Lab 6: Diodes

ECEN 325 - 511

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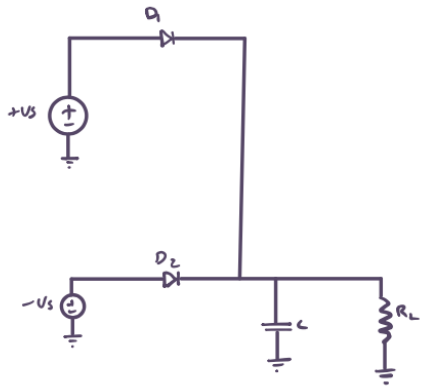
Date Performed: October 19, 2021

Due Date: October 26, 2021

Purpose

The purpose of this lab was to learn about the basic properties of semiconductors diodes. These characteristics include switching behavior, and rectification properties are examined, which leads to the construction of a DC power supply.

Calculations



Output should be 3V (V_m)

I_m = 3mA

10% of max ripple,

f = 250Hz

V_d = 0.7V

Load Resistance = $\frac{V_m}{I_m} = \frac{3V}{0.003A} =$ $R_L = 1k\Omega$

$V_r = 0.1 \times 3V = 0.3V$

$V_p = 3 + 0.3 = 3.3V$

$V_s = V_p + V_d = 3.3 + 0.7 = 4V$

$V_s = 4V$

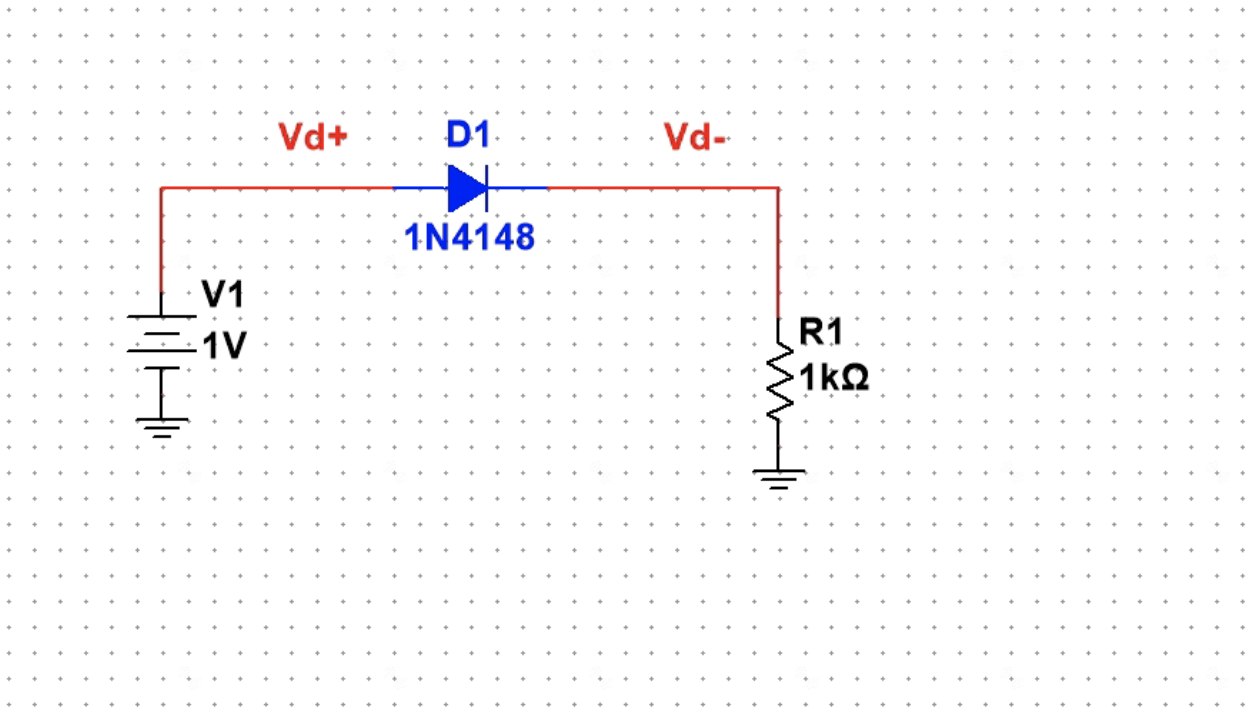
so $C = \frac{1}{2fR_Lk}$ where $k = 0.1$

$C = \frac{1}{2 \times 0.1 \times 1000 \times 250}$

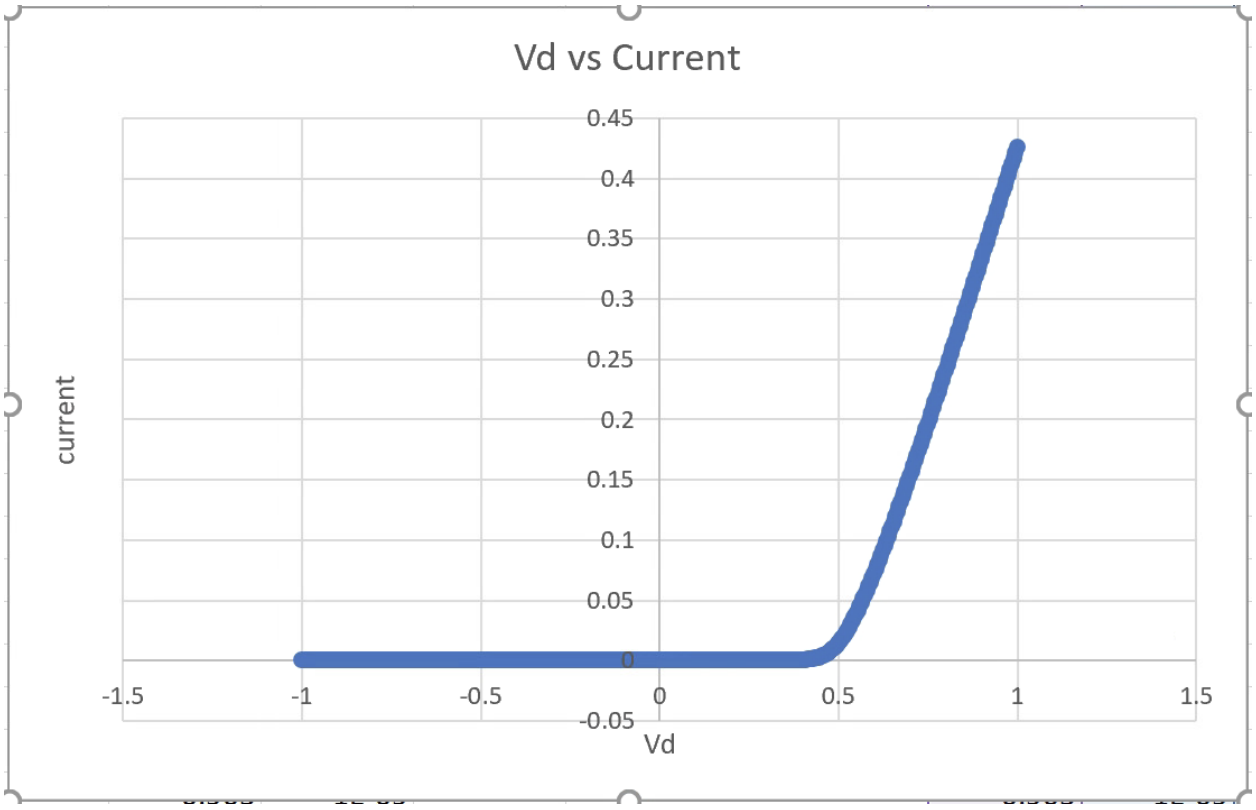
$C = 20\mu F$

Simulations (on Multisim)

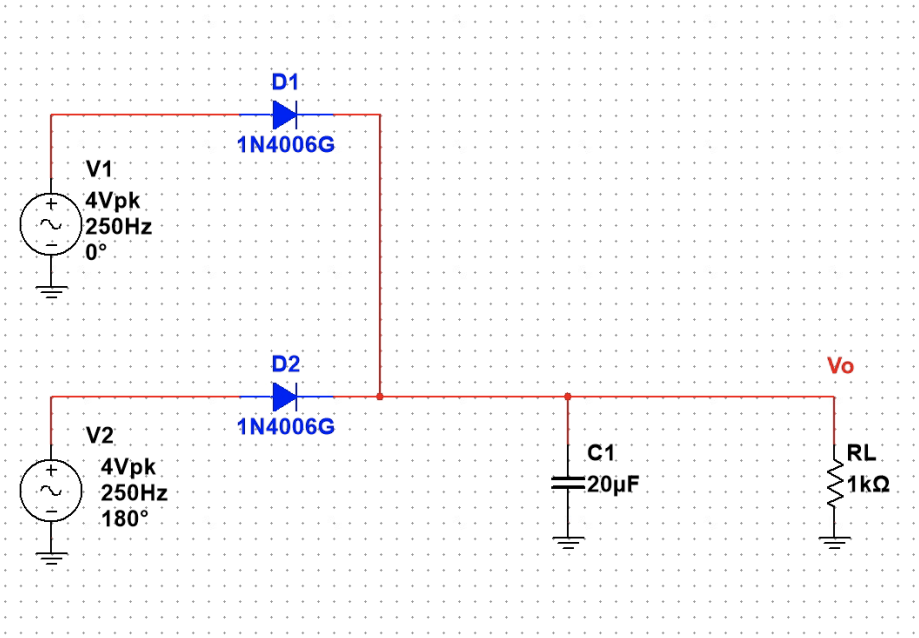
Schematic



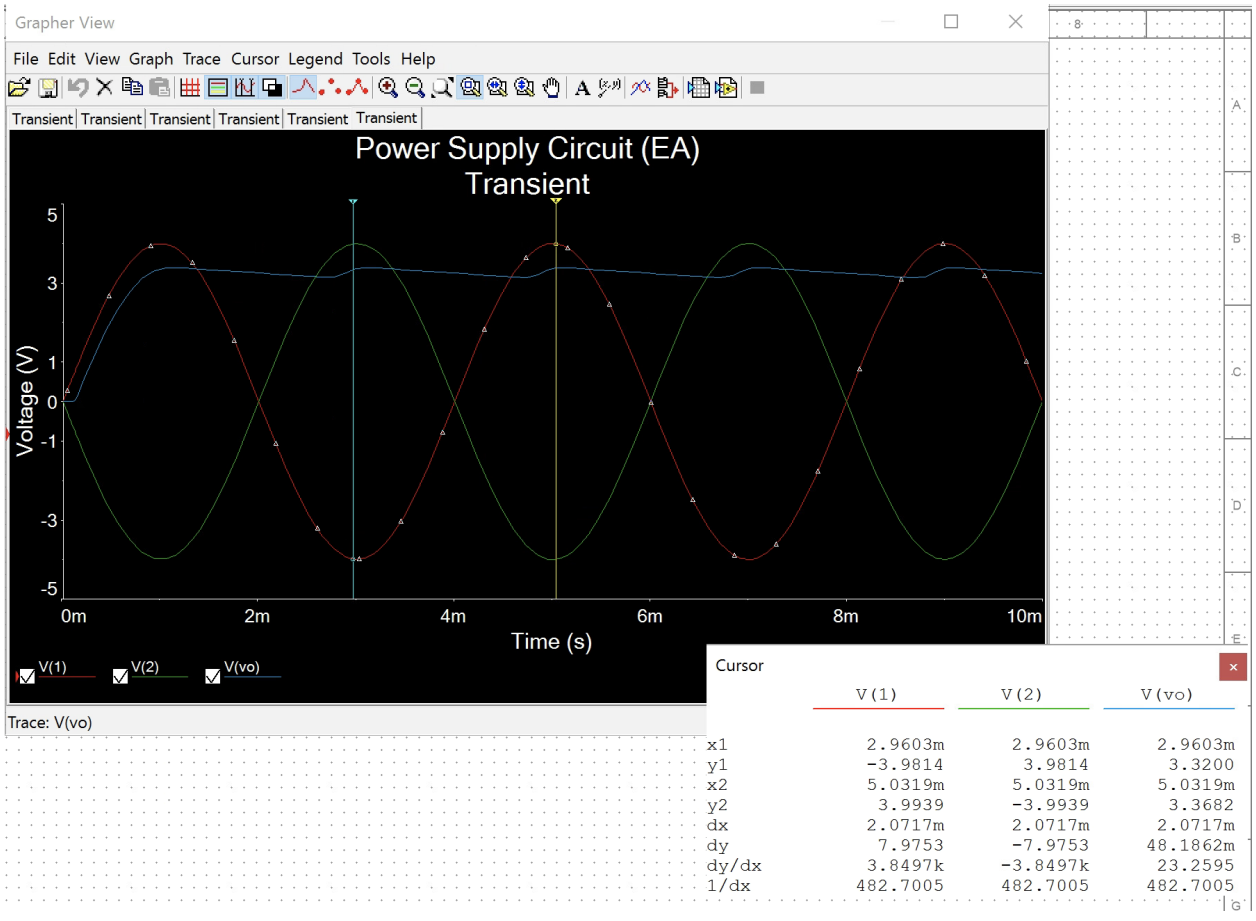
Plot



Schematic

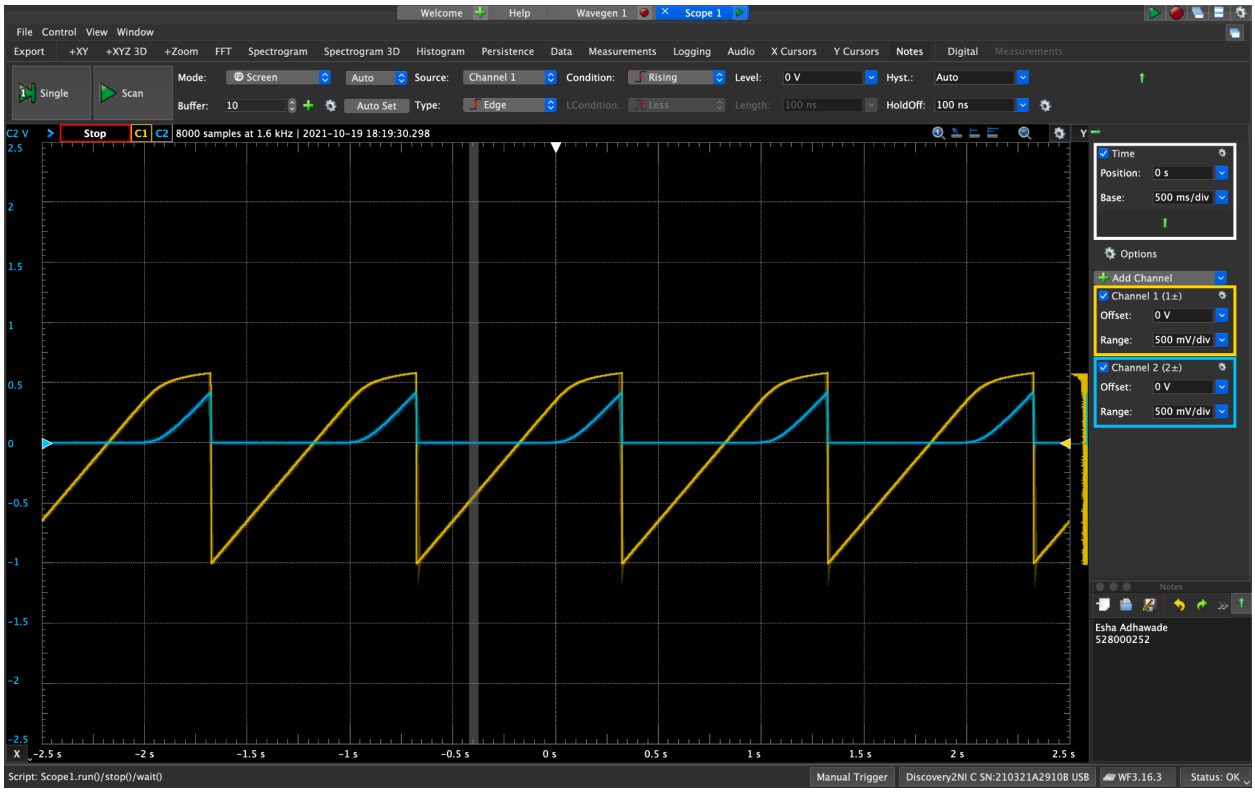


Transient



Measurements

Figure 2a Scope Measurements



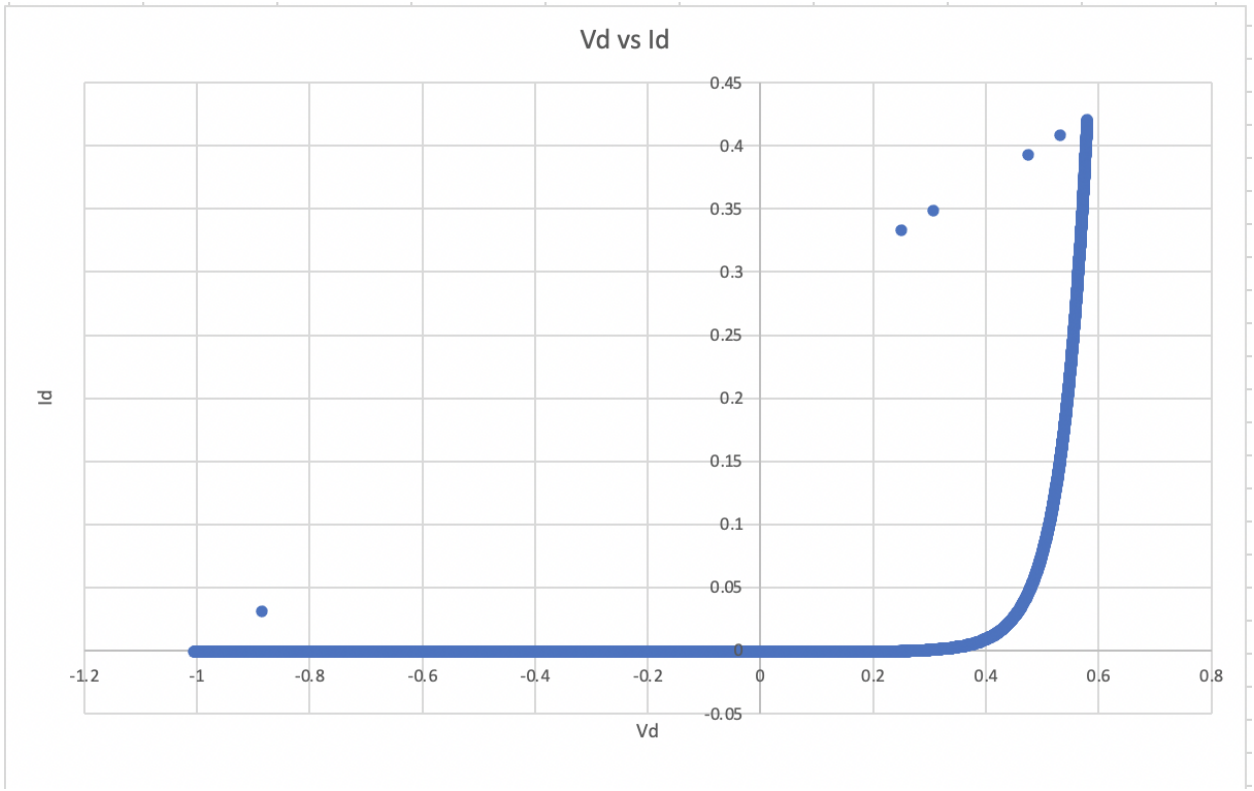
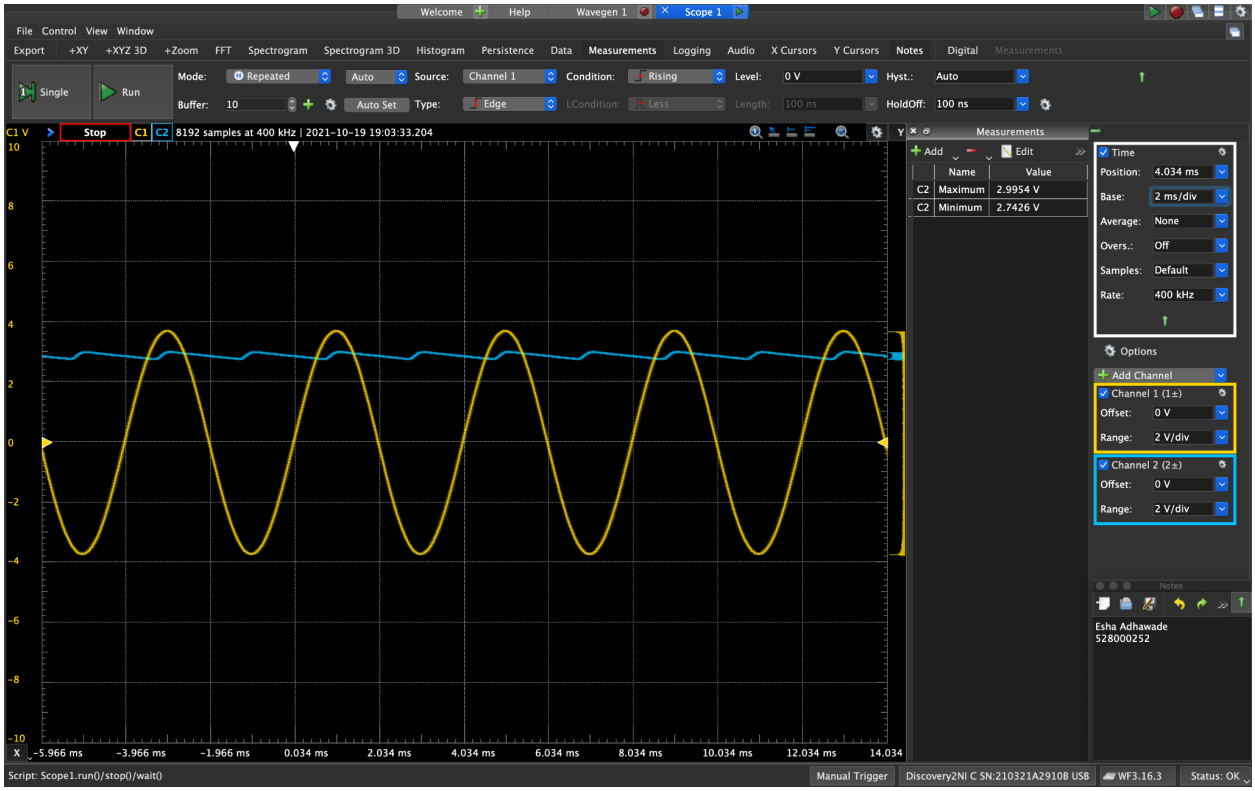


Figure 5 Scope



Data Tables

	Calculations	**Simulations**	**Measurements**
Peak Output voltage	3.3 V	3.3682 V	2.9954 V
Ripple voltage	300 mV	0.49 V	0.601 V

Discussion

For lab 6, students learned about the basic properties of semiconductors diodes. Most of the values between the simulations and measurements were pretty consistent for the circuits. If there were any minor differences, that's probably because of component differences, old breadboards, or loose wires.