

Cree® PLCC2 White SMD LED

CLM3C-WKW/MKW

Data Sheet

Cree PLCC white LEDs offer high-intensity light output and a wide viewing angle in an industry-standard package. The flat-top package eases mating with light pipes for customized lighting solutions. Designed to work in a wide array of environmental conditions, Cree PLCC white LEDs are suited for lighting applications such as linear, channel-letter and backlighting.



FEATURES

- Size (mm): 2.7 x 2.0
- Color Temperatures (K):
 - » CLM3C-WKW: Cool White (4600 to 15000) / Typical (5500)
 - » CLM3C-MKW: Warm White (2500 to 4600) / Typical (3200)
- CRI
 - » Typical CRI for Cool White (4600 – 15000K) is 72
 - » Typical CRI for Warm White (2500 – 4600K) is 80
- Viewing Angle: 120 degrees
- Luminous Intensity (mcd):
 - » Cool White (1400 - 3550)
 - » Warm White (1120 - 2800)
- RoHS-Compliant

APPLICATIONS

- Light Strip
- Channel Letter
- Backlight



Absolute Maximum Ratings ($T_A = 25^{\circ}\text{C}$)

Items	Symbol	Absolute Maximum Rating	Unit
		Cool/Warm	
Forward Current	I_F	25	mA
Peak Forward Current ^{Note 1}	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	100	mW
Operation Temperature	T_{opr}	-40 ~ +100	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^{\circ}\text{C}$
Junction Temperature	T_J	110	$^{\circ}\text{C}$
Junction/Ambient	R_{THJA}	350	$^{\circ}\text{C/W}$
Junction/Solder Point	R_{THJS}	300	$^{\circ}\text{C/W}$

Note:

1. Pulse width ≤ 10 msec, duty cycle $\leq 10\%$.

Typical Electrical & Optical Characteristics ($T_A = 25^{\circ}\text{C}$)

Characteristics	Color	Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	Cool/Warm	V_F	$I_F = 20$ mA	V		3.2	4.0
Reverse Current	Cool/Warm	I_R	$V_R = 5$ V	μA			10
Luminous Flux	Cool	Φ_V	$I_F = 20$ mA	mlm		4200	
	Warm	Φ_V	$I_F = 20$ mA	mlm		4000	
Luminous Intensity	Cool	I_V	$I_F = 20$ mA	mcd	1400	1850	
	Warm	I_V	$I_F = 20$ mA	mcd	1120	1560	
Chromaticity Coordinates	Cool	x	$I_F = 20$ mA			0.3325	
		y	$I_F = 20$ mA			0.3411	
	Warm	x	$I_F = 20$ mA			0.4234	
		y	$I_F = 20$ mA			0.3990	
Viewing Angle	Cool/Warm	$2\theta_{1/2}$	$I_F = 20$ mA	deg		120	



Intensity Bin Limit ($I_F = 20 \text{ mA}$)

Cool White

Bin Code	Min. (mcd)	Max. (mcd)
Wb	1400	1800
Xa	1800	2240
Xb	2240	2800
Ya	2800	3550

Warm White

Bin Code	Min. (mcd)	Max. (mcd)
Wa	1120	1400
Wb	1400	1800
Xa	1800	2240
Xb	2240	2800

Tolerance of measurement of luminous intensity is $\pm 10\%$.

VF Bin Limit ($I_F = 20 \text{ mA}$)

Cool White

Bin Code	Min. (V)	Max. (V)
27	2.8	3.0
28	3.0	3.2
29	3.2	3.4
2a	3.4	3.6
2b	3.6	3.8
2c	3.8	4.0

Warm White

Bin Code	Min. (V)	Max. (V)
27	2.8	3.0
28	3.0	3.2
29	3.2	3.4
2a	3.4	3.6
2b	3.6	3.8
2c	3.8	4.0

Tolerance of measurement of V_F is $\pm 0.05\text{V}$.

