UNIVERSITY OF CALIFORNIA AT BERKELEY
College of Engineering
Department of Electrical Engineering and Computer Sciences
EE105 Lab Experiments

Experiment 8: Single Stage Amplifier
Lab Report

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Lab group: Tuesday 8-11 / Tuesday 5-8 / Thursday 8-11 / Thursday 5-8

3. Lab Worksheet

Submit the lab worksheet to Gradescope.

3.1. Biasing with R_s=0, 20KHz BW spec

3.1.1. Set R_{g2} to achieve a 1mA of current through the transistor. Measure your DC gate voltage V_g and observe the transistor current over time? Is it increasing or decreasing? Why?

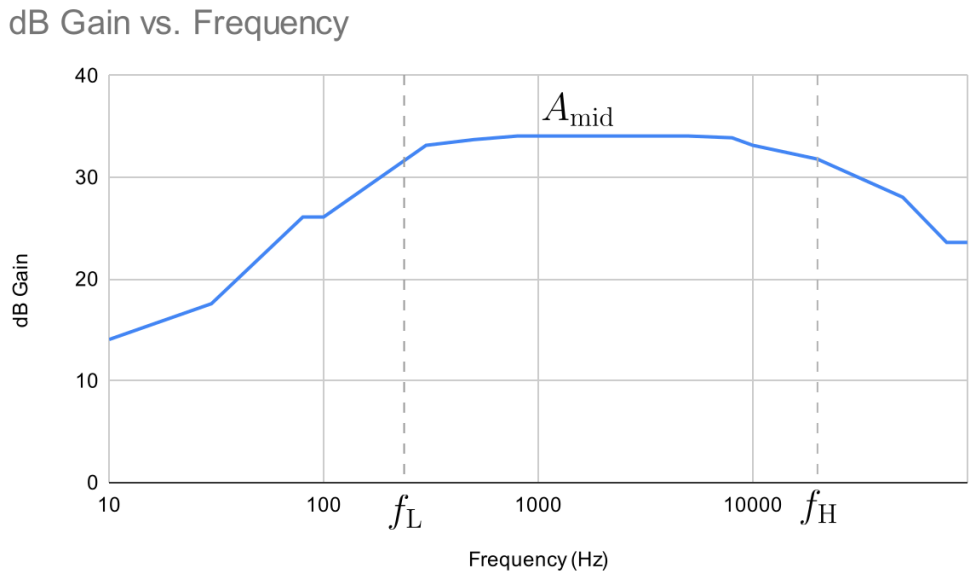
R_{g2} = 1.7 kΩ
The current is fluctuating on the order of microamperes. Even when forcefully adjusting the temperature, the transistor's current will stabilize.

3.2. Biasing with R_s≠0, 20KHz BW spec

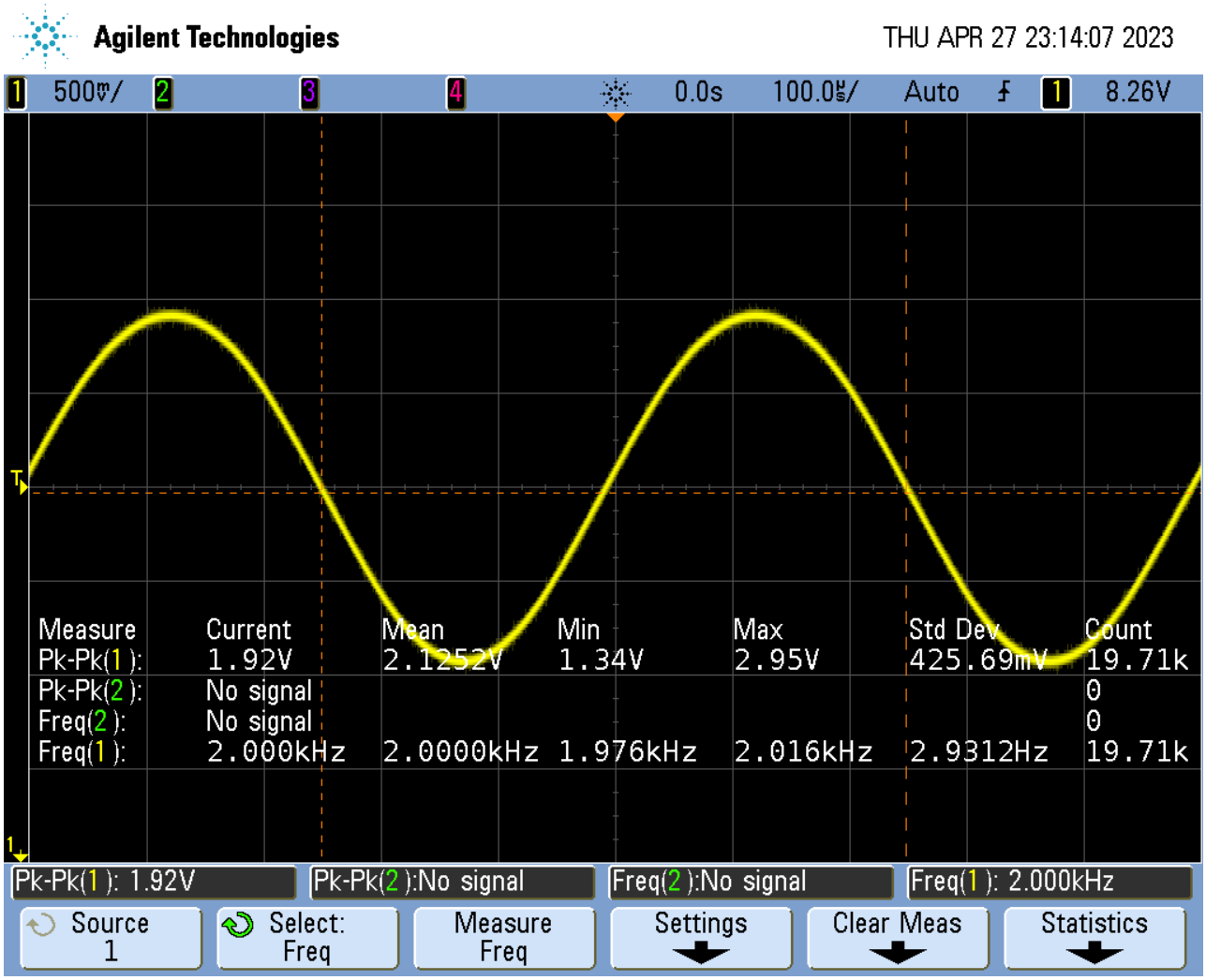
A_{mid} = 55.55

3.2.1. Why is the output swing decreasing for higher input voltages?
The output swing decreases for higher input voltages due to constraints such as switching time and the limitations of the power rails.

3.2.2. Attach a Bode plot of the gain and mark A_{mid}, f_L and f_H on the curve. Record from 10Hz to 100kHz with 4 points per decade.



3.2.3.Record the output waveform showing output swing.



3.2.4. Fill in the component values and the results in the table in your lab worksheet.

R_{g2} [kΩ]	R_D [kΩ]	R_S [kΩ]	C_{in} [µF]	C_S [µF]

2.7	6.8	1	1	10

3.2.5. What is the measured total current consumption of the amplifier? What part of it is the transistor and what part is the R_{g1},R_{g2} biasing?

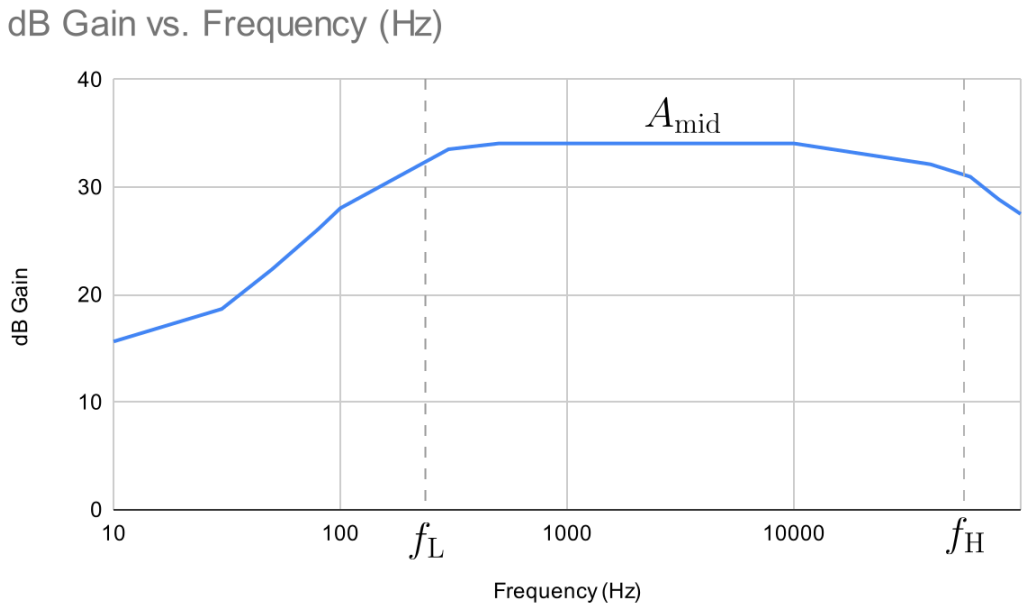
I_{g1} = 1.2 mA

I_D = 1 mA

I_{tot} = 2.2 mA

3.3. Biasing with $R_s \neq 0$, 40KHz BW spec

3.3.1. Attach a Bode plot of the gain and mark A_{mid}, f_L and f_H on the curve. Record from 10Hz to 100kHz with 4 points per decade.



3.3.2. Fill in the component values and the results in the table in your lab worksheet.

R_{g2} [kΩ]	R_D [kΩ]	R_S [kΩ]	C_{in} [µF]	C_S [µF]
2.7	3.5	0.5	1	20

3.3.3. What is the measured total current consumption of the amplifier? What part of it is the transistor and what part is the R_{g1},R_{g2} biasing?

I_{g1} = 1.2 mA

I_D = 2 mA

I_{tot} = 3.2 mA