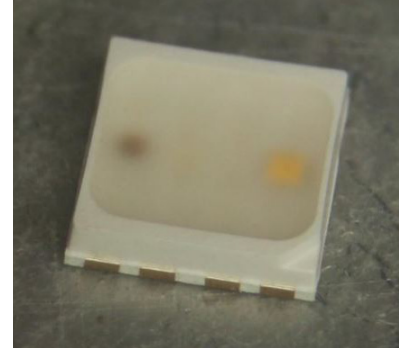


# Cree® PLCC8 4 in 1 SMD LED CLQ6A-TKW



## PRODUCT DESCRIPTION

These SMD LEDs are packaged in an industry standard PLCC8 package. These high performance 4 color SMT LEDs are designed to work in a wide range of applications. A wide viewing angle and high brightness make these LEDs suitable for signage applications.

## FEATURES

- Size (mm): 5.0 x 5.2 x 1.1
- Dominant Wavelength/CCT  
Red (619 - 624nm)  
Green (520 - 535nm)  
Blue (460 - 475nm)  
White (2500-6500k)
- Luminous Intensity (mcd)  
Red (3000-5860)  
Green (7030-14400)  
Blue (1824-4180)  
White (5860-12000)
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant

## APPLICATIONS

- Architecture Lighting
- Decorative Lighting
- Amusement

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

Items	Symbol	Absolute Maximum Rating				Unit
		R	G	B	W	
Forward Current <sup>Note 1</sup>	$I_F$	200	180	180	200	mA
Peak Forward Current <sup>Note 2</sup>	$I_{FP}$	500	400	400	500	mA
Reverse Voltage	$V_R$	5	5	5	5	V
Power Dissipation	$P_D$	520	684	684	720	mW
Operation Temperature	$T_{opr}$	-40 ~ +85				$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +100				$^\circ\text{C}$
Junction Temperature	$T_J$	110	110	110	110	$^\circ\text{C}$
Junction/ambient 1 chip on	$R_{THJA}$	60	110	70	80	$^\circ\text{C/W}$
Junction/solder point 1 chip on	$R_{THJS}$	20	70	40	40	$^\circ\text{C/W}$
Electrostatic Discharge Classification(MIL-STD-883E)	ESD	1000 V				

**Note:** 1.Single-color light.  
2.Pulse width  $\leq 0.1$  msec, duty  $\leq 1/10$ .

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

Characteristics	Condition	Symbol	Values				Unit
			R	G	B	W	
Dominant Wavelength	$I_F = 100$ mA(R) $I_F = 100$ mA(G) $I_F = 100$ mA(B) $I_F = 100$ mA(W)	$\lambda_{DOM}$	619~624	520~535	460~475	NA	nm
Spectral bandwidth at 50% $I_{REL}$ max	$I_F = 100$ mA(R) $I_F = 100$ mA(G) $I_F = 100$ mA(B) $I_F = 100$ mA(W)	$\Delta \lambda$	24	38	28	NA	nm
Forward Voltage	$I_F = 100$ mA(R) $I_F = 100$ mA(G) $I_F = 100$ mA(B) $I_F = 100$ mA(W)	$V_{F(avg)}$	2.1	3.0	3.1	2.9	V
		$V_{F(max)}$	2.6	3.8	3.8	3.6	V
Luminous Intensity	$I_F = 100$ mA(R) $I_F = 100$ mA(G) $I_F = 100$ mA(B) $I_F = 100$ mA(W)	$I_{V(min)}$	3000	7030	1824	5860	mcd
		$I_{V(avg)}$	4500	10400	3000	8200	mcd
Luminous Flux(Reference)	$I_F = 100$ mA(R) $I_F = 100$ mA(G) $I_F = 100$ mA(B) $I_F = 100$ mA(W)	$\Phi_{V(avg)}$	14	30	8.2	25	lm
Reverse Current (max)	$V_R = 5$ V	$I_R$	10	10	10	10	$\mu\text{A}$

**Note:** Continuous reverse voltage can cause LED damage.

**INTENSITY BIN LIMIT (RED  $I_F = 100\text{mA}$ , GREEN  $I_F = 100\text{mA}$ , BLUE  $I_F = 100\text{mA}$ , WHITE  $I_F = 100\text{mA}$ )**

Red

Bin Code	Min.(mcd)	Max.(mcd)
1L	3000	4180
1M	3590	5020
1N	4180	5860

Green

Bin Code	Min.(mcd)	Max.(mcd)
1R	7030	10100
1S	8200	12000
1T	10100	14400

Blue

Bin Code	Min.(mcd)	Max.(mcd)
1H	1824	2560
1J	2130	3000
1K	2560	3590
1L	3000	4180

White

Bin Code	Min.(mcd)	Max.(mcd)
1Q	5860	8200
1R	7030	10100
1S	8200	12000

Tolerance of measurement of luminous intensity is  $\pm 10\%$ .

**COLOR BIN LIMIT (RED  $I_F = 100\text{mA}$ , GREEN  $I_F = 100\text{mA}$ , BLUE  $I_F = 100\text{mA}$ , WHITE  $I_F = 100\text{mA}$ )**

Red

Bin Code	Min.(nm)	Max.(nm)
RB	619	624

Green

Bin Code	Min.(nm)	Max.(nm)
G7	520	525
G23	522.5	527.5
G8	525	530
G45	527.5	532.5
G9	530	535

Blue

Bin Code	Min.(nm)	Max.(nm)
B3	460	465
B23	462.5	467.5
B4	465	470
B45	467.5	472.5
B5	470	475

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

White

Bin Code	Sub-bins	x	y
XA	A11	0.3146	0.3172
		0.3201	0.3222
		0.3211	0.3106
		0.3161	0.3059
	A12	0.3130	0.3284
		0.3190	0.3339
		0.3201	0.3222
		0.3146	0.3172
	A13	0.3190	0.3339
		0.3251	0.3394
		0.3256	0.3273
		0.3201	0.3222
	A14	0.3201	0.3222
		0.3256	0.3273
		0.3261	0.3152
		0.3211	0.3106
	A21	0.3115	0.3397
		0.3180	0.3456
		0.3190	0.3339
		0.3130	0.3284
	A22	0.3099	0.3509
		0.3170	0.3572
		0.3180	0.3456
		0.3115	0.3397
A23	0.3170	0.3572	
	0.3240	0.3636	
	0.3245	0.3515	
	0.3180	0.3456	
A24	0.3180	0.3456	
	0.3245	0.3515	
	0.3251	0.3394	
	0.3190	0.3339	

Bin Code	Sub-bins	x	y
XA	A31	0.3245	0.3515
		0.3311	0.3574
		0.3311	0.3449
		0.3251	0.3394
	A32	0.3240	0.3636
		0.3311	0.3699
		0.3311	0.3574
		0.3245	0.3515
	A33	0.3311	0.3699
		0.3381	0.3762
		0.3376	0.3633
		0.3311	0.3574
	A34	0.3311	0.3574
		0.3376	0.3633
		0.3371	0.3504
		0.3311	0.3449
	A41	0.3256	0.3273
		0.3311	0.3324
		0.3311	0.3199
		0.3261	0.3152
	A42	0.3251	0.3394
		0.3311	0.3449
		0.3311	0.3324
		0.3256	0.3273
A43	0.3311	0.3449	
	0.3371	0.3504	
	0.3366	0.3374	
	0.3311	0.3324	
A44	0.3311	0.3324	
	0.3366	0.3374	
	0.3361	0.3245	
	0.3311	0.3199	

Bin Code	Sub-bins	x	y
XB	B11	0.3610	0.3630
		0.3692	0.3683
		0.3667	0.3570
		0.3590	0.3521
	B12	0.3629	0.3739
		0.3717	0.3796
		0.3692	0.3683
		0.3610	0.3630
	B13	0.3717	0.3796
		0.3805	0.3854
		0.3775	0.3736
		0.3692	0.3683
	B14	0.3692	0.3683
		0.3775	0.3736
		0.3744	0.3619
		0.3667	0.3570
	B21	0.3649	0.3848
		0.3742	0.3910
		0.3717	0.3796
		0.3629	0.3739
	B22	0.3668	0.3957
		0.3767	0.4023
		0.3742	0.3910
		0.3649	0.3848
B23	0.3767	0.4023	
	0.3866	0.4089	
	0.3836	0.3972	
	0.3742	0.3910	
B24	0.3742	0.3910	
	0.3836	0.3972	
	0.3805	0.3854	
	0.3717	0.3796	

Bin Code	Sub-bins	x	y
XB	B31	0.3836	0.3972
		0.3929	0.4033
		0.3893	0.3911
		0.3805	0.3854
	B32	0.3866	0.4089
		0.3965	0.4155
		0.3929	0.4033
		0.3836	0.3972
	B33	0.3965	0.4155
		0.4065	0.4221
		0.4023	0.4095
		0.3929	0.4033
	B34	0.3929	0.4033
		0.4023	0.4095
		0.3981	0.3969
		0.3893	0.3911
	B41	0.3775	0.3736
		0.3857	0.3789
		0.3821	0.3667
		0.3744	0.3619
	B42	0.3805	0.3854
		0.3893	0.3911
		0.3857	0.3789
		0.3775	0.3736
B43	0.3893	0.3911	
	0.3981	0.3969	
	0.3940	0.3842	
	0.3857	0.3789	
B44	0.3857	0.3789	
	0.3940	0.3842	
	0.3898	0.3716	
	0.3821	0.3667	

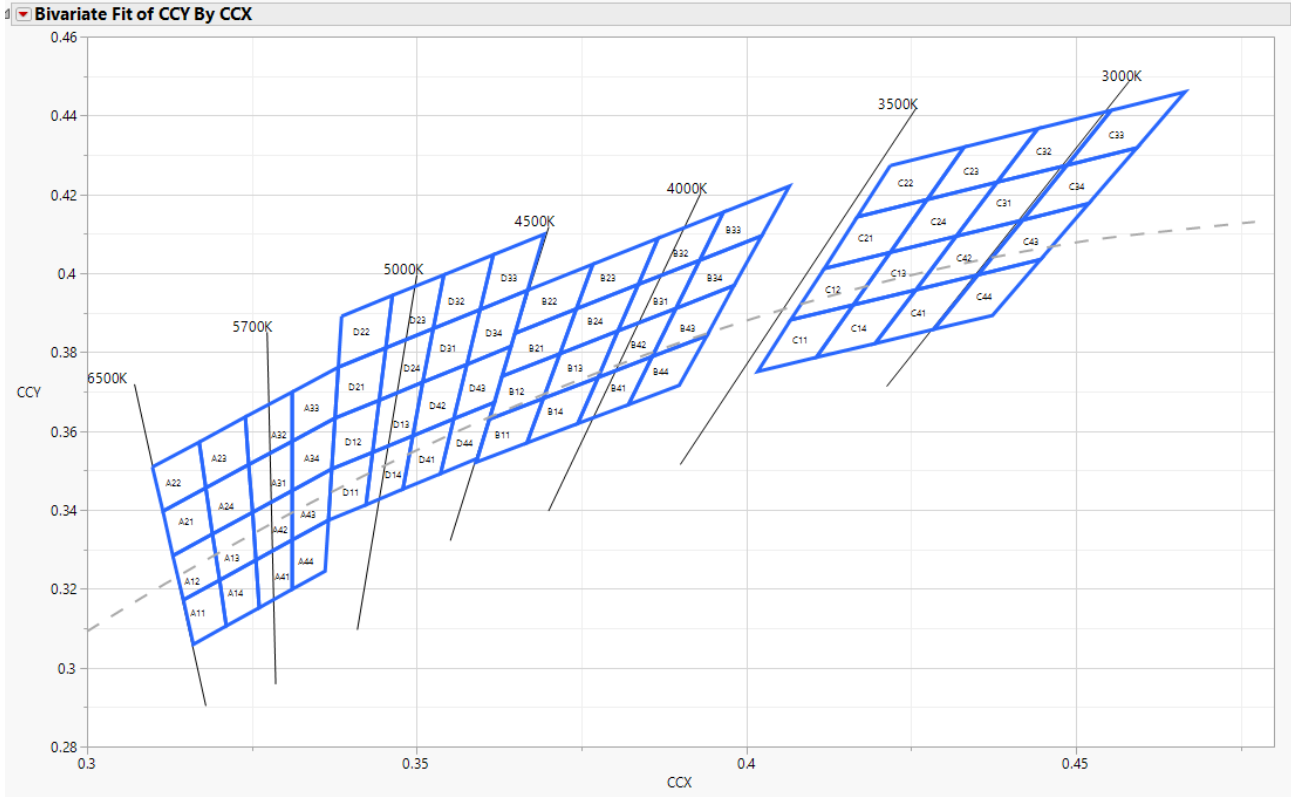
- Tolerance of measurement of the color coordinates is  $\pm 0.01$ .

White

Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y			
XC	C11	0.4067	0.3882	XC	C31	0.4380	0.4231	XD	D11	0.3371	0.3504	XD	D31	0.3525	0.3860			
		0.4162	0.3920			0.4486	0.4274			0.3433	0.3546			0.3596	0.3908			
		0.4106	0.3787			0.4419	0.4135			0.3423	0.3413			0.3576	0.3769			
		0.4017	0.3751			0.4318	0.4094			0.3366	0.3374			0.3509	0.3724			
	C12	0.4118	0.4012		C32	0.4442	0.4367		D12	0.3376	0.3633		D32	0.3541	0.3996	D33	0.3616	0.4047
		0.4218	0.4053			0.4553	0.4413			0.3443	0.3678			0.3616	0.4047			
		0.4162	0.3920			0.4486	0.4274			0.3433	0.3546			0.3596	0.3908			
		0.4067	0.3882			0.4380	0.4231			0.3371	0.3504			0.3525	0.3860			
	C13	0.4218	0.4053		C33	0.4553	0.4413		D13	0.3443	0.3678		D34	0.3616	0.4047	D41	0.3616	0.4047
		0.4318	0.4094			0.4665	0.4460			0.3509	0.3724			0.3693	0.4099			
		0.4257	0.3958			0.4592	0.4318			0.3494	0.3588			0.3668	0.3957			
		0.4162	0.3920			0.4486	0.4274			0.3433	0.3546			0.3596	0.3908			
	C14	0.4162	0.3920		C34	0.4486	0.4274		D14	0.3433	0.3546		D42	0.3596	0.3908	D43	0.3596	0.3908
		0.4257	0.3958			0.4592	0.4318			0.3494	0.3588			0.3668	0.3957			
		0.4195	0.3822			0.4519	0.4177			0.3479	0.3453			0.3643	0.3815			
		0.4106	0.3787			0.4419	0.4135			0.3423	0.3413			0.3576	0.3769			
	C21	0.4168	0.4143		C41	0.4257	0.3958		D21	0.3381	0.3762		D44	0.3494	0.3588	D44	0.3494	0.3588
		0.4274	0.4187			0.4351	0.3996			0.3453	0.3811			0.3556	0.3631			
		0.4218	0.4053			0.4284	0.3858			0.3443	0.3678			0.3536	0.3492			
		0.4118	0.4012			0.4195	0.3822			0.3376	0.3633			0.3479	0.3453			
	C22	0.4218	0.4273		C42	0.4318	0.4094		D22	0.3386	0.3891		D42	0.3509	0.3724	D42	0.3509	0.3724
		0.4330	0.4320			0.4419	0.4135			0.3463	0.3944			0.3576	0.3769			
		0.4274	0.4187			0.4351	0.3996			0.3453	0.3811			0.3556	0.3631			
		0.4168	0.4143			0.4257	0.3958			0.3381	0.3762			0.3494	0.3588			
	C23	0.4330	0.4320		C43	0.4419	0.4135		D23	0.3463	0.3944		D43	0.3576	0.3769	D43	0.3576	0.3769
		0.4442	0.4367			0.4519	0.4177			0.3541	0.3996			0.3643	0.3815			
		0.4380	0.4231			0.4446	0.4035			0.3525	0.3860			0.3618	0.3673			
		0.4274	0.4187			0.4351	0.3996			0.3453	0.3811			0.3556	0.3631			
	C24	0.4274	0.4187		C44	0.4351	0.3996		D24	0.3453	0.3811		D44	0.3556	0.3631	D44	0.3556	0.3631
		0.4380	0.4231			0.4446	0.4035			0.3525	0.3860			0.3618	0.3673			
		0.4318	0.4094			0.4373	0.3893			0.3509	0.3724			0.3592	0.3531			
		0.4218	0.4053			0.4284	0.3858			0.3443	0.3678			0.3536	0.3492			

- Tolerance of measurement of the color coordinates is  $\pm 0.01$ .

## CIE CHROMATICITY DIAGRAM



**ORDER CODE TABLE\***

Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Pack- age
		Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	
CLQ6A-TKW-C1L1R1H1QBB7935AA3	Red	Any 1 Intensity bin from 1L(3000) - 1N(5860)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from 1R(7030) - 1T(14400)		Any 1 hue bin from G7(520) - G9(535)				Reel
	Blue	Any 1 Intensity bin from 1H(1824) - 1L(4180)		Any 1 hue bin from B3(460) - B5(475)				Reel
	White	Any 1 Intensity bin from 1Q(5860) - 1S(12000)		XA				Reel
CLQ6A-TKW-C1L1R1H1QBB7935BB3	Red	Any 1 Intensity bin from 1L(3000) - 1N(5860)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from 1R(7030) - 1T(14400)		Any 1 hue bin from G7(520) - G9(535)				Reel
	Blue	Any 1 Intensity bin from 1H(1824) - 1L(4180)		Any 1 hue bin from B3(460) - B5(475)				Reel
	White	Any 1 Intensity bin from 1Q(5860) - 1S(12000)		XB				Reel
CLQ6A-TKW-C1L1R1H1QBB7935CC3	Red	Any 1 Intensity bin from 1L(3000) - 1N(5860)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from 1R(7030) - 1T(14400)		Any 1 hue bin from G7(520) - G9(535)				Reel
	Blue	Any 1 Intensity bin from 1H(1824) - 1L(4180)		Any 1 hue bin from B3(460) - B5(475)				Reel
	White	Any 1 Intensity bin from 1Q(5860) - 1S(12000)		XC				Reel
CLQ6A-TKW-C1L1R1H1QBB7935DD3	Red	Any 1 Intensity bin from 1L(3000) - 1N(5860)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from 1R(7030) - 1T(14400)		Any 1 hue bin from G7(520) - G9(535)				Reel
	Blue	Any 1 Intensity bin from 1H(1824) - 1L(4180)		Any 1 hue bin from B3(460) - B5(475)				Reel
	White	Any 1 Intensity bin from 1Q(5860) - 1S(12000)		XD				Reel

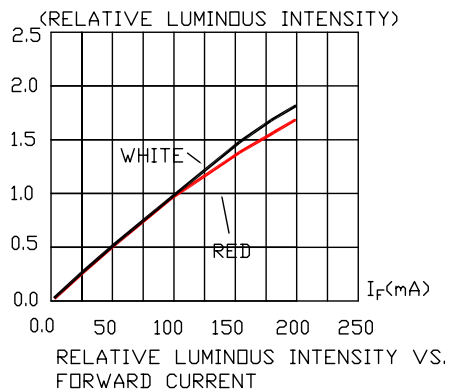
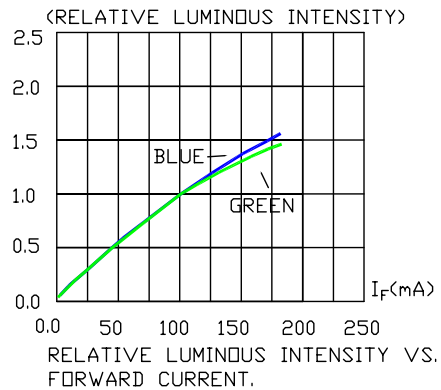
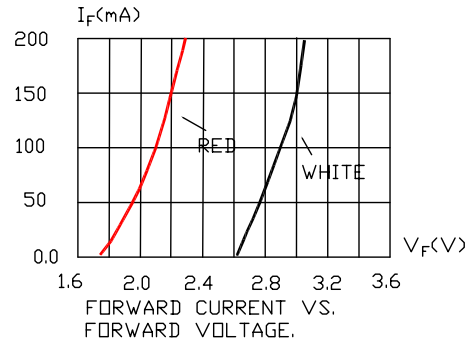
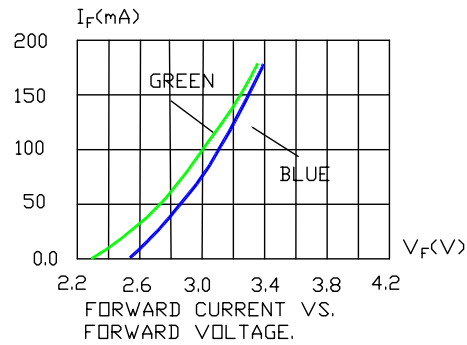
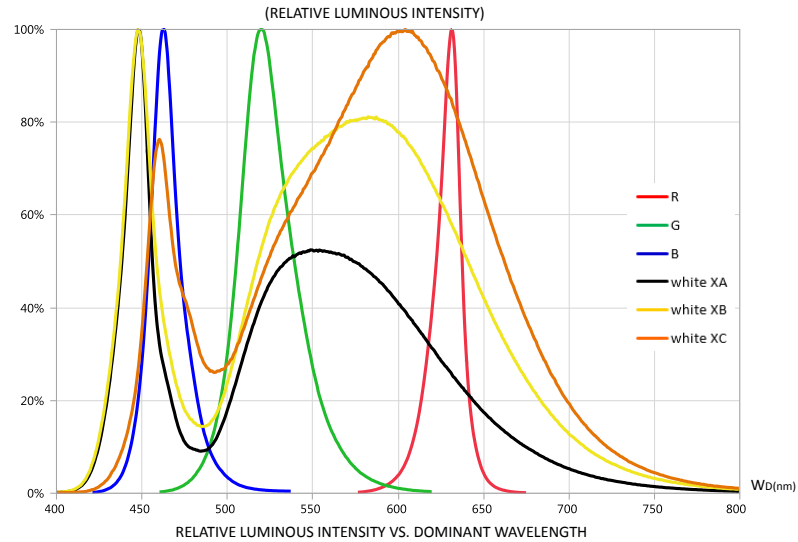
**Notes:**

1. The above kit numbers represent the order codes which 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 code and single color-bin code will be orderable in certain quantities. For example, any 1 intensity bin from 1R - 1T means only 1 intensity bin (1R or 1S or 1T) will be shipped by Cree. For example, any 1 color bin from G7 - G9 means only 1 color bin (G7 or G23 or G8 or G45 or G9) will be shipped by Cree.
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](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>

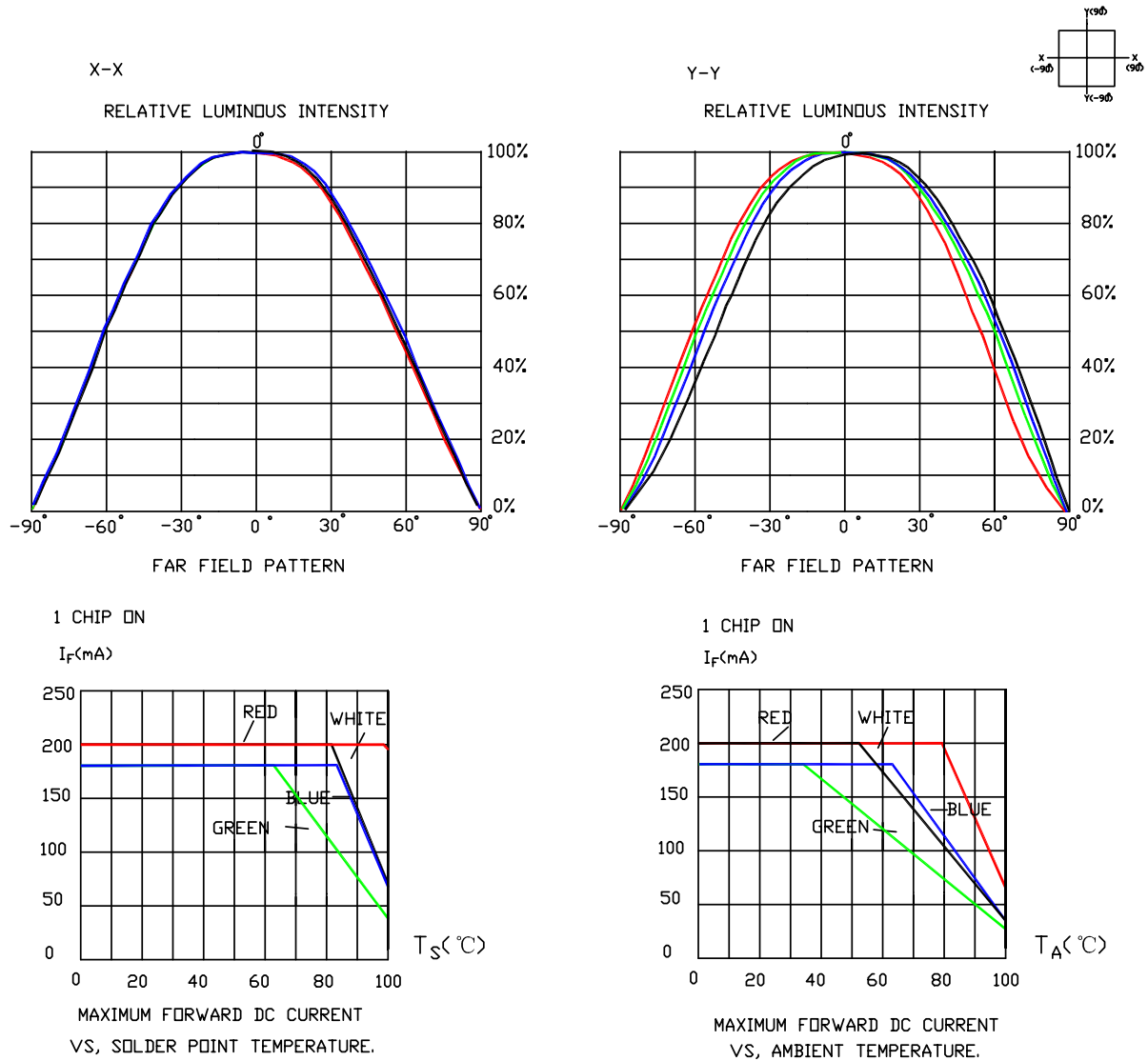
## GRAPHS



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.

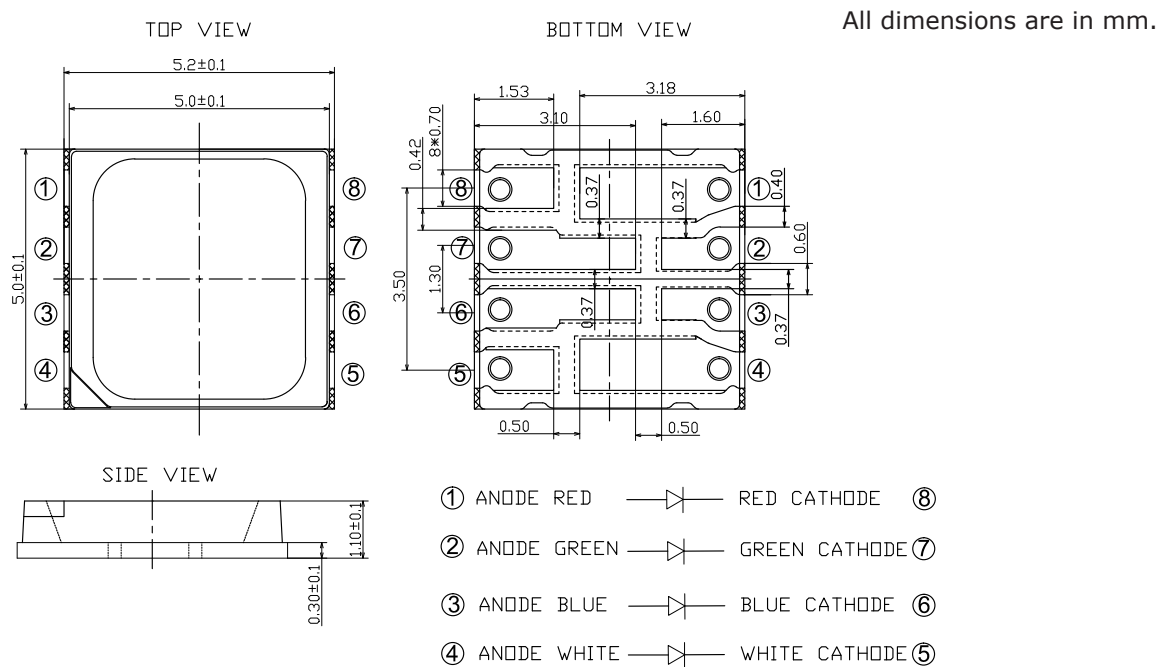


## GRAPHS

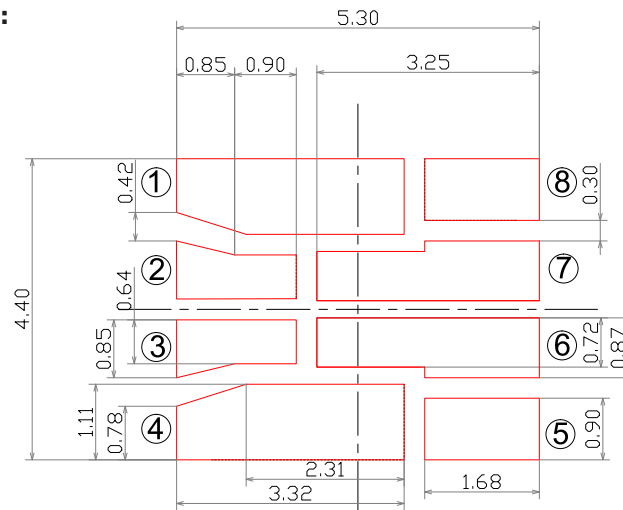


The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

## MECHANICAL DIMENSIONS



**Solder Pad recommend:**



- Tolerance of measurement of the dimension is  $\pm 0.1$ .

