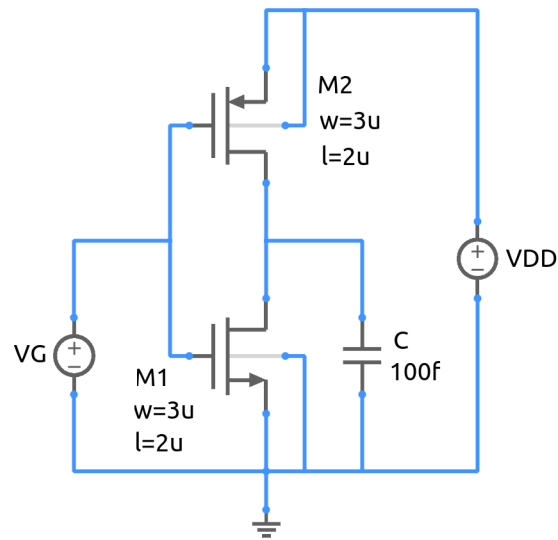


mos_inverter_trns.sqproj



Note: BSIM1 model is used for MOS transistors.

Shown in the figure is a CMOS inverter circuit with a capacitive load. When the input voltage goes from low to high, M_1 turns on, M_2 turns off, and the capacitor C discharges through M_1 to 0 V. When the input voltage goes from high to low, M_1 turns off, M_2 turns on, and the capacitor C charges through M_2 to V_{DD} .

Exercise Set

1. Simulate the circuit, and plot $V_i(t)$, $V_o(t)$ (together).
2. How would $V_o(t)$ change if
 - (a) The width of M_1 is doubled.
 - (b) The width of M_2 is doubled.
 - (c) The capacitance C is doubled.
3. Check your answers against simulation results.

References

1. H. Taub and D. Schilling, *Digital Integrated Electronics*, McGraw-Hill, 1977.
2. M.B. Patil, *Basic Electronic Devices and Circuits*, Prentice-Hall India, 2013.