GREELED 格瑞电子

Specification

Model No.: SK6812V12-Side

Product: 5V SOP4 0.2W sideview RGB led

Document No.: SPC-TOP-C/230325

Issue Date :25-03-2023

Version: C-23

ELECTROSTAIC SENSITIVE DEVICES

RoHS

CE

Greeled Approval		Customer Approval	
Aduit	Confirmation	Aprroval	Audit
Mr Chiang	Ms Lee		
Date:		□ Qualified	□ Disqualified
Reason:			

1.Product feature:

- ●The control circuit and RGB chips are integrated in one SMD4020 package as one pixel,Built in various of function units.

- ●DC5V,Default current 12mA per color,0.2W power consumption

- ●The PWM Scanning Frequency 1.0khz

- ●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
- ●Upgrade led bracket to enhance PCB solder

2.Working principle description:

The SK6812 side emitting 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:
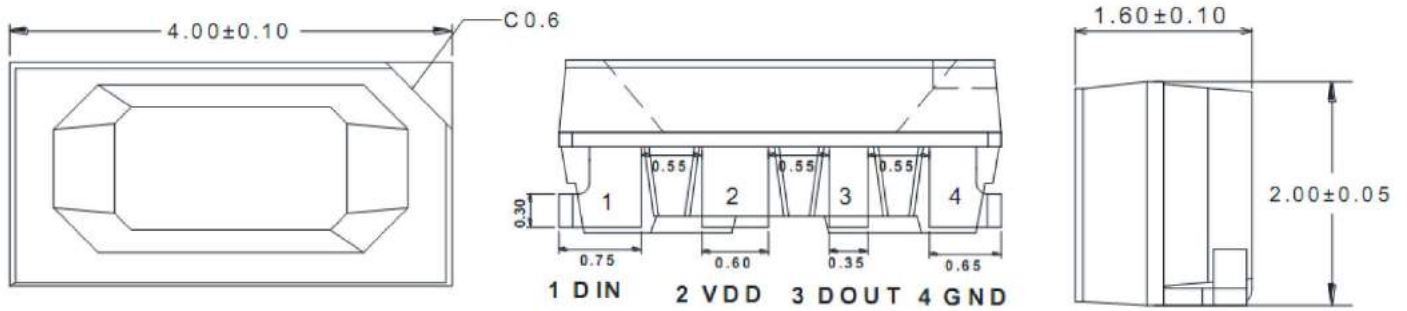
Remarks: All dimensions are marked in millimeters and the tolerance is ±0.10 mm, unless otherwise specified.

5.Pin diagram and function description：

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

6.Recommend solder Pad dimension：
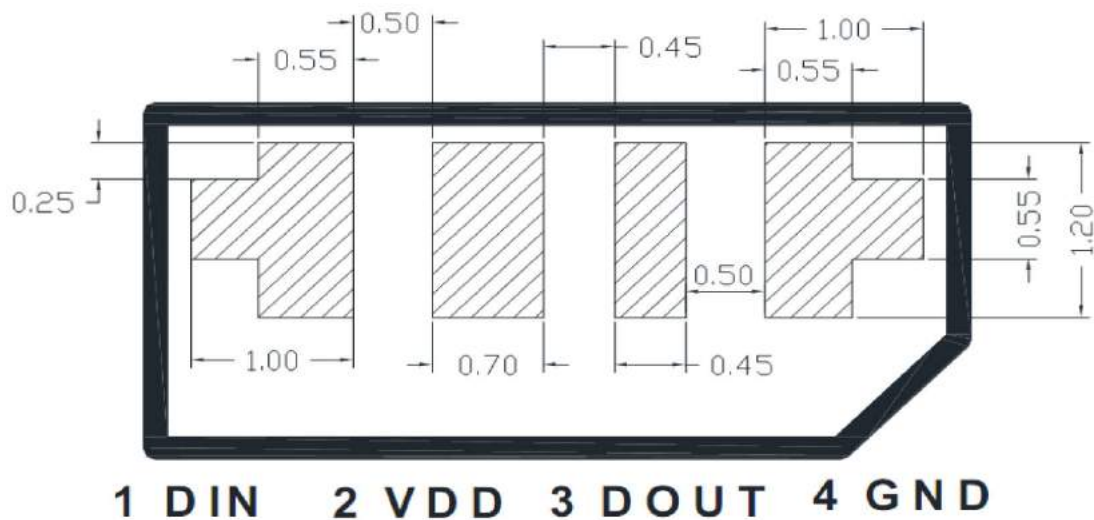
7.RGB chip characteristic parameter Ta=25℃ at 12mA：

