CLD-CT1387.004

Cree® PLCC8 4 in 1 SMD LED CLQ6A-TKW

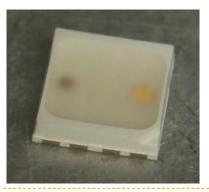
PRODUCT DESCRIPTION

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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 ($T_A = 25^{\circ}C$)

Thomas	Symbol	Absolute Maximum Rating						
Items	Symbol	R	G	В	w	Unit		
Forward Current Note 1	I _F	200	180	180	200	mA		
Peak Forward Current Note 2	\mathbf{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}		°C					
Storage Temperature	T _{stg}		-40 ~	+100		°C		
Junction Temperature	T,	110	110	110	110	°C		
Junction/ambient 1 chip on	R _{THJA}	60	110	70	80	°C/W		
Junction/solder point 1 chip on	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 ($T_A = 25^{\circ}C$)

Ohanna sharifati sa		O marked					
Characteristics	Condition	Symbol	R	G	В	w	Unit
Dominant Wavelength	$ I_{\rm F} = 100 {\rm mA(R)} \\ I_{\rm F} = 100 {\rm mA(G)} \\ I_{\rm F} = 100 {\rm mA(B)} \\ I_{\rm F} = 100 {\rm mA(W)} $	λ_{dom}	619~624	520~535	460~475	NA	nm
Spectral bandwidth at 50% $\rm I_{\rm \tiny REL}$ max	$ I_{\rm F} = 100 \rm{mA(R)} \\ I_{\rm F} = 100 \rm{mA(G)} \\ I_{\rm F} = 100 \rm{mA(B)} \\ I_{\rm F} = 100 \rm{mA(W)} $	Δλ	24	38	28	NA	nm
	$I_{F} = 100 \text{ mA(R)}$ $I_{F} = 100 \text{ mA(G)}$	$V_{F(avg)}$	2.1	3.0	3.1	2.9	V
Forward Voltage	$I_{F} = 100 \text{ mA(G)}$ $I_{F} = 100 \text{ mA(B)}$ $I_{F} = 100 \text{ mA(W)}$	$V_{\rm F(max)}$	2.6	3.8	3.8	3.6	v
	$I_{F} = 100 \text{ mA(R)}$	I _{v(min)}	3000	7030	1824	5860	mcd
Luminous Intensity	$I_{F} = 100 \text{ mA(G)}$ $I_{F} = 100 \text{ mA(B)}$ $I_{F} = 100 \text{ mA(W)}$	$\mathbf{I}_{\mathrm{V}(\mathrm{avg})}$	4500	10400	3000	8200	mcd
Luminous Flux(Reference)	$ I_{\rm F} = 100 {\rm mA(R)} \\ I_{\rm F} = 100 {\rm mA(G)} \\ I_{\rm F} = 100 {\rm mA(B)} \\ I_{\rm F} = 100 {\rm mA(W)} $	$\Phi_{v(avg)}$	14	30	8.2	25	lm
Reverse Current (max)	$V_{R} = 5 V$	I _R	10	10	10	10	μA

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

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

Rlup

B5

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

Wh	ite
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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

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

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

470

475

Tolerance of measurement of dominant wavelength is ± 1 nm.

