

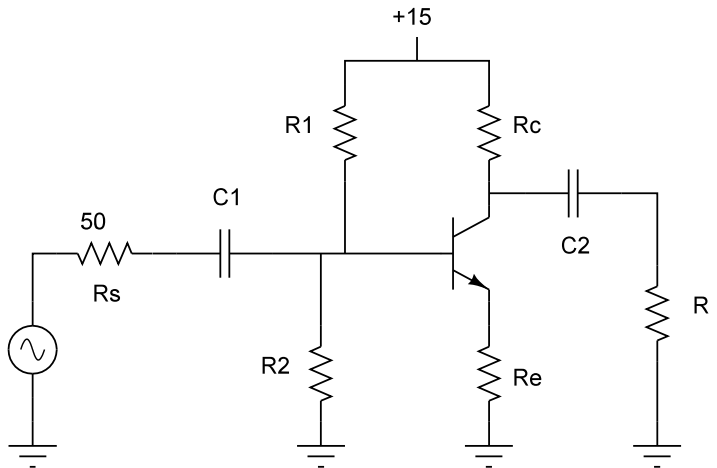
ENGR-356
Lab # 8
Common-Emitter Amplifier

Goals

The principle goal is to investigate and to understand the biasing and large signal operation of a common-emitter amplifier.

Design

Using the circuit topology shown in figure 1, complete a design that has the following performance: $R_{in} > 20k$, voltage gain (maximize, but at least > 5), low distortion.



The general approach is to find the DC Q point while keeping in mind the expressions for gain. Recall that small signal gain will depend on Beta, R_e , R_{out} , R_{load} , r_e . Attempt to achieve the stated gain without bypassing R_e . Likely you will find that the value of R_{load} will have a significant effect on gain. You might try an initial design without R_{load} and then add it.

Measurements should include:

Gain, range of frequencies where the output drops to no less than .707 of the maximum given a constant level input voltage, the maximum p-p output voltage without significant distortion.

Documentation

Take careful notes in your lab notebook.

Lab Report

The lab report will be one page on which you document the following:

- Component values for R_1 , R_2 , R_c , R_e , C_1 , C_2 in your breadboarded circuit.
- Calculated R_{in} and Voltage gain
- Measured voltage gain at 10Khz
- Measured maximum p-p output without significant distortion
- Measured frequency range (between the -3db points)
- Observations about the lab (challenges, what worked, what didn't, etc).