

Cree® P4 LED

CP41B-RDS/ADS (40 degrees)

CP41B-RFS/AFS (70 degrees)

CP41B-RHS/AHS (100 degrees)

Data Sheet

This revolutionary package design allows the lighting designer to reduce the number of LEDs required and provide a more uniform and unique illuminated appearance than with other LED solutions.

This is possible through the efficient optical package design and high-current capabilities. The low-profile package can be easily coupled with reflectors or lenses to efficiently distribute light and provide the desired lit appearance. This product family employs red and amber LED materials, which allows designers to match the color of many lighting applications like vehicle signal lamps, channel letters and gaming-equipment lighting.



FEATURES

- Size (mm): 7.6 x 7.6
- Color and Typical Dominant Wavelength (nm):
 - » Red (628)
 - » Amber (591)
- Luminous Flux (mlm)
 - » CP41B-RDS (4400 - 11000)
 - » CP41B-RFS (4400 - 11000)
 - » CP41B-RHS (4400 - 13200)
 - » CP41B-ADS (4400 - 11000)
 - » CP41B-AFS (5500 - 13200)
 - » CP41B-AHS (5500 - 13200)
- Lead-Free
- RoHS Compliant

APPLICATIONS

- Channel Letter
- Amusement



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

Items	Symbol	Absolute Maximum Rating	Unit
		Red/Amber	
Forward Current	I_F	70 ^{Note1}	mA
Peak Forward Current ^{Note2}	I_{FP}	200	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	220	mW
Operation Temperature	T_{opr}	-40 ~ +100	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^\circ\text{C}$
Lead Soldering Temperature	T_{sol}	Max. 260 $^\circ\text{C}$ for 5 sec. max. (3 mm from the base of the epoxy bulb)	

Note:

1. A heat sink is recommended if the device is operated at ambient temperatures higher than 25 $^\circ\text{C}$.
2. Pulse width ≤ 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	Red/Amber	V_F	$I_F = 70$ mA	V		2.5	3.0
Reverse Current	Red/Amber	I_R	$V_R = 5$ V	μA			100
Dominant Wavelength	Red	λ_D	$I_F = 70$ mA	nm	620	628	637
	Amber	λ_D	$I_F = 70$ mA	nm	584	591	599
Luminous Flux	Red	CP41B-RDS (40 degree)	Φ_v	$I_F = 70$ mA	mlm	4400	7000
		CP41B-RFS (70 degree)	Φ_v	$I_F = 70$ mA	mlm	4400	7500
		CP41B-RHS (100 degree)	Φ_v	$I_F = 70$ mA	mlm	5500	8000
	Amber	CP41B-ADS (40 degree)	Φ_v	$I_F = 70$ mA	mlm	4400	6500
		CP41B-AFS (70 degree)	Φ_v	$I_F = 70$ mA	mlm	5500	7500
		CP41B-AHS (100 degree)	Φ_v	$I_F = 70$ mA	mlm	5500	8000
50% Power Angle	CP41B-RDS/ADS		$2\theta_{1/2}$	$I_F = 70$ mA	deg	40	
	CP41B-RFS/AFS		$2\theta_{1/2}$	$I_F = 70$ mA	deg	70	
	CP41B-RHS/AHS		$2\theta_{1/2}$	$I_F = 70$ mA	deg	100	



Flux Bin Limit ($I_F = 70 \text{ mA}$)

Red

CP41B-RDS/RFS (40/70 degree)

Bin Code	Min. (mlm)	Max. (mlm)
LO	4400	5500
M0	5500	6600
N0	6600	8730
P0	8730	11000

Amber

CP41B-ADS (40 degree)

Bin Code	Min. (mlm)	Max. (mlm)
LO	4400	5500
M0	5500	6600
N0	6600	8730
P0	8730	11000

CP41B-RHS (100 degree)

Bin Code	Min. (mlm)	Max. (mlm)
LO	4400	5500
M0	5500	6600
N0	6600	8730
P0	8730	11000
Q0	11000	13200

CP41B-AFS/AHS (70/100 degree)

Bin Code	Min. (mlm)	Max. (mlm)
M0	5500	6600
N0	6600	8730
P0	8730	11000
Q0	11000	13200

Tolerance of measurement of luminous Flux is $\pm 15\%$

Color Bin Limit ($I_F = 70 \text{ mA}$)

Red

Bin Code	Min. (nm)	Max. (nm)
RE	620	637

Amber

Bin Code	Min. (nm)	Max. (nm)
A2	584	587
A3	587	590
A4	590	593
A5	593	596
A6	596	599

