# Cree® PLCC6 3 in 1 SMD LED CLY6D-FKC



#### **PRODUCT DESCRIPTION**

This SMD LED features an 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):2.8x2.8x2.5
- Dominant Wavelength: Red (619 - 624nm)
   Green (520 - 540nm)
   Blue (460 - 480nm)
- Luminous Intensity (mcd)
   Red (560 1120)
   Green (900 1800)
   Blue (140 355)
- Water-Resistant (IPx8)\*
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant

#### **APPLICATIONS**

- Outdoor Full-Color Video Screen
- Decorative lighting
- Amusement

\*:This part is tested under the condition of assembling it on a PCB with isolating the electrical path by silicone. The leads area of the LED is not IPx8 rated and it's required to insulate for moisture by customer in outdoor application.



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

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Items	Symbol	R	G	В	Unit
Forward Current Note 1	$I_{\scriptscriptstyle \sf F}$	50	50 35 20		
Peak Forward Current Note 2	I <sub>FP</sub>	200	200 100 100		mA
Reverse Voltage	$V_R$	5	5 5 5		V
Power Dissipation	$P_{_{D}}$	130	119	76	mW
Operation Temperature	$T_{opr}$	-40 ∼ +85 °C			
Storage Temperature	$T_{stg}$	-40 ~ +100 °C			
Junction Temperature	T,	110	110 110 110		
Junction/ambient	R <sub>THJA</sub>	440 480 420		°C/W	
Junction/solder point	$R_{THJS}$	180	230	200	°C/W
Electrostatic Discharge Classification(MIL-STD-883E)	ESD	1000 V			

**Note:** 1. Single-color light.

2. Pulse width  $\leq 0.1$  msec, duty  $\leq 1/10$ .

# TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS $(T_A = 25^{\circ}C)$

Characteristics	Condition	Symbol		Unit			
Cital acteristics	R		R	G	В	Onic	
Dominant Wavelength	$I_F = 15 \text{ mA(R)}$ $I_F = 10 \text{ mA(G)}$ $I_F = 10 \text{ mA(B)}$	$\lambda_{\scriptscriptstyle DOM}$	619~624	520~540	460~480	nm	
Spectral bandwidth at 50% $\rm I_{REL}$ max	$I_F = 15 \text{ mA(R)}$ $I_F = 10 \text{ mA(G)}$ $I_F = 10 \text{ mA(B)}$	Δλ	24	38	28	nm	
Farmend Vellage	$I_{F} = 15 \text{ mA(R)}$ $I_{F} = 10 \text{ mA(G)}$	$V_{F(avg)}$	2.1	2.7	3.0	V	
Forward Voltage	$I_{F} = 10 \text{ mA(G)}$ $I_{F} = 10 \text{ mA(B)}$	$V_{F(max)}$	2.6	3.4	3.8	V	
	$I_F = 15 \text{ mA(R)}$ $I_F = 10 \text{ mA(G)}$	$I_{v(min)}$	560	900	140	mcd	
Luminous Intensity	$I_F = 10 \text{ mA(G)}$ $I_F = 10 \text{ mA(B)}$	$I_{V(avg)}$	750	1350	240	mcd	
Luminous Intensity(Reference)	$I_F = 20 \text{ mA}(R/G/B)$	$I_{V(avg)}$	1000	2250	460	mcd	
Reverse Current (max)	$V_R = 5 V$	$I_R$	10	10	10	μΑ	

**Note:** Continuous reverse voltage can cause LED damage.



# INTENSITY BIN LIMIT (RED $I_F = 15$ mA, GREEN $I_F = 10$ mA, BLUE $I_F = 10$ mA)

## Red

Bin Code	Min.(mcd)	Max.(mcd)
K	560	710
np	635	805
М	710	900
qr	805	1010
N	900	1120

#### Green

Bin Code	Min.(mcd)	Max.(mcd)
N	900	1120
st	1010	1260
Р	1120	1400
vw	1260	1600
Q	1400	1800

#### Blue

Bin Code	Min.(mcd)	Max.(mcd)
D	140	180
9a	160	202
Е	180	224
bc	202	252
F	224	280
de	252	318
G	280	355

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

# COLOR BIN LIMIT (RED $I_F = 15$ mA, GREEN $I_F = 10$ mA, BLUE $I_F = 10$ mA)

Red

Bin Code	Min.(nm)	Max.(nm)
RB	619	624

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Bin Code	Min.(nm)	Max.(nm)
<b>G</b> 7	520	525
G23	522.5	527.5
G8	525	530
G45	527.5	532.5
G9	530	535
G67	532.5	537.5
Ga	535	540

#### Blue

Bin Code	Min.(nm)	Max.(nm)
В3	460	465
B23	462.5	467.5
B4	465	470
B45	467.5	472.5
B5	470	475
B67	472.5	477.5
В6	475	480

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



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

		Luminous Inte	Dominant Wavelength (nm)				Dools	
Kit Number Col	Color	Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	Pack- age
	Red	560	1120	RB	619	RB	624	Reel
CLY6D-FKC-CKNNQDGBB7a363	Green	900	1800	G7	520	Ga	540	Reel
	Blue	140	355	В3	460	В6	480	Reel
	Red	Any 1 Intensity bin fro	m K(560) - N(1120)	RB	619	RB	624	Reel
CLY6D-FKC-CK1N1D1BB7D3D3	Green	Any 1 Intensity bin fro	Any 1 Intensity bin from N(900) - Q(1800)		Any 1 hue bin from G7(520) - Ga(540)			Reel
	Blue	Any 1 Intensity bin from D(140) - G(355)		Any 1 h	ue bin fron	n B3(460) - E	36(480)	Reel
	Red	Any 1 Intensity bin from	m np(635) - N(1120)	RB	619	RB	624	Reel
CLY6D-FKC-Cnp1st1E1BB7D3D3	Green	Any 1 Intensity bin from st(1010) - Q(1800)		Any 1 hue bin from G7(520) - Ga(540)			Ga(540)	Reel
	Blue	Any 1 Intensity bin fro	Any 1 Intensity bin from E(180) - G(355)		ue bin fron	n B3(460) - E	36(480)	Reel

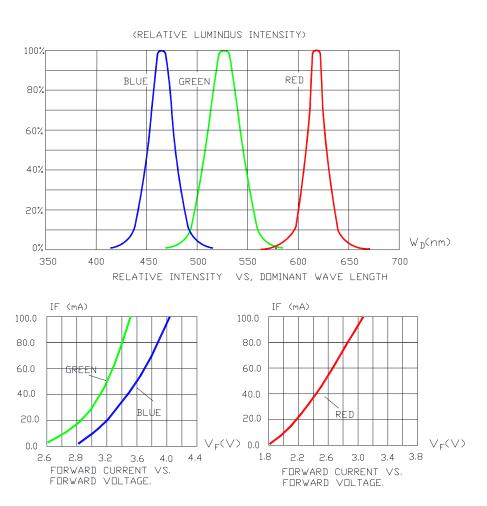
#### Notes:

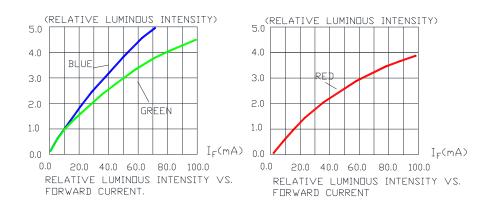
- 1. The above kit numbers represent the order codes which include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each reel. Single intensity-bin code and single color-bin code will be orderable in certain quantities. For example, any 1 intensity bin from N Q means only 1 intensity bin (N or st or P or vw or Q) will be shipped by Cree. For example, any 1 color bin from G7 Ga means only 1 color bin (G7 or G23 or G8 or G45 or G9 or G67 or Ga) will be shipped by Cree.
- 2. Please refer to the "Cree LED Lamp Reliability Test Standards" document #1 for reliability test conditions.
- 3. Please refer to the "Cree LED Lamp Soldering & Handling" document\*2 for information about how to use this LED product safely.

- #1: Refer to http://www.cree.com/led-components/media/documents/LED Lamp Reliability Test Standard.pdf
- #2: Refer to http://www.cree.com/led-components/media/documents/sh-HB.pdf



#### **GRAPHS**

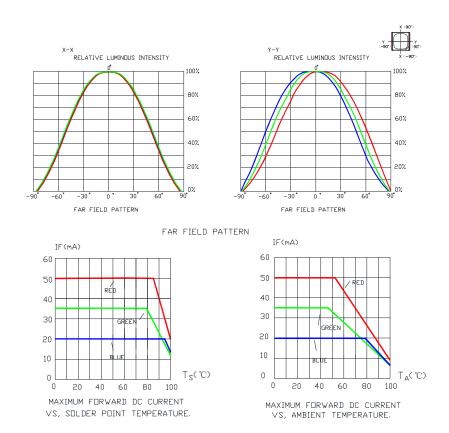




The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



#### **GRAPHS**

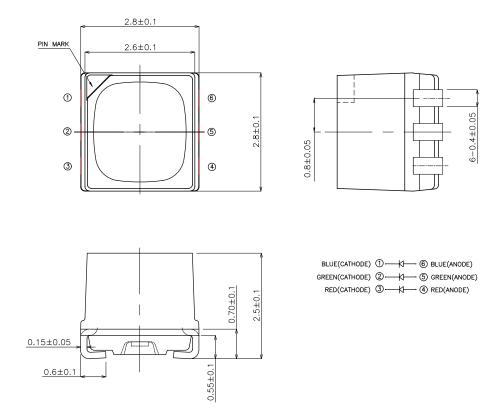


The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



#### **MECHANICAL DIMENSIONS**

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 by EU member states on January 2, 2013 and amended on March 31, 2015 by EU Directive 2015/863/EU.

RoHS Declarations for this product can be obtained from your Cree representative or from the Product Ecology section of the Cree website.

#### Vision Advisory Claim

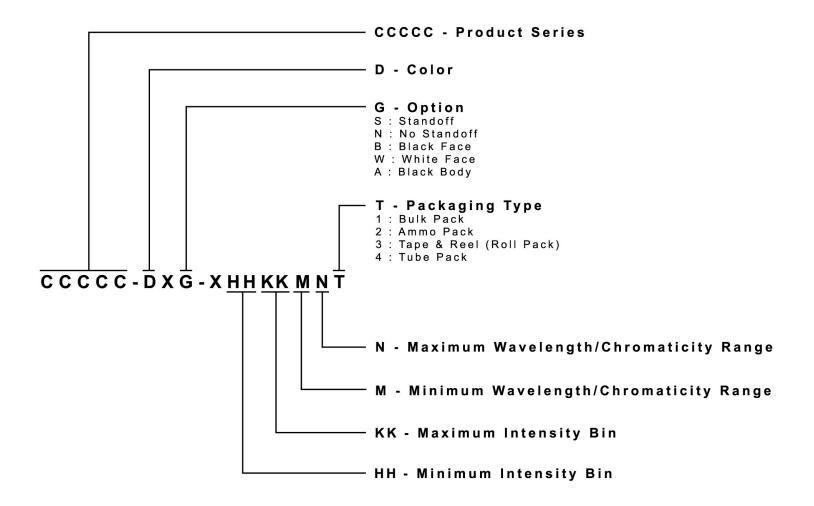
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.



#### 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.

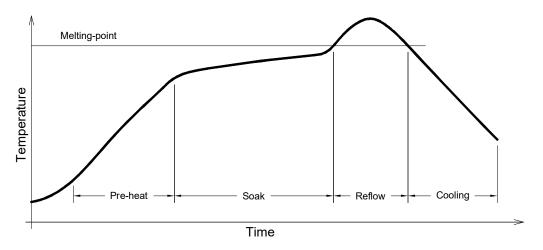
Cree LEDs are sold by order codes in combinations of bins called kits. Order codes are configured in the following manner:





#### **REFLOW SOLDERING**

- The CLY6D-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 CLY6D-FKC

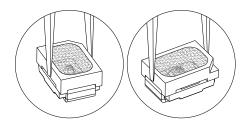
Solder
Average ramp-up rate = 4°C/s max
Preheat temperature = 150°C ~200°C
Preheat time = 120s max
Ramp-down rate = 6°C/s max
Peak temperature = 235°C max
Time within 5°C of actual Peak Temperature = 10s max
Duration above 217°C is 45s max

Refer to "http://www.cree.com/led-components/media/documents/sh-HB.pdf" for soldering & handling details.



## **NOTES**

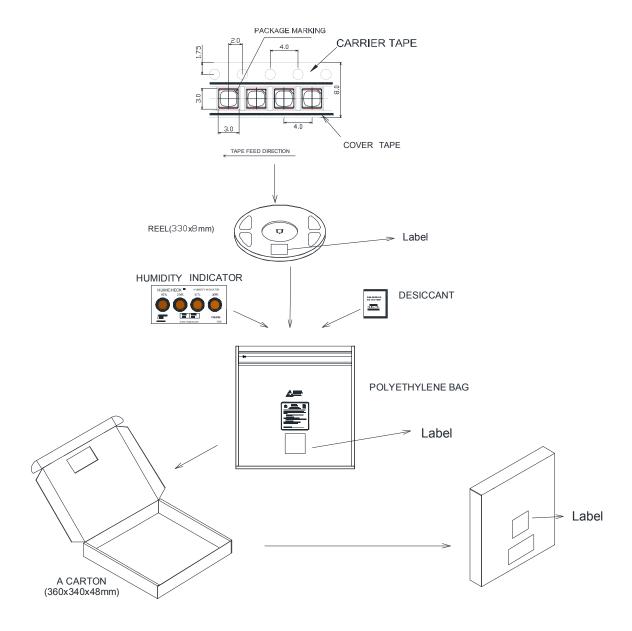
- The packaging sizes of these SMD products are very small and the resin is still soft after solidification. Users are required to handle with care. Never touch the resin surface of SMD products.
- To avoid damaging the product's surface and interior device, it is recommended to choose a special nozzle 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 6500 pcs per reel.





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ИНН 7805602321 КПП 780501001 P/C 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 3010181090000000703 БИК 044030703

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- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
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- Наличие сертификата ISO.

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