Experiment-1(a)

Aim: Plot the IV characteristics of an N-MOSFET

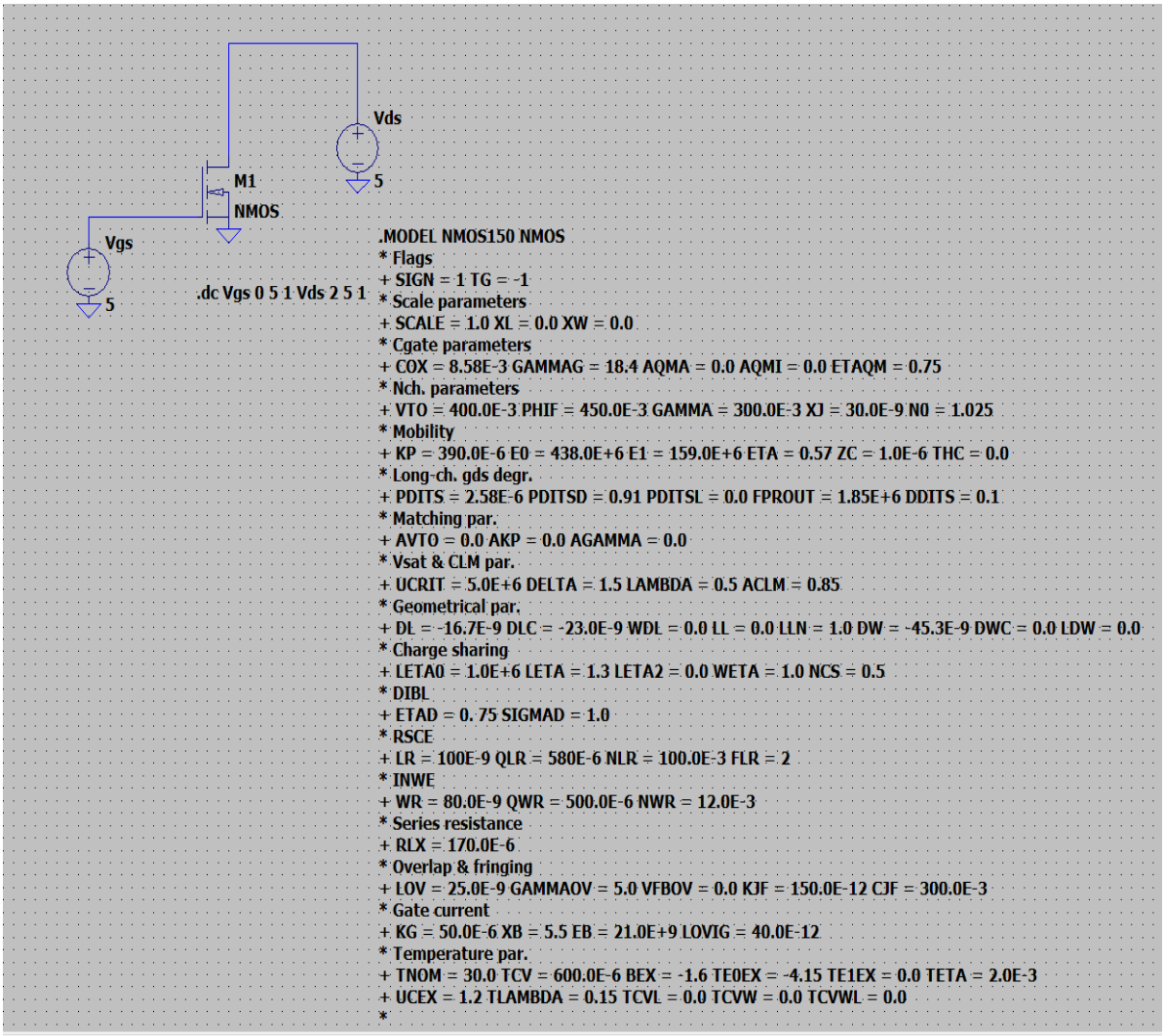
Apparatus used: LTSpice XVII software

Theory:

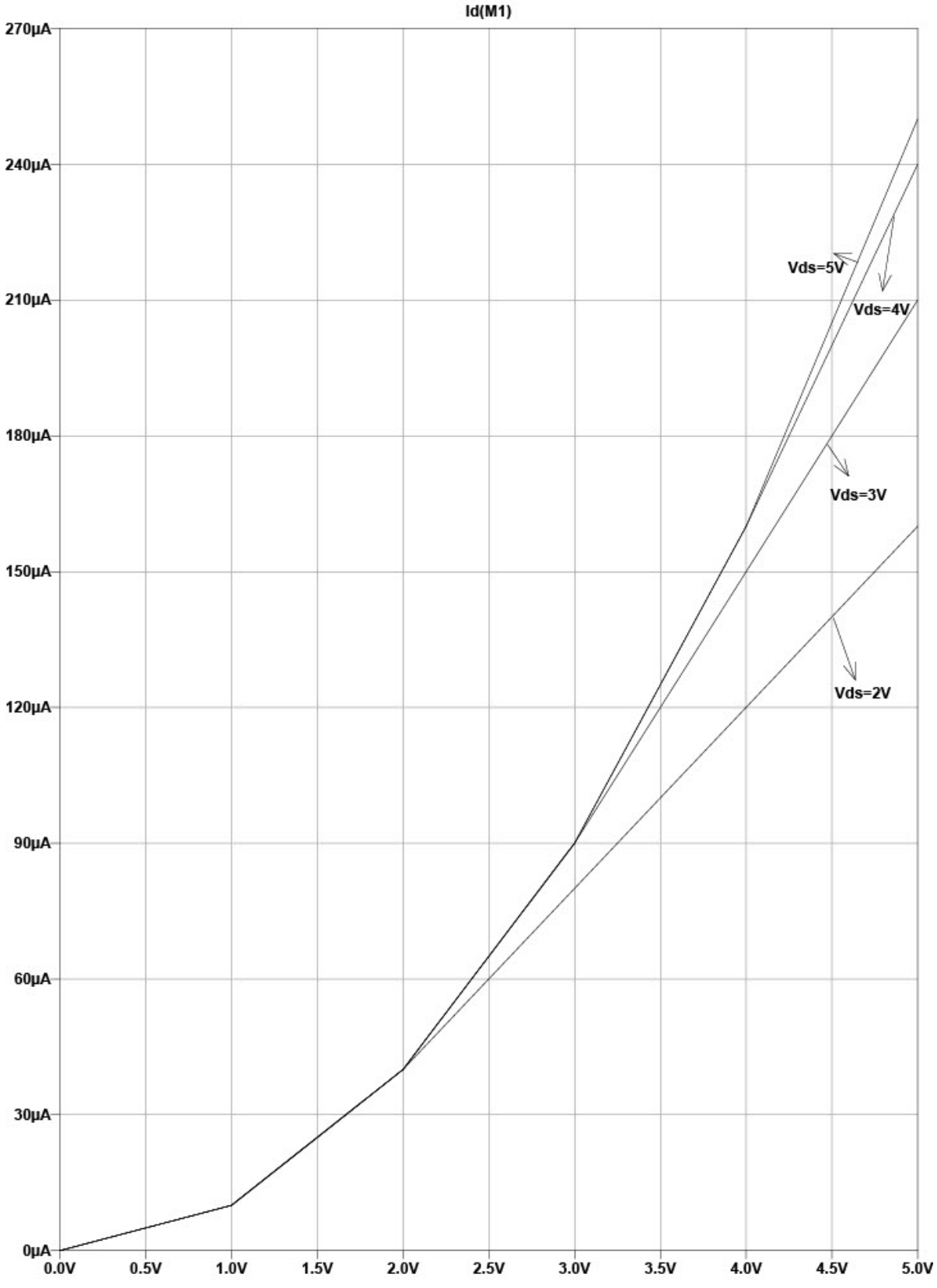
N-type metal-oxide-semiconductor uses n-type (-) MOSFETs (metal-oxidesemiconductor field-effect transistors) to implement logic gates and other digital circuits. These nMOS transistors operate by creating an inversion layer in a ptype transistor body. This inversion layer, called the n-channel, can conduct electrons between n-type "source" and "drain" terminals. The n-channel is created by applying voltage to the third terminal, called the gate. Like other MOSFETs, nMOS transistors have four modes of operation: cut-off (or subthreshold), triode, saturation (sometimes called active), and velocity saturation

