SHNNG

SPECIFICATION   FOR   APPROVAL

Customer : _____

Customer Part No: _____

SHINING Part No: SN-LT5050ADABRGB-C_____

Emitted color: RGB+IC_____

Revision History		
Date	**Revision History**	**Prepared**
2023.5.15	New Version	A/0

Confirmed By Customer	Approval by	Prepared by
	Liusan	**Shaochengcheng**

Feature

△ Viewing angle:120 deg

△ 5.4mm×5.0mm×1.58mm

△ Pb-free

△ RoHS compliant lead-free soldering compatible

△ Status indicator

△ Full-color strip.

△ Front panel backlighting

△ Signal and symbol luminary

△ Indoor/outdoor decorative lighting/ curtain display

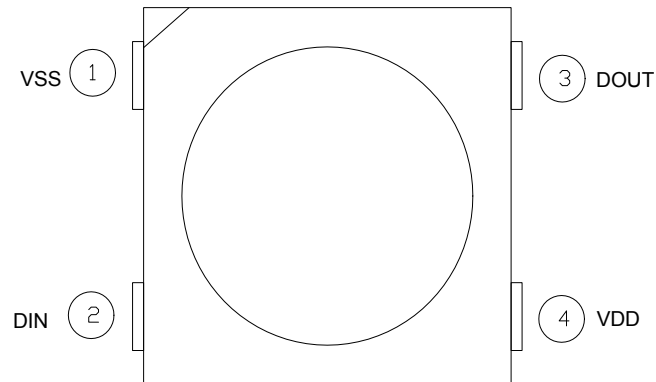△ Telecommunication, office automation, home appliances,

Package Outline
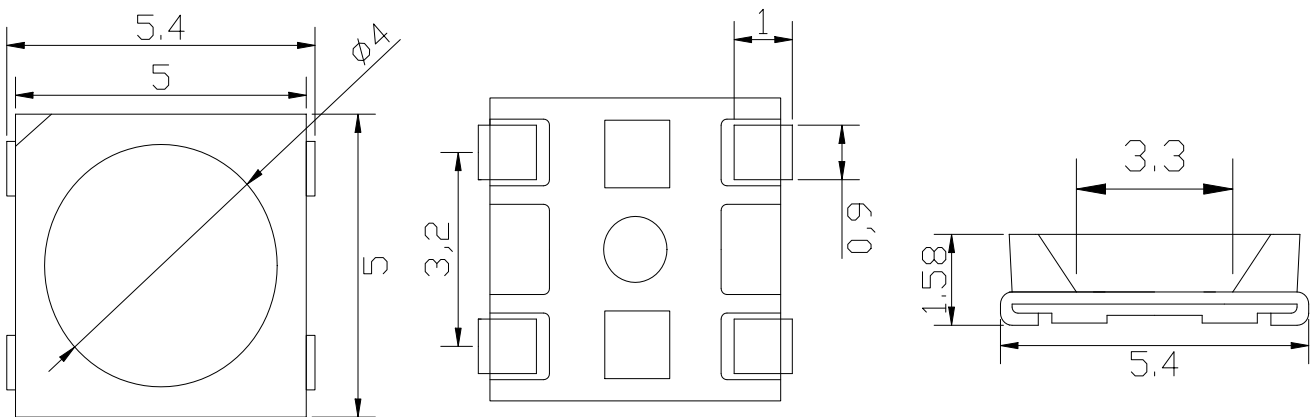
NOTES:

1. All dimensions are in millimeters ;
2. Tolerances are ±0.2mm unless otherwise noted.

ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES
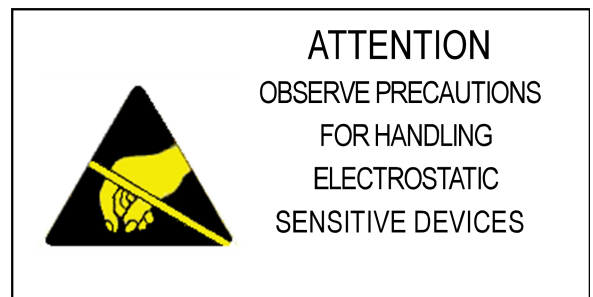
PIN Configuration

No.	Symbol	Function description
①	VSS	Ground
②	DIN	Control date signal input
③	DOUT	Control data signal output
④	VDD	Power supply LED

Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{DD}	+4.2 ~ +5.5	V
Output 0/1/2 Voltage	V_{OUT}	8	V
LED Output Current	I_{OUT}	12.0	mA
Operating Temperature	T_{opr}	-20 ~ +85	℃
Storage Temperature	T_{stg}	-55 ~ +150	℃

Recommended Operating Condition（Ta = -20 ~ +85℃ · Vss = 0V）

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}	—		5.0		V
Input Voltage (High)	V_{IH}	—	3.3	—	VDD	V
Input Voltage (Low)	V_{IL}	—	0	—	0.3 VDD	V

DC Electrical Characteristics（Ta = -20~+85℃ · VDD = 5V · Vss = 0V）

Characteristics	Symbol	Condition	Min.	Typ.	Max.	Unit
Output Current	I_{OL}	OUT_0/1/2 [7:0]=8b'11111111 @ Vout=1.2V	—	12.0	—	mA
Input Voltage (High-level)	V_{IH}		3.3	—	—	V
Input Voltage (Low-level)	V_{IL}		—	—	$0.3\ V_{DD}$	V
Current Dissipation	IDD	OUT_0/1/2 [7:0]= 8b'00000000 @ Latch time=2ms	—	0.6	—	mA

Electro-optical characteristics at Ta=25℃

| Parameter	Test Condition		Symbol	Value			Unit
				Min.	Typ.	Max.	
Luminous intensity	If=12mA	OUT1:R	Iv	400	--	700	Mcd
	If=12mA	OUT2:B	Iv	150		250	Mcd
	If=12mA	OUT0:G	Iv	1000		2000	Mcd
Dominant Wave Length	If=12mA	R	WD	620		625	nm
	If=12mA	B	WD	465		470	nm
	If=12mA	G	WD	520		525	nm
Viewing angle at 50% Iv	If=12mA		2 θ 1/2	--	120	--	Deg

NOTE: (Tolerance: IV±10%, WD ±1nm)

（All the parameters of the above table are tested by xieyuan photoelectric instrument）

Communication Protocol

The RT7908B uses a single communication wire for LED PWM control. After power on reset, the first RT7908B takes the first 24 bits data, and latches into itself shift register. Then the second 24 bits data will be passed to next chip. The PWM outputs are controlled by duty ratio which depends on the 24bits data. All chips will latch new data when DIN port received the latch signal (> 50us low-level signal).
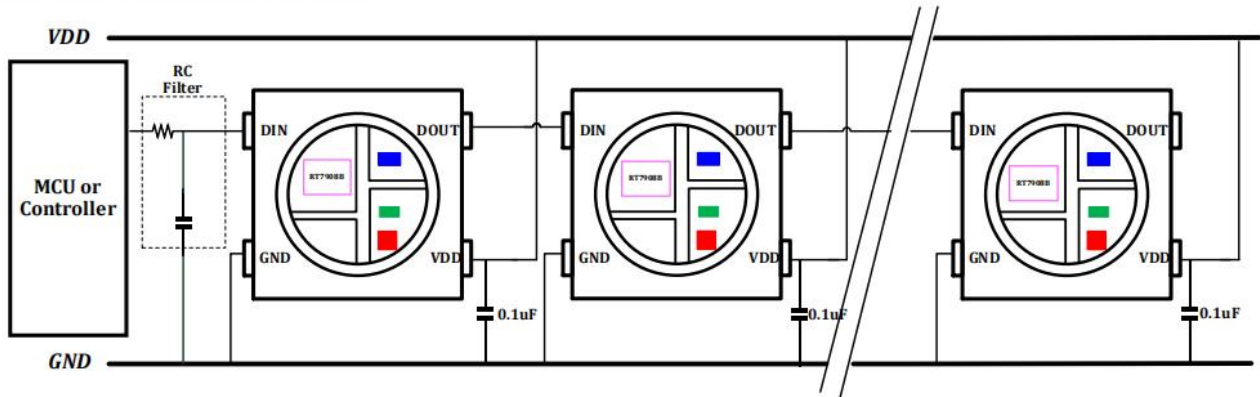
Timing Wave Form
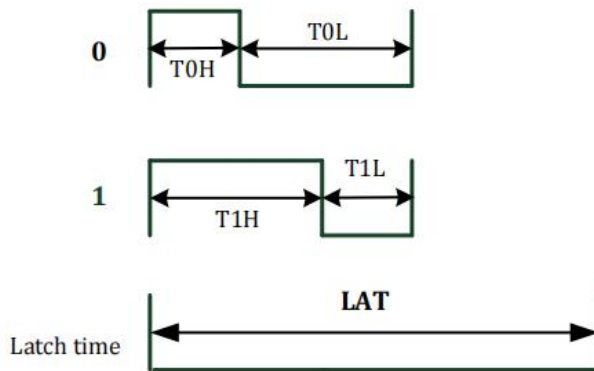
High Speed mode

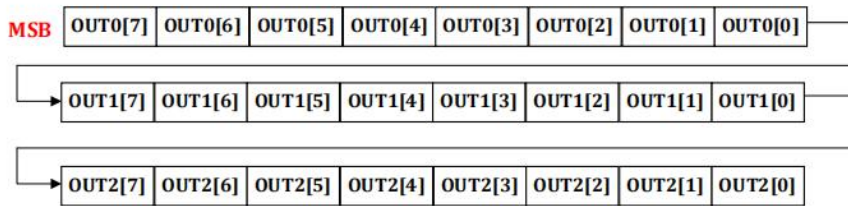| Item	Description	Typical	Allowance
T_{0H}	0 code · High-level time	300ns	± 80ns
T_{0L}	0 code · Low-level time	900ns	± 80ns
T_{1H}	1 code · High-level time	900ns	± 80ns
T_{1L}	1 code · Low-level time	300ns	± 80ns
LAT	Latch time	> 50us	

Cascading connection

Note1: RC Filter must be added or reserved on the board for better waveform of signals in different applications. The value is subject to the practical system environment.
Note2: The by-pass capacitor of VDD pin is necessary to be added on the board for the stability of chip operation. The suggested value of capacitor is 0.1uF.
Note3: More note of layout and control, please ask for document.

24bits data format

RT7908B implements the 8bits grayscale level, OUT [7-0] for each output. Therefore each RT7908B needs 24bits data. The data sequence is shown below and the MSB is sent firstly.

MSB	OUT0[7]	OUT0[6]	OUT0[5]	OUT0[4]	OUT0[3]	OUT0[2]	OUT0[1]	OUT0[0]
	OUT1[7]	OUT1[6]	OUT1[5]	OUT1[4]	OUT1[3]	OUT1[2]	OUT1[1]	OUT1[0]
	OUT2[7]	OUT2[6]	OUT2[5]	OUT2[4]	OUT2[3]	OUT2[2]	OUT2[1]	OUT2[0]

Data Communication of cascading chips

Time Interval between 24 bits signal

Reflow profile

■ Soldering condition
  • Recommended soldering conditions

Reflow Soldering		Hand Soldering	
Pre-heat	160～180℃	Temperature	300℃ Max.
Pre-heat time	120 seconds Max.		
Peak temperature	260℃ Max.	Soldering time	3 second Max.
Soldering time	10 seconds Max.		(one time only)
Condition	Refer to Temperature-profile		

  • After reflow soldering rapid cooling should be avoided

■ Temperature-profile (Surface of circuit board)
 Use the following conditions shown in the figure.
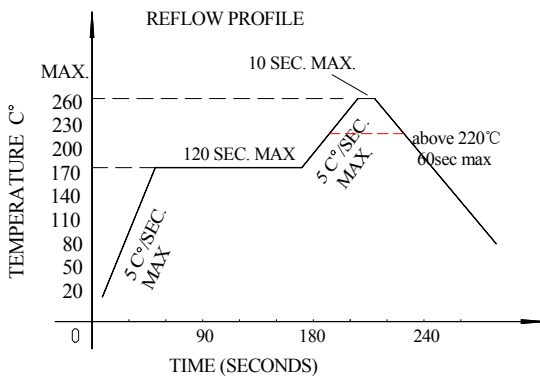
  1. Reflow soldering should not be done more than two times
  2. When soldering ,do not put stress on the LEDs during heating

■ Soldering iron
  1. When hand soldering, keep the temperature of the iron under 300℃, and at that temperature keep the time under 3 sec.
  2. The hand soldering should be done only a time
  3. The basic spec is ≤5 sec. when the temperature of 260℃, do not contact the resin when hand soldering

■ Rework
  1. Customer must finish rework within 5 sec under 2
  2. The head of iron can not touch the resin
  3. Twin-head type is preferred.
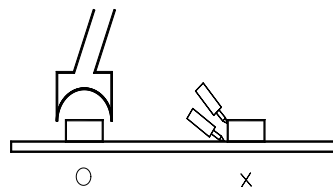
■ CAUTIONS

The encapsulated material of the LEDs is silicone . Therefore the LEDs have a soft surface on the top of package.   The pressure to the top surface will be influence to the reliability of the LEDs.   Precautions should be taken to avoid the strong pressure on the encapsulated part.   So when using the picking up nozzle, the pressure on the silicone resin should be proper.

Reliability

(1)TEST ITEMS AND RESULTS

Type	Test Item	Test Conditions	Note	Number of Damaged
Environmental Sequence	Resistance to Soldering Heat(Reflow Soldering)	Tsld=260℃,10sec	2 times	0/22
	Temperature Cycle	-40℃ 30min ↑↓5min 105℃ 30min	100 cycle	0/22
	High Temperature Storage	T_a=100℃	1000 hrs	0/22
	Low Temperature Storage	T_a=-40℃	1000 hrs	0/22
Operation Sequence	Life Test	T_a=25℃ V=5V I_F=12mA	1000 hrs	0/22
	High Humidity Heat Life Test	60℃ RH=80% V=5V I_F= 12mA	1000 hrs	0/22

(2)CRITERIA FOR JUDGING THE DAMAGE

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=12mA	_	U.S.L*)×1.1
Reverse Current	IR	VR=5V	_	U.S.L*)×2.0
Luminous Intensity	IV	IF=12mA	L.S.L**)×0.7	_

U.S.L.: Upper Standard Level   **L.S.L.: Lower Standard Level**

Packaging Specifications

Packaging specifications

1000 Pcs/Reel

标签

FQCXX

FQCXX

Side Red

1 Reel / Anti-Static Bags

6 Bags / Inner Carton

5 Inner Cartons / Outer Carton
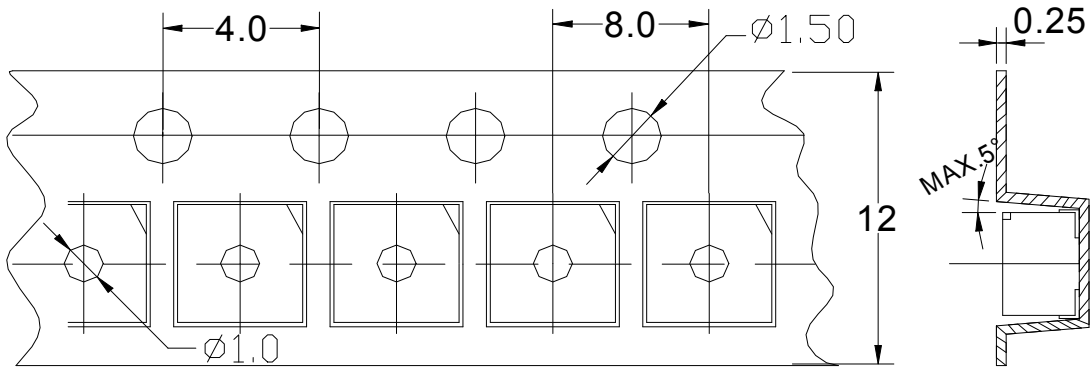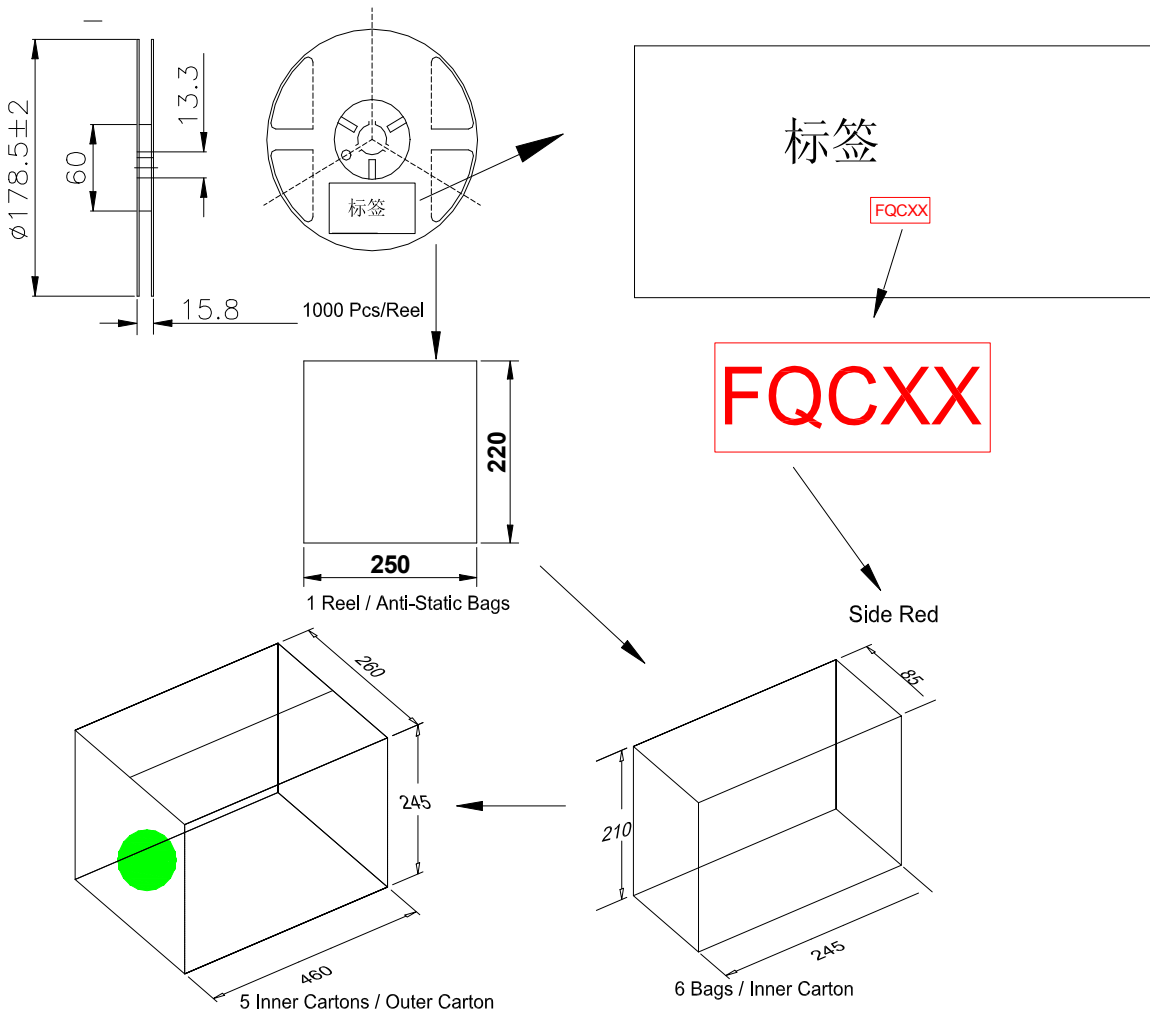
CAUTIONS

Storage conditions

Before opening the package:

The LEDs should be kept at 30℃ or less and 70%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

After opening the package:

The LEDs should be kept at 30℃ or less and 50%RH or less. The LEDs should be soldered within 24 hours (1days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again.

This specification shining has the right of final interpretation