

ECE 230L - LAB 7

DEVICE NON-IDEALITIES

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1 Objectives of this Laboratory

The objectives of this laboratory session are as follows:

- To gain understanding of some of the less than ideal behavior of devices and circuits explored in previous laboratories.
- To explore methods for measuring these non-idealities in a less structured lab environment using the tools presented during the course of the semester.
- To work with a group in the course to explore these methods.
- To present group findings to fellow students in the course in a lab presentation.

2 Experimental Exploration Format

3 Experimental Exploration 1: Thermal Effects on PN junction diode & MOSFET

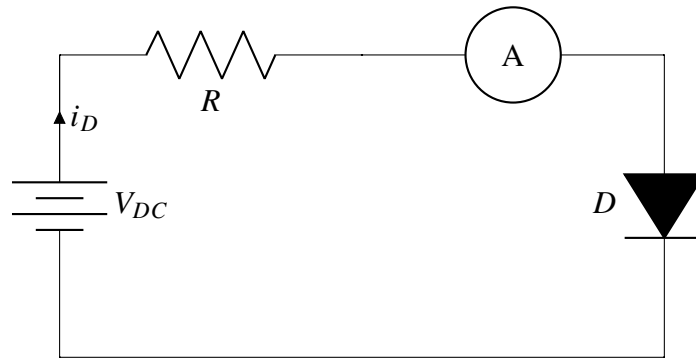


Figure 1: PN-Junction Diode Test Circuit

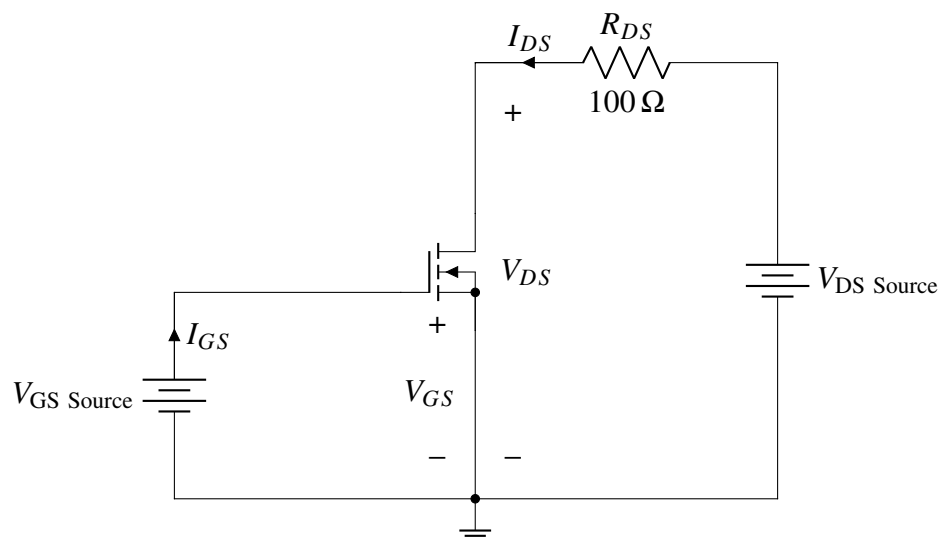
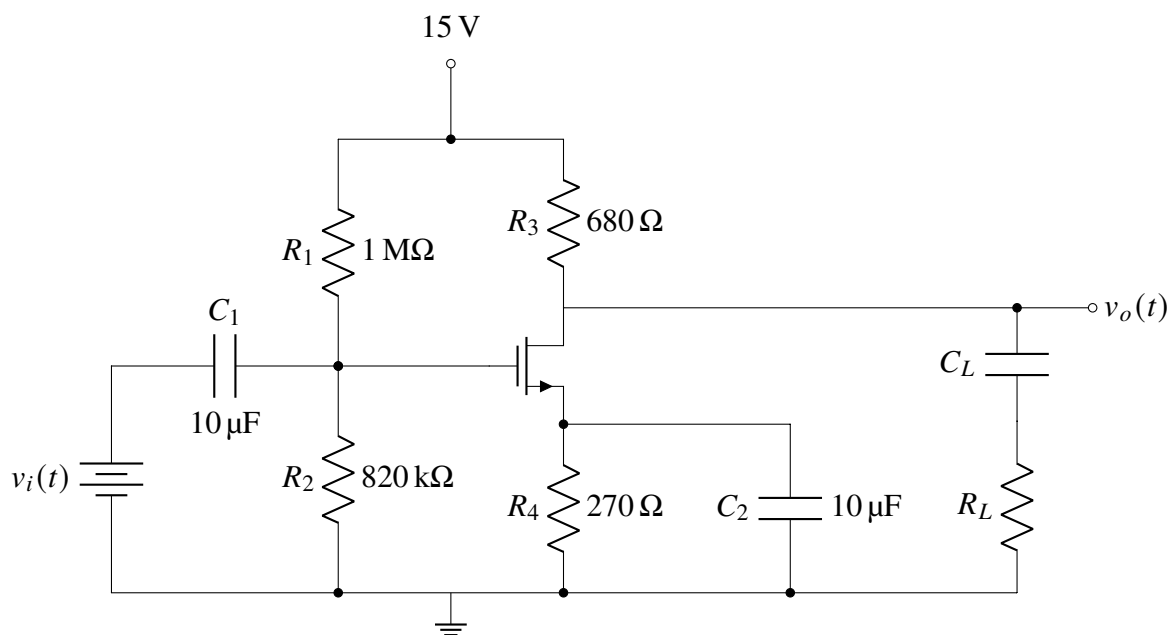
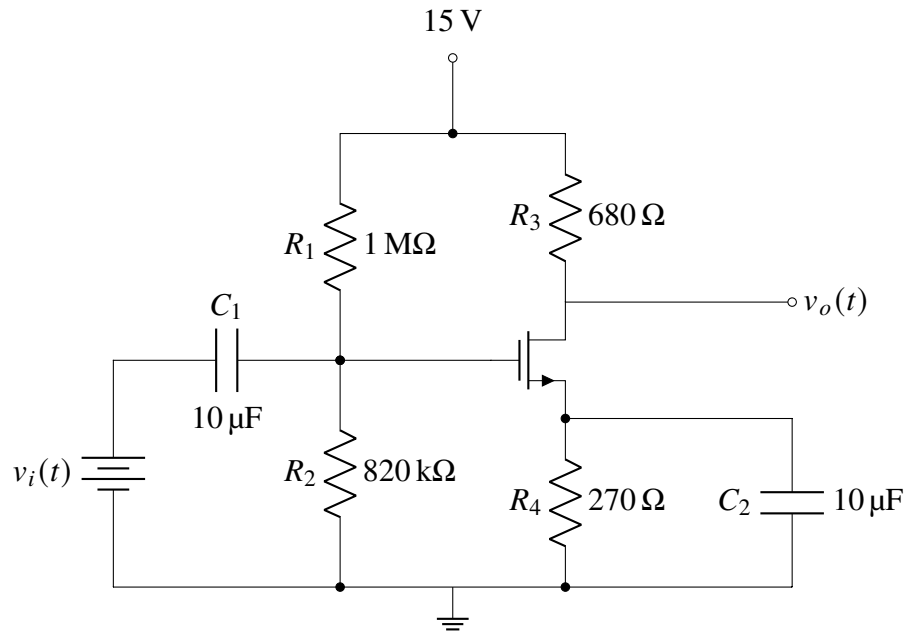
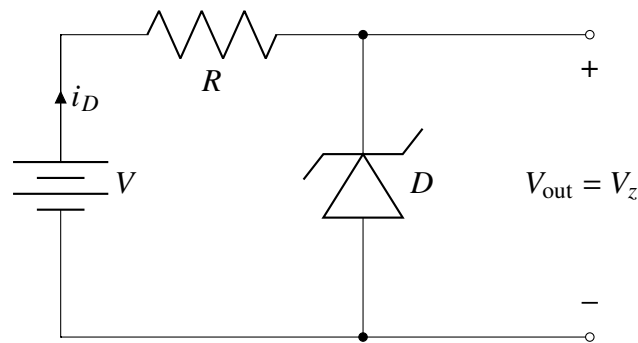


Figure 2: Circuit used to characterize an NMOSFET



4 Experimental Exploration 2: MOSFET Amplifier Gain and Load Limits**5 Experimental Exploration 3: MOSFET Input and Output Resistance****6 Experimental Exploration 4: MOSFET Inverter maximum clock frequency with external capacitive load****7 Experimental Exploration 5: Zener diode (Reverse breakdown)**

Grading Rubric