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White																						
Bin Code	Sub- bins	x	у		Bin Code	Sub- bins	×	У		Bin Code	Sub- bins	x	У	Bin Code	Sub- bins	x	У					
		0.3146	0.3172				0.3245	0.3515				0.3610	0.3630			0.3836	0.3972					
	A11	0.3201	0.3222			A31	0.3311	0.3574			B11	0.3692	0.3683		B31	0.3929	0.4033					
	AII	0.3211	0.3106			AJI	0.3311	0.3449			DII	0.3667	0.3570		531	0.3893	0.3911					
		0.3161	0.3059				0.3251	0.3394				0.3590	0.3521			0.3805	0.3854					
		0.3130	0.3284				0.3240	0.3636				0.3629	0.3739			0.3866	0.4089					
	A12	0.3190	0.3339			A32	0.3311	0.3699			B12	0.3717	0.3796		B32	0.3965	0.4155					
	AIZ	0.3201	0.3222			AJZ	0.3311	0.3574			DIZ	0.3692	0.3683		DJZ	0.3929	0.4033					
		0.3146	0.3172				0.3245	0.3515				0.3610	0.3630			0.3836	0.3972					
		0.3190	0.3339				0.3311	0.3699				0.3717	0.3796			0.3965	0.4155					
	A13	0.3251	0.3394			A33	0.3381	0.3762			B13	0.3805	0.3854		B33	0.4065	0.4221					
	AIJ	0.3256	0.3273			AJJ	0.3376	0.3633			DIJ	0.3775	0.3736		533	0.4023	0.4095					
		0.3201	0.3222				0.3311	0.3574				0.3692	0.3683			0.3929	0.4033					
		0.3201	0.3222									0.3311	0.3574				0.3692	0.3683			0.3929	0.4033
	A14 0.3256 0.3261	0.3256	0.3273			A34	0.3376	0.3633			B14	0.3775	0.3736		B34	0.4023	0.4095					
		0.3261	0.3152		ХА	7,54	0.3371	0.3504			DIT	0.3744	0.3619		531	0.3981	0.3969					
ХА		0.3211	0.3106				0.3311	0.3449	ХВ	VD		0.3667	0.3570	ХВ		0.3893	0.3911					
~~~		0.3115	0.3397					0.3256	0.3273		ΛD		0.3649	0.3848	AD		0.3775	0.3736				
	A21	0.3180	0.3456			A41	0.3311	0.3324			B21	0.3742	0.3910		B41	0.3857	0.3789					
	721	0.3190	0.3339			741	0.3311	0.3199			DZI	DZI	0.3717	0.3796		041	0.3821	0.3667				
		0.3130	0.3284				0.3261	0.3152				0.3629	0.3739			0.3744	0.3619					
		0.3099	0.3509				0.3251	0.3394				0.3668	0.3957			0.3805	0.3854					
	A22	0.3170	0.3572			A42	0.3311	0.3449			B22	0.3767	0.4023		B42	0.3893	0.3911					
	AZZ	0.3180	0.3456			A42	0.3311	0.3324			DZZ	0.3742	0.3910		D42	0.3857	0.3789					
		0.3115	0.3397				0.3256	0.3273				0.3649	0.3848			0.3775	0.3736					
		0.3170	0.3572				0.3311	0.3449				0.3767	0.4023			0.3893	0.3911					
	A23	0.3240	0.3636			A43	0.3371	0.3504			B23	0.3866	0.4089		B43	0.3981	0.3969					
	AZJ	0.3245	0.3515			AHJ	0.3366	0.3374			DZJ	0.3836	0.3972		040	0.3940	0.3842					
		0.3180	0.3456				0.3311	0.3324				0.3742	0.3910			0.3857	0.3789					
		0.3180	0.3456				0.3311	0.3324				0.3742	0.3910			0.3857	0.3789					
	A24	0.3245	0.3515			A44	0.3366	0.3374			DD4	0.3836	0.3972		D44	0.3940	0.3842					
	AZ4	0.3251	0.3394			A44	0.3361	0.3245			B24	0.3805	0.3854		B44	0.3898	0.3716					
		0.3190	0.3339				0.3311	0.3199				0.3717	0.3796			0.3821	0.3667					

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

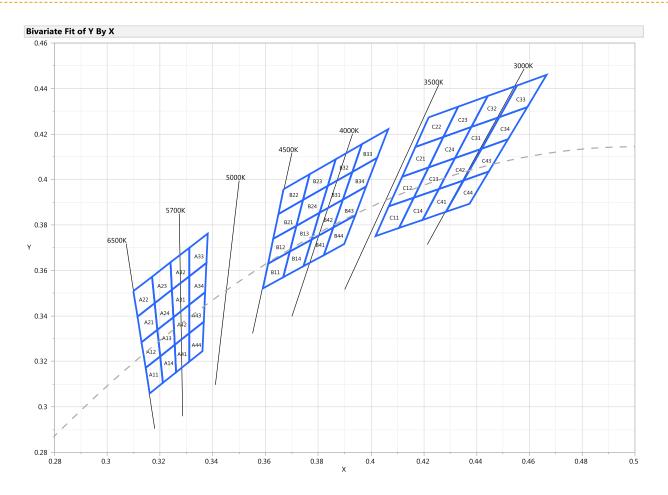
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	White							
