

ECE 230L - LAB 6

MOSFET SIMULATION WITH PSPICE

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1 Objectives of this Laboratory

The objectives of this laboratory session are as follows:

- Measure the static and switching characteristics of discrete (transistors, resistors, and capacitors) MOS inverter circuits,
- Determine experimentally the truth tables of CMOS integrated-circuit gates,
- Measure the static voltage-transfer characteristics of CMOS NOR and NAND gates, and
- Measure the switching characteristics of CMOS NOR and NAND gates

Table 1: ECE 230L Laboratory 6 Grading Rubric

Criteria	Points Possible
Circuit Schematic used to simulate MOSFET	10
Verification of ZETEK BS170 Plots	8
Extracted BS170 parameter simulation	15
Plot of I_{DS} vs $V_{DS}(V_{GS})$	15
Class average BS170 parameter simulation	20
Average Calculation	5
Plot of I_{DS} vs $V_{DS}(V_{GS})$	15
Manufacturer specified BS170 parameter simulation	15
Plot of I_{DS} vs $V_{DS}(V_{GS})$	15
Compare values of V_{TH}, K_p, and λ for all three simulations	15
Comment on the effects of V_{TH}, K_p, and λ on the graphs	10
Extension	7
Total	100