Color Bin Limit ($I_F = 20 \text{ mA}$)

Cool White

Bin Code	Sub-bin	x	y
W1	Wa	0.2545	0.2480
		0.2633	0.2410
		0.2545	0.2245
		0.2450	0.2290
	Wb	0.2633	0.2410
		0.2720	0.2340
		0.2640	0.2200
		0.2545	0.2245
	Wc	0.2545	0.2480
		0.2640	0.2670
		0.2720	0.2575
		0.2633	0.2410
	Wd	0.2633	0.2410
		0.2720	0.2575
		0.2800	0.2480
		0.2720	0.2340

Bin Code	Sub-bin	x	y
W2	We	0.2640	0.2670
		0.2735	0.2860
		0.2808	0.2740
		0.2720	0.2575
	Wf	0.2720	0.2575
		0.2808	0.2740
		0.2880	0.2620
		0.2800	0.2480
	Wg	0.2735	0.2860
		0.2830	0.3050
		0.2895	0.2905
		0.2808	0.2740
	Wh	0.2808	0.2740
		0.2895	0.2905
		0.2960	0.2760
		0.2880	0.2620

Bin Code	Sub-bin	x	y
W3	Wj	0.2830	0.3050
		0.2950	0.3210
		0.2998	0.3028
		0.2895	0.2905
	Wk	0.2895	0.2905
		0.2998	0.3028
		0.3045	0.2865
		0.2960	0.2760
	Wm	0.2950	0.3210
		0.3070	0.3370
		0.3100	0.3150
		0.2998	0.3028
	Wn	0.2998	0.3028
		0.3100	0.3150
		0.3130	0.2970
		0.3045	0.2865



Color Bin Limit ($I_F = 20 \text{ mA}$)

Cool White

Bin Code	Sub-bin	x	y
W4	Wp	0.3070	0.3370
		0.3185	0.3485
		0.3200	0.3270
		0.3100	0.3150
	Wq	0.3100	0.3150
		0.3200	0.3270
		0.3215	0.3075
		0.3130	0.2970
	Wr	0.3185	0.3485
		0.3300	0.3600
		0.3300	0.3390
		0.3200	0.3270
	Ws	0.3200	0.3270
		0.3300	0.3390
		0.3300	0.3180
		0.3215	0.3075

Bin Code	Sub-bin	x	y
W5	Wt	0.3300	0.3600
		0.3455	0.3725
		0.3443	0.3535
		0.3300	0.3390
	Wu	0.3300	0.3390
		0.3443	0.3535
		0.3430	0.3345
		0.3300	0.3180
	Wv	0.3455	0.3725
		0.3610	0.3850
		0.3585	0.3680
		0.3443	0.3535
	Ww	0.3443	0.3535
		0.3585	0.3680
		0.3560	0.3510
		0.3430	0.3345

Tolerance of measurement of the color coordinates is ± 0.01 .

Warm White

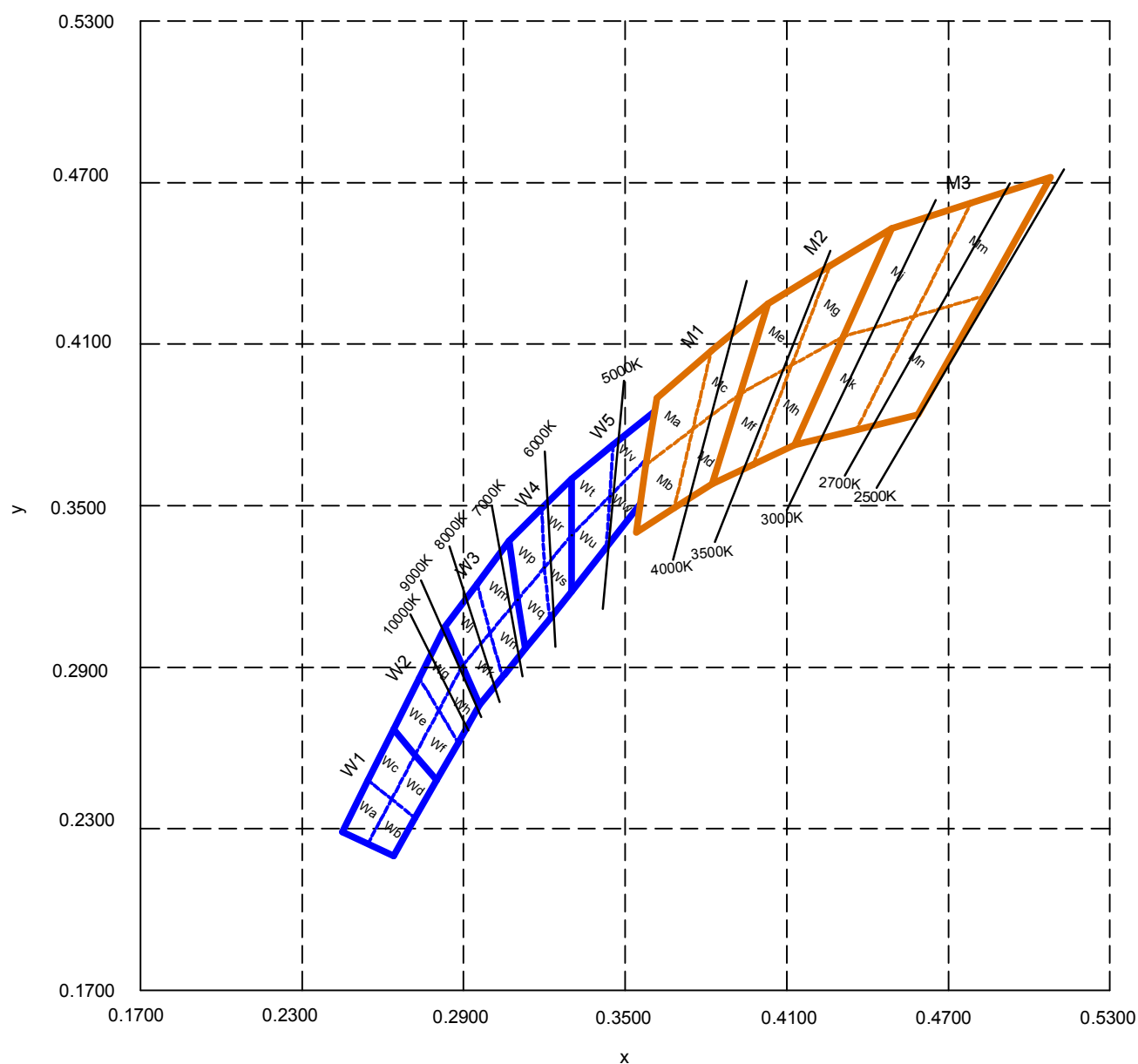
Bin Code	Sub-bin	x	y
M1	Ma	0.3610	0.3900
		0.3576	0.3651
		0.3751	0.3783
		0.3820	0.4075
	Mb	0.3576	0.3651
		0.3541	0.3401
		0.3682	0.3491
		0.3749	0.3781
	Mc	0.3820	0.4075
		0.3751	0.3783
		0.3926	0.3915
		0.4030	0.4250
	Md	0.3751	0.3783
		0.3682	0.3491
		0.3822	0.3580
		0.3926	0.3915

