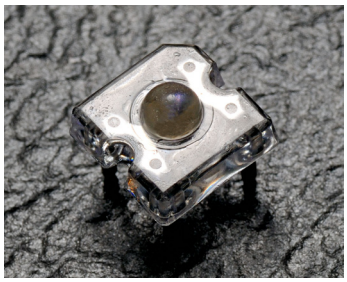
CLD-CT1092.007

Cree® P4 LED
CP41B-WES/WGS



PRODUCT DESCRIPTION

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 green and blue LED materials, which allows designers to match the color of many lighting applications such as vehicle signal lamps and amusement lighting.

FEATURES

- Size (mm): 7.6 X 7.6
- Color Temperatures:
  Cool White :
  Min . (4600K) / Typical (9000K)
- Luminous Flux (mlm):
  CP41B-WES:(3850-11000)
  CP41B-WGS:(3850-11000)
- Viewing angle:
  CP41B-WES: 60 degree
  CP41B-WGS: 90 degree
- Lead-Free
- RoHS Compliant

APPLICATIONS

- Channel Letter
- Amusement

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Durham, NC 27703
USA Tel: +1.919.313.5300

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Items	Symbol	Absolute Maximum Rating	Unit
		CP41B-WES/WGS	
Forward Current	I_F	35	mA
Peak Forward Current Note	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	154	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: 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	CP41B-WES/WGS	V_F	I_F = 30 mA	V		3.6	4.4
Reverse Current	CP41B-WES/WGS	I_R	V_R = 5 V	μA			100
Luminous Flux	CP41B-WES/WGS	Φ_v	I_F = 30 mA	mlm	3850	7000	
Luminous Intensity	CP41B-WES	I_V	I_F = 30 mA	mcd		5200	
	CP41B-WGS	I_V	I_F = 30 mA	mcd		3000	
Chromaticity Coordinates	CP41B-WES/WGS	x	I_F = 30 mA			0.2895	
	CP41B-WES/WGS	y	I_F = 30 mA			0.2905	
50% Power Angle	CP41B-WES	2θ½	I_F = 30 mA	deg		60	
	CP41B-WGS	2θ½	I_F = 30 mA	deg		90	

Note: Continuous reverse voltage can cause LED damage.

FLUX BIN LIMIT (I_F = 30 mA)

Cool White(CP41B-WES/WGS)

Bin Code	Min.(mlm)	Max.(mlm)
K0	3850	4400
L0	4400	5500
M0	5500	6600
N0	6600	8730
P0	8730	11000

- Tolerance of measurement of luminous flux is ±15%

VF BIN LIMIT (I_F = 30 mA)

Cool White (CP41B-WES/WGS)

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
2d	4.0	4.2
2e	4.2	4.4

- Tolerance of measurement of VF is ±0.05V.

COLOR BIN LIMIT (I_F = 30 mA)

Bin Code	Sub-bin	x	y
W1	Wa1	0.2449	0.2288
		0.2497	0.2384
		0.2543	0.2356
		0.2497	0.2267
	Wa2	0.2497	0.2267
		0.2543	0.2356
		0.2589	0.2328
		0.2545	0.2245
	Wa3	0.2497	0.2384
		0.2545	0.2480
		0.2589	0.2445
		0.2543	0.2356
	Wa4	0.2543	0.2356
		0.2589	0.2445
		0.2633	0.2410
		0.2589	0.2328
	Wb1	0.2545	0.2245
		0.2589	0.2328
		0.2635	0.2299
		0.2593	0.2223
	Wb2	0.2593	0.2223
		0.2635	0.2299
		0.2680	0.2270
		0.2640	0.2200
	Wb3	0.2589	0.2328
		0.2633	0.2410
		0.2677	0.2375
		0.2635	0.2299
	Wb4	0.2635	0.2299
		0.2677	0.2375
		0.2720	0.2340
		0.2680	0.2270

Bin Code	Sub-bin	x	y
W1	Wc1	0.2545	0.2480
		0.2593	0.2575
		0.2635	0.2534
		0.2589	0.2445
	Wc2	0.2589	0.2445
		0.2635	0.2534
		0.2677	0.2493
		0.2633	0.2410
	Wc3	0.2593	0.2575
		0.2640	0.2670
		0.2680	0.2623
		0.2635	0.2534
	Wc4	0.2635	0.2534
		0.2680	0.2623
		0.2720	0.2575
		0.2677	0.2493
	Wd1	0.2633	0.2410
		0.2677	0.2493
		0.2718	0.2451
		0.2677	0.2375
	Wd2	0.2677	0.2375
		0.2718	0.2451
		0.2760	0.2410
		0.2720	0.2340
	Wd3	0.2677	0.2493
		0.2720	0.2575
		0.2760	0.2528
		0.2718	0.2451
	Wd4	0.2718	0.2451
		0.2760	0.2528
		0.2800	0.2480
		0.2760	0.2410

