

# **Adjustable DC Power Supply**

## **Build Instructions**

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**General Information:**

- Input voltage 4.5V - 35V
- Output voltage adjustable from 1.2V - 32V (upper voltage limited by input voltage)
- Max output current 1.35A (may be limited by CEENBoT charger)

**Warnings:**

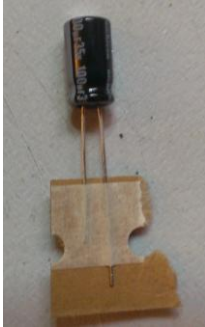
The power supply can accept source inputs from the barrel jack or the header pins (if soldered). Do not connect more than one source at a time to the supply.

Do not exceed the voltage or current limits shown above. The current is fused at 1.35 A to protect the power supply but do not solely rely on the fuse. If the voltage or current limits are exceeded, the power supply will most likely be damaged.

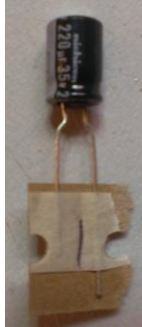
When using the CEENBoT AC/DC charging adapter, the limits of the power supply will be determined by the limits of the adapter. Refer to the markings on the adapter for the max voltage and current limits.

## Step 1 - Component Check:

Ensure that you have all the required components:



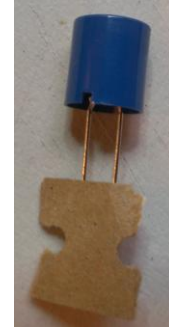
100 $\mu$ F Capacitor



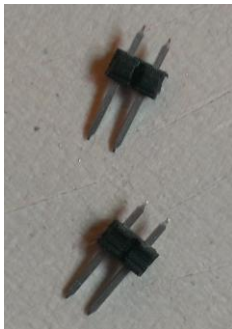
220 $\mu$ F Capacitor



Diode



33  $\mu$ H Inductor



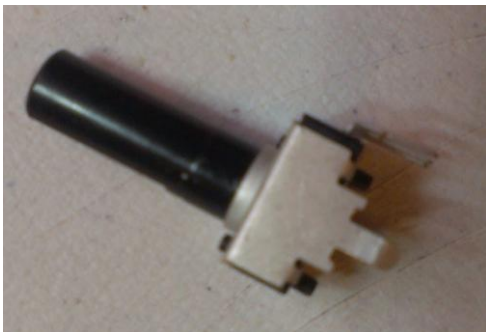
Header Pins



Barrel Jack



Regulator IC



50 k $\Omega$  Potentiometer



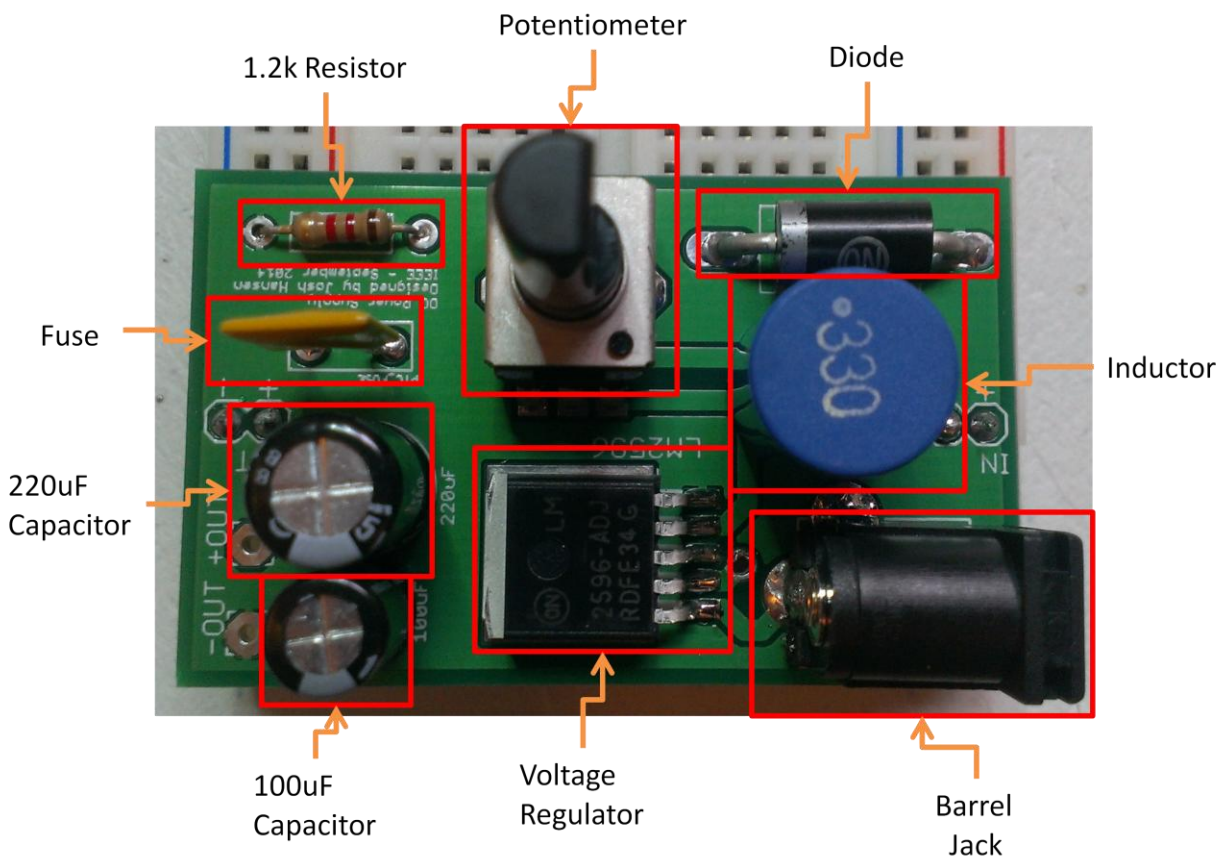
PCB

If for some reason you are missing any components, let an IEEE officer know.

## Step 2 - Soldering:

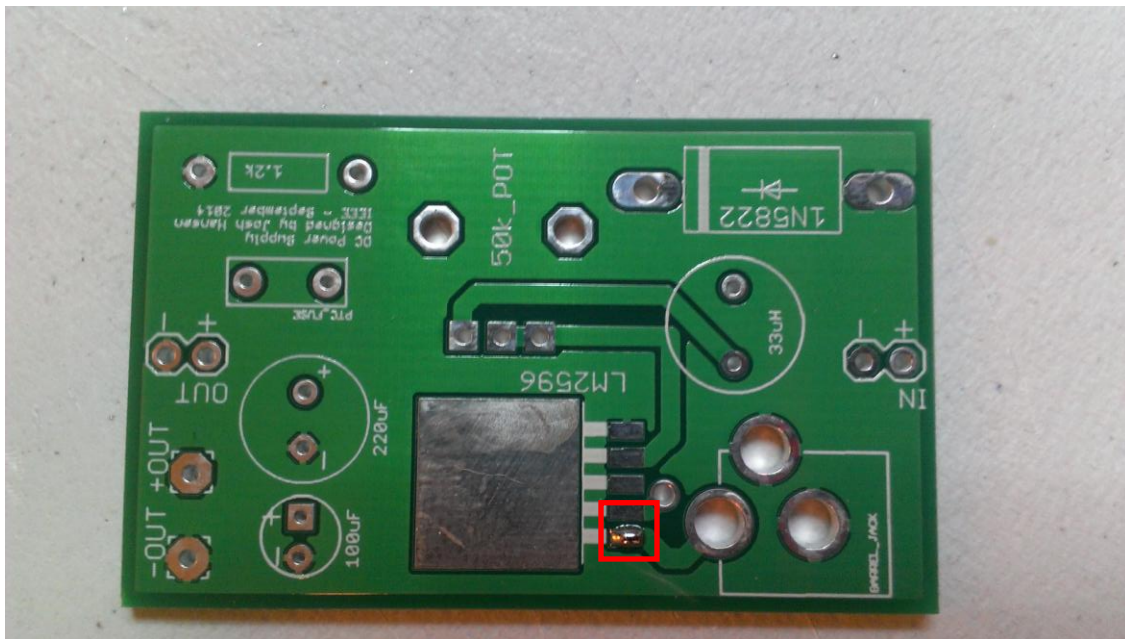
It is recommended that the voltage regulator IC be soldered first as it is a surface mount part and slightly more difficult to solder.

If you have experience soldering and would like to skip the step by step soldering instructions, you can use the following image as a guide:

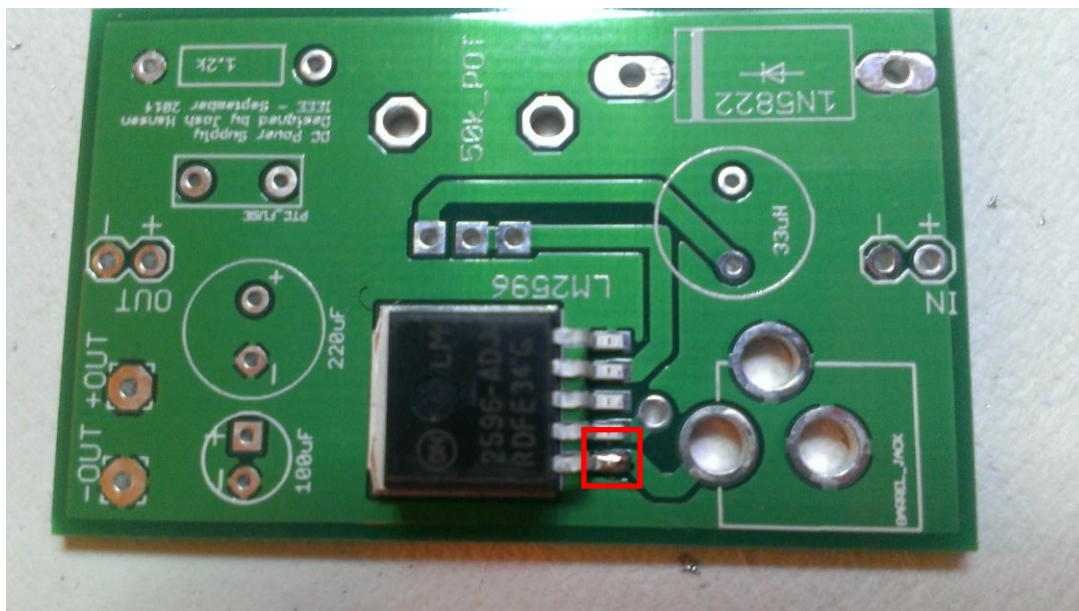


## Soldering Step A - Regulator IC

Apply a small amount of solder to one of the lead pads of the regulator IC as shown in the image:

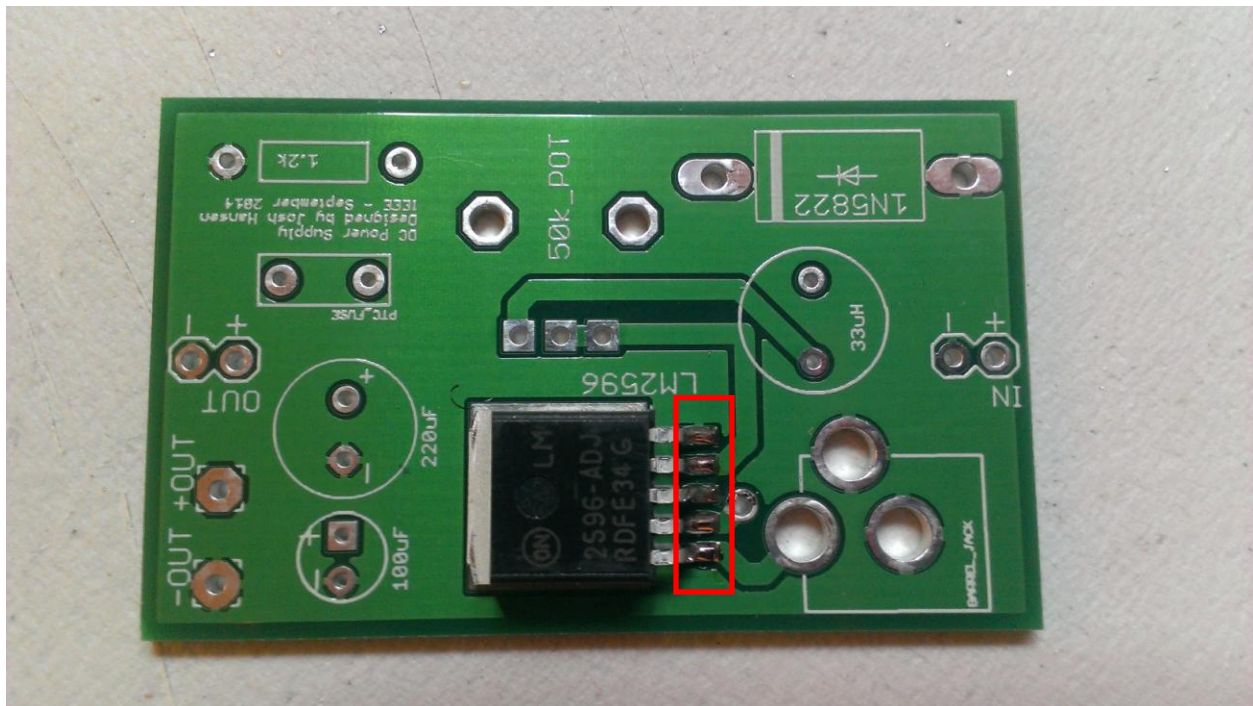


While reheating the solder to its liquid state, slide the regulator IC into place. The first lead of the IC should now be soldered as shown in the image:



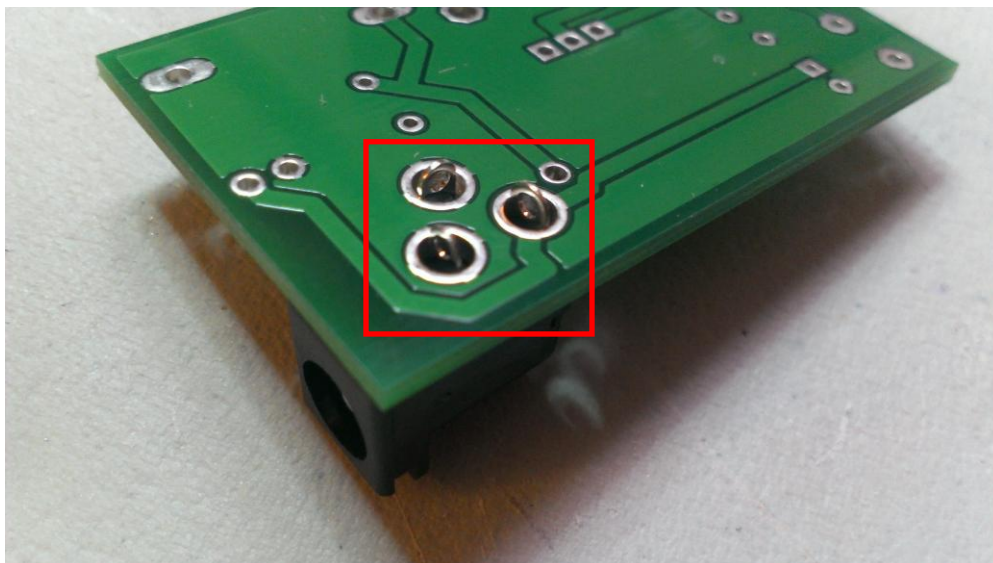


Solder the remaining four leads of the regulator IC as shown in the image:

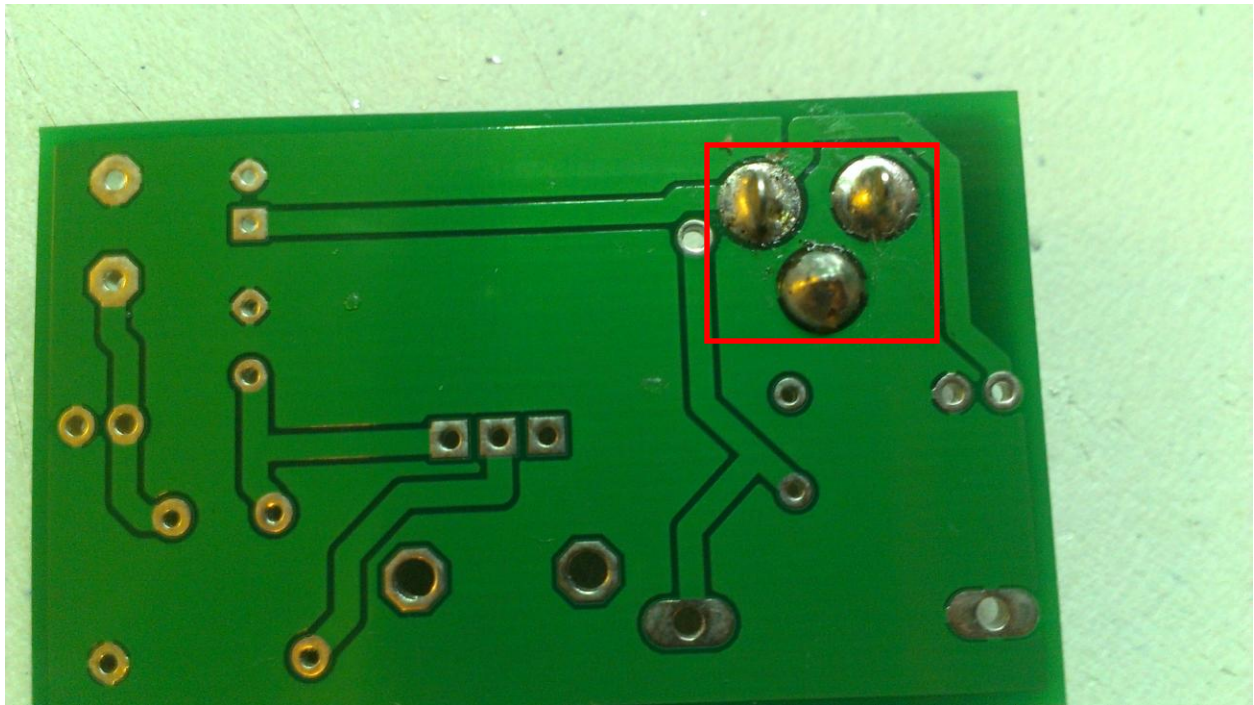


### Soldering Step B - Barrel Jack

Insert the barrel jack and flip the PCB over as shown in the image:



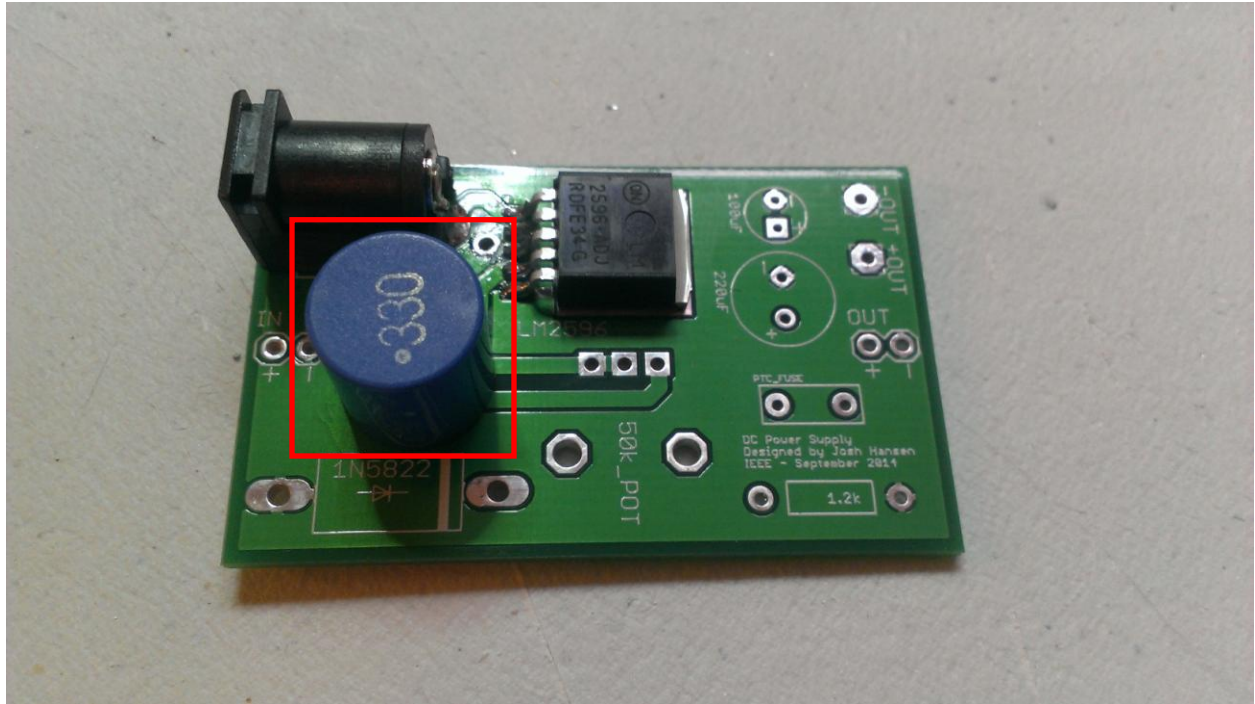
Solder the three barrel jack leads. When apply the solder, touch it to the leads themselves and not the empty space between the hold and the lead. This will keep the solder from falling through the gap to the other side. When finished soldering, ensure that the solder has not flowed through to the other side and caused and solder bridging.





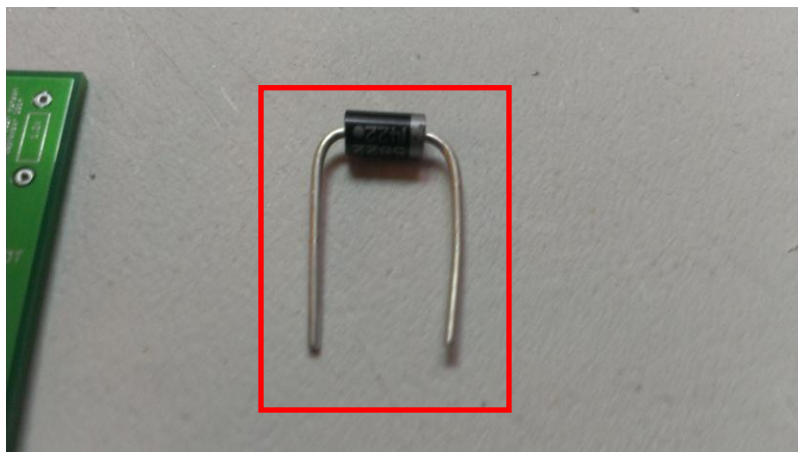
### Soldering Step C - 33 $\mu$ H Inductor

Inset and solder the inductor as shown in the image:

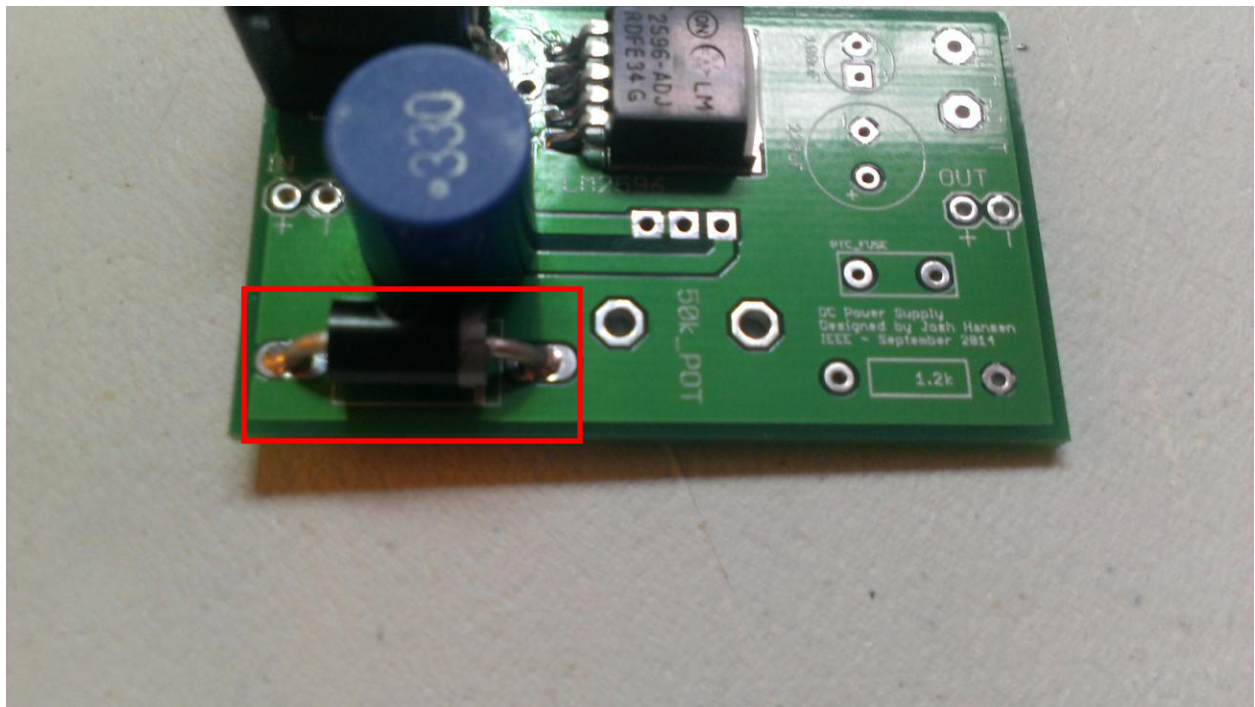


### Soldering Step D - Diode

Bend the leads of the diode at 90 degree angles as shown in the picture:

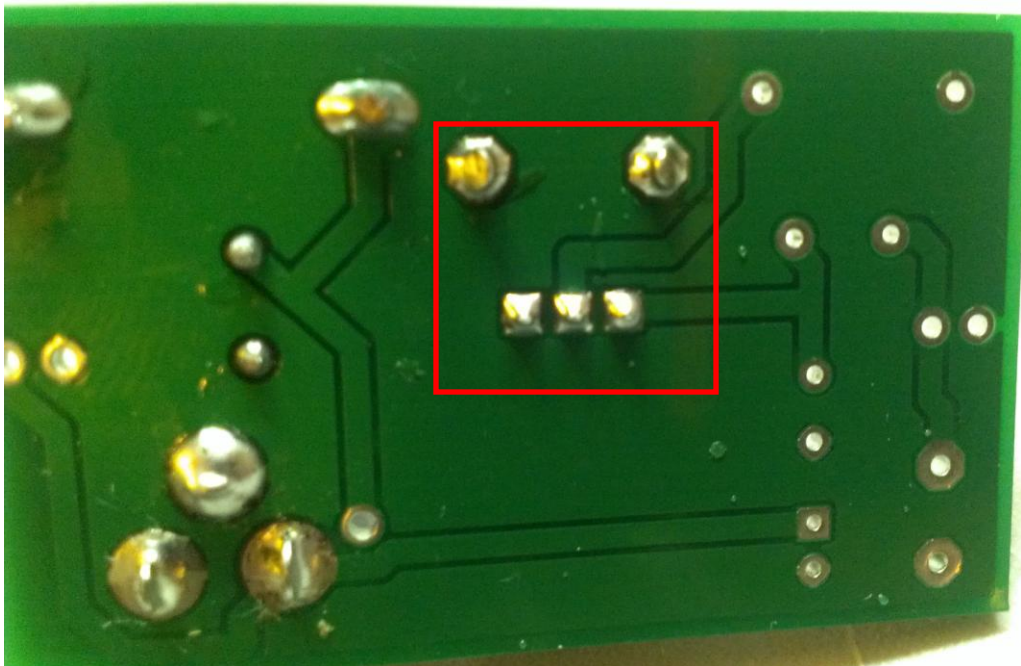
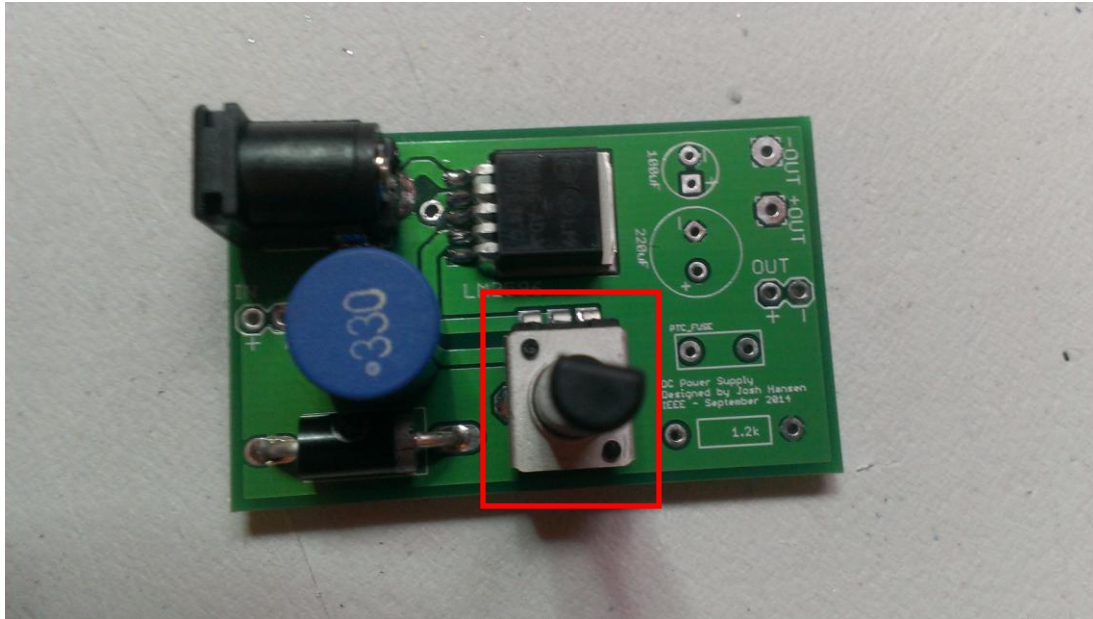


