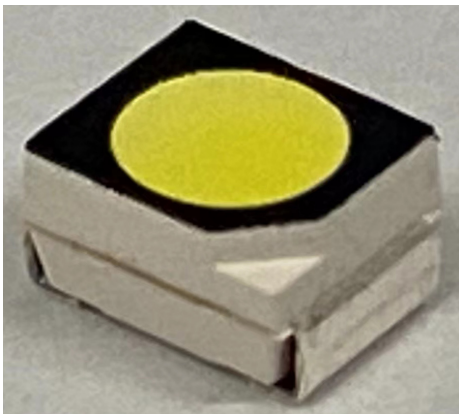
CLM1C-WKB: PLCC2 1 IN 1 SMD LED



PRODUCT DESCRIPTION

SMD LEDs is packaged in the industry standard package. These LEDs have high reliability performance and are designed to work under a wide range of environmental conditions.
This high reliability feature makes them ideally suited to be used under illumination application conditions.

Its wide viewing angle makes these LEDs ideally suited for channel letter, or general backlighting and illumina-tion applications. The flat top emitting surface makes it easy for these LEDs to mate with light pipes.

FEATURES

- Size (mm): 3.2 X 2.8
- Color Temperatures:
  Cool White :
  Min . (4600K) / Typical (6800K)
- Luminous Intensity (mcd)
  CLM1C-WKB:(1800-2800)
- Moisture Sensitivity Level: 5a
- Lead - Free
- RoHS Compliant

APPLICATIONS

- Channel Letter

Cree LED / 4001 E. Hwy. 54, Suite 2000 / Durham, NC 27713 USA / +1.919.313.5330 / www.cree-led.com

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Items	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	25	mA
Peak Forward Current Note 1	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	85	mW
Operation Temperature	T_{opr}	-40 ~ +100	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Junction Temperature	T_J	110	°C
Junction/Ambient	R_{THJA}	450	°C/W
Junction/Solder Point	R_{THJS}	300	°C/W

Note:

1. Pulse width ≤0.1 msec, duty ≤1/10.

TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS (T_A = 25°C)

Characteristics	Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	V_F	I_F = 20 mA	V	2.7	2.9	3.4
Reverse Current	I_R	V_R = 5 V	μA			10
Luminous Intensity	I_V	I_F = 20 mA	mcd	1800	2100	
Chromaticity Coordinates	x	I_F = 20 mA			0.3100	
	y	I_F = 20 mA			0.3200	

* Continuous reverse voltage can cause LED damage.

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INTENSITY BIN LIMIT

Cool White (20 mA) - CLM1C-WKB		
Bin Code	**Min.(mcd)**	**Max.(mcd)**
X1	1800	2020
X2	2020	2240
X3	2240	2520
X4	2520	2800

* Tolerance of measurement of luminous intensity is ±10%

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COLOR BIN LIMIT

Cool White (20 mA) - CLM1C-WKB

Bin Code	Sub-bin	x	y
W1	Wa	0.2545	0.2480
		0.2633	0.2410
		0.2545	0.2245
		0.2450	0.2290
	Wb	0.2633	0.2410
		0.2720	0.2340
		0.2640	0.2200
		0.2545	0.2245
	Wc	0.2545	0.2480
		0.2640	0.2670
		0.2720	0.2575
		0.2633	0.2410
	Wd	0.2633	0.2410
		0.2720	0.2575
		0.2800	0.2480
		0.2720	0.2340
W2	We	0.2640	0.2670
		0.2735	0.2860
		0.2808	0.2740
		0.2720	0.2575
	Wf	0.2720	0.2575
		0.2808	0.2740
		0.2880	0.2620
		0.2800	0.2480
	Wg	0.2735	0.2860
		0.2830	0.3050
		0.2895	0.2905
		0.2808	0.2740
	Wh	0.2808	0.2740
		0.2895	0.2905
		0.2960	0.2760
		0.2880	0.2620

Bin Code	Sub-bin	x	y
W3	Wj	0.2830	0.3050
		0.2950	0.3210
		0.2998	0.3028
		0.2895	0.2905
	Wk	0.2895	0.2905
		0.2998	0.3028
		0.3045	0.2865
		0.2960	0.2760
	Wm	0.2950	0.3210
		0.3070	0.3370
		0.3100	0.3150
		0.2998	0.3028
	Wn	0.2998	0.3028
		0.3100	0.3150
		0.3130	0.2970
		0.3045	0.2865
W4	Wp	0.3070	0.3370
		0.3185	0.3485
		0.3200	0.3270
		0.3100	0.3150
	Wq	0.3100	0.3150
		0.3200	0.3270
		0.3215	0.3075
		0.3130	0.2970
	Wr	0.3185	0.3485
		0.3300	0.3600
		0.3300	0.3390
		0.3200	0.3270
	Ws	0.3200	0.3270
		0.3300	0.3390
		0.3300	0.3180
		0.3215	0.3075

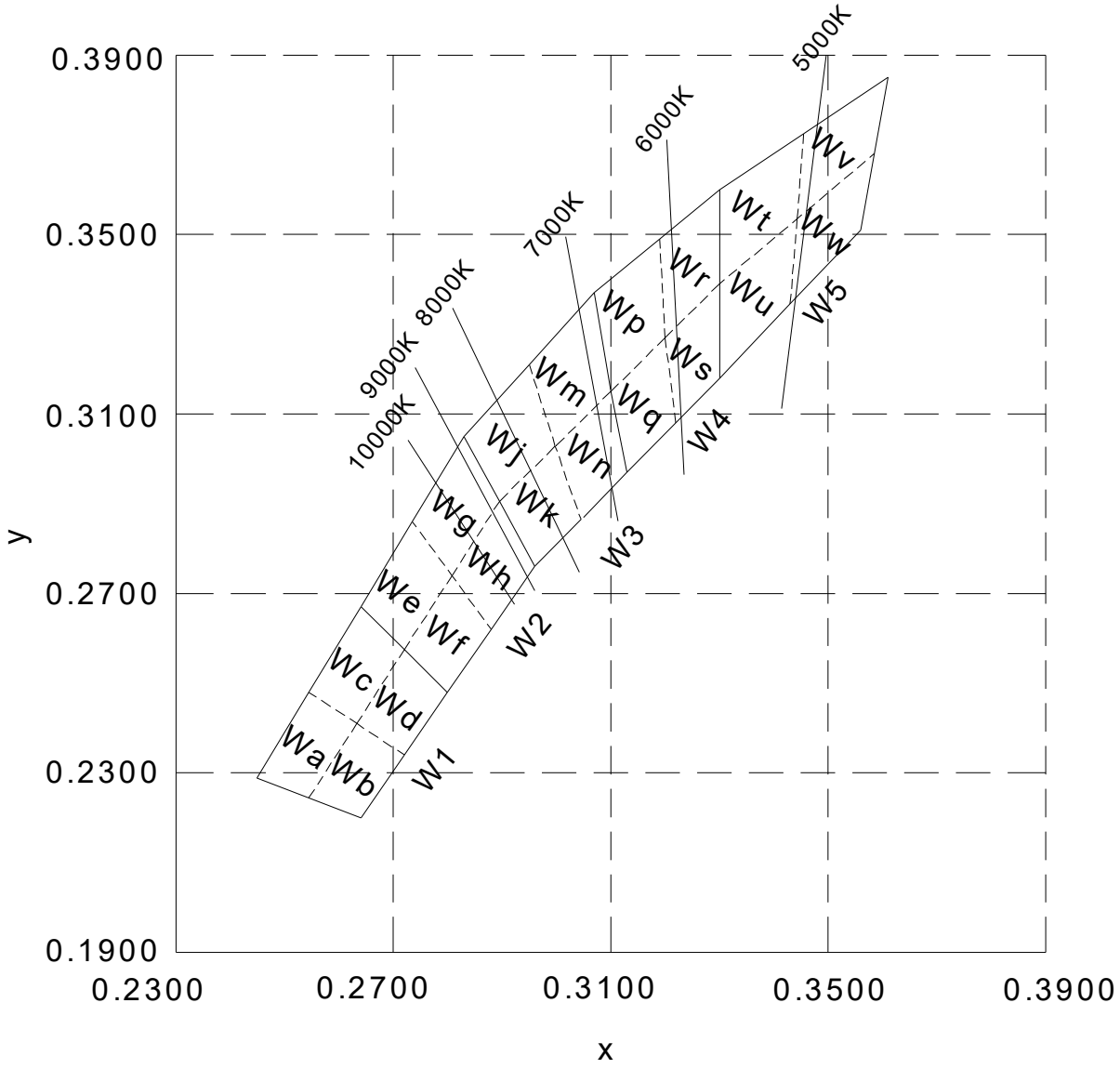
Bin Code	Sub-bin	x	y
W5	Wt	0.3300	0.3600
		0.3455	0.3725
		0.3443	0.3535
		0.3300	0.3390
	Wu	0.3300	0.3390
		0.3443	0.3535
		0.3430	0.3345
		0.3300	0.3180
	Wv	0.3455	0.3725
		0.3610	0.3850
		0.3585	0.3680
		0.3443	0.3535
	Ww	0.3443	0.3535
		0.3585	0.3680
		0.3560	0.3510
		0.3430	0.3345

* Tolerance of measurement of the color coordinates is ±0.01

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CIE CHROMATICITY DIAGRAM



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ORDER CODE TABLE

Color	Kit Number	Luminous Intensity (mcd)		Color Bin Code
		Min.	Max.	
Cool White	CLM1C-WKB-CX1X4153	1800	2800	W1,W2,W3,W4,W5
	CLM1C-WKB-CX1X4233	1800	2800	W2,W3
	CLM1C-WKB-CX1X4343	1800	2800	W3,W4
	CLM1C-WKB-CX1X4453	1800	2800	W4,W5

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.

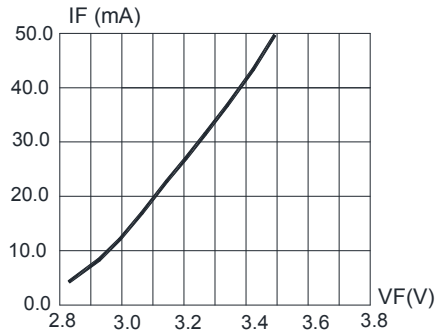


FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

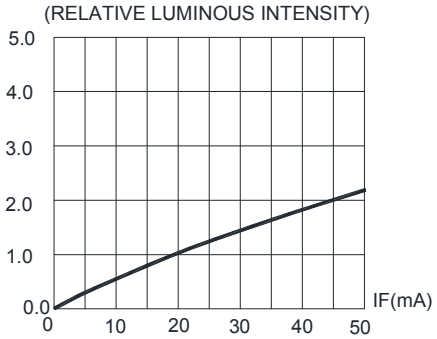


FIG.2 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

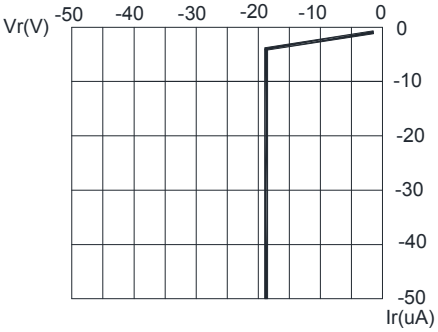


FIG.3 REVERSE CURRENT VS. REVERSE VOLTAGE.

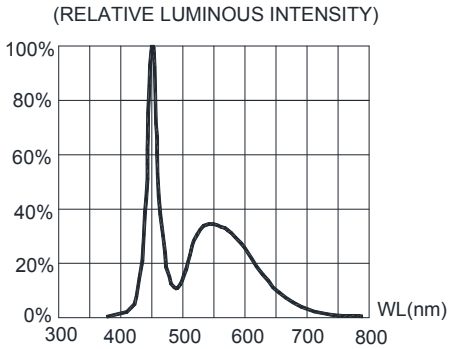


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

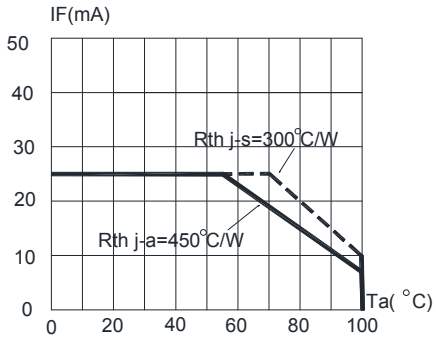


FIG.5 MAXIMUM FORWARD DC CURRENT VS AMBIENT TEMPERATURE (Tjmax=110°C)



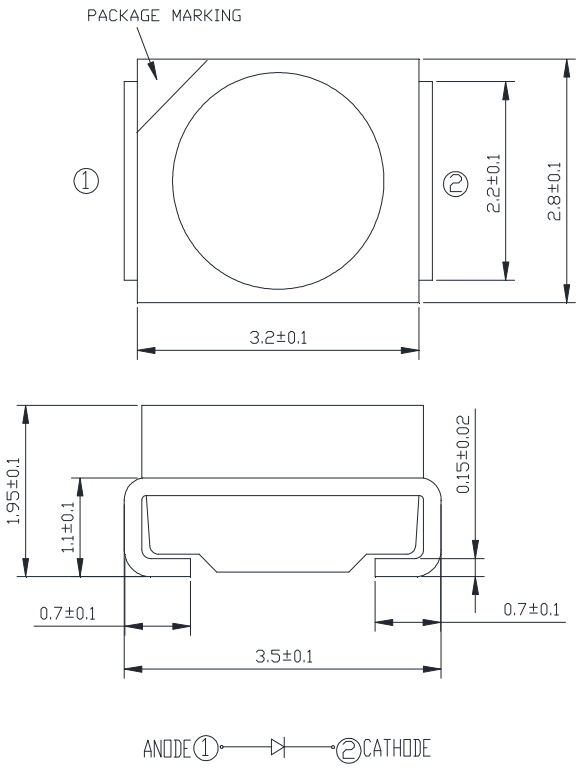
FIG.6 FAR FIELD PATTERN

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MECHANICAL DIMENSIONS

All dimensions are in mm.



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.

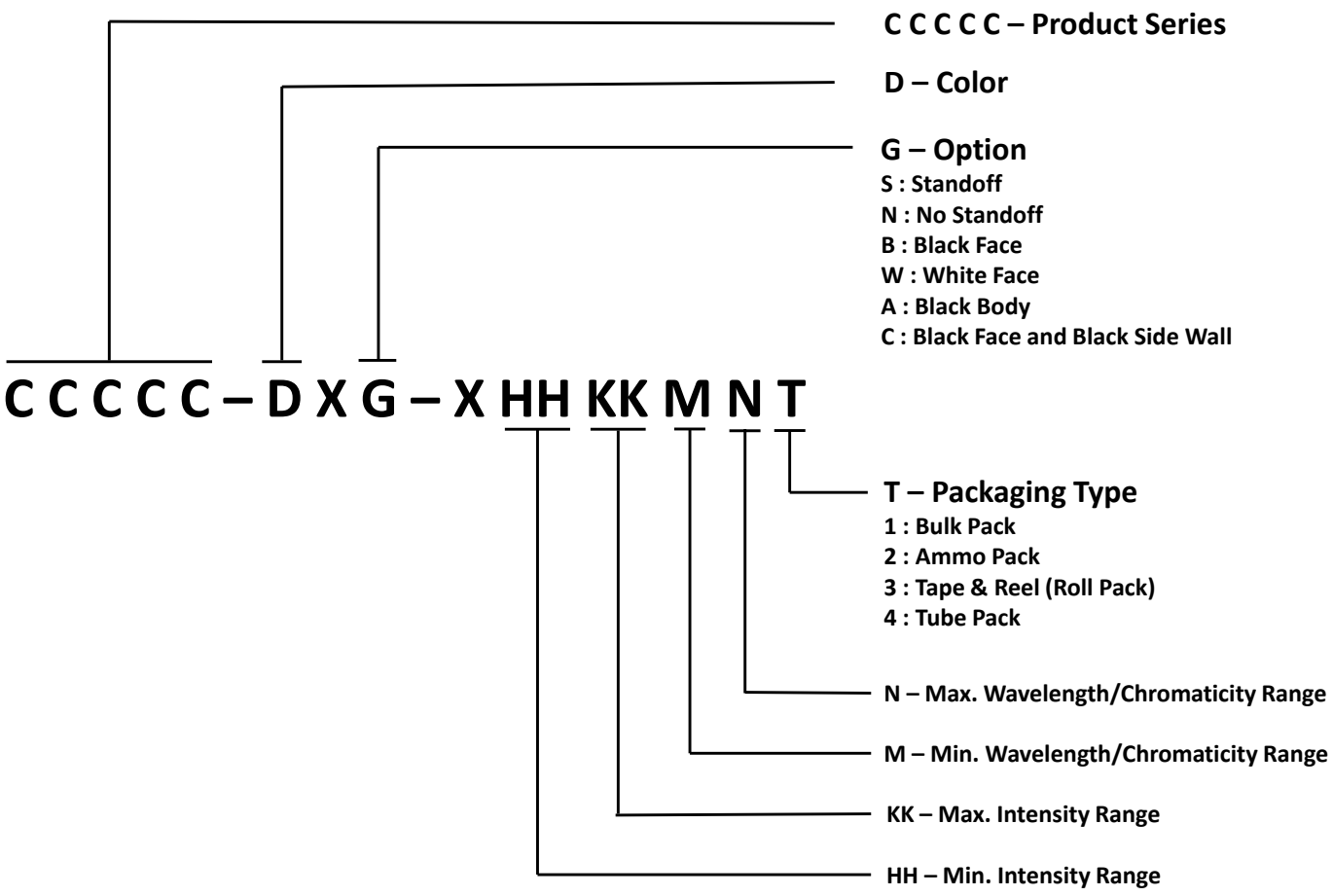
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KIT NUMBER SYSTEM

Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options.

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

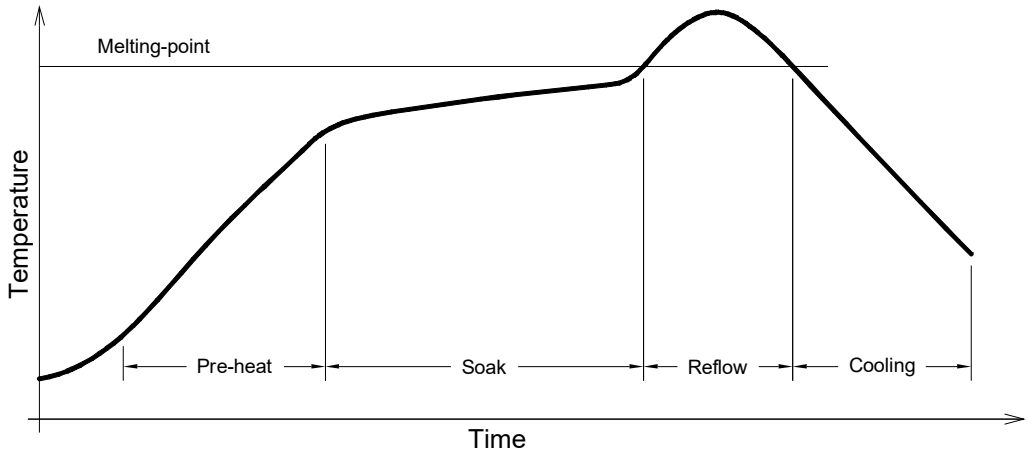


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REFLOW SOLDERING

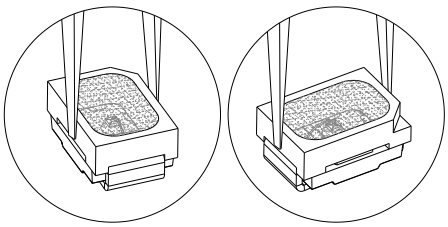
- The CLM1C-WKB is rated as a MSL 5a product.
- The recommended floor life out of bag is 24hrs.
- The temperature profile is as below.



Use only with CLM1C-WKB

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

- 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:
- Please refer to the HB LED Lamp Soldering & Handling document for information about how to use this LED product safely.

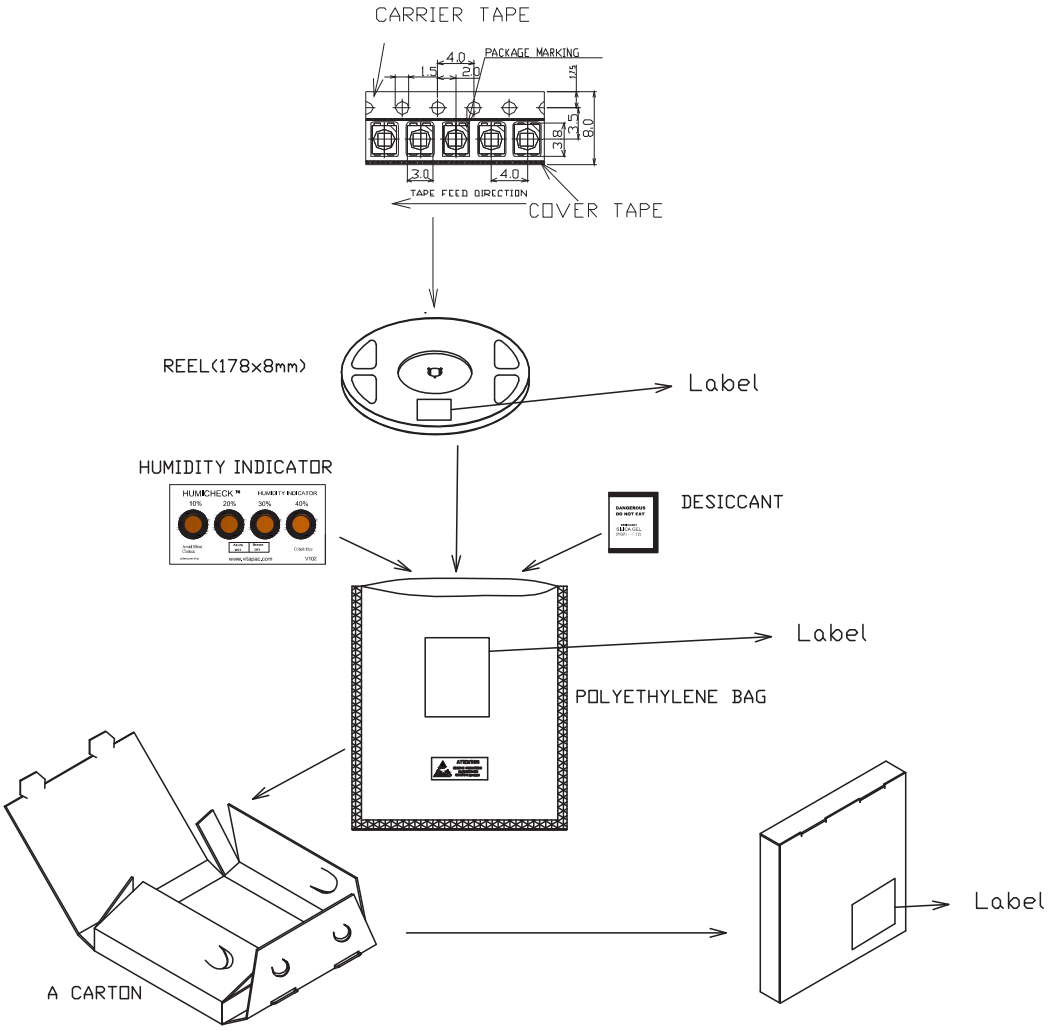


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PACKAGING

- 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 shock during transportation.
- The boxes are not water resistant, and they must be kept away from water and moisture.
- The reel pack is applied in SMD LED.
- Max 2000 pcs per reel.



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