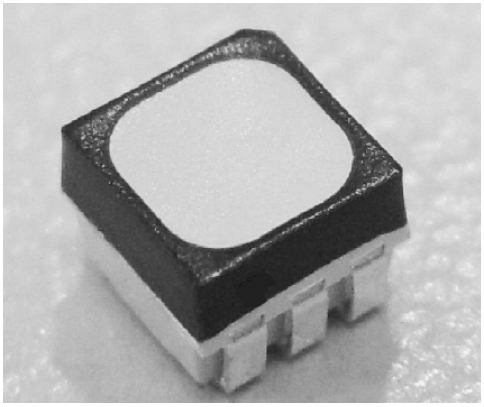
CLX6E-FKC: PLCC6 3 in 1 SMD LED



PRODUCT DESCRIPTION

This SMD LED features an IPX7/IPX8* water resistant rating in a PLCC6 package. These high performance tricolor SMT LEDs are designed to work in a wide range of applications. A wide viewing angle and high brightness make these LEDs suitable for outdoor and full color video signage applications.

The encapsulation resin contains UV inhibitors to minimize the effects of long-term exposure to direct sunlight, resulting in stable light output over the life of the LED. This PLCC6 package has an increased package height to ease in the manufacturing process.

FEATURES

- Size (mm): 3.5 x 3.4 x 2.8
- Dominant Wavelength
  Red (619 - 624nm)
  Green (520 - 535nm)
  Blue (460 - 480nm)
- Luminous Intensity (mcd)
  Red (355 - 1010)
  Green (710 - 1400)
  Blue (140 - 355)
- Water-Resistant (IPX7/IPX8*)
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant
- Matte Surface

APPLICATIONS

- Architecture Lighting
- Outdoor Full-Color Video Screen
- Decorative Lighting
- Amusement

*: This part is tested under the condition of being assembled on a PCB, with leads area isolated by silicone to prevent moisture from being permeated inside along the LED leads, IPX8 is tested by immersing in 1m water for 24hrs.

Cree LED / 4001 E. Hwy. 54, Suite 2000 / Durham, NC 27709 USA / +1.919.313.5330 / www.cree-led.com

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Items	Symbol	Absolute Maximum Rating			Unit
		R	G	B	
Forward Current Note 1	I_F	50	30	35	mA
Peak Forward Current Note 2	I_{FP}	200	100	100	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_D	125	105	123	mW
Operation Temperature	T_{opr}	-40 ~ +85			°C
Storage Temperature	T_{stg}	-40 ~ +100			°C
Junction Temperature	T_J	110	110	110	°C
Junction/ambient 1 chip on	R_{THJA}	450	400	450	°C/W
Junction/solder point 1 chip on	R_{THJs}	230	230	200	°C/W
Electrostatic Discharge Classification(MIL-STD-883E)	ESD	1000V			

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	
Dominant Wavelength	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	λ_{DOM}	619~624	520~535	460~480	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$\Delta\lambda$	24	28	20	nm
Forward Voltage	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$V_{F(typ)}$	2.0	2.7	2.7	V
		$V_{F(max)}$	2.5	3.5	3.5	V
Luminous Intensity	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$I_{V(min)}$	355	710	140	mcd
		$I_{V(typ)}$	750	1100	270	mcd
Luminous Flux(Reference)	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$\Phi_{V(typ)}$	2.1	3.0	0.8	lm
Luminous Intensity(Reference)	I_F = 20mA(R/G/B)	$I_{V(typ)}$	1000	1800	520	mcd
Reverse Current (max)	V_R = 5 V	I_R	10	10	10	μA

* Continuous reverse voltage can cause LED damage.

INTENSITY BIN LIMIT

Red (15 mA)			Green (10 mA)			Blue (10 mA)		
Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)
H	355	450	M	710	900	D	140	180
hj	403	505	qr	805	1010	9a	160	202
J	450	560	N	900	1120	E	180	224
km	505	635	st	1010	1260	bc	202	252
K	560	710	P	1120	1400	F	224	280
np	635	805				de	252	318
M	710	900				G	280	355
qr	805	1010						

* Tolerance of measurement of luminous intensity is ±10%.

COLOR BIN LIMIT

Red (15 mA)			Green (10 mA)			Blue (10 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
						B67	472.5	477.5
						B6	475	480

* Tolerance of measurement of dominant wavelength is ±1 nm.

ORDER CODE TABLE

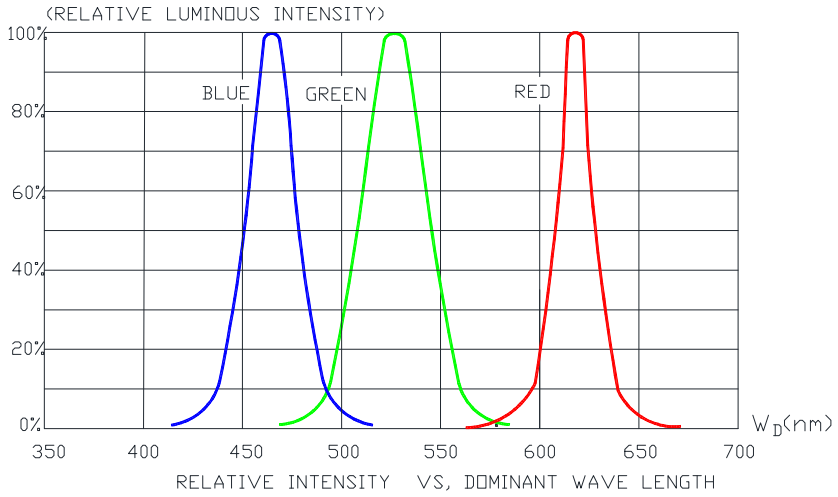
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max. (nm)	
CLX6E-FKC-CHnpMPDGBB79363	Red	355	805	RB	619	RB	624	Reel
	Green	710	1400	G7	520	G9	535	Reel
	Blue	140	355	B3	460	B6	480	Reel
CLX6E-FKC-CHqrMPDGBB79363	Red	355	1010	RB	619	RB	624	Reel
	Green	710	1400	G7	520	G9	535	Reel
	Blue	140	355	B3	460	B6	480	Reel
CLX6E-FKC-CH1M1D1BB7C3D3	Red	Any 1 Intensity bin from H(355) - np(805)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from M(710) - P(1400)		Any 1 hue bin from G7(520)-G9(535)				Reel
	Blue	Any 1 Intensity bin from D(140) - G(355)		Any 1 hue bin from B3(460)-B6(480)				Reel
CLX6E-FKC-Ckm1M1D1BB7C3D3	Red	Any 1 Intensity bin from km(505) - qr(1010)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from M(710) - P(1400)		Any 1 hue bin from G7(520)-G9(535)				Reel
	Blue	Any 1 Intensity bin from D(140) - G(355)		Any 1 hue bin from B3(460)-B6(480)				Reel

Notes:

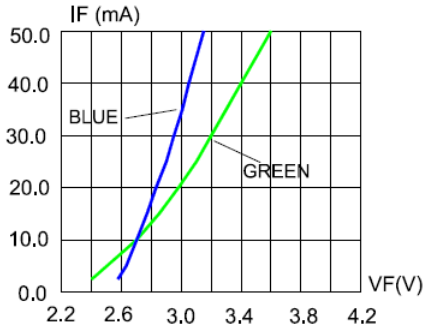
- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each bulk. Single intensity-bin code and single color-bin codes will not be orderable.
- Please refer to the HB LED Lamp Reliability 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

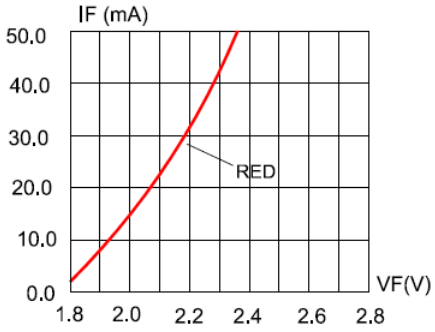
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



RELATIVE INTENSITY VS, DOMINANT WAVE LENGTH



FORWARD CURRENT VS. FORWARD VOLTAGE.



