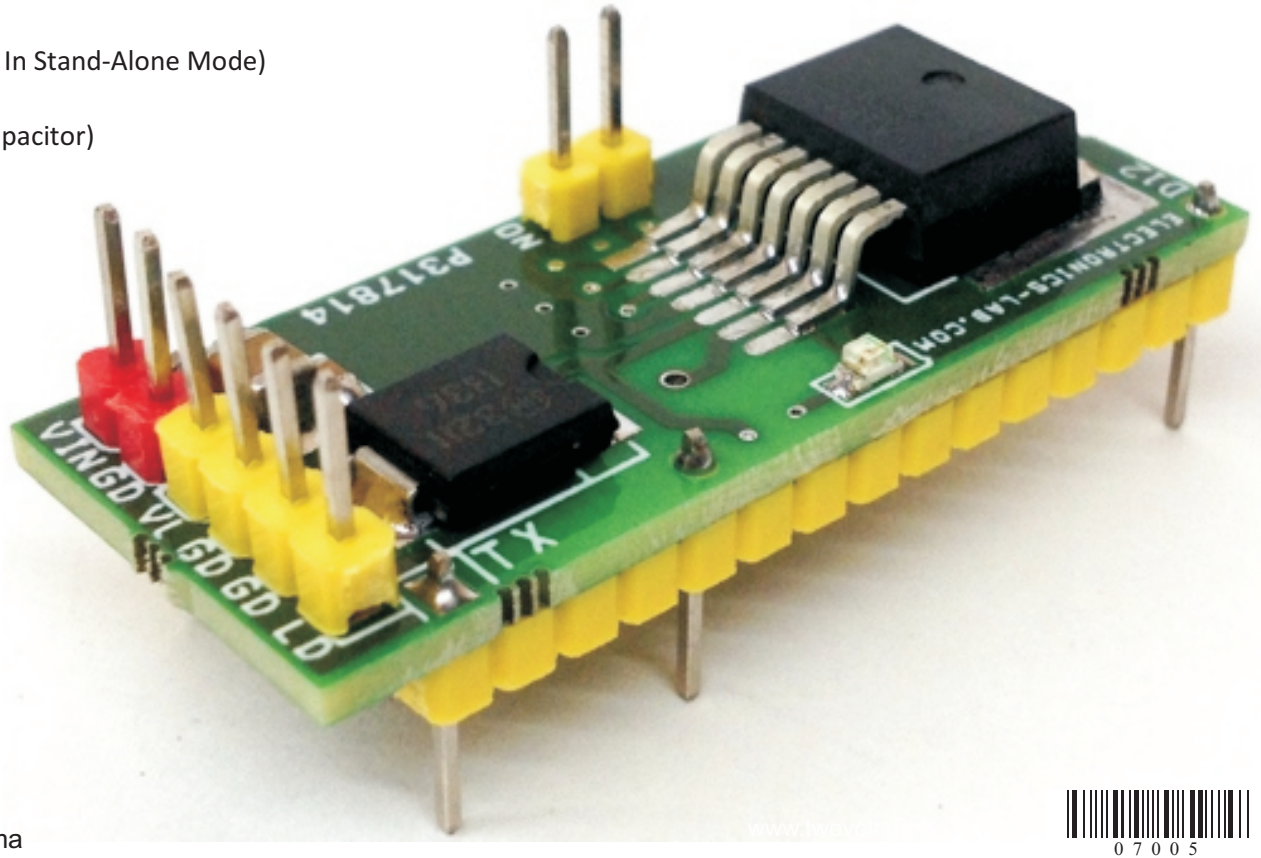
2.7A PWM VALVE/SOLENOID DRIVER ARDUINO NANO SHIELD

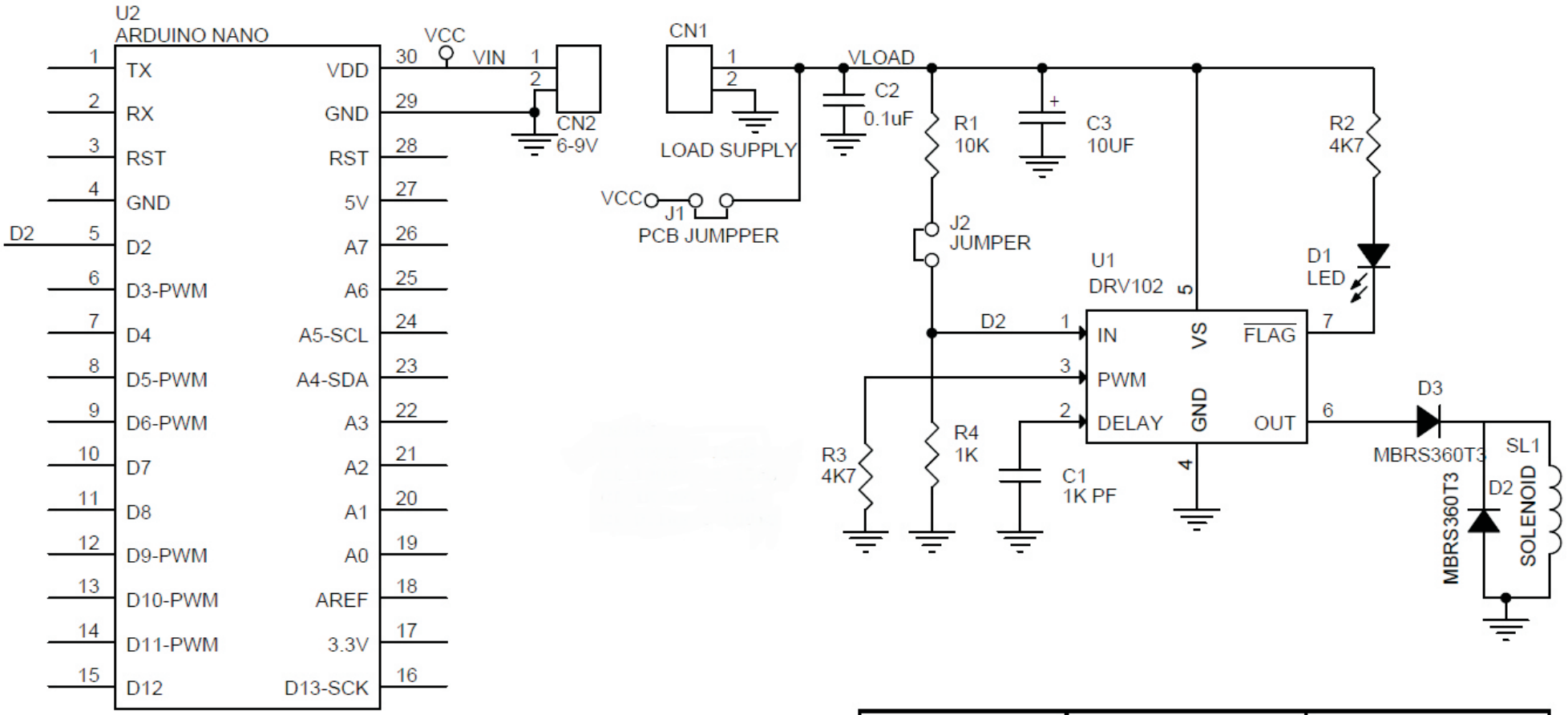
The Arduino shield can help to drive various loads like solenoid, valve, motor, inductive actuator, heater and bulb. A wide supply range 8V-60V load current 2.7A allows use with a variety of actuators. The project is can used as stand-alone driver or can be controlled by Arduino Nano. DRV102 is the heart of the project which is a high-side power switch employing a pulse-width modulated (PWM) output. Its rugged design is optimized for driving electromechanical devices such as valves, solenoids, relays, actuators, and positioners. The circuit is also ideal for driving thermal devices such as heaters and lamps. PWM operation conserves power and reduces heat rise in the device, resulting in higher reliability. In addition, adjustable PWM allows fine control of the power delivered to the load. Time from dc output to PWM output is externally adjustable using C1 capacitor. The DRV102 can be set to provide a strong initial closure, automatically switching to a soft hold mode for power savings. Duty cycle can be controlled by a resistor R3. LED D1 output indicates thermal shutdown and over/under current limit. D2 of the Arduino Nano connected to input of DRV102 to control on/off of the load, J2 jumper can be used to on/off the load in stand-alone mode, J1 PCB jumper provided to run the project with signal supply 9V Maximum. The project required dual supply, Load supply 8-60V and logic supply 6-9V.

Note : The board is set for 0.97mS delay on/off and can be alter for other delay using C1, Default duty cycle is 90% can be alter using R3.

Features

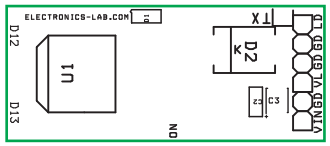
- Load Supply 8-60V
- Logic Supply Arduino Nano 6-9V DC (Not Required In Stand-Alone Mode)
- Load Current 2.7A
- Delay On/Off Adjustable 15uS-97mSeconds (C1-Capacitor)
- PWM Duty Cycle Adjustable (10-90%)
- D1 LED Flag Indicator (Fault LED)



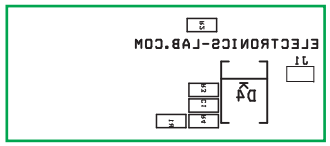


CONSTANT OUTPUT DURATION (Delay Time to PWM Mode)	C1
3µs	Pin Connected to 5V
15µs	Pin Open
97µs	100pF
0.97ms	1nF
97ms	0.1µF

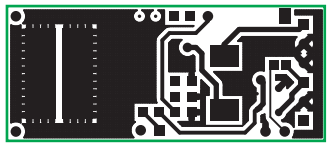
DUTY CYCLE	R3 RESISTOR R_{PWM} (kΩ)	VOLTAGE(2) V_{PWM} (V)
10	536	3.67
20	137	3.31
30	66.5	2.91
40	39.2	2.49
50	24.9	2.07
60	16.2	1.66
70	10.5	1.26
80	6.65	0.88
90	4.42	0.56



SILK SCREEN TOP



SILK SCREEN BOTTOM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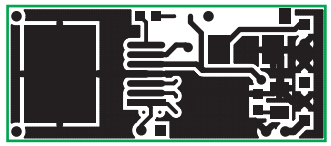
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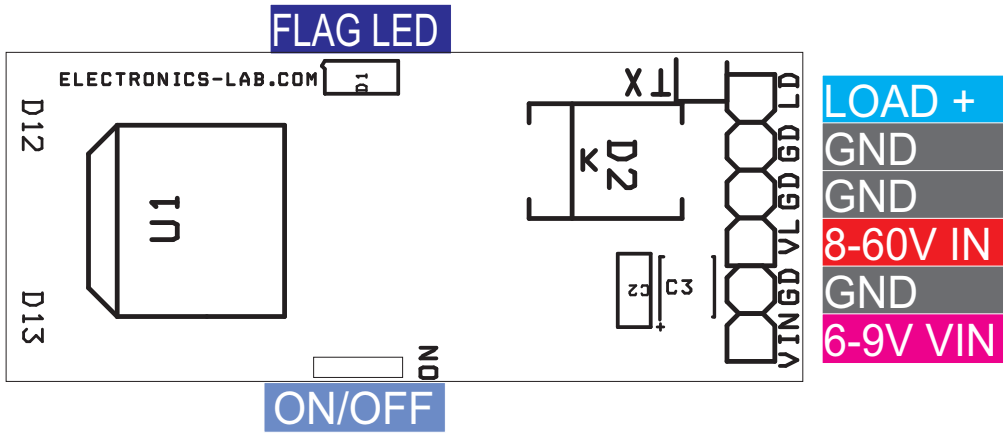

BOM			
SR.	QNTY.	REF.	DESC.
1	1	CN1	2 PIN HEADER CONNECTOR
2	1	CN2	2 PIN HEADER CONNECTOR
3	1	C1	1K PF
4	1	C2	0.1uF
5	1	C3	10UF
6	1	D1	LED
7	2	D2,D3	MBRS360T3
8	1	J1	PCB JUMPPER
9	1	J2	JUMPER
10	1	R1	10K
11	2	R2,R3	4K7
12	1	R4	1K
13	1	SL1	2 PIN HEADER CONNECTOR
14	1	U1	DRV102
15	1	U2	ARDUINO NANO