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0.4162         0.3920           0.4067         0.3882           0.4218         0.4053           0.4218         0.4094           0.4257         0.3958           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4195         0.3822           0.4195         0.3822           0.4106         0.3787           XC         0.4168           0.4218         0.4053           0.4218         0.4053           0.4218         0.4274           0.4218         0.4273           0.4274         0.4187           0.4330         0.4230           0.4330         0.4231           0.4330         0.4231           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.4274     <		C12	0.4218	0.4053		633	232	0.4553
0.4218         0.4053           0.4318         0.4094           0.4257         0.3958           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4162         0.3920           0.4195         0.3958           0.4195         0.3958           0.4195         0.3958           0.4195         0.3958           0.4195         0.3958           0.4195         0.3958           0.4106         0.3787           0.4108         0.4143           0.4218         0.4012           0.4218         0.4012           0.4218         0.4187           0.4230         0.4320           0.4330         0.4320           0.4330         0.4231           0.4274         0.4187           0.4274         0.4187           0.4230         0.4231           0.4231         0.4187           0.4380         0.4231           0.4380         0.4231           0.4318		CIZ	0.4162	0.3920		CS	Z	0.4486
<ul> <li>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</li></ul>			0.4067	0.3882				0.4380
C13         0.4257         0.3958         C33           0.4162         0.3920         0.4162         0.3920           0.4162         0.3920         0.4162         0.3920           0.4162         0.3920         0.4162         0.3920           0.4162         0.3920         0.4162         0.3920           0.4162         0.3920         0.4162         0.3958           0.4162         0.3958         0.4162         0.3958           0.4165         0.3958         0.4163         0.4163           0.4106         0.3787         XC         A           C21         0.4168         0.4143         0.4053           0.4118         0.4012         0.4187         C41           0.4218         0.4274         0.4187         C42           0.4274         0.4187         0.4360         C43           C23         0.4330         0.4231         C43           0.4274         0.4187         C43         C43           C24         0.4380         0.4231         C44           0.4318         0.4094         C44			0.4218	0.4053				0.4553
0.42570.39580.41620.39200.41620.39200.41620.39200.41620.39580.41950.38220.41060.37870.41060.37870.41080.41430.42740.41870.42180.40530.41180.40120.41180.40120.42180.42740.41180.40120.42180.42740.43300.43200.42740.41870.41680.41430.41680.42310.43800.42310.42740.41870.42740.41870.42740.41870.42740.41870.42740.41870.42740.41870.43800.42310.42740.41870.43180.4094		C12	0.4318	0.4094		C22		0.4665
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Acta0.42570.39580.41950.38220.41060.37870.41060.37870.41060.41430.42740.41870.42180.40530.41180.40120.41180.40230.42180.42310.42740.41870.42640.41870.41680.41430.42740.41870.41680.41430.41680.41430.41680.41430.41680.41430.41680.41870.43800.42310.42740.41870.43800.42310.42740.41870.43800.42310.43800.42310.43800.42310.43800.42310.43800.42310.43800.42310.43800.42310.43800.42310.43800.4231			0.4162	0.3920				0.4486
C14         0.4195         0.3822         C34           0.4106         0.3787         XC         XC           0.4168         0.4143         0.4187         A           0.4274         0.4187         A         A           0.4218         0.4053         A         A           0.4118         0.4012         A         A           0.4218         0.4053         A         A           0.4118         0.4012         A         A           0.4218         0.4273         A         A           0.4218         0.4273         A         A           0.4214         0.4187         A         A           0.4214         0.4187         A         A           0.4214         0.4187         A         A           0.4168         0.4143         A         A           A         A         A         A           A         A         A         A           A         A         A         A           A         A         A         A           A         A         A         A           A         A         A         A			0.4162	0.3920				0.4486
XC         0.4195         0.3822           0.4106         0.3787           0.4106         0.3787           A         0.4168         0.4143           0.4274         0.4187           0.4218         0.4053           0.4118         0.4012           0.4118         0.4012           0.4118         0.4273           0.4168         0.4187           0.4274         0.4187           0.4218         0.4273           0.4218         0.4274           0.4274         0.4187           0.4168         0.4143           0.4168         0.4143           0.4168         0.4143           0.4330         0.4320           0.4380         0.4231           0.4380         0.4231           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.428         0.4231           0.428         0.4231           0.4318         0.4094		C14	0.4257	0.3958		C24		0.4592
XC         0.4168         0.4143           0.4274         0.4187         0.4187           0.4218         0.4053         0.4187           0.4118         0.4012         0.4187           0.4118         0.4012         0.4187           0.4218         0.4012         0.4187           0.4218         0.4012         0.4187           0.4218         0.4273         0.4230           0.4274         0.4187         0.4187           0.4168         0.4143         0.4320           0.4168         0.4143         0.4320           0.4180         0.4231         0.4330           0.4234         0.4231         .4187           0.4274         0.4187         .4187           0.4274         0.4187         .4187           0.4274         0.4187         .4187           0.4231         0.4231         .4187           0.4318         0.4094         .4187		C14	0.4195	0.3822		C34		0.4519
