LAB 4 NMOS - Prelab

Prelab is due at the beginning of your lab section. Partial credit will be given for late prelabs. Show the TA the following page completely filled out to get checked off at the beginning of your lab.

Find a copy of the ALD1106 datasheet online, and use it to answer the following questions.

1. Estimate $r_o$ when $V_{DS}=5\text{V}$ and $I_{DS}=10\text{mA}$. [hint: on the datasheet the relevant parameter is called “output conductance”]

2. From the first graph on page 3, estimate the gate bias necessary to achieve $I_{DS}=10\text{mA}$ when $V_{DS}=5\text{V}$.

3. Under the bias conditions above, estimate the transconductance, $g_m$.

4. Estimate the voltage gain under these bias conditions, for the common source amplifier shown below.

5. How do you set the body voltage on the MOSFETs when using the ALD1106?

Figure 1 An NMOS common source amplifier.

| $r_o =$ | $V_{gs} =$ | $g_m =$ | $A_v =$ |