

Homework #6 (Adjustable Power Supply with Current Limit)

Design a linear power supply that will output +7V and is current limited to 200mA. The input to the supply will be a **120VAC (i.e. wall socket)**. Use the **LM317** adjustable voltage regulator to limit the maximum output current to **200mA** and to regulate the output voltage. Note: You'll need two LM317s (one for the current limit and one for the voltage regulator).

LM317 Datasheet: <http://www.ti.com/lit/ds/symlink/lm117.pdf>

Provide a **Digikey** part # for the transformer and rectifier. Calculate the ripple voltage on the filter cap and show there is sufficient headroom for the voltage regulator and current limit to operate. Don't forget about the rectifier voltage drop, ripple voltage on the filter cap, headroom on the LM317s (about 2V each), the voltage across the current limit resistor (about 1.25V), and a safety margin.

Draw a complete schematic and label the voltages at the input to both LM317s when the output current is less than 200mA (i.e. the current limit isn't limiting the current).

Don't worry about calculating the regulators temperature rise or heatsink requirements for this homework.