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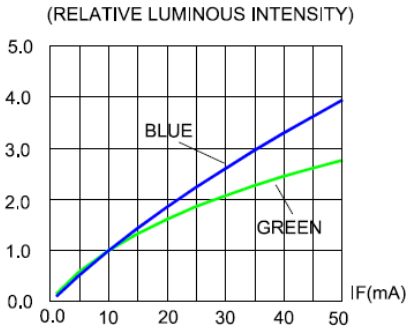
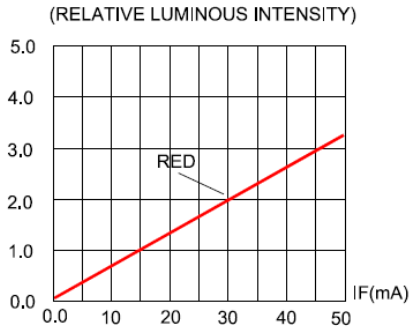


RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

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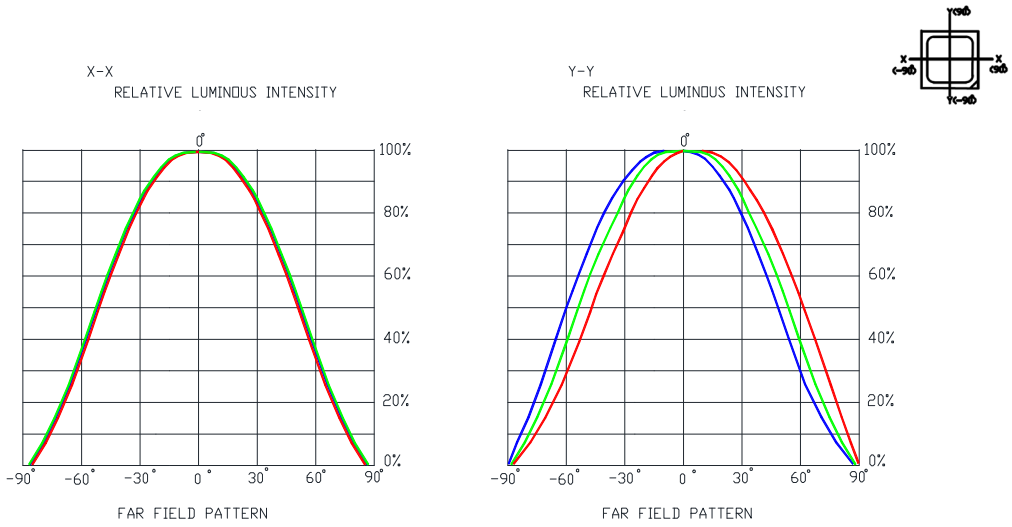
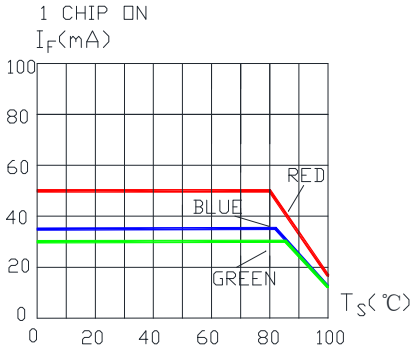
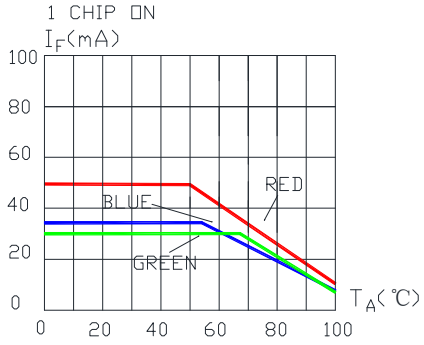


FAR FIELD PATTERN



MAXIMUM FORWARD DC CURRENT
VS, SOLDER POINT TEMPERATURE.

