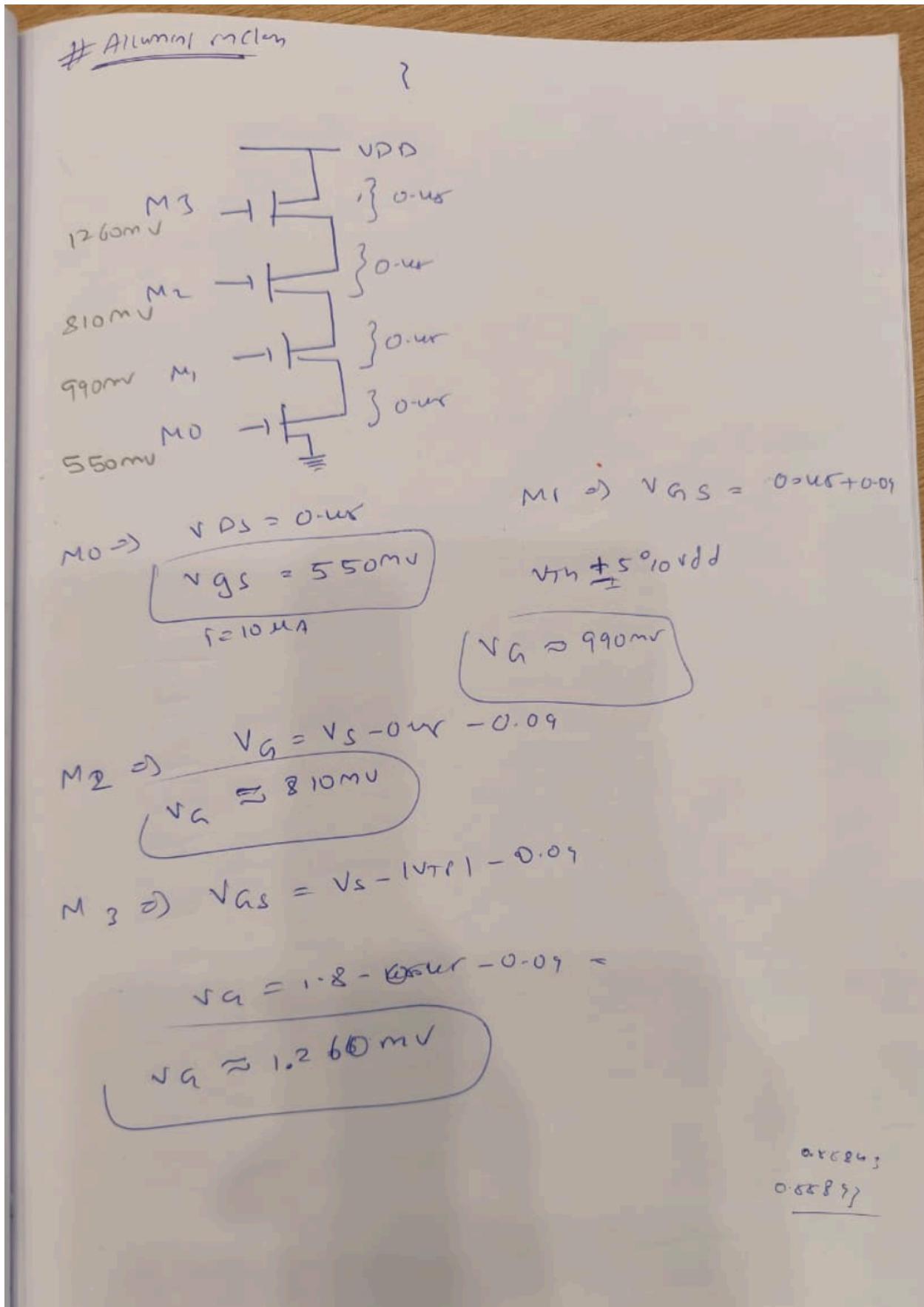
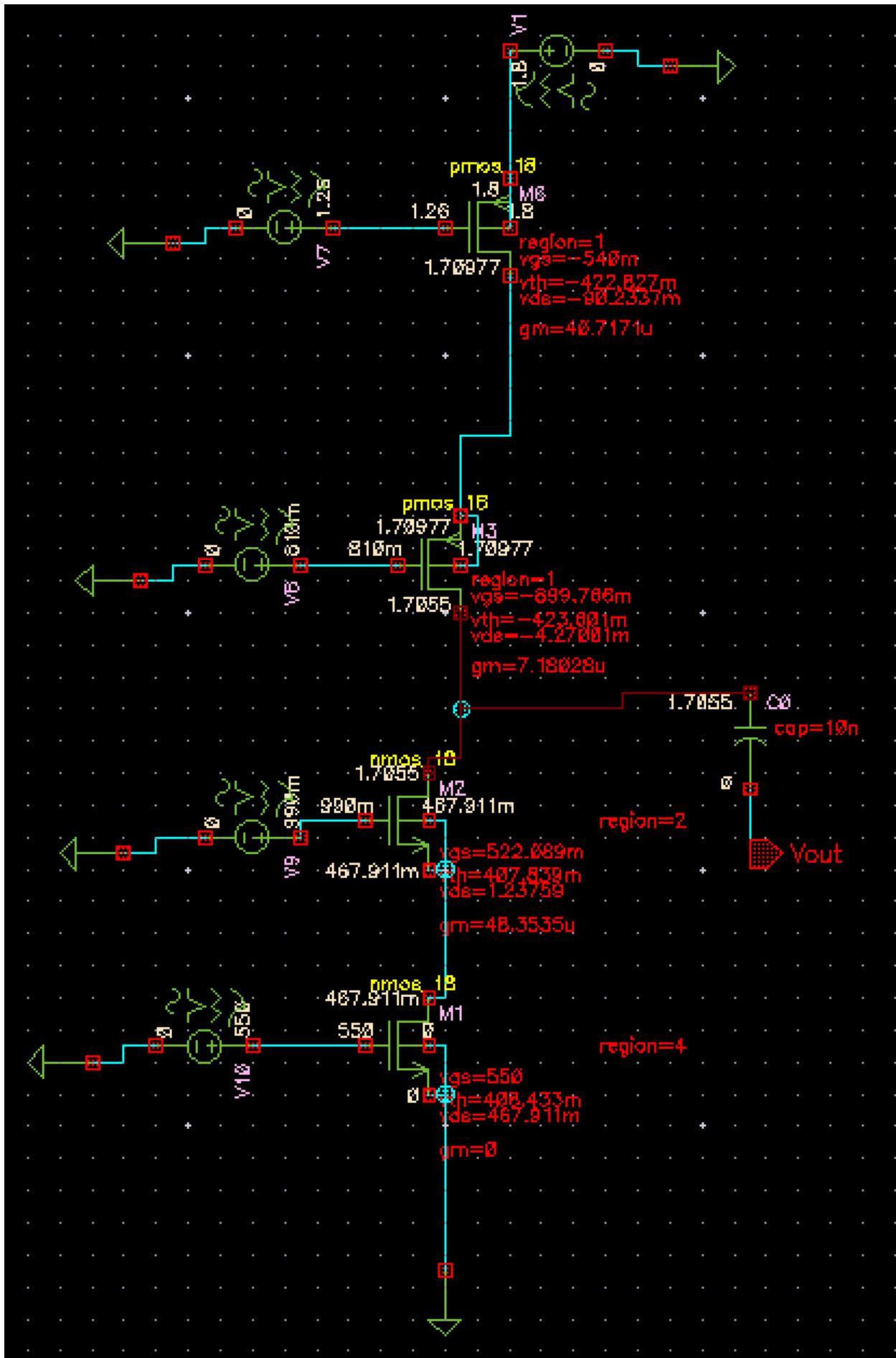


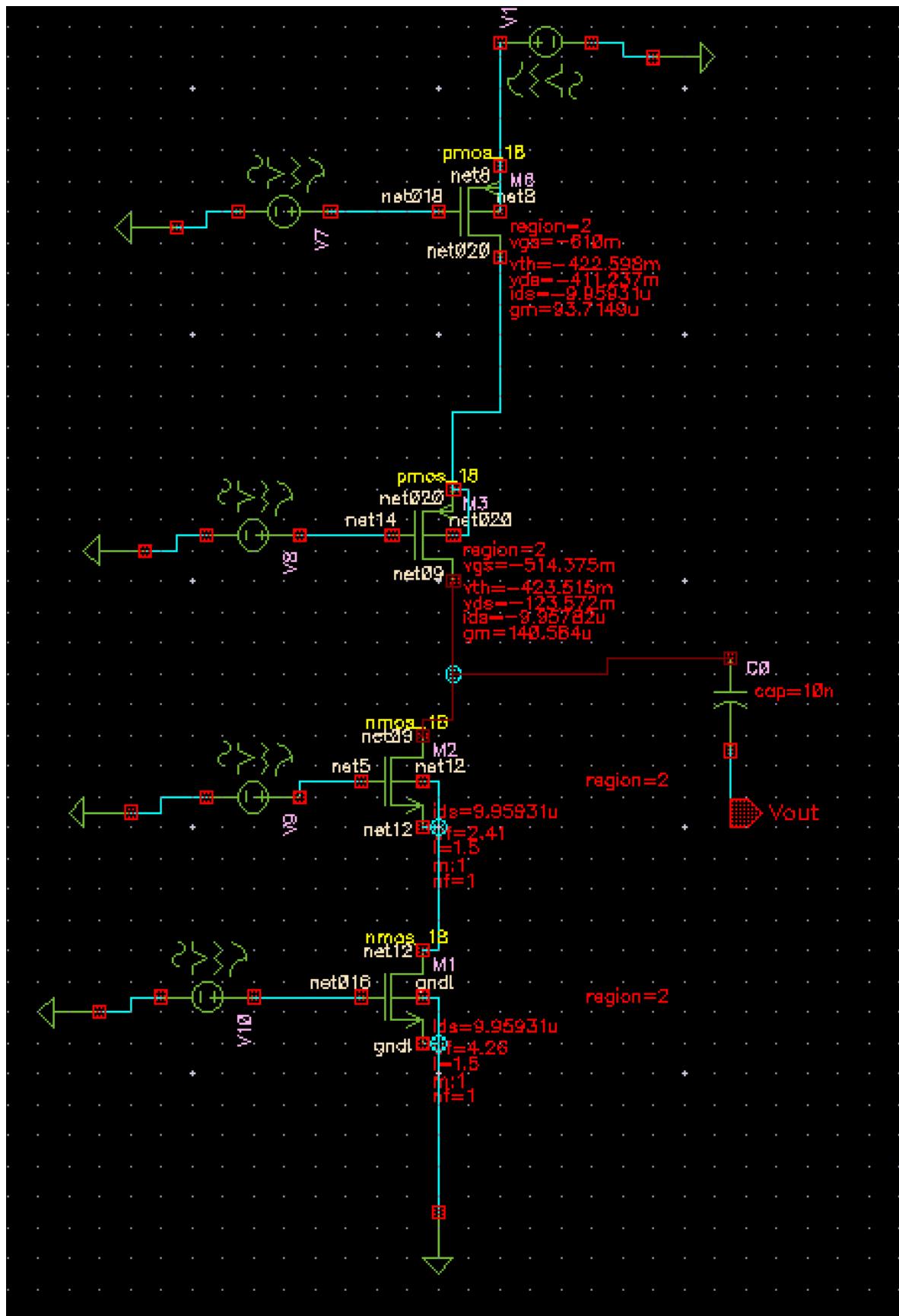
1st question

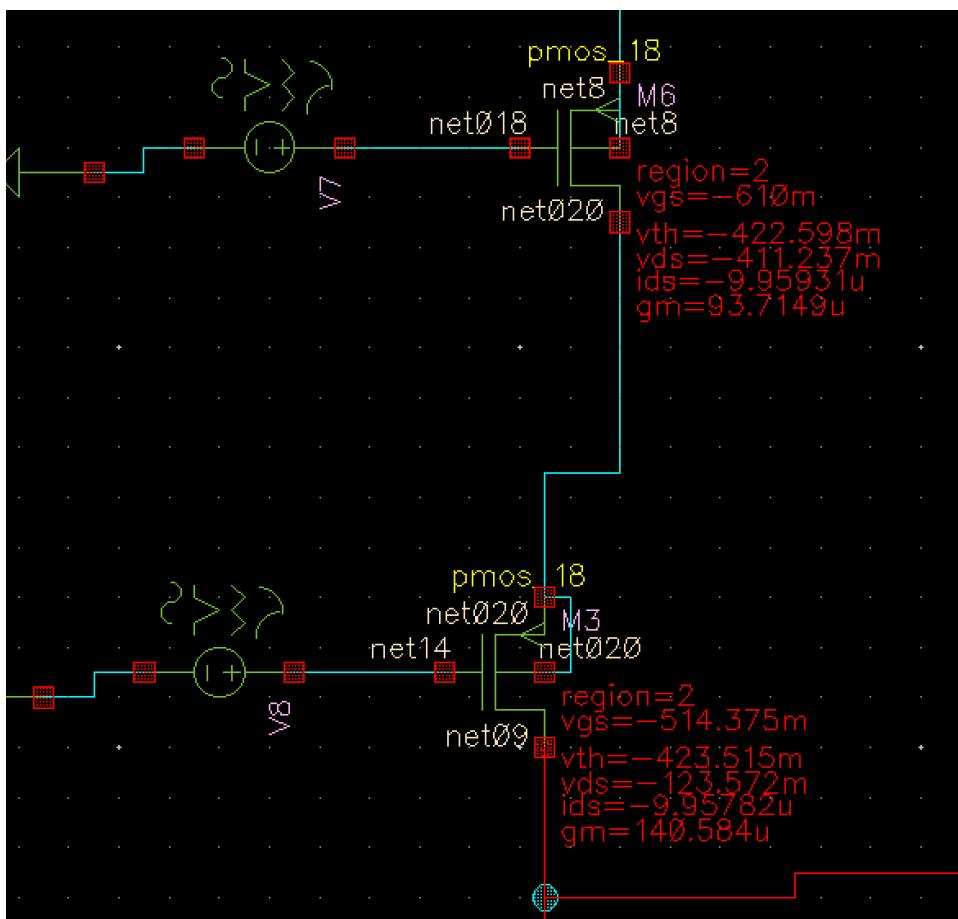
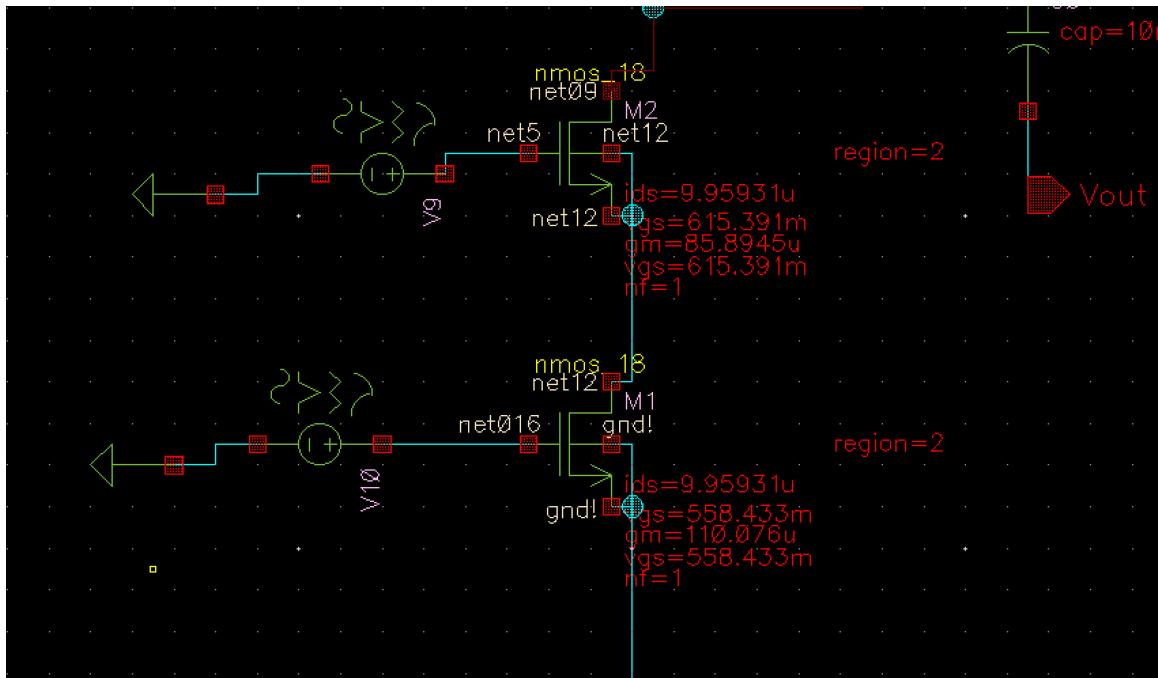
1st iteration





9th iteration





Width and length values for each mosfet:

Model name	n18
New pcell style	No
Total Gate ...	4.26
Finger Width	4.26
Gate Length...	1.5
<i>Fingers</i>	1
Number of ...	1
Apply Thresh...	false
Multiplier	1
Connect gates	No
Drain Contac...	100
Source Conta...	100
Switch S/D	No

...mouse L: schSingleSelectPt()

Model name	n18
New pcell style	No
Total Gate ...	2.41
Finger Width	2.41
Gate Length...	1.5
<i>Fingers</i>	1
Number of ...	1
Apply Thresh...	false
Multiplier	1
Connect gates	No
Drain Contac...	100
Source Conta...	100
Switch S/D	No

...mouse L: schSingleSelectPt()

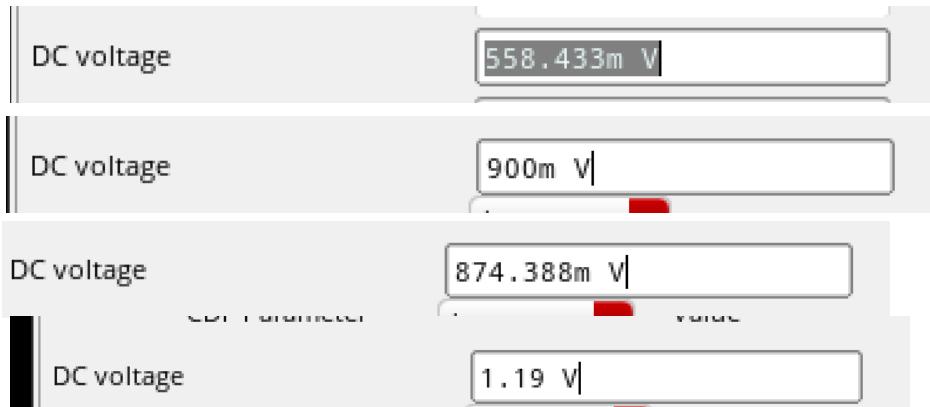
Model name	p18
New pcell style	No
Total Gate ...	17.4
Finger Width	17.4
Gate Length...	0.5
<i>Fingers</i>	1
Number of ...	1
Apply Thresh...	false
Multiplier	1
Connect gates	No
Drain Contac...	100
Source Conta...	100
Switch S/D	No

...mouse L: schSingleSelectPt()

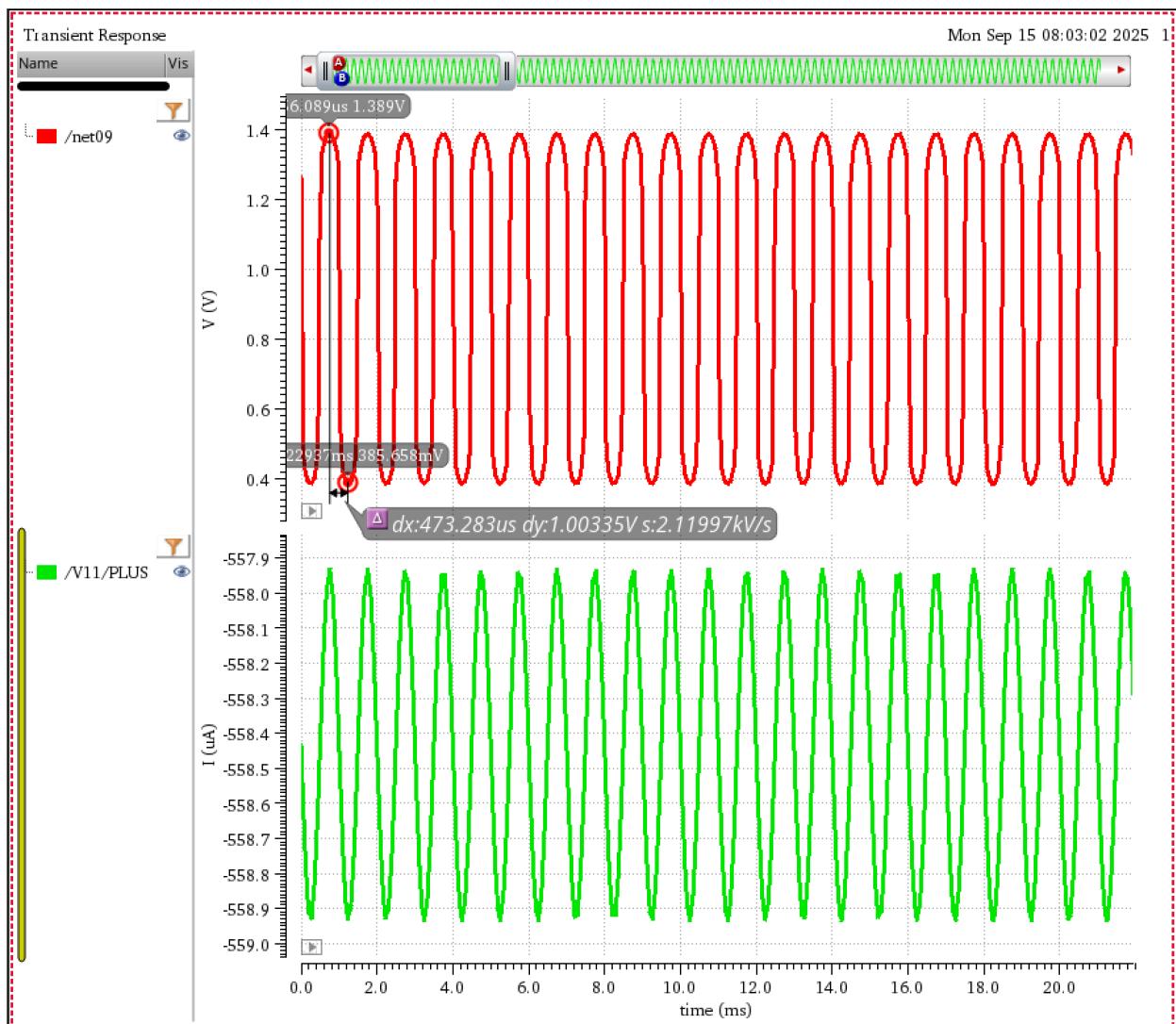
Model name	p18
New pcell style	No
Total Gate ...	5.16
Finger Width	5.16
Gate Length...	0.5
<i>Fingers</i>	1
Number of ...	1
Apply Thresh...	false
Multiplier	1
Connect gates	No
Drain Contac...	100
Source Conta...	100
Switch S/D	No

...mouse L: schSingleSelectPt()

Final Biasing voltages

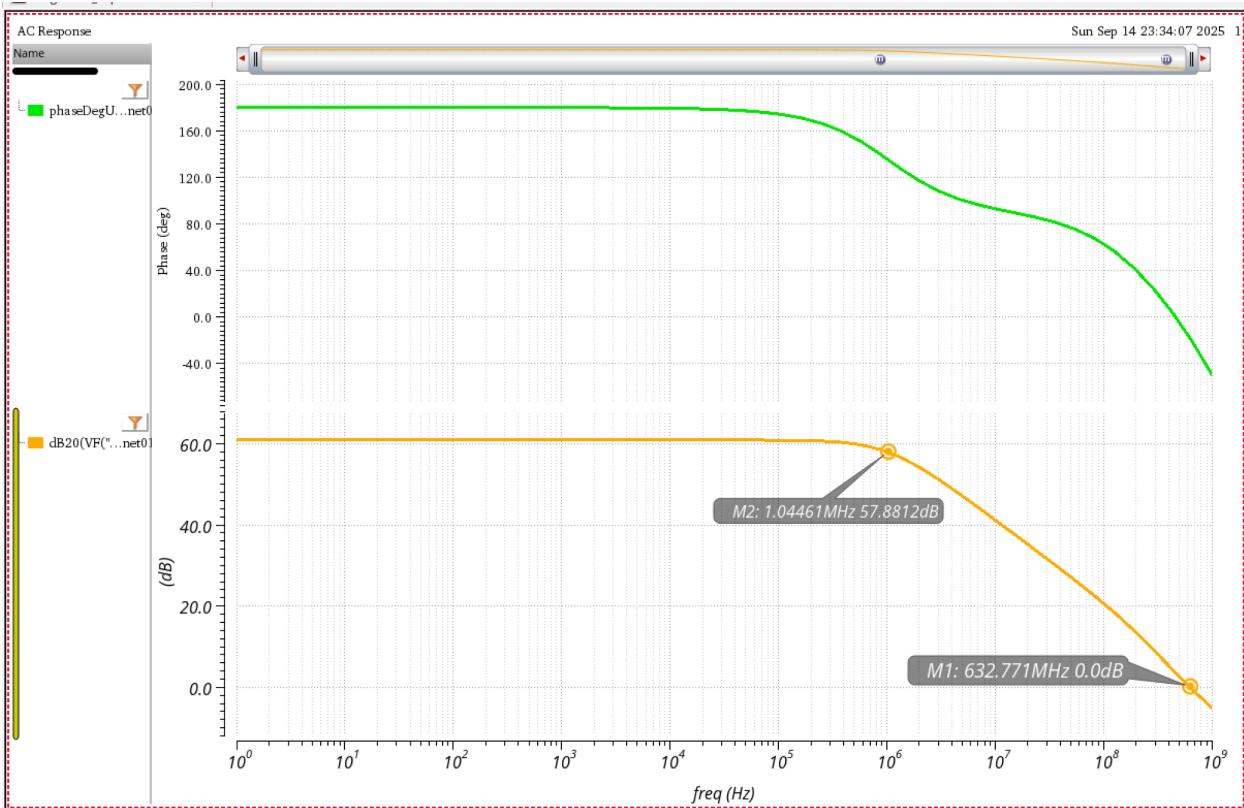


Transient response:



Input 1mv swing
Output 1.00335v
Gain is 60.8812dB

Ac response:



Peak value

M1: 1.0Hz 60.8812dB

-3db gain=> 57.8812db => freq at -3db is 1.04461MHz
Bandwidth = 1.04461MHz

Gain crossover frequency (ω_{gc})

- Where gain = 0 dB.

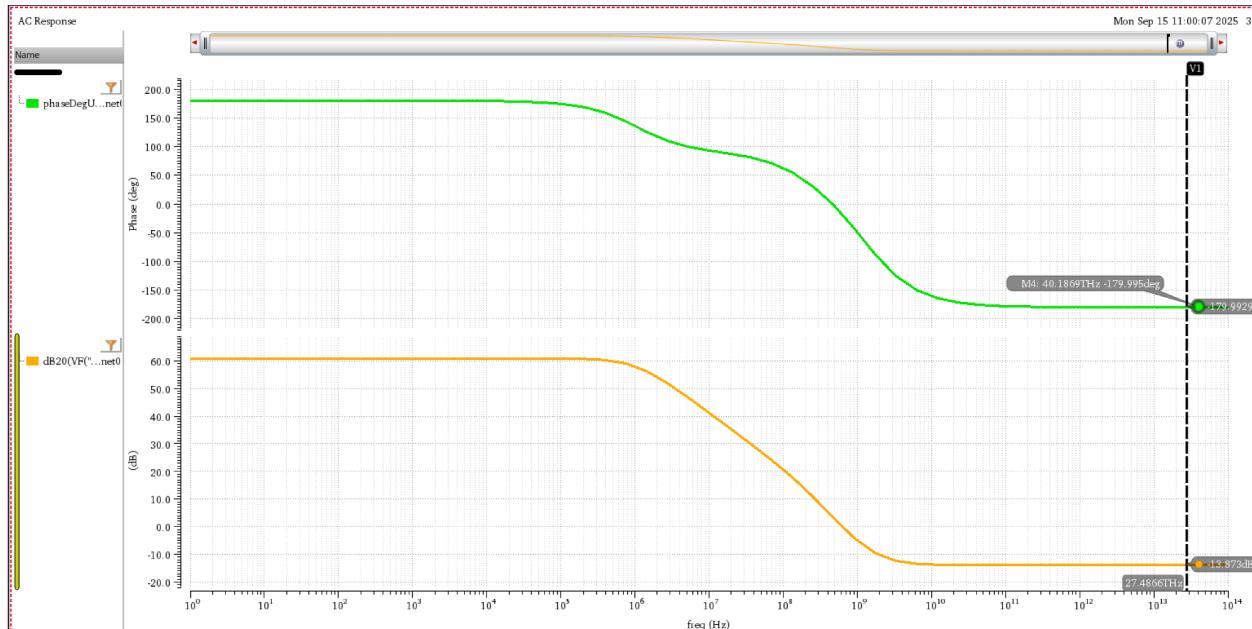
- From the orange curve:
 $F_{gc} \approx 650.8 \text{ MHz}$

At this frequency, the phase (green curve) is:

$$\phi(f_{gc}) \approx -18.9 \text{ degree}$$

Phase Margin (PM):

$$PM = 180^\circ + \phi(f_{gc}) = 180 - 18.9 \approx 161.1 \text{ degree}$$



Phase crossover frequency (ω_{pc})

- Where **phase = -180°** .
- Looking at my phase plot (green), it never reaches $-180^\circ \Rightarrow$

Maybe the **phase never crosses -180°** , so **Gain Margin (GM)** is infinite (**system stable with respect to gain**).

or

Or if we consider the approximation
 phase Going to -179.995 at 27.486THz freq

Gain at phase crossover frequency where phase = -180° : $G(f_{pc}) \approx -13.873 \text{ dB}$

$$GM = -G(f_{pc}) = -(-13.873 \text{ dB}) = 13.82 \text{ dB}$$

Mosfet	W/L	Vgt	Vbias	gm	gds
M0	2.84	0.150	558.4	110u	1.2u
M1	1.606	0.207	900	85u	178n
M2	34.6	0.90	874	140u	13.9u
M3	10.32	0.187	1.2	93u	1.06u

