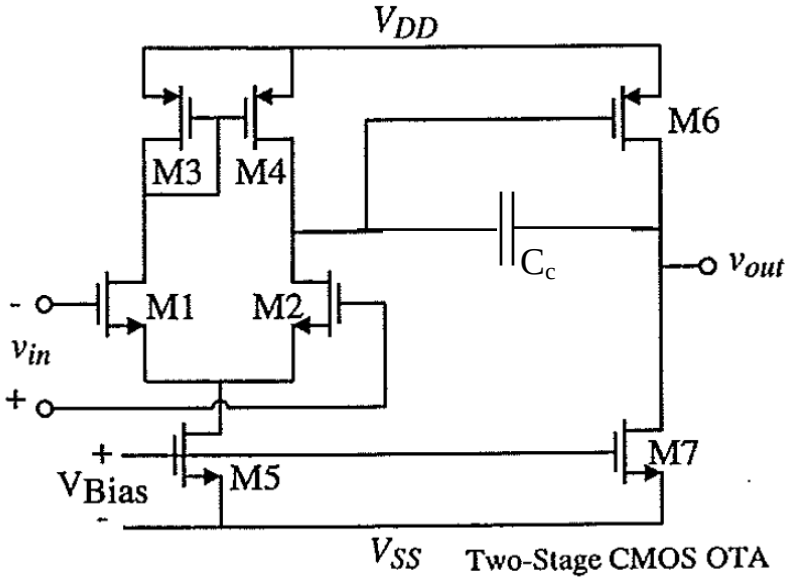
Homework 4

Due: Tuesday, April 2

1) 80 points
Design, layout and extract a netlist for a two stage differential operational amplifier with 60dB gain, Unity gain BW of 2Mhz, with greater than 70 degrees phase margin, slew rate 5v/us for a 20pF load, less than 20mv offset. Show hspice or eldo simulations results for all design parameters using hspice ac analysis and transient analysis. Check common mode range using a transient simulation.



dc Gain = 60dB
Phase Margin > 70 degrees
SlewRate = 5V/us with 20 pF load

Vdd = 5v

Input Range 1.2v - 3.5v

Unity Gain BW = 2Mhz

2) (20 Points) Check a 50mV step response with 20pF load in closed loop (source follower) using a transient simulation and see if amplifier is under, over or critically damped. What is the settling time for the step response.

3) (20 Points) Re-check problem 1 simulations at temperatures 0, 75 degrees C Junction Temp and note changes