Design a Gain Stage with the following specs			

Spec.			
DC Gain	6 dB	Power Consumption	2.5 mW
BW	≥ 15 GHz	Reference Current	200 uA

$$P_{cons} = V_{DD}\, I_{ss} \leq 2.5\ mW \rightarrow I_{ss} \leq 2\ mA$$

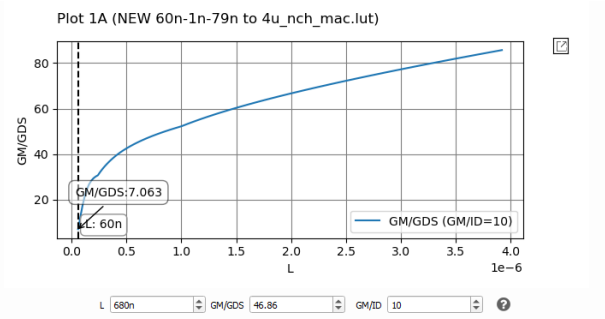
$$GBW = \frac{g_{m1}}{2\pi C_L} \geq 2 * 15\ GHz \rightarrow g_{m1} \geq 4.71\ mS \rightarrow g_{m1} = 10\ mS \rightarrow \frac{g_{m1}}{I_D} = 10$$

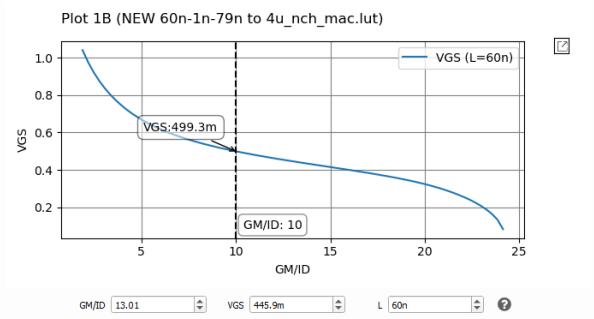
$$V_{OUT,CM} = 0.7\ V \rightarrow R_D = 500\ \Omega$$

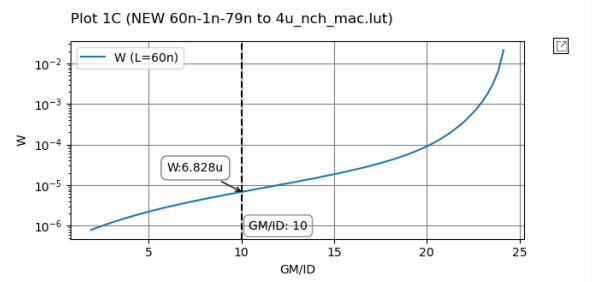
$$A_v = g_{m1} R_{out} = 2 \rightarrow R_{out} = 200\ \Omega \rightarrow r_{o1} = 335\ \Omega \rightarrow \frac{g_{m1}}{g_{ds}} \geq 3.35$$

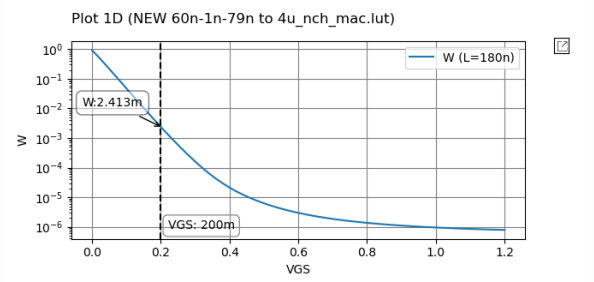
$$L_1 = 60\ nm, V_{GS1} = 499.3\ mV, W_1 = 6.828\ um$$

$$\text{Assume } L_2 = 180\ nm \rightarrow V_{DS2} = 200\ mV \rightarrow V_{GS2} = 200\ mV \rightarrow W_2 = 2.413\ mm$$









Simulations Results