Circuit Schematic:

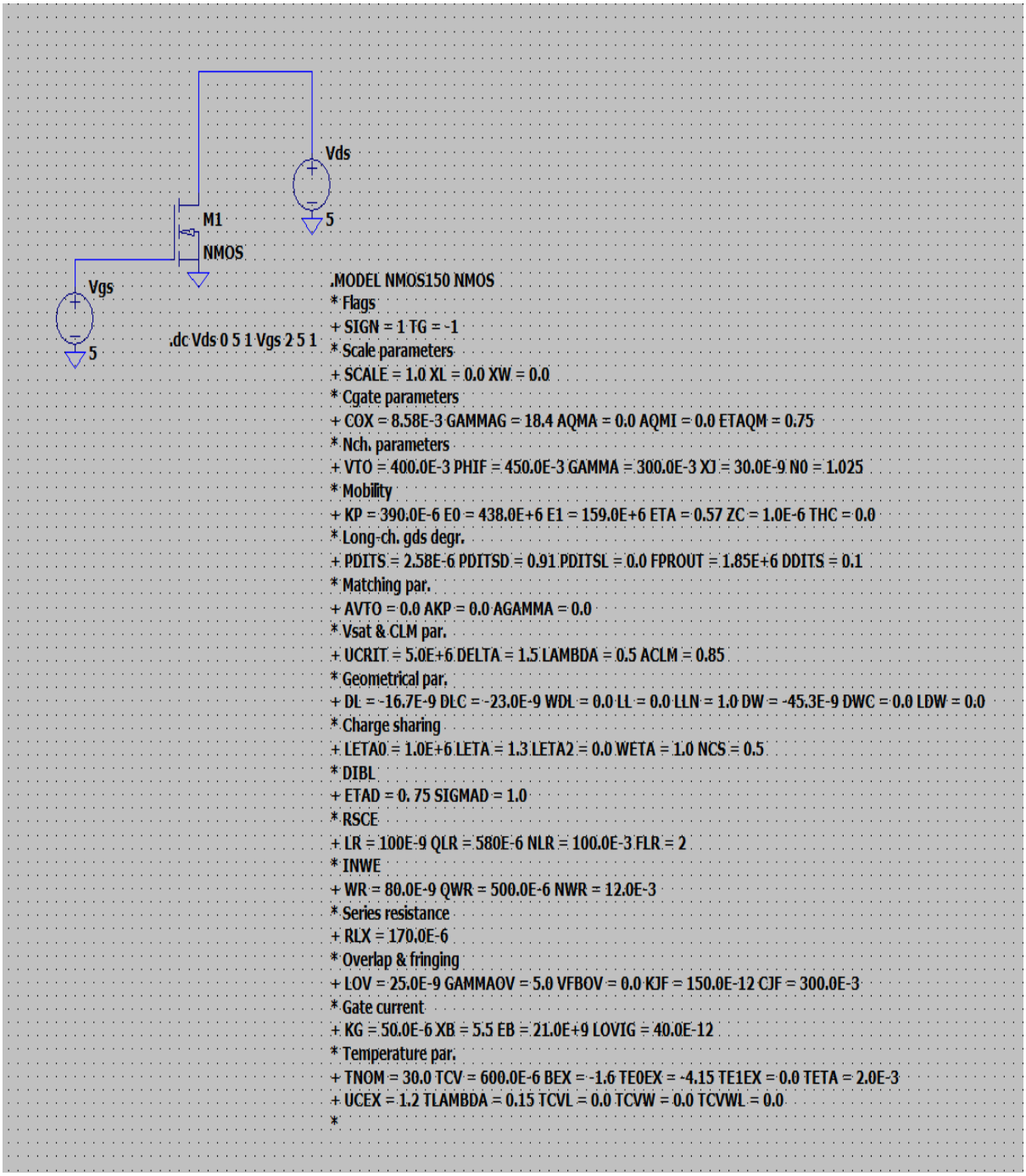
NMOS input Schematic



