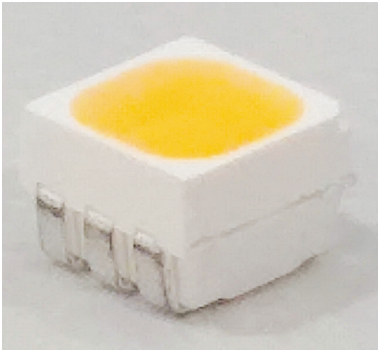


## CLX6F-WKW: PLCC6 3 IN 1 SMD LED



### PRODUCT DESCRIPTION

These SMD LEDs are packaged in an industry standard PLCC6 package. These high reliability and high brightness LEDs are designed to work in a wide range of environmental condition and are ideally suited for use in illumination applications.

Its wide viewing angle makes these LEDs ideally suited for channel letter, or general backlighting and illumination applications. The flat top emitting surface makes it easy for these LEDs to mate with light pipes.

### FEATURES

- Size (mm): 3.5 x 3.4 x 2.8
- Luminous Intensity (mcd)  
CLX6F-WKW:(7030 - 14400)
- CRI Min 80
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant

### APPLICATIONS

- Architecture Lighting
- Channel Letter
- Backlight

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

Items	Symbol	Absolute Maximum Rating	Unit
Forward Current <sup>Note 1</sup>	$I_F$	3 x 70	mA
Peak Forward Current <sup>Note 2</sup>	$I_{FP}$	3 x 200	mA
Reverse Voltage	$V_R$	5	V
Power Dissipation	$P_D$	3 x 280	mW
Operation Temperature	$T_{opr}$	-40 ~ +85	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +100	$^\circ\text{C}$
Junction Temperature	$T_J$	110	$^\circ\text{C}$
Junction/Ambient 1 chip on	$R_{THJA}$	220	$^\circ\text{C}/\text{W}$
Junction/Solder Point 1 chip on	$R_{THJS}$	140	$^\circ\text{C}/\text{W}$
Electrostatic Discharge Classification (MIL-STD-883E)	ESD	1000V	

**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
Spectral bandwidth at 50% $I_{REL}$ max	$I_F = 3 \times 35\text{mA}$	$\Delta \lambda$	81	nm
Forward Voltage	$I_F = 3 \times 35\text{mA}$	$V_{F(avg)}$	3.3	V
		$V_{F(max)}$	4.0	V
Luminous Intensity	$I_F = 3 \times 35\text{mA}$	$I_{V(min)}$	7030	mcd
		$I_{V(avg)}$	10500	mcd
Luminous Flux	$I_F = 3 \times 35\text{mA}$	$\Phi_{V(avg)}$	23	lm
Reverse Current (max)	$V_R = 5 \text{ V}$	$I_R$	10	$\mu\text{A}$

\* Continuous reverse voltage can cause LED damage.

## INTENSITY BIN LIMIT

White (3 x 35 mA) - CLX6F-WKW		
Bin Code	Min.(mcd)	Max.(mcd)
1R	7030	10100
1S	8200	12000
1T	10100	14400

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

## VOLTAGE BIN LIMIT

White (3 x 35 mA) - CLX6F-WKW		
Bin Code	Min.(nm)	Max.(nm)
49	3.0	3.4

\* Tolerance of measurement of voltage is  $\pm 0.05V$

## CRI BIN LIMIT

White (3 x 35 mA)		
Bin Code	CRI Min.	CRI Max.
H	80	85
J	85	90

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

COLOR BIN LIMIT

Cool White (3 x 35 mA) - CLX6F-WKW

Region	x	y	Region	x	y	Region	x	y	Region	x	y
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
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
4C1	0.3615	0.3659	4C2	0.3628	0.3732	4C3	0.3663	0.3758	4C4	0.3646	0.3680
	0.3628	0.3732		0.3641	0.3804		0.3680	0.3833		0.3663	0.3758
	0.3663	0.3758		0.3680	0.3833		0.3736	0.3874		0.3719	0.3797
	0.3646	0.3680		0.3663	0.3758		0.3719	0.3797		0.3702	0.3722
4D1	0.3590	0.3521	4D2	0.3603	0.3590	4D3	0.3630	0.3611	4D4	0.3614	0.3539
	0.3603	0.3590		0.3615	0.3659		0.3646	0.3680		0.3630	0.3611
	0.3630	0.3611		0.3646	0.3680		0.3702	0.3722		0.3686	0.3649
	0.3614	0.3539		0.3630	0.3611		0.3686	0.3649		0.3670	0.3578
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
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

• Tolerance of measurement of the color coordinates is ±0.01

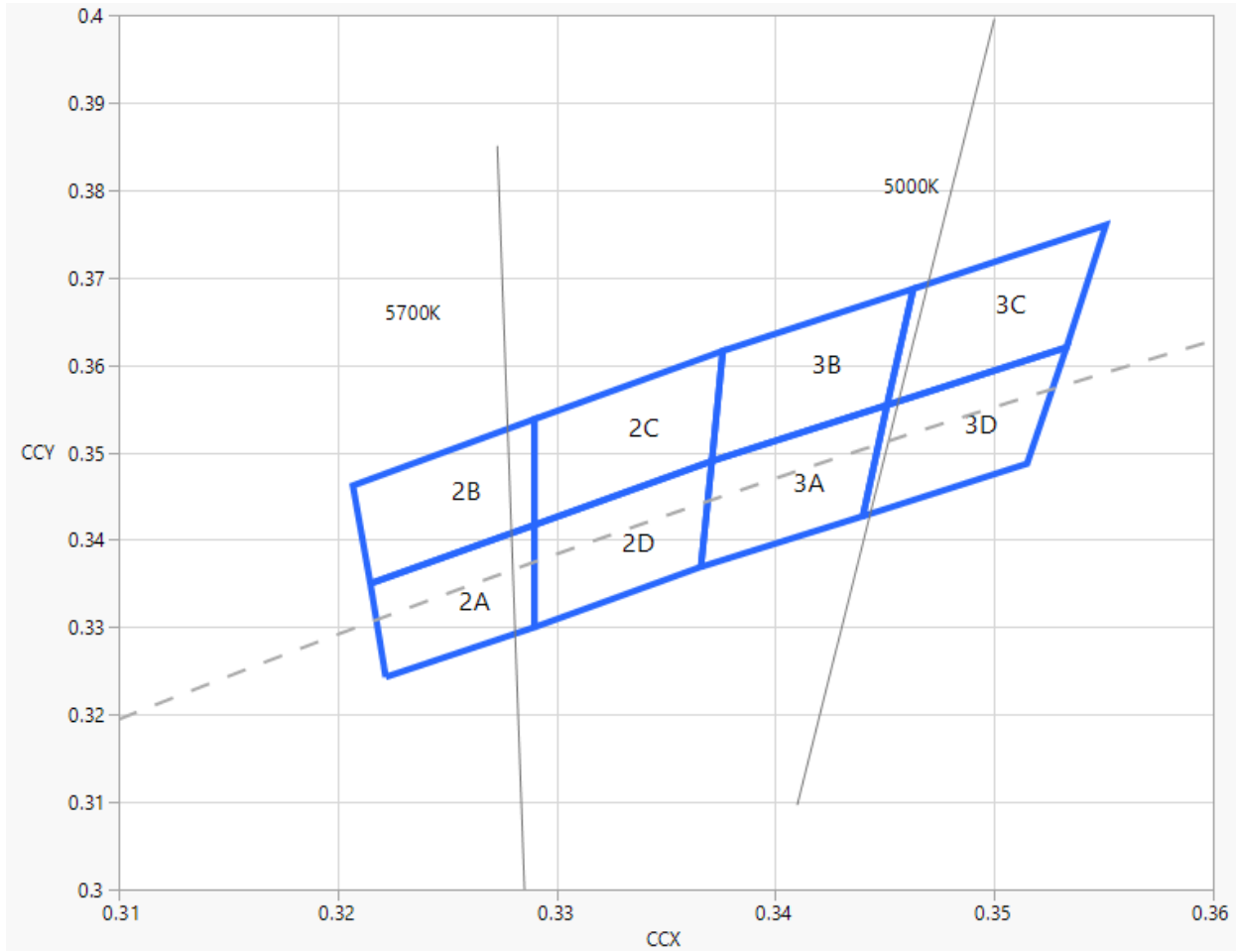
COLOR BIN LIMIT

Cool White (3 x 35 mA) - CLX6F-WKW

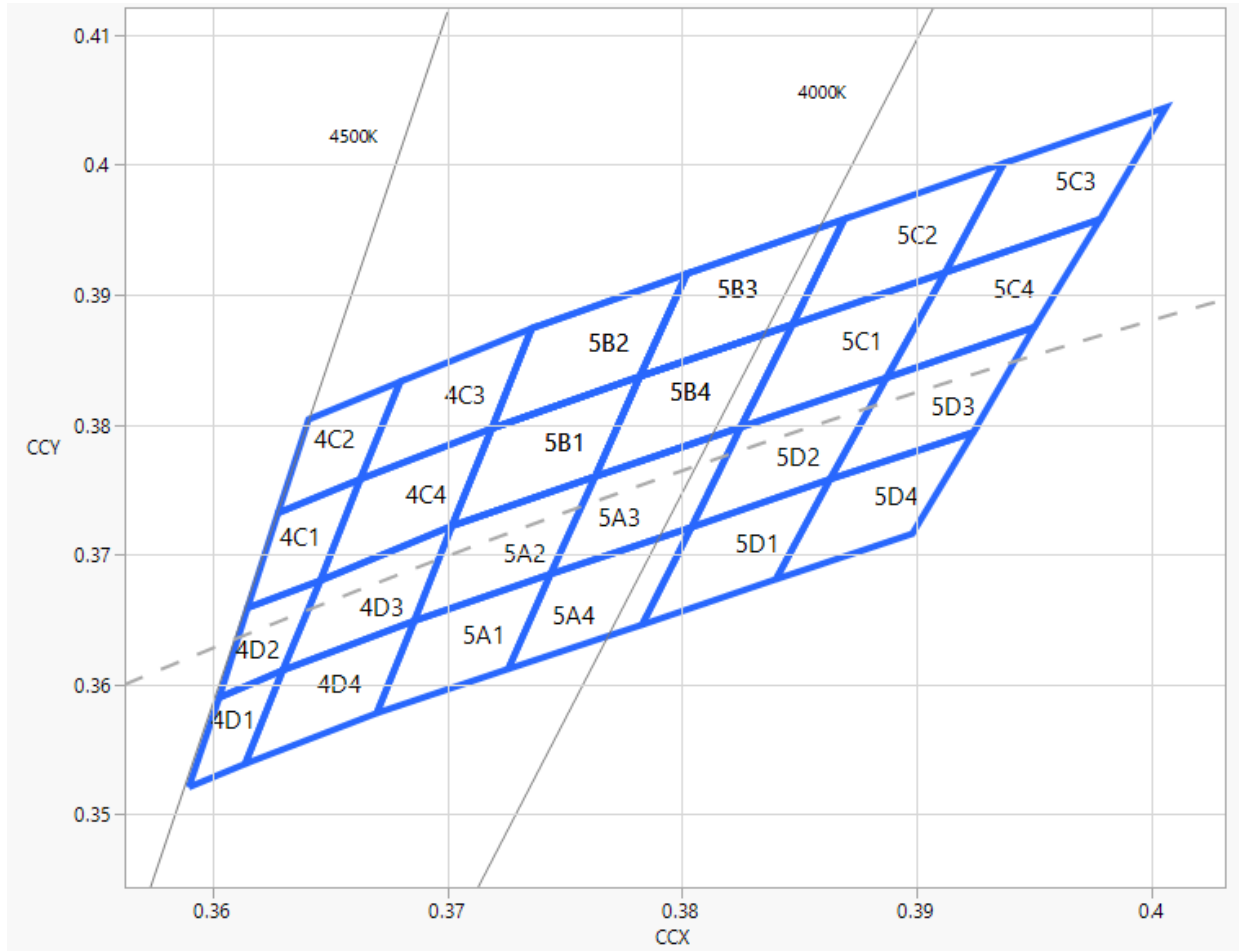
Region	x	y	Region	x	y	Region	x	y	Region	x	y
7A1	0.4147	0.3814	7A2	0.4183	0.3898	7A3	0.4242	0.3919	7A4	0.4203	0.3833
	0.4183	0.3898		0.4221	0.3984		0.4281	0.4006		0.4242	0.3919
	0.4242	0.3919		0.4281	0.4006		0.4342	0.4028		0.4300	0.3939
	0.4203	0.3833		0.4242	0.3919		0.4300	0.3939		0.4259	0.3853
7B1	0.4221	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
8A1	0.4373	0.3893	8A2	0.4418	0.3981	8A3	0.4475	0.3994	8A4	0.4428	0.3906
	0.4418	0.3981		0.4465	0.4071		0.4523	0.4085		0.4475	0.3994
	0.4475	0.3994		0.4523	0.4085		0.4582	0.4099		0.4532	0.4008
	0.4428	0.3906		0.4475	0.3994		0.4532	0.4008		0.4483	0.3919
8B1	0.4465	0.4071	8B2	0.4513	0.4164	8B3	0.4573	0.4178	8B4	0.4523	0.4085
	0.4513	0.4164		0.4562	0.4260		0.4624	0.4274		0.4573	0.4178
	0.4573	0.4178		0.4624	0.4274		0.4687	0.4289		0.4634	0.4193
	0.4523	0.4085		0.4573	0.4178		0.4634	0.4193		0.4582	0.4099
8C1	0.4582	0.4099	8C2	0.4634	0.4193	8C3	0.4695	0.4207	8C4	0.4641	0.4112
	0.4634	0.4193		0.4687	0.4289		0.4750	0.4304		0.4695	0.4207
	0.4695	0.4207		0.4750	0.4304		0.4813	0.4319		0.4756	0.4221
	0.4641	0.4112		0.4695	0.4207		0.4756	0.4221		0.4700	0.4126
8D1	0.4483	0.3919	8D2	0.4532	0.4008	8D3	0.4589	0.4021	8D4	0.4538	0.3931
	0.4532	0.4008		0.4582	0.4099		0.4641	0.4112		0.4589	0.4021
	0.4589	0.4021		0.4641	0.4112		0.4700	0.4126		0.4646	0.4034
	0.4538	0.3931		0.4589	0.4021		0.4646	0.4034		0.4593	0.3944

• Tolerance of measurement of the color coordinates is ±0.01

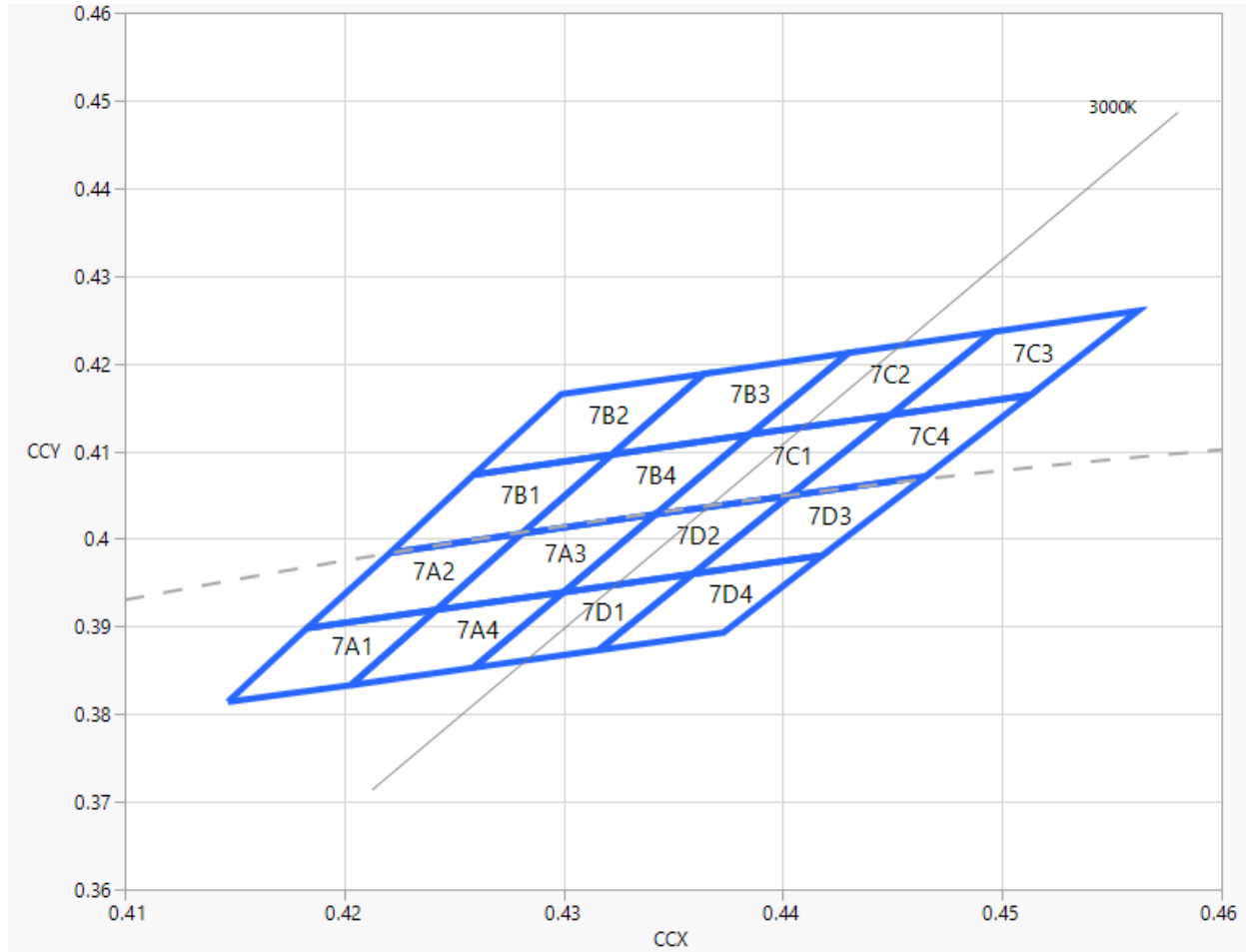
CIE CHROMATICITY DIAGRAM



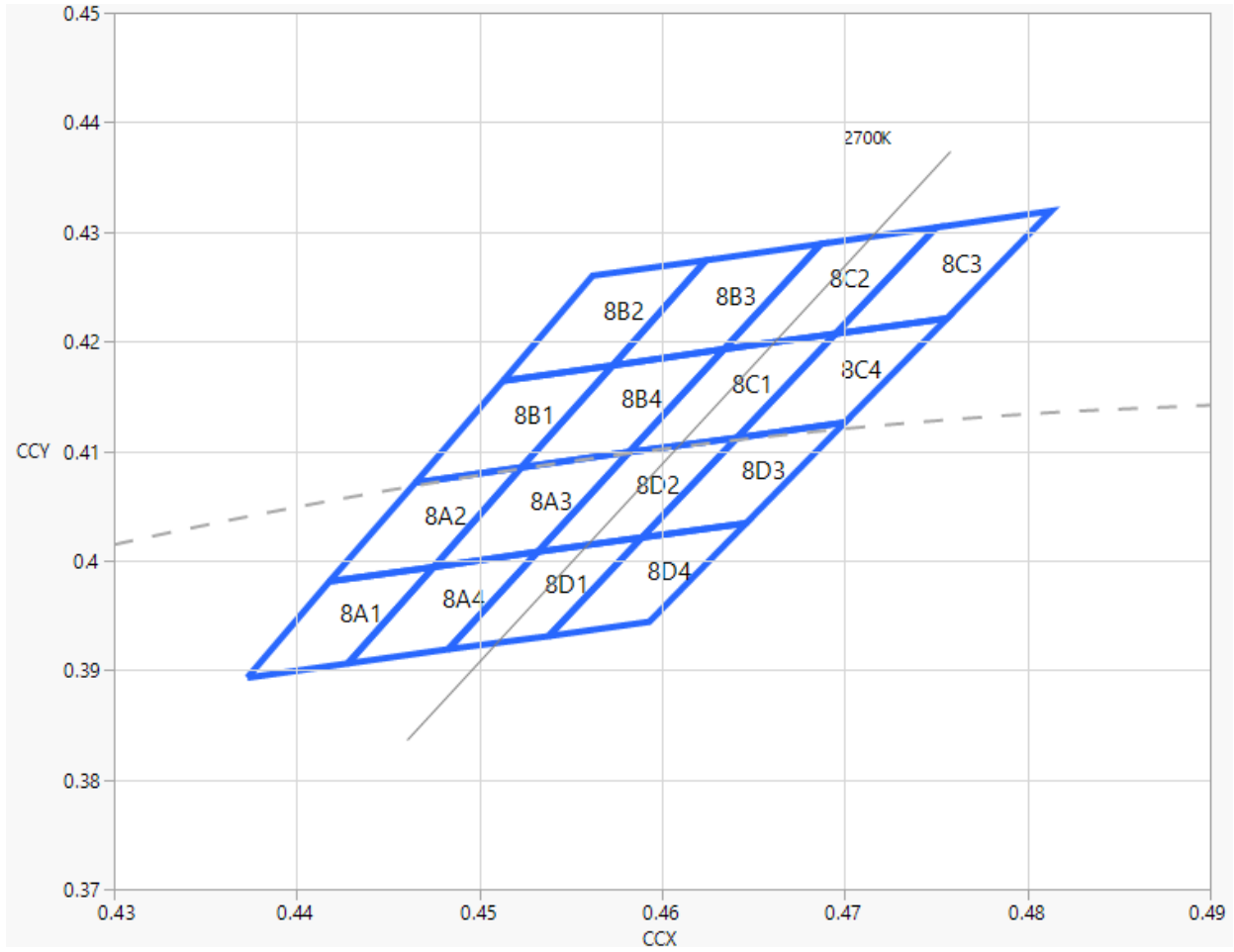
CIE CHROMATICITY DIAGRAM



CIE CHROMATICITY DIAGRAM



CIE CHROMATICITY DIAGRAM



## ORDER CODE TABLE

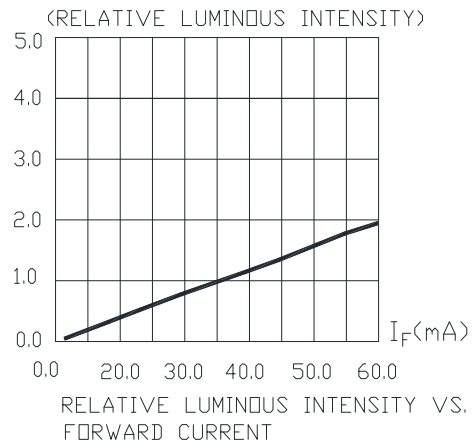
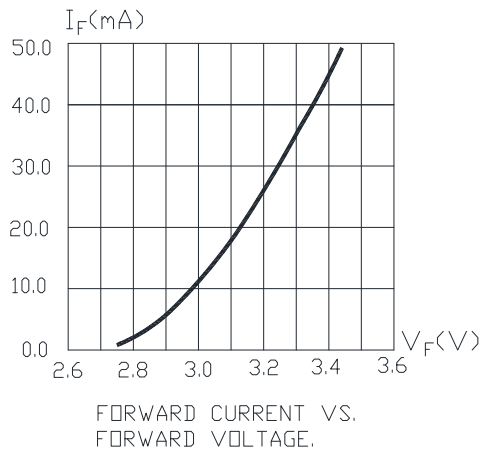
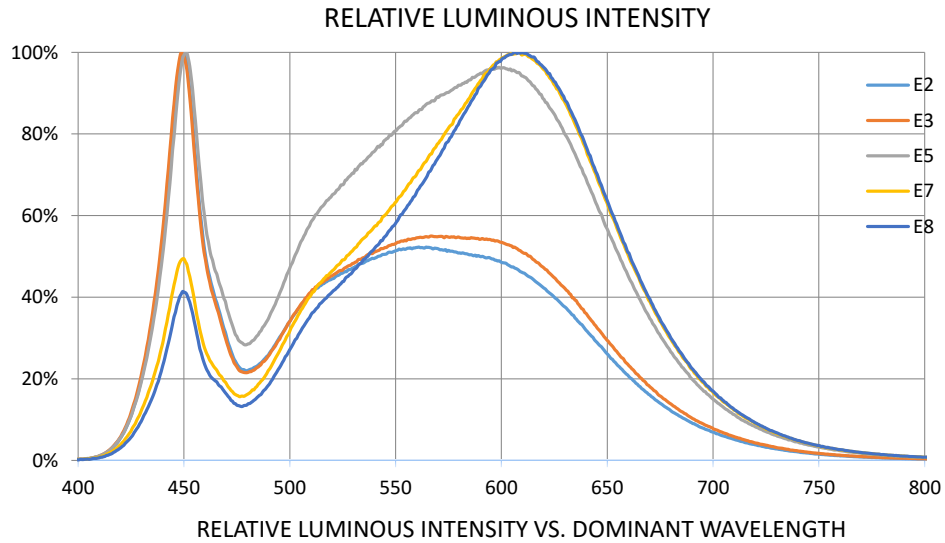
Chromaticity		Kit Number	Color	Luminous Intensity (lm)		Dominant Wavelength (nm)				Package
Kit	CCT			Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max.(nm)	
E2	5700K	CLX6F-WKW-V1R2E23	White	Any 2 Intensity bin from 1R(7030) - 1T(14400)		2A0,2B0,2C0,2D0				Reel
E3	5000K	CLX6F-WKW-V1R2E33	White	Any 2 Intensity bin from 1R(7030) - 1T(14400)		3A0,3B0,3C0,3D0				Reel
F5	4500K	CLX6F-WKW-V1R2F53	White	Any 2 Intensity bin from 1R(7030) - 1T(14400)		4C1,4C2,4C3,4C4,4D1,4D2,4D3,4D4.5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4				Reel
E5	4000K	CLX6F-WKW-V1R2E53	White	Any 2 Intensity bin from 1R(7030) - 1T(14400)		5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4.5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4				Reel
E7	3000K	CLX6F-WKW-V1R2E73	White	Any 2 Intensity bin from 1R(7030) - 1T(14400)		7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4.7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4				Reel
E8	2700K	CLX6F-WKW-V1R2E83	White	Any 2 Intensity bin from 1R(7030) - 1T(14400)		8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4.8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4				Reel

## Notes:

- 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, intensity bin from 1R - 1T means intensity bin from (1R or 1S or 1T) will be shipped by Cree LED.
- 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.

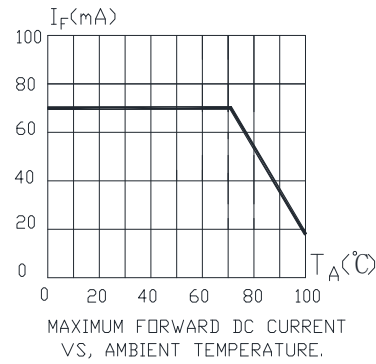
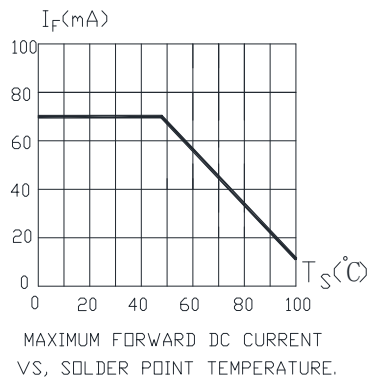
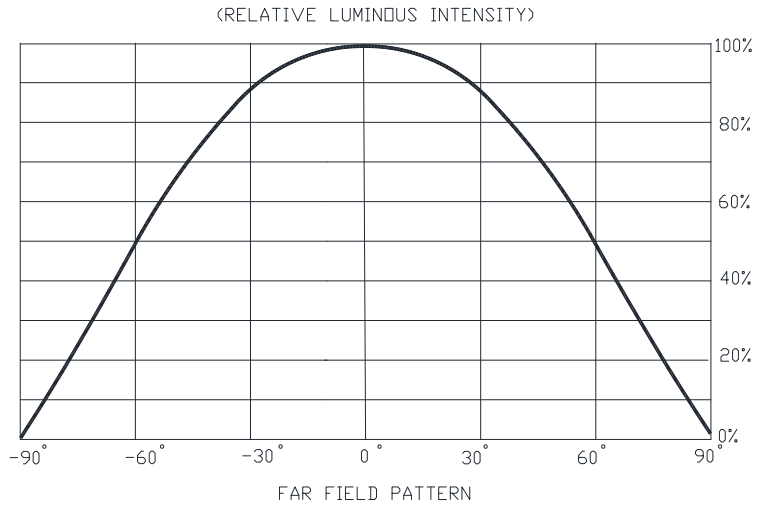
GRAPHS

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.



**GRAPHS**

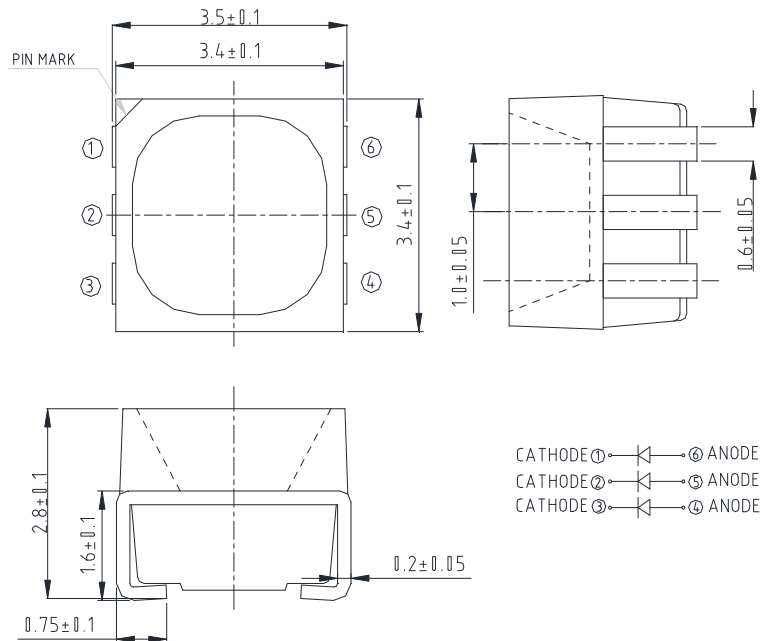
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



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

## MECHANICAL DIMENSIONS

All dimensions are in mm.



## 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.

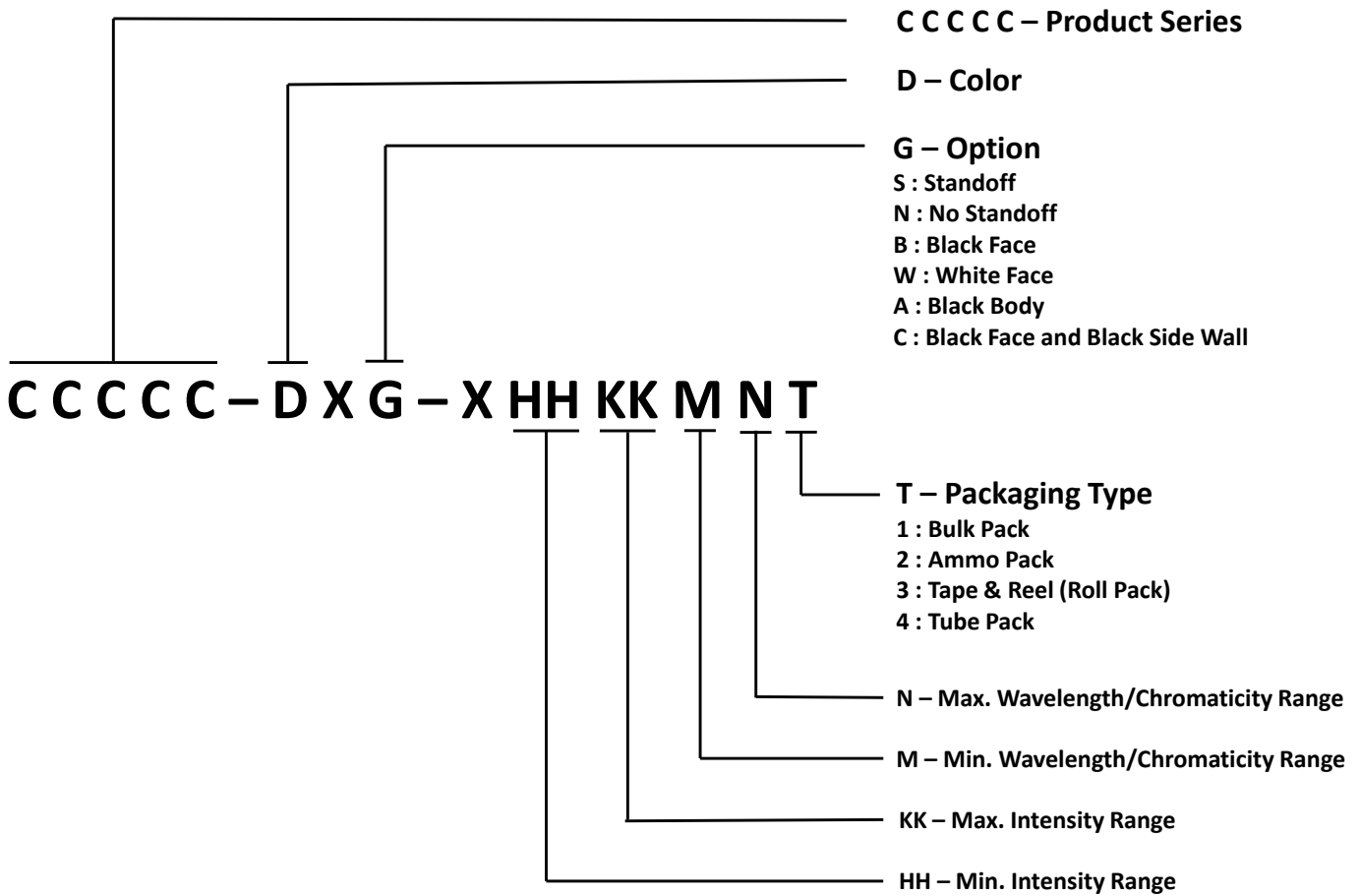
### Vision Advisory

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

## KIT NUMBER SYSTEM

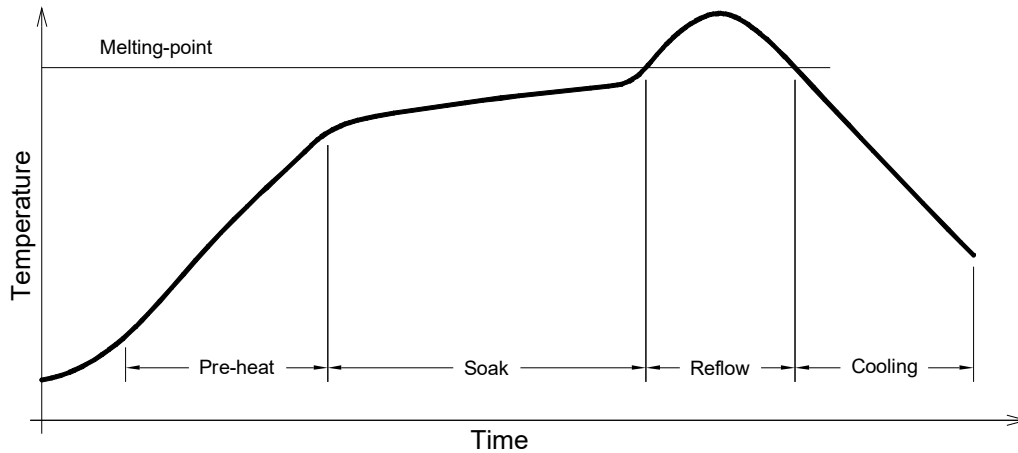
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options.

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



## REFLOW SOLDERING

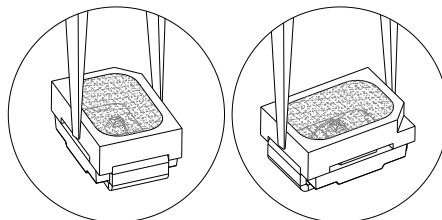
- The CLX6F-WKW is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below.



Use only with CLX6F-WKW

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

- 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:
- Please refer to the [HB LED Lamp Soldering & Handling](#) document for information about how to use this LED product safely.



## PACKAGING

- 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 shock during transportation.
- The boxes are not water resistant, and they must be kept away from water and moisture.
- The reel pack is applied in SMD LED.
- Max 2800 pcs per reel.

