CLV1L-FKB: PLCC4 3 in 1 SMD LED

PRODUCT DESCRIPTION

Cree LED PLCC full-color LEDs offer high-intensity light output and a wide viewing angle in an industry-standard package. Designed to work in a wide array of environmental conditions, Cree LED PLCC full-color LEDs are suited for indoor video screen, decorative lighting and amusement applications.

FEATURES

- Size (mm): 3.2 x 2.8
- Dominant Wavelength
  Red (619 - 624nm)
  Green (520 - 535nm)
  Blue (460- 475nm)
- Luminous Intensity (mcd)
  Red (450 - 1010)
  Green (900 - 1800)
  Blue (180 - 403)
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant

APPLICATIONS

- Full-Color Video Screen
- Decorative Lighting
- Amusement

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	35	20	20	mA
Peak Forward Current Note 2	I_{FP}	200	100	100	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_D	91	80	80	mW
Operation Temperature	T_{opr}	-40 ~ +100			°C
Storage Temperature	T_{stg}	-40 ~ +100			°C
Junction Temperature	T_J	110	110	110	°C
Junction/ambient 1 chip on	R_{THJA}	336	507	474	°C/W
Junction/solder point 1 chip on	R_{THJS}	138	322	298	°C/W

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 = 20mA(R) I_F = 15mA(G) I_F = 15mA(B)	λ_{DOM}	619~624	520~535	460~475	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 20mA(R) I_F = 15mA(G) I_F = 15mA(B)	Δ λ	24	38	28	nm
Forward Voltage	I_F = 20mA(R) I_F = 15mA(G) I_F = 15mA(B)	$V_{F(avg)}$	2.0	3.1	3.1	V
		$V_{F(max)}$	2.6	4.0	4.0	V
Luminous Intensity	I_F = 20mA(R) I_F = 15mA(G) I_F = 15mA(B)	$I_{V(min)}$	450	900	180	mcd
		$I_{V(avg)}$	680	1250	235	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 (20 mA)			Green (15 mA)			Blue (15 mA)		
Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)
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	vw	1260	1600	de	252	318
M	710	900	Q	1400	1800	G	280	355
qr	805	1010				fg	318	403

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

COLOR BIN LIMIT

Red (20 mA)			Green (15 mA)			Blue (15 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

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

ORDER CODE TABLE

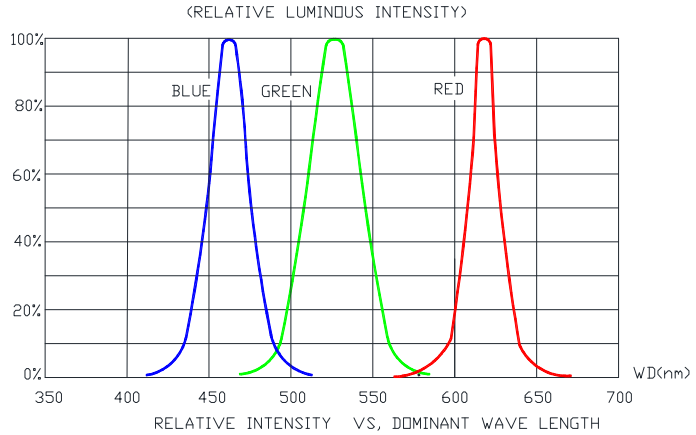
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max. (nm)	
CLV1L-FKB-CJqrNQEfgBB79353	Red	450	1010	RB	619	RB	624	Reel
	Green	900	1800	G7	520	G9	535	Reel
	Blue	180	403	B3	460	B5	475	Reel
CLV1L-FKB-CJ1N1E1BB7B3B3	Red	Any 1 Intensity bin from J(450) - qr(1010)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from N(900) - Q(1800)		Any 1 hue bin from G7(520)-G9(535)				Reel
	Blue	Any 1 Intensity bin from E(180) - fg(403)		Any 1 hue bin from B3(460)-B5(475)				Reel

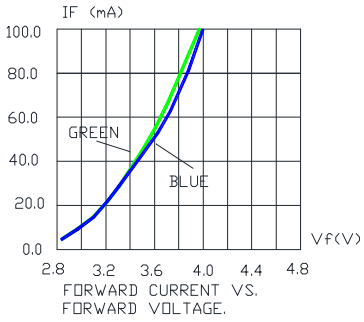
Notes:

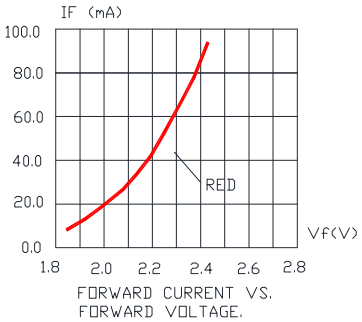
- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each bulk. Single intensity-bin code and single color-bin codes will not be orderable.
- Please refer to the HB LED Lamp Reliability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

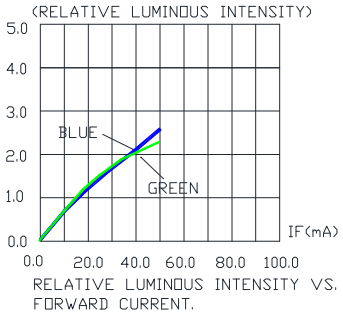
GRAPHS

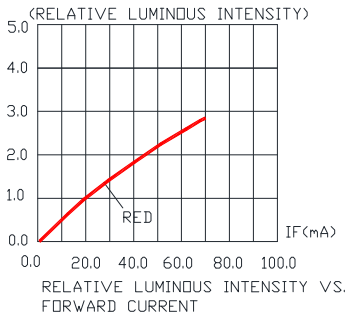
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.











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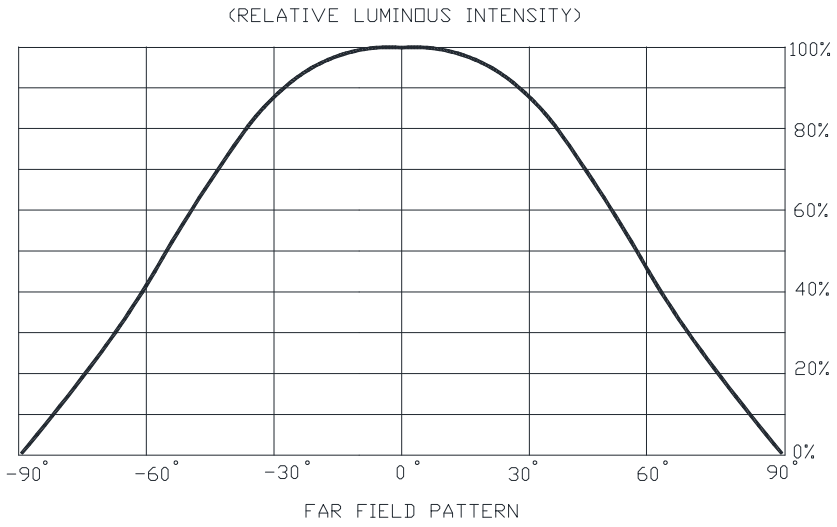
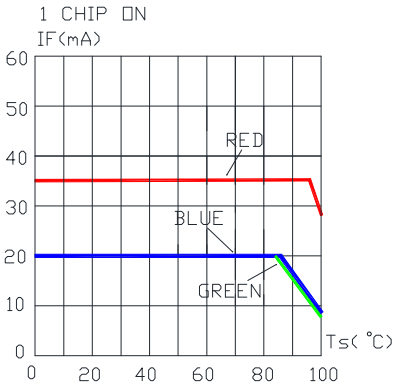
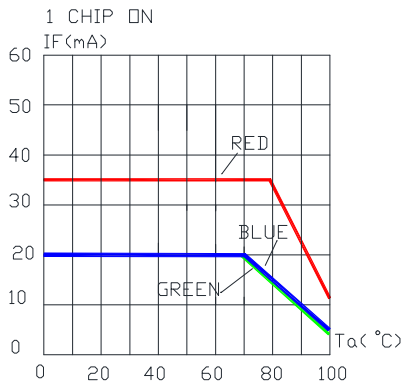


FAR FIELD PATTERN



MAXIMUM FORWARD DC CURRENT
VS, SOLDER POINT TEMPERATURE.

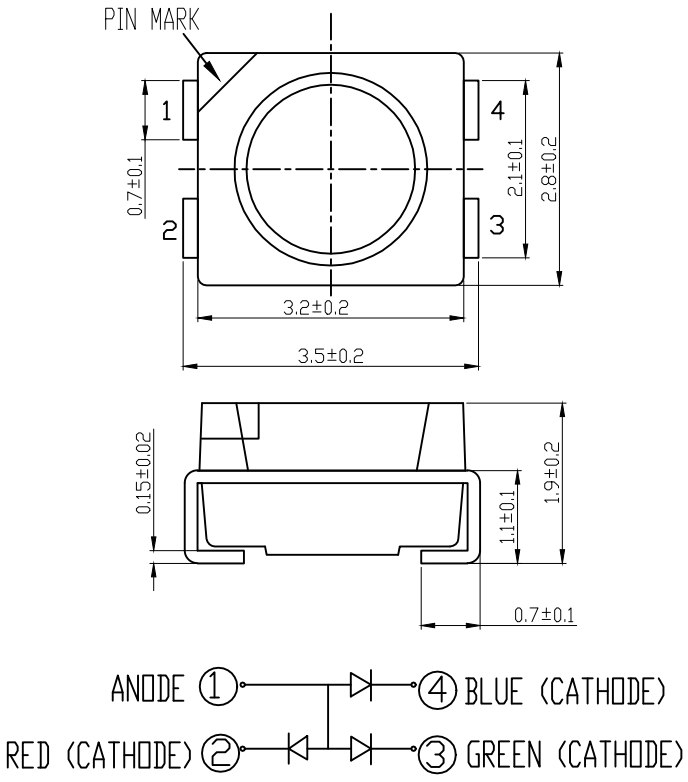


MAXIMUM FORWARD DC CURRENT
VS, AMBIENT TEMPERATURE.

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.

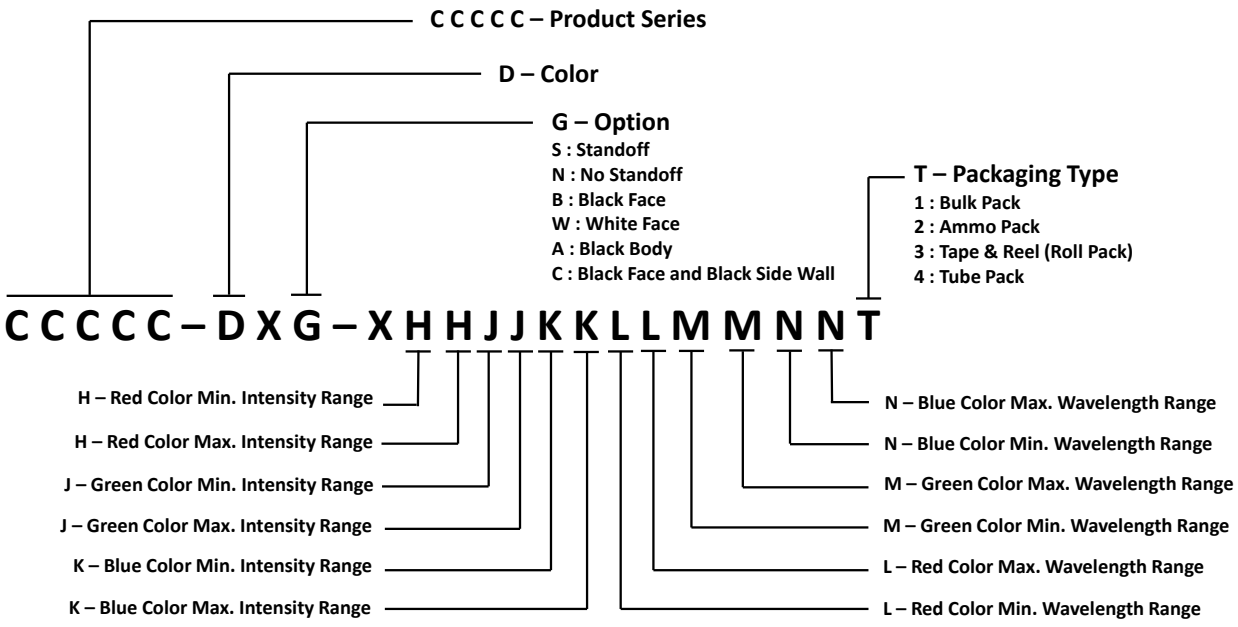
Vision Advisory

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

KIT NUMBER SYSTEM

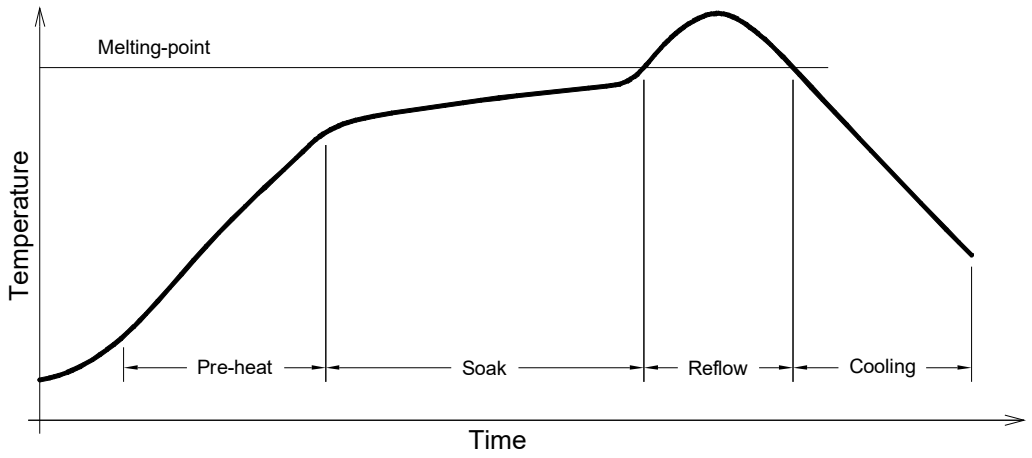
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness.

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



REFLOW SOLDERING

- The CLV1L-FKB is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below.

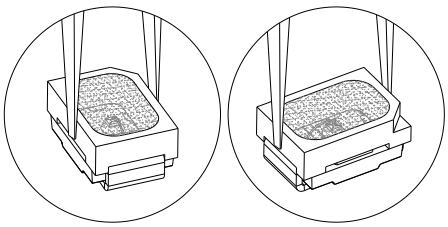


Use only with CLV1L-FKB

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 CLV1L-FKB is rated as a MSL 5a product.
- 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 2000 pcs per reel.