TD4

Question 1

1.d’abord on peut trouver que le R C est constante ,donc on peut utiliser ça

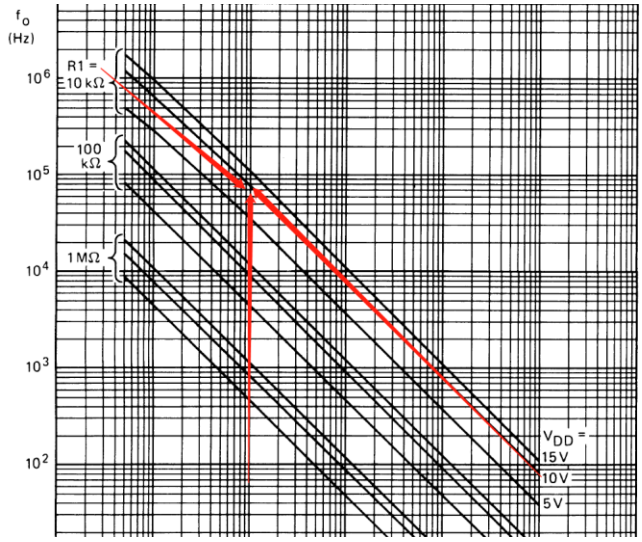
VCO component selection

Recommended range for R1 and R2: 10 kΩ to 1 MΩ; for C1: 50 pF to any practical value.

1. VCO without frequency offset (R2 = ∞).
   a) Given f_o: use f_o with Fig.7 to determine R1 and C1.
   b) Given f_{max}: calculate f_o from $f_o = \frac{1}{2} f_{max}$; use f_o with Fig.7 to determine R1 and C1.

On sait que le plage de VCO est [f0,fmax],donc c’est [f0,2f0]

On a ça



f0 est de 80kHz ,donc fmax est de 160kHz ,on a le plage de fonctionnement est de [80kHz ,160kHz].

2.

On a que pour

V1 =1 fs= 1.9569972KHz

V1 =2 fs= 21.459916KHz

V1 =3 fs = 40.979984KHz

V1 =4 fs = 60.479692KHz

V1 =5 fs = 79.999631KHz

V1 =6 fs = 110.28347kHz

V1 =7 fs = 119.01936KHz

V1 =8 fs = 140.23812kHz

V1 =9 fs = 160.34534kHz

V1 =10 fs =160.28134kHz

On a que ce VCO fonctionne bien en comparant avec le fiche technique .

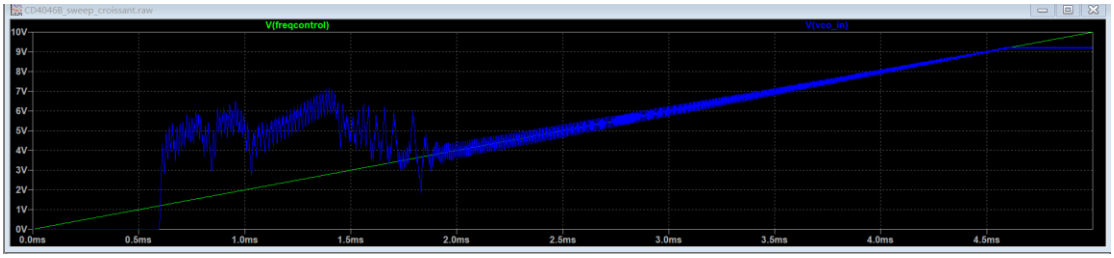
Et on trouve que de V1=2 à V1=9 fs=20+20(V-2)

Question 2

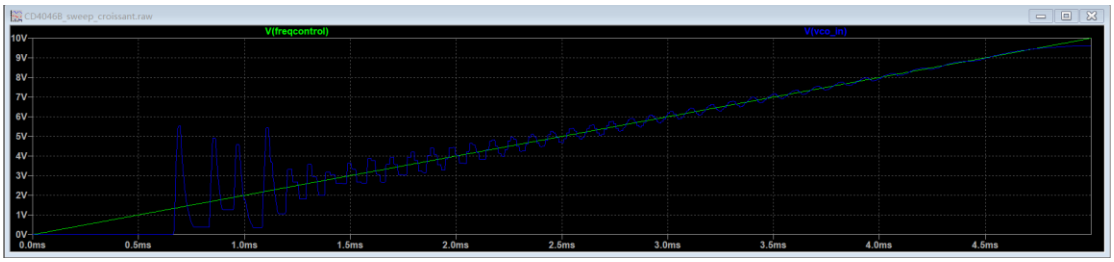
1.

