EEO 352 Fall 2023 - Assignment 6 – Operational Amplifiers

Please document each step with snapshots of the built circuit, plots, pictures and your observations. Please include this page.

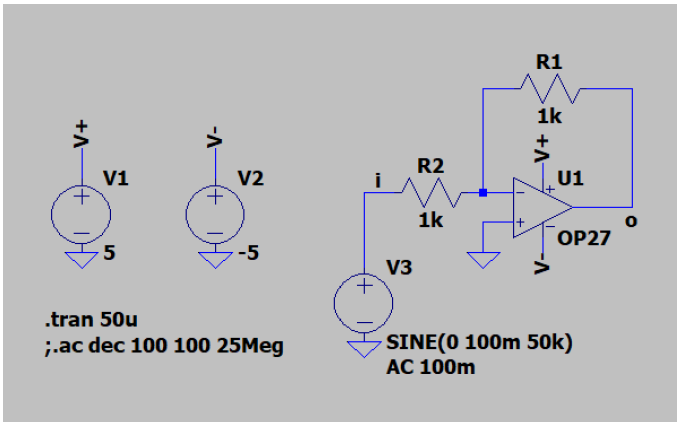

Fig.1

1) Using the OP27 component in the OpAmps library and 1kΩ and 20kΩ resistors, design and simulate the following circuits (**25pts**):

a) Non-inverting buffer

b) Non-inverting amplifier with gain 21

c) Inverting buffer (see example in Fig.1)

d) Inverting amplifier with gain 20

For each circuit:

- plot (input and output) the response to a 50kHz 100mV sinusoidal signal

- plot the frequency response (amplitude and phase) from 100Hz to 25MHz, extrapolate the -3dB frequency and the corresponding phase

- estimate the input resistance of each circuit

2) Using the OP27 part and 1kΩ and 10kΩ resistors, build and measure the following circuits at (1a), (1b), (1c), and (1d) (**75pts**)

For each circuit:

- using the waveform generator measure and plot (input and output) the response to a 50kHz 100mV sinusoidal signal

- using the network analyzer measure and plot (amplitude and phase) the frequency response from 100Hz to 25MHz and extract the -3dB frequency and the corresponding phase, and calculate the gain-bandwidth product

Note: with the network analyzer, use 100 points/decade and a 100mV input amplitude