EEO 352 Fall 2023 - Assignment 3 – DC Power Supplies - ABET

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

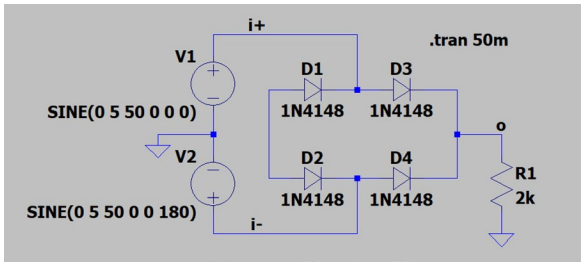

Fig.1a

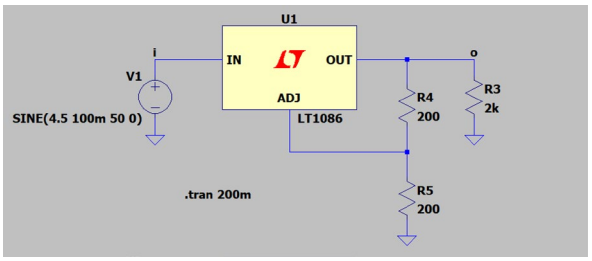

Fig.1c

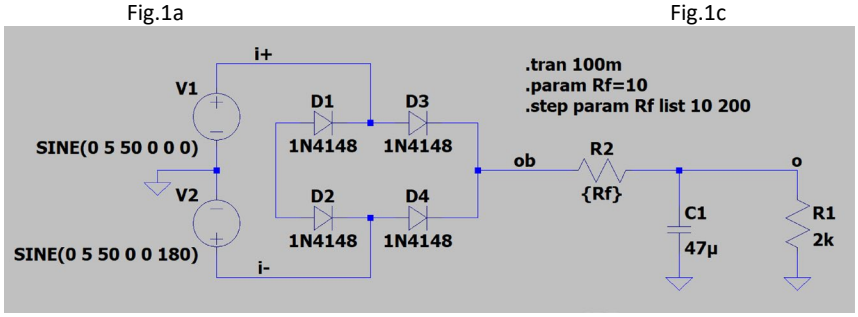

Fig.1b

1) Design and simulate the three circuits in Figures 1a, 1b and 1c (**60pts**):

a) For Fig.1a plot the inputs and output and make your observations
b) For Fig.1b plot the outputs from the parametric simulation and make your observations
c) For Fig.1c plot the input and output in separate panes and note the peak-peak ripple values, report the DC output voltage and compare with the expected from the datasheet

Note1: Fig.1b is a parametric simulation vs Rf
Note2: You must explain in your own words how each of the three circuits operates

2) Build and measure the three circuits at (1) (**140 pts**) *(ABET PI-62,PI-63,PI-64)*

a) For Fig.1a plot the positive input and the output, compare with the simulation and make your observations
b) For Fig.1b plot the positive input and the output for the Rf=10Ω case applying the required offset to clearly show the ripple; report the ripple value; compare with the simulation and make your observations
c) For Fig.1c measure and plot the input and output and note the peak-peak ripples, report the DC output voltage and compare with the expected DC value from the datasheet

Note1: You can use the 1N4001 in place of the 1N4148, use the LM317 in place of the LT1086
Note2: For (a) and (b) generate the two input signals using the two synchronized waveform generators
Note3: For the plots in (c) subtract the offsets and use a appropriate scales for input and output