

② Current amplification factor (β)

→ Gain of BJT

$$\beta = \frac{\Delta I_C}{\Delta I_B}$$

β 20 to 500

CB → $\alpha = \frac{\Delta I_C}{\Delta I_E}$ → α → α range 0.9 to 0.99

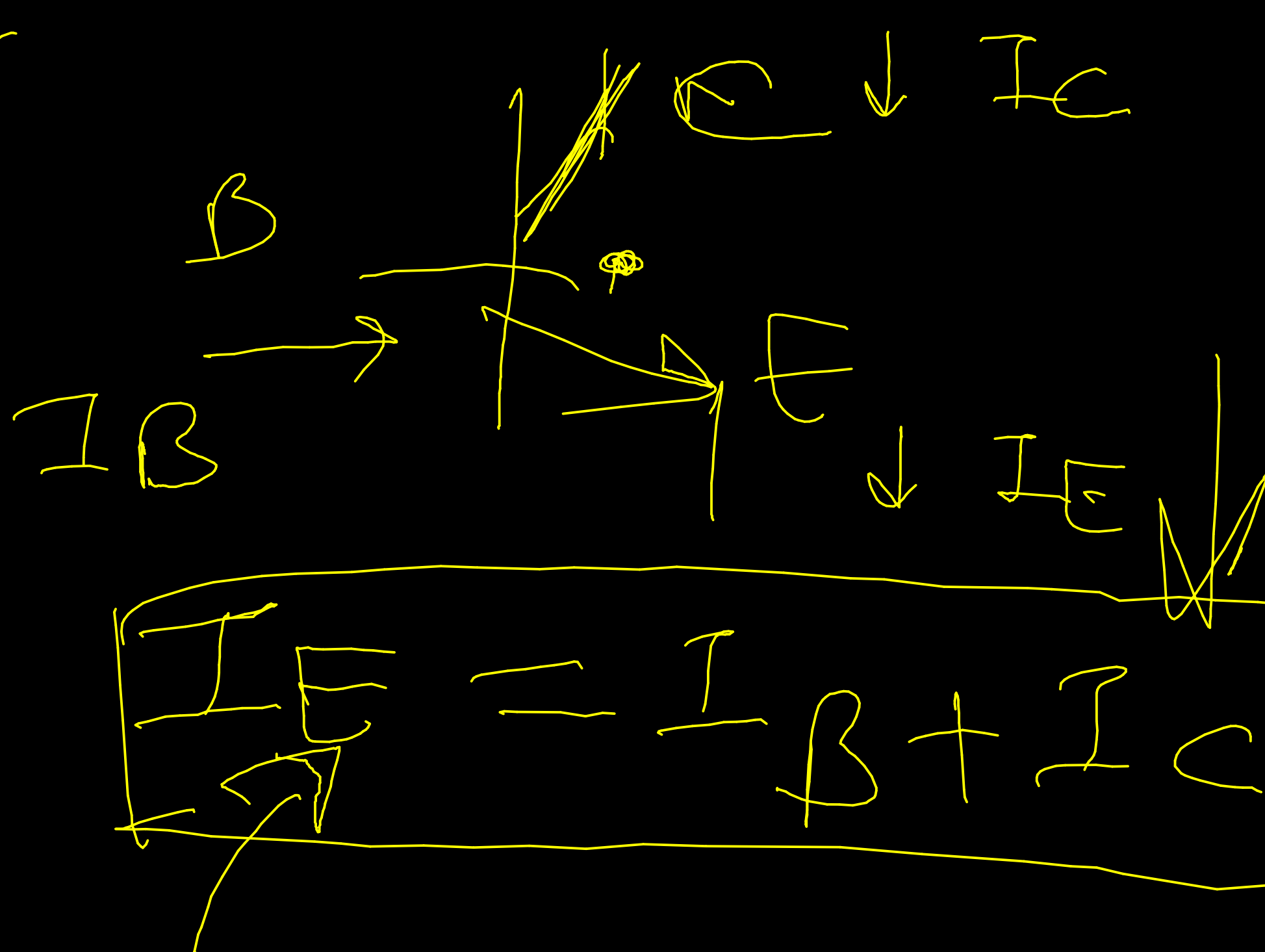
Relation betn α & β

→ CB → CE

$$I_E = I_B + I_C$$

$$I_B = I_E - I_C$$

$$\Delta I_B = \Delta I_E - \Delta I_C$$



$$\beta = \frac{\Delta I_C}{\Delta I_B} = \frac{\Delta I_C}{\Delta I_E - \Delta I_C}$$

Dividing N & D by ΔI_E

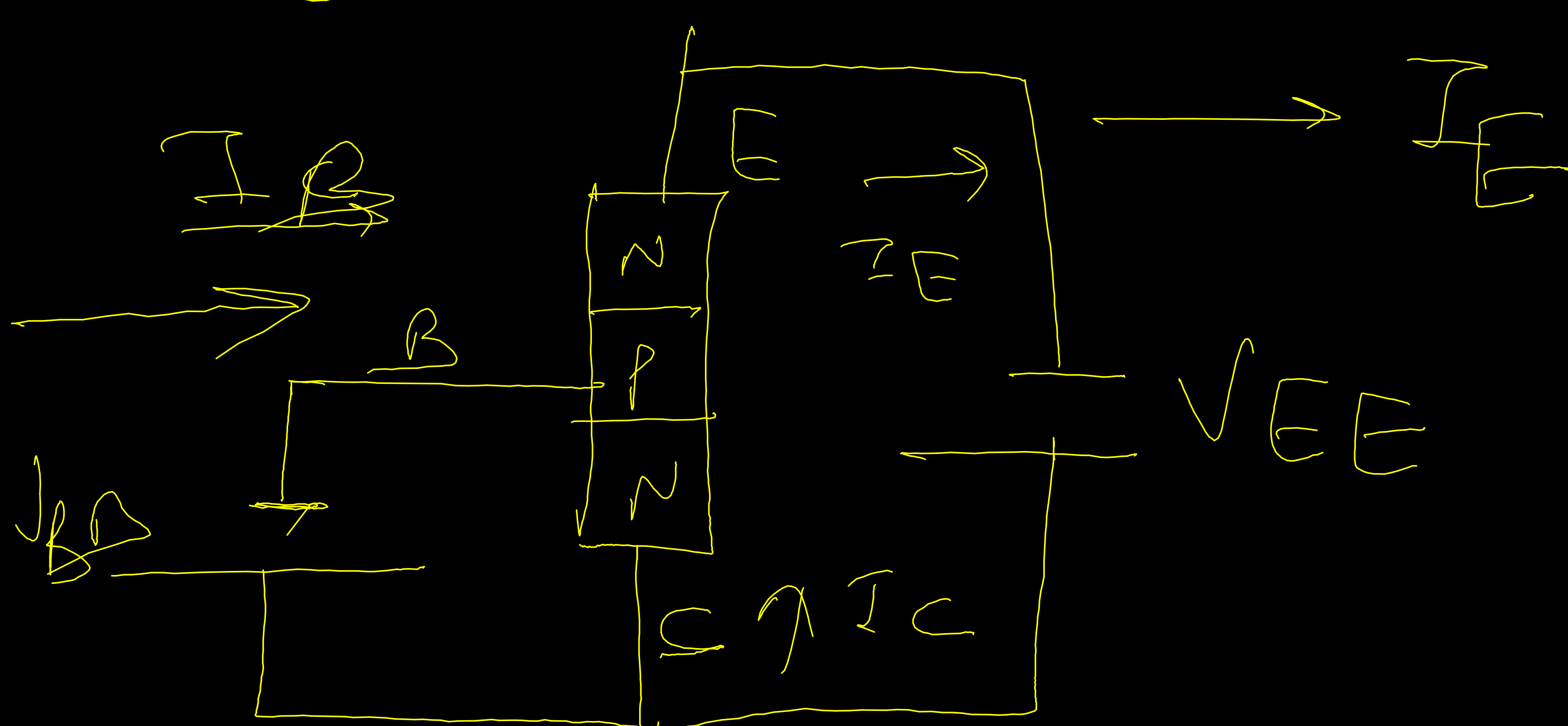
$$\beta = \frac{\Delta I_C}{\Delta I_E} = \frac{\alpha}{1 - \frac{\Delta I_C}{\Delta I_E}}$$

$$\beta = \frac{\alpha}{1 - \alpha}$$

As $\frac{\Delta I_C}{\Delta I_E} = \alpha$

Common Collector Configuration

CC



Current Amplification factor (γ)

$$\gamma = \frac{\Delta I_E}{\Delta I_B}$$

$$I_E = I_B + I_C$$

$$\Delta I_B = \Delta I_E - \Delta I_C$$

$$\gamma = \frac{\Delta I_E}{\Delta I_E - \Delta I_C}$$

$$= \frac{\Delta I_E}{\Delta I_E}$$

$$\gamma = \frac{\Delta I_E}{\Delta I_E - \frac{\Delta I_C}{\Delta I_E}}$$

$$\gamma = \frac{1}{1 - \alpha}$$