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Team Azwan 🕶️

JLab Final Project Report

Table:

Component	Theoretical	Actual
R1	1M Ω	999k Ω
R2	1M Ω	1.00M Ω
R3	2.2k Ω	2.33k Ω
R4	1k Ω	945 Ω
R5	1k Ω	956 Ω
R6	910 Ω	932 Ω
R7	500 Ω	539 Ω
R8	560 Ω	532 Ω
R9	500 Ω	489 Ω
R11	100k Ω	100k Ω
R12	100k Ω	99.9k Ω
C1	10uF	9.123uF
C2	1nF	0.997uF
C3	68pF	67.023pF
C5	47uF	46.93uF
C6	47uF	45.17uF
L1	10uH	11.23uH

Independent Voltage Source - V2

X

Functions

☐ (none)

☐ PULSE(V1 V2 Tdelay Trise Tfall Ton Period Ncycles)

☒ SINE(Voffset Vamp Freq Td Theta Phi Ncycles)

☐ EXP(V1 V2 Td1 Tau1 Td2 Tau2)

☐ SFFM(Voff Vamp Fcar MDI Fsig)

☐ PWL(t1 v1 t2 v2...)

☐ PWL FILE: Browse

DC offset[V]:

Amplitude[V]:

Freq[Hz]:

Tdelay[s]:

Theta[1/s]:

Phi[deg]:

Ncycles:

Additional PWL Points

Make this information visible on schematic: ☒

DC Value

DC value:

Make this information visible on schematic: ☒

Small signal AC analysis(.AC)

AC Amplitude:

AC Phase:

Make this information visible on schematic: ☒

Parasitic Properties

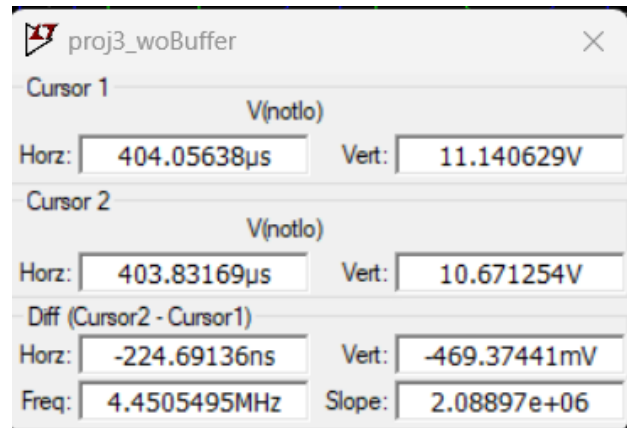
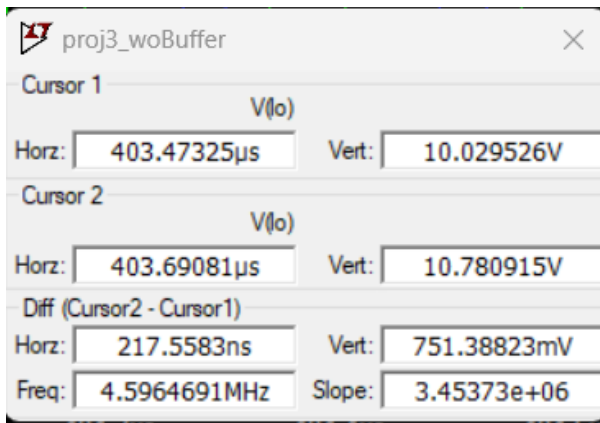
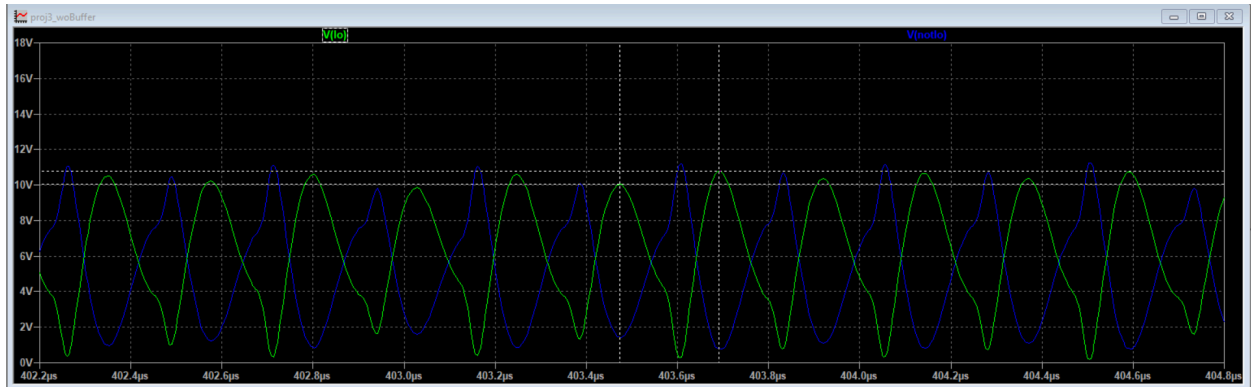
Series Resistance[Ω]:

Parallel Capacitance[F]:

Make this information visible on schematic: ☒

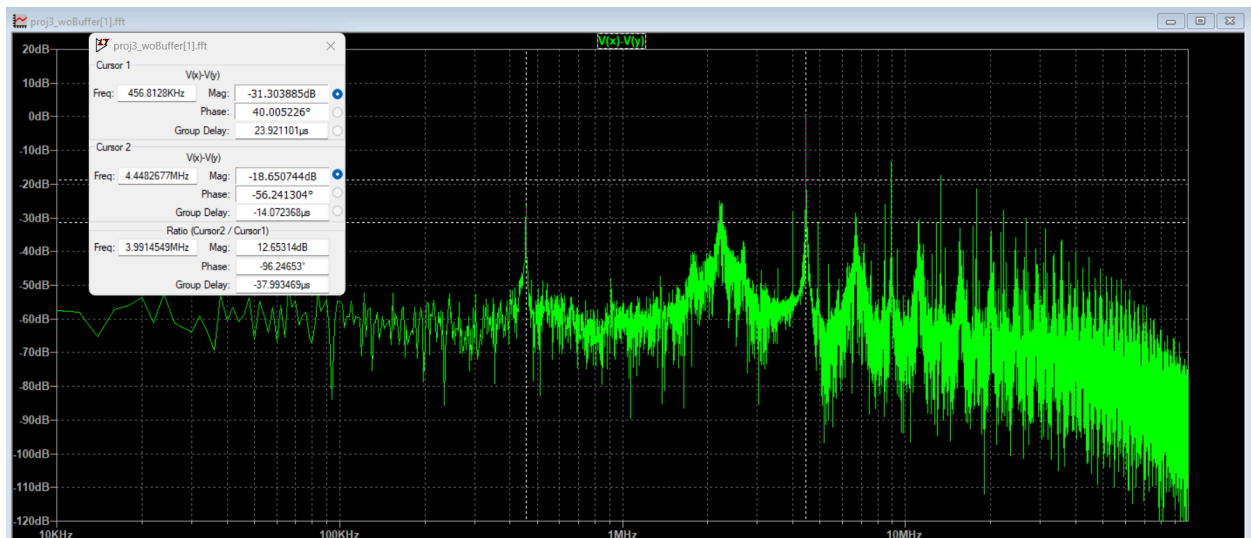
Cancel

OK



LO = 4.60 MHz, notLO = 4.45 Mhz

RF = 4000kHz = 4MHz



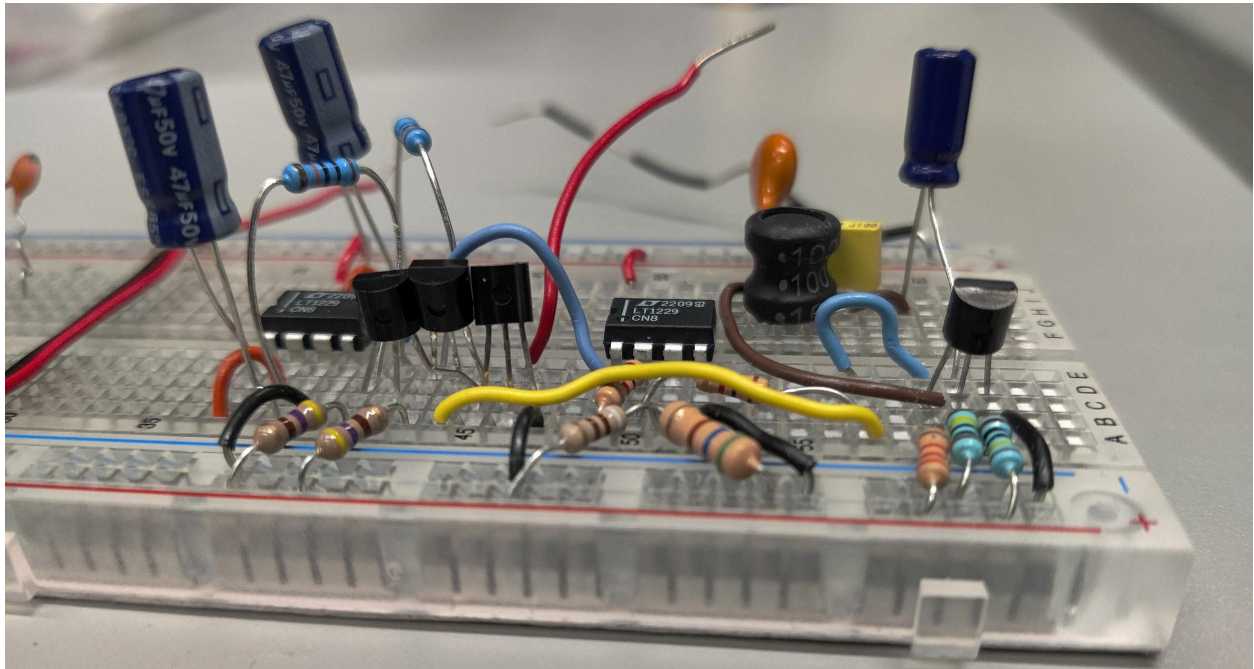
FFT Output peak at 457kHz ~ 600kHz/450kHz