Bin Code	Sub-bin	x	y
M2	Me	0.4030	0.4250
		0.3926	0.3915
		0.4118	0.4021
		0.4260	0.4390
	Mf	0.3926	0.3915
		0.3822	0.3580
		0.3976	0.3653
		0.4118	0.4021
	Mg	0.4260	0.4390
		0.4118	0.4021
		0.4310	0.4128
		0.4490	0.4530
	Mh	0.4118	0.4021
		0.3976	0.3653
		0.4129	0.3725
		0.4310	0.4128

Bin Code	Sub-bin	x	y
M3	Mj	0.4490	0.4530
		0.4310	0.4128
		0.4572	0.4203
		0.4785	0.4625
	Mk	0.4310	0.4128
		0.4129	0.3726
		0.4359	0.3782
		0.4572	0.4203
	Mm	0.4785	0.4625
		0.4572	0.4203
		0.4834	0.4279
		0.5080	0.4720
	Mn	0.4572	0.4203
		0.4359	0.3782
		0.4588	0.3838
		0.4834	0.4279

Tolerance of measurement of the color coordinates is ± 0.01 .

CIE Chromaticity Diagram





Order Code Table*

Color	Kit Number	Viewing Angle	Luminous Intensity (mcd)		Color Bin Code
			Min.	Max.	
Cool White	CLM3C-WKW-CWbYa153	120	1400	3550	W1,W2,W3,W4,W5
Cool White	CLM3C-WKW-CWbYa453	120	1400	3550	W4,W5
Cool White	CLM3C-WKW-CXaYa453	120	1800	3550	W4,W5

Color	Kit Number	Viewing Angle	Luminous Intensity (mcd)		Color Bin Code
			Min.	Max.	
Warm White	CLM3C-MKW-CWaXb133	120	1120	2800	M1,M2,M3
Warm White	CLM3C-MKW-CWaXb513	120	1120	2800	W5,M1
Warm White	CLM3C-MKW-CWaXb233	120	1120	2800	M2,M3
Warm White	CLM3C-MKW-CWbXb513	120	1400	2800	W5,M1
Warm White	CLM3C-MKW-CWbXb233	120	1400	2800	M2,M3

Notes:

- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each reel. Single intensity-bin code and single color-bin codes will not be orderable.
- Please refer to the "Cree LED Lamp Reliability Test Standards" document for reliability test conditions.
- Please refer to the "Cree LED Lamp Soldering & Handling" document for information about how to use this LED product safely.

