

CLA1A-WKW/MKW: PLCC4 1 IN 1 SMD LED



PRODUCT DESCRIPTION

SMD LEDs is packaged in the industry • standard package. These LEDs have high reliability performance and are • designed to work under a wide range of environmental conditions. This high reliability feature makes them ideally suited to be used under

illumination application conditions.

Its wide viewing angle makes these LEDs ideally suited for channel letter, or general backlighting and illumina-tion applications. The flat top emitting surface makes it easy for these LEDs to mate with light pipes.

FEATURES

- Size (mm): 3.2 X 2.8
- Color Temperatures: Cool White : Min . (4600K) / Typical (5500K) Warm White : Min . (2500K) / Typical (3200K)
- Luminous Intensity (mcd) CLA1A-WKW:(1800-4500) CLA1A-MKW:(1400-3550)
- CRI: Typical CRI for Cool White is 72 Typical CRI for Warm White is 80
- Lead Free
- RoHS Compliant

APPLICATIONS

Channel Letter

Cree LED / 4400 Silicon Drive / Durham, NC 27703 USA / +1.919.313.5330 / www.cree-led.com

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Items	Symbol	Absolute Maximum Rating	Unit
Forward Current	I _F	35	mA
Peak Forward Current Note 1	I _{FP}	100	mA
Reverse Voltage	V _R	5	V
Power Dissipation	P _D	147	mW
Operation Temperature	T _{opr}	-40 ~ +100	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C
Junction Temperature	TJ	110	°C
Junction/Ambient	R _{thja}	350	°C/W
Junction/Solder Point	R _{THJS}	200	°C/W

Note:

1. Pulse width ≤ 0.1 msec, duty $\leq 1/10$.

TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS ($T_A = 25^{\circ}C$)

Characteristics	Color	Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	Cool/Warm	V _F	l _F = 30 mA	V		3.6	4.2
Reverse Current	Cool/Warm	I _R	V _R = 5 V	μA			10
Luminous Flux	Cool	Φ _v	I _F = 30 mA	lm		7000	
Luminous Flux	Warm	Φ _v	I _F = 30 mA	lm		6000	
Luminous Intensity	Cool	I _v	I _F = 30 mA	mcd	1800	2800	
Luminous intensity	Warm	l _v	I _F = 30 mA	mcd	1400	2500	
	Cool	х	I _F = 30 mA			0.3325	
Chromaticity	COOL	у	I _F = 30 mA			0.3411	
Coordinates	Warm	х	I _F = 30 mA			0.4234	
	vvdiiii	у	I _F = 30 mA			0.3990	

* Continuous reverse voltage can cause LED damage.



INTENSITY BIN LIMIT

Cool W	nite (30 mA) - CLA1			hite (30 mA) - CLA	
C001 W1	iite (30 mA) - CLAI		warm w	nite (30 mA) - CLA	
Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)
Ха	1800	2240	Wb	1400	1800
Xb	2240	2800	Xa	1800	2240
Ya	2800	3550	Xb	2240	2800
Yb	3550	4500	Ya	2800	3550

Tolerance of measurement of luminous intensity is ±10%

VOLTAGE BIN LIMIT

*

Cool WI	nite (30 mA) - CLA1	A-WKW	Warm White (30 mA) - CLA1A-MKW			
Bin Code	Min. (V)	Max. (V)	Bin Code	Min. (V)	Max. (V)	
27	2.8	3.0	27	2.8	3.0	
28	3.0	3.2	28	3.0	3.2	
29	3.2	3.4	29	3.2	3.4	
2a	3.4	3.6	2a	3.4	3.6	
2b	3.6	3.8	2b	3.6	3.8	
2c	3.8	4.0	2c	3.8	4.0	
2d	4.0	4.2	2d	4.0	4.2	

