

## LECTURE - 32

### FIELD EFFECT TRANSISTORS

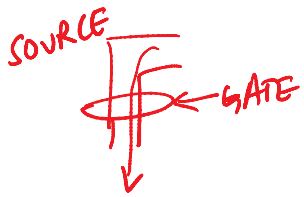
#### FET

- ① JFET → JUNCTION FIELD EFFECT TRANSISTOR
- ② A DEVICE FORMED BY AN N-TYPE CHANNEL BETWEEN TWO P-TYPE MATERIALS → nJFET
- ③ A P-TYPE CHANNEL BETWEEN TWO N-TYPE MATERIALS → pJFET

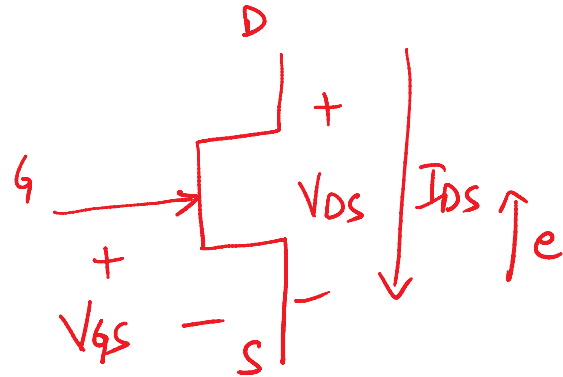
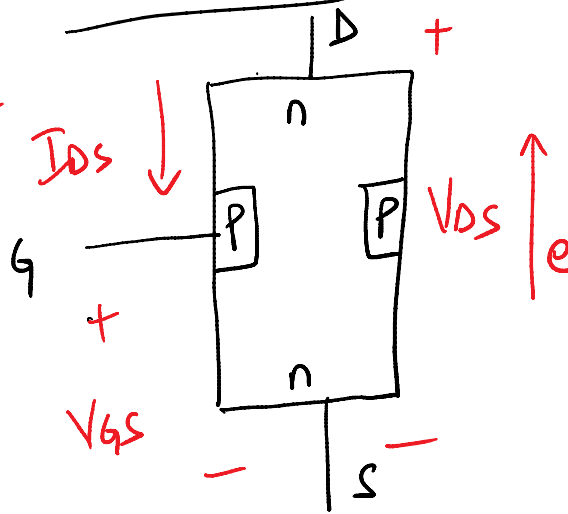
### 3-TERMINAL DEVICE

- ① GATE (G)
- ② DRAIN (D)
- ③ SOURCE (S)

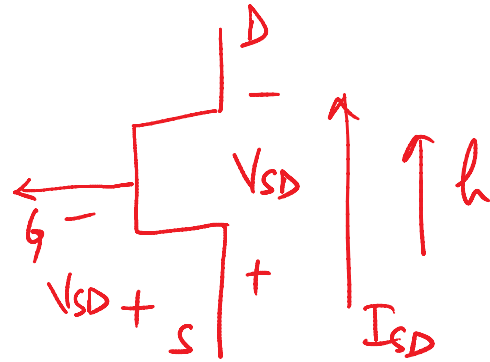
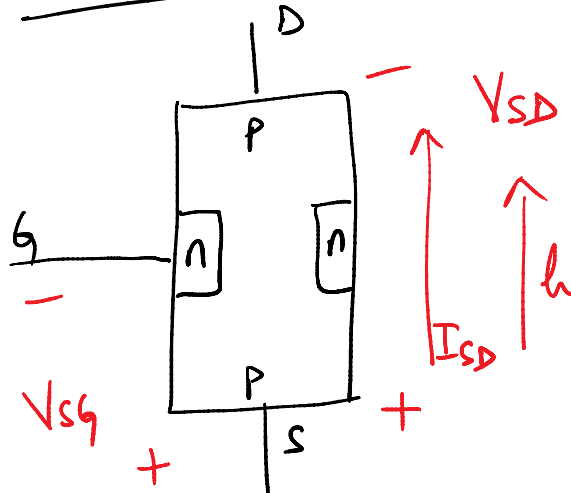
### n-CHANNEL nJFET

