--- University of Minnesota ---Institute of Technology Department of Electrical Engineering

Home Work #5 Due: Monday November 2nd, 1998

EE5505: Analog Integrated Circuit Design Fall 1998

1) Design 3 NMOS current mirror designs to meet the following conditions. Iout (DC) = Iin (DC) = 1μ A. Small-signal output impedance ro = 10Meg, 100Meg, 100Meg. Vomin = 0.2V, 1.2V and 0.4V respectively. Your circuit designs are simple current mirror, cascode current mirror and low voltage current mirror.

Confirm your result using SPICE. Get the latest models for the 1.2µ NWELL AMI process from the mosis site http://www.mosis.org/vendors.... or from my website.

Complete the layout for the low voltage cascode. Extract the circuit in magic. Convert the extracted file to a spice file using "ext2spice". Look at the value of the extracted parasitics. Use HSPICE to confirm that the extracted circuit is the same one you designed. Perform an AC analysis to evaluate the impact of parasitic capacitances.