

东莞市欧思科光电科技有限公司

DONGGUANG OPSCO OPTOELECTRONICS CO., LTD

SK6812

Intelligent Control LED Integrated Light Source

Product Overview

SK6812 is a smart LED control circuit and light emitting circuit in one controlled LED source, which has the shape of a 5050 LED chip. Each lighting element is a pixel, and the intensities of the pixels are contained within the intelligent digital interface input. The output is driven by patented PWM technology, which effectively guarantees high consistency of the color of the pixels. The control circuit consists of a signal shaping amplification circuit, a built-in constant current circuit, and a high precision RC oscillator.

The data protocol being used is unipolar NRZ communication mode. The 24-bit data is transmitted from the controller to DIN of the first element, and if it is accepted it is extracted pixel to pixel. After an internal data latch, the remaining data is passed through the internal amplification circuit and sent out on the DO port to the remaining pixels. The pixel is reset after the end of DIN. Using automatic shaping forwarding technology makes the number of cascaded pixels without signal transmission only limited by signal transmission speed.

The LED has a low driving voltage (which allows for environmental protection and energy saving), high brightness, scattering angle, good consistency, low power, and long life. The control circuit is integrated in the LED above.

Main Application Field:

- Full color LED string light, LED full color module, LED super hard and soft lights, LED guardrail tube, LED appearance / scene lighting
- LED point light, LED pixel screen, LED shaped screen, a variety of electronic products, electrical equipment etc..

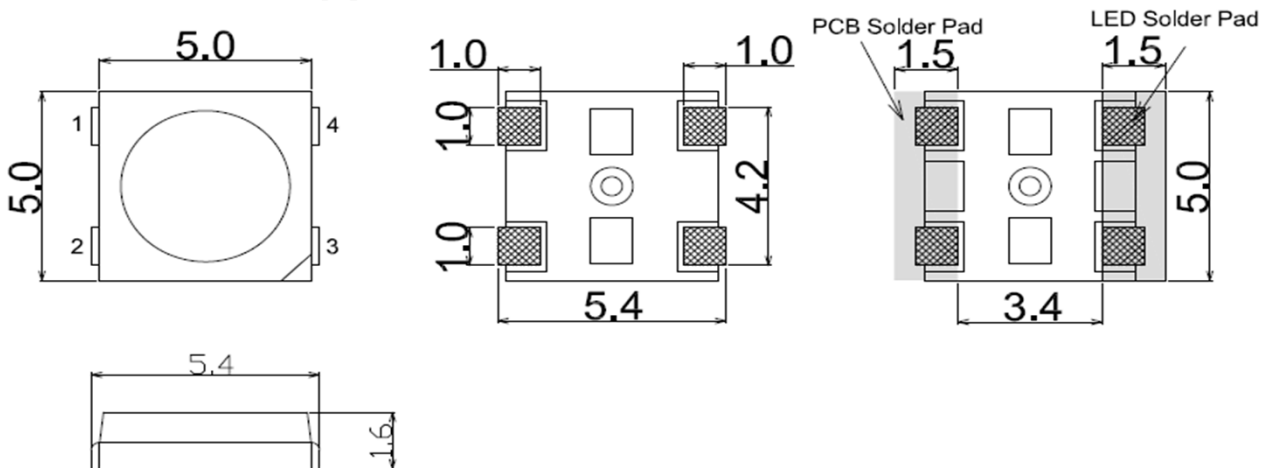
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Description:

- Top SMD internal integrated high quality external control line serial cascade constant current IC;
- control circuit and the RGB chip in SMD 5050 components, to form a complete control of pixel, color mixing uniformity and consistency;
- built-in data shaping circuit, a pixel signal is received after wave shaping and output waveform distortion will not guarantee a line;
- The built-in power on reset and reset circuit, the power does not work;
- gray level adjusting circuit (256 level gray scale adjustable);
- red drive special treatment, color balance;
- line data transmission;
- plastic forward strengthening technology, the transmission distance between two points over 10M;
- data transmission frequency up to 800Kbps, when the refresh rate of 30 frames per second, a cascade of not less than 1024;
- built-in powerpolarity protection module, powerpolarity will not damage.

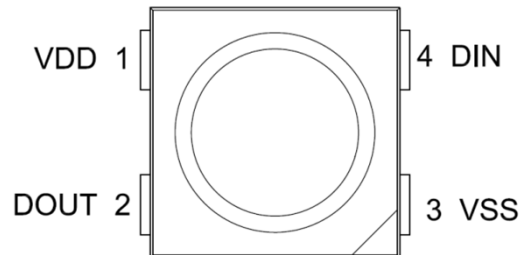
Mechanical Product Size (unit mm):



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Mechanical Size and Pin Map (unit mm):



Pin Function:

Item	Symbol	Pin Name	Function description
1	VDD	Power	power supply pin
2	DOUT	Data Output	control signal output data
3	VSS	Ground	The signal and power supply and grounding
4	DIN	Data Input	control signal input data

The electrical parameters (limit parameters, $T_a=25\text{ C}$, $V_{SS}=0\text{V}$):

Parameter	Symbol	Range	Unit
Input voltage	V_{IN}	+5~+24	V
Logic input voltage	V_I	-0.5~ $V_{DD}+5.5$	V
Working temperature	T_{opt}	-40~+85	°C
Storage temperature	T_{stg}	-50~+150	°C
EST pressure	V_{ESD}	4K	V

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The electrical parameters (such as no special instructions, TA=-20 ~ +70 ~ 5.5V C, VDD=4.5, VSS=0V):

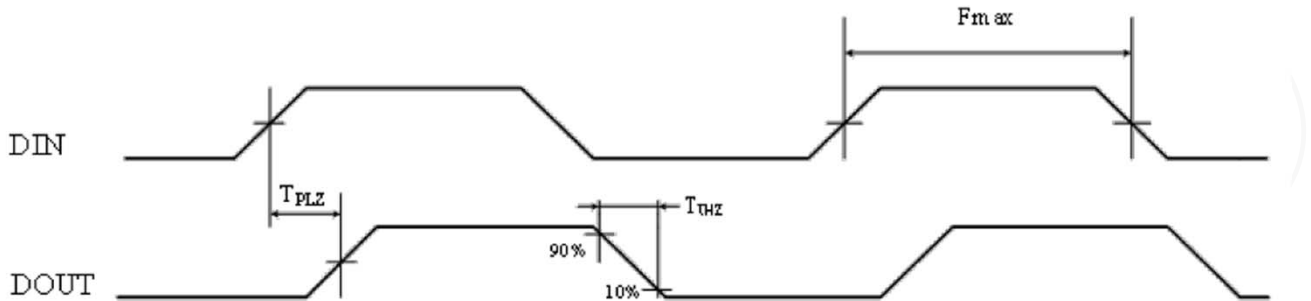
Parameter	Symbol	Min	Typical	Max	Unit	Test conditions
The chip supply voltage	VDD	---	5.2		V	---
R/G/B port pressure	VDS,MAX	---	---	26	V	---
DOUT drive capability	IDOH	---	49	---	mA	DOUT connect ground, the maximum drive current
	IDOL	---	-50	---	mA	DOUT connect +, the largest current
The signal input flip threshold	VIH	---	3.4	---		VDD=5.0V
	VIL	---	1.6	---		
The frequency of PWM	FPWM	---	1.2	---	KHZ	---
Static power consumption	IDD	---	1	---	mA	---

The dynamic parameters (Ta=25 C):

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	T _{PLZ}	---	---	500	ns	DIN→DOUT
	T _{PLZ}	---	---	500	ns	

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RGB chip characteristic parameters:

Color	Wavelength(nm)	Luminous intensity(mcd)	Working voltage(v)
Red	620-625	700-1000	2.0-2.2
Green	522.5-525	1500-2200	3.0-3.3
Blue	467.5-470	700-1000	3.0-3.3

The data transmission time ($T_H+T_L=1.25\mu s\pm 600ns$):

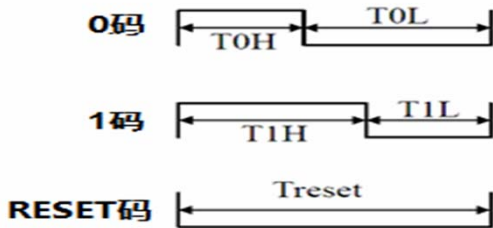
T0H	0 code, high level time	0.3 μs	$\pm 0.15\mu s$
T1H	1 code, high level time	0.6 μs	$\pm 0.15\mu s$
T0L	0 code, low level time	0.9 μs	$\pm 0.15\mu s$
T1L	1 code, low level time	0.6 μs	$\pm 0.15\mu s$
Trst	Reset code, low level time	80 μs	

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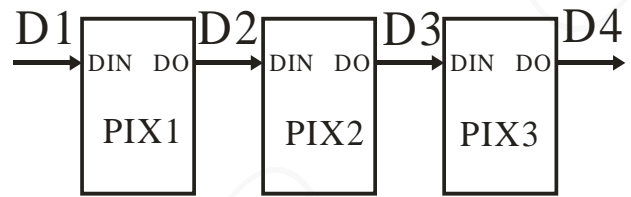
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Timing waveform:

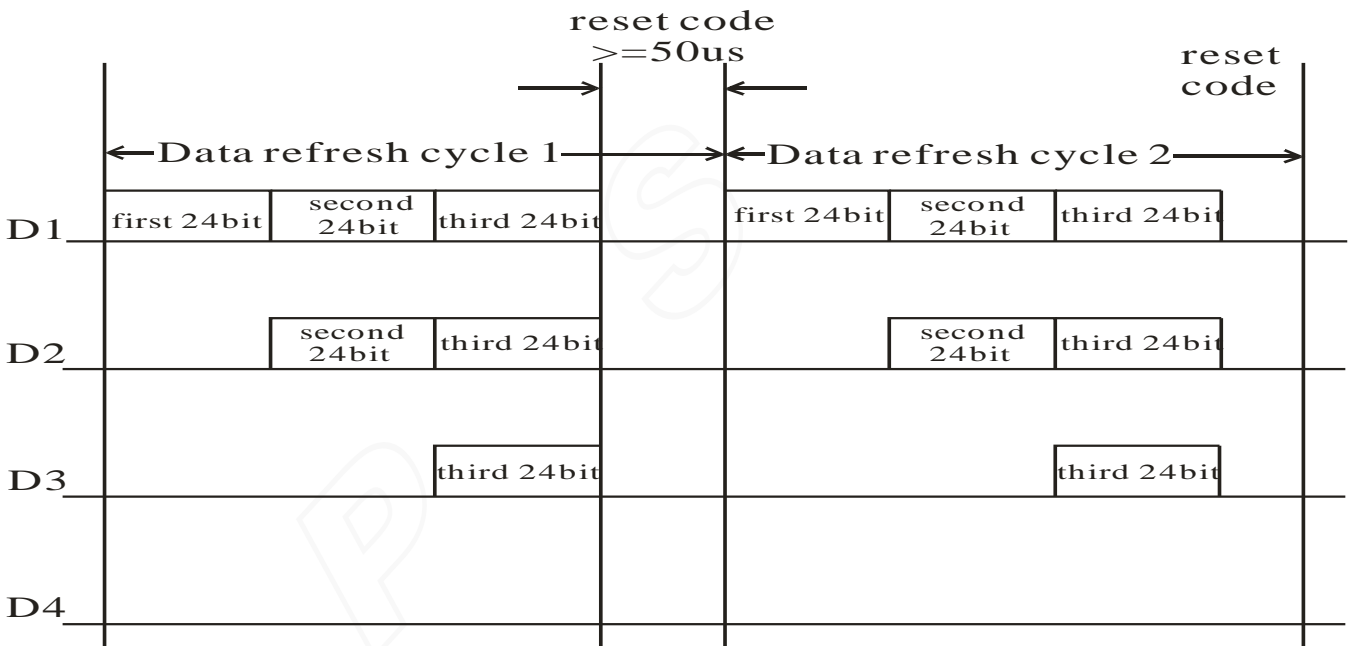
Input code:



Connection mode:

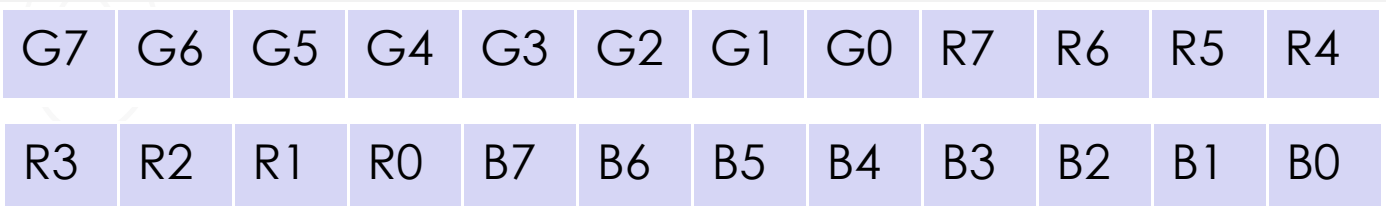


The method of data transmission:



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

The data structure of 24bit:



Note: high starting, in order to send data (G7 - G6 -B0)

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The typical application circuit:

