NANYANG TECHNOLOGICAL UNIVERSITY

EE2073 Introduction to EEE Design and Project

Week 7 - Logbook

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Lab Group: 9B

Academic Year: 2021

Transistor Amplifier

Objective: As part of the overall audio amplifier system, we are building the Power Amplifier (PA) subsystem this week and studying its Bode frequency response.

We, along with VCA, continue to build the PA on our previous breadboard. The PA is the center of the gain and power amplification needed to drive the load (speaker). The IC used for the PA subsystem is LM380N, with the following pin diagram shown: -

Project Tasks:

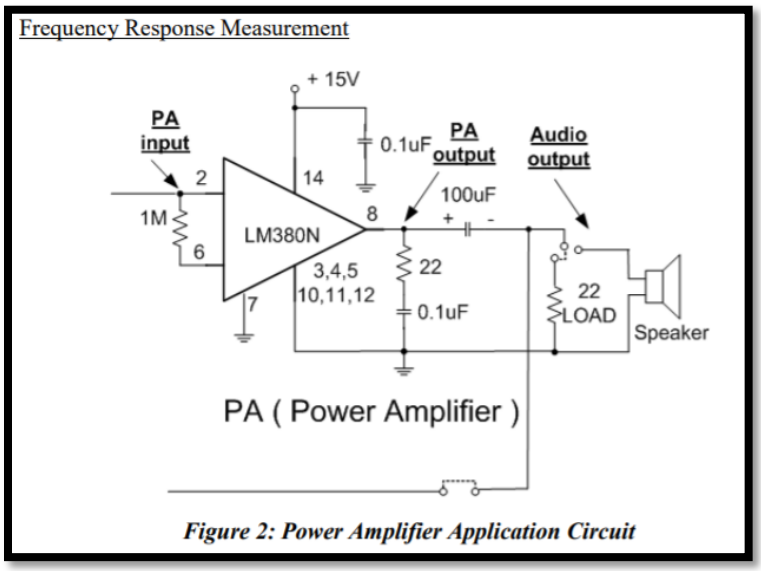


Figure 2: Power Amplifier Application Circuit

Circuit Diagrams

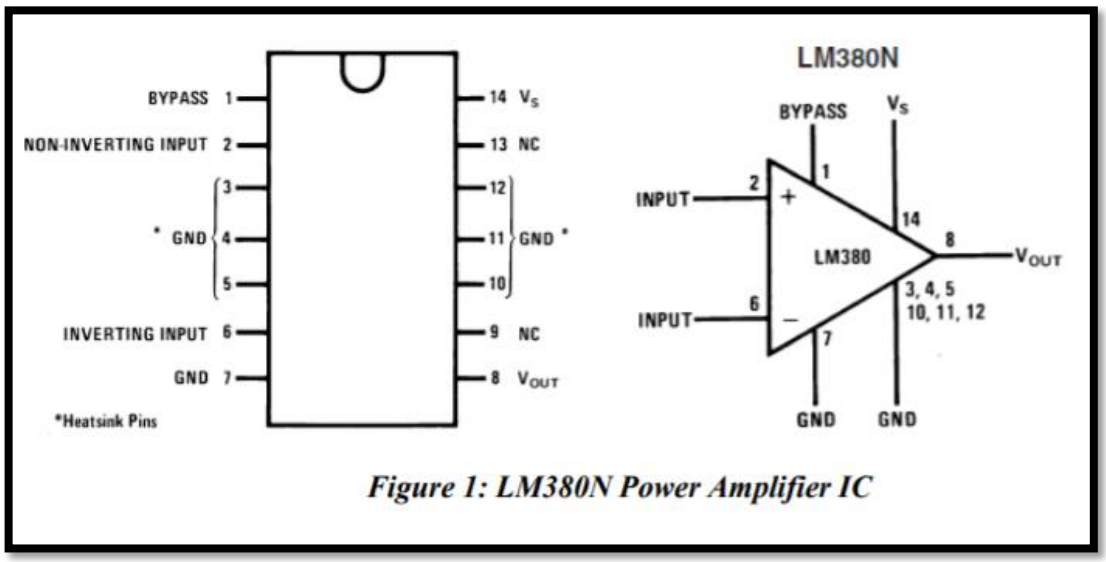
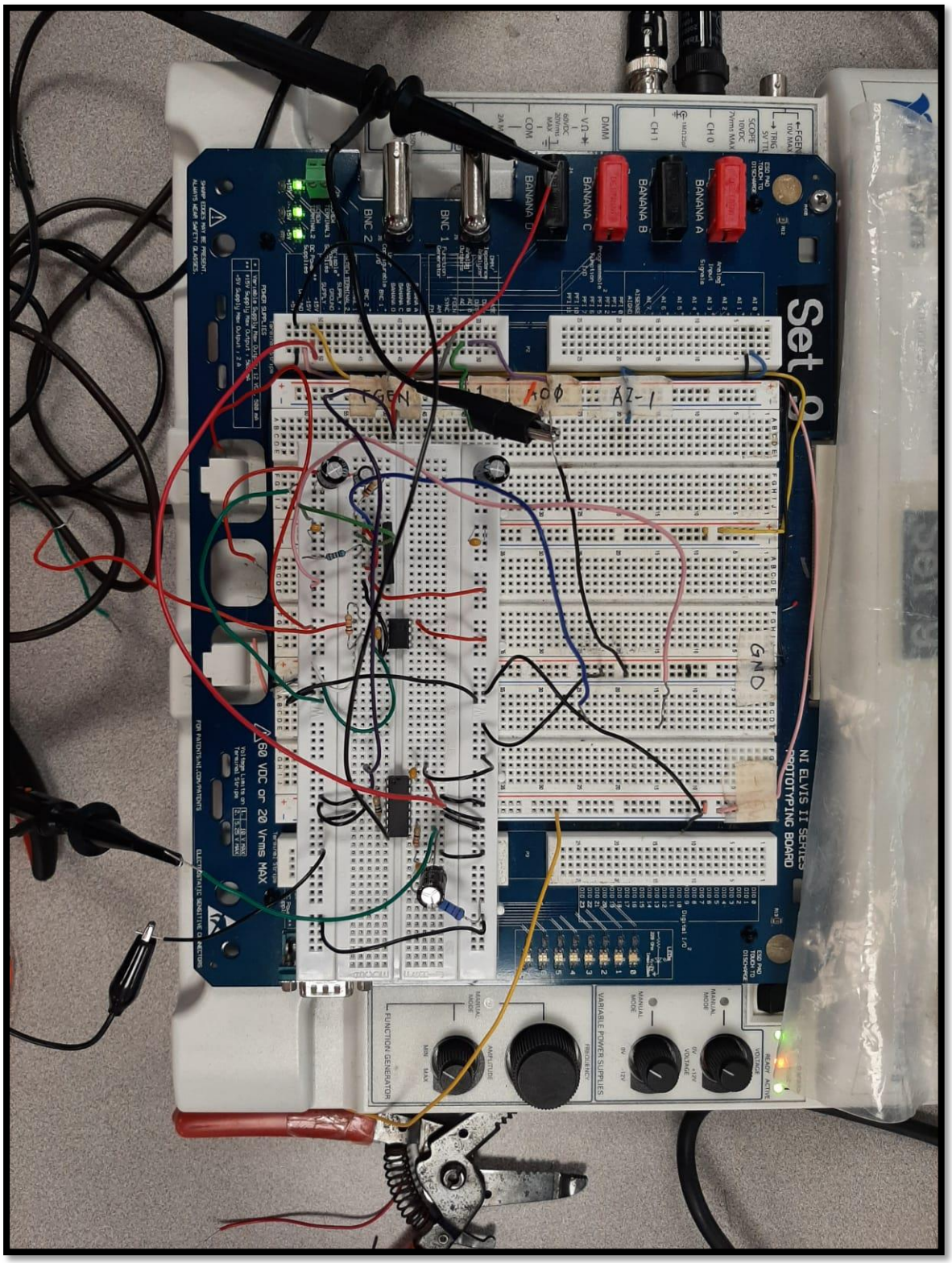
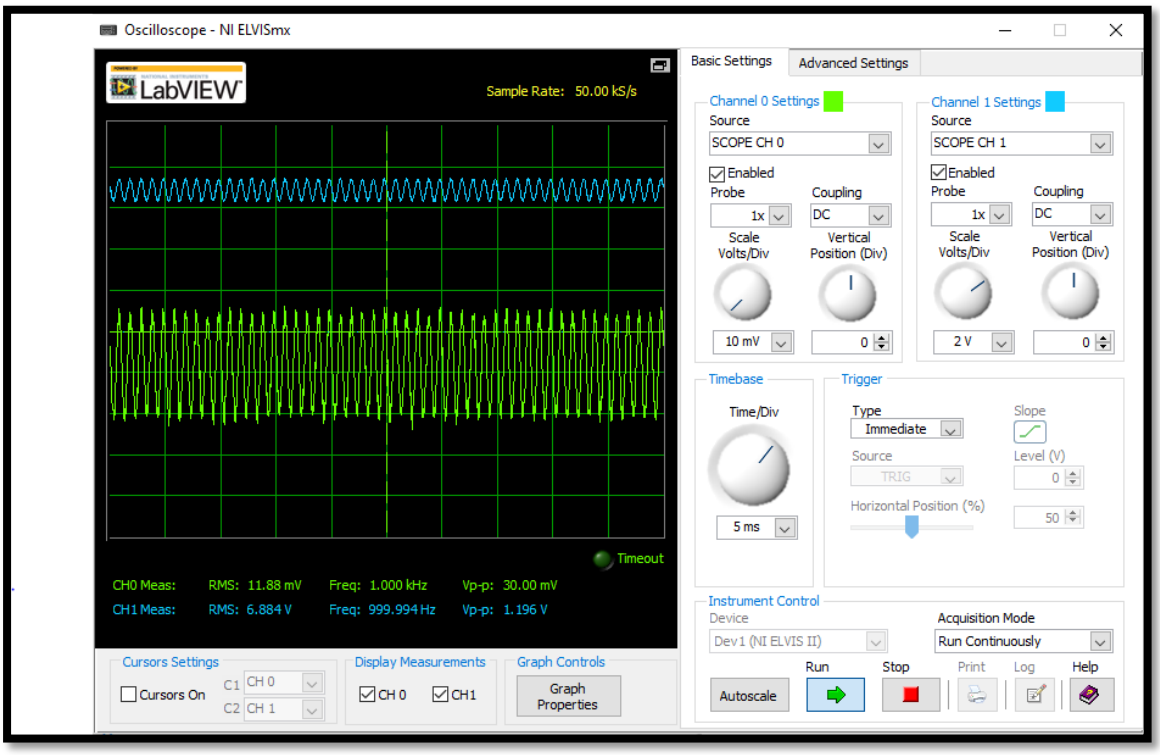
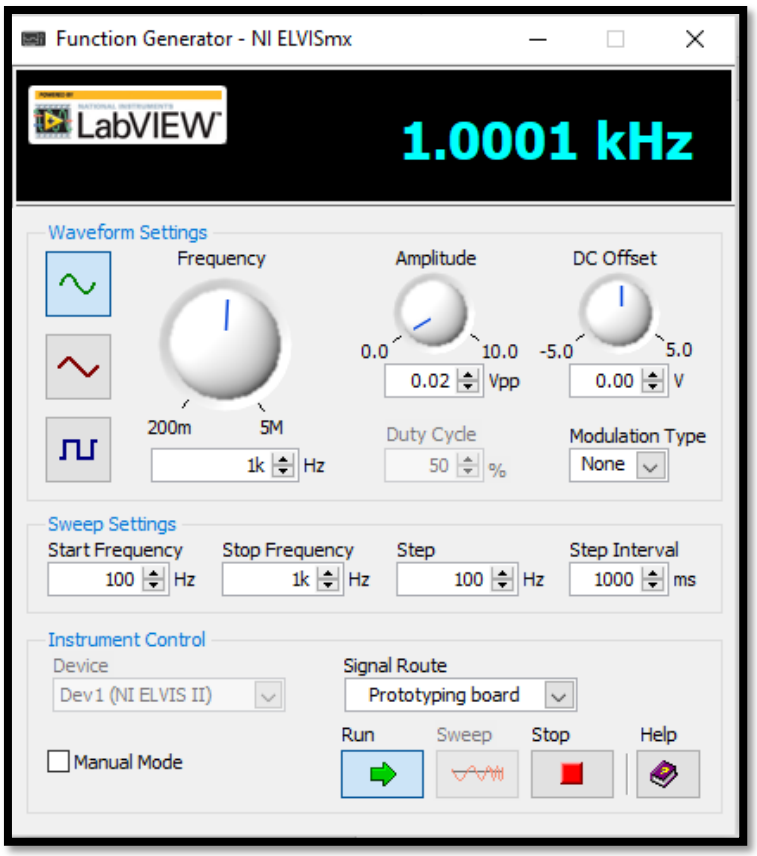


Figure 1: LM380N Power Amplifier IC

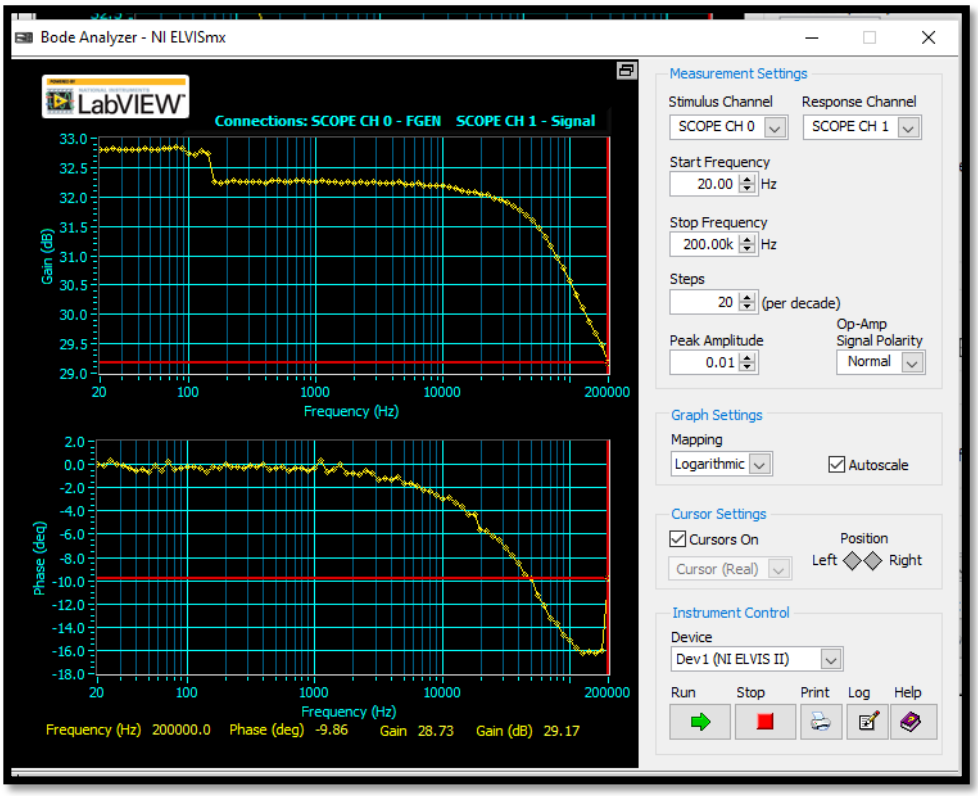


Circuit Connections made to build power amplifier

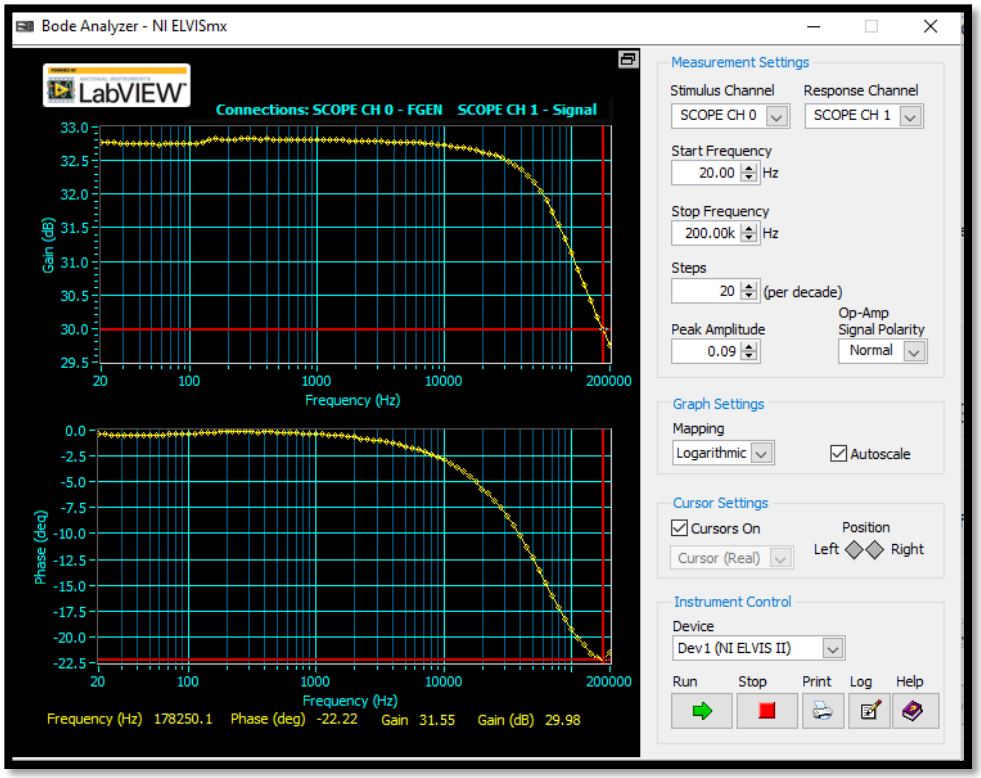




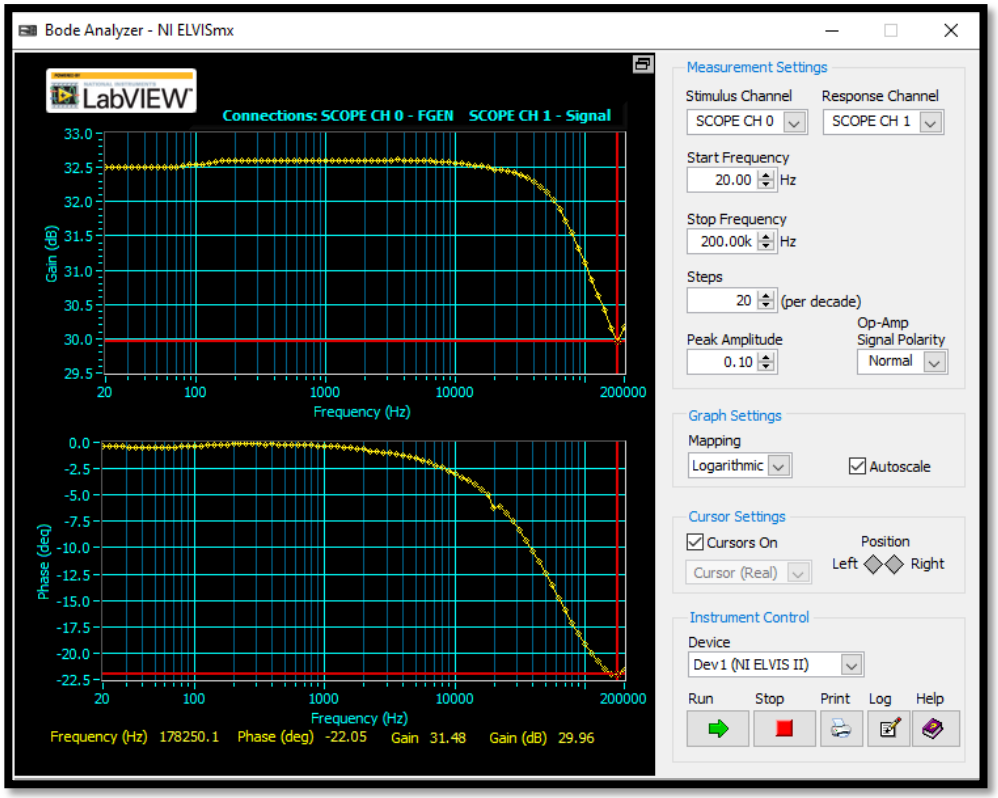
Gain=20 log10 (Vout / Vin)= 32.012

V_p (V)	Bode Analyzer Window Capture
0.02	
0.01	

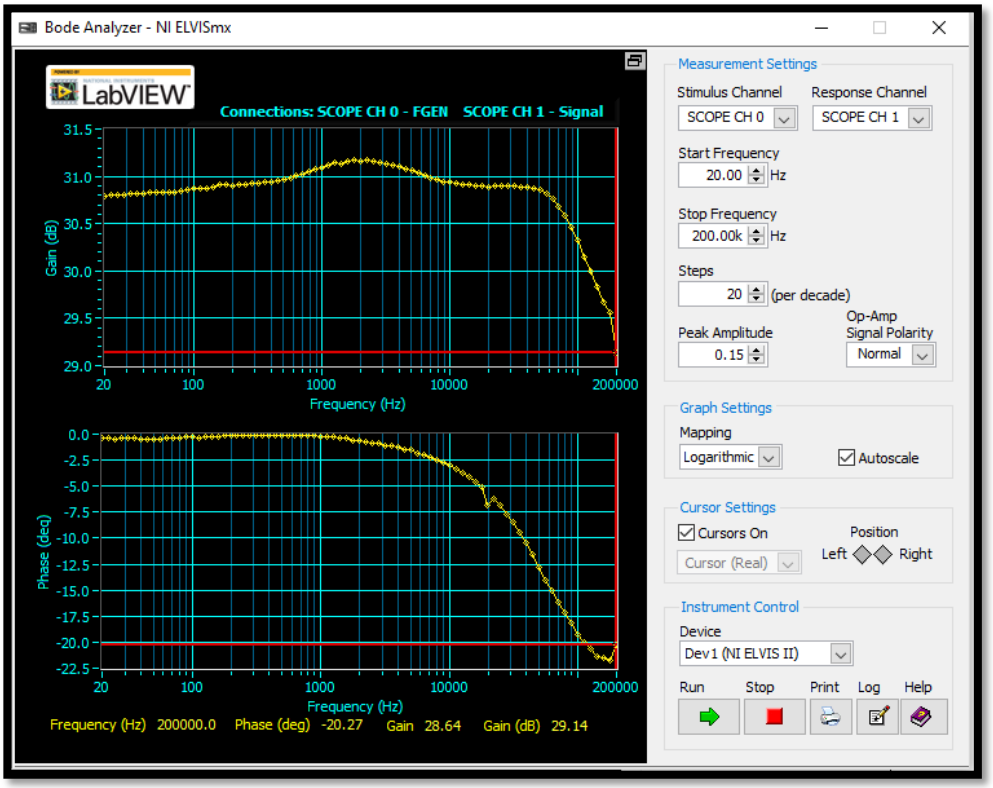
0.09



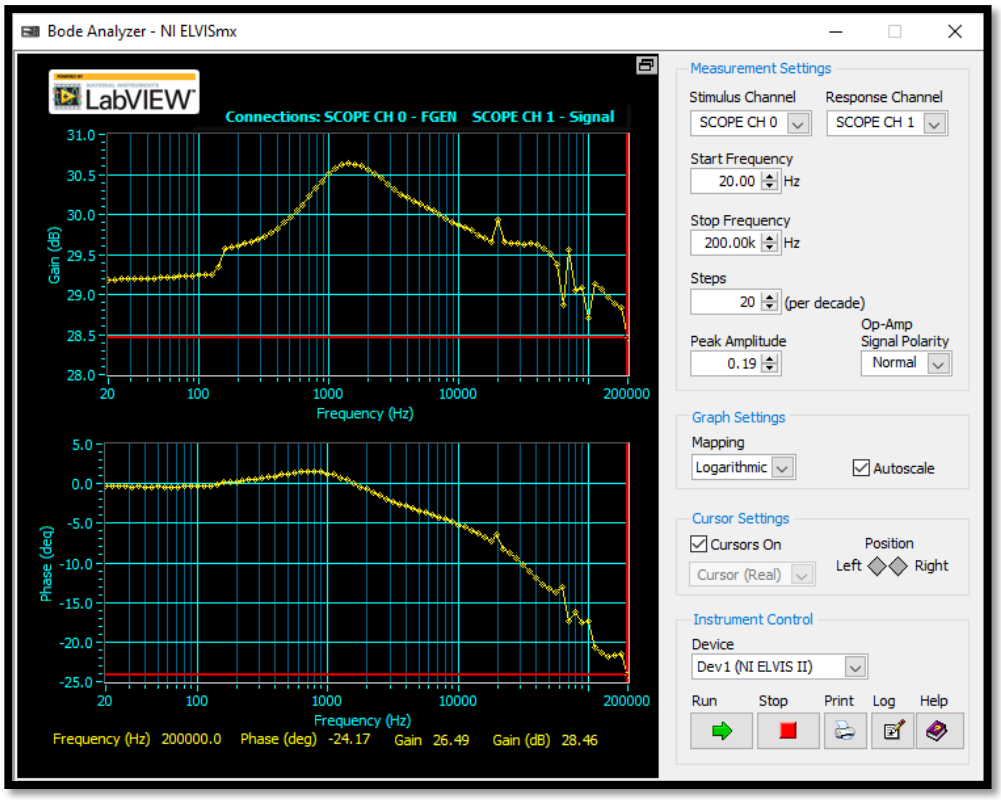
0.02

0.02	
0.10	

0.15



0.19



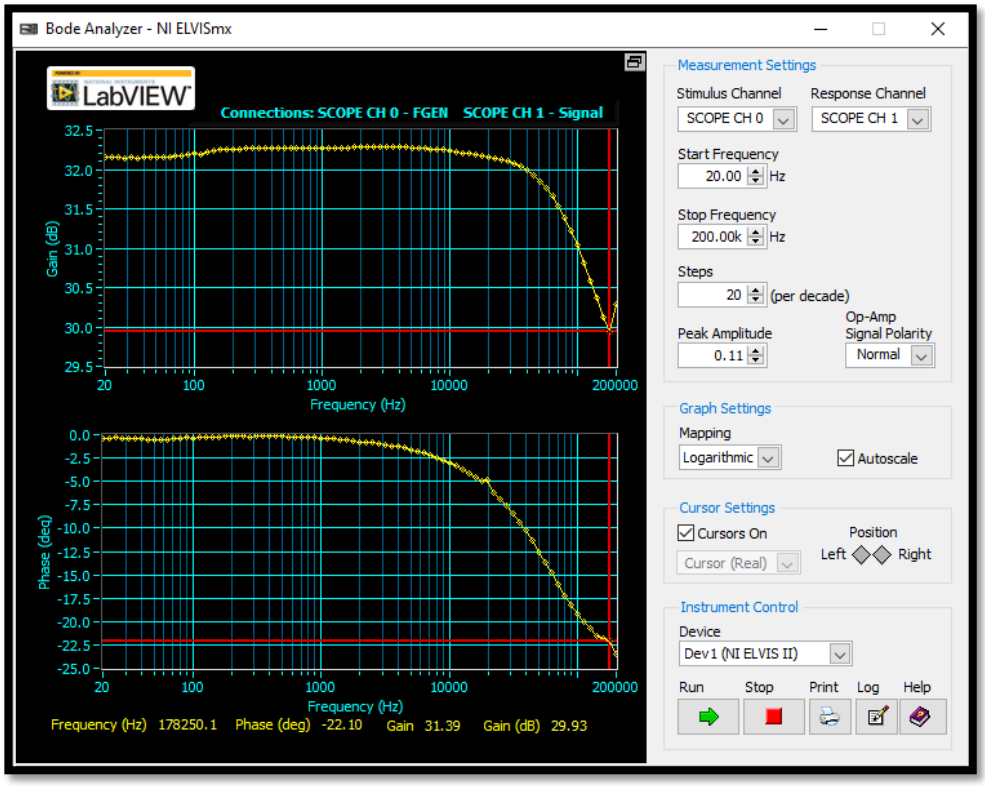
0.11	

Table: Frequency Response Measurement

Observation:

We observe that the gain is constant for a certain range of frequencies and a flat straight line is obtained in these regions. However the gain at higher V_{P-P} like (0.19V) does not stay constant and keeps fluctuating. Most of the values for -3dB are at the edge of the plot.

Therefore the amplifier works efficiently for low voltages and up to a certain region of frequencies hence working like a low pass filter.

Open Ended Questions

Q. What type of filter does the Bode Analyzer show?

The bode analyzer is a low pass filter. For measuring the frequency responses of passive/active filters, complex impedances and any other electronic circuit, the Bode analyzer is an ideal application. The Gain/Phase frequency response can be used to fully characterize any device under test, and linear and logarithmic sweeps can be performed. From 1Hz to 60 MHz, gain and phase can be measured. The basic user interface allows fast interaction.