

Experiment No. 3
Sinusoidal Steady State Analysis
ECE 213

Peter CHINETTI

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Date Performed: September 25 & October 9, 2013
Instructor: Professor Shanechi

1 Purpose of the Laboratory Procedure

- a. Measurements of a circuit at different frequencies
- b. Practice in the use of hand Phasor arithmetic to compute impedance computations and the steady state response of active network.
- c. Use of a spreadsheet and PSpice simulations to confirm hand calculations.
- d. Magnitude and phase measurements.
- e. Examination of a low pass response function.

2 Procedure

- a. Solve circuit for ω .
- b. Plot expected circuit response using a spreadsheet program.
- c. Simulate circuit using PSpice.
- d. Build circuit.
- e. Test response of circuit.

3 Problems

The only computer problem experienced was learning how to simulate circuits using PSpice. There were more problems while conducting the measurements. When constructing the OP Amp circuit, the correct value of capacitors (non-electrolytic) could not be found, so lower capacitance and higher resistance components were substituted. While attempting to measure delay time, some measurements were estimated due to noise making the scope display hard to read. The built in delay calculator was tried, but reported incorrect results.

4 Observations

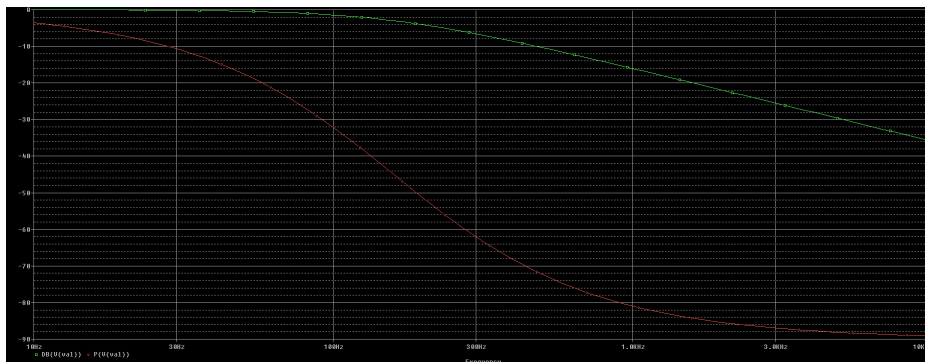
The measurement of the phase response had a lot of noise. It is difficult to draw any meaningful conclusions from those measurements. However, speaking generally, the plot of the RC filter roughly matches the shape of the expected PSpice response.

The plot of the OP Amp looks nothing like the full PSpice plot. Using different capacitors and resistors affected the response of the circuit more than assumed, and expanded the frequency response. Because of this, the plot only shows the start of the response curve. With this in mind, the plot matches fairly well.

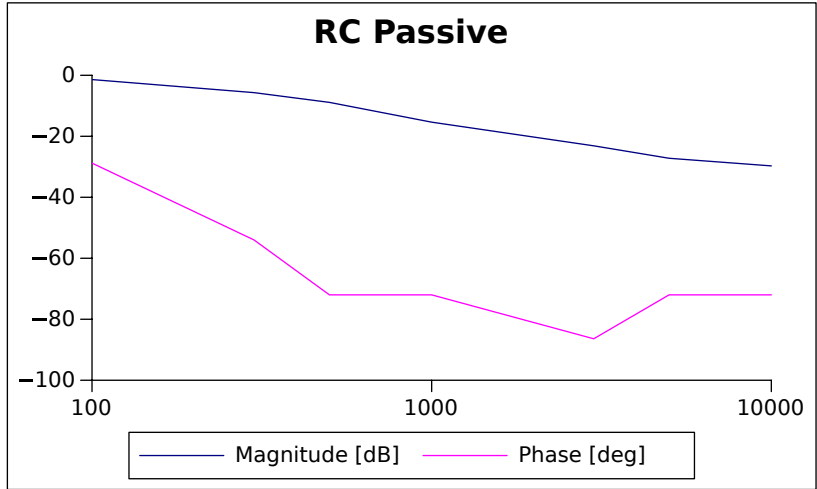
5 Plots

5.1 RC Circuit

5.1.1 PSpice

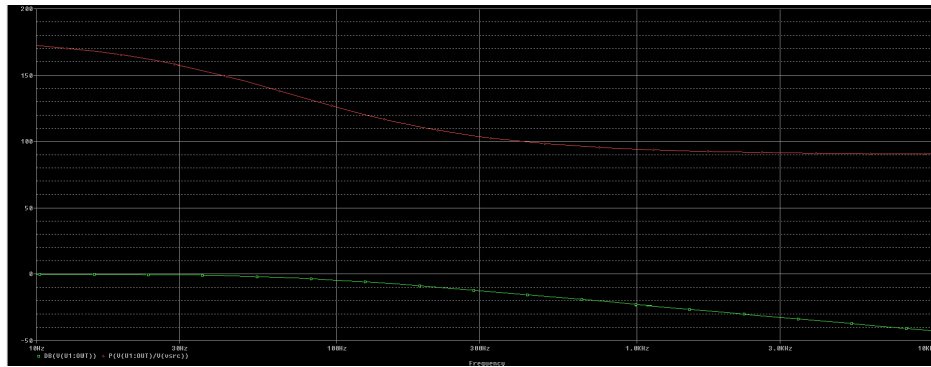


5.1.2 Measured



5.2 OP Amp Circuit

5.2.1 PSpice



5.2.2 Measured

