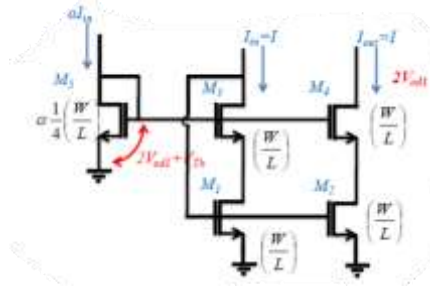


Design the current mirror shown in figure to get

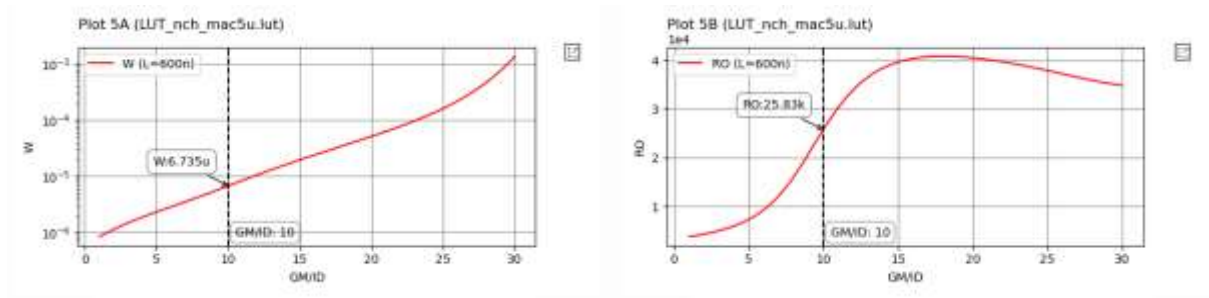
Spec	
Rout	$\geq 200 \text{ k}\Omega$
VDC @ M4 Drain	400 mV
Mirroring ration	1 : 2.5
Input Current	25 uA



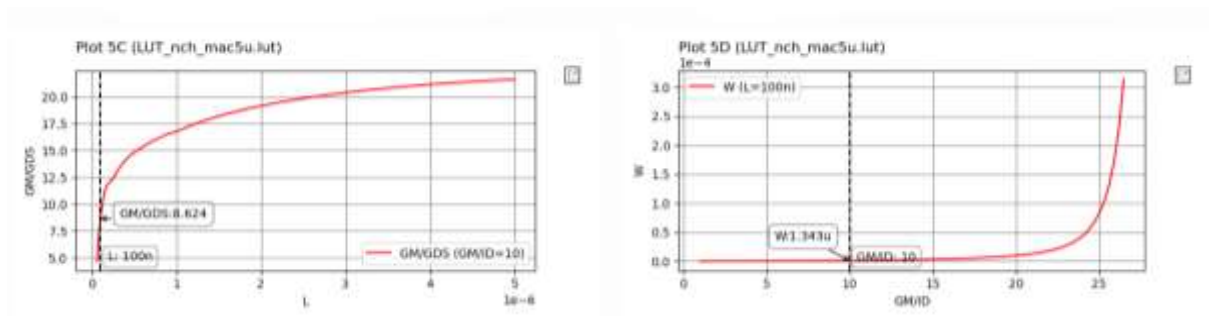
- Steps

1 | $V_{DC} = V_{3,4}^* + V_{1,2}^* = V_{3,4}^* + V_{GS1,2} = 400 \text{ mV}$

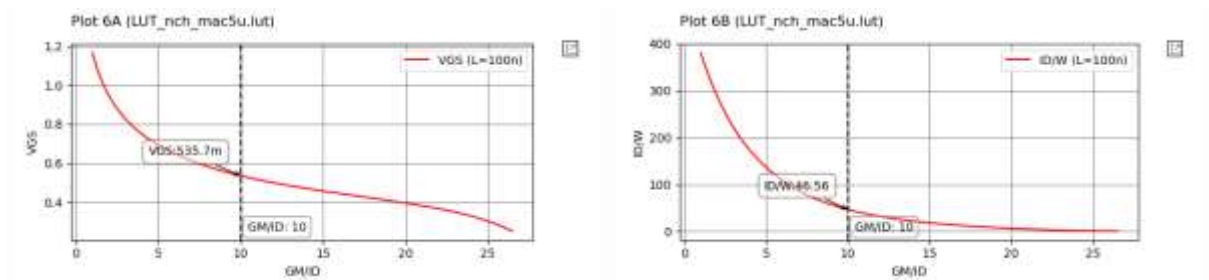
2 | Assume $V_{1,2}^* = V_{3,4}^* = 200 \text{ mV}$ and large L for the large Rout : $L_{1,2} = 600 \text{ nm} \rightarrow \frac{g_m}{I_D} = 10$



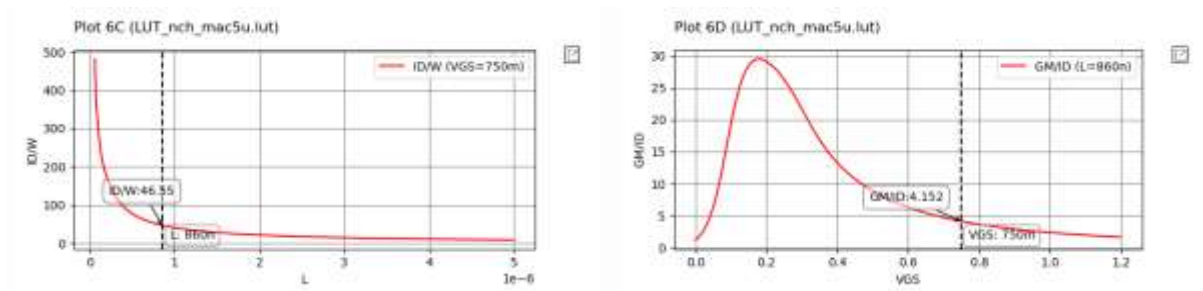
3 | $\therefore R_{out} = r_{o3,4} \times g_{m3,4} r_{o1,2} \rightarrow g_{m3,4} r_{o3,4} \geq 7.8 \rightarrow L_{3,4} = 100 \text{ nm}$



4 | $\therefore V_{GS5} = V_{GS3,4} + V_{1,2}^* = 735.7 \text{ mV} \rightarrow V_{GS5} = 750 \text{ mV}$ a littel deeper into saturation and JD = 46.6



5 | Sweeping L_{MB} that gives the same JD @ same $W_{3,4} \rightarrow L_{MB} = 860 \text{ nm}$

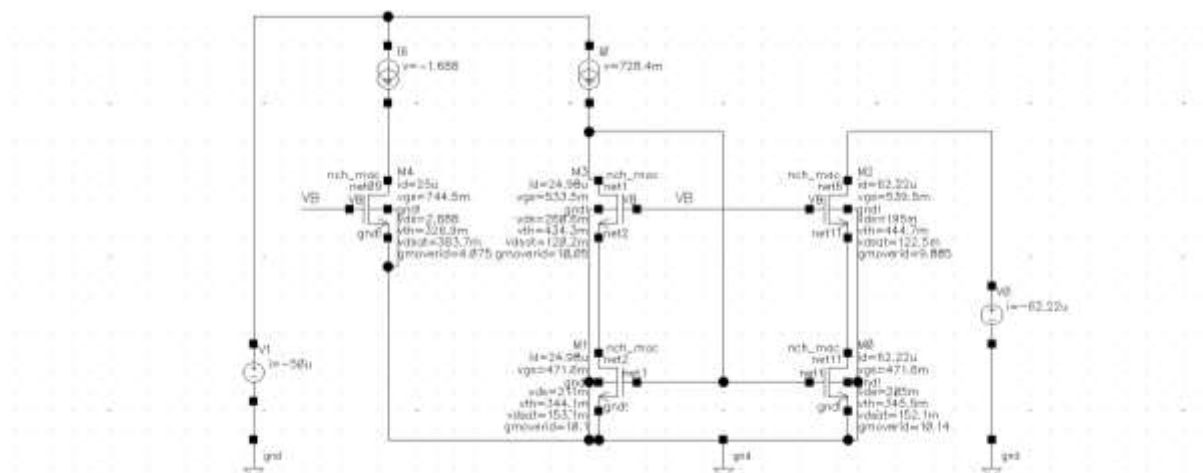


- Setup



- Results

1. DC Operating Points



2. Rout

