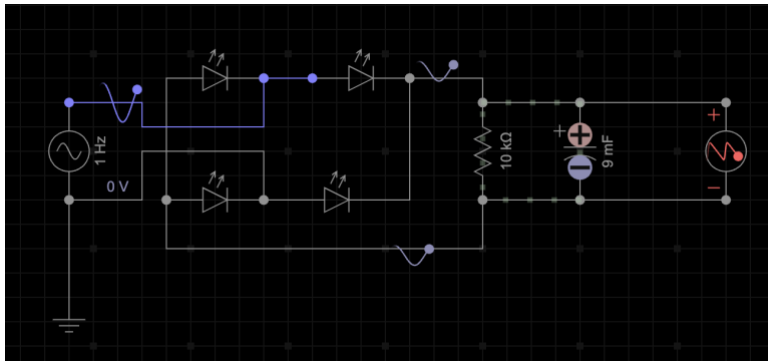


Lab Document: Embedded Systems: 28-Aug

This document should help you maintain flow and understand requirements from the lab.

1. Understand AC-to-DC conversion

[1]



2. Make the circuit which accepts a rectified output and regulates it using a voltage regulator. Ensure that you have a ground plane pour and sufficiently wide tracks and pads. The circuit should have the following specifications:

[2]

a. 7-12V input, 5V output at 0-1.5 A

3. For the load, you are allowed to use a terminal block with wires for variable resistor or a variable resistor on board.

[1]

4. Before printing your circuit on copper, ensure that the component sizes are right by printing it on a piece of paper. For 1:1 ratio, use a CAM Job in Eagle [ref1, ref2].

[1]

5. Once the circuit is printed, we need to characterize it. To simulate different types of outputs that you might get after the rectification stage, we will simulate the effect using a function generator. Report the following for your circuit:

a. Dropout voltage, i.e., minimum difference in V_{in} and V_{out} for V_{out} to be 5V at no load.

b. Line Regulation

c. Load regulation

d. Power Supply Rejection Ratio

e. Ripple

Wherever applicable, find the best fit after plotting outputs from 5-10 observations.

[2]

6. Repeat the circuit on a breadboard and report the 5 parameters again.

[2]

7. What difference do you observe between the breadboard and the PCB and what is a possible explanation for the same?

[1]

Submit your observations on Brightspace by the end of the lab.