Bin Code	Sub-bin	x	y
W2	We1	0.2640	0.2670
		0.2688	0.2765
		0.2726	0.2711
		0.2680	0.2623
	We2	0.2680	0.2623
		0.2726	0.2711
		0.2764	0.2658
		0.2720	0.2575
	We3	0.2688	0.2765
		0.2735	0.2860
		0.2772	0.2800
		0.2726	0.2711
	We4	0.2726	0.2711
		0.2772	0.2800
		0.2808	0.2740
		0.2764	0.2658
	Wf1	0.2720	0.2575
		0.2764	0.2658
		0.2802	0.2604
		0.2760	0.2528
	Wf2	0.2760	0.2528
		0.2802	0.2604
		0.2840	0.2550
		0.2800	0.2480
	Wf3	0.2764	0.2658
		0.2808	0.2740
		0.2844	0.2680
		0.2802	0.2604
	Wf4	0.2802	0.2604
		0.2844	0.2680
		0.2880	0.2620
		0.2840	0.2550

- Tolerance of measurement of the color coordinates is ±0.01.

COLOR BIN LIMIT (I_F = 30 mA)

Bin Code	Sub-bin	x	y
W2	Wg1	0.2735	0.2860
		0.2783	0.2955
		0.2817	0.2889
		0.2772	0.2800
	Wg2	0.2772	0.2800
		0.2817	0.2889
		0.2852	0.2823
		0.2808	0.2740
	Wg3	0.2783	0.2955
		0.2830	0.3050
		0.2863	0.2978
		0.2817	0.2889
	Wg4	0.2817	0.2889
		0.2863	0.2978
		0.2895	0.2905
		0.2852	0.2823
	Wh1	0.2808	0.2740
		0.2852	0.2823
		0.2886	0.2756
		0.2844	0.2680
	Wh2	0.2844	0.2680
		0.2886	0.2756
		0.2920	0.2690
		0.2880	0.2620
	Wh3	0.2852	0.2823
		0.2895	0.2905
		0.2928	0.2833
		0.2886	0.2756
	Wh4	0.2886	0.2756
		0.2928	0.2833
		0.2960	0.2760
		0.2920	0.2690

Bin Code	Sub-bin	x	y
W3	Wj1	0.2830	0.3050
		0.2890	0.3130
		0.2918	0.3048
		0.2863	0.2978
	Wj2	0.2863	0.2978
		0.2918	0.3048
		0.2947	0.2967
		0.2895	0.2905
	Wj3	0.2890	0.3130
		0.2950	0.3210
		0.2974	0.3119
		0.2918	0.3048
	Wj4	0.2918	0.3048
		0.2974	0.3119
		0.2998	0.3028
		0.2947	0.2967
	Wk1	0.2895	0.2905
		0.2947	0.2967
		0.2975	0.2890
		0.2928	0.2833
	Wk2	0.2928	0.2833
		0.2975	0.2890
		0.3003	0.2813
		0.2960	0.2760
	Wk3	0.2947	0.2967
		0.2998	0.3028
		0.3022	0.2946
		0.2975	0.2890
	Wk4	0.2975	0.2890
		0.3022	0.2946
		0.3045	0.2865
		0.3003	0.2813

Bin Code	Sub-bin	x	y
W3	Wm1	0.2950	0.3210
		0.3010	0.3290
		0.3030	0.3190
		0.2974	0.3119
	Wm2	0.2974	0.3119
		0.3030	0.3190
		0.3050	0.3090
		0.2998	0.3028
	Wm3	0.3010	0.3290
		0.3070	0.3370
		0.3085	0.3260
		0.3030	0.3190
	Wm4	0.3030	0.3190
		0.3085	0.3260
		0.3100	0.3150
		0.3050	0.3090
	Wn1	0.2998	0.3028
		0.3050	0.3090
		0.3070	0.3005
		0.3022	0.2946
	Wn2	0.3022	0.2946
		0.3070	0.3005
		0.3090	0.2920
		0.3045	0.2865
	Wn3	0.3050	0.3090
		0.3100	0.3150
		0.3115	0.3060
		0.3070	0.3005
	Wn4	0.3070	0.3005
		0.3115	0.3060
		0.3130	0.2970
		0.3090	0.2920

- Tolerance of measurement of the color coordinates is ±0.01.

COLOR BIN LIMIT (I_F = 30 mA)

Bin Code	Sub-bin	x	y
W4	Wp1	0.3070	0.3370
		0.3130	0.3430
		0.3140	0.3320
		0.3085	0.3260
	Wp2	0.3085	0.3260
		0.3140	0.3320
		0.3150	0.3210
		0.3100	0.3150
	Wp3	0.3130	0.3430
		0.3190	0.3490
		0.3195	0.3380
		0.3140	0.3320
	Wp4	0.3140	0.3320
		0.3195	0.3380
		0.3200	0.3270
		0.3150	0.3210
	Wq1	0.3100	0.3150
		0.3150	0.3210
		0.3163	0.3118
		0.3115	0.3060
	Wq2	0.3115	0.3060
		0.3163	0.3118
		0.3175	0.3025
		0.3130	0.2970
	Wq3	0.3150	0.3210
		0.3200	0.3270
		0.3208	0.3173
		0.3163	0.3118
	Wq4	0.3163	0.3118
		0.3208	0.3173
		0.3215	0.3075
		0.3175	0.3025

Bin Code	Sub-bin	x	y
W4	Wr1	0.3190	0.3490
		0.3245	0.3545
		0.3248	0.3438
		0.3195	0.3380
	Wr2	0.3195	0.3380
		0.3248	0.3438
		0.3250	0.3330
		0.3200	0.3270
	Wr3	0.3245	0.3545
		0.3300	0.3600
		0.3300	0.3495
		0.3248	0.3438
	Wr4	0.3248	0.3438
		0.3300	0.3495
		0.3300	0.3390
		0.3250	0.3330
	Ws1	0.3200	0.3270
		0.3250	0.3330
		0.3255	0.3230
		0.3208	0.3173
	Ws2	0.3208	0.3173
		0.3255	0.3230
		0.3260	0.3130
		0.3215	0.3075
	Ws3	0.3250	0.3330
		0.3300	0.3390
		0.3300	0.3285
		0.3255	0.3230
	Ws4	0.3255	0.3230
		0.3300	0.3285
		0.3300	0.3180
		0.3260	0.3130

Bin Code	Sub-bin	x	y
W5	Wt1	0.3300	0.3600
		0.3378	0.3663
		0.3375	0.3563
		0.3300	0.3495
	Wt2	0.3300	0.3495
		0.3375	0.3563
		0.3372	0.3463
		0.3300	0.3390
	Wt3	0.3378	0.3663
		0.3455	0.3725
		0.3449	0.3630
		0.3375	0.3563
	Wt4	0.3375	0.3563
		0.3449	0.3630
		0.3443	0.3535
		0.3372	0.3463
	Wu1	0.3300	0.3390
		0.3372	0.3463
		0.3368	0.3363
		0.3300	0.3285
	Wu2	0.3300	0.3285
		0.3368	0.3363
		0.3365	0.3263
		0.3300	0.3180
	Wu3	0.3372	0.3463
		0.3443	0.3535
		0.3437	0.3440
		0.3368	0.3363
	Wu4	0.3368	0.3363
		0.3437	0.3440
		0.3430	0.3345
		0.3365	0.3263

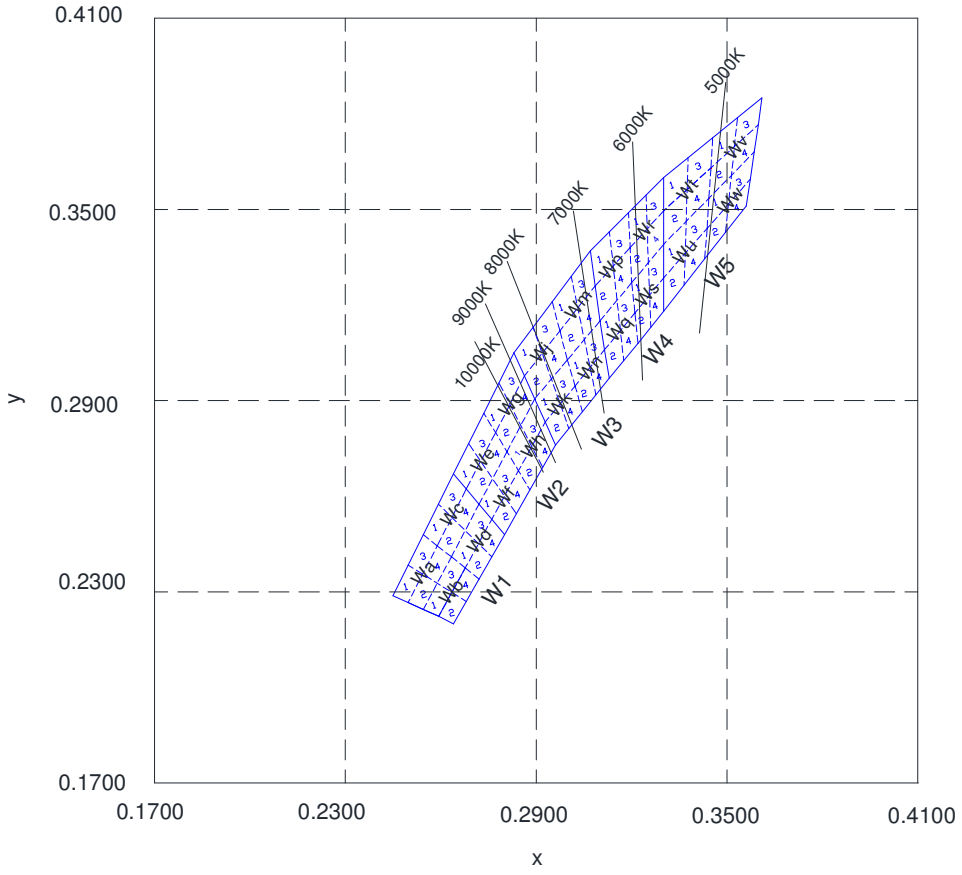
- Tolerance of measurement of the color coordinates is ±0.01.

COLOR BIN LIMIT (I_F = 30 mA)

Bin Code	Sub-bin	x	y
W5	Wv1	0.3455	0.3725
		0.3533	0.3788
		0.3523	0.3698
		0.3449	0.3630
	Wv2	0.3449	0.3630
		0.3523	0.3698
		0.3514	0.3608
		0.3443	0.3535
	Wv3	0.3533	0.3788
		0.3610	0.3850
		0.3598	0.3765
		0.3523	0.3698
	Wv4	0.3523	0.3698
		0.3598	0.3765
		0.3585	0.3680
		0.3514	0.3608
	Ww1	0.3443	0.3535
		0.3514	0.3608
		0.3505	0.3518
		0.3437	0.3440
	Ww2	0.3437	0.3440
		0.3505	0.3518
		0.3495	0.3428
		0.3430	0.3345
	Ww3	0.3514	0.3608
		0.3585	0.3680
		0.3573	0.3595
		0.3505	0.3518
	Ww4	0.3505	0.3518
		0.3573	0.3595
		0.3560	0.3510
		0.3495	0.3428

- Tolerance of measurement of the color coordinates is ±0.01.

CIE CHROMATICITY DIAGRAM



ORDER CODE TABLE*

Cool White (60 degree)

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Color Bin Code
			Min.	Max.	
Cool White	CP41B-WES-CK0P0154	60	3850	11000	W1,W2,W3,W4,W5
Cool White	CP41B-WES-CL0P0134	60	4400	11000	W1,W2,W3
Cool White	CP41B-WES-CM0P0134	60	5500	11000	W1,W2,W3
Cool White	CP41B-WES-CM0P0234	60	5500	11000	W2,W3
Cool White	CP41B-WES-CM0P0244	60	5500	11000	W2,W3,W4
Cool White	CP41B-WES-CN0P0134	60	6600	11000	W1,W2,W3

Cool White (90 degree)

Color	Kit Number	Viewing Angle	Luminous Flux (mlm)		Color Bin Code
			Min.	Max.	
Cool White	CP41B-WGS-CK0P0154	90	3850	11000	W1,W2,W3,W4,W5
Cool White	CP41B-WGS-CL0P0134	90	4400	11000	W1,W2,W3
Cool White	CP41B-WGS-CM0P0134	90	5500	11000	W1,W2,W3
Cool White	CP41B-WGS-CM0P0234	90	5500	11000	W2,W3
Cool White	CP41B-WGS-CM0P0244	90	5500	11000	W2,W3,W4
Cool White	CP41B-WGS-CN0P0134	90	6600	11000	W1,W2,W3

Notes:

1. The above kit numbers represent order codes which include multiple flux-bin and color-bin codes.
   Only one flux-bin code and one color-bin code will be shipped on each reel.
   And single flux-bin code,single color bin-codes will not be orderable.
2. Please refer to the "Cree LED Lamp Reliability Test Standards" document #1 for reliability test conditions.
3. Please refer to the "Cree LED Lamp Soldering & Handling" document #2 for information about how to use this LED product safely.

#1: Refer to http://www.cree.com/led-components/media/documents/LED_Lamp_Reliability_Test_Standard.pdf

#2: Refer to http://www.cree.com/led-components/media/documents/sh-HB.pdf

GRAPHS

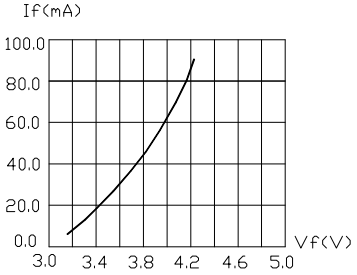


FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE

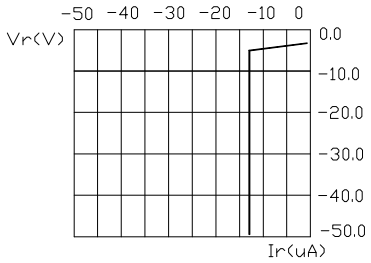


FIG.2 REVERSE CURRENT VS. REVERSE VOLTAGE

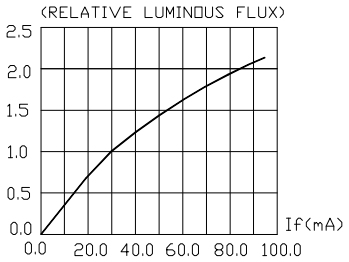


FIG.3 RELATIVE LUMINOUS FLUX VS. FORWARD CURRENT

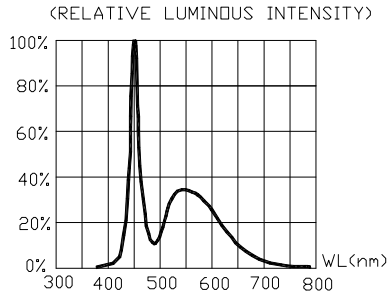


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

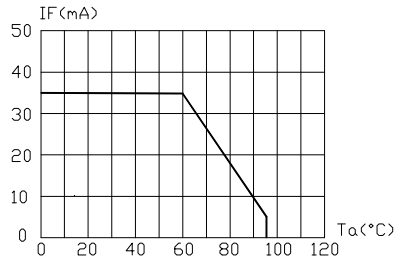


FIG.5 MAXIMUM FORWARD CURRENT VS. AMBIENT TEMPERATURE(Tjmax=120°C)

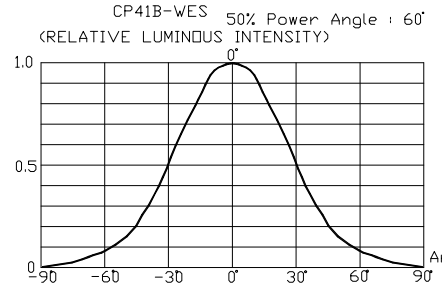


FIG.6 FAR FIELD PATTERN

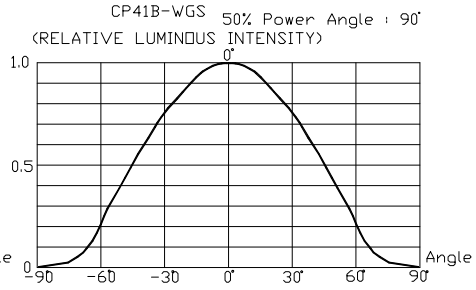


FIG.7 FAR FIELD PATTERN

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.

