ShanghaiTech University
School of Information Science and Technology
EE112 Lab Experiments

Lab 5: Multi-Stage Amplifiers Lab Worksheet

4. Lab

4.1 Input stage

Component Design	Measurement	Multisim Simulation
R_{G1}		
R_{G2}		
R_D		

Table 1: Input stage component design

Performance	Measurement	Multisim Simulation
Middle Band Gain (A_{mid})		
Output Voltage (V_D)		
Output Resistance (R_{out})		
Output Swing (SW)		

Table 2: Input stage performance

Attach a single oscilloscope trace with both input voltage and output voltage waveforms demonstrating the input stage's gain, output voltage, and swing.

Attach an oscilloscope trace with both input and output voltage waveforms showing the output resistance measurement.

4.2 Output stage

Component Design	Measurement	Multisim Simulation
R_C		

Table 3: Output stage component values

Performance	Measurement	Multisim Simulation
Middle Band Gain (A_{mid})		
Input Resistance (R_{out})		
Output Swing (SW)		

Table 4: Output stage performance

Attach a single oscilloscope trace with both input voltage and output voltage waveforms demonstrating the output stage's gain and swing.

Attach an oscilloscope trace with both input and output voltage waveforms showing the input resistance measurement.

4.3 Middle stage

Component Design	Measurement	Multisim Simulation
R_E		

Table 5: Middle stage component design

Performance	Measurement	Multisim Simulation
Unloaded Middle Band Gain (A_{mid})		X
Input Resistance (R_{in})		X
Output Resistance (R_{out})		X
Output Swing (SW)		

Table 6: Middle stage performance

Attach a single oscilloscope trace with both input voltage and output voltage waveforms demonstrating the middle stage's gain and swing.

Attach an oscilloscope trace with both input and output voltage waveforms showing the input resistance measurement.

Attach an oscilloscope trace with both input and output voltage waveforms showing the output resistance measurement.

4.4 Putting it all together

Measured Parameter	Value
V_D	
V_{E2}	
V_{E3}	
Middle Band Gain (A_{mid})	
Output Swing (SW)	

Table 7: Completed circuit measurements

Attach a single oscilloscope trace with both input voltage and output voltage

waveforms demonstrating the completed circuit’s gain and swing.

Reference

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