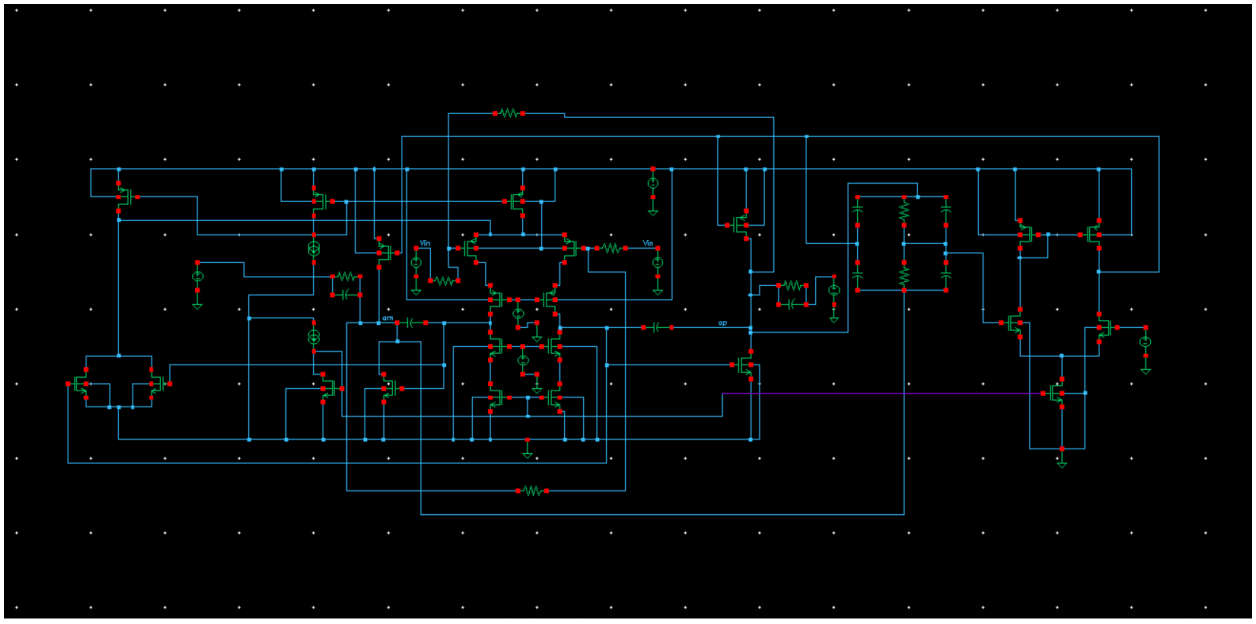
ASSIGNMENT 8

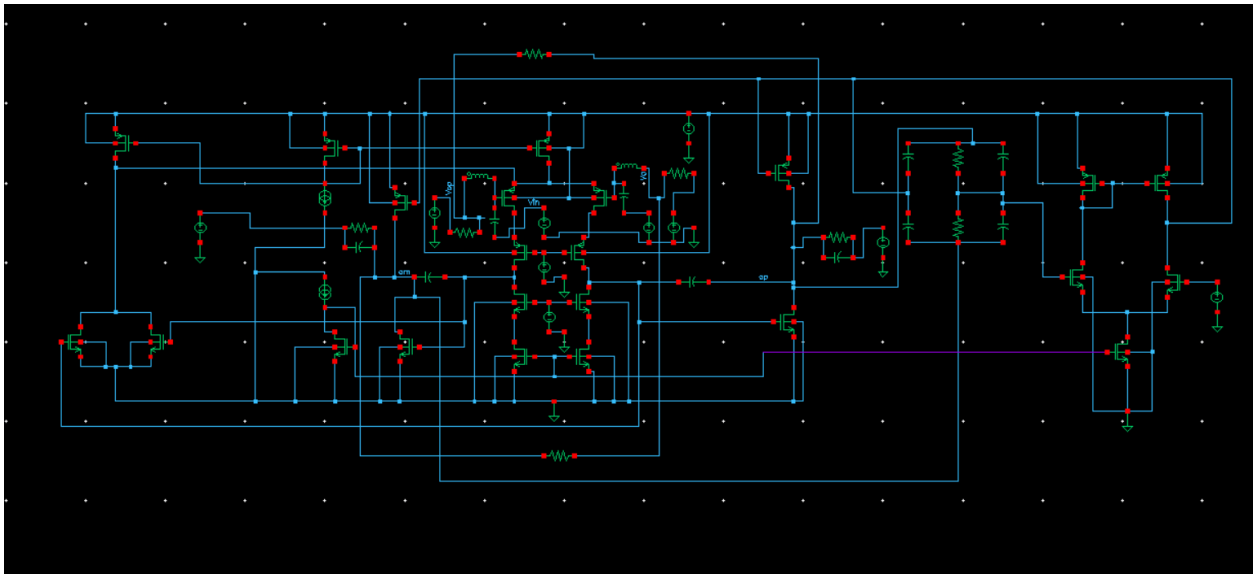
Anchal Debnath EE21B017

Name of Parameter	Value
Supply Voltage	1.8 V
Vss	0
Common Mode Bias (Vcm)	0.9 V
Length of all transistors(L)	0.3 um
Unit Width	1 um
m00	2
m01	2
m3x,m4x	6
mc0	95
mc1,mc2	13
mc3,mc4	50
m0,m0x	46
m1,m2,m5,m6	53
m3,m4,m7,m8	16
m11,m13	31
m12,m14	106
Bias Current (I00)	10uA, 13uA
VB56	0.65 V
VB78	1.1 V
Simulation Temperature	100 Degree Celsius

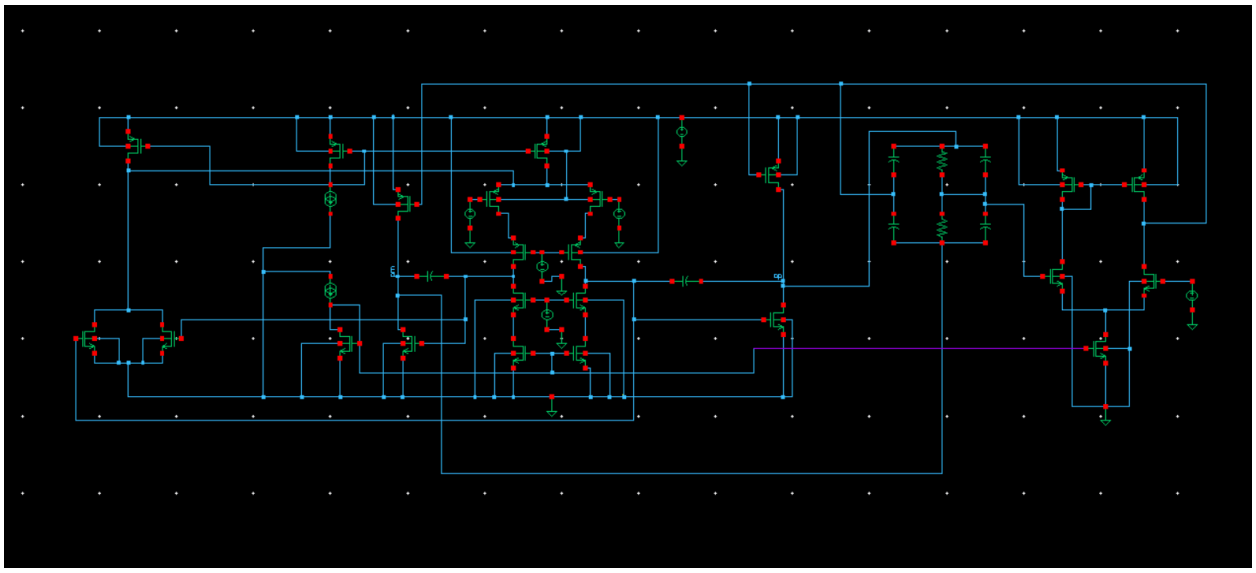
gm1	1.275m
gm11	4.156m
Cc	1 pF
RL	2.04k Ohms
CL	12 pF
k	13
RCM	100k Ohms
CCM	10f F
CCMX	1 pF



Closed Loop Circuit



Loop Gain Circuit



Op Amp Circuit

Name of Parameter	Obtained Value
Closed Loop DC Gain	12.97
Closed Loop 3-dB bandwidth	16.7Mhz
Unity Loop Gain Frequency	10.069 MHz
Phase Margin	77.22
Opamp Open Loop DC Gain	2095.55

Positive Slew Rate	36.34V/us
Negative Slew Rate	31.69V/us
Positive Swing Limit	0.798V
Negative Swing Limit	1.00189V
Positive Swing Limit output	-1.49V
Negative Swing Limit Output	+1.49V
Supply Voltage	1.8
Current Consumption	2.815

Noise Contribution:

Ri	73.92
Rf	4.92
First Stage	21.1
Second Stage	0.02

Device	Param	Noise Contribution	% Of Total
/R2	rn	0.00104516	36.96
/R3	rn	0.00104516	36.96
/M3	fn	0.000449734	6.84
/M4	fn	0.000449734	6.84
/R5	rn	0.000269804	2.46
/R4	rn	0.000269804	2.46
/M3	id	0.000235459	1.88
/M4	id	0.000235459	1.88
/M2	id	0.000226309	1.73
/M1	id	0.000226309	1.73
/M1	fn	4.90341e-05	0.08
/M2	fn	4.90341e-05	0.08
/M5	id	2.44881e-05	0.02
/M6	id	2.44881e-05	0.02
/M11	fn	1.14866e-05	0.00
/M13	fn	1.14866e-05	0.00
/M12	id	1.13731e-05	0.00
/M14	id	1.13731e-05	0.00
/M11	id	1.0707e-05	0.00
/M13	id	1.0707e-05	0.00
/M8	fn	9.18251e-06	0.00
/M7	fn	9.18251e-06	0.00
/M8	id	6.16139e-06	0.00
/M7	id	6.16139e-06	0.00
/R6	rn	3.97869e-06	0.00
/R7	rn	3.97869e-06	0.00
/M5	fn	3.45624e-06	0.00
/M6	fn	3.45624e-06	0.00
/M12	fn	8.76896e-07	0.00
/M14	fn	8.76896e-07	0.00
/R1	rn	3.97438e-07	0.00
/R0	rn	3.97438e-07	0.00
/Mc2	fn	8.44346e-19	0.00
/Mc1	fn	8.42004e-19	0.00
/M01	fn	3.5998e-19	0.00
/M00	id	2.015e-19	0.00

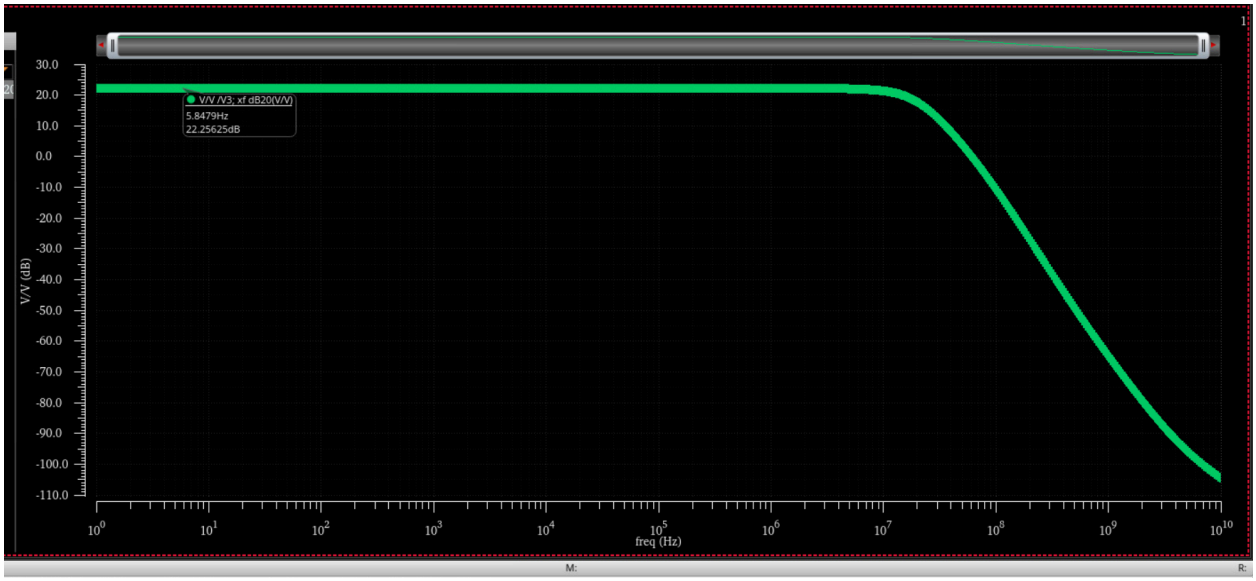
/M8	fn	9.18251e-06	0.00
/M7	fn	9.18251e-06	0.00
/M8	id	6.16139e-06	0.00
/M7	id	6.16139e-06	0.00
/R6	rn	3.97869e-06	0.00
/R7	rn	3.97869e-06	0.00
/M5	fn	3.45624e-06	0.00
/M6	fn	3.45624e-06	0.00
/M12	fn	8.76896e-07	0.00
/M14	fn	8.76896e-07	0.00
/R1	rn	3.97438e-07	0.00
/R0	rn	3.97438e-07	0.00
/Mc2	fn	8.44346e-19	0.00
/Mc1	fn	8.42004e-19	0.00
/M01	fn	3.5998e-19	0.00
/M00	id	2.015e-19	0.00
/M01	id	1.48028e-19	0.00
/Mc4	fn	1.41624e-19	0.00
/Mc3	fn	1.37175e-19	0.00
/M00	fn	1.11548e-19	0.00
/Mc4	id	7.29845e-20	0.00
/Mc1	id	7.24144e-20	0.00
/Mc2	id	7.24064e-20	0.00
/Mc3	id	7.0284e-20	0.00
/M3x	fn	6.41092e-20	0.00
/M4x	fn	6.41092e-20	0.00
/M0	id	2.79127e-20	0.00
/M0x	id	2.79127e-20	0.00
/M3x	id	1.77226e-20	0.00
/M4x	id	1.77226e-20	0.00

