

EE420 lab - week 3

Tweeking the multistage amplifier

19th April 2005

1 Objectives

For the last two weeks, you measured and analyzed a multi-stage amplifier. This time, you can emperically change it for better performance.

2 Procedure

1. Begin with your circuit from last week.
2. Modify it so it will drive the 1K load to 5 volts p-p. To do this, you will probably need to make two changes. The first is to lower the value of R10, now at 10K, to make more negative current available. The second is to adjust the bias so the clipping is symmetric. To adjust the bias, change the value of R6, now at 56K. I am not sure whether it needs to be higher or lower. You should make R10 have the highest value that provides 5 volts p-p into a 1K load.
3. Modify it for a gain of 25. There are many ways to do this. One of them is to change the value of R4. This may change the bias a little. Check it to make sure it is still good. If it isn't, you may need to change R1 or R2 to correct it.

3 Report

3.1 Executive Summary (on cover)

Show a schematic of the improved amplifier, with measured and simulated gain, and a statement that it meets specifications, if you succeed, or what it actually does if you are not able to fully meet specifications.

3.2 More detailed summary

Write a paragraph on what you learned, and point out any surprises. How much output could you get? Does it match the simulation? Explain. Limit this section to one page.

3.3 Journal

Provide a journal of what you did, with enough detail that someone else can reproduce your experiment and verify your work.

3.4 Simulation

Try to do the same with simulation. Start with your old circuit. Change the values and rerun. Repeat until you get good results. This should be much easier than modifying the real circuit in the lab.

3.5 Analysis

Verify your results with calculations. Normally, you would calculate it first, but I wanted you to try a raw experimental method.