

## Specification

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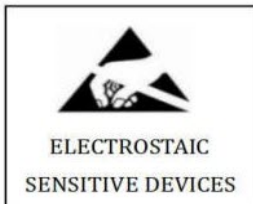
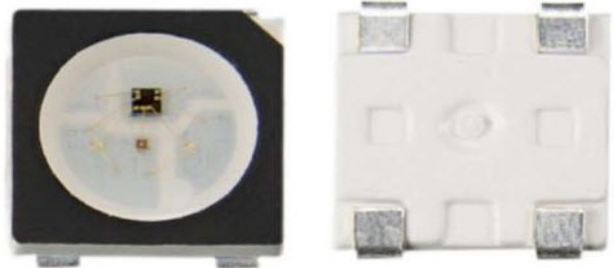
Model No.: GE8812B series

Product: 5V SOP4 0.2W Intelligent led

Document No.: SPC-TOP-C/230023

Issue Date :20-04-2023

Version: C-23



Greeled Approval		Customer Approval	
Audit	Confirmation	Approval	Audit
Mr Chiang	Ms Lee		
Date:		<input type="checkbox"/> Qualified	<input type="checkbox"/> Disqualified
Reason:			

## **1.Product feature:**

- The control circuit and RGB chips are integrated in one SMD5050 package as one pixel,Built in various of function units.
- DC5V,Default current 12mA per color,0.2W power consumption
- The PWM Scanning Frequency 1.2khz
- 8bit per color,256 Gray scale,  $256*256*256=16777216$  true color display.
- Support data rate up to 800kbps
- The pixel cascades number is not less than 1024 pixels at 30 frame per second.
- The data transmit base on SPI Communication protocol

## **2.Working principle description:**

The GE8812B led adopt single data signal communication method, The data encoding adopt RZ code. The Din of led receive data from signal source,locking 24bit data and send them to data latch, PWM scanning unit deal 24bit data and send relative duty ratio signal to relative Emitting chips OUTR,OUTG,OUTB.

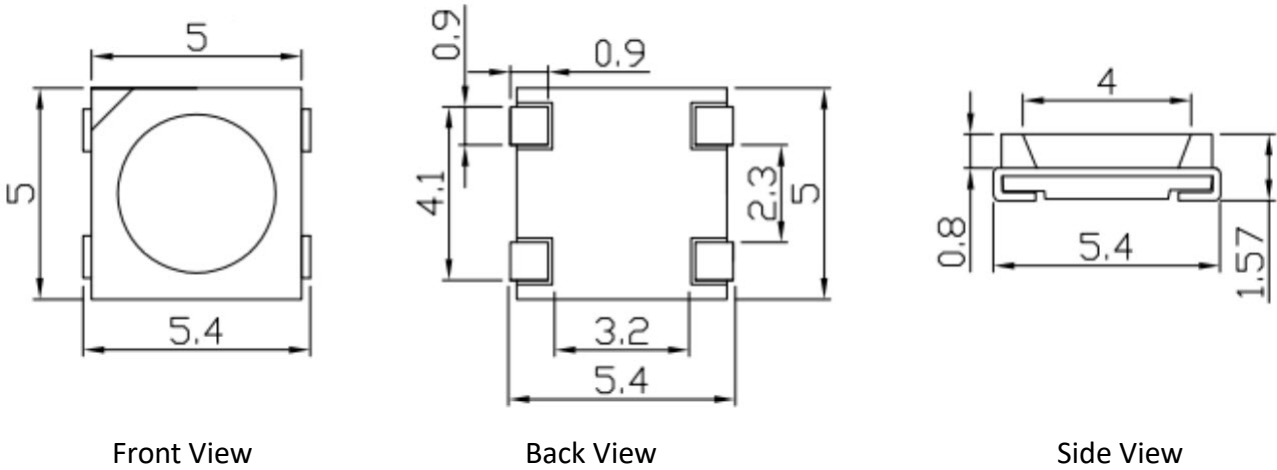
At the same time, Reshaping and amplify extra data,Forwarding them to subsequent led via Dout of led. Based on this rule. The data reduce 24bit pass through every pixel. All Emitting chips receive relative duty ratio signal and Emitting color.

The data auto-reshaping forwarding technology to ensure that the number of cascaded pixel is not limited. The more cascaded pixels request the higher data transmission rate.