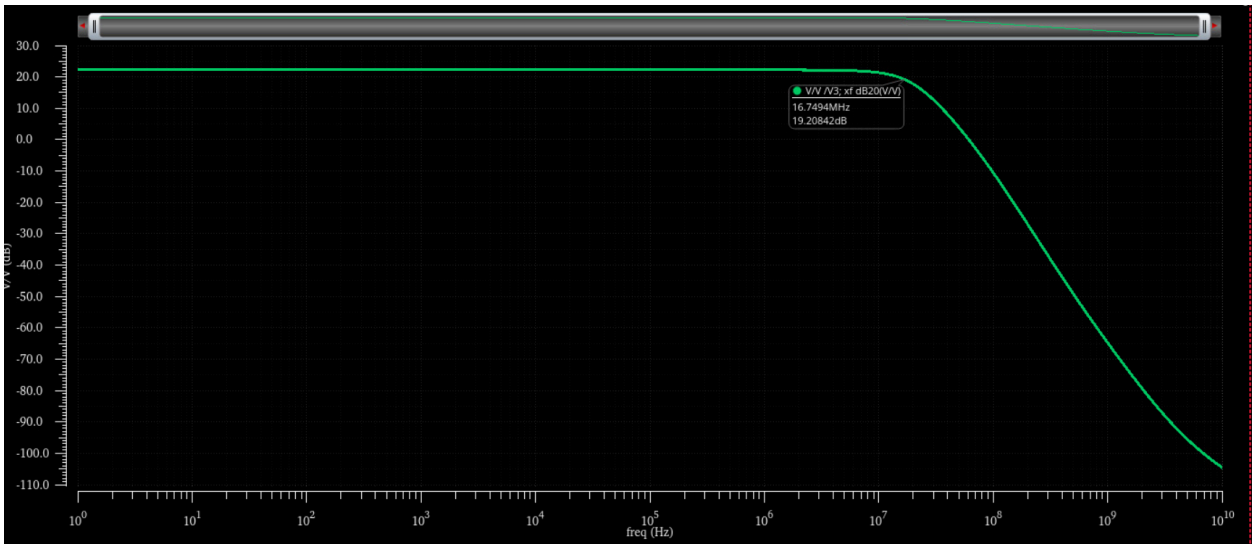
Integrated Noise Summary (in V) Sorted By Noise Contributors

