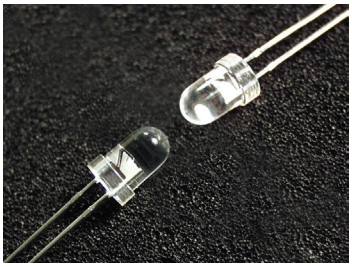
Cree® 5-mm Blue and Green Round LED C503T-BAS/BAN/GAS/GAN (15 degrees) C503T-GCS/GCN (30 degrees)

Data Sheet

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 outdoor signal and sign applications.



FEATURES

- Size (mm): 5
- Color and Typical Dominant Wavelength (nm):
  - Blue (470)
  - Green (527)
- Luminous Intensity (mcd)
  - C503T-BAS/BAN (3000-16800)
  - C503T-GAS/GAN (12000-64600)
  - C503T-GCS/GCN (4180-16800)
- Viewing Angle:
  - C503T-BAS/BAN/GAS/GAN: 15 degrees
  - C503T-GCS/GCN: 30 degrees
- Lead-Free
- RoHS-Compliant

APPLICATIONS

- Electronic Signs & Signals (ESS)
- Motorway Signs
- Variable-Message Sign (VMS)
- Advertising Signs
- Petrol Signs
- Amusement

Absolute Maximum Ratings (T_A = 25°C)

Items	Symbol	Absolute Maximum Rating	Unit
		Blue/Green	
Forward Current	I_F	25	mA
Peak Forward Current Note1	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	100	mW
Operation Temperature	T_{opr}	-40 ~ +95	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Lead Soldering Temperature	T_{sol}	Max. 260°C for 3 sec. max. (3 mm from the base of the epoxy bulb)	

Note:
1. Pulse width ≤0.1 msec, duty ≤1/10.

Typical Electrical & Optical Characteristics (T_A = 25°C)

Characteristics	Color		Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	Blue/Green		V_F	I_F = 20 mA	V		3.4	4.0
Forward Voltage	Blue/Green		V_F	I_F = 1.0 μA	V	1.7		2.5
Reverse Current	Blue/Green		I_R	V_R = 5 V	μA			100
Dominant Wave-length	Blue		λ_D	I_F = 20 mA	nm	465	470	475
	Green		λ_D	I_F = 20 mA	nm	520	527	535
Luminous Intensity	Blue	C503T-BAS/BAN (15 degree)	I_V	I_F = 20 mA	mcd	3000	7000	
	Green	C503T-GAS/GAN (15 degree)	I_V	I_F = 20 mA	mcd	12000	23000	
		C503T-GCS/GCN (30 degree)	I_V	I_F = 20 mA	mcd	4180	7500	
50% Power Angle	C503T-BAS/BAN/GAS/GAB		2θ½	I_F = 20 mA	deg		15	
	C503T-GCS/GCN		2θ½	I_F = 20 mA	deg		30	

Cree, Inc.
4600 Silicon Drive
Durham, NC 27703
USA Tel: +1.919.313.5300
Fax: +1.919.313.5778
www.cree.com/ledlamps

Intensity Bin Limit (I_F = 20 mA)

Blue

C503T-BAS/BAN (15 degree)

Bin Code	Min. (mcd)	Max. (mcd)
W0	3000	4180
X0	4180	5860
Y0	5860	8200
Z0	8200	12000
A0	12000	16800

Green

C503T-GAS/GAN (15 degree)

Bin Code	Min. (mcd)	Max. (mcd)
A0	12000	16800
B0	16800	23500
C0	23500	32900
D0	32900	46100
E0	46100	64600

C503T-GCS/GCN (30 degree)

Bin Code	Min. (mcd)	Max. (mcd)
X0	4180	5860
Y0	5860	8200
Z0	8200	12000
A0	12000	16800

Tolerance of measurement of luminous intensity is ±15%.

Color Bin Limit (I_F = 20 mA)

Blue

Bin Code	Min. (nm)	Max. (nm)
B4	465	470
B5	470	475

Green

Bin Code	Min. (nm)	Max. (nm)
G7	520	525
G8	525	530
G9	530	535

Tolerance of measurement of dominant wavelength is ±1 nm.

