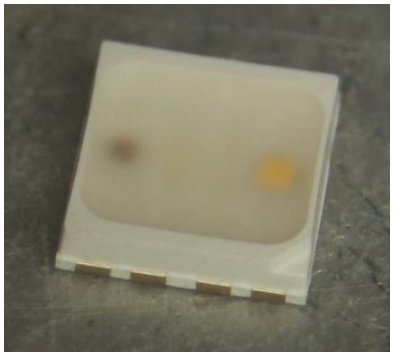
CLD-CT1387.001

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 (1824-3590)
  White (5860-12000)
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant

APPLICATIONS

- Architecture Lighting
- Decorative Lighting
- Amusement

Cree, Inc.
4600 Silicon Drive
Durham, NC 27703
USA Tel: +1.919.313.5300

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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 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 ≤1/10.

TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS (T_A = 25°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)	λ_{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)	Δ λ	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	2700	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	μA

INTENSITY BIN LIMIT(RED I_F =100mA,GREEN I_F =100mA,BLUE I_F =100mA,WHITE I_F =100mA)

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

White

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

Tolerance of measurement of luminous intensity is ±10%.

COLOR BIN LIMIT (RED I_F =100mA,GREEN I_F =100mA,BLUE I_F =100mA,WHITE I_F =100mA)

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 ±1 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 ±0.01.

