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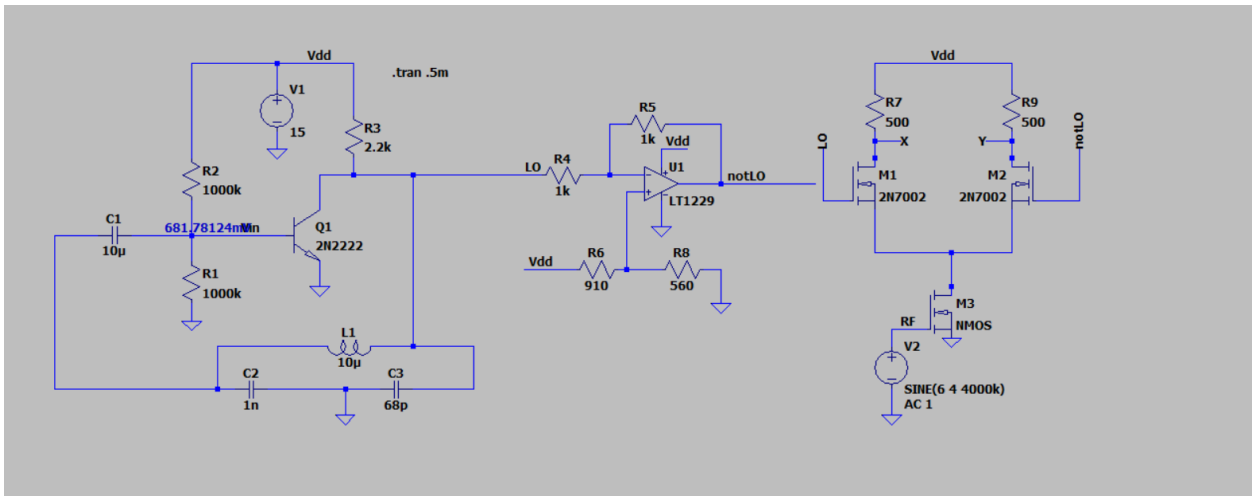
Team Azwan 😎

