

DC Power Supply Project

Presented By
Dr. Sherif Hekal

Variable Regulated Power Supply

Description:

the project aims to construct an adjustable regulated power supply that can provide DC voltage ranging from **1.2 – 30 V**.

the electric circuit consists of an AC Transformer followed by a rectifier bridge then smoothing capacitor and an adjustable voltage regulator integrated circuit.

Variable Regulated Power Supply

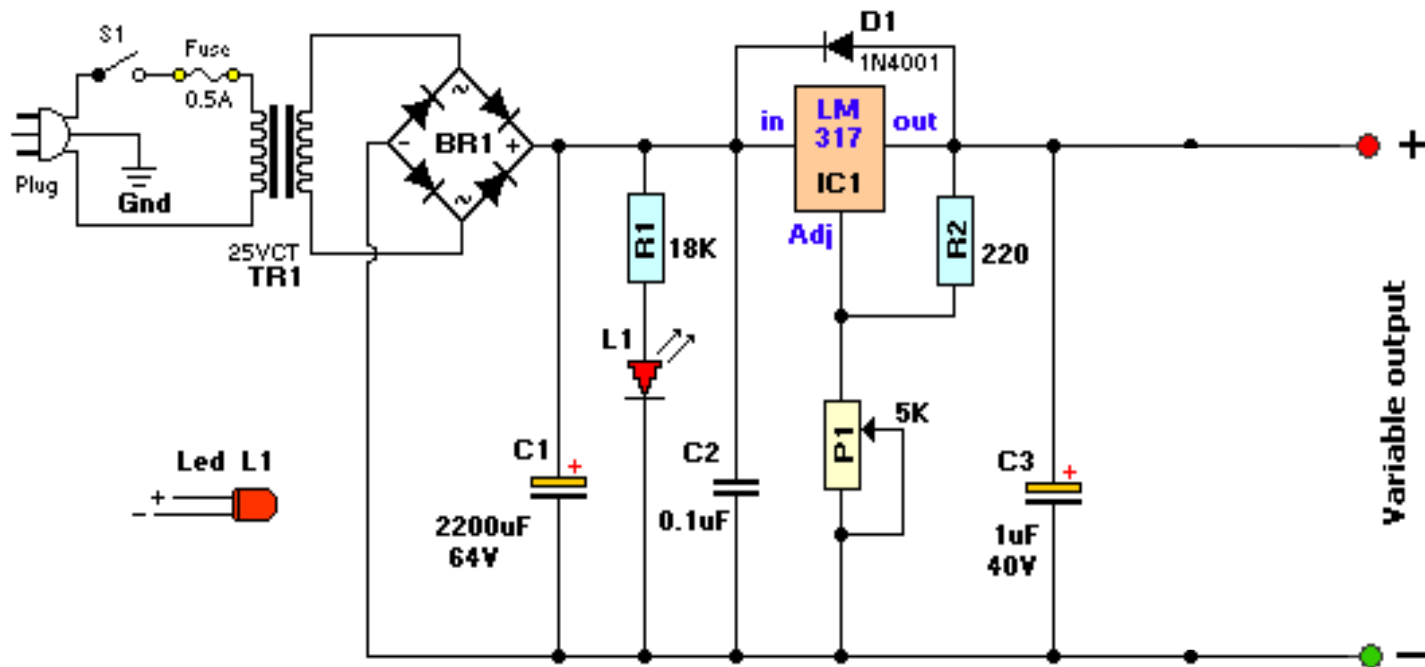
Objective: you will learn the following skills that are related to the topics of the course

- Understanding the working theory of diodes, rectifiers, and linear regulators.
- Design and simulate the electric circuit on the simulator (Proteus).
- Read the data sheets of different components in the circuit to select the suitable components for design.
- Extract the layout of printed circuit from Proteus then Implement the electric circuit on PCB board.
- Solve the problems of practical implementation through troubleshooting.

Variable Regulated Power Supply

Variable Regulated Power Supply

1.2 to 30Volts @ 1.5 Amps.



