Smart RGB LED Light Stick (Arduino Compatible)

This is a Smart LED light stick that contains 20 x WS2812B single wire addressable full colors RGB LEDs and Atmega328 microcontroller. These full colors chainable intelligent RGB LEDs work with a single wire addressable protocol thus they require a micro-controller to generate the pulse train to control the colors and flashing effects. Refer to the datasheet of LEDs to decode the various colors flashing effects. The operating supply of the circuit is 5V DC with a maximum current of 1A.

Example Arduino code will help you to test the board. The Atmega328 chip can be programmed using the Arduino platform, we have used the DIP package of the microcontroller for easy programming using Arduino UNO and insertion of the programmed chip to the LED stick.

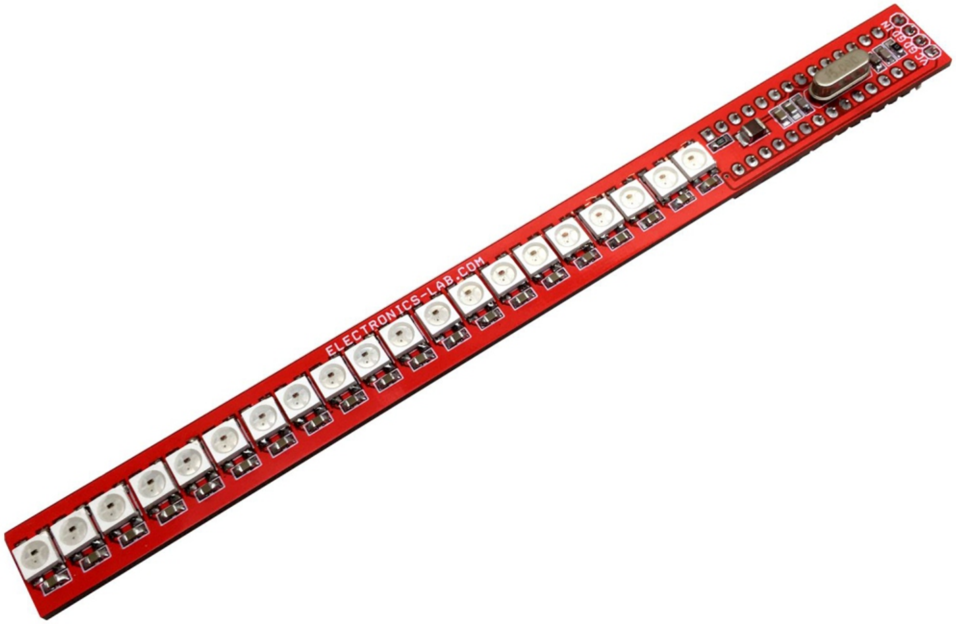
Features:

- Digital pin D2 controls the LEDs, and Analog pin A0 provided to interface sensor or switch.
- Operating Supply 5V DC / 1Amp
- PCB Dimensions 156.37MM X 13.81MM

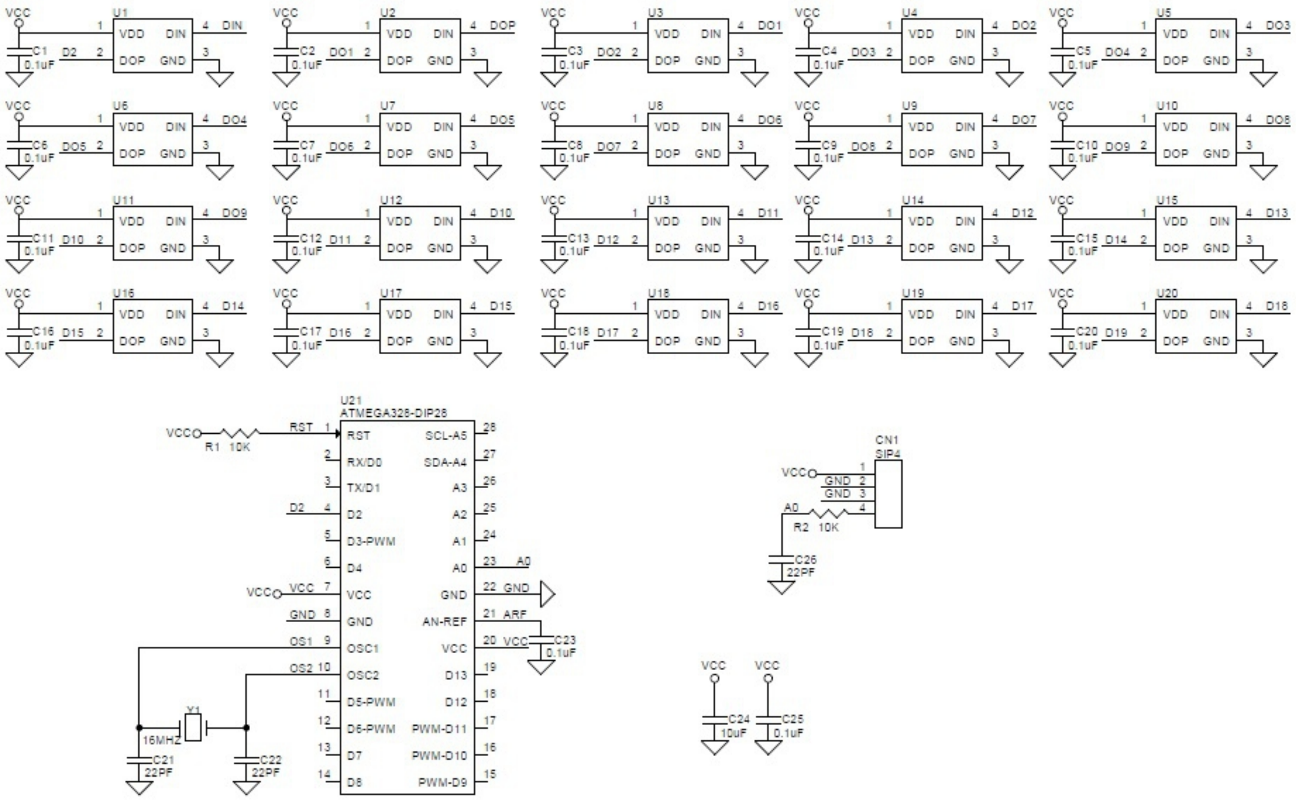
Boot-loader/Arduino Programming Atmega328 available here

https://www.arduino.cc/en/Tutorial/BuiltInExamples/ArduinoToBreadboard

WS2812B LED

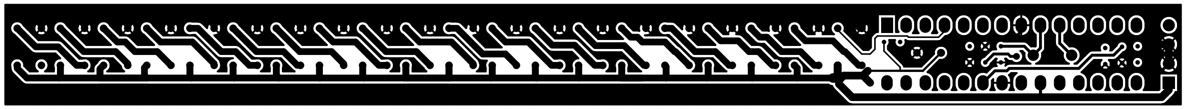


WS2812B is a intelligent control LED light source that the control circuit and RGB chip are integrated in a package of 5050 components. It internal include intelligent digital port data latch and signal reshaping amplification drive circuit. Also include a precision internal oscillator and a voltage programmable constant current control part, effectively ensuring the pixel point light colour height consistent. The data transfer protocol uses single NZR communication mode. After the pixel power-on reset, the DIN port receive data from controller, the first pixel collects 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. pixel adopt auto reshaping transmit technology, making the pixel cascade number is not limited the signal transmission, only depend on the speed of signal transmission. RESET time>280µs, it won't cause wrong reset while interruption, it supports the lower frequency and inexpensive MCU. Refresh Frequency updates to 2KHz, Low Frame Frequency and No Flicker appear in HD Video Camera, it improves excellent display effect. LED with low driving voltage, environmental protection and energy saving, high brightness, scattering angle is large, good consistency, low power, long life and other advantages. The control chip integrated in LED above becoming more simple circuit, small volume, convenient installation.

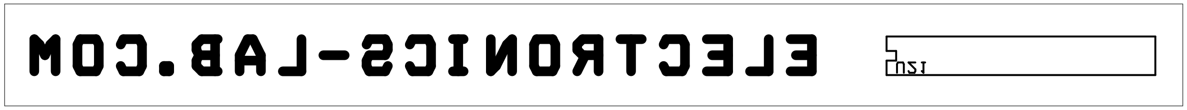


VCC
U1
VDD
DIN
DOP
GND
C1 0.1uF
D2
DIN
U2 … U20
C2 … C20 0.1uF
DO1
DO2
DO3
DO4
DO5
DO6
DO7
DO8
DO9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
U21
ATMEGA328-DIP28
R1 10K
RST
RX/D0
TX/D1
D2
D3-PWM
D4
VCC
GND
OSC1
OSC2
D5-PWM
D6-PWM
D7
D8
SCL-A5
SDA-A4
A3
A2
A1
A0
AN-REF
D13
D12
PWM-D11
PWM-D10
PWM-D9
ARF
OS1
OS2
Y1
16MHZ
C21 22PF
C22 22PF
C23 0.1uF
CN1
SIP4
R2 10K
C26 22PF
C24 10uF
C25 0.1uF

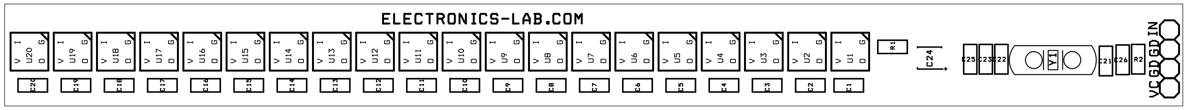
TOP LAYER



BOTTOM LAYER

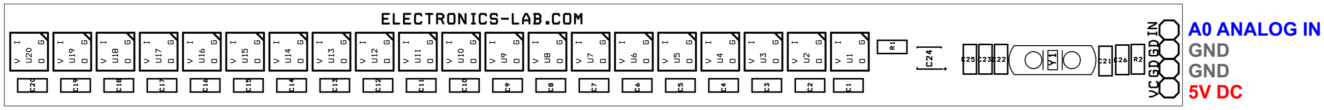


SILK SCREEN BOTTOM



SILK SCREEN TOP

PCB DIMENSIONS 156.37MM X 13.81MM



BOM				
SR.	***QNTY.***	***REF.***	***DESC.***	***VENDOR/DIGIKEY/MOUSER***
1	1	CN1	4 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
2	22	C1 - C19,C20,C23,C25	0.1uF/50V SMD SIZE 0805	YAGEO
3	3	C21,C22,C26	22PF/50V SMD SIZE 0805	YAGEO
4	1	C24	10uF/10V SMD SIZE 1210	YAGEO
5	2	R1,R2	10K 5% SMD SIZE 0805	YAGEO
6	20	U1 - U20	WS1228B SMD SIZE 5050	DIGIKEY 1528-1104-ND
7	1	U21	ATMEGA328-DIP28	DIGIKEY ATMEGA328-PU-ND
8	1	Y1	16MHZ	DIGIKEY X1103-ND
9	2	SOCKET	28 PIN IC SOCKET	DIGIKEY S7012-ND

07005

electronics-lab.com

www.electronics-lab.com Author Rajkumar Sharma

07005