Spec.	
DC Gain	23 dB
BW	≥ 10 MHz
Power Consumption	≤ 30 uW
Cap Load	500 fF

- Steps

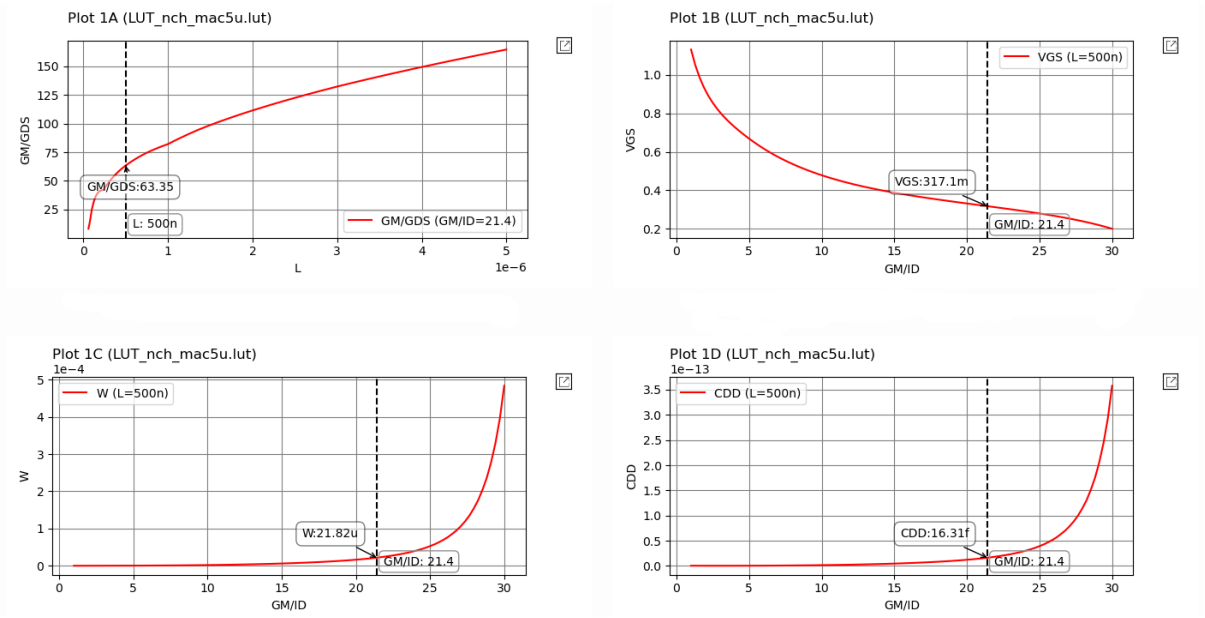
1 | $P_{cons} = V_{DD}\, I_D \leq 30\ uW \rightarrow I_D \leq 25\ uA$

2 | $GBW = \frac{g_m}{2\pi C_{out}} \geq 14.2 * 10\ MHz \rightarrow g_m \geq 446\ uS \rightarrow g_m = 535.2\ uS \rightarrow \frac{g_m}{I_D} = 21.4$

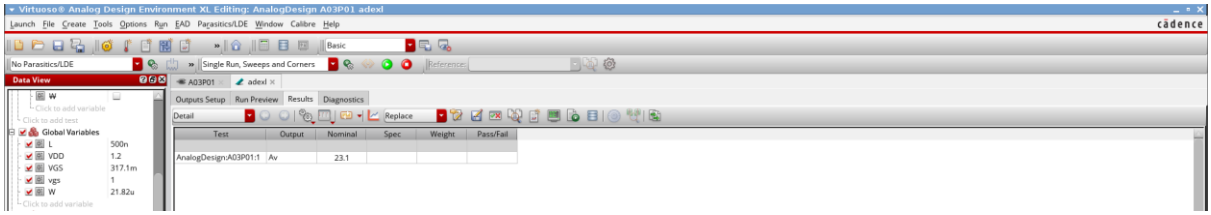
3 | $A_v = g_m R_{out} \geq 14.2 \rightarrow R_{out} = 26.6\ k\Omega \rightarrow R_D = 34.58\ k\Omega \rightarrow r_o = 116 \rightarrow g_m r_o = 62$

4 | $V_{out} = 1.2 - 25u \times 34.6k = 335mV$

5 | $L = 500nm \rightarrow V_{GS} = 317.1mV \rightarrow W = 21.82um$

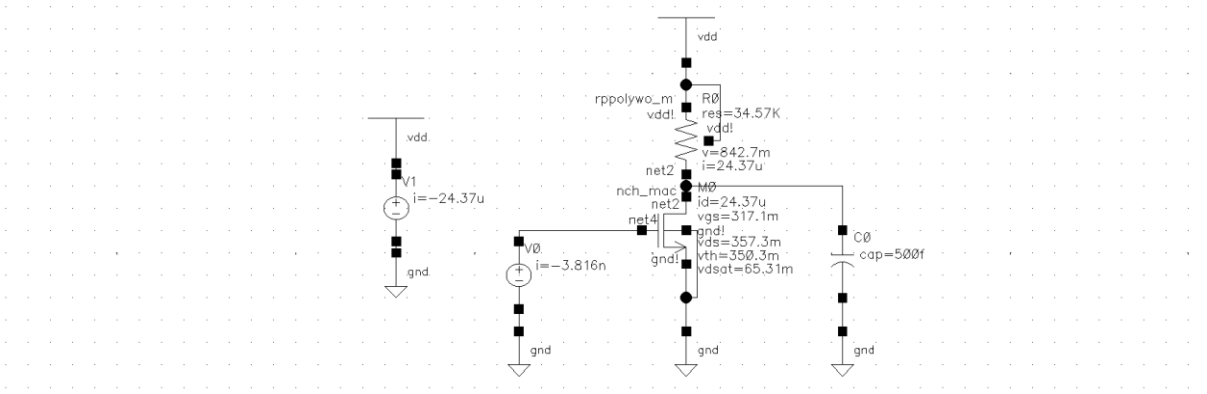


- Setup



- Results

1. DC



2. AC