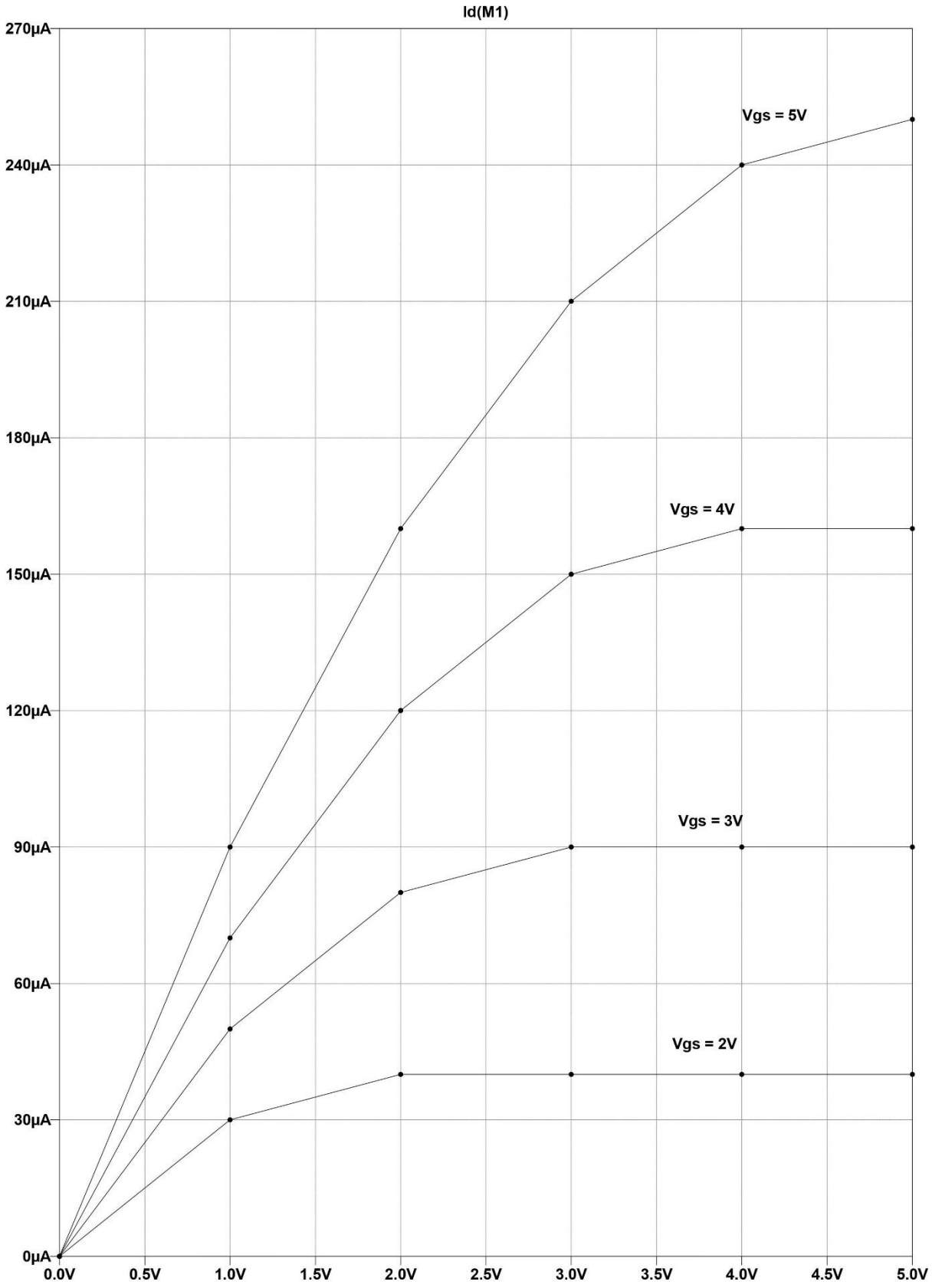
Input Waveform:



Output Schematic:



Output Waveform:



Experiment-1(b)

Aim: Plot the IV characteristics of a P-MOSFET

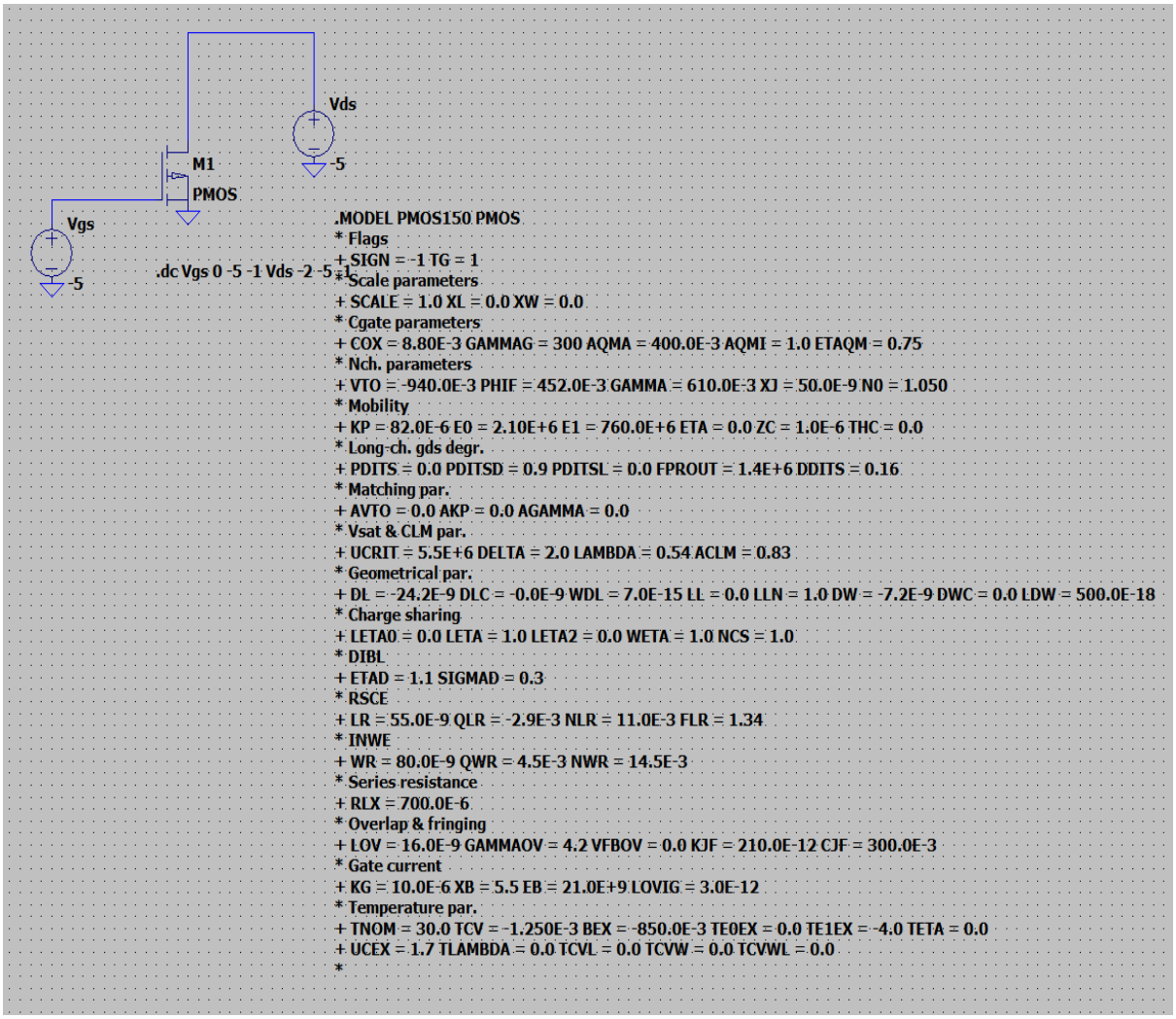
Apparatus used: LTSpice XVII software

Theory:

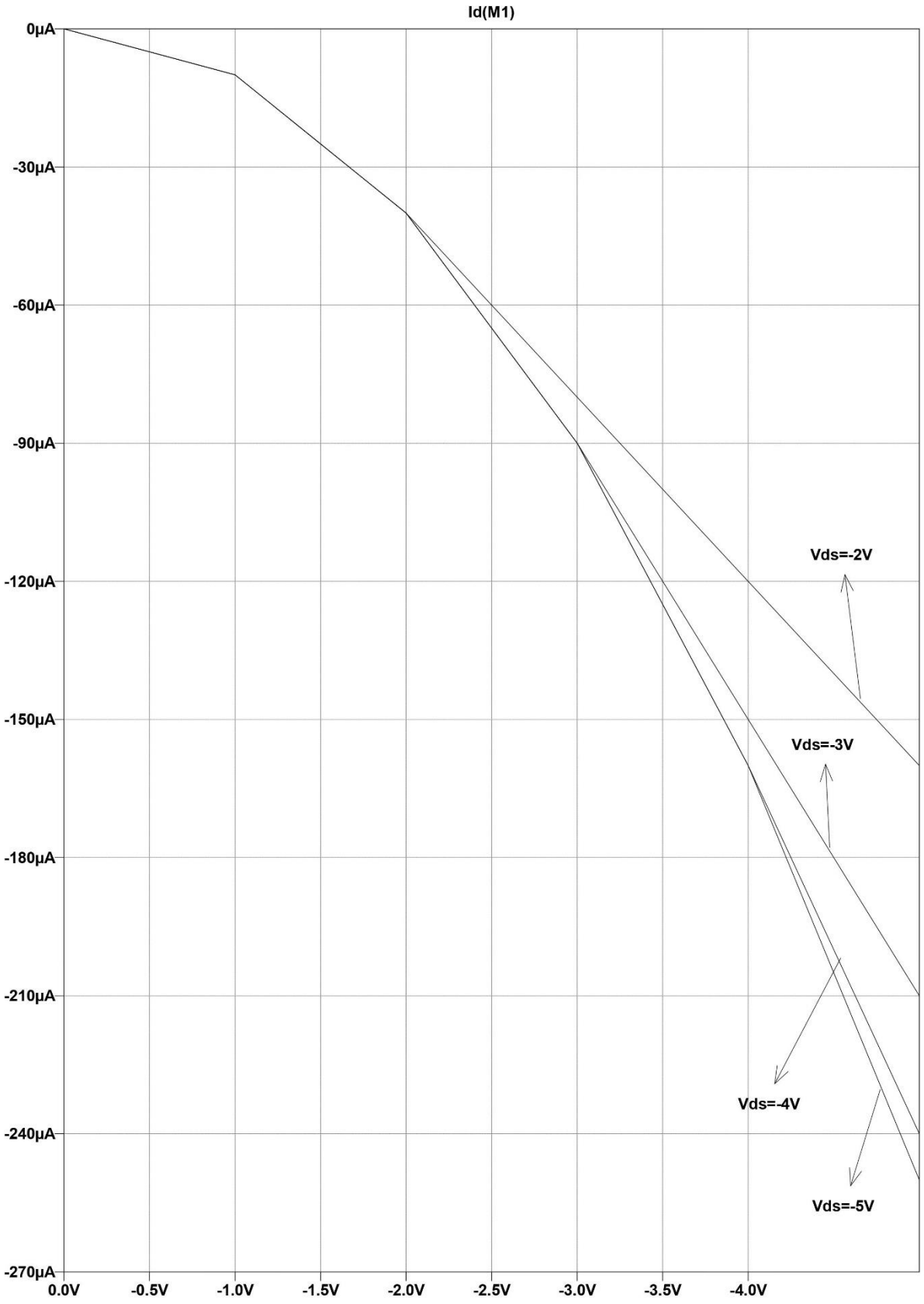
PMOS uses p-channel (+) metal-oxide-semiconductor field effect transistors (MOSFETs) to implement logic gates and other digital circuits. PMOS transistors operate by creating an inversion layer in an n-type transistor body. This inversion layer, called the p-channel, can conduct holes between p-type "source" and "drain" terminals. The p-channel is created by applying a negative voltage (-25V was common) to the third terminal, called the gate. Like other MOSFETs, PMOS transistors have four modes of operation: cut-off (or sub-threshold), triode, saturation (sometimes called active), and velocity saturation.

