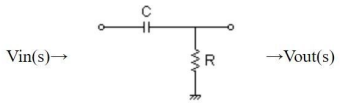
Tessa Vincent
EEET.222: Lab 3
Professor Cliver
Due Date: 3/30/2021

Cutoff Frequency Week 1:

RC High-pass Filter Design Tool - Result -

Calculated the Transfer Function for the RC High-pass filter, displayed on graphs, showing Bode diagram, Nyquist diagram, Impulse response and Step response

CR Filter



Transfer Function:

$$G(s)=\frac{s}{s+40}$$

Cut-off frequency

fc = 6.3661977236758[Hz]

Rise/Fall time of step response

R = 2500 ΩC = 1.0E-5 F
Stead-state value: 100 %→ 10 %

Calculate

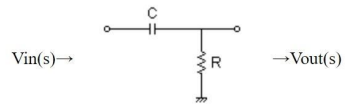
tr = 0.057564627324851 [sec]

Cutoff Frequency Week 2:

RC High-pass Filter Design Tool - Result -

Calculated the Transfer Function for the RC High-pass filter, displayed on graphs, showing Bode diagram, Nyquist diagram, Impulse response and Step response

CR Filter



Transfer Function:

$$G(s)=\frac{s}{s+21.276595744681}$$

Cut-off frequency

fc = 3.3862753849339[Hz]

