ECEN 325 – Electronics

Fall 2020

Lab 12: Report

Submitted by:

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Date Performed: November 17, 2020

I. Objective

The objective of this lab is to design and build a multi-stage MOSEFT given specific requirements for the circuit and to obtain and analyze its measurements.

II. Procedure

For the procedure I first had to calculate the values of the multi-stage MOSEFT amplifier circuit. Then I used the values I calculated to build the circuit. From there, I created a schematic MOSEFT amplifier circuit. After that, I performed an interactive simulation, AC simulation, Fourier simulation and a transient simulation of the circuit to obtain measurements of its resistances, currents, voltages, and total harmonic distortion.

III. Difficulties

There were no difficulties during this lab.

IV. Results

Fig.1 Circuit schematic

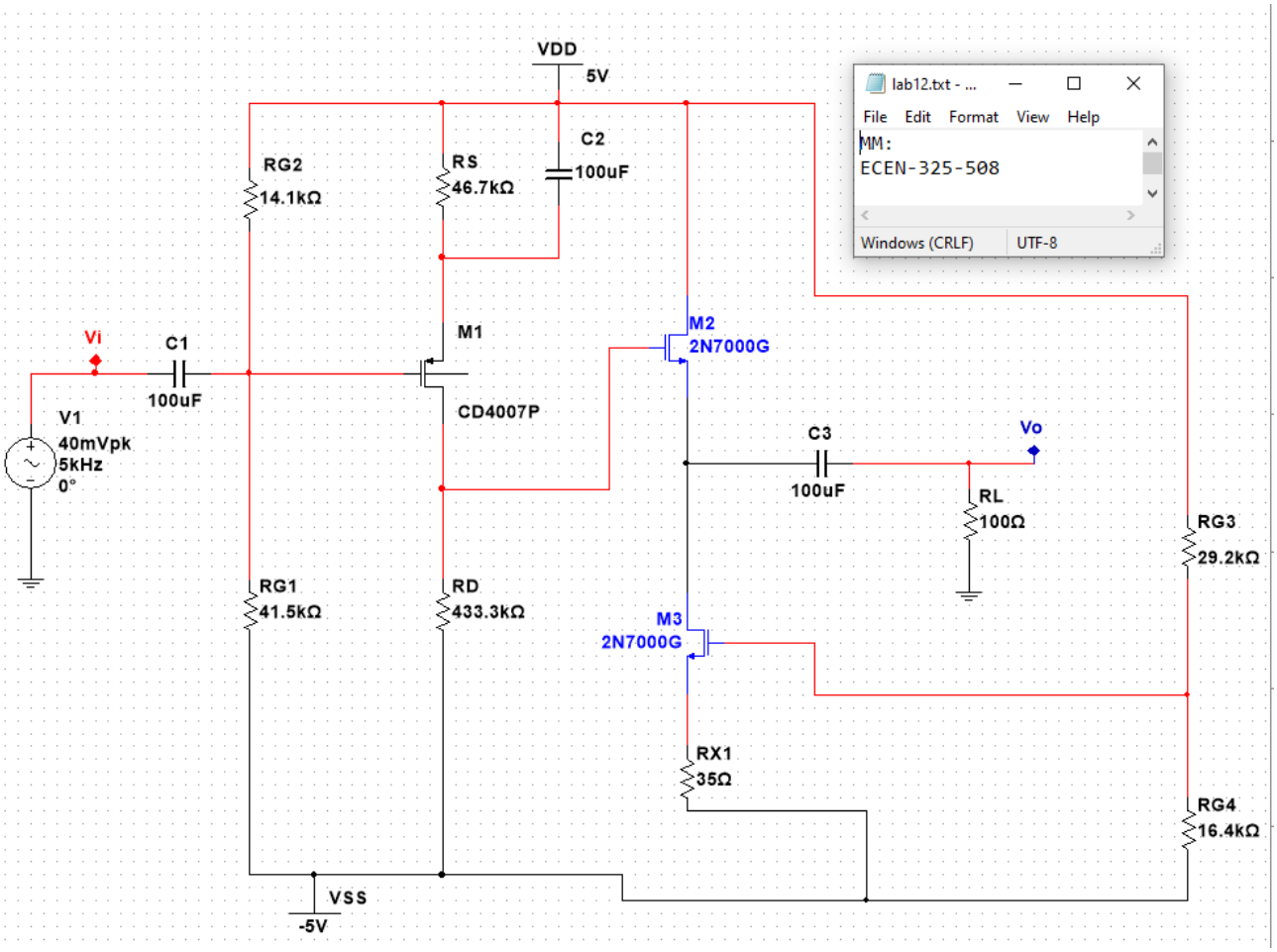


Fig.1 DC solution measured and calculated results

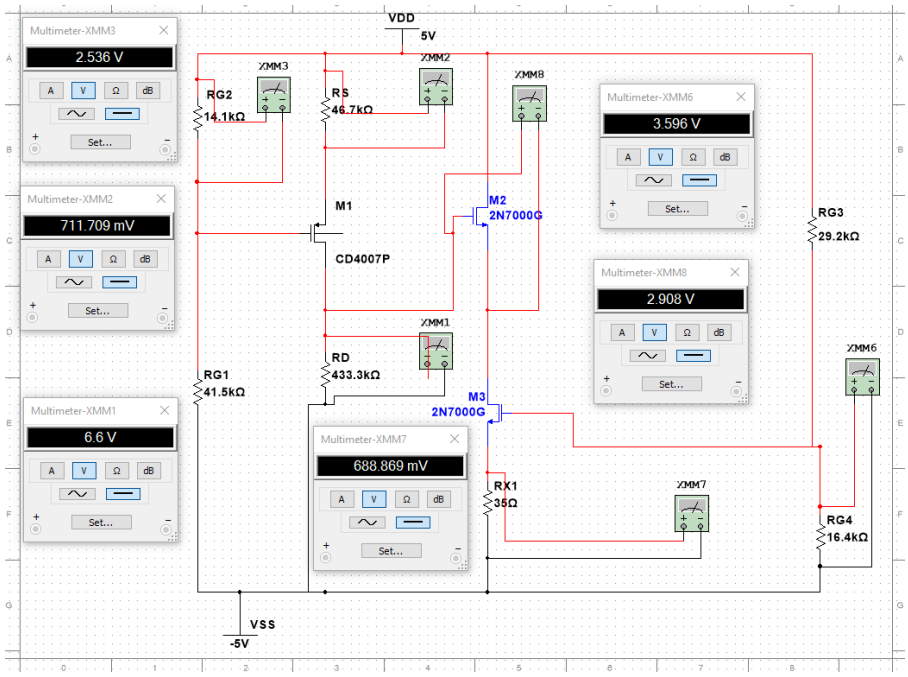


fig.1	V_{RG2} (V)	V_{RS} (V)	V_{RD} (V)	V_d (V)	V_X (V)	V_{RG4} (V)
Measured	2.536	0.711709	6.6	2.908	0.688869	3.596
Calculated	2.3	0.7	6.5	2.23	0.7	3.6

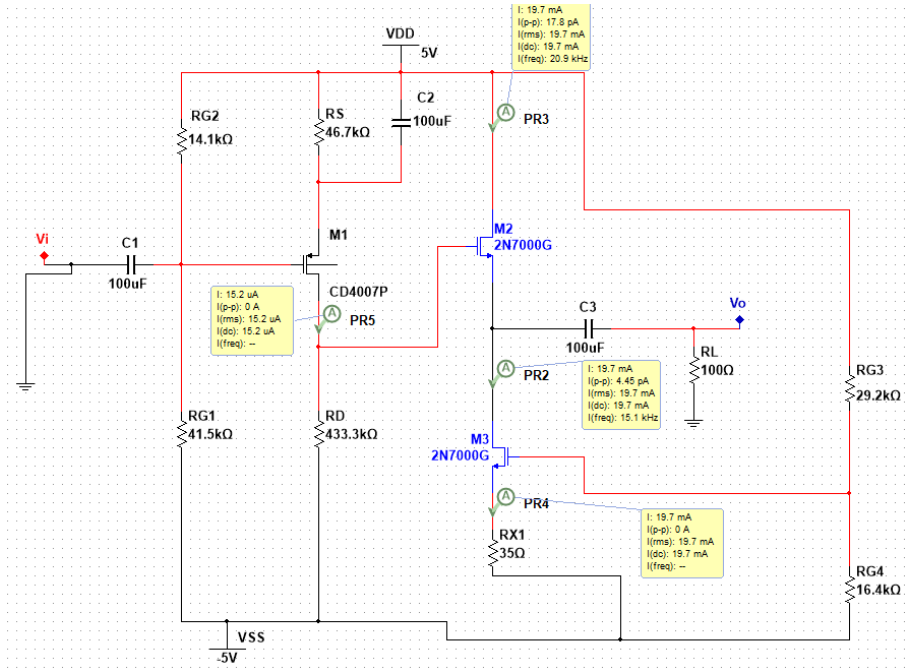
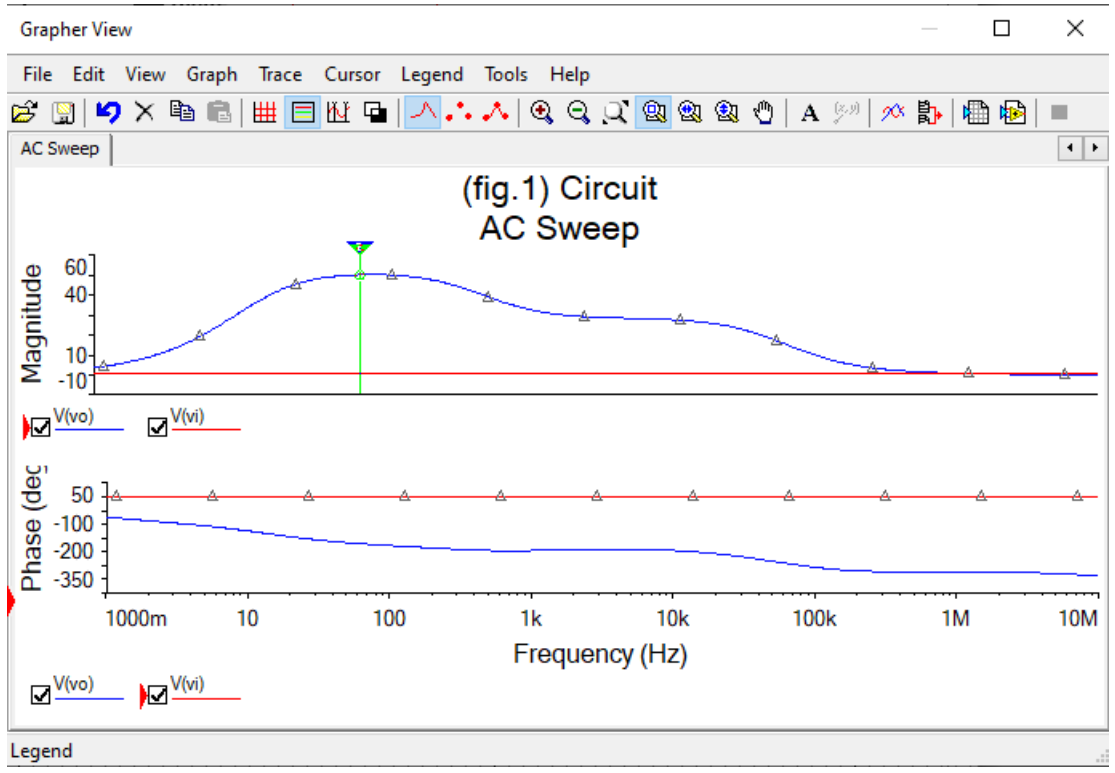


fig.1	I_{D1} (mA)	I_{D2} (mA)	I_{D3} (mA)	I_{DX} (mA)
Measured	0.0152	19.7	19.7	19.7
Calculated	0.015	20	20	20

Fig.1 AC Simulation measured and calculated results



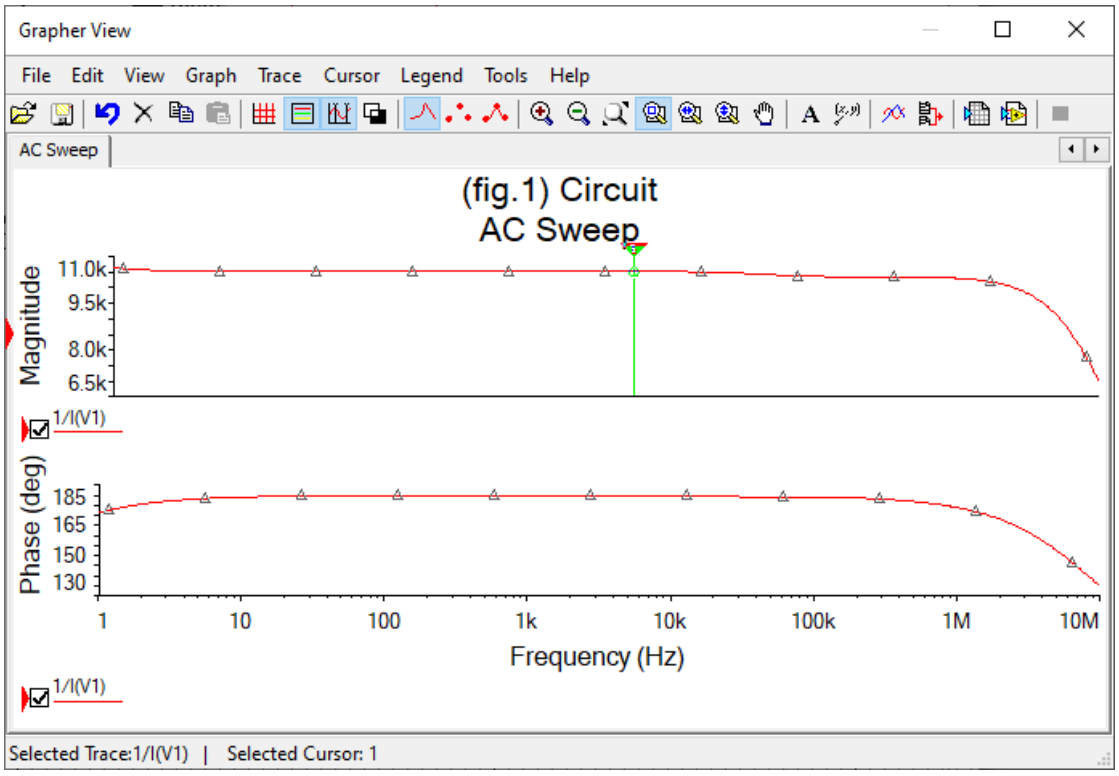


fig.1	|Av|	Ri (Ω)
Measured	50.0207	10520.4
Calculated	50	10500

Fig.1 Time-Domain Waveform

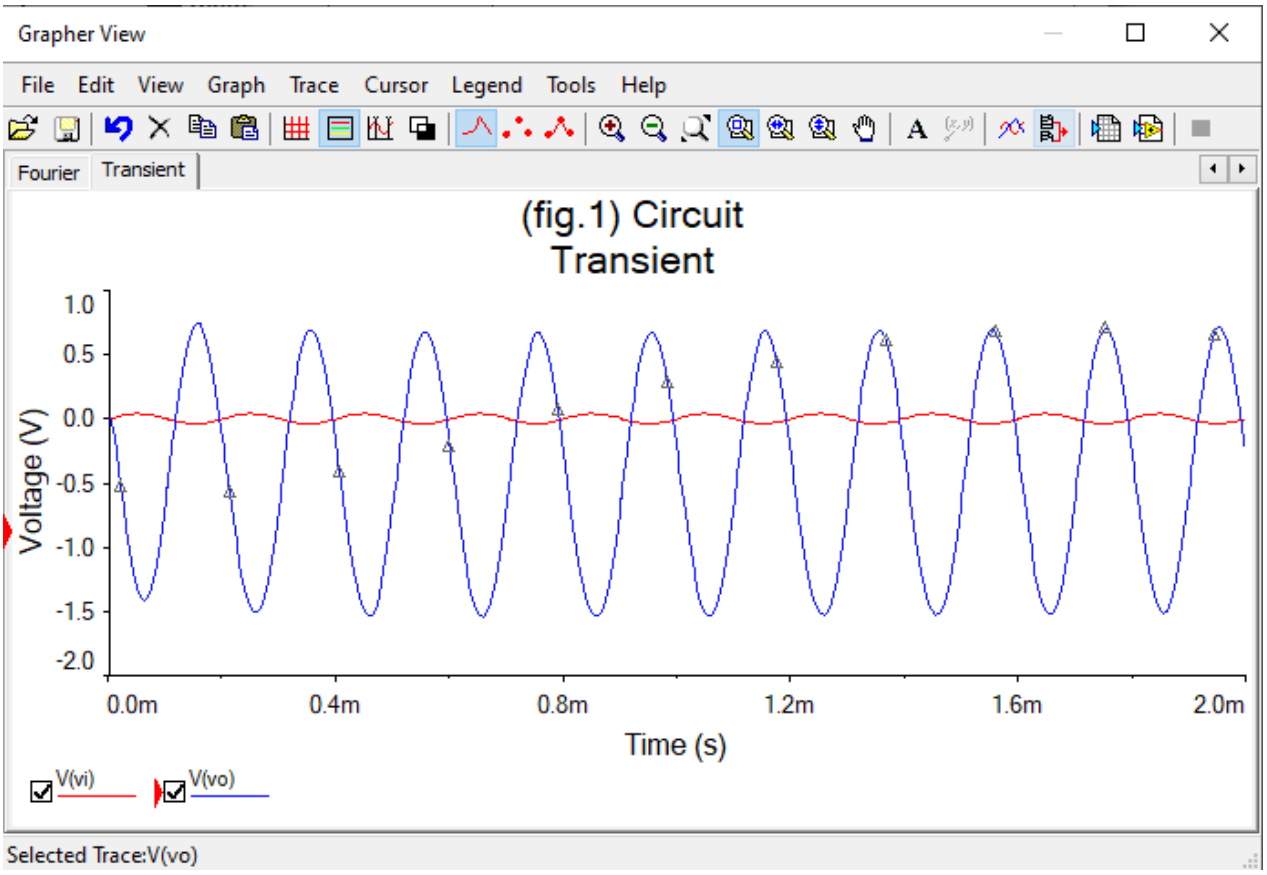


Fig.1 Fourier Simulation

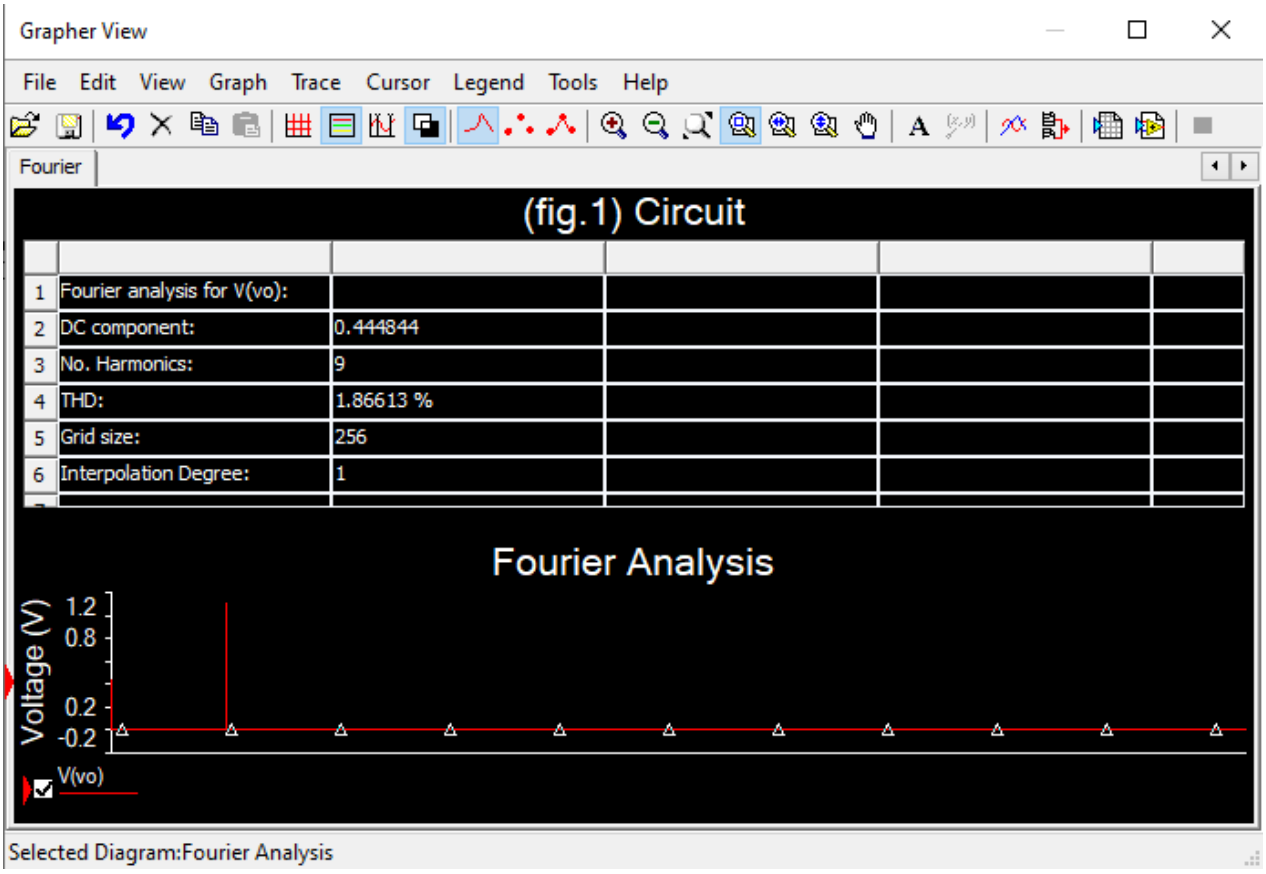


fig.1	THD (%)
Measured	1.86613

V. Conclusion

In conclusion, from comparing my calculated with my measured results, I was able to verify that I had designed my circuit to the correct specifications. I was able to determine this by comparing my measured and calculated from the DC solution and AC simulation and seeing that there was very little to no difference. I was also able to determine this by viewing the time domain waveform and seeing that Vo increases about 50 times bigger then Vi peak voltage and then checked to see that if THD was smaller than 8 percent.