by Tony van Roon

Variable Regulated Power Supply

Component List

BR1 = Bridge Rectifier, 100V - 3A

IC1 = LM317, adjustable regulator

V = Meter, 30V, $R_i = 85 \text{ ohm}$

TR1 = Transformer, 25V, 2A

R1 = 18K, 5%

R2 = 220 ohm, 5%

R3 = 27K, 5%

P1 = 5K, potentiometer

C1 = 2200 μF , 63V

C2 = 0.1 μF

C3 = 1 μF , 40V

Plug = 3-wire plug & cord

S1 = On-Off toggle switch

D1 = 1N4001

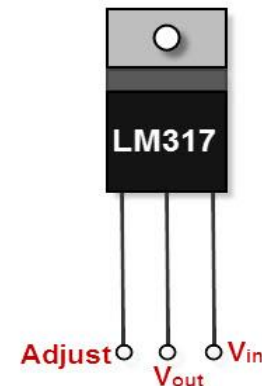
Fuse = 220V, 500mA, slow-blow

Fuse Holder, wires, solder, case

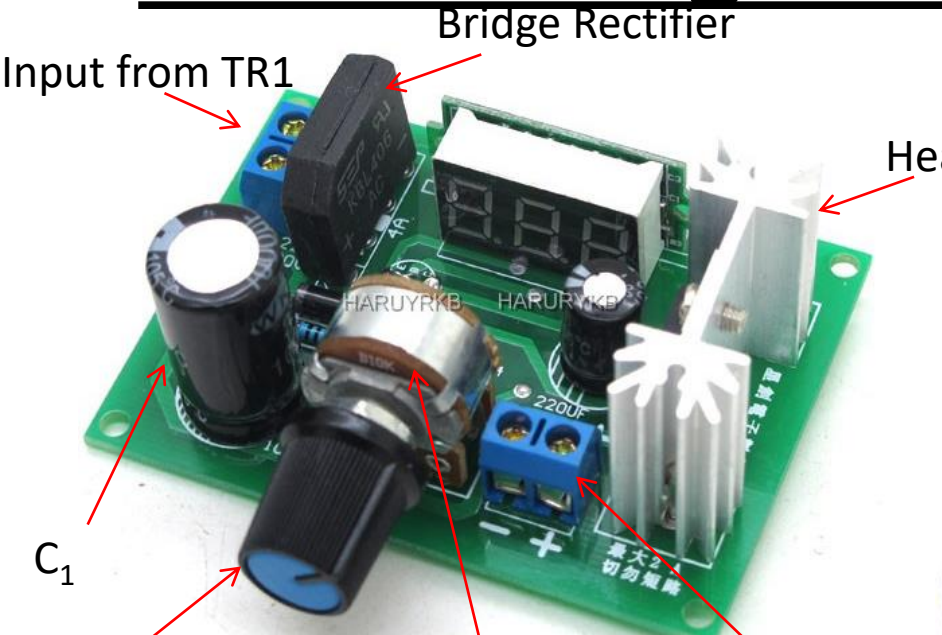
Heat sink, knob for P1

Soldering Iron

Red & Black Banana Jacks



Variable Regulated Power Supply



Bridge Rectifier

Input from TR1

Heat sink

C₁

HARUYRKB

HARUYRKB

220UF

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knob for P1

Potentiometer (P1)

DC output

Expected electronic circuit

Expected project packaging / casing



Case

BK PRECISION
LETTING NEW STANDARDS IN PERFORMANCE & VALUE

BATTERY ELIMINATOR
1502

VOLTAGE

1.5 3 4.5 6 9 12

DC OUTPUT

knob for P1

POWER



S1 = On-Off toggle switch

Red & Black Banana Jacks

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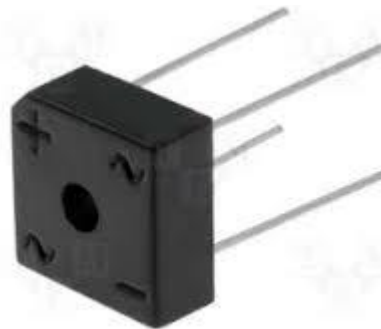
Soldering Iron



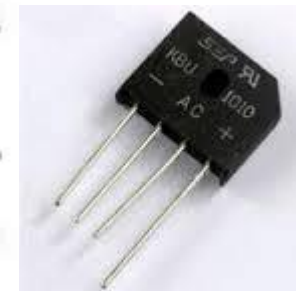
Solder



Fuse



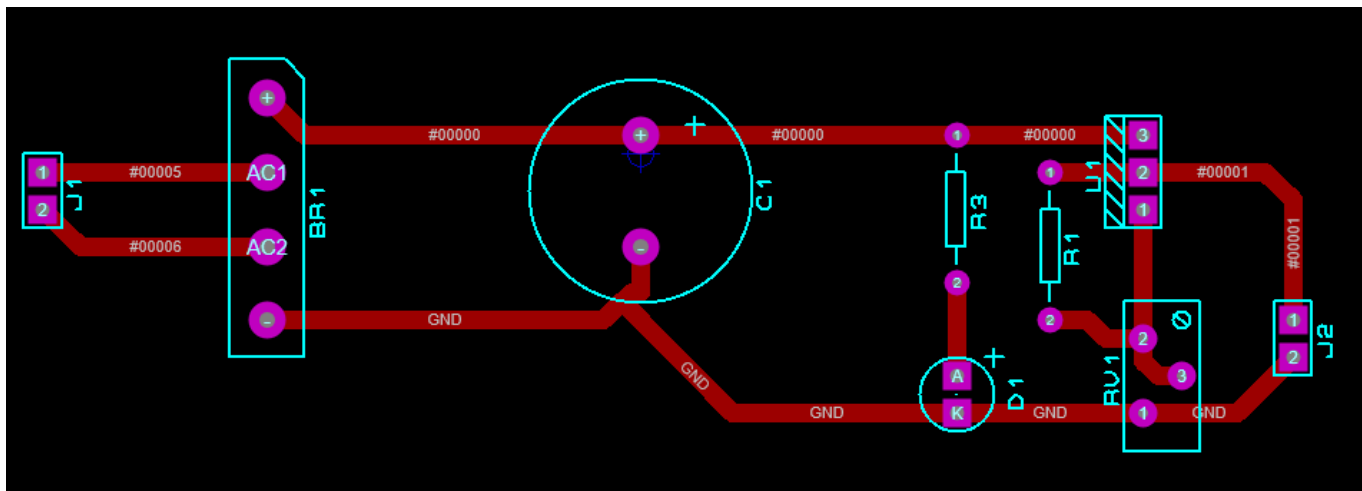
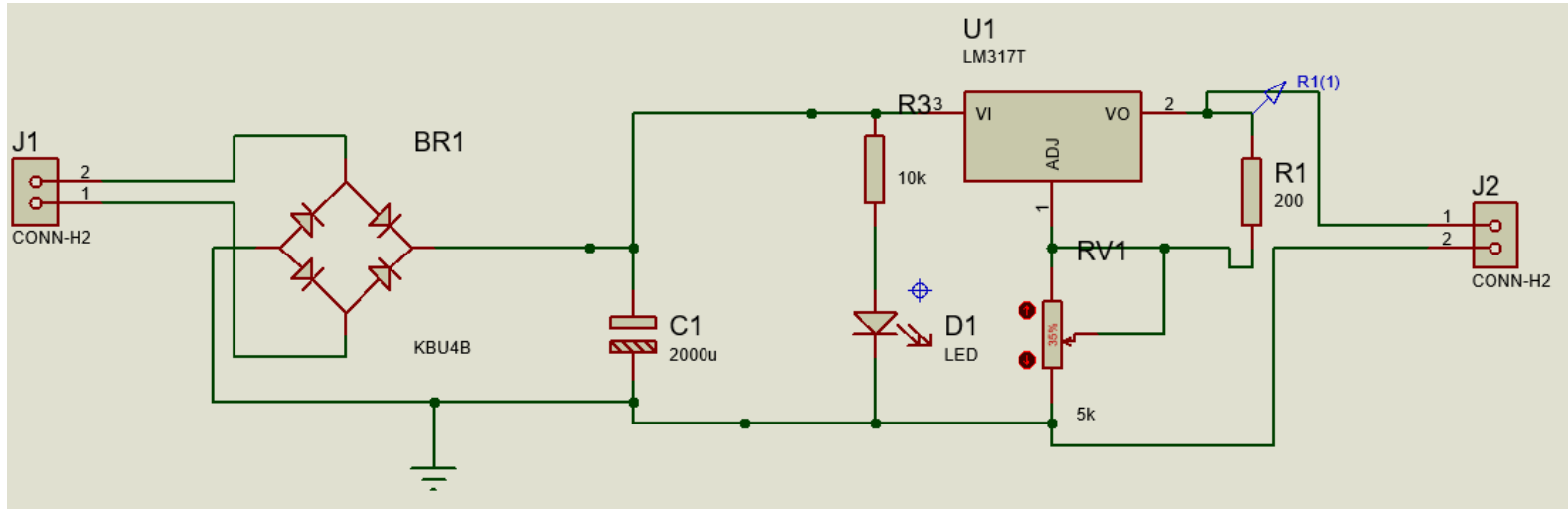
Bridge Rectifier



PCB Layout

- The next slide shows simple circuit with the exported PCB layout using proteus.
- I need your circuit to be optimized more than the proposed one in the next slide.
- Try to optimize the positions of different components to get small size of the electronic circuit, say 40 mm x 40 mm.

PCB Layout for example



3D view from proteus for example