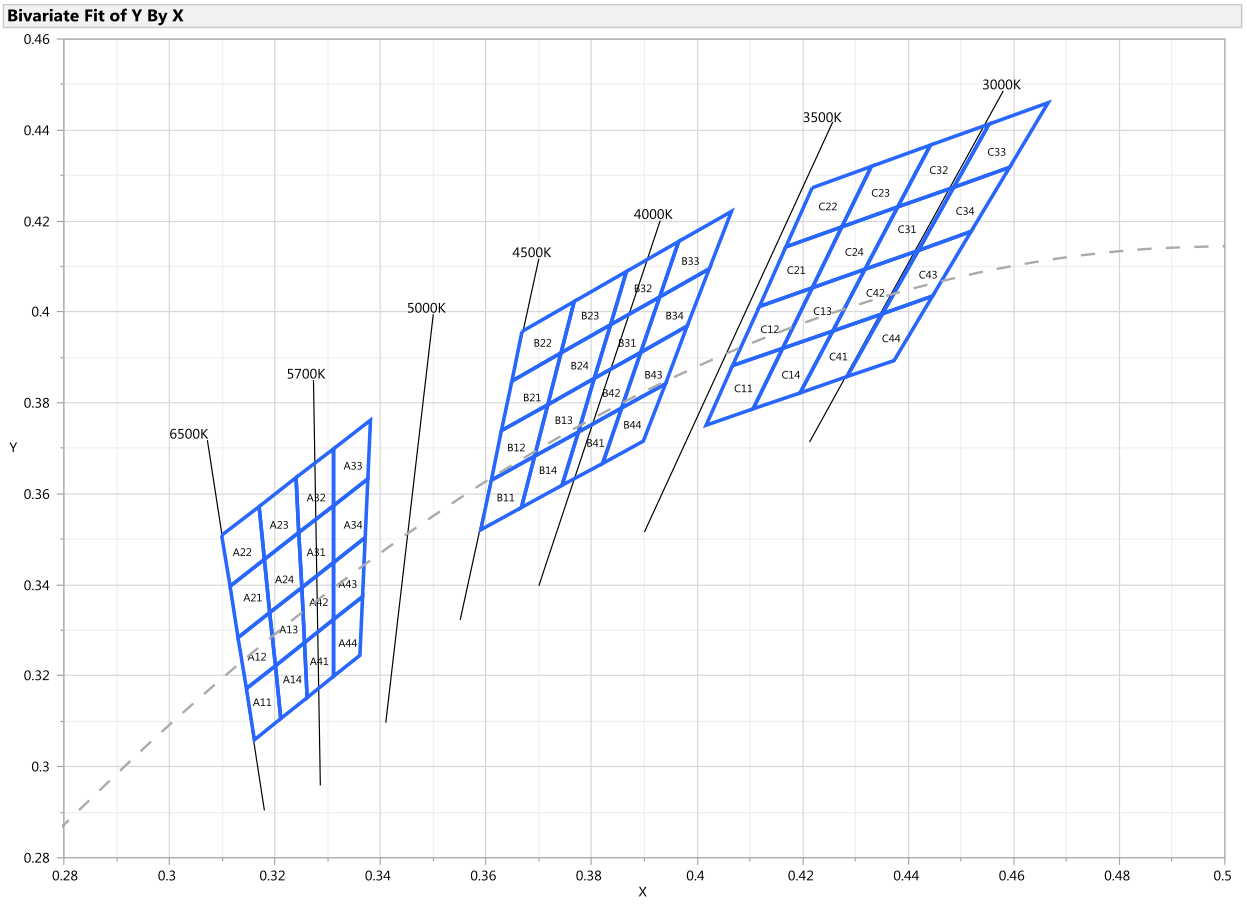
White

Bin Code	Sub-bins	x	y
XC	C11	0.4067	0.3882
		0.4162	0.3920
		0.4106	0.3787
		0.4017	0.3751
	C12	0.4118	0.4012
		0.4218	0.4053
		0.4162	0.3920
		0.4067	0.3882
	C13	0.4218	0.4053
		0.4318	0.4094
		0.4257	0.3958
		0.4162	0.3920
	C14	0.4162	0.3920
		0.4257	0.3958
		0.4195	0.3822
		0.4106	0.3787
	C21	0.4168	0.4143
		0.4274	0.4187
		0.4218	0.4053
		0.4118	0.4012
	C22	0.4218	0.4273
		0.4330	0.4320
		0.4274	0.4187
		0.4168	0.4143
	C23	0.4330	0.4320
		0.4442	0.4367
		0.4380	0.4231
		0.4274	0.4187
	C24	0.4274	0.4187
		0.4380	0.4231
		0.4318	0.4094
		0.4218	0.4053

Bin Code	Sub-bins	x	y
XC	C31	0.4380	0.4231
		0.4486	0.4274
		0.4419	0.4135
		0.4318	0.4094
	C32	0.4442	0.4367
		0.4553	0.4413
		0.4486	0.4274
		0.4380	0.4231
	C33	0.4553	0.4413
		0.4665	0.4460
		0.4592	0.4318
		0.4486	0.4274
	C34	0.4486	0.4274
		0.4592	0.4318
		0.4519	0.4177
		0.4419	0.4135
	C41	0.4257	0.3958
		0.4351	0.3996
		0.4284	0.3858
		0.4195	0.3822
	C42	0.4318	0.4094
		0.4419	0.4135
		0.4351	0.3996
		0.4257	0.3958
	C43	0.4419	0.4135
		0.4519	0.4177
		0.4446	0.4035
		0.4351	0.3996
	C44	0.4351	0.3996
		0.4446	0.4035
		0.4373	0.3893
		0.4284	0.3858

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

CIE CHROMATICITY DIAGRAM

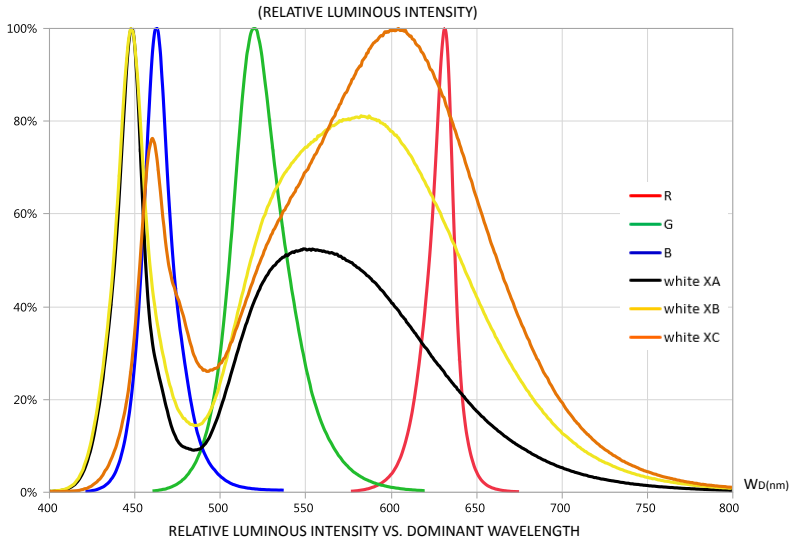


ORDER CODE TABLE*

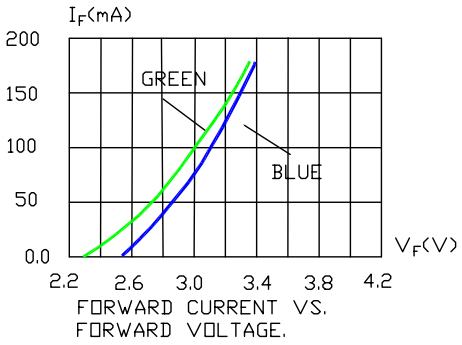
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Pack-age
		Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	
CLQ6A-TKW-C1L1R1H1QBB7935AA3	Red	3000	5860	RB	619	RB	624	Reel
	Green	7030	14400	G7	520	G9	535	Reel
	Blue	1824	3590	B3	460	B5	475	Reel
	White	5860	12000	XA				Reel
CLQ6A-TKW-C1L1R1H1QBB7935BB3	Red	3000	5860	RB	619	RB	624	Reel
	Green	7030	14400	G7	520	G9	535	Reel
	Blue	1824	3590	B3	460	B5	475	Reel
	White	5860	12000	XB				Reel
CLQ6A-TKW-C1L1R1H1QBB7935CC3	Red	3000	5860	RB	619	RB	624	Reel
	Green	7030	14400	G7	520	G9	535	Reel
	Blue	1824	3590	B3	460	B5	475	Reel
	White	5860	12000	XC				Reel

Notes:
1. 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 bulk. Single intensity-bin code and single color-bin codes will not be orderable.
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.

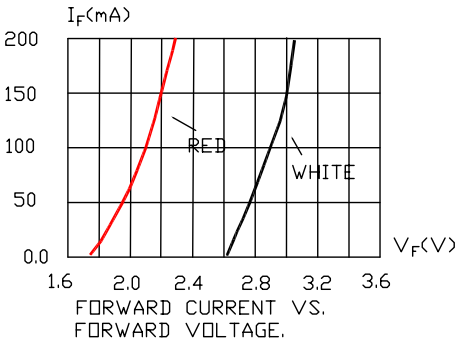
GRAPHS



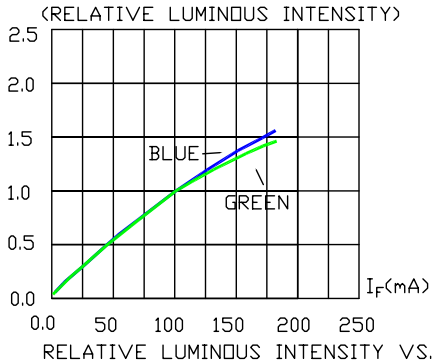
RELATIVE LUMINOUS INTENSITY VS. DOMINANT WAVELENGTH



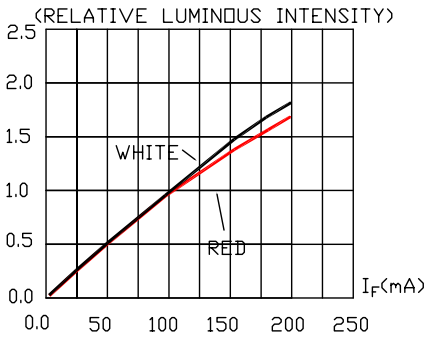
FORWARD CURRENT VS. FORWARD VOLTAGE.



FORWARD CURRENT VS. FORWARD VOLTAGE.