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Order Code Table*

Blue (15 degree)

Color	Kit Number	Viewing Angle	Luminous Intensity (mcd)		Dominant Wavelength				Package	Standoff
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)		
Blue	C503T-BAS-CW0A0451	15	3000	16800	B4	465	B5	475	Bulk	Yes
Blue	C503T-BAN-CW0A0451	15	3000	16800	B4	465	B5	475	Bulk	No
Blue	C503T-BAS-CW0A0452	15	3000	16800	B4	465	B5	475	Ammo	Yes
Blue	C503T-BAN-CW0A0452	15	3000	16800	B4	465	B5	475	Ammo	No

Green (15 degree)

Color	Kit Number	Viewing Angle	Luminous Intensity (mcd)		Dominant Wavelength				Package	Standoff
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)		
Green	C503T-GAS-CA0E0791	15	12000	64600	G7	520	G9	535	Bulk	Yes
Green	C503T-GAN-CA0E0791	15	12000	64600	G7	520	G9	535	Bulk	No
Green	C503T-GAS-CA0E0792	15	12000	64600	G7	520	G9	535	Ammo	Yes
Green	C503T-GAN-CA0E0792	15	12000	64600	G7	520	G9	535	Ammo	No

Green (30 degree)

Color	Kit Number	Viewing Angle	Luminous Intensity (mcd)		Dominant Wavelength				Package	Standoff
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)		
Green	C503T-GCS-CX0A0791	30	4180	16800	G7	520	G9	535	Bulk	Yes
Green	C503T-GCN-CX0A0791	30	4180	16800	G7	520	G9	535	Bulk	No
Green	C503T-GCS-CX0A0792	30	4180	16800	G7	520	G9	535	Ammo	Yes
Green	C503T-GCN-CX0A0792	30	4180	16800	G7	520	G9	535	Ammo	No

Notes:

- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one colo-bin code will be shipped on each bulk or ammo. Single intensity-bin codes 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.

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Graphs

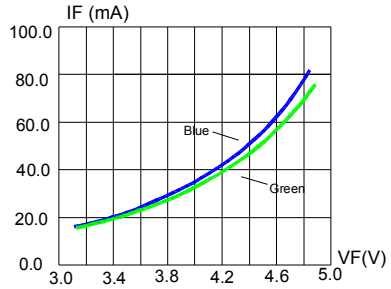

FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

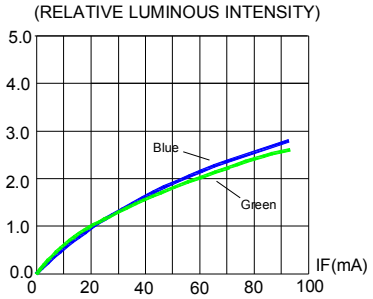

FIG.2 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

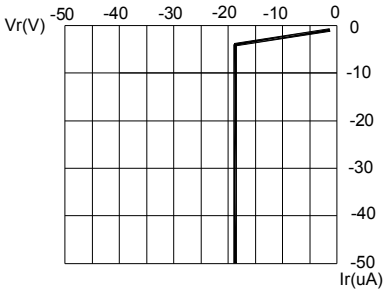

FIG.3 BLUE REVERSE CURRENT VS. REVERSE VOLTAGE.

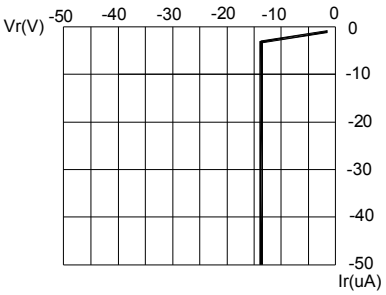

FIG.4 GREEN REVERSE CURRENT VS. REVERSE VOLTAGE.

