

EAGLECAD Circuit Simulation Assignment

ECE 445

*University of Illinois at Urbana-Champaign
Department of Electrical and Computer Engineering*

Assignment

Your task is to create an Eagle schematic for the basic diode circuit in Figure 1 and run some SPICE Circuit Simulations on it. The completed assignment must be demoed live to a TA before the deadline listed on the Course Calendar. Extra office hours will be held in the week preceding for students to get assistance and demo their solutions. If you've never used SPICE to simulate a circuit before, you will find the EAGLECAD Circuit Simulation Tutorial document useful.

The assignment can be broken down into three parts. First, you must build the schematic using components that have SPICE models attached. Second, you must run multiple DC Operating Point Analysis simulations for various resistor values to measure the effect on the current through the diode. Third, you must run a DC Sweep Analysis to determine the turn-on voltage of the diode.

Circuit Schematic

Your circuit should contain one voltage source, one resistor, and one diode. These components should all be wired in series. Figure 1 shows a generic schematic as a guide for your Eagle schematic. All components must have SPICE models attached that are compatible with the circuit simulation. Assign reasonable values for the voltage source and resistor. This part of the assignment should be completed before you demo to a TA.

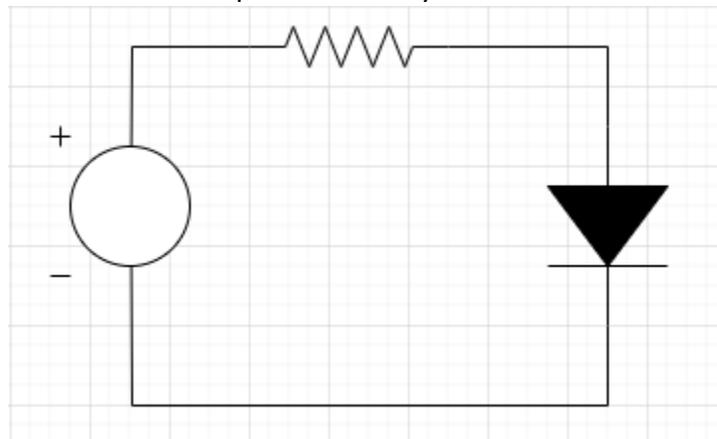


Figure 1: Circuit Schematic

DC Operating Point Analysis

You will need to run at least three DC Operating Point simulations on the circuit, varying the resistor value each time. For each simulation you will need to identify the current flowing through the diode. These simulations will be demoed to a TA, but you should run them before you demo to ensure you are familiar with the process and can quickly configure and identify the necessary information.

DC Sweep Analysis

You will need to run a DC Sweep simulation on the circuit. The voltage should sweep from 0-10 V, and the resistor value should be fixed to a reasonable value. From this simulation you will need to identify the turn-on voltage of the diode. Again, this simulation will be demoed to a TA, but you should be familiar with the process before you demo.

Rubric

Grading for Schematic:

1. Schematic contains correct components with SPICE models (1 point)
2. All components are SPICE enabled (1 point)

Grading for DC Operating Point Simulation:

1. Simulation is run correctly (1 point)
2. Student can accurately identify current through diode (2 points)
3. Student can modify simulation to test different resistor values (1 point)

Grading for DC Sweep Simulation:

1. Simulation is run correctly (2 points)
2. Student can accurately identify turn-on voltage of diode (2 points)