Tolerance of measurement of dominant wavelength is $\pm 1 \text{ nm}$

VF Bin Limit ($I_F = 70 \text{ mA}$)

Red

Bin Code	Min. (V)	Max. (V)
23	2.0	2.2
24	2.2	2.4
25	2.4	2.6
26	2.6	2.8
27	2.8	3.0

Amber

Bin Code	Min. (V)	Max. (V)
23	2.0	2.2
24	2.2	2.4
25	2.4	2.6
26	2.6	2.8
27	2.8	3.0

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



Order Code Table*

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Dominant Wavelength			
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)
Red	CP41B-RDS-CL0P0EE4	40	4400	11000	RE	620	RE	637
Red	CP41B-RDS-CM0P0EE4	40	5500	11000	RE	620	RE	637

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Dominant Wavelength			
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)
Red	CP41B-RFS-CL0P0EE4	70	4400	11000	RE	620	RE	637
Red	CP41B-RFS-CM0P0EE4	70	5500	11000	RE	620	RE	637
Red	CP41B-RFS-CN0P0EE4	70	6600	11000	RE	620	RE	637

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Dominant Wavelength			
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)
Red	CP41B-RHS-CL0Q0EE4	100	4400	13200	RE	620	RE	637
Red	CP41B-RHS-CM0Q0EE4	100	5500	13200	RE	620	RE	637
Red	CP41B-RHS-CN0Q0EE4	100	6600	13200	RE	620	RE	637



Order Code Table*

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Dominant Wavelength			
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)
Amber	CP41B-ADS-CL0P0264	40	4400	11000	A2	584	A6	599
Amber	CP41B-ADS-CM0P0354	40	5500	11000	A3	587	A5	596
Amber	CP41B-ADS-CM0P0454	40	5500	11000	A4	590	A5	596

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Dominant Wavelength			
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)
Amber	CP41B-AFS-CM0Q0264	70	5500	13200	A2	584	A6	599
Amber	CP41B-AFS-CN0Q0354	70	6600	13200	A3	587	A5	596
Amber	CP41B-AFS-CN0Q0454	70	6600	13200	A4	590	A5	596

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Dominant Wavelength			
			Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)
Amber	CP41B-AHS-CM0Q0264	100	5500	13200	A2	584	A6	599
Amber	CP41B-AHS-CN0Q0354	100	6600	13200	A3	587	A5	596
Amber	CP41B-AHS-CN0Q0454	100	6600	13200	A4	590	A5	596

Note: 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 codes and single color-bin codes will not be orderable.

Graphs

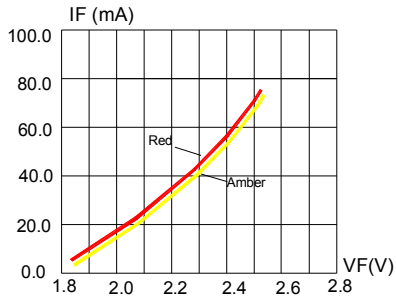


FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

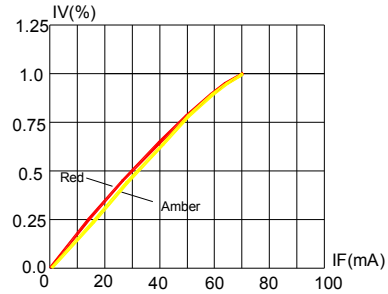


FIG.2 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

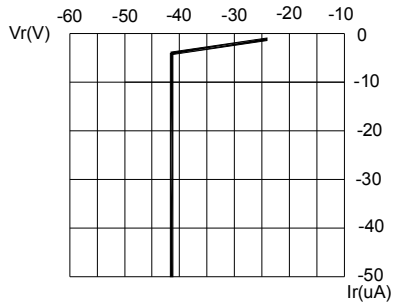


FIG.3 Red & Amber REVERSE CURRENT VS. REVERSE VOLTAGE.

