Analogue Integrated Circuits Report

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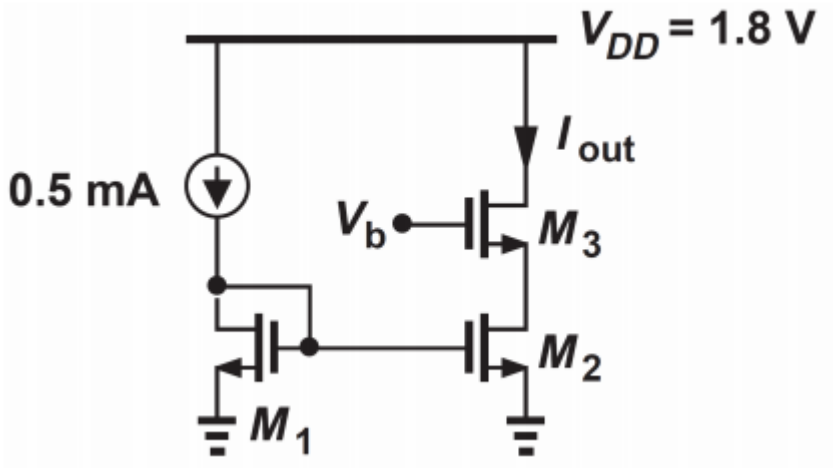
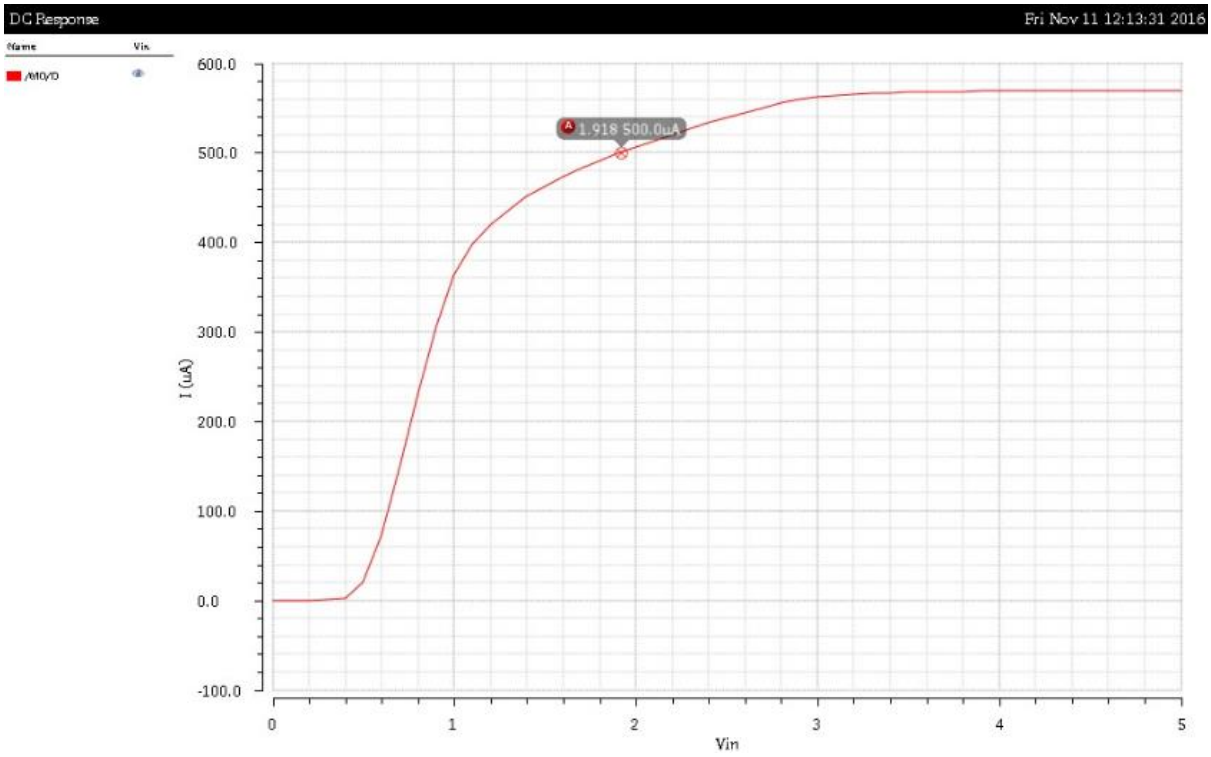
Lab 6



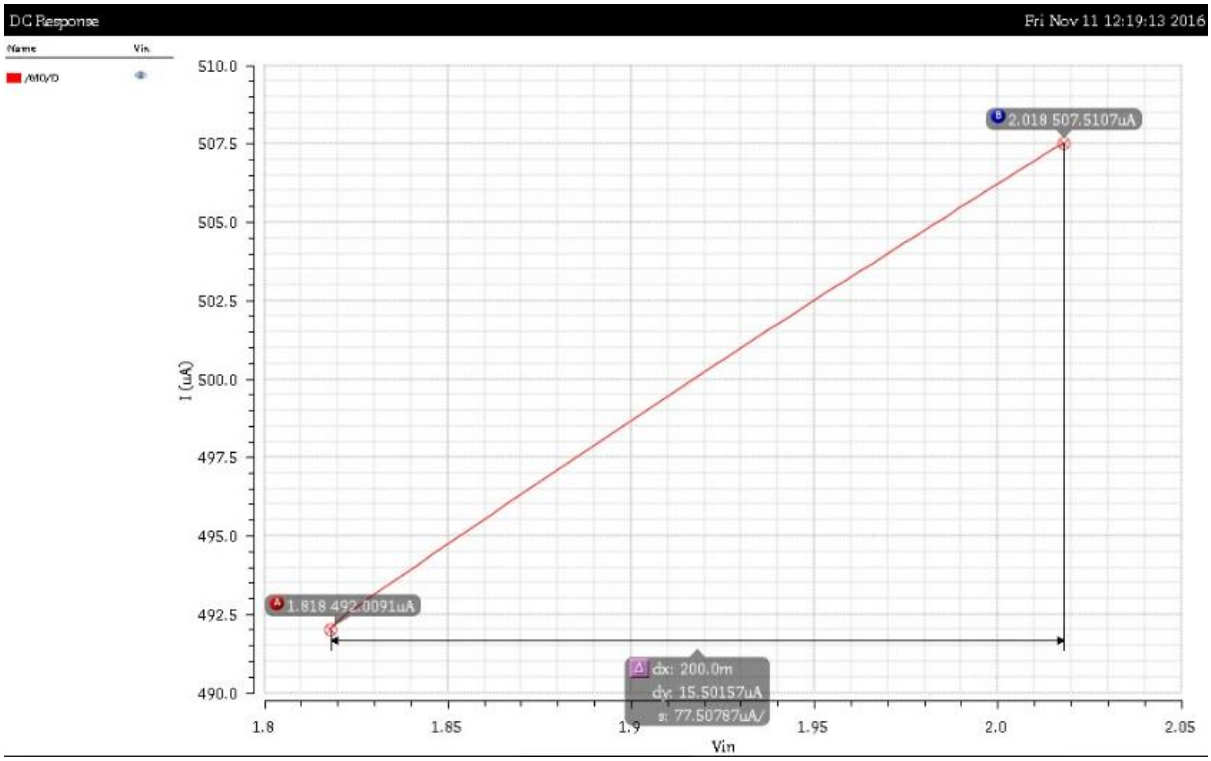
a.

We were asked to find a value for our V_b voltage that gave an output current I_{out} of 0.5mA. to do this we ran a DC simulation and swept our voltage V_b $(in\ simulation\ we\ called\ it\ V_{in})$ from 0 – 5V, and located the point where our output current was exactly 0.5mA. For us this point was when V_b was equal to 1.918V



b.

We then checked how our current was affected by a voltage change of $\mp$ 100mV of V_b. To do this we ran a DC sweep of 1.818V – 2.018V.

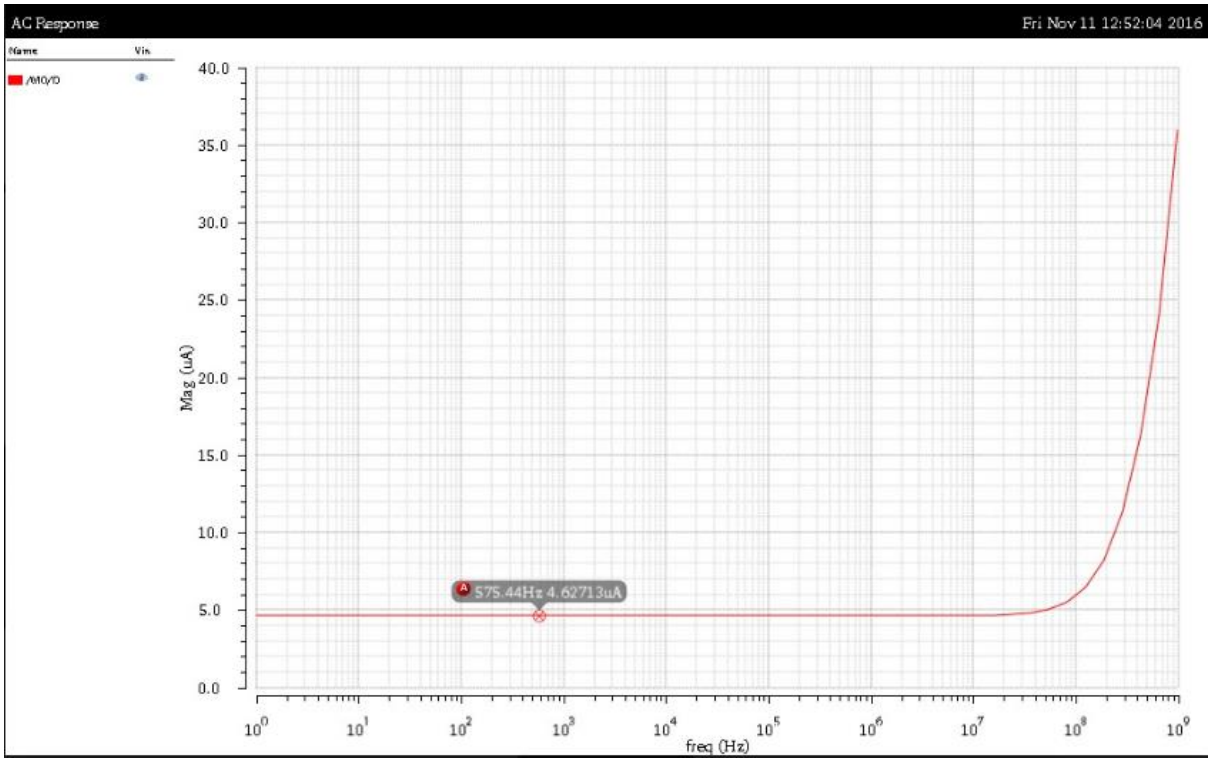


As we can see that close to our operating point of $V_b = 1.918V$ our current increases linearly with a small change in voltage from 0.492mA-0.507mA.

c.

We then were asked to calculate our R_{out}. To do this we ran an AC sweep setting our V_{out} to have an AC magnitude of 1V. We then once again measured our current and using this were able to find our R_{out}.

$$R_{out} = \frac{V_{out}}{I_{out}} = \frac{1}{4.6271\mu} \cong 216k\Omega$$


AC Response
Fri Nov 11 12:52:04 2016
Name
Vin
/M0/D
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Mag (uA)
575.44Hz 4.62713uA
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7
10^8
10^9
freq (Hz)