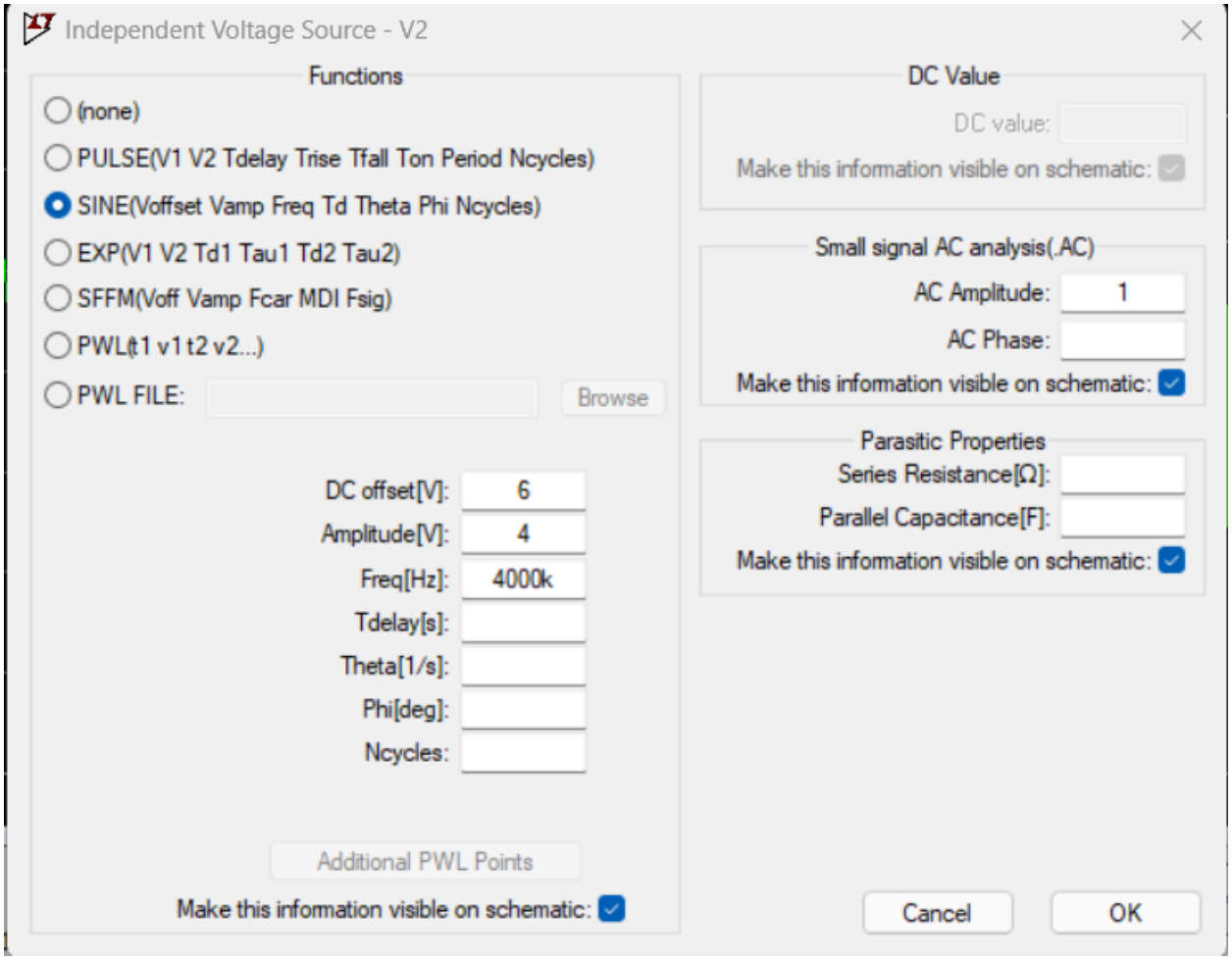
JLab Final Project Report

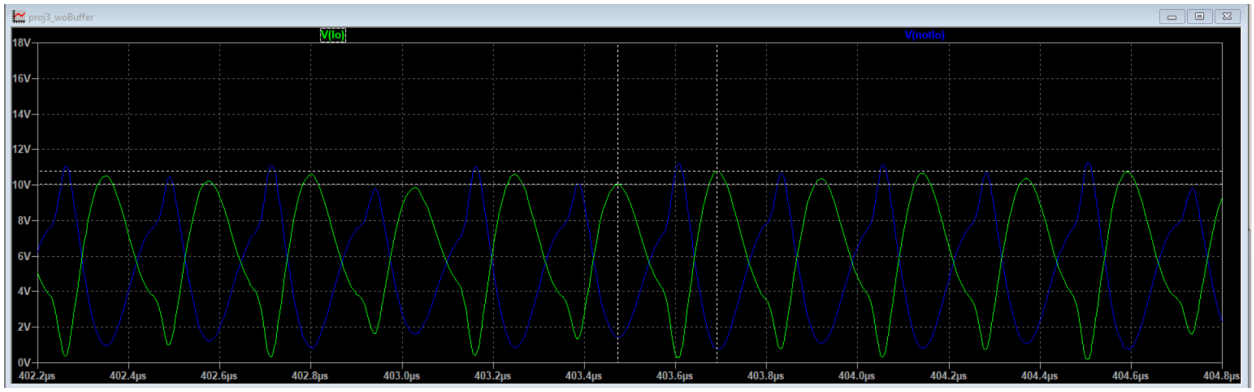
Table:

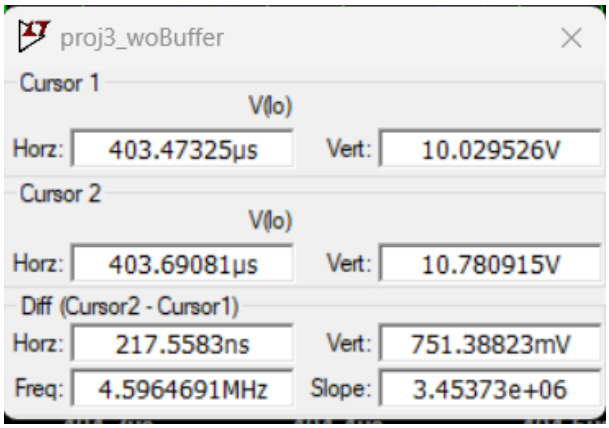
Component	Theoretical	Actual
R1	1MΩ	999kΩ
R2	1MΩ	1.00MΩ
R3	2.2kΩ	2.33kΩ
R4	1kΩ	945Ω
R5	1kΩ	956Ω
R6	910Ω	932Ω
R7	500Ω	539Ω
R8	560Ω	532Ω
R9	500Ω	489Ω
R11	100kΩ	100kΩ
R12	100kΩ	99.9kΩ
C1	10uF	9.123uF
C2	1nF	0.997uF
C3	68pF	67.023pF
C5	47uF	46.93uF
C6	47uF	45.17uF
L1	10uH	11.23uH