[illegible]

The image displays a Bode plot with the following characteristics:

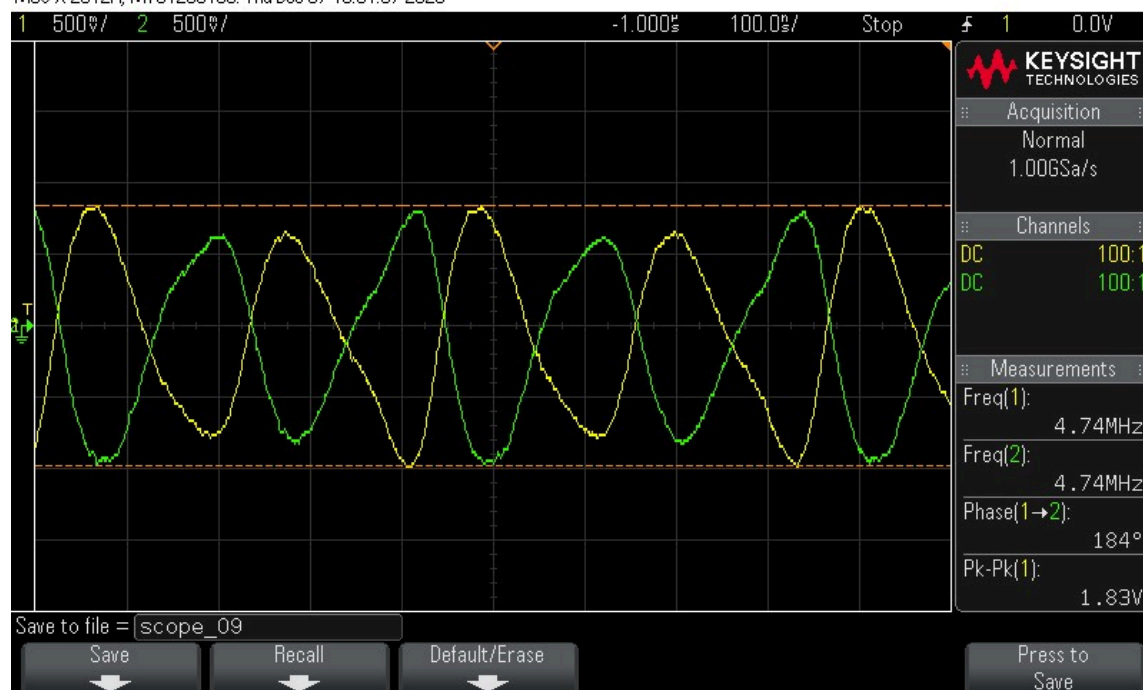
- Y-axis:** Magnitude in dB, ranging from -240dB to 20dB.
- X-axis:** Frequency in Hz, on a logarithmic scale from 10KHz to 100MHz.
- Plot Data:** A green line shows the magnitude response. It has a constant slope of -20dB/decade from 10KHz to 1MHz. At 1MHz, the magnitude is -160dB. For frequencies above 1MHz, the plot is highly oscillatory, with a noise floor around -180dB and peaks reaching -120dB.
- Cursor 1 Data:**
 - Freq: 4.4455194MHz
 - Mag: -135.75463dB
 - Phase: 87.059041°
 - Group Delay: -9.9432338µs
- Cursor 2 Data:** All values are "N/A".
- Ratio Data:** All values are "N/A".

Actual Circuit:



Phase Difference From LO (and frequency):

MSO-X 2012A, MY51250183: Thu Dec 07 19:01:07 2023



Function Generator Parameters:



Active Mixer working with FFT:

MSO-X 2012A, MY51250183, Thu Dec 07 19:05:49 2023



FFT Mixer Math: RF = 5.1MHz, LO = 4.78MHz, Expected f_{out} = 320kHz. Actual: 320kHz

2nd Mixing



MSO-X 2012A, MY51250183: Mon Dec 11 22:19:57 2023



LO = 4.6MHz, RF = 4MHz. Expected fout = 600kHz. Actual fout = 600kHz

FFT Working with LPF?

MSO-X 2012A, MY51250183: Mon Dec 11 23:21:54 2023

