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

EE105 Lab Experiments

Experiment 3: Single Stage CE & CS Amplifier Pre-Lab Worksheet

1 Pre-Lab

To make the plots more readable and to save on printer toner, change the background color of your plots to white before printing your plot. In WaveView, click *Config* → *Preferences* to change the WaveView program settings. Next, click the *Waveview* tab, and find the *Waveview Background* option and set it to *White*.

1.1 Attentuation Network

Attentuation Ratio V_{in}/V_{source}:_____

Equivalent Impedance R_{in}:_____

Draw Thevenin equivalent model:

1.2 Single Stage CE BJT Amplifier

Explain the function of R_e:

Small Signal Circuit:

Expression of middle band gain A_v:_____

Expression of output impedance of the amplifier R_{out}:_____

Expression of high cutoff frequency f_H: _____

Table 1: Component Design

Component Design	Hand Calculation	Hspice Simulation
R_{b1}		
R_{b2}		
R_c		
R_e		

Table 2: Performance Verification

Performance	Hand Calculation	Hspice Simulation
Middle Band Gain(A_{mid})		
High Cutoff Frequency(f_H)		
Output Swing(SW)		
Total Power Consumption(P_{total})		

Plot Amplifier Gain(in dB20) v.s. Frequency (in log scale)

Plot Input and Output Waveforms showing the Output Swing

1.3 Single Stage CS MOSFET Amplifier

Explain the function of R_s:

Small Signal Circuit:

Expression of middle band gain A_v:_____

Expression of output impedance of the amplifier R_{out}:_____

Expression of high cutoff frequency f_H: _____

Table 3: Component Design

Component Design	Hand Calculation	Hspice Simulation
R_{g1}		
R_{g2}		
R_d		
R_s		

Table 4: Performance Verification

Performance	Hand Calculation	Hspice Simulation
Middle Band Gain(A_{mid})		
High Cutoff Frequency(f_H)		
Output Swing(SW)		
Total Power Consumption(P_{total})		

Plot Amplifier Gain(in dB20) v.s. Frequency (in log scale)

Plot Input and Output Waveforms showing the Output Swing