EE8331: Advanced Analog Integrated Circuit Design

HW #1
Due Friday 01/28/00

1) Calculate the minimum capacitance necessary for a 8, 10, 12, 14, 16, 18 and 20 bit system. Plot Cmin vs number of bits of resolution. Assume a 2.5V supply.

2) For strong inversion and saturation the drain to source current is given by

$$Ids = \frac{kW}{2L}(Vgs - Vt)^2(1 + \lambda Vds)$$

Likewise for weak inversion and "saturation" the drain to source current is given by

$$Ids = Ido\frac{W}{L}e^{\frac{Vgs}{nUT}}(1 + \lambda Vds)$$

Find a "fitting" function for moderate inversion. The fitting function should be continuous is Ids, gm and gds