

# Radio Remote Control LED Dimmer Using NRF24L01-Arduino Compatible

This is an easy-to-make LED dimmer using RF remote control. The project is capable of driving a load up to 24W (2A X 12V LED). Any 12V single or 12V LED strip can be used. This is an open-source Arduino compatible hardware that has Atmega328 microcontroller, Potentiometer, MOSFET, 5V Regulator, 3.3V Regulator, NRF24L01 Radio modules, and few other components. The same PCB can be used for Transmitter and Receiver. LED D2 Power LED, LED D1 optional.

## Arduino Pins Transmitter

- NRF24L01 RF Module: GND>>GND, 3.3V>>3.3V Regulator, CE>> Arduino Digital Pin D9, CSN>> Arduino Digital Pin D10, MOSI>>Arduino Digital Pin D11, MISO>> Arduino Digital Pin D12, CSK>>Arduino Digital Pin D13
- Potentiometer: Analog Pin A3

## Arduino Pins Receiver

- NRF24L01 RF Module: GND>>GND, 3.3V>>3.3V Regulator, CE>> Arduino Digital Pin D9, CSN>> Arduino Digital Pin D10, MOSI>>Arduino Digital Pin D11, MISO>> Arduino Digital Pin D12, CSK>>Arduino Digital Pin D13
- LED Driver MOSFET Gate: Digital Pin D3

**Note:** PCB has dual options, it can be used for transmitter and receiver, for transmitter don't install Q1 MOSFET and CN4 connector, for receiver don't install potentiometer. Upload the related Arduino code that is available as a download.

**Courtesy:** This is a modified code, original author R Girish

## Arduino Code

Arduino code for transmitter and receiver is available as download, uploading code is easy, follow bellow link

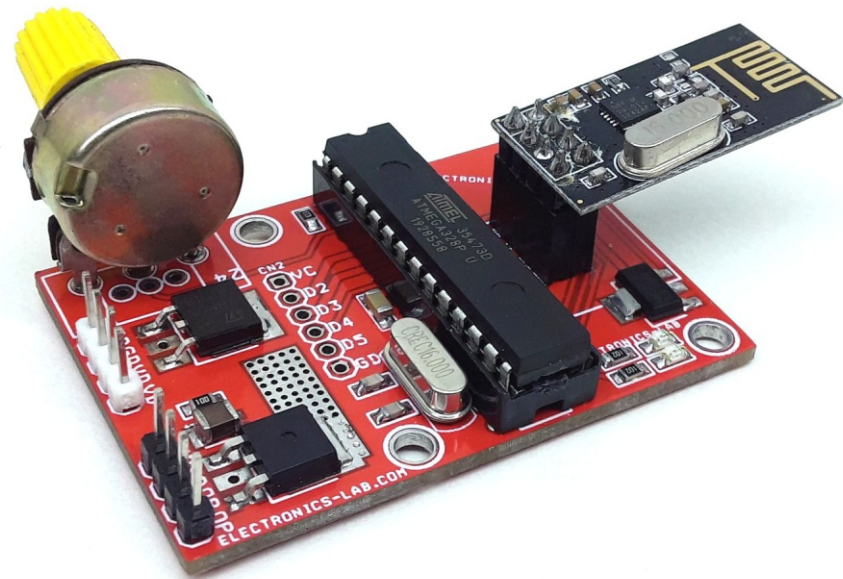
<https://www.arduino.cc/en/Tutorial/BuiltInExamples/ArduinoToBreadboard>

