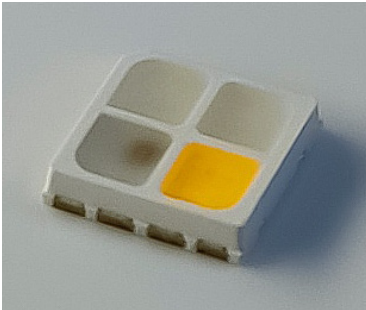


## CLR6A-TKW: PLCC8 4 in 1 SMD LED



### 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): 3.8x 3.8 x 0.8
- Dominant Wavelength/CCT  
Red (619 - 624nm)  
Green (520 - 535nm)  
Blue (460 - 475nm)  
White (3000K/4000K/5000K/5700K)
- Luminous Flux (lm)  
Red (6.3 - 12.3)  
Green (10.7 - 18.1)  
Blue (2.9 - 4.8)  
White (8.2 - 18.1)
- 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>	$I_F$	65	65	65	65	mA
Peak Forward Current <sup>Note 2</sup>	$I_{FP}$	100	100	100	100	mA
Reverse Voltage	$V_R$	5	5	5	5	V
Power Dissipation	$P_D$	214.5	260	260	260	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	$R_{THJA}$	97	87	68	72	$^\circ\text{C/W}$
Junction/solder point	$R_{THJS}$	93	79	63	67	$^\circ\text{C/W}$
Electrostatic Discharge Classification(MIL-STD-883K)	ESD	Class 1B				

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	$I_F = 50\text{ mA(R)}$ $I_F = 50\text{ mA(G)}$ $I_F = 50\text{ mA(B)}$ $I_F = 50\text{ mA(W)}$	$\lambda_{DOM}$	619~624	520~535	460~475	NA	nm
Spectral bandwidth at 50% $I_{REL}$ max	$I_F = 50\text{ mA(R)}$ $I_F = 50\text{ mA(G)}$ $I_F = 50\text{ mA(B)}$ $I_F = 50\text{ mA(W)}$	$\Delta\lambda$	24	38	28	NA	nm
Forward Voltage	$I_F = 50\text{ mA(R)}$ $I_F = 50\text{ mA(G)}$ $I_F = 50\text{ mA(B)}$ $I_F = 50\text{ mA(W)}$	$V_{F(avg)}$	2.1	3.0	3.1	2.9	V
		$V_{F(max)}$	3.3	4.0	4.0	4.0	V
Luminous Flux	$I_F = 50\text{ mA(R)}$ $I_F = 50\text{ mA(G)}$ $I_F = 50\text{ mA(B)}$ $I_F = 50\text{ mA(W)}$	$\Phi_{V(min)}$	6.3	10.7	2.9	8.2	lm
		$\Phi_{V(avg)}$	7.5	15.5	3.3	14	lm
Luminous Intensity(Reference)	$I_F = 50\text{ mA(R)}$ $I_F = 50\text{ mA(G)}$ $I_F = 50\text{ mA(B)}$ $I_F = 50\text{ mA(W)}$	$I_{V(avg)}$	2700	5200	1050	4800	mcd
Reverse Current (max)	$V_R = 5\text{ V}$	$I_R$	100	100	100	100	$\mu\text{A}$

\* Continuous reverse voltage can cause LED damage.

## FLUX BIN LIMIT

Red (50 mA)			Green (50 mA)			Blue (50 mA)			White (50 mA)		
Bin Code	Min.(lm)	Max.(lm)	Bin Code	Min.(lm)	Max.(lm)	Bin Code	Min.(lm)	Max.(lm)	Bin Code	Min.(lm)	Max.(lm)
D0	6.3	8.2	F0	10.7	13.9	A0	2.9	3.7	E0	8.2	10.7
E0	8.2	10.7	G0	13.9	18.1	B0	3.7	4.8	F0	10.7	13.9
F1	10.7	12.3							G0	13.9	18.1

\* Tolerance of measurement of luminous flux is  $\pm 10\%$ .

## COLOR BIN LIMIT

Red (50 mA)			Green (50 mA)			Blue (50 mA)		
Bin Code	Min.(nm)	Max.(nm)	Bin Code	Min.(nm)	Max.(nm)	Bin Code	Min.(nm)	Max.(nm)
RB	619	624	G7	520	525	B3	460	465
			G23	522.5	527.5	B23	462.5	467.5
			G8	525	530	B4	465	470
			G45	527.5	532.5	B45	467.5	472.5
			G9	530	535	B5	470	475

\* Tolerance of measurement of dominant wavelength is  $\pm 1$  nm.

## CRI BIN LIMIT

White (50 mA)		
Bin Code	CRI Min.	CRI Max.
H	80	85
J	85	90

\* Tolerance of measurement of CRI is  $\pm 2$ .

## PERFORMANCE GROUPS - CHROMATICITY

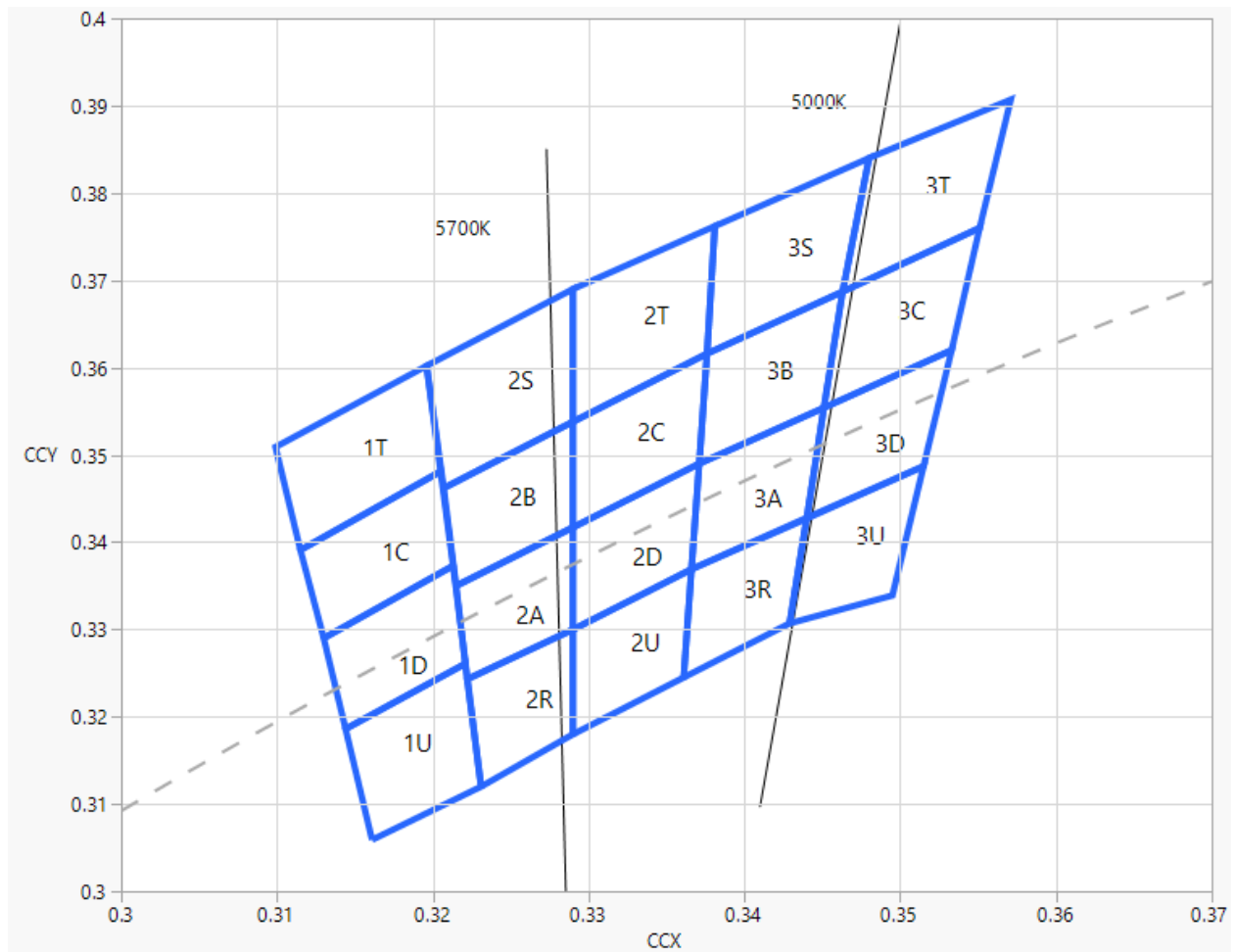
Region	x	y	Region	x	y	Region	x	y	Region	x	y
1C	0.3115	0.3391	1D	0.3130	0.3290	1T	0.3099	0.3509	1U	0.3144	0.3186
	0.3205	0.3481		0.3213	0.3373		0.3196	0.3602		0.3221	0.3261
	0.3213	0.3373		0.3221	0.3261		0.3205	0.3481		0.3231	0.3120
	0.3130	0.3290		0.3144	0.3186		0.3115	0.3391		0.3161	0.3059
2A	0.3215	0.3350	2B	0.3207	0.3462	2C	0.3290	0.3538	2D	0.3290	0.3417
	0.3290	0.3417		0.3290	0.3538		0.3376	0.3616		0.3371	0.3490
	0.3290	0.3300		0.3290	0.3417		0.3371	0.3490		0.3366	0.3369
	0.3222	0.3243		0.3215	0.3350		0.3290	0.3417		0.3290	0.3300
2R	0.3222	0.3243	2S	0.3196	0.3602	2T	0.3290	0.3690	2U	0.3290	0.3300
	0.3290	0.3300		0.3290	0.3690		0.3381	0.3762		0.3366	0.3369
	0.3290	0.3180		0.3290	0.3538		0.3376	0.3616		0.3361	0.3245
	0.3231	0.3120		0.3207	0.3462		0.3290	0.3538		0.3290	0.3180
3A	0.3371	0.3490	3B	0.3376	0.3616	3C	0.3463	0.3687	3D	0.3451	0.3554
	0.3451	0.3554		0.3463	0.3687		0.3551	0.3760		0.3533	0.3620
	0.3440	0.3427		0.3451	0.3554		0.3533	0.3620		0.3515	0.3487
	0.3366	0.3369		0.3371	0.3490		0.3451	0.3554		0.3440	0.3427
3R	0.3366	0.3369	3S	0.3381	0.3762	3T	0.3480	0.3840	3U	0.3440	0.3428
	0.3440	0.3428		0.3480	0.3840		0.3571	0.3907		0.3515	0.3487
	0.3429	0.3307		0.3463	0.3687		0.3551	0.3760		0.3495	0.3339
	0.3361	0.3245		0.3376	0.3616		0.3463	0.3687		0.3429	0.3307
5A1	0.3670	0.3578	5A2	0.3686	0.3649	5A3	0.3744	0.3685	5A4	0.3726	0.3612
	0.3686	0.3649		0.3702	0.3722		0.3763	0.3760		0.3744	0.3685
	0.3744	0.3685		0.3763	0.3760		0.3825	0.3798		0.3804	0.3721
	0.3726	0.3612		0.3744	0.3685		0.3804	0.3721		0.3783	0.3646

## PERFORMANCE GROUPS - CHROMATICITY (CONTINUED)

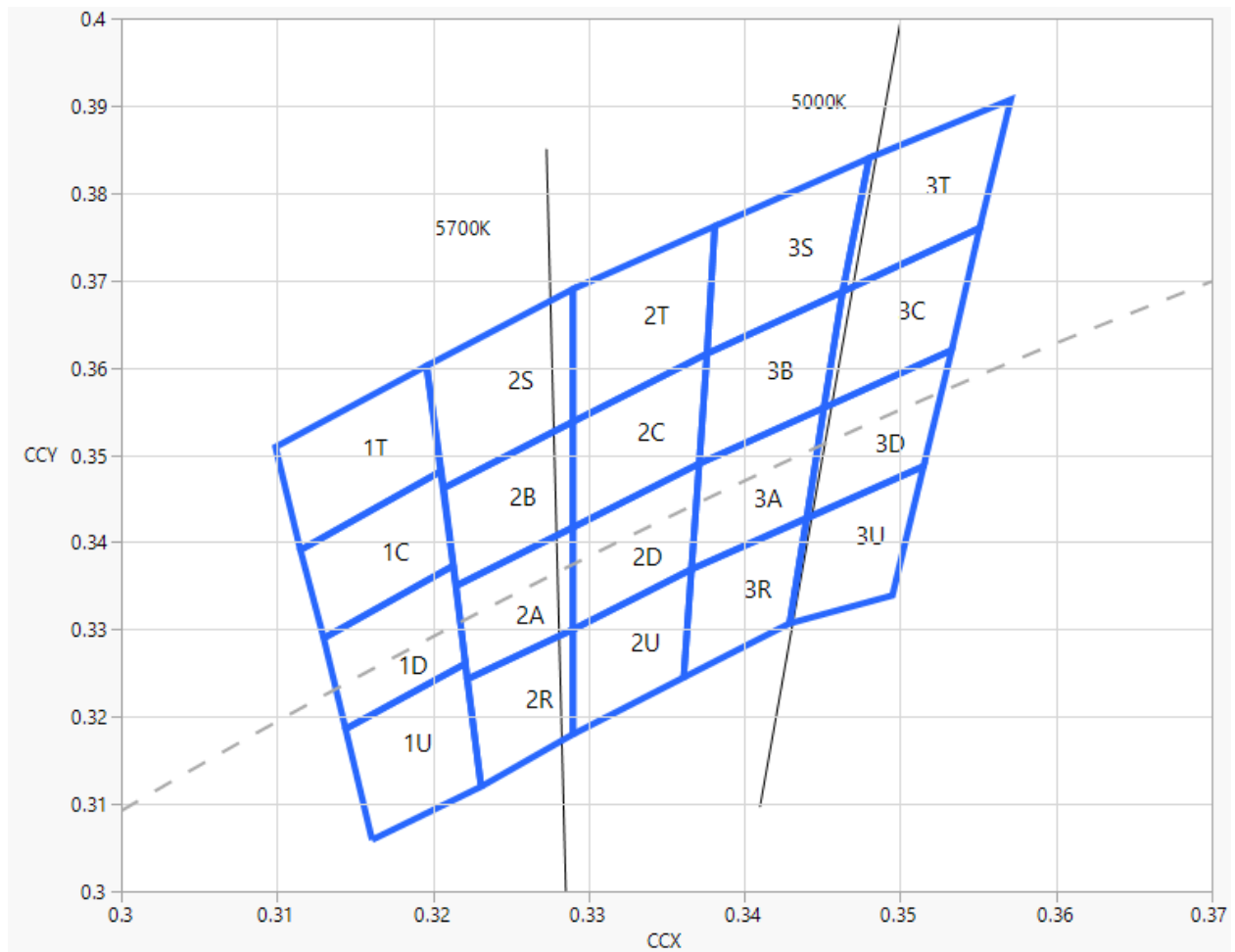
Region	x	y	Region	x	y	Region	x	y	Region	x	y
5B1	0.3702	0.3722	5B2	0.3719	0.3797	5B3	0.3782	0.3837	5B4	0.3763	0.3760
	0.3719	0.3797		0.3736	0.3874		0.3802	0.3916		0.3782	0.3837
	0.3782	0.3837		0.3802	0.3916		0.3869	0.3958		0.3847	0.3877
	0.3763	0.3760		0.3782	0.3837		0.3847	0.3877		0.3825	0.3798
5C1	0.3825	0.3798	5C2	0.3847	0.3877	5C3	0.3912	0.3917	5C4	0.3887	0.3836
	0.3847	0.3877		0.3869	0.3958		0.3937	0.4001		0.3912	0.3917
	0.3912	0.3917		0.3937	0.4001		0.4006	0.4044		0.3978	0.3958
	0.3887	0.3836		0.3912	0.3917		0.3978	0.3958		0.3950	0.3875
5D1	0.3783	0.3646	5D2	0.3804	0.3721	5D3	0.3863	0.3758	5D4	0.3840	0.3681
	0.3804	0.3721		0.3825	0.3798		0.3887	0.3836		0.3863	0.3758
	0.3863	0.3758		0.3887	0.3836		0.3950	0.3875		0.3924	0.3794
	0.3840	0.3681		0.3863	0.3758		0.3924	0.3794		0.3898	0.3716
7A1	0.4147	0.3814	7A2	0.4183	0.3898	7A3	0.4242	0.3919	7A4	0.4203	0.3833
	0.4183	0.3898		0.4221	0.3984		0.4281	0.4006		0.4242	0.3919
	0.4242	0.3919		0.4281	0.4006		0.4342	0.4028		0.4300	0.3939
	0.4203	0.3833		0.4242	0.3919		0.4300	0.3939		0.4259	0.3853
7B1	0.4221	0.3984	7B2	0.4259	0.4073	7B3	0.4322	0.4096	7B4	0.4281	0.4006
	0.4259	0.4073		0.4299	0.4165		0.4364	0.4188		0.4322	0.4096
	0.4322	0.4096		0.4364	0.4188		0.4430	0.4212		0.4385	0.4119
	0.4281	0.4006		0.4322	0.4096		0.4385	0.4119		0.4342	0.4028
7C1	0.4342	0.4028	7C2	0.4385	0.4119	7C3	0.4449	0.4141	7C4	0.4403	0.4049
	0.4385	0.4119		0.4430	0.4212		0.4496	0.4236		0.4449	0.4141
	0.4449	0.4141		0.4496	0.4236		0.4562	0.4260		0.4513	0.4164
	0.4403	0.4049		0.4449	0.4141		0.4513	0.4164		0.4465	0.4071
7D1	0.4259	0.3853	7D2	0.4300	0.3939	7D3	0.4359	0.3960	7D4	0.4316	0.3873
	0.4300	0.3939		0.4342	0.4028		0.4403	0.4049		0.4359	0.3960
	0.4359	0.3960		0.4403	0.4049		0.4465	0.4071		0.4418	0.3981
	0.4316	0.3873		0.4359	0.3960		0.4418	0.3981		0.4373	0.3893

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

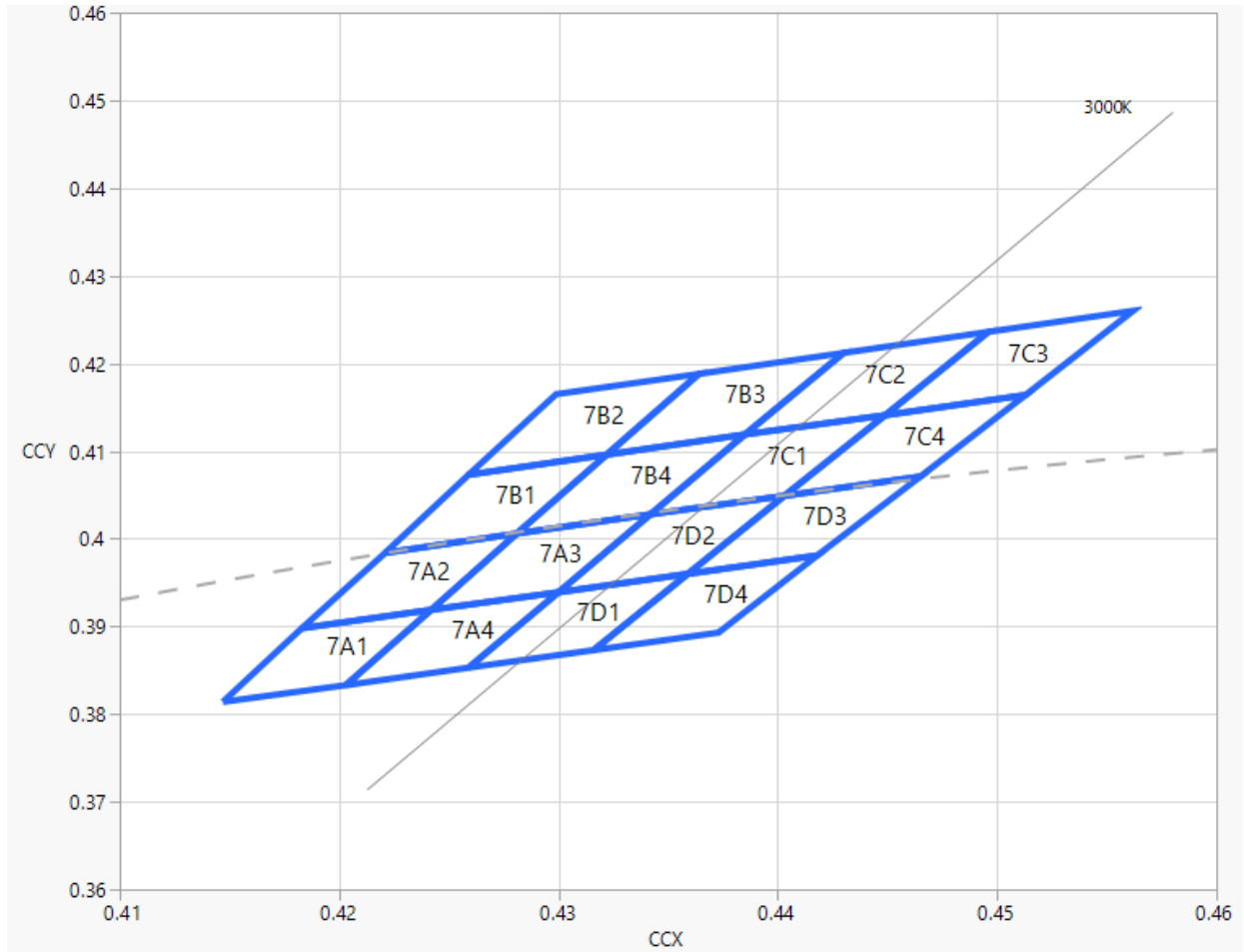
## CIE CHROMATICITY DIAGRAM



## CIE CHROMATICITY DIAGRAM



## CIE CHROMATICITY DIAGRAM





## ORDER CODE TABLE

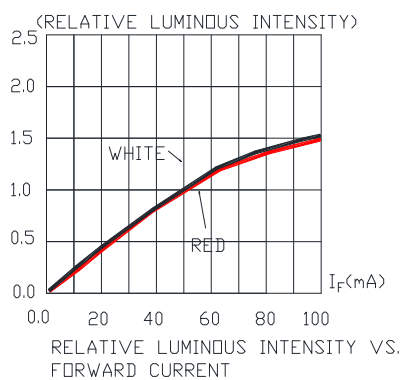
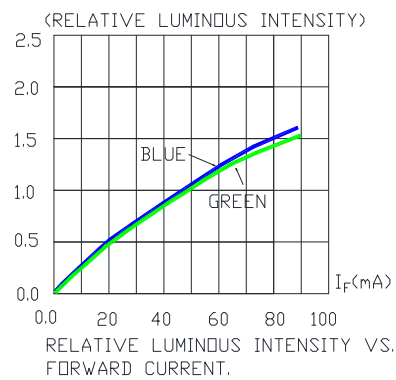
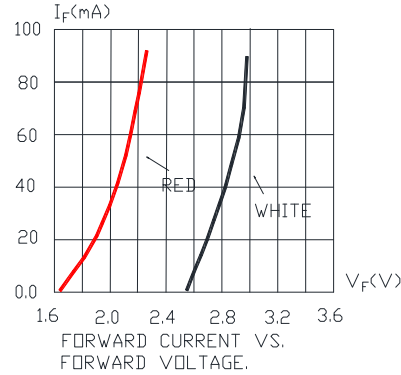
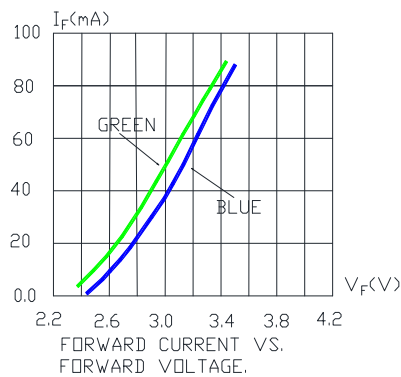
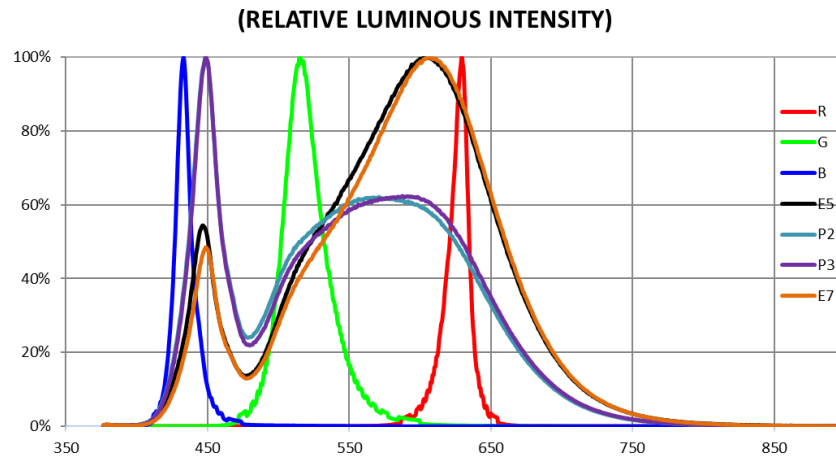
Chromaticity		Kit Number	Color	Luminous Intensity (lm)		Dominant Wavelength (nm)				Package
Kit	CCT			Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max.(nm)	
52	5700K	CLR6A-TKW-SD0F0A0E0BB7C3C523	Red	Any 1 Intensity bin from D0(6.3) - F1(12.3)		RB	619	RB	624	Reel
			Green	Any 1 Intensity bin from F0(10.7) - G0(18.1)		Any 1 hue bin from G7(520)-G9(535)				Reel
			Blue	Any 1 Intensity bin from A0(2.9) - B0(4.8)		Any 1 hue bin from B3(460)-B5(475)				Reel
			White	Any 1 Intensity bin from E0(8.2) - G0(18.1)		1C,1D,1T,1U,2A,2B,2C,2D,2R,2S,2T,2U				Reel
P2	5700K	CLR6A-TKW-SD0F0A0E0BB7C3CP23	Red	Any 1 Intensity bin from D0(6.3) - F1(12.3)		RB	619	RB	624	Reel
			Green	Any 1 Intensity bin from F0(10.7) - G0(18.1)		Any 1 hue bin from G7(520)-G9(535)				Reel
			Blue	Any 1 Intensity bin from A0(2.9) - B0(4.8)		Any 1 hue bin from B3(460)-B5(475)				Reel
			White	Any 1 Intensity bin from E0(8.2) - G0(18.1)		2A,2B,2C,2D,2R,2S,2T,2U				Reel
P3	5000K	CLR6A-TKW-SD0F0A0E0BB7C3CP33	Red	Any 1 Intensity bin from D0(6.3) - F1(12.3)		RB	619	RB	624	Reel
			Green	Any 1 Intensity bin from F0(10.7) - G0(18.1)		Any 1 hue bin from G7(520)-G9(535)				Reel
			Blue	Any 1 Intensity bin from A0(2.9) - B0(4.8)		Any 1 hue bin from B3(460)-B5(475)				Reel
			White	Any 1 Intensity bin from E0(8.2) - G0(18.1)		3A,3B,3C,3D,3R,3S,3T,3U				Reel
E5	4000K	CLR6A-TKW-SD0F0A0E0BB7C3CE53	Red	Any 1 Intensity bin from D0(6.3) - F1(12.3)		RB	619	RB	624	Reel
			Green	Any 1 Intensity bin from F0(10.7) - G0(18.1)		Any 1 hue bin from G7(520)-G9(535)				Reel
			Blue	Any 1 Intensity bin from A0(2.9) - B0(4.8)		Any 1 hue bin from B3(460)-B5(475)				Reel
			White	Any 1 Intensity bin from E0(8.2) - G0(18.1)		5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4, 5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4				Reel
E7	3000K	CLR6A-TKW-SD0F0A0E0BB7C3CE73	Red	Any 1 Intensity bin from D0(6.3) - F1(12.3)		RB	619	RB	624	Reel
			Green	Any 1 Intensity bin from F0(10.7) - G0(18.1)		Any 1 hue bin from G7(520)-G9(535)				Reel
			Blue	Any 1 Intensity bin from A0(2.9) - B0(4.8)		Any 1 hue bin from B3(460)-B5(475)				Reel
			White	Any 1 Intensity bin from E0(8.2) - G0(18.1)		5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4, 5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4, 5S0,5T0				Reel

## Notes:

- The above kit numbers represent order codes that include multiple flux-bin and color-bin codes. Only one flux-bin code and one color-bin code will be shipped on each bulk. Single flux-bin code and single color-bin codes will not be orderable.
- Please refer to the [HB LED Lamp Reliability Test Standards](#) document for reliability test conditions.
- Please refer to the [HB LED Lamp Soldering & Handling](#) document for information about how to use this LED product safely.

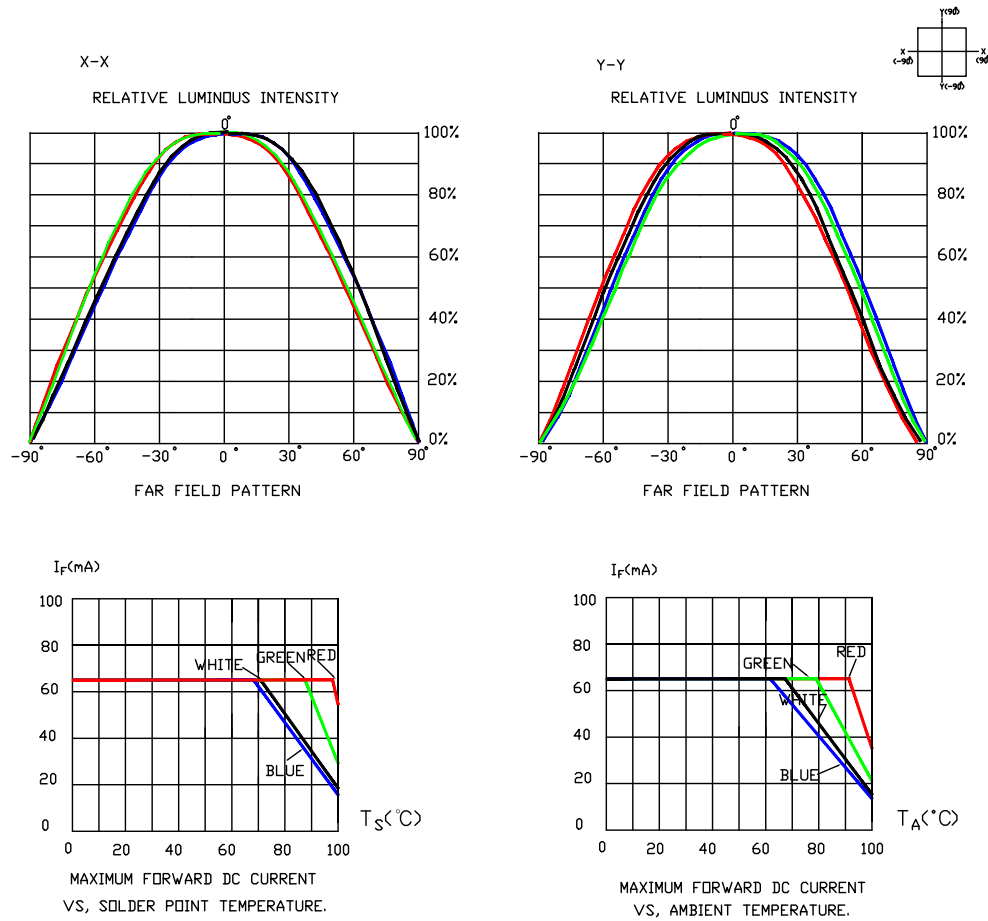
## GRAPHS

The data below 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.



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The data below 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.

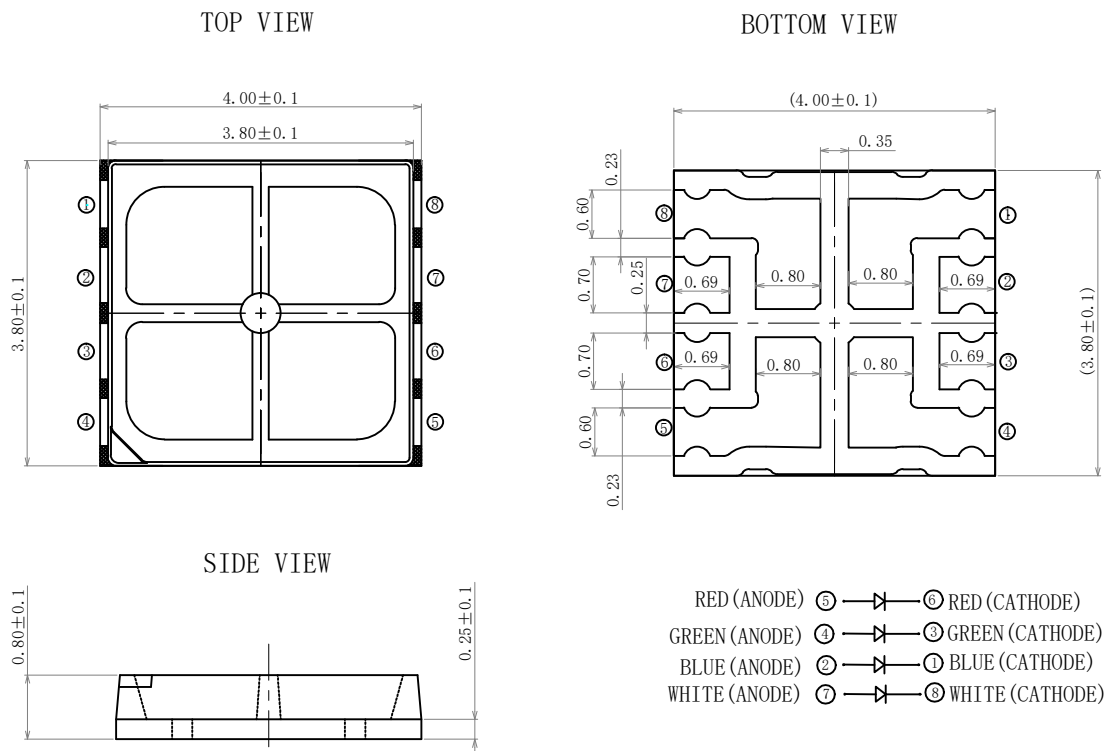


The graph shows the maximum allowable DC current for a LED die of each color.

## MECHANICAL DIMENSIONS

All dimensions are in mm.

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



## 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 January 2, 2013. RoHS Declarations for this product can be obtained from your Cree LED representative or from the [Product Ecology](#) section of the Cree LED website.

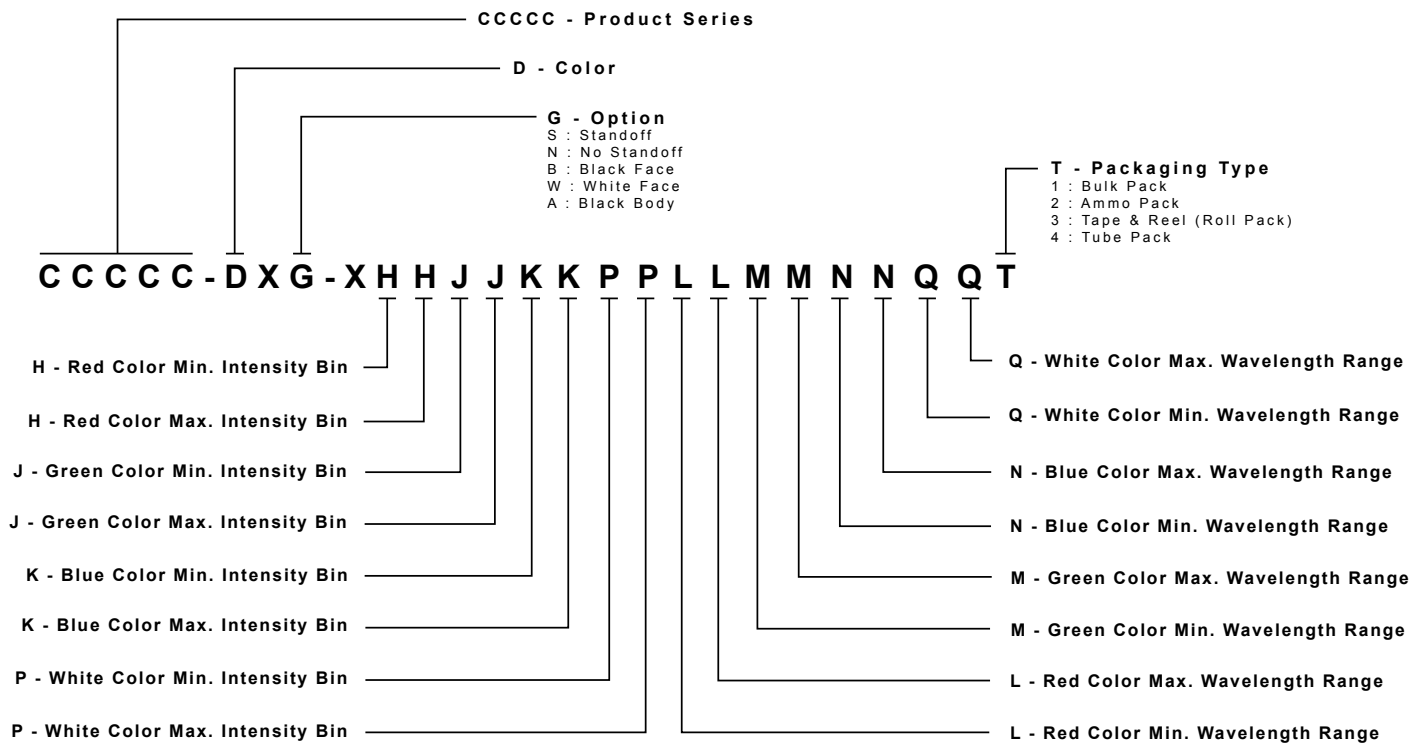
### Vision Advisory

**WARNING:** Do not look at an exposed lamp in operation. Eye injury can result.

## KIT NUMBER SYSTEM

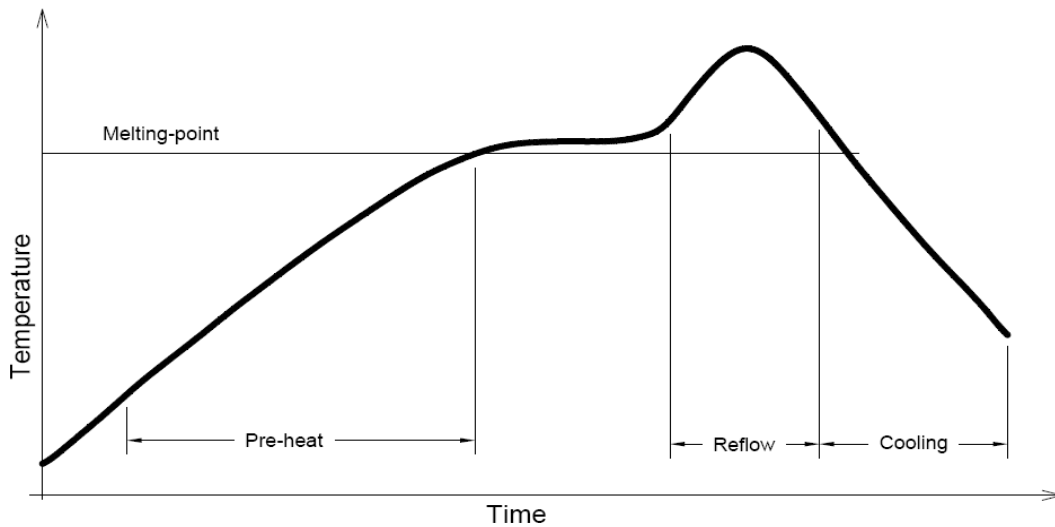
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness.

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



## REFLOW SOLDERING

- The CLR6A-TKW is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below.

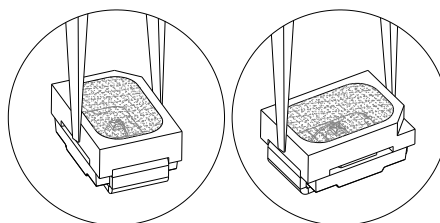


Use only with CLR6A-TKW

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

## 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 2000 pcs per reel.

