

ECEN 325 – Electronics

Fall 2020

Lab 6: Report



Submitted by:

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Date Performed: October 8st, 2020

I. Objective

The objective of this lab is to introduce us to diodes by examining its basic properties and characteristics.

II. Procedure

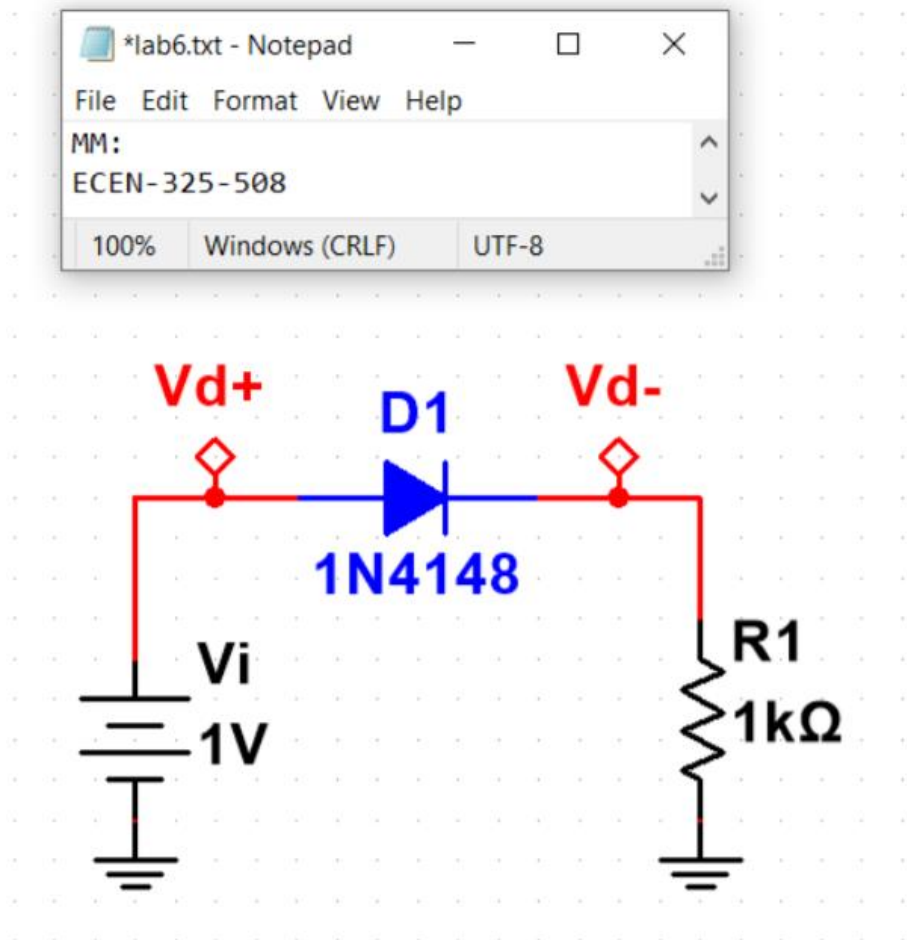
For the procedure I first had to build a diode test circuit and graph its I-V characteristics. Then I had to calculate the values for figure 5 circuit then build its schematic. After that, I obtained its time domain waveform from the measurements.

III. Difficulties

There were no difficulties during the lab.

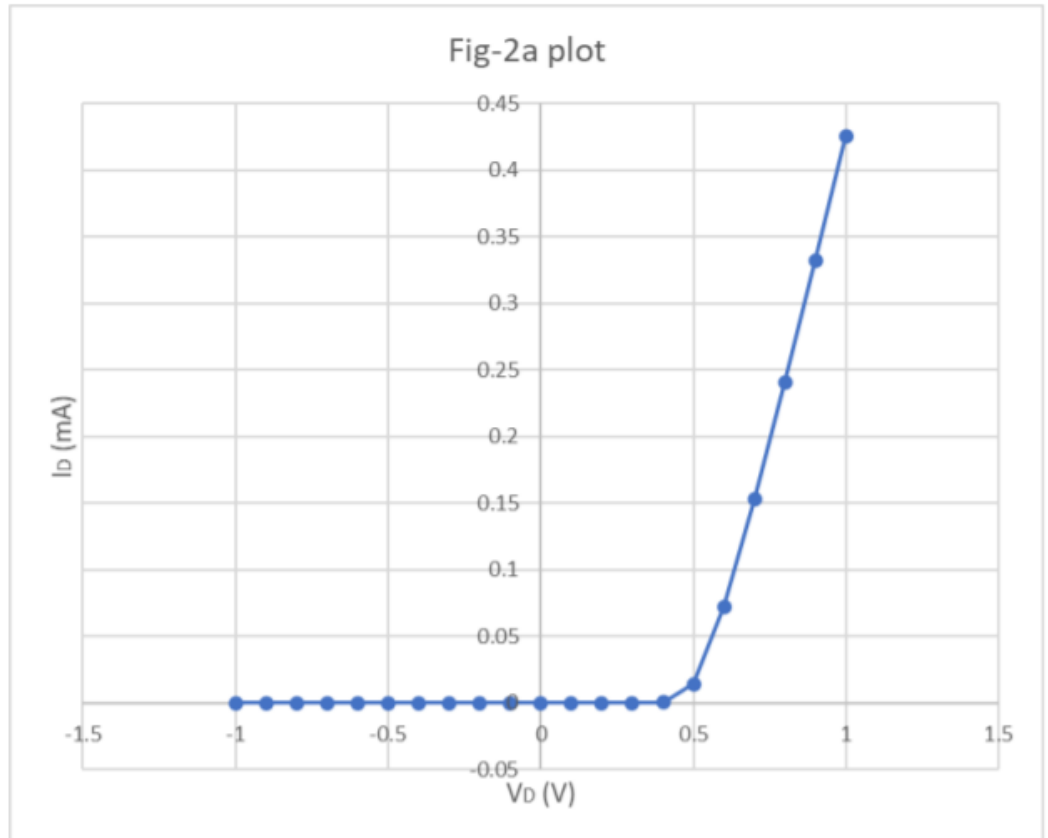
IV. Results

(fig-2) circuit schematic



Plot and table for (fig-2) circuit

V_D (V)	I_D (mA)
-1	-1.1E-09
-0.9	-1E-09
-0.8	-9E-10
-0.7	-8E-10
-0.6	-7E-10
-0.5	-6E-10
-0.4	-5E-10
-0.3	-4E-10
-0.2	-3E-10
-0.1	-2E-10
-1.4E-16	-6.7E-25
0.1	4.78E-09
0.2	2.28E-07
0.3	1.09E-05
0.4	0.00051
0.5	0.014304
0.6	0.072298
0.7	0.152857
0.8	0.241028
0.9	0.33242
1	0.425854



Calculations for (fig-5) circuit

$$R_L = \frac{V_o}{I_{o,max}} \quad C = \frac{1}{2f_i R_L K_r} \quad \hat{V}_s \approx V_o + 0.7$$

$$I_{o,max} = 3\text{mA} \quad V_o = 3\text{V} \quad f_i = 250\text{Hz}$$

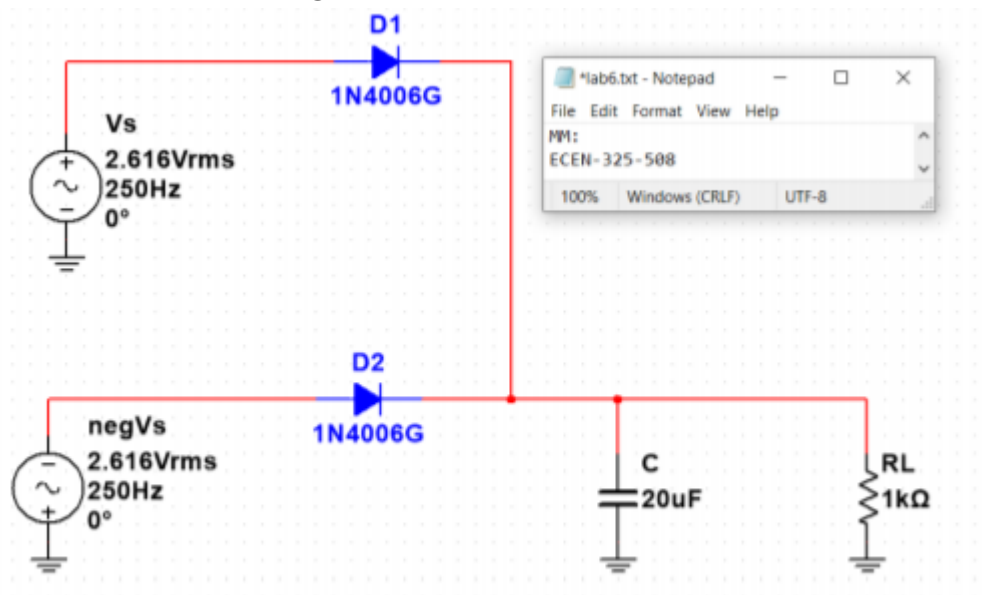
$$R_L = \frac{3}{3\text{mA}} = 1\text{k}\Omega \quad K_r = 0.1 \quad C = \frac{1}{2(250)(1\text{k})(0.1)} = 20\mu\text{F}$$

$$C = 20\mu\text{F} \quad V_s = 3 + 0.7 = 3.7$$

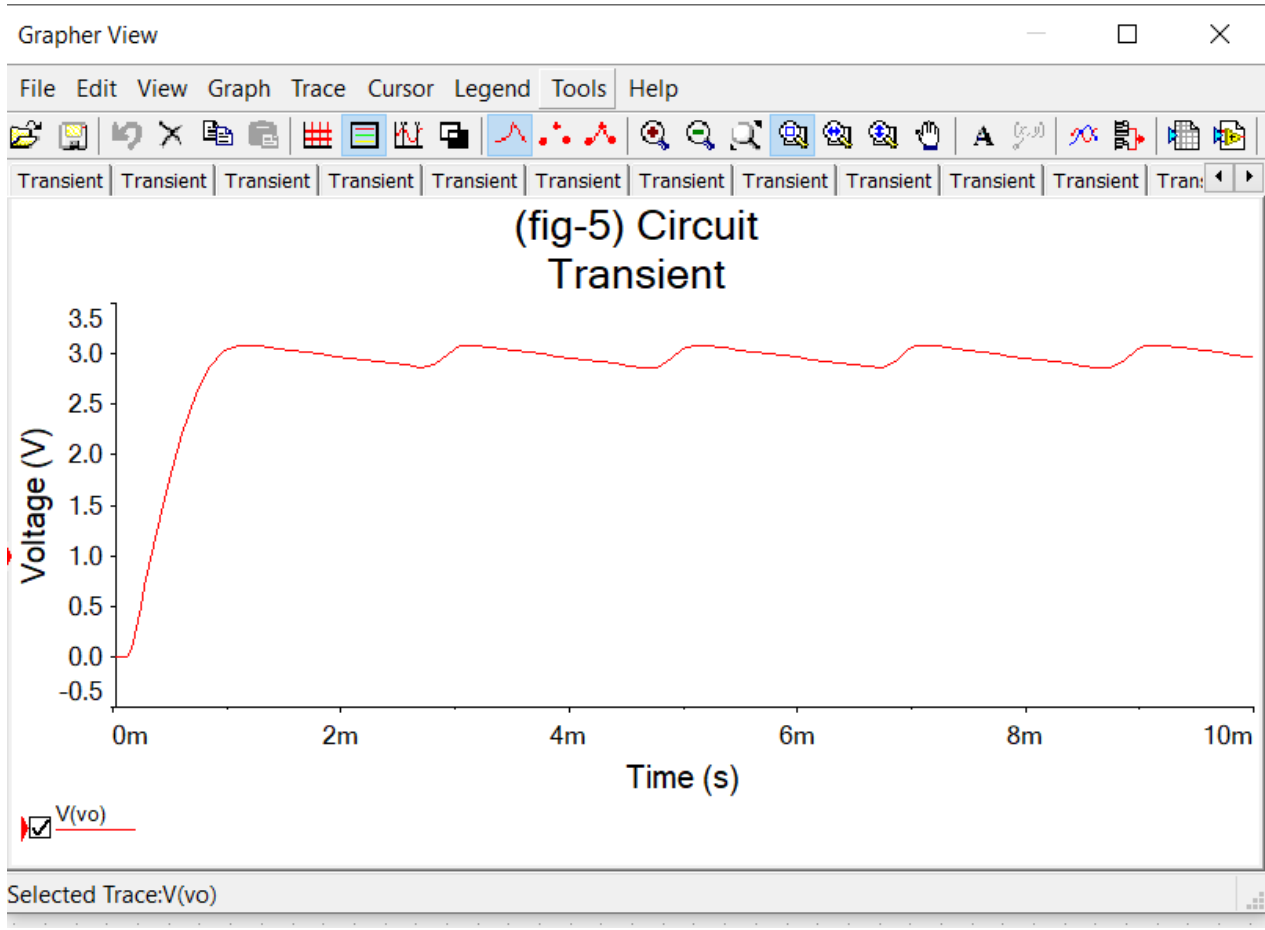
$$V_s = 3.7 \sin(500\pi t) \text{V}$$

$$-V_s = -3.7 \sin(500\pi t) \text{V}$$

(fig-5) Circuit schematic



(fig-5) Dc sweep of V_o



Measured and calculated values of (fig-5) circuit

peak V_o (V)	maximum ripple (%)	peak I_{D1} (A)	peak I_{D2} (A)	peak I_L (A)
3.08	10	29.1 m	29.3	0

V. Conclusion

In conclusion, when comparing my calculated with my measured results the avg output voltage is only slightly different between my calculated output voltage. This might be due to averaging output voltage only gives you a estimated look at the voltage that is being out putted.