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10		0.4106	0.3787				0.4419
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			0.4168	0.4143	XC			0.4257
			0.4274	0.4187		641		0.4351
0.4218         0.4273           0.4300         0.4320           0.4274         0.4187           0.4168         0.4143           0.4168         0.4143           0.4330         0.4320           0.4422         0.4367           0.4423         0.4367           0.4380         0.4231           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.4380         0.4231           0.4380         0.4231		C21	0.4218	0.4053		C41		0.4284
0.4330         0.4320           0.4274         0.4187           0.4168         0.4143           0.4168         0.4143           0.4330         0.4320           0.4330         0.4320           0.4330         0.4320           0.4330         0.4320           0.4330         0.4320           0.4330         0.4320           0.4342         0.4367           0.4380         0.4231           0.4274         0.4187           0.4380         0.4231           0.4380         0.4231           0.4318         0.4094			0.4118	0.4012				0.4195
C22         0.4274         0.4187         C42           0.4168         0.4143             0.4168         0.4143             0.4300         0.4320             0.4330         0.4367             0.4380         0.4231             0.4274         0.4187             0.4274         0.4187             0.4380         0.4231             0.4318         0.4094			0.4218	0.4273			Ī	0.4318
0.4274         0.4187           0.4168         0.4143           0.4330         0.4320           0.4330         0.4320           0.4422         0.4367           0.4380         0.4231           0.4274         0.4187           0.4274         0.4187           0.4274         0.4187           0.4284         0.4187           0.4380         0.4231           0.4380         0.4231           0.4318         0.4094		633	0.4330	0.4320				0.4419
0.4330         0.4320           0.4442         0.4367           0.4380         0.4231           0.4274         0.4187           0.4274         0.4187           0.4380         0.4231           0.4380         0.4231           0.4274         0.4187           0.4380         0.4231           0.4380         0.4231		022	0.4274	0.4187		C42		0.4351
0.4442         0.4367         0.4367           0.4380         0.4231         0.4274         0.4187           0.4274         0.4187         0.4187         10.4380         0.4231           C44         0.4318         0.4094         10.4094         10.4094			0.4168	0.4143				0.4257