* Tolerance of measurement of voltage is ±0.05V

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COLOR BIN LIMIT

Cool White (30 mA) - CLA1A-WKW

Bin Code	Sub-bin	x	у
		0.2545	0.2480
	14/0	0.2633	0.2410
	Wa	0.2545	0.2245
		0.2450	0.2290
		0.2633	0.2410
	Wb	0.2720	0.2340
	UVV	0.2640	0.2200
W1		0.2545	0.2245
VV I		0.2545	0.2480
	Wc	0.2640	0.2670
	VVC	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
		0.2640	0.2670
	14/0	0.2735	0.2860
	We	0.2808	0.2740
		0.2720	0.2575
		0.2720	0.2575
	14/5	0.2808	0.2740
	Wf	0.2880	0.2620
14/0		0.2800	0.2480
W2		0.2735	0.2860
		0.2830	0.3050
	Wg	0.2895	0.2905
		0.2808	0.2740
		0.2808	0.2740
	14/1	0.2895	0.2905
	Wh	0.2960	0.2760
		0.2880	0.2620

 Wij 0.2830 0.3010 0.2905 0.2005 0.2006 0.2006 0.2007 0.30100 0.30100<	Bin Code	Sub-bin	x	у
Wi0.29980.30280.28950.29050.28950.20050.29080.20050.3040.29080.30280.3040.29600.27600.29600.32100.31000.30700.33700.33700.3000.31500.30280.1000.31300.29700.31000.31500.31500.31000.31500.31600.31000.31500.32700.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.30750.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.31500.31000.31500.31600.31000.31600.31600.31000.33000.33000.32000.32700.32700.32000.32700.33000.32000.32700.32700.32000.32700.33000.32000.32700.33000.32000.32700.33000.32000.32700.33000.32000.32700.33000.32000.32700.33000.33000.33000.33000.33000.33000			0.2830	0.3050
Image: A construct of the section o			0.2950	0.3210
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Wr 0.3300 0.3390 0.3200 0.3270 0.3200 0.3270 Ws 0.3300 0.3390 0.3300 0.3390 0.3300 0.3180	***		0.3185	0.3485
0.3300 0.3390 0.3200 0.3270 0.3200 0.3270 0.3200 0.3270 0.3300 0.3390 0.3300 0.3390 0.3300 0.3390		W/r	0.3300	0.3600
Ws 0.3200 0.3270 0.3300 0.3390 0.3300 0.3180			0.3300	0.3390
Ws 0.3300 0.3390 0.3300 0.3180			0.3200	0.3270
Ws 0.3300 0.3180			0.3200	0.3270
0.3300 0.3180		Ws	0.3300	0.3390
0.3215 0.3075		113	0.3300	0.3180
			0.3215	0.3075

Bin Code	Sub-bin	x	у
		0.3300	0.3600
	Wt	0.3455	0.3725
	VVL	0.3443	0.3535
		0.3300	0.3390
		0.3300	0.3390
	Wu	0.3443	0.3535
	vvu	0.3430	0.3345
W5		0.3300	0.3180
¥¥5		0.3455	0.3725
	Wv	0.3610	0.3850
	VVV	0.3585	0.3680
		0.3443	0.3535
		0.3443	0.3535
	Ww	0.3585	0.3680
	V V VV	0.3560	0.3510
		0.3430	0.3345