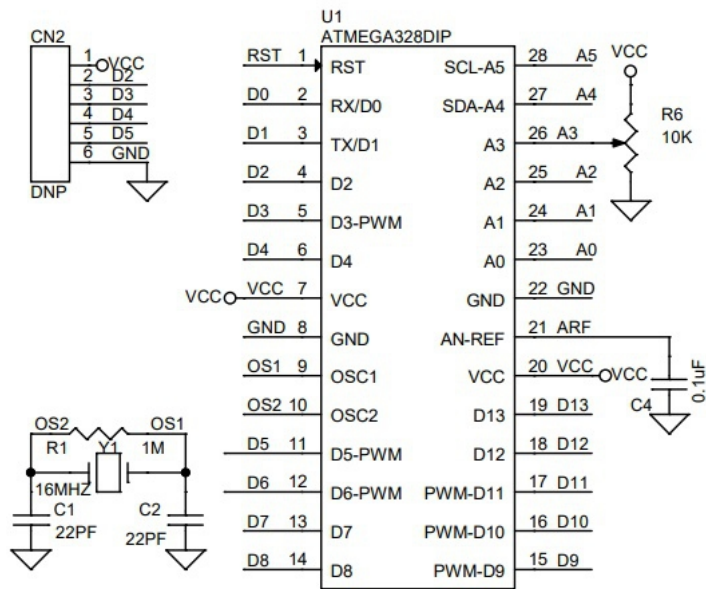
## Features- Receiver

- Supply Receiver 12 DC (7-15V Range)
- LED Load Up to 2Amps (2A X 12V = 1W To 24W) 12V LED.
- PCB Dimensions 54.61MM X 37.31MM
- Operating Frequency 490Hz
- PWM Duty Cycle 0 to 100%

