Part Number: XZMECBDDG45SHTA

3.5x2.8mm PLCC4 SMD LED

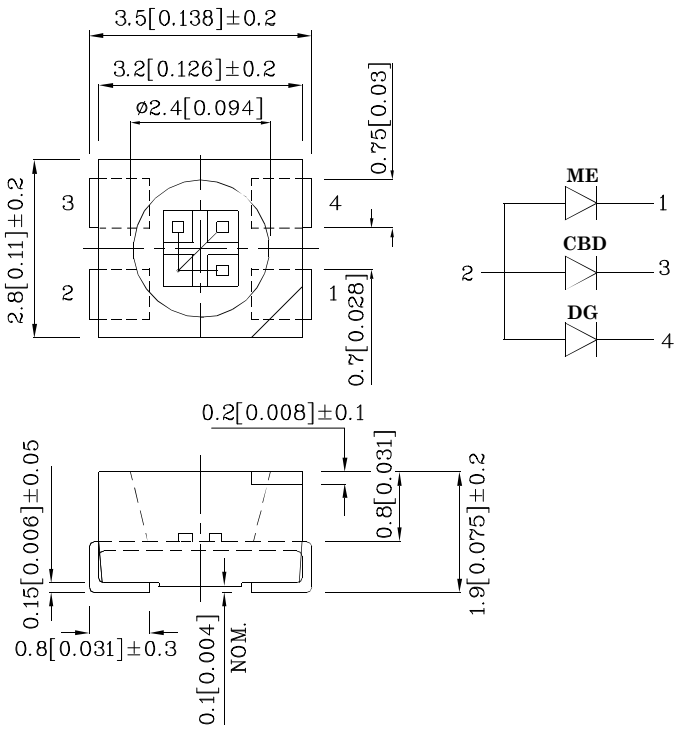
Features

- Ideal for indication light on hand held products
- Long life and robust package
- Package: 2,000pcs / reel
- MSL (Moisture Sensitivity Level): 3
- RoHS compliant

Applications

- Backlighting for tell-tale indicators
- Dashboard lighting
- Interior lighting (footwell, dome light, accent lighting, etc.)
- Exterior lighting (turn signals, side markers, CHMSL, etc.)
- Signs and signals
- Various applications requiring high temperature rating

Package Schematics

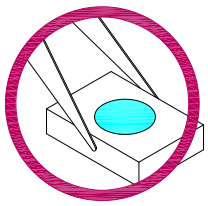


Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25(0.01") unless otherwise noted.
3. Specifications are subject to change without notice.

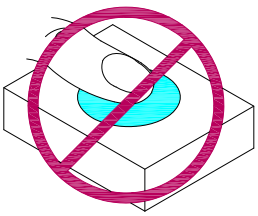
Handling Precautions

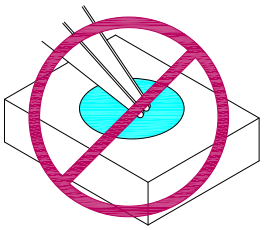
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.
As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

1. Handle the component along the side surfaces by using forceps or appropriate tools.

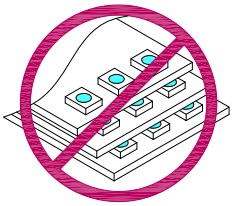


2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

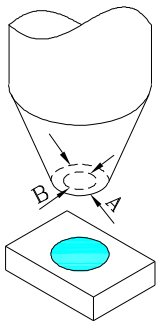




3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



4.1. The inner diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks.
4.2. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
4.3. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



5. As silicone encapsulation is permeable to gases, some corrosive substances such as H_2S might corrode silver plating of lead-frame. Special care should be taken if an LED with silicone encapsulation is to be used near such substances.