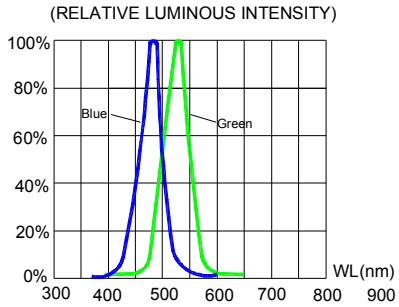

FIG.5 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

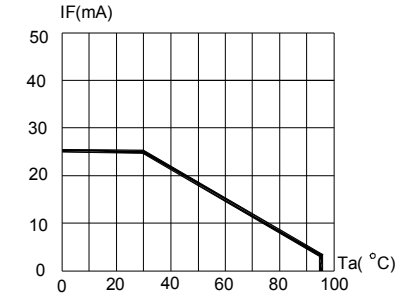

FIG.6 BLUE & GREEN MAXIMUM FORWARD DCCURRENT VS AMBIENT TEMPERATURE (Tjmax=105°C)

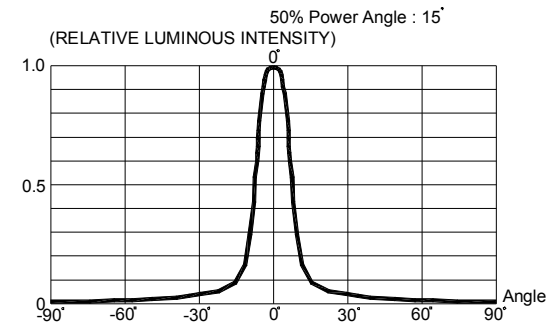

FIG.7 FAR FIELD PATTERN

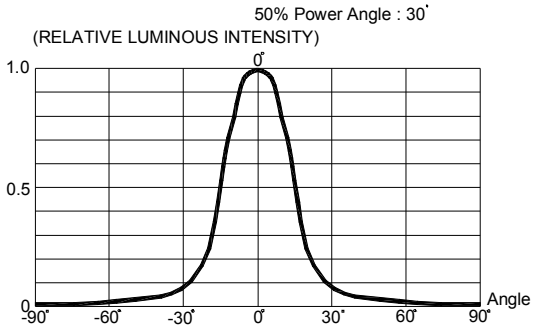

FIG.8 FAR FIELD PATTERN

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

Cree, Inc.
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Durham, NC 27703
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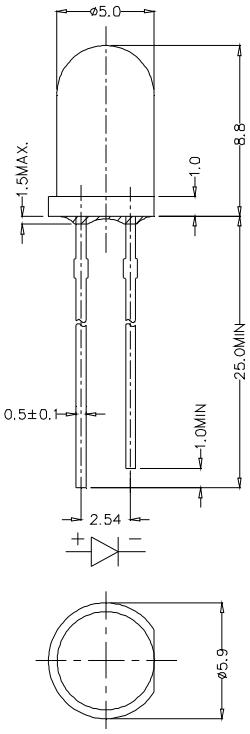
Mechanical Dimensions

All dimensions are in mm. Tolerance is ±0.25 mm unless otherwise noted.

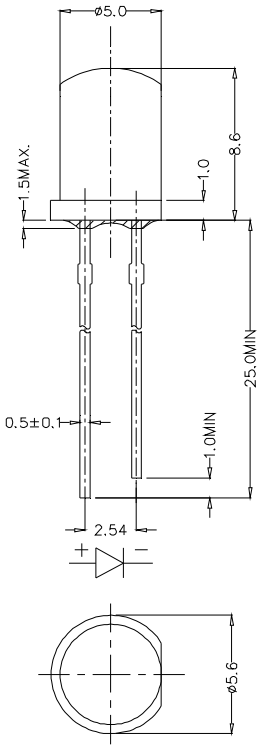
An epoxy meniscus may extend about 1.5 mm down the leads.

Burr around bottom of epoxy may be 0.5 mm max.

