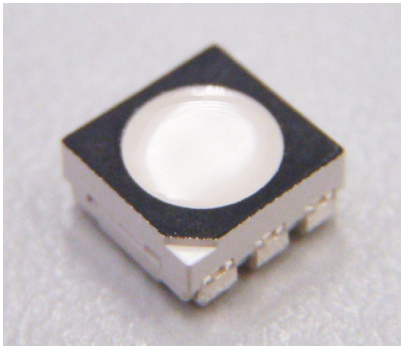
CLV6F-FKB: PLCC6 3 in 1 SMD LED



PRODUCT DESCRIPTION

These SMD LEDs are packaged in an industry standard PLCC6 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 various full color 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.

FEATURES

- Size (mm): 5.5 x 5.5
- Dominant Wavelength
  Red (619 - 624nm)
  Green (520 - 540nm)
  Blue (460 - 480nm)
- Luminous Intensity (mcd)
  Red (805 - 1600)
  Green (1600 - 3175)
  Blue (355 - 805)
- Moisture Sensitivity Level: 5a
- Lead-Free
- RoHS Compliant

APPLICATIONS

- Decorative Lighting
- Amusement

Cree LED / 4400 Silicon Drive / Durham, NC 27703 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}	200	100	100	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_D	130	126	140	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}	450	400	450	°C/W
Junction/solder point	R_{THJS}	230	230	200	°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 = 20mA	λ_{DOM}	619~624	520~540	460~480	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 20mA	$\Delta\lambda$	24	38	28	nm
Forward Voltage	I_F = 20 mA	$V_{F(avg)}$	2.1	2.9	3.2	V
		$V_{F(max)}$	2.6	3.6	4.0	V
Luminous Intensity	I_F = 20 mA	$I_{V(min)}$	805	1600	355	mcd
		$I_{V(avg)}$	1100	2600	600	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 (20 mA)			Blue (20 mA)		
Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)	Bin Code	Min.(mcd)	Max.(mcd)
qr	805	1010	xy	1600	2020	H	355	450
N	900	1120	R	1800	2240	hj	403	505
st	1010	1260	z1a	2020	2520	J	450	560
P	1120	1400	S	2240	2800	km	505	635
vw	1260	1600	1b1c	2520	3175	K	560	710
						np	635	805

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

COLOR BIN LIMIT

Red (20 mA)			Green (20 mA)			Blue (20 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
			G67	532.5	537.5	B67	472.5	477.5
			Ga	535	540	B6	475	480

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

ORDER CODE TABLE

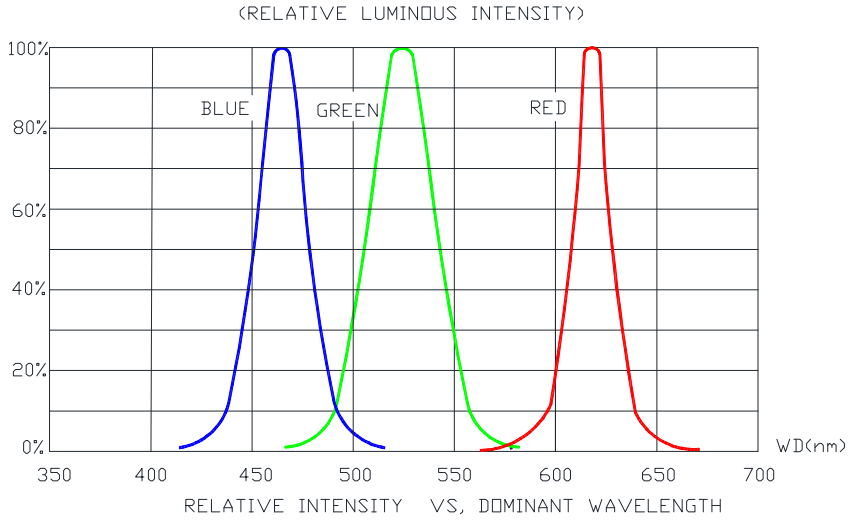
Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max. (nm)	
CLV6F-FKB-Cqrvwxy1b1cHnpBB7a36	Red	805	1600	RB	619	RB	624	Reel
	Green	1600	3175	G7	520	Ga	540	Reel
	Blue	355	805	B3	460	B6	480	Reel
CLV6F-FKB-Cqr1xy1H1BB7D3D3	Red	Any 1 Intensity bin from qr(805) - vw(1600)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from xy(1600) - 1b1c(3175)		Any 1 hue bin from G7(520)-Ga(540)				Reel
	Blue	Any 1 Intensity bin from H(355) - np(805)		Any 1 hue bin from B3(460)-B6(480)				Reel

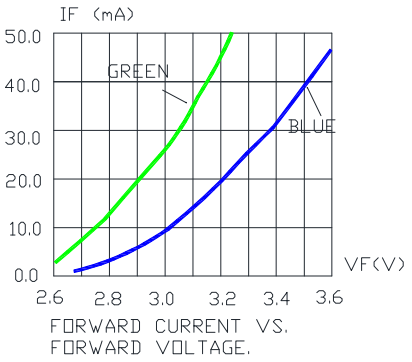
Notes:

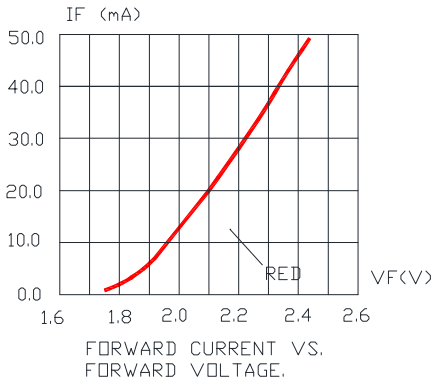
- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each bulk. Single intensity-bin code and single color-bin codes will not be orderable.
- Please refer to the HB LED Lamp Reliability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

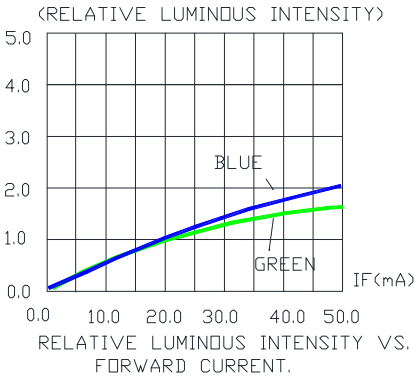
GRAPHS

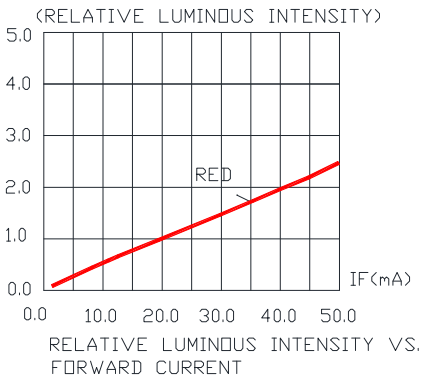
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.











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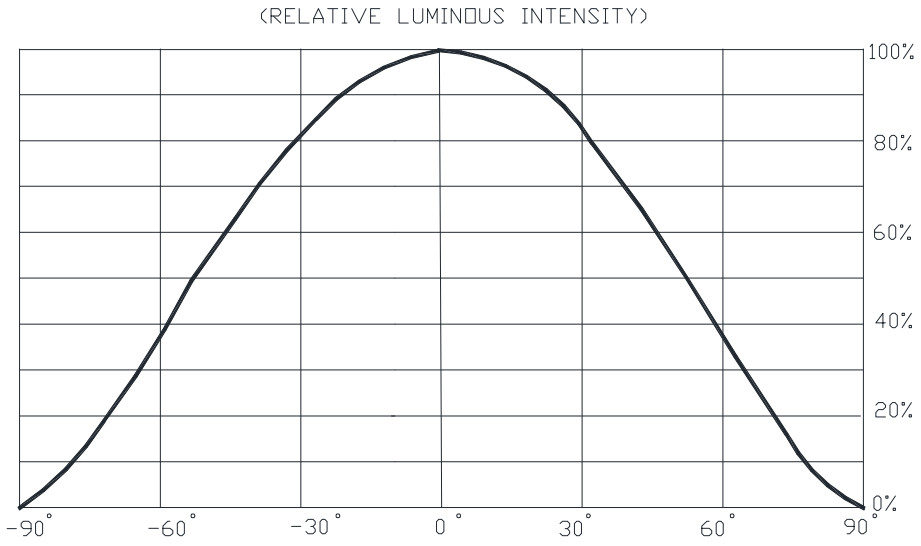
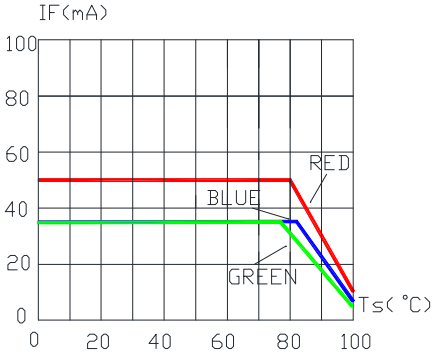
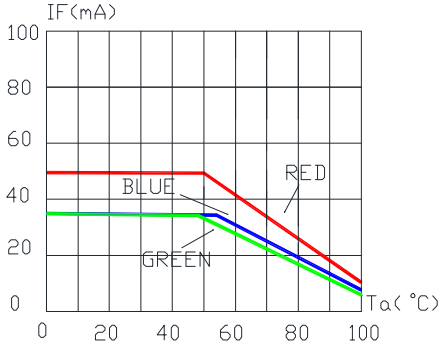


FAR FIELD PATTERN



MAXIMUM FORWARD DC CURRENT
VS, SOLDER POINT TEMPERATURE.

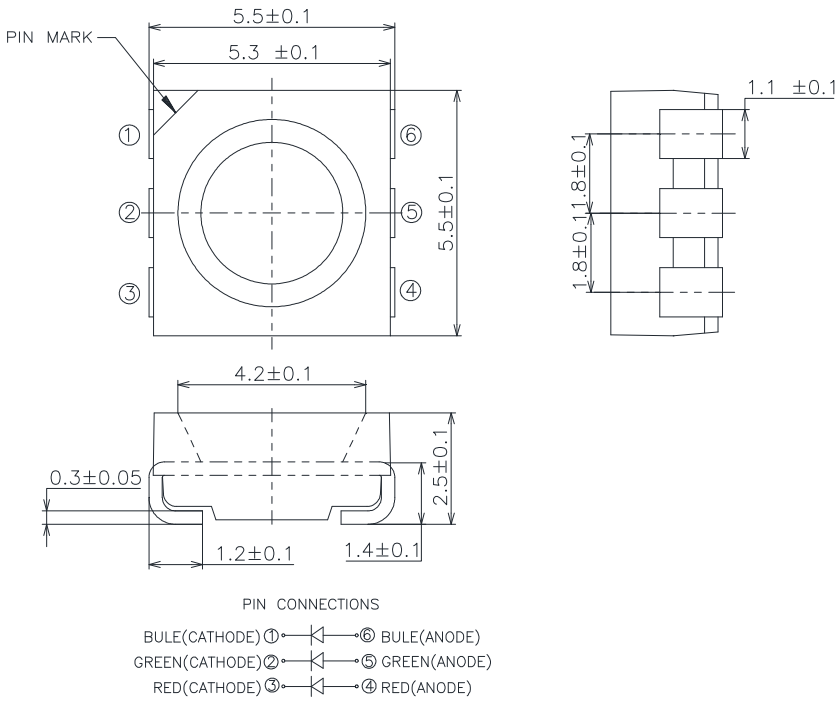


MAXIMUM FORWARD DC CURRENT
VS, AMBIENT TEMPERATURE.

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.

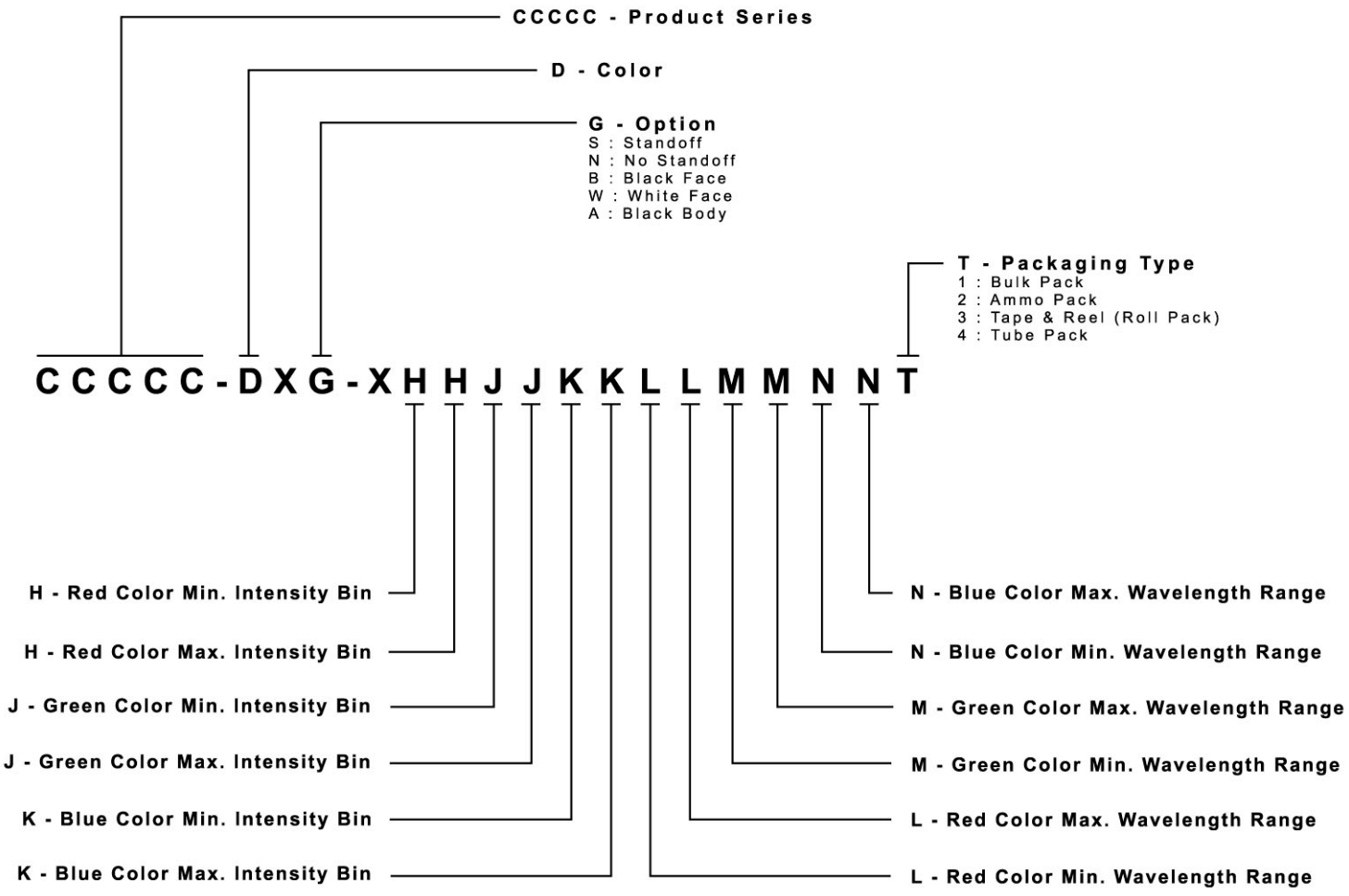
Vision Advisory

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:



RELIABILITY

Tests and Results

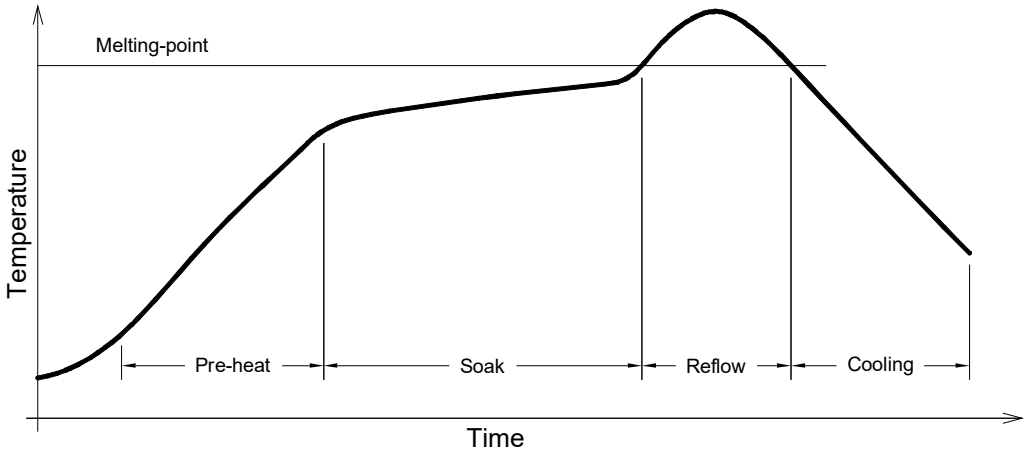
Test	Applicable Standards	Test Condition	Note	Number of Damaged
Temperature Cycle	JEITA ED-4701 100 105	-40°C~25°C~100°C~25°C 30 mins, 5 mins, 30 mins, 5 mins	100 cycles	0/45
Thermal Shock	MIL-STD-202G	-40°C~100°C 30 mins, 30 mins	100 cycles	0/45
Moisture Resistance	JEITA ED-4701 200 203	25°C~65°C~ 90%RH 24hrs/1cycle	10 cycles	0/45
High Temperature Storage	JEITA ED-4701 200 201	T_A=100°C	500 hrs	0/45
Temperature Humidity Storage	JEITA ED-4701 100 103	T_A=60°C RH=90%	500 hrs	0/45
Low Temperature Storage	JEITA ED-4701 200 202	T_A=-40°C	500 hrs	0/45
High Temperature Life Test	-	T_A=85°C I_F=15 mA	1000 hrs	0/45
Life Test	-	T_A=25°C IF: R=30mA G=35mA B=20mA	1000 hrs	0/45
High Humidity Heat Life Test	-	60°C RH=90% I_F=15 mA	500 hrs	0/45
Low Temperature Life Test	-	Ta=-40°C IF: R=30mA G=35mA B=20mA	500 hrs	0/45
Resistance to Soldering Heat(Reflow Soldering)	JEITA ED-4701 300 301	T_{sol}=235°C,10sec (Pre treatment 30°C,70%,168hrs)	2 times	0/45
Vibration-variable Frequency	MIL-STE-883 Method 2007	20G min, 20 to 2000Hz, 4cycles, 4mins, Each x,y,z	/	0/45
Electrostatic Discharge Test	AEC(Q101-001)	Human body model 1000 V (Forward and reverse current conduct electricity each 1time)	/	0/45

Failure Criteria

Item	Symbol	Test Condition	Criteria for Judgment	
			Min.	Max.
Forward Voltage	V_F	I_F = 20 mA	–	Initial Data x 1.1
Reverse Current	I_R	V_R = 5 V	-	10 μA
Luminous Flux/Intensity	Φ_V	I_F = 20 mA	Initial Data x 0.7	-
Resistance to Soldering Heat	-	I_F = 20 mA	No dead lamps and visual damage	
Vibration-variable Frequency	-	I_F = 20 mA	No dead lamps and visual damage	

REFLOW SOLDERING

- The CLV6F-FKB is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below.

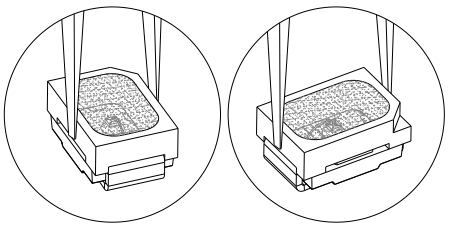


Use only with CLV6F-FKB

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

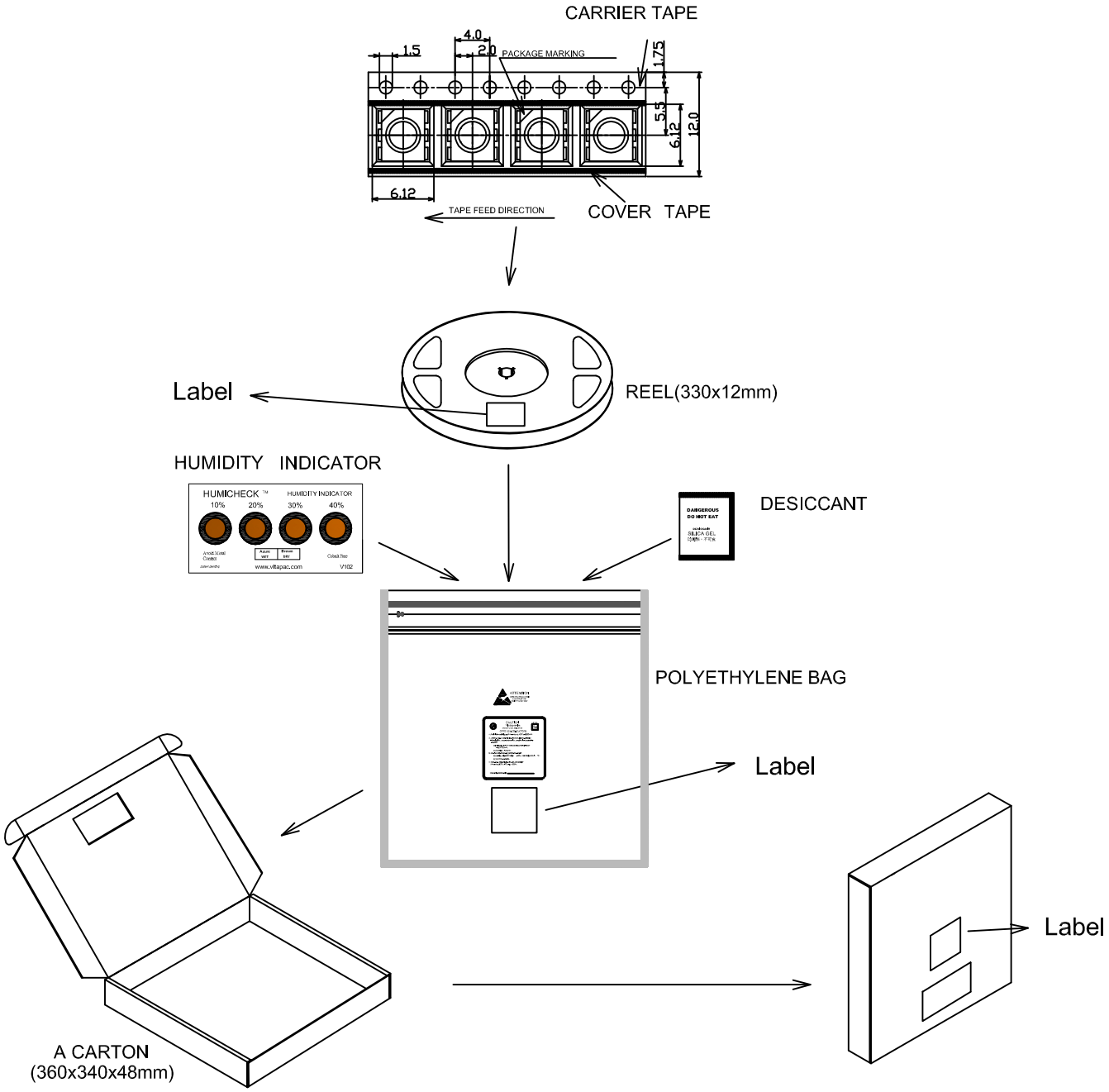
NOTES

- 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 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 3000 pcs per reel.



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Cree LED:

CLV6F-FKB-CQR1XY1H1BB7D3D3 CLV6F-FKB-CQRVWXY1B1CHNPBB7A363