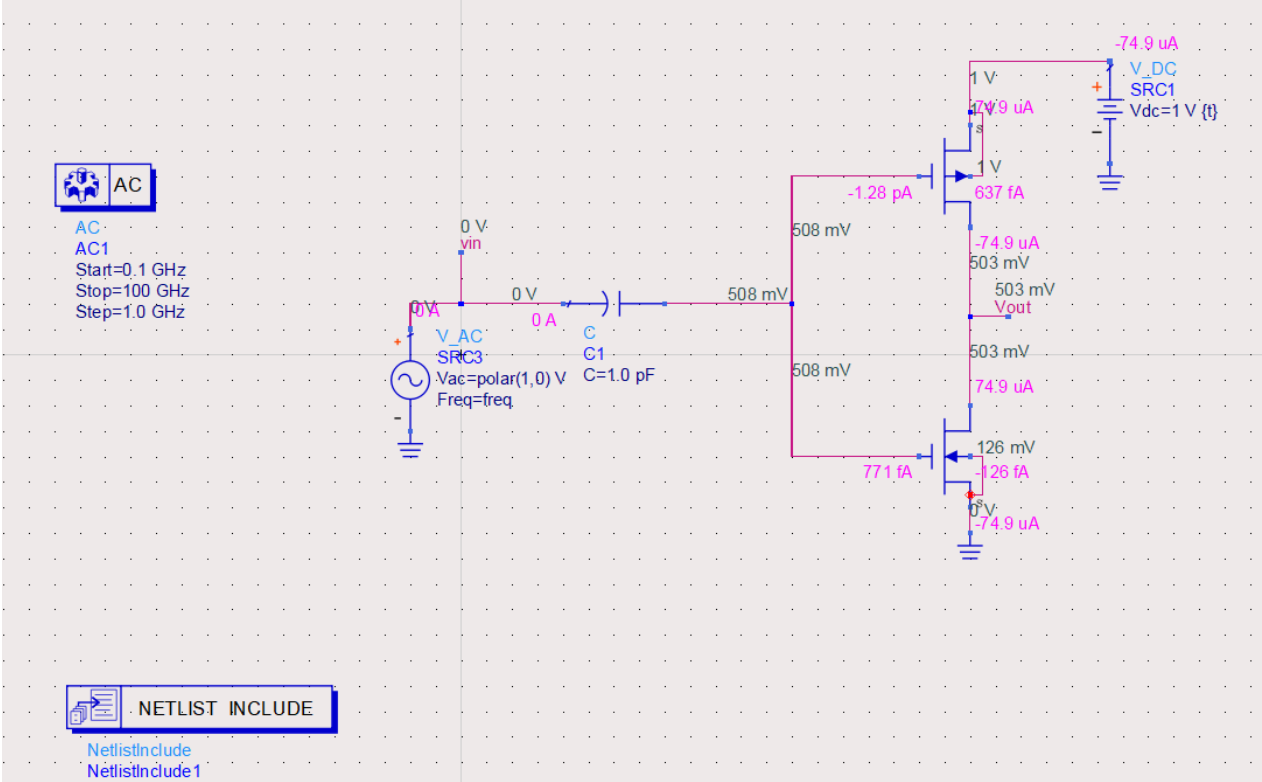
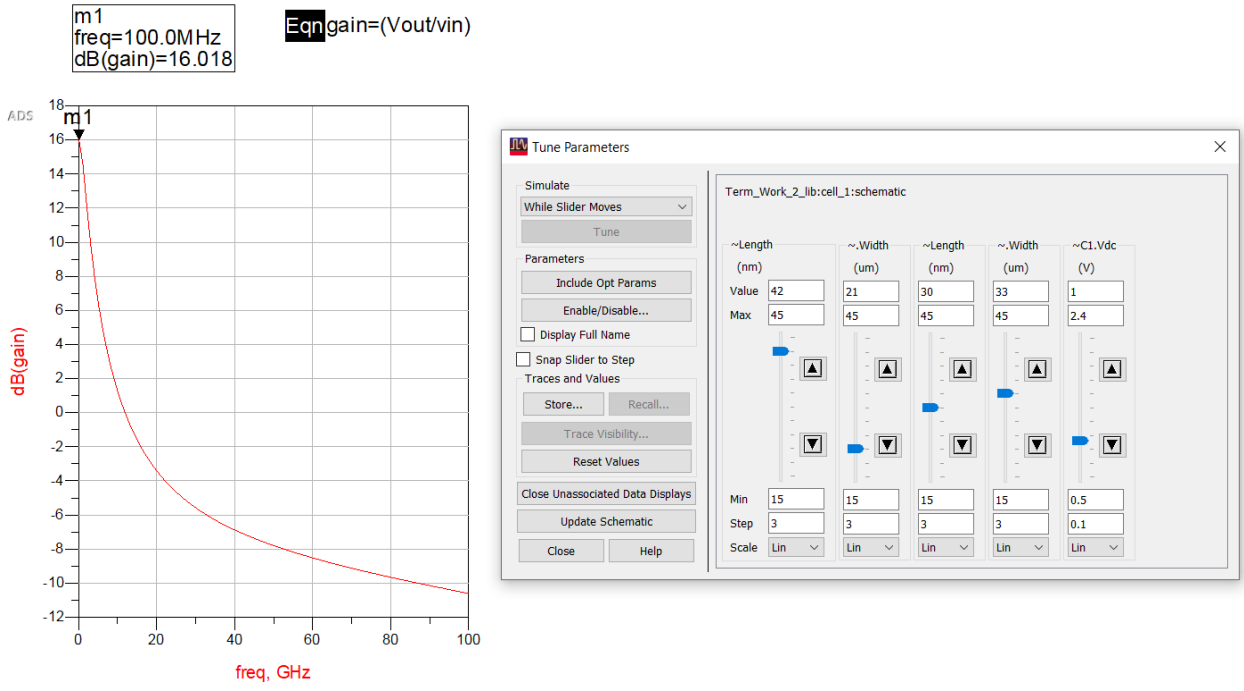
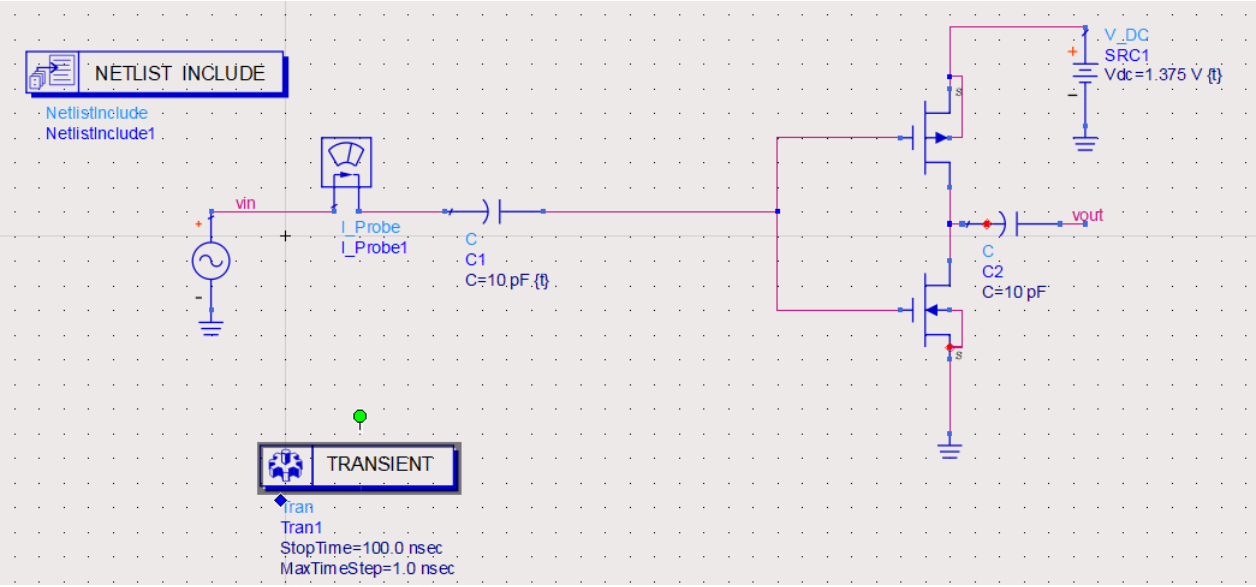
Cascode amplifier:



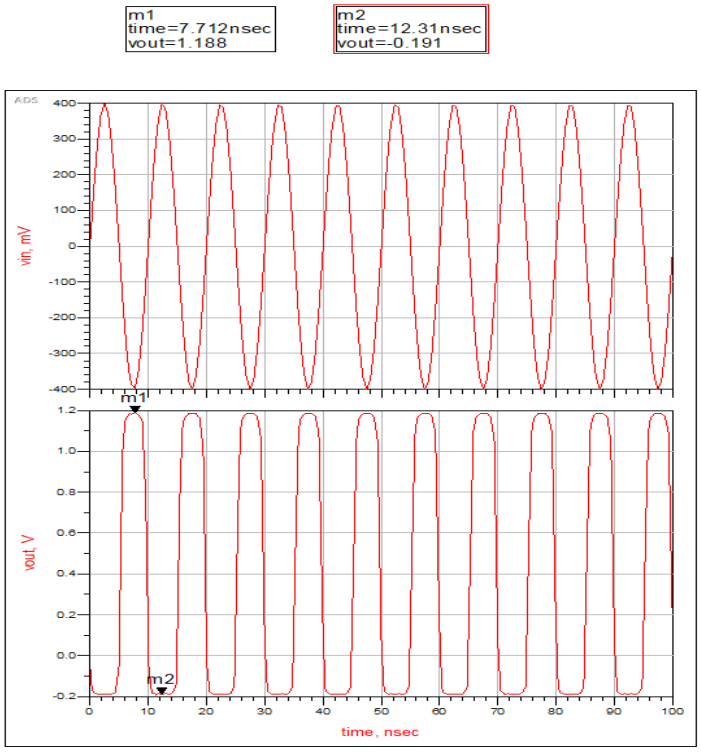
Tuning done to set the gain value at 16dB:



Transcient:



Input voltage Vs Output voltage:



PMOS Operating points:

```
 ----------------------------------
BSIM4        MOSFET1 vdc=1

Id                -74.9 uA
Ig                 -1.28 pA
Is                 74.9 uA
Ib                637 fA
Power              37.2 uW
Gm                  1.65 mS
Gmb               334 uS
Gds               218 uS
Vth              -522 mV
Vdsat             -59.2 mV
dQg_dVgb           33.2 fF
dQg_dVdb          -12.2 fF
dQg_dVsb          -17.2 fF
dQb_dVgb           -3.96 fF
dQb_dVdb           19.2 aF
dQb_dVsb         -211 aF
dQd_dVgb          -13 fF
```

```
dQd_dVgb          -13 fF
dQd_dVdb           12.3 fF
dQd_dVsb          859 aF
Vgs              -492 mV
Vds              -497 mV
Vbs                -1.46 pV
Vgms             -492 mV
Vges             -492 mV
Vdbs               -4.45 pV
Vsbs             -728 fV
Ids               -74.9 uA
Ibs                -8.02e-25 A
Ibd               497 fA
Isub              139 fA
Igso                0 A
Igdo                0 A
Igb                 1.05 fA
Igcs              645 fA
Igcd              634 fA
Igidl               0 A
```

NMOS Operating points:

BSIM4	MOSFET2 vdc=1
Id	74.9 uA
Ig	771 fA
Is	-74.9 uA
Ib	-126 fA
Power	37.7 uW
Gm	1.57 mS
Gmb	376 uS
Gds	90.4 uS
Vth	577 mV
Vdsat	52.8 mV
dQg_dVgb	22.4 fF
dQg_dVdb	-7.92 fF
dQg_dVsb	-10.6 fF
dQb_dVgb	-3.98 fF
dQb_dVdb	1.83 aF
dQb_dVsb	-42 aF
dQd_dVgb	-8.25 fF
dQd_dVdb	7.94 fF
dQd_dVsb	374 aF
Vgs	508 mV
Vds	503 mV
Vbs	126 mV
Vgms	508 mV
Vges	508 mV
Vdbs	126 mV
Vsbs	126 mV
Ids	74.9 uA
Ibs	353 fA
Ibd	-377 fA
Isub	102 fA
Igso	0 A
Igdo	0 A
Igb	514 aA
Igcs	389 fA
Igcd	382 fA
Igidl	0 A
Igisl	0 A

ID = 74.9 µA

VDS = 503 mV

Vov = Vd sat = 52.8 mV

Gm = 1.57 ms

r0 = (1/ (λ*Id)) = (1/ (0.02 * 74.9 µA))

= 1/(1.498 * 10^-6)

= 667.556 KΩ

Rout = rout = r0/2 = (667.556 KΩ /2)

= 333.778 KΩ

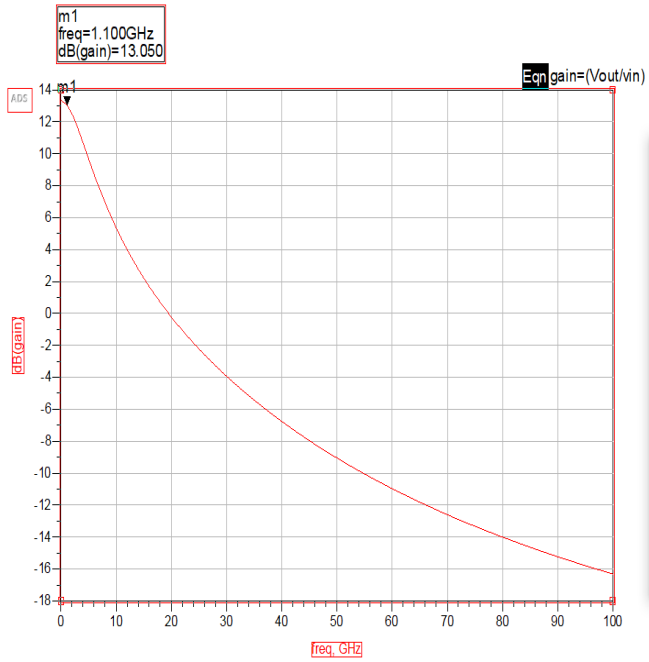
signal voltage (vd)@ drain = VDS = 503 mV

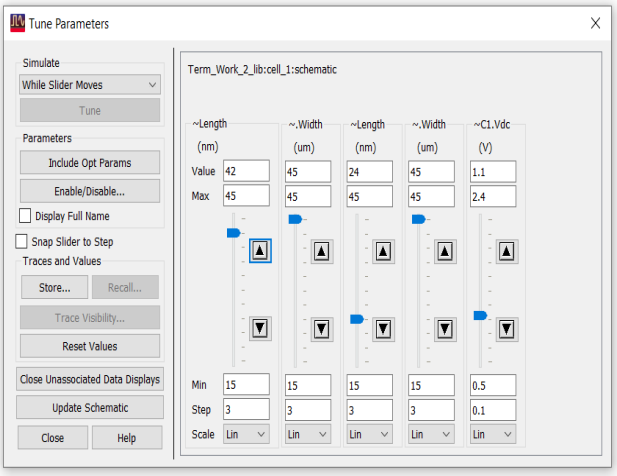
signal swing = 0.191 V - 1.188V

Rin = ∞

Av = 16 dB or 6.309573 V/V

3dB frequency – 1.1 GHz





Technology used = 32 nm

VDD = 1V

Pdc = 37.7 µW