C23 0.4380 0.4231 C43 0.4274 0.4187 C43 C43 C43 C43 C43 0.4274 0.4187 C24 0.4380 0.4231 0.4318 0.4094 C44 C44 C44 C44 C44 C44 C44 C44 C44 C			0.4330	0.4320				0.4419
0.4380 0.4231 0.4274 0.4187 0.4274 0.4187 0.4380 0.4231 0.4318 0.4094 C44		0000	0.4442	0.4367				0.4519
0.4274         0.4187           0.4380         0.4231           0.4318         0.4094		C23	0.4380	0.4231		C43		0.4446
C24 0.4380 0.4231 C44			0.4274	0.4187				0.4351
C24 0.4318 0.4094 C44			0.4274	0.4187				0.4351
0.4318 0.4094		62.4	0.4380	0.4231				0.4446
0.4218 0.4053		C24	0.4318	0.4094		C44		0.4373
			0.4218	0.4053				0.4284

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

#### **CIE CHROMATICITY DIAGRAM**



#### **ORDER CODE TABLE***

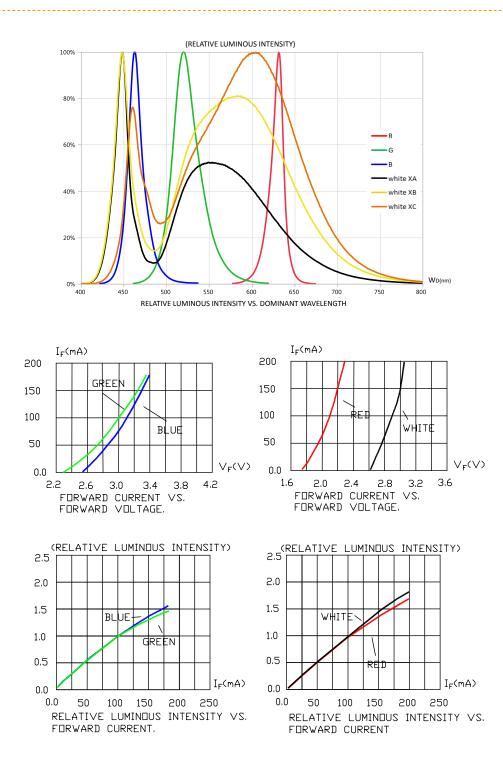
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Deals
		Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	Pack- age
CLQ6A-TKW-C1L1R1H1QBB7935AA3	Red	Any 1 Intensity bin fro	om 1L(3000) - 1N(5860)	RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from 1R(7030) - 1T(14400) Any 1 hue bin from G7(520) - G9(535)				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 fro	om 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 fro	om 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)		B5(475)	Reel			
	White	Any 1 Intensity bin from 1Q(5860) - 1S(12000) XC				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 for reliability test conditions.
- 3.Please refer to the "Cree LED Lamp Soldering & Handling" document for information about how to use this LED product safely.



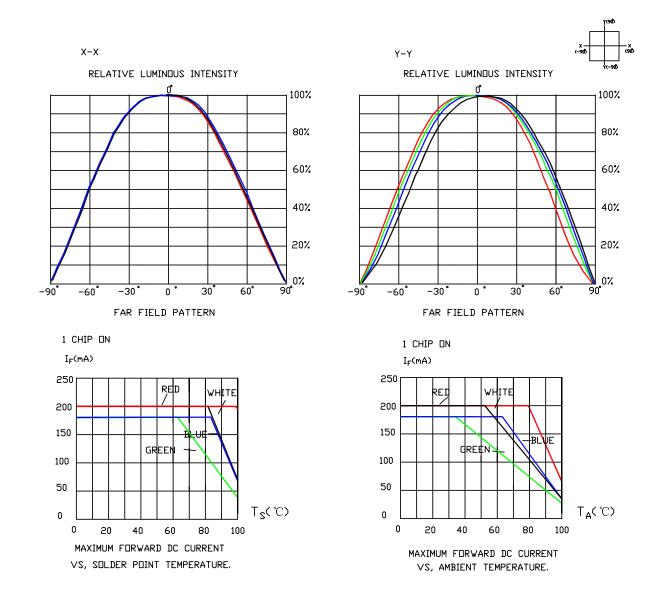
#### **GRAPHS**



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.



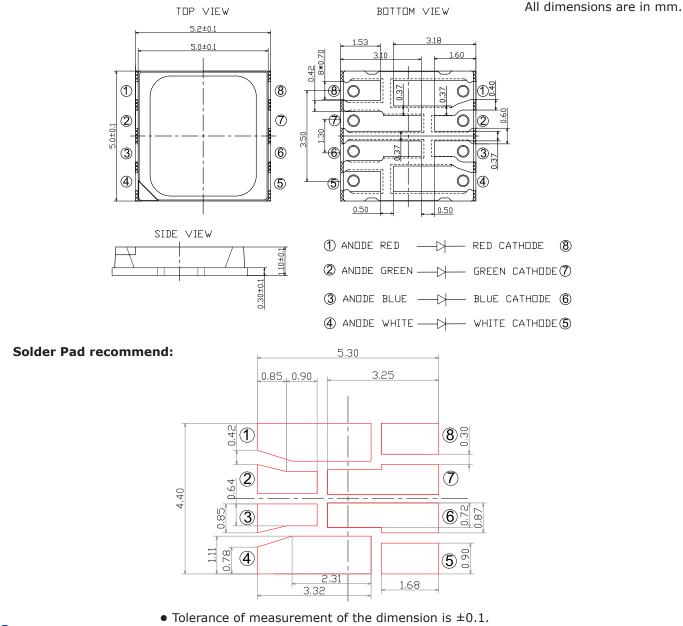
#### **GRAPHS**



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**



#### **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

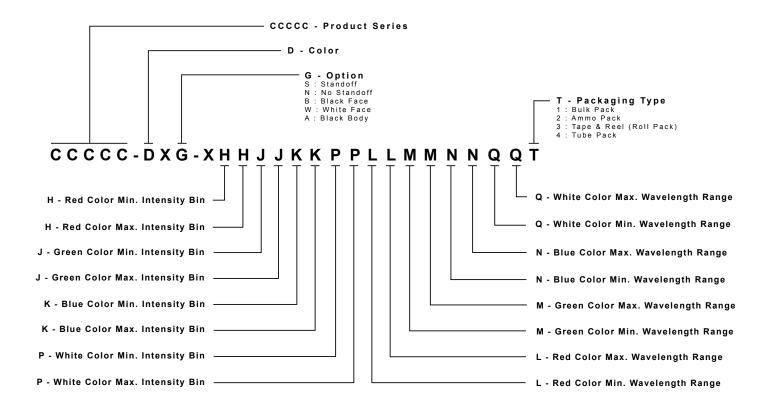
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.



#### **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.

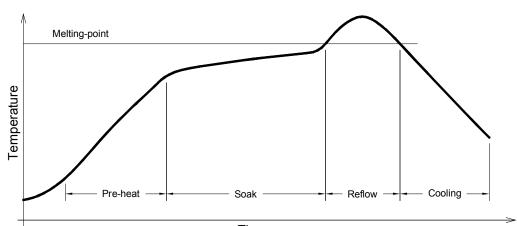
Cree LEDs are sold by order codes in combinations of bins called kits. Order codes are configured in the following manner:





#### **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

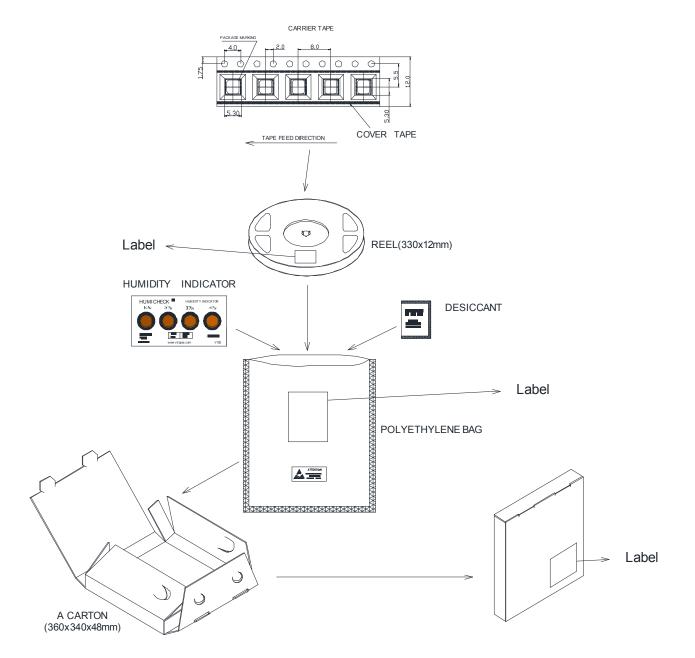
Time

Solder			
Average ramp-up rate = $4^{\circ}C/s$ max			
Preheat temperature = 150°C ~200°C			
Preheat time = 120s max			
Ramp-down rate = $6^{\circ}$ 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			



#### 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.



### **Mouser Electronics**

Authorized Distributor

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

Cree, Inc.:

<u>CLQ6A-TKW-C1L1R1H1QBB7935AA3</u> <u>CLQ6A-TKW-C1L1R1H1QBB7935BB3</u> <u>CLQ6A-TKW-C1L1R1H1QBB7935CC3</u>