Graphs

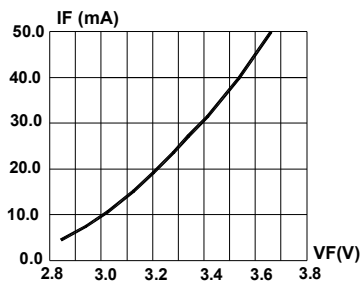


FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

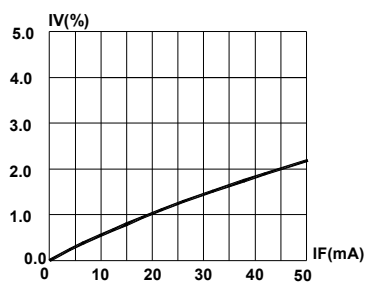


FIG.2 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

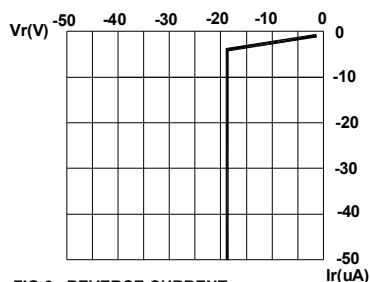


FIG.3 REVERSE CURRENT VS. REVERSE VOLTAGE.

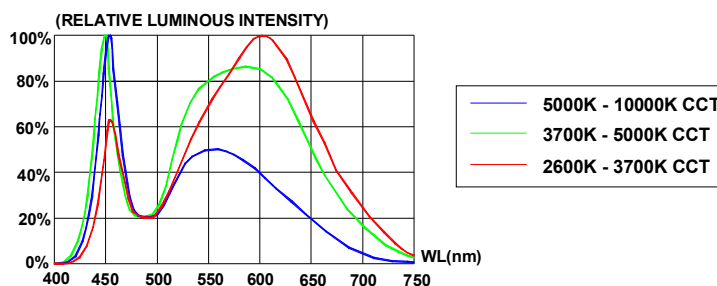


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

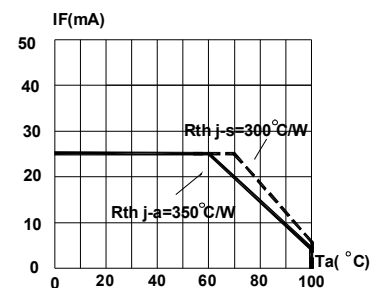


FIG.5 MAXIMUM FORWARD DCCURRENT VS AMBIENT TEMPERATURE ($T_{jmax}=110^{\circ}\text{C}$)

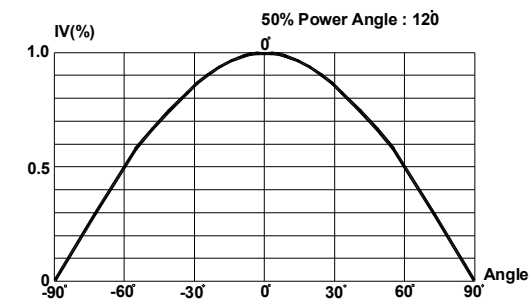
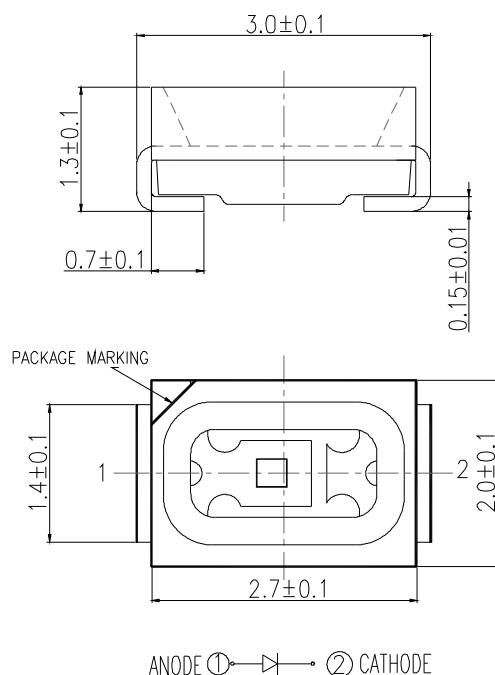


FIG.6 FAR FIELD PATTERN



Mechanical Dimensions

All dimensions are in mm.