* Tolerance of measurement of the color coordinates is ±0.01

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COLOR BIN LIMIT

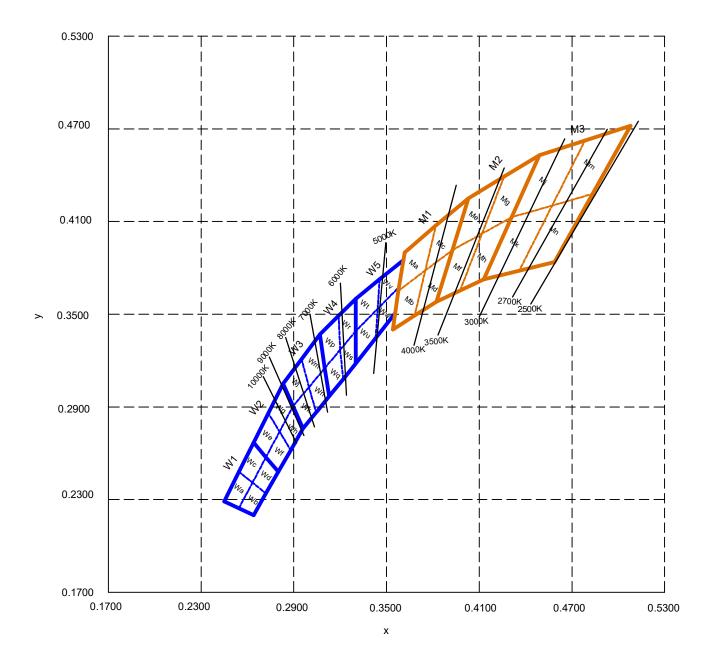
Warm White	(30 mA)	- CLA1A-MKW
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Bin Code	Sub-bin	x	у	Bin Code	Sub-bin	x	у		Bin Code	Sub-bin	x	у
		0.3610	0.3900			0.4030	0.4250				0.4490	0.4530
	Ма	0.3576	0.3651		Me	0.3926	0.3915			Mi	0.4310	0.4128
	IVIA	0.3751	0.3783		IVIE	0.4118	0.4021			IVIJ	0.4572	0.4203
		0.3820	0.4075			0.4260	0.4390				0.4785	0.4625
		0.3576	0.3651			0.3926	0.3915			Mk	0.4310	0.4128
	Mb	0.3541	0.3401		Mf	0.3822	0.3580		M3		0.4129	0.3726
	IVID	0.3682	0.3491			0.3976	0.3653				0.4359	0.3782
M1		0.3749	0.3781	M2		0.4118	0.4021				0.4572	0.4203
IVII		0.3820	0.4075	IVIZ	1112	0.4260	0.4390			Mm	0.4785	0.4625
	Мс	0.3751	0.3783		Mg	0.4118	0.4021				0.4572	0.4203
	IVIC	0.3926	0.3915		ivig	0.4310	0.4128				0.4834	0.4279
		0.4030	0.4250			0.4490	0.4530				0.5080	0.4720
		0.3751	0.3783			0.4118	0.4021				0.4572	0.4203
	Md	0.3682	0.3491		Mh	0.3976	0.3653			Mn	0.4359	0.3782
	IVIU	0.3822	0.3580		IVIII	0.4129	0.3725			IVIII	0.4588	0.3838
		0.3926	0.3915			0.4310	0.4128				0.4834	0.4279

* Tolerance of measurement of the color coordinates is ± 0.01

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CIE CHROMATICITY DIAGRAM



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ORDER CODE TABLE

Color	Kit Number	Luminous In	tensity (mcd)	Color Bin Code
Color	Kit Number	Min.	Max.	Color bin Code
	CLA1A-WKW-CXaYb153	1800	4500	W1,W2,W3,W4,W5
Cool White	CLA1A-WKW-CXaYb453	1800	4500	W4,W5
	CLA1A-WKW-CXbYb453	2240	4500	W4,W5

Color	Kit Number	Luminous In	tensity (mcd)	Color Bin Code
Color	Kit Number	Min.	Max.	color bin code
	CLA1A-MKW-CWbYa133	1400	3550	M1,M2,M3
	CLA1A-MKW-CWbYa513	1400	3550	W5,M1
Warm White	CLA1A-MKW-CWbYa233	1400	3550	M2,M3
	CLA1A-MKW-CXaYa233	1800	3550	M2,M3
	CLA1A-MKW-CXaYa513	1800	3550	W5,M1

Notes:

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• 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 bulk. Single intensity-bin code and single color-bin codes will not be orderable.

• Please refer to the HB LED Lamp Reliability Test Standards document for reliability test conditions.

Please refer to the HB LED Lamp Soldering & Handling document for information about how to use this LED product safely.

GRAPHS

The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

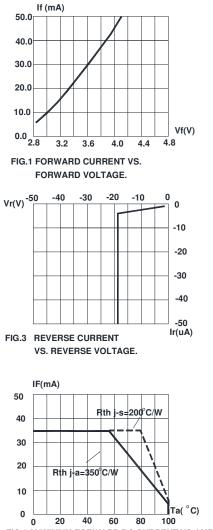
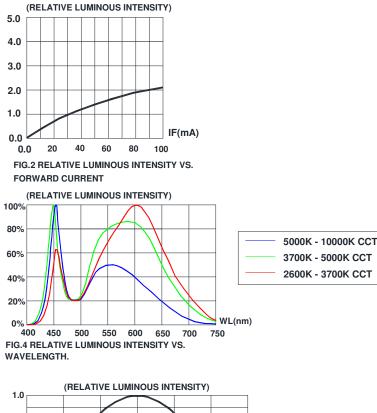
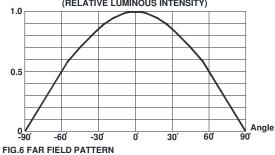


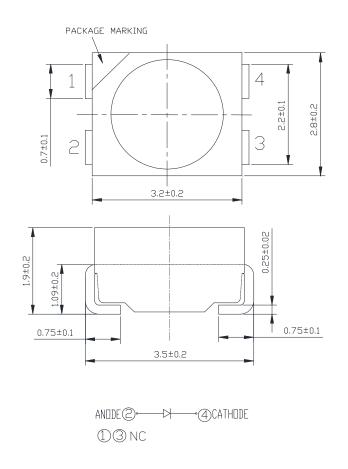
FIG.5 MAXIMUM FORWARD DC CURRENT VS AMBIENT TEMPERATURE (Tjmax=110°C)





MECHANICAL DIMENSIONS

All dimensions are in mm.



NOTES

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.

Vision Advisory

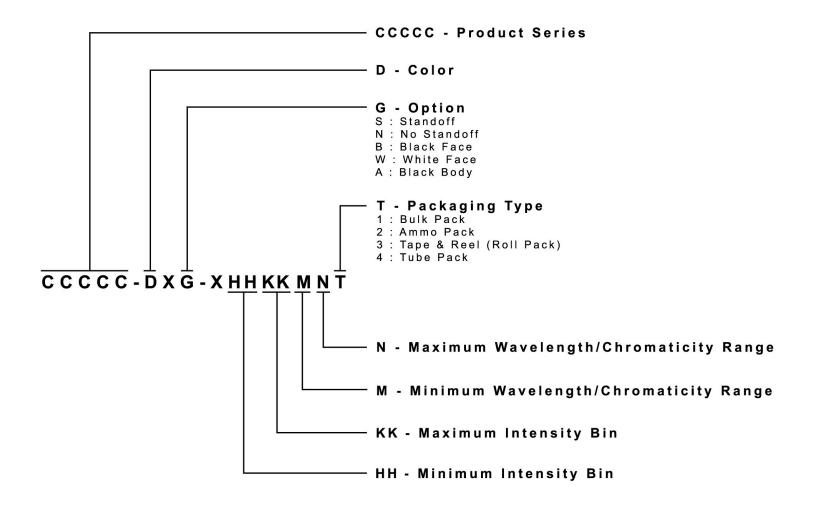
WARNING: Do not look at an exposed lamp in operation. Eye injury can result.

KIT NUMBER SYSTEM

Downloaded from Arrow.com.

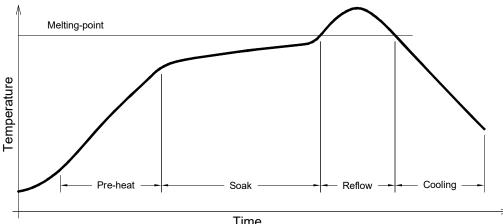
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options.

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



REFLOW SOLDERING

- The CLA1A-WKW/MKW is rated as a MSL 5a product. .
- The recommended floor life out of bag is 24hrs. •
- The temperature profile is as below.

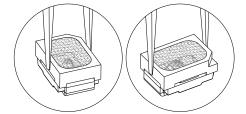




Use only with CLA1A-WKW/MKW

Solder
Average ramp-up rate = 4°C/s max
Preheat temperature = 150°C ~200°C
Preheat time = 120s max
Ramp-down rate = 6°C/s max
Peak temperature = 250°C max
Time within 5°C of actual Peak Temperature = 10s max
Duration above 217°C is 60s max

- The packaging sizes of these SMD products are very small and the resin is still soft after solidification. Users are required to handle • with care. Never touch the resin surface of SMD products.
- · To avoid damaging the product's surface and interior device, it is recommended to choose a special nozzle to pick up the SMD products during the process of SMT production. If handling is necessary, take special care when picking up these products. The following method is necessary:
- Please refer to the HB LED Lamp Soldering & Handling document for information about how to use this LED product safely. •





PACKAGING

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- 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 shock during transportation.
- The boxes are not water resistant, and they must be kept away from water and moisture.
- The reel pack is applied in SMD LED.
- Max 2000 pcs per reel.

