EC244 **Spring 2012**

Experiment #3

Pre-Lab

Diodes

1. Look up the datasheet for the 1N4001 diode to determine the component connection diagram and maximum ratings – pay particular attention to the limitations on forward current and reverse voltage.
2. Look up the datasheet for the 1N4153 diode to determine the component connection diagram and maximum ratings – pay particular attention to the limitations on forward current, reverse voltage, and both forward and reverse recovery time (look up a definition for recovery time and make sure that you understand what that term means).
3. Different diodes for different purposes. We'll look at these components and their use in circuits involving AC sources. Using each of these diodes, design and simulate a simple AC voltage source (5 V peak), diode, and resistor (10 kΩ) series circuit. Explore through simulation what happens to the voltage across the resistor as the AC source frequency increases. How or does this response change for the different diodes?

Laboratory Work

1. Finish all remaining work that you have not completed from Experiments #1 and #2.
2. Build the series circuit that you simulated in Pre-Lab step 3 – for both diodes individually.
3. Sweep the AC frequency (from the function generator) over the range 100 – 100 kHz. Use the oscilloscope to document the performance of your circuit.
4. Discuss and describe the differences you observed in the behavior of the 1N4001 and 1N4150.