

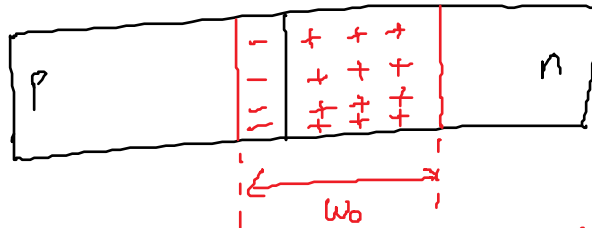
LECTURE - 15

P+N OR N+P JUNCTIONS

WHEN ONE SIDE IS DOPED SIGNIFICANTLY MORE THAN THE OTHER SIDE

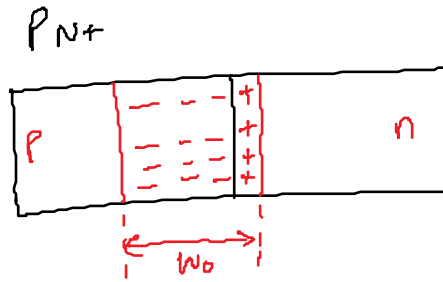
- ① CONTROL OF SIZE
- ② CURRENT DOMINATION BY EITHER ELECTRON OR HOLE FLOW

P+N



$|x_{p0}| < |x_{n0}|$

- * WIDTH PRIMARILY IN THE n SIDE
- * MORE SIGNIFICANT VARIATIONS OF w DUE TO BIAS ON THE n SIDE
- * FB CURRENT \rightarrow HOLE CURRENT

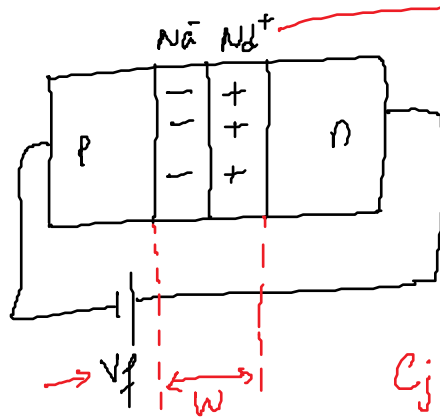


$$|X_{p0}| > |X_{n0}|$$

- * WIDTH PRIMARILY IN P SIDE
- * w VARIATIONS MAINLY IN P SIDE
- * FB CURRENT : ELECTRON CURRENT

CAPACITANCE IN PN JUNCTIONS

JUNCTION CAPACITANCE → MAINLY IN RB



UNCOMPENSATED CHARGES THAT CREATE A DIPOLE, WHICH CREATES A CAPACITOR

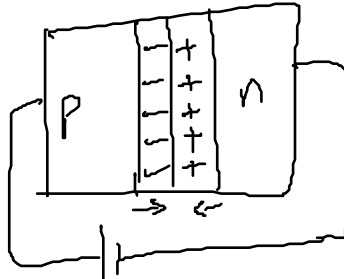
$$C_j = \frac{A\epsilon}{w}$$

'w' DEPENDS ON V_f

$V_f \uparrow \quad w \uparrow \quad C_j \downarrow$

VARIABLE → C_j DEPENDS OF V_f
APPLICATION → USED IN TUNING CIRCUITS!

2) DIFFUSION CAPACITANCE →
ONLY FOR FORWARD BIAS



AS $V_f \uparrow$ ~~the~~ V_f DIFFUSION CURRENT INCREASES \uparrow $w \downarrow$