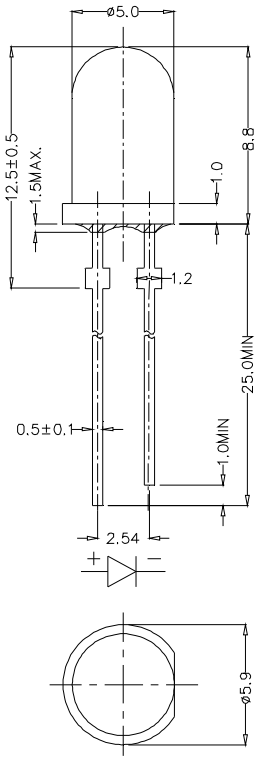
C503T-BAN/GAN:



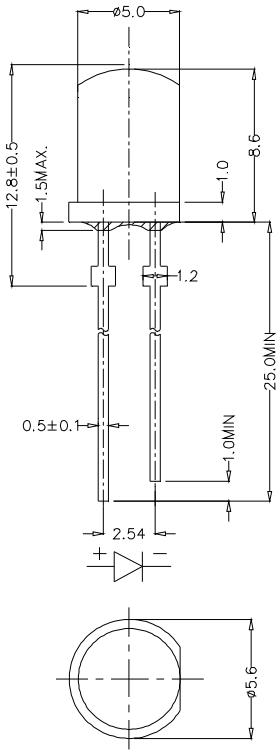
C503T-GCN:



C503T-BAS/GAS:



C503T-GCS:



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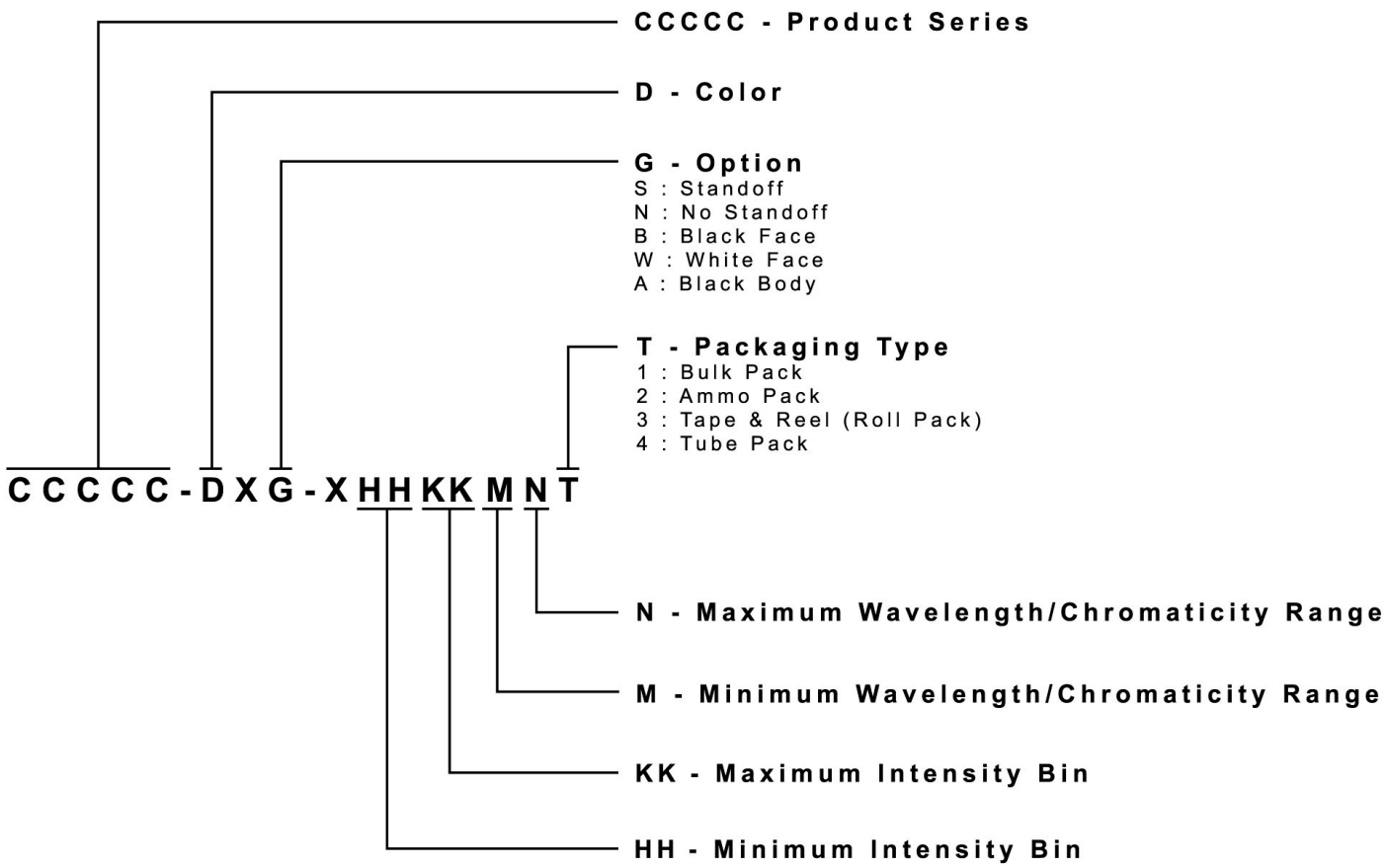
Kit Number System