Notes

RoHS Compliance

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise 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 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), as amended through April 21, 2006.

Vision Advisory Claim

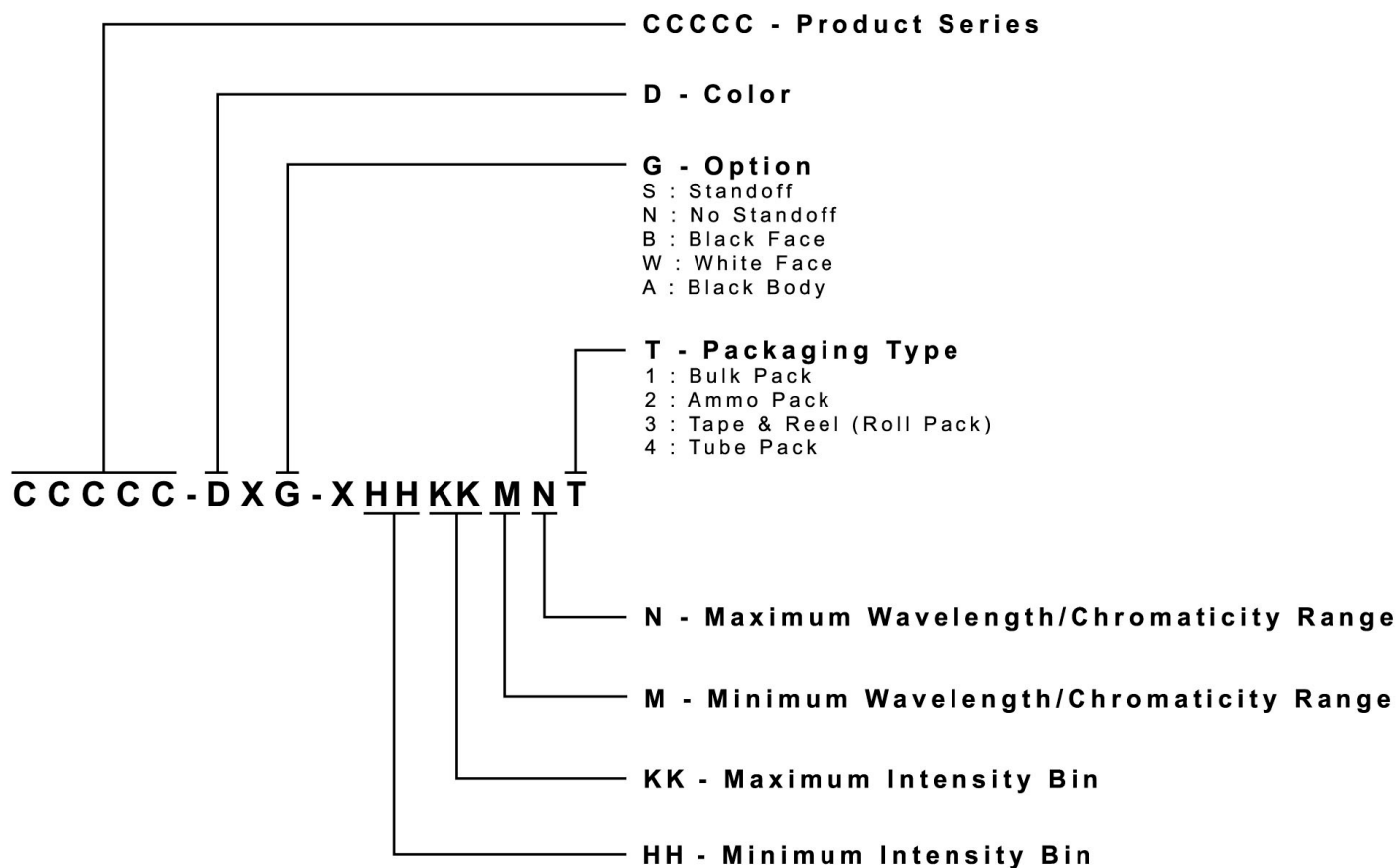
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.



Kit Number System

Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping and packaging options.

Cree LEDs are sold by order codes in combinations of bins called kits. Order codes are configured in the following manner:



Packaging

- The boxes are not water-resistant, and they must be kept away from water and moisture.
- The LEDs are packed in cardboard boxes after packaging in normal or anti-electrostatic bags.
- Cardboard boxes will be used to protect the LEDs from mechanical shocks during transportation.
- The reel pack is applied in SMD LED.
- Max 2500 pcs per reel.

