Spec.	
DC Gain	12 dB
BW	≥ 3 GHz
Power Consumption	≤ 2 mW
Cap Load	50 fF

- Steps

1 | $P_{cons} = V_{DD}\, I_D \leq 2\ mW \rightarrow I_D \leq 1.6\ mA$

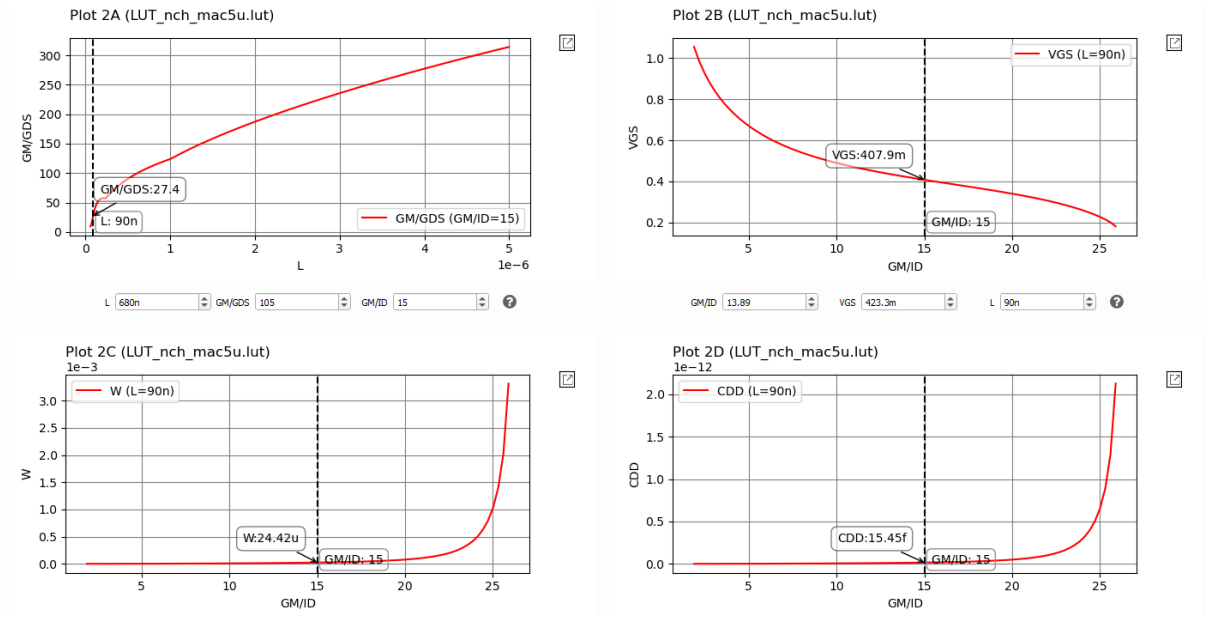
2 | Assume Cout = 2 CL as CL is very small and CDD will not be ignorable

3 | $GBW = \frac{g_m}{2\pi C_{out}} \geq 4 * 3\ GHz \rightarrow g_m \geq 7.55\ mS \rightarrow g_m = 9\ mS \rightarrow \text{if } \frac{g_m}{I_D} = 15 \rightarrow I_D = 600\ uA$

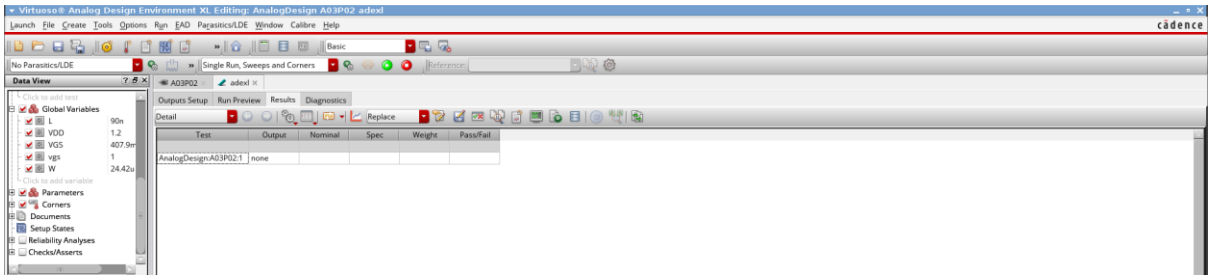
4 | $A_v = g_m R_{out} \geq 4 \rightarrow R_{out} = 450\ \Omega \rightarrow R_D = 550\ \Omega \rightarrow r_o = 2650\ \Omega \rightarrow g_m r_o = 24$

5 | $V_{out} = 1.2 - 600u \times 550 = 880\ mV$

6 | $L = 90nm \rightarrow V_{GS} = 407.9mV \rightarrow W = 24.42um$

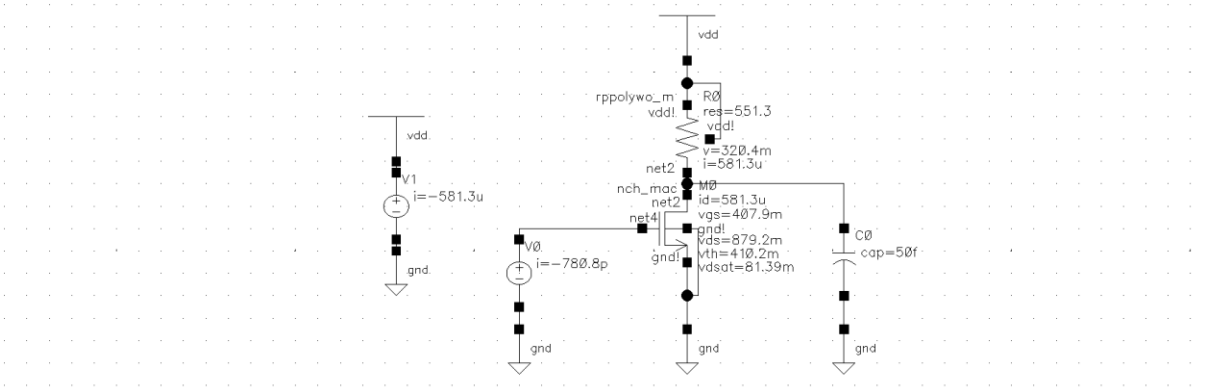


- Setup



- Results

1. DC



2. AC