Insert the diode being careful to line up the markings on the diode with the silkscreen markings. Do not use excessive force when inserting the diode as this could cause the PCB to be damaged. If there is resistance when inserting the diode, remove it, re-bend the leads and try again. Once the diode is inserted, solder the two leads as shown in the image:



## Soldering Step E - Potentiometer

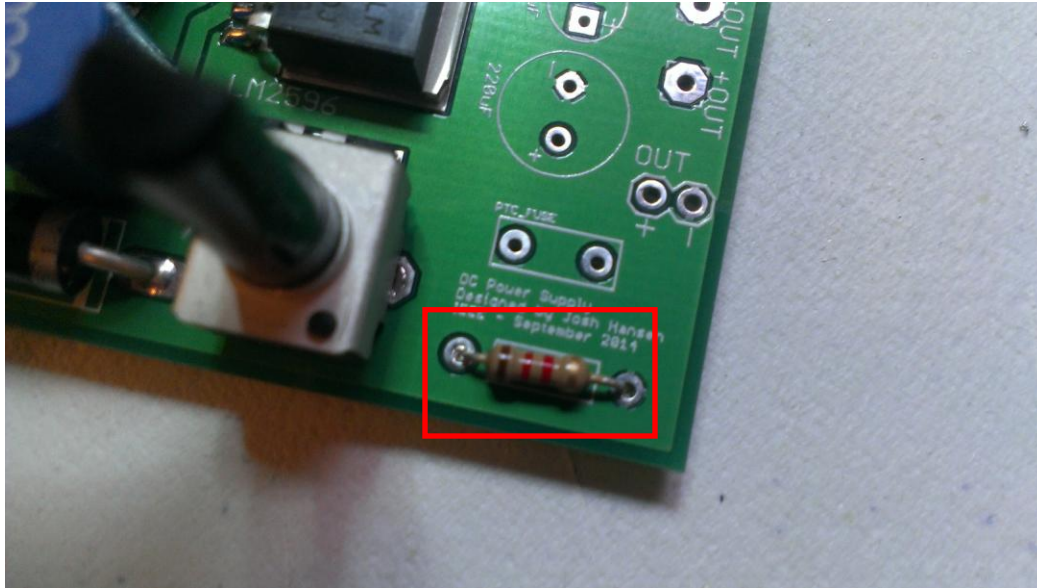
Insert and solder the potentiometer as shown in the images:





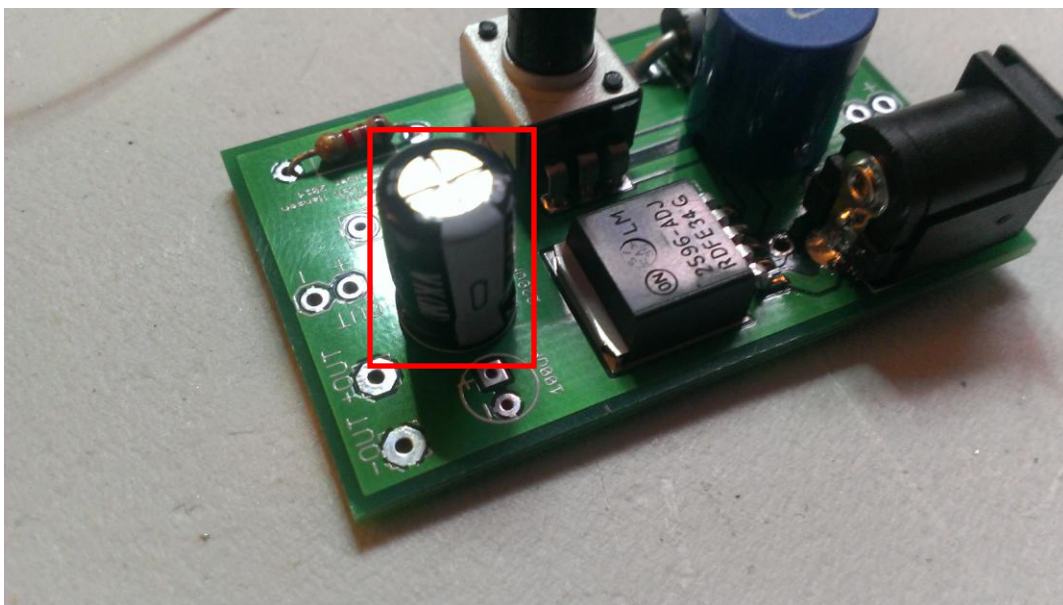
### Soldering Step F - 1.2 k $\Omega$ Resistor

Insert and solder the resistor as shown in the image:



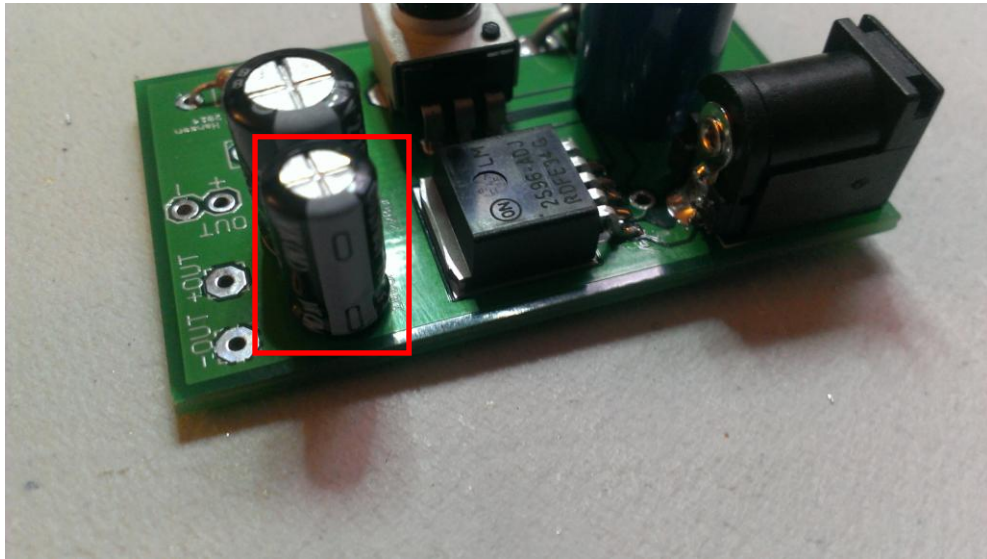
### Soldering Step G - 220 $\mu$ F Capacitor

Insert the 220 $\mu$ F capacitor ensuring to line up the polarity markings on the capacitor with the markings on the silkscreen. Solder the capacitor as shown in the image:



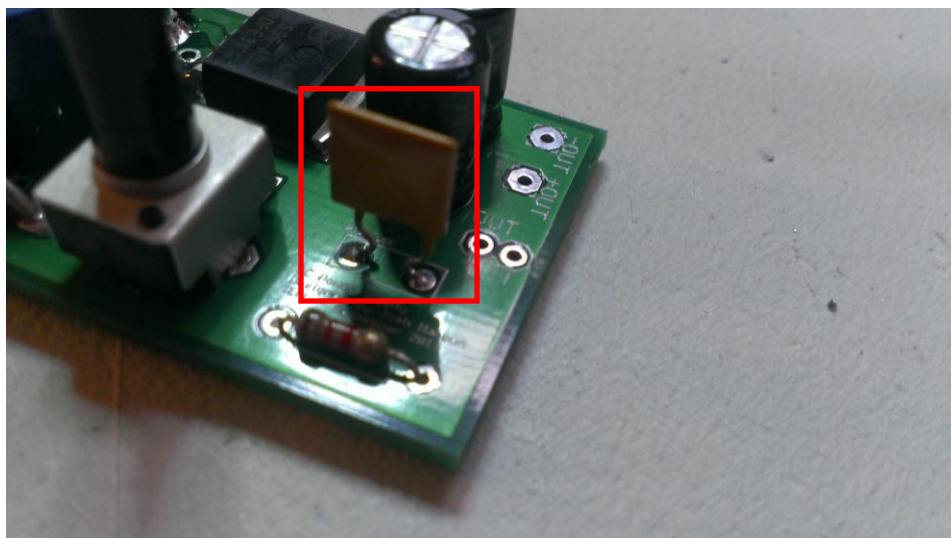
### Soldering Step H - 100 $\mu$ F Capacitor

Insert the 100 $\mu$ F capacitor ensuring to line up the polarity markings on the capacitor with the markings on the silkscreen. Solder the capacitor as shown in the image:



### Soldering Step I - Fuse

Insert and solder the PTC fuse as shown in the image:





### Soldering Step J - Two Pin Header

Insert and solder the two pin header to the voltage OUT holes on the PCB. This step is optional. If you are not planning on using this power supply in breadboard applications, you can leave the header pins off. Also, you can optionally solder another set of header pins to the IN holes of the PCB. Doing this will cause one rail of the PCB to be at the same voltage as the input voltage to the power supply.