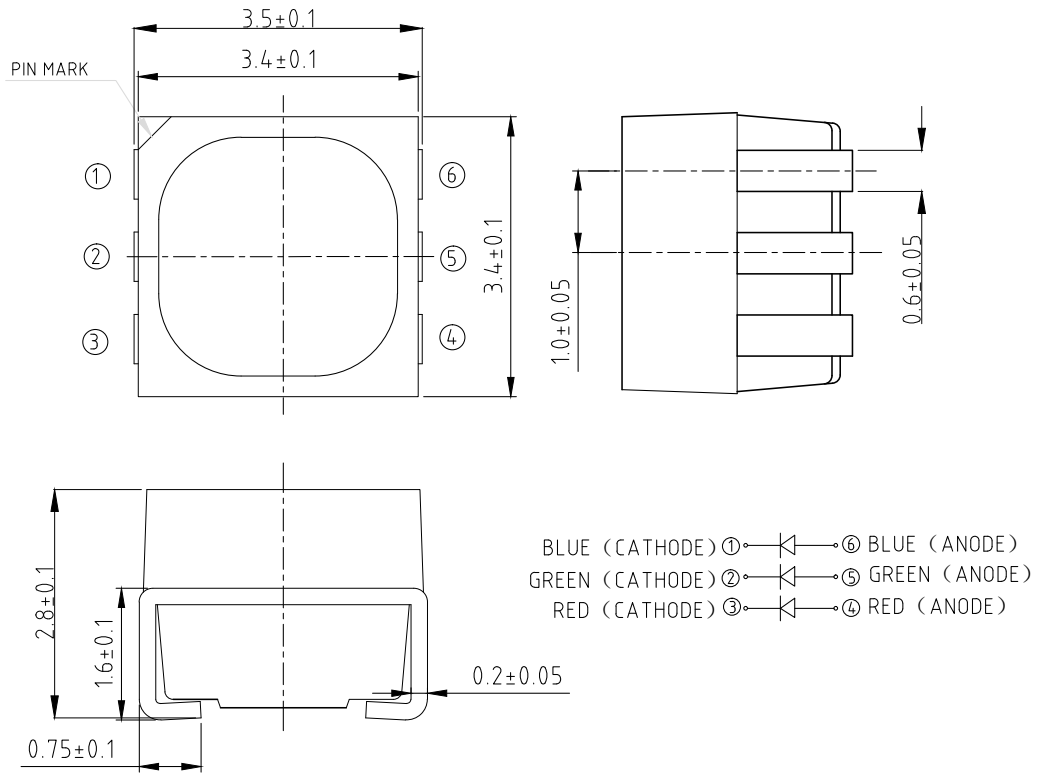


MAXIMUM FORWARD DC CURRENT
VS, AMBIENT TEMPERATURE.

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 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.

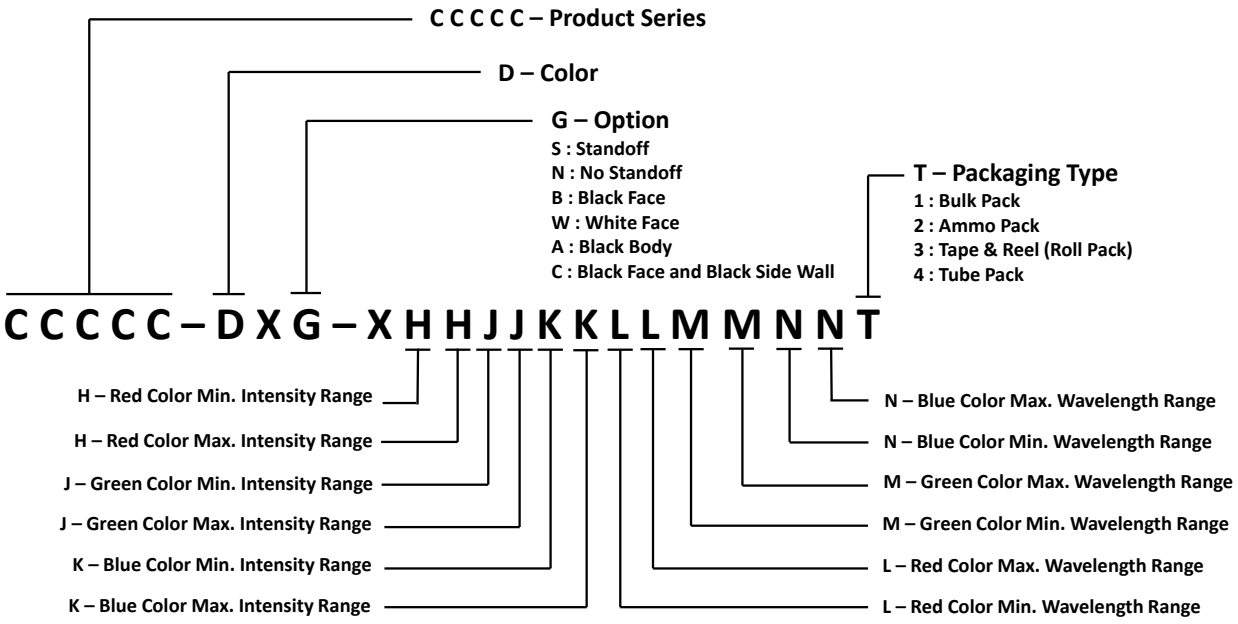
Vision Advisory

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

KIT NUMBER SYSTEM

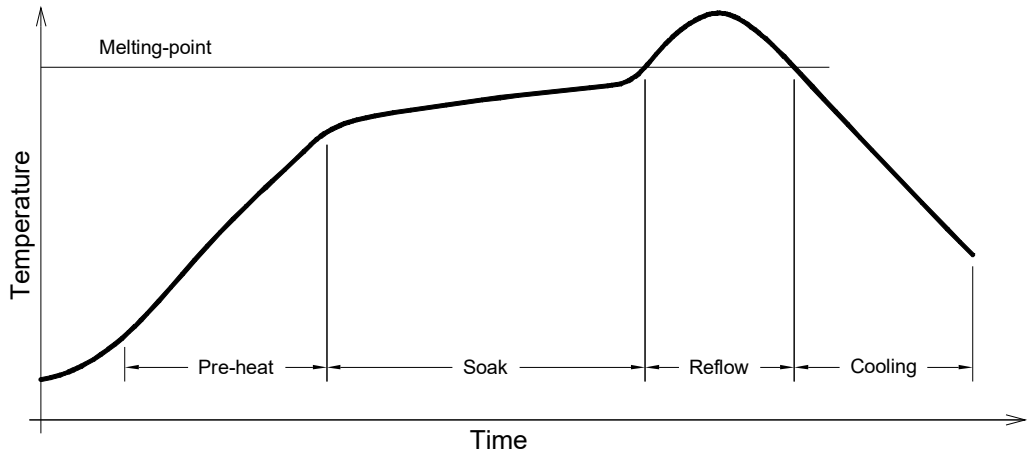
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness.

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



REFLOW SOLDERING

- The CLX6E-FKC is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below

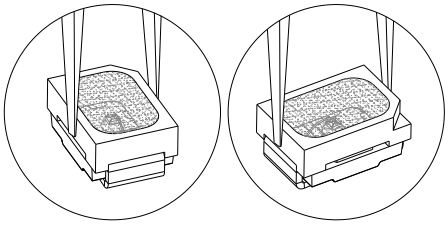


Use only with CLX6E-FKC

Solder
Average ramp-up rate = 4 °C/second max.
Soak temperature = 150°C-200°C
Soak time = 120 seconds max.
Duration above 217 °C = 60 seconds max.
Peak temperature = 250°C max
Time within 5 °C of peak temperature = 10 seconds max.
Ramp-down rate = 6 °C/second 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 2800 pcs per reel.