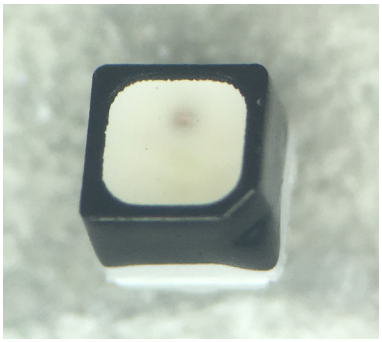
CLMWB-FKC: PLCC4 3 in 1 SMD LED



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): 1.7 x 1.6 x 1.6
- Dominant Wavelength
  Red (619 - 624nm)
  Green (520 - 535nm)
  Blue (465 - 477.5nm)
- Luminous Intensity (mcd)
  Red (403 - 635)
  Green (900 - 1260)
  Blue (160 - 280)
- 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.

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Items	Symbol	Absolute Maximum Rating			Unit
		R	G	B	
Forward Current Note 1	I_F	30	20	20	mA
Peak Forward Current Note 2	I_{FP}	250	100	100	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_D	69	58	68	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}	510	420	460	°C/W
Junction/solder point	R_{THJ}	460	380	400	°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	465~477.5	nm
Spectral bandwidth at 50% I_{REL} max	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$\Delta\lambda$	15	28	19	nm
Forward Voltage	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$V_{F(avg)}$	2.1	2.7	3.1	V
		$V_{F(max)}$	2.3	2.9	3.4	V
Luminous Intensity	I_F = 15mA(R) I_F = 10mA(G) I_F = 10mA(B)	$I_{V(min)}$	403	900	160	mcd
		$I_{V(avg)}$	525	1030	210	mcd
Luminous Intensity(Reference)	I_F = 20mA(R/G/B)	$I_{V(avg)}$	705	1700	340	mcd
Reverse Current (max)	V_R = 5 V	I_R	10	10	10	μA

* Continuous reverse voltage can cause LED damage.

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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)
hj	403	505	N	900	1120	9a	160	202
J	450	560	st	1010	1260	E	180	224
km	505	635				bc	202	252
						F	224	280

* 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			

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

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ORDER CODE TABLE

Kit Number	Color	Luminous Intensity (mcd)		Dominant Wavelength (nm)				Package
		Min.	Max.	Color Bin	Min.(nm)	Color Bin	Max. (nm)	
CLMWB-FKC-ChjkmNst9aFBB794673	Red	403	635	RB	619	RB	624	Reel
	Green	900	1260	G7	520	G9	535	Reel
	Blue	160	280	B4	465	B67	477.5	Reel
CLMWB-FKC-Chj1N19a1BB7C4R3	Red	Any 1 Intensity bin from hj(403) - km(635)		RB	619	RB	624	Reel
	Green	Any 1 Intensity bin from N(900) - st(1260)		Any 1 hue bin from G7(520)-G9(535)				Reel
	Blue	Any 1 Intensity bin from 9a(160) - F(280)		Any 1 hue bin from B4(465)-B67(477.5)				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.

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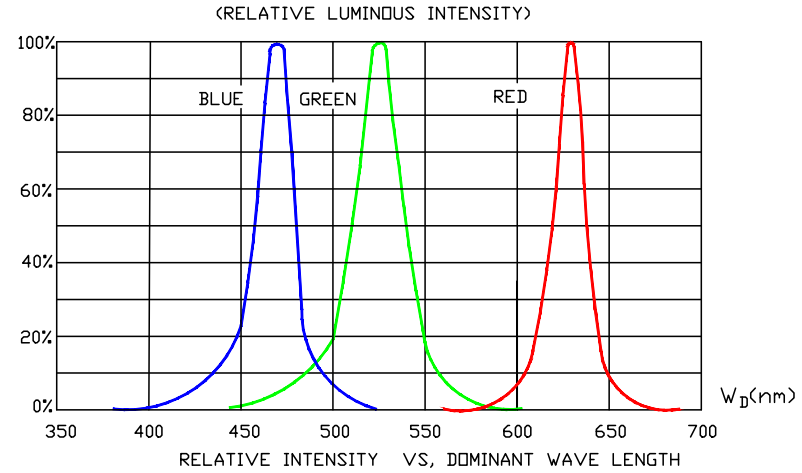
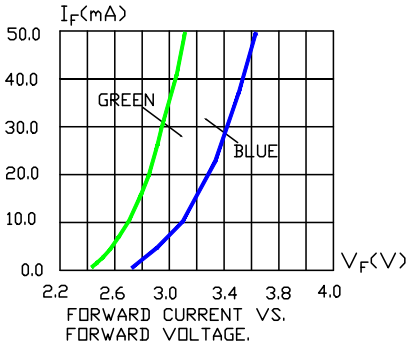
GRAPHS

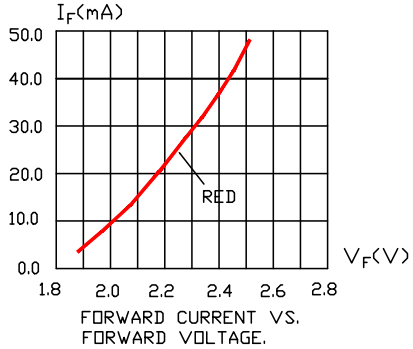
The data below are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



RELATIVE INTENSITY VS, DOMINANT WAVE LENGTH



FORWARD CURRENT VS. FORWARD VOLTAGE.



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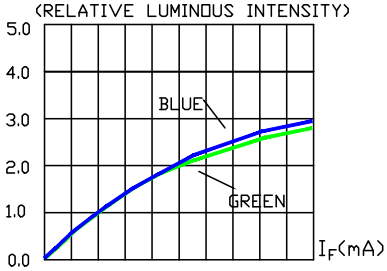
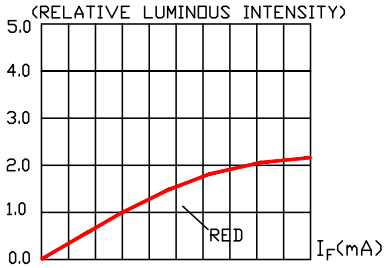


RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT.



RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

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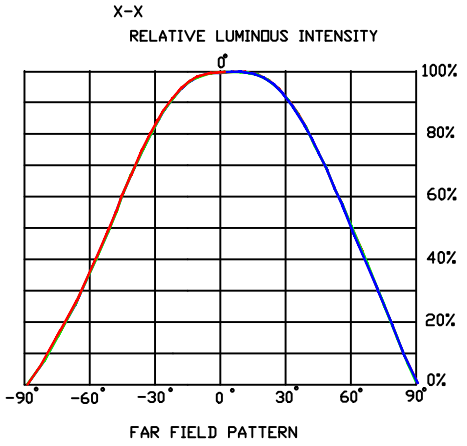
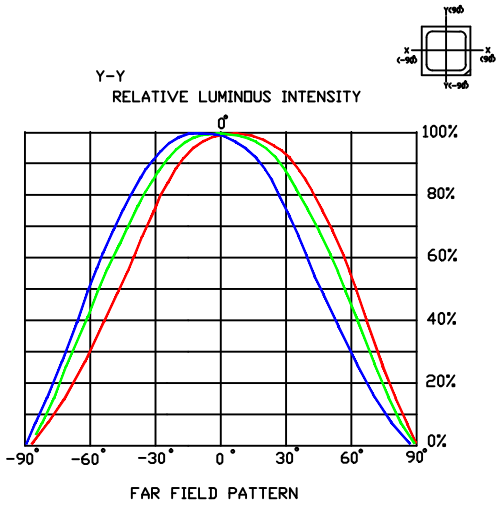
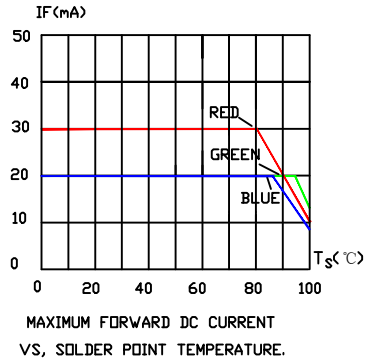
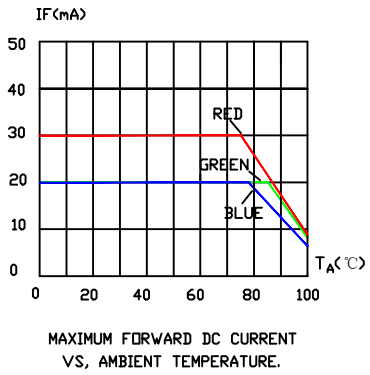






MAXIMUM FORWARD DC CURRENT
VS, SOLDER POINT TEMPERATURE.



MAXIMUM FORWARD DC CURRENT
VS, AMBIENT TEMPERATURE.

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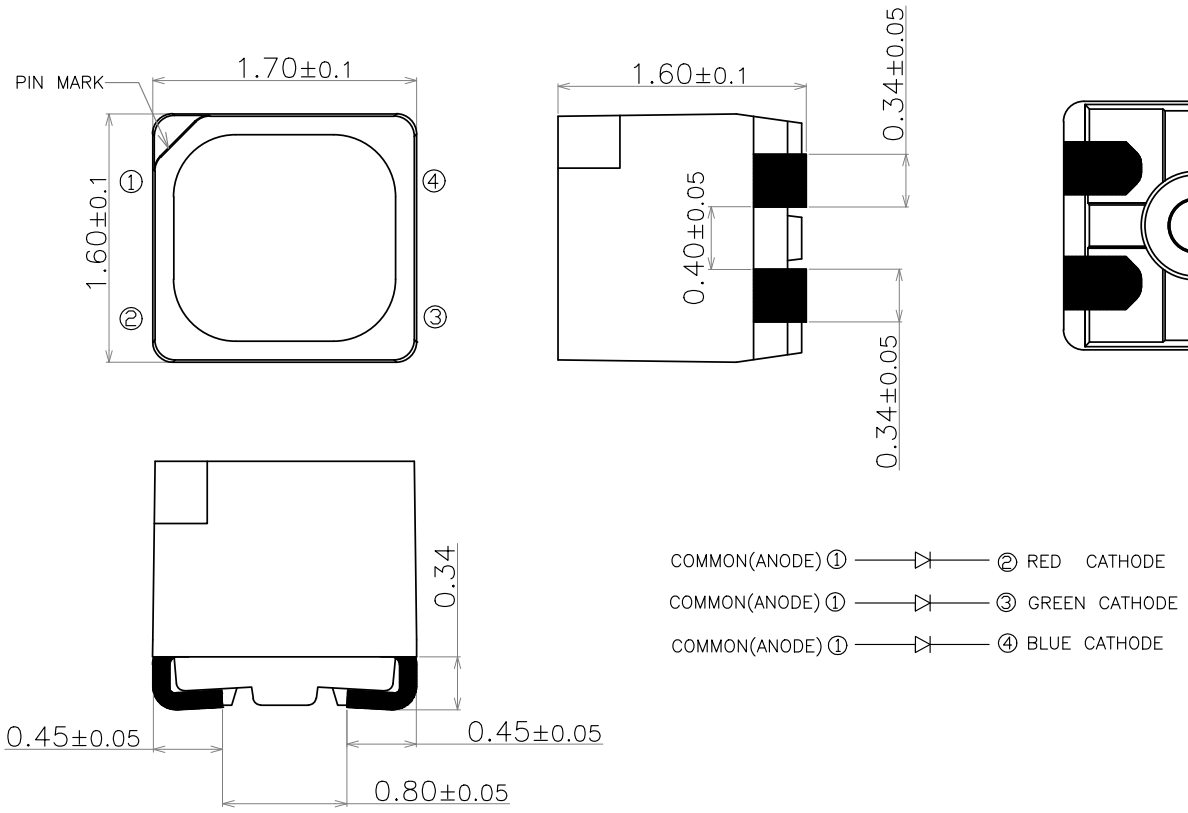
MECHANICAL DIMENSIONS

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.

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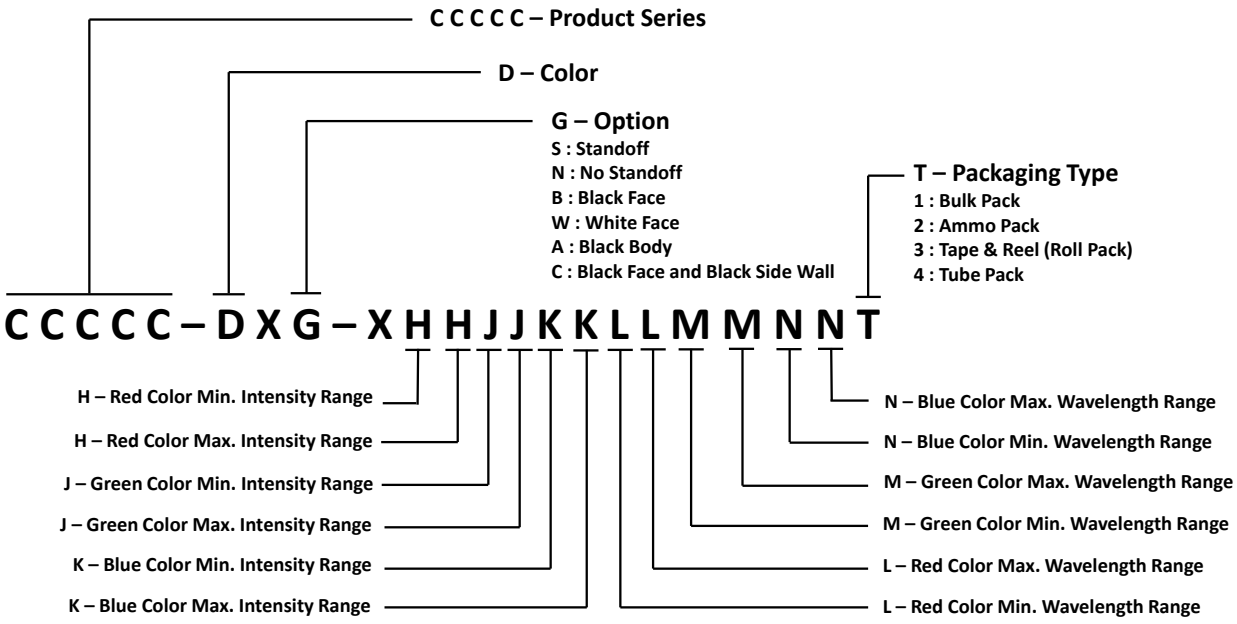
KIT NUMBER SYSTEM

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:



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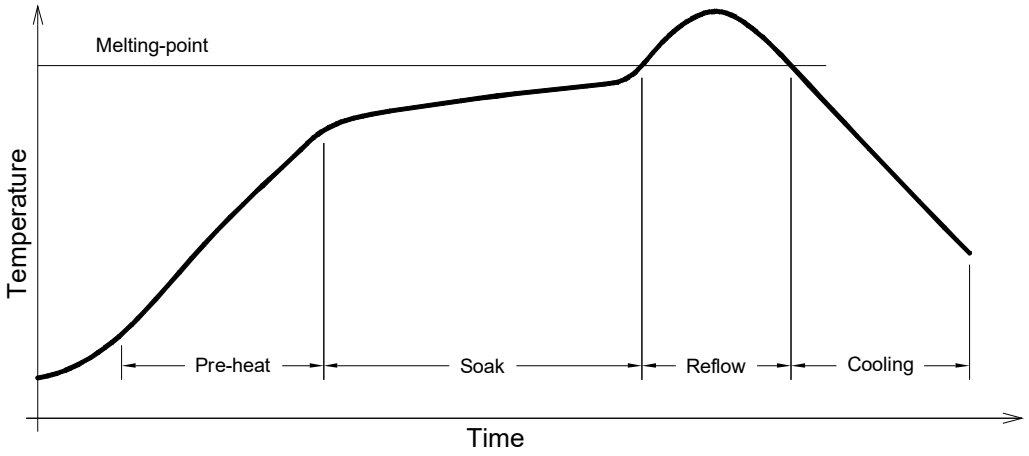
REFLOW SOLDERING

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

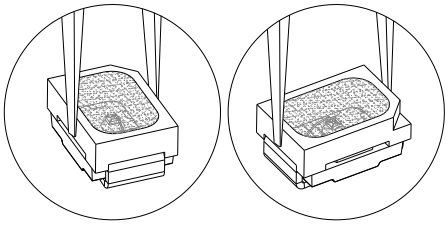


Use only with CLMWB-FKC

Solder
Average ramp-up rate = 4 °C/second max.
Soak temperature = 150°C-200°C
Soak time = 120 seconds max.
Duration above 217 °C = 60 seconds max.
Peak temperature = 250°C max
Time within 5 °C of peak temperature = 10 seconds max.
Ramp-down rate = 6 °C/second 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:



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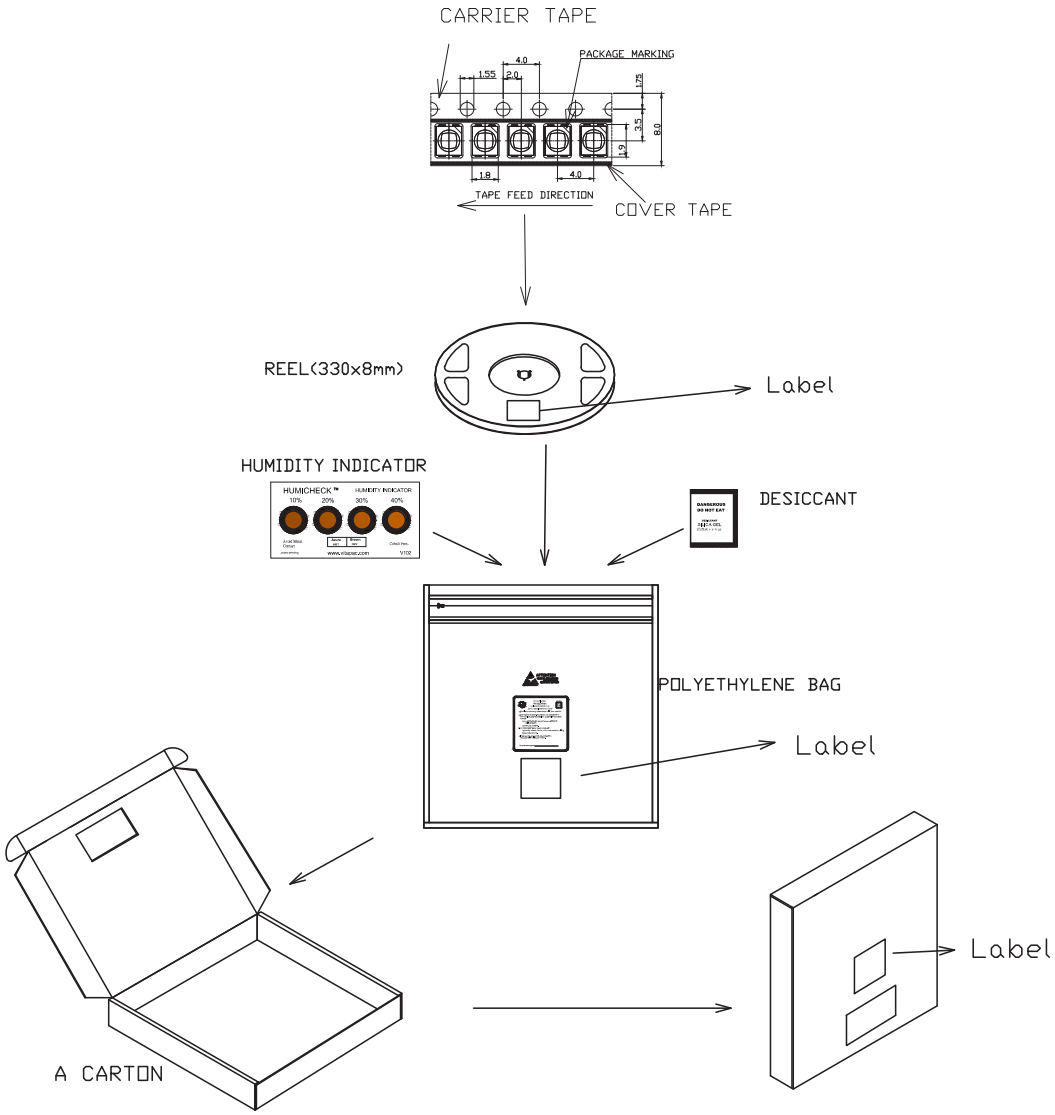
PACKAGING

- 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.



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