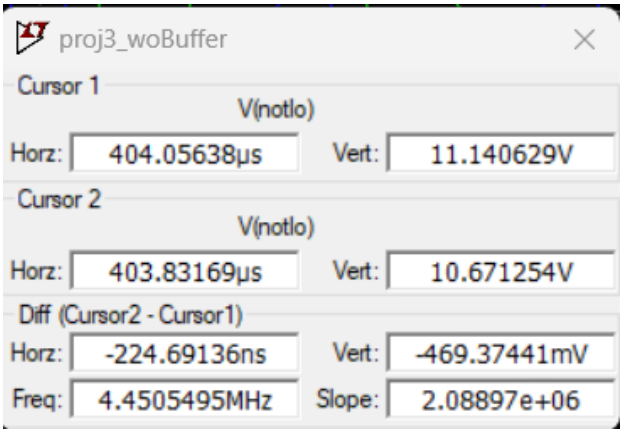
Simulation without Low Pass:



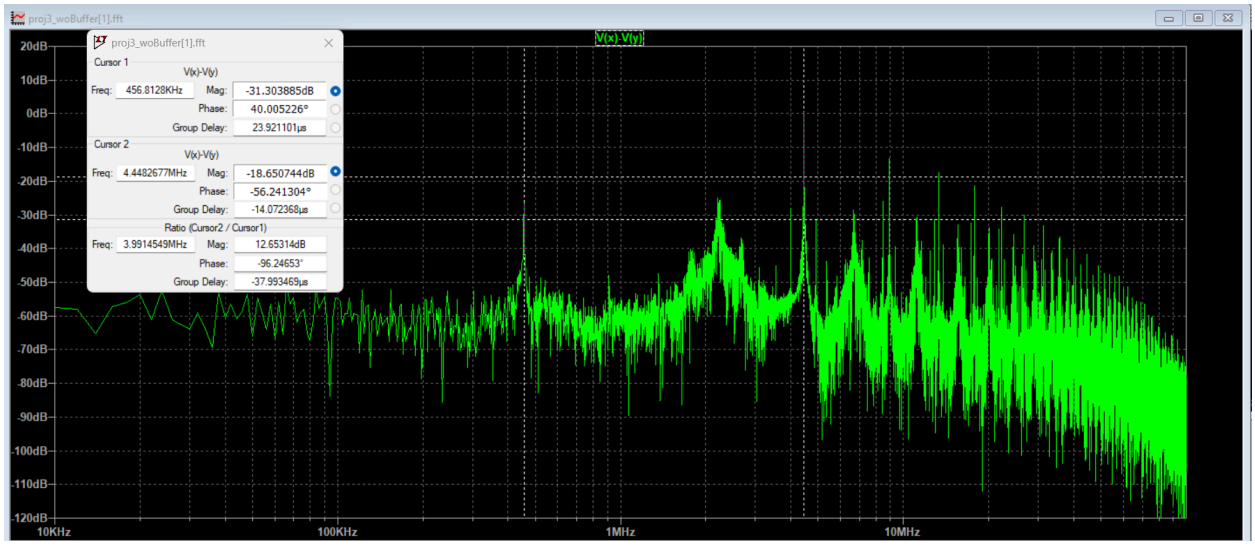






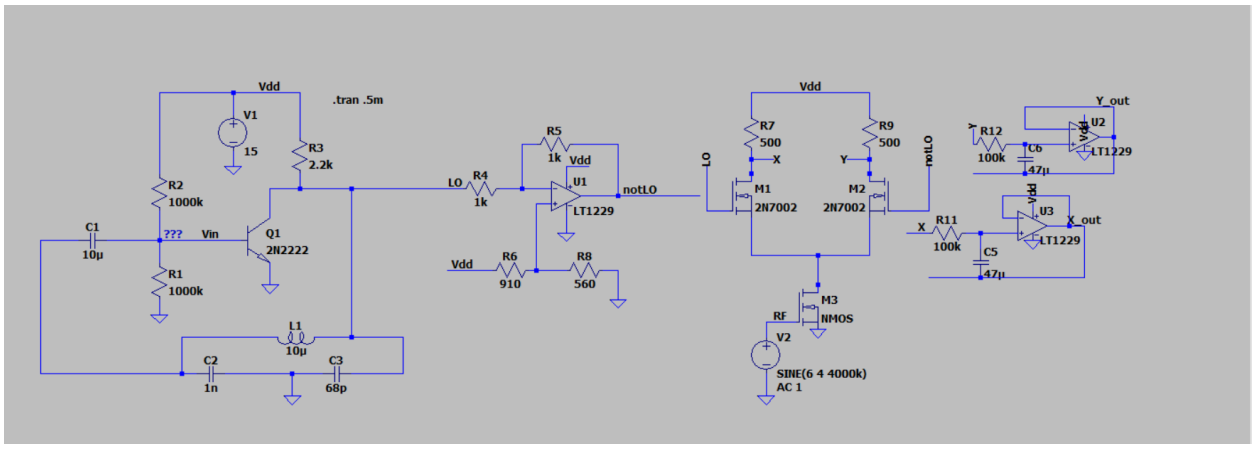