Circuit Schematic:

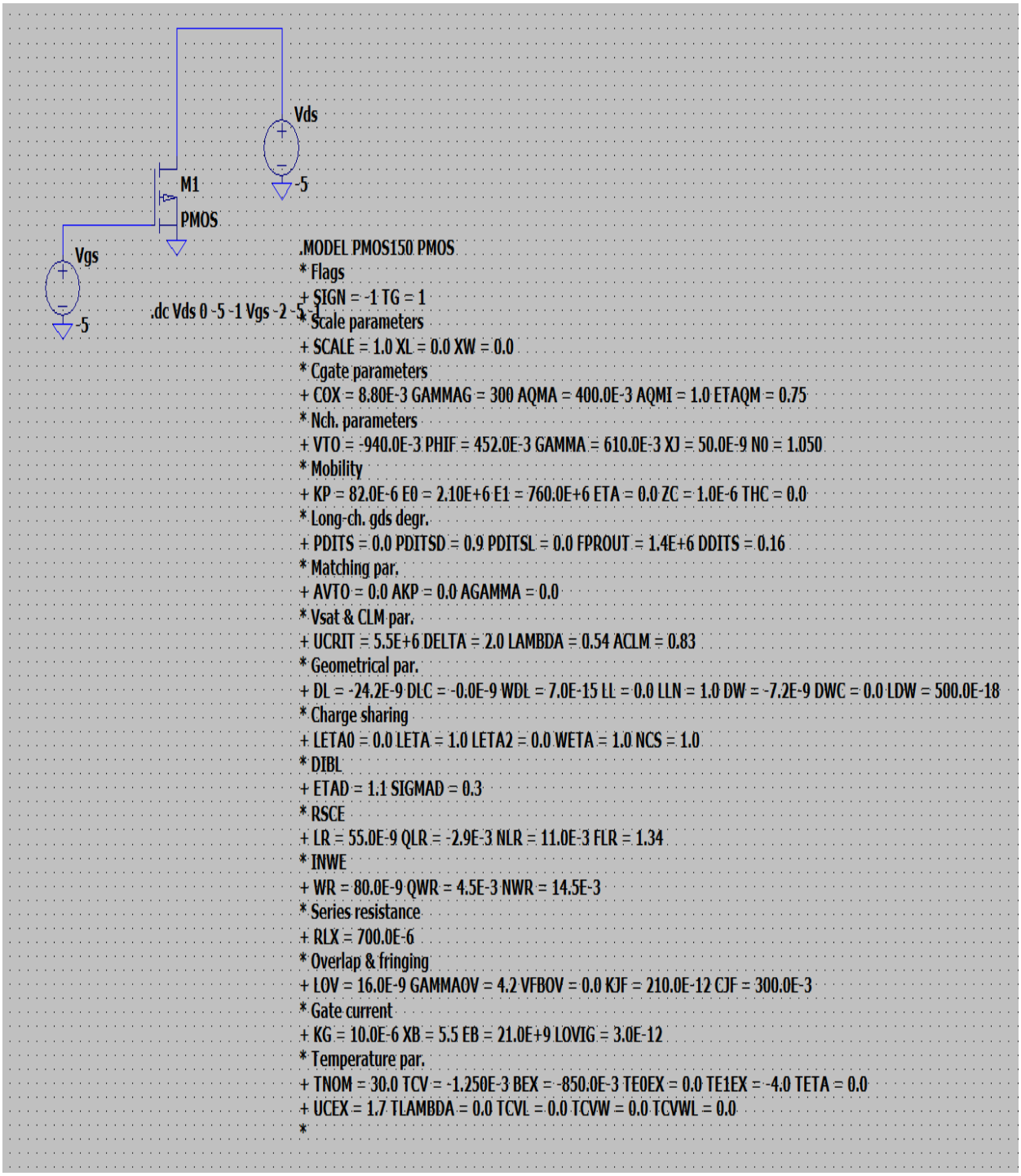
PMOS input Schematic



Input Waveform:



Output Schematic:



Output Waveform: