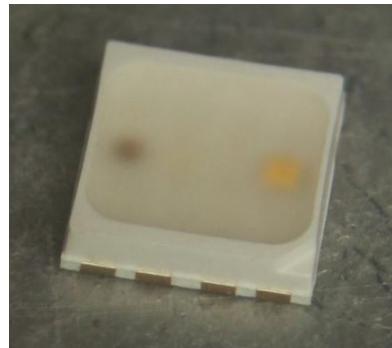


Cree® PLCC8 4 in 1 SMD LED

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(3000K/4000K/5000K/5700K)
- 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 Note 1	I_F	200	180	180	200	mA
Peak Forward Current Note 2	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				°C
Storage Temperature	T_{stg}	-40 ~ +100				°C
Junction Temperature	T_J	110	110	110	110	°C
Junction/ambient	R_{THJA}	60	110	70	80	°C/W
Junction/solder point	R_{THJS}	20	70	40	40	°C/W
Electrostatic Discharge Classification(MIL-STD-883E)	ESD	1000 V				

Note: 1.Single-color light.

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

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 $\pm 1\text{ nm}$.

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

Bin Code	CRI Min.	CRI Max.
A	65	70
C	70	75
D	75	80
H	80	85
J	85	90

Tolerance of measurement of CRI is ± 2 .

COLOR BIN LIMIT (RED $I_F = 100\text{mA}$, GREEN $I_F = 100\text{mA}$, BLUE $I_F = 100\text{mA}$, WHITE $I_F = 100\text{mA}$)
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
XA	A11	0.3146	0.3172	A31	A31	0.3245	0.3515	4C3	4C3	0.3663	0.3758	5T4	5T4	0.3937	0.4001
		0.3201	0.3222			0.3311	0.3574			0.3680	0.3833			0.3962	0.4086
		0.3211	0.3106			0.3311	0.3449			0.3736	0.3874			0.4035	0.4133
		0.3161	0.3059			0.3251	0.3394			0.3719	0.3797			0.4006	0.4044
	A12	0.3130	0.3284	A32	A32	0.3240	0.3636	4C4	4C4	0.3646	0.368	5A1	5A1	0.3670	0.3578
		0.3190	0.3339			0.3311	0.3699			0.3663	0.3758			0.3686	0.3649
		0.3201	0.3222			0.3311	0.3574			0.3719	0.3797			0.3744	0.3685
		0.3146	0.3172			0.3245	0.3515			0.3702	0.3722			0.3726	0.3612
	A13	0.3190	0.3339	A33	A33	0.3311	0.3699	4D3	4D3	0.3630	0.3611	5A2	5A2	0.3686	0.3649
		0.3251	0.3394			0.3381	0.3762			0.3646	0.368			0.3702	0.3722
		0.3256	0.3273			0.3376	0.3633			0.3702	0.3722			0.3763	0.3760
		0.3201	0.3222			0.3311	0.3574			0.3686	0.3649			0.3744	0.3685
	A14	0.3201	0.3222	A34	A34	0.3311	0.3574	4D4	4D4	0.3614	0.3539	5A3	5A3	0.3744	0.3685
		0.3256	0.3273			0.3376	0.3633			0.3630	0.3611			0.3763	0.3760
		0.3261	0.3152			0.3371	0.3504			0.3686	0.3649			0.3825	0.3798
		0.3211	0.3106			0.3311	0.3449			0.3670	0.3578			0.3804	0.3721
	A21	0.3115	0.3397	A41	A41	0.3256	0.3273	SB	SB	0.3680	0.3833	5A4	5A4	0.3726	0.3612
		0.3180	0.3456			0.3311	0.3324			0.3698	0.3915			0.3744	0.3685
		0.3190	0.3339			0.3311	0.3199			0.3754	0.3954			0.3804	0.3721
		0.3130	0.3284			0.3261	0.3152			0.3736	0.3874			0.3783	0.3646
	A22	0.3099	0.3509	A42	A42	0.3251	0.3394	5S1	5S1	0.3736	0.3874	5B1	5B1	0.3702	0.3722
		0.3170	0.3572			0.3311	0.3449			0.3754	0.3954			0.3719	0.3797
		0.3180	0.3456			0.3311	0.3324			0.3820	0.3997			0.3782	0.3837
		0.3115	0.3397			0.3256	0.3273			0.3802	0.3916			0.3763	0.3760
	A23	0.3170	0.3572	A43	A43	0.3311	0.3449	5S4	5S4	0.3802	0.3916	5B2	5B2	0.3719	0.3797
		0.3240	0.3636			0.3371	0.3504			0.3820	0.3997			0.3736	0.3874
		0.3245	0.3515			0.3366	0.3374			0.3894	0.4044			0.3802	0.3916
		0.3180	0.3456			0.3311	0.3324			0.3871	0.3959			0.3782	0.3837
	A24	0.3180	0.3456	A44	A44	0.3311	0.3324	5T1	5T1	0.3871	0.3959	5B3	5B3	0.3782	0.3837
		0.3245	0.3515			0.3366	0.3374			0.3894	0.4044			0.3802	0.3916
		0.3251	0.3394			0.3361	0.3245			0.3962	0.4086			0.3869	0.3958
		0.3190	0.3339			0.3311	0.3199			0.3937	0.4001			0.3847	0.3877

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

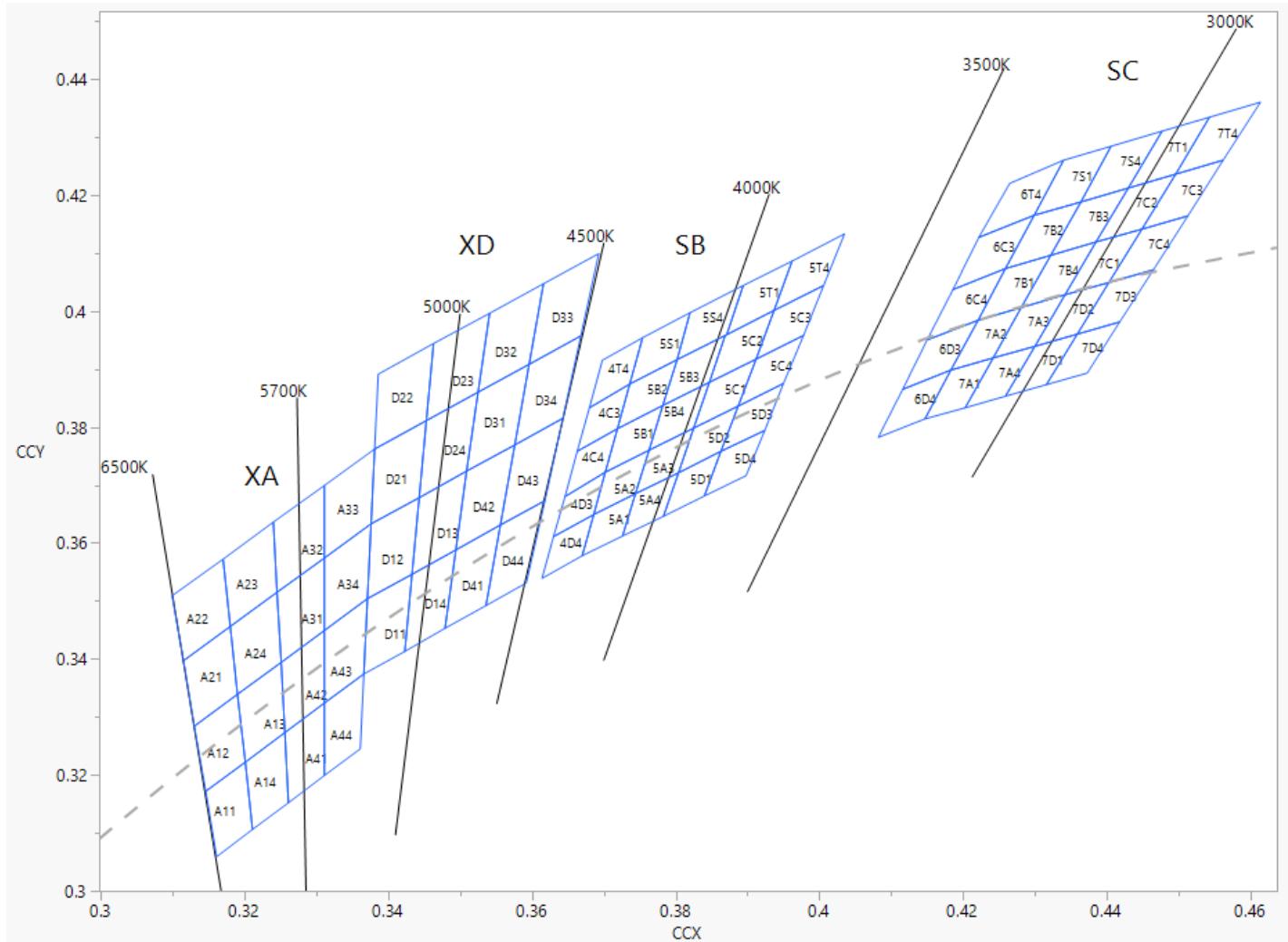
Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y									
SB	5B4	0.3763	0.3760	6C3	0.4186	0.4037	7A1	0.4147	0.3814	7C1	0.4342	0.4028												
		0.3782	0.3837		0.4222	0.4127		0.4183	0.3898		0.4385	0.4119												
		0.3847	0.3877		0.4299	0.4165		0.4242	0.3919		0.4449	0.4141												
		0.3825	0.3798		0.4259	0.4073		0.4203	0.3833		0.4403	0.4049												
	5C1	0.3825	0.3798	6C4	0.4150	0.3950	7A2	0.4183	0.3898	7C2	0.4385	0.4119												
		0.3847	0.3877		0.4186	0.4037		0.4221	0.3984		0.4430	0.4212												
		0.3912	0.3917		0.4259	0.4073		0.4281	0.4006		0.4496	0.4236												
		0.3887	0.3836		0.4221	0.3984		0.4242	0.3919		0.4449	0.4141												
	5C2	0.3847	0.3877	6D3	0.4116	0.3865	7A3	0.4242	0.3919	7C3	0.4449	0.4141												
		0.3869	0.3958		0.4150	0.3950		0.4281	0.4006		0.4496	0.4236												
		0.3937	0.4001		0.4221	0.3984		0.4342	0.4028		0.4562	0.4260												
		0.3912	0.3917		0.4183	0.3898		0.4300	0.3939		0.4513	0.4164												
	5C3	0.3912	0.3917	6D4	0.4082	0.3782	7A4	0.4203	0.3833	7C4	0.4403	0.4049												
		0.3937	0.4001		0.4116	0.3865		0.4242	0.3919		0.4449	0.4141												
		0.4006	0.4044		0.4183	0.3898		0.4300	0.3939		0.4513	0.4164												
		0.3978	0.3958		0.4147	0.3814		0.4259	0.3853		0.4465	0.4071												
	5C4	0.3887	0.3836	6T4	0.4222	0.4127	7B1	0.4221	0.3984	7D1	0.4259	0.3853												
		0.3912	0.3917		0.4265	0.4220		0.4259	0.4073		0.4300	0.3939												
		0.3978	0.3958		0.4340	0.4260		0.4322	0.4096		0.4359	0.3960												
		0.3950	0.3875		0.4299	0.4165		0.4281	0.4006		0.4316	0.3873												
	5D1	0.3783	0.3646	7S1	0.4299	0.4165	7B2	0.4259	0.4073	7D2	0.4300	0.3939												
		0.3804	0.3721		0.4340	0.4260		0.4299	0.4165		0.4342	0.4028												
		0.3863	0.3758		0.4406	0.4284		0.4364	0.4188		0.4403	0.4049												
		0.3840	0.3681		0.4364	0.4188		0.4322	0.4096		0.4359	0.3960												
	5D2	0.3804	0.3721	7S4	0.4364	0.4188	7B3	0.4322	0.4096	7D3	0.4359	0.3960												
		0.3825	0.3798		0.4406	0.4284		0.4364	0.4188		0.4403	0.4049												
		0.3887	0.3836		0.4477	0.4310		0.4430	0.4212		0.4465	0.4071												
		0.3863	0.3758		0.4430	0.4212		0.4385	0.4119		0.4418	0.3981												
	5D3	0.3863	0.3758	7T1	0.4430	0.4212	7B4	0.4281	0.4006	7D4	0.4316	0.3873												
		0.3887	0.3836		0.4477	0.4310		0.4322	0.4096		0.4359	0.3960												
		0.3950	0.3875		0.4543	0.4334		0.4385	0.4119		0.4418	0.3981												
		0.3924	0.3794		0.4496	0.4236		0.4342	0.4028		0.4373	0.3893												
	5D4	0.3840	0.3681	7T4	0.4496	0.4236																		
		0.3863	0.3758		0.4543	0.4334																		
		0.3924	0.3794		0.4614	0.4360																		
		0.3898	0.3716		0.4562	0.4260																		

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

Bin Code	Sub-bins	x	y	Bin Code	Sub-bins	x	y
XD	D11	0.3371	0.3504	XD	D31	0.3525	0.3860
		0.3433	0.3546			0.3596	0.3908
		0.3423	0.3413			0.3576	0.3769
		0.3366	0.3374			0.3509	0.3724
	D12	0.3376	0.3633		D32	0.3541	0.3996
		0.3443	0.3678			0.3616	0.4047
		0.3433	0.3546			0.3596	0.3908
		0.3371	0.3504			0.3525	0.3860
	D13	0.3443	0.3678		D33	0.3616	0.4047
		0.3509	0.3724			0.3693	0.4099
		0.3494	0.3588			0.3668	0.3957
		0.3433	0.3546			0.3596	0.3908
	D14	0.3433	0.3546		D34	0.3596	0.3908
		0.3494	0.3588			0.3668	0.3957
		0.3479	0.3453			0.3643	0.3815
		0.3423	0.3413			0.3576	0.3769
	D21	0.3381	0.3762		D41	0.3494	0.3588
		0.3453	0.3811			0.3556	0.3631
		0.3443	0.3678			0.3536	0.3492
		0.3376	0.3633			0.3479	0.3453
	D22	0.3386	0.3891		D42	0.3509	0.3724
		0.3463	0.3944			0.3576	0.3769
		0.3453	0.3811			0.3556	0.3631
		0.3381	0.3762			0.3494	0.3588
	D23	0.3463	0.3944		D43	0.3576	0.3769
		0.3541	0.3996			0.3643	0.3815
		0.3525	0.3860			0.3618	0.3673
		0.3453	0.3811			0.3556	0.3631
	D24	0.3453	0.3811		D44	0.3556	0.3631
		0.3525	0.3860			0.3618	0.3673
		0.3509	0.3724			0.3592	0.3531
		0.3443	0.3678			0.3536	0.3492

- Tolerance of measurement of the color coordinates is ± 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-S1L1R1H1QBB7935AA3	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-S1L1R1H1QBB7935BB3	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)		SB				Reel
CLQ6A-TKW-S1L1R1H1QBB7935CC3	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)		SC				Reel
CLQ6A-TKW-S1L1R1H1QBB7935DD3	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

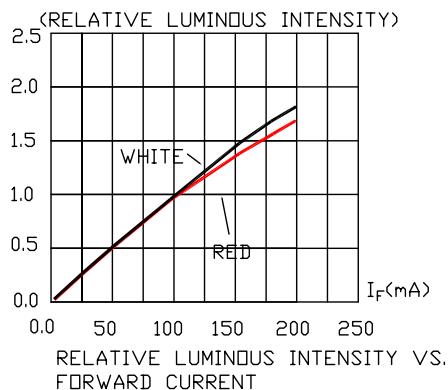
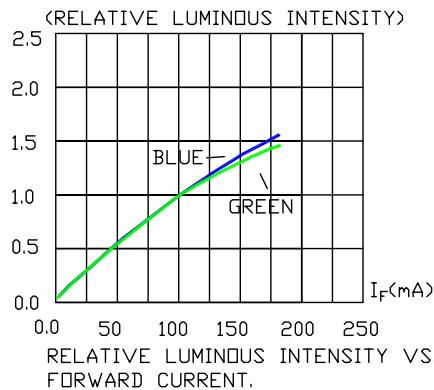
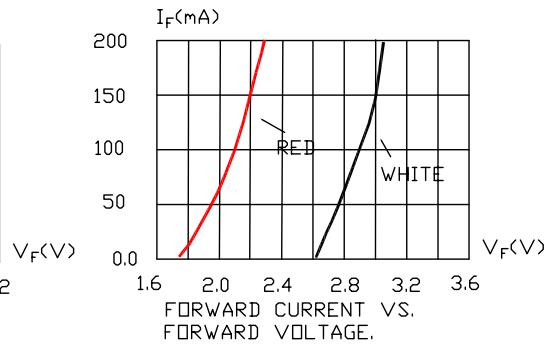
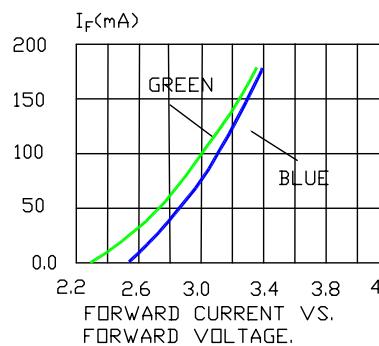
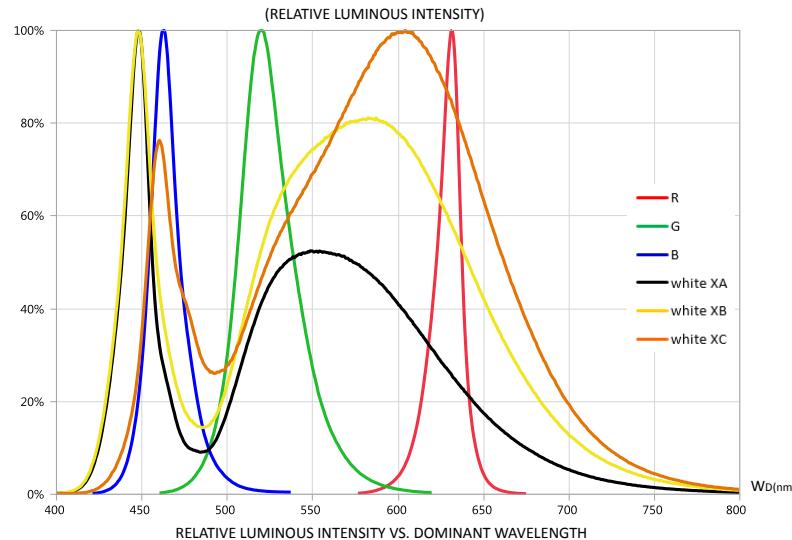
Notes:

- 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

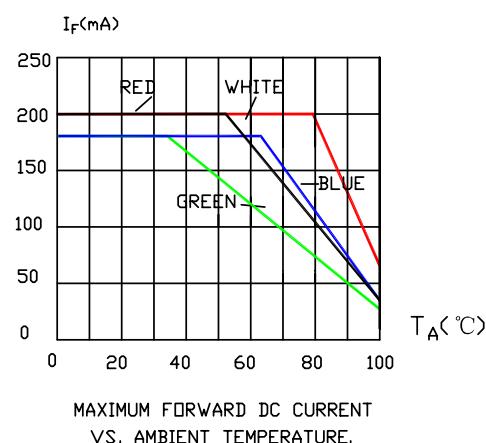
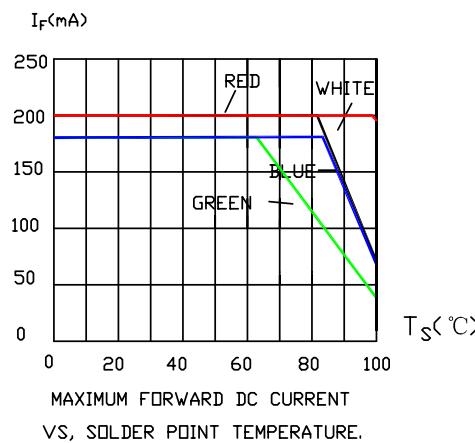
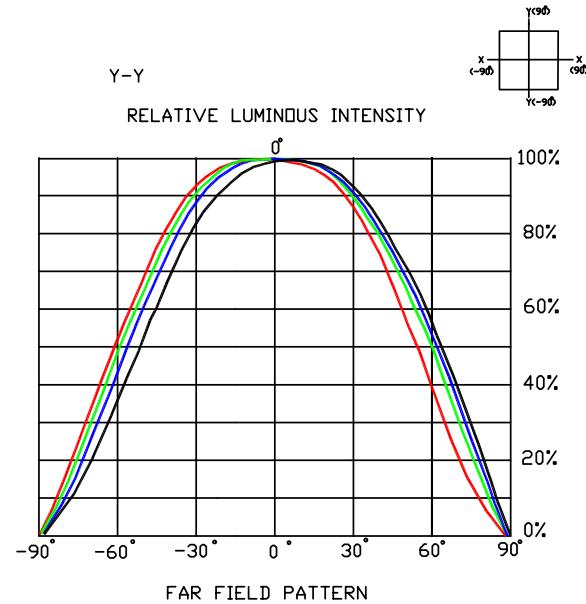
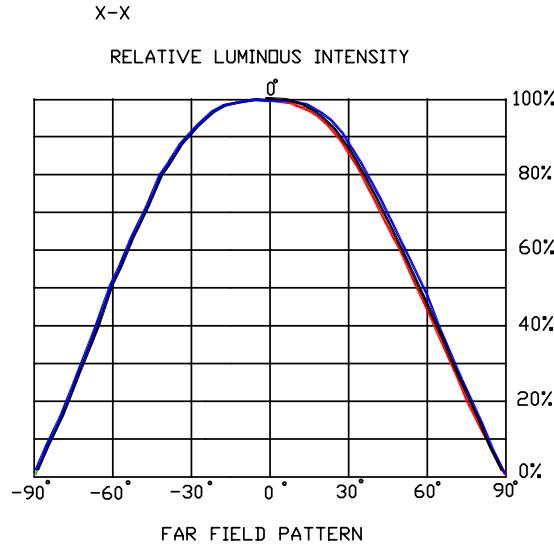
#2: Refer to <http://www.cree.com/led-components/media/documents/sh-HB.pdf>

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

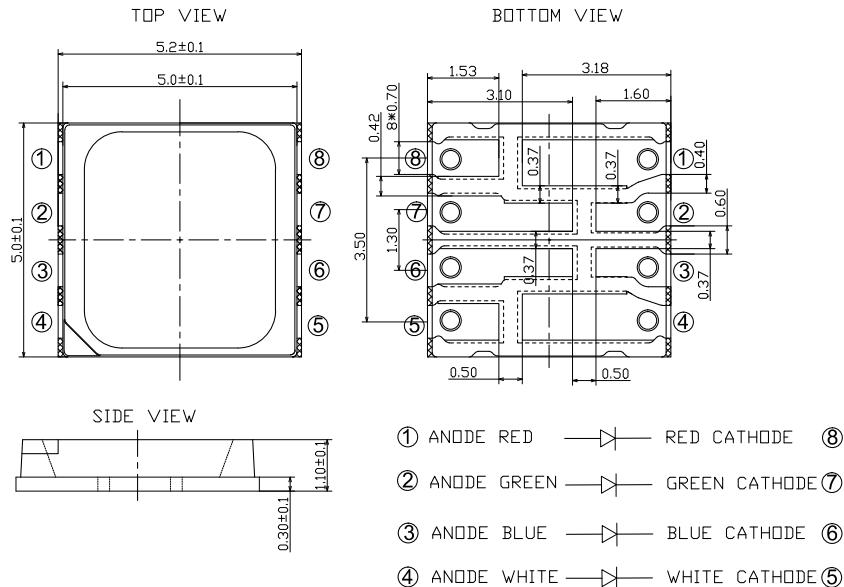


The graph shows the maximum allowable DC current for a LED die of each color.

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 of measurement of the dimension is ± 0.1 .

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.

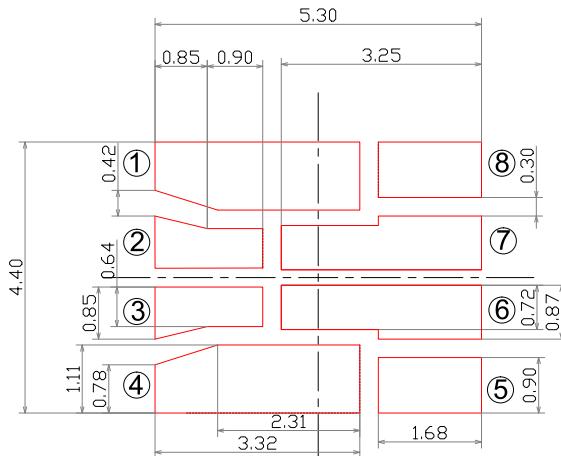
RoHS Declarations for this product can be obtained from your Cree representative or from the Product Ecology section of the Cree website.

Vision Advisory Claim

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

Solder Pad recommend:

All dimensions are in mm.



- Tolerance of measurement of the dimension is ± 0.1 .

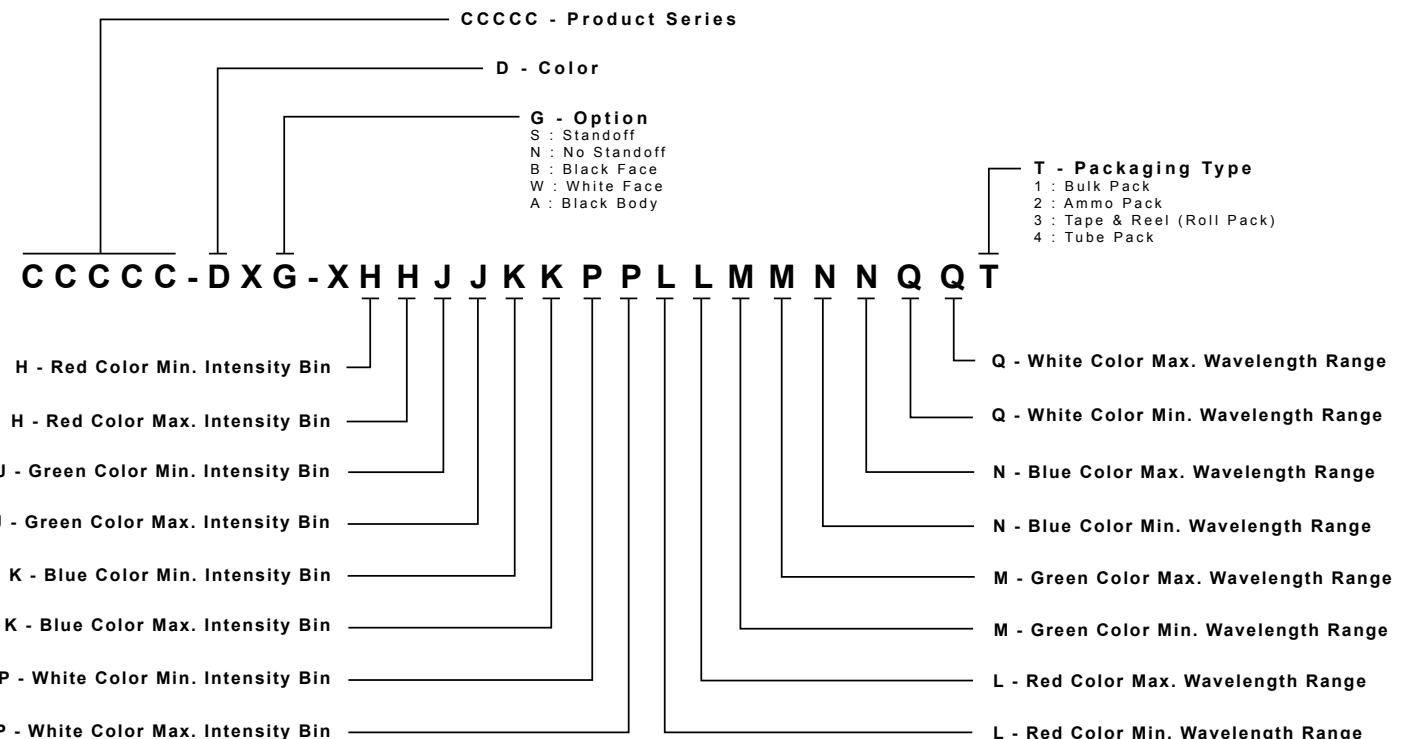
Assembly notes:

- Modification of an SMD LED is not recommended after soldering. If modification cannot be avoided, the modifications must be pre-qualified to avoid damaging the SMD LED.
- Reflow soldering should not be done more than two times(according to model's MSL requirements).
- No stress should be exerted on the package during soldering.
- The package may be affected by environments & assemblies which contain corrosive substance. Please avoid conditions which may cause the LEDs to corrode tarnish or discolor.
- The PCB should not be wrapped after soldering to allow natural cooling down to 40°.

KIT NUMBER SYSTEM

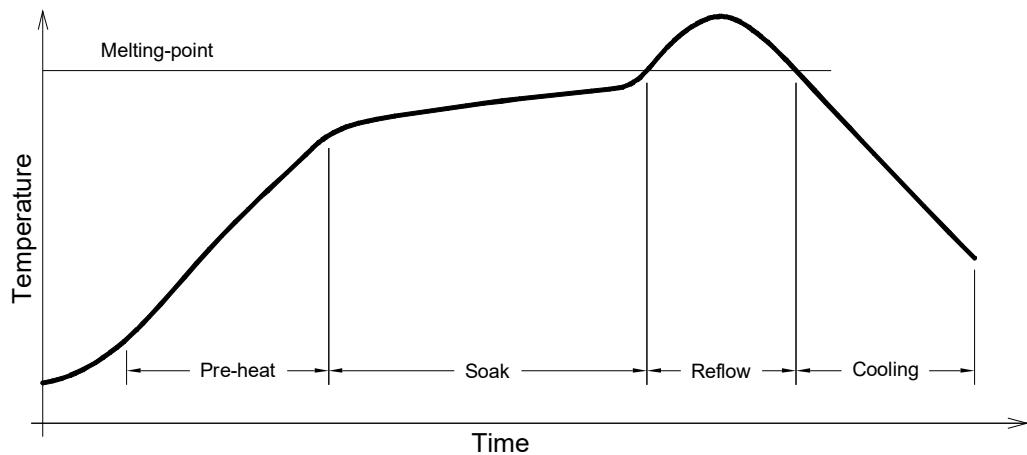
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping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



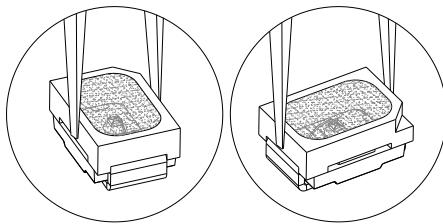
Use only with CLQ6A-TKW

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.

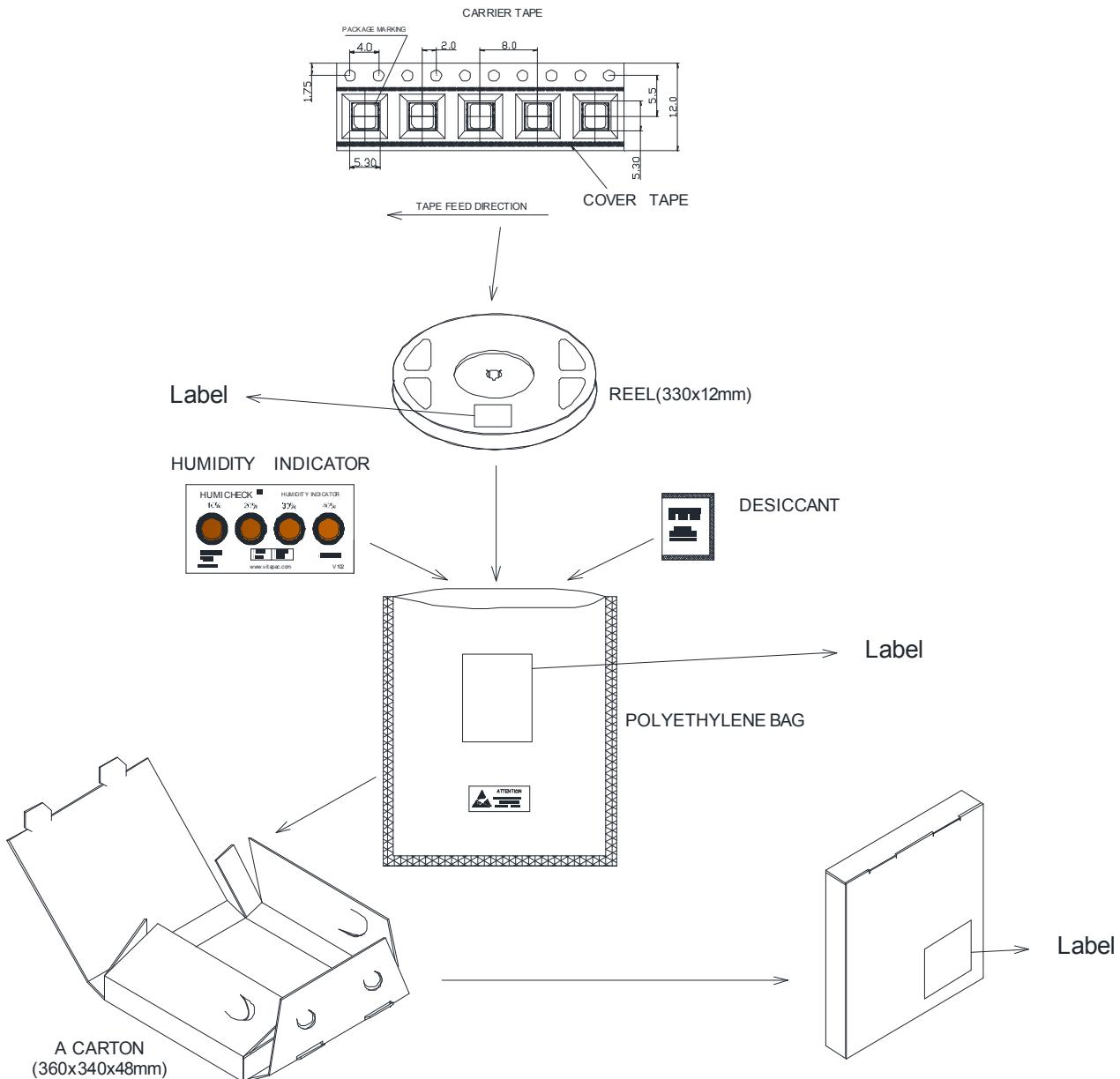
NOTES

- 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.



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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибуторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

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