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LC8808B-3535 LED

SPECIFICIFATION

INTEGRATED LIGHT SOURCE INTELLIGENT CONTROL SMD LED

Document No.: SPC/ LC8808B-3535 LED

Model No.: LC8808B-3535

Description: 3.5x3.7x0.95mm Intelligent control SMD LED

1. General description

The LC8808B-3535 is a three-channel LED driver IC driven by a 12V power supply with high-precision constant-current output and integrated MCU digital connections. Circuits such as ports, data latches, and LED drivers. The peripheral gray MCU control realizes the individual gray scale and cascade control of the chip to realize outdoor large

The color dot matrix illumination control of the screen. The product has excellent performance and reliable quality.

2. Feature

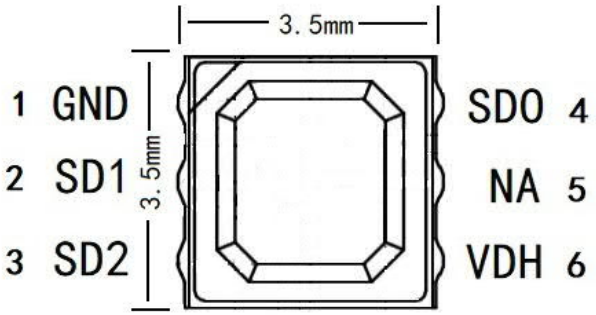
High voltage CMOS process, 12V single point single control
Output constant current value absolute accuracy ± 2%, RGB relative accuracy ± 1%
High efficiency, low power consumption, long transmission distance without discoloration
The default output constant current value is 9mA, suitable for built-in lamp beads
The default power-on does not light up.
Gray scale adjustment circuit (256 levels of grayscale adjustable)
Single-line serial cascading interface (DIN.DOUT)
Built-in high precision and high stability oscillator
Data shaping: automatically receive subsequent data shaping output after receiving the unit data
Data transmission rate 800 Kbps

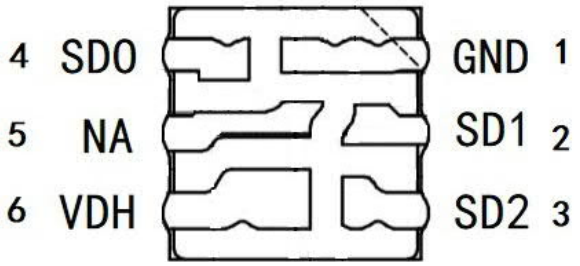
3. Product Naming

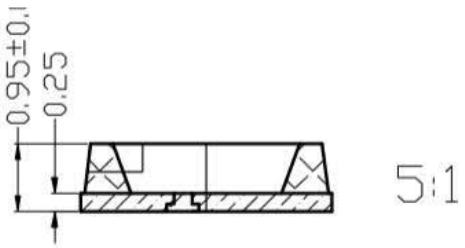
LC8808B mean white surface ,9mA/channel ,White surface,the IC is integrated in 3535 (standard version)

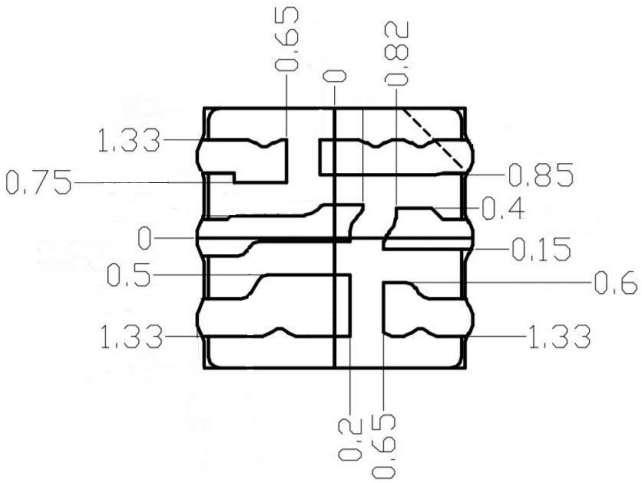
LC8808B-B mean black surface ,9mA/channel ,the IC is integrated in 3535

4. Mechanical Dimensions:









Notes:

1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted

5. Pin Configuration:

NO.	Symbol	Function description
1	GND	Ground
2	SDI	Series data input
3	SD2	Redundant Series data input
4	SDO	Series data output
5	NA	Empty
6	VDH	12V Power supply

6. Absolute Maximum Ratings（Ta=25℃,VSS=0V） :

Parameter	Symbol	Range	Unit
Power supply voltage	VDD	-0.4V～+14	V
Logic input voltage	V_{IN}	-0.5～VDD+0.5	V
R/G/B output current	I_{OUT}	9	mA
Working temperature	Topt	-40~+85	℃
Storage temperature	Tstg	-50~+150	℃
ESD pressure	V_{ESD}	2K	V

7. RGB LED photoelectric parameters

Color	LC8808B-3535 RGB LED Wavelength		
	MCD	Lumen	
Red	620-623nm	800-900mcd	2.5-3lm
Green	517.5-520nm	1600-1800mcd	5.0-6.0lm
Blue	467.5-470nm	500-600mcd	1.5-2lm

8. The electrical parameters (unless otherwise specified, TA=-20 ~ +70 ℃, VDD=4.5～5.5V,VSS=0V):

Parameter	Symbol	Min	Typical	Max	Unit	Test conditions
The chip supply Voltage	VIN	10.8	12	13.2	V	---
R/G/B output current	I_{OUT}	8.82	9	9.18	mA	---
The Signal Input flip threshold	VIH	4	---	---	V	VDD=5.0V
	VIL	---	---	1	V	
Static power consumptionThe frequency of PWM	FPWM	---	8	---	KHZ	------
	IDD	---	2	---	mA	

9 The dynamic parameters (Ta=25 ℃):

Parameter	Symbol	Min	Typical	Max	Unit	Test conditions
The speed of data transmission	FDIN	---	800	---	KHZ	The duty ratio of 67% (data 1)
DOUT transmission delay	TPLH	---	---	500	ns	DIN→DOUT
	TPHL	---	---	500	ns	
OUT Rise/Drop Time	Tr	---	100	---	ns	VDS=1.5 IOUT=13mA
	Tr	---	100	---	ns	

10 function description

The chip adopts single-line communication mode and uses a return-to-zero code to transmit signals. After the power-on reset, the chip receives the number from the DIN terminal.According to the data, after receiving 24 bits, the DOUT port starts to forward data and provides input data for the next chip. DOUT port before forwarding Keep pulling low. At this point, the chip will not receive new data, and the three PWM output ports of the chips OUTR, OUTG, and OUTB are received according to the 24 bit data, the corresponding signal with different duty cycle is issued, and the signal period is 4 ms. If the input signal to the DIN terminal is the RESET signal, The chip sends the received data to the display, and the chip will re-receive the new data after the signal is finished. After receiving the first 24 bits of data,The data is forwarded through the DOUT port. The original output of the OUTR, OUTG, and OUTB pins remains unchanged before the chip receives the RESET code.Change, when receiving a low level RESET code above 80 μ s, the chip will output the 24-bit PWM data pulse width just received to OUTR,On the OUTG, OUTB pins.

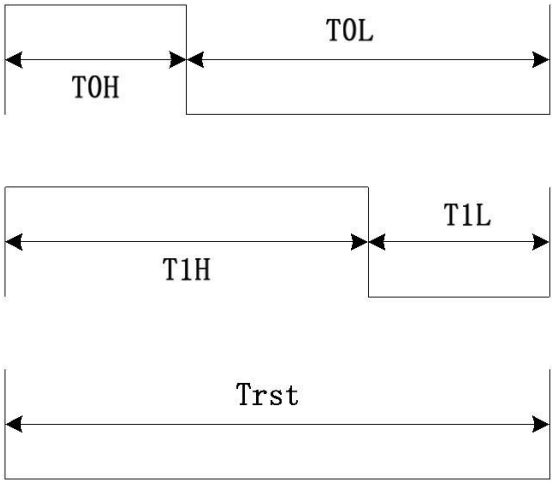
The chip adopts automatic shaping and forwarding technology, so that the number of cascaded chips is not limited by signal transmission, and only the speed of the screen is limited.
For example, we design a 1024 cascade, which has a screen time of 1024X 0.4X 2 = 0.8192ms (the data latency of the chip is 0.4 μ s), there will be no flickering.

11. The data transmission time (TH+TL=1.25μs±600ns)

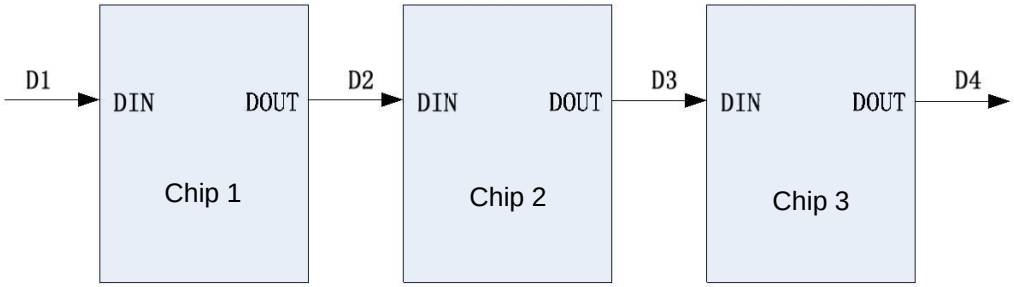
T0H	0 code, high level time	0.3μs	±0.05μs
T0L	0 code, low level time	0.9μs	±0.05μs
T1H	1 code, high level time	0.9μs	±0.05μs
T1L	1 code, low level time	0.3μs	±0.05μs
Trst	Reset code，low level time	80μs	±0.05μs

11. Timing waveform:

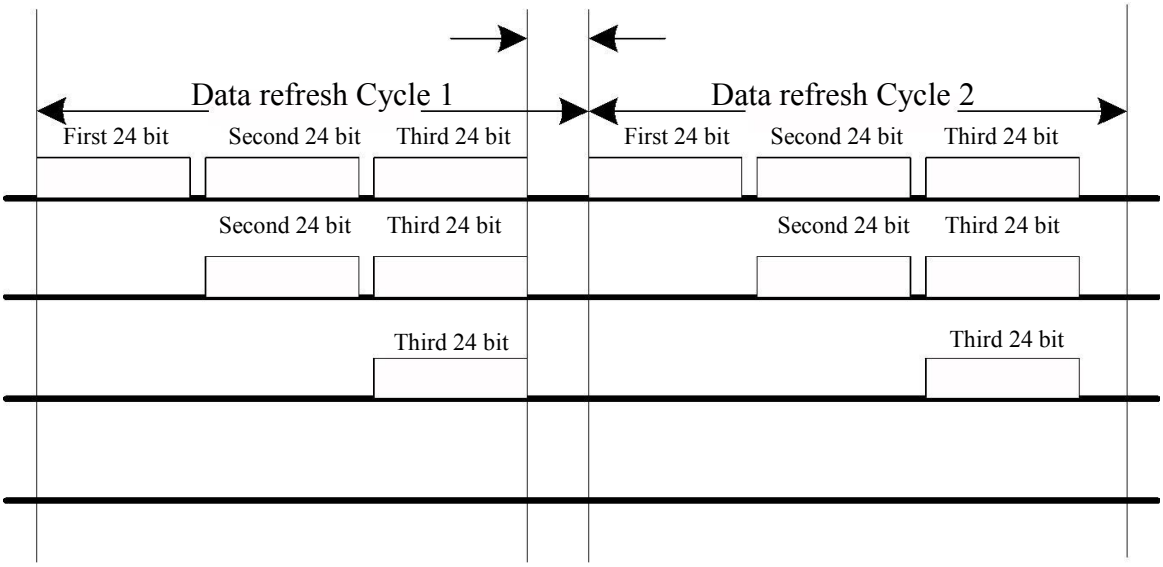
1) Input Code



2) Connect Mode



12. The method of data transmission:



Note: the D1 sends data for MCU, D2, D3, D4 for data forwarding automatic shaping cascade circui

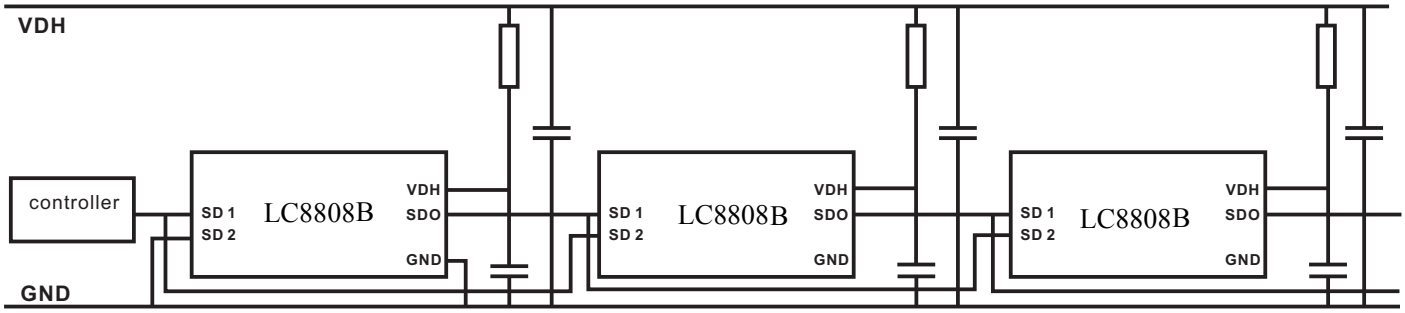
14. The 24bit data Structure

B7	B6	B5	B4	B3	B2	B1	B0	G7	G6	G5	G4
G3	G2	G1	G0	R7	R6	R5	R4	R3	R2	R1	R0

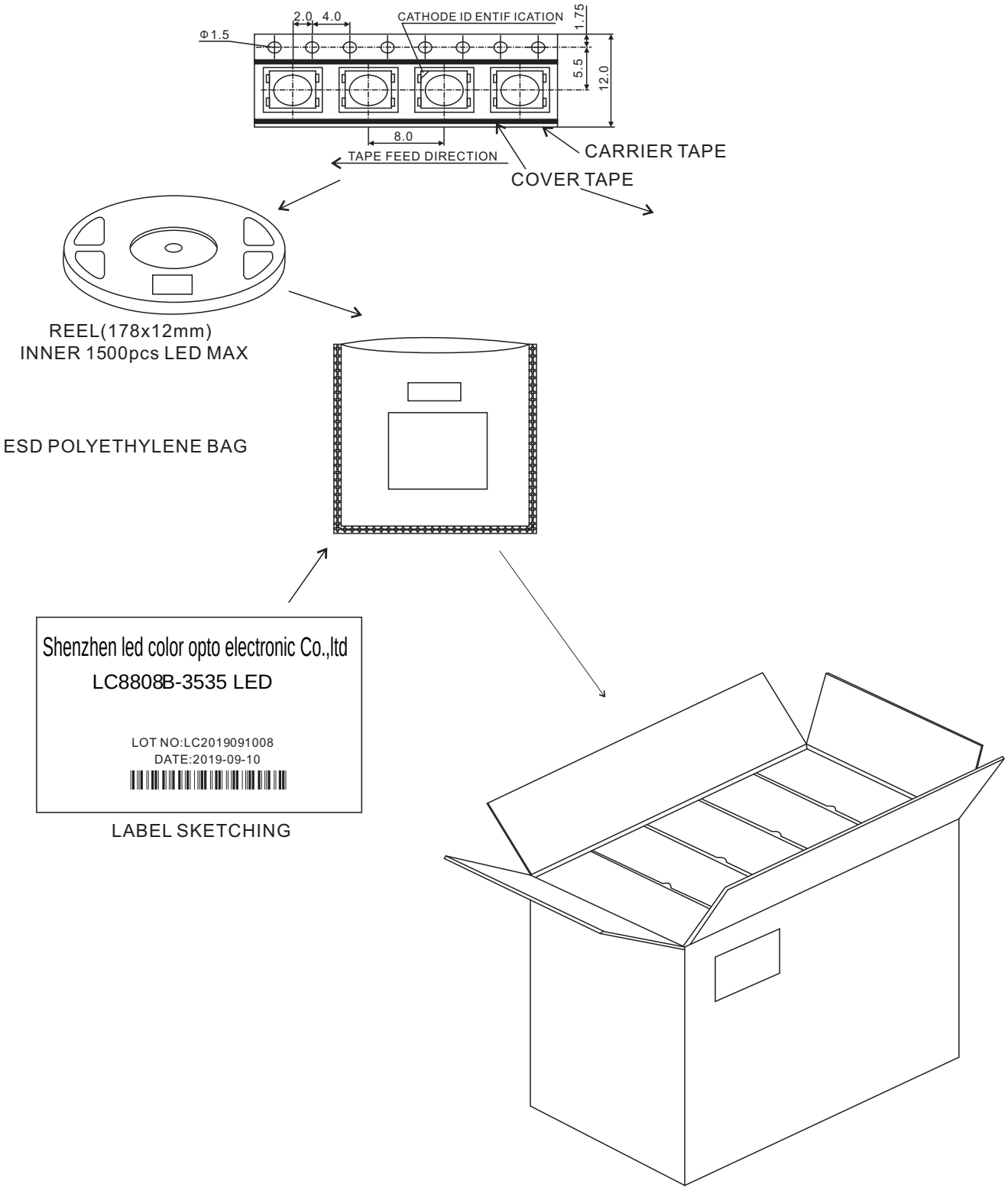
Note: high starting, in order to send data (B7 - B6 - ....R0)

13. The typical application circuit:

LC8808B-3535 LED



14. Packaging Standard:



The reel pack is applied in SMD LED. 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 boxes are not water resistant and therefore must be kept away from water and moisture.

15. Attention

15.1 Dust & Cleaning

The LED use epoxy glue to package the 3535 Surface, epoxy surface can protect optical properties and improved anti-aging properties. However, epoxy is a softer material and prone to attract dust. While a minimal amount of dust and debris on the LED will not cause significant reduction in illumination.We still need to avoid dust falling on the LED surface. After open the bags it must be used immediately.

When you use trichloroethylene or acetone to clean, sometimes the LED surface will dissolve.

Avoid using organic solvent, it is recommended that isopropyl be used as a solvent for cleaning the LEDs.When using other solvents, it should be confirmed beforehand whether the solvents will dissolve thepackage and the resin of not.

Do not clean the LEDs by the ultrasonic. When it is absolutely necessary, the influence as ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power. Baking time and assembled condition.

Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

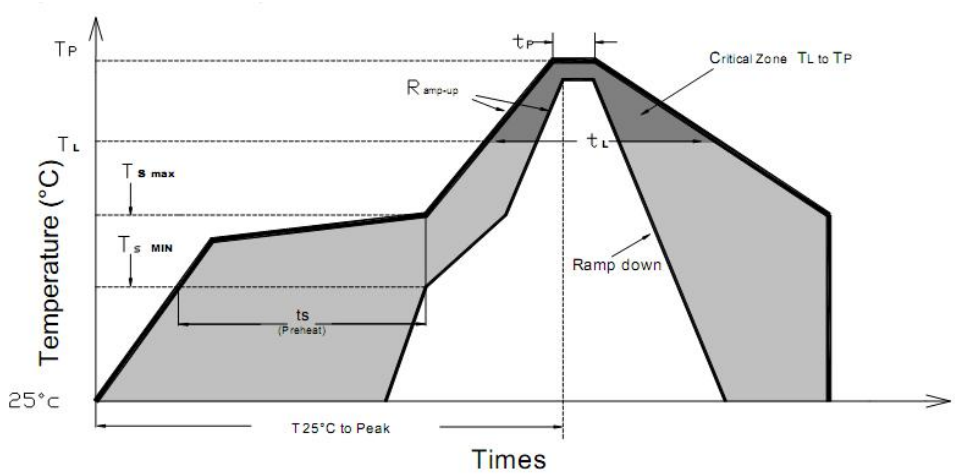
15.2 Dehumidification

LED COLOR smart led are moisture sensitive components, In IPC/JEDEC J-STD-020 MSL Level is 6. **No Matter the Package bag is open or not ,The LED must do dehumidification in the oven for 24 hours at 70 degree before use and used within 4 hours, otherwise it need to be dehumidified again**

15.3 Reflow Soldering Characteristics

In our Test, LED Color comfirm those smart led are compatible with JEDEC J-STD-020C,Customers are required to follow the soldering temperature profile recommended by the solder paste manufacturer used.

Please note that this general guideline may not apply to all PCB design and reflow soldering equipment configurations.



Profile Feature	Lead-Based Solder	Lead-Free Solder
Average Ramp-Up Rate (Ts max to Tp)	3 ℃/second max.	
Preheat: Temperature Min (Ts min)	100℃	150℃
Preheat: Temperature Min (Ts max)	150℃	200℃
Preheat: Time (ts min to ts max)	60-120 seconds	60-180 seconds
Time Maintained Above: Temperature (T L)	183 ℃	217 ℃
Time Maintained Above: Time (t L)	60-150 seconds	60-150 seconds
Peak/Classification Temperature (T P)	215 ℃	238 ℃
Time Within 5℃ ℃ of Actual Peak Temperature (tp)	<10 seconds	<10 seconds
Ramp-Down Rate	6 ℃/second max	6 ℃/second max
Time 25 ℃ ℃ to Peak Temperature	<6 minutes max	<6 minutes max

Note: All temperatures refer to topside of the package, measured on the package body surface.

15.4. Anti-static and surge protection for IC devices

Static electricity and surges can damage the LED products of IC devices, so appropriate protective measures must be taken;

The signal input and output ports of IC devices must be connected in series with protective resistors to prevent product failure due to surge or electrostatic shock ports;

In order to protect the LED products of IC devices, whenever you encounter LEDs, wear anti-static straps, anti-static straps and anti-static gloves.

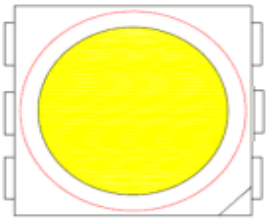
All devices and equipment must be grounded

It is recommended that each product be tested before shipment for relevant electrical tests to select defective products due to static electricity.

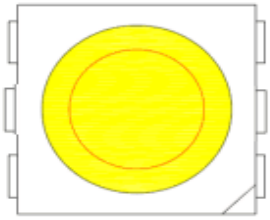
In the design of the circuit, consideration should be given to eliminating the surge to the LED

15.5 Other requirements

SMT nozzle requirements: (red circle refers to the inside diameter of the nozzle)



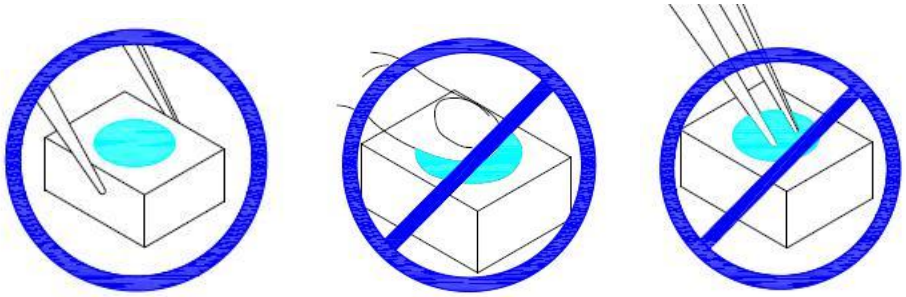
OK (the inside diameter of the nozzle is larger than the light-emitting area of the lamp)



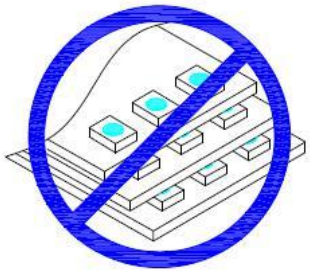
NG (the inside diameter of the nozzle is smaller than the lighting area of the lamp)

Pressing the colloid surface will affect the reliability of LED because the LED is advanced silicone-gel.And therefore precautions should be taken to avoid the strong pressure on the component. It's proper to make the LED be used in safe condition when using a suction nozzle. Silicon packing with soft and elastic, it greatly reduces thermal stresses and unable to bear external mechanical forces. Therefore, preventive measures should be taken in process of manually handling.

① Clip the LED from its side.Neither directly touch the gel surface with the hand or sharp instrument, it may damage its internal circuit.



② Not to be double stacked, it may damage its internal circuit.



③ Can not be stored in or applied in the acidic sites of PH<7.

Modify Records

Item NO.	Rev. No.	Modify Content Summary		
LC8808B-3535	01	Initial Document	Andy Zhu	2019-09-09