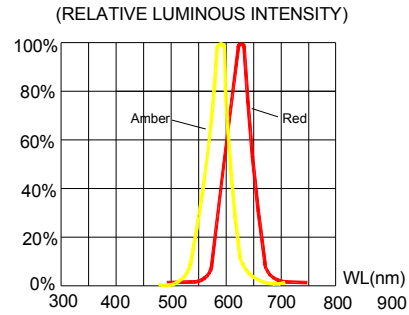


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

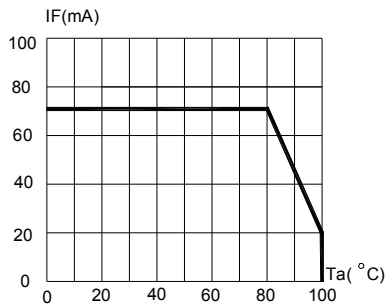


FIG.5 Red & Amber MAXIMUM FORWARD DC CURRENT VS AMBIENT TEMPERATURE ($T_{jmax}=120^{\circ}C$)

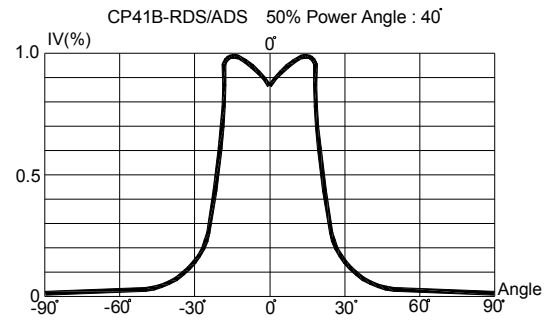


FIG.6 FAR FIELD PATTERN

Graphs

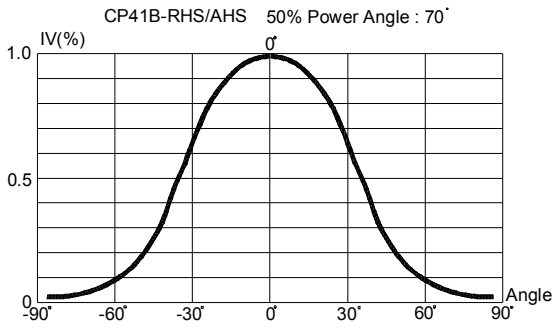


FIG.7 FAR FIELD PATTERN

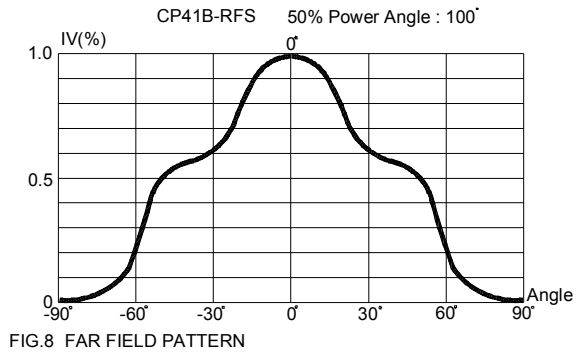


FIG.8 FAR FIELD PATTERN

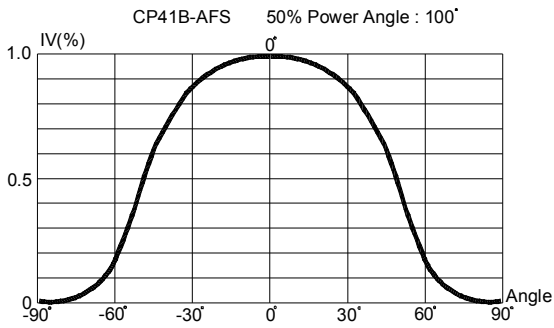


FIG.9 FAR FIELD PATTERN

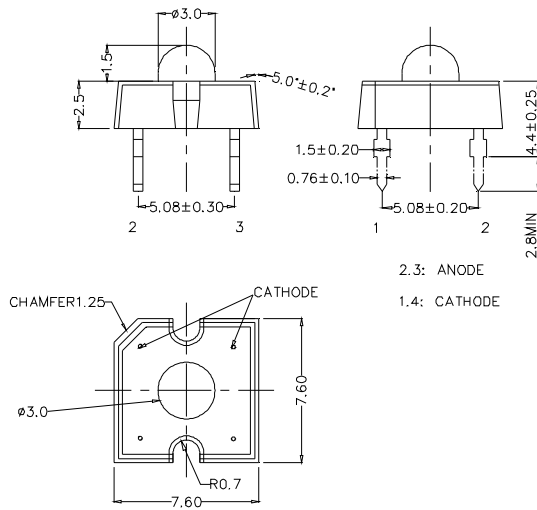
Mechanical Dimensions

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

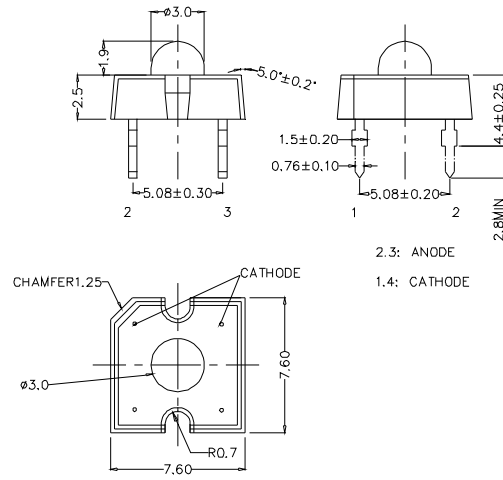
An epoxy meniscus may extend about 1.5 mm down the leads.

Burr around bottom of epoxy may be 0.5 mm max.

CP41B-RHS/AHS:



CP41B-RDS/RFS/ADS/AFS:



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

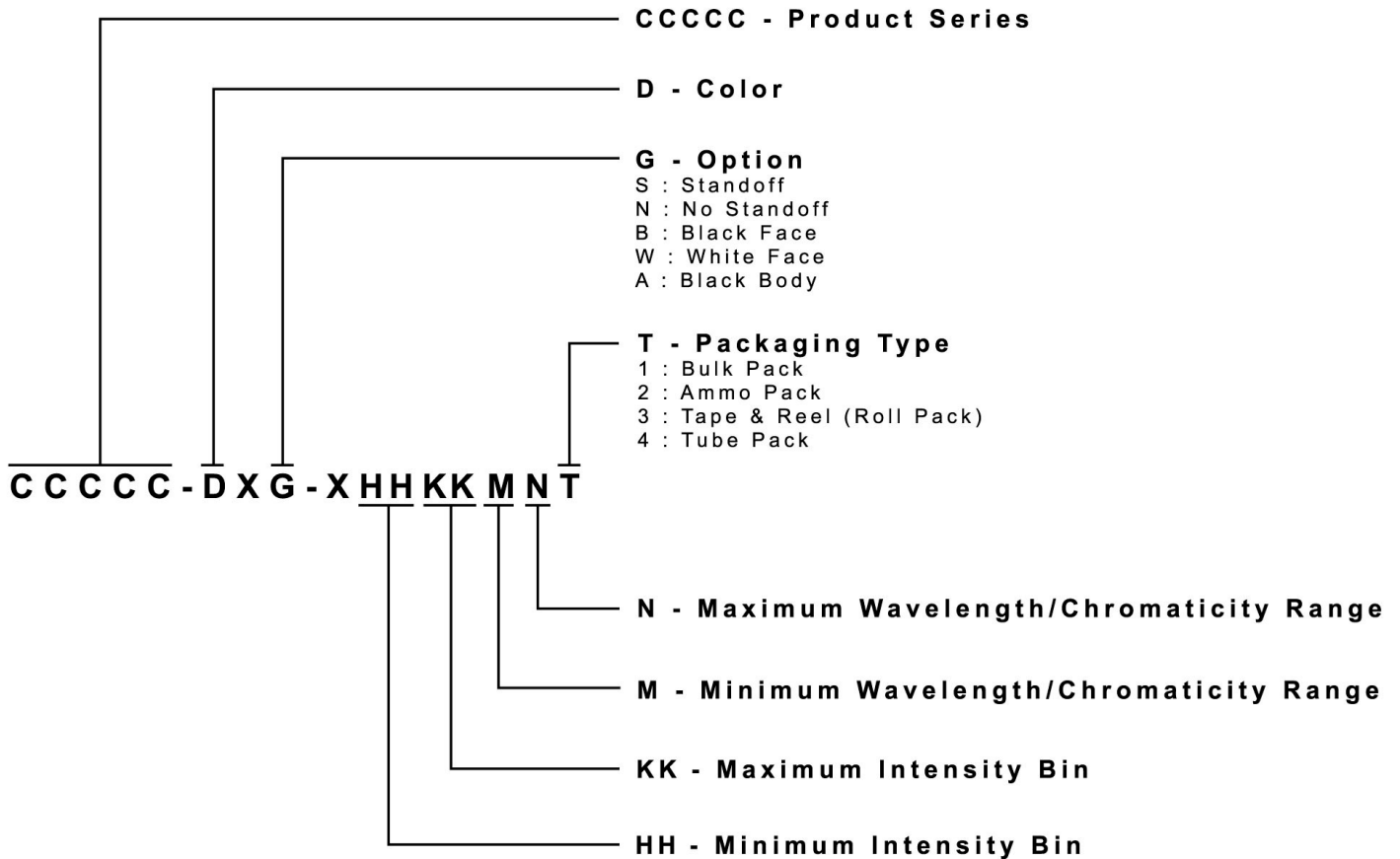
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.



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:



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 Tube Pack type of packaging.
- Max 60 pcs per tube.

