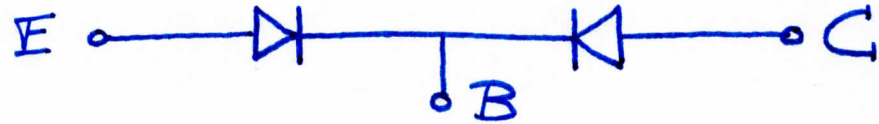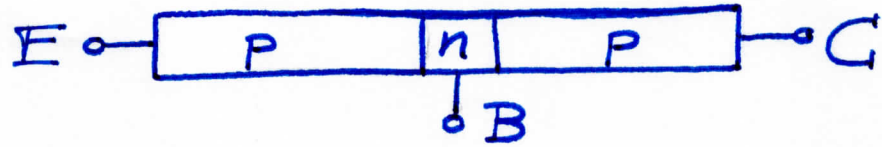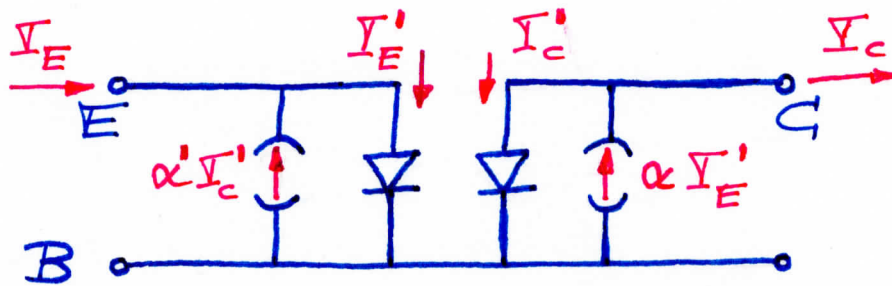# BJT equivalent circuit

BJT (pnp)
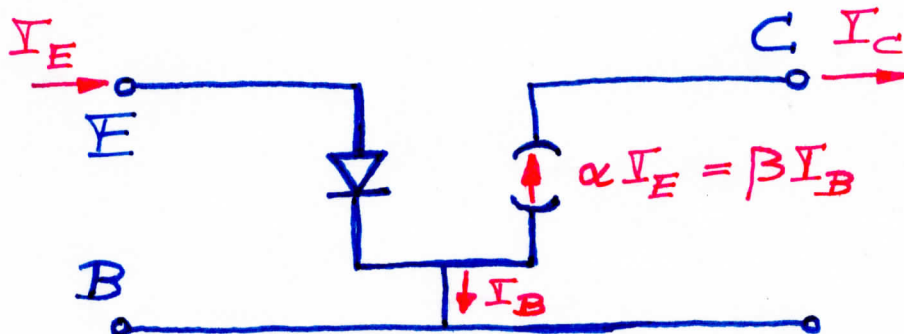

Equivalent circuit

Typically $\alpha' < \alpha$ (Why?)
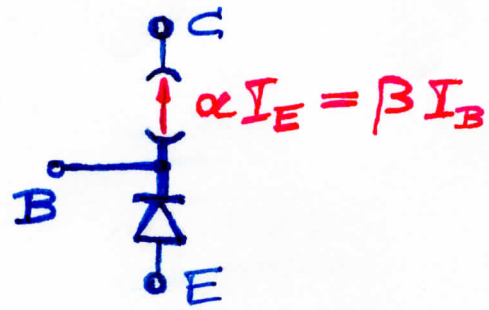
Note $\alpha I_E = I_c = \beta I_B$

Active regime $\Rightarrow$ CB diode is reverse biased
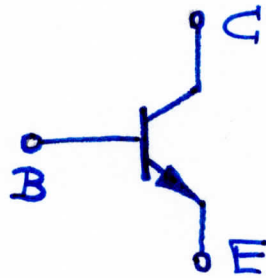
$\Rightarrow$ CB diode = OC (open circuit)

$\alpha I_E = \beta I_B$

Redrawing equivalent circuit for pnp and npn transistor

pnp

$\alpha I_E = \beta I_B$

B

E

npn

$\alpha I_E = \beta I_B$

B

E
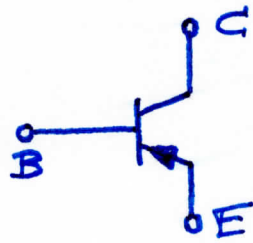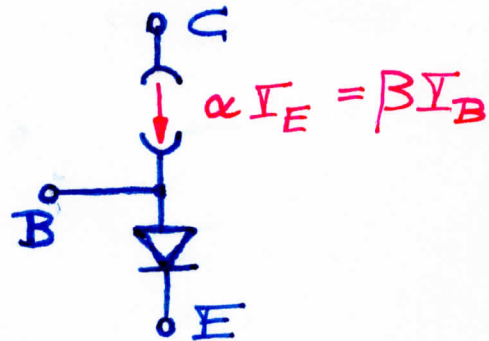
Output characteristic based on equivalent circuit

$I_C = \beta I_B$

I_B

$I_C = \beta I_B = 0$

V_{CE}
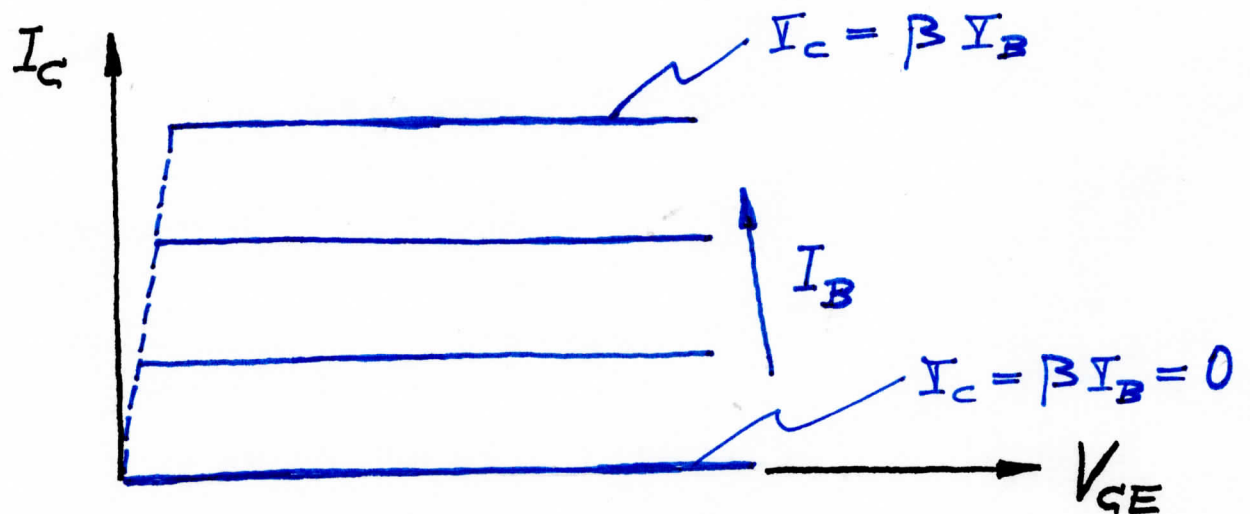
Output characteristic $\Rightarrow$ Current source $\Rightarrow$

Current I_C for any voltage V_{CE}.

What is output resistance of transistor?