## **3.Application:**

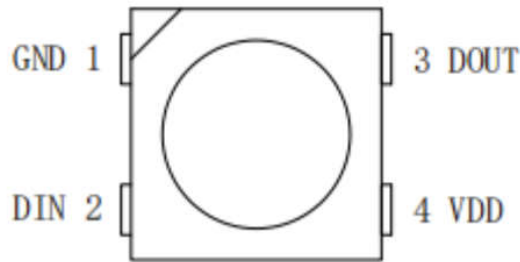
- Billboard,light box,Device,Cabinet decoration
- The Component of light source.

#### 4.Package dimension:



Remarks: All dimensions are marked in millimeters and the tolerance is  $\pm 0.15$  mm, unless otherwise specified.

#### 5.Pin diagram and function description:



No.	Symbol	Function description
1	GND	Ground
2	DIN	Control data signal input
3	VDD	Power Supply
4	DOUT	Forwarding control data signal output

#### 6.RGB chip characteristic parameter $T_a=25^\circ\text{C}$ at 12mA:

Color	Wavelength(nm)	Light Intensity ( mcd )	Lumen ( LM )
Red	620-630	500-700	0.8-1.2
Green	520-535	800-1200	2.5-3.5
Blue	460-475	300-400	0.7-0.9

## 7. Maximum rating (if no special instructions, $T_a=25^{\circ}\text{C}$ , $V_{SS}=0\text{V}$ ):

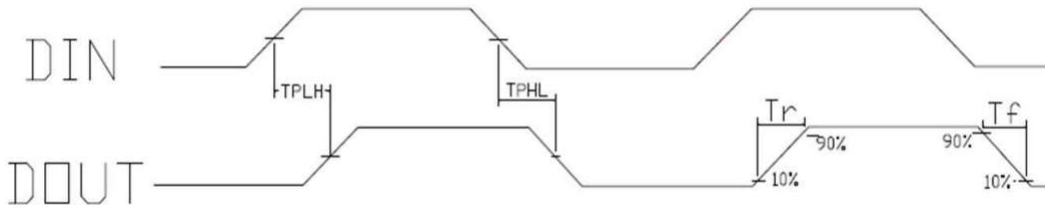
Parameter	Symbol	Range	Unit
Voltage	VDD	+3.5~+5.5	V
Logic Input Voltage	VI	-VDD~VDD+0.5	V
Working temperature	Topt	-40~+85	$^{\circ}\text{C}$
Storage temperature	Tstg	-50~+85	$^{\circ}\text{C}$
ESD pressure (Device mode)	VESD	200	V
ESD pressure (body mode)	VESD	4000	V

## 8. Electrical characteristics (if no special instructions, $T_a=25^{\circ}\text{C}$ ):

Parameter	Symbol	Min	Typical	Max	Unit
The chip supply Voltage	VDD	4	5	5.5	V
R/G/B port output drive current	IOUT	-	12	-	mA
High level input voltage	VIH	4	-	-	V
Low level input voltage	VIL	-	-	1	V
Static power	IDD	-	1	-	mA
PWM Frequency	Fpwm	-	1.2	-	KHZ

## 9. Switch characteristics (if no special instructions, $T_a=25^{\circ}\text{C}$ ):

Parameter	Symbol	Min	Typical	Max	Unit	Test Conditions
Data Rate	bps	-	800	-	Kbps	Duty Ratio 75%
Rise/drop time	Tr	-	100	-	ns	-----
	Tr	-	100	-	ns	
Transmission delay time	TPLH	-	-	500	ns	DIN to DOUT
	TPHL	-	-	500	ns	

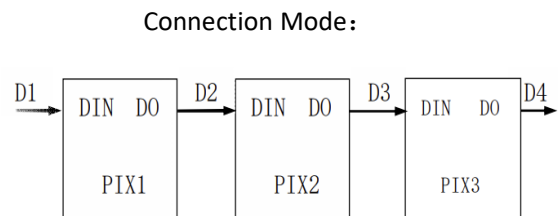
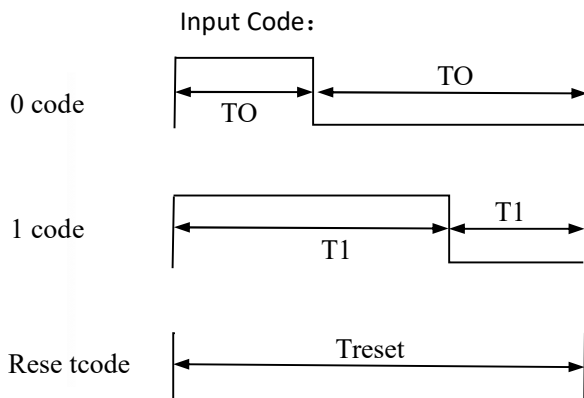


### 10.Data transmission time( $TH+TL\geq 1.25\mu s$ )

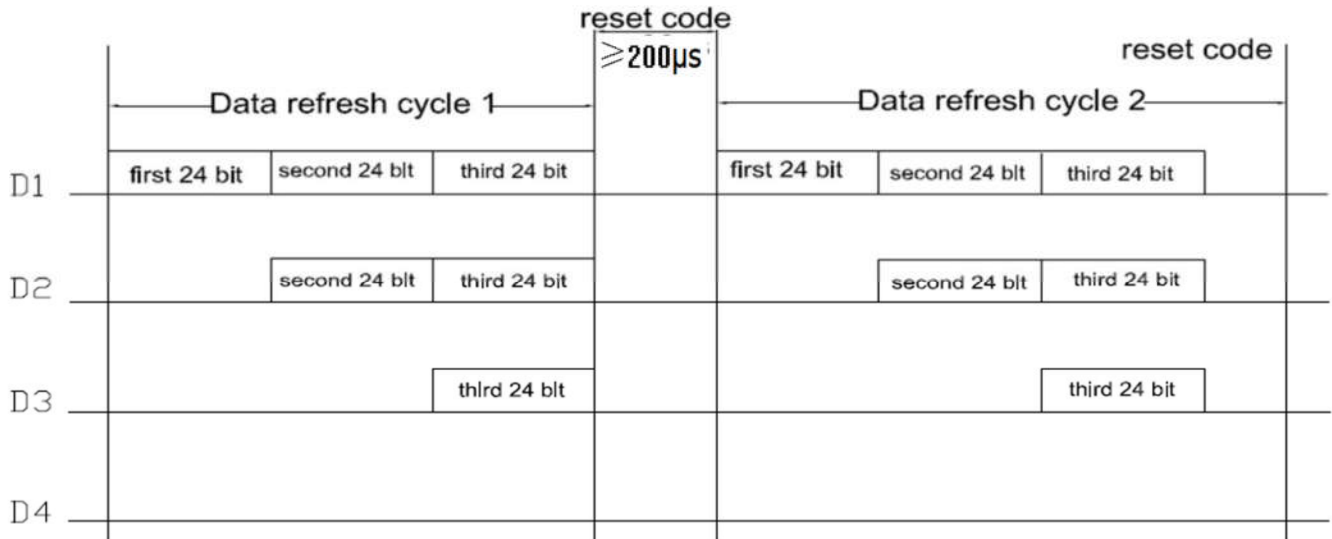
Name	Description	Min	Typical	Max	Allowable error	Unit
T0H	0 code, high level time	-	0.3	-	$\pm 0.05$	$\mu s$
T1H	1 code, high level time	-	0.9	-	$\pm 0.05$	$\mu s$
T0L	0 code, low level time	-	0.9	-	$\pm 0.05$	$\mu s$
T1L	1 code, low level time	-	0.3	-	$\pm 0.05$	$\mu s$
TRST	Reset code, low level time	200	-	-	-	$\mu s$

### 11.Coding timing diagram:

The chip protocol adopt unipolar return-to-zero code, and every symbol must have be converted. Each symbol of this protocol starts with a high level, and the time width of the high level determines the "0" code or the "1" code.



### 12.Data transmission method (Ta=25°C) :



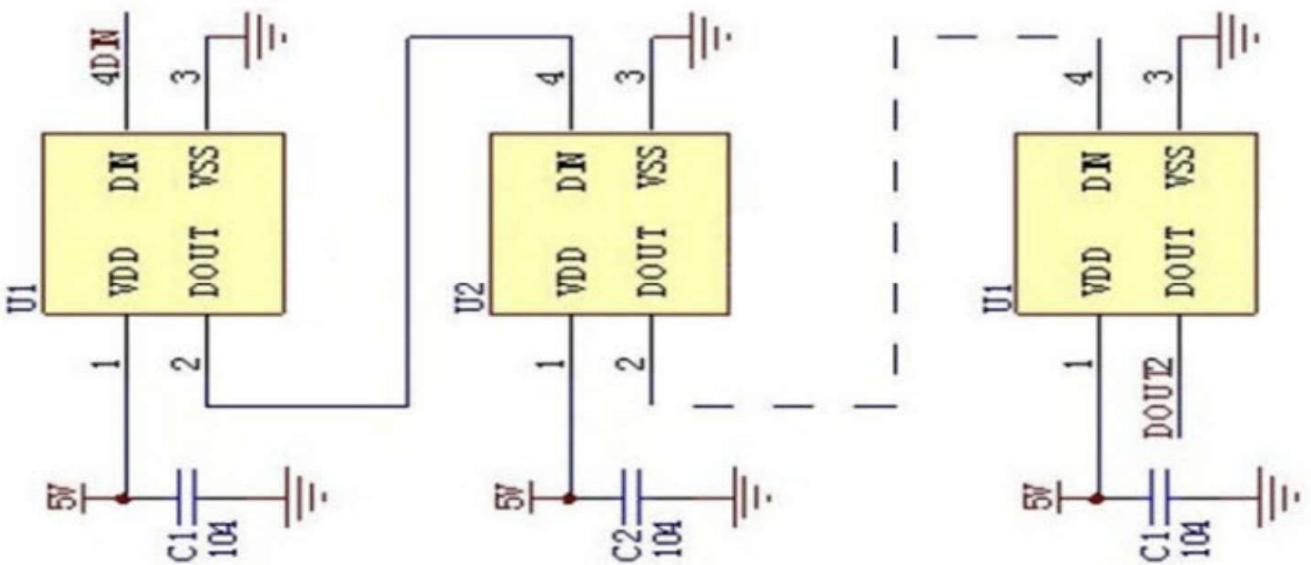
Note: D1 is the data sent by the MCU, and D2, D3, and D4 are the data that the cascade circuit automatically reshapes and forwards.

### 13.Data structure (Ta=25°C):

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

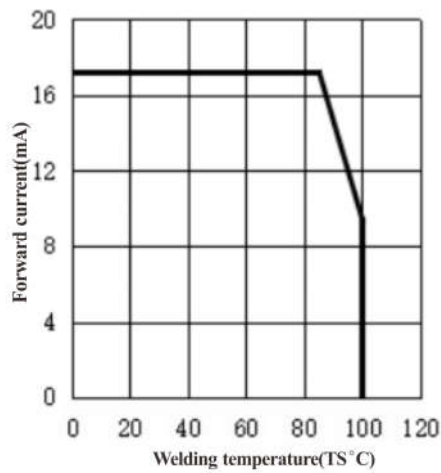
Note: The high bit is sent first, and the data is sent in the order of GRB (G7 → G6 →.....B0).

### 14.Typical application circuit:

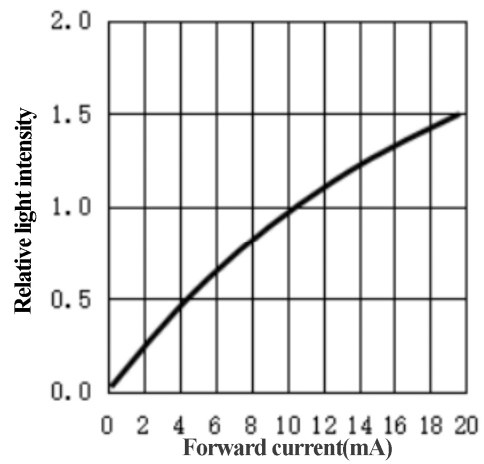


## 15. Typical optical characteristic curve:

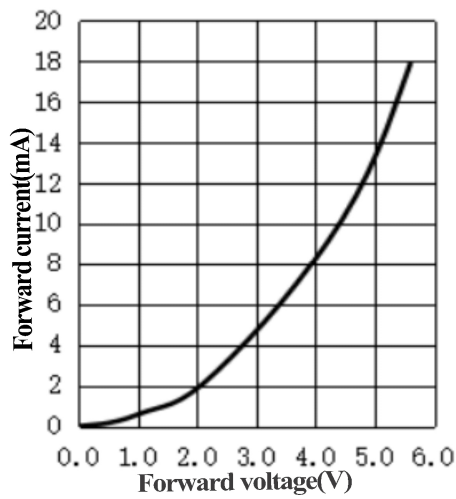
Welding temperature VS Forward current



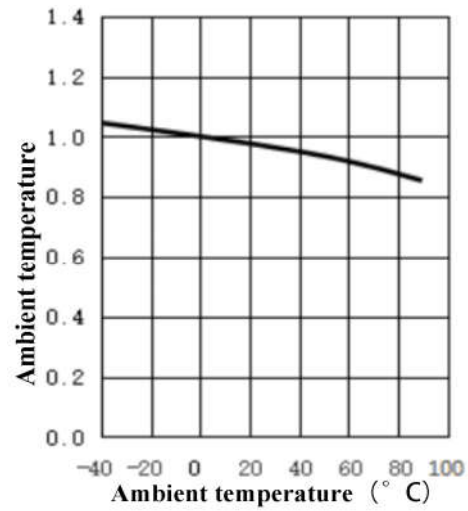
Forward current VS Relative light intensity



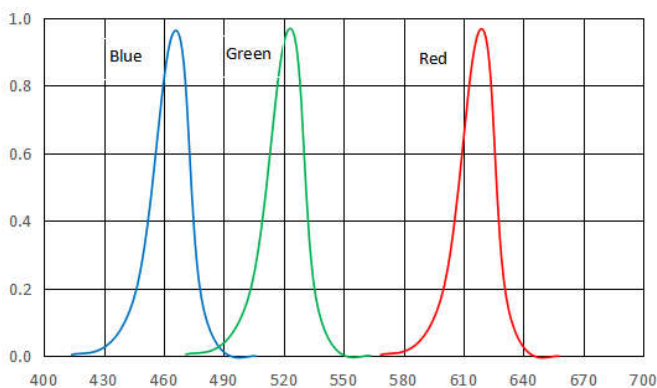
Forward voltage VS Forward current



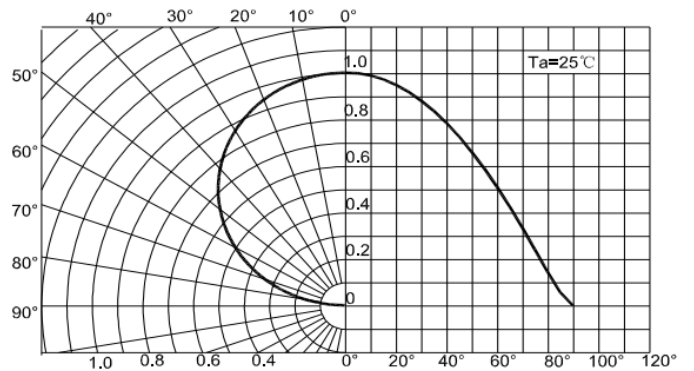
Ambient temperature VS Relative light intensity



Relative spectral distribution chart

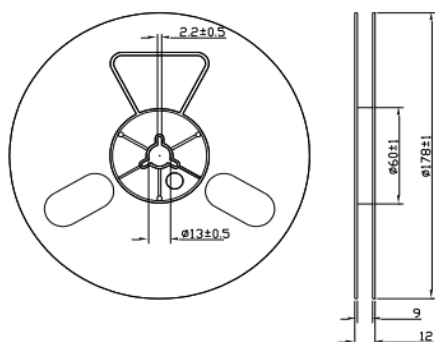


Relative spectral distribution chart

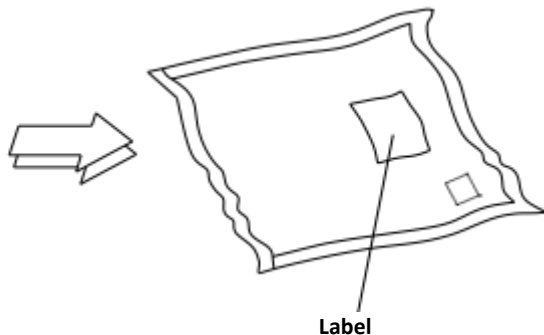
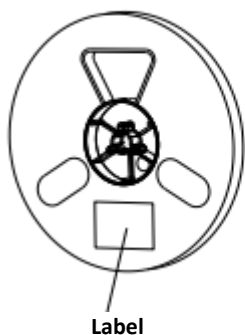
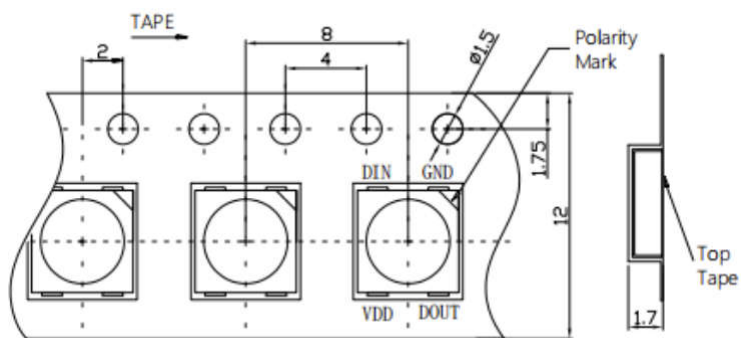


## 16.Packing specifications:

Reel size:



Carrier tape specifications (unit: mm)



Model	Appearance color	Capacitor built in	QTY/Reel	Reel/CTN
GE8812B	White mask	No	1k/Reel	50Reel/CTN
GE8812B-B	Black mask	No	1k/Reel	50Reel/CTN
GE8812	White mask	Yes	1k/Reel	50Reel/CTN
GE8812-B	Black mask	Yes	1k/Reel	50Reel/CTN

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