ShanghaiTech University
School of Information Science and Technology

EE112 Lab Experiments

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

Contents

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.

1.1. Attenuation Network

Attenuation 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	Multisim Simulation
R_{b1}		
R_{b2}		
R_c		
R_e		

Table 2: Performance Verification

Performance	Hand Calculation	Multisim 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:

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	Multisim Simulation
R_{g1}		
R_{g2}		
R_d		
R_s		

Table 4: Performance Verification

Performance	Hand Calculation	Multisim 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:

Plot Input and Output Waveforms showing the Output Swing:

Reference

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