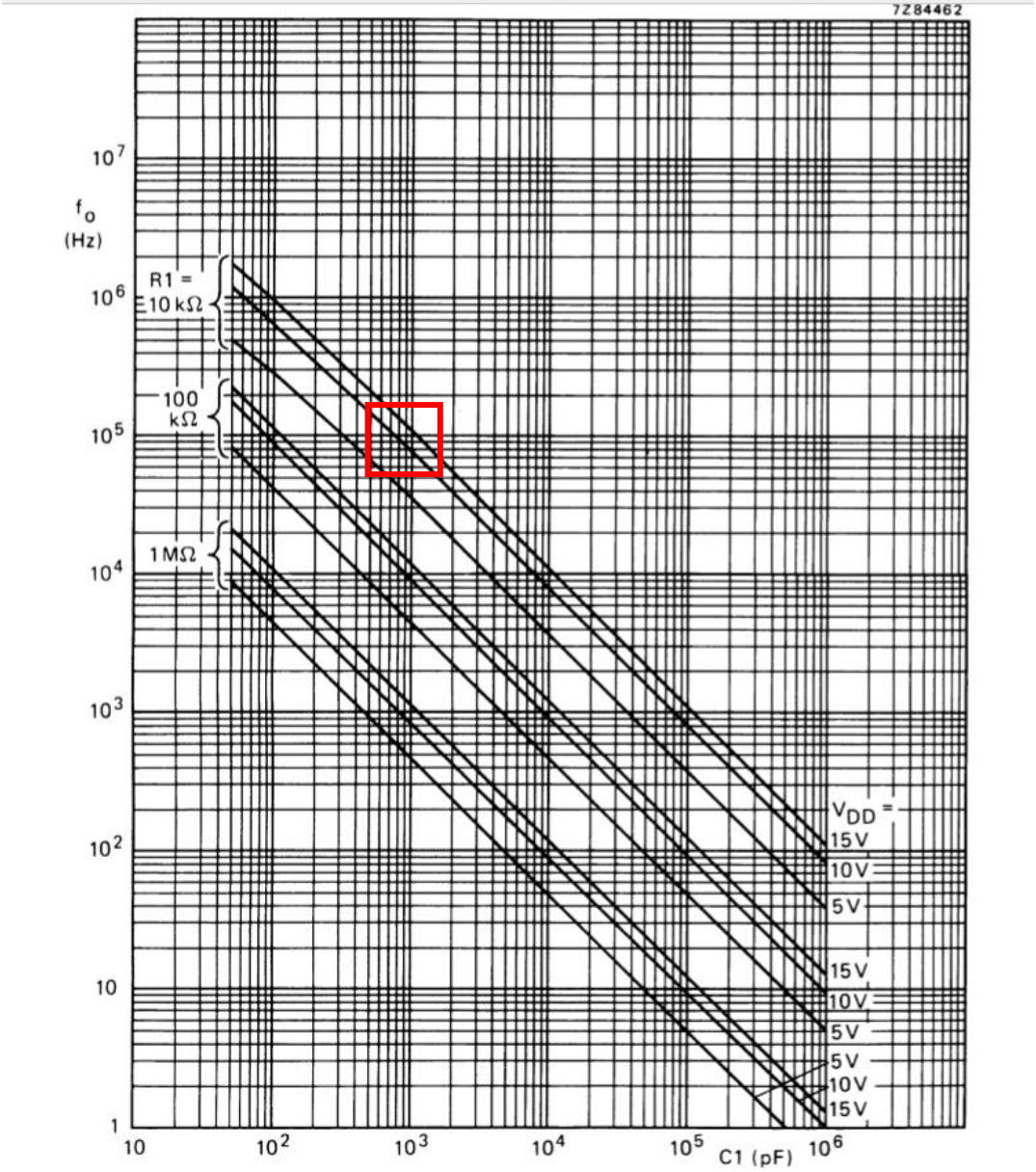
Devoir4

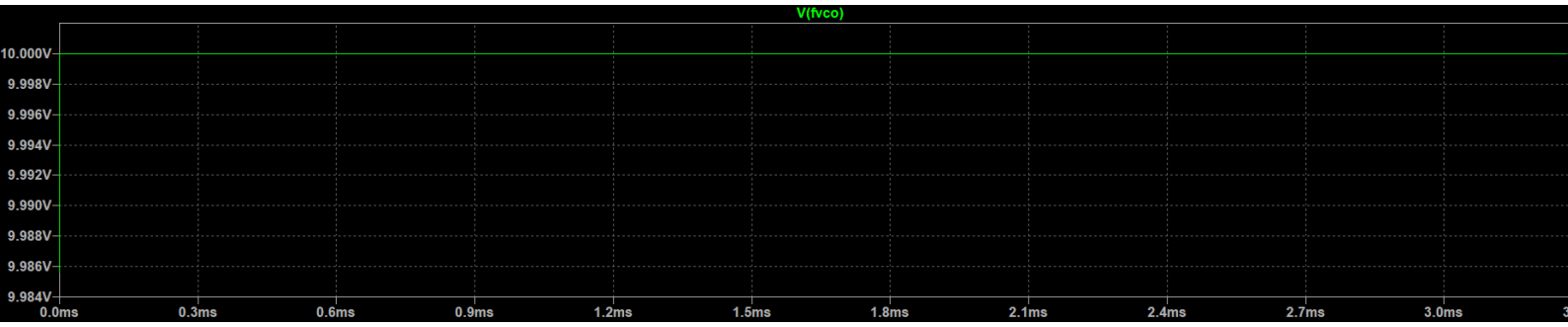
Jules SY1924105

1.Dans figure7, on peut voir que f0≈85kHz, fmax=2f0=170kHz,PLAGE=170kHz

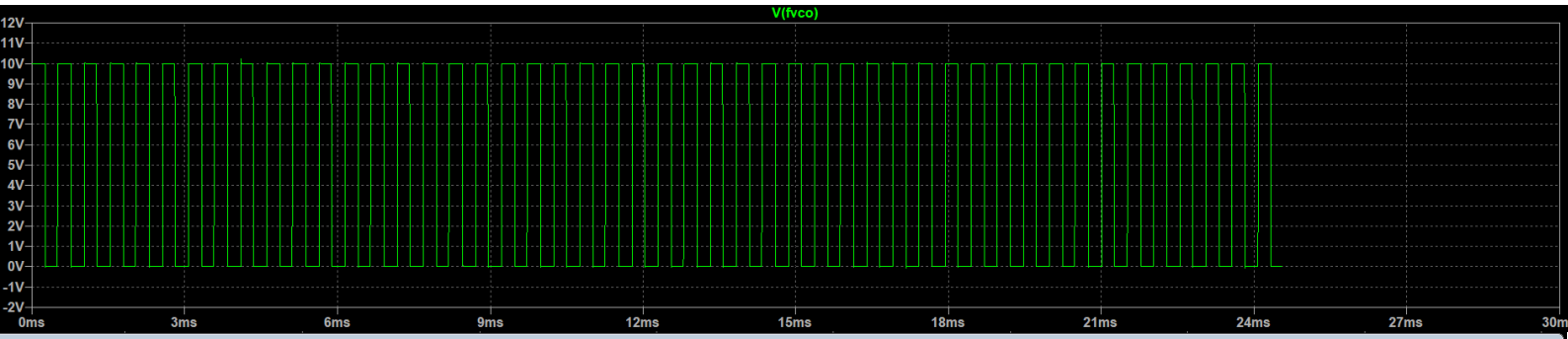


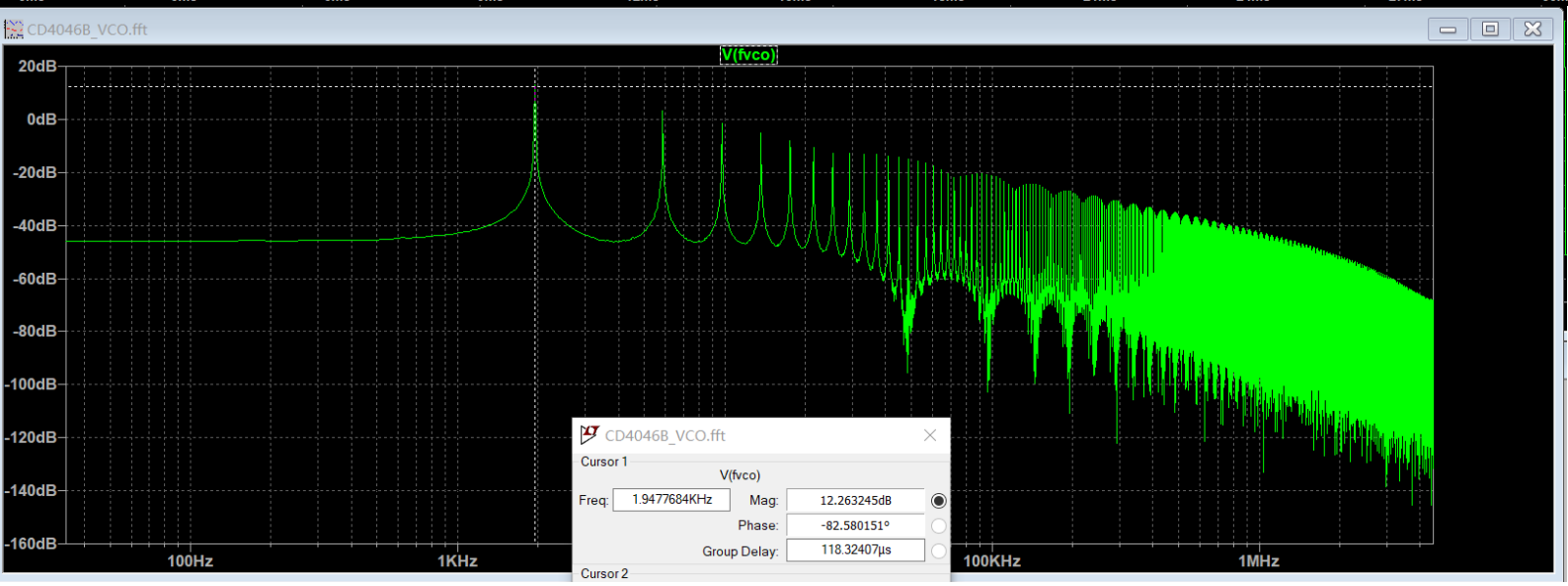
2.

