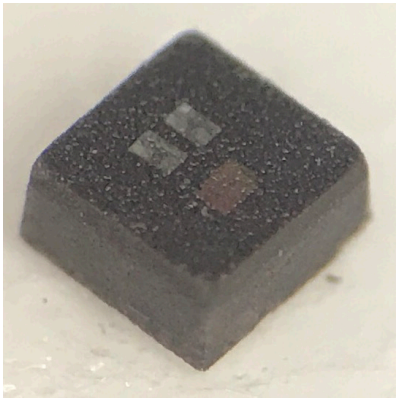
UHD1110-FKA: RGB SMD LED



PRODUCT DESCRIPTION

The UHD1110 full-color RGB LED offers a high-intensity light output and a wide viewing angle. The compact 1.0mm x 1.0mm package allows for a very high resolution screen and is designed to work in a wide array of environmental conditions. Cree LED PLCC full-color RGB LEDs are suited for indoor video screen,decorative lighting and amusement applications.

FEATURES

- Size (mm): 1.0 x 1.0
- Dominant Wavelength
  Red (619 - 624nm)
  Green (523 - 536nm)
  Blue (465 - 472nm)
- Luminous Intensity (mcd)
  Red (56-101)@ 5mA
  Green (71-140)@ 5mA
  Blue (16-32)@ 5mA
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant
- Matte Surface
- No crosstalk
- High contrast

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	10	10	10	mA
Peak Forward Current Note 2	I_{FP}	60	48	48	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_D	25	36	36	mW
Operation Temperature	T_{opr}	-40 ~ +85			°C
Storage Temperature	T_{stg}	-40 ~ +85			°C
Junction Temperature	T_J	110	110	110	°C
Junction/ambient	R_{THJA}	310	340	290	°C/W
Junction/solder point	R_{THJS}	210	240	200	°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 = 5mA	λ_{DOM}	619~624	523~536	465~472	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 5mA	$\Delta\lambda$	24	38	28	nm
Forward Voltage	I_F = 5 mA	$V_{F(avg)}$	1.9	2.9	2.9	V
		$V_{F(max)}$	2.5	3.6	3.6	V
Luminous Intensity	I_F = 5 mA	$I_{V(min)}$	56	71	16	mcd
		$I_{V(avg)}$	78	106	24	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 (5 mA)			Green (5 mA)			Blue (5 mA)		
Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)
L	56	71	A	71	90	3r3q	16	20
3c3b	64	81	3a4	81	101	L5	18	22
A	71	90	B	90	112	3p3n	20	25
3a4	81	101	56	101	126	L6	22	28
			C	112	140	3m3k	25	32

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

COLOR BIN LIMIT

Red (5 mA)			Green (5 mA)			Blue (5 mA)		
Bin Code	Min.(nm)	Max.(nm)	Bin Code	Min.(nm)	Max.(nm)	Bin Code	Min.(nm)	Max.(nm)
RB	619	624	GQ	523	526	BM	465	468
			g2e	525	528	b1p	467	470
			GT	527	530	BQ	469	472
			g3e	529	532			
			gt	531	534			
			g4t	533	536			

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

ORDER CODE TABLE

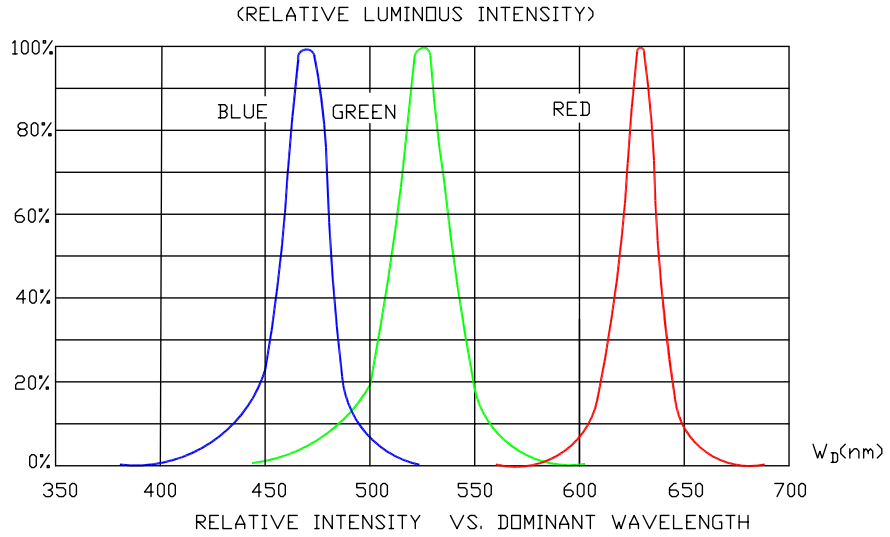
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max. (nm)	
UHD1110-FKA-CL1A13r3q1BBQFMF3	Red	Any 1 Intensity bin from L(56) - 3a4(101)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from A(71) - C(140)		Any consecutive 3nm within GQ(523)-g4t(536)				Reel
	Blue	Any 1 Intensity bin from 3r3q(16) - 3m3k(32)		Any consecutive 3nm within BM(465)-BQ(472)				Reel

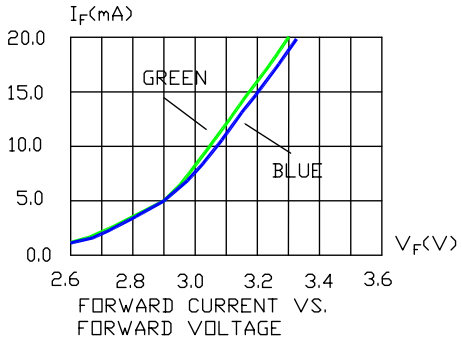
Notes:

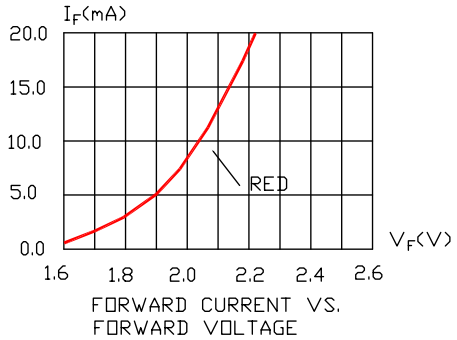
- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each bulk. Single intensity-bin code and single color-bin codes will not be orderable.
- Please refer to the HB LED Lamp Reliability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

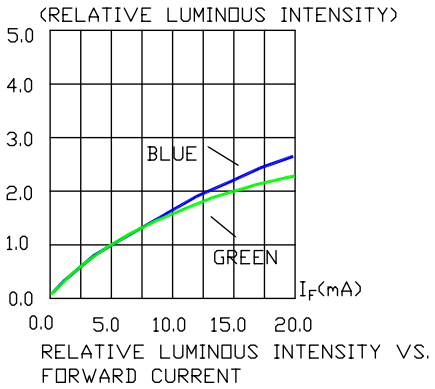
GRAPHS

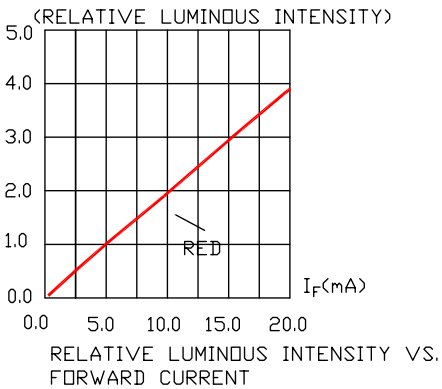
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.











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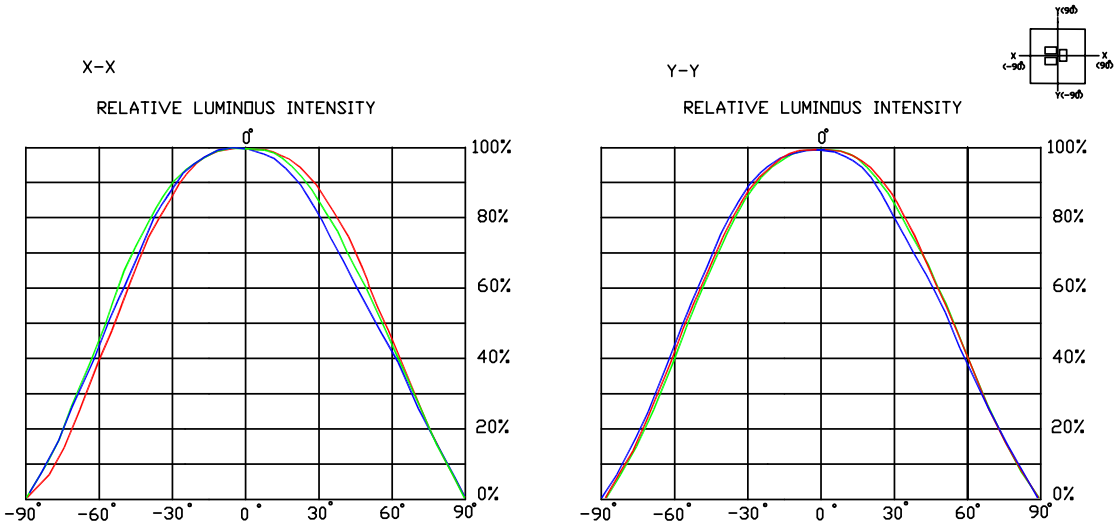
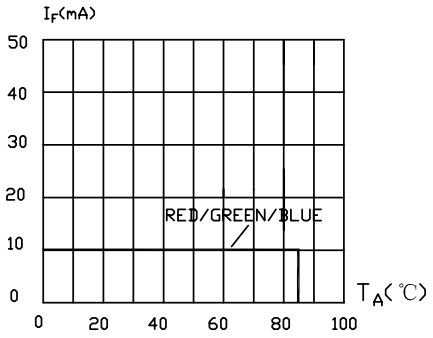




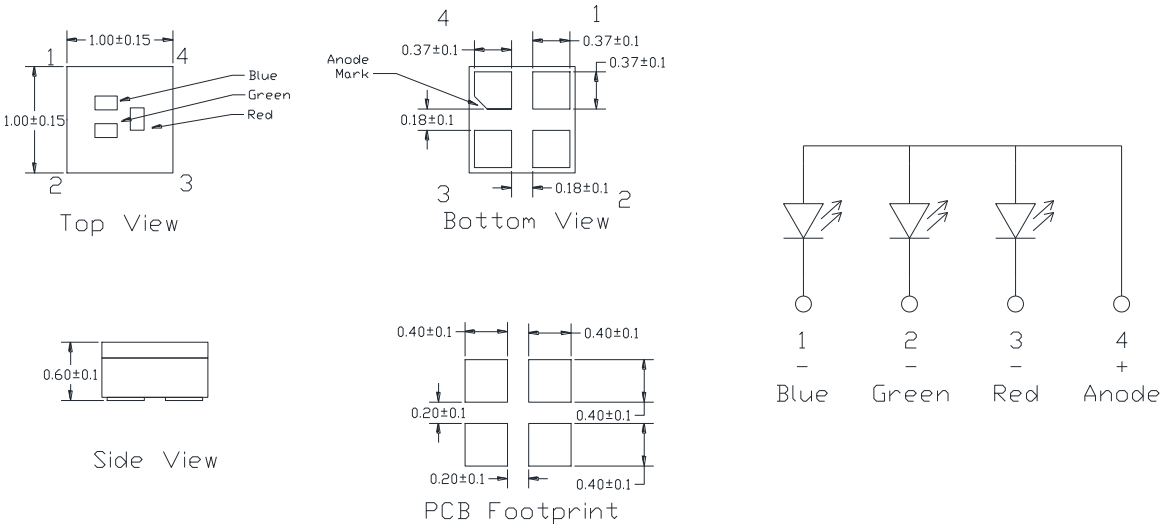
MAXIMUM FORWARD DC CURRENT
VS. AMBIENT TEMPERATURE

The graph shows the maximum allowable DC current for a LED die of each color.

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.

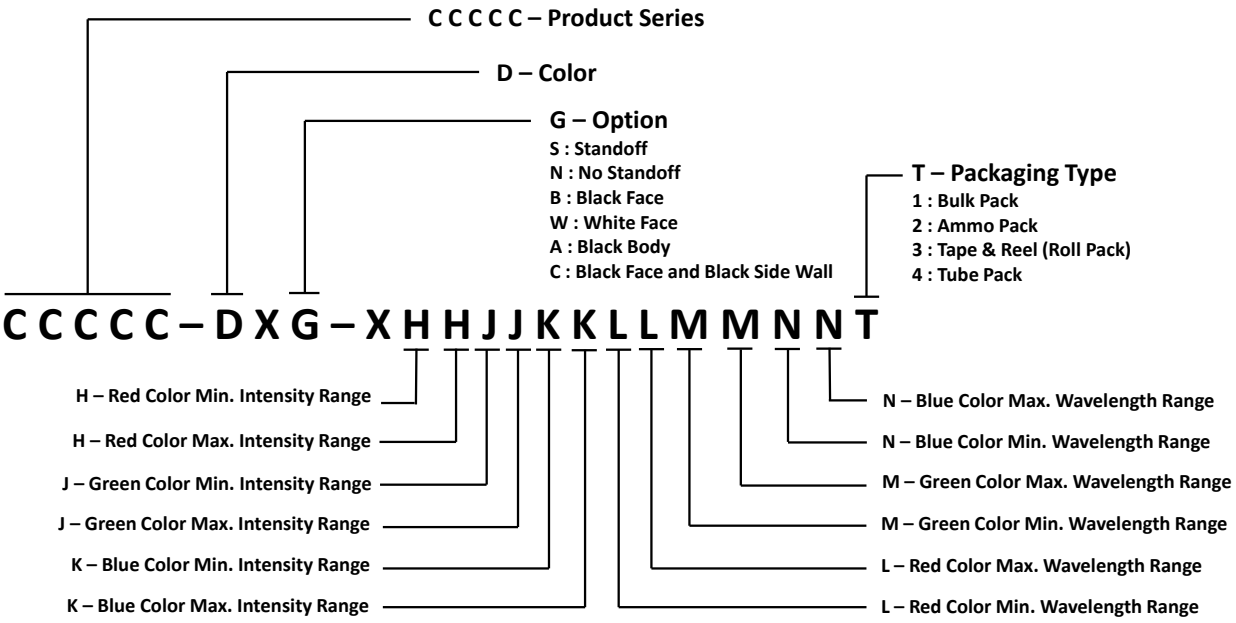
Vision Advisory

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

KIT NUMBER SYSTEM

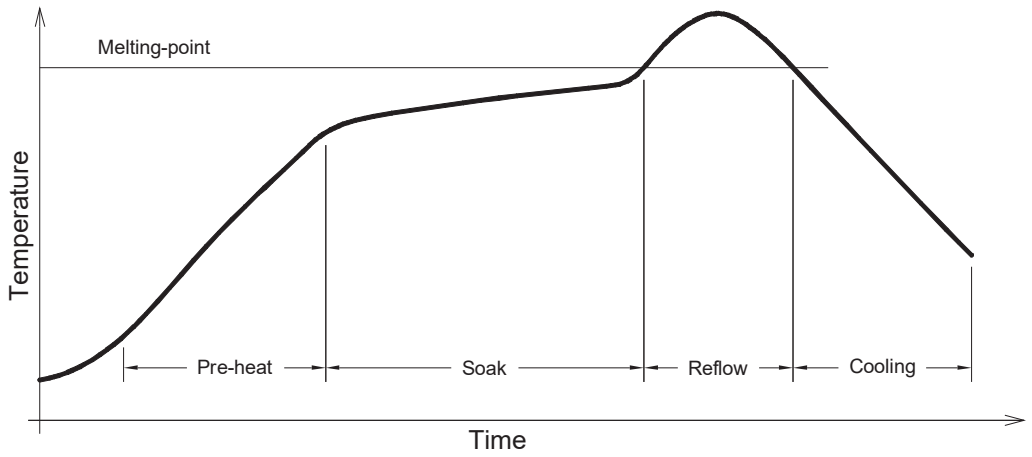
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness.

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



REFLOW SOLDERING

- The UHD1110-FKA is rated as a MSL 5a product.
- After opening the sealed bag,the SMD LED must be stored under the condition<30ºC and<60%RH. Under these conditions,the SMD LEDs must be used (subject to reflow) within 24 hours after bag opening, and baking 24-hour/80ºC is required when exceeding 24 hours.
- Note that baking must only be done once.
- The temperature profile is as below.

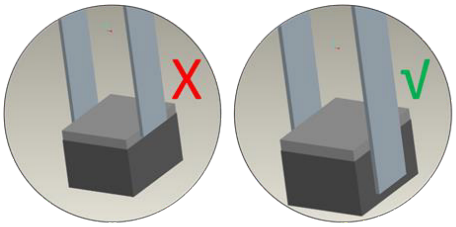


Use only with UHD1110-FKA

Solder
Average ramp-up rate = 4ºC/s max
Preheat time = 120s max
Soak temperature = 155-175ºC
Soak time = 60-100s max
Peak temperature = 235-245ºC max
Duration above 217ºC is 60s max
Ramp-down rate = 6ºC/s max

NOTES

- The packaging sizes of this model is 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.touch the package by hand is not suggested and avoid scratch on device surface. The following method is necessary:



PACKAGING

- The UHD1110-FKA 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 10000 pcs per reel.