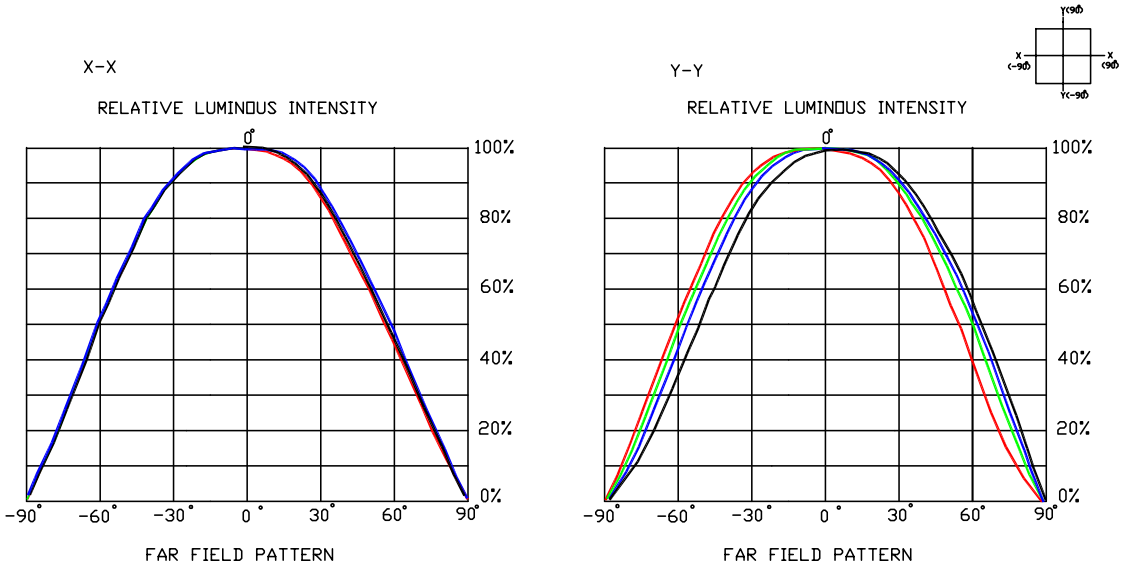
RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT.