### 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.

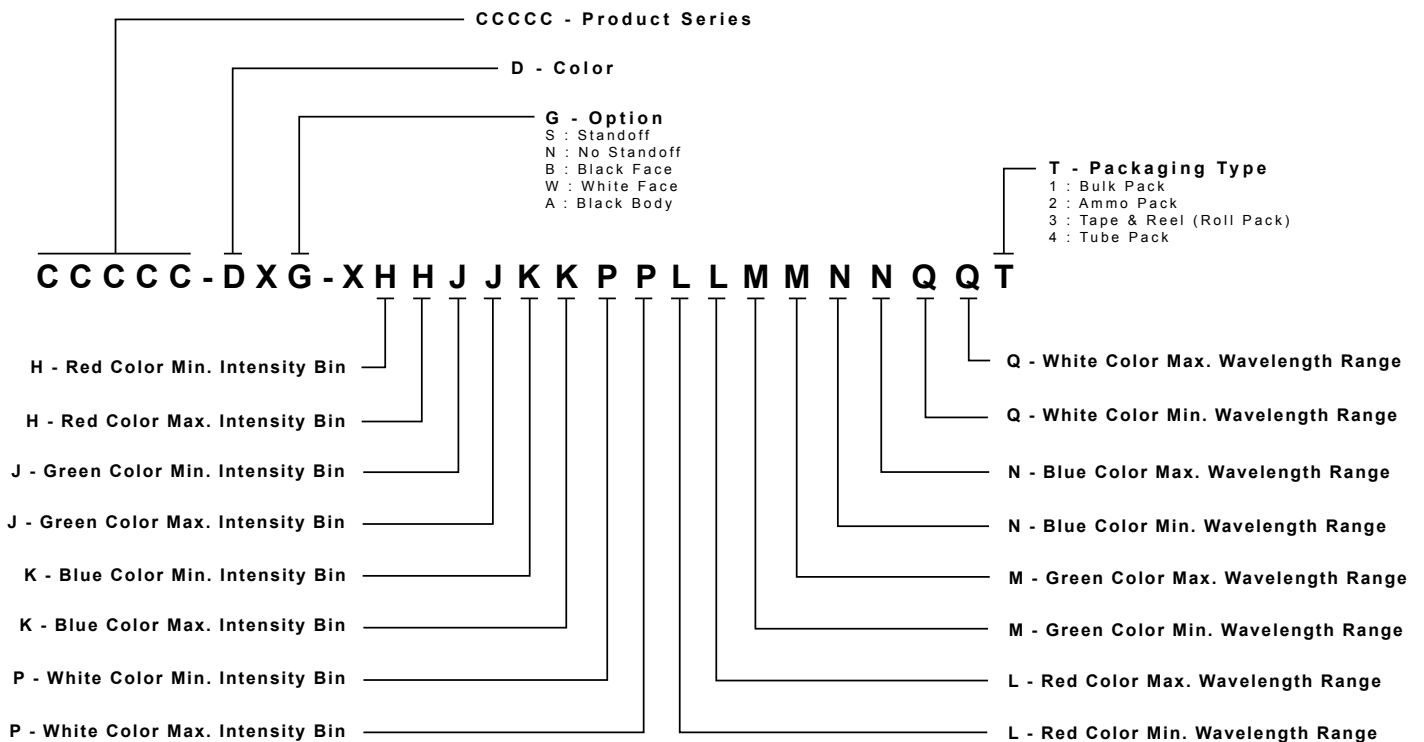
Vision Advisory Claim

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

## KIT NUMBER SYSTEM

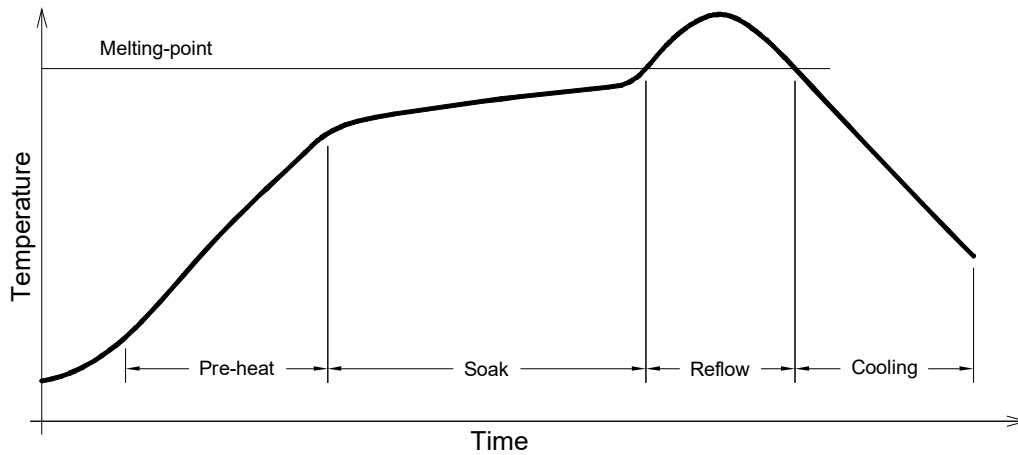
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping and packaging options.

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



## REFLOW SOLDERING

- The CLQ6A-TKW 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 CLQ6A-TKW

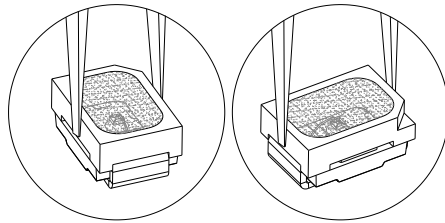
Solder
Average ramp-up rate = 4°C/s max
Preheat temperature = 150°C ~200°C
Preheat time = 120s max
Ramp-down rate = 6°C/s max
Peak temperature = 250°C max
Time within 5°C of actual Peak Temperature = 10s max
Duration above 217°C is 60s max

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

## NOTES

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- 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:



## PACKAGING

- The boxes are not water resistant and they must be kept away from water and moisture.
- 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 shocks during transportation.
- The reel pack is applied in SMD LED.
- Max 4000 pcs per reel.