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:



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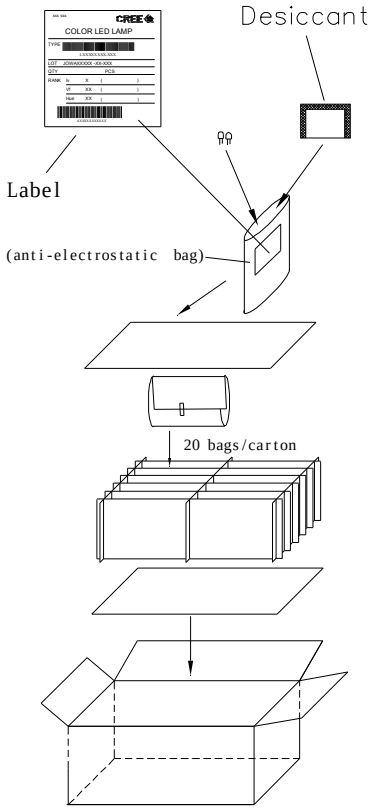
Package

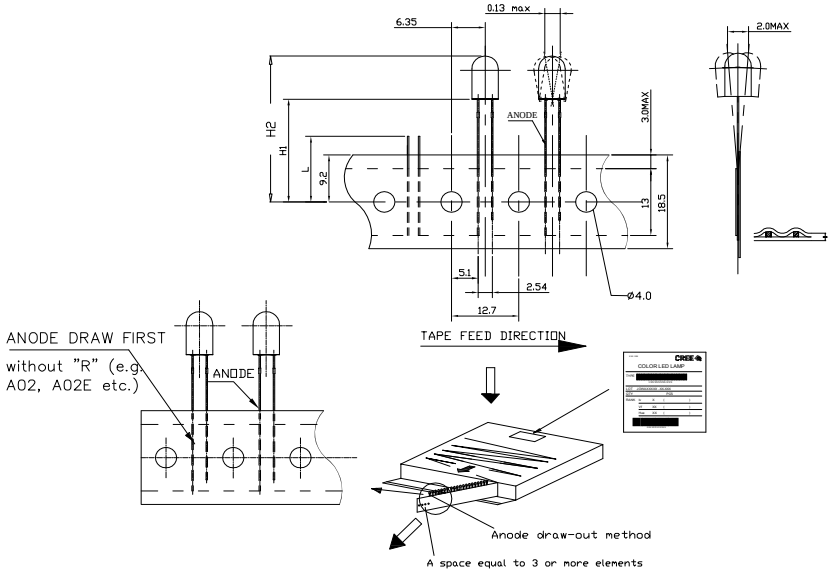
Features:

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

Bulk Pack Packaging Type:



Ammo Pack Packaging Type:



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