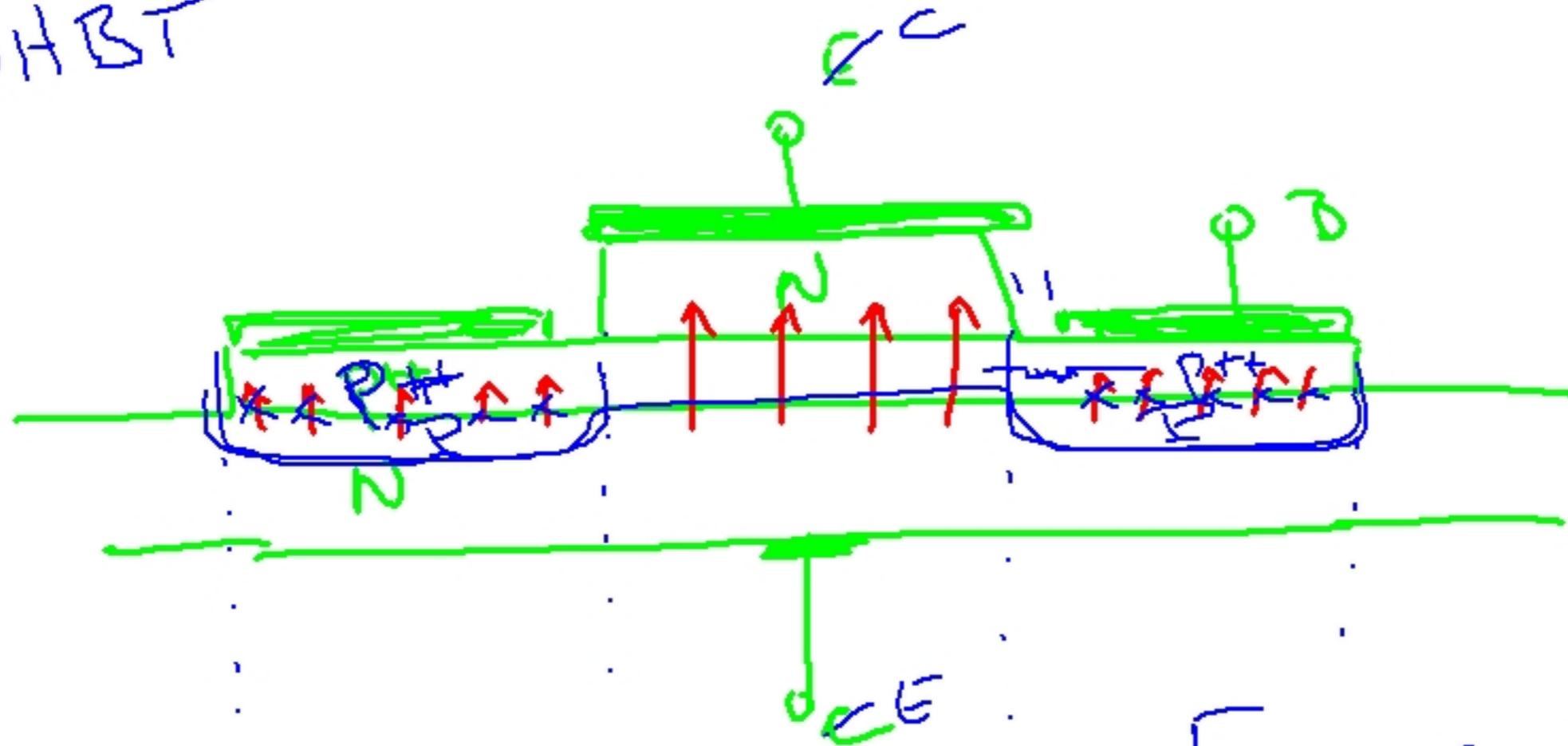


LECTURE 14 - HBT-2

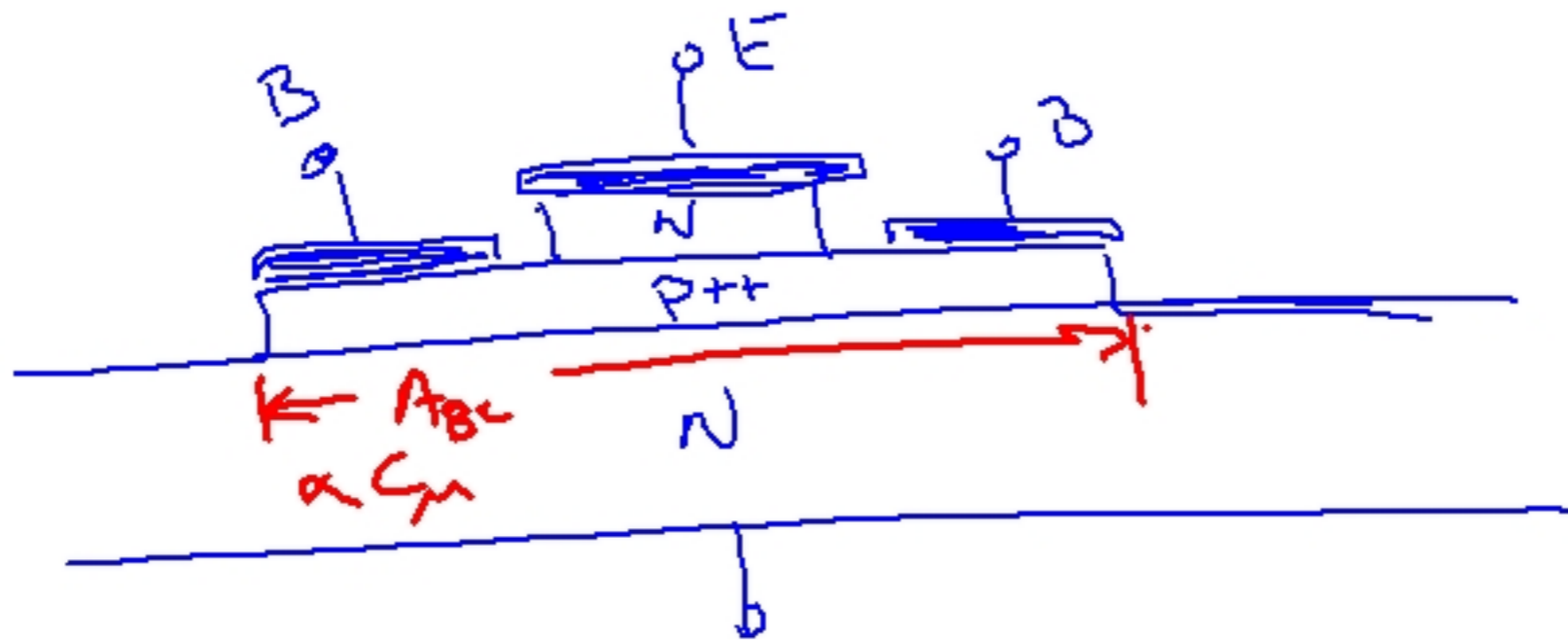
DHBT



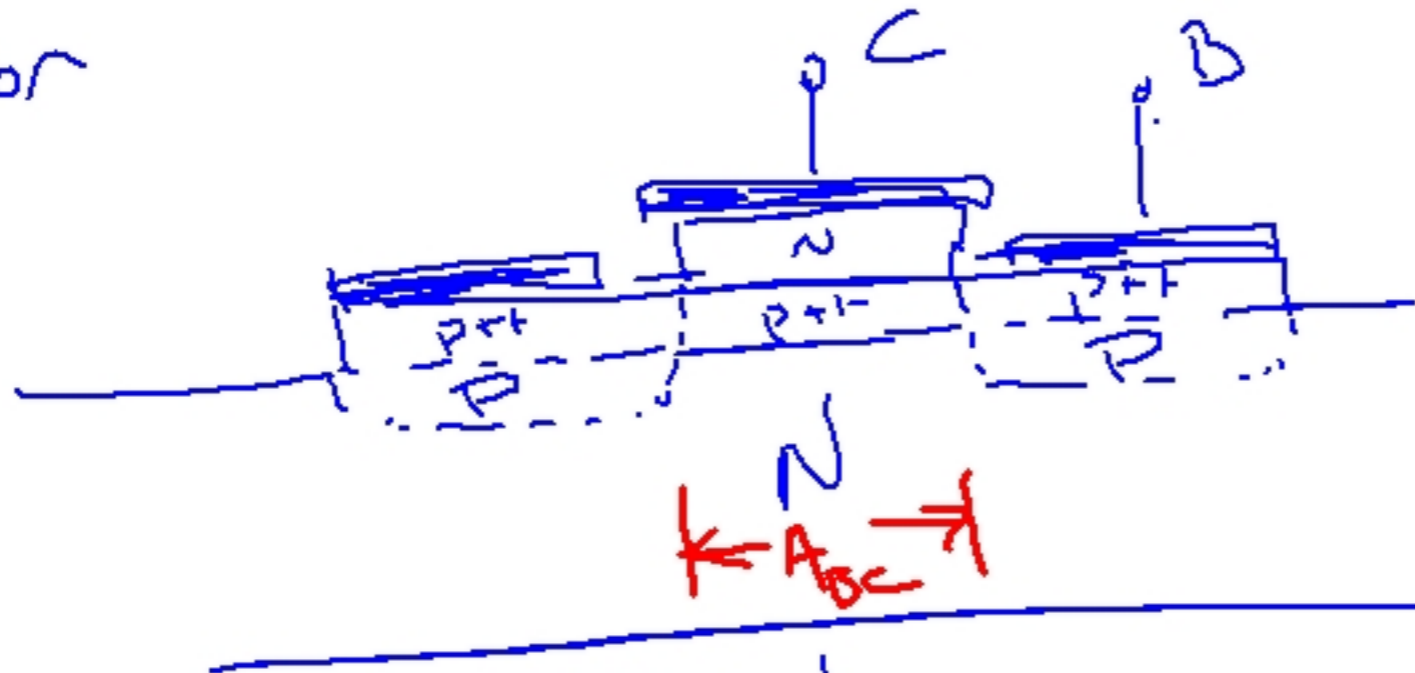
EMITTER-UP
GEOMETRY

$C_{je} \propto A_{je}$

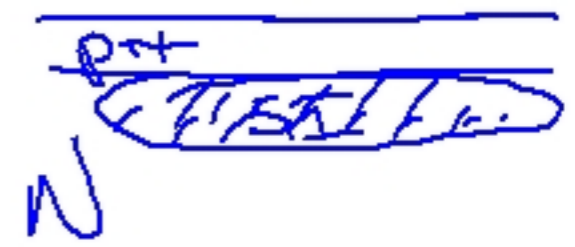
Emitter
up



Collector
up



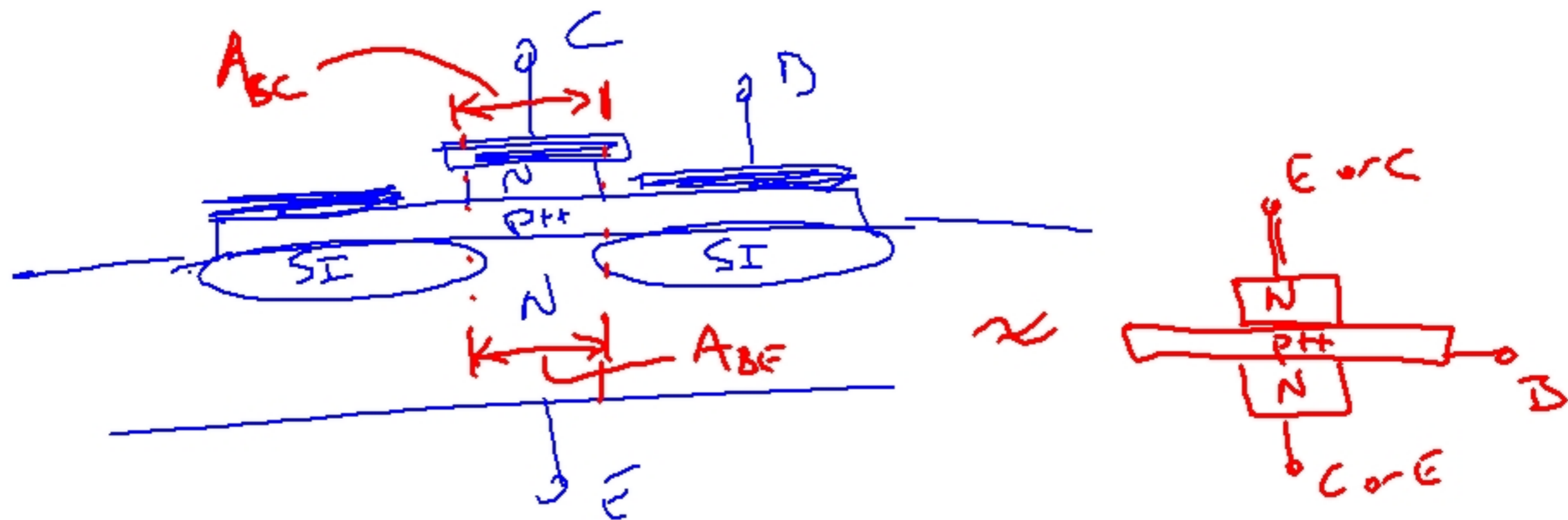
Alternative:
↓ 0+ ↓ 0+



$$C_{\pi} = C_{eb\text{depl}} + C_{eb\text{diff}} \approx C_{eb\text{diff}} @ 1/2 V_{be}$$

$$C_{\pi} = \underbrace{C_{eb, \text{depl}}}_{\propto A_{EB}} + \underbrace{C_{eb, \text{diff}}}_{\propto I_c}$$

$C_{\pi} \rightarrow C_{eb, \text{diff}} @ \text{large } I_c$



NORMAL IN BJT - homo j

$$N_{DE} \gg N_{AB} \gg N_{DC}$$

to increase emitter injection
i.e. for large β_F

to minimize base width
modulation



In heterojunction BJT:

$$N_{DE} \ll N_{AB} \gg N_{DC}$$

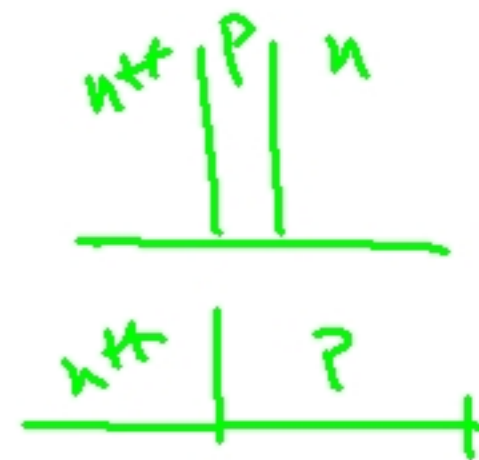
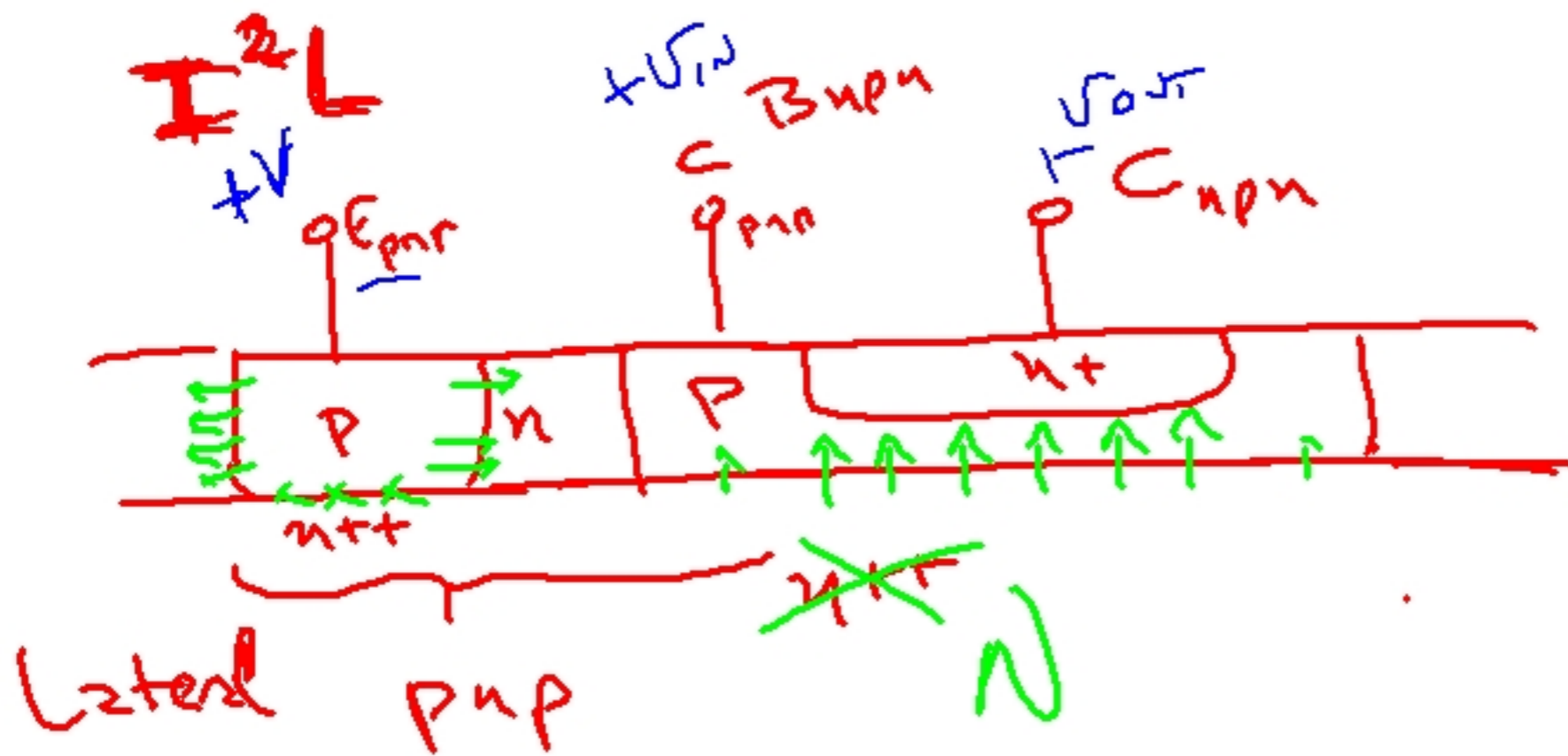
$$\textcircled{E} \quad \textcircled{B} \quad \textcircled{C}$$

$$N \cdot p^{++} \cdot n$$

SHBT

DHBT

$$N \quad p^{++} \quad N$$



also called
MERGED TRANSISTOR
LOGIC (MTL)