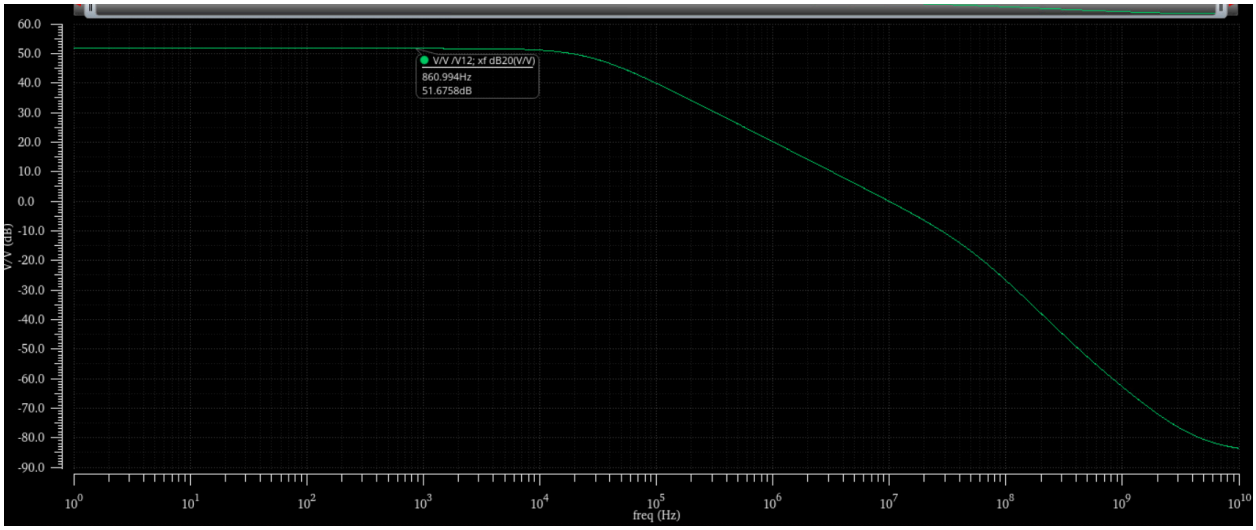
Total Summarized Noise = 0.00171907

Total Input Referred Noise = 0.000323672

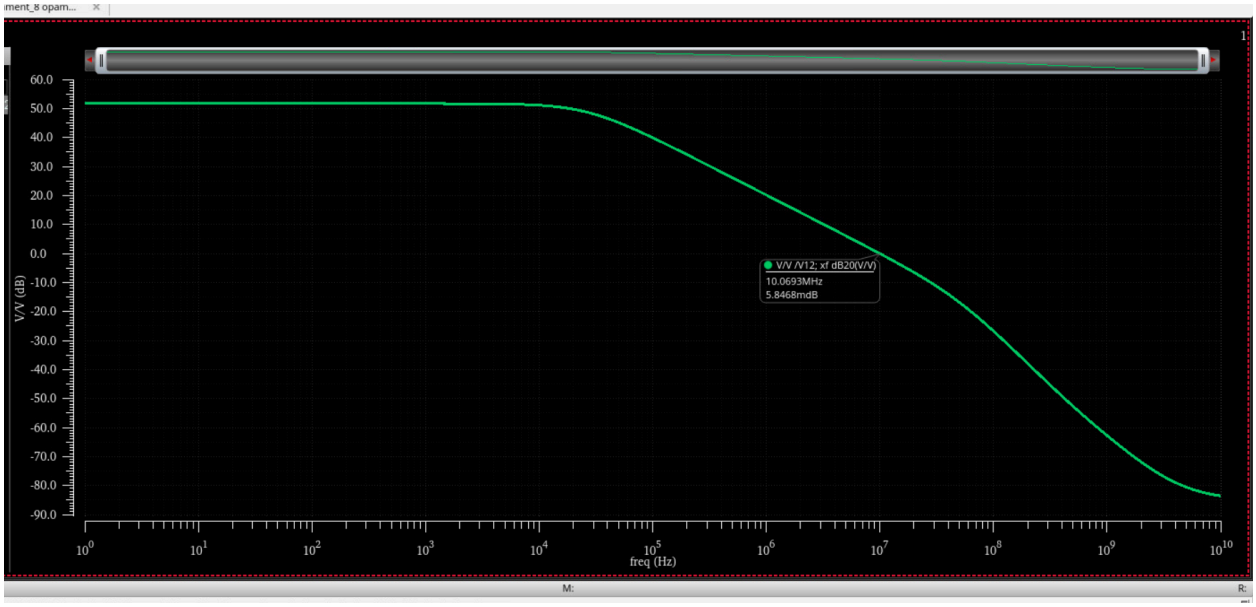
Closed Loop gain


V/V /V3; xf dB20(V/V)
5.8479Hz
22.25625dB
V/V (dB)
freq (Hz)

