UNIVERSITY OF CALIFORNIA AT BERKELEY

College of Engineering

Department of Electrical Engineering and Computer Sciences

EE105 Lab Experiments

Experiment 5: MOSFET Characterization

Pre-Lab Worksheet

Student 1 name:

Student 2 name:

Lab group: Tuesday 8-11 / Tuesday 5-8 / Thursday 8-11 / Thursday 5-8

Before adding Cadence plots to your report, please **change the background color to white**:

Edit->Properties-> Click the black rectangle near the "Background" -> change to white.

# Pre-Lab

# MOSFET Characterization

Screenshot of cadence window, showing simulation setup:

Plot of parametric Sweep of BS170 MOSFET:

Please indicate the operating regions on these curves (“off”, “triode”, “saturation”).

Which regions are used for “logic” operations?

Which region present linear resistivity?

Which region can be used as an “analog amplification”?

What are KN, VT and λ for this NMOS transistor?

# Resistive Touch Sensor

Why do we need the transistor? Can we have the same functionality using the circuit in Figure 3(b)?

What are the functions of R1 and R2?

What is the status of the LED before and after touching for (a)? Why?

Using the VT and KN values you got from the previous step, what is the ID current before and after touching to the sensor? Show your calculations.