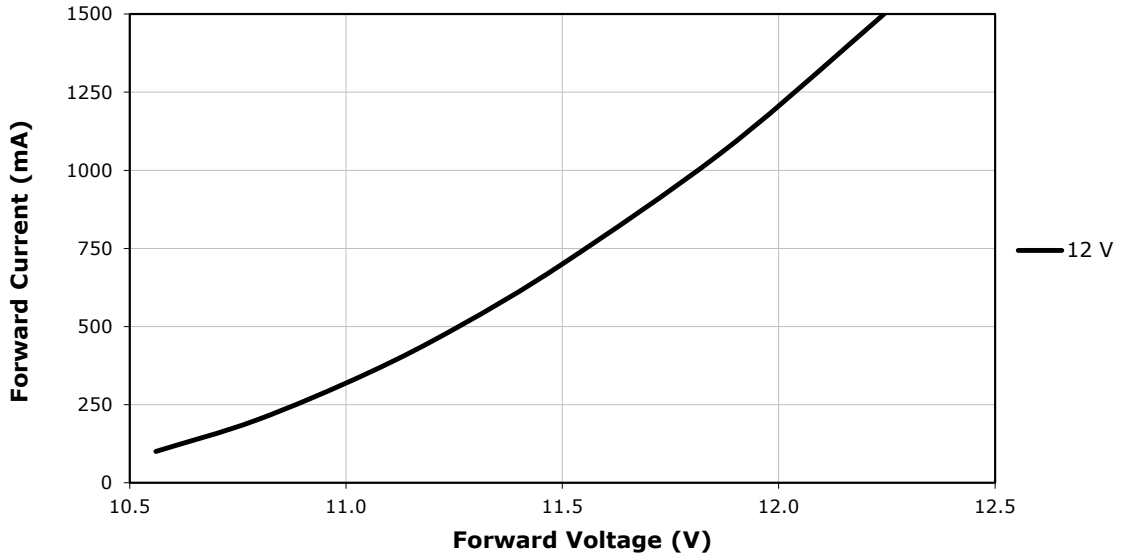
RELATIVE FLUX VS. JUNCTION TEMPERATURE

Reference condition: 6 V, I_F = 1400 mA; 12 V, I_F = 700 mA

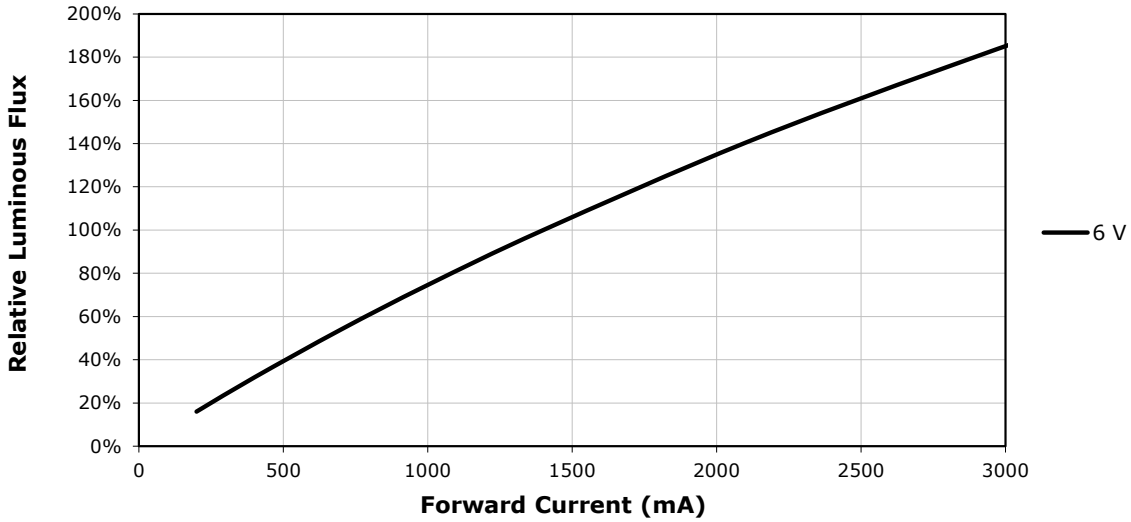


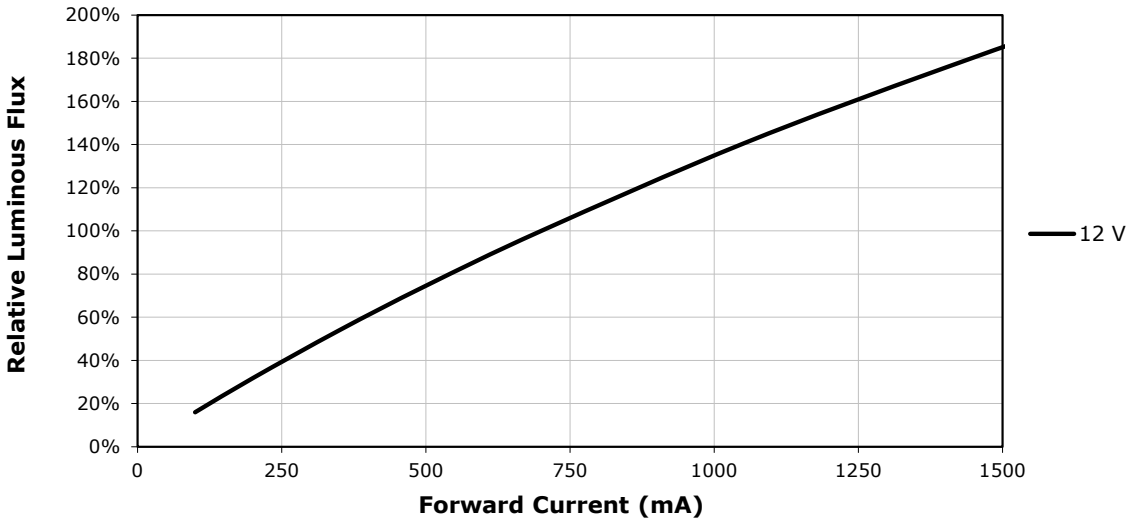
ELECTRICAL CHARACTERISTICS (T_J = 85 °C)



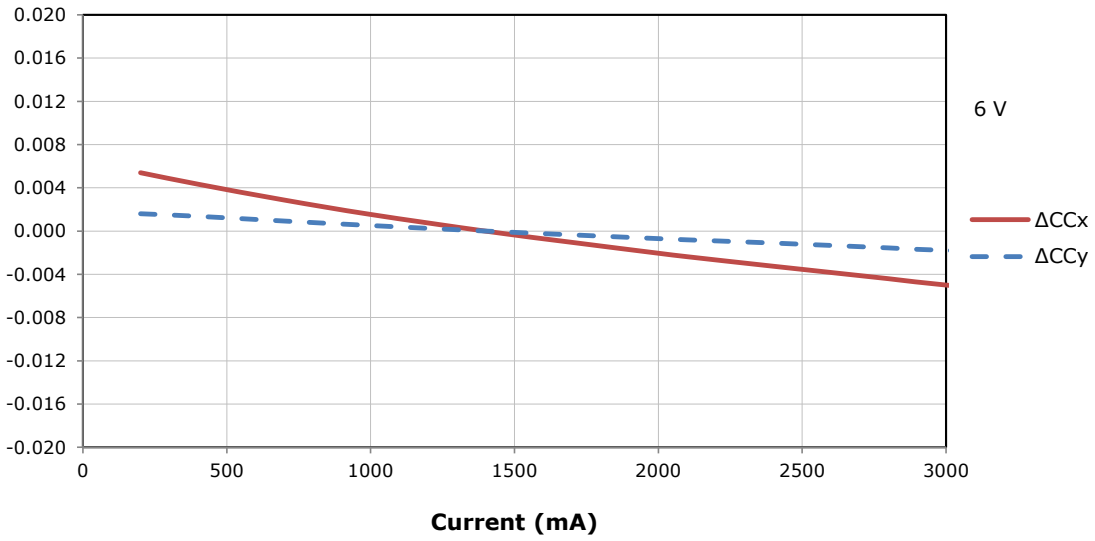


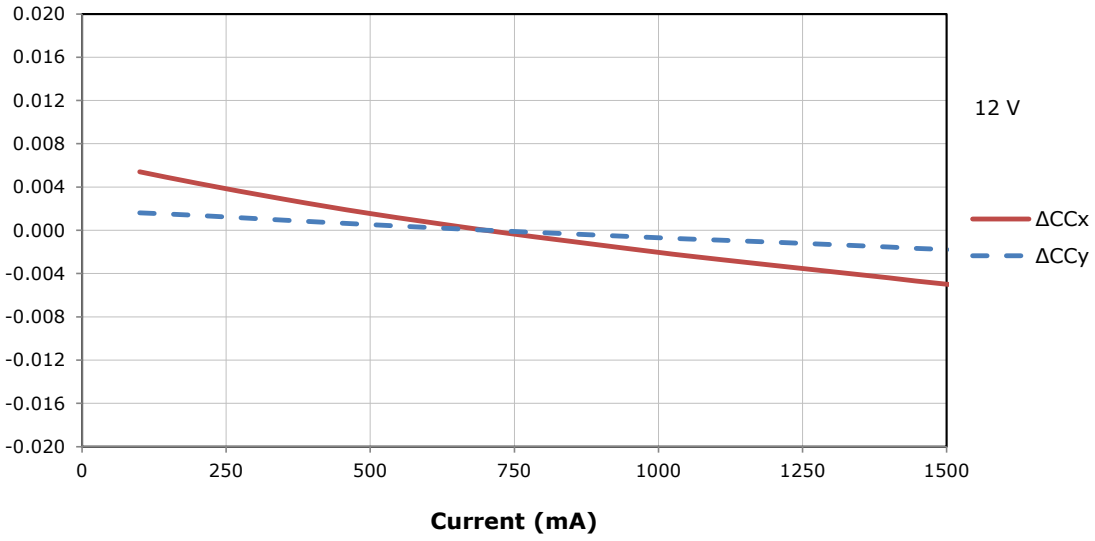
RELATIVE FLUX VS. CURRENT (T_J = 85 °C)





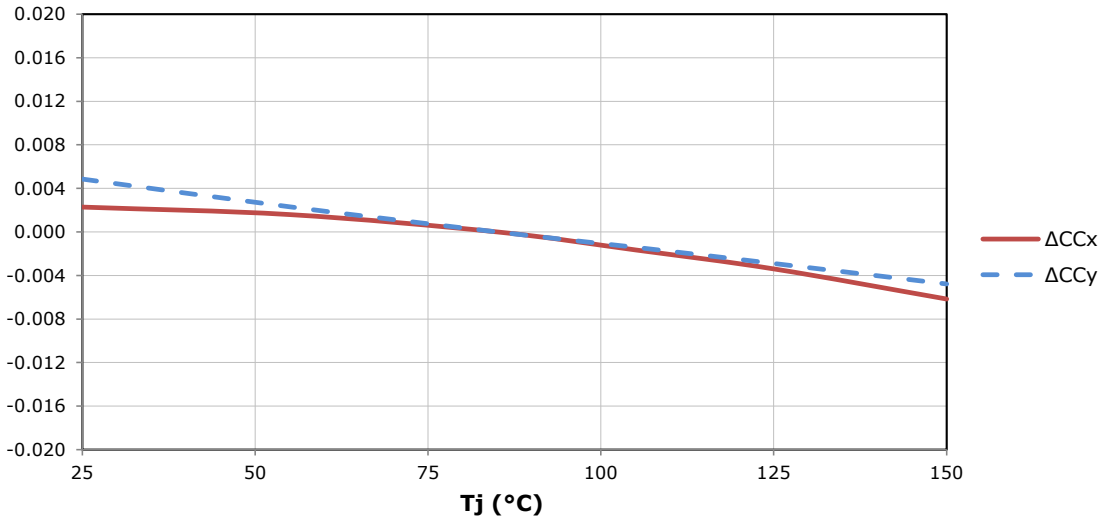
RELATIVE CHROMATICITY VS CURRENT (WARM WHITE)





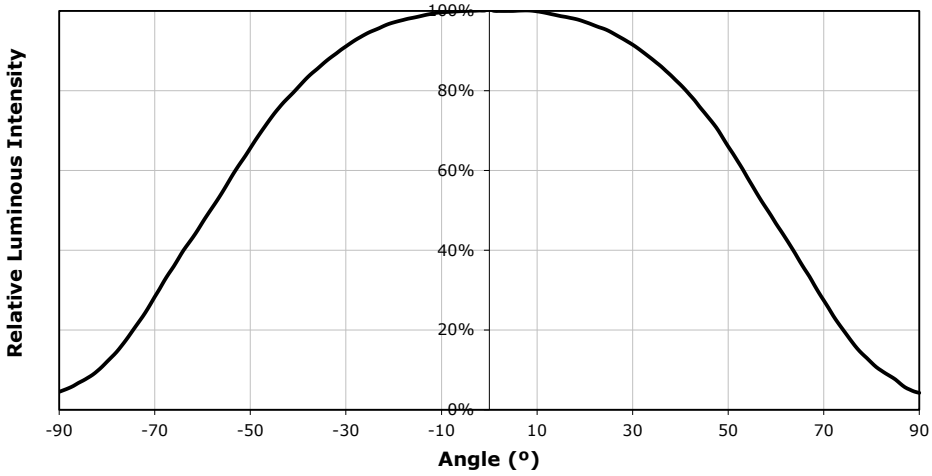
RELATIVE CHROMATICITY VS TEMPERATURE (WARM WHITE)

Reference condition: 6 V, I_F = 1400 mA; 12 V, I_F = 700 mA



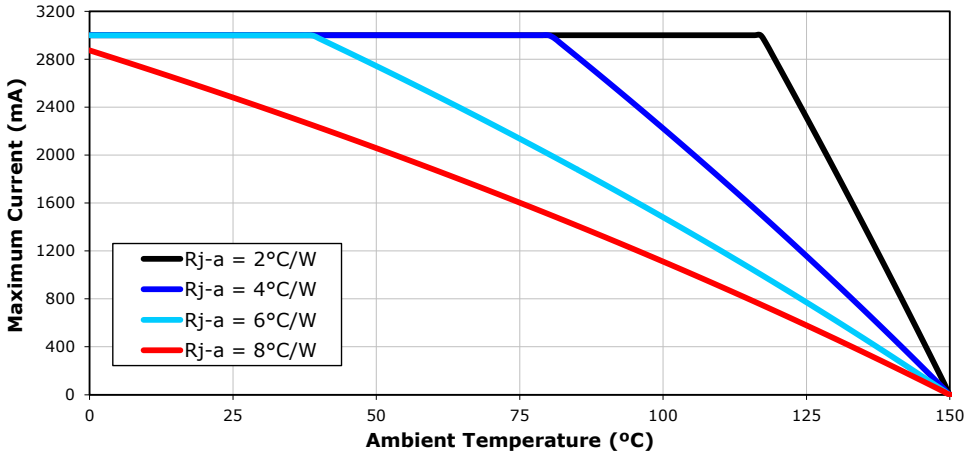
TYPICAL SPATIAL DISTRIBUTION

Reference condition: T_J = 85 °C; 6 V, I_F = 1400 mA; 12 V, I_F = 700 mA

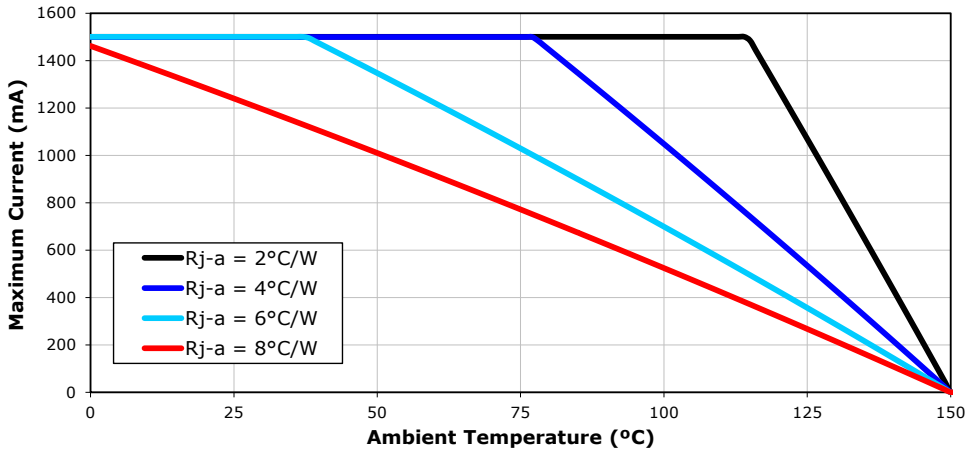


THERMAL DESIGN

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.



6 V



12 V

PERFORMANCE GROUPS – LUMINOUS FLUX (T_J = 85 °C)

XLamp XHP50 LEDs are tested for luminous flux and placed into one of the following luminous-flux groups.

Group Code	Min. Luminous Flux	Max. Luminous Flux
E4	635	680
F2	680	730
F4	730	780
G2	780	840
G4	840	900
H2	900	970
H4	970	1040
J2	1040	1120
J4	1120	1200

PERFORMANCE GROUPS – CHROMATICITY

XLamp XHP50 LEDs are tested for chromaticity and placed into one of the regions defined by the following bounding coordinates.

Region	x	y	Region	x	y	Region	x	y	Region	x	y
0A	0.2950	0.2970	0B	0.2920	0.3060	0C	0.2984	0.3133	0D	0.2984	0.3133
	0.2920	0.3060		0.2895	0.3135		0.2962	0.3220		0.3048	0.3207
	0.2984	0.3133		0.2962	0.3220		0.3028	0.3304		0.3068	0.3113
	0.3009	0.3042		0.2984	0.3133		0.3048	0.3207		0.3009	0.3042
0R	0.2980	0.2880	0S	0.2895	0.3135	0T	0.2962	0.3220	0U	0.3037	0.2937
	0.2950	0.2970		0.2870	0.3210		0.2937	0.3312		0.3009	0.3042
	0.3009	0.3042		0.2937	0.3312		0.3005	0.3415		0.3068	0.3113
	0.3037	0.2937		0.2962	0.3220		0.3028	0.3304		0.3093	0.2993
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
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

PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

EasyWhite Color Temperatures – 2-Step			
Bin Code	**CCT**	**x**	**y**
40H	4000 K	0.3777	0.3739
		0.3797	0.3816
		0.3861	0.3855
		0.3838	0.3777
35H	3500 K	0.4022	0.3858
		0.4053	0.3942
		0.4125	0.3977
		0.4091	0.3891
30H	3000 K	0.4287	0.3975
		0.4328	0.4064
		0.4390	0.4086
		0.4347	0.3996
27H	2700 K	0.4524	0.4048
		0.4574	0.4140
		0.4633	0.4154
		0.4581	0.4062

EasyWhite Color Temperatures – 3-Step Ellipse						
Bin Code	**CCT**	**Center Point**		**Major Axis**	**Minor Axis**	**Rotation Angle (°)**
		x	**y**	**a**	**b**	
50G	5000 K	0.3447	0.3553	0.00840	0.00312	65.0
45G	4500 K	0.3611	0.3658	0.00852	0.00330	61.5
40G	4000 K	0.3818	0.3797	0.00939	0.00402	53.7
35G	3500 K	0.4073	0.3917	0.00927	0.00414	54.0
30G	3000 K	0.4338	0.4030	0.00834	0.00408	53.2
27G	2700 K	0.4577	0.4099	0.00834	0.00420	48.5

EasyWhite Color Temperatures – 5-Step Ellipse						
Bin Code	**CCT**	**Center Point**		**Major Axis**	**Minor Axis**	**Rotation Angle (°)**
		x	**y**	**a**	**b**	
50E	5000 K	0.3447	0.3553	0.01400	0.00520	65.0
45E	4500 K	0.3611	0.3658	0.01420	0.00550	61.5
40E	4000 K	0.3818	0.3797	0.01565	0.00670	53.7
35E	3500 K	0.4073	0.3917	0.01545	0.00690	54.0
30E	3000 K	0.4338	0.4030	0.01390	0.00680	53.2

PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

ANSI White Bins			
CCT	Bin Code	x	y
6500 K	1A0	0.3048	0.3207
		0.3130	0.3290
		0.3144	0.3186
		0.3068	0.3113
	1B0	0.3028	0.3304
		0.3115	0.3391
		0.3130	0.3290
		0.3048	0.3207
	1C0	0.3115	0.3391
		0.3205	0.3481
		0.3213	0.3373
		0.3130	0.3290
	1D0	0.3130	0.3290
		0.3213	0.3373
		0.3221	0.3261
		0.3144	0.3186

ANSI White Bins			
CCT	Bin Code	x	y
5700 K	2A0	0.3215	0.3350
		0.3290	0.3417
		0.3290	0.3300
		0.3222	0.3243
	2B0	0.3207	0.3462
		0.3290	0.3538
		0.3290	0.3417
		0.3215	0.3350
	2C0	0.3290	0.3538
		0.3376	0.3616
		0.3371	0.3490
		0.3290	0.3417
	2D0	0.3290	0.3417
		0.3371	0.3490
		0.3366	0.3369
		0.3290	0.3300

ANSI White Bins			
CCT	Bin Code	x	y
5000 K	3A0	.3371	.3490
		.3451	.3554
		.3440	.3427
		.3366	.3369
	3B0	.3376	.3616
		.3463	.3687
		.3451	.3554
		.3371	.3490
	3C0	.3463	.3687
		.3551	.3760
		.3533	.3620
		.3451	.3554
	3D0	.3451	.3554
		.3533	.3620
		.3515	.3487
		.3440	.3427

ANSI White Bins			
CCT	Bin Code	x	y
4500 K	4A0	0.3530	0.3597
		0.3615	0.3659
		0.3512	0.3465
		0.3515	0.3487
	4B0	0.3548	0.3736
		0.3641	0.3804
		0.3530	0.3597
		0.3533	0.362
	4C0	0.3641	0.3804
		0.3736	0.3874
		0.3702	0.3722
		0.3615	0.3659
	4D0	0.3615	0.3659
		0.3702	0.3722
		0.3670	0.3578
		0.3590	0.3521

ANSI White Bins			
CCT	Bin Code	x	y
4000 K	5A0	.3670	.3578
		.3702	.3722
		.3825	.3798
		.3783	.3646
	5B0	.3702	.3722
		.3736	.3874
		.3869	.3958
		.3825	.3798
	5C0	.3825	.3798
		.3869	.3958
		.4006	.4044
		.3950	.3875
	5D0	.3783	.3646
		.3825	.3798
		.3950	.3875
		.3898	.3716

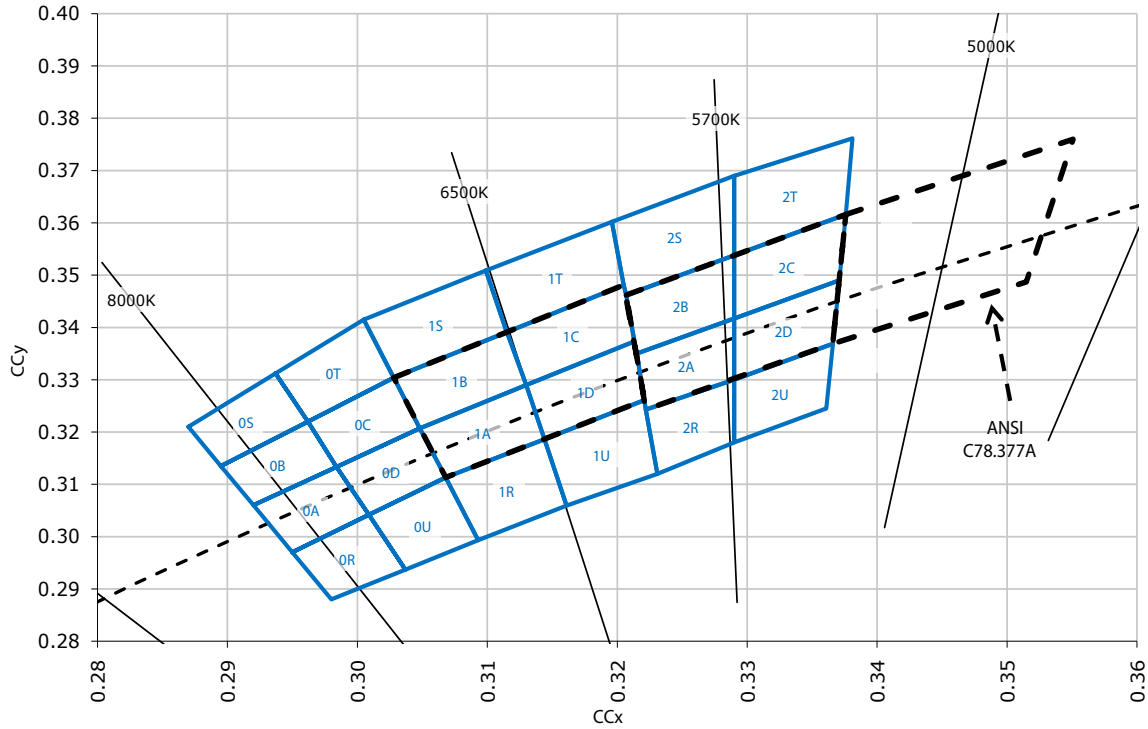
ANSI White Bins			
CCT	Bin Code	x	y
3500 K	6A0	.3889	.3690
		.3941	.3848
		.4080	.3916
		.4017	.3751
	6B0	.3941	.3848
		.3996	.4015
		.4146	.4089
		.4080	.3916
	6C0	.4080	.3916
		.4146	.4089
		.4299	.4165
		.4221	.3984
	6D0	.4017	.3751
		.4080	.3916
		.4221	.3984
		.4147	.3814

PERFORMANCE GROUPS – CHROMATICITY (CONTINUED)

ANSI White Bins			
CCT	**Bin Code**	**x**	**y**
3000 K	7A0	.4147	.3814
		.4221	.3984
		.4342	.4028
		.4259	.3853
	7B0	.4221	.3984
		.4299	.4165
		.4430	.4212
		.4342	.4028
	7C0	.4342	.4028
		.4430	.4212
		.4562	.4260
		.4465	.4071
	7D0	.4259	.3853
		.4342	.4028
		.4465	.4071
		.4373	.3893

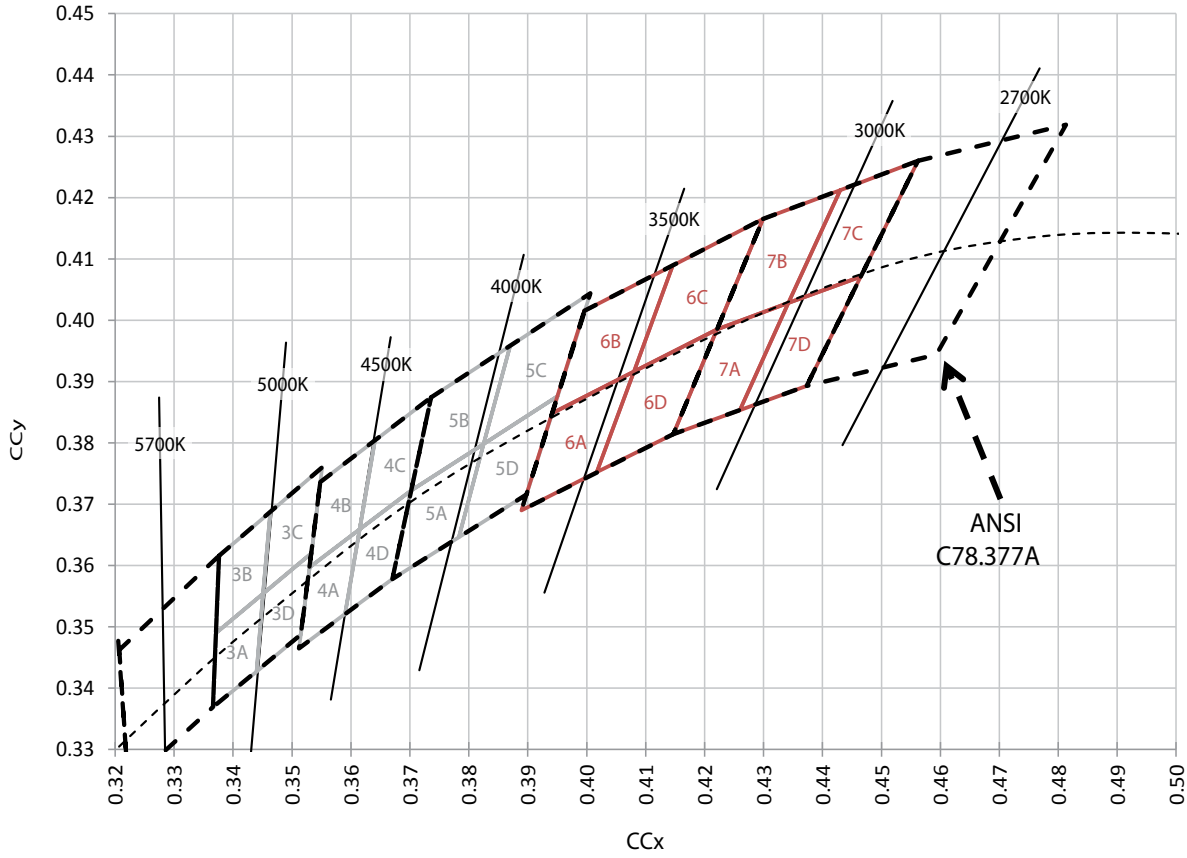
CREE'S STANDARD WHITE CHROMATICITY REGIONS PLOTTED ON THE CIE 1931 CURVE

ANSI Cool White

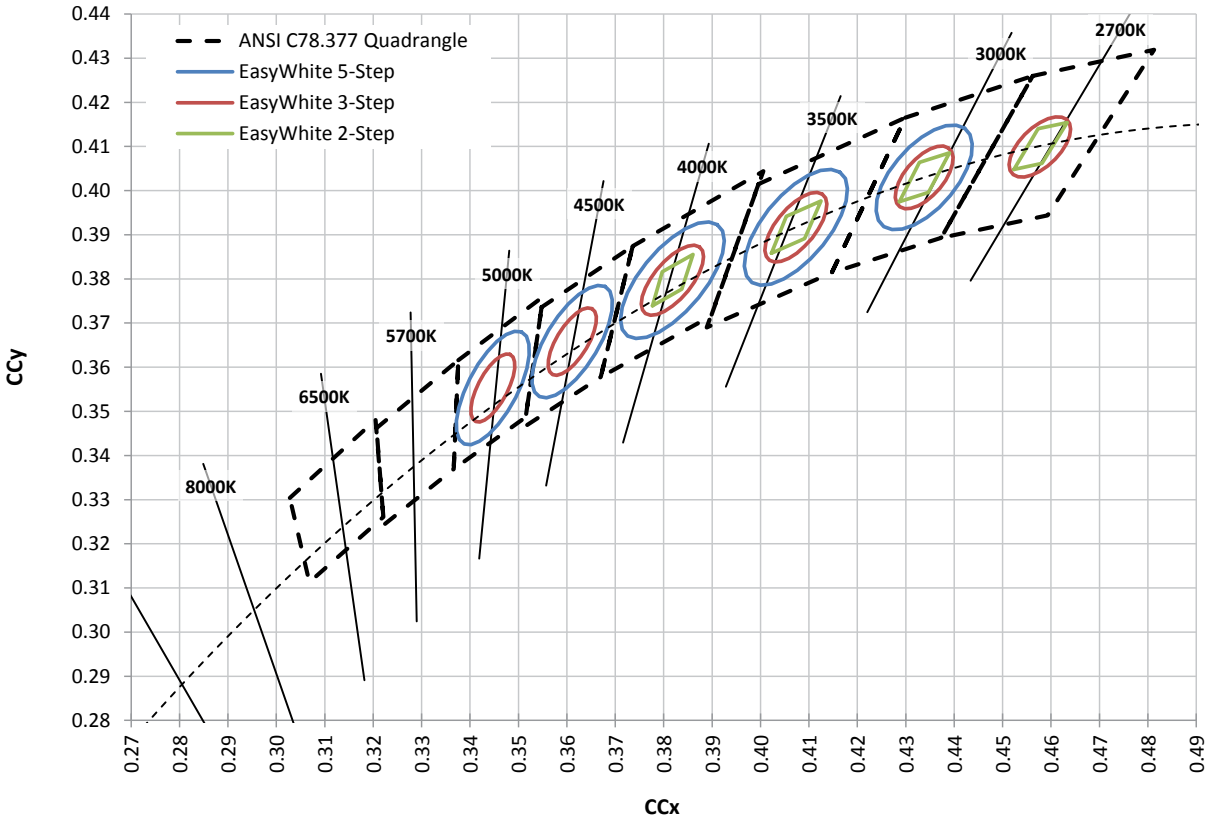


CREE'S STANDARD WHITE CHROMATICITY REGIONS PLOTTED ON THE CIE 1931 CURVE - CONTINUED

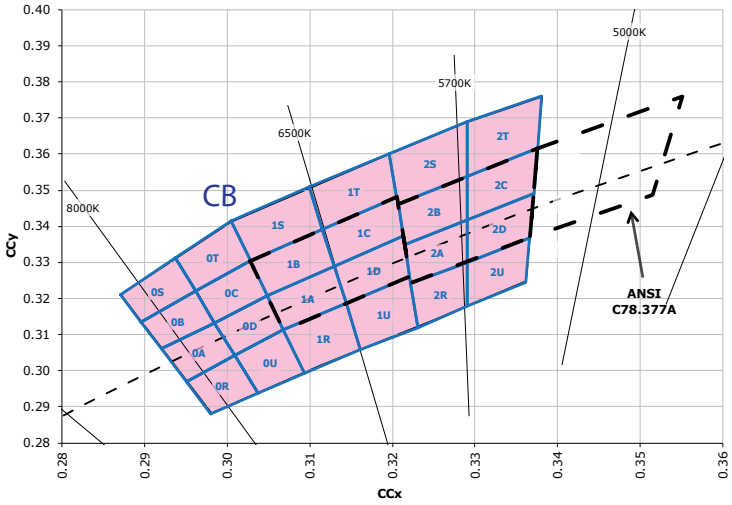
ANSI Neutral White and ANSI Warm White

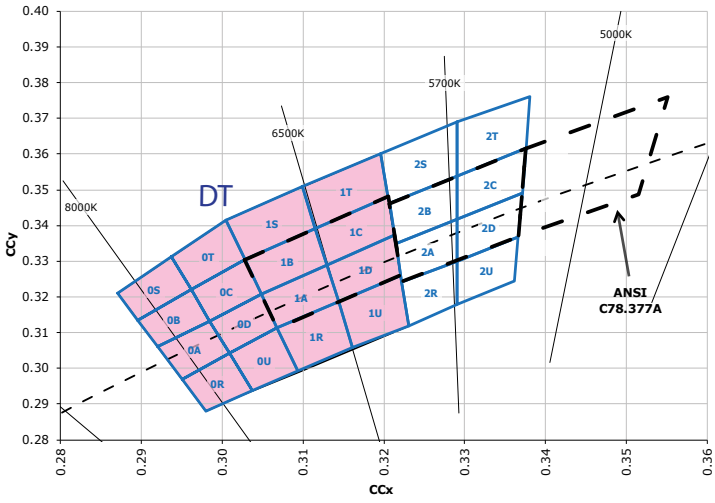


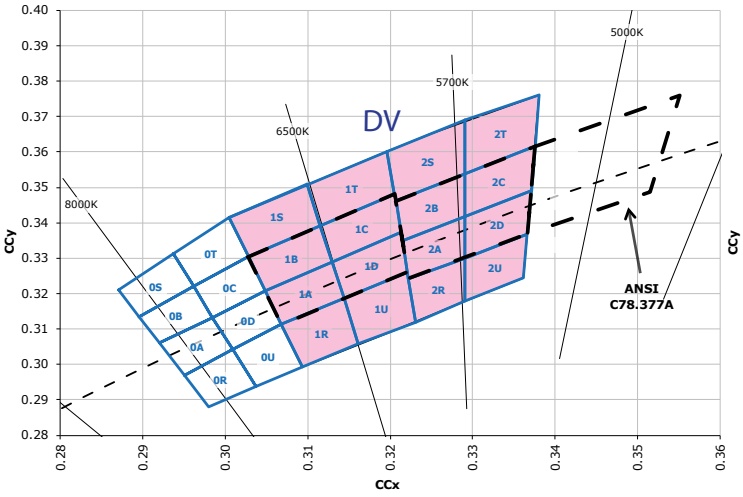
CREE'S STANDARD WHITE CHROMATICITY REGIONS PLOTTED ON THE CIE 1931 CURVE - CONTINUED

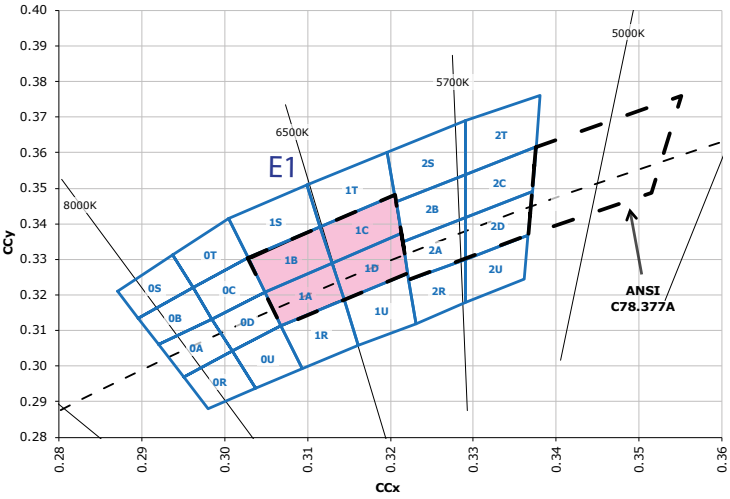


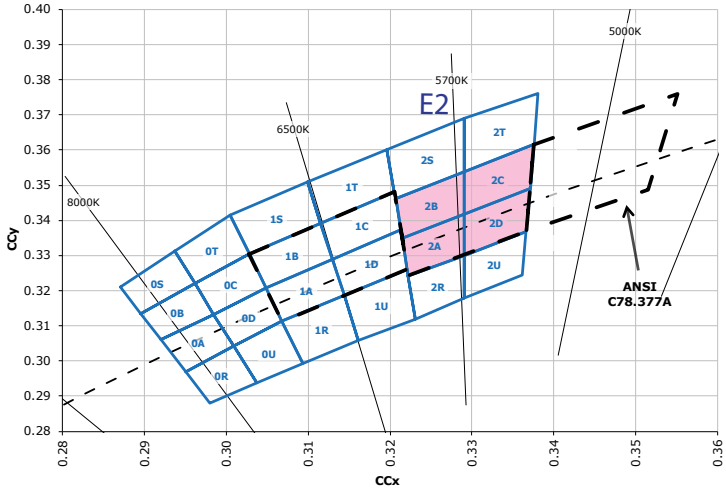
CREE'S STANDARD COOL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



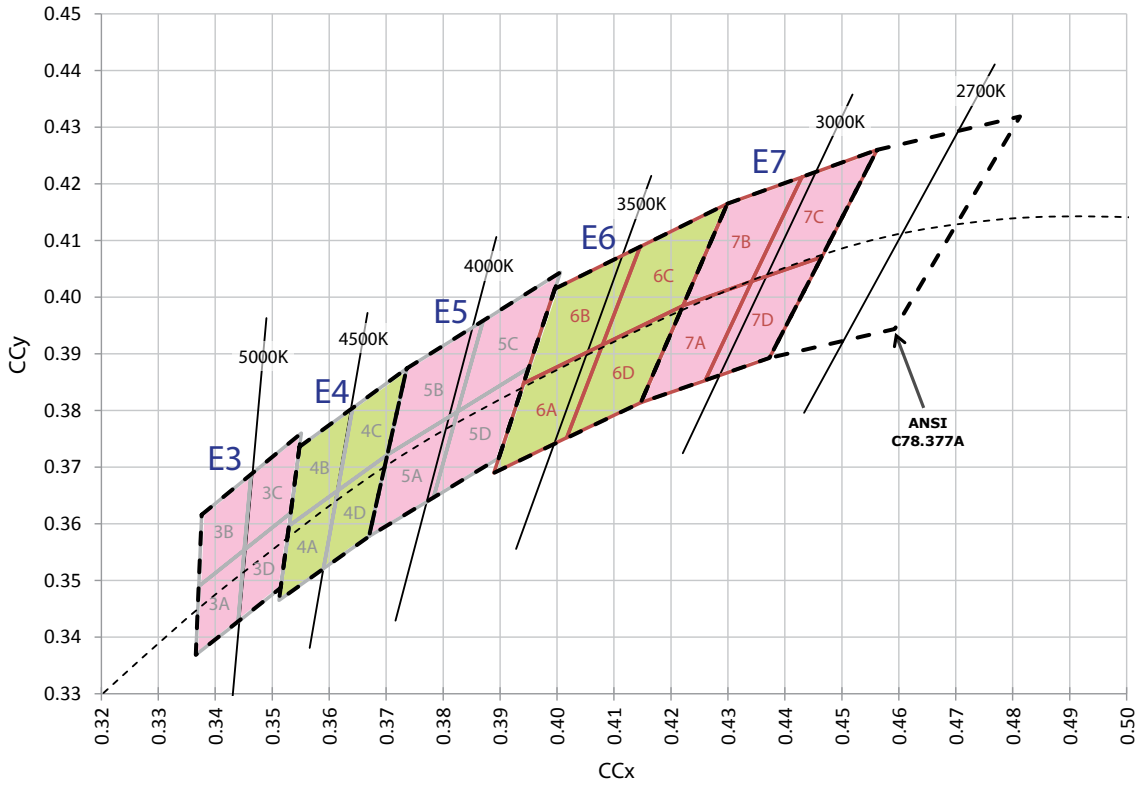








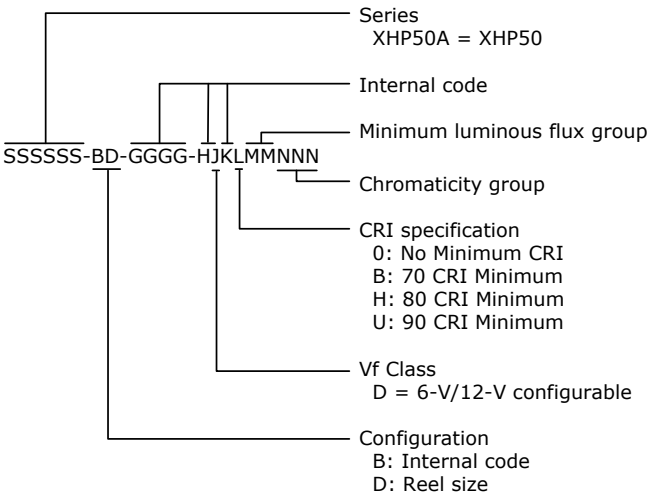
CREE'S STANDARD WARM AND NEUTRAL WHITE KITS PLOTTED ON ANSI STANDARD CHROMATICITY REGIONS



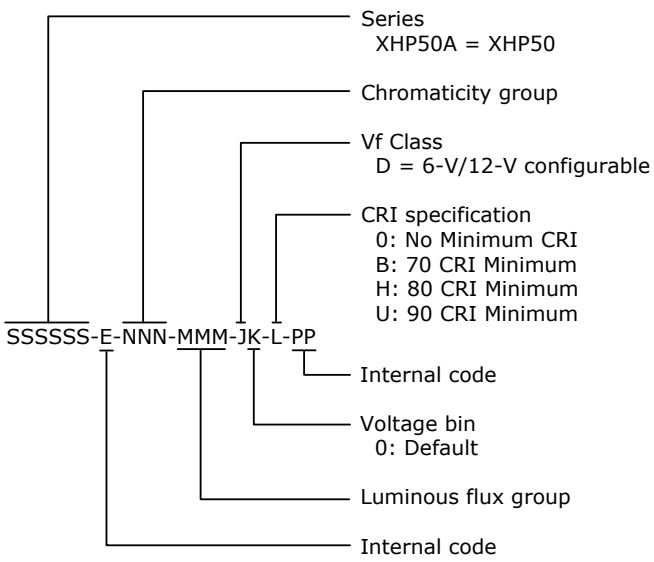
BIN AND ORDER-CODE FORMAT

Bin codes and order codes for XHP50 LEDs are configured in the following manner:

Order Code



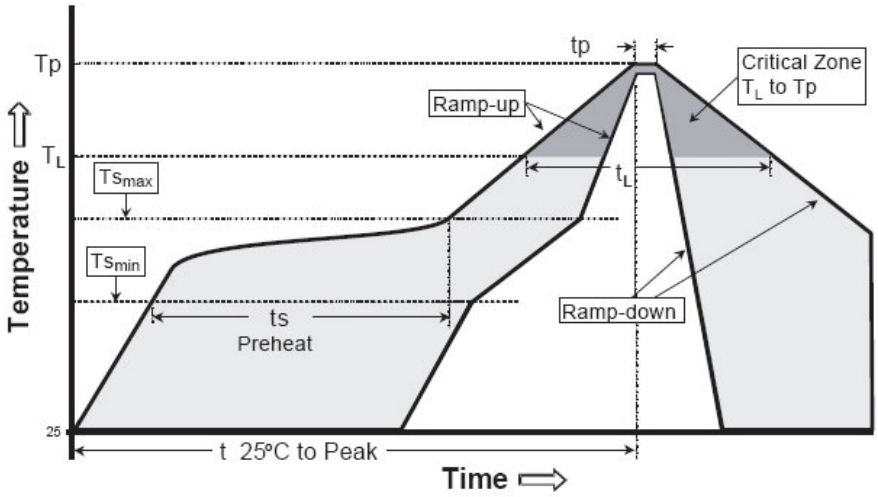
Bin Code



REFLOW SOLDERING CHARACTERISTICS

In testing, Cree has found XLamp XHP50 LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, Cree recommends that users follow the recommended soldering profile provided by the manufacturer of solder paste used.

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-Based Solder	Lead-Free Solder
Average Ramp-Up Rate (Ts_{max} to Tp)	3 °C/second max.	3 °C/second max.
Preheat: Temperature Min (Ts_{min})	100 °C	150 °C
Preheat: Temperature Max (Ts_{max})	150 °C	200 °C
Preheat: Time (ts_{min} to ts_{max})	60-120 seconds	60-180 seconds
Time Maintained Above: Temperature (T_L)	183 °C	217 °C
Time Maintained Above: Time (t_L)	60-150 seconds	60-150 seconds
Peak/Classification Temperature (Tp)	215 °C	260 °C
Time Within 5 °C of Actual Peak Temperature (tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6 °C/second max.	6 °C/second max.
Time 25 °C to Peak Temperature	6 minutes max.	8 minutes max.

Note: All temperatures refer to the topside of the package, measured on the package body surface.

NOTES

Measurements

The luminous flux, radiant power, chromaticity 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'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 as specifications.

Lumen Maintenance

Cree 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'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 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 XHP50 LEDs may be stored as MSL 1 per JEDEC J-STD-033, meaning they have unlimited floor life in conditions of ≤ 30 ºC/85% relative humidity (RH). Regardless of the storage condition, Cree recommends sealing any unsoldered LEDs in the original MBP.

UL® Recognized Component

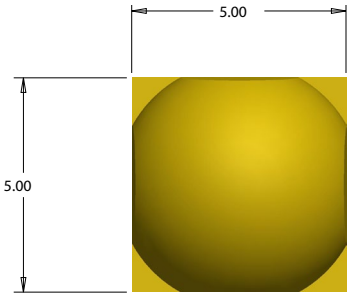
Level 4 enclosure consideration. The LED package or a portion thereof has been investigated as a fire and electrical enclosure per ANSI/UL 8750.

Vision Advisory

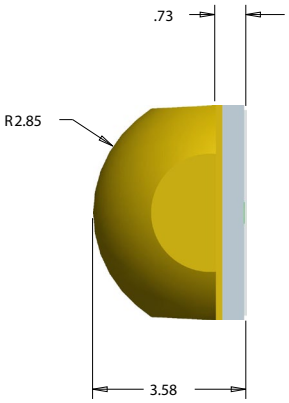
WARNING: Do not look at exposed lamp in operation. Eye injury can result. For more information about LEDs and eye safety, please refer to the LED Eye Safety application note.

MECHANICAL DIMENSIONS

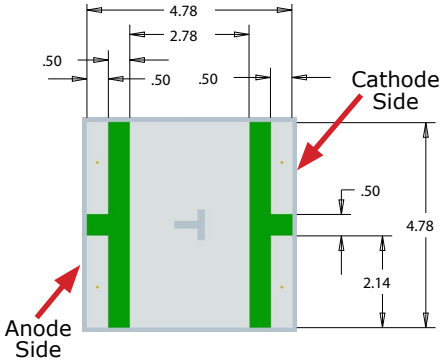
All dimensions are ±.13 mm unless otherwise indicated.



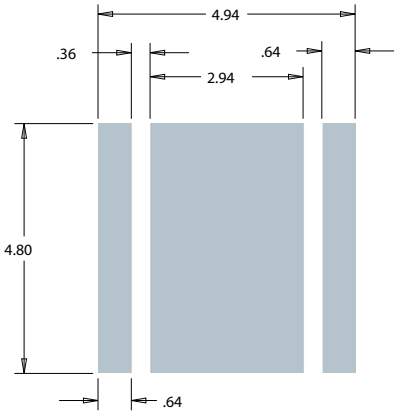
Top View



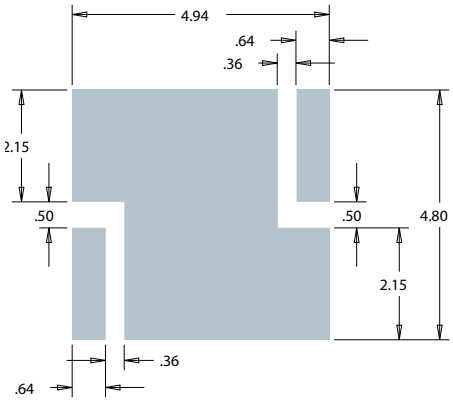
Side View



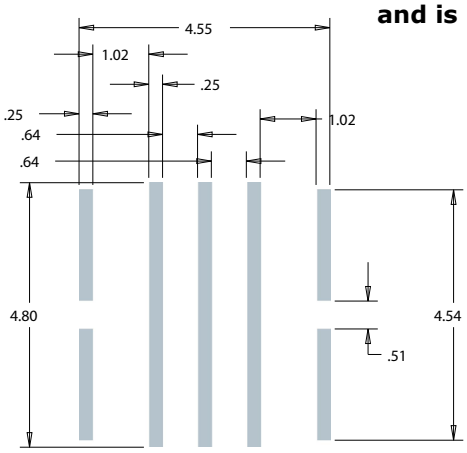
Bottom View - as shown in this view, thermal pad is electrically isloated



Recommended PCB Solder Pad 6 V Configuration (thermal pad is electrically isolated)

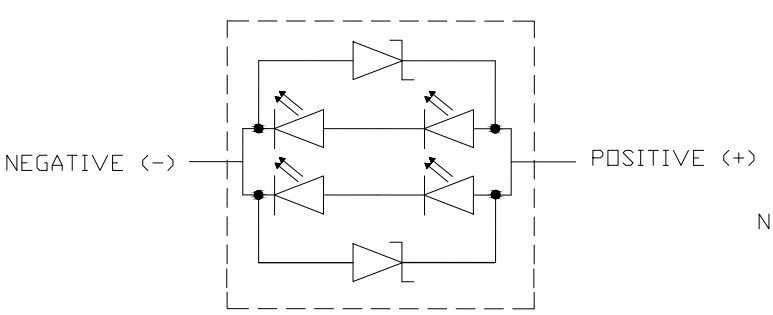


Recommended PCB Solder Pad 12 V Configuration (thermal pad is connected to anode and cathode and is not electrically isolated)

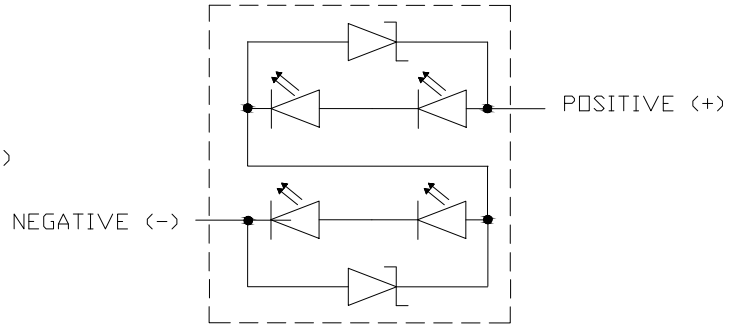


Recommended Stencil Pattern 6 V & 12 V Configurations (shaded area is open)

ELECTRICAL CONFIGURATION



6-V Configuration

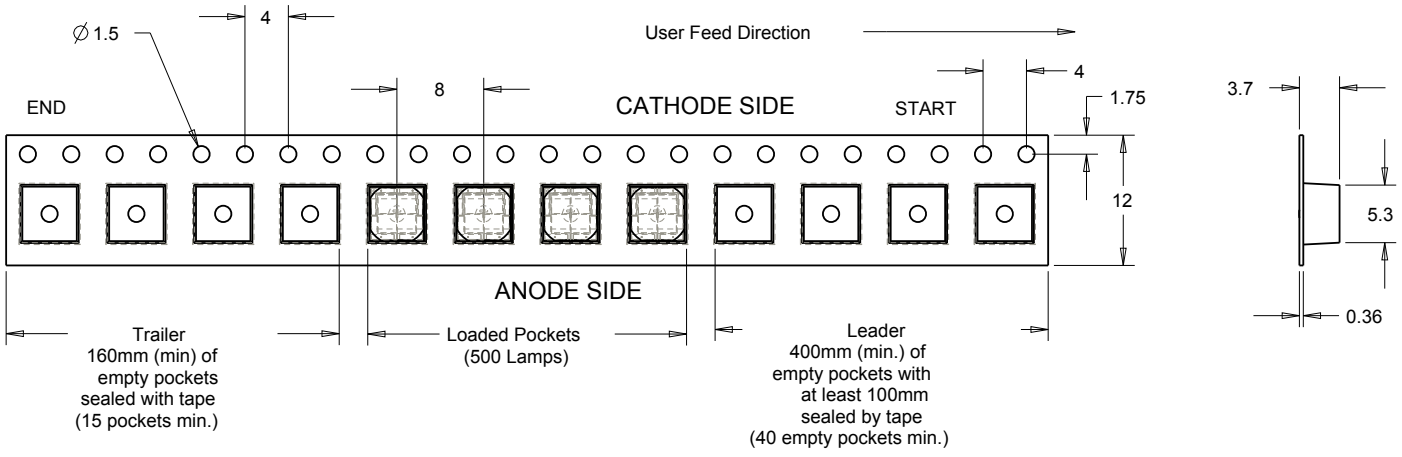


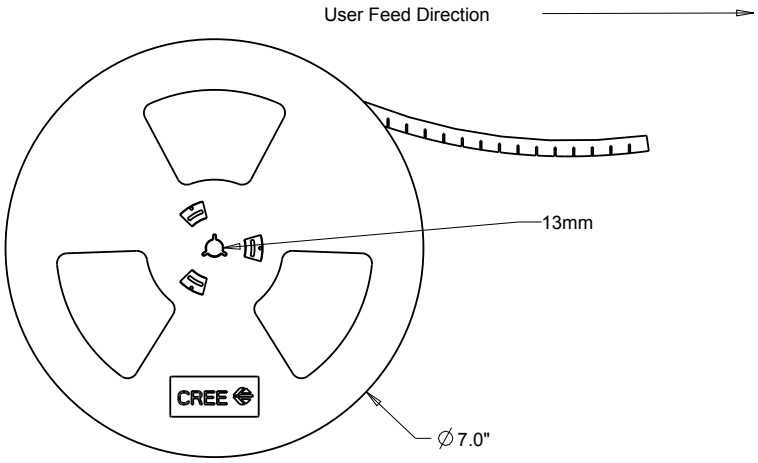
12-V Configuration

TAPE AND REEL

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

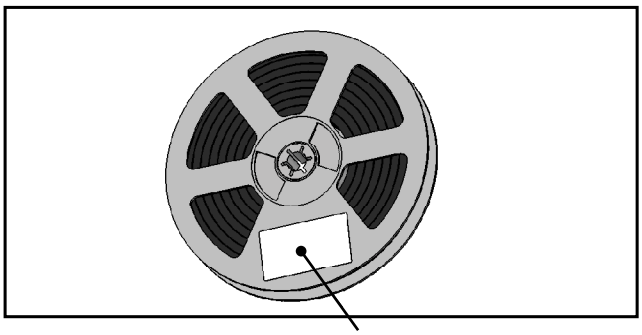
All dimensions are ±.13 mm unless otherwise indicated.



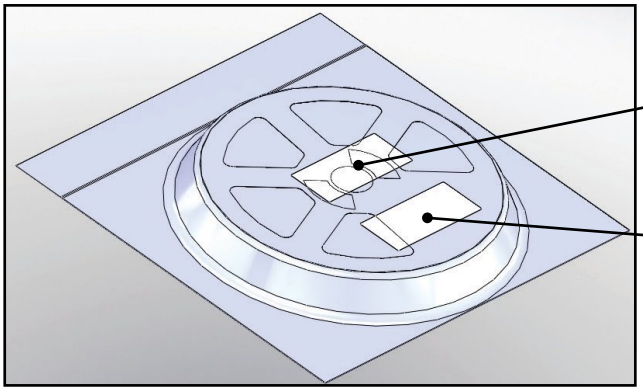


PACKAGING

Unpackaged Reel



Packaged Reel



Boxed Reel