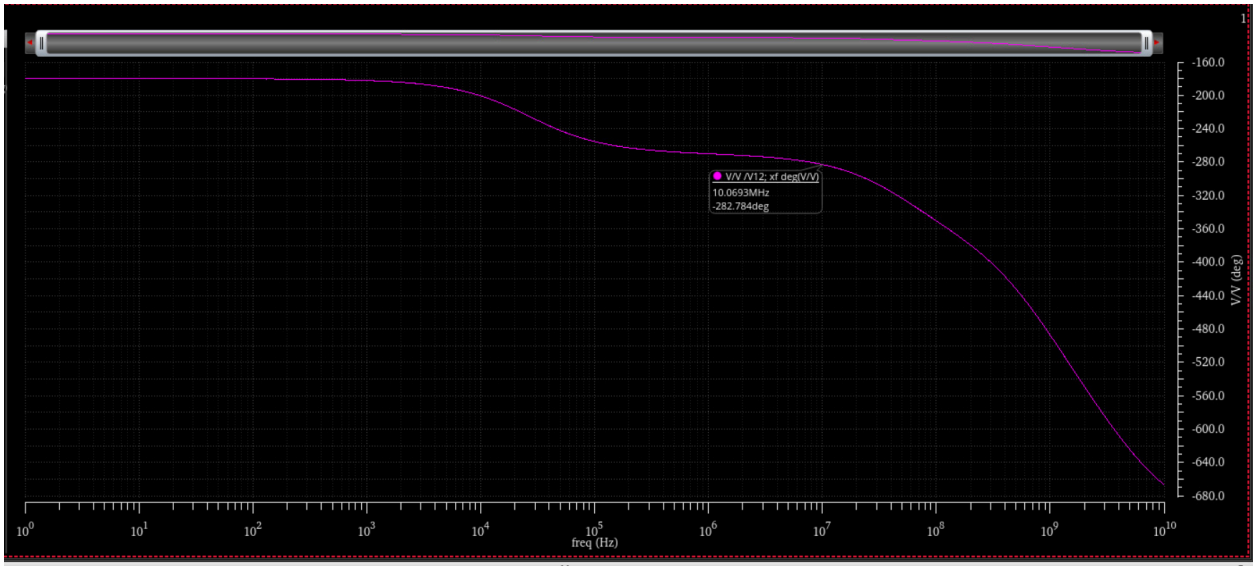

V/V /V3; xf dB20(V/V)
16.7494MHz
19.20842dB
freq (Hz)