Color	Wavelength(nm)	Light Intensity（mcd）	Lumen（LM）
Red	620-625	240-450	0.5-0.8
Green	520-525	800-1200	2.5-3.5
Blue	465-475	160-320	0.4-0.6

8.Maximum rating (if no special instructions,Ta=25℃， VSS=0V):

Parameter	Symbol	Range	Unit
Voltage	VDD	+3.7～+5.5	V
Logic Input Voltage	VI	-0.5～VDD+0.5	V
Working temperature	Topt	-40～+85	℃
Storage temperature	Tstg	-50～+85	℃
ESD pressure（HM）	VESD	200	V
ESD pressure（HBM）	VESD	2K	V

9.Electrical characteristics (if no special instructions, Ta=25℃):

Parameter	Symbol	Min	Typical	Max	Unit
The chip supply Voltage	VDD	-	5.2	-	V
R/G/B port output drive current	IOUT	-	12	-	mA
High level input voltage	VIH	0.7*VDD	-	-	V
Low level input voltage	VIL	-	-	0.3*VDD	V
Static power	IDD	-	1	-	mA
PWM Frequency	Fpwm	-	1.0	-	KHZ

10.Switch characteristics (if no special instructions, Iout=12mA Ta=25℃)：

Parameter	Symbol	Min	Typical	Max	Unit	Test Conditions
Data Rate	bps	-	800K	-	bps	Duty Ratio 67％(data 1)
Rise/drop time	Tr	-	22	-	ns	R=200Ω Dout to VDD C=30pf VDD to GND
	Tf	-	75	-	ns	
DOUT Conversion time	TTLH	-	9.6	-	ns	VDD to GND C=30pf
	TTHL	-	11.6	-	ns	
DOUT transmit delay time	TPLH	-	67	-	ns	DIN to DOUT at 30fps
	TPHL	-	82	-	ns	
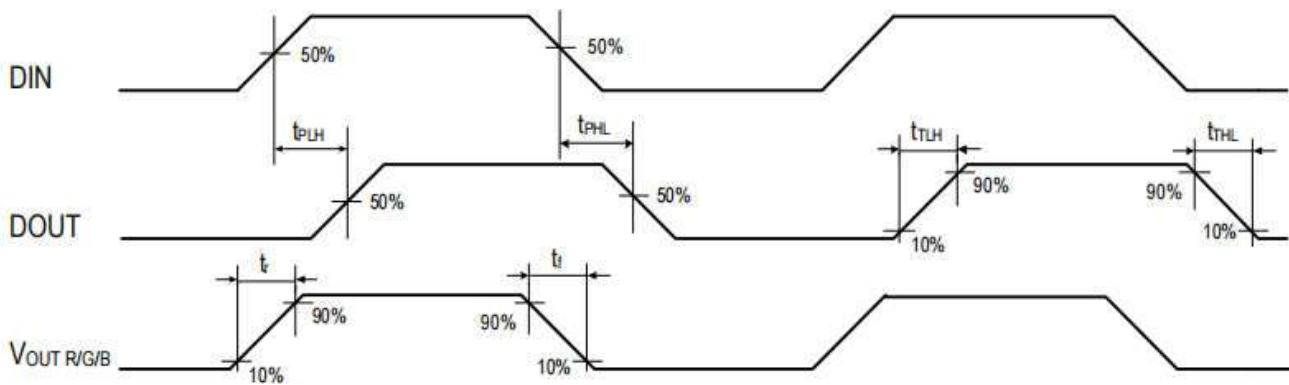
11.Data transmission time(TH+TL≥1.20μs)

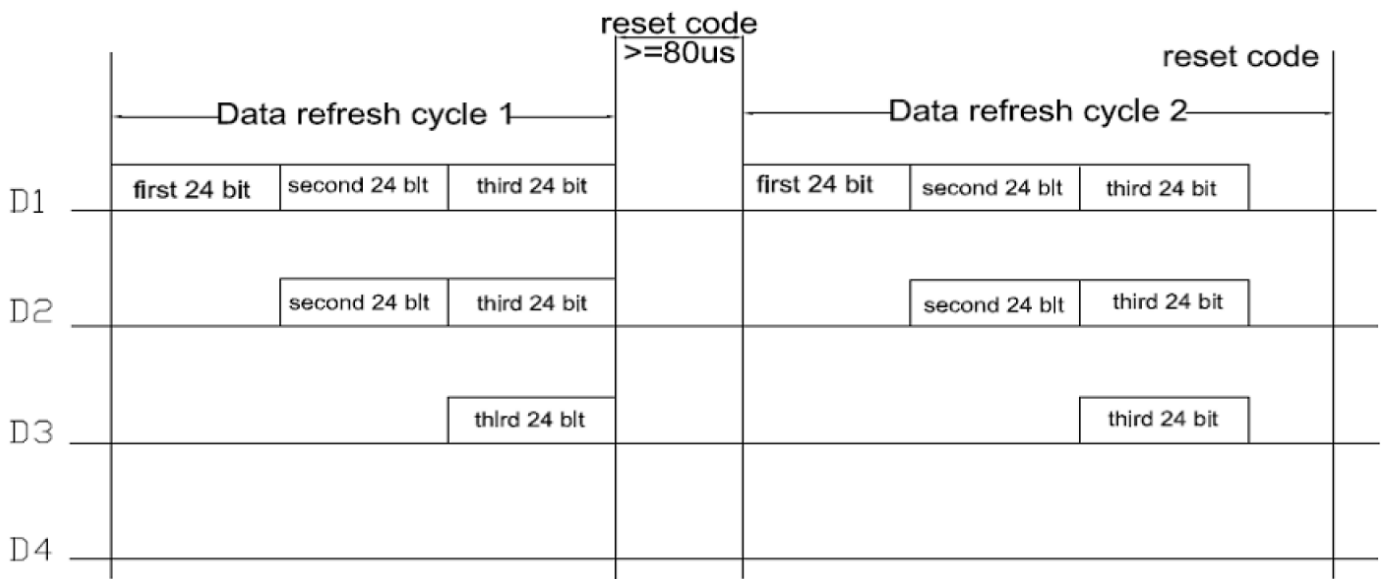| Name	Description	Min	Typical	Max	Allowable error	Unit
T0H	0 code, high level time	0.2	0.32	0.4	±0.05	μs
T1H	1 code, high level time	0.6	0.67	1.0	±0.05	μs
T0L	0 code, low level time	0.8	-	-	±0.05	μs
T1L	1 code, low level time	0.2	-	-	±0.05	μs
TRST	Reset code，low level time	80	-	-	-	μs

1. The protocol uses a unipolar zeroing code. Each symbol must have a low level. Each symbol in this protocol starts with a high level. The high time width determines the "0" or "1" code. .

2. When writing programs, the minimum symbol period is 1.2μs.

3. The high level time of "0" code and "1" code should be in accordance with the stipulated range in the above table. The low level time requirement of "0" code and "1" code is less than 20μs

12.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.