V1=0V



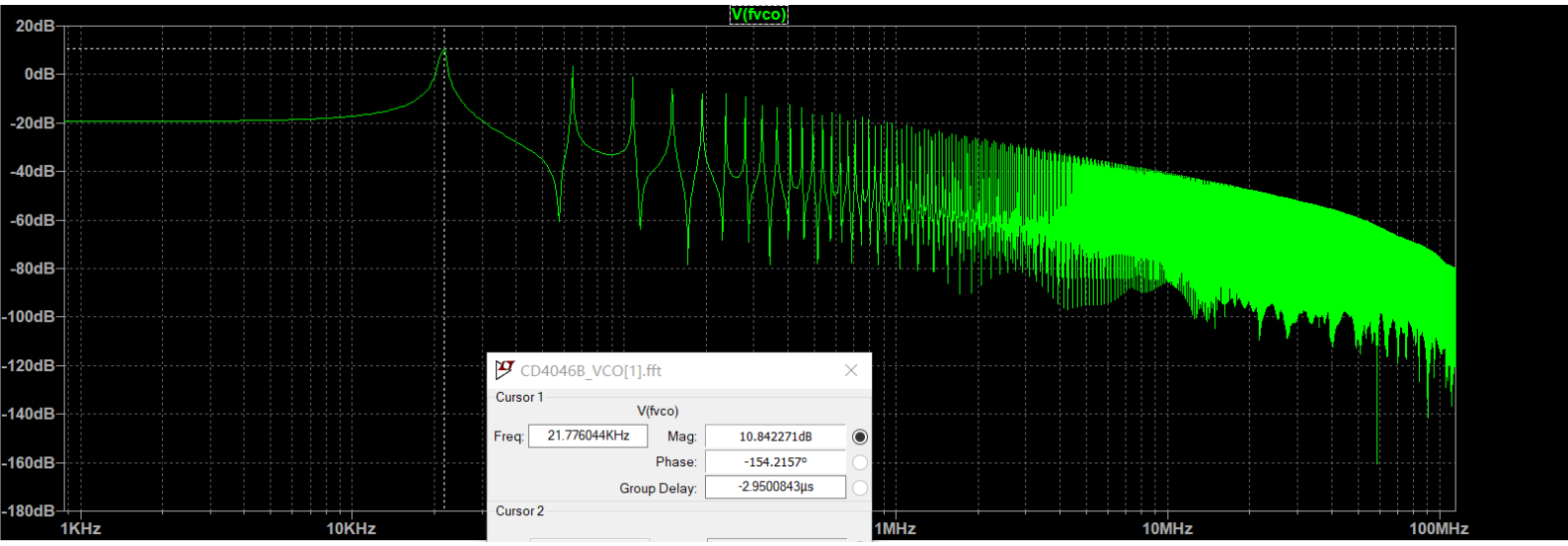
V1=1V





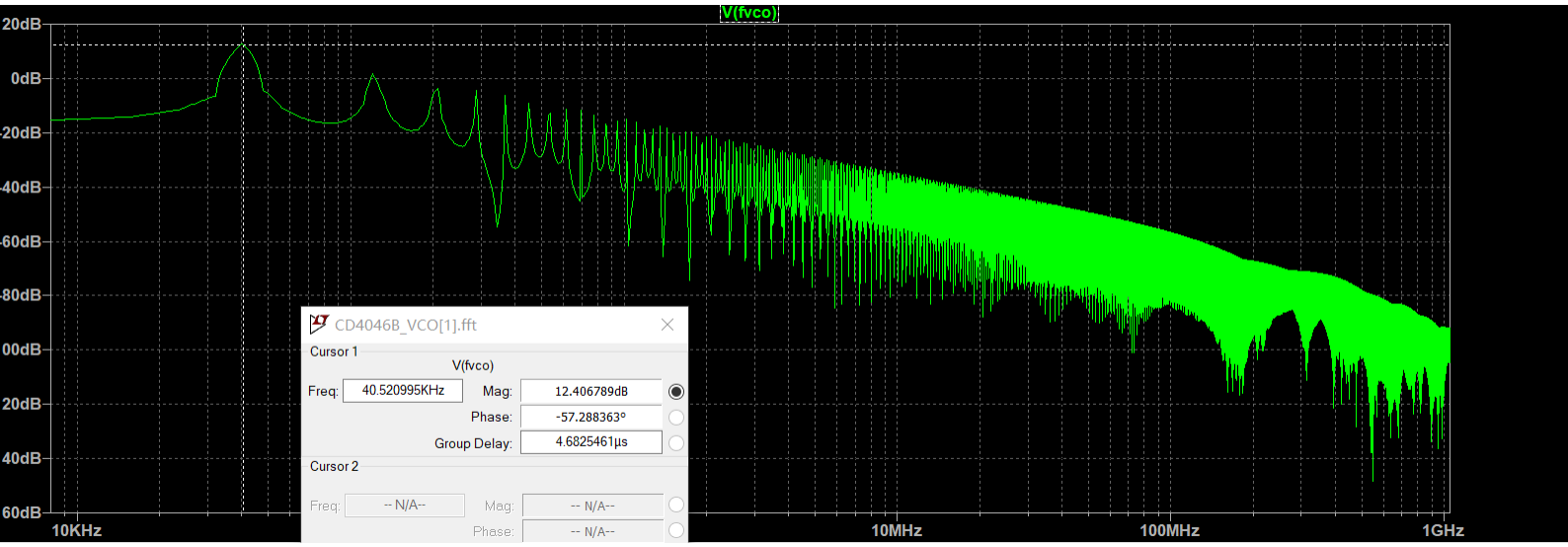
f=1.95kHz, G=12.26dB

V1=2V



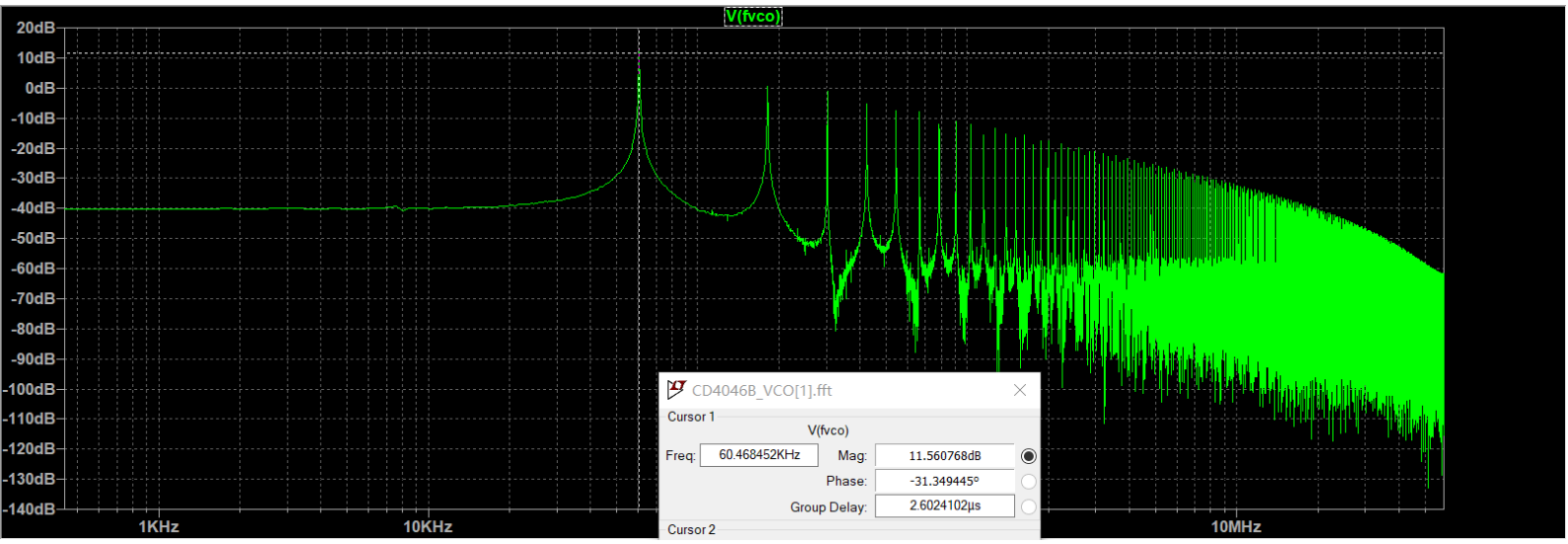
f=21.78kHz, G=10.84dB

V1=3V



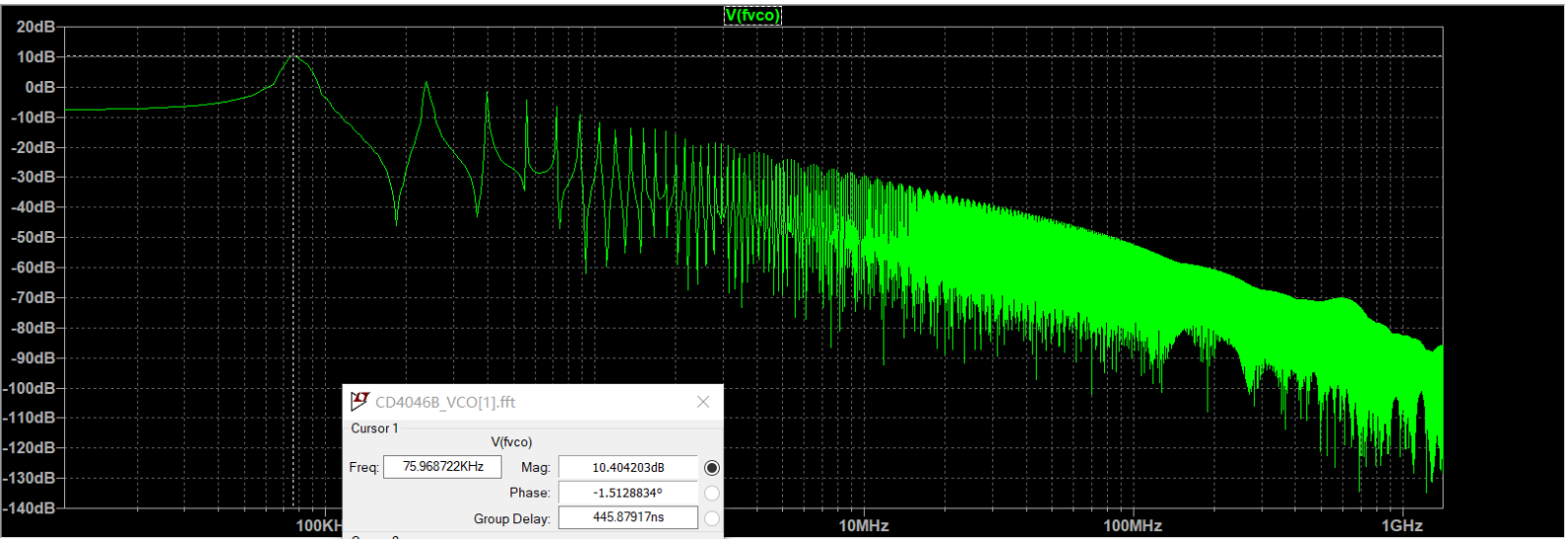
f=40.52kHz, G=12.41dB

V1=4V



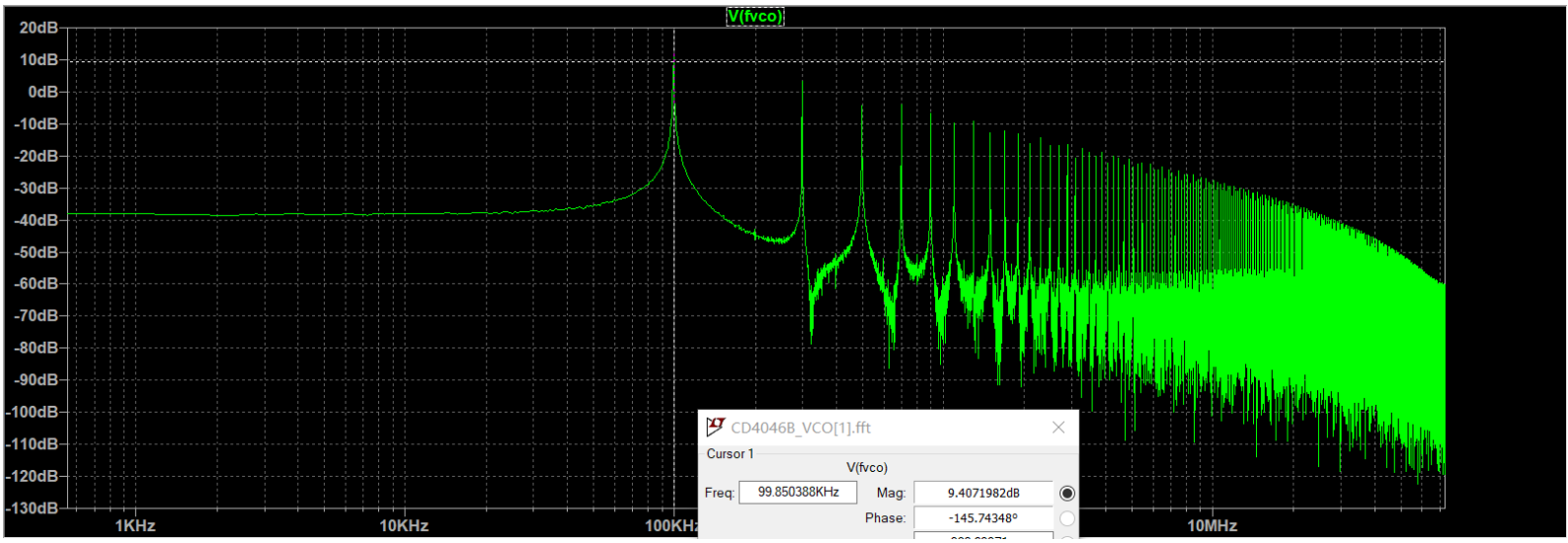
f=60.47kHz, G=11.56dB

V1=5V



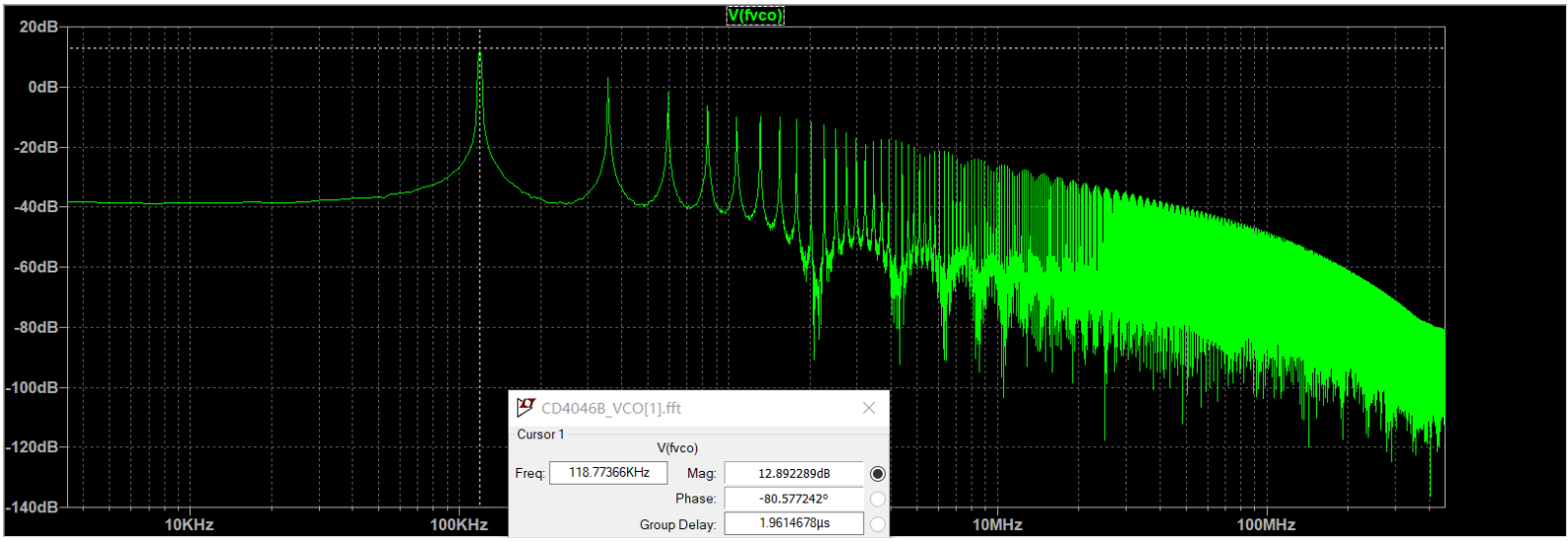
f=75.97kHz, G=10.40dB