C=10nF

Pc1

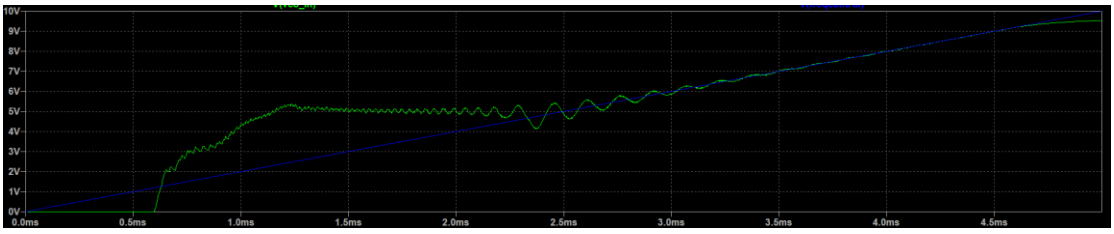


Pc2

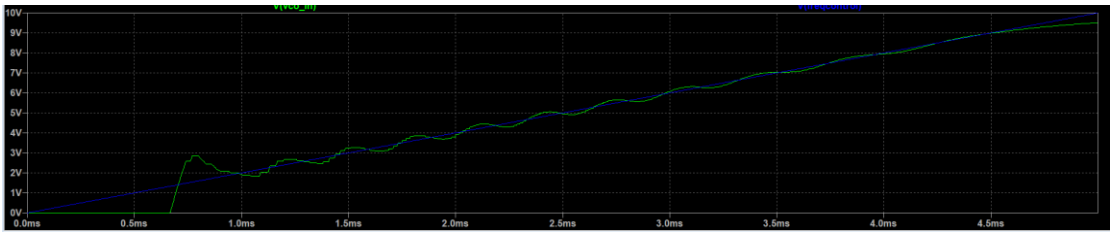


C=100nF

PC1



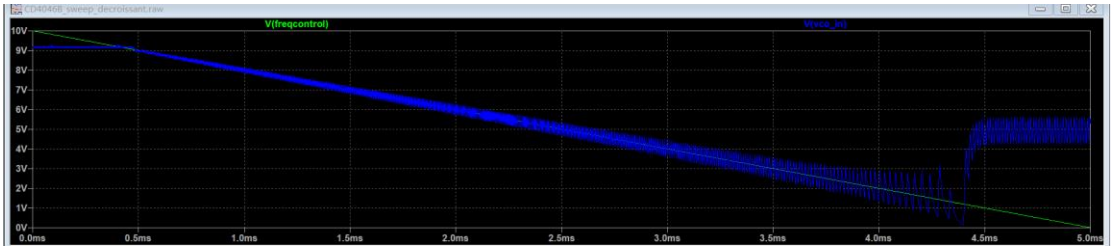
PC2



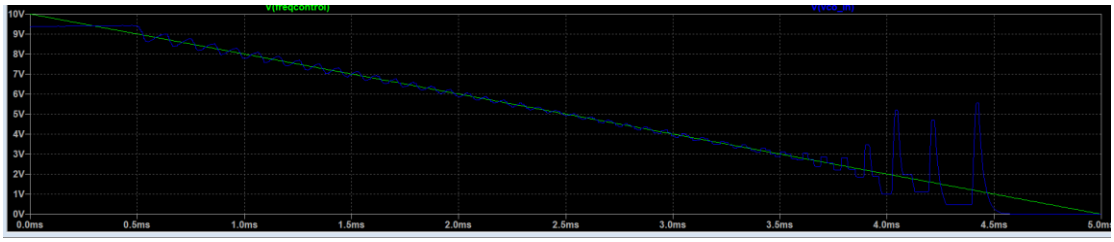
2.

C=10nF

Pc1

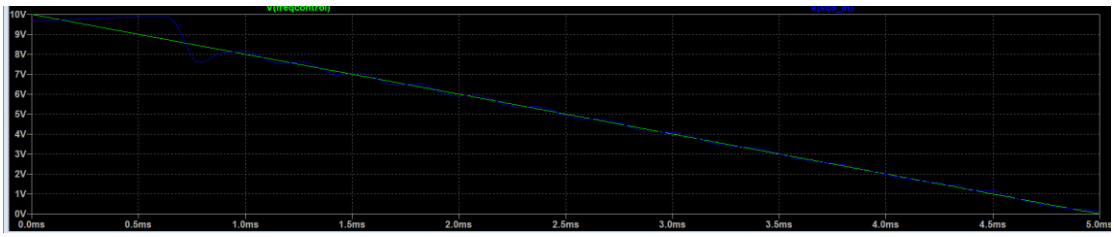


Pc2

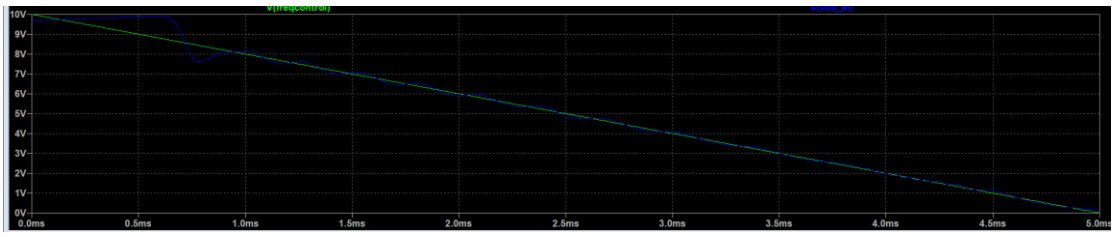


C=100nF

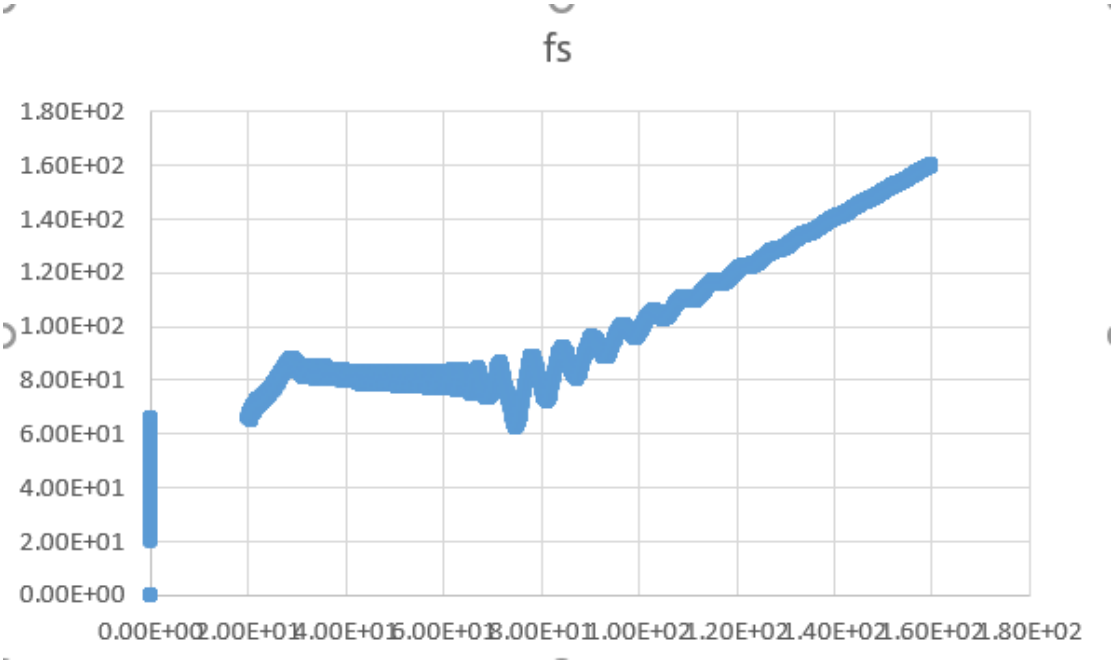
PC1



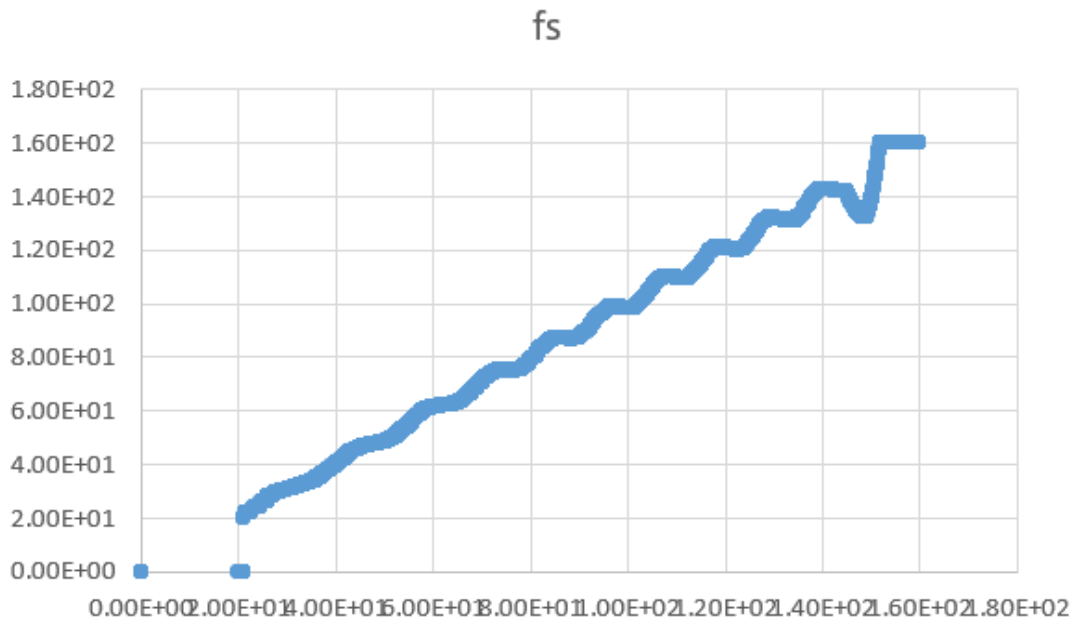
PC2



3.on a que
pc1 100n croissant

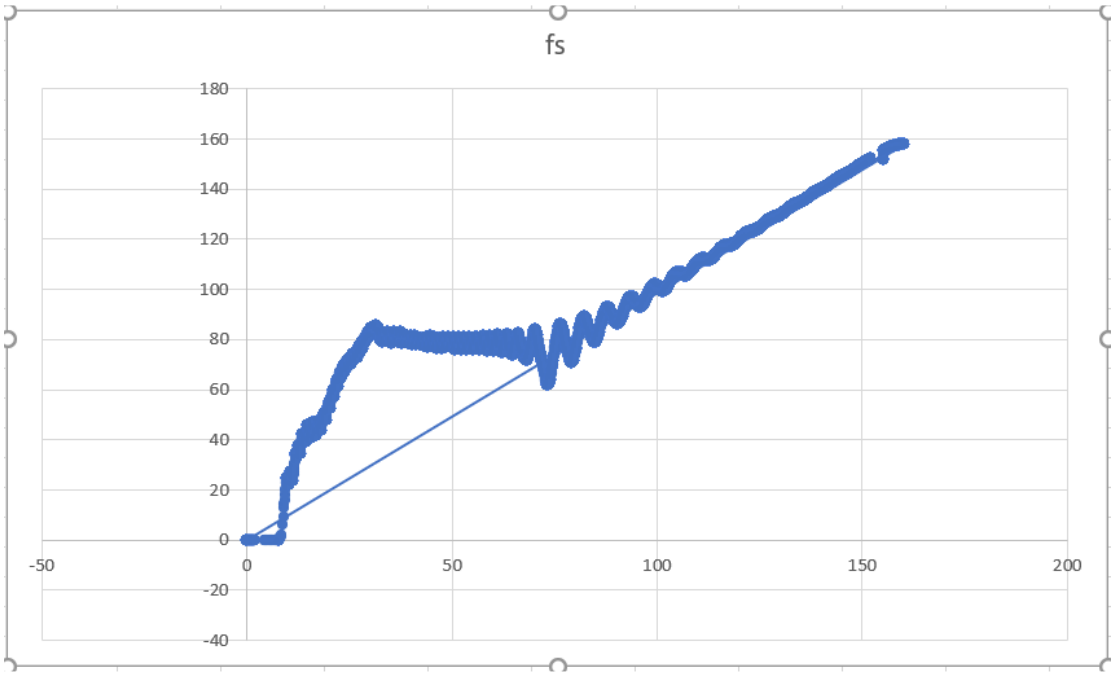