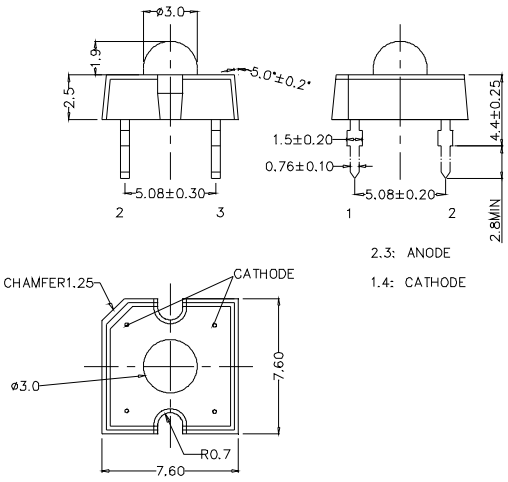
MECHANICAL DIMENSIONS

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

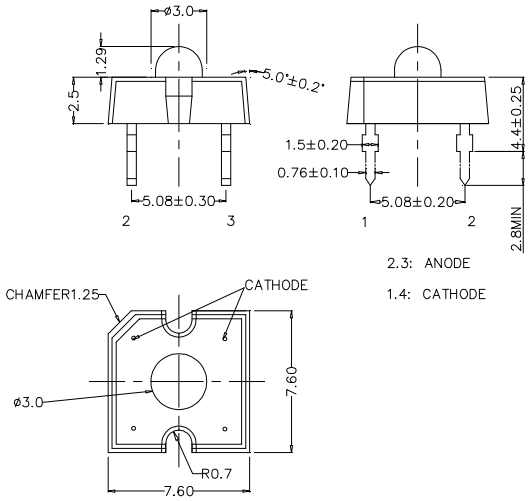
An epoxy meniscus extend about 1.5 mm down the leads.

All metal burr dimension is 0.2 mm max.

CP41B-WES:



CP41B-WGS:



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 by EU member states on January 2, 2013 and amended on March 31, 2015 by EU Directive 2015/863/EU.

RoHS Declarations for this product can be obtained from your Cree representative or from the Product Ecology section of the Cree website.