Part Number	Emitting Color	Emitting Material	Lens-color	Luminous Intensity CIE127-2007* (I_F=20mA) mcd			Wavelength CIE127-2007* nm λP	Viewing Angle 2θ 1/2
				Code.	min.	max.		
XZMECBDDG45SHTA	Red	AlGaInP	Water Clear	*N	*120	*200	640*	120°
				*P	*200	*300		
				*Q	*300	*400		
	Blue	InGaN		*H	*55	*80	465*	
				*M	*80	*120		
				*N	*120	*200		
	Green	InGaN		*R	*400	*500	520*	
				*S	*500	*700		
				*T	*700	*1000		

Notes:
1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Luminous intensity / luminous Flux: +/-15%.
* Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Value			Unit
		Red	Green	Green	
Power dissipation	P_D	75	80	82	mW
Reverse Voltage	V_R	5	5	5	V
Junction temperature	T_J	115	110	110	°C
Operating Temperature	Top	-40 To +100			°C
Storage Temperature	Tstg	-40 To +110			°C
DC Forward Current[1]	I_F	30	20	20	mA
Peak Forward Current [2]	I_{FM}	195	150	150	mA
Electrostatic Discharge Threshold (HBM)		3000	250	450	V
Thermal Resistance (Junction/ambient)	$R_{th\ j\text{-}a}$	590	440	340	°C/W

Notes:
1. Rth(j-a) Results from mounting on PC board FR4 (pad size≥16 mm² per pad),
2. 1/10 Duty Cycle, 0.1ms Pulse Width.

Electrical / Optical Characteristics at Ta=25°C

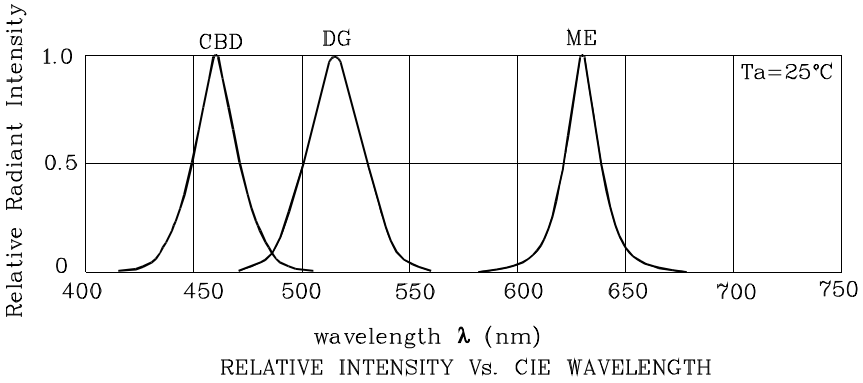
Parameter	Symbol	Chip	Value				Unit
			Code.	Min.	Typ.	Max.	
Wavelength at peak emission IF=20mA	λpeak	Red Blue Green			630 460 515		nm
Dominant Wavelength IF=20mA	λdom [1]	Red		610		635	nm
		Blue	1A*	460*		463*	
			1B*	463*		466*	
			2A*	466*		469*	
			2B*	469*		471*	
			3A*	471*		473*	
		Blue	1*	515*		520*	
			2*	520*		525*	
			3*	525*		530*	
			4*	530*		535*	
Spectral bandwidth at 50%Φ REL MAX IF=20mA	Δλ	Red Blue Green			20 25 30		nm
Forward Voltage IF=20mA	VF [2]	Red Blue Green			2 3.3 3.3	2.5 4 4.1	V
Reverse Current (VR = 5V)	IR	Red Blue Green				10 50 50	uA
Temperature coefficient of λpeak IF=20mA, -10°C≤ T≤100°C	TC λ peak	Red Blue Green			0.12 0.06 0.06		nm/°C
Temperature coefficient of λdom IF=20mA, -10°C≤ T≤100°C	TC λ dom	Red Blue Green			0.08 0.05 0.05		nm/°C
Temperature coefficient of VF IF=20mA, -10°C≤ T≤100°C	TCV	Red Blue Green			-2.0 -2.5 -3.0		mV/°C

Notes:

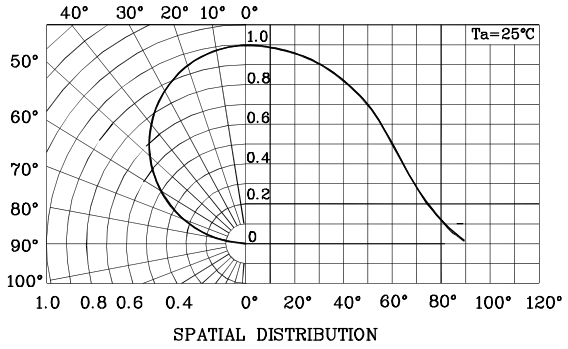
1.The dominant Wavelength (λ d) above is the setup value of the sorting machine. (Tolerance λ d : ±1nm.)

2. Forward Voltage: +/-0.1V.

* wavelength value is in accordance with CIE127-2007 standards.

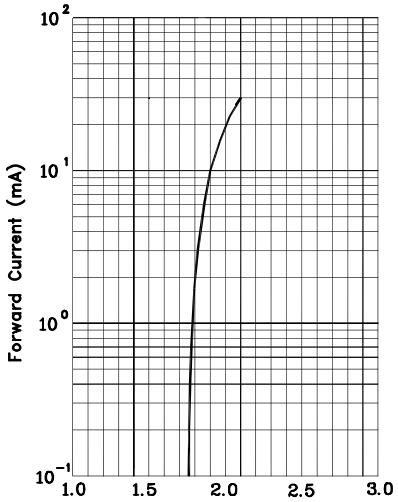


RELATIVE INTENSITY Vs. CIE WAVELENGTH

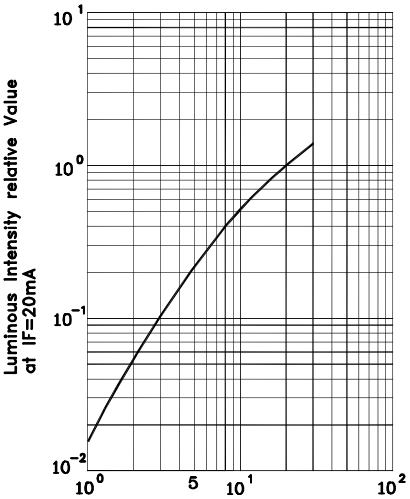


SPATIAL DISTRIBUTION

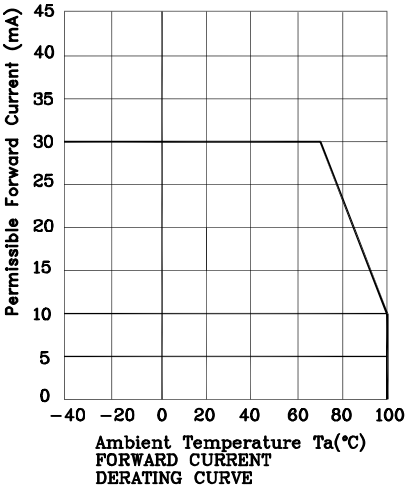
❖ **ME**



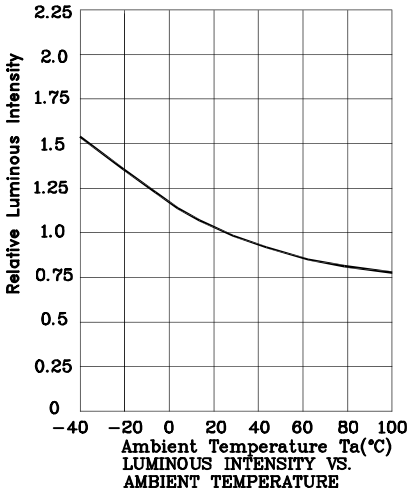
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT

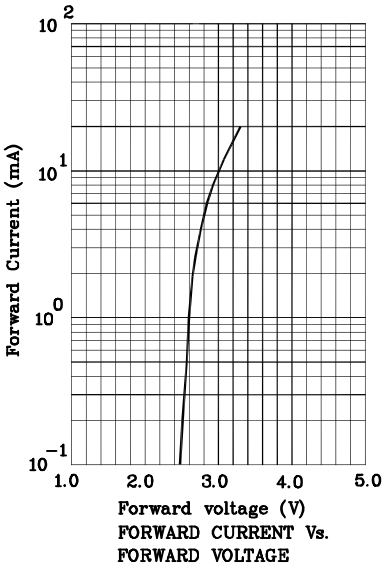


FORWARD CURRENT
DERATING CURVE

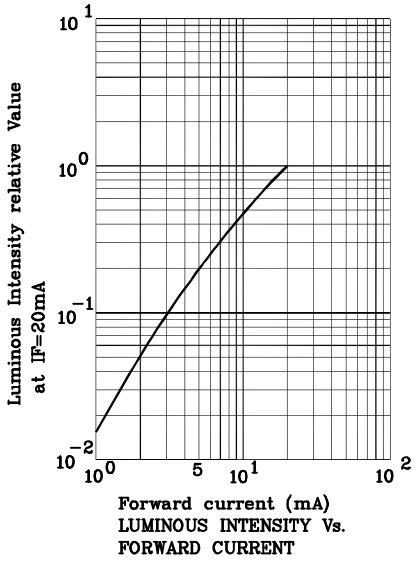


LUMINOUS INTENSITY VS.
AMBIENT TEMPERATURE

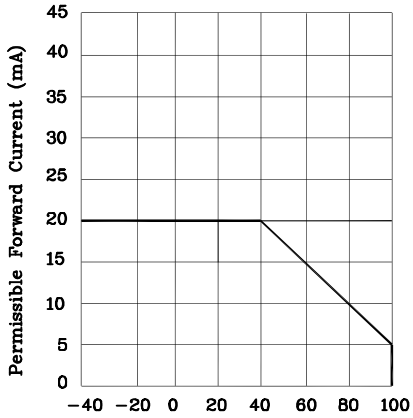
❖ CBD



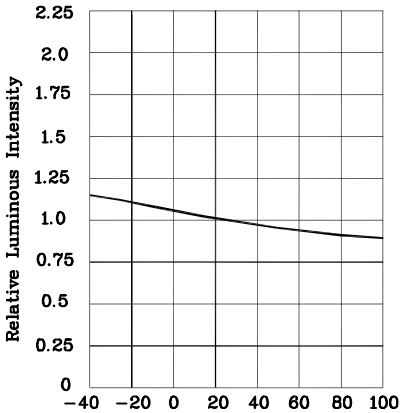
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT

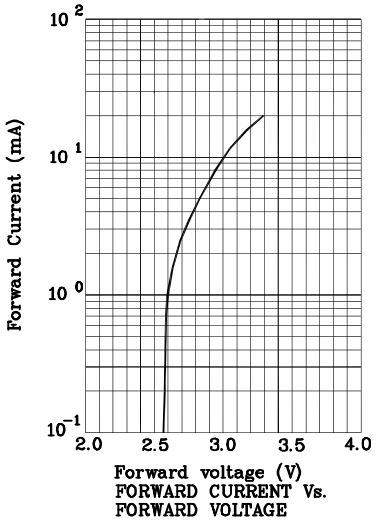


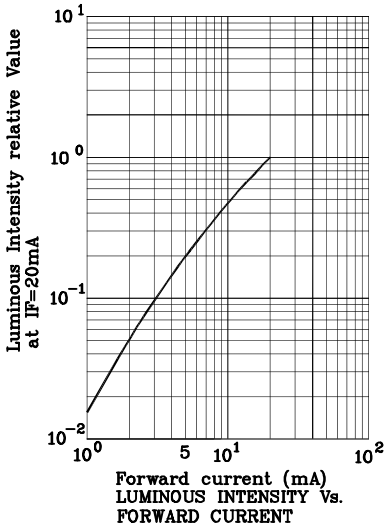
FORWARD CURRENT
DERATING CURVE

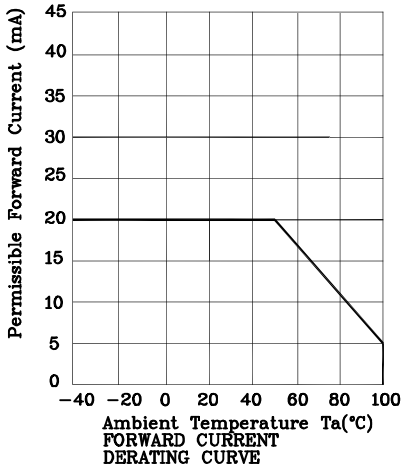


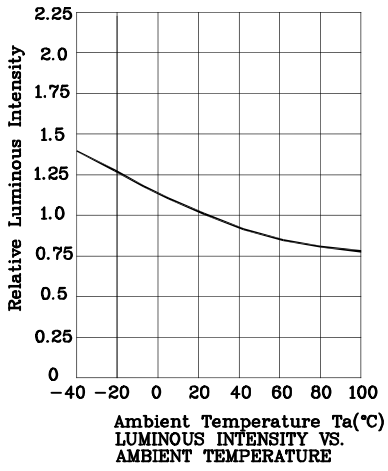
LUMINOUS INTENSITY VS.
AMBIENT TEMPERATURE

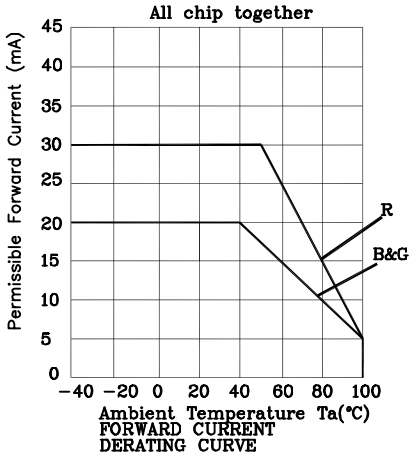
❖ **DG**


Forward Current (mA)
10^2
10^1
10^0
10^{-1}
2.0
2.5
3.0
3.5
4.0
Forward voltage (V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE


Luminous Intensity relative Value
at IF=20mA
10^1
10^0
10^{-1}
10^{-2}
10^0
5
10^1
10^2
Forward current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT

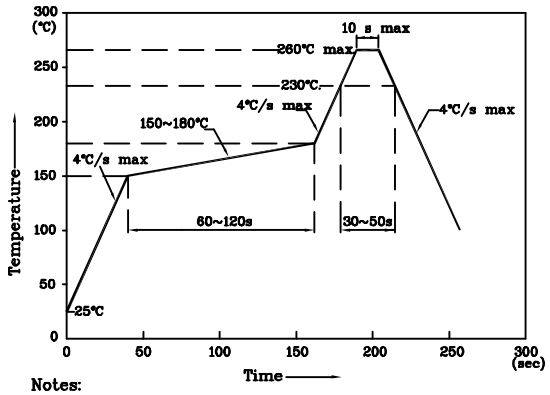

Permissible Forward Current (mA)
45
40
35
30
25
20
15
10
5
0
−40 −20 0 20 40 60 80 100
Ambient Temperature Ta(°C)
FORWARD CURRENT
DERATING CURVE


Relative Luminous Intensity
2.25
2.0
1.75
1.5
1.25
1.0
0.75
0.5
0.25
0
−40 −20 0 20 40 60 80 100
Ambient Temperature Ta(°C)
LUMINOUS INTENSITY VS.
AMBIENT TEMPERATURE


All chip together
Permissible Forward Current (mA)
45
40
35
30
25
20
15
10
5
0
R
B&G
−40 −20 0 20 40 60 80 100
Ambient Temperature Ta(°C)
FORWARD CURRENT
DERATING CURVE

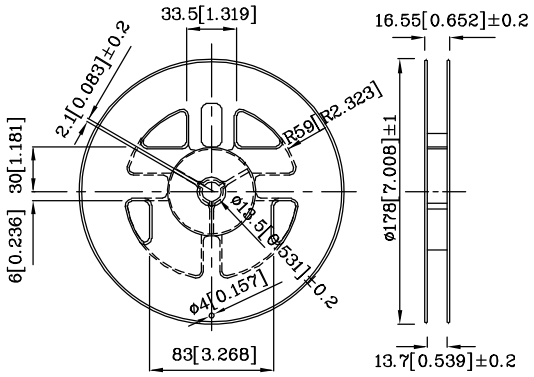
Reflow soldering is recommended and the soldering profile is shown below.
Other soldering methods are not recommended as they might cause damage to the product.

Reflow Soldering Profile for SMD Products (Pb−Free Components)

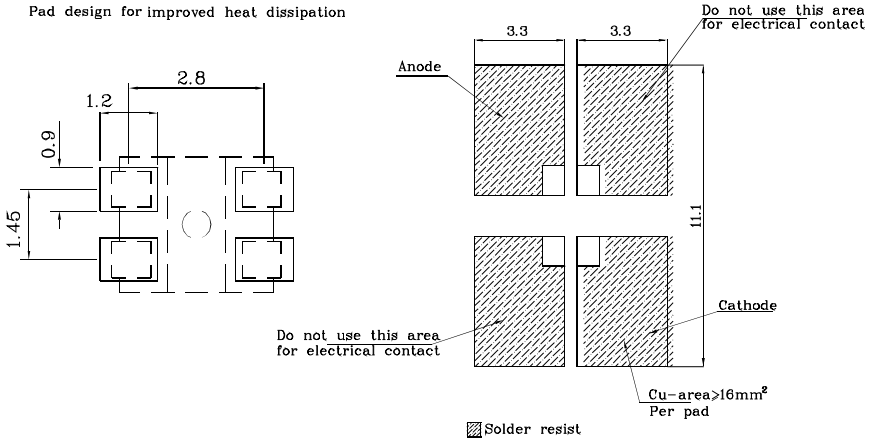


Notes:
1. Maximum soldering temperature should not exceed 260°C
2. Recommended reflow temperature: 145°C−260°C
3. Do not put stress to the epoxy resin during high temperatures conditions

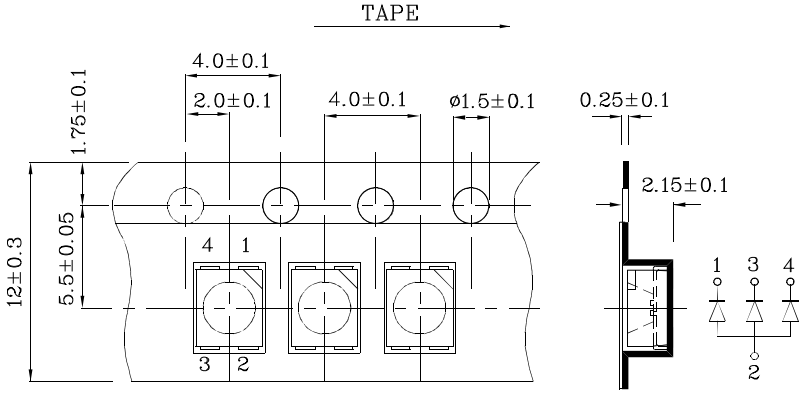
❖ Reel Dimension



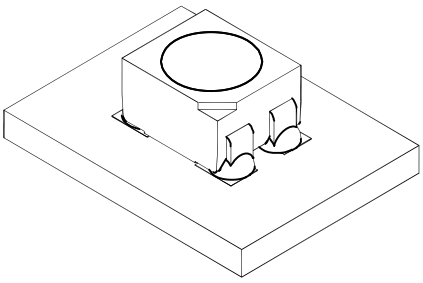
❖ Recommended Soldering Pattern (Units : mm; Tolerance: ± 0.1)



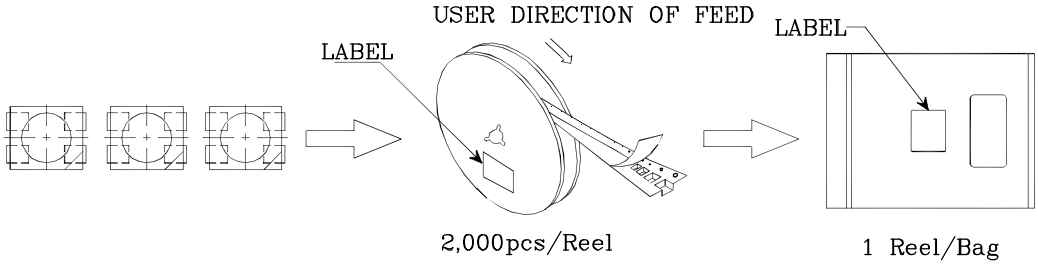
❖ Tape Specification (Units : mm)

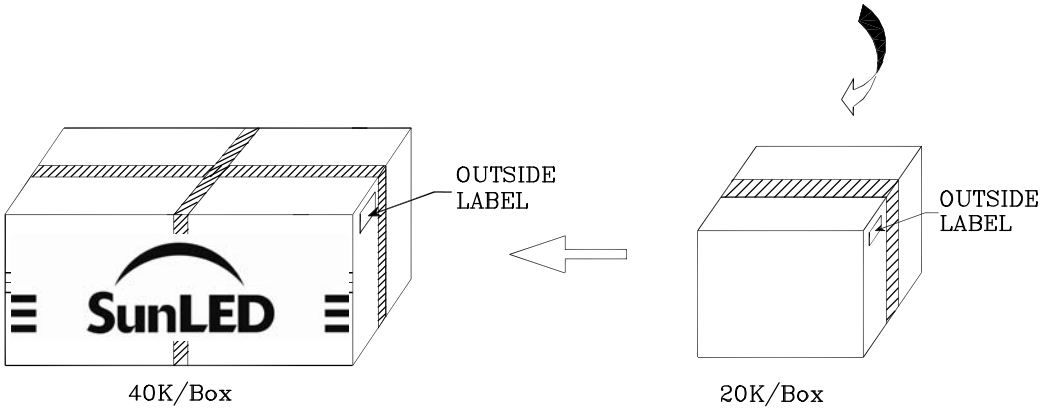


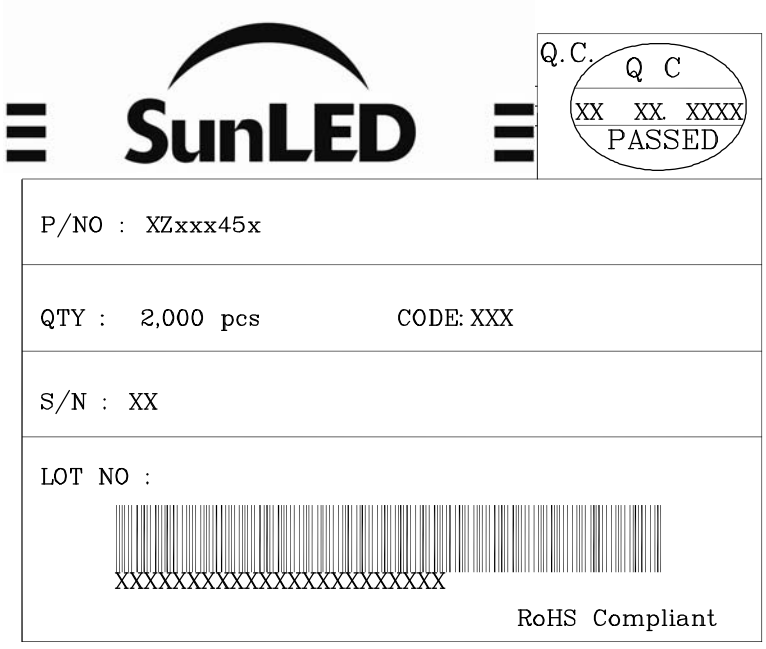
❖ The device has a single mounting surface. The device must be mounted according to the specifications.



PACKING & LABEL SPECIFICATIONS







TERMS OF USE

1. Data presented in this document reflect statistical figures and should be treated as technical reference only.
2. Contents within this document are subject to improvement and enhancement changes without notice.
3. The product(s) in this document are designed to be operated within the electrical and environmental specifications indicated on the datasheet. User accepts full risk and responsibility when operating the product(s) beyond their intended specifications.
4. The product(s) described in this document are intended for electronic applications in which a person's life is not reliant upon the LED. Please consult with a SunLED representative for special applications where the LED may have a direct impact on a person's life.
5. The contents within this document may not be altered without prior consent by SunLED.
6. Additional technical notes are available at http://www.SunLEDusa.com/TechnicalNotes.asp

Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below

Lot Tolerance Percent Defective (LTPD) : 10%

No.	Test Item	Standards	Test Condition	Test Times / Cycles	Number of Damaged
1	Continuous operating test	-	Ta =25°C ,IF = maximum rated current*	1,000 h	0 / 22
2	High Temp. operating test	EIAJ ED-4701/100(101)	Ta = 100°C IF = derated current at 100°C	1,000 h	0 / 22
3	Low Temp. operating test	-	Ta = -40°C, IF = maximum rated current*	1,000 h	0 / 22
4	High temp. storage test	EIAJ ED-4701/100(201)	Ta = maximum rated storage temperature	1,000 h	0 / 22
5	Low temp. storage test	EIAJ ED-4701/100(202)	Ta = -40°C	1,000 h	0 / 22
6	High temp. & humidity storage test	-	Ta = 60°C, RH = 90%	500 h	0 / 22
7	High temp. & humidity operating test	-	Ta = 60°C, RH = 90% IF = derated current at 60°C	500 h	0 / 22
8	Soldering reliability test	EIAJ ED-4701/100(301)	Moisture soak : 30°C,70% RH, 72h Preheat : 150~180°C(120s max.) Soldering temp : 260°C(10s)	2 times	0 / 18
9	Thermal shock operating test	-	Ta = -40°C(15min) ~ 100°C(15min) IF = derated current at 100°C	1,000 cycles	0 / 22
10	Thermal shock test	-	Ta = -40°C(15min) ~ 100°C(15min)	1,000 cycles	0 / 22
11	Electric Static Discharge (ESD)	EIAJ ED-4701/100(304)	C = 100pF , R2 = 1.5KΩ V = 3000V(Red) V=450V(Green) V=250V(Bluee)	Once each Polarity	0 / 22
12	Vibration test	-	a = 196m/s² , f = 100~2KHz , t = 48min for all xyz axes	4 times	0 / 22

* : Refer to forward current vs. derating curve diagram

Failure Criteria

Items	Symbols	Conditions	Failure Criteria
luminous Intensity	Iv	I_F = 20mA	Testing Min. Value <Spec.Min.Value x 0.5
Forward Voltage	V_F	I_F = 20mA	Testing Max. Value ≥Spec.Max.Value x 1.2
Reverse Current	I_R	V_R = Maximum Rated Reverse Voltage	Testing Max. Value ≥Spec.Max.Value x 2.5
High temp. storage test	-	-	Occurrence of notable decoloration, deformation and cracking