Proiect Scia

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Specializare: Electronica Aplicata, anul 3

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**Etajul 1. Amplificator neinversor cu 1 AO cu compensare DC**

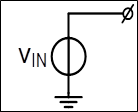
I.I) Dimensionare

Tip sursa semnal: 1(single ended)

amplitudine minima (pt castig maxim PGA): 0.07V

amplitudine maxima (pt castig maxim PGA): 0.14V

Vin:0.10V

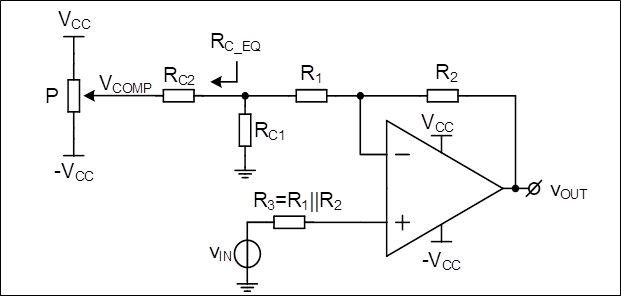


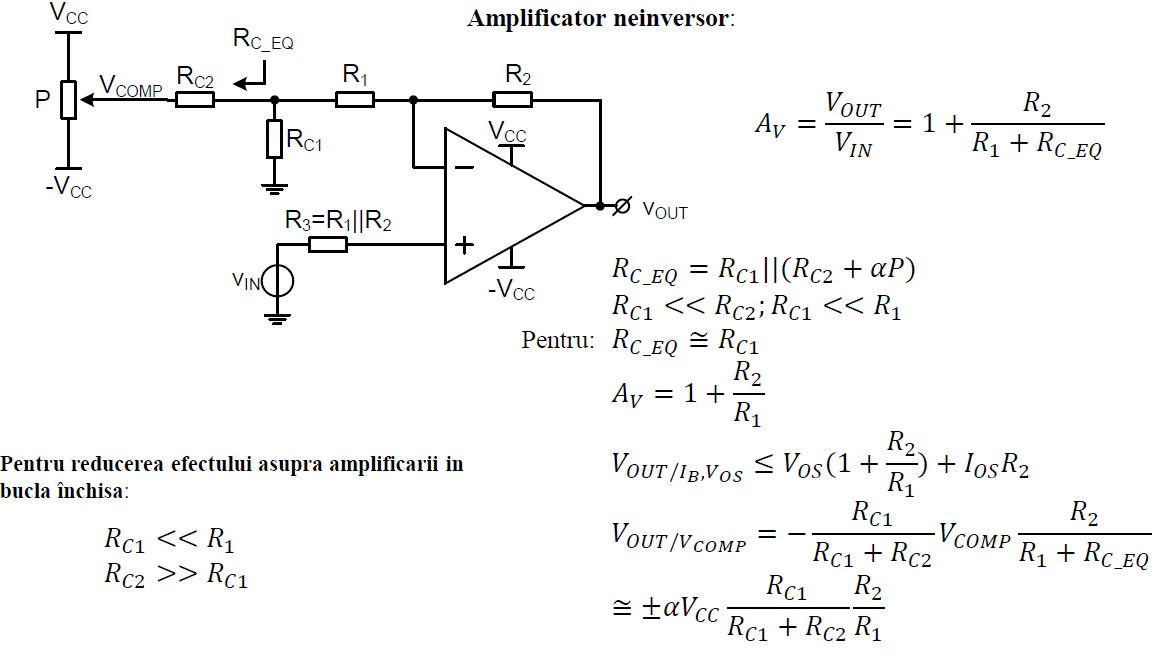
Tip etaj 1: 1

Tipul de AO: ADTL082

Castig in liniar: 7

Castig in db:

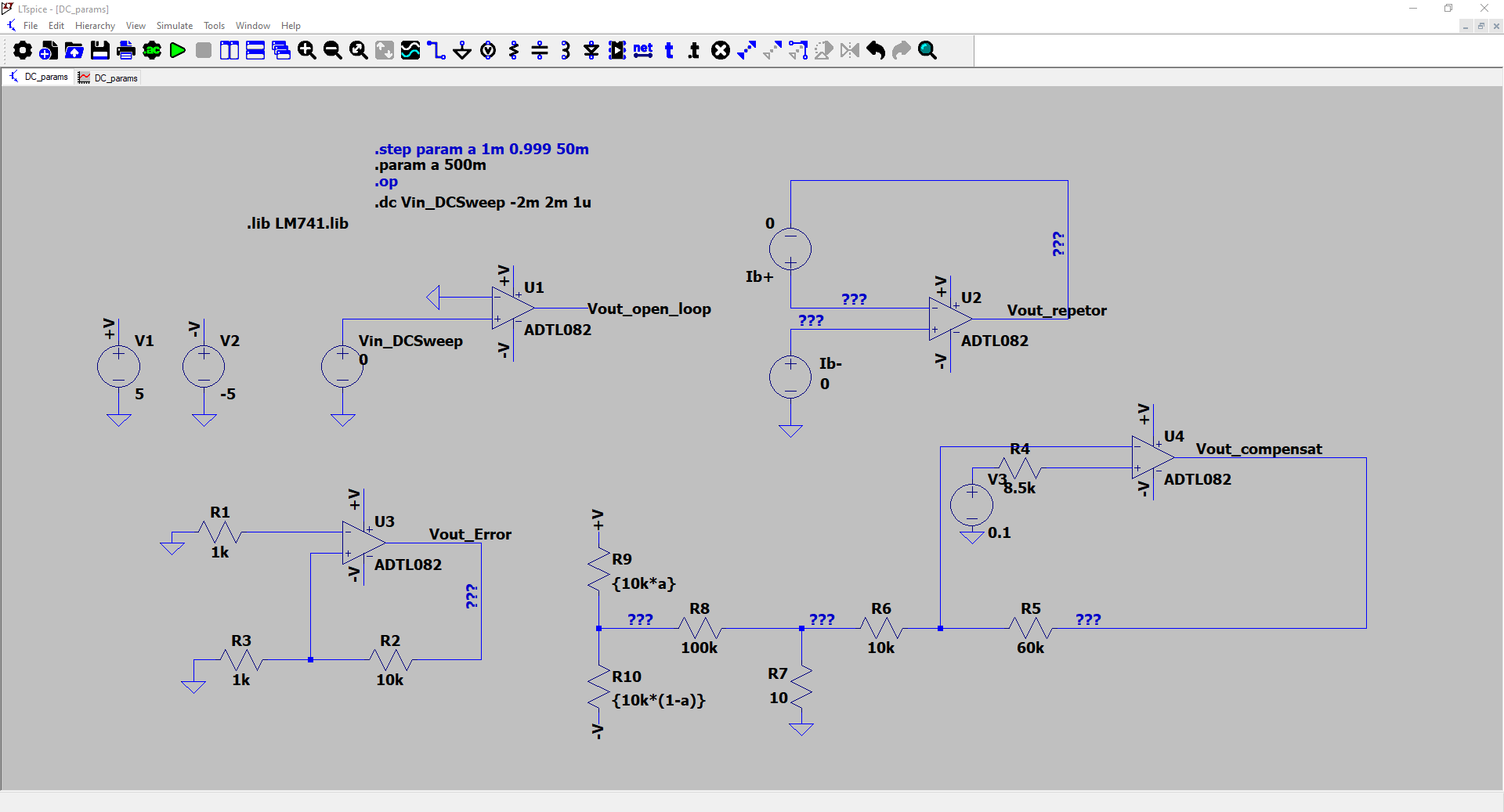




Avand in vedere specificatiile avem urmatoarele rezultate:

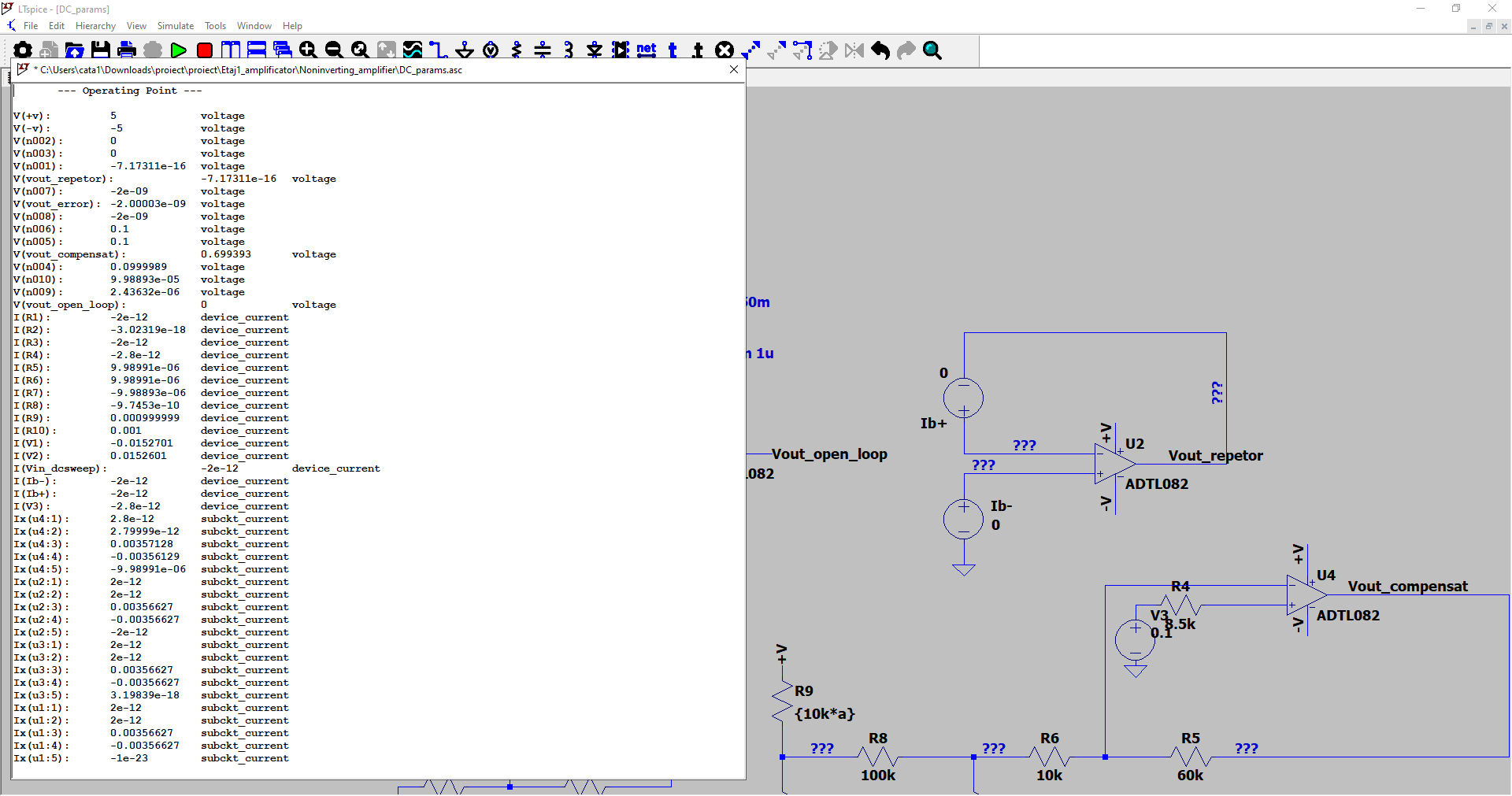
Pentru a obtine o amplificare de 7 avem nevoie sa dimensionam rezistenele in felul urmator: R1=10k, R2=60k, R3=R1||R2 =8.5k

Alegem si celelalte rezistente pentru a reduce efectul asupra amplificarii: RC1 =10 si RC2 =100k