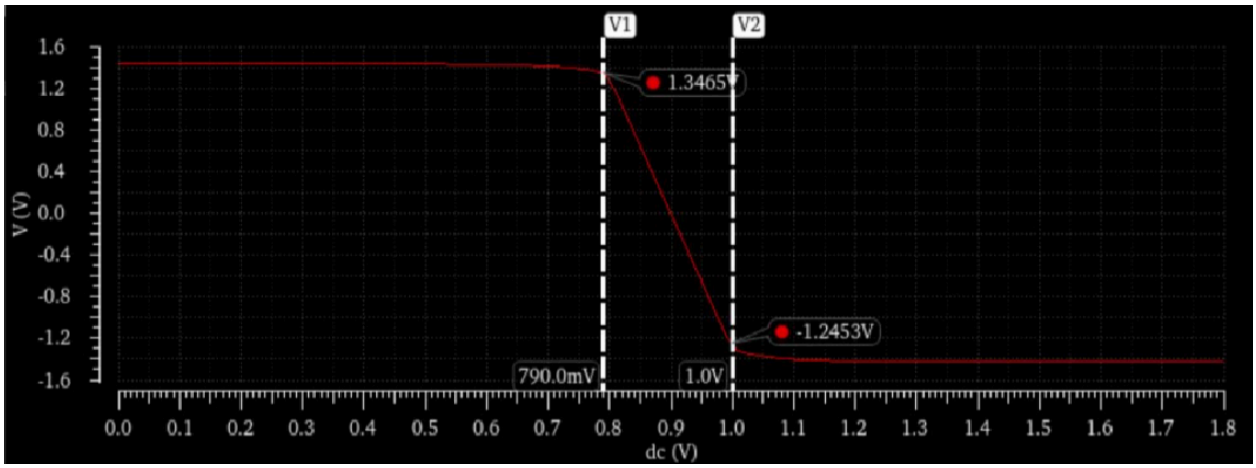
Loop Gain



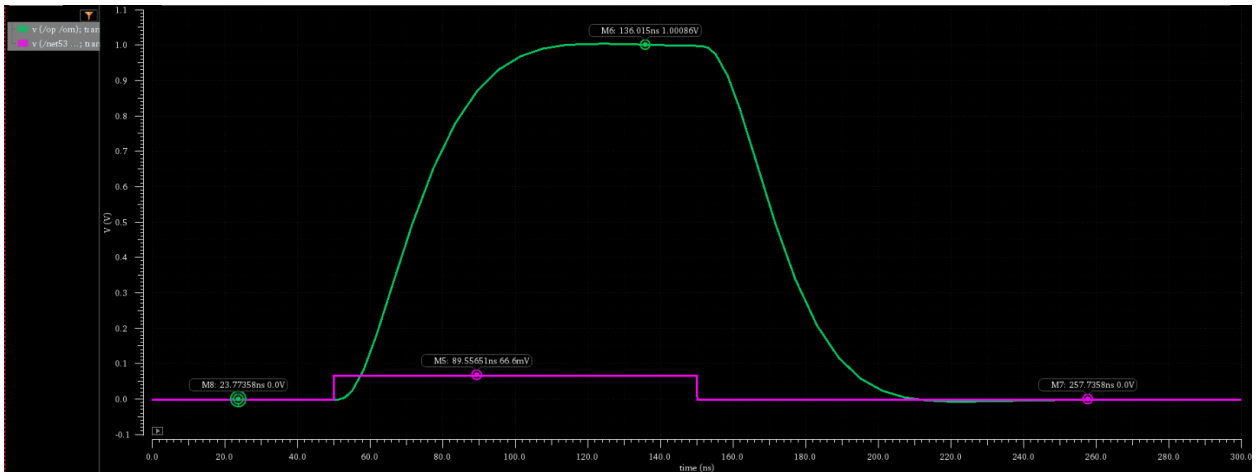
Phase Margin



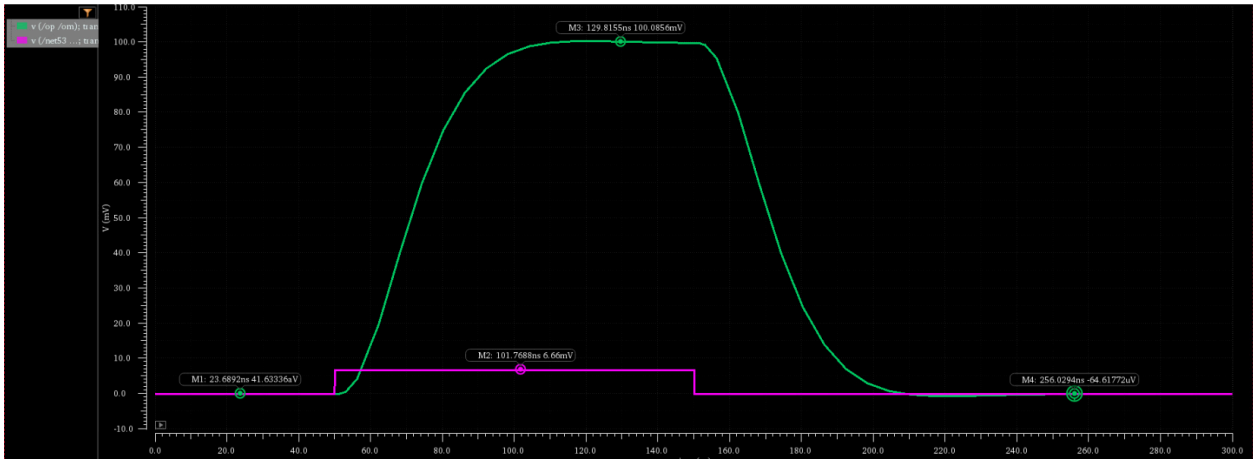
Closed Loop DC Transfer Function



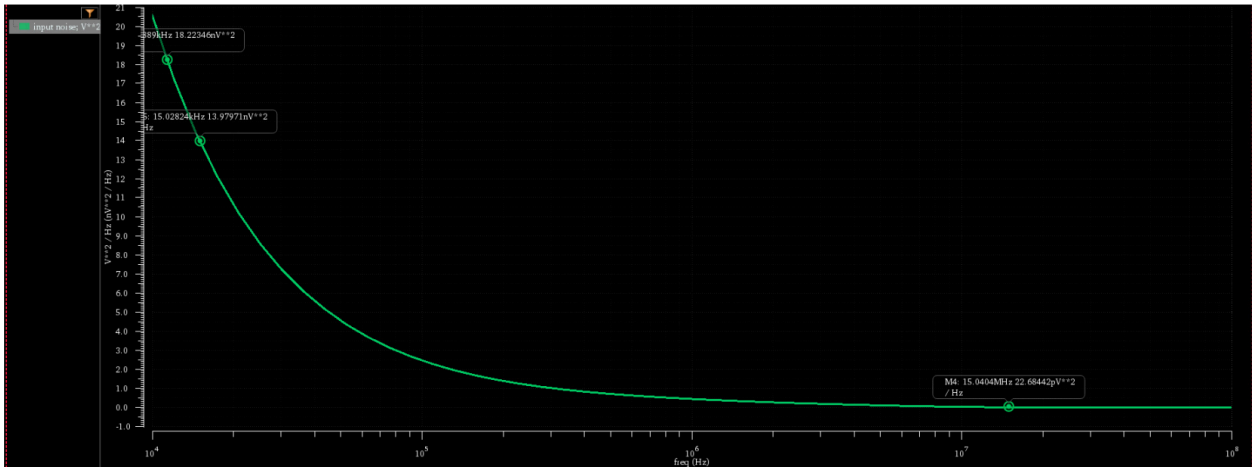
Large signal step response:



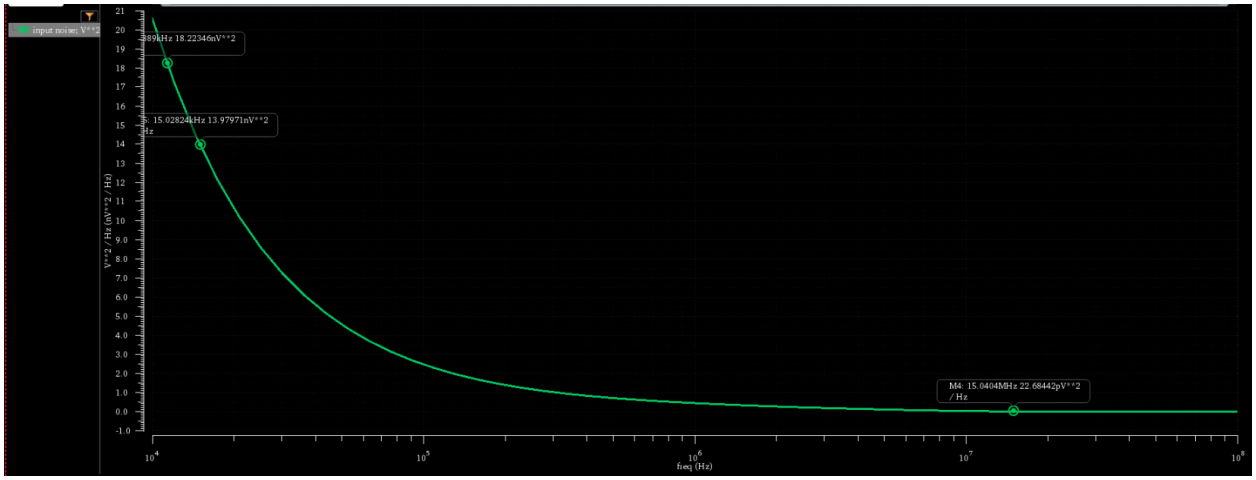
Small-Signal Step Response



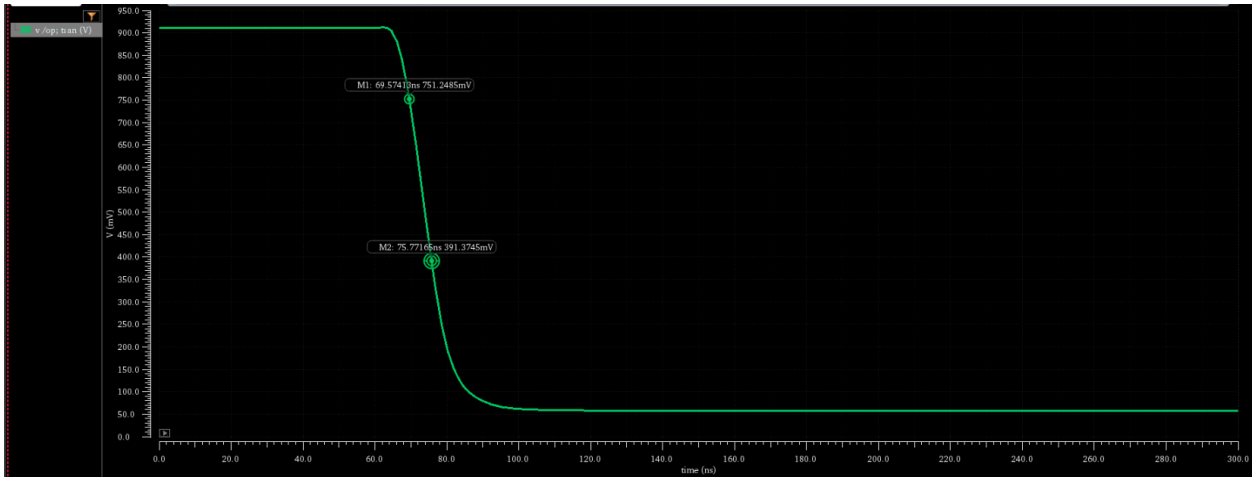
Input Refered Noise



Output Referred Noise



slew rate step = 0.7V Positive slew rate:



Negative slew rate: