

60W LED Dimmer using 555 Timer

The project shown here is a cheap 60W LED dimmer for 12V LEDs/12V LED strips. The circuit is based on the very popular, versatile, and low-cost 555 timer IC, NE555 IC generates a PWM signal and IRF540 MOSFET works as output driver for the LEDs. In this circuit the 555 IC used in an astable multivibrator configuration to generate the PWM, by controlling the charging and discharging of the timing of capacitor C3, using D2, D3 and PR1. Potentiometer R7 is provided to control the intensity of LED connected to connector CN2, Connector CN1 provided to power the project with 12V DC. D1 is power indicator LED. Large thermal area provided as heatsink to cool down the MOSFET. The circuit can drive a load up to 36W (12V X 3Amps) in normal room temperature, and a load up to 5A requires forced air cooling for MOSFET Q1. D1 power LED, CN1 Power supply input, CN2 LED connections. R7 Potentiometer to control the intensity of LED.

Note 1: Circuit is built as an LED dimmer but it also can be used as a filament lamp dimmer, heater controller, of course, the load has to be within voltage and current limit capacity of the circuit.

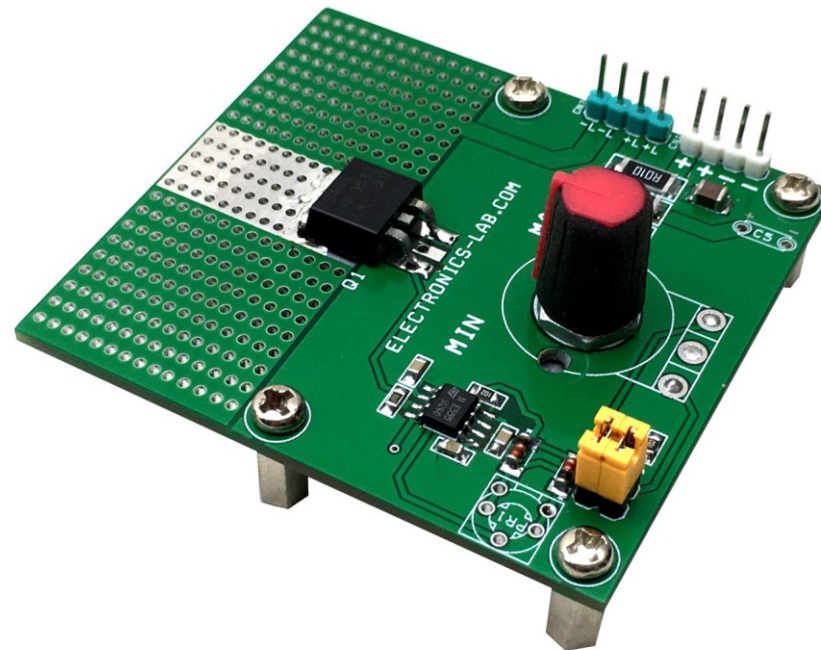
Note 2: Use Resistor R1, R4, R6 0 Ohms to drive 12 LEDs, if LED doesn't have current control series resistor, choose R1, R4, R6 value as per LED current control.

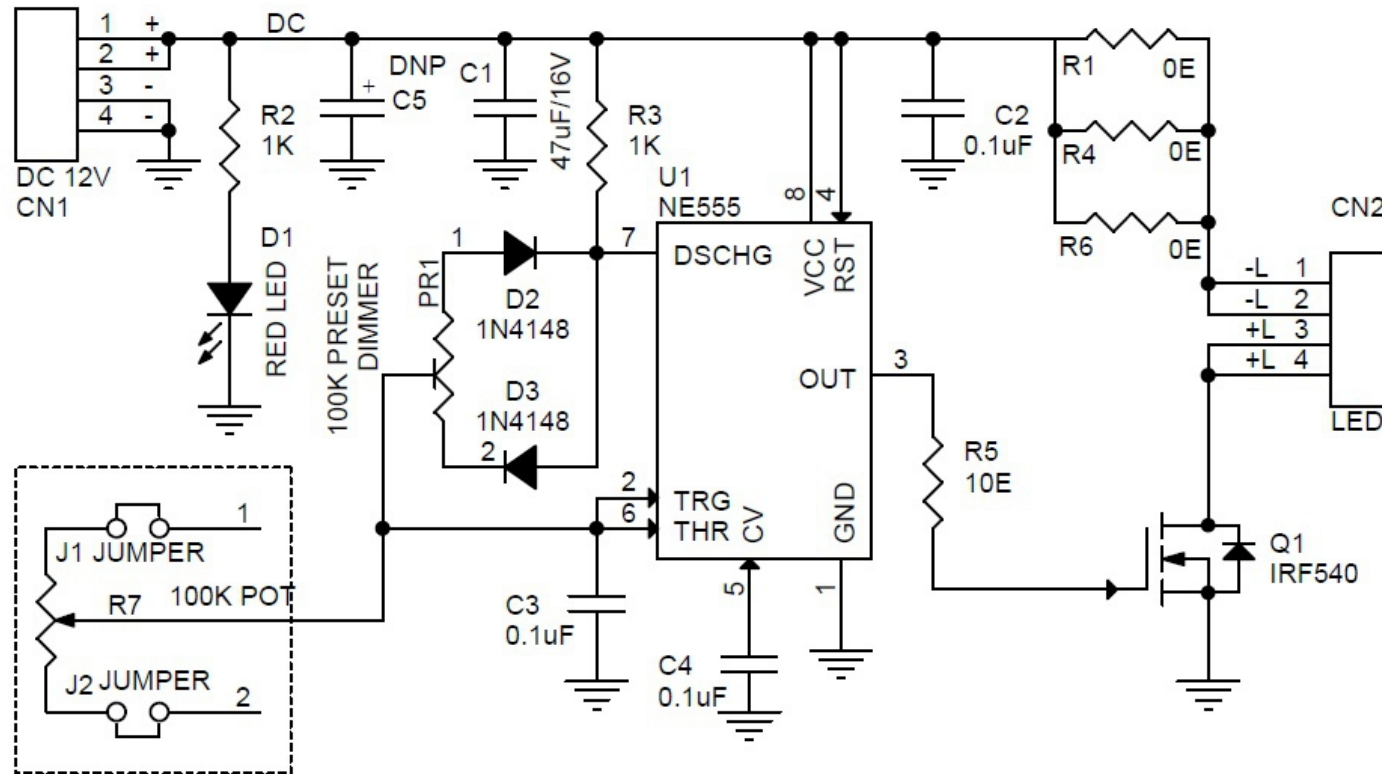
Note 3: Project has 2 options for PWM adjust, PR1 Trimmer or R7 Potentiometer, for 16mm R7 potentiometer >>>use jumper J1, J2 and R7, for Trimmer Omit >> J1, J2, and R7

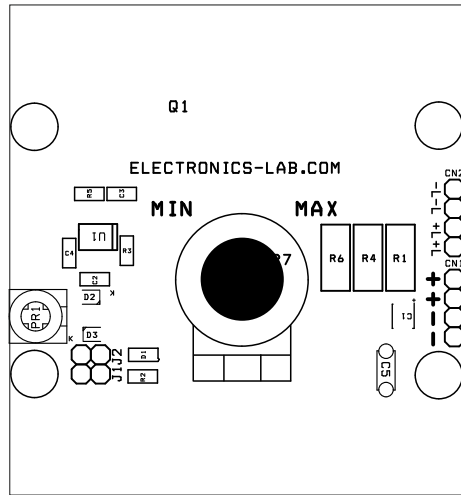
Note 4: It is advisable to use C5 Electrolytic Capacitor 1000uF-16V or 470uF/16V for Higher Load up to 5A

Features

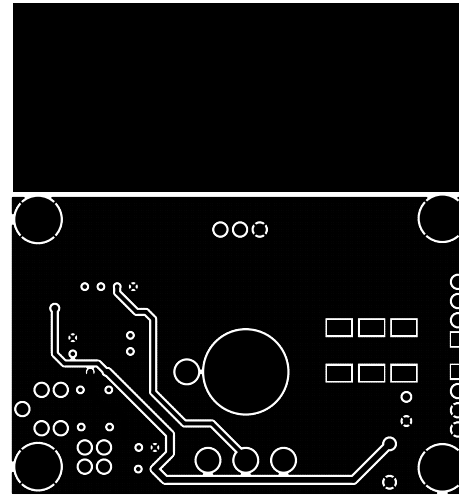
- Operating Supply 12V DC
- Load up to 3Amps Room temperature
- Load up to 5Amps Force cool air on MOSFET
- PWM Duty Cycle 5 % to 95 % (Approx.)
- Frequency 130Hz
- PCB Dimensions 65.41MM X 60.80mm



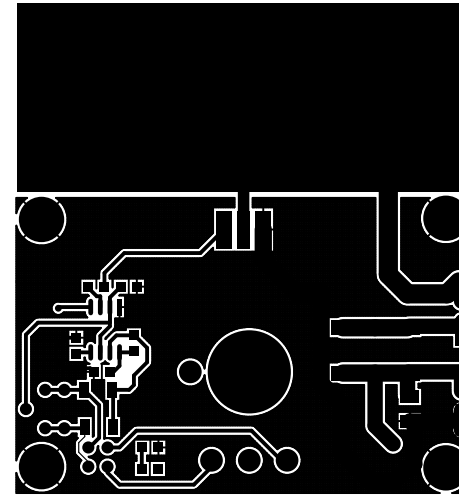




SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 65.41MM X 60.80MM

BOM				
SR.	QNTY.	REF.	DESC.	VENDOR/MOUSER/DIGIKEY
1	2	CN1,CN2	4 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
2	1	C1	47uF/16V SMD SIZE 1210	YAGEO
3	3	C2,C3,C4	0.1uF/50V SMD SIZE 0805	YAGEO
4	1	C5	DO NOT POPULATE	OMIT
5	1	D1	RED LED SMD SIZE 0805	DIGIKEY 475-1415-1-ND
6	2	D2,D3	1N4148 SMD	DIGIKEY 1N4148UR-1-ND
7	2	J1,J2	JUMPER SHUNT	DIGIKEY 952-2169-ND
8	1	PR1	100K PRESET/OPTIONAL	OMIT
9	1	Q1	IRF540 SMD TO263	DIGIKEY IRF540STRLPBFTR-ND
10	3	R1,R4,R6	0E SMD SIZE 2512	YAGEO
11	2	R2,R3	1K 5% SMD SIZE 0805	YAGEO
12	1	R5	10E 5% SMD SIZE 0805	YAGEO
13	1	R7	100K POT 16MM	DIGIKEY PDB181-K420K-104B-ND
14	1	U1	NE555 TIMER SOIC8	DIGIKEY 296-6501-1-ND

