main feature

- The control circuit IC and a LED light source power utility.
- RGB control circuit 5050 integrated in a chip package components constituting a complete external control pixels.
- Shaping circuit built-in signal, any point after receiving the pixel signal and then output through the waveform shaping, the waveform distortion does not guarantee line accumulation.
- Built-on reset and power-down reset circuit.
- **Three primary colors of each pixel can be achieved 256 Display brightness level, complete 16777216 True color full-color display, the scanning frequency is not less than 400Hz / s.**
- Serial cascade interface, a signal line is completed by the reception and decoding of data.
- **Any two pass transmission distance of not more than 3 Without adding any circuit when the meters.**
- When the refresh rate of 30 frames / sec, the number of the cascade is not less than 1024 points.
- **Data transmission speed of up to 800Kbps .**
- Highly uniform color of the light, cost-effective.

The main application areas

- Full color LED emitting character string lights, LED full-color flexible light strip light bar, LED guardrail.
- LED light source, LED pixel screen, LED shaped screen, various electronic products, electrical equipment marquees.

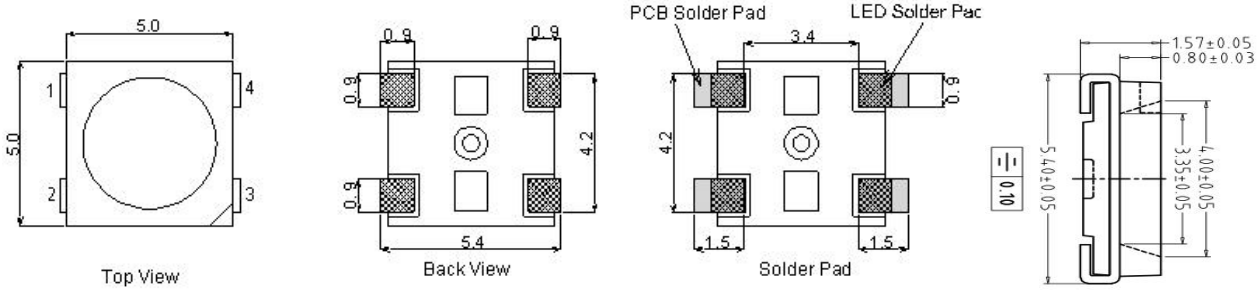
product description

WS2812B It is a collection control circuit and intelligent lighting circuit in one of the external control led light source. Its appearance with a 5050LED Same lamp beads, each element that is a pixel. Pixel point contains internal smart digital interface data latch signal amplification shaping driving circuit further includes a high-precision internal oscillator and programmable high voltage 12V constant current control section, to ensure the effective pixel color light highly consistent.

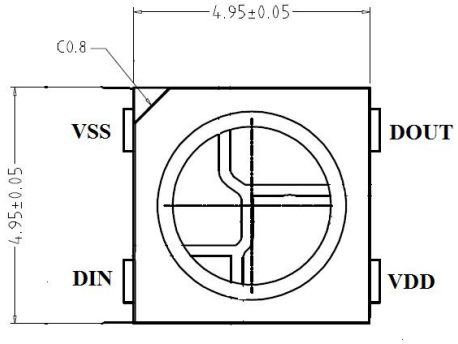
Data communication protocol uses a single line NRZ, pixels in POR, DIN Receiving a transmission from the controller over the end of data sent over the first 2 4bit After the first data is extracted a pixel, the pixel data to the internal latch, the remaining data after the shaping process through the internal circuit is amplified by shaping DO Pixel output port begins forwarding to the next cascade, each pixel via a transmission point, reducing the signal 2 4bit . Pixel automatic forwarding shaping techniques, such that the number of pixels of the concatenation is not limited transmission signal, the signal transmission speed is only limited.

LED having a low driving voltage, high energy saving and environmental protection, brightness, large angle scattering, consistency, low power, long life and other advantages. The LED control circuit is integrated in the above, the circuit becomes more simple, small size, easier installation.

Mechanical Size (in mm)



Mechanical dimensions of the pin (unit mm):



Pin Function :

No.	Symbol	Pin name	Functional Description
1	VDD	power supply	Power supply pins
2	DOUT	Data output control	data output signal
3	VSS	Ground	Signal ground and power ground
4	DIN	Data input control	data signal input

Maximum Ratings (Unless otherwise specified, T_A = 25 ℃, V_{SS} = 0V)

parameter	symbol	range	unit
voltage	V_{DD}	+3.5 + 5.3	V
Logic Input Voltage	V_I	-0.5 ~ VDD + 0.5	V
Operating temperature	Topt	--25 ~ + 80	℃
Storage temperature	Tstg	- 40 to + 105	℃

Electrical parameters (Unless otherwise specified, T_A = - 20 ~ + 70 ℃, V_{DD} = 4.5 ~ 5.5V, V_{SS} = 0V)

parameter	Symbol	Min	Typical	Max	Unit		Test Conditions
Input Current	I_I	-	-	-	± 1	μA	$V_I = V_{DD} / V_{SS}$
High-level input	V_{IH}	0.7V_{DD}		-	- V		D_{IN} , SET
Low Input	V_{IL}	-	-	-	0.3 V_{DD}	V	D_{IN} , SET
Hysteresis voltage	V_H	-	-	0.35	- V		D_{IN} , SET

Switching Characteristics (Unless otherwise specified, T_A = - 20 ~ + 70 ℃, V_{DD} = 4.5 ~ 5.5V, V_{SS} = 0V)

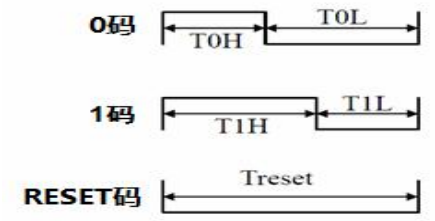
Symbol	Parameter	Min	Typ	Max	Units		Test Conditions
Transmission delay between	t_{PLZ}	-	-	300		ns	CL = 15pF, DIN → DOUT, RL = 10KΩ
Fall Time	t_{THZ}	-	-	120		μs	CL = 300pF, OUTR / OUTG / OUTB
Input capacitance	C_I	-	-	--15		pF	- -

led Parameters

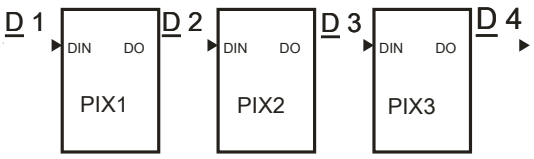
The luminescent color dominant wavelength (nm) light intensity(mcd)			Working current(mA)	Operating Voltage(V)
Red light	620 to 630	550 to 700	16	1.8 to 2.2
Green	515 to 530	1100 to 1400	16	2.8 to 3.1
Blu-Ray	465 ~ 475	200 to 400	16	2.9 to 3.2

A timing waveform chart

Enter the code:



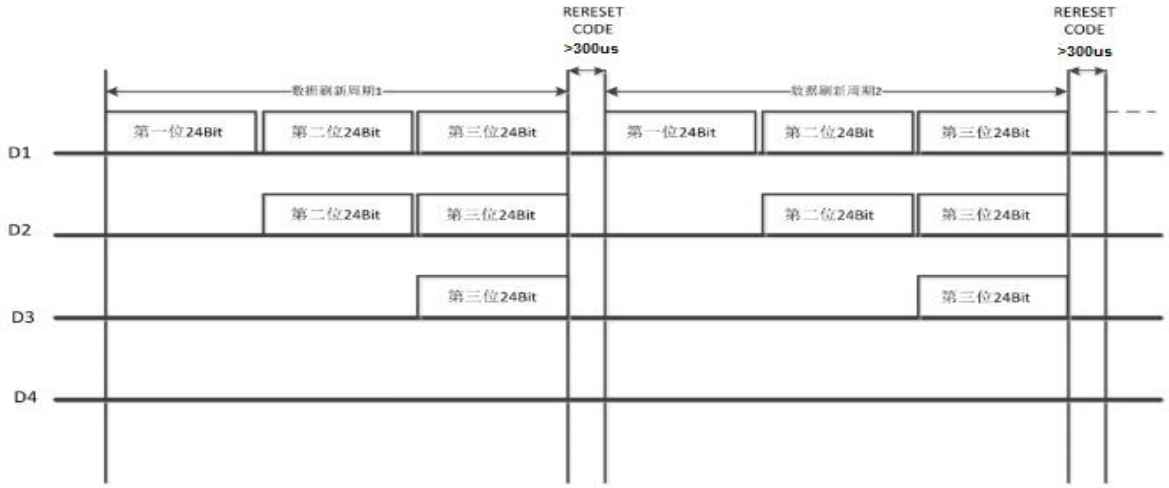
connection method:



Data transmission time (TH + TL = 1.1μs ± 300ns)

T0H	0 Code, high time	220ns ~ 420ns
T1H	1 Code, high time	750ns ~ 1.6μs
T0L	0 Code, low time	750ns ~ 1.6μs
T1L	1 Code, low time	220ns ~ 420ns
RES	Frame unit, low time	300μs the above

The data transmission method :



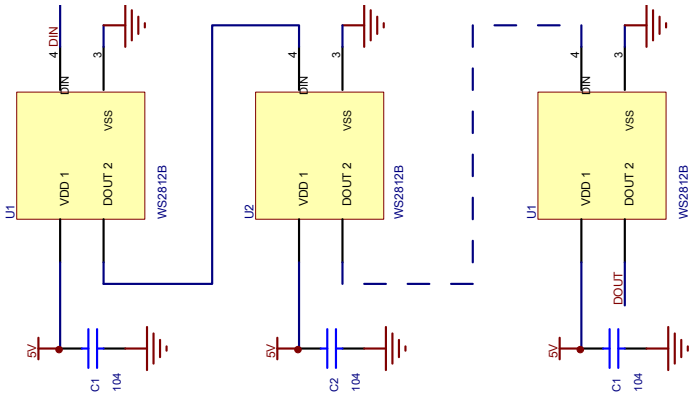
Note: One D1 for MCU End of the transmitted data, D2 , D3 , D4 Cascade shaping circuit automatically forwarded data.

24bit data structure:

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 starting, in accordance with GRB The transmission data sequence.

Typical application circuit:



Reflow Guidelines

Curve Description	Leaded reflow	Lead-free reflow
Minimum preheating temperature (Tsmin)	100 ℃	150 ℃
Maximum preheat temperature (Tsmax)	150 ℃	200 ℃
Preheating zone time (Tsmin to Tsmax) (ts)	60-120 S	60-180 S
The average heating rate (Tsmax to Tp)	<3 ℃ / S	<3 ℃ / S
Liquidus temperature (TL)	183 ℃	217 ℃
Liquid zone holding time (tL)	60-150 S	60-150 S
Peak temperature (Tp)	215 ℃	250 ℃
High temperature zone (peak temperature - 5 ℃) retention time (tp)	<10 S	<10 S
Cooling rate	<6 ℃ / S	<6 ℃ / S
Wen Zhifeng room temperature value of the residence time	<6 min	<6 min

Reflow Note:

1. Before use Keep out 65-70 Degree oven baked twenty four hour.

2. After coming out from the oven in 2 I.e., within hours after use.

3. Do not use the product in a timely manner back into the oven.

4. When the night shift or break is complete placement had finished the furnace and then to work, there is no patch promptly back into the oven.