Pc1 100n decorissant

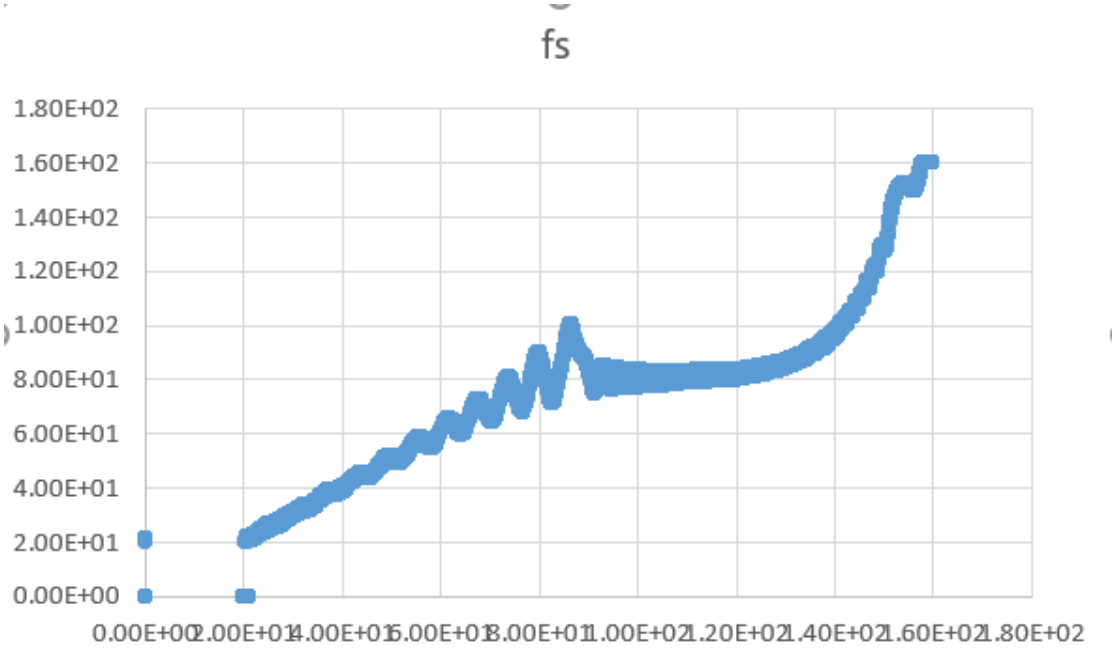


On a que pour les deux figures ,
Pc1 100n croissant :$f_{début}$=10kHz f_{final}=160kHz
Pc1 100n decorissant : $f_{début}$=0 f_{final}=150kHz
Donc
La plage de capture:10-150kHz
La plage de verrouillage: 0-160kHz

Pc2 100n croissant

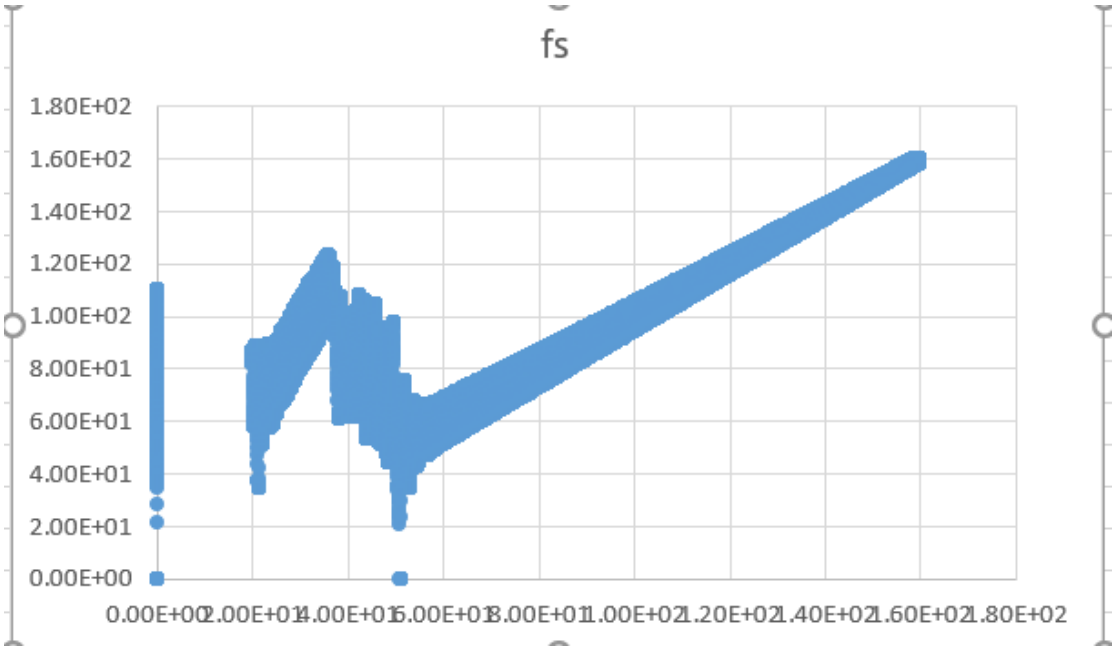


Pc2 100n decroissant

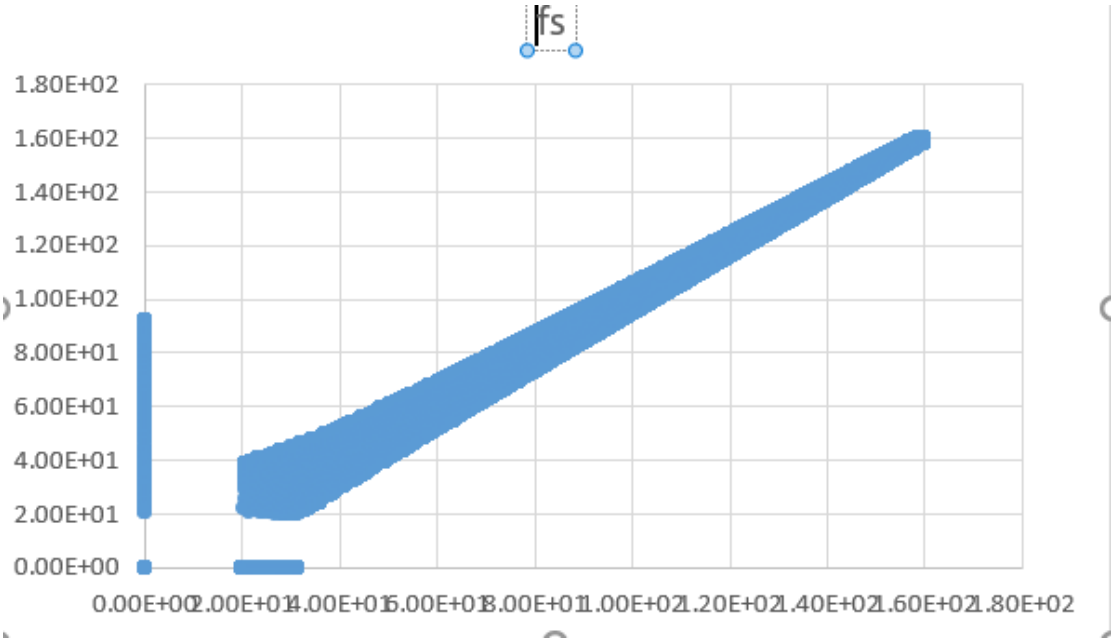


On a que pour les deux figures ,
Pc2 100n croissant :$f_{début}$=8kHz f_{final}=160kHz
Pc2 100n decorissant : $f_{début}$=0kHz f_{final}=155kHz
Donc
La plage de capture:8-155kHz
La plage de verrouillage: 0-160kHz

Pc1 10n croissant

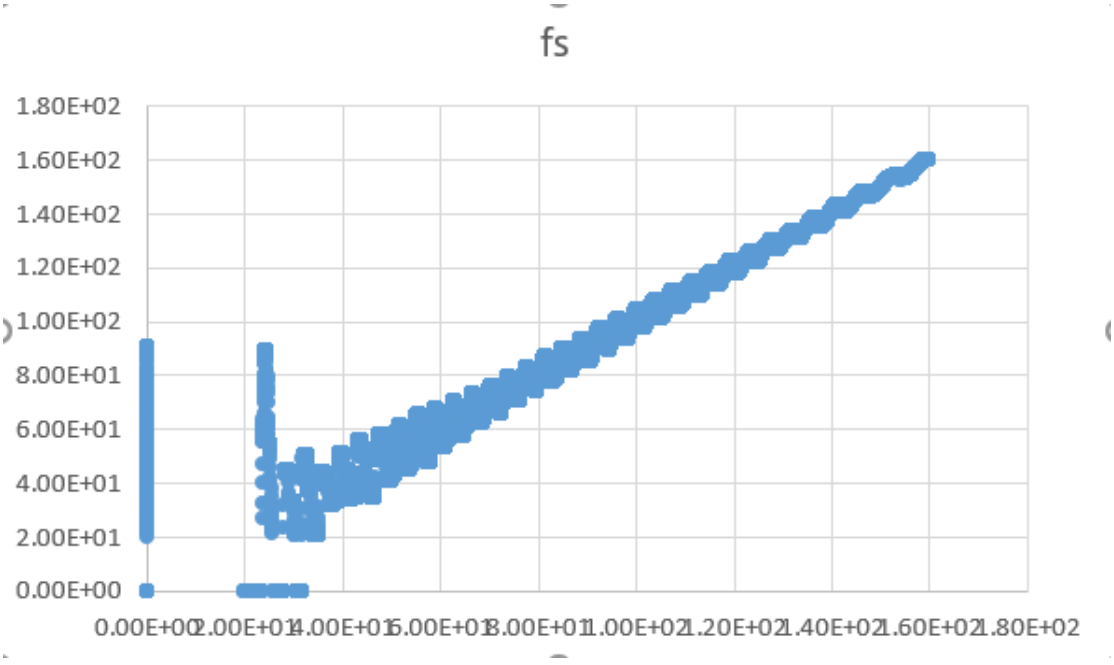


Pc1 10n decroissant

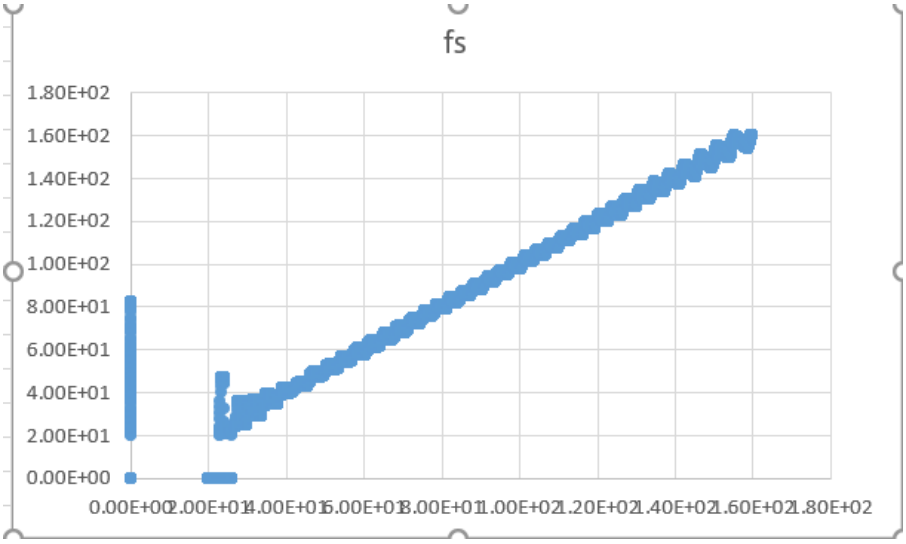


On a que pour les deux figures ,
Pc1 10n croissant :$f_{début}$ =8kHz f_{final}=160kHz
Pc1 10n decorissant : $f_{début}$ =0kHz f_{final}=160kHz
Donc
La plage de capture:8-160kHz
La plage de verrouillage: 0-160kHz

