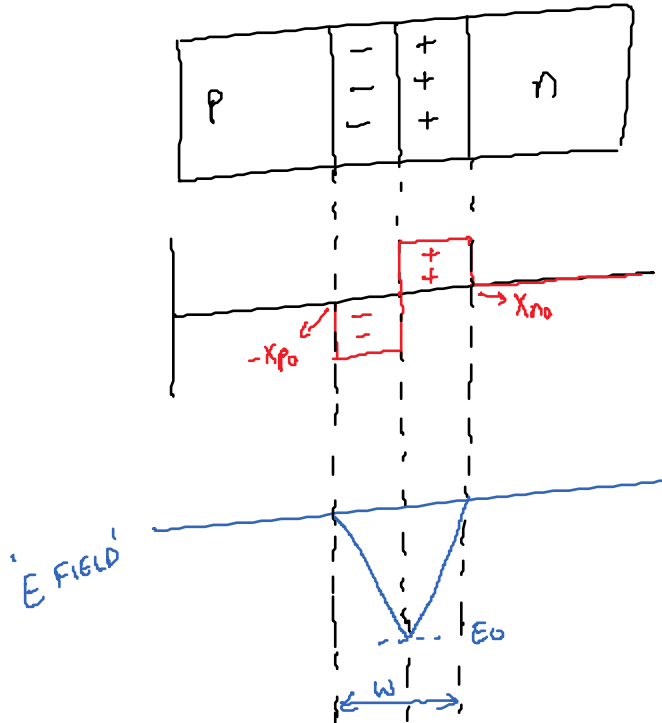


# LECTURE -16

## SUMMARY OF PN JUNCTIONS

① PEAK E FIELD IS LOCATED AT JUNCTION

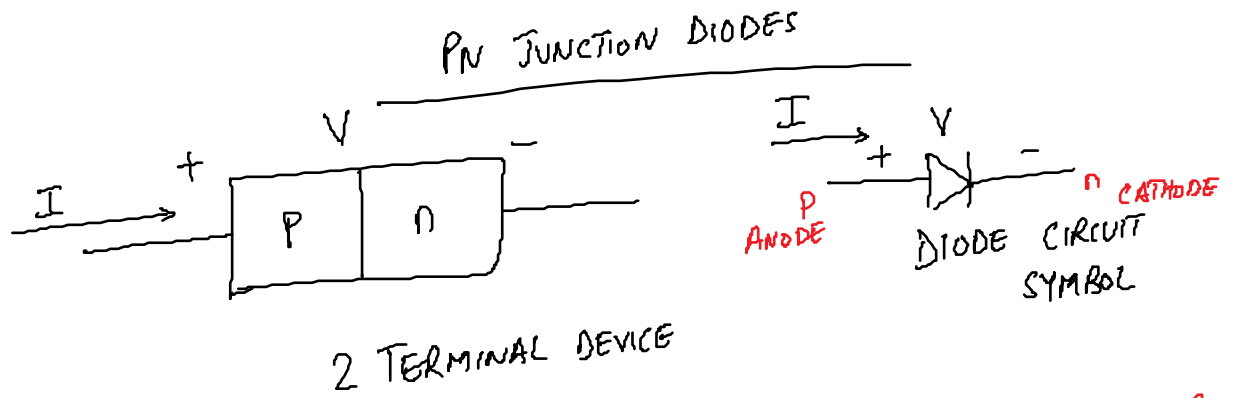


2) POTENTIAL DIFFERENCE IN THE ENERGY BANDS =  $q(V_0 - V)$

$V = V_f \longrightarrow$  FB

$V = -V_r \longrightarrow$  RB

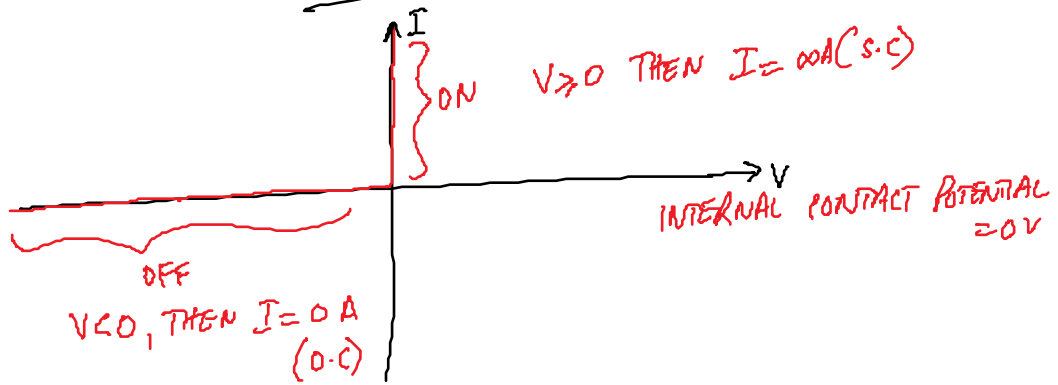
3) FERMI LEVEL DIFFERENCE =  $q|V|$



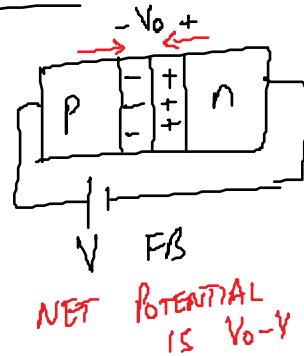
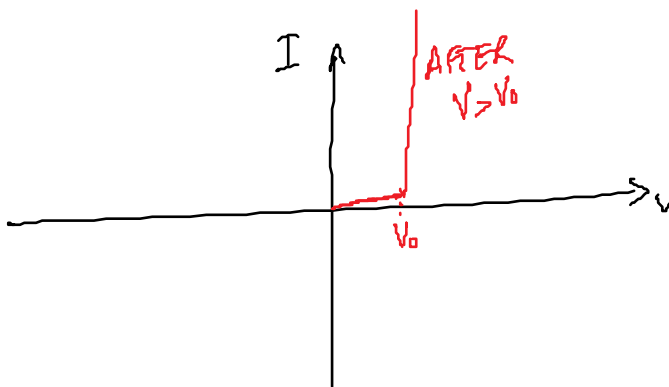
\* ELECTRONIC BEHAVIOR DIFFERS FOR FORWARD BIAS (FB)  
AND REVERSE BIAS (RB)

