Spec.	
Common Gate (CG) Amplifier	
DC Gain	20 dB
BW	≥ 14 MHz
Power Consumption	≤ 70 uW
Cap Load	1 pF

- Steps

1 | $P_{cons} = V_{DD}\, I_D \leq 70\ uW \rightarrow I_D \leq 58\ uA$

2 | $GBW = \frac{g_m}{2\pi C_{out}} \geq 10 * 14\ MHz \rightarrow g_m \geq 880\ uS \rightarrow g_m = 1.05\ mS \rightarrow \frac{g_m}{I_D} = 18.1$

3 | $A_v = g_m R_{out} = 10 \rightarrow R_{out} = 9.6\ k\Omega \rightarrow R_D = 11.5\ k\Omega \rightarrow r_o \geq 58.1\ k\Omega \rightarrow \frac{g_m}{g_{ds}} \geq 61$

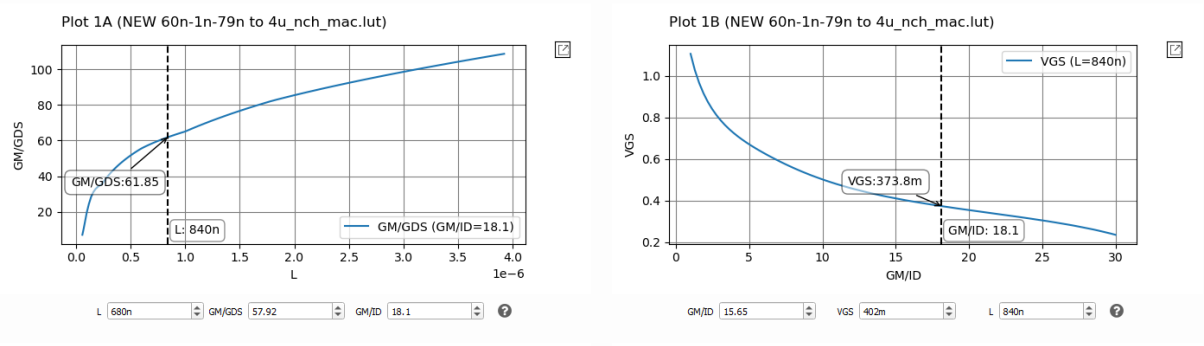
4 | $V_{out} = V_{DD} - I_D * R_D = 1.2 - 58u *\ 11.5k = 0.533\ V$

5 | Assume Vout divided equally between M1 and M2

6 | $L_1 = 840\ nm, V_{GS1} = 373.8\ mV, W_1 = 44.71\ um$

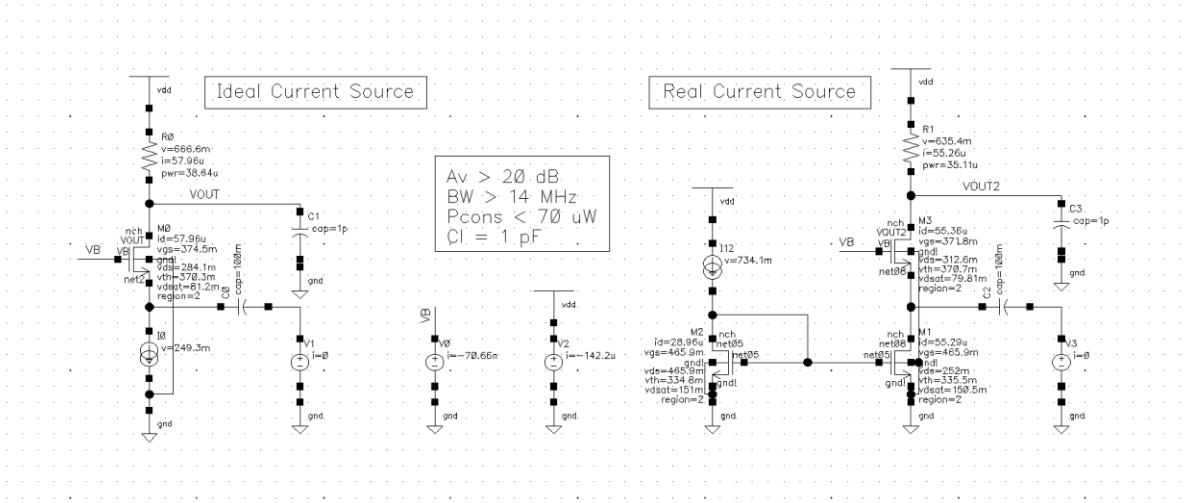
7 | For the Current source assume long L and bias it in SI to achieve large output resistance

8 | $L_2 = 1\ um, W_2 = 4.88\ um$



- Results

1. DC Operating Points



2. AC Analysis