Input Code：

0 code
TO
TO

1 code
T1
T1

Rese tcode
Treset

Connection Mode：

D1 → DIN DO D2 → DIN DO D3 → DIN DO D4 →
PIX1   PIX2   PIX3
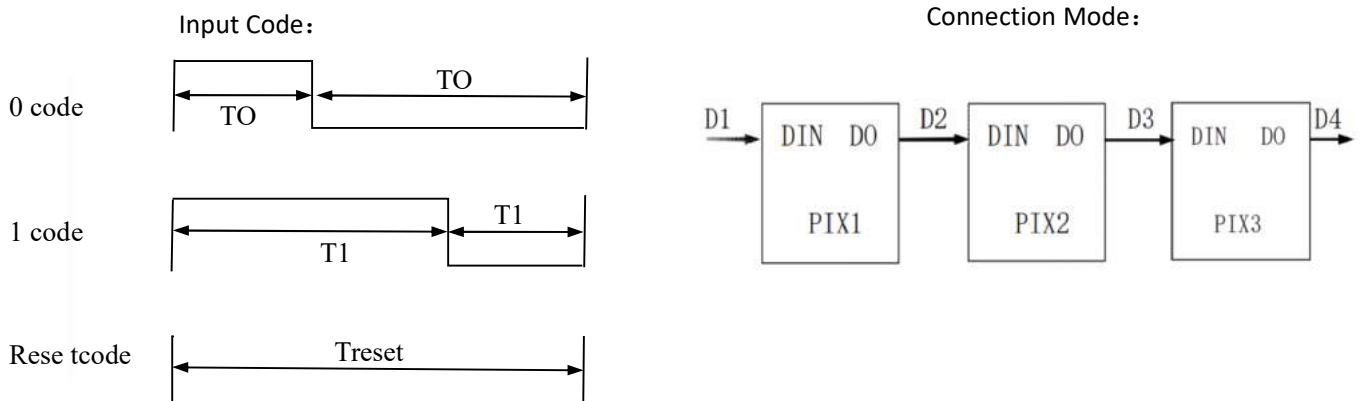
13.Data transmission method（Ta=25℃）:

reset code
>=80us

reset code

Data refresh cycle 1

Data refresh cycle 2

D1
first 24 bit | second 24 blt | third 24 bit
first 24 bit | second 24 blt | third 24 bit

D2
second 24 blt | third 24 bit
second 24 blt | third 24 bit

D3
thlrd 24 blt
third 24 bit

D4

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.

14.Data structure (Ta=25℃):

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：
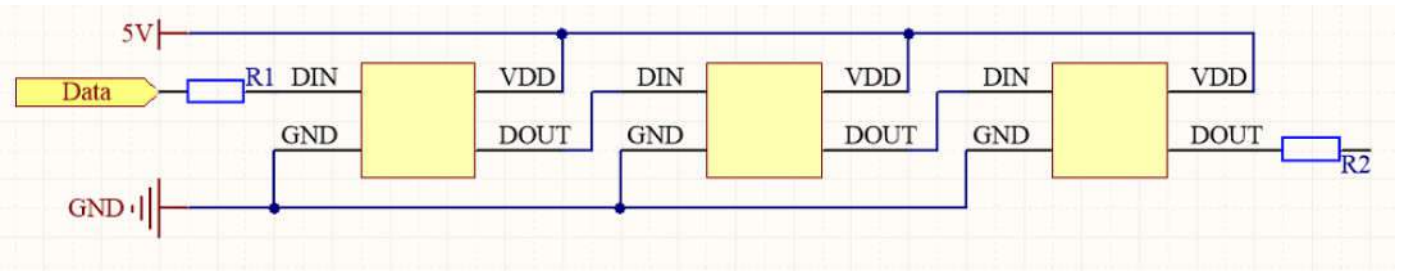
In the practical application circuit, the signal input and output pins of the IC signal input and output pins should be connected to the signal input and output terminals. In addition, in order to make the IC chip is more stable, even the capacitance between beads is essential back;Application: used for soft lamp strip or hard light, lamp beads transmission distance is short, suggested in signal in time the clock lineinput and output end of each connected in series protection resistors, R1=R2 of about 500 ohms.

Application: for module or general special-shaped products, lamp beads transmission distance is long, because of different wire and transmission distance, in the signal in time clock at both ends of the line on grounding protection resistance will be slightly different;to the actual use of fixed;

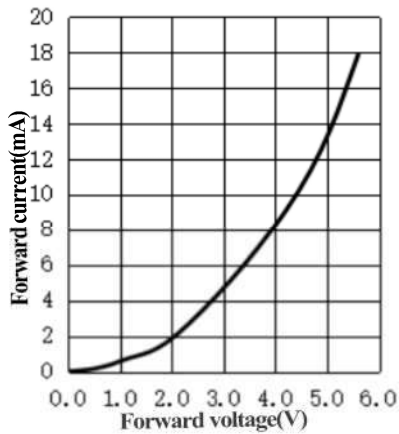## 15.Typical optical characteristic curve:

Welding temperature VS Forward current
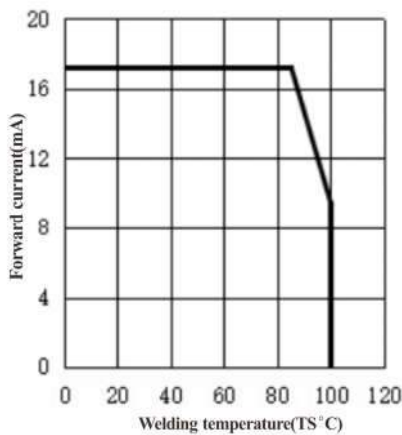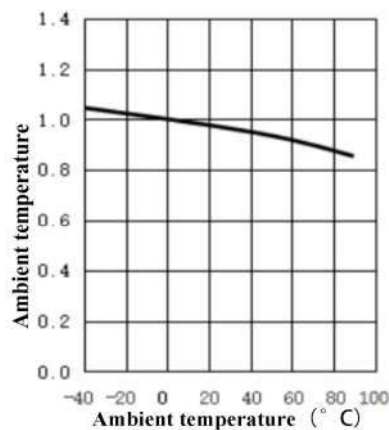

Forward current VS Relative light intensity
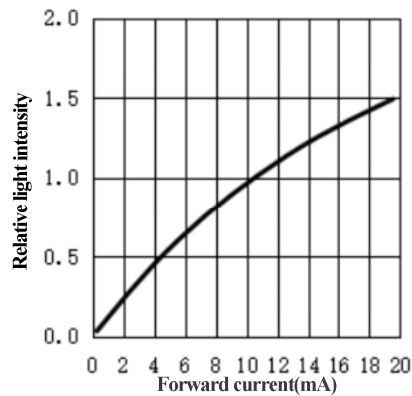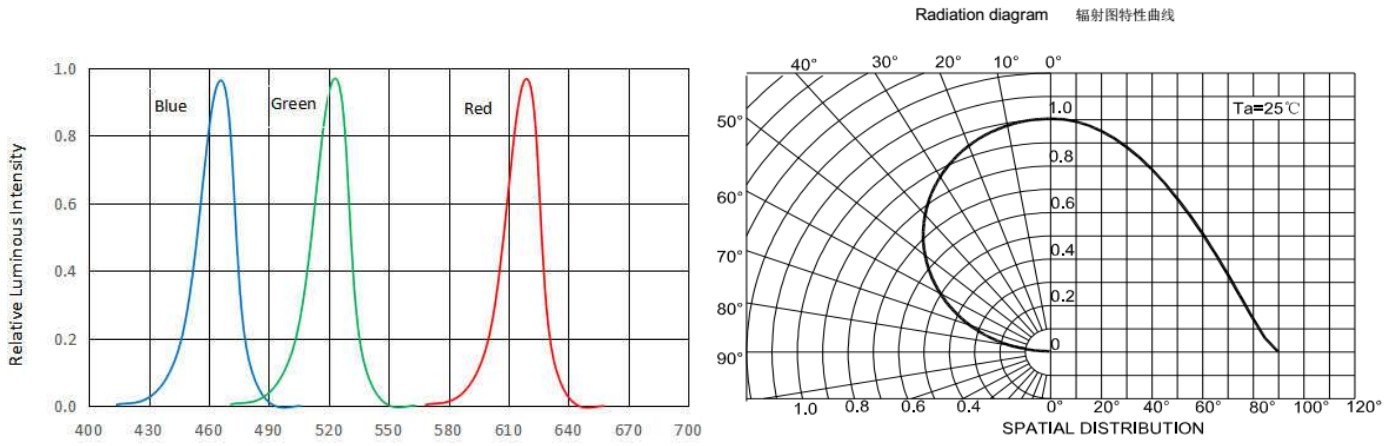