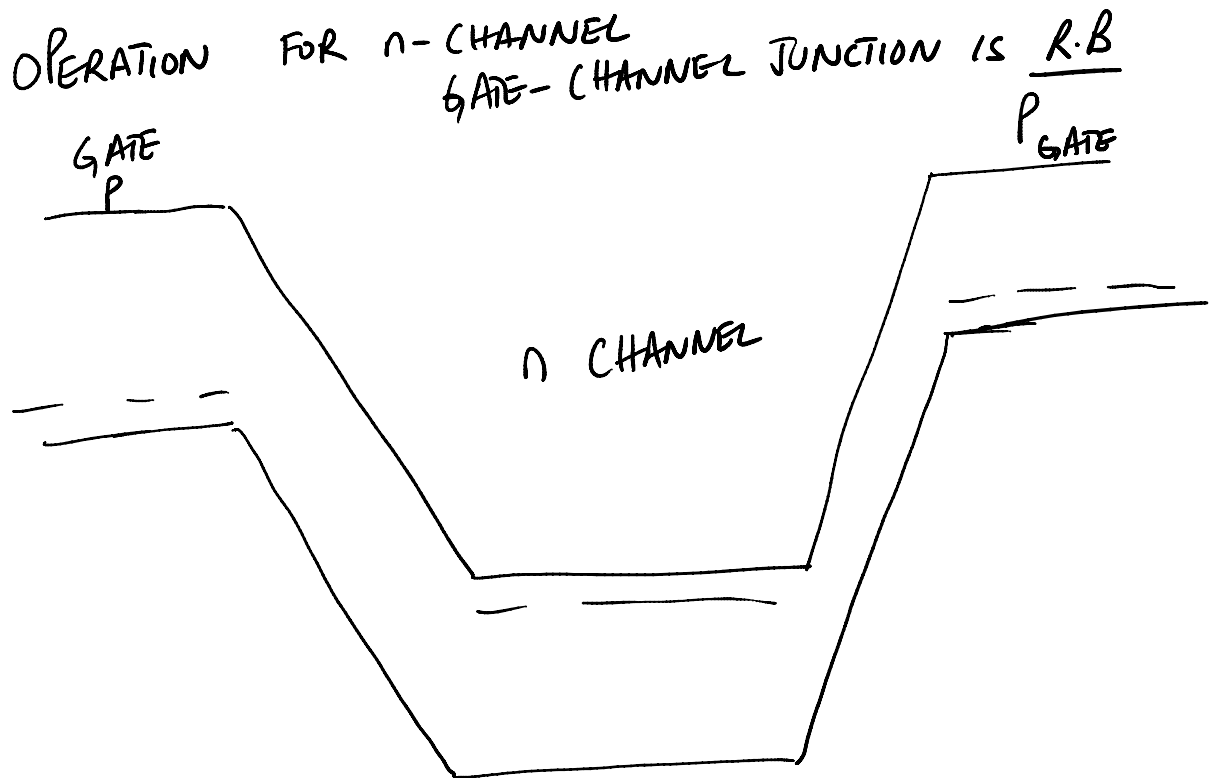
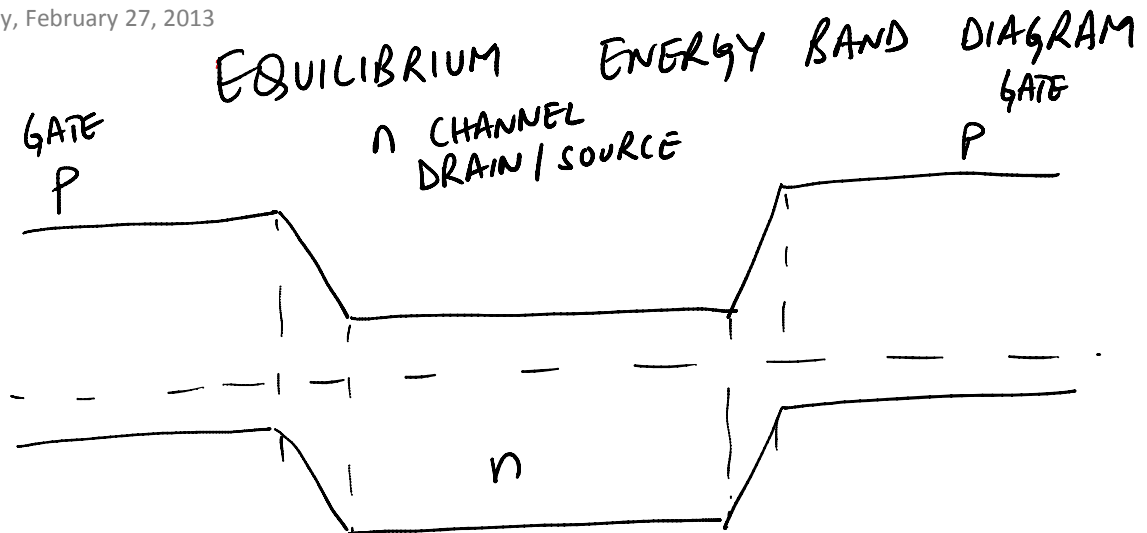