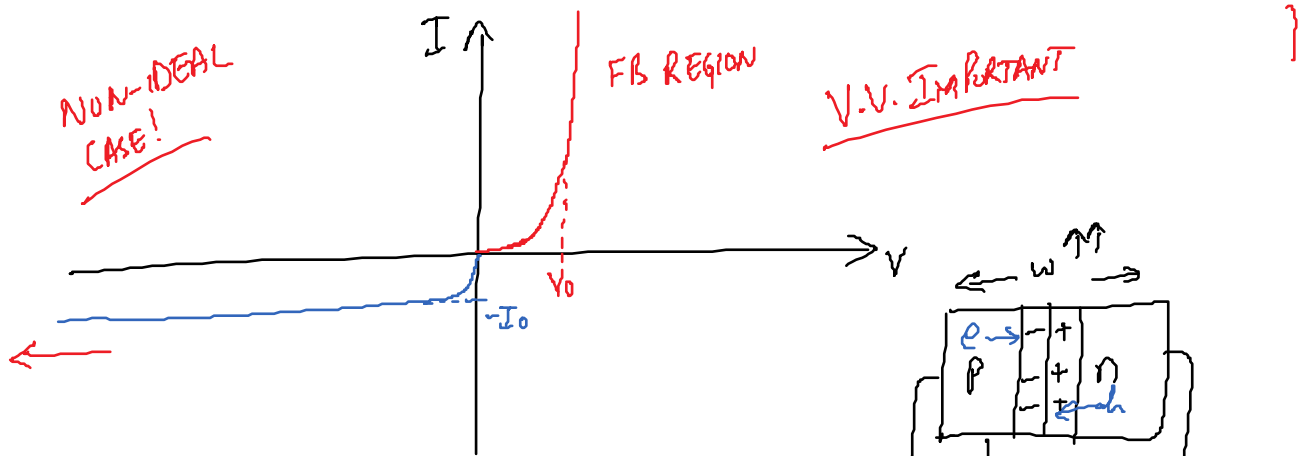
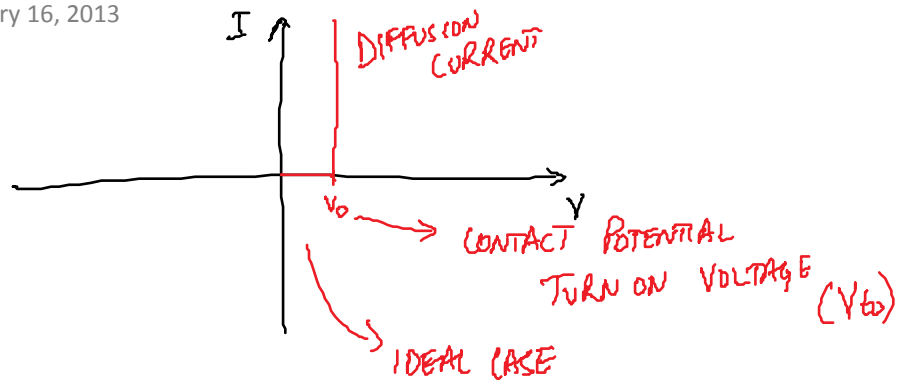
# I-V CHARACTERISTICS

## IDEAL CASE



## DIODES ARE NON-IDEAL

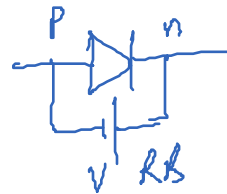




$I_0 \rightarrow$  REVERSE SATURATION CURRENT

$$|I_0| \ll \ll |I|_{FB \text{ CASE}}$$

REVERSE BIASED CASE!



MINORITY CURRENT DRIFT CURRENT

FB

- 1) DIFFUSION  $I$
- 2) FOR  $V > V_{to}$ , LARGE CURRENT
- 3) DRIFT CURRENT  $I_0$  IS NEGLIGIBLE

RB

- 1) DIFFUSION CURRENT  $I = 0$
- 2) DRIFT CURRENT DOMINATES, BUT SMALL!

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