Pc2 10n croissant



Pc2 10n decroissant



On a que pour les deux figures ,

Pc2 10n croissant :$f_{début}$ =20kHz f_{final}=160kHz

Pc2 10n decorissant : $f_{début}$ =25kHz f_{final}=155kHz

Donc

La plage de capture:20-155kHz

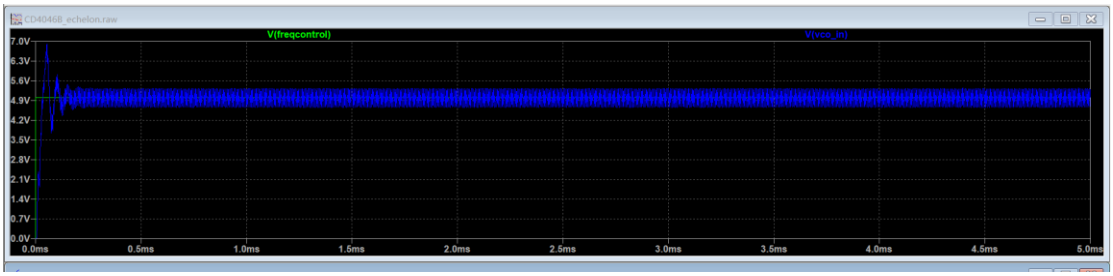
La plage de verrouillage: 25-160kHz

Question 3

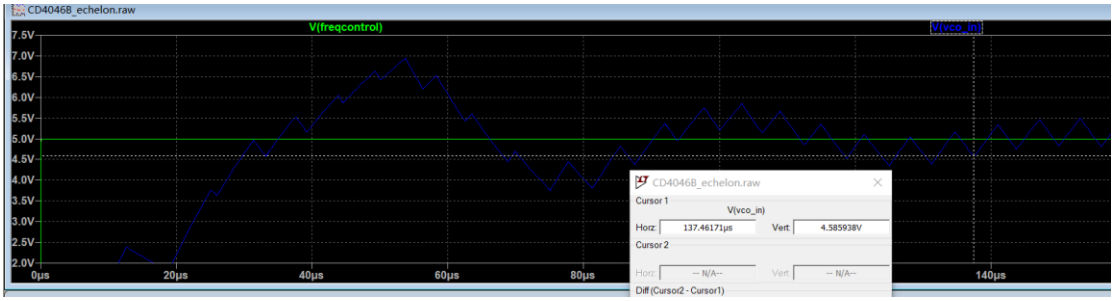
1. 2.

C=10nF

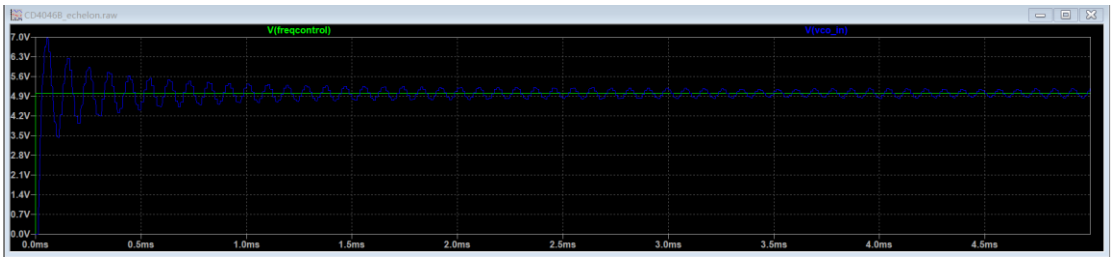
PC1



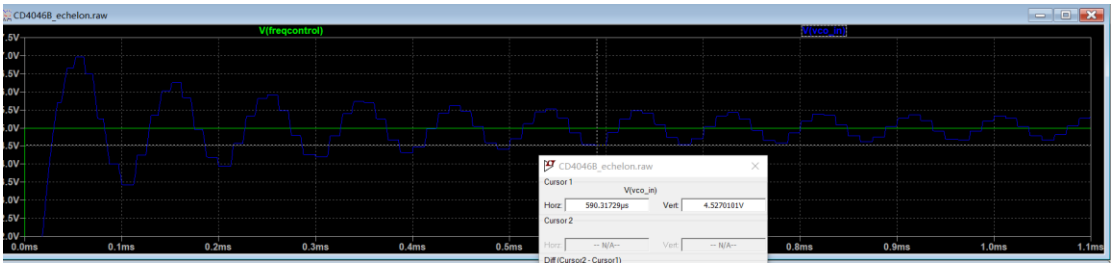
$T_{90\%}$=137.46171µs



PC2

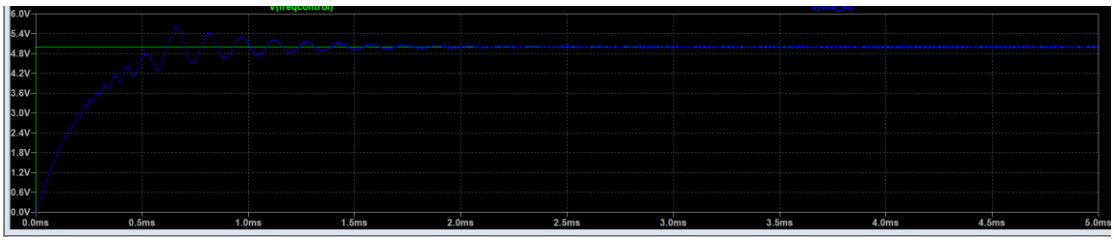


$T_{90\%}$=590.31729µs

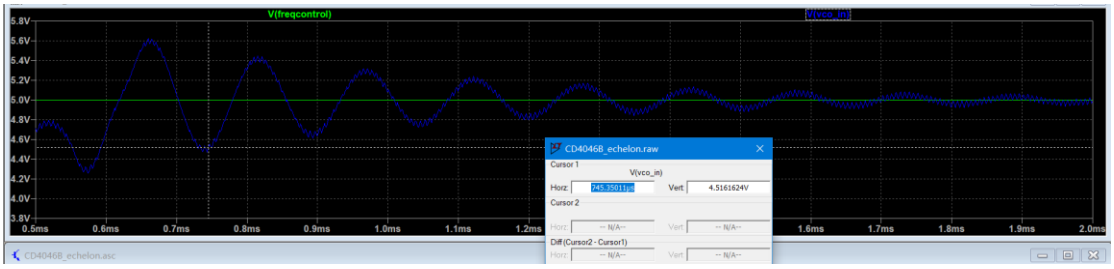


Quand C=100nF

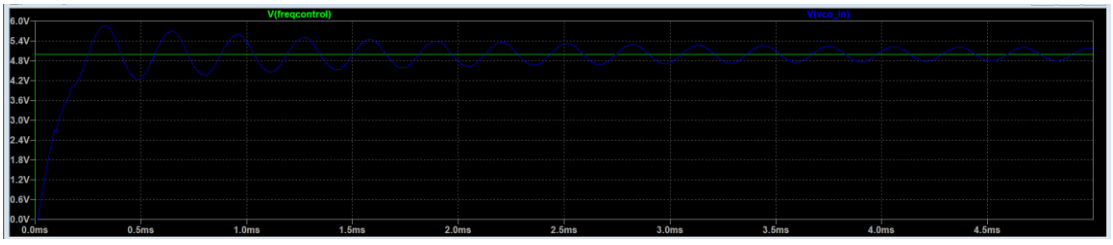
PC1



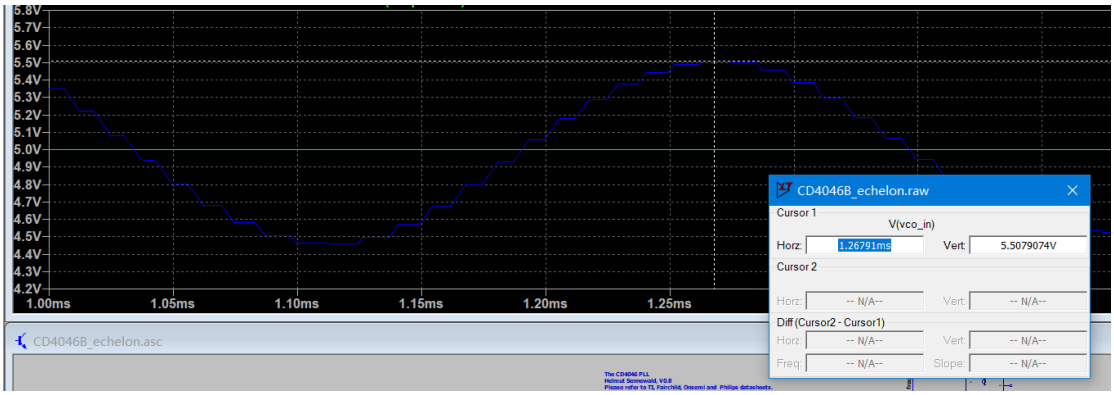
$T_{90\%}$=745.35011µs



PC2



$T_{90\%}$=1,26791ms


5.8V
5.7V
5.6V
5.5V
5.4V
5.3V
5.2V
5.1V
5.0V
4.9V
4.8V
4.7V
4.6V
4.5V
4.4V
4.3V
4.2V
1.00ms
1.05ms
1.10ms
1.15ms
1.20ms
1.25ms
CD4046B_echelon.raw
Cursor 1
V(vco_in)
Horz: 1.26791ms
Vert: 5.5079074V
Cursor 2
Horz: -- N/A--
Vert: -- N/A--
Diff (Cursor2 - Cursor1)
Horz: -- N/A--
Vert: -- N/A--
Freq: -- N/A--
Slope: -- N/A--
CD4046B_echelon.asc