

Features and Benefits

- The control circuit and RGB chip are integrated in a 3535 components, to form an external control pixel.
- 12V power supply voltage,maximize the consistency of the mixed light when the pixel is transmitted over a long distance.
- Using the built-in signal reshaping circuit to achieve the signal waveform shaping, and no distortion of waveform of signal takes place.
- The gray levels of each pixel are of 256 levels, which achieves “256*256*256=16777216” full-color display
- Port scanning frequency 4KHz.
- Serial cascade interface, data receiving and decoding depend on just one signal line.
- Any two point the distance more than 5M transmission signal without any increase circuit.
- When the refresh rate is 30fps, cascade numbers is at least 1024 pixels.
- Data transmitting at speeds of up to 800Kbps.
- Good color consistency reliability, high cost-effective.

Applications

- Full-color module, LED full-color soft/hard light bar, LED guardrail tube.
- LED point light source, LED pixel screen,Special-shaped screen.

General description

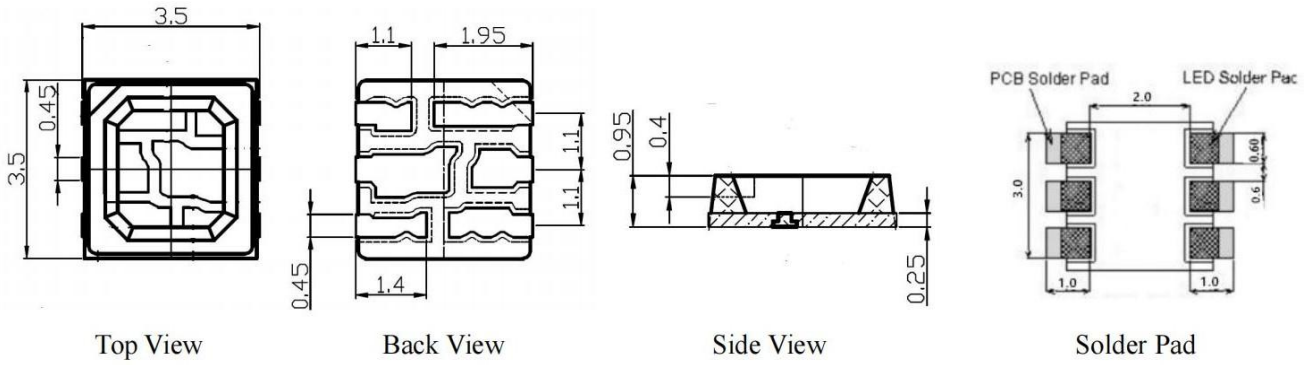
WS2815F-MINI-6P is an intelligent control LED light source that the control circuit and RGB chip are integrated in a package of 3535 components.

Each component is a pixel,its internal include intelligent digital port data latch and signal reshaping amplification drive circuit. Also include a precision internal oscillator and a 12V voltage programmable constant current control part, which achieves highly consistent color effect.

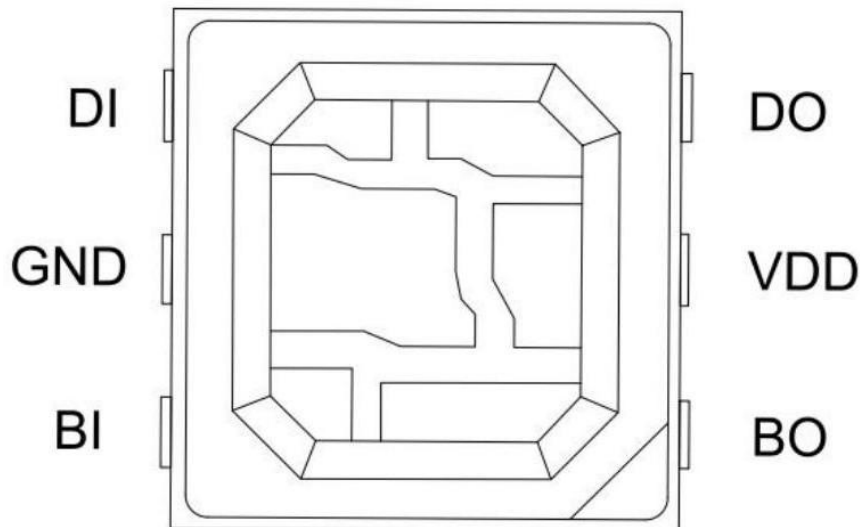
The data transfer protocol use single NZR communication mode. After the pixel power-on reset, the DIN port receive data from controller, the first pixel collect initial 24bit data then sent to the internal data latch, the other data which reshaping by the internal signal reshaping amplification circuit sent to the next cascade pixel through the DO port. After transmission for each pixel, the signal to reduce 24bit. Every pixel adopts auto-reshaping transmit technology, making the pixel cascade numbers are not limited to the signal transmission, only relate to the speed of signal transmission.

RESET time>280μs, it won't cause wrong reset while interruption, Can support lower frequency, less expensive MCUS.

Mechanical Dimensions(Unit:mm)



PIN Configuration



PIN Function

NO.	Symbol	PIN	Function description
1	BO	Backup signal output	Backup signal output pin
2	VDD	Power supply	Power supply pin
3	DO	Main signal output	Main control signal output pin
4	DI	Main signal input	Main signal input pin
5	GND	Ground	Signal ground and power ground pins
6	BI	Backup signal input	Backup signal input pin

Absolute Maximum Ratings (T_A=25°C, V_{SS}=0V)

Parameter	Symbol	Ratings	Unit
Power supply voltage	V _{DD}	+9.5~+13.5	V
Logical Input Voltage	V _I	-0.3~5.7	V
Working Temperature	T _{opt}	-40~+65	°C
Storage Temperature	T _{stg}	-40~+85	°C

Electrical Characteristics (T_A=25°C, V_{DD}=12V, V_{SS}=0V)

Parameter	Symbol	Min.	Tpy.	Max.	Unit	Conditions
Input Current	I _I	—	—	±1	μA	V _I =V _{DD} /V _{SS}
High-level Input	V _{IH}	2.7	—	5.7	V	D _{IN} , SET
Low-level Input	V _{IL}	-0.3	—	1.5	V	D _{IN} , SET

Switching Characteristics (T_A=25°C, V_{DD}=12V, V_{SS}=0V)

Parameter	Symbol	Min	Tpy	Max	Unit	Condition
Transmission Delay Time	T _{PLZ}	—	—	300	ns	CL=15pF, DIN→DOUT, RL=10KΩ
Fall time	T _{THZ}	—	—	120	μs	CL=300pF, OUTF/OUTG/OUTB
Input-capacitance	C _I	—	—	15	pF	—

LED Characteristics

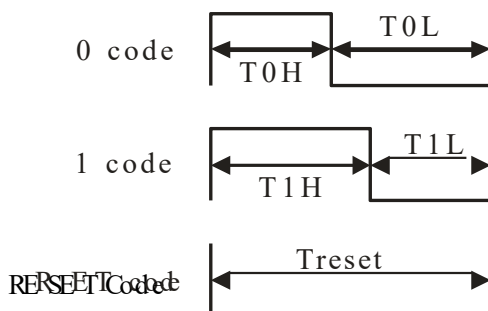
Parameter	Symbol	Color	Quiescent Current: <2mA			Unit	Condition (Working current)
			Min	Tpy	Max		
Brightness	IV	Red	200	300	450	mcd	12mA
		Green	400	620	1000		
		Blue	100	170	250		
Wavelength	λ_d	Red	620	623	630	nm	12mA
		Green	520	524	530		
		Blue	460	467	470		

Data Transfer Time

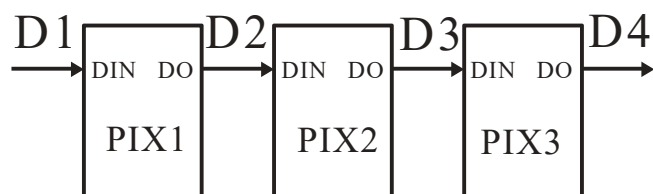
T0H	0-code, High-level time	220ns~380ns
T1H	1-code, High-level time	580ns~840ns
T0L	0-code, Low-level time	900ns~5000ns
T1L	1-code, Low-level time	600ns~5000ns
RES	Frame unit, Low-level time	> 280 μ s
T_{DATA}	Data cycle	\geq 1.25 μ s

Timing Waveform

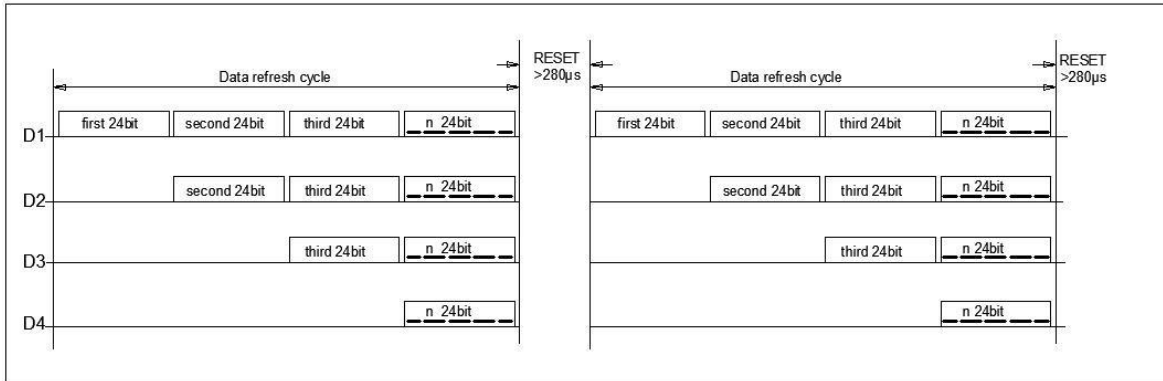
Sequence chart



Cascade method



Data Transmission Method



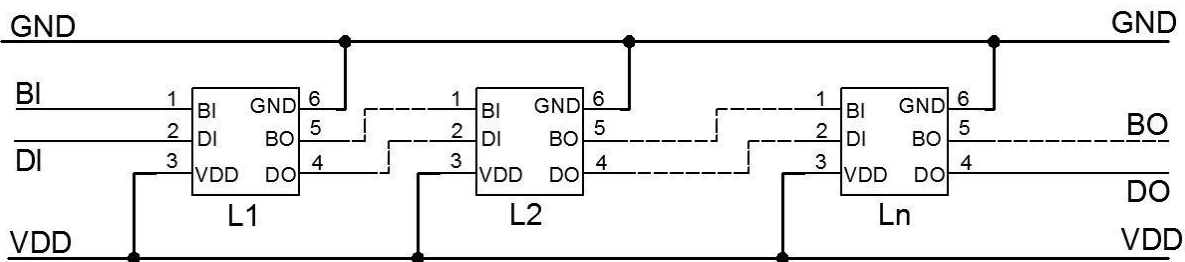
Note: D1 is the data from MCU, and D2, D3, D4 are from Cascade Circuits.

Composition of 24bit data

G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4	R3	R2	R1	R0	B7	B6	B5	B4	B3	B2	B1	B0
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Note: Data transmit in order of GRB, high bit data is first.

Typical Application Circuit: The peripheral circuit don't need to add filter capacitor.



Note 1: The led has a built-in filter capacitor, that is, the led can work normally without using an external filter capacitor;

The external filter capacitor can increase the stability of the lamp bead use, and can also be appropriately external, and the recommended value of the capacitor is 100nf.

Note 2: BI grounding of the first LED during finished application.