V1=6V



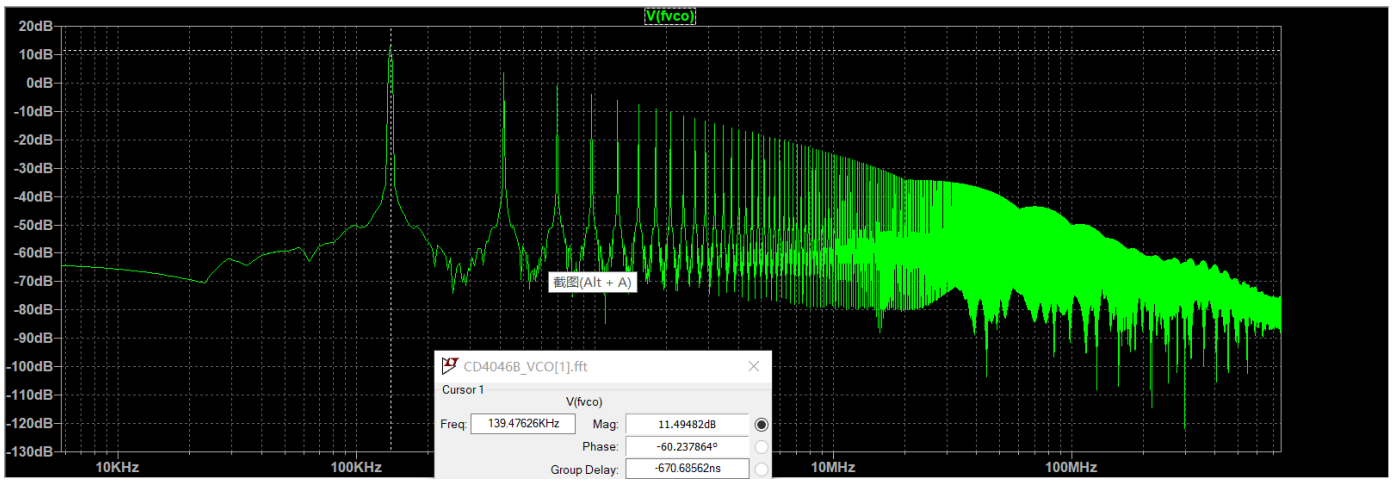
f=99.85kHz, G=9.41dB

V1=7V



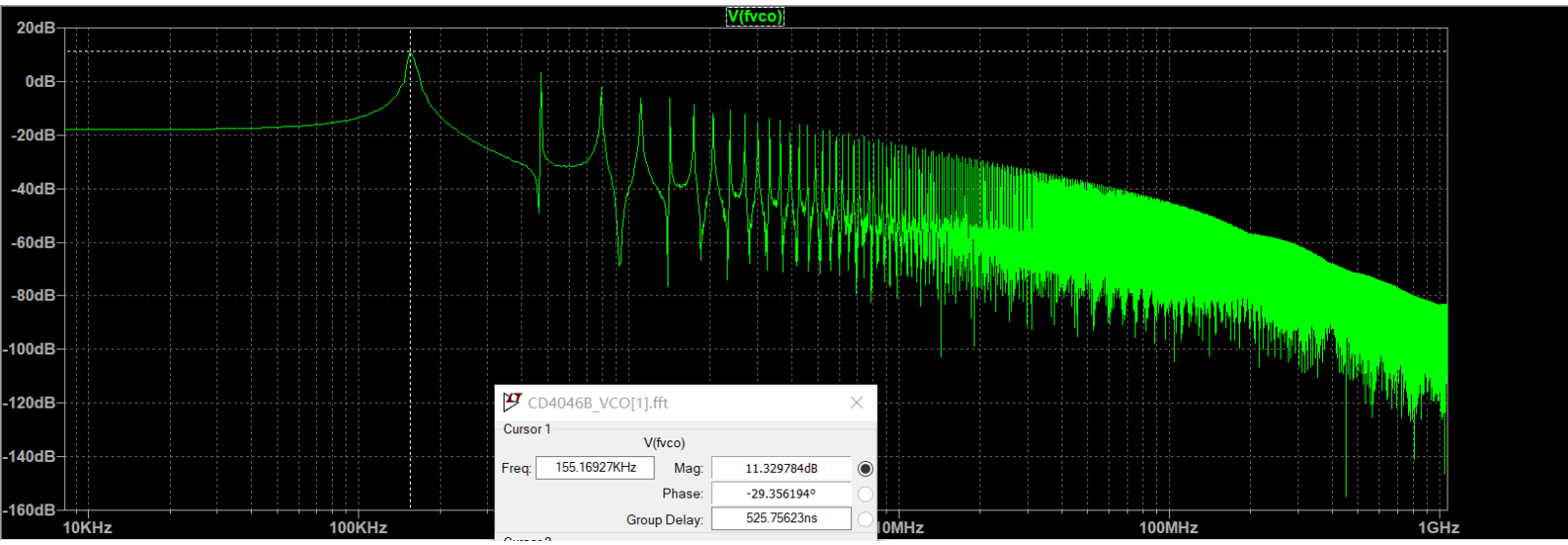
f=118.77kHz, G=12.89dB

V1=8V



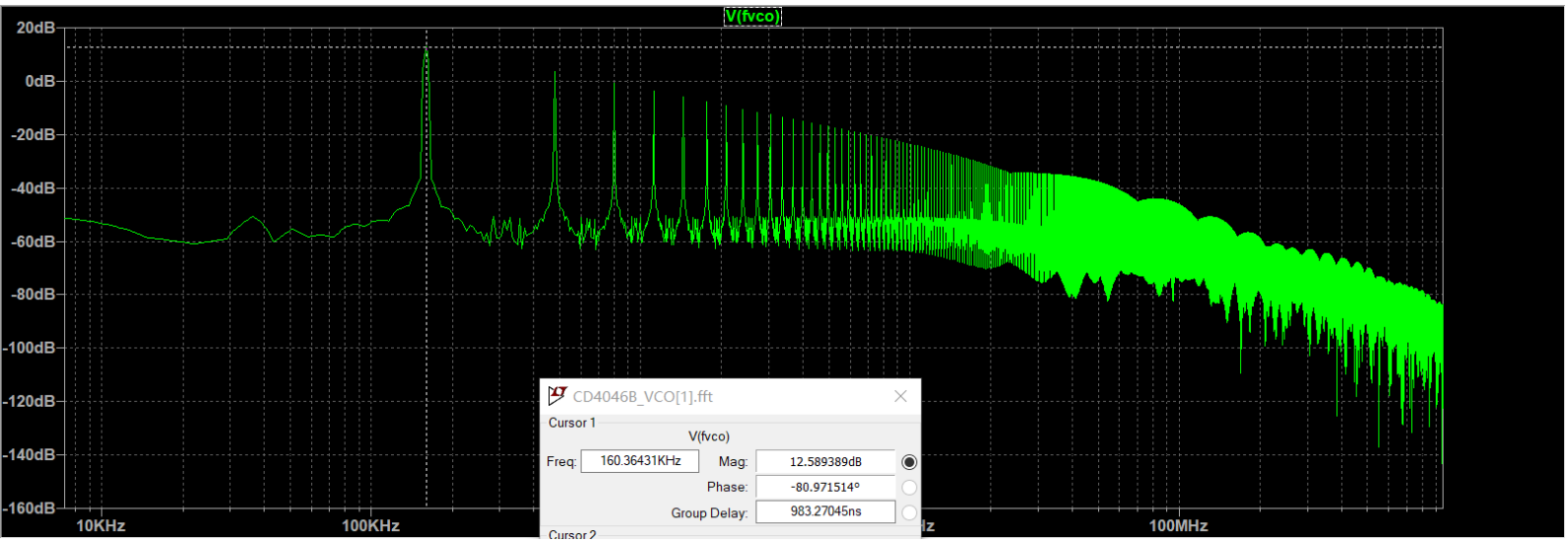
f=139.48kHz, G=11.49dB

V1=9V



f=155.17kHz, G=11.33dB

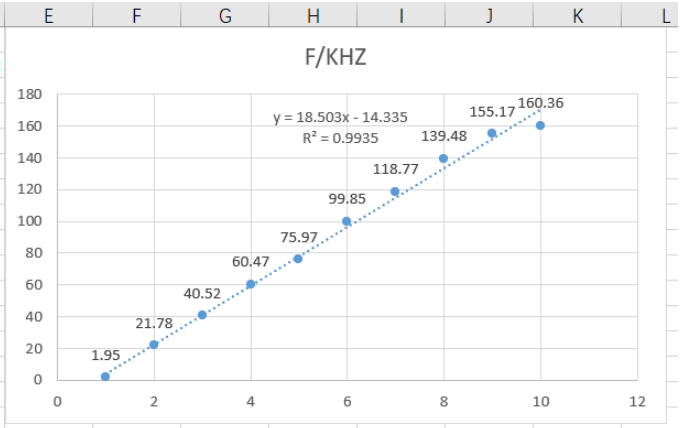
V1=10V

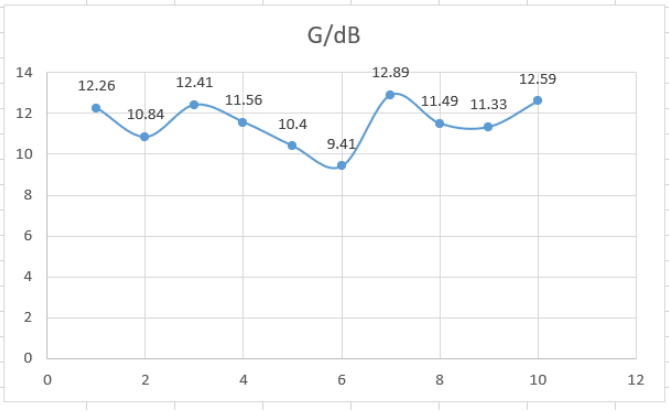


f=160.36kHz, G=12.59dB

