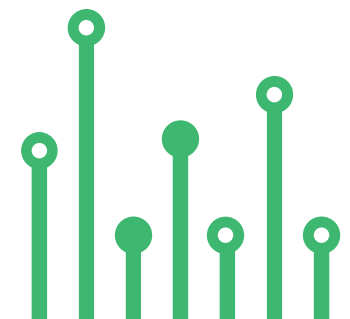


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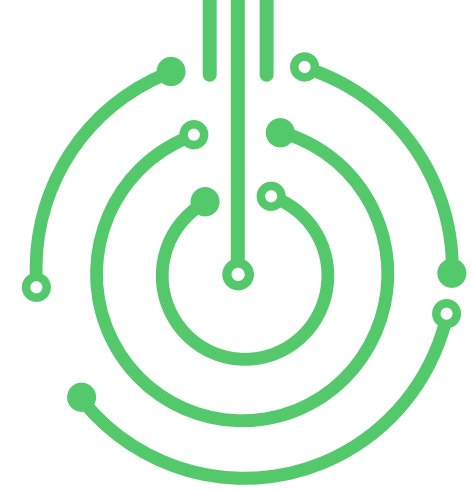
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POWER SUPPLY



# DC Electronic Load - 1A



SKU: EL138799

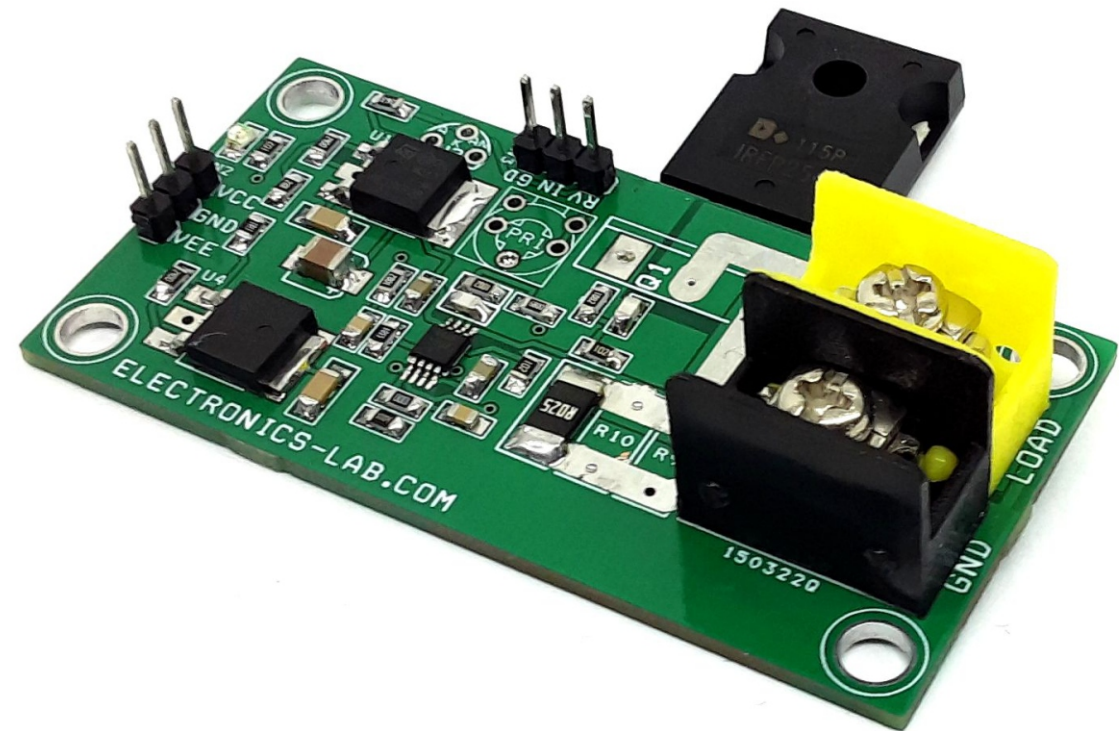
# DC Electronic Load - 1A



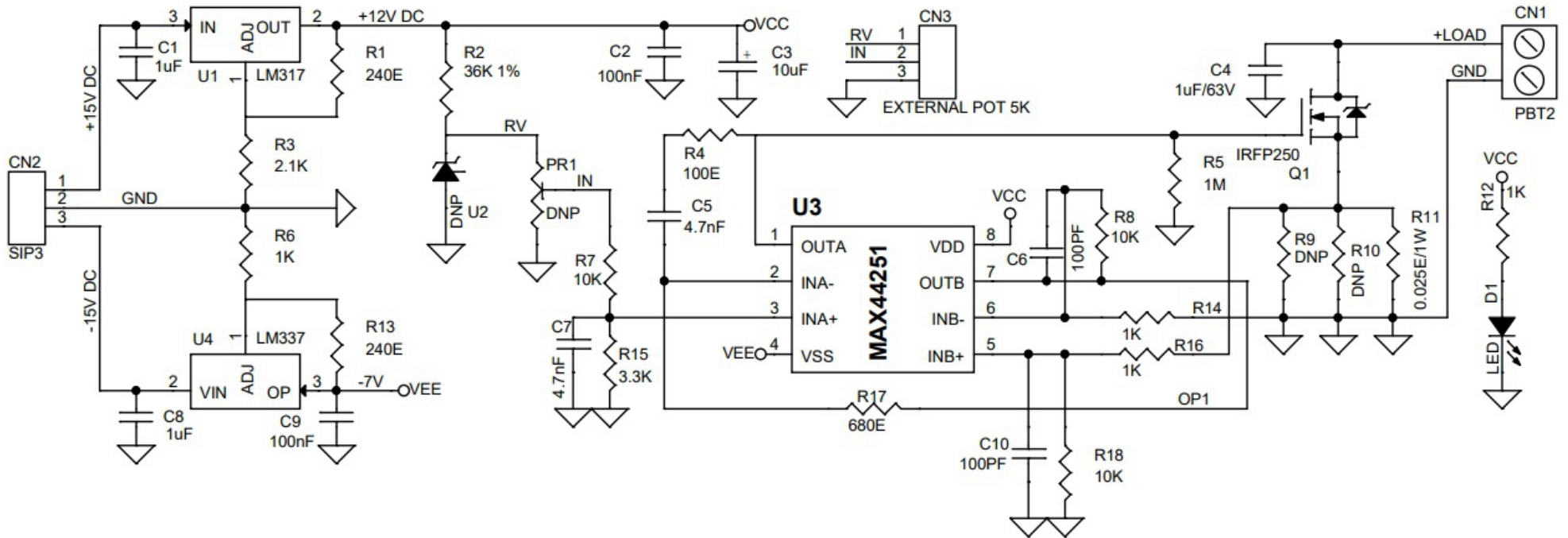
This is a very precise Electronic Load project built using the ultra-Precision, Low-Noise OPAMP MAX44251 from Analog Devices. The project can sink current from a power source. It can be used as test gear for power supplies, chargers, solar panels, batteries, and DC-DC converters. The resistor R11 acts as a shunt, OPAMPs convert current into voltage, 2nd op-amp, and Q1 MOSFET are used to control the load current. A Multi-turn potentiometer helps to adjust the load current in the range of 0 to 1A. The supply voltage is up to 60V DC. The board works with dual supply +/-15V DC and draws a few milli amps. LM317 regulator provides 12V DC top op-amp and LM337 provides regulated -7V supply to op-amp. At full load, MOSFET Q1 produces lots of heat, and a fan and large heatsink on MOSFET will help cool it down. Users may use a current meter in series to load to display the current. Optional onboard Trimmer potentiometer provided in case external potentiometer is not required.

## Features

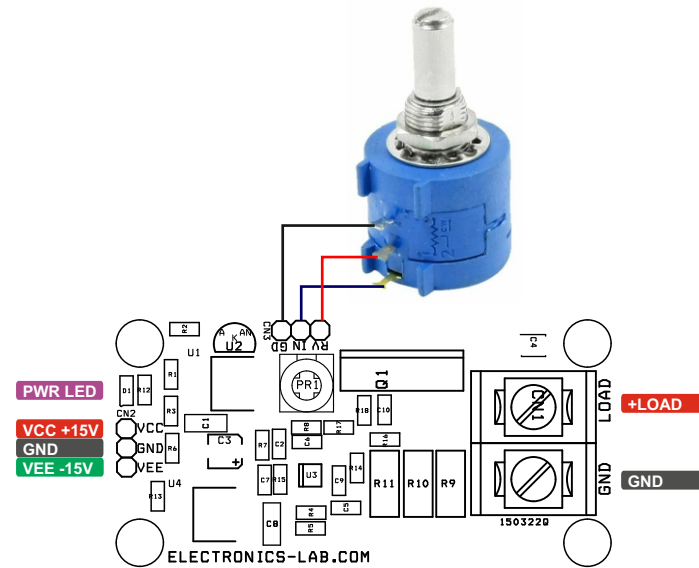
- Operating Power Supply Dual 15V DC (+/-15V DC)
- Load Current 1Amp, Power Supply Up to 60V DC
- Highly Efficient and Ultra-Precision Current Control
- On Board Power LED
- Barrier Block Connector for Load connection
- External Or On-Board Trimmer Potentiometer
- Option for Current Control
- PCB dimensions: 66.52 x 33.66 mm



# Schematic



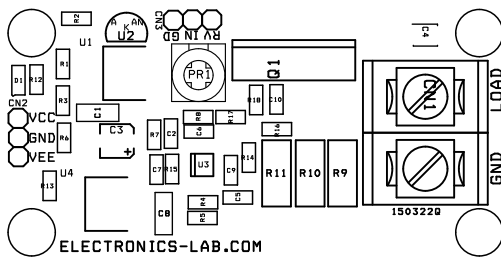
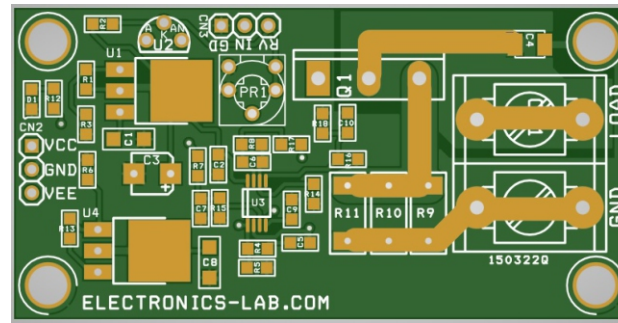
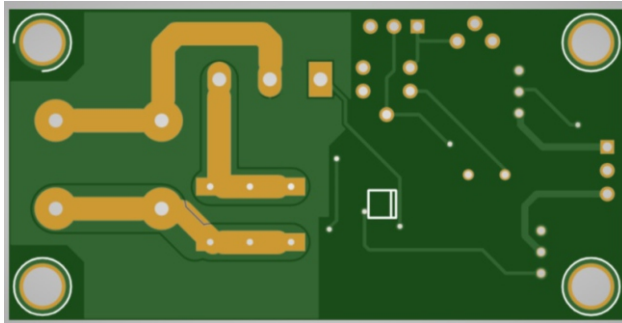
# Connections



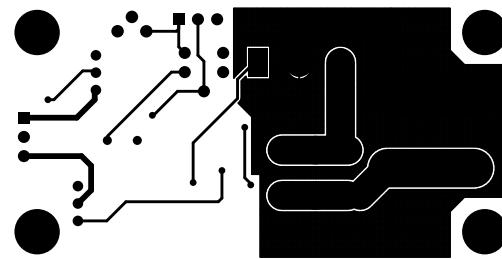
## Connections and other details

- CN1: Pin 1 = +Load, Pin 2 = GND
- CN2: Pin 1 = +15V DC Power Supply, Pin 2 = GND, Pin 3 = +15V Power Supply
- D1: Power LED
- PR1: Optional Trimmer Potentiometer (Do Not Use CN3 Potentiometer If this is used)
- CN3: External Potentiometer Pin 1 = Reference Voltage, Pin 2 = Input, Pin 3 = GND

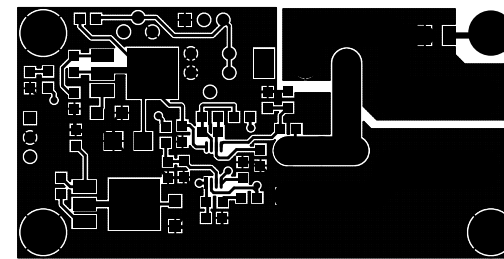
# PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 66.52 X 33.66MM

# Parts List

| BOM |      |                |  |                 |          |                    |
|-----|------|----------------|--|-----------------|----------|--------------------|
| NO  | QNTY | REF            | DESC                                       | MANUFACTURER    | SUPPLIER | SUPPLIER PART NO   |
| 1   | 1    | CN1            | 2 PIN BARRIER BLOCK CONNECTOR PITCH 9.53MM | TE COONECTIVITY | DIGIKEY  | A98495-ND          |
| 2   | 1    | CN2            | 3 PIN MALE HEADER PITCH 2.54MM             | WURTH           | DIGIKEY  | 732-5316-ND        |
| 3   | 1    | CN3            | 3 PIN MALE HEADER PITCH 2.54MM 5K POT      | WURTH           | DIGIKEY  | 732-5316-ND        |
| 4   | 2    | C1,C8          | 1uF/25V CERAMUC SMD SIZE 1206              | YAGEO/MURATA    | DIGIKEY  |                    |
| 5   | 2    | C2,C9          | 100nF/50V CERAMIC SMD SIZE 0805            | YAGEO/MURATA    | DIGIKEY  |                    |
| 6   | 1    | C3             | 10uF/25V CERAMIC SMD SIZE 1210             | YAGEO/MURATA    | DIGIKEY  |                    |
| 7   | 1    | C4             | 1uF/80V CERAMIC SMD SIZE 1210              | YAGEO/MURATA    | DIGIKEY  |                    |
| 8   | 2    | C5,C7          | 4.7nF/50V CERAMIC SMD SIZE 0805            | YAGEO/MURATA    | DIGIKEY  |                    |
| 9   | 2    | C6,C10         | 100PF/50V CERAMIC SMD SIZE 0805            | YAGEO/MURATA    | DIGIKEY  |                    |
| 10  | 1    | D1             | LED RED SMD SIZE 0805                      | OSRAM           | DIGIKEY  | 475-1278-1-ND      |
| 11  | 4    | PR1,U2,R9,R10  | DNP  |                 |          |                    |
| 12  | 1    | Q1             | IRFP250 TO247 MOSFET                       | VISHAY          | DIGIKEY  | IRFP250PBF-ND      |
| 13  | 2    | R1,R13         | 240E 1% SMD SIZE 0805                      | YAGEO/MURATA    | DIGIKEY  |                    |
| 14  | 1    | R2             | 36K 1% SMD SIZE 0805                       | YAGEO/MURATA    | DIGIKEY  |                    |
| 15  | 1    | R3             | 2.1K 1% SMD SIZE 0805                      | YAGEO/MURATA    | DIGIKEY  |                    |
| 16  | 1    | R4             | 100E 1% SMD SIZE 0805                      | YAGEO/MURATA    | DIGIKEY  |                    |
| 17  | 1    | R5             | 1M 5% SMD SIZE 0805                        | YAGEO/MURATA    | DIGIKEY  |                    |
| 18  | 4    | R6,R12,R14,R16 | 1K 1% SMD SIZE 0805                        | YAGEO/MURATA    | DIGIKEY  |                    |
| 19  | 3    | R7,R8,R18      | 10K 1% SMD SIZE 0805                       | YAGEO/MURATA    | DIGIKEY  |                    |
| 20  | 1    | R11            | 0.025E/1W 1% SMD SZIE 2512                 | YAGEO/MURATA    | DIGIKEY  |                    |
| 21  | 1    | R15            | 3.3K 1% SMD SIZE 0805                      | YAGEO/MURATA    | DIGIKEY  |                    |
| 22  | 1    | R17            | 680E 1% SMD SIZE 0805                      | YAGEO/MURATA    | DIGIKEY  |                    |
| 23  | 1    | U1             | LM317 DPAK                                 | TI              | DIGIKEY  | 497-1574-1-ND      |
| 24  | 1    | U3             | MAX44251                                   | ANALOG DEVICE   | DIGIKEY  | MAX44251AUA+TTR-ND |
| 25  | 1    | U4             | LM337 DPAK                                 | TI              | DIGIKEY  | 296-21578-1-ND     |
| 26  | A    | POT            | MULTI-TURN POTENTIOMETER 5K OHM            | BOURNS          | DIGIKEY  | 3590S-1-502L-ND    |

# Notes

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## APP

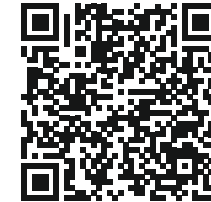
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### Android App

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