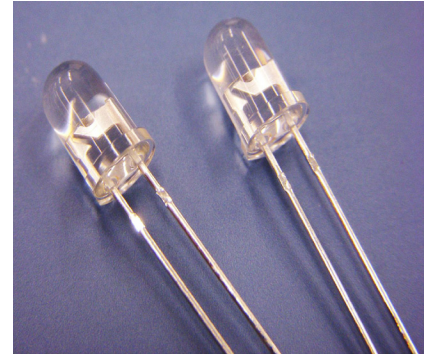


# Cree® 5mm Round LED C512A-WNS/WNN



## PRODUCT DESCRIPTION

Round LEDs offer superior light output for excellent readability in sunlight and dependable performance. They provide extremely stable light output over long periods of time.

These lamps are made with an advanced optical grade epoxy offering superior high temperature and high moisture resistance performance in lighting and illumination applications.

## FEATURES

- Size (mm): 5
- Color Temperatures:  
Cool White :  
Min . (4600K) / Typical (9000K)
- Luminous Intensity (mcd)  
C512A-WNS/WNN:  
(8200-32900)
- Viewing angle:  
C512A-WNS/WNN: 25 degree
- Lead-Free
- RoHS Compliant

## APPLICATIONS

- Torch
- Light Strip
- Channel Letter
- Retail Display Lighting

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

Items	Symbol	Absolute Maximum Rating	Unit
Forward Current	$I_F$	25	mA
Peak Forward Current <sup>Note</sup>	$I_{FP}$	100	mA
Reverse Voltage	$V_R$	5	V
Power Dissipation	$P_D$	100	mW
Operation Temperature	$T_{opr}$	-40 ~ +95	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +100	$^\circ\text{C}$
Lead Soldering Temperature	$T_{sol}$	Max. 260 $^\circ\text{C}$ for 3 sec. max. (3 mm from the base of the epoxy bulb)	

**Note:** Pulse width  $\leq 0.1$  msec, duty  $\leq 1/10$ .

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

Characteristics	Color	Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	WNS/WNN	$V_F$	$I_F = 20$ mA	V		3.2	4.0
Reverse Current	WNS/WNN	$I_R$	$V_R = 5$ V	$\mu\text{A}$			100
Luminous Intensity	WNS/WNN	$I_V$	$I_F = 20$ mA	mcd	8200	18000	
Chromaticity Coordinates	WNS/WNN	x	$I_F = 20$ mA			0.2877	
		y	$I_F = 20$ mA			0.2831	
50% Power Angle	WNS/WNN	$2\theta_{1/2}$	$I_F = 20$ mA	deg		25	

### INTENSITY BIN LIMIT ( $I_F = 20 \text{ mA}$ )

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Cool White(C512A-WNS/WNN)

Bin Code	Min.(mcd)	Max.(mcd)
Z0	8200	12000
A0	12000	16800
B0	16800	23500
C0	23500	32900

- Tolerance of measurement of luminous intensity is  $\pm 15\%$

### VF BIN LIMIT ( $I_F = 20 \text{ mA}$ )

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Cool White(C512A-WNS/WNN)

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 VF is  $\pm 0.05\text{V}$ .

**COLOR BIN LIMIT ( $I_f = 20 \text{ mA}$ )**

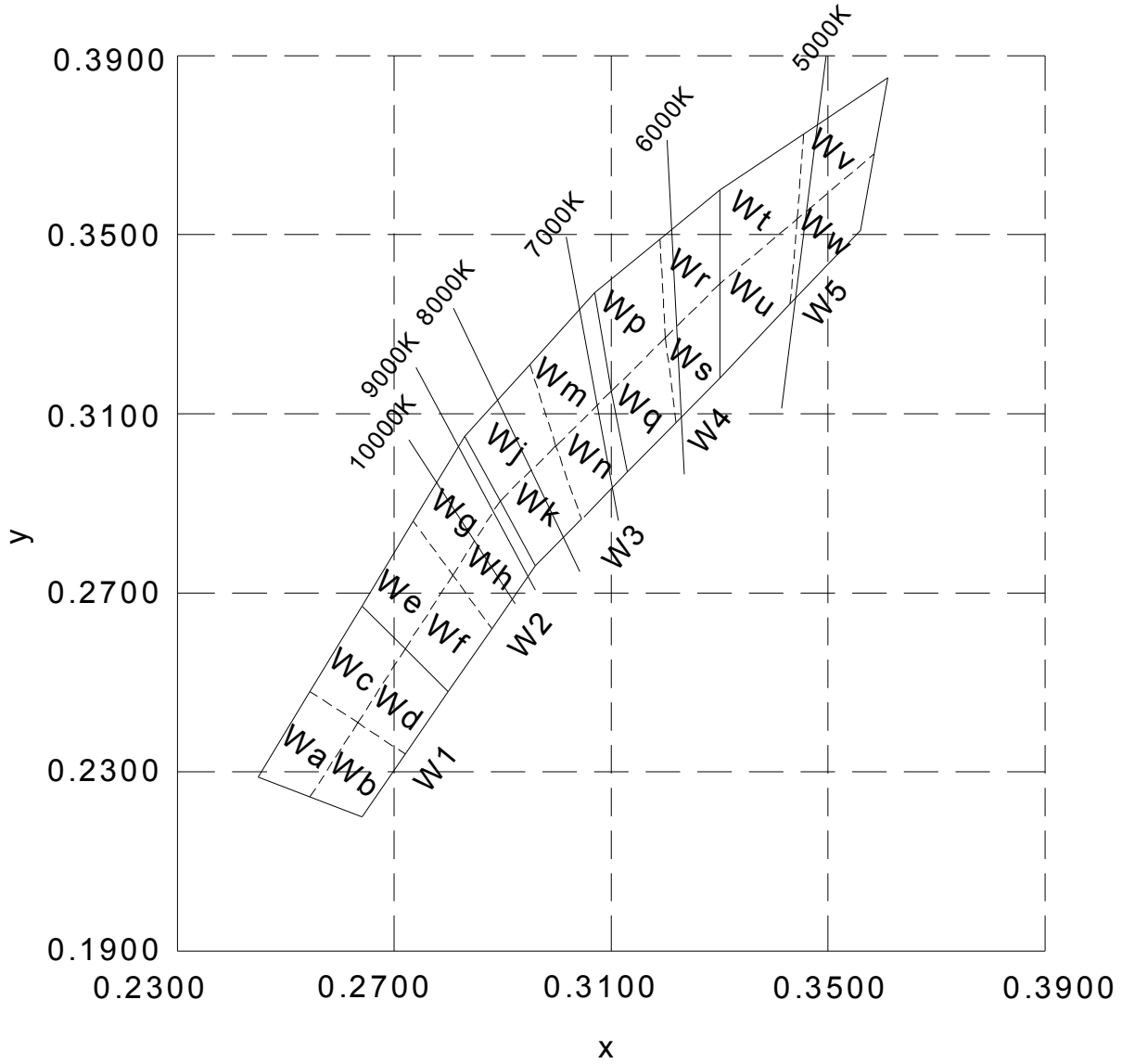
Bin Code	Sub-bin	x	y
W1	Wa	0.2545	0.2480
		0.2633	0.2410
		0.2545	0.2245
		0.2450	0.2290
	Wb	0.2633	0.2410
		0.2720	0.2340
		0.2640	0.2200
		0.2545	0.2245
	Wc	0.2545	0.2480
		0.2640	0.2670
		0.2720	0.2575
		0.2633	0.2410
	Wd	0.2633	0.2410
		0.2720	0.2575
		0.2800	0.2480
		0.2720	0.2340
W2	We	0.2640	0.2670
		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
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  $\pm 0.01$ .

**CIE CHROMATICITY DIAGRAM**



**ORDER CODE TABLE\***

Color	Kit Number	Viewing Angle	Luminous Intensity (mcd)		Color Bin Code	Package	Standoff
			Min.	Max.			
Cool White	C512A-WNN-CZ0B0151	25	8200	23500	W1,W2,W3,W4,W5	Bulk	No
Cool White	C512A-WNN-CZ0B0152	25	8200	23500	W1,W2,W3,W4,W5	Ammo	No
Cool White	C512A-WNS-CZ0C0151	25	8200	32900	W1,W2,W3,W4,W5	Bulk	Yes
Cool White	C512A-WNS-CZ0C0152	25	8200	32900	W1,W2,W3,W4,W5	Ammo	Yes
Cool White	C512A-WNS-CA0C0151	25	12000	32900	W1,W2,W3,W4,W5	Bulk	Yes
Cool White	C512A-WNS-CA0C0152	25	12000	32900	W1,W2,W3,W4,W5	Ammo	Yes

Notes:

1. 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.
2. Please refer to the "Cree LED Lamp Reliability Test Standards" document for reliability test conditions.
3. Please refer to the "Cree LED Lamp Soldering & Handling" document for information about how to use this LED product safely.

GRAPHS

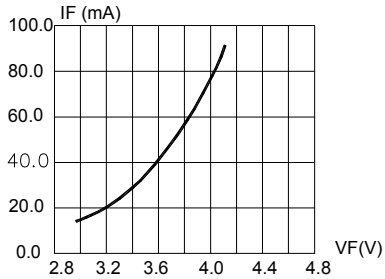


FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

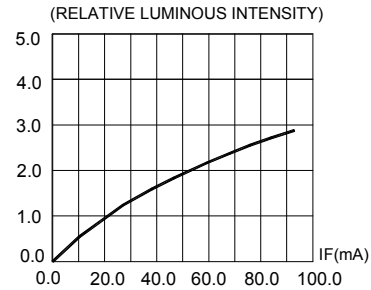


FIG.2 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

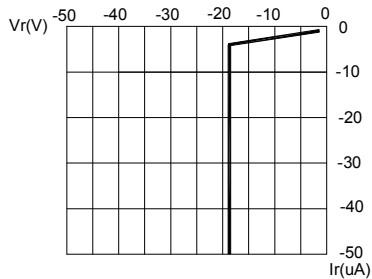


FIG.3 REVERSE CURRENT VS. REVERSE VOLTAGE.

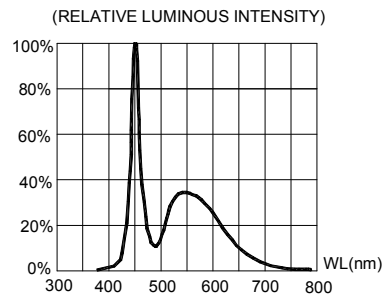


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

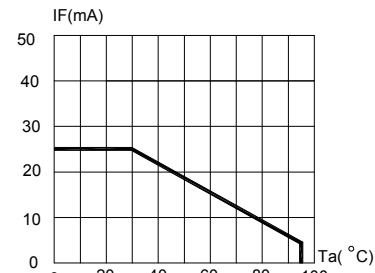


FIG.5 MAXIMUM FORWARD DC CURRENT VS AMBIENT TEMPERATURE (Tjmax=105°C)

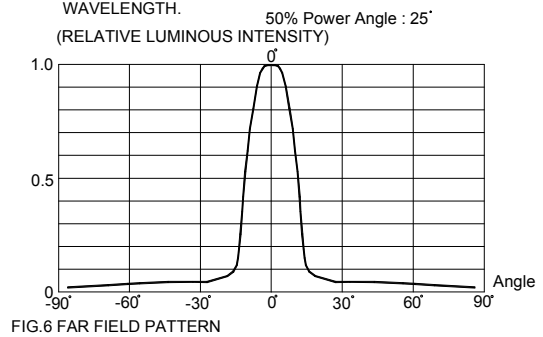


FIG.6 FAR FIELD PATTERN

The above data 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.

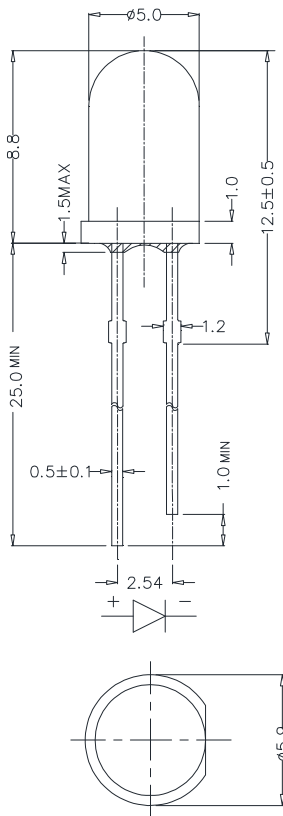
## MECHANICAL DIMENSIONS

All dimensions are in mm. Tolerance is  $\pm 0.25$  mm unless otherwise noted.

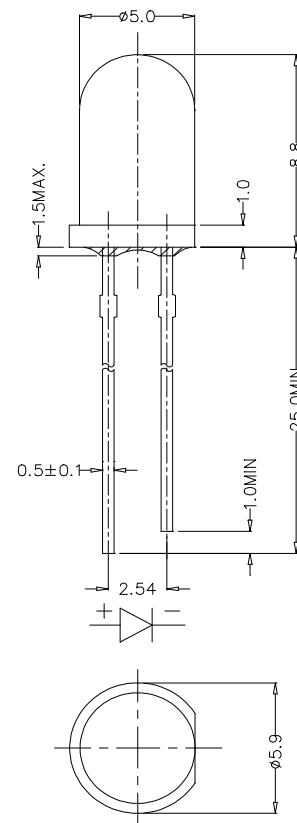
An epoxy meniscus may extend about 1.5 mm down the leads.

Burr around bottom of epoxy may be 0.5 mm max.

