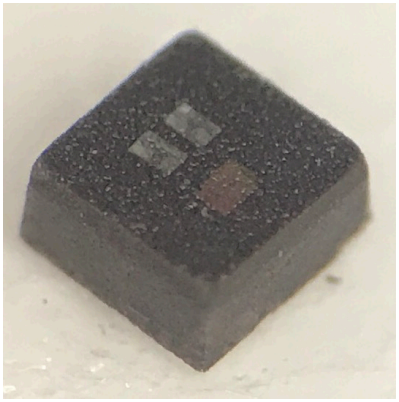
CLD-CT1349.001

Cree® RGB SMD LED
UHD1110-FKA



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 full-color RGB LEDs are suited for indoor video screen, decorative lighting and amusement applications.

FEATURES

- Size (mm):1.0x 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, 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	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 1 chip on	R_{THJA}	310	340	290	°C/W
Junction/solder point 1 chip on	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 = 5 mA	λ_{DOM}	619~624	523~536	465~472	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 5 mA	Δ λ	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

Note: LEDs should not be reverse biased continuously otherwise it will increase the LED damage risk.

INTENSITY BIN LIMIT (I_F = 5 mA)

Red

Bin Code	Min.(mcd)	Max.(mcd)
L	56	71
3c3b	64	81
A	71	90
3a4	81	101

Green

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

Blue

Bin Code	Min.(mcd)	Max.(mcd)
3r3q	16	20
L5	18	22
3p3n	20	25
L6	22	28
3m3k	25	32

Tolerance of measurement of luminous intensity is ±10%.

COLOR BIN LIMIT (I_F = 5 mA)

Red

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

Green

Bin Code	Min.(nm)	Max.(nm)
GQ	523	526
g2e	525	528
GT	527	530
g3e	529	532
gt	531	534
g4t	533	536

Blue

Bin Code	Min.(nm)	Max.(nm)
BM	465	468
b1p	467	470
BQ	469	472

Tolerance of measurement of dominant wavelength is ±1 nm.

ORDER CODE TABLE*

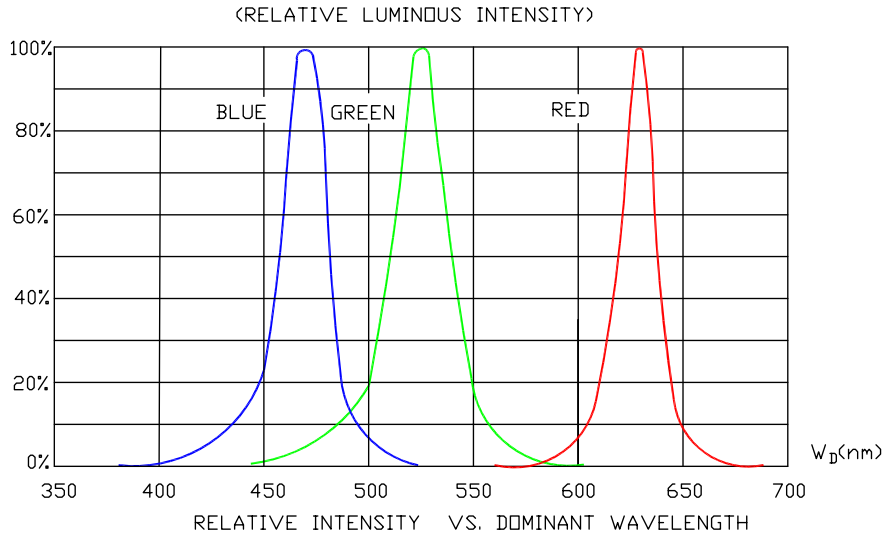
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	
UHD1110-FKA-CL1A13r3q1BBQFMF3	Red	Any 1 Intensity bin from L(56) - 3a4(101)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from A(71) - C(140)		Any consecutive 3nm within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

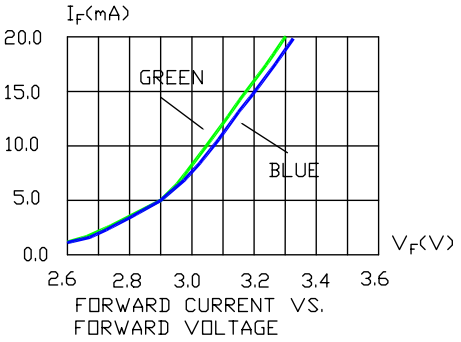
Notes:
1. The above kit numbers represent the order codes which include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each reel. Single intensity-bin code and single color-bin code will be orderable in certain quantities.
2. For example, any 1 intensity-bin from A - C means only 1 intensity-bin (A or 3a4 or B or 56 or C) will be shipped by Cree.
3. For example, any 3nm consecutive color-bin from GQ - g4t means only 1 color-bin (GQ or g2e or GT or g3e or gt or g4t) will be shipped by Cree.
4. Please refer to the "Cree LED Lamp Reliability Test Standards" document #1 for reliability test conditions.
5. Please refer to the "Cree LED Lamp Soldering & Handling" document #2 for information about how to use this LED product safely.

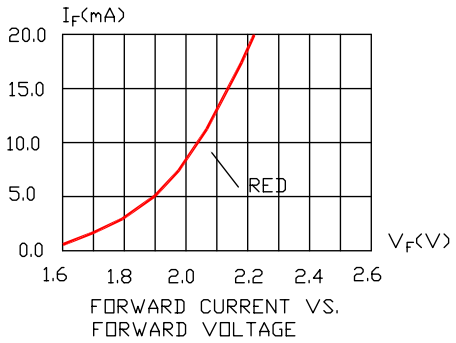
#1: Refer to http://www.cree.com/led-components/media/documents/LED_Lamp_Reliability_Test_Standard.pdf

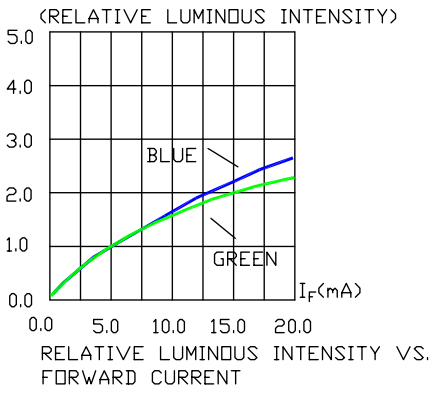
#2: Refer to http://www.cree.com/led-components/media/documents/sh-HB.pdf

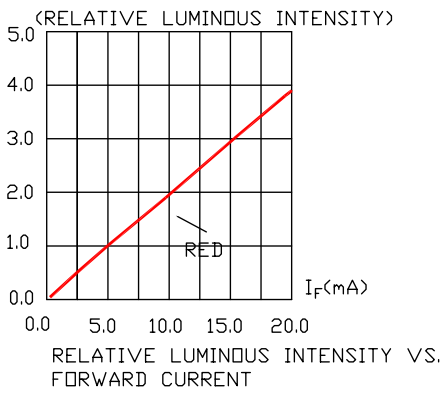
GRAPHS





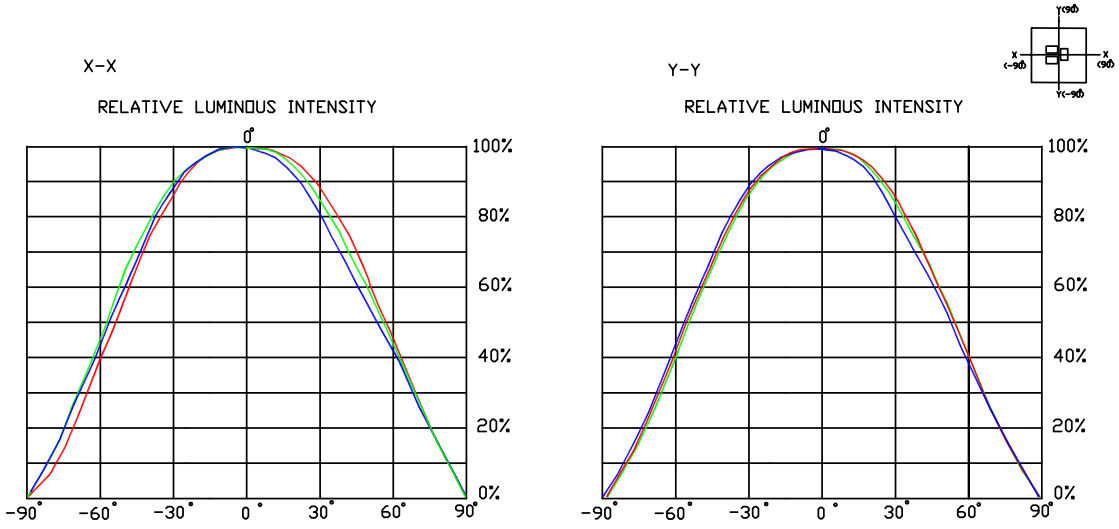


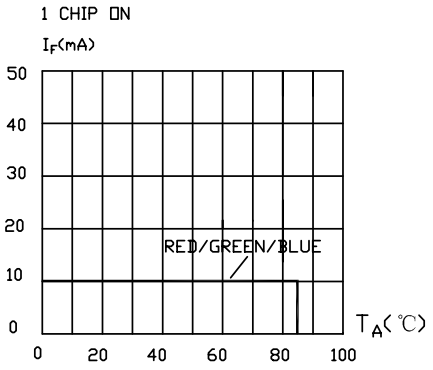




The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.

GRAPHS



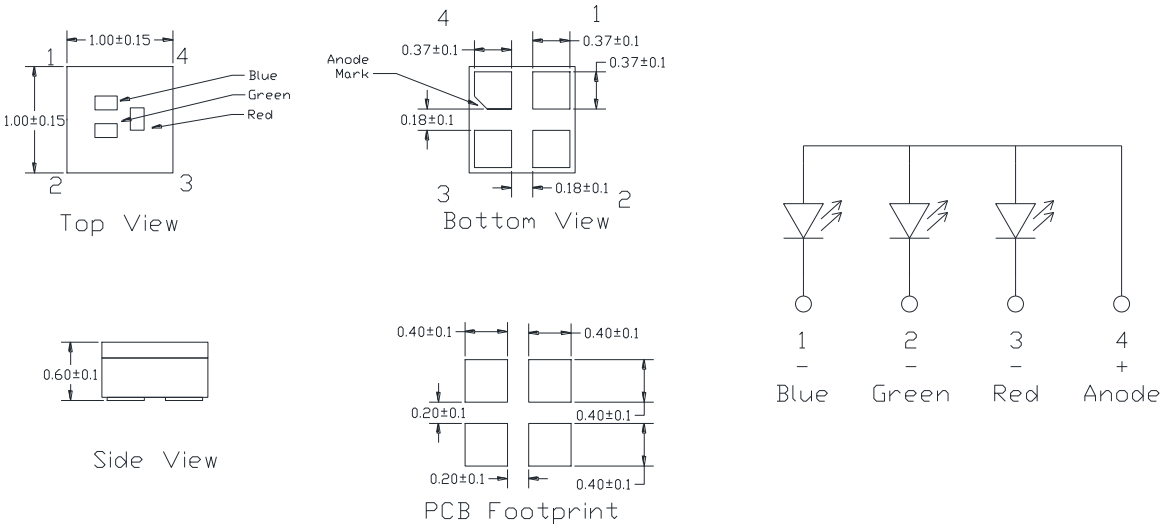


MAXIMUM FORWARD DC CURRENT
VS. AMBIENT TEMPERATURE

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.

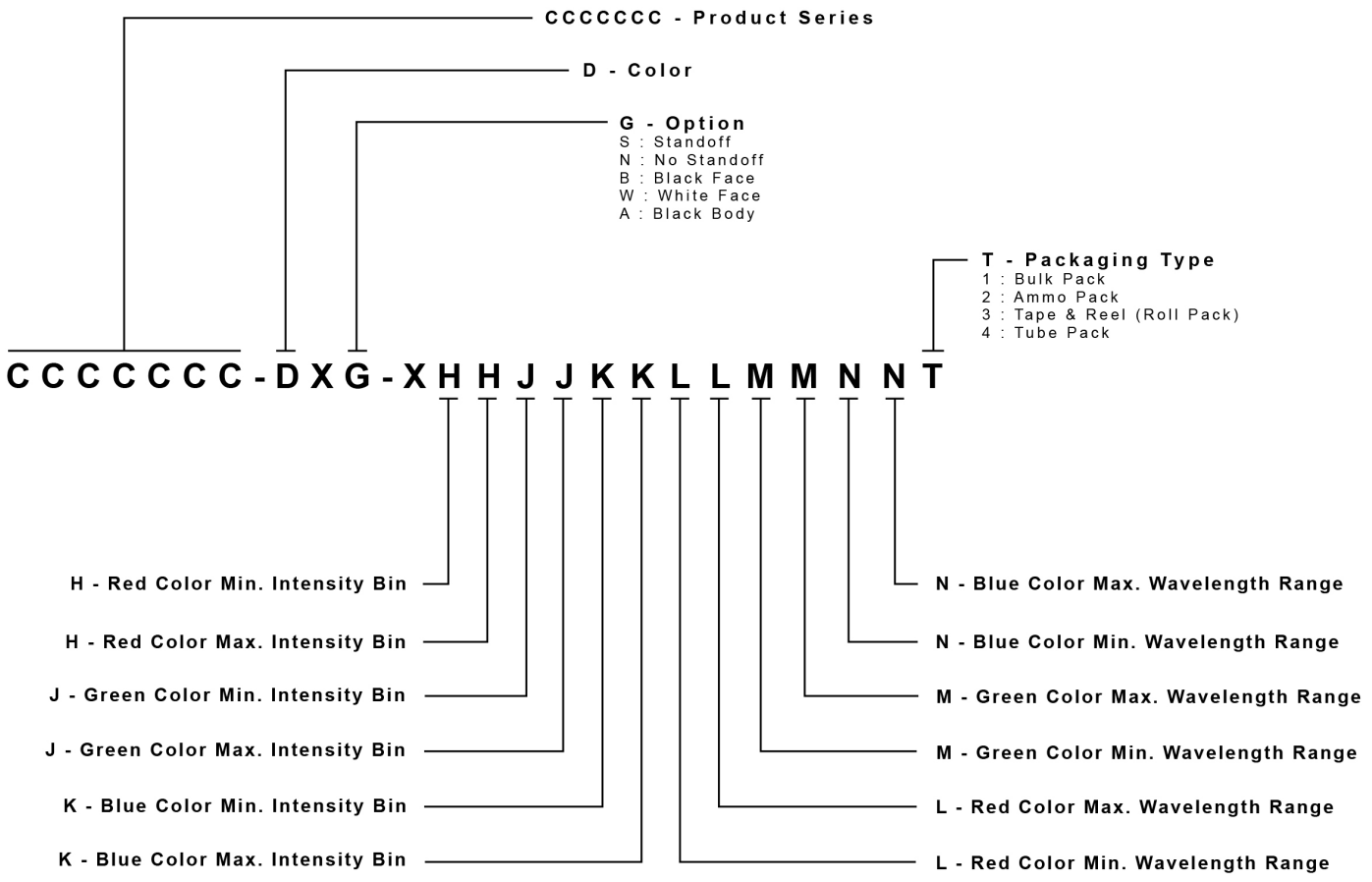
Vision Advisory Claim

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

KIT NUMBER SYSTEM

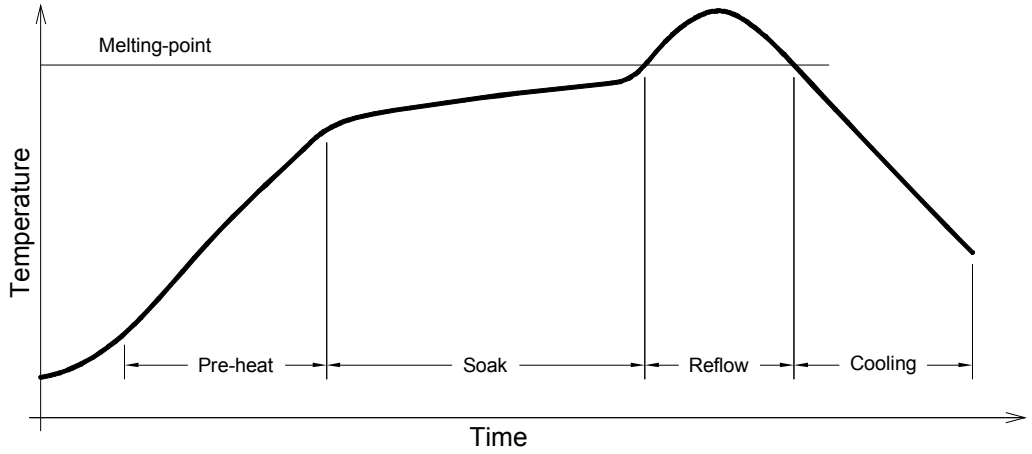
Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping 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 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.



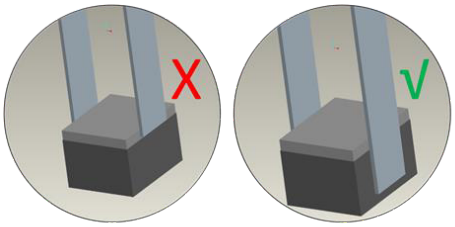
Use only with UHD1110-FKA

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

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

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.