On peut voir les résultat dans excel, fréquence f est quasi-linénaire, mais quand V1 est dans[0,1]ou[9,10], la linéarité est mal, et fmax=160.36kHz qui est le meme que le modèl

	A	B	C	D
1	V1/V	F/KHZ	G/dB	G_average/dB
2	1	1.95	12.26	11.518
3	2	21.78	10.84	
4	3	40.52	12.41	
5	4	60.47	11.56	
6	5	75.97	10.4	
7	6	99.85	9.41	
8	7	118.77	12.89	
9	8	139.48	11.49	
10	9	155.17	11.33	
11	10	160.36	12.59	





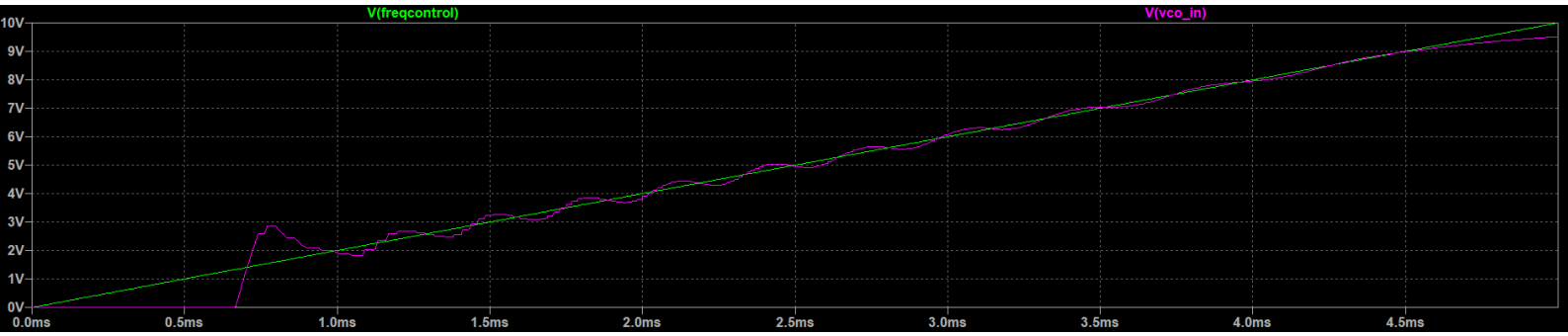
FMAX=0.160 e6.

3.

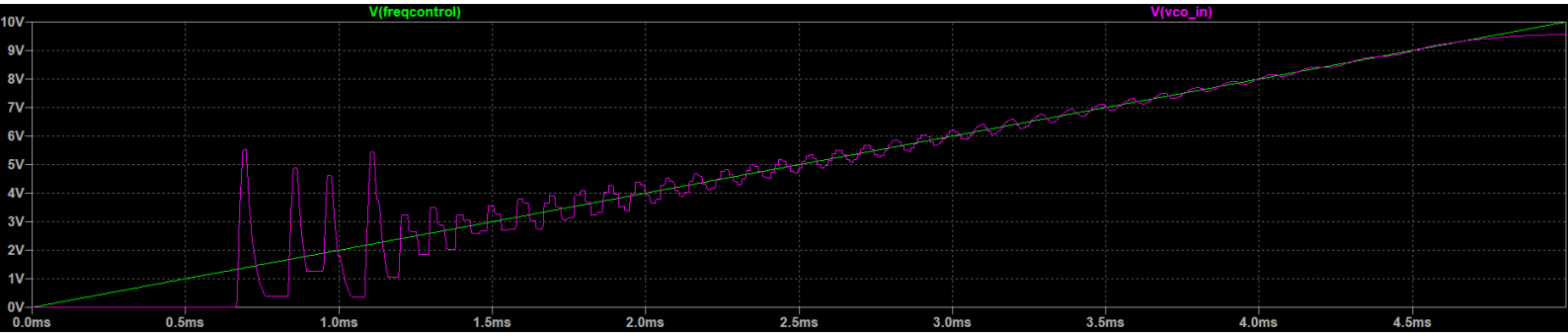
1)croissante

1.1)pc2

C2=100nF

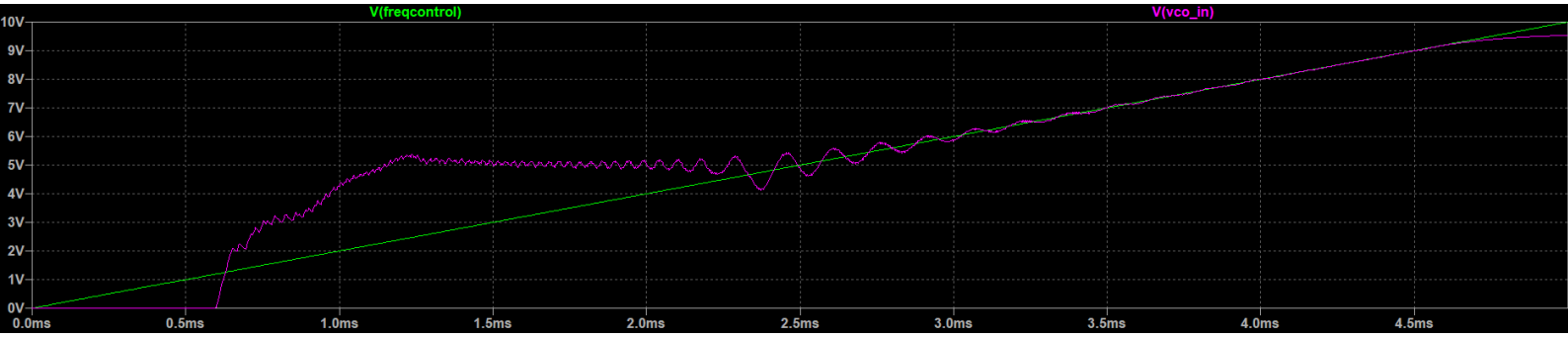


C2=10nF

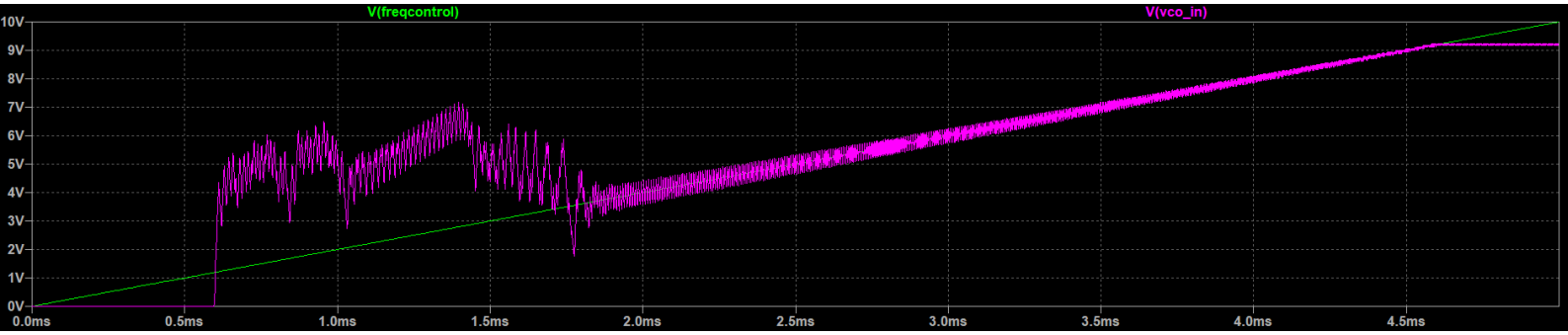


1.2)pc1

C2=100nF



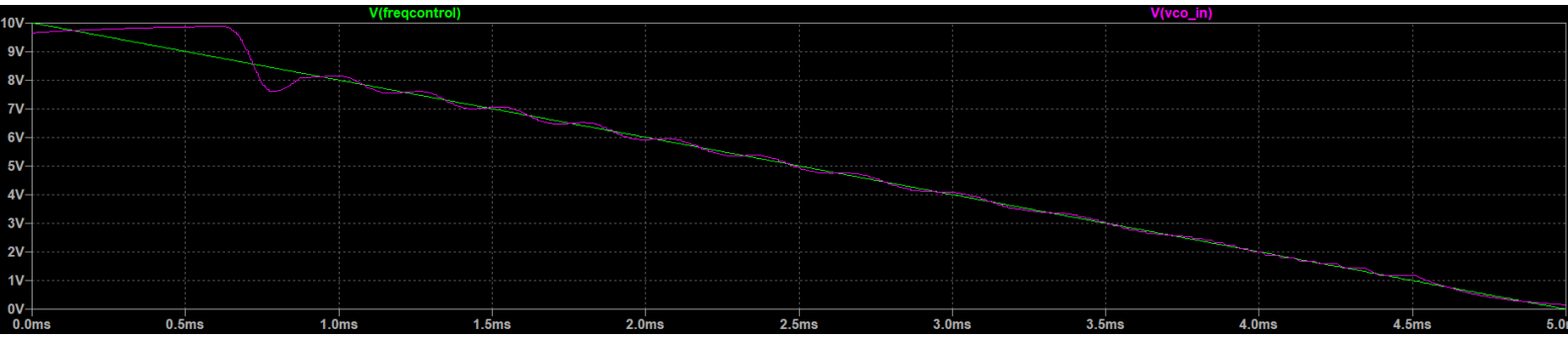
C2=10nF



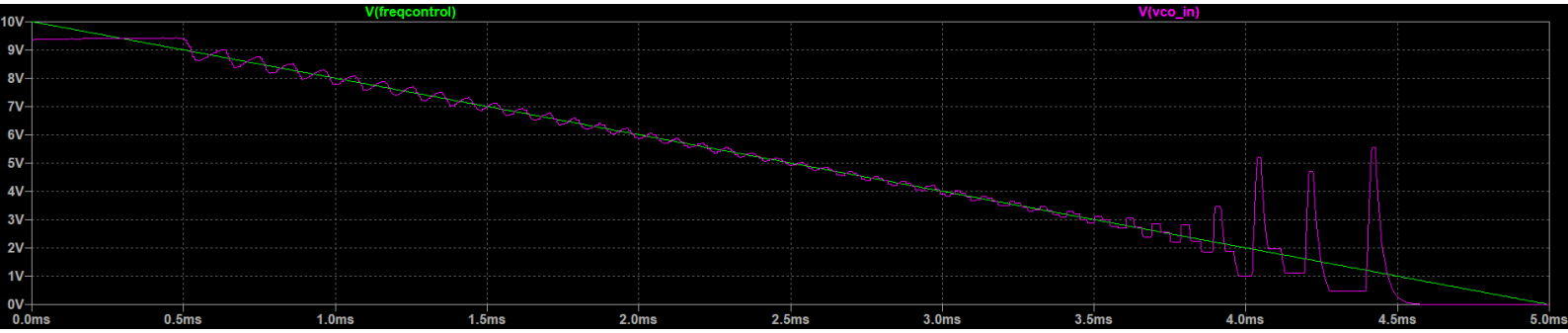
2)decroissante

2.1)pc2

C2=100nF

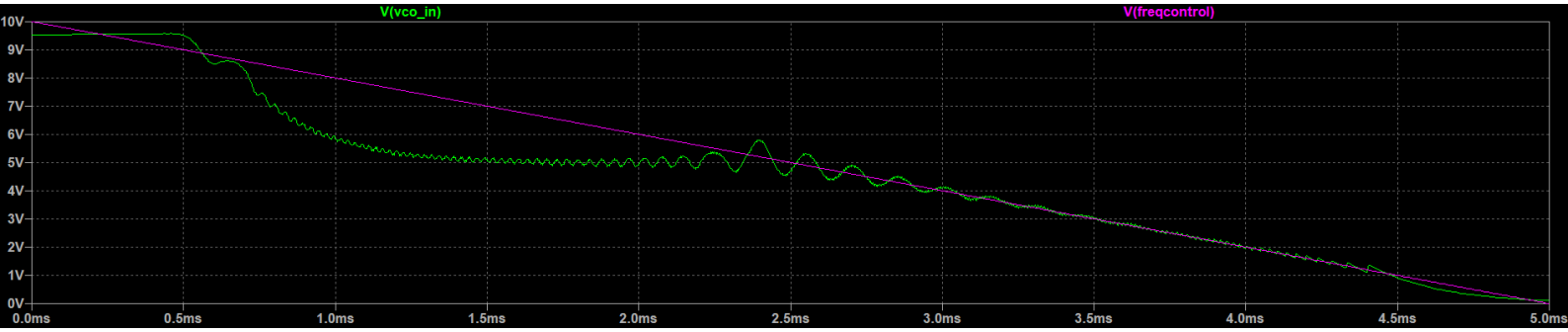


C2=10nF

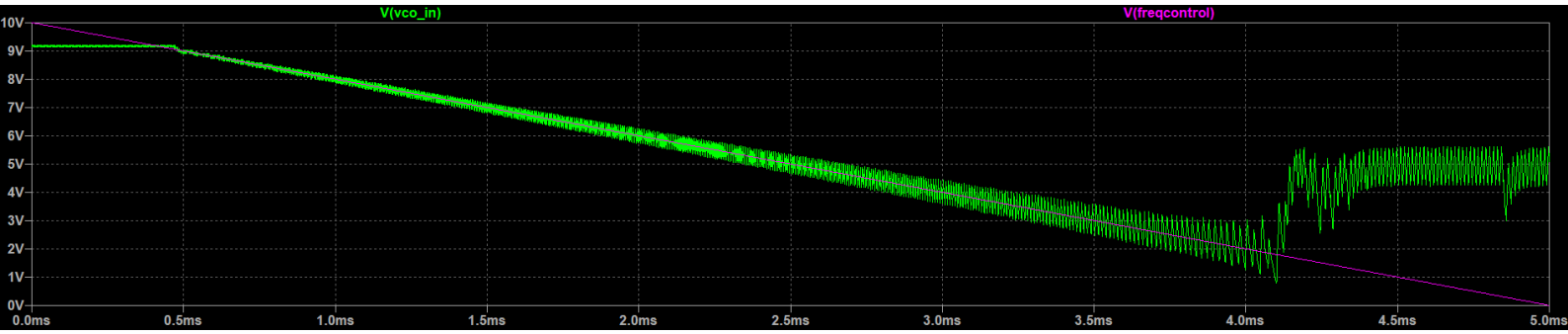


2.2)pc1

C2=100nF



C2=10nF



5.

on divise la relation entre f et V dans 3 partie[0,1],[1,9]et[9,10].

$$f = 1.95V$$

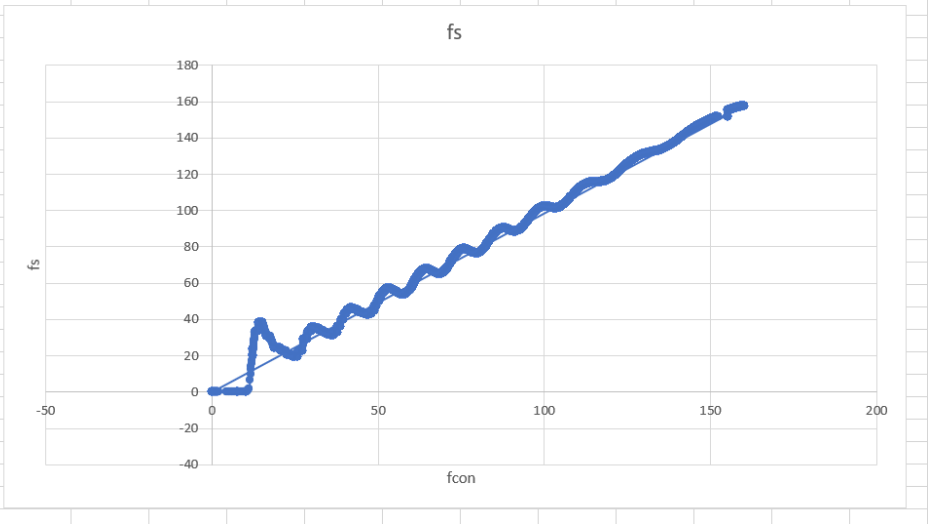
$$f = 18.503V - 14.335$$

$$f = 5.19V + 108.46$$

1)pc2 AVEC C2=100nF ET CROISSANTE

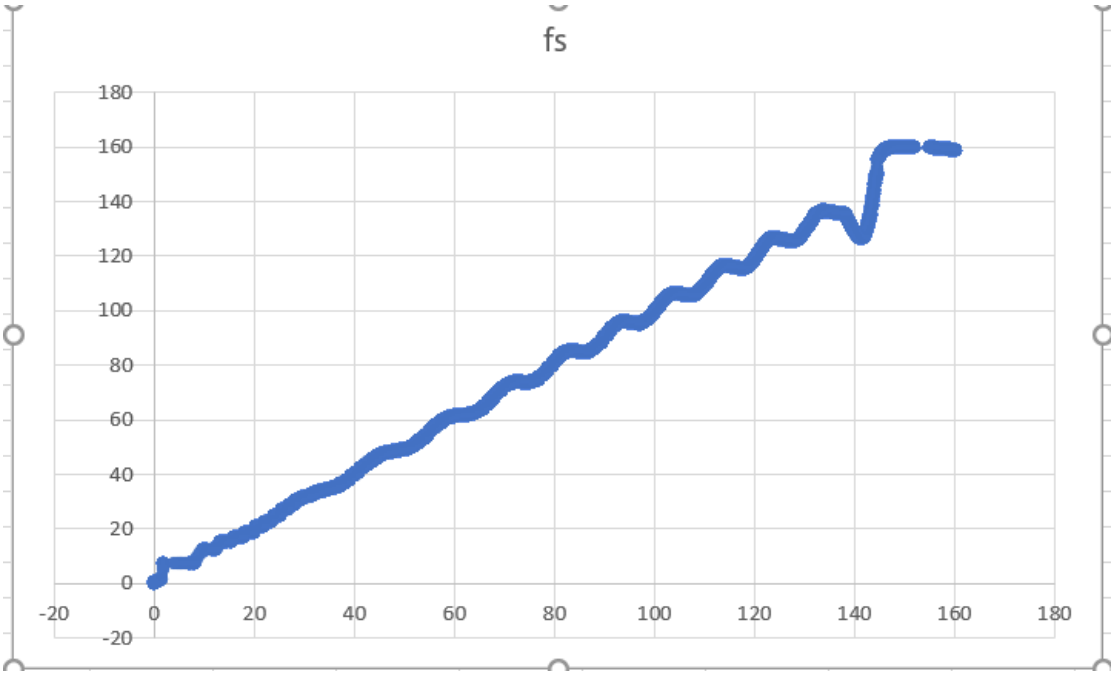
D2 =IF(B2<1,1.95*B2,IF(B2<9,18.503*B2-14.335,5.19*B2+108.46))

	A	B	C	D	E
1	time	V(freqcontrol)	V(vco_in)	fcon	fs
2	0.00E+00	1.02E-08	2.36E-09	1.99356E-08	4.60185E-09
3	3.05E-13	1.08E-08	2.51E-09	2.11258E-08	4.89164E-09
4	3.46E-13	1.09E-08	2.53E-09	2.12855E-08	4.93088E-09
5	4.28E-13	1.11E-08	2.57E-09	2.1605E-08	5.01016E-09
6	5.92E-13	1.14E-08	2.65E-09	2.22439E-08	5.16945E-09
7	9.20E-13	1.21E-08	2.82E-09	2.35217E-08	5.48948E-09
8	1.57E-12	1.34E-08	3.14E-09	2.60773E-08	6.13045E-09
9	2.72E-12	1.57E-08	3.72E-09	3.05622E-08	7.25172E-09
10	4.14E-12	1.85E-08	4.42E-09	3.60708E-08	8.61791E-09
11	6.64E-12	2.35E-08	5.65E-09	4.58359E-08	1.10136E-08
12	9.32E-12	2.89E-08	6.95E-09	5.62939E-08	1.35461E-08
13	1.31E-11	3.63E-08	8.73E-09	7.08655E-08	1.70217E-08
14	1.74E-11	4.50E-08	1.08E-08	8.78276E-08	2.09964E-08
15	2.46E-11	5.94E-08	1.41E-08	1.15837E-07	2.74166E-08
16	3.52E-11	8.07E-08	1.88E-08	1.57333E-07	3.66583E-08
17	5.39E-11	1.18E-07	2.68E-08	2.30116E-07	5.22907E-08
18	7.84E-11	1.67E-07	3.69E-08	3.25804E-07	7.18843E-08
19	1.25E-10	2.60E-07	5.48E-08	5.06063E-07	1.06853E-07
20	1.69E-10	3.48E-07	7.09E-08	6.77818E-07	1.38229E-07
21	2.40E-10	4.90E-07	9.53E-08	9.56072E-07	1.85854E-07
22	3.24E-10	6.59E-07	1.22E-07	1.28523E-06	2.38344E-07
23	4.93E-10	9.97E-07	1.72E-07	1.94353E-06	3.36005E-07
24	6.49E-10	1.31E-06	2.16E-07	2.55077E-06	4.20957E-07



f1=10.77kHz,f2=160.34kHz

2) pc2 AVEC C2=100nF ET Decroissante



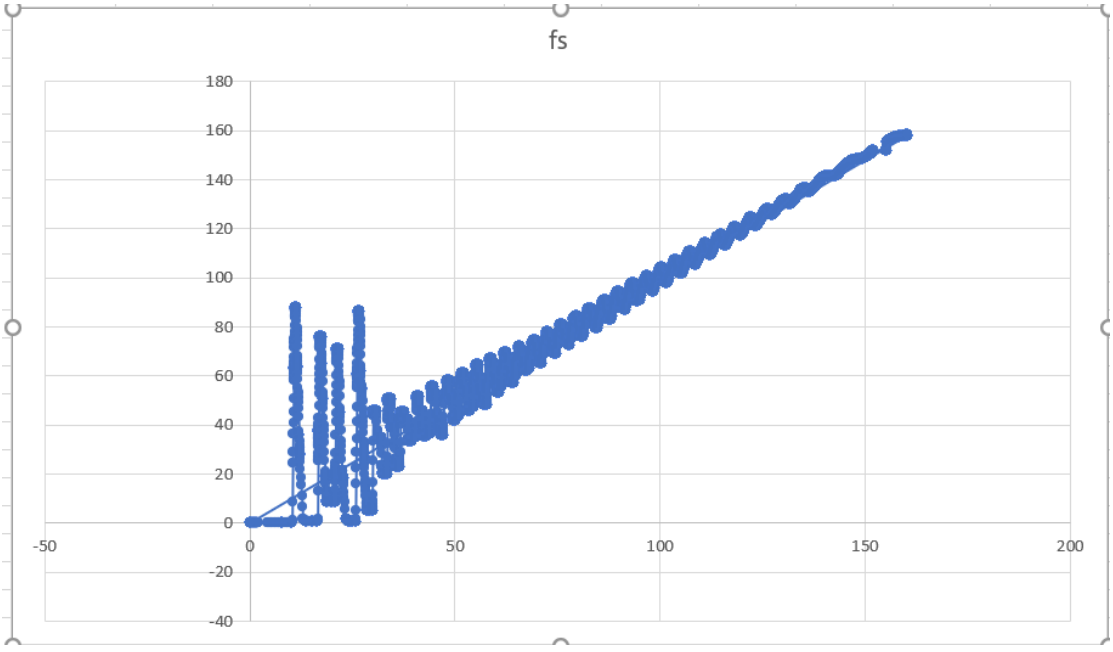
f1=0,f2=145.65kHz

donc pour pc2 C2=100nF

La plage de capture :10.77-145.65kHz

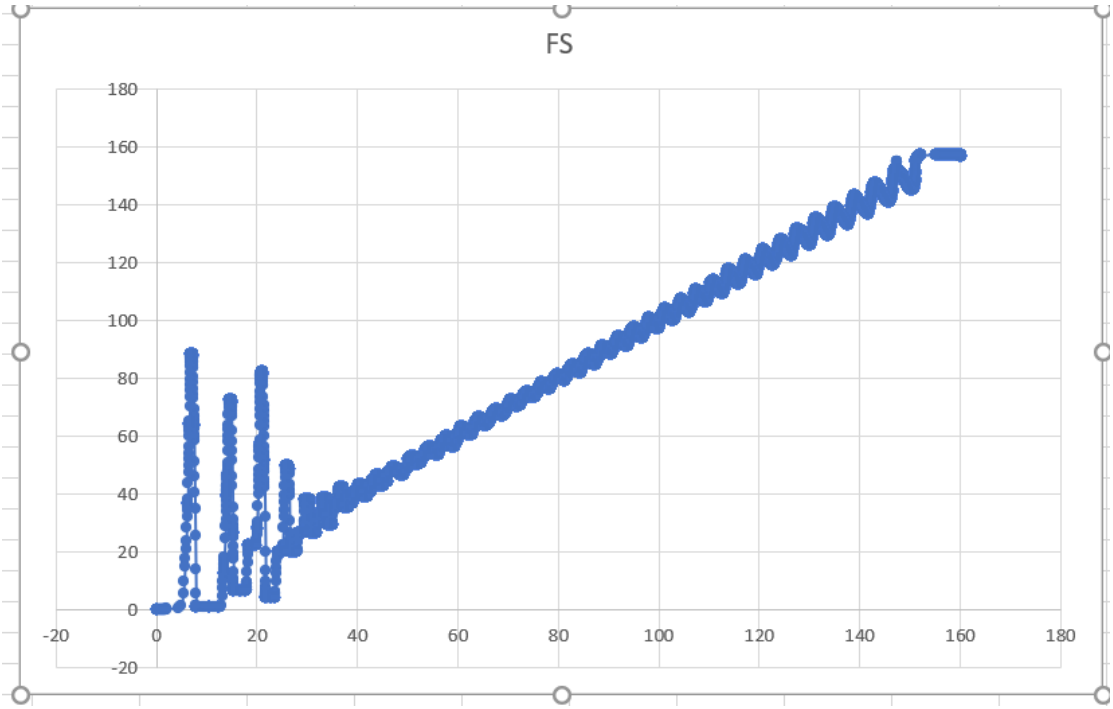
La plage de verrouillage :0-160.34kHz

3) pc2 AVEC C2=10nF ET CROISSANTE



f1=13.31kHz,f2=160kHz

3) pc2 AVEC C2=10nF ET DECROISSANTE



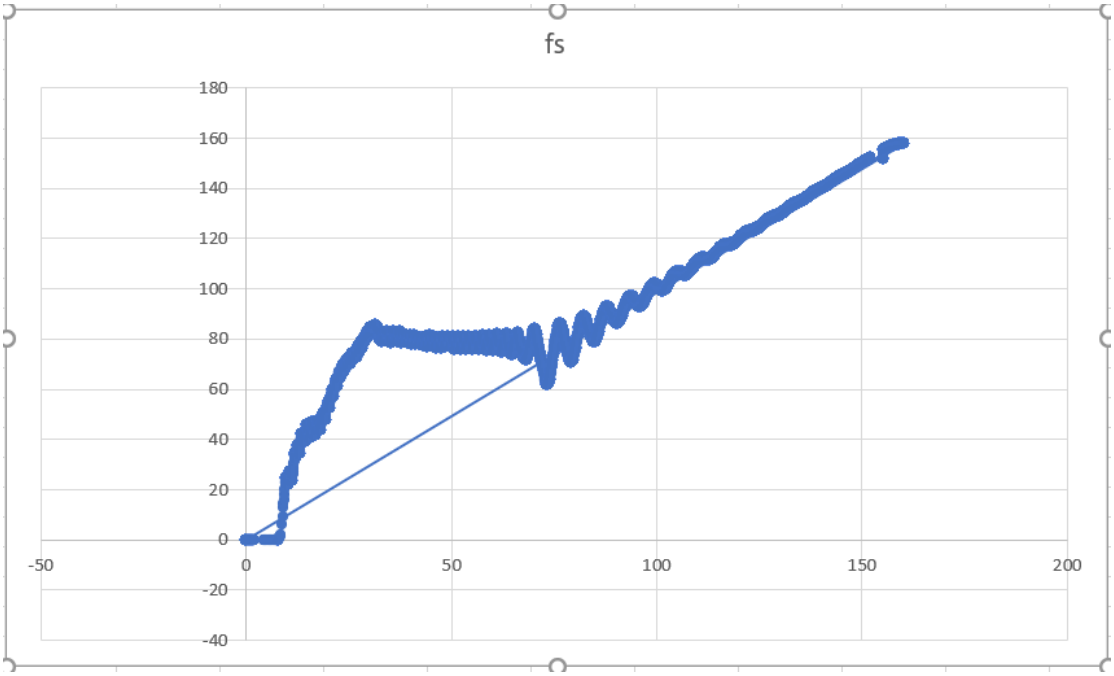
f1=4.35kHz, f2=151.33kHz

donc pour pc2 C2=10nF

La plage de capture :13.31-151.33kHz

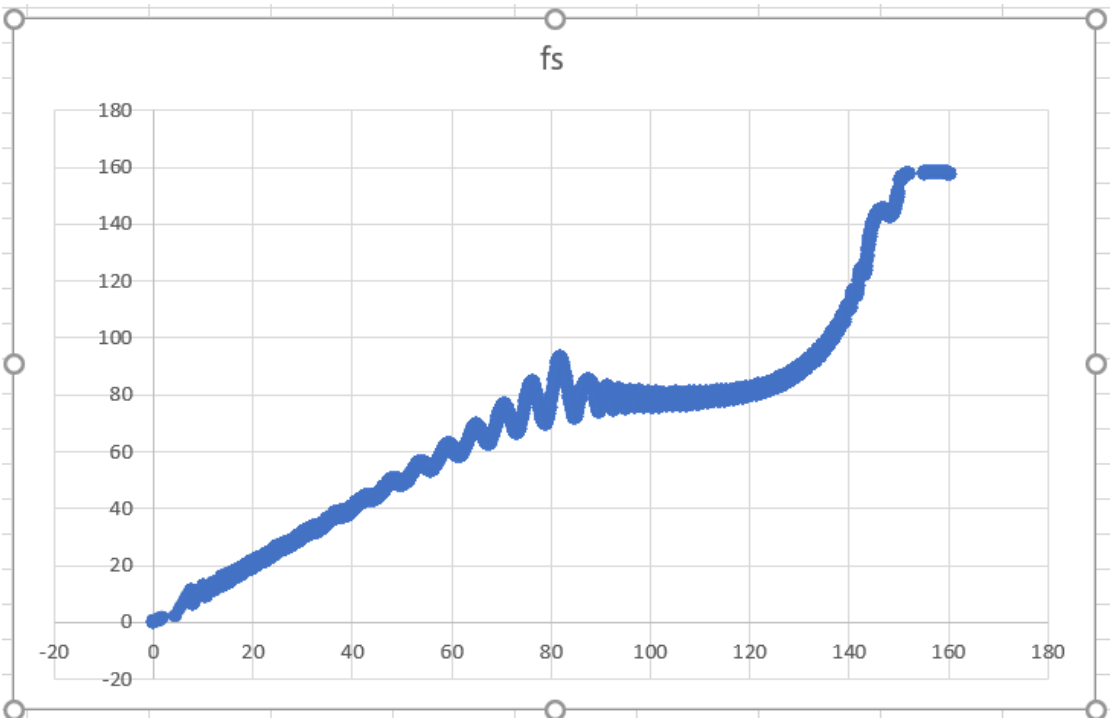
La plage de verrouillage :4.35-160kHz

5) pc1 AVEC C2=100nF ET CROISSANTE



f1=8.05kHz,f2=160kHz

6) pc1 AVEC C2=100nF ET DECROISSANTE



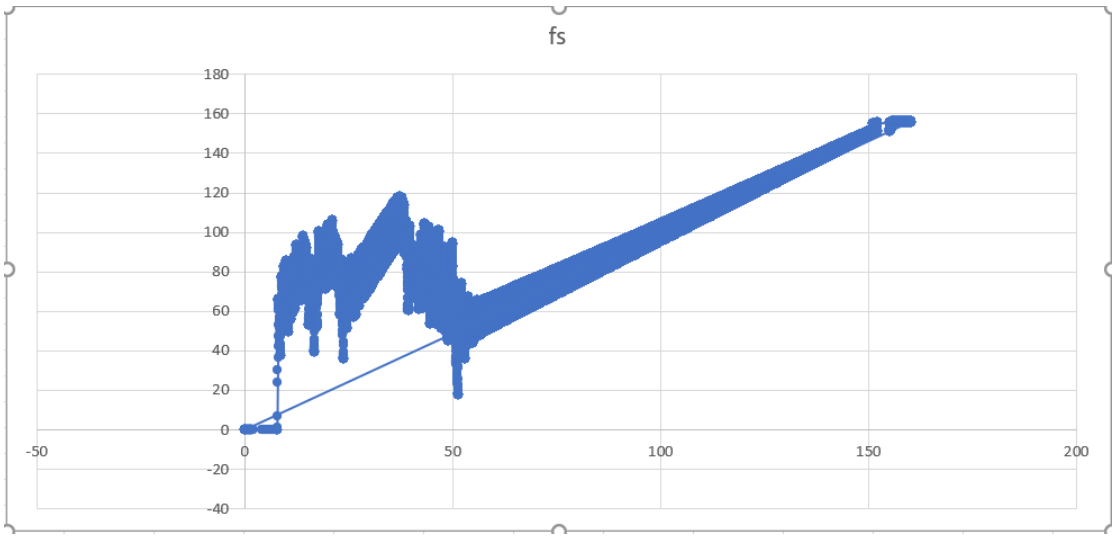
f1=0,f2=150.29kHz

donc pour pc1 C2=100nF

La plage de capture :8.05-150.29kHz

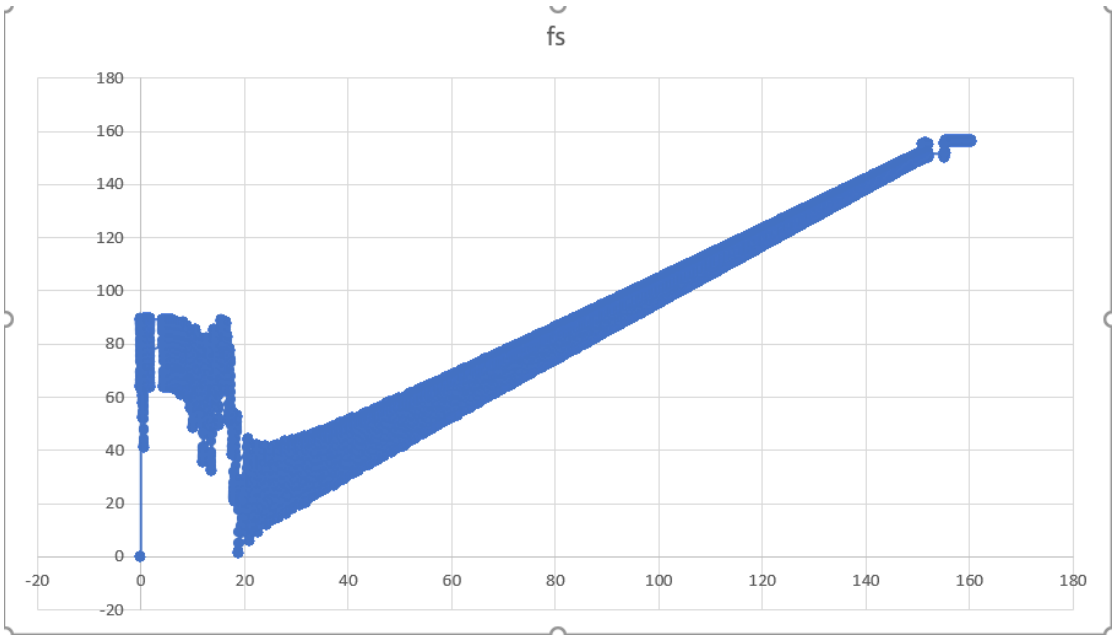
La plage de verrouillage :0-160kHz

7) pc1 AVEC C2=10nF ET CROISSANTE



f1=7.78kHz,f2=157.20kHz

8) pc1 AVEC C2=10nF ET DECROISSANTE



f1=0,f2=155.22kHz

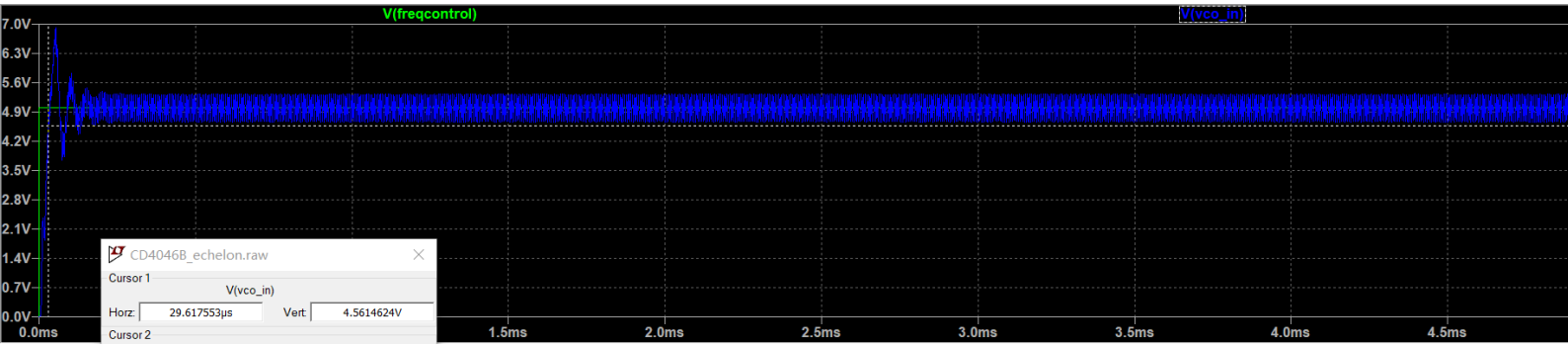
donc pour pc1 C2=10nF

La plage de capture :7.78-155.22kHz

La plage de verrouillage :0-157.20kHz

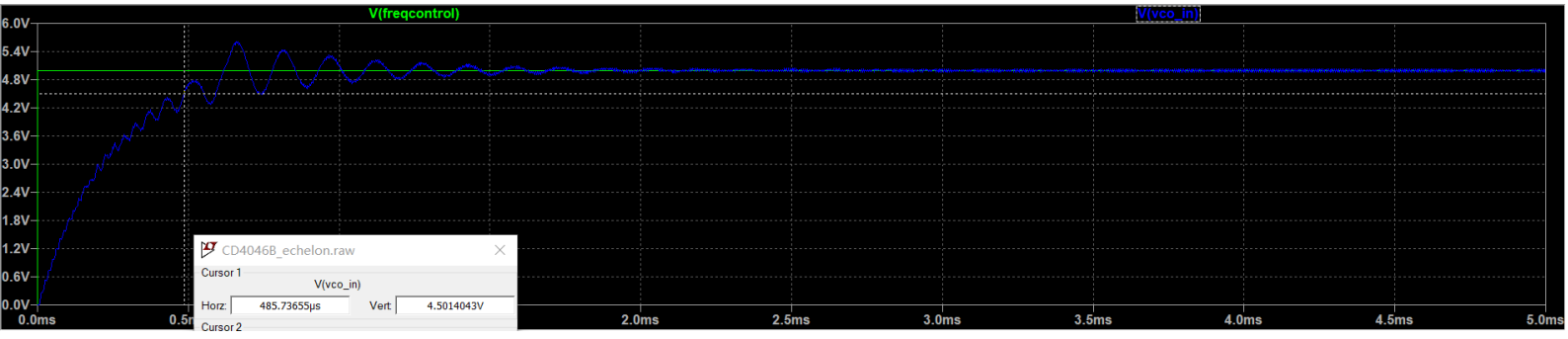
Q3

1)pc1,C2=10nF



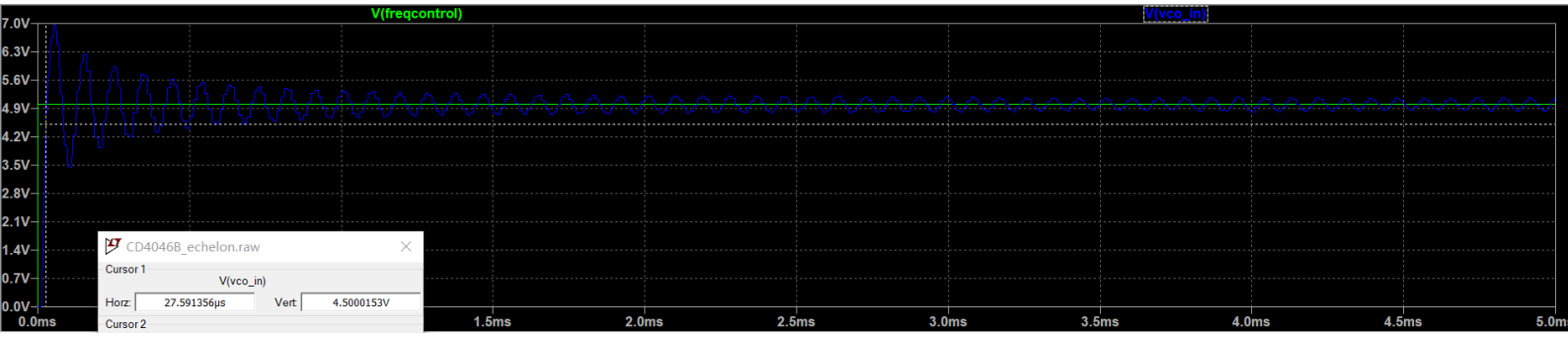
t=29.62µs

2)pc1,C2=100nF



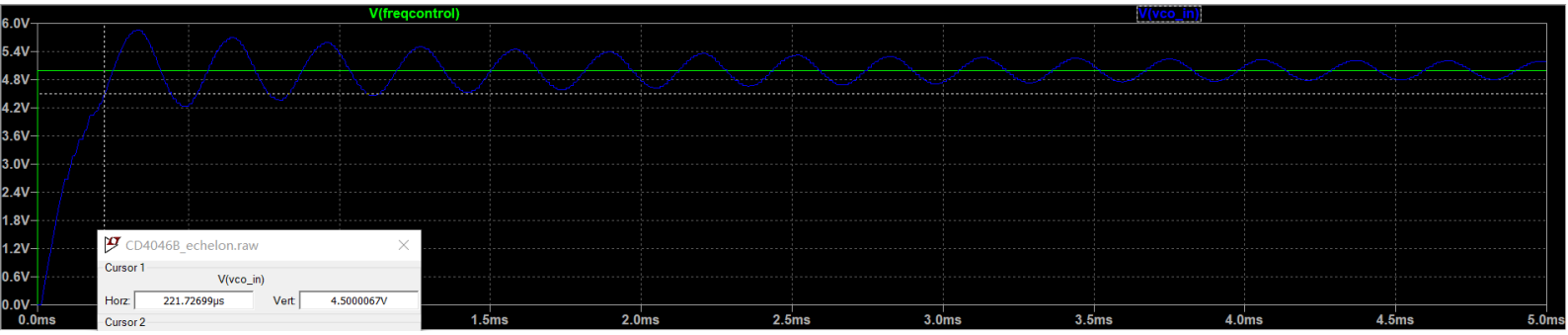
t=485.74µs

3) pc2,C2=10nF



t=27.59µs

4)pc2,C2=100nF



t=221.73µs

on sait que

$\tau = RC$

1)C2=100nF,R3=1.8kΩ

$\tau = 180\mu s$

En fait, pour pc1, τ=485.74µs,pour pc2, τ=221.73µs

2) C2=10nF,R3=1.8kΩ

$\tau = 18\mu s$

En fait, pour pc1, τ=29.62µs,pour pc2, τ=27.59µs