CLMXB-FKA: PLCC4 3 in 1 SMD LED

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): 2.19 x 1.8 x 1.55
- 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. The leads area of the LED is not IPx8 rated and it's required to insulate for moisture by customer in outdoor application.

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	35	35	mA
Peak Forward Current Note 2	I_{FP}	250	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_{THJ}	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 = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	λ_{DOM}	619~624	520~535	465~480	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	Δ λ	24	38	28	nm
Forward Voltage	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(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 = 15mA(R) I_F = 10mA(G) I_F = 10mA(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

* 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)
bc	202	252	hj	403	505	A	71	90
F	224	280	J	450	560	3a4	81	101
de	252	318	km	505	635	B	90	112
G	280	355	K	560	710	56	101	126
fg	318	403	np	635	805	C	112	140

* 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	B4	465	470
			G23	522.5	527.5	B45	467.5	472.5
			G8	525	530	B5	470	475
			G45	527.5	532.5	B67	472.5	477.5
			G9	530	535	B6	475	480

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

ORDER CODE TABLE

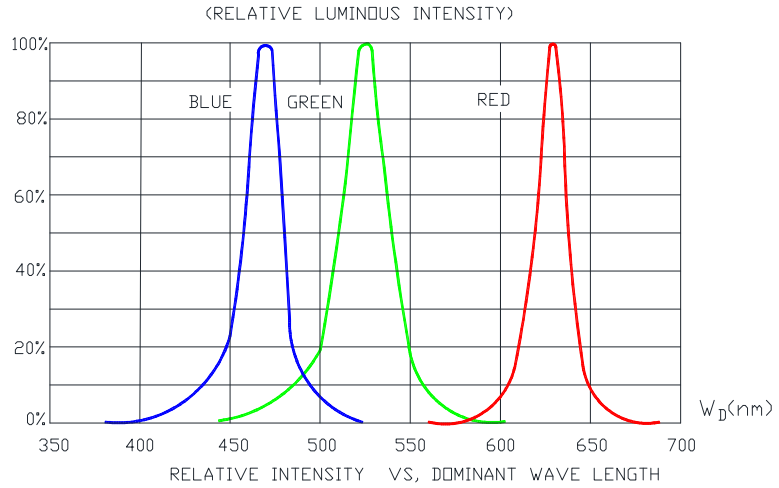
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max. (nm)	
CLMXB-FKA-CbcfghjnpACBB79463	Red	202	403	RB	619	RB	624	Reel
	Green	403	805	G7	520	G9	535	Reel
	Blue	71	140	B4	465	B6	480	Reel
CLMXB-FKA-Cbc1hj1A1BB7C4C3	Red	Any 1 Intensity 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:

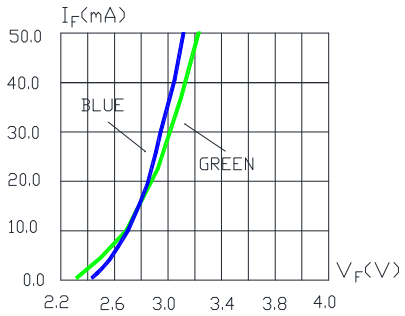
- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each bulk. Single intensity-bin code and single color-bin codes will not be orderable.
- Please refer to the HB LED Lamp Reliability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

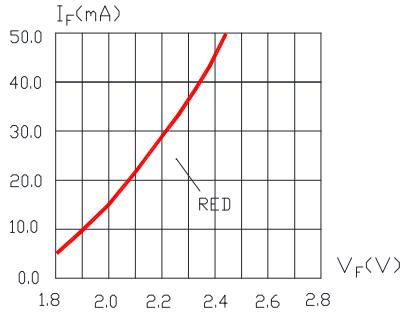
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



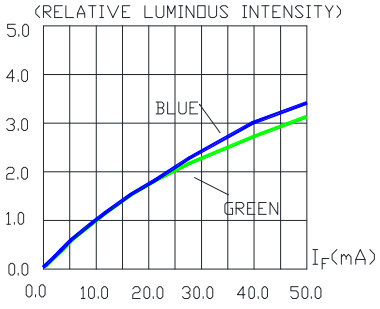
RELATIVE INTENSITY VS, DOMINANT WAVE LENGTH



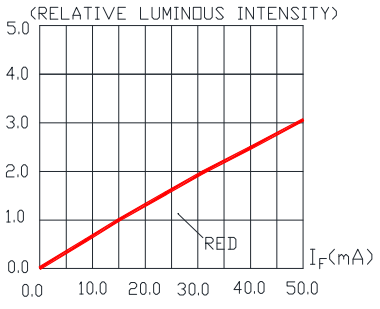
FORWARD CURRENT VS. FORWARD VOLTAGE.



FORWARD CURRENT VS. FORWARD VOLTAGE.



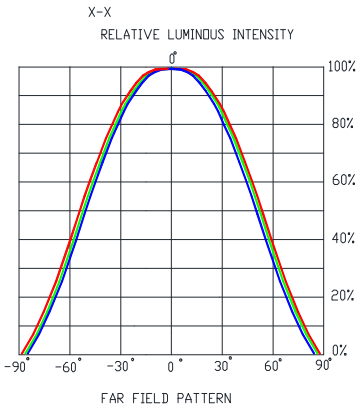
RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT.



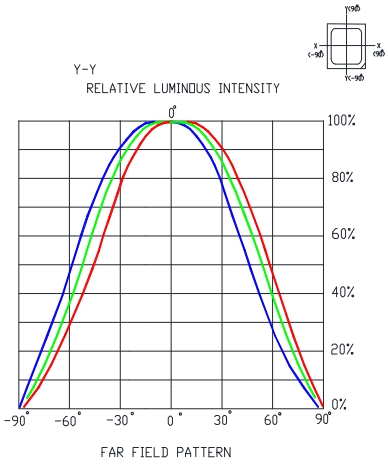
RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

GRAPHS

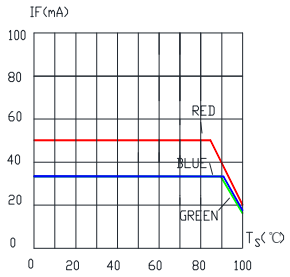
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



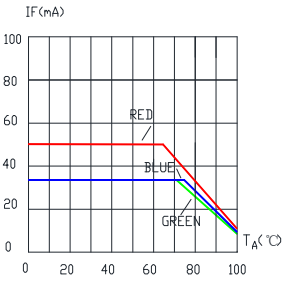
FAR FIELD PATTERN



FAR FIELD PATTERN



MAXIMUM FORWARD DC CURRENT
VS, SOLDER POINT TEMPERATURE.

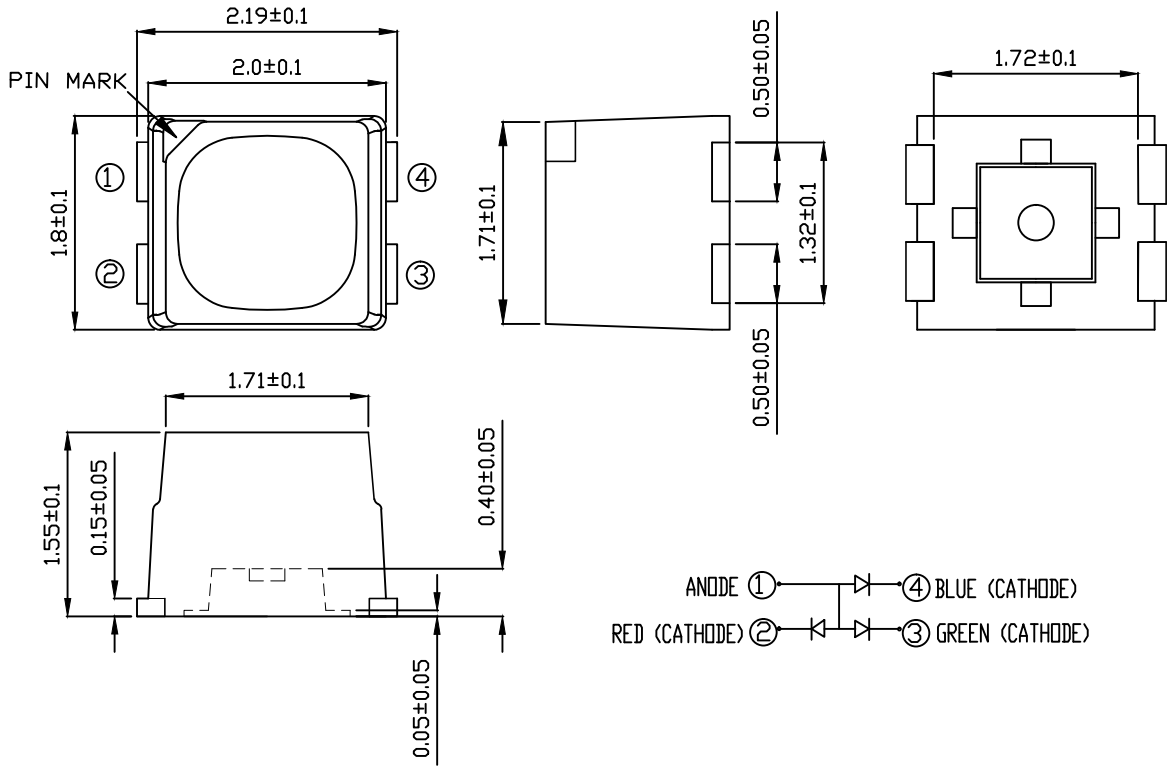


MAXIMUM FORWARD DC CURRENT
VS, AMBIENT TEMPERATURE.

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.

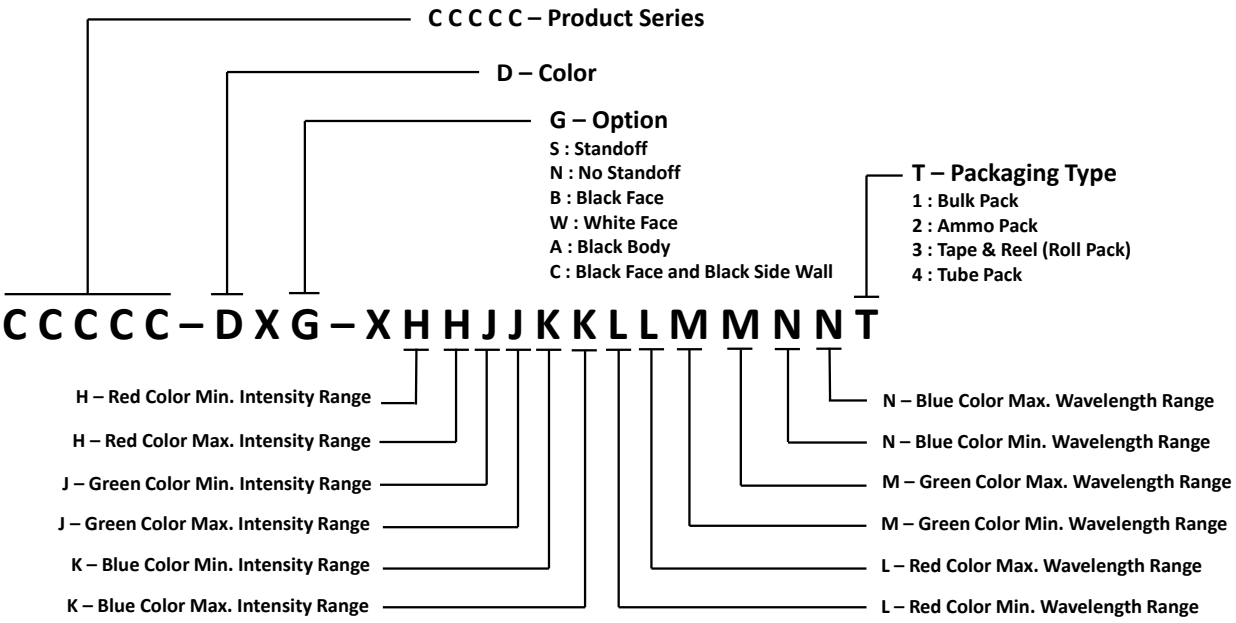
Vision Advisory

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

KIT NUMBER SYSTEM

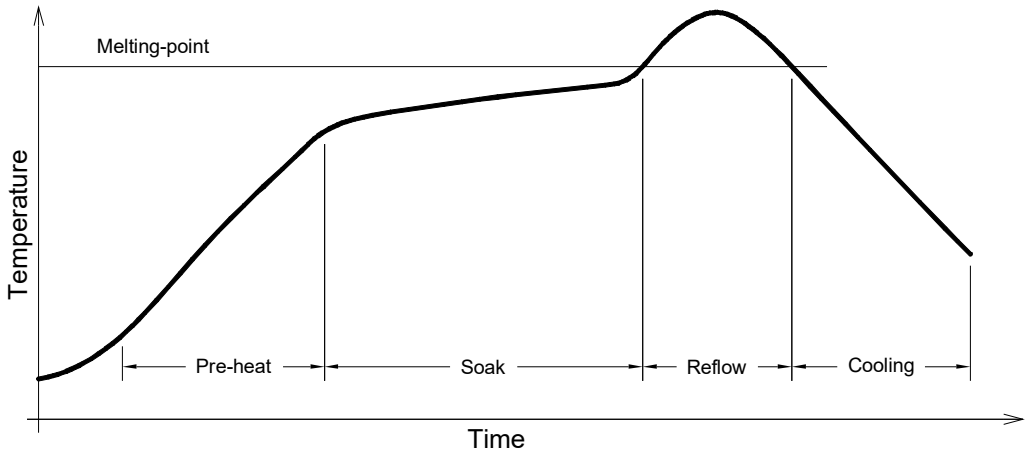
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness.

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



REFLOW SOLDERING

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

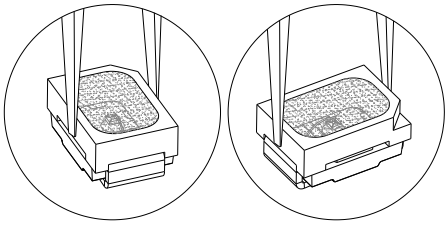


Use only with CLMXB-FKA

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 9500 pcs per reel.