Forward voltage VS Forward current

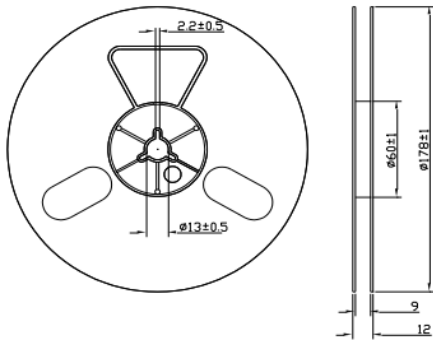Ambient temperature VS Rrelative light intensity

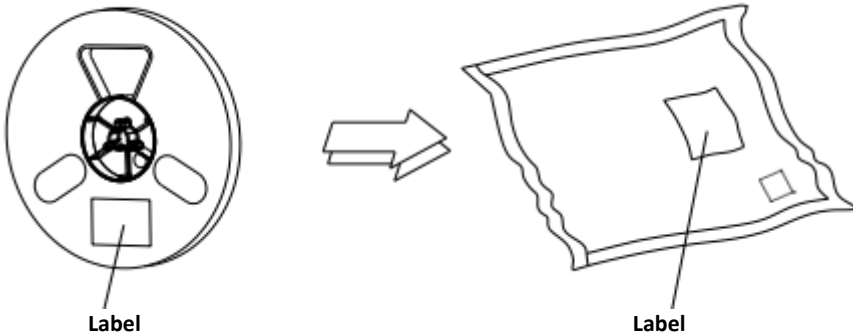Relative spectral distribution chart   Relative spectral distribution chart

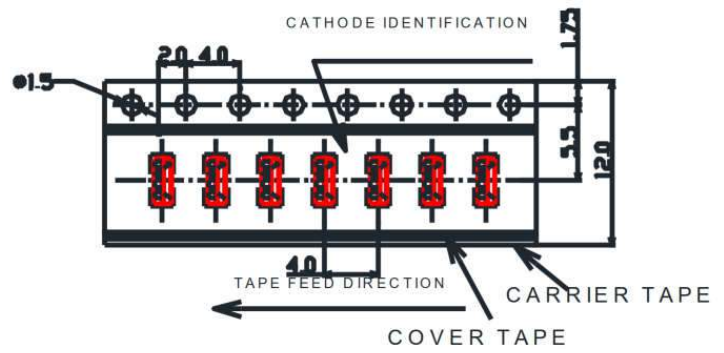Radiation diagram 辐射图特性曲线

16.Packing specifications:

Reel size:

Carrier tape specifications (unit: mm)

Label

Label

Model	Package	Emitting color	QTY/Reel	Reel/CTN
SK6812V12- Side	SMD4020	Side emitting RGB	1.5k/Reel	50Reel/CTN

GREELED ELECTRONIC LTD

Add: 2F,1st Building logistic park,shiyan town,shenzhen city
E-mail:sales@gree-leds.com   Skype:greeledelectronic