LO = 4.60 MHz, notLO = 4.45 Mhz
RF = 4000kHz = 4MHz

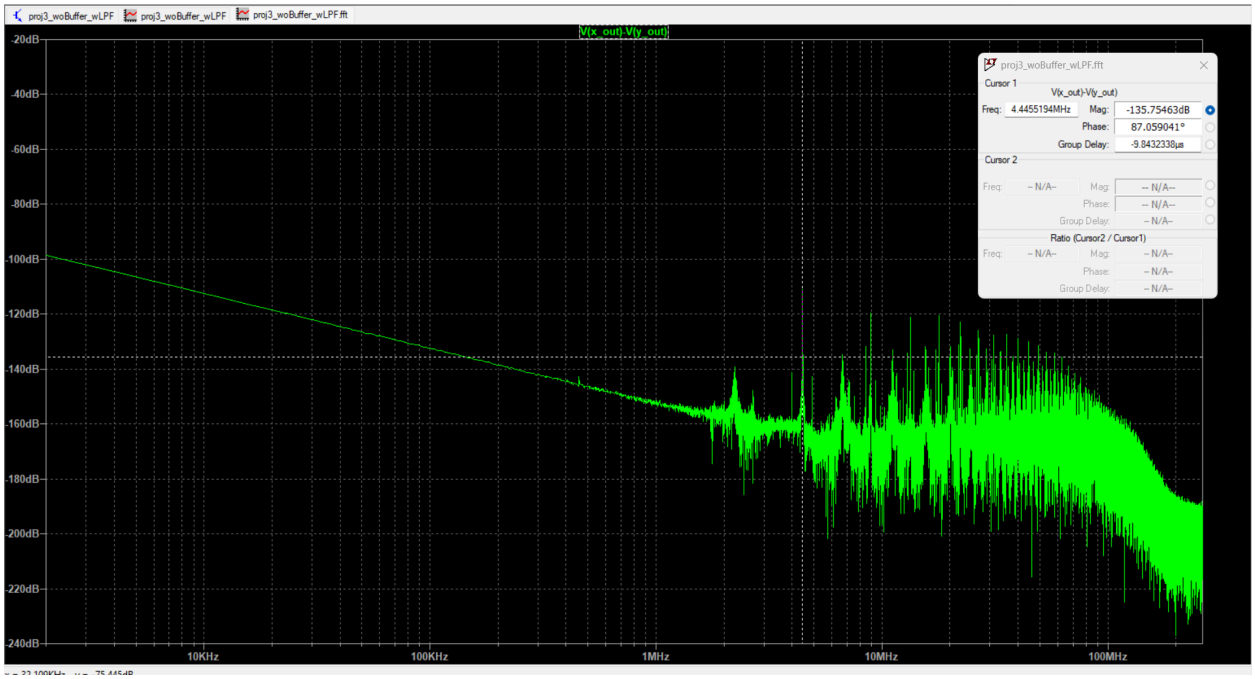


FFT Output peak at 457kHz ~ 600kHz/450kHz

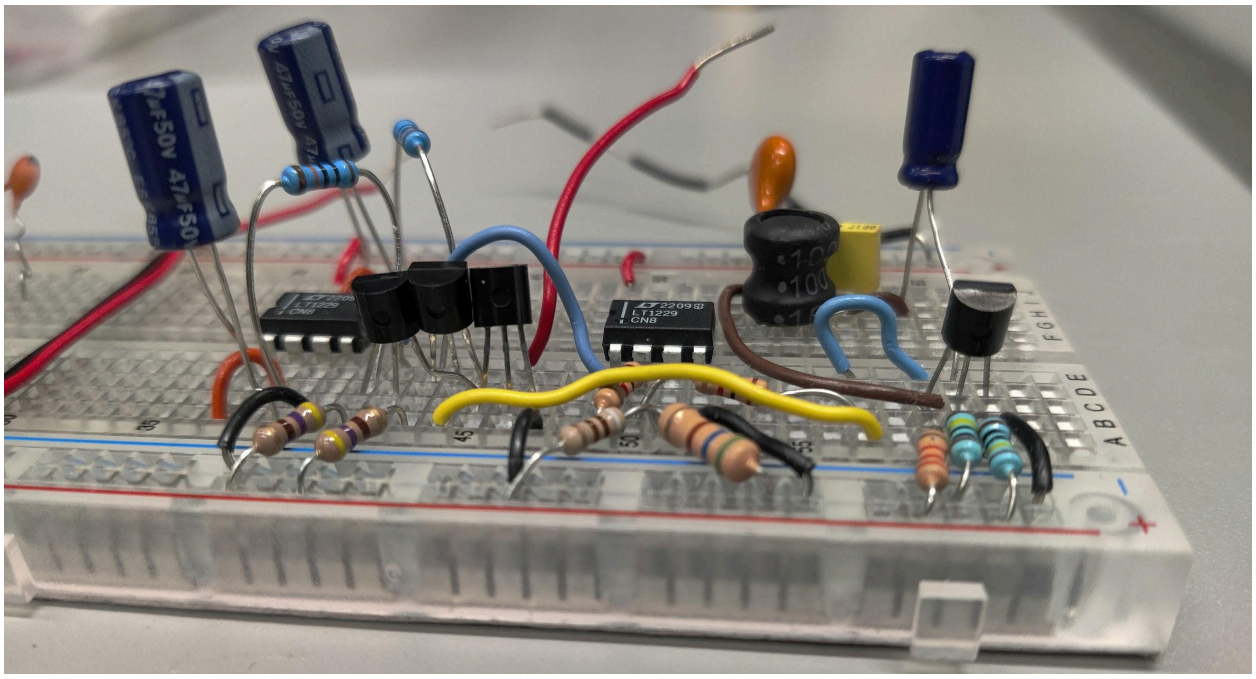
Simulation with Low Pass Filter



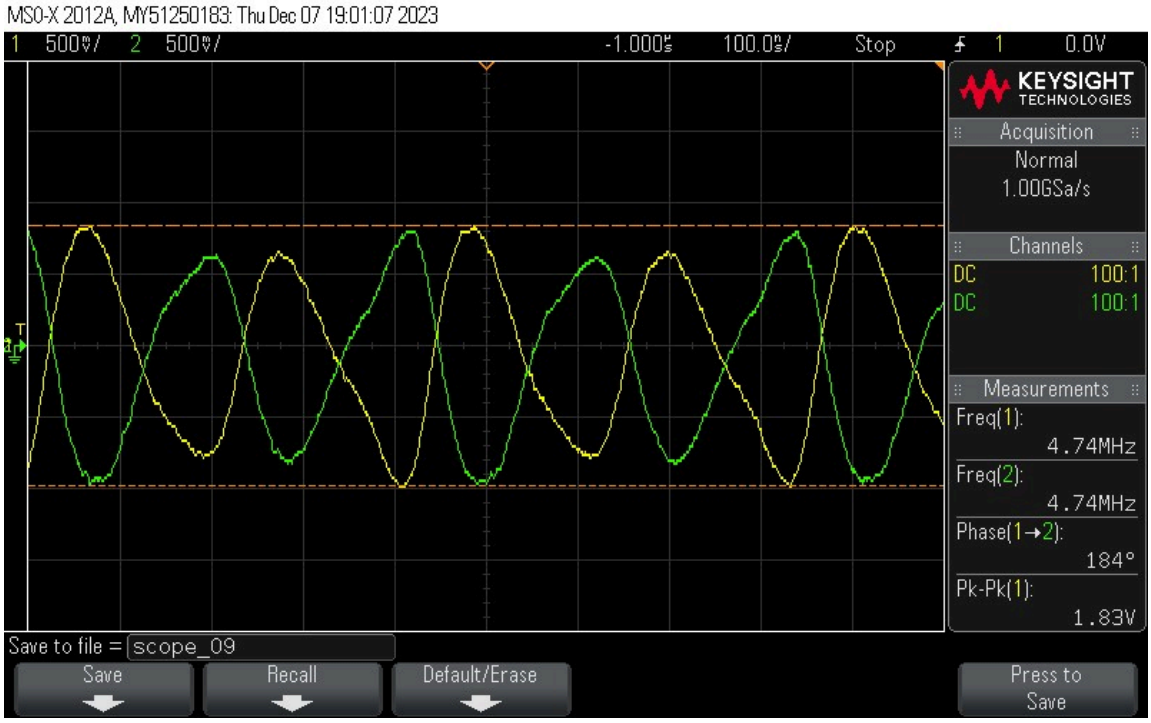
Simulation FFT doesn't work oddly enough



