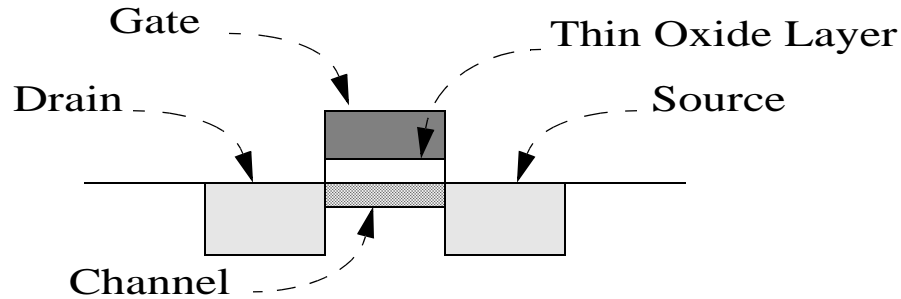


MOSFETs

Metal Oxide Semiconductor Field Effect Transistors



Gate is epitaxially grown polycrystalline Silicon

Drain & Source are diffusion regions

Thinox is epitaxially grown SiO_2

Ion implanted channel (depletion mode only)

Two channel types

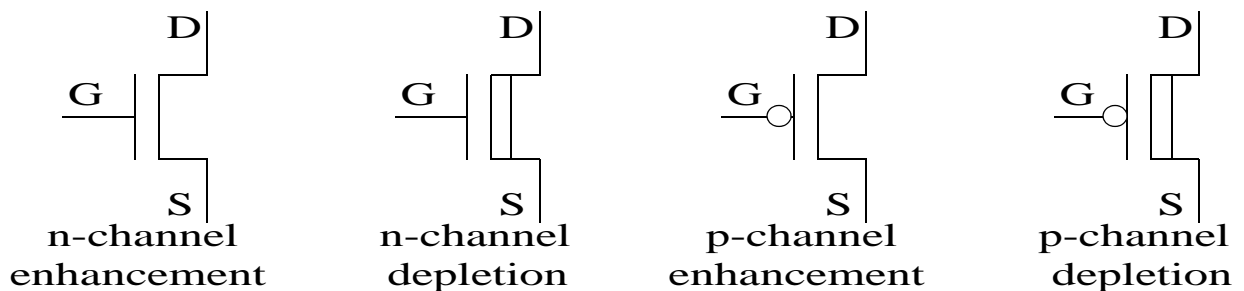
n-channel (Drain & Source are n-type diffusion)

p-channel (Drain & Source are p-type diffusion)

Two channel modes

Depletion Mode (channel exists with no voltage)

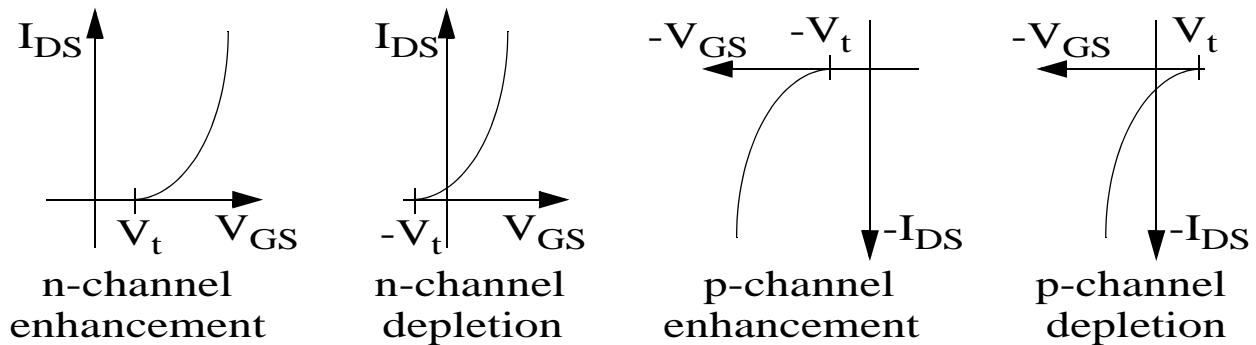
Enhancement Mode (voltage creates channel)



Basic Operation

Threshold voltage (V_t) - Gate voltage (V_{GS}) at which the MOSFET begins to conduct (turn-on)

Assuming fixed, positive V_{DS} :



NMOS technology uses n-channel depletion and enhancement mode transistors

CMOS technology uses both n-channel and p-channel enhancement mode transistors

We will mainly consider CMOS (some NMOS)

Good and poor logic values

