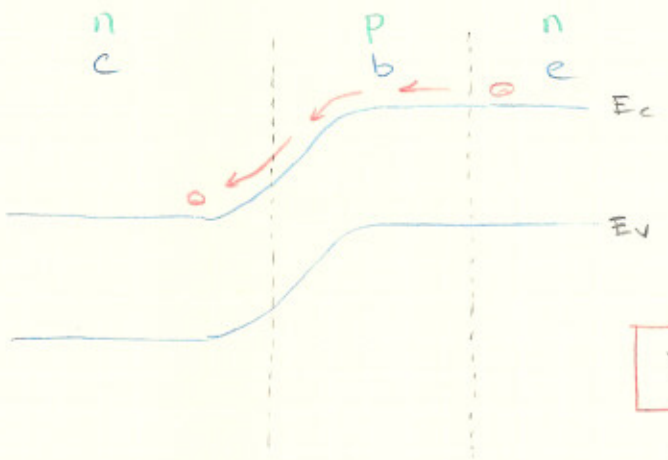
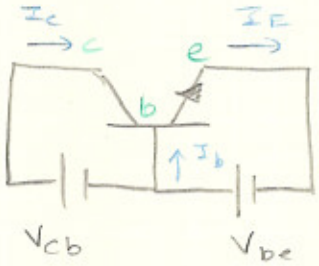


$V_{be} > V_T$

electron flows into the valley.

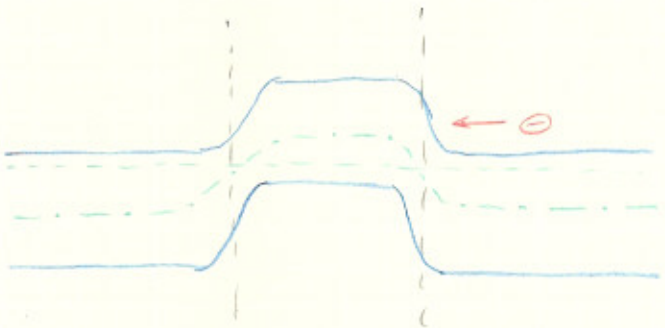


$V_{be} > V_T$,

$I_C = \alpha I_E$

$0 \leq \alpha \leq 1$

transistor configured in common base (CB) configuration.

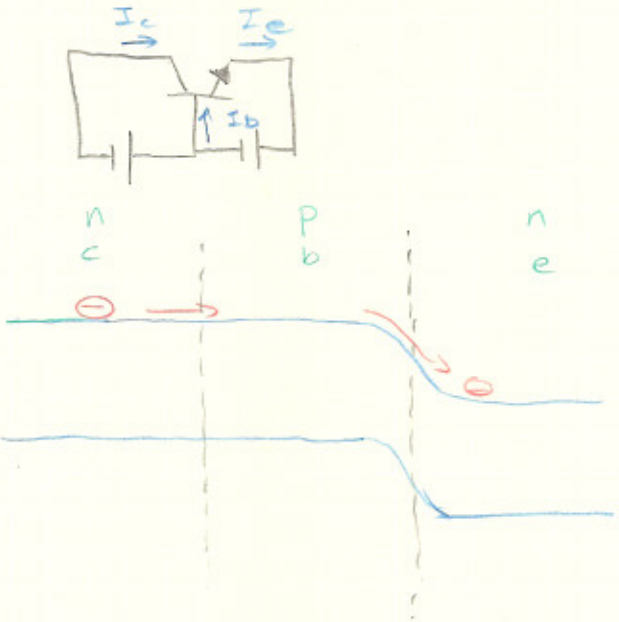


$V_{be} < V_T$

electron can not pass.

INVERSE MODE

the collector valley is raised up and emitter is shrunk, electrons now collect at the emitter.

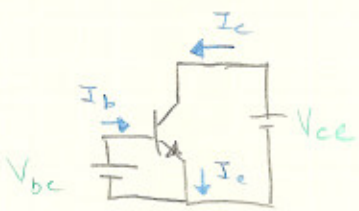


$$I_E = \alpha_i I_c$$

$$0 < \alpha_i < 1$$

note: $\alpha_i < \alpha$ normally

COMMON EMITTER (CE)

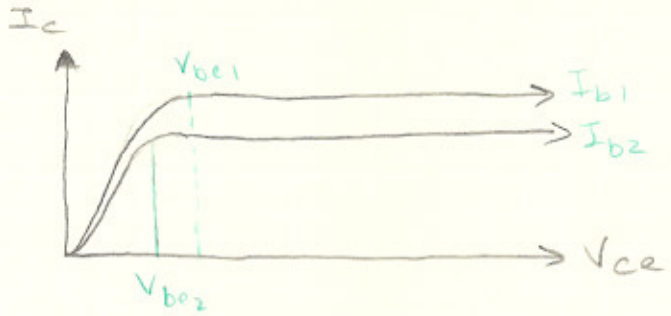


note: the same energy band digraim is applicatiple as the CB,

$$I_c = \beta I_B$$

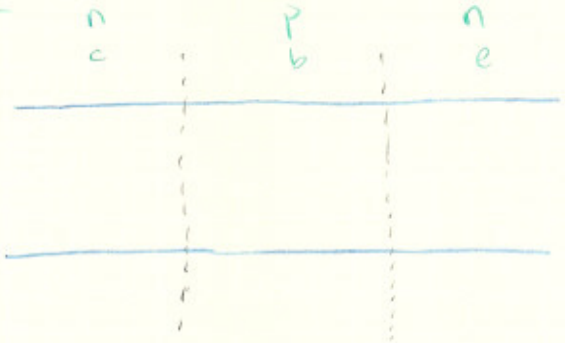
$$0 < \beta < 10^5$$

$$0 < V_{ce} < V_{ce\,max}$$

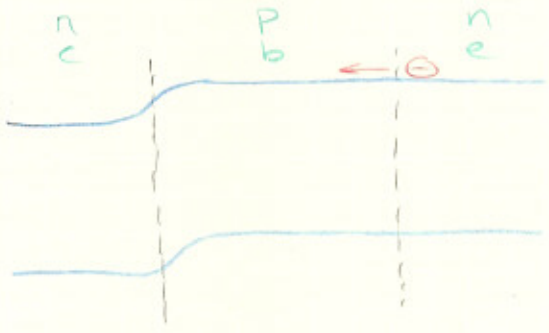


levels out b/c once the valley is created, it is there can't get any deeper.

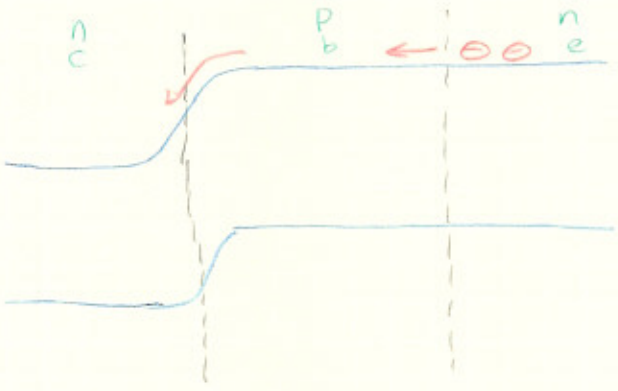
$V_{ce} = 0$

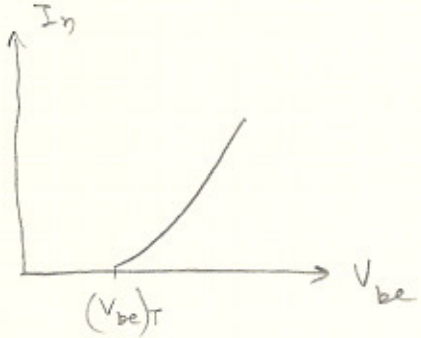


$V_{ce} > 0$, but small.

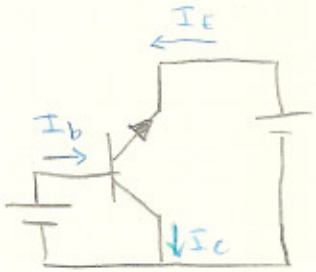


$V_{ce} > V_{be}$





COMMON EMITTER INVERSE

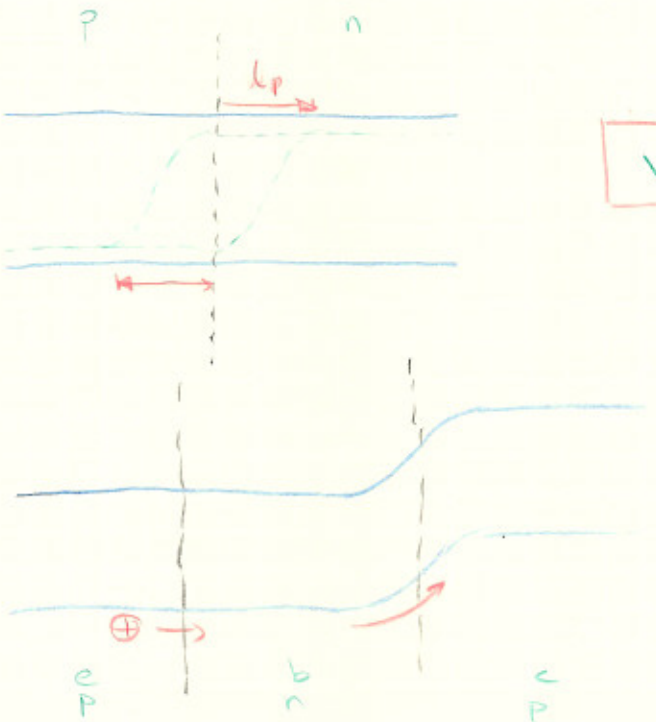


$$I_E = \beta_i I_c$$

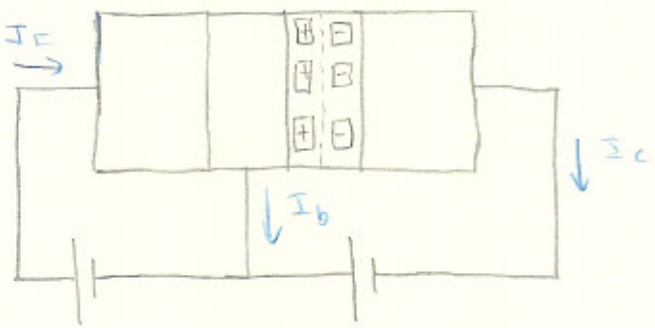
$$\beta_i = \frac{\alpha_i}{1-\alpha_i}$$

$$\alpha_i < \alpha \qquad \beta_i < \beta$$

PNP TRANSISTOR



$$V > V_T$$



$$\omega_b < L_p$$

$$J_p^{\cdot drift} = q_b D_p \frac{d\,p(x)}{dx}$$