Actual Circuit:

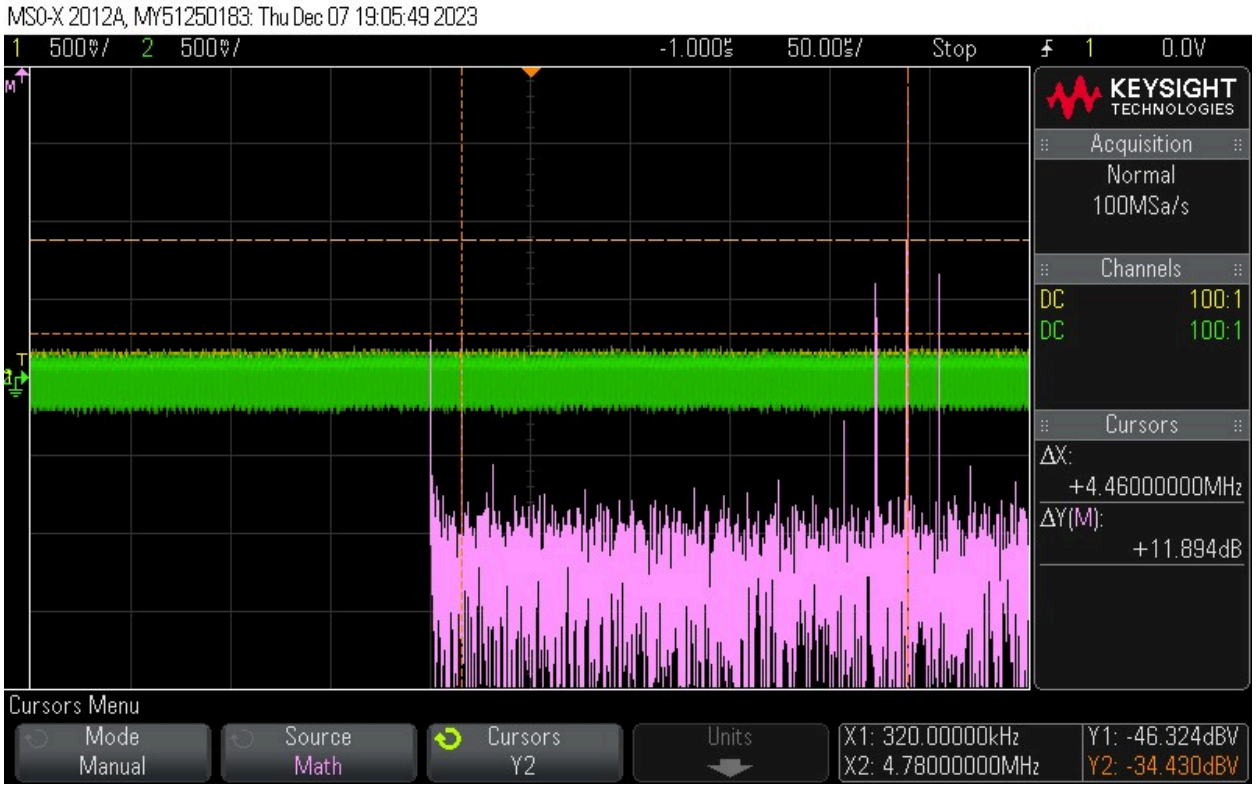


Phase Difference From LO (and frequency):



Function Generator Parameters:

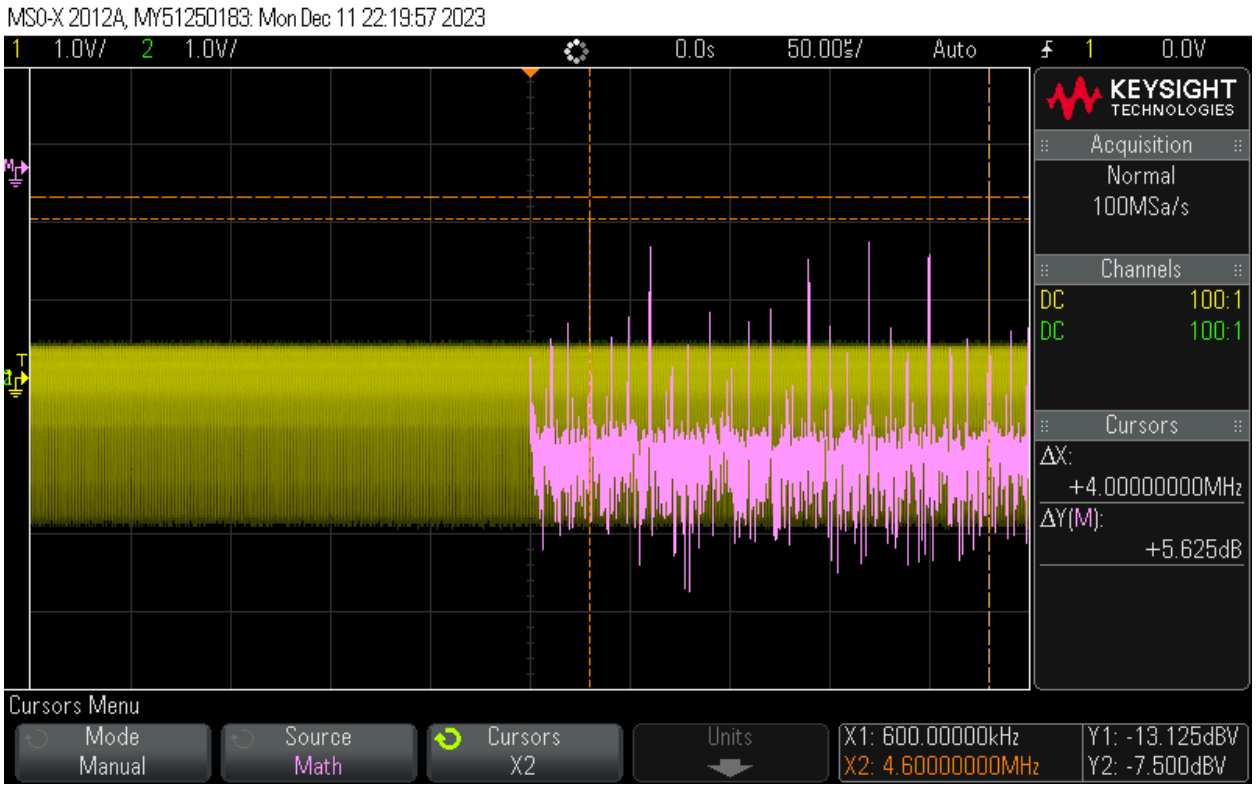
Active Mixer working with FFT:



FFT Mixer Math: RF = 5.1MHz, LO = 4.78MHz, Expected fout = 320kHz. Actual: 320kHz

2nd Mixing


RIGOL
DG812
2 Channel
SiFi II
10 MHz
125 MSa/s
RIGOL
Continuous
Freq
4.000,000,000,00 MHz
Ampl
3.000,0 Vpp
Offset
1.000,0 Vdc
Phase
0.000 °
1
Sine
HighZ
2
Sine
HighZ
Home
Menu
Preset
Lock
Trig
Utility
Store
Help/
Local
Align
Output1
Output2
CH1



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

FFT Working with LPF?