## Features- Transmitter

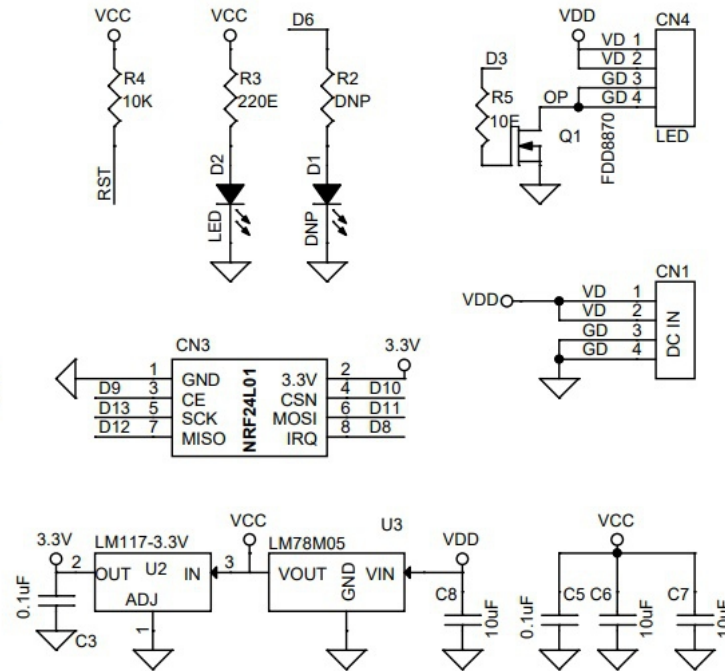
Supply 12V DC @ 70mA

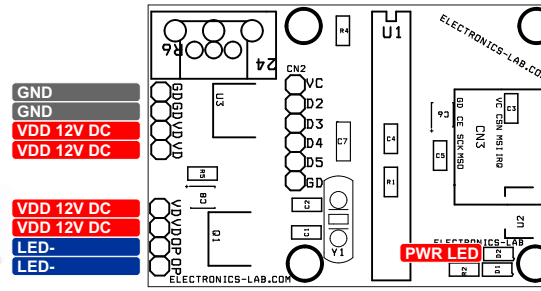




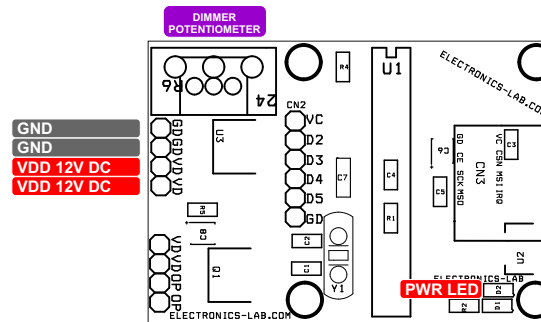
TRANSMITTER : SOLDER POTENTIOMETER, OMIT Q1 MOSFET AND CN4

RECEIVER : OMIT POTENTIOMETER , SOLDER Q1 MOSFET AND CN4

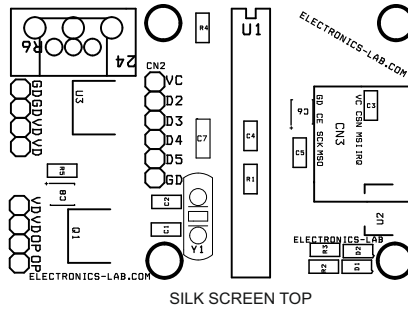




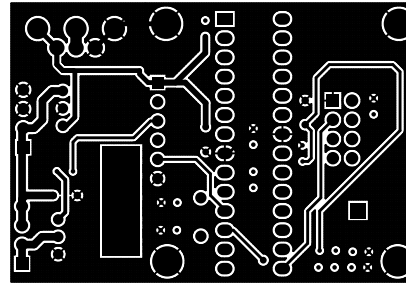
## LED DRIVER RX UNIT



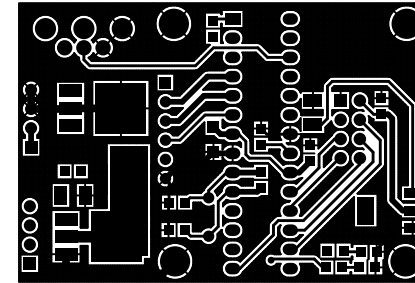
## TRANSMITTER



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 54.61MM X 37.31MM

| BOM |       |           |                                |                |          |                        |
|-----|-------|-----------|--------------------------------|----------------|----------|------------------------|
| NO  | QNTY. | REF.      | DESC.                          | MANUFACTURER   | SUPPLIER | SUPPLIER PART NO       |
| 1   | 2     | CN1,CN4   | 4 PIN MALE HEADER PITCH 2.54MM | WURTH          | DIGIKEY  | 732-5317-ND            |
| 2   | 3     | D1,R2,CN2 | DNP                            |                | DIGIKEY  |                        |
| 3   | 1     | CN3       | NRF24L01 RF MODULE SEED STUDIO | SEEDSTUDIO     | DIGIKEY  | ALIEXPRESS/AMAZON      |
| 4   | 1     | D2        | LED SMD SIZE 0805              | LITE ON INC    | DIGIKEY  | 160-1427-1-ND          |
| 5   | 2     | C1,C2     | 22PF/50V SMD SIZE 0805         | MURATA/YAGEO   | DIGIKEY  |                        |
| 6   | 3     | C3,C4,C5  | 0.1uF/50V SMD SIZE 0805        | MURATA/YAGEO   | DIGIKEY  |                        |
| 7   | 3     | C6,C7,C8  | 10uF/25V SMD SIZE 1206         | MURATA/YAGEO   | DIGIKEY  |                        |
| 8   | 1     | Q1        | FDD8870                        | ON SEMI        | MOUSER   | 512-FDD8870            |
| 9   | 1     | R1        | 1M 5% SMD SIZE 0805            | MURATA/YAGEO   | DIGIKEY  |                        |
| 10  | 1     | R3        | 220E 5% SMD SIZE 0805          | MURATA/YAGEO   | DIGIKEY  |                        |
| 11  | 1     | R4        | 10K 5% SMD SIZE 0805           | MURATA/YAGEO   | DIGIKEY  |                        |
| 12  | 1     | R5        | 10E 5% SMD SIZE 0805           | MURATA/YAGEO   | DIGIKEY  |                        |
| 13  | 1     | U1        | ATMEGA328DIP                   | MICROCHIP      | DIGIKEY  | ATMEGA328-PU-ND        |
| 14  | 1     | U2        | LM117-3.3V                     | TI             | DIGIKEY  | LM1117MP-3.3/NOPBCT-ND |
| 15  | 1     | U3        | LM78M05 SMD DPAK               | ON SEMI        | DIGIKEY  | MC78M05CDTGOS-ND       |
| 16  | 1     | Y1        | 16MHZ                          | ECS INC        | DIGIKEY  | X1103-ND               |
| 17  | 1     | R6        | POTENTIOMETER                  | TT ELECTRONICS | DIGIKEY  | 987-1307-ND            |