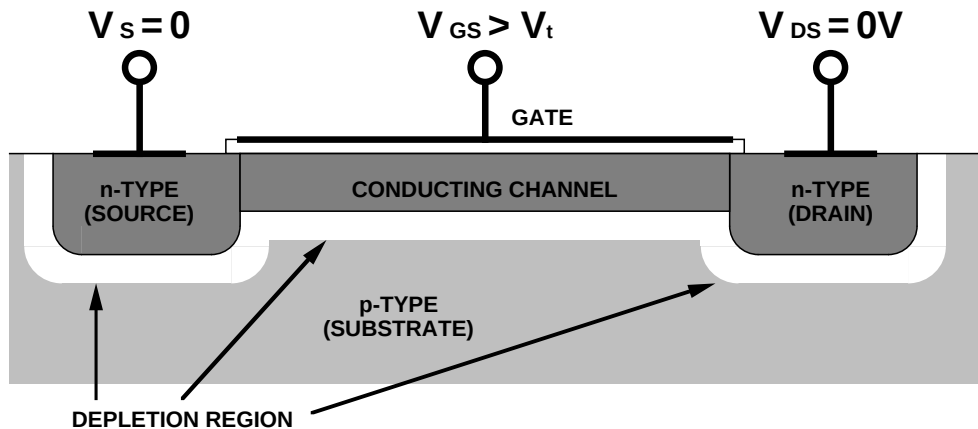
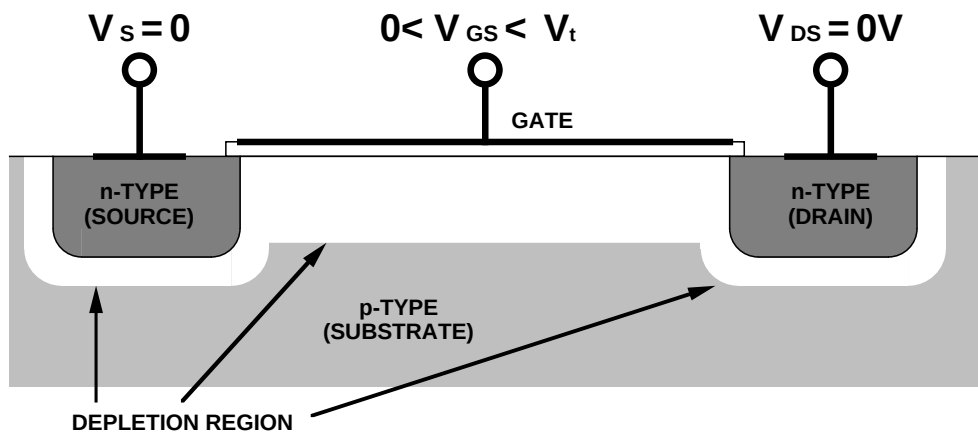


EE4902: CHANNEL ACCUMULATION, DEPLETION, INVERSION



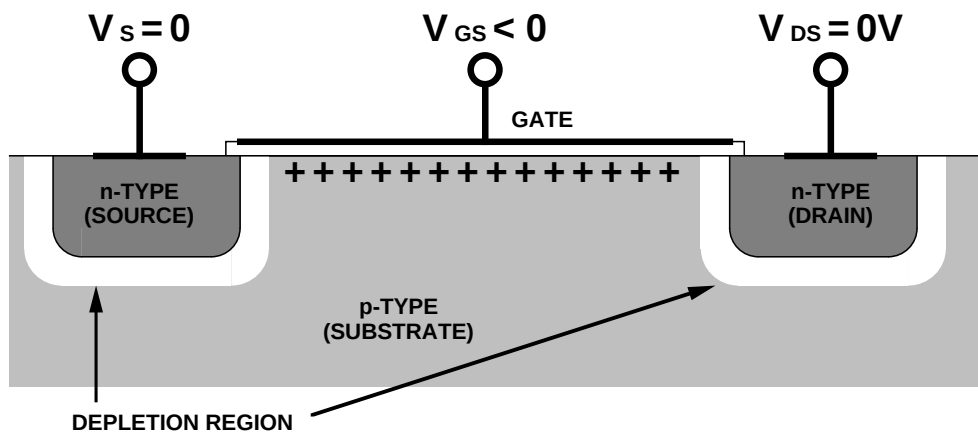
INVERSION

SILICON UNDER CHANNEL "INVERTED" FROM p-TYPE TO n-TYPE
REASON: NEGATIVE CARRIERS ATTRACTED TO SURFACE BY FIELD FROM POSITIVE GATE VOLTAGE.
CONDUCTING CHANNEL EXISTS FROM SOURCE TO DRAIN: CURRENT CAN FLOW IF V_{DS} APPLIED.



DEPLETION

SILICON UNDER CHANNEL "DEPLETED" OF MOBILE CARRIERS
REASON: POSITIVE CARRIERS REPELLED FROM SURFACE BY FIELD FROM GATE VOLTAGE. GATE VOLTAGE NOT YET BIG ENOUGH TO CREATE CONDUCTING CHANNEL FROM SOURCE TO DRAIN.



ACCUMULATION

ADDITIONAL POSITIVE CARRIERS "ACCUMULATE" UNDER GATE, MAKING CHANNEL EVEN MORE p-TYPE
REASON: POSITIVE CARRIERS ATTRACTED TO SURFACE BY FIELD FROM NEGATIVE GATE VOLTAGE.
BACK-TO-BACK DIODES BETWEEN SOURCE TO DRAIN EVEN MORE REVERSE BIASED: NO CURRENT CAN FLOW.