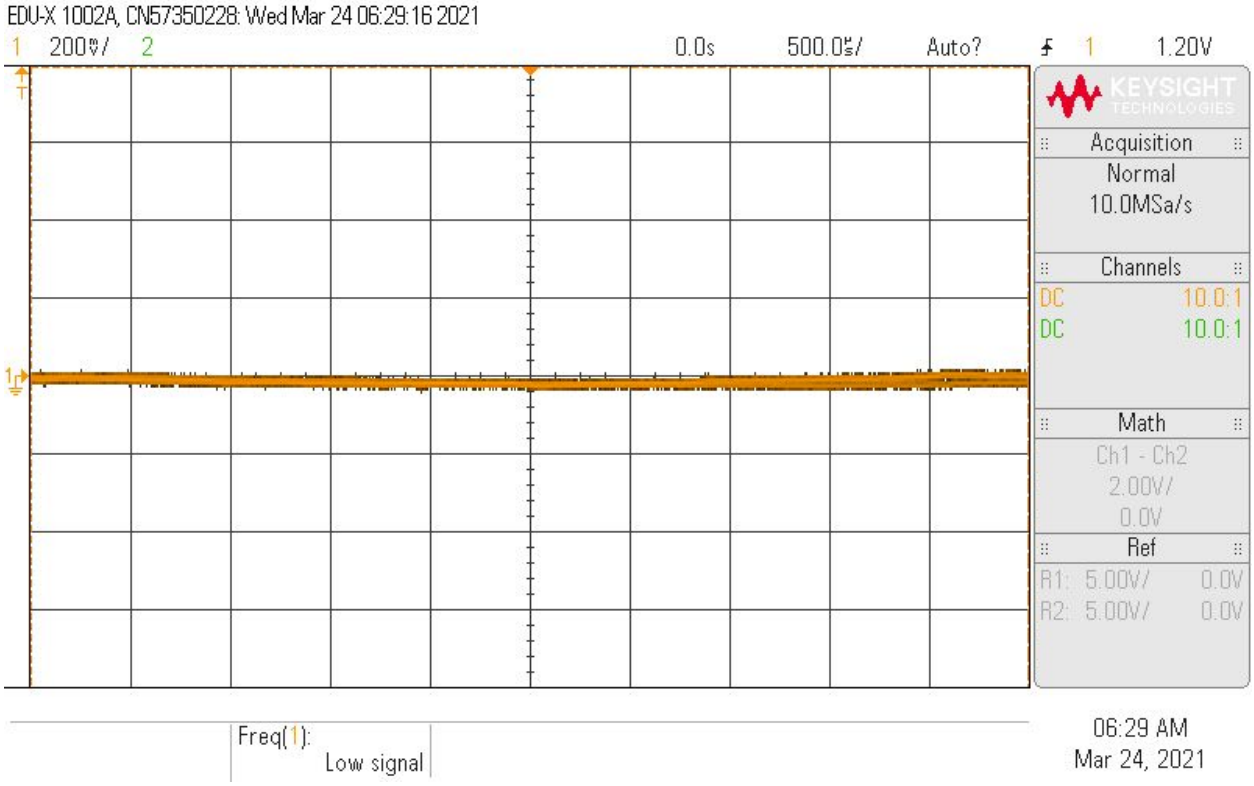
Rise/Fall time of step response

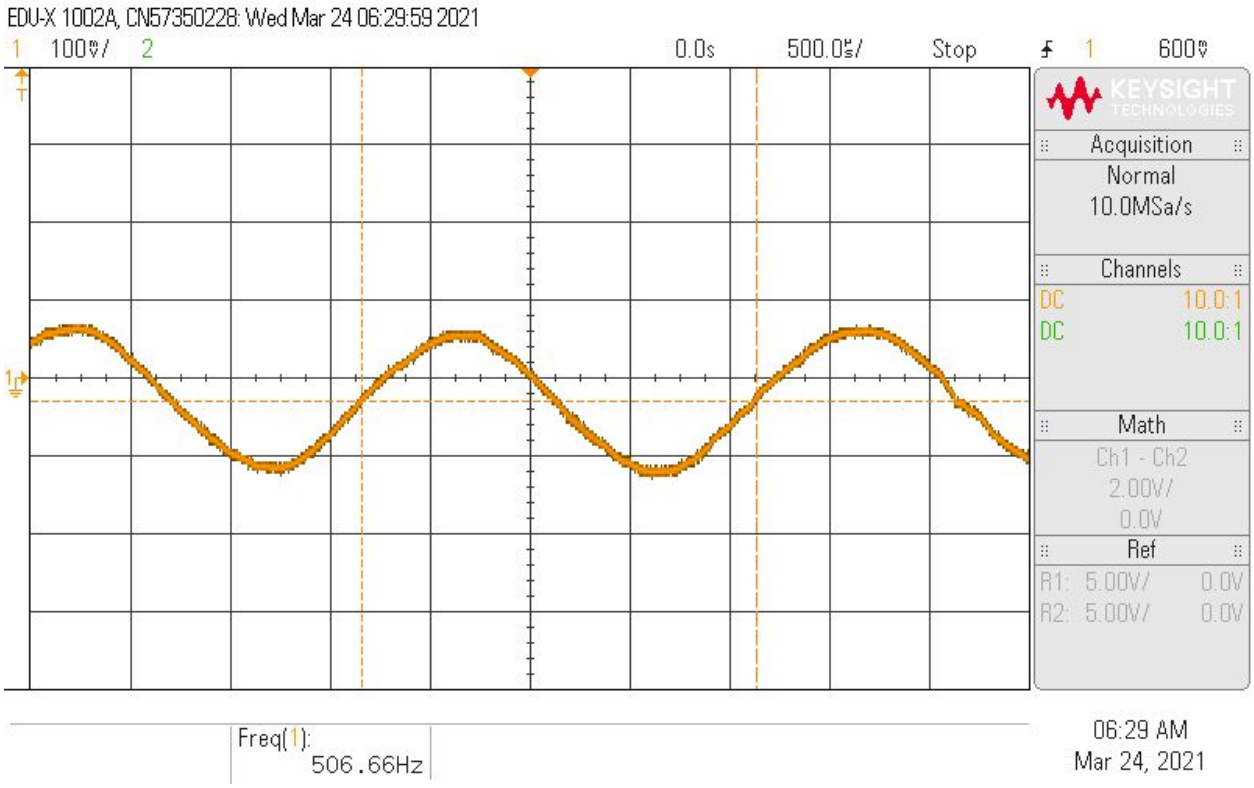
R = 1000 ΩC = 4.7E-5 F
Stead-state value: 100 %→ 10 %

Calculate

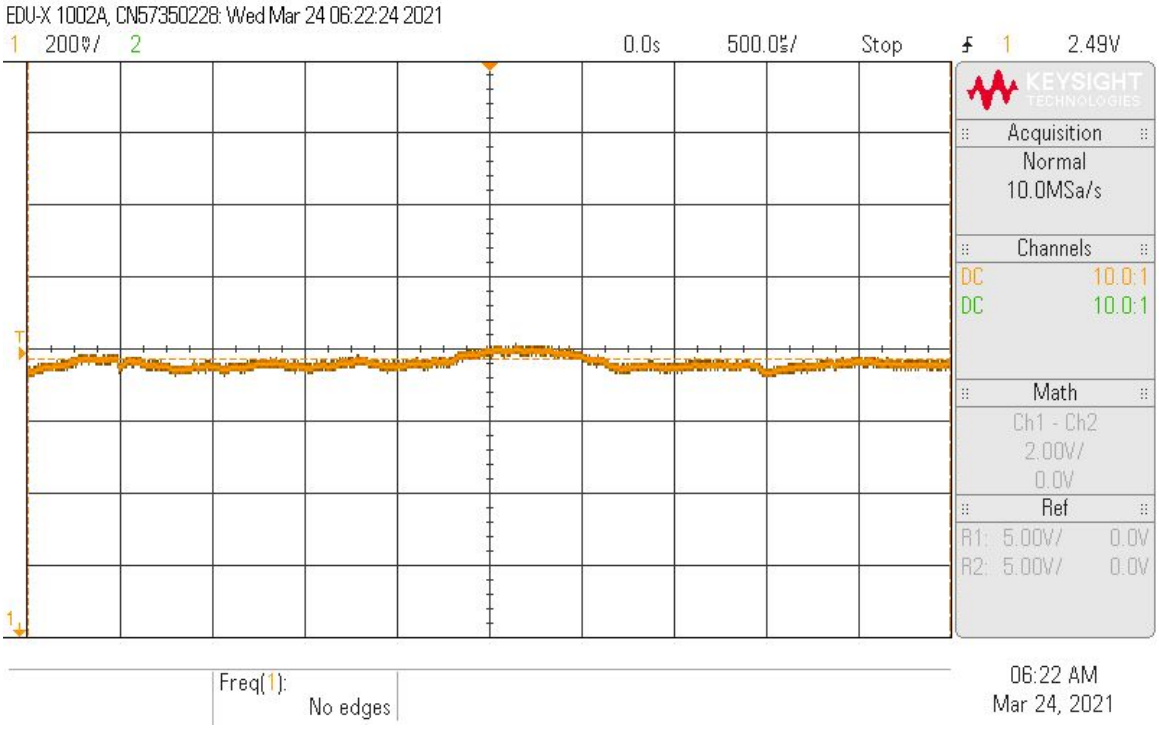
tr = 0.10822149937072 [sec]

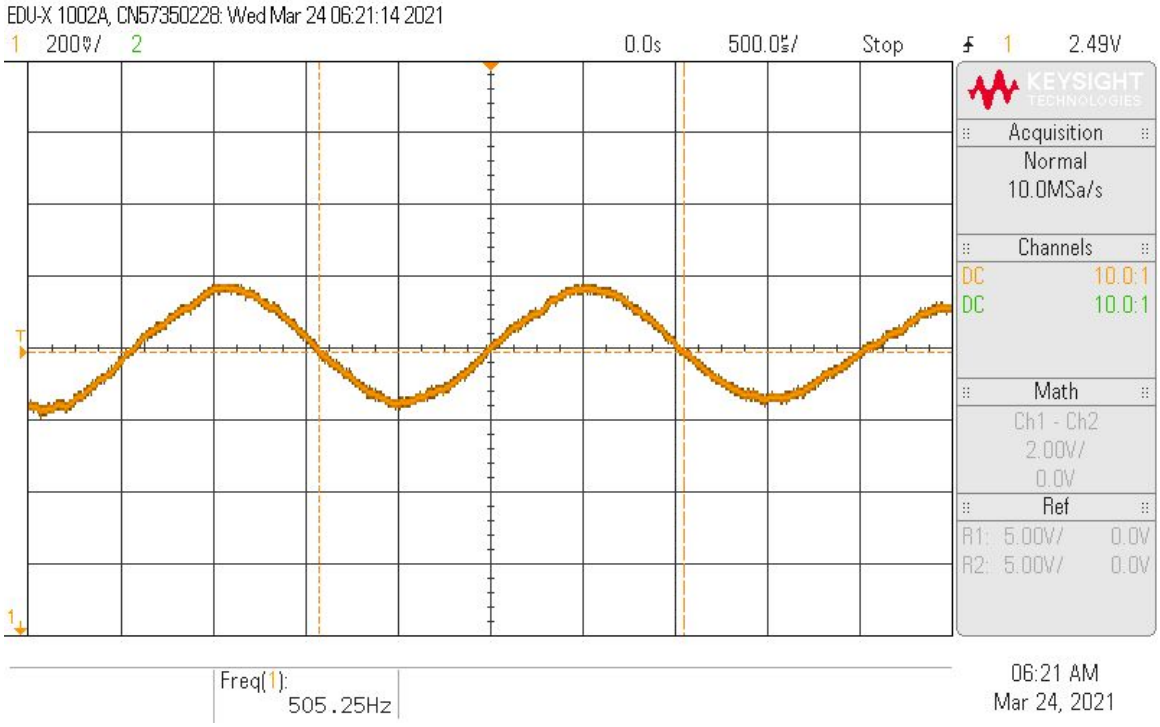
Single Frequency Sound





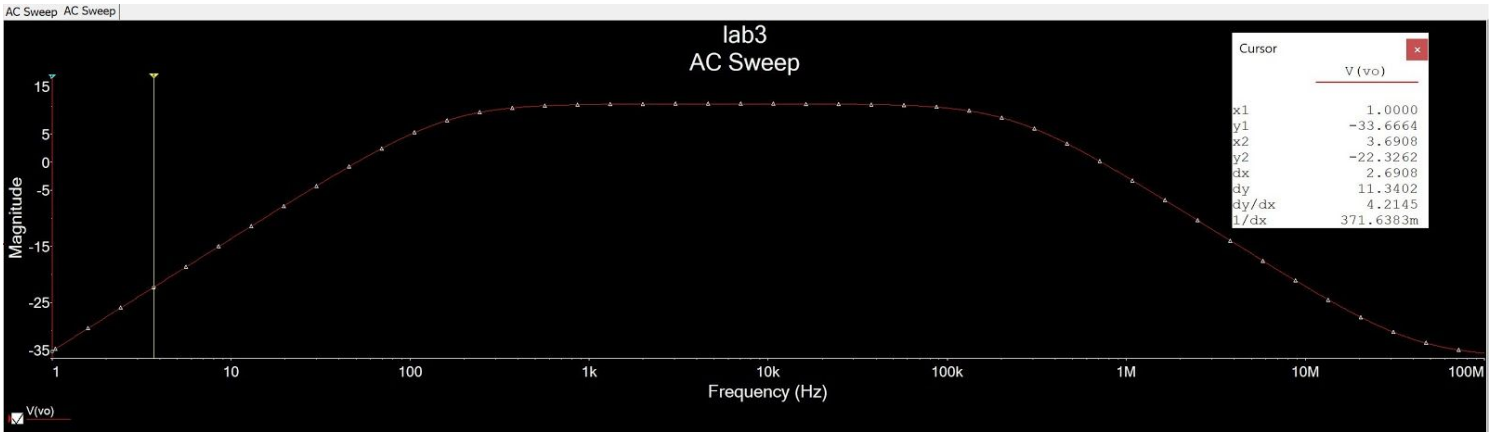
Single Frequency Sound - Shifted by 2.5V



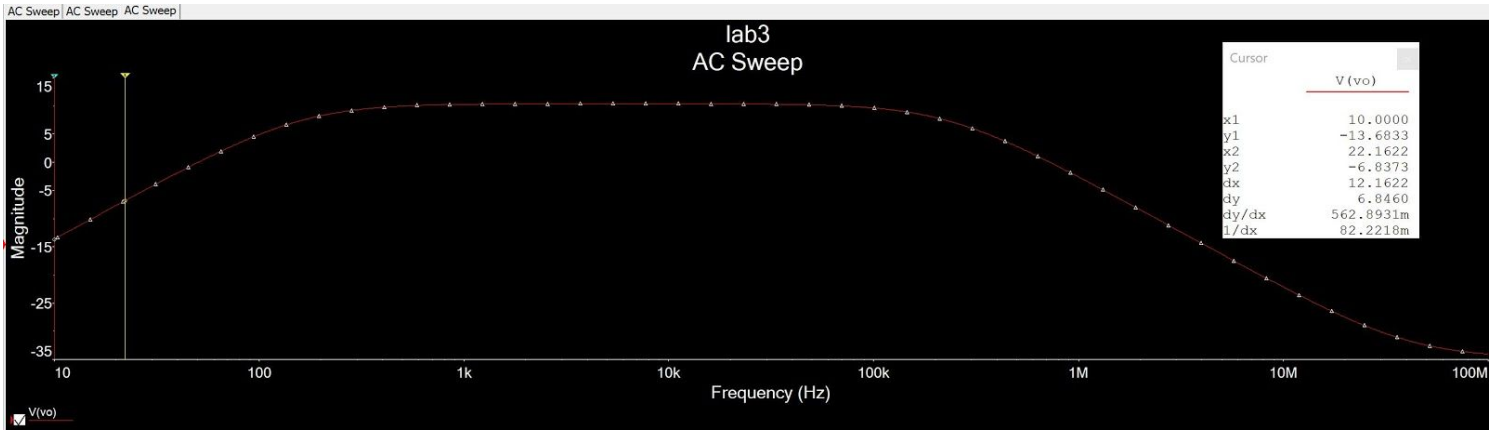


High Pass Filter:

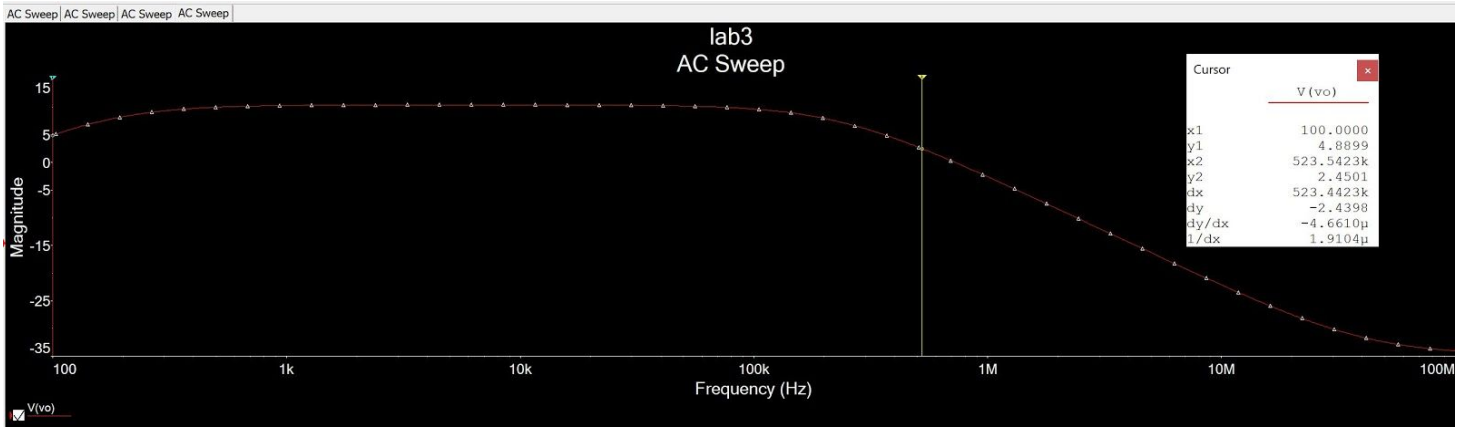
1Hz



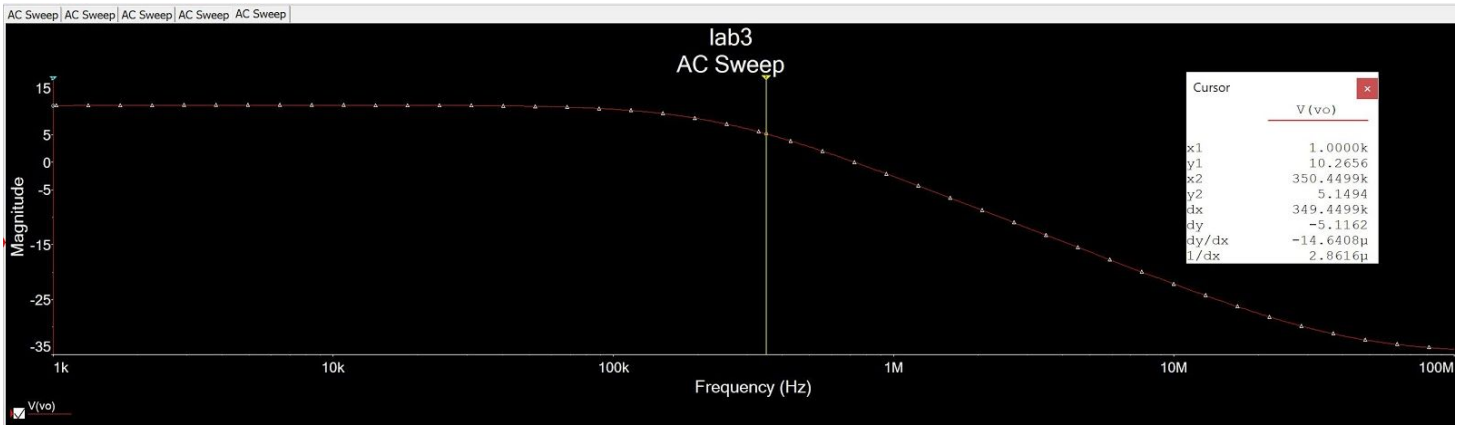
10Hz



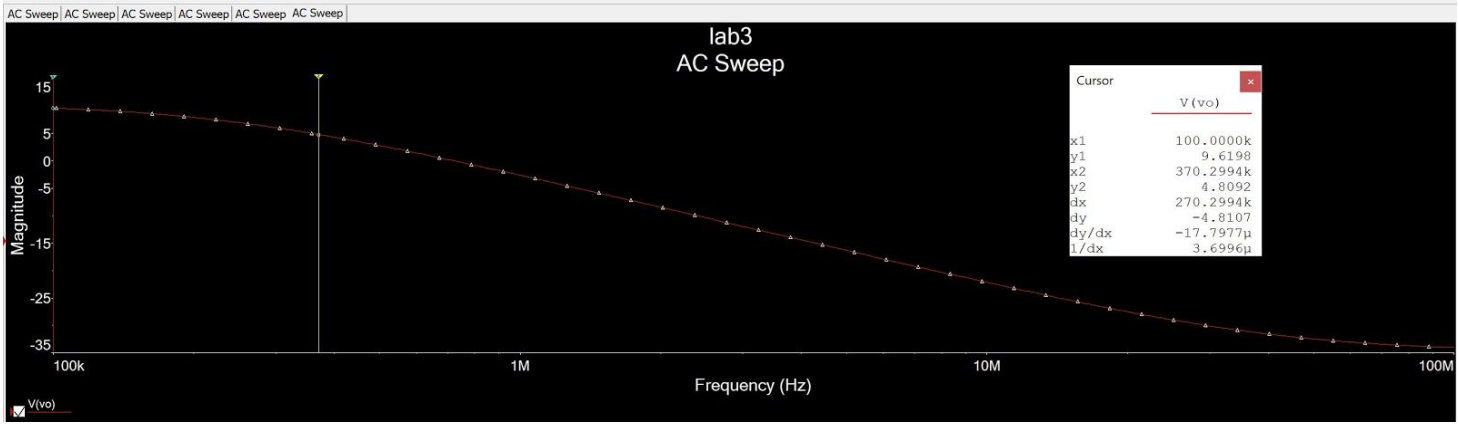
100Hz



1KHz

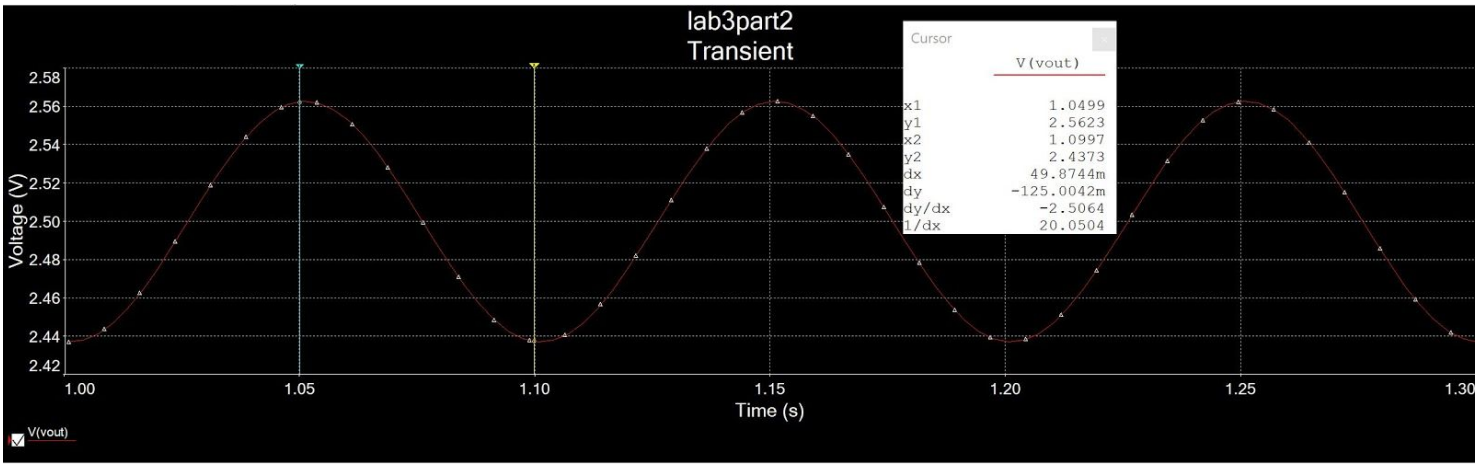

AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep
lab3
AC Sweep
Cursor
V(vo)
x1 1.0000k
y1 10.2656
x2 350.4499k
y2 5.1494
dx 349.4499k
dy -5.1162
dy/dx -14.6408µ
1/dx 2.8616µ
Magnitude
15
5
0
-5
-15
-25
-35
1k
10k
100k
1M
10M
100M
Frequency (Hz)
V(vo)

100KHz

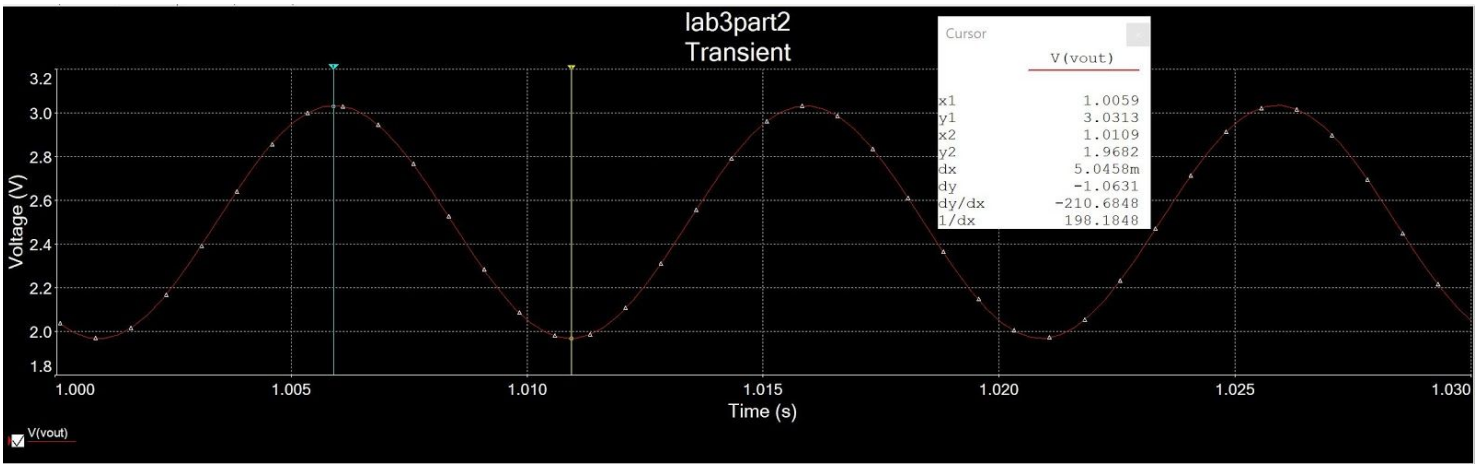

AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep
lab3
AC Sweep
Cursor
V(vo)
x1 100.0000k
y1 9.6198
x2 370.2994k
y2 4.8092
dx 270.2994k
dy -4.8107
dy/dx -17.7977µ
1/dx 3.6996µ
Magnitude
15
5
0
-5
-15
-25
-35
100k
1M
10M
100M
Frequency (Hz)
V(vo)

Level Shifting High Pass Filter:

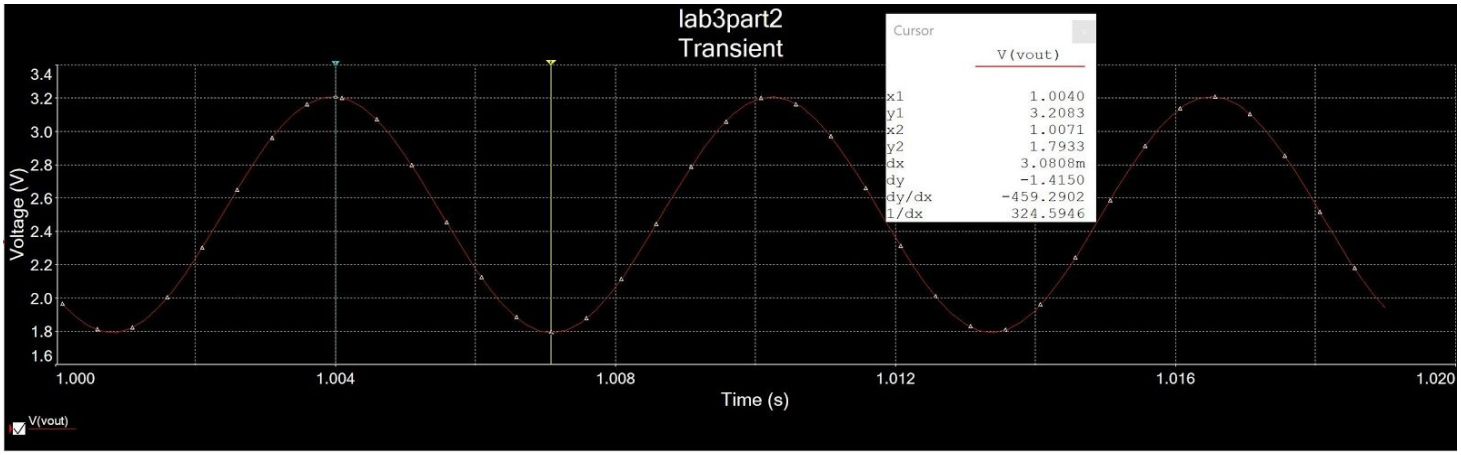
10Hz



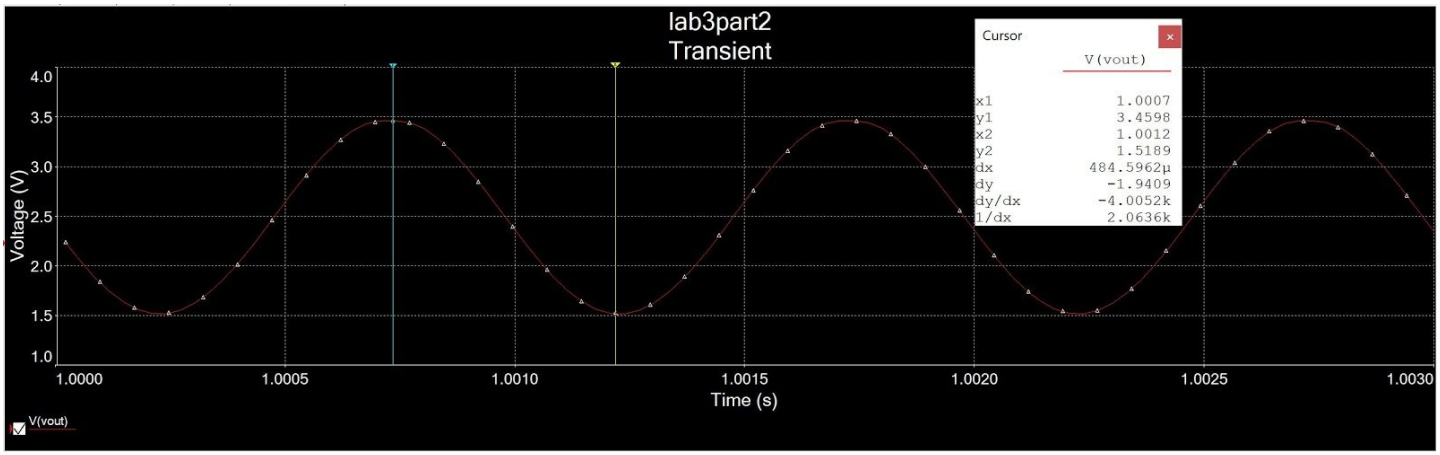
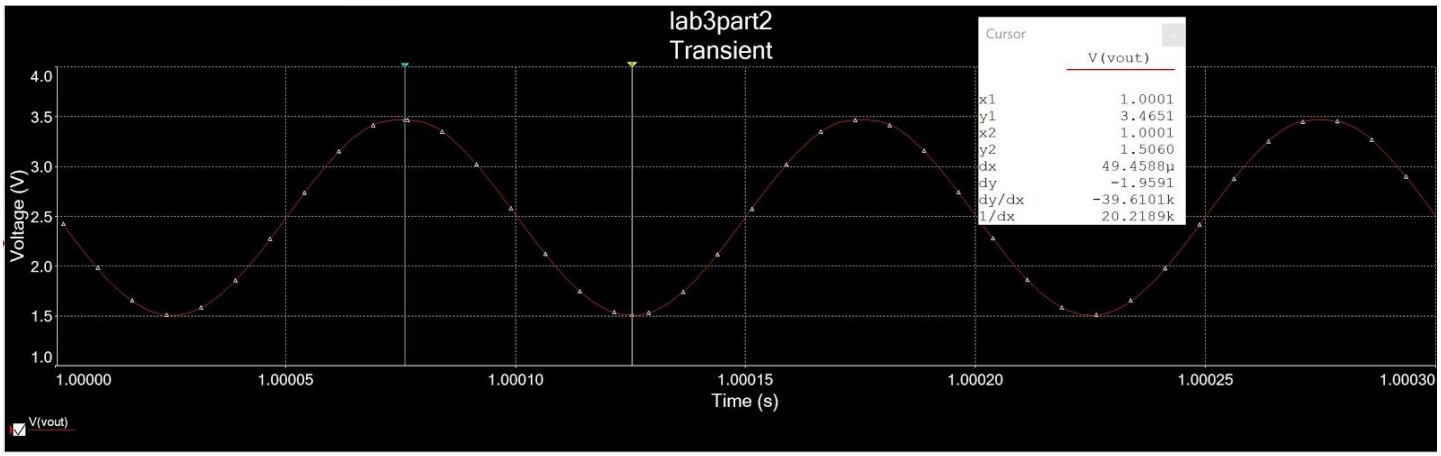
100Hz



156Hz



1KHz



10KHz