CLD-CT1368.003

Cree® PLCC4 3 in 1 SMD LED CLMXB-FKA

PRODUCT DESCRIPTION

This SMD LED features an IPx8 water resistant rating in a PLCC 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 PLCC package has an increased package height to ease in the manufacturing process.

FEATURES

- Size (mm):2.19x1.8x1.55
- Dominant Wavelength:
  Red (619 - 624nm)
  Green (520 - 535nm)
  Blue (465 - 480nm)
- Luminous Intensity (mcd)
  Red (202 - 403)
  Green (403 - 805)
  Blue (71 - 140)
- 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.

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	
Forward Current Note 1	I_F	50	35	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	130	112	112	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	R_{THJA}	350	350	320	°C/W
Junction/solder point	R_{THJS}	200	180	160	°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 = 15 mA(R) I_F = 10 mA(G) I_F = 10 mA(B)	λ_{DOM}	619~624	520~535	465~480	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 15 mA(R) I_F = 10 mA(G) I_F = 10 mA(B)	Δ λ	24	38	28	nm
Forward Voltage	I_F = 15 mA(R) I_F = 10 mA(G) I_F = 10 mA(B)	$V_{F(avg)}$	2.0	2.7	2.7	V
		$V_{F(max)}$	2.6	3.2	3.2	V
Luminous Intensity	I_F = 15 mA(R) I_F = 10 mA(G) I_F = 10 mA(B)	$I_{V(min)}$	202	403	71	mcd
		$I_{V(avg)}$	275	565	95	mcd
Reverse Current (max)	V_R = 5 V	I_R	10	10	10	μA

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)
bc	202	252
F	224	280
de	252	318
G	280	355
fg	318	403

Green

Bin Code	Min.(mcd)	Max.(mcd)
hj	403	505
J	450	560
km	505	635
K	560	710
np	635	805

Blue

Bin Code	Min.(mcd)	Max.(mcd)
A	71	90
3a4	81	90
B	90	112
56	101	126
C	112	140

Tolerance of measurement of luminous intensity is ±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

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)
B4	465	470
B45	467.5	472.5
B5	470	475
B67	472.5	477.5
B6	475	480

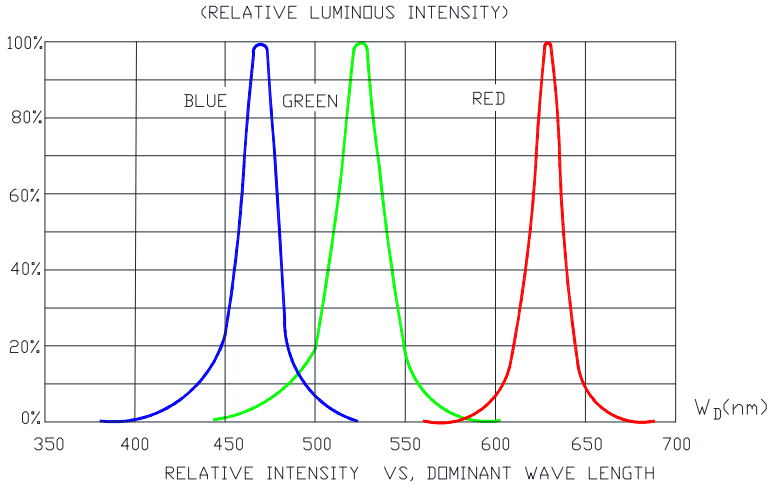
Tolerance of measurement of dominant wavelength is ±1 nm.

ORDER CODE TABLE*

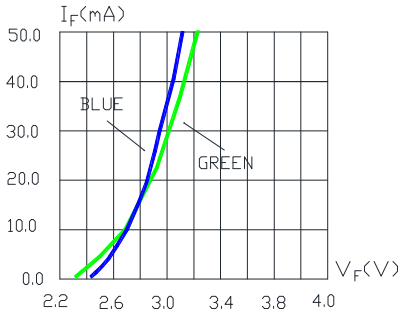
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	
CLMXB-FKA-CbcfghjnpACBB79463	Red	202	403	RB	619	RB	624	Reel
	Green	403	805	G7	520	G9	535	Reel
	Blue	71	140	B4	465	B6	480	Reel
CLMXB-FKA-Cbc1hj1A1BB7C4C3	Red	Any 1 Intensity bin from bc(202) - fg(403)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from hj(403) - np(805)		Any 1 hue Bin from G7(520) - G9(535)				Reel
	Blue	Any 1 Intensity bin from A(71) - C(140)		Any 1 hue Bin from B4(465) - B6(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 hj - np means only 1 intensity bin (hj or J or km or K or np) will be shipped by Cree. For example, any 1 color bin from G7 - G9 means only 1 color bin (G7 or G23 or G8 or G45 or G9) will be shipped by Cree.
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.

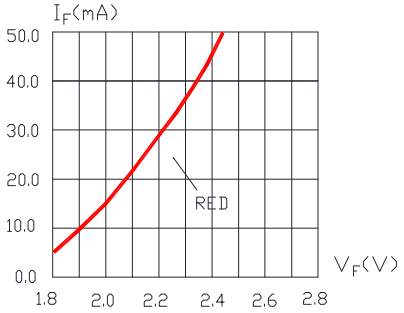
GRAPHS



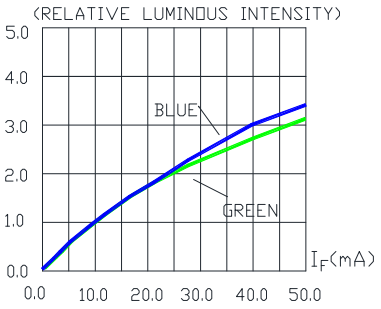
RELATIVE INTENSITY VS, DOMINANT WAVE LENGTH



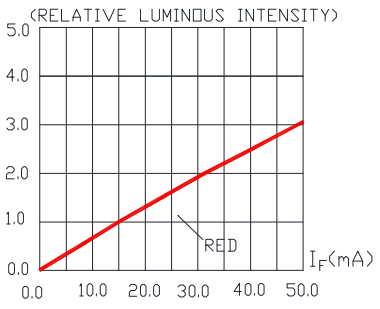
FORWARD CURRENT VS.
FORWARD VOLTAGE.



FORWARD CURRENT VS.
FORWARD VOLTAGE.



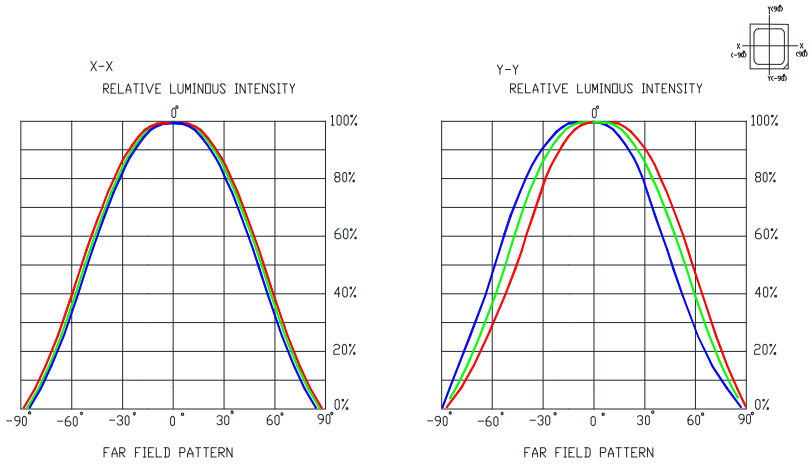
RELATIVE LUMINOUS INTENSITY VS.
FORWARD CURRENT.

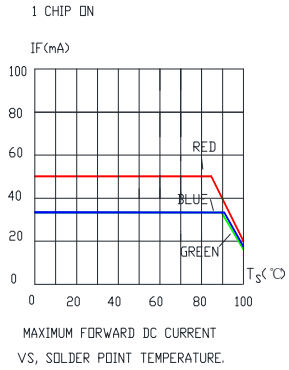


RELATIVE LUMINOUS INTENSITY VS.
FORWARD CURRENT

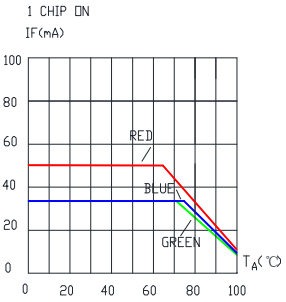
The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

GRAPHS





MAXIMUM FORWARD DC CURRENT
VS, SOLDER POINT TEMPERATURE.

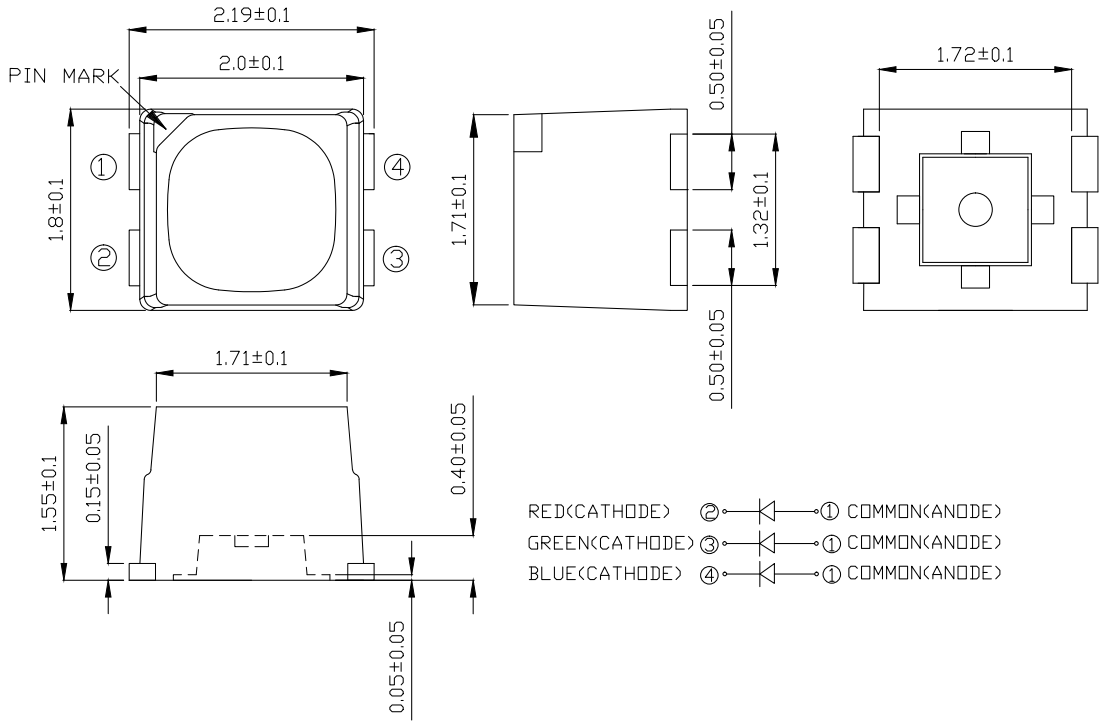


MAXIMUM FORWARD DC CURRENT
VS, AMBIENT TEMPERATURE.

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 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.

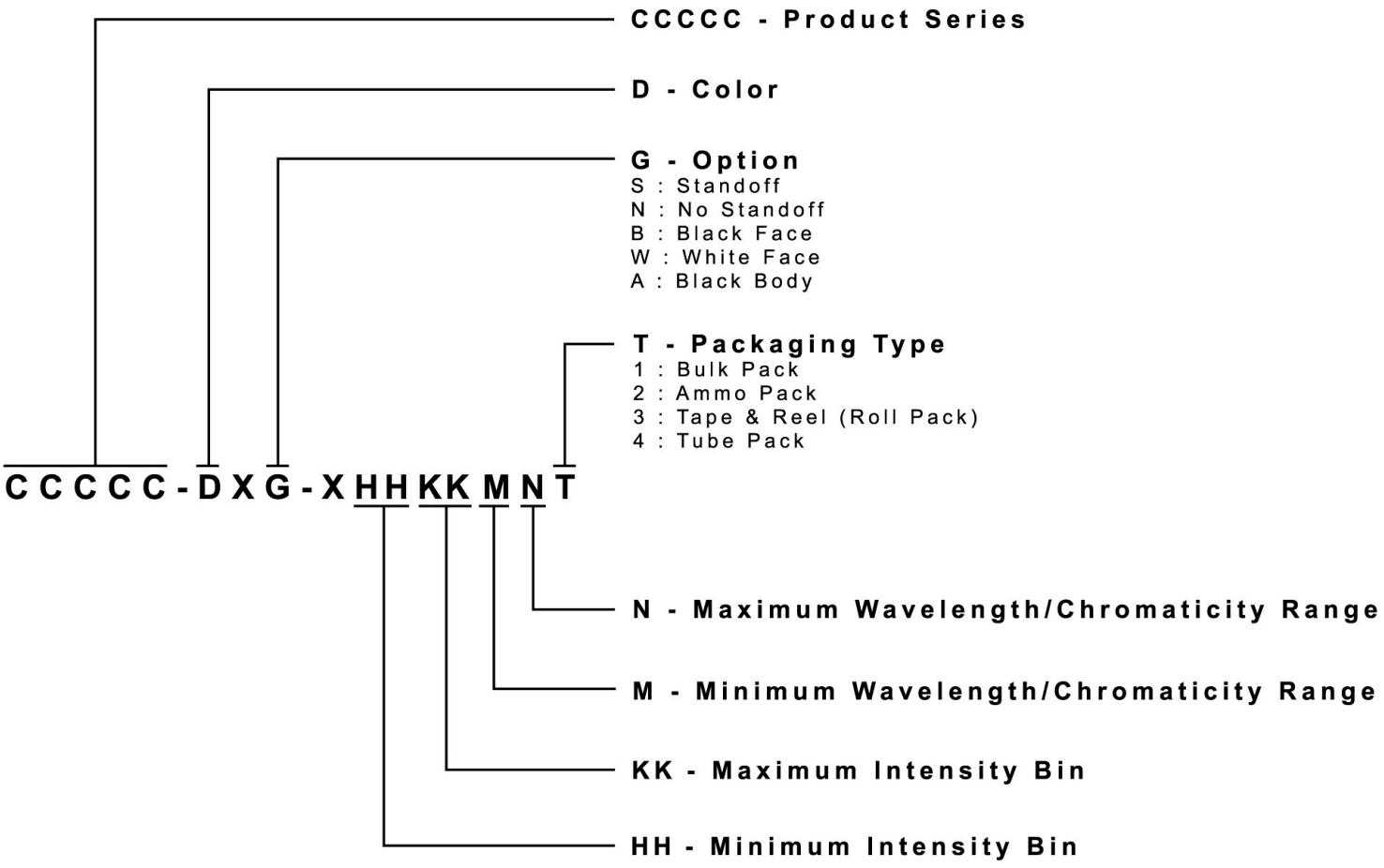
Vision Advisory Claim

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

KIT NUMBER SYSTEM

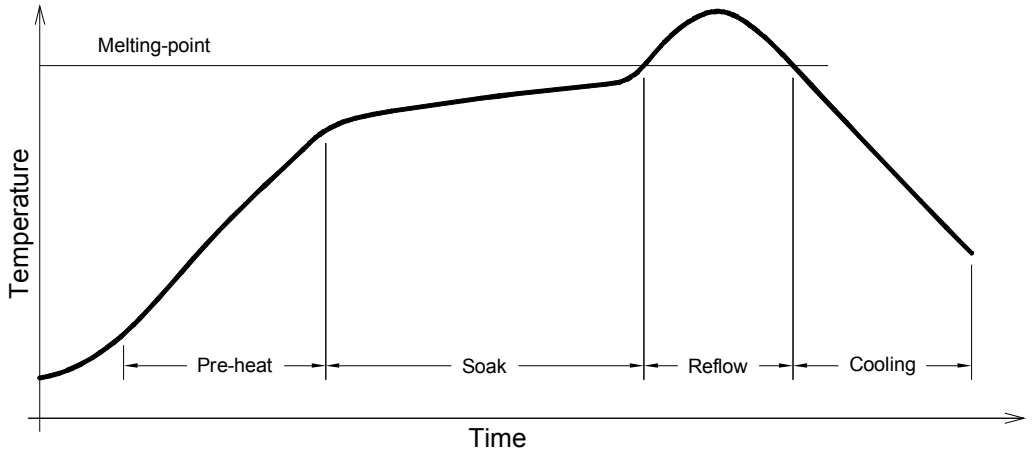
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping 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 CLMXB-FKA is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The best practices suggestion is to bake 24-hour/80ºC before use.
- The temperature profile is as below.



Use only with CLMXB-FKA

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 2500 pcs per reel.