SOURCE  
GATE  
SINK  
DRAIN

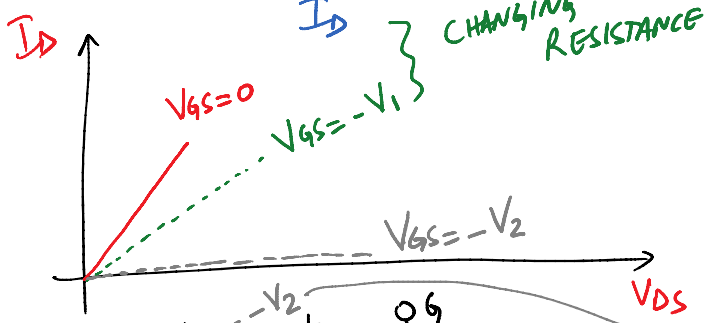
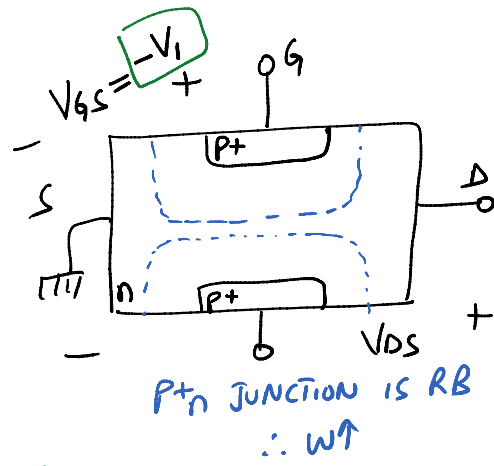
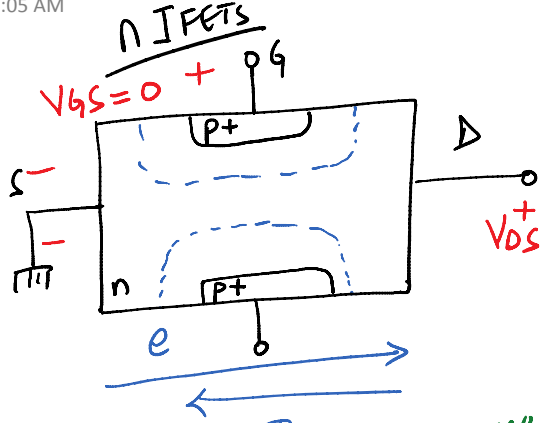


### p-CHANNEL pJFET

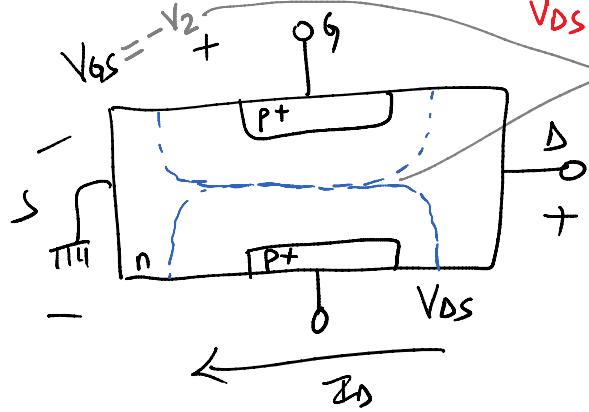




- GATE-CHANNEL (R.B)
- \* JUNCTION WIDTH INCREASE
  - \* DRIFT CURRENT DOMINATES (SMALL)
- CHANNEL DRAIN-SOURCE CURRENT PATH
- \* CURRENT (MAINLY ELECTRONS) IN n-CHANNEL
  - \* ELECTRONS TRAVEL FROM SOURCE TO DRAIN



$|V_2| > |V_1|$



"PINCH OFF"

VOLTAGE DEPLETION REGION ISOLATES THE DRAIN AND SOURCE

VCCS

\* JFET IS "NORMALLY ON" DEVICE, VOLTAGE MUST BE APPLIED TO TURN IT OFF!

KEEP  $V_{GS}$  CONSTANT BUT ~~EA~~ CHANGE  $V_{DS}$