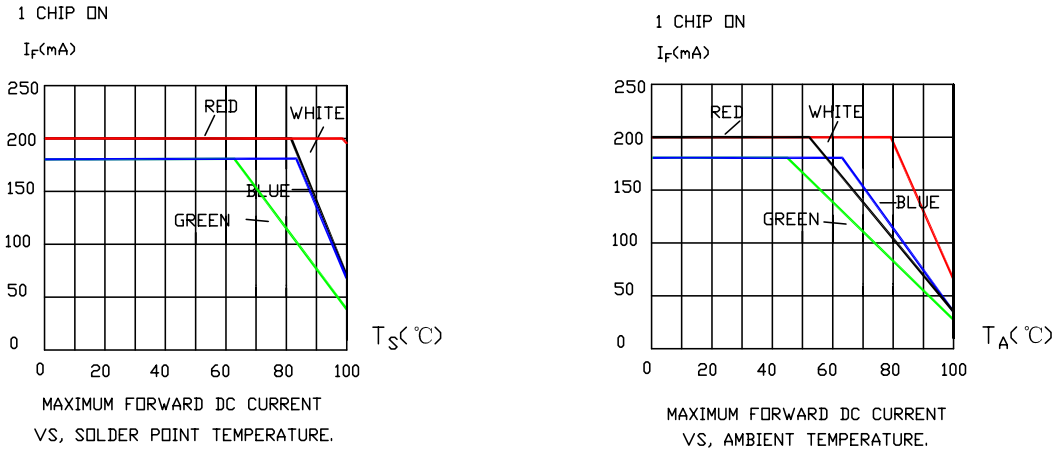


RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

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

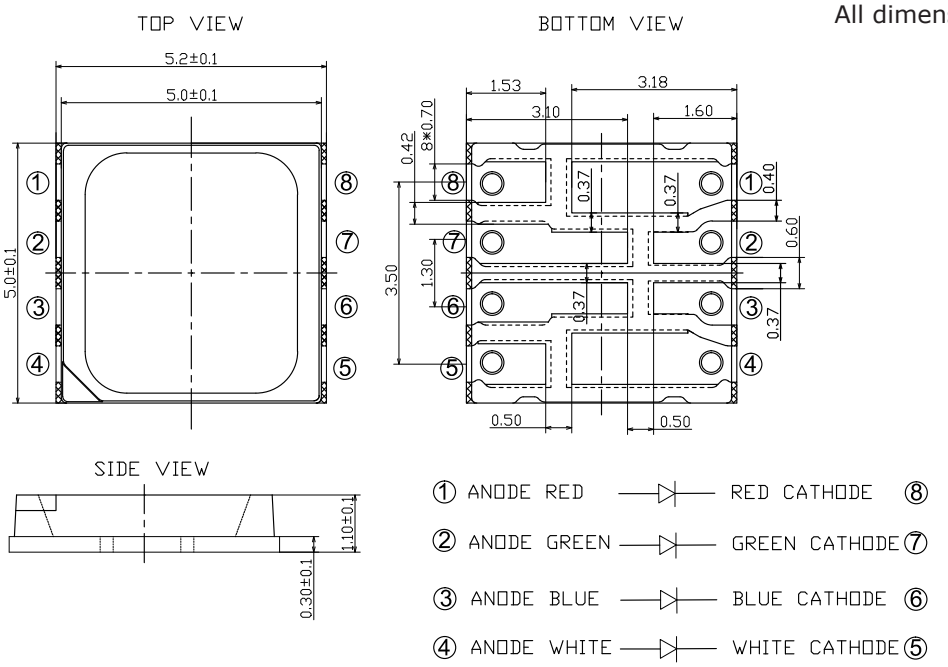




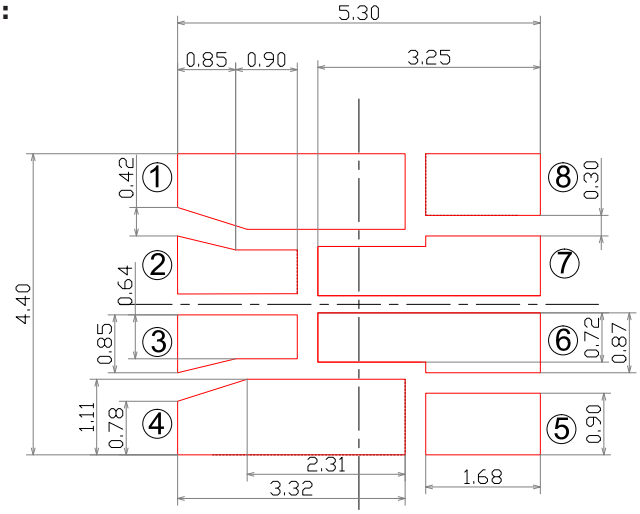
The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

MECHANICAL DIMENSIONS

All dimensions are in mm.



Solder Pad recommend:



- Tolerance of measurement of the dimension is ±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.

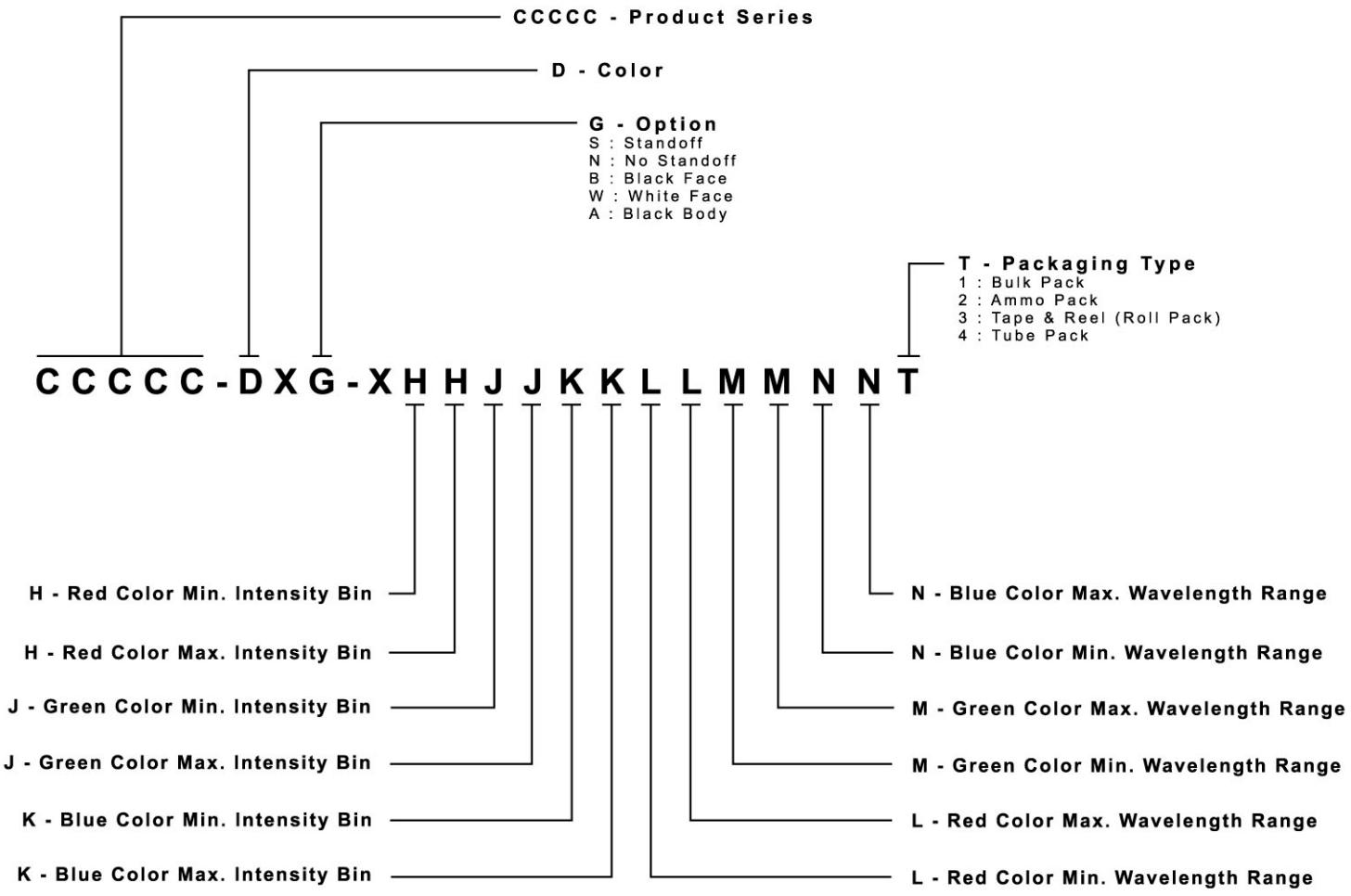
Vision Advisory Claim

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

KIT NUMBER SYSTEM

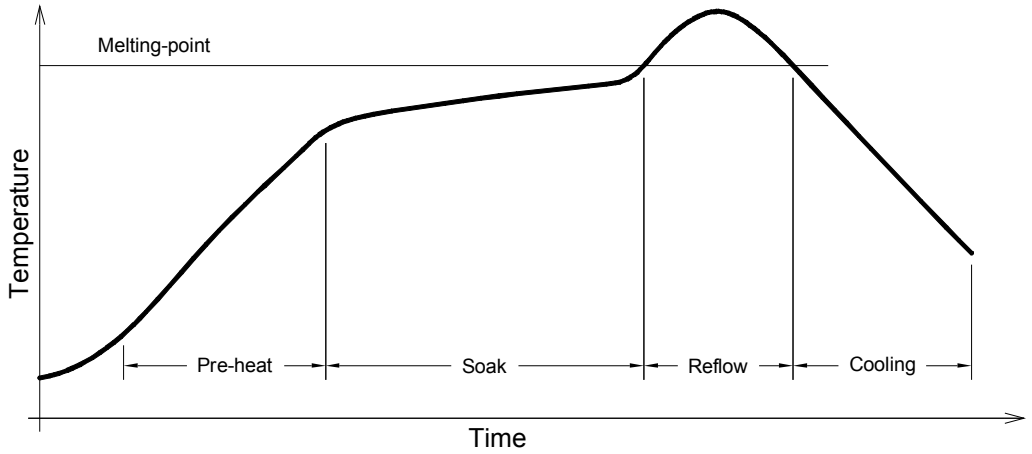
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping 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 = 4ºC/s max
Preheat temperature = 150ºC ~200ºC
Preheat time = 120s max
Ramp-down rate = 6ºC/s max
Peak temperature = 250ºC max
Time within 5ºC of actual Peak Temperature = 10s max
Duration above 217ºC 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.