

1Amp Constant Current LED Driver Shield for Arduino Nano

1A Constant current LED driver shield for Arduino Nano has been designed for verity of LED related applications. The shield provides accurate LED current sink to regulate LED current in a string of LEDs or LED. The LED current is mirrored from the current flowing from the RSET Preset PR1. On board 1W LED is used for testing purpose. External high Wattage LED or multiple LED string can be connected by pulling two wires from the PCB, this shield fit directly on back side of Arduino Nano. Shield also has on board tactile switch connected to Digital D2 pin using pull down resistor if required for any application. On board preset helps to set the maximum constant current. PWM input pin connected to Digital pin D6 of Nano to control the LED intensity. Example code FADE-IN/FADEOUT helps to test the shield.

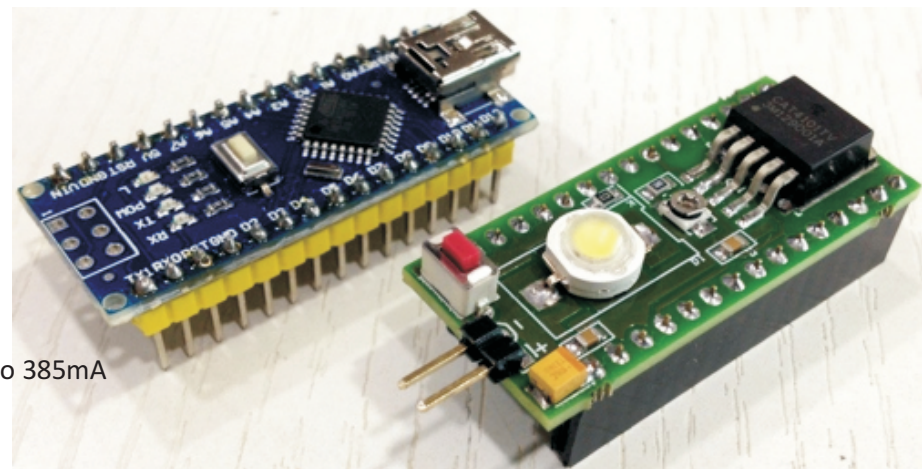
The board built using CAT4101 IC from ON Semiconductor. The CAT4101 is a constant- current sink driving a string of high- brightness LEDs up to 1 A with very low dropout of 0.5 V at full load. It requires no inductor, provides a low noise operation and minimizes the number of components. The LED current is set by an external Trimmer preset PR1 connected to the RSET pin. The LED pin is compatible with high voltage up to 12 V, allowing the driving of long strings of LEDs. The device ensures an accurate and regulated current in the LEDs independent of supply and LED forward voltage variation. The PWM/EN input allows the device shutdown and the LED brightness adjustment by using an external pulse width modulation (PWM) signal coming from Arduino Nano D6 pin. The driver features a thermal shutdown protection that becomes active whenever the die temperature exceeds 150°C.

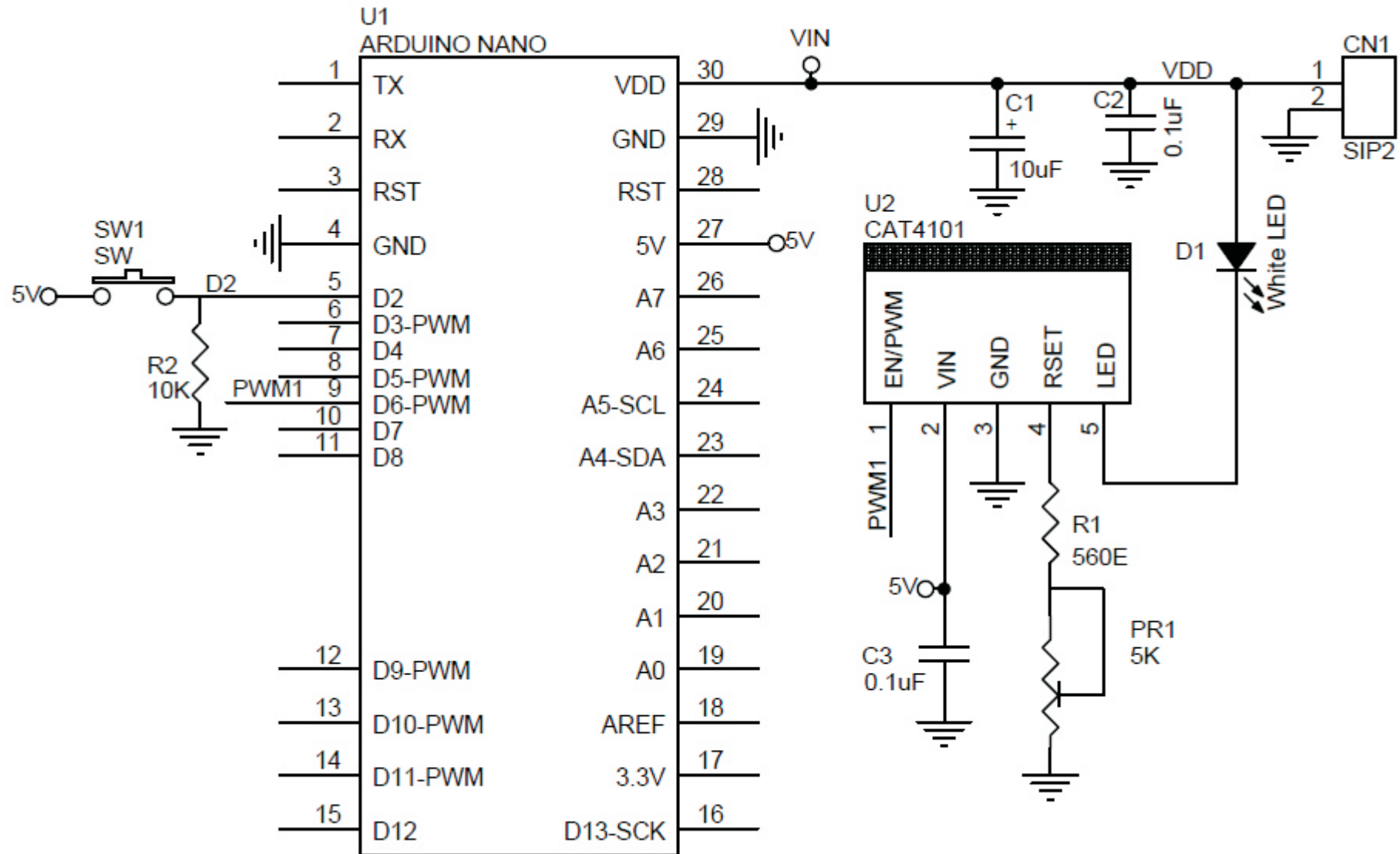
PWM Duty Cycle and Frequency

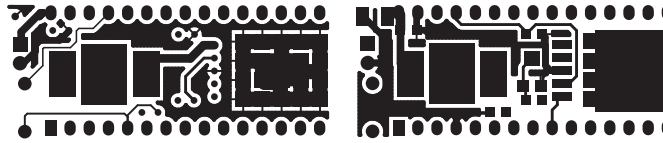
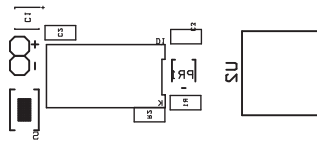
Accurate linear dimming is compatible with PWM frequencies from 100 Hz to 5 kHz for PWM duty cycle down to 1%. PWM frequencies up to 50 kHz can be supported for duty cycles greater than 10%.When performing a combination of low frequencies and small duty cycles, the device may enter shutdown mode. This has no effect on the dimming accuracy, because the turn- on time TPS is very short, in the range of 1s. To ensure that PWM pulses are recognized, pulse width low time TLO should be longer the 1s. The CAT4101 enters a “zero current” shutdown mode after a 5 ms delay (typical) when EN/PWM is held low.

Features

- Supply 7-12V DC
- Load Current 1A Max
- Constant Current adjustable Up To 1A
- High Resolution PWM Dimming
- On Board Trimmer Potentiometer to set the constant Current
- Nano Digital Pin D6 Connected to PWM of the CAT4101 IC
- Nano Digital Pin D2 Connected to Tact Switch using Pull Down
- When PR1 Trimmer Minimum its set to 1A current, @ 1.5K Ohms set to 385mA

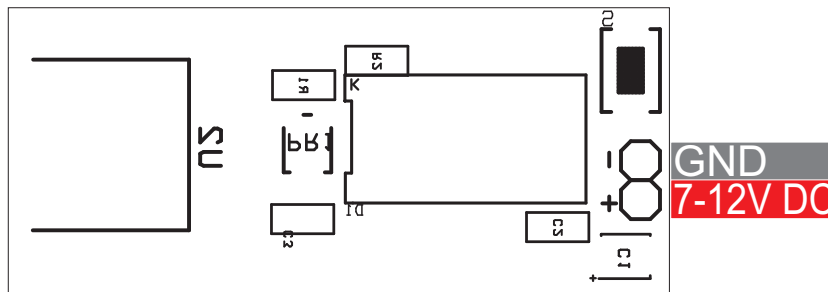






TXO	VIN	G
RX	RS	R5
RST	SV	A7
GND	D2	D3
	D4	D5
	D6	D7
	D8	D9
	D10	D11
	D12	D13
U1		

ELECTRONICS-LAB.COM



BOM			
SR.	QNTY.	REF.	DESC.
1	1	CN1	2 PIN HEADER CONNECTOR
2	1	C1	10uF/16V SMD 1210
3	2	C2,C3	0.1uF
4	1	D1	White LED 1W LED
5	1	PR1	5K SMD 3MM PRESET
6	1	R1	560E SMD 0805
7	1	R2	10K SMD 0805
8	1	SW1	TACT SWITCH
9	1	U1	ARDUINO NANO
10	1	U2	CAT4101