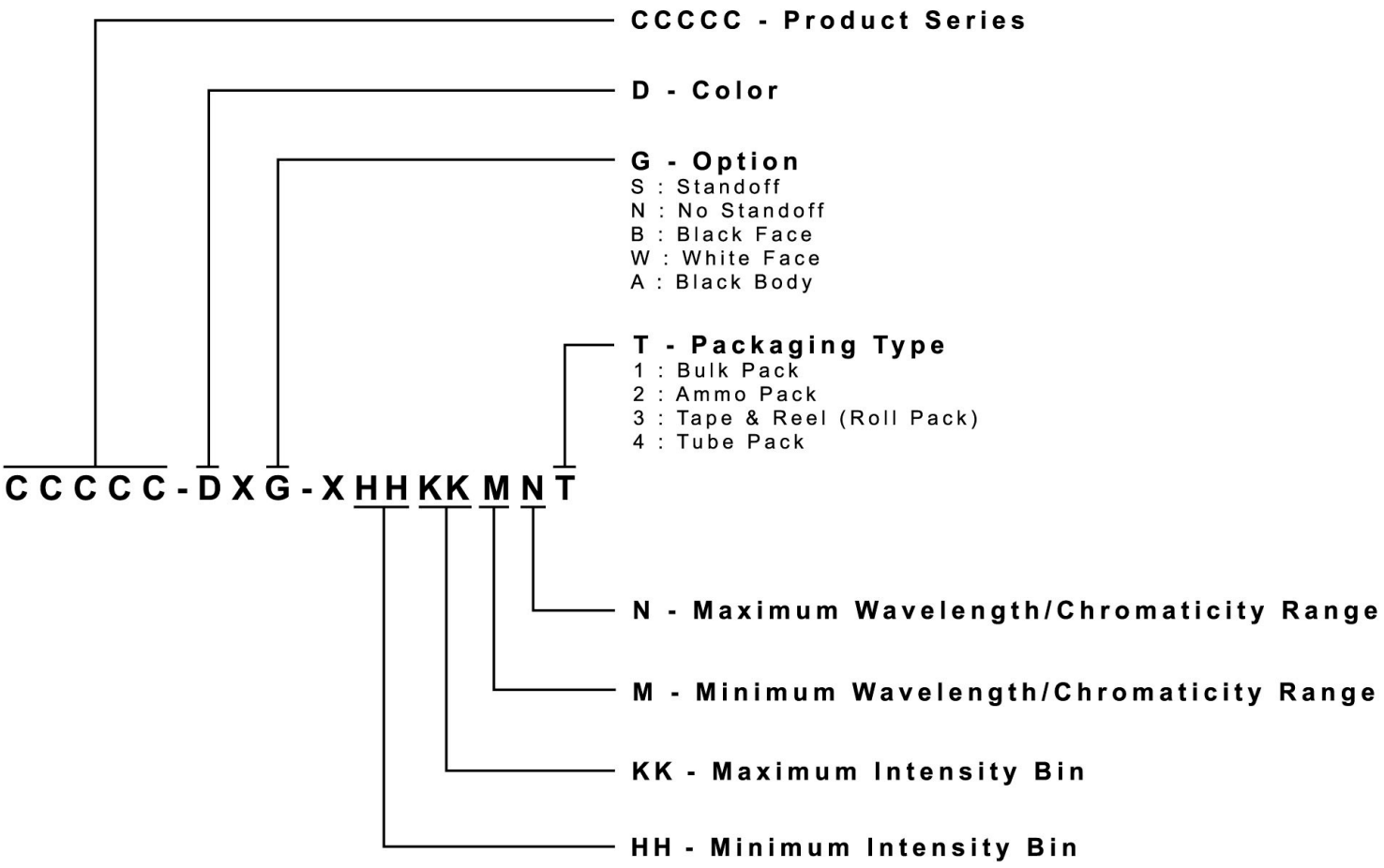
Vision Advisory Claim

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:

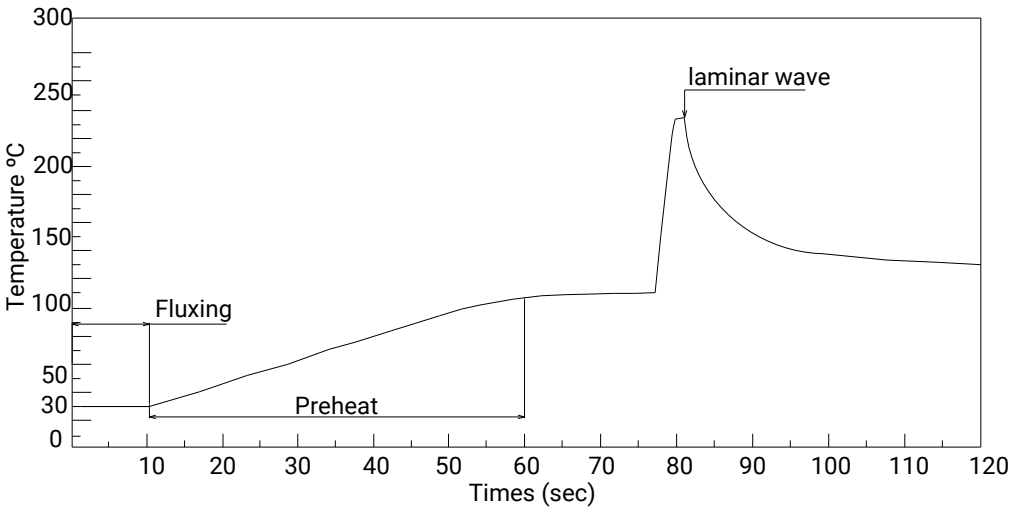


REFLOW SOLDERING

The LED soldering specification is shown below(suitable for both leaded solder & lead-free solder):

Manual Soldering		Solder Dipping	
Soldering iron	35 W max	Preheat	110 ºC max
Temperature	300 ºC max	Preheat time	60 seconds max
		Solder-bath temperature	260 ºC Max
Soldering time	3 seconds max	Dipping time	5 seconds max
Position	Not less than 3 mm from the base of the package.	Position	Not less than 3 mm from the base of the package.

• Manual soldering onto the PCB is not recommended because soldering time is uncontrollable.
• The recommended wave soldering is as below:



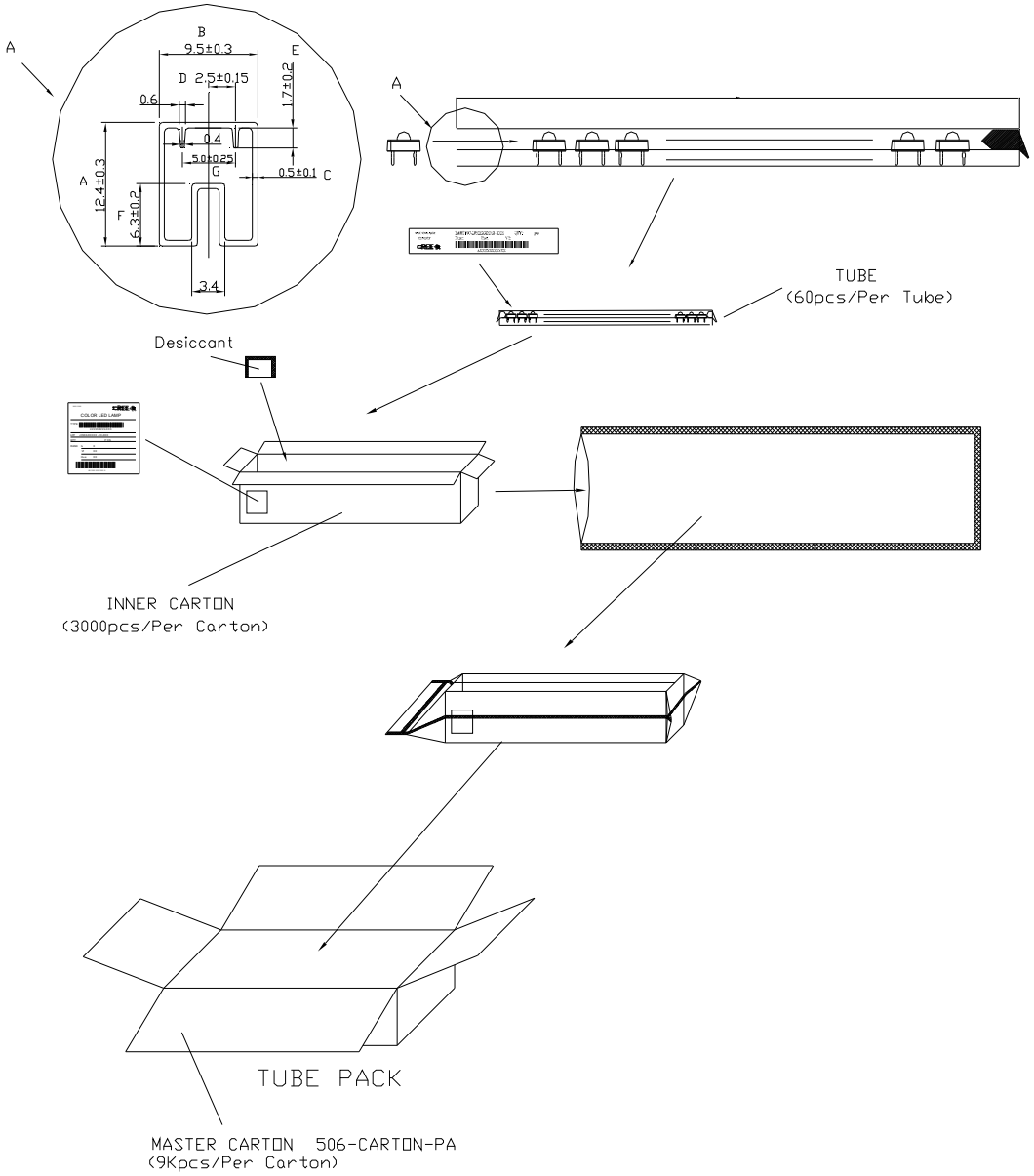
- Do not apply any stress to the LED package, particularly when heated.
- Only bottom preheat is suggested & should not preheat on top in order to reduce thermal stress experienced by the LEDs.
- The LEDs must not be re used once they have been extracted from PCB.
- After soldering the LEDs, the package should be protected from mechanical shock or vibration until the LEDs have reached 40 ºC or below.
- Precautions must be taken as mechanical stress on the LEDs may be caused by PCB warpage or from the clinching and cutting of the LED leads.
- When it is necessary to clam the LEDs during soldering, it is important to ensure no mechanical stress is exerted on the LEDs.
- Cut the LED lead at normal room temperature. Lead cutting at high temperature may cause failure of the LEDs.

Refer to "http://www.cree.com/led-components/media/documents/sh-HB.pdf" for soldering & handling details.

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



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Cree, Inc.:

CP41B-WES-CL0P0134 CP41B-WES-CM0P0134 CP41B-WES-CM0P0234 CP41B-WES-CM0P0244 CP41B-WES-CN0P0134 CP41B-WGS-CL0P0134 CP41B-WGS-CM0P0134 CP41B-WGS-CM0P0234 CP41B-WGS-CM0P0244 CP41B-WGS-CN0P0134 CP41B-WES-CK0P0154 CP41B-WGS-CK0P0154