



GUANGDONG TONGJIA OPTOELECTRONICS TECHNOLOGY CO., LTD

承認書

Specification For Approval

Customer: (客戶)

Description: (產品描述)

SMD0603灯珠冰蓝

Part number: (產品型號)

TJ-S1608SW6TGLC ICB-A5

Date: (日期)

Approved By: (客戶承認)

Prepared By: (我司承認)

Approval	Check	Design	Sales

核准

審核

製作

業務

Customer Service Hotline: **400-676-8616**

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E-MAIL : dg@togialed.com

FAX: 0769-8200 2227

WEB: www.togialed.com

Features

1.6mm × 0.8mm SMT LED, 0.6mm thickness

Low power consumption

Wide view angle

Package: 4000pcs/reel

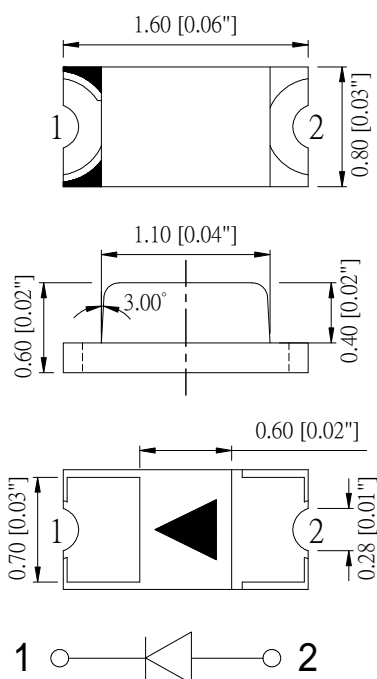
RoHS Compliant

Applications

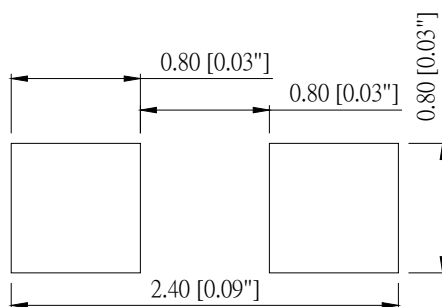
Ideal for back light and indicator

Various colors and lens types available

Package outlines



Recommend Pad Layout



Part No.	Emitted color	Dice	Lens color
TJ-S1608SW6TGLCICB-A5	Ice Blue	InGaN/GaN	Yellow

Notes:

1. All dimensions are in millimeters (inches);
2. Tolerances are $\pm 0.1\text{mm}$ (0.004inch) unless otherwise noted.
3. The appearance and specifications of the product may be modified for improvement without prior notice.

Absolute maximum ratings (TA=25°C)

Parameter	Symbol	Value	Unit
Forward current	If	20	mA
Power dissipation	Pd	68	mw
Operating temperature	Top	-40 ~+80	°C
Storage temperature	Tstg	-40 ~+85	°C
Peak pulsing current (1/8 duty f=1kHz)	Ifp	60	mA

Notes:

1. Duty Factor =10%, Frequency=1kHz.
2. Derate linearly as shown in derating curve.

Electro-optical characteristics (TA=25°C)

Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Color Tremperature	If=20mA	CCT	X:0.19 Y:0.26	-- --	0.23 0.33	K
Forward voltage	If=20mA	Vf	2.8	--	3.4	V
Luminous intensity	If=20mA	Iv	400	630	--	mcd
Viewing angle at 50% Iv	If=10mA	2 θ 1/2	--	120	--	Deg
Reverse current	Vr=5V	Ir	--	--	10	μA

Notes:

1. Luminous Intensity measurement tolerance: ±10%.
2. Wavelength measurement tolerance: ±1nm.
3. Forward voltage measurement tolerance: ±0.1V.
4. Reverse voltage (VR) condition is applied to IR test only. The device is not designed for reverse operation.

Optical characteristic curves

Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

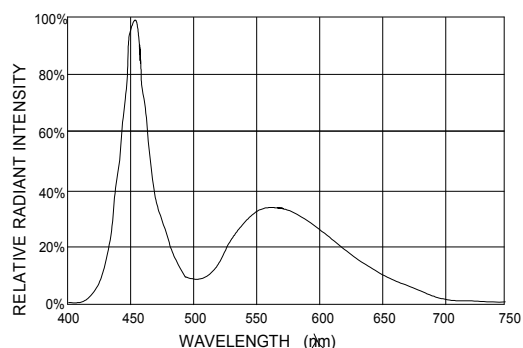


Fig.2 FORWARD CURRENT VS. AMBIENT TEMPERATURE

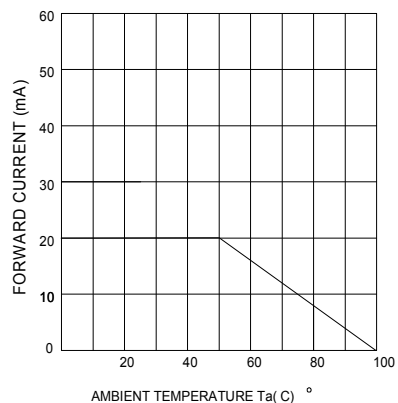


Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

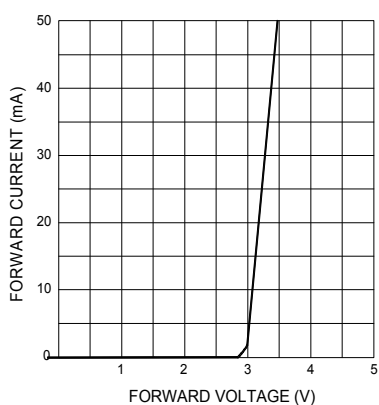


Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

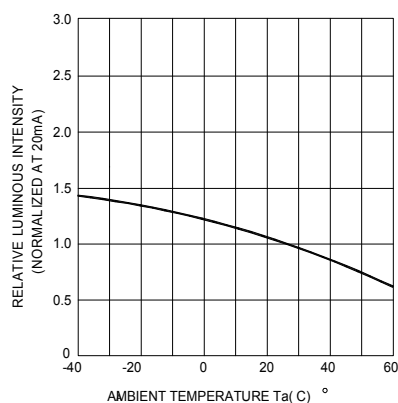


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

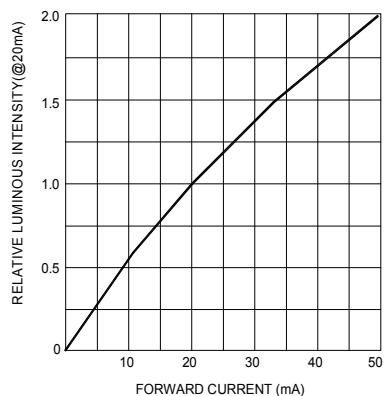
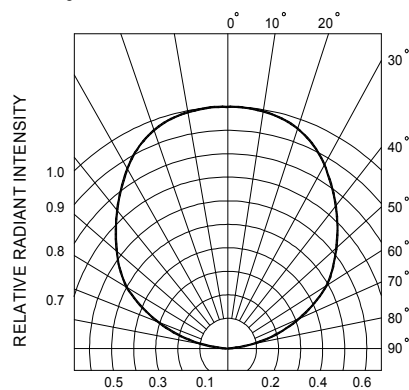
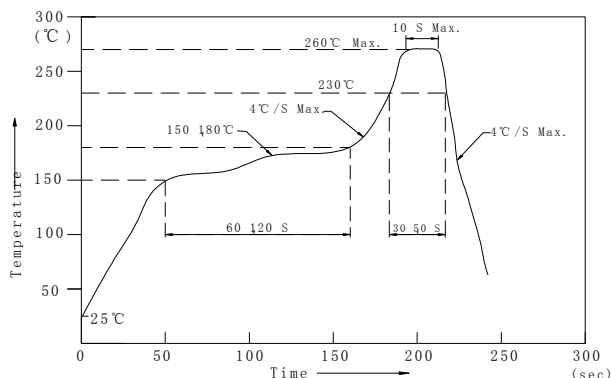


Fig.6 RADIATION DIAGRAM



Reflow Profile

■ Reflow Temp/Time



Notes:

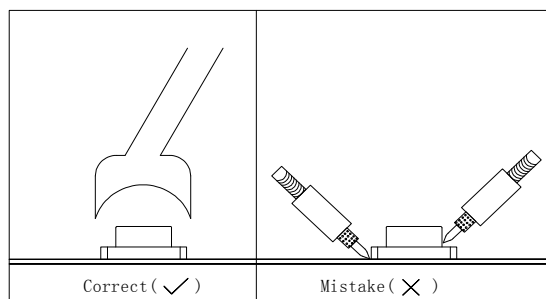
1. We recommend the reflow temperature 245°C (±5°C). the maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

■ Soldering iron

Basic spec is $\leq 5\text{sec}$ when 260°C. If temperature is higher, time should be shorter (+10°C → -1sec). Power dissipation of iron should be smaller than 20W, and temperatures should be controllable. Surface temperature of the device should be under 230°C.

■ Rework

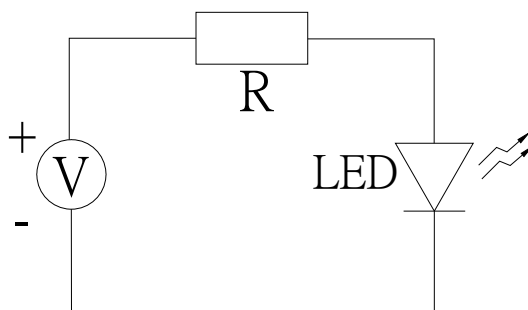
1. Customer must finish rework within 5 sec under 260°C.
2. The head of iron can not touch copper foil
3. Twin-head type is preferred.



- Avoid rubbing or scraping the resin by any object, during high temperature, for example reflow solder etc.

Test circuit and handling precautions

■ Test circuit



1. Handling precautions

1.1 When designing a circuit, it is essential to ensure that the current flowing through the LED does not exceed the specified maximum value.

1.2 LED is a nonlinear component, and when used at a constant voltage, it requires the series connection of an appropriate resistor to prevent minor voltage variations from causing significant current changes, which could lead to product malfunction.

1.3 When using LEDs in parallel, it is necessary to connect an appropriate resistor in series with each LED to avoid voltage differences between LEDs, which can lead to uneven current distribution and brightness variations.

2. Storage

2.1 It is recommended to store the products in the following conditions:

Humidity: 60% R.H. Max.

Temperature : 5°C~30°C(41°F~86°F)

2.2 Shelf life in sealed bag: 3 month at <5°C~30°C and <30% R.H. after

the package is Opened, the products should be used within a week or they should be keeping to stored at ≤ 20 R.H. with zip-lock sealed.

3. Baking

It is recommended to baking before soldering when the pack is unsealed after 24hrs. The Conditions are as followings:

3.1 $60 \pm 3^\circ\text{C}$ x(12~24hrs) and <5%RH, taped reel type

3.2 $100 \pm 3^\circ\text{C}$ x(45min~1hr), bulk type

3.3 $130 \pm 3^\circ\text{C}$ x(15~30min), bulk type

Test items and results of reliability

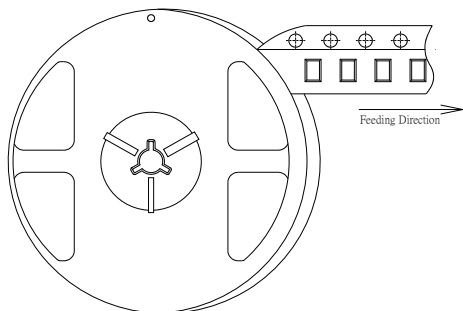
Type	Test Item	Test Conditions	Note	Number of Damaged
Environmental Sequence	Temperature Cycle	-20℃ 30min ↑ ↓ 80℃ 30min	100 cycle	0/22
	Thermal Shock	-20℃ 15min ↑ ↓ 80℃ 15min	100 cycle	0/22
	High Humidity Heat Cycle	30℃ ⇔ 65℃ 90%RH 24hrs/1cycle	10 cycle	0/22
	High Temperature Storage	Ta=80℃	1000 hrs	0/22
	Humidity Heat Storage	Ta=60℃ RH=90%	1000 hrs	0/22
	Low Temperature Storage	Ta=-30℃	1000 hrs	0/22
Operation Sequence	Life Test	Ta=25℃ IF=20mA	1000 hrs	0/22
	High Humidity Heat Life Test	60℃ RH=90% IF=10mA	500 hrs	0/22
	Low Temperature Life Test	Ta=-20℃ IF=20mA	1000 hrs	0/22

Note:

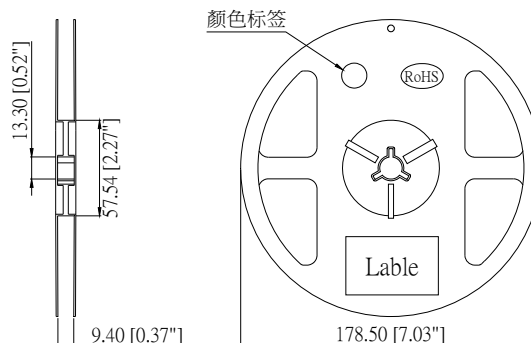
If the customer needs to conduct a high-temperature and high-humidity lighting test, please use a DC regulated power supply and directly light up the LED beads according to the test current level. Our company cannot evaluate the effectiveness of other lighting methods.

1608 Series SMD Chip LED Lamps Packaging Specifications

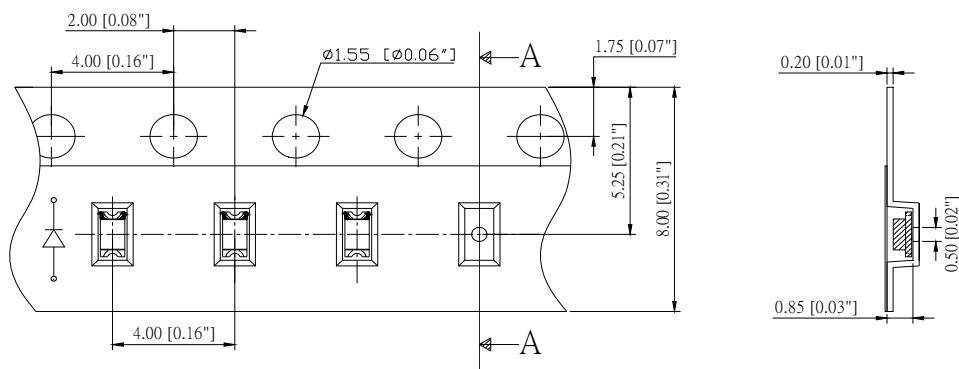
● Feeding Direction



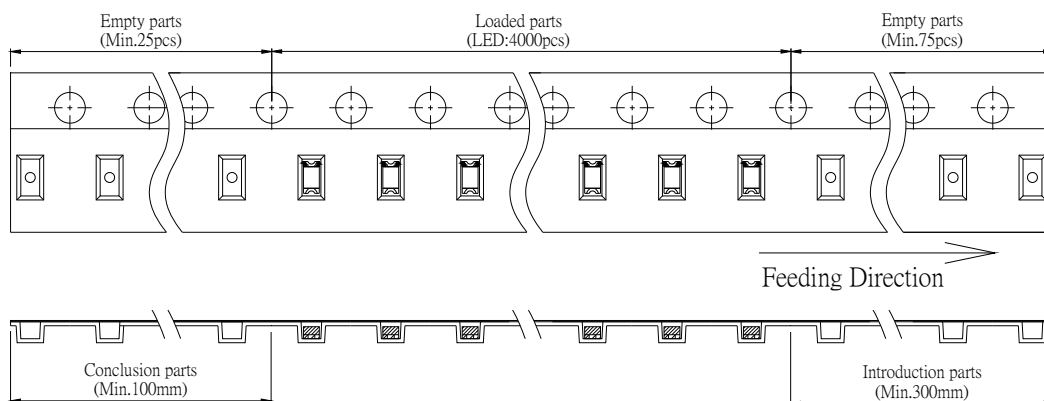
● Dimensions of Reel (Unit: mm)



● Dimensions of Tape (Unit: mm)



● Arrangement of Tape

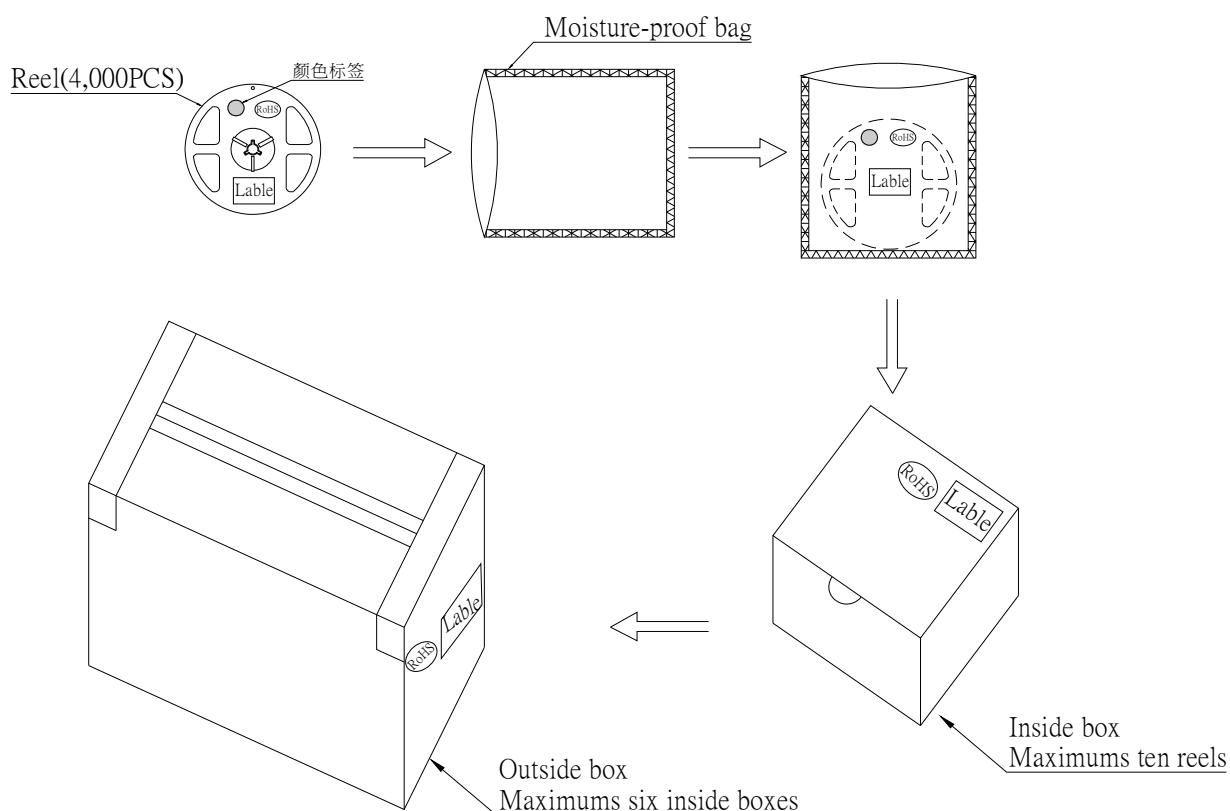


Notes:

1. Empty component pockets are sealed with top cover tape;
2. The maximum number of missing lamps is two;
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.
4. 4,000 pcs/Reel.

1608 Series SMD Chip LED Lamps Packaging Specifications

- Packaging specifications



Notes:

Reeled products (numbers of products are 4,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, Seven moisture-proof bag of maximums (total maximum number of products are 40,000pcs) packed in an inside box (about size: 240 x 220 x 120mm) and four inside boxes of maximums are put in the outside box (about size: 460mm x 246mm x 250mm) Together with buffer material, and it is packed. (Part No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the label on the cardboard box.) The number of the loading steps of outside box (cardboard box) has it to three steps.

When using multiple identical LED products together, make sure to check the BIN number and parameters on the packaging bag. After using up one set of BIN number and parameters on the packaging bag. After using up one set of BIN number and parameters, start using the next set. Avoid using with mixed BIN numbers to prevent color differences between the products.

Design consideration:

1. When designing the circuit, it is essential to ensure that the current passing through the LED does not exceed the specified maximum value.

2. When designing the circuit, it is necessary to ensure that when the LED is in operation, the reverse voltage applied to the circuit must be lower than 5V.

3. LED is a nonlinear component. When operating at a constant voltage, an appropriate resistor needs to be connected in series to prevent small voltage fluctuations from causing significant current fluctuations, which could lead to the failure of the product's functionality.

4. When LEDs are used in parallel, an appropriate resistor must be connected in series with each LED to prevent voltage differences between the LEDs from causing uneven current and resulting in brightness variations.

5. Prevention of Reverse Avalanche Breakdown in High-Voltage AC Circuit with Resistance Series Connection:

In simple component design scenarios, it is common to encounter situations where 220VAC/120VAC mains power is directly connected in series with resistors to drive LEDs. In reality, each second, the LED products will experience reverse avalanche breakdown dozens of times, causing certain damage to the LED products. Although they seem to be operating normally, the LED products will thus have a reduced lifespan. Therefore, when designing control circuit boards in such cases, it is recommended to at least series-connect a 1N4007 diode or parallel-connect a diode in reverse polarity, or parallel-connect a voltage stabilizing tube for protection; or you can choose LED products with built-in zener diodes.

6. Prevention of high voltage intrusion during the overall machine withstand voltage test:

For PCBA boards with fewer components, during the production process of electrical appliances that are equipped with metal casings, when conducting a 1800VAC withstand voltage test, high voltage may have the opportunity to intrude through the weak points of the metal casing or the wiring of the LED, causing the LED to be broken and fail. For such products, if they are blue light, emerald green or white light LED products, it is recommended to choose LED products with zener diodes when designing.

7. Transient reverse voltage design avoidance:

When transistors are used for scanning or when dedicated chips such as TM1628 are involved in scanning, the LEDs are always in a high-resistance state during the non-operational phase. In Some circuits are driven solely by the MCU port scanning. During the inactive stage, a reverse 5V voltage is applied to achieve this. The LED chip generates a 8V voltage difference from +3V to -5V. Such frequent transient reverse voltage shock may cause cumulative damage to the blue and white light chips. When designing the program, if it is difficult to switch to high resistance, it is recommended to consider connecting a 4148 diode in series to the common scanning terminal.

8. When using LEDs in high-temperature and high-humidity environments, it is strictly prohibited to apply reverse voltage to prevent metal migration, which could lead to leakage or short circuit.