C512A-WNS:



C512A-WNN:



## 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

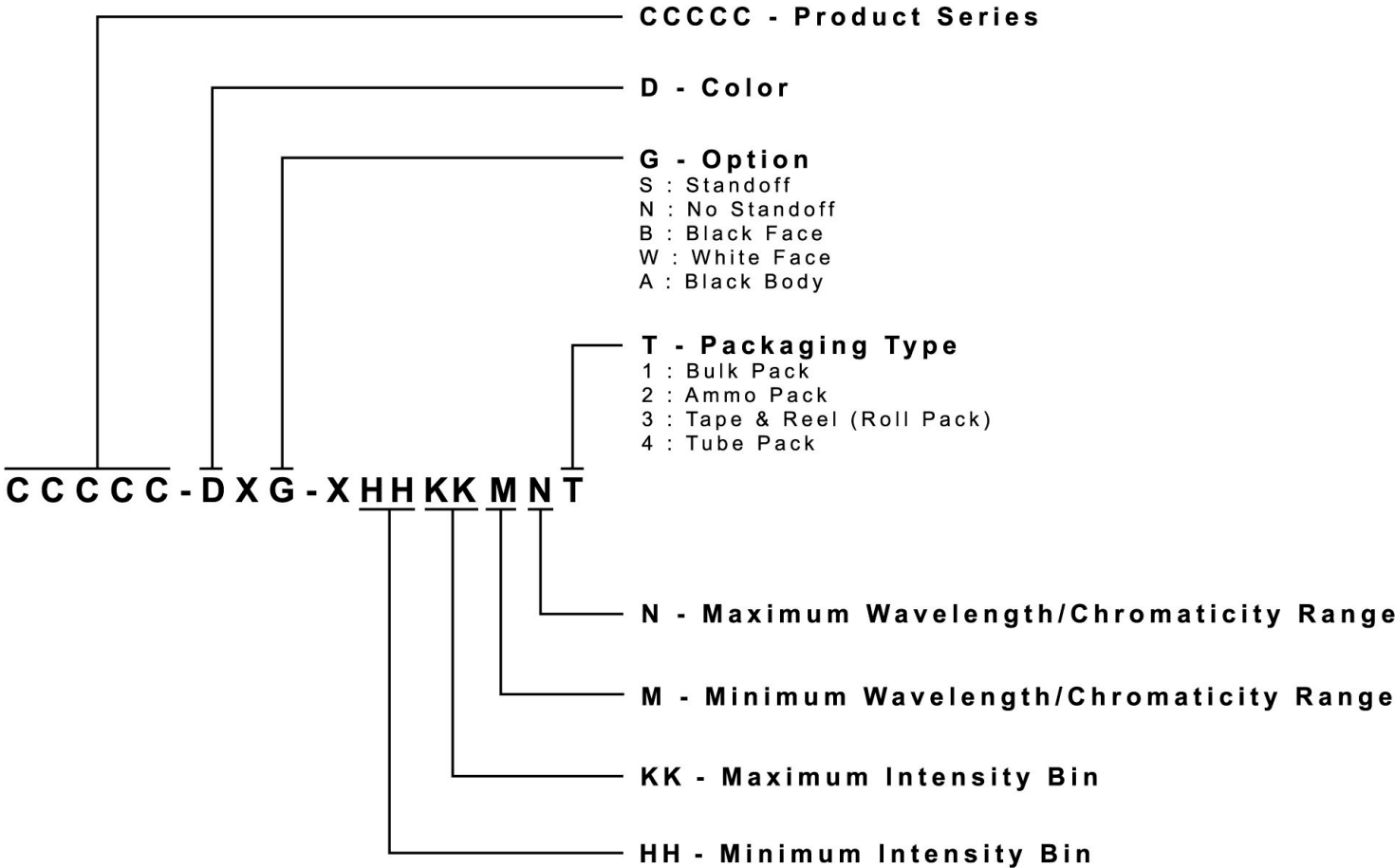
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.



**KIT NUMBER SYSTEM**

All dimensions in mm. 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:

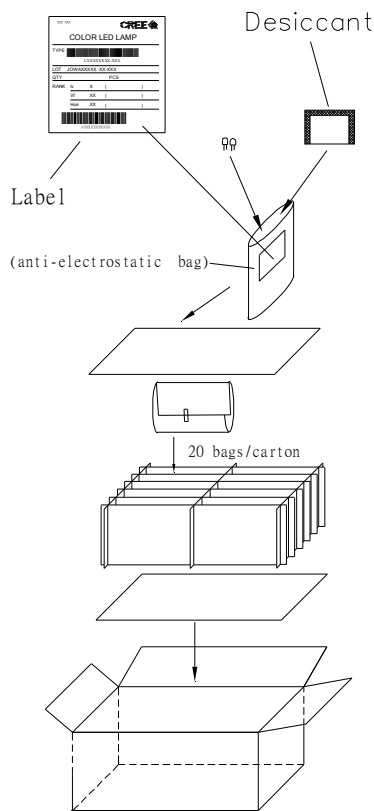


## PACKAGING

### Features:

- 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 Bulk Pack types of packaging.
- Max 500 pcs per bulk and Max 2500 pcs per ammo.

### Bulk Pack Packaging Type:



### Ammo Pack Packaging Type:

