1. Product Overview

SK6812MINI-E is an intelligent external LED light source integrating control circuit and luminous circuit. Its appearance is consistent with one SMD3528 top surface luminous LED lamp bead
Same, each element is a pixel. The pixel contains an intelligent digital interface data latch signal shaping, amplification and driving circuit, and a power regulator circuit
The built-in constant current circuit, high-precision RC oscillator, and patented PWM technology are used for the output drive, which effectively ensure the color consistency of the light in the pixel.
The data protocol adopts the communication mode of unipolar zero code. After the pixel is powered on and reset, the DIN terminal receives the data transmitted from the controller and sends it first
The incoming 24bit data is extracted by the first pixel and sent to the data latch inside the pixel. The remaining data is shaped and amplified by the internal shaping processing circuit
Then, it starts to forward the output to the next cascaded pixel through the DO port, and the signal will be reduced by 24bit for each pixel transmission. Pixel points adopt automatic
The shaping and forwarding technology makes the number of cascaded pixels not limited by the signal transmission, but only limited by the signal transmission speed.
LED has the advantages of low voltage drive, environmental protection and energy conservation, high dielectric strength, large scattering angle, good consistency, ultra-low power, and ultra long life. Integrate the control circuit
On the LED, the circuit becomes simpler, the volume is smaller, and the installation is more convenient.

2. Main applications:

(1) LED full-color luminous character string, LED full-color module, LED slide color soft and hard light strip, LED guardrail tube, LED appearance/scene lighting
(2) LED point light source, LED pixel screen, LED special-shaped screen, all kinds of electronic products, electrical equipment marquee.

3. Characteristic description:

● Top SMD is internally integrated with high-quality external control single wire serial cascade constant current IC;

● The control circuit and chip are integrated in the SMD 3528 components to form a complete external control pixel, with uniform color temperature effect and high consistency.

● Built in data shaping circuit, any pixel receives the signal and then outputs it after waveform shaping to ensure that the waveform distortion of the line circuit will not accumulate.

● Built in power on reset circuit and power off reset circuit, and the light does not turn on when power on;

● Gray scale adjustment circuit (256 levels of gray scale can be adjusted),

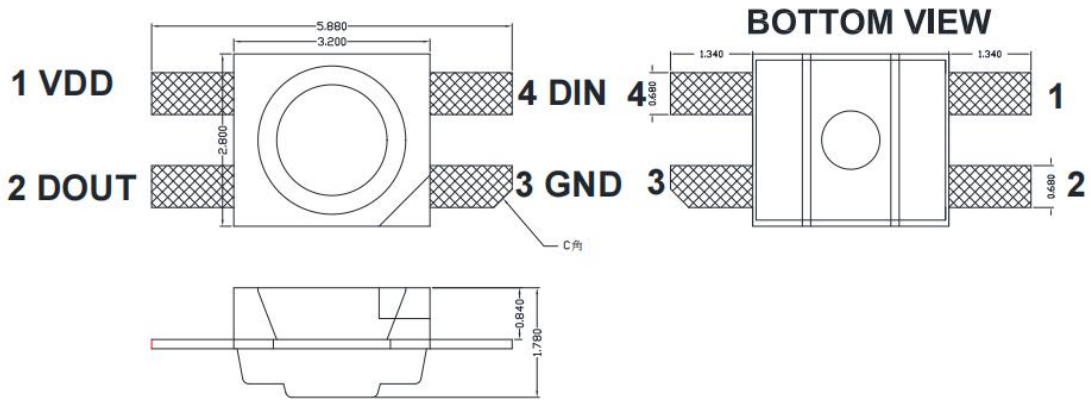
● Special red light driven processing, more balanced color matching,

● Single line data transmission, which can be cascaded infinitely.

● Shaping and forwarding enhancement technology, with transmission distance between two points exceeding 10M

● The data transmission frequency can reach 800Kbps. When the refresh rate is 30 frames/second, the number of cascades shall not be less than 1024.

4. Mechanical dimensions:



Remarks:

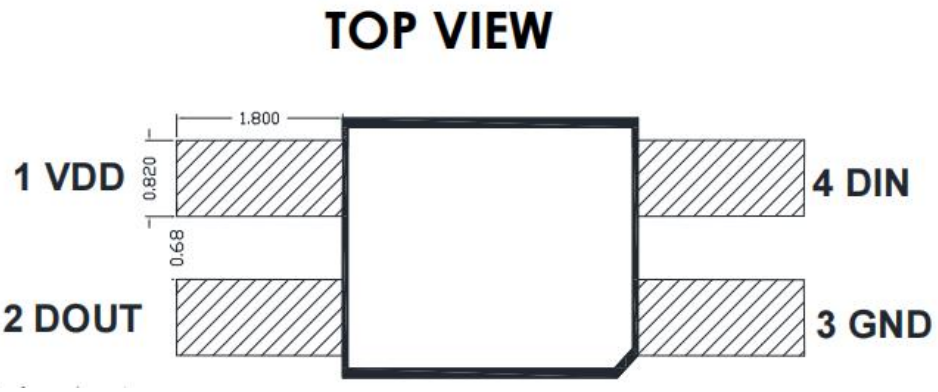
1. The above marking unit is mm

2. Unless otherwise noted, the dimensional tolerance is ± 0.1 mm

5. Pin Function Description

NO.	Symbol	Pin name	Function description
1	VDD	Power Supply	Power supply pin
2	DOUT	data output	Control data signal output
3	GND	land	Signal grounding and power grounding
4	DIN	data input	Control data signal input

6. Recommended PCB pad size



7. General Description of Product Naming

CGL SK 6812-MINI-E- X

内部代码 ① ② ③ ④ ⑤

Internal code

①	②	③	④	⑤
Series	IC series and current code	Footprint	PPA surface color	Color of sealant
The default is RGB chip integrated with	Refers to 68 series CXX, including 5MA/12MA current version	3.2x2.8 x 1.78mm straight leg package	B: Black W: white, generally not marked	D: Represent diffusion/frosting W: Represent transparency, not marked

8. Electrical parameters (limit parameter, Ta=25 ℃, VSS=0V):

Parameters	Symbol	Range	Company
Voltage Voltage	VDD	+3.7~+5.5	V
Migration input voltage	V	-0.5~VDD+0.5	V
Operating temperature	Topt	-40~+85	℃
Storage temperature	Tstg	-40~+85	℃
ESD withstand voltage (equipment mode)	VESD	two hundred	V
ESD withstand voltage (human mode)	VESD	2K	

9. RGB LED photoelectric parameters:

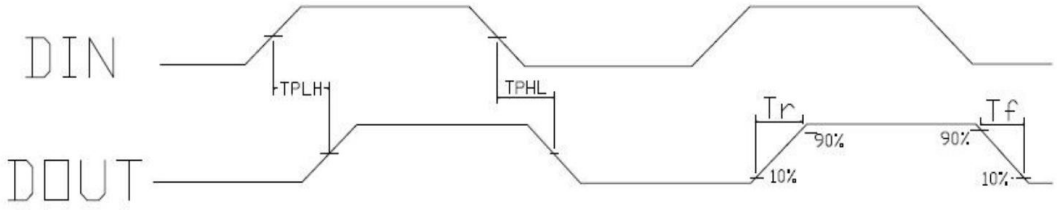
Color	SK6812MINI-E 12mA	
	Wavelength (nm)	Brightness (mcd)
RED	615-625	160-320
GREEN	520-525	815-1275
BLUE	460-470	120-240

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

Parameters	Symbol	minimum	Typical	maximum	Company	Test conditions
Chip internal power supply voltage	VDD	---	fifty-two	---	V	---
Signal input turnover value	V	0.7VDD	---	---	V	+ VDD=5.0V
	V_{IL}	---	---	0.3VDD	V	
PWM frequency	FPWM	---	one point two	---	KHZ	---
Static power consumption	IDD	---	1	---	mA	---

11. Switch characteristics (Ta=25 ℃):

Parameters	Symbol	minimum	Typical	maximum	Company	Test conditions
Data transmission speed	fDIN	---	eight hundred	---	KHZ	Duty cycle 67% (data1)
DOUT transmission delay	TPLH	---	---	five hundred	ns	DIN→DOUT
	TPHL	---	---	five hundred	ns	
Rise time	T_r	---	one hundred	---	ns	=1.5V =13mA
	T_f	---	one hundred	---	ns	



12. Data transmission time:

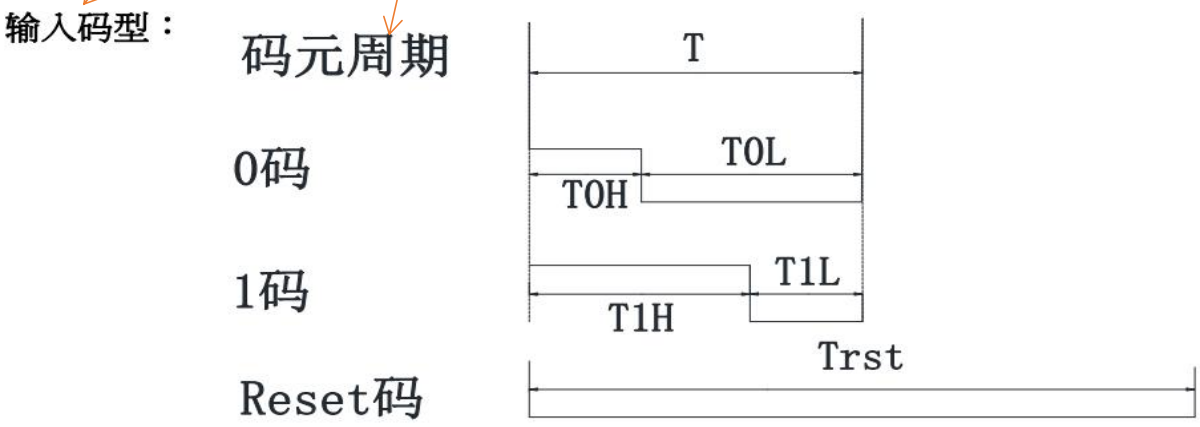
Timeline name		Min.	Actual value	Max.	Company
T	Meta period	one point two zero	--	--	**μs**
TOH	0 ma, high level time	zero point two	zero point three two	zero point four	us
TOL	0, low level time	zero point eight	--	--	**μs**
T1H	1. High level time	zero point five eight	zero point six four	one	us
TIL	1. Low level time	zero point two	--	--	**μs**
Reset	Reset?, Low level time	>80	--	--	uS

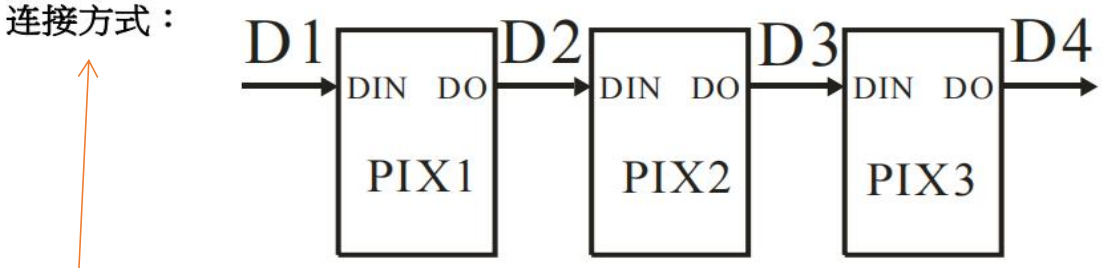
(1). The protocol uses unipolar return to zero code. Each code element must have a low level. Each code element in this protocol starts with a high level, a high level
The level time width determines "0" code or "1" code.
(2) When writing programs, the symbol cycle is required to be 1.2 μ s at least.
(3). The high level time of "0" code and "1" code shall be within the range specified in the table above, and the low level time of "0" code and "1" code shall be less than 20 μ s

13. Time sequence oscillogram (Ta=25 ℃):

Input code type

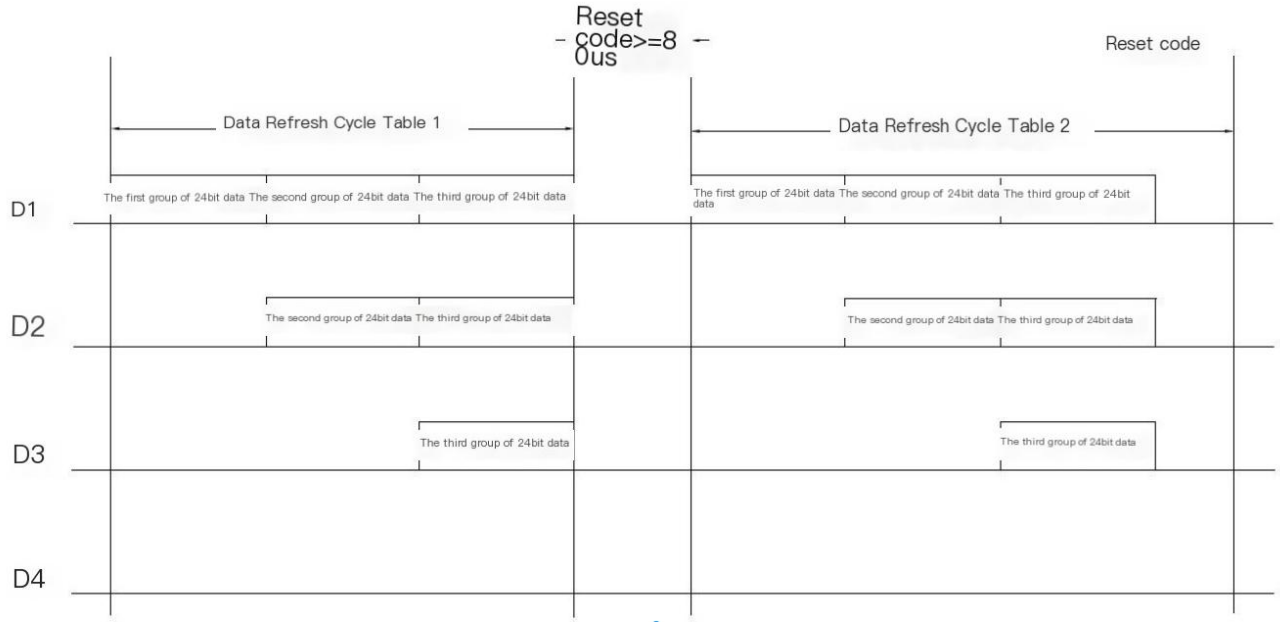
Code source period





Connection mode

14. Data transmission mode (Ta=25 ℃):



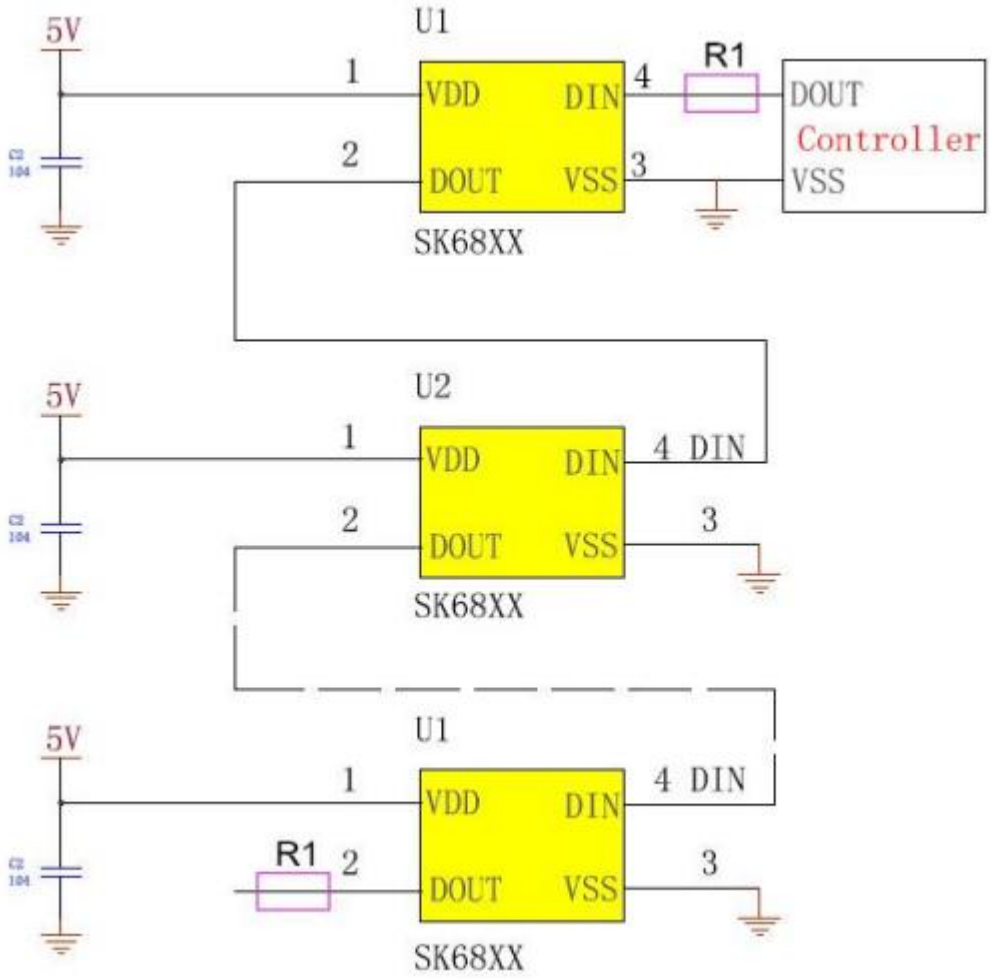
Note: D1 is the data sent by MCU, D2, D3 and D4 are the data automatically shaped and forwarded by cascade circuit.

15. 24bit 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: High bit first, send data in GRB order (G7 → G6 →..... B0)

16. Typical application circuit:



In the actual application circuit, in order to prevent the instantaneous high-voltage damage to the IC internal signal input and output pins caused by hot plugging during the test

And the output terminal is connected in series with the protection resistor. In addition, in order to make the IC chips work more stably, the decoupling capacitor between the lamp beads is essential;

Application 1: For soft lamp or hard lamp strip, if the transmission distance between lamp beads is short, it is recommended to connect protective resistors in series at the input and output terminals of signal and clock wire, namely

R1=R0 about 500 Ω;

Application 2: It is used for modules or general special-shaped products. The transmission distance between lamp beads is long. Due to different wire materials and transmission distances, the signal and clock lines are connected in series

The protective resistance will be slightly different; It depends on the actual use;

17. Photoelectric characteristics