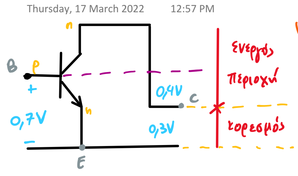
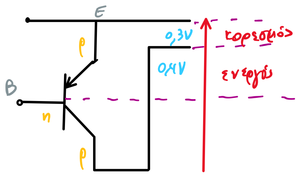
17.03.22

Thursday, 17 March 2022 12:57 PM



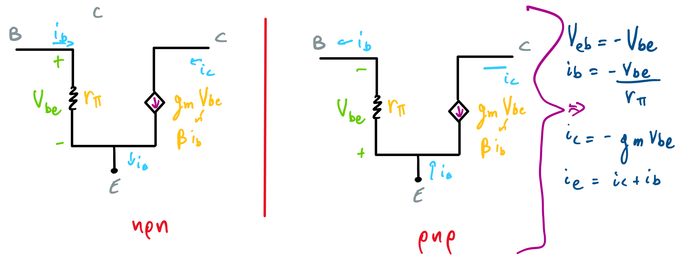
$V_c > V_B - 0{,}4V$

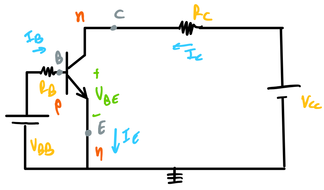
npn

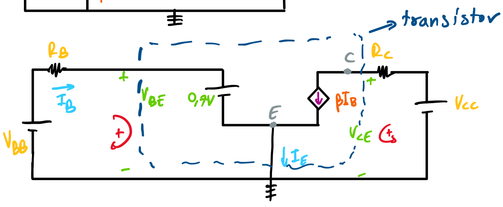


$V_C < V_B + 0{,}4V$

pnp

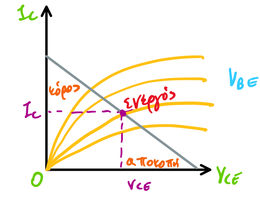






Βρόχος εισόδου: $V_{BB} - V_{BE} = I_B R_B \Rightarrow I_B = \frac{V_{BB} - V_{BE}}{R_B}$

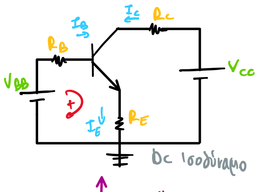
Βρόχος εξόδου: $V_{CC} - V_{CE} = I_C R_C \Rightarrow V_{CE} = V_C - I_C R_C$



$V_{CC} - V_{CE} = I_C R_C$

$I_C = \frac{V_{CC} - V_{CE}}{R_C}$

$I_C = -\frac{V_{CE}}{R_C} + \frac{V_{CC}}{R_C}$



$V_{BB} - V_{BE} = I_B R_B + I_E R_E$

$I_E = (\beta+1) I_B$

$I_B = \frac{V_{BB} - V_{BE}}{R_B + (\beta+1) R_E}$

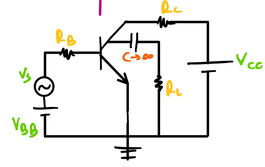
$\Rightarrow V_{CC} - V_{CE} = I_C R_C + I_E R_E$

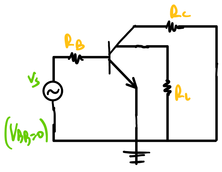
$I_E = a I_C$

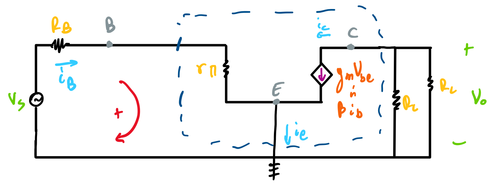
$a = \frac{\beta}{\beta+1}$

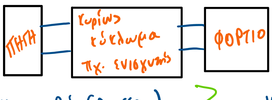
$\Rightarrow I_E = \frac{\beta+1}{\beta} I_C$

DC ανάλυση









$V_{ce} = v_o = -\beta i_b (R_C // R_L)$

$V_s = i_b (R_B + r_\pi)$

$\Rightarrow \frac{V_o}{V_s} = \frac{-\beta (R_C // R_L)}{R_B + r