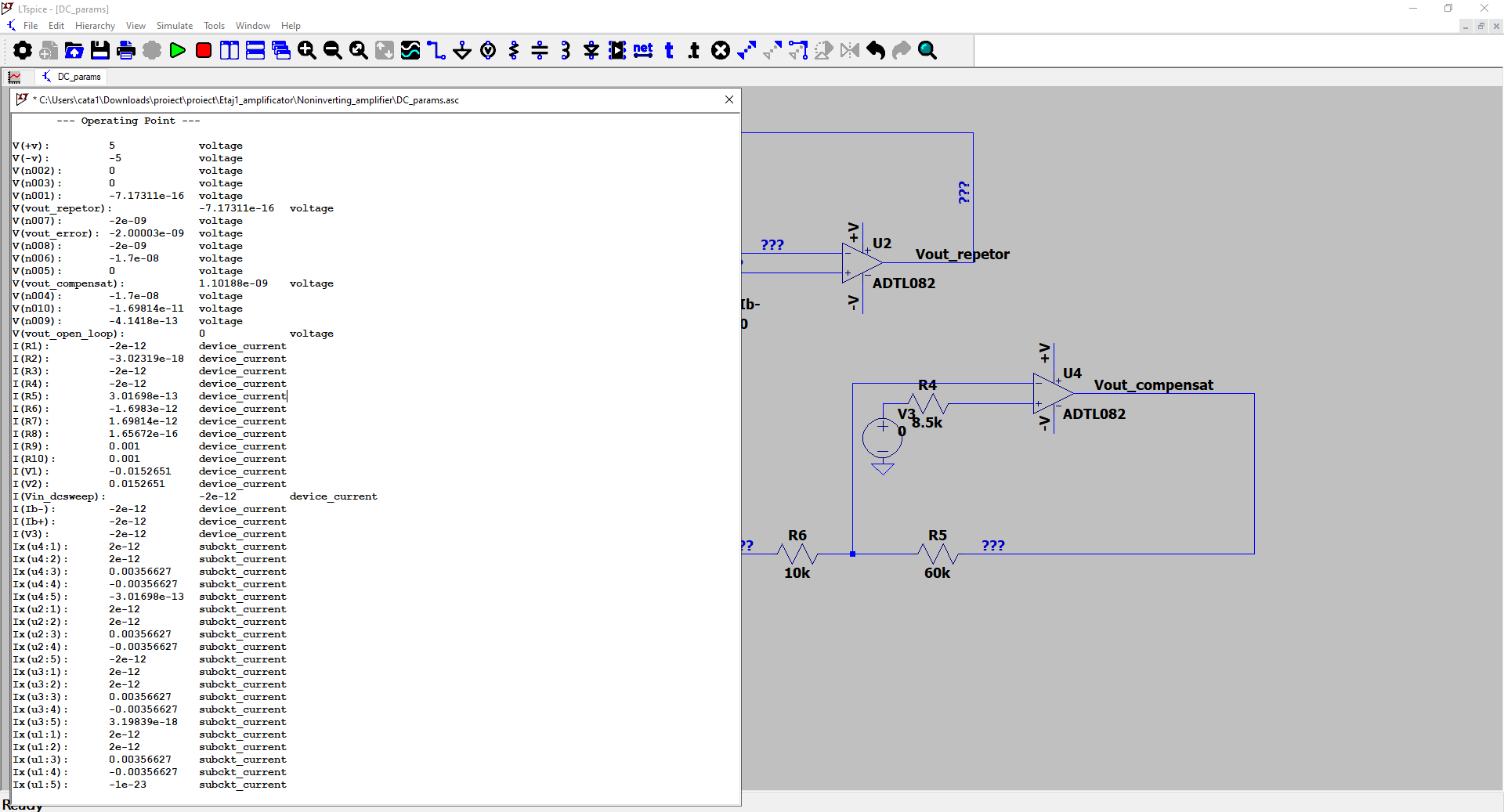


I.II) Simulari

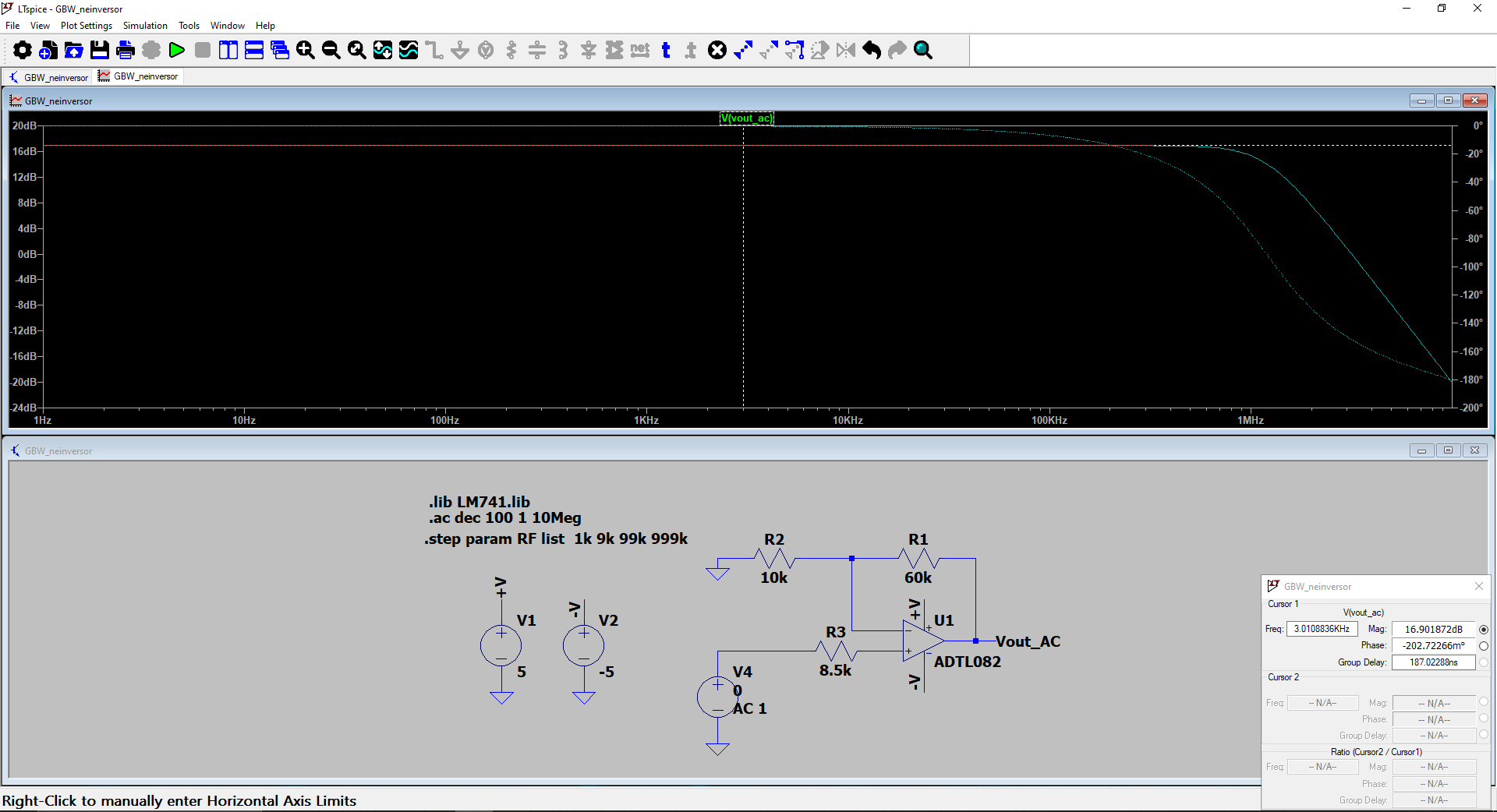
DCOP



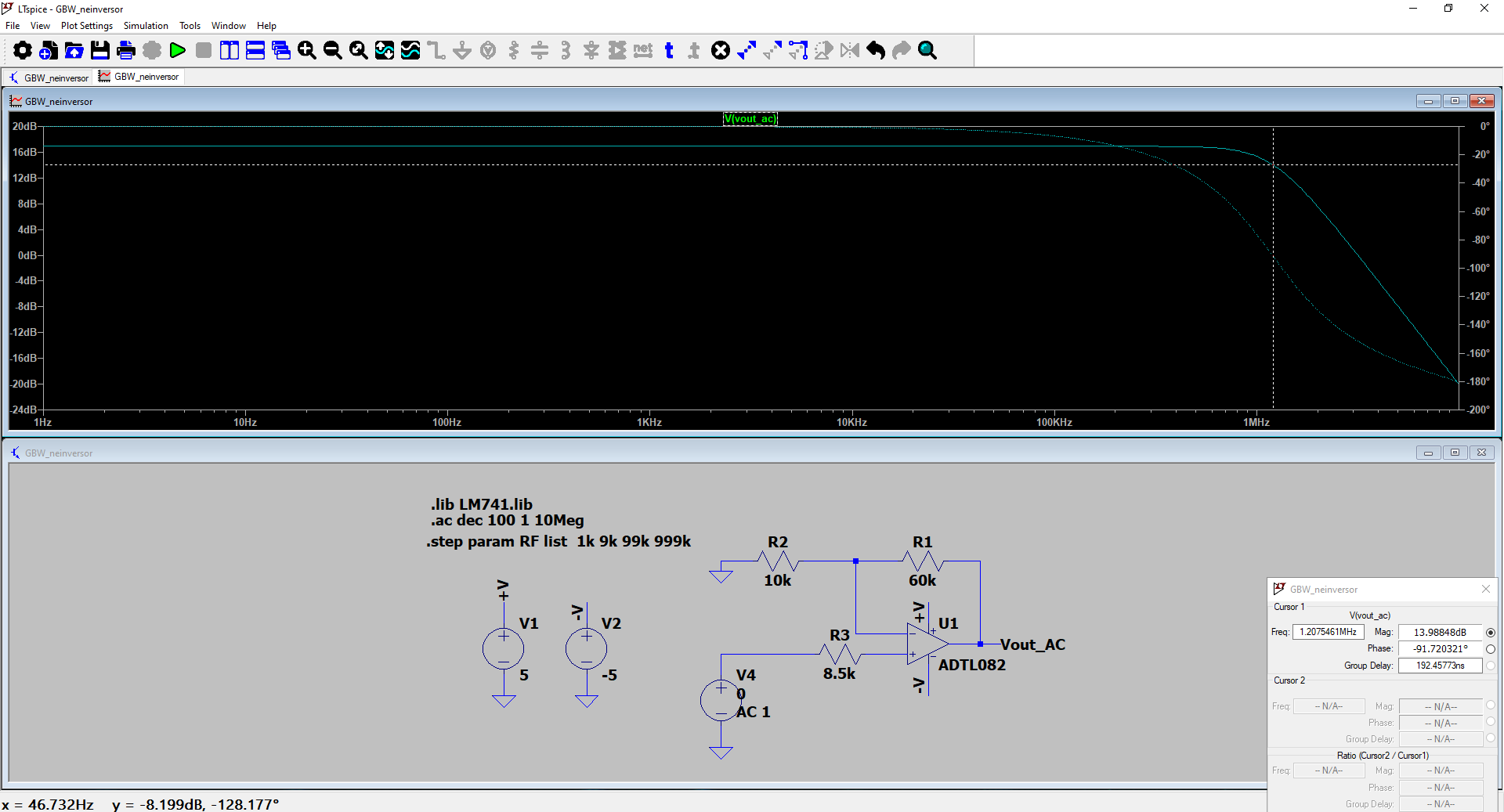
Compensare DC



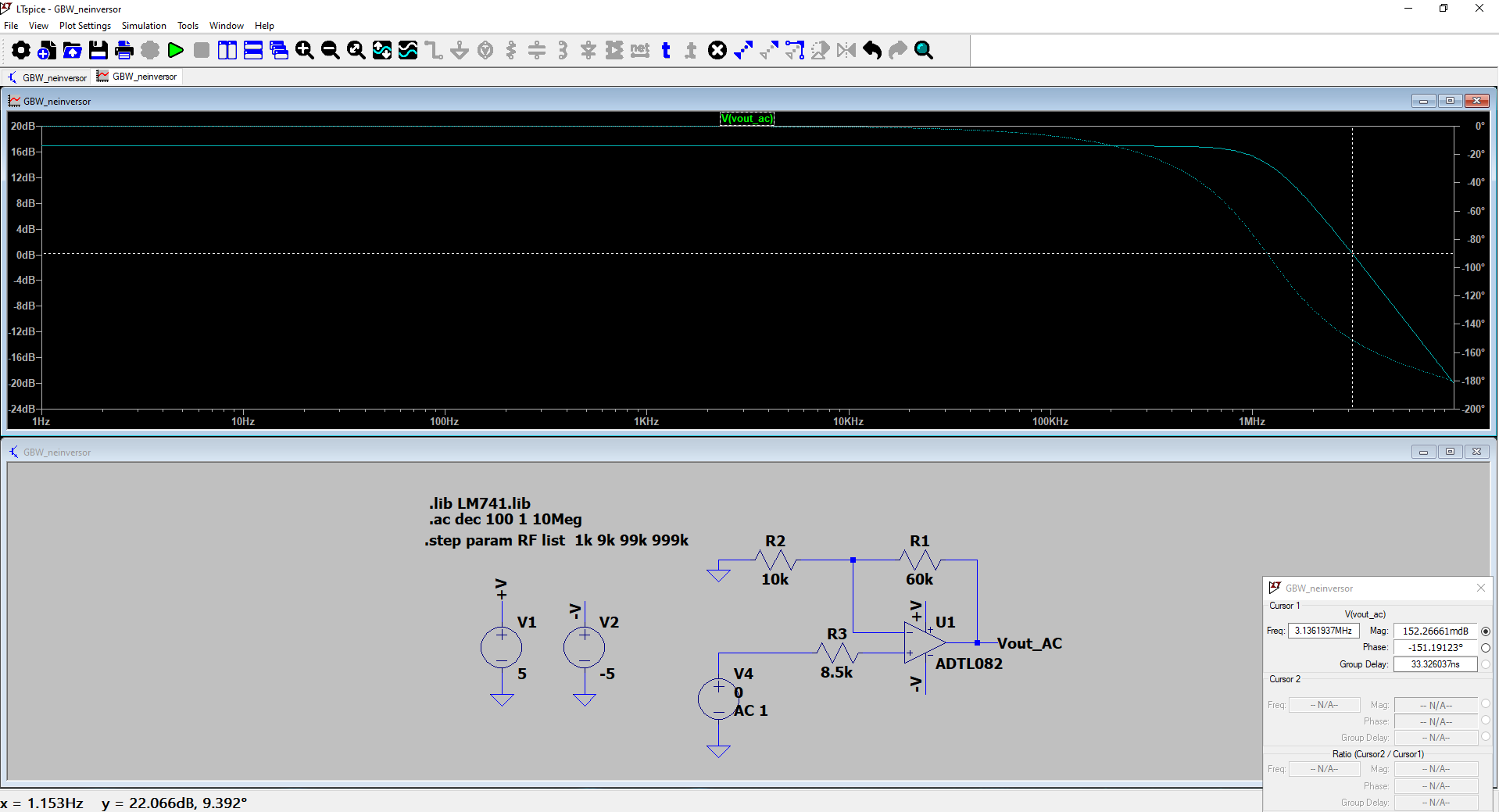
Castig la joasa frecventa



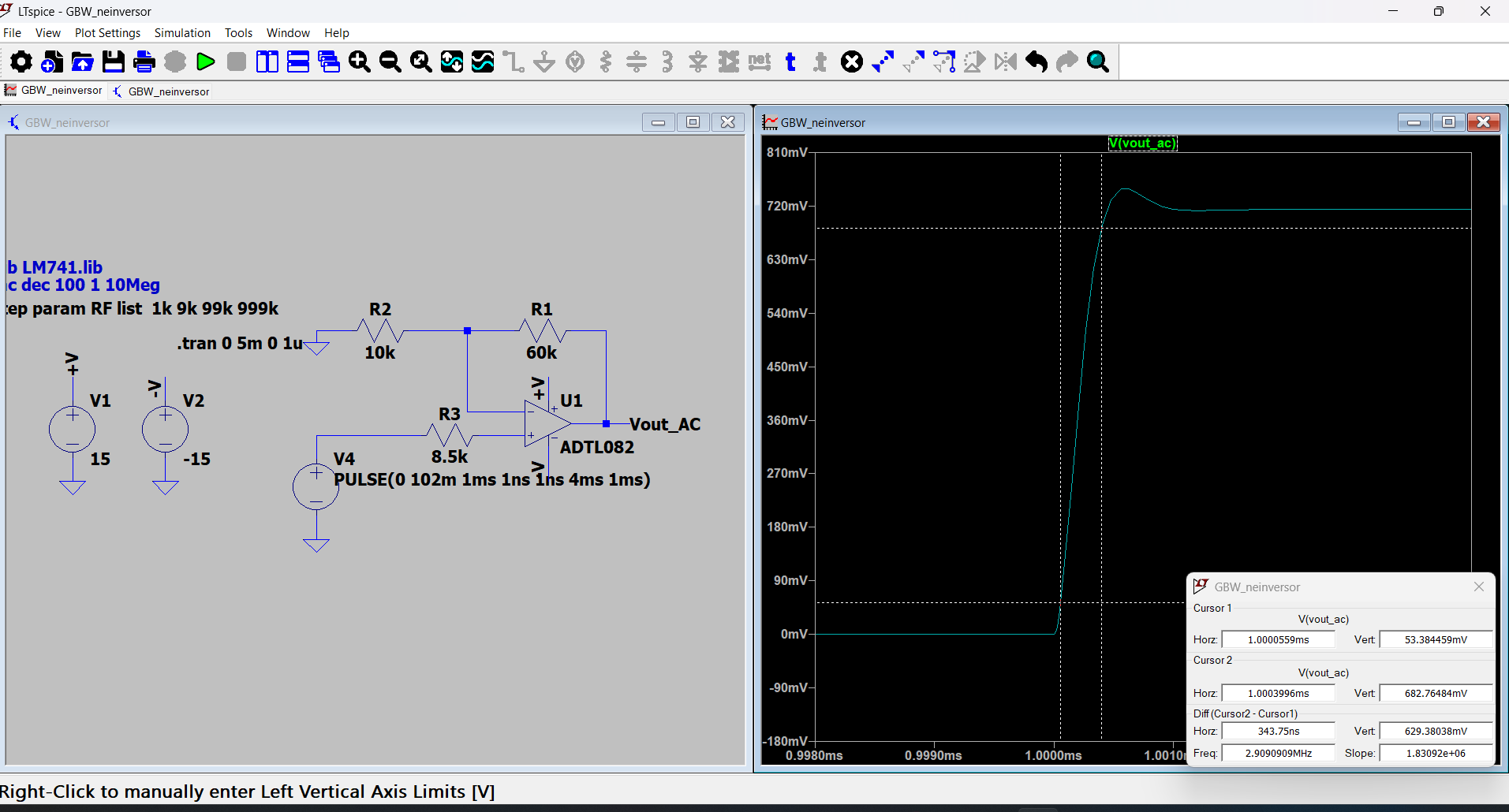
Banda



GBW

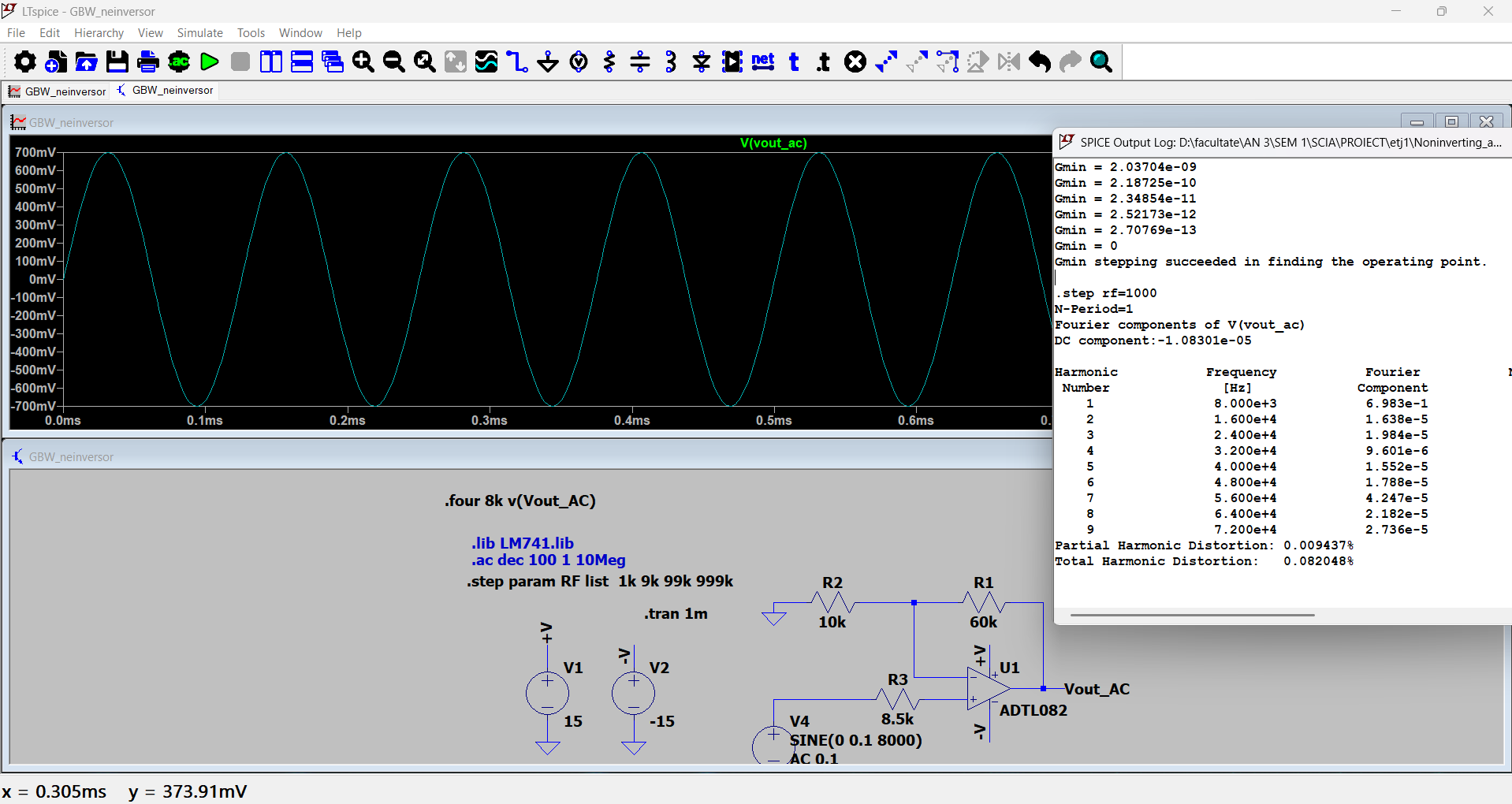


Slewrate

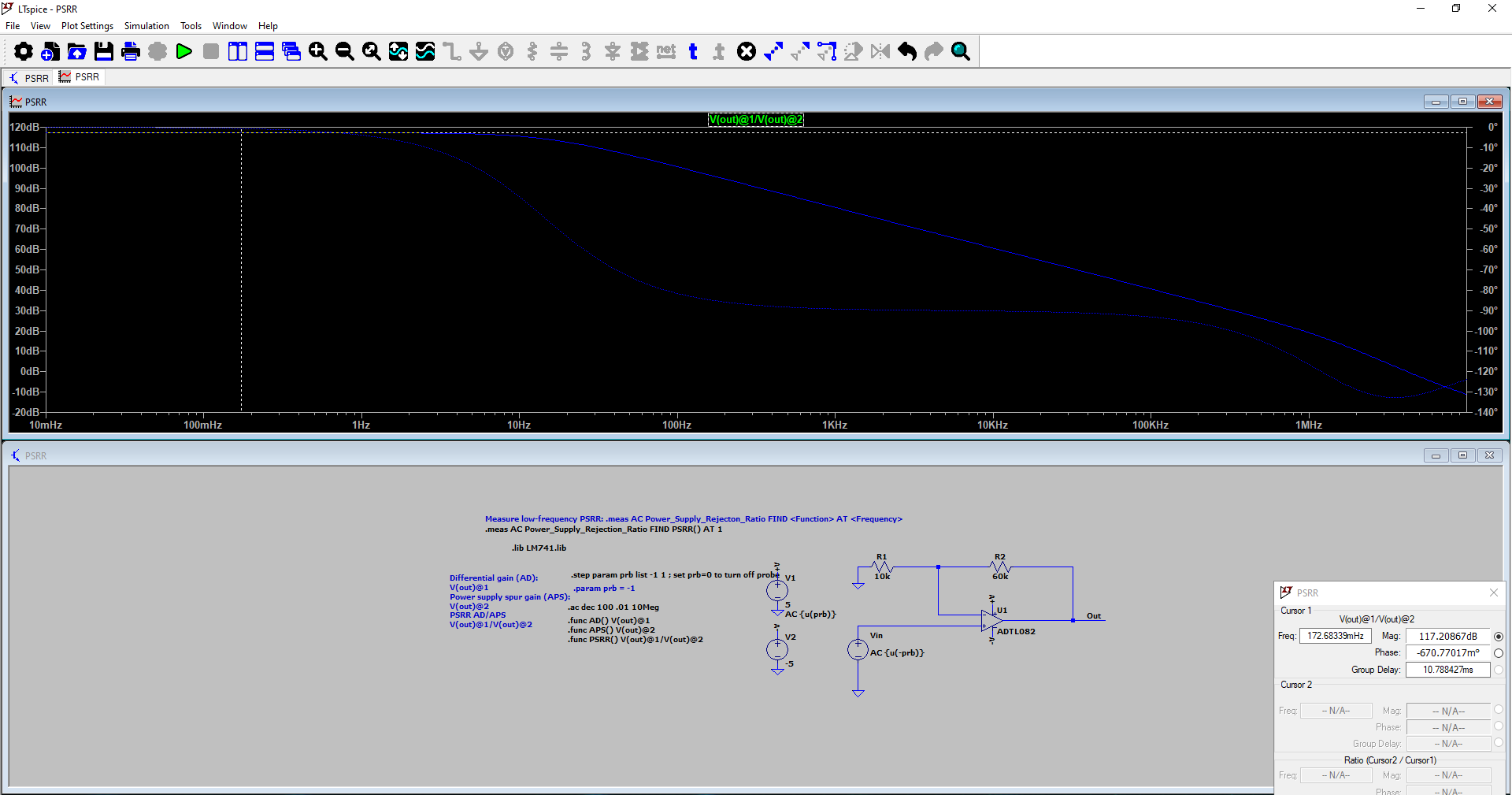


SR = 1.8 V/us

Liniaritate la fin>finmax



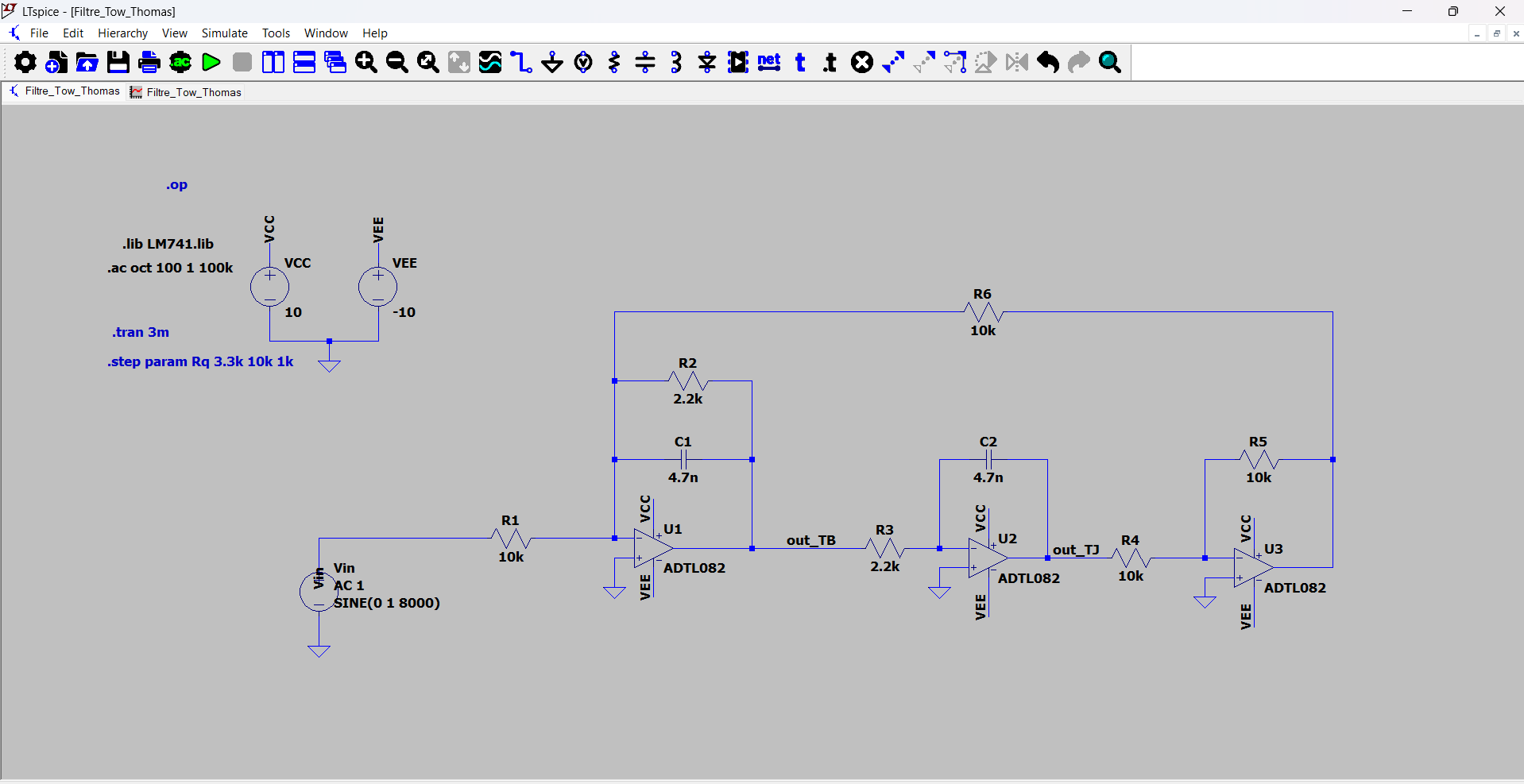
PSRR



II.I) Dimensionari

Ho-1, Banda-7000, Q-1.41, Rinmin-1k

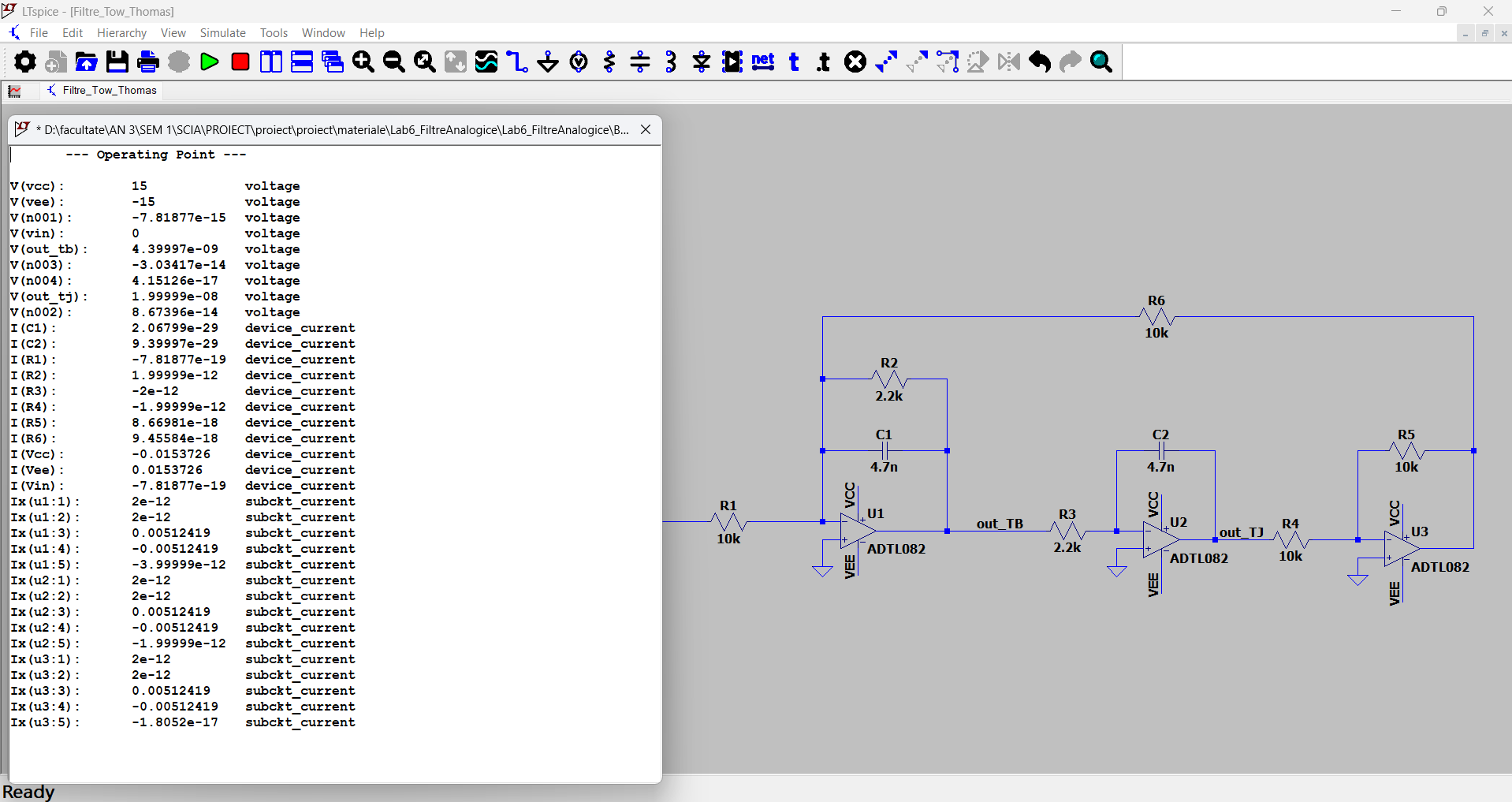
Filtru trece jos Tow-Thomas(V-V)



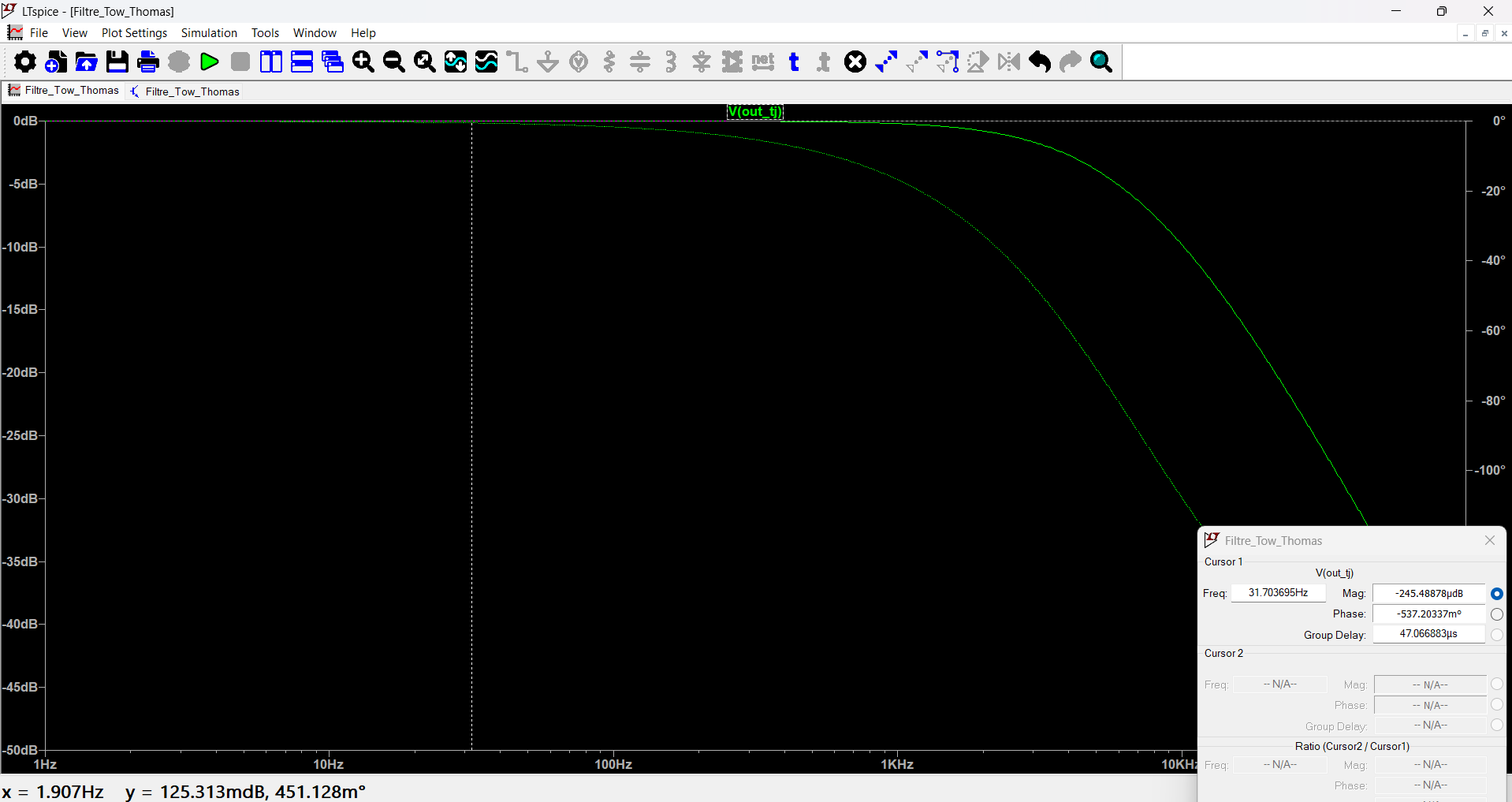


II.II) Simulari

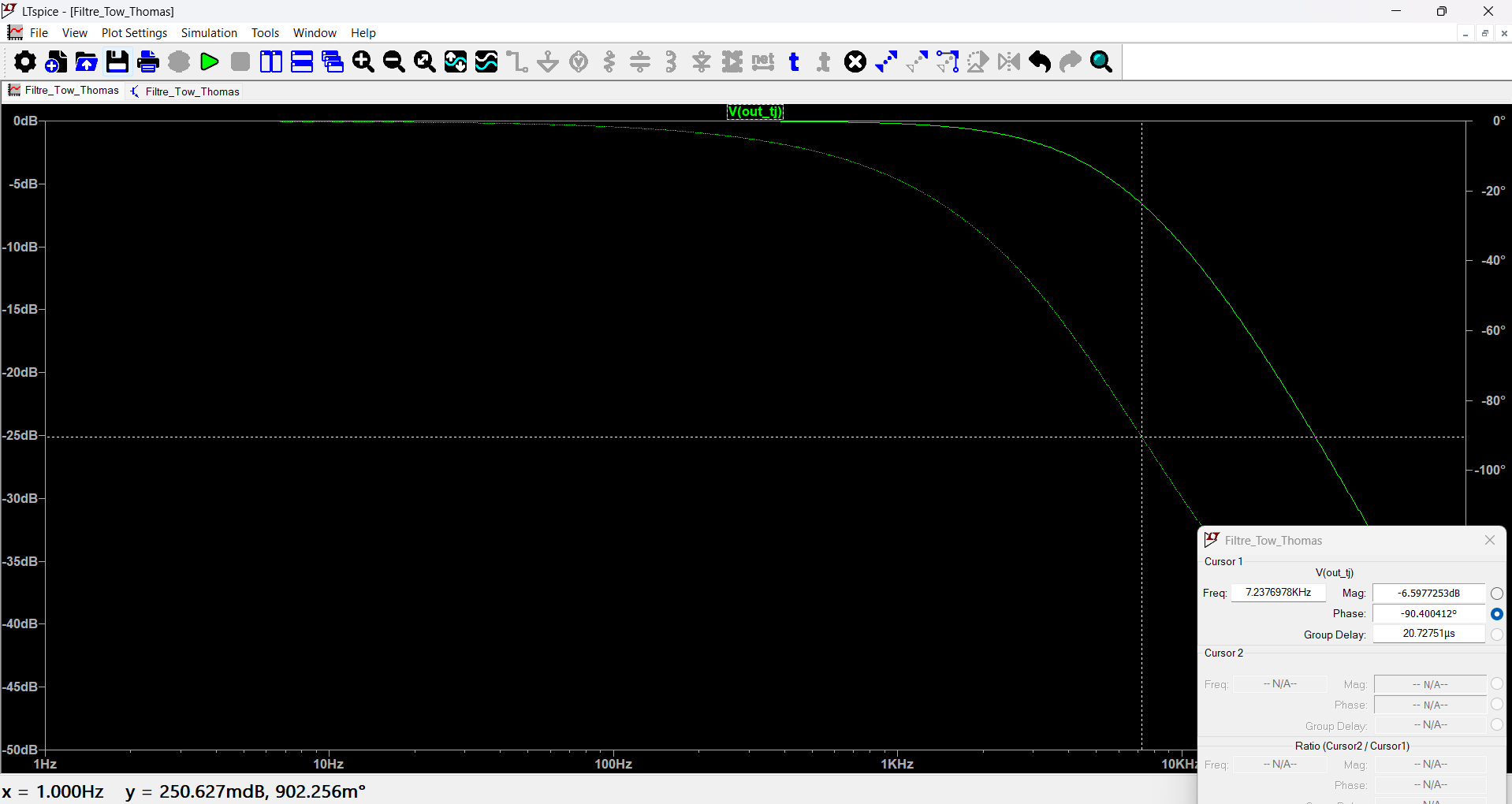
DCOP



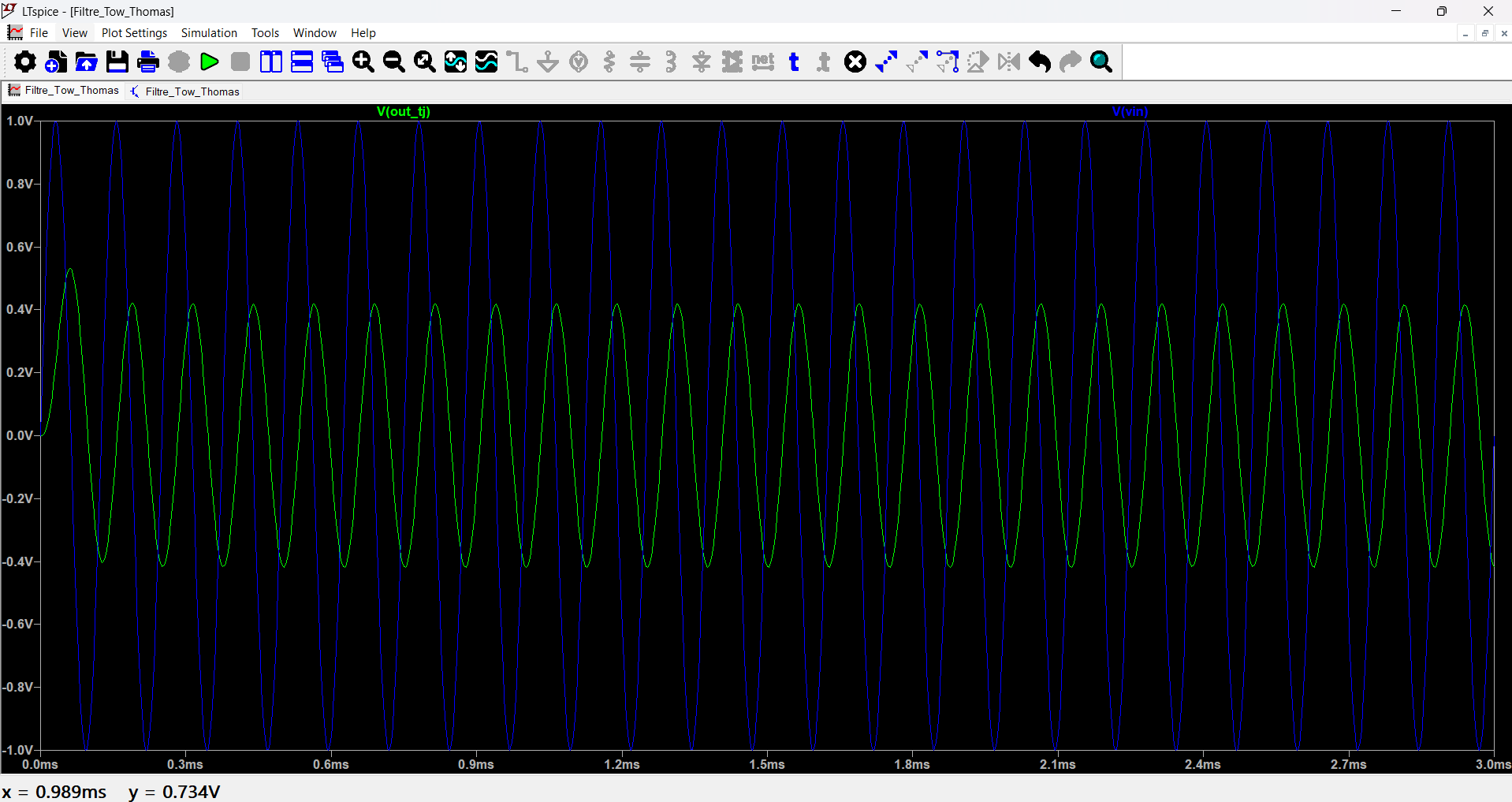
Ho



Banda



Liniaritate>specs

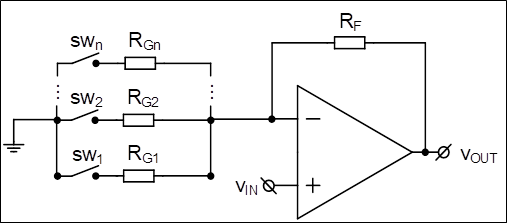


III.I) Dimensionari

castig minim [dB]-8

castig maxim [dB]-14

numar pasi-4



Pentru Sw1-On =>

Pentru Sw1,2-On =>

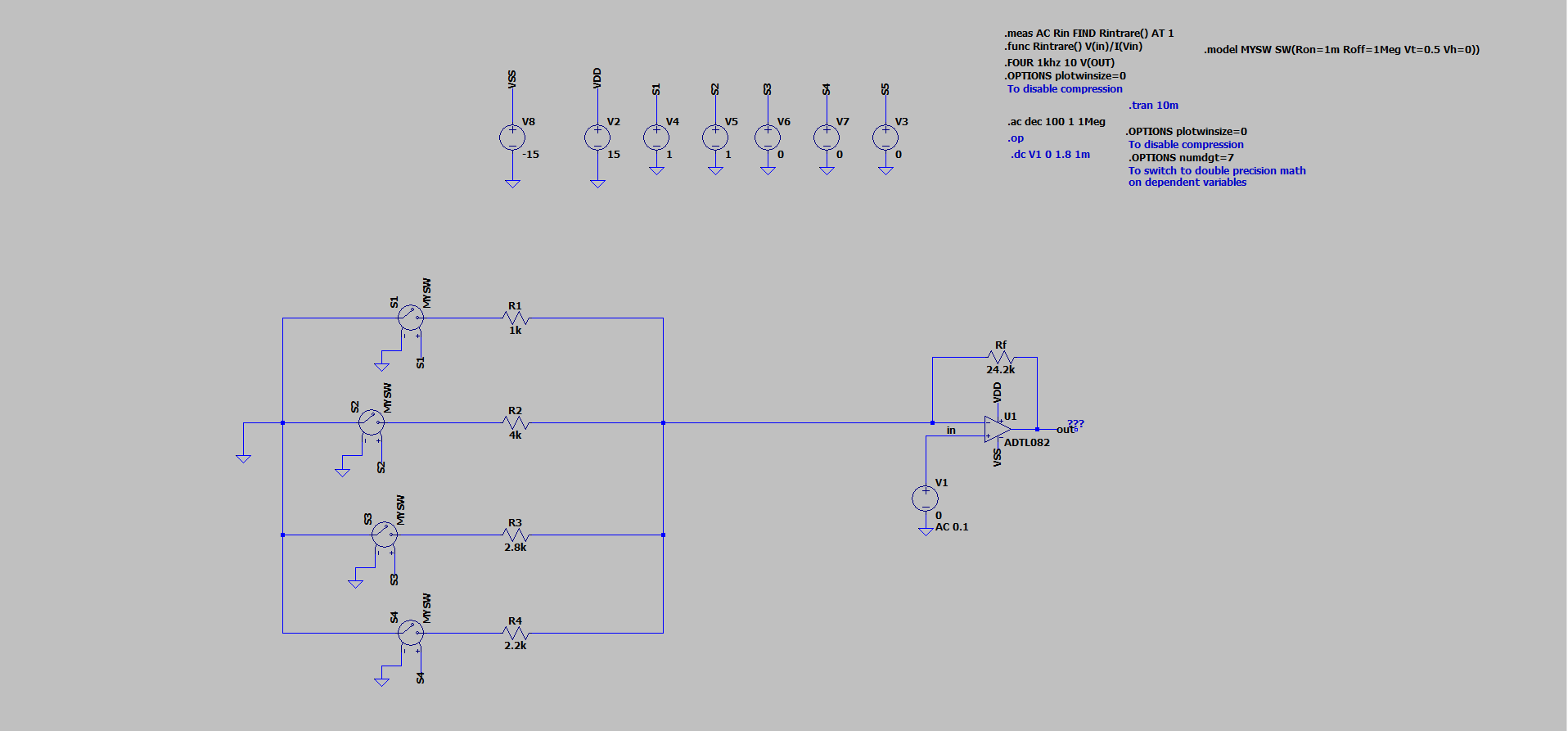
Pentru Sw1,2,3-On =>

Pentru Sw1,2,3,4-On =>

Avand in vedere relatiile acestea alegem urmatoarele valori:

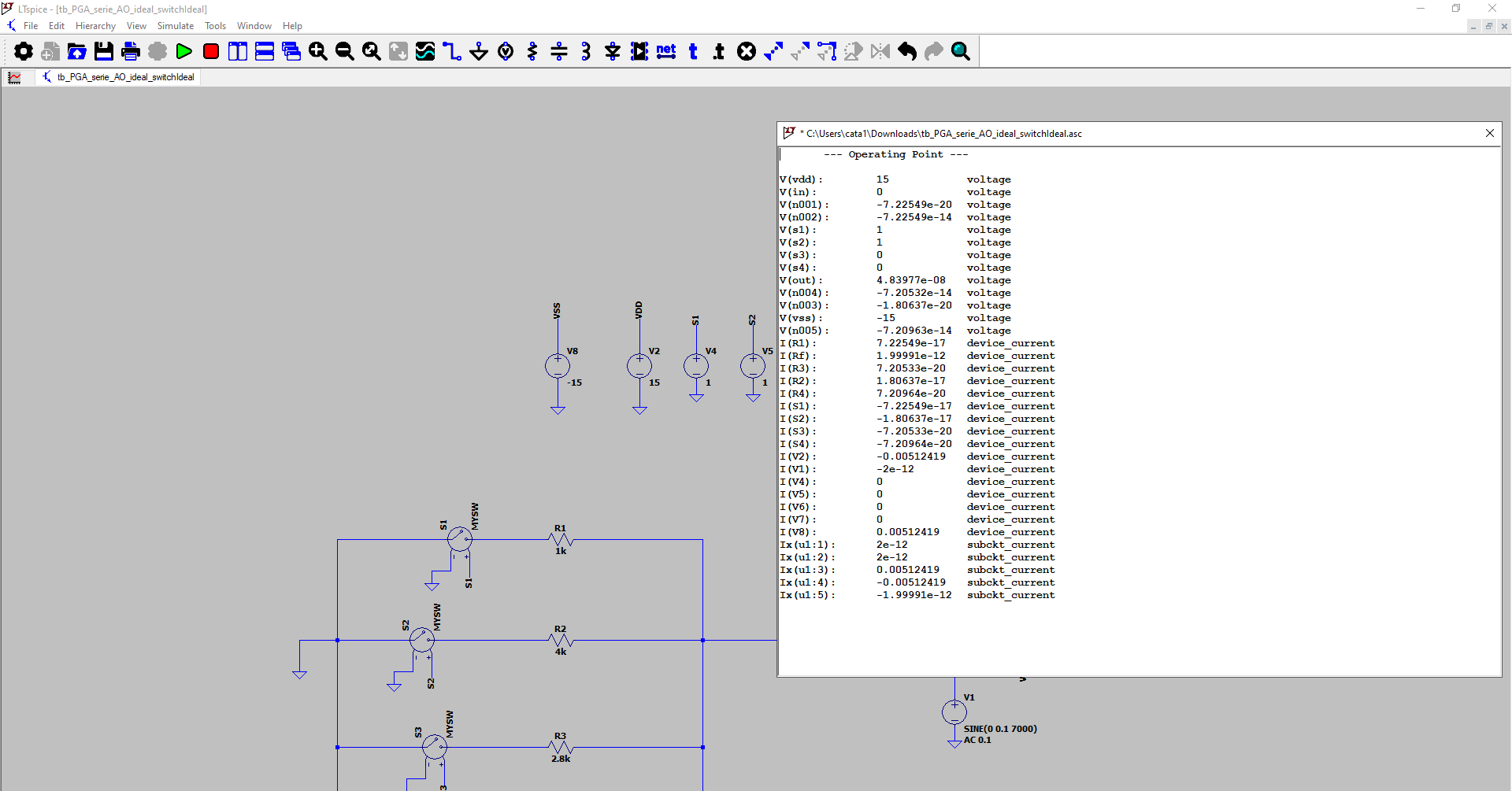
Vin=0.1(din cerinta)

Rf=24.2k, Rg1=1k, Rg2=4k, Rg3=2.8k, Rg4=2.2k

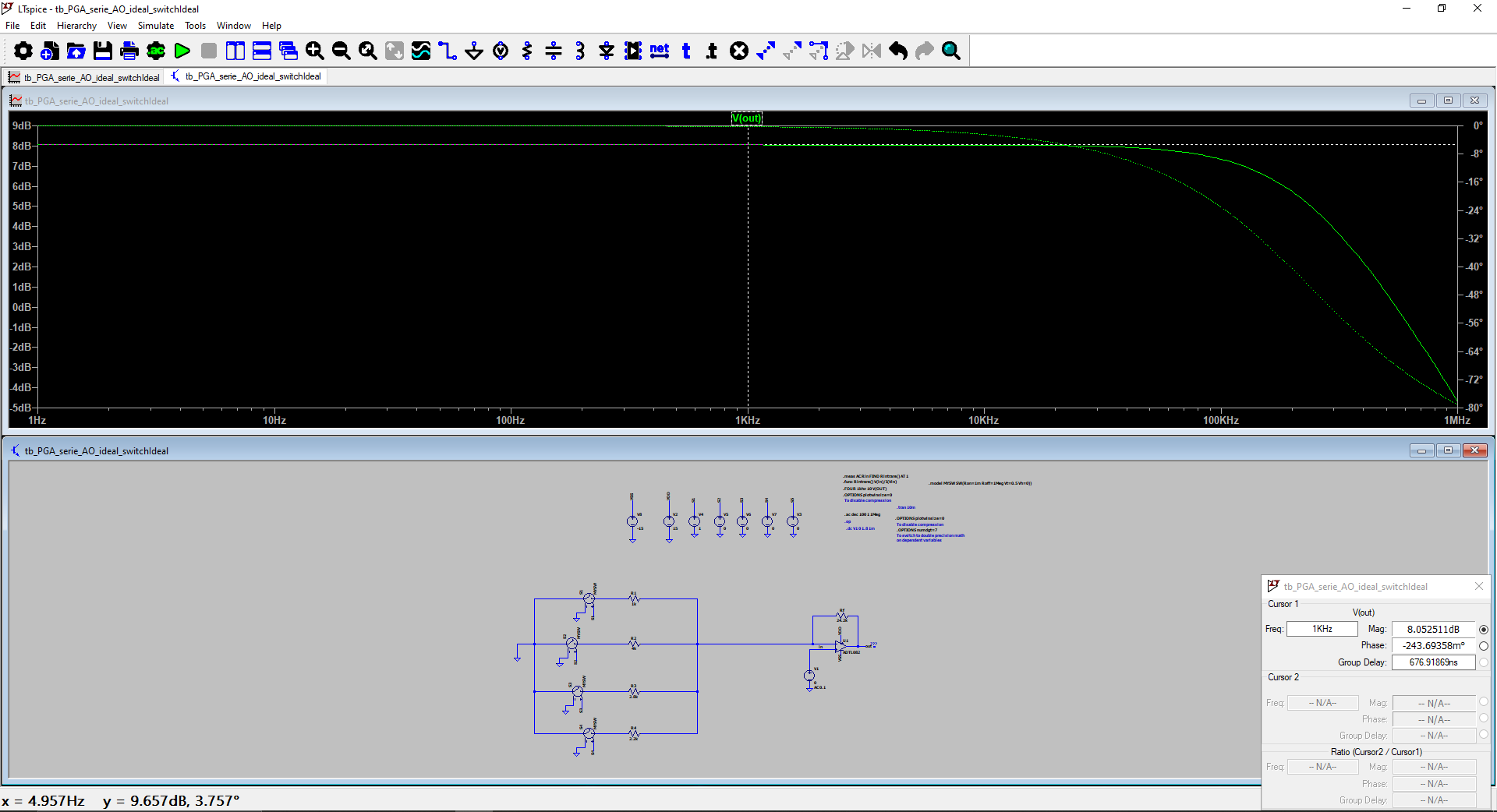


III.II) Simulari

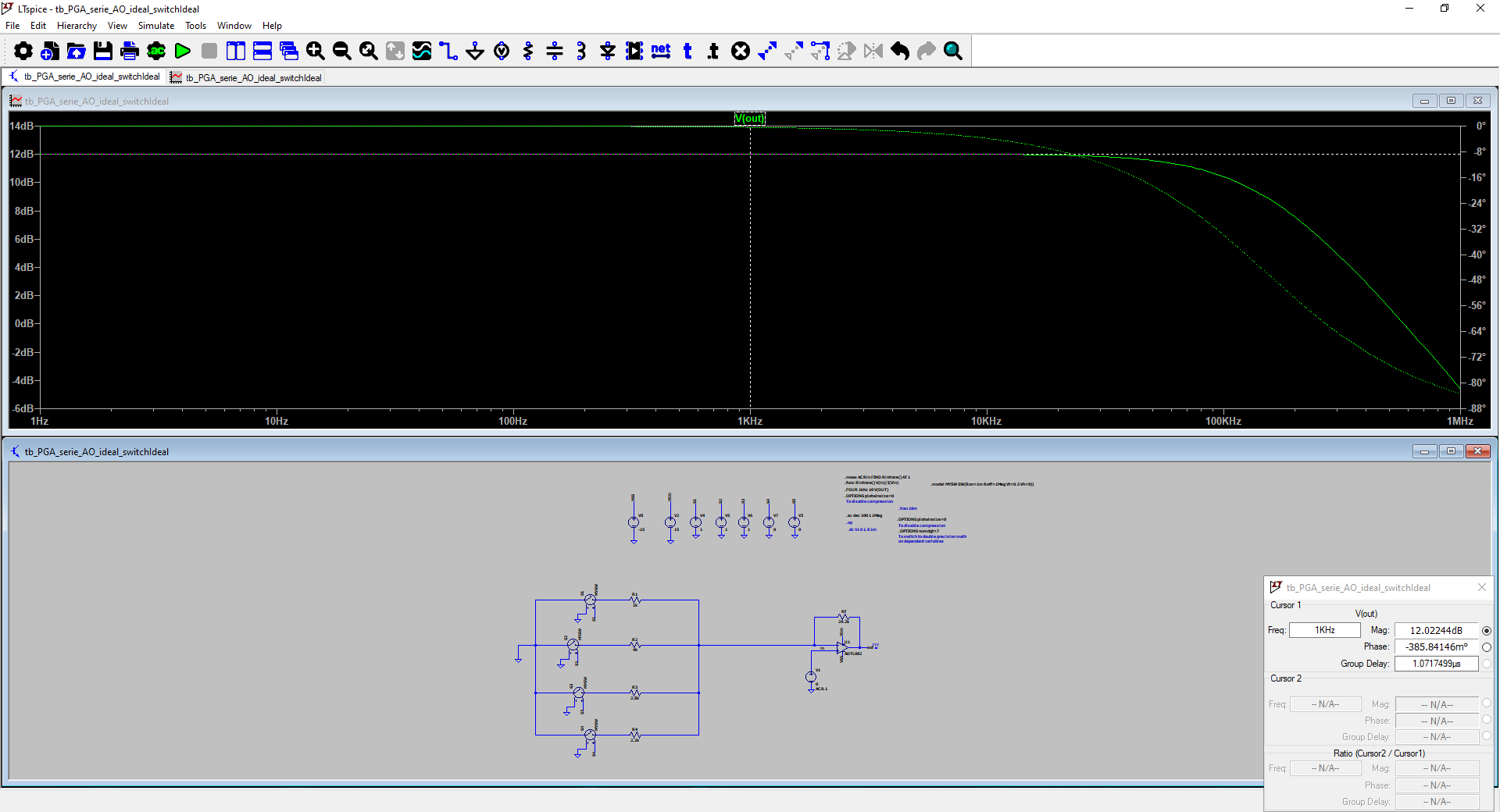
DCOP

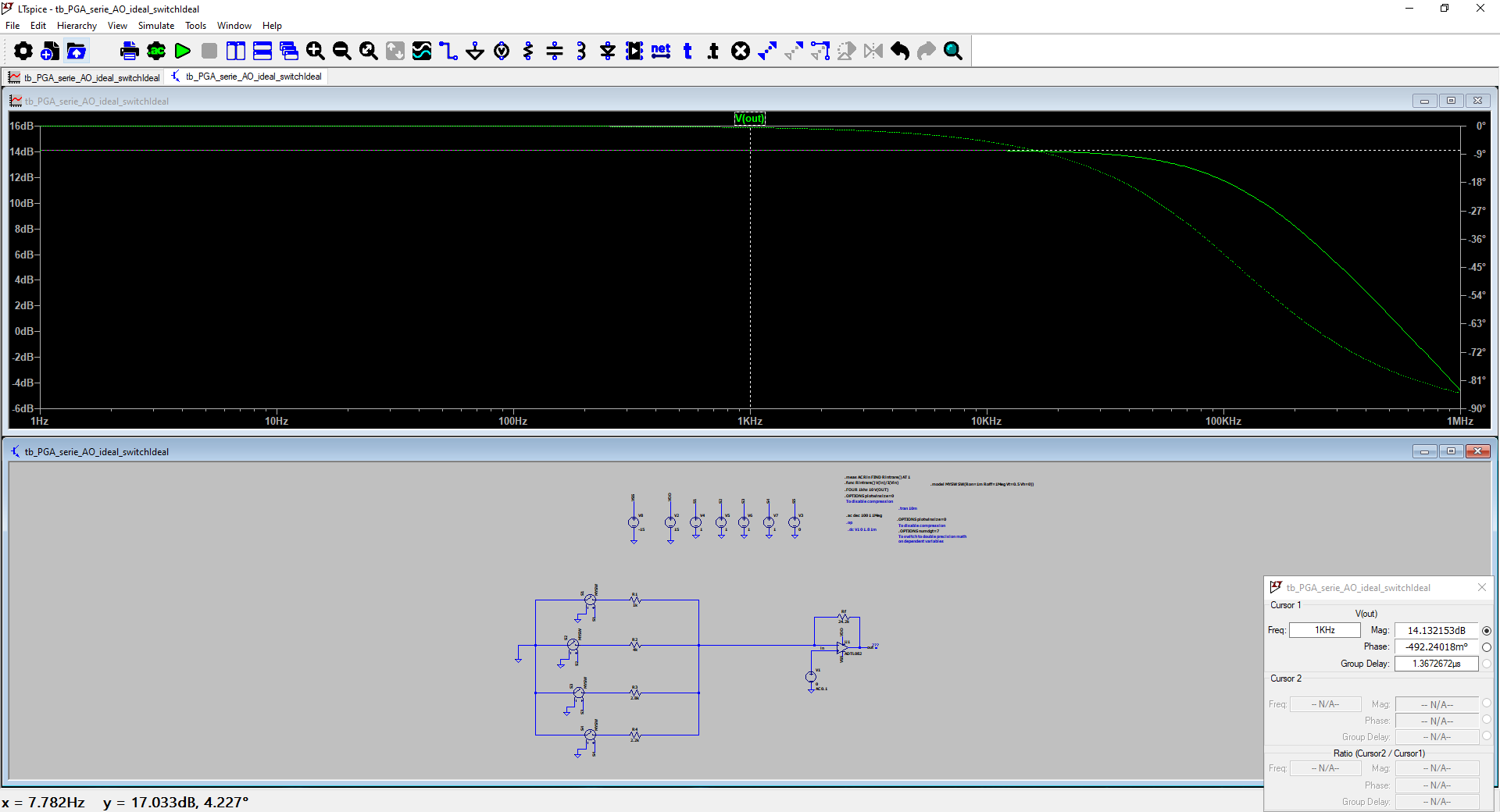


Cu aceste valori avem urmatoarele rezultate:

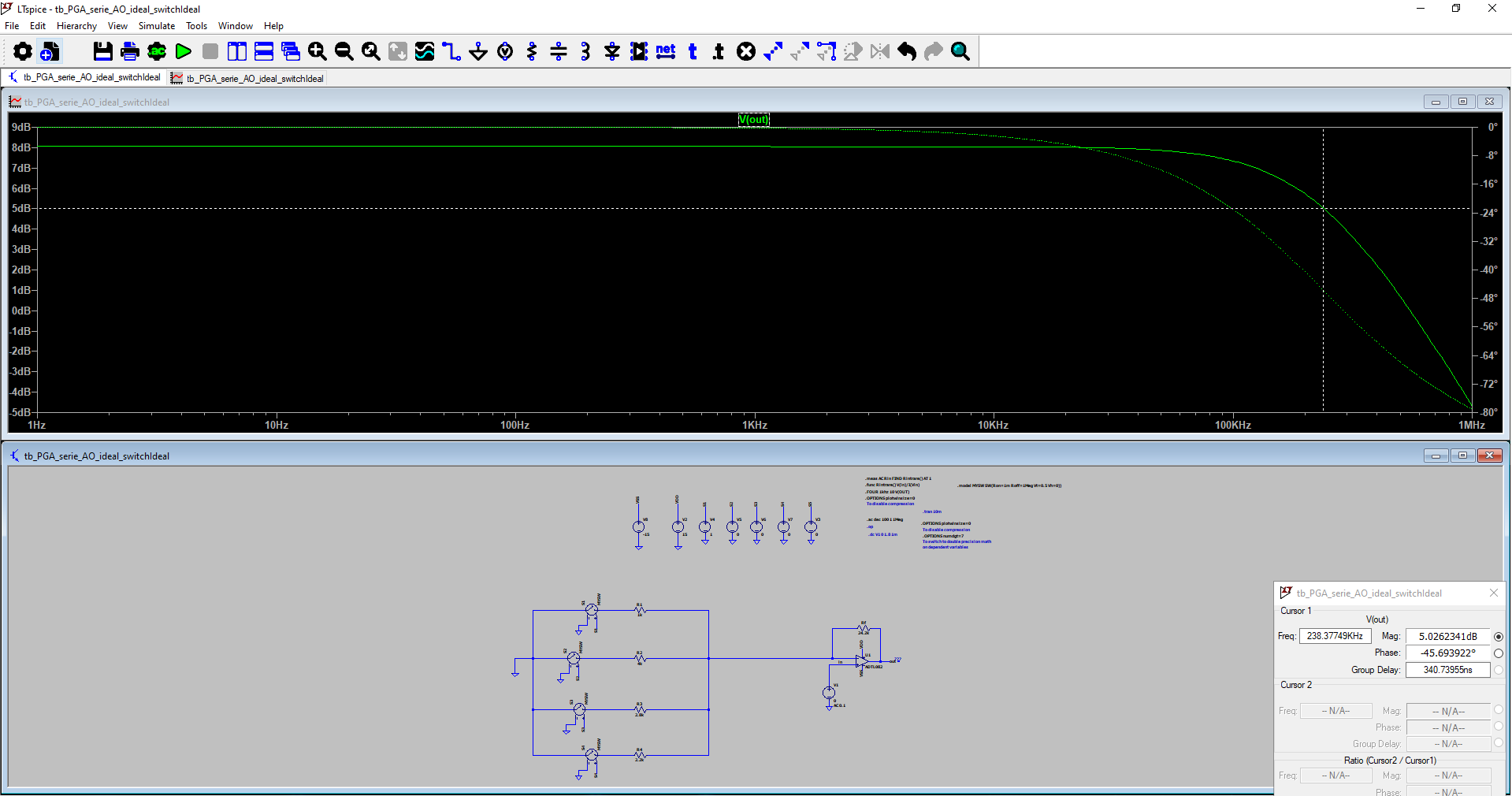








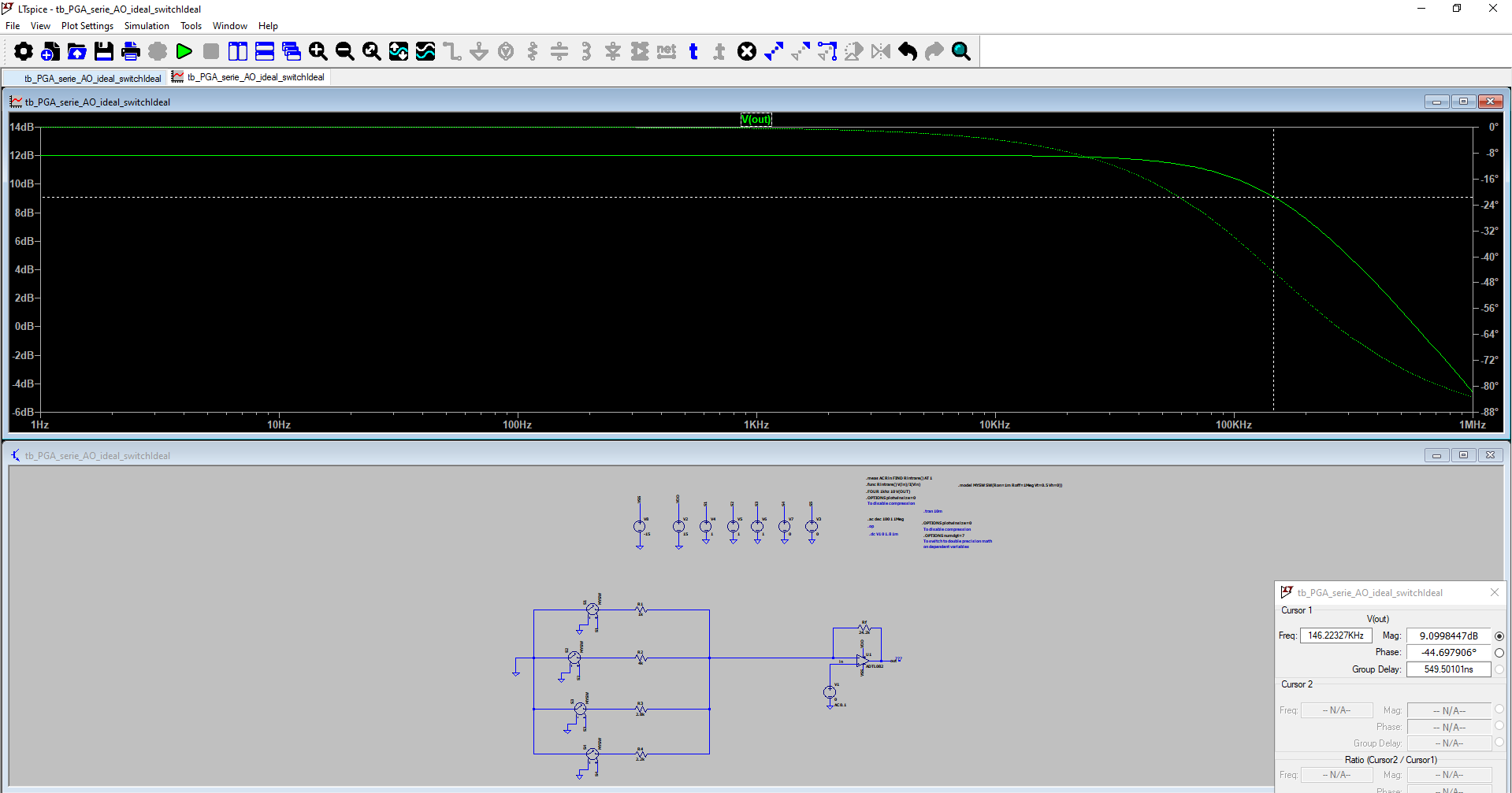
Banda pentru primul pas



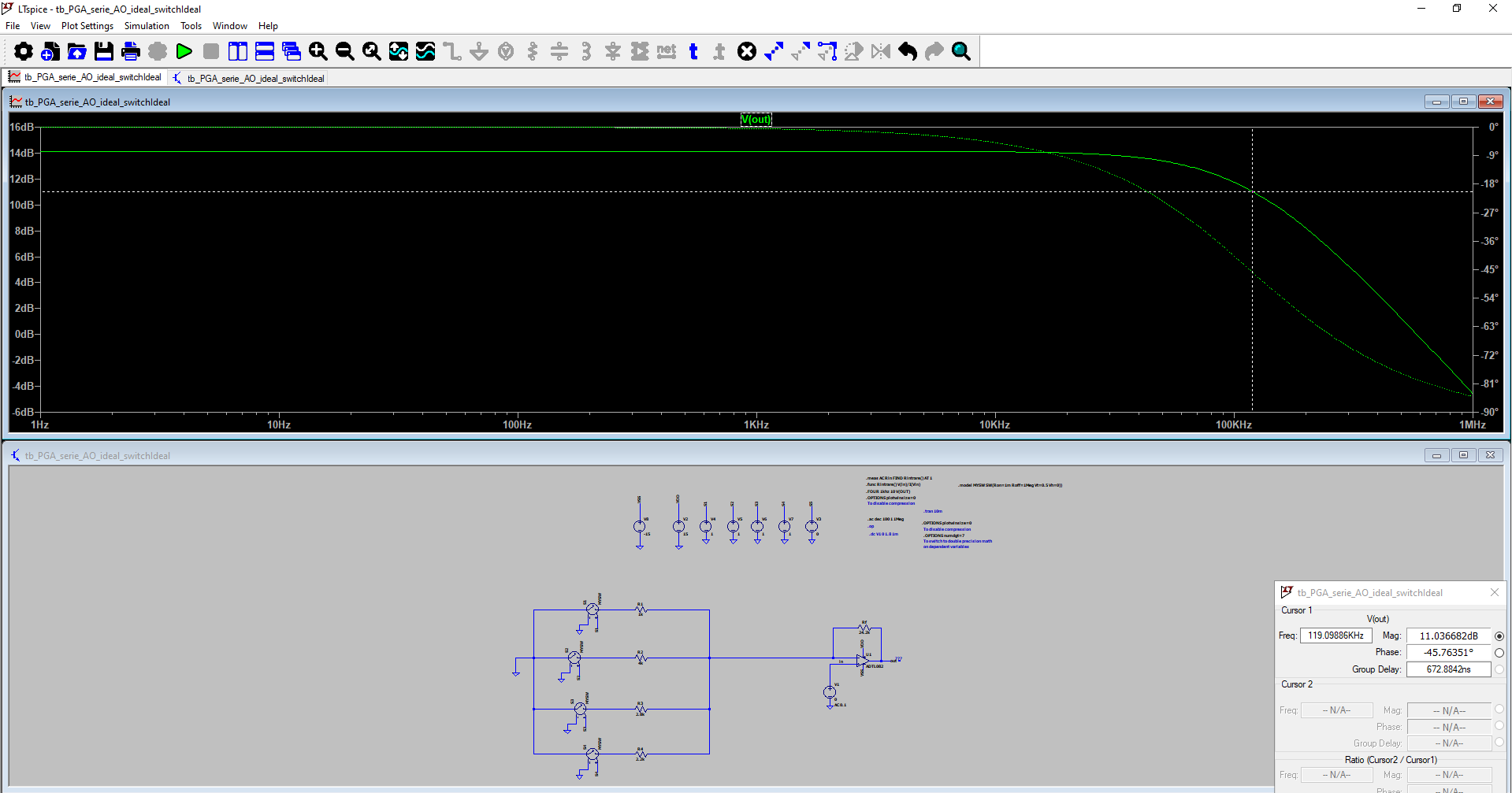
Banda pentru al doilea pas



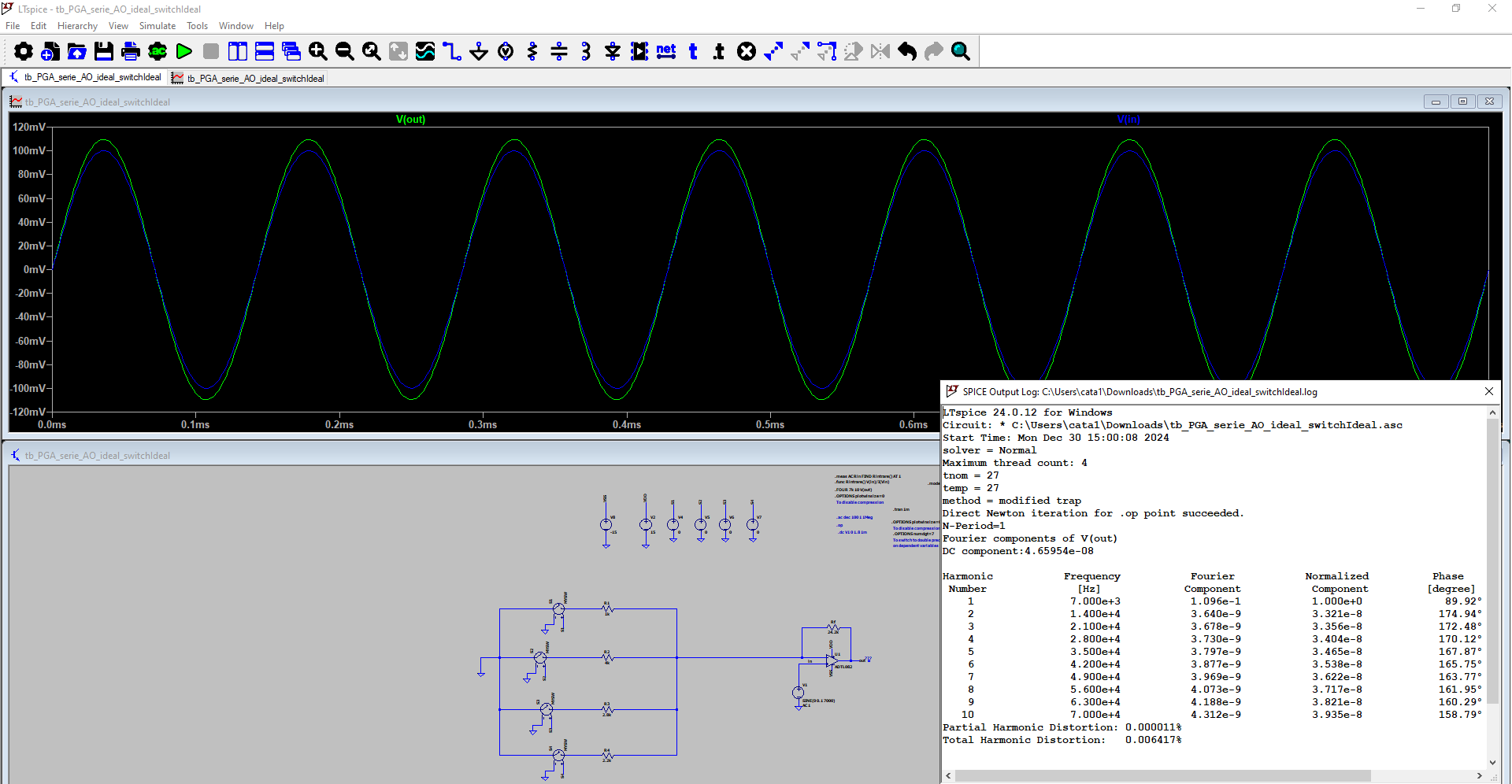
Banda pentru al treilea pas



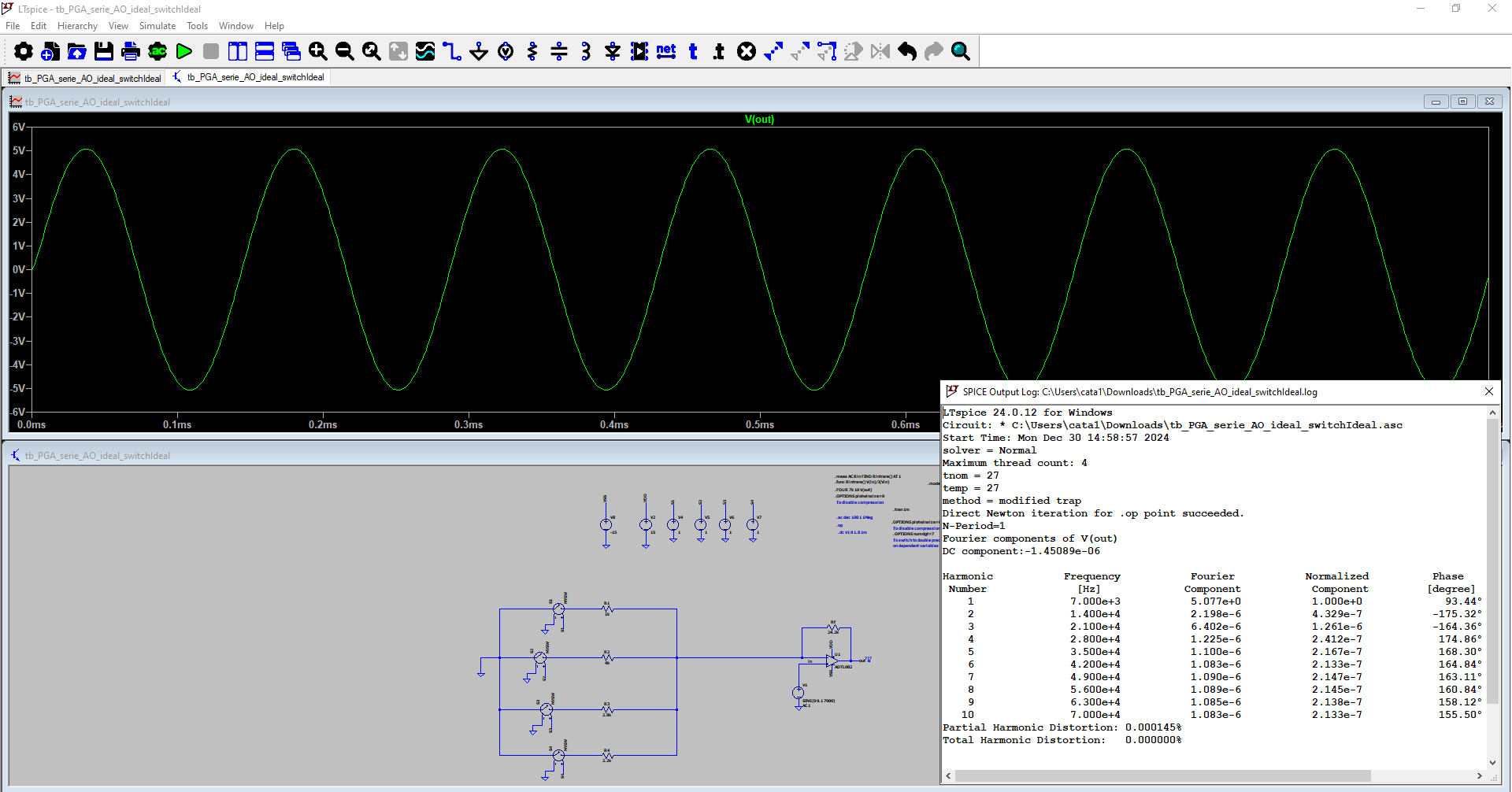
Banda pentru al patrulea pas



Analiza tranzitorie pentru castig minim



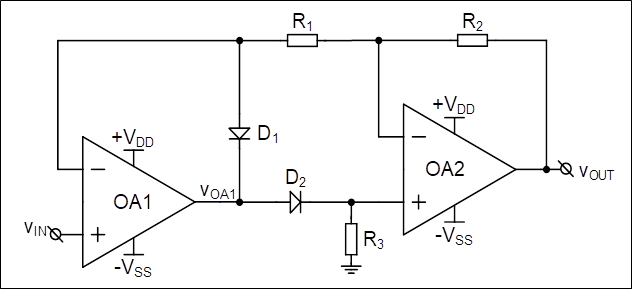
Analiza tranzitorie pentru castig maxim

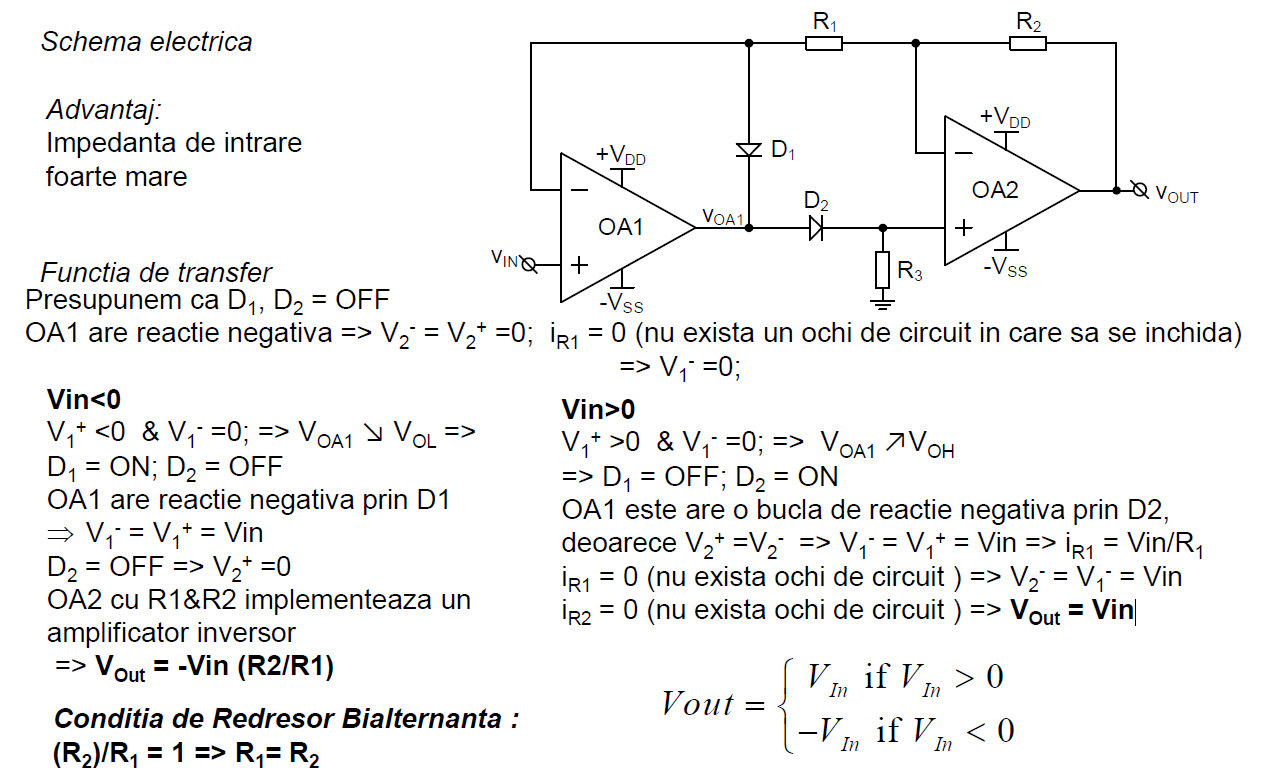


IIII.I) Dimensionari

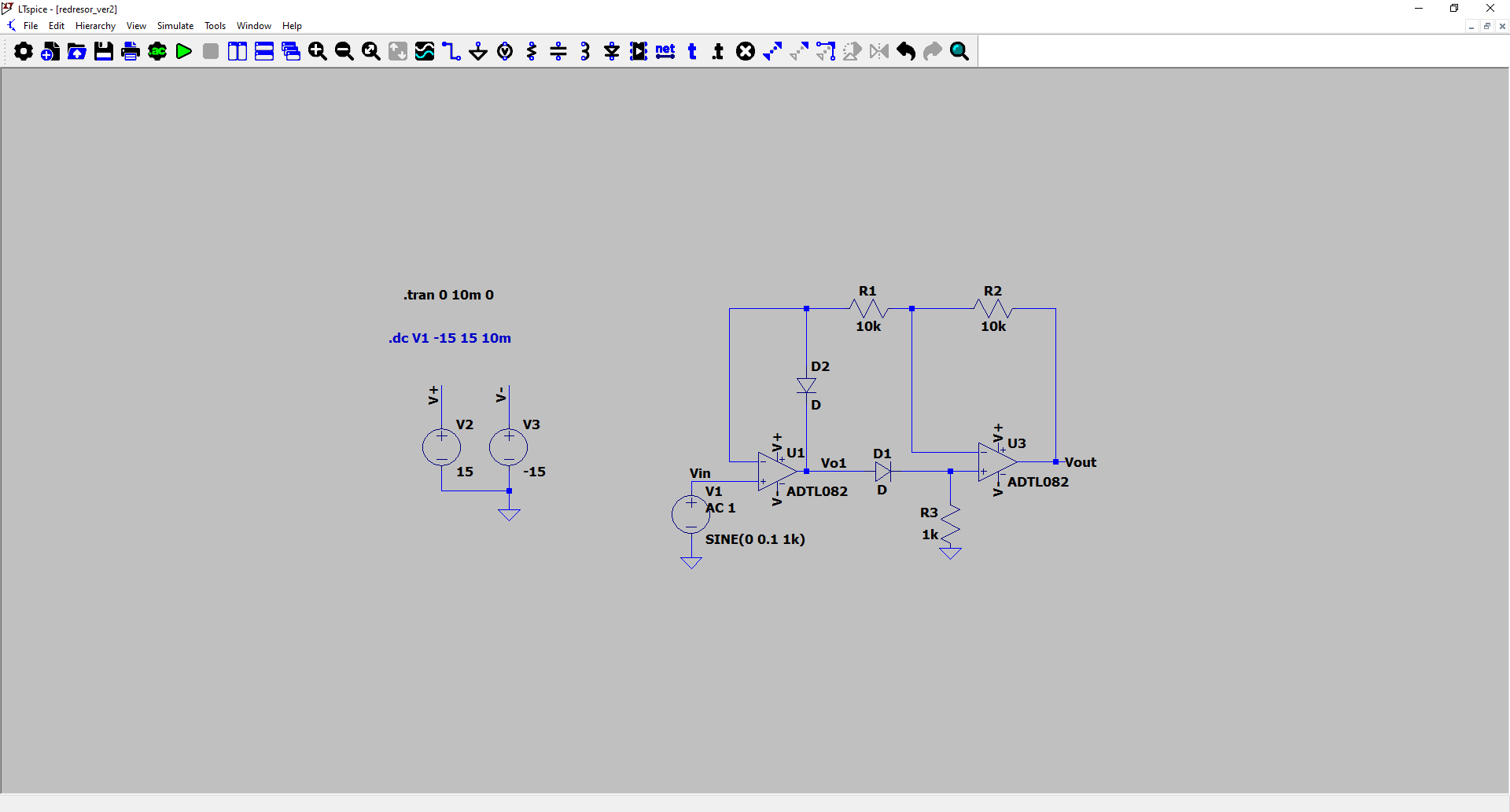
Tip etaj-9

Castig in liniar-1



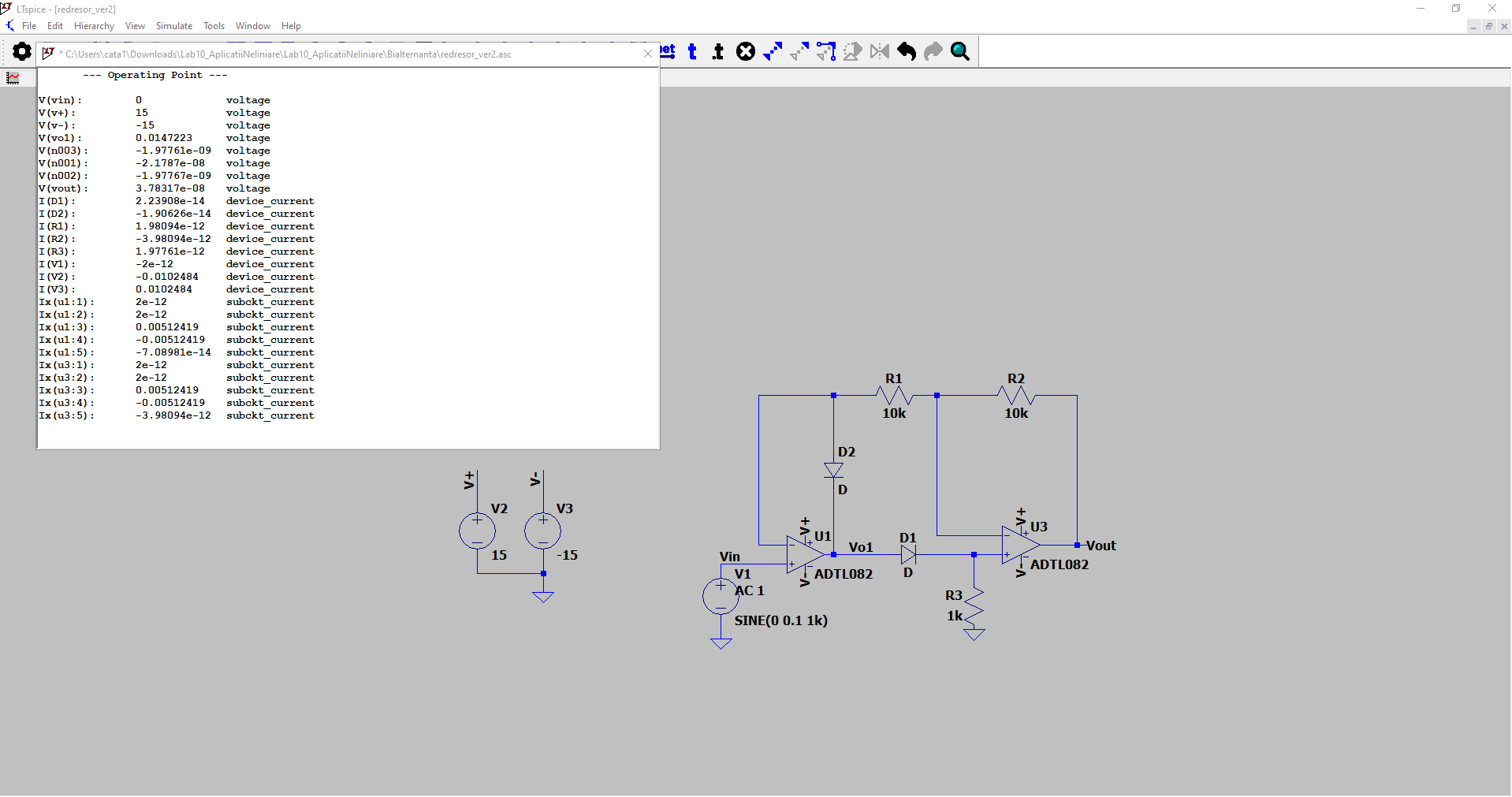


Pentru a realiza castigul liniar-1, alegem R1=R2=10k, si R3=1k

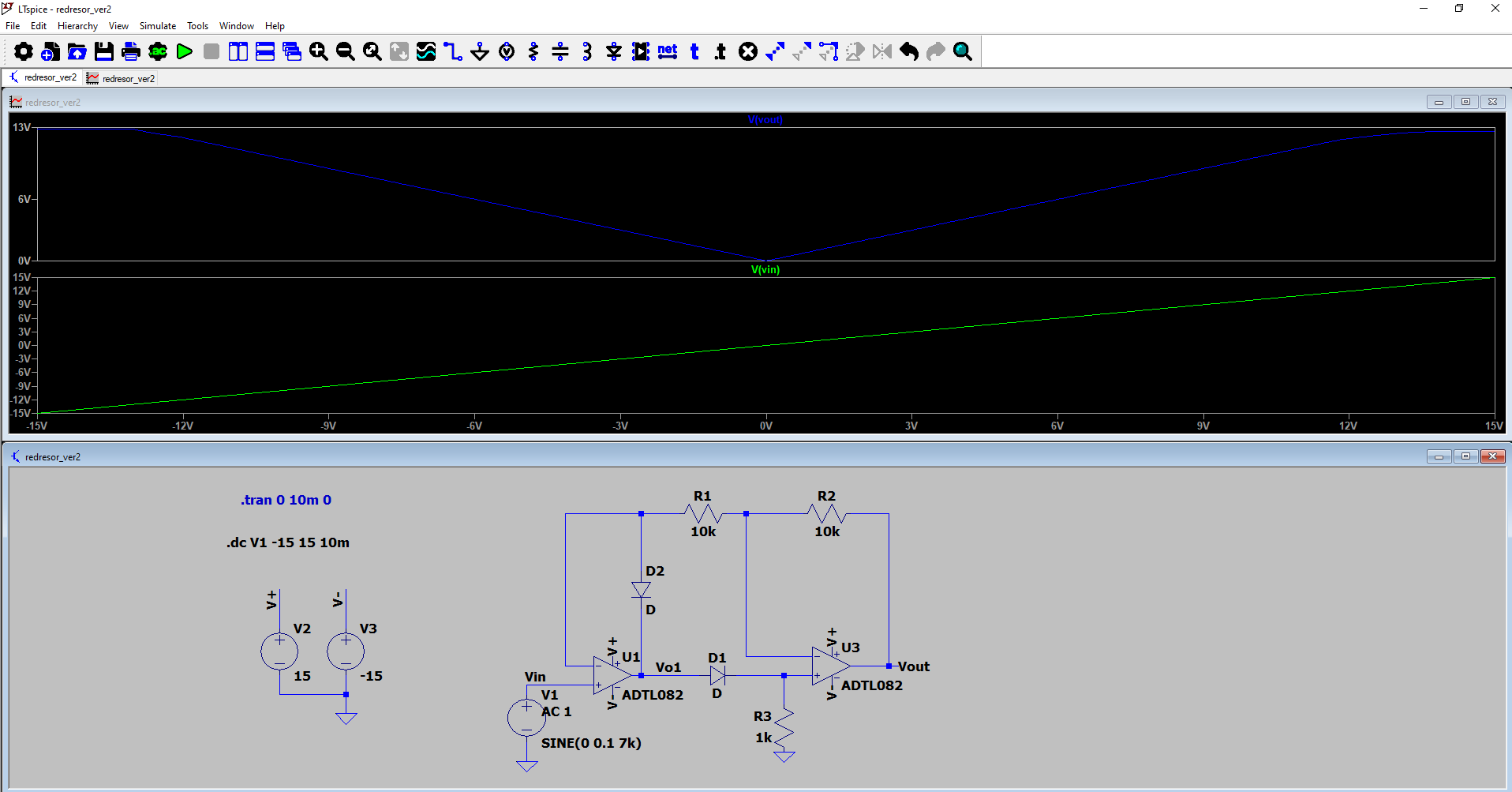


IIII.II) Simulari

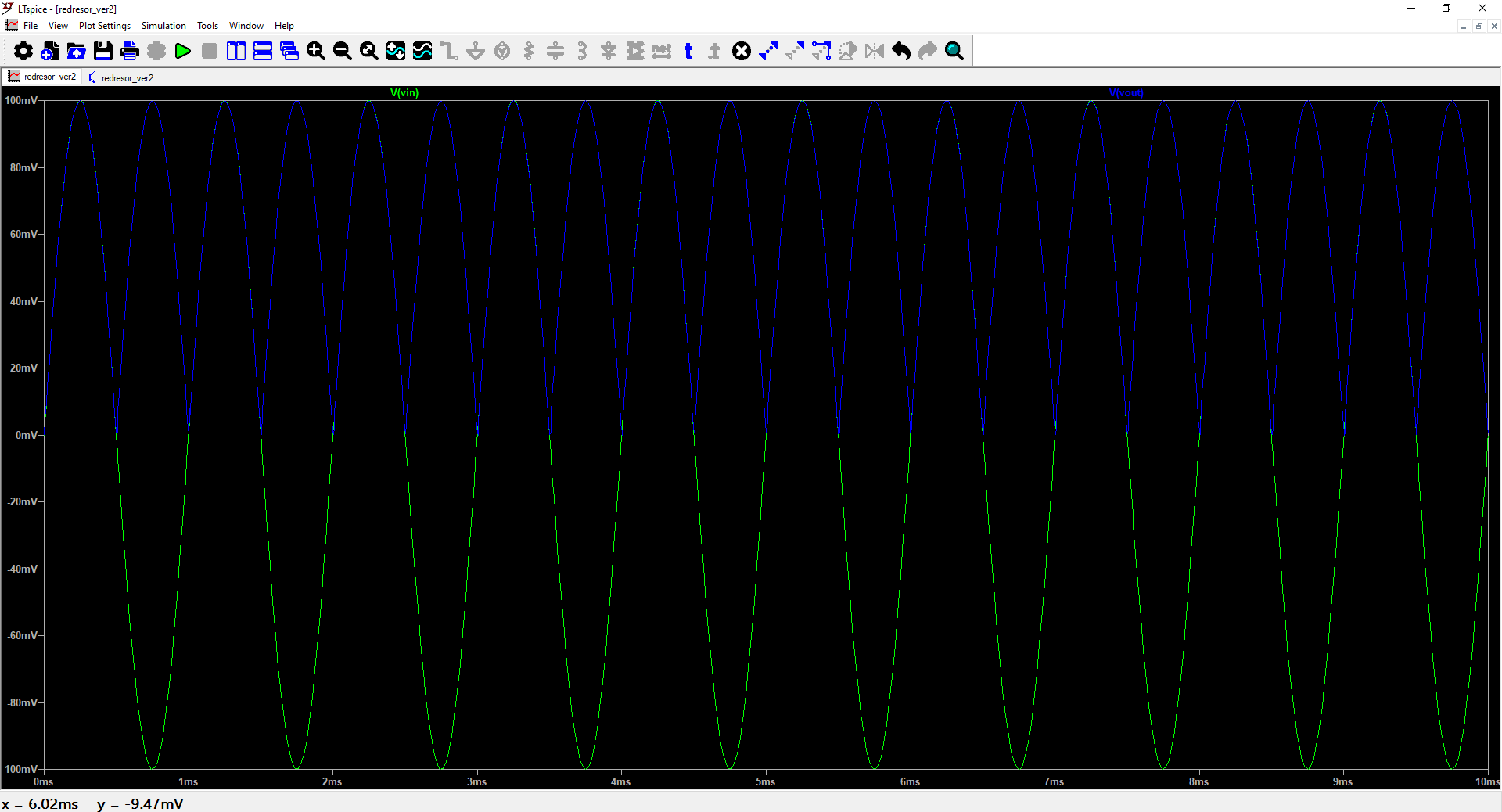
DCOP



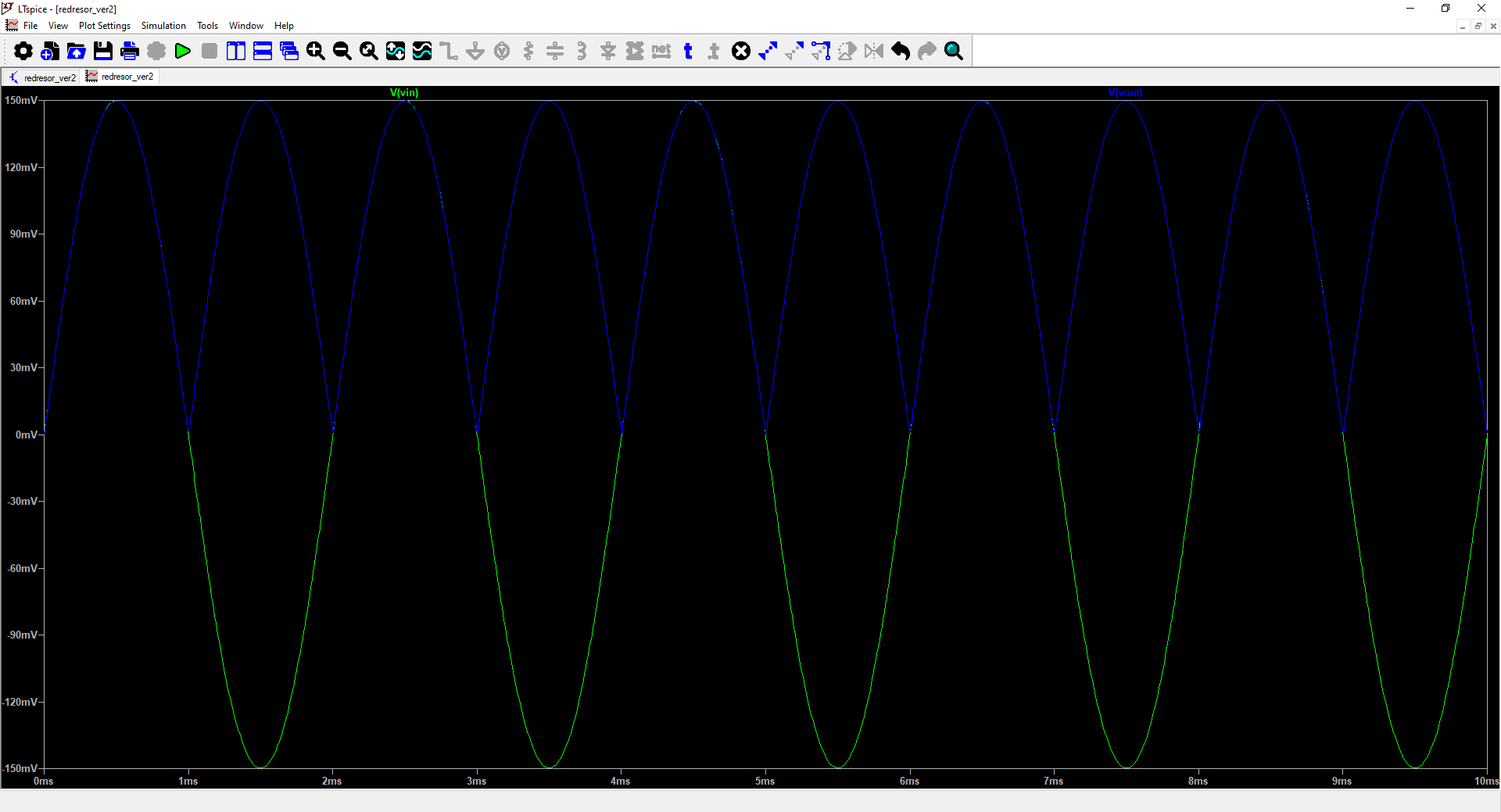
DC SWEEP



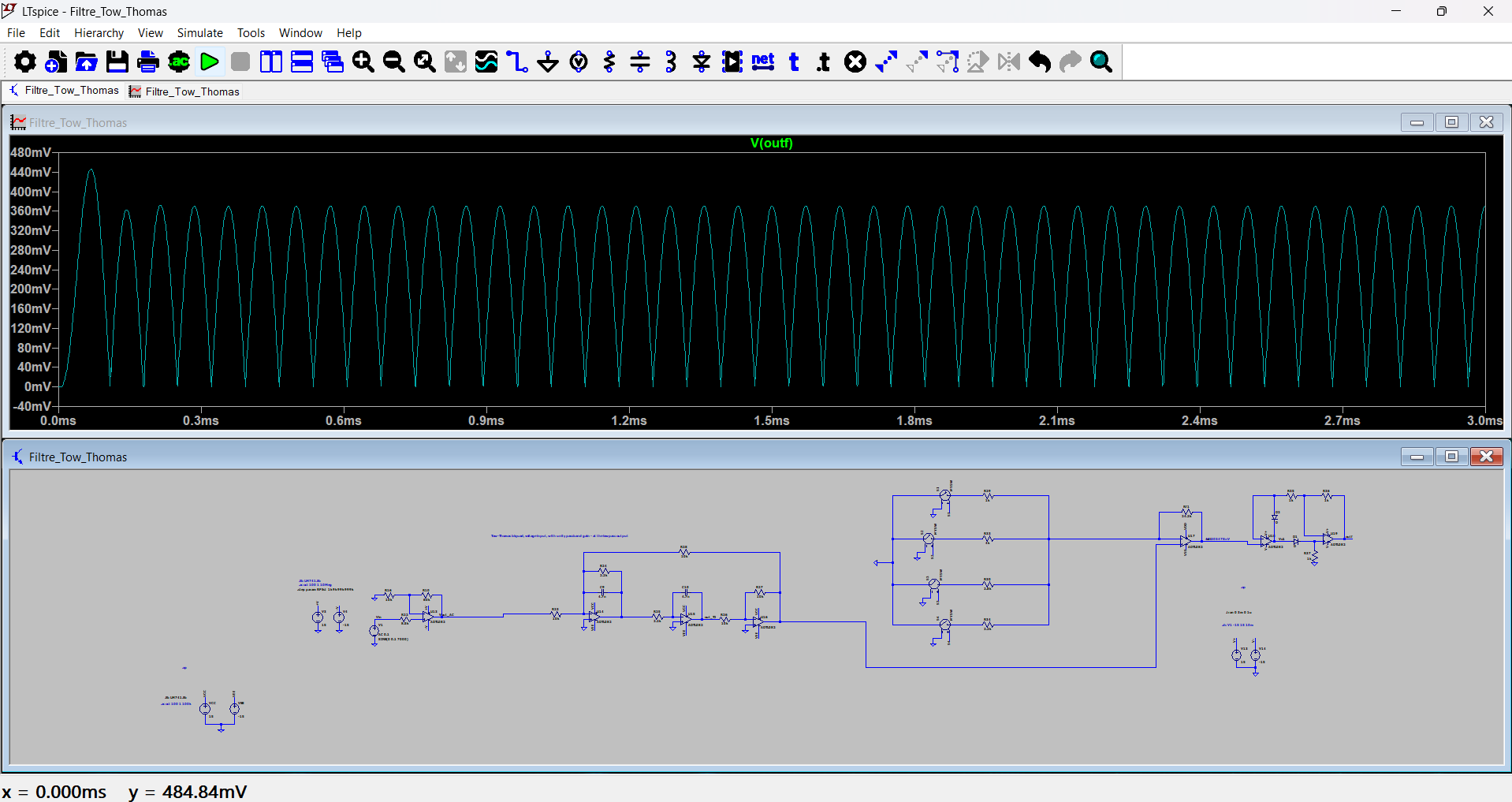
Transient



Transient pentru amplitudine de intrare mai mare

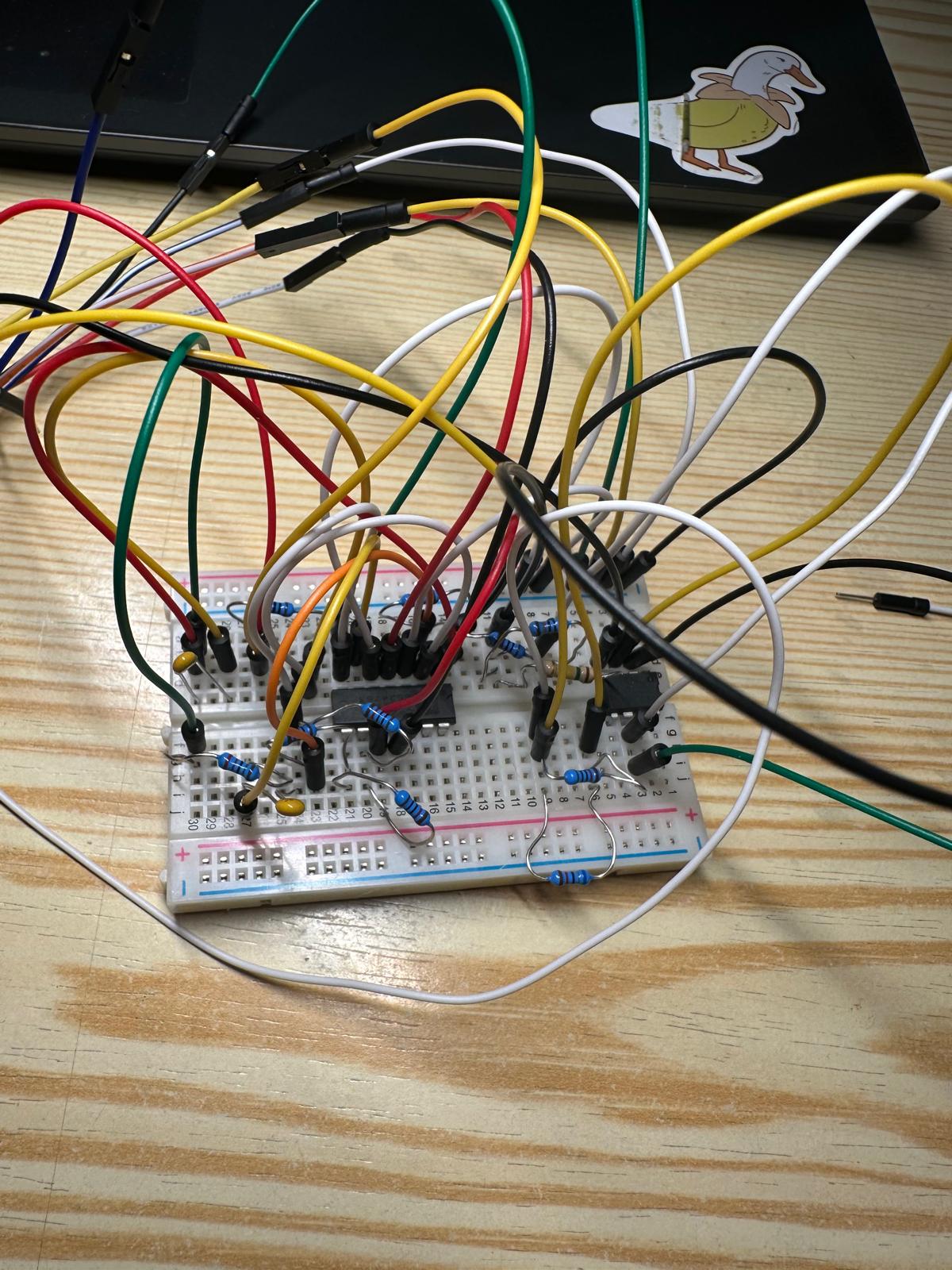


Circuitul complet



V) Implementare analogica

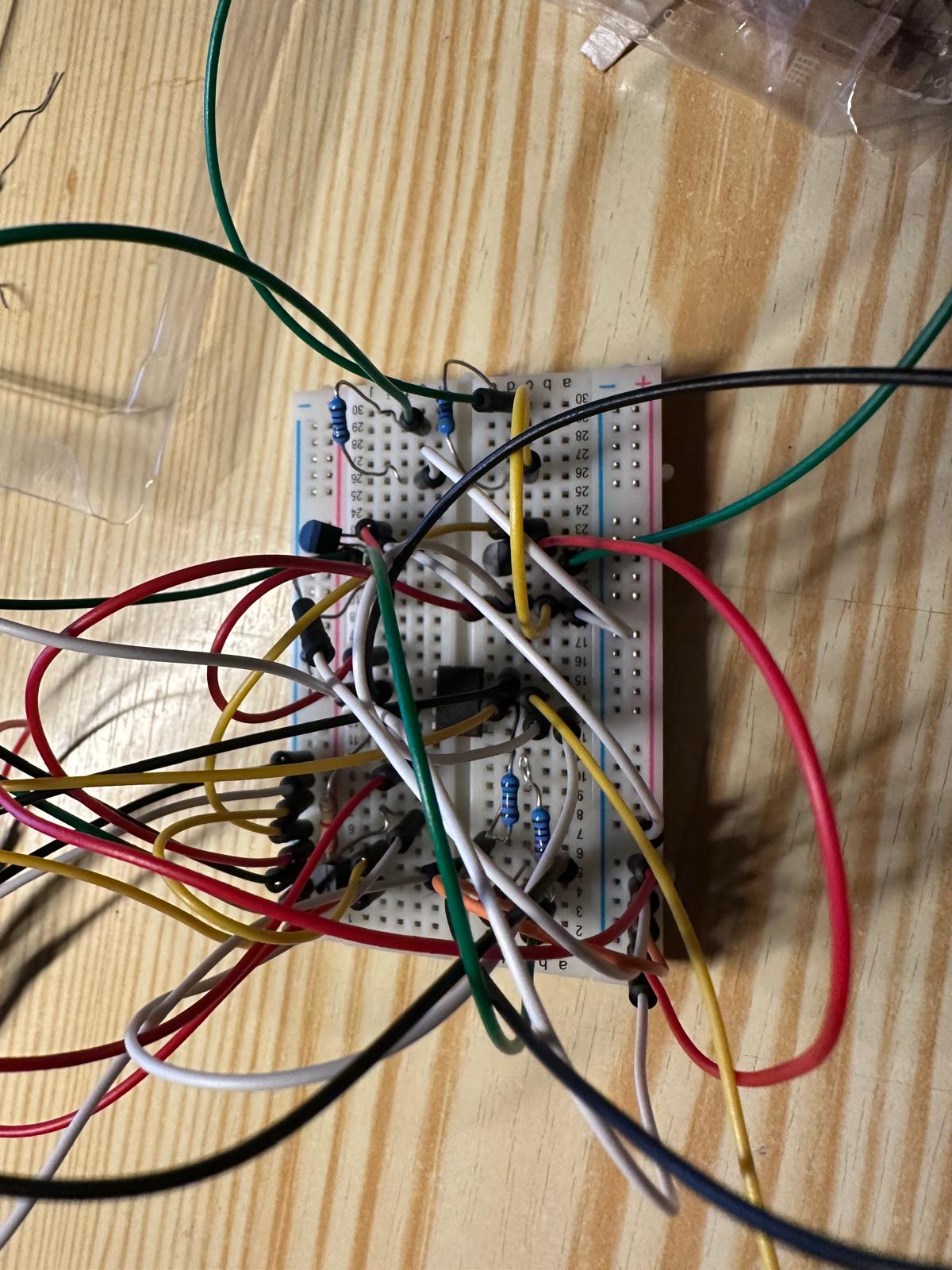
Etajele 1 si 2



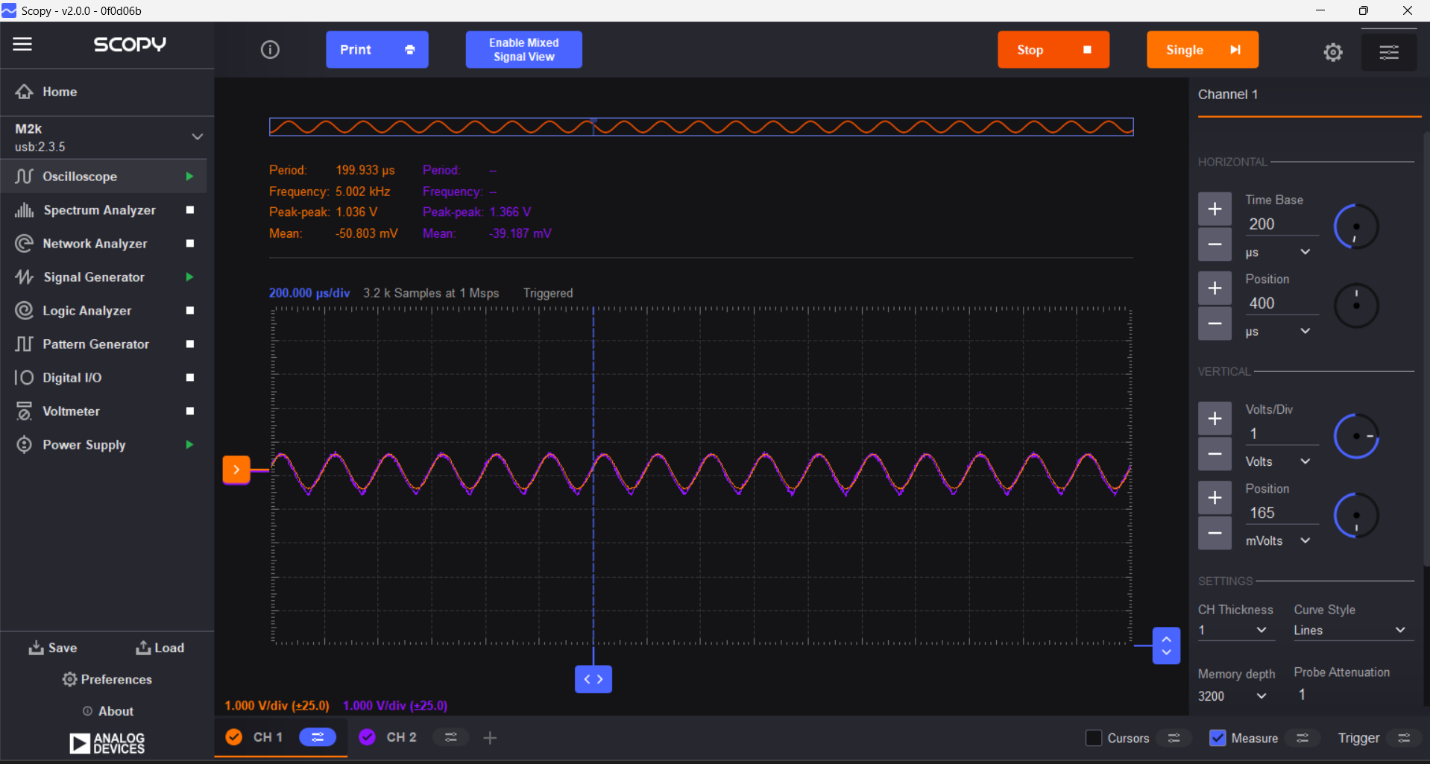




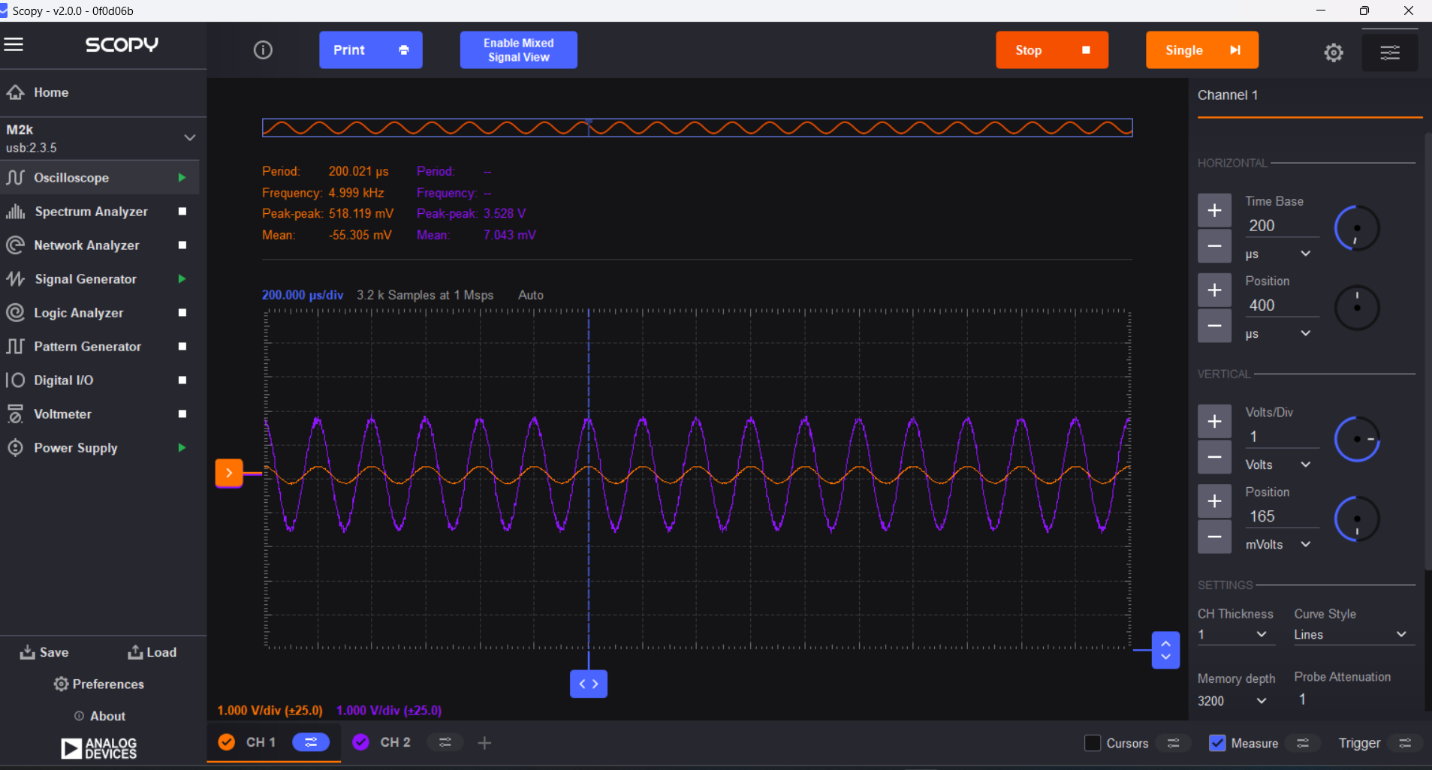
Etajul 3



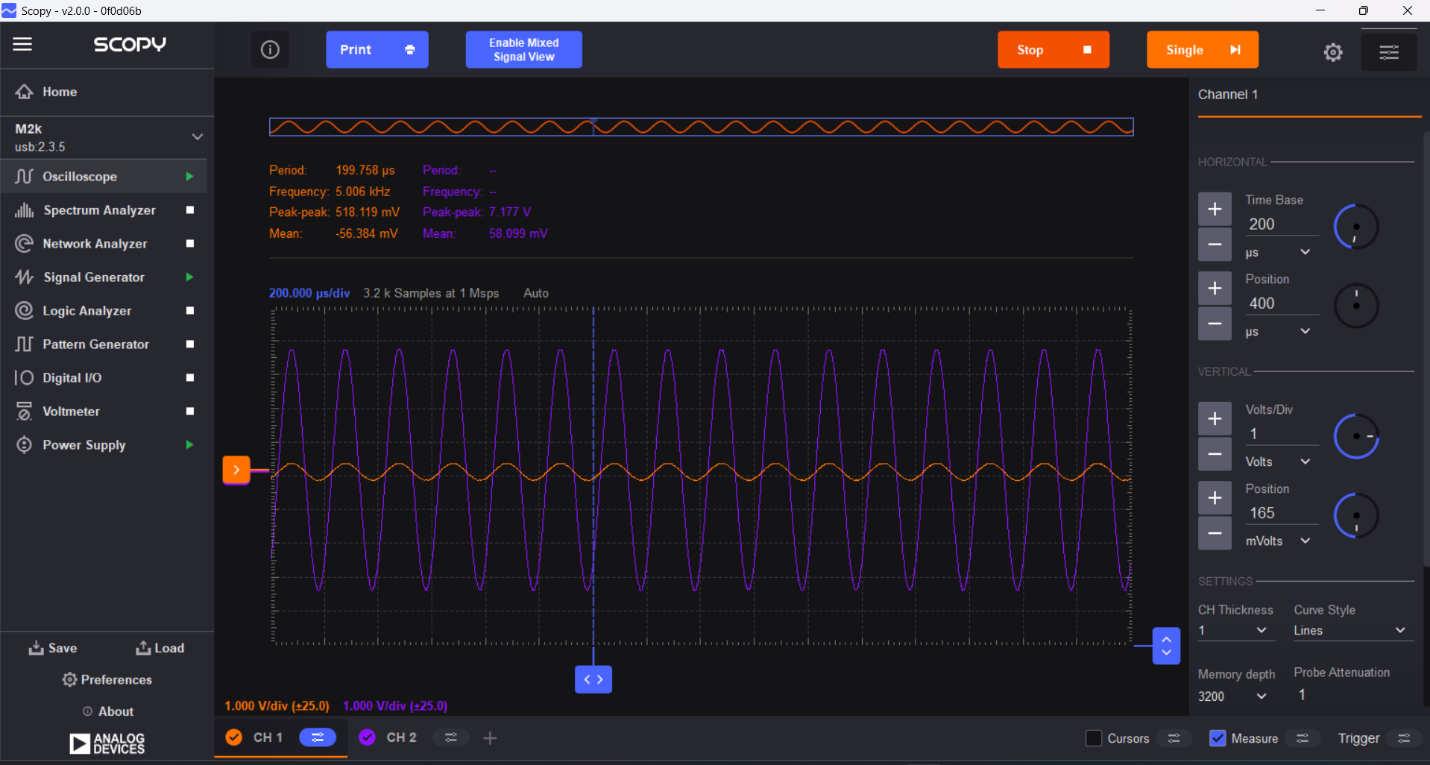
SW1-ON



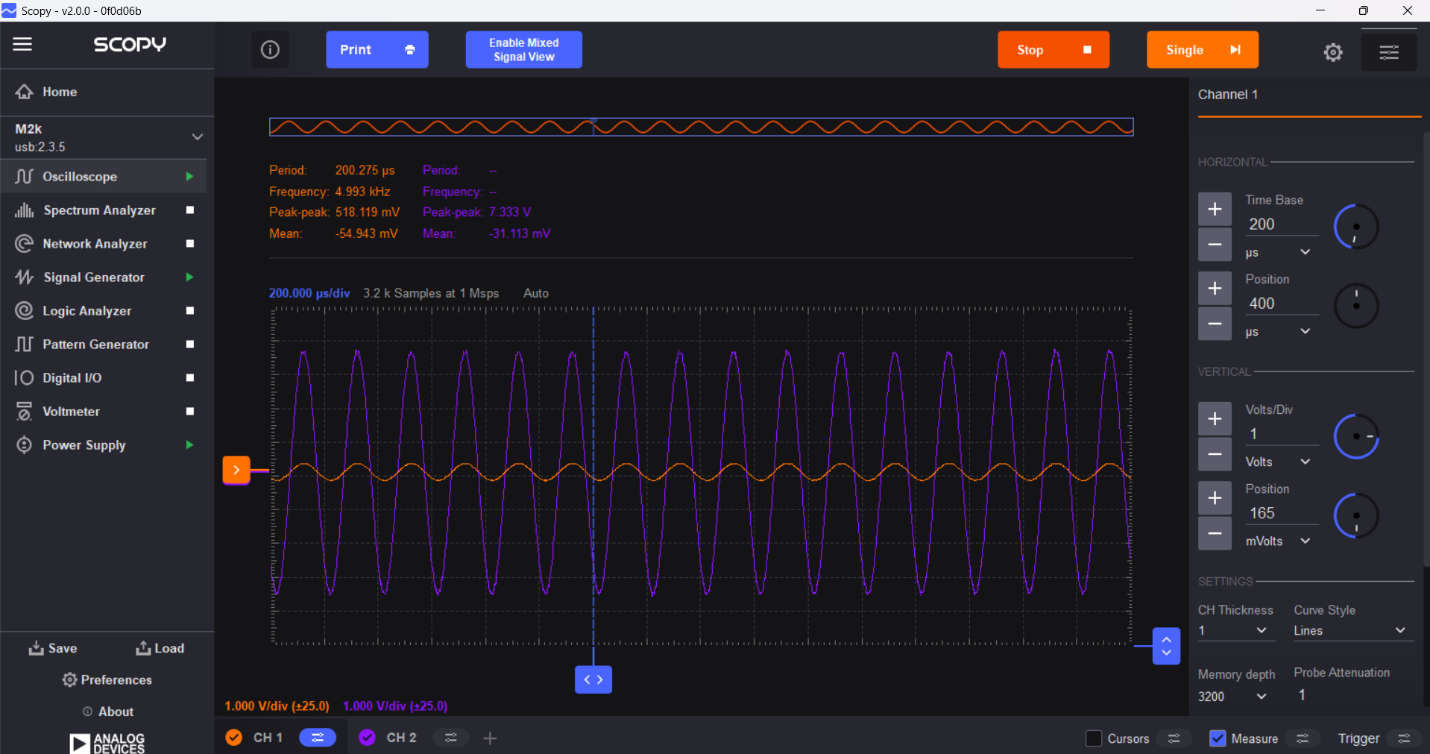
SW1,2-ON



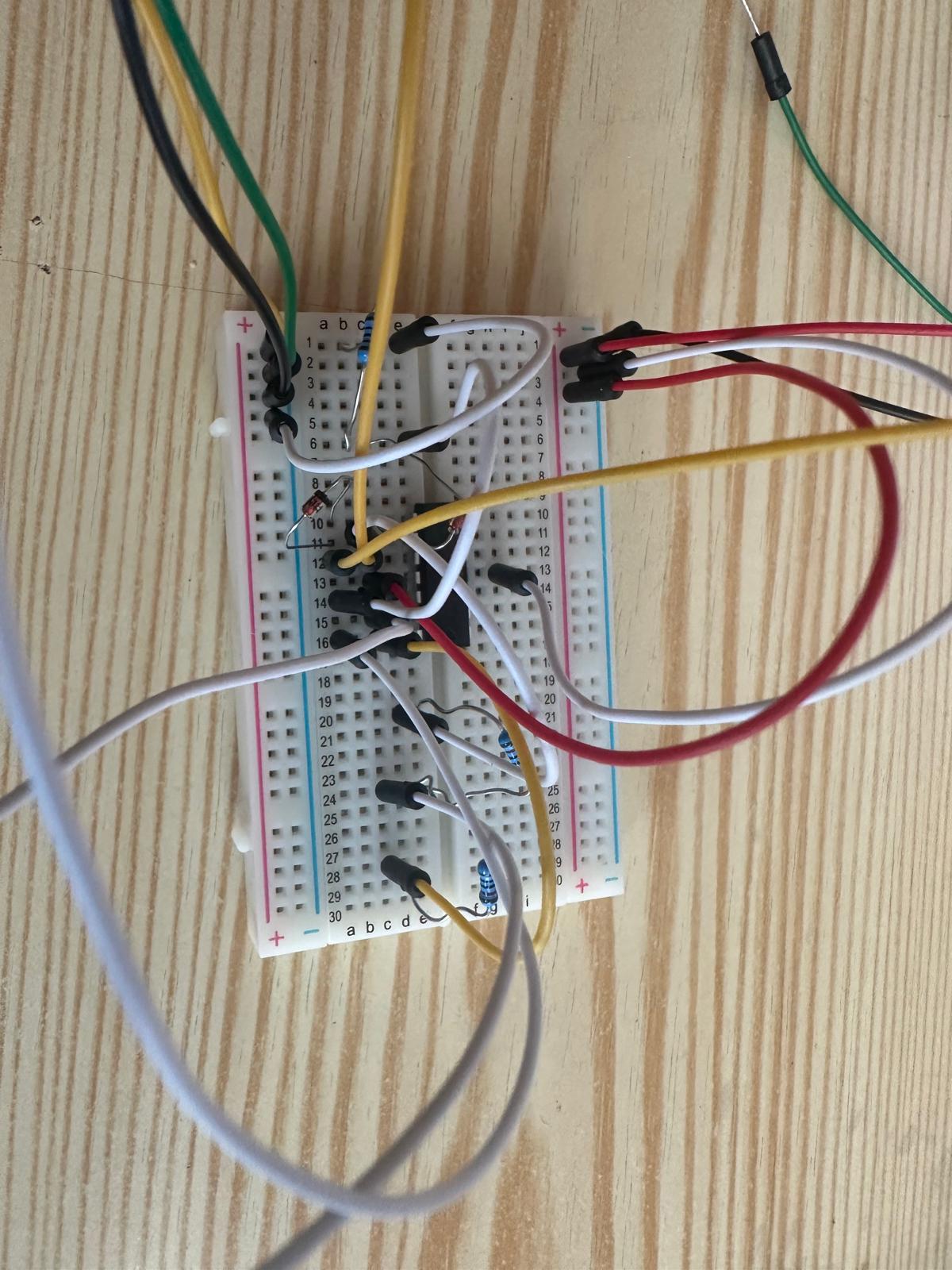
SW1,2,3-ON



SW1,2,3,4-ON



Etajul 4





VI).Concluzii

|  |  |  |  |
| --- | --- | --- | --- |
| Etajul 1 |  |  |  |
| Analiza AC |  | Specificatii | Masuratori |
|  | Castig[V/V] | 7 | 6.99 |
|  | Banda > Banda Filtru | 7k | 3.13M |
|  | CMRR | 86 |  |
|  | PSRR | 86 | 117 |
| Etajul 2 |  |  |  |
| Analiza AC | |H0| | 1 | 1 |
|  | Banda[Hz] | 7k | 7.2k |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Etajul 3 |  |  |  |
| Analiza AC | Castig [dB] | 8 | 8.05 |
|  | Castig [dB] | 10 | 9.99 |
|  | Castig [dB] | 12 | 12.02 |
|  | Castig [dB] | 14 | 14.13 |
|  |  |  |  |
|  |  |  |  |
| Etajul 4 | Castig [V/V] | 1 | 1 |