

Lab 5: Diodes

(estimated time: 30 minutes)

1. Measure the I-V characteristic of a diode (you may use a regular diode or an LED). Please make sure that you do not exceed ~ 100 mA through the diode. A good way to measure the I-V curve is to use the “one-way current gate” circuit from the course notes so that the resistor limits the current flowing through the circuit.

(estimated time: 30 minutes)

2. Construct the full-wave rectifier with a voltage signal at 10 kHz, 4 diodes, an audio transformer, and a load resistor of 100 k Ω . Measure the amplitude of the input signal and characterize the output signal through the load resistor. Why do we need the transformer?

(estimated time: 30 minutes)

3. (same set-up as question 2) Use the FFT (Fast Fourier Transform) function to measure the frequency spectrum of the output. Measure the amplitude and frequency of the principal harmonics (i.e. the one you can see). How do you convert dB to Volts? What FFT window did you use? Does it matter?