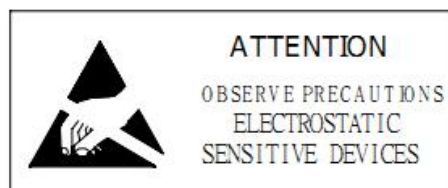
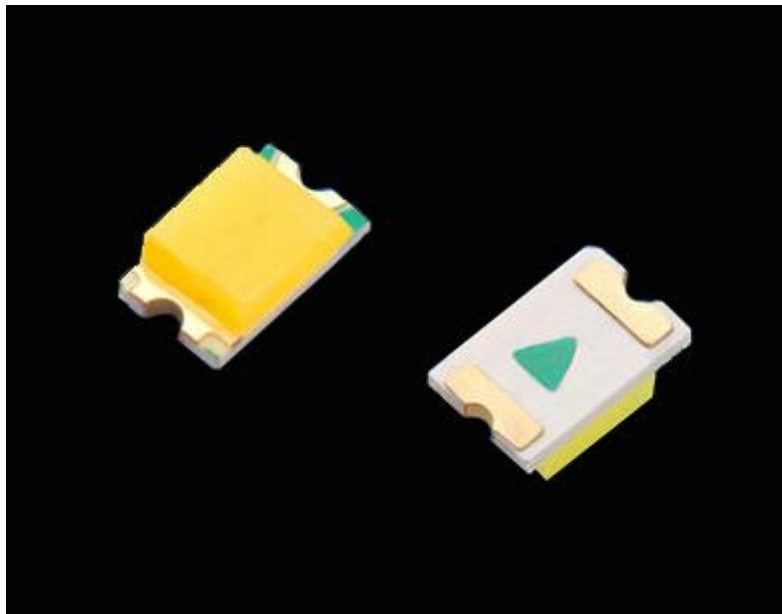


TOP LED:0603WC **(0603 SMD LED-White)**

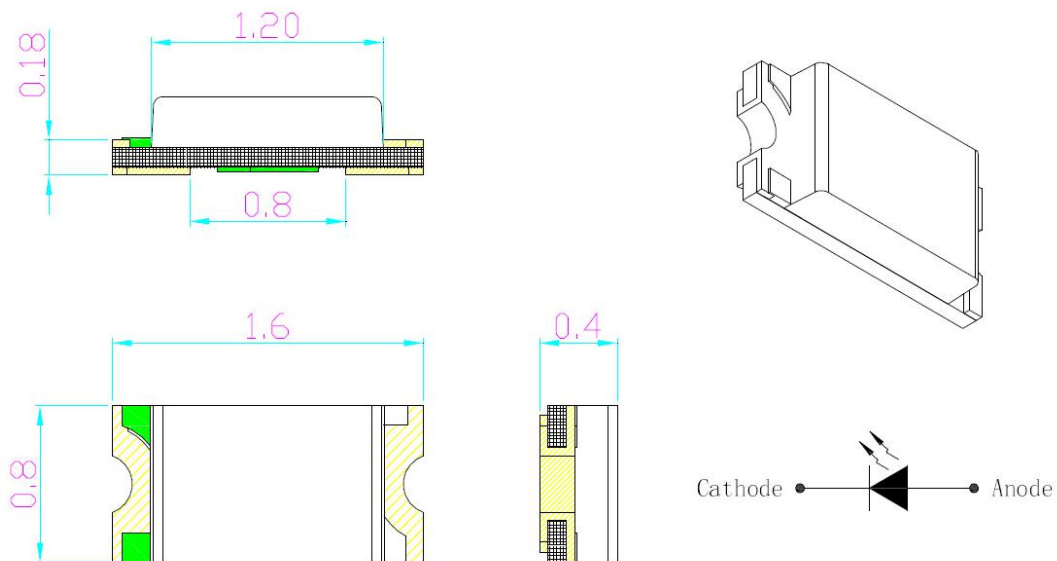


CUSTOMER APPROVED SIGNATURES	SALES APPROVED	APPROVED BY	CHECKED BY	PREPARED BY

1. Features

- Color :7000k White LED
- Lens: Water clear
- High Luminous LEDS
- Low forward voltage
- Meet ROHS, Green Product
- Compatible With Infrared Reflow Solder And Wave Solder Process

2. Package Profile & Soldering PAD Suggested



Notes: 1. All dimensions are in millimeters ;
2. Tolerance is ± 0.10 mm unless otherwise noted.

**3. Absolute Maximum Ratings At Ta=25°C**

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	120	mW
Pulse Forward Current	IFP	100	mA
Forward Current	IF	30	mA
Reverse Voltage	VR	5	V
Junction Temperature	Tj	100	°C
Operating Temperature	Topr	-40 ~ +80	°C
Storage Temperature Range	Tstg	-40 ~ +100	°C
Soldering Temperature	Tsol	260	°C
Electro-Static-Discharge(HBM)	ESD	1000	V
Service life under normal conditions	Time	80000	H
Warranty	Time	5	Years
Antistatic bag	Piece	4000	Bag

***Pulse Forward Current Condition:Duty 1% and Pulse Width=10us.**

***Soldering Condition:Soldering condition must be completed with 3 seconds at 260°C**

4. Electrical Optical Characteristics At Ta=25°C

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage	VF	2.8	3.0	3.4	V	IF=20mA
Luminous Intensity	IV	150		170	mcd	IF=5mA
		600		900		IF=20mA
Color Rendering Index	Ra	70				IF=20mA
Color Temperature	Tc	6000		9000	K	IF=20mA
CIE 1931 Coordinate	X/Y	X:0.25-0.33 Y:0.25-0.33				IF=20mA
Half Width	$\Delta\lambda$		15		nm	IF=20mA
Viewing Half Angle	2 θ 1/2		±70		deg	IF=20mA
Reverse Current	IR			5	uA	VR=5V
Rise Time	tr		15		ns	IF=20mA
Fall Time	tf		15		ns	IF=20mA

*Luminous Intensity is measured by ZWL600.

* θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

* λ P is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

5. Typical Electrical-Optical Characteristics Curves

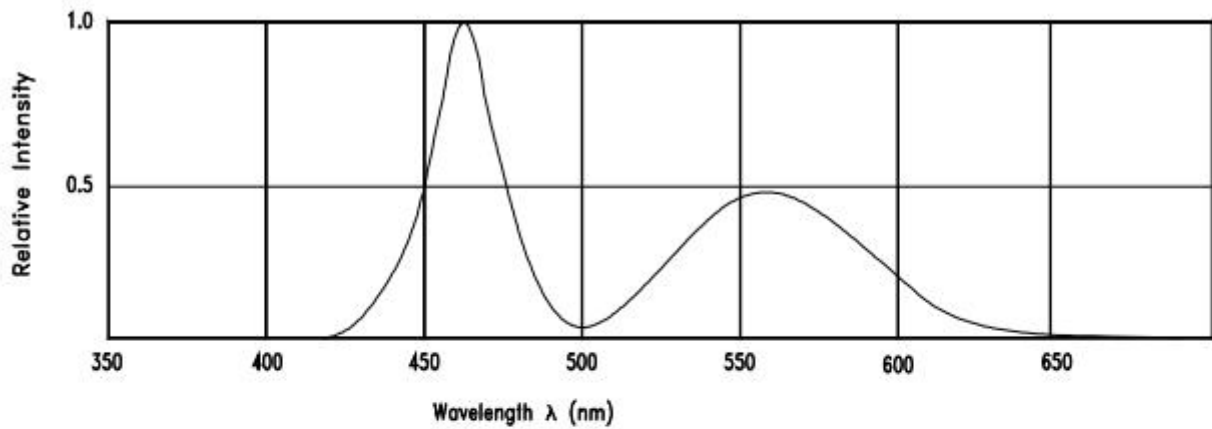


Fig.1 Relative Intensity vs. Wavelength

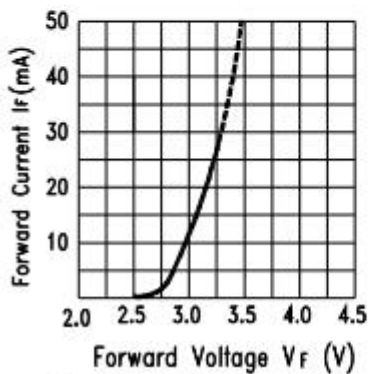


Fig.2 Forward Current vs. Forward Voltage

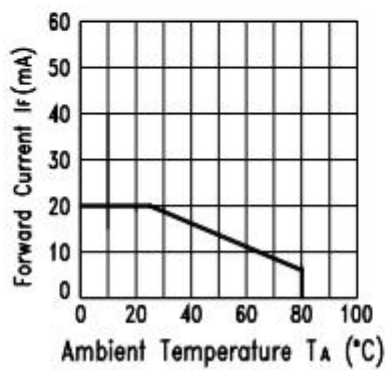


Fig.3 Forward Current Derating Curve

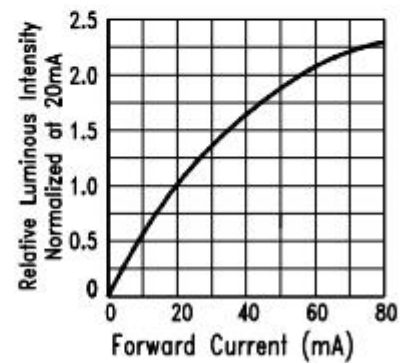


Fig.4 Relative Luminous Intensity vs. Forward Current

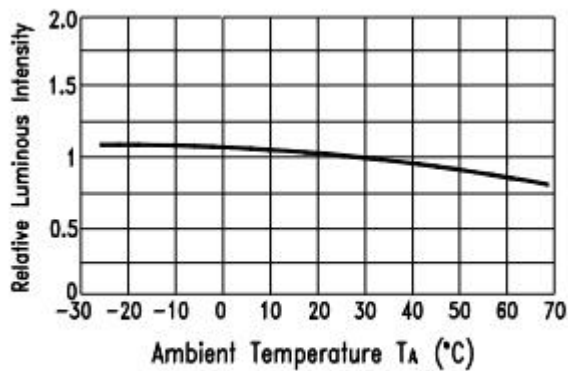


Fig.5 Luminous Intensity vs. Ambient Temperature

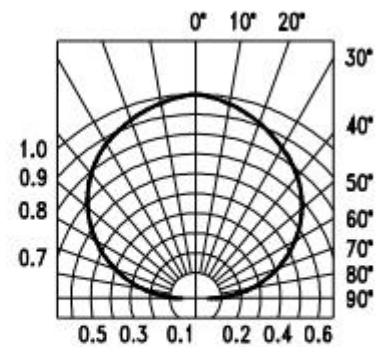


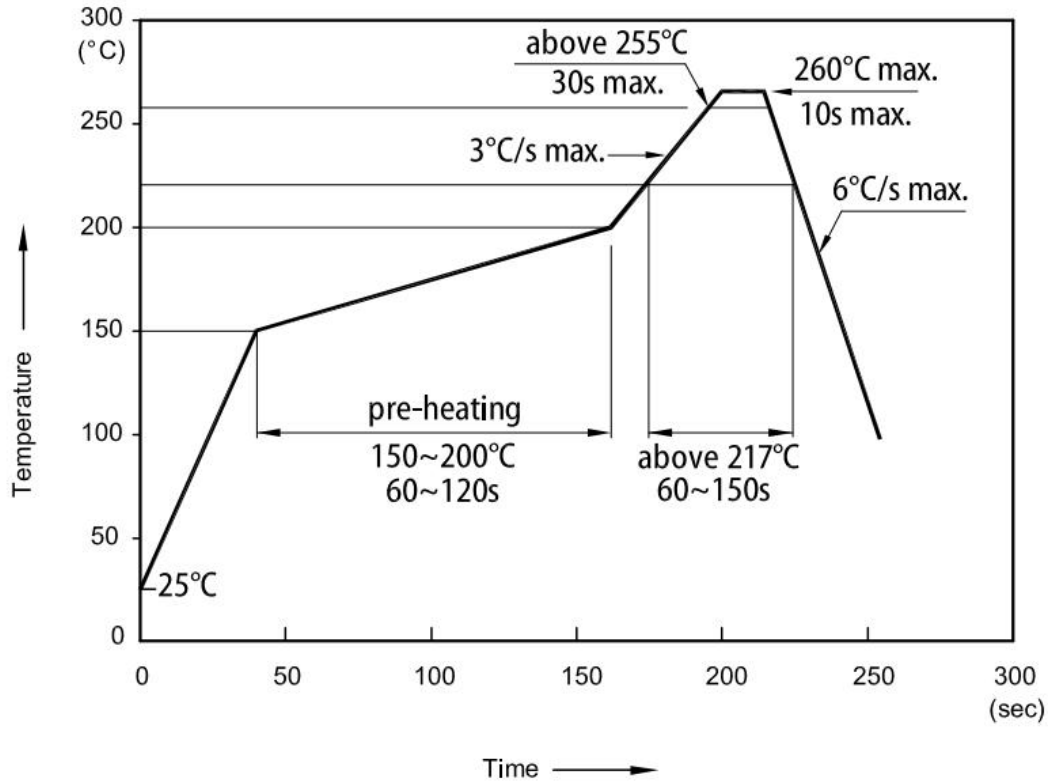
Fig.6 Spatial Distribution

6. Reliability Test

Classification	Test Item	Test Condition	Reference Standard	Reference Standard
Endurance Test	Operation Life	Ta= Under Room Temperature As Per Data Sheet Maximum Rating	1000HRS (-24HRS,+72HRS)*@20mA	MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1
	High Temperature, High Humidity Storage	IR-Reflow In-Board, 2 Times Ta= 65±5℃,RH= 90~95%	240HRS±2HRS	MIL-STD-202F:103B JIS C 7021:B-11
	High Temperature Storage	Ta= 105±5℃	1000HRS (-24HRS,+72HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= -55±5℃	1000HRS (-24HRS,+72H RS)	JIS C 7021:B-12
Environmental Test	Temperature Cycling	105℃ ~ 25℃ ~ -55℃ ~ 25℃ 30mins 5mins 30mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4
	Thermal Shock	IR-Reflow In-Board, 2 Times 85 ± 5℃ ~ -40℃ ± 5℃ 10mins 10mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Solder Resistance	T.sol= 260 ± 5℃	10 ± 1secs	MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1
	IR-Reflow Normal Process	Ramp-up rate(183℃ to Peak) +3℃ / second max Temp. maintain at 125(±25)℃ 120 seconds max Temp. maintain above 183℃ 60-150 seconds Peak temperature range 235℃+5/-0℃ Time within 5℃ of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate +6℃/second max	----	MIL-STD-750D:2031.2 J-STD-020C
	IR-Reflow Pb Free Process	Ramp-up rate(217℃ to Peak) +3℃ / second max Temp. maintain at 175(±25)℃ 180 seconds max Temp. maintain above 217℃ 60-150 seconds Peak temperature range 260℃+0/-5℃ Time within 5℃ of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate +6℃/second max	----	MIL-STD-750D:2031.2 J-STD-020C
	Solderability	T.sol= 235 ± 5℃ Immersion rate 25±2.5 mm/sec Coverage ≥95% of the dipped surface	Immersion time 2±0.5 sec	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 IEC 68 Part 2-20 JIS C 7021:A-2

7. Cautions

Reflow soldering profile for LEAD-FREE SMD process



Notes:

1. Don't cause stress to the LEDs while it is exposed to high temperature.
2. The maximum number of reflow soldering passes is 2 times
3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product

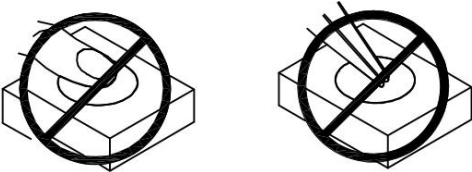
HANDLING PRECAUTIONS

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.

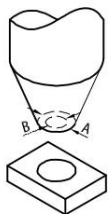


4. 4-A The inner diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks

4-B A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup

4-C The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production

4-D As silicone encapsulation is permeable to gases, some corrosive substances such as H₂S might corrode silver plating of leadframe. Special care should be taken if an LED with Silicone encapsulation is to be used near such substances.



5. Avoid continued exposure to the condensing moisture environment and keep the product away from rapid transitions in ambient temperature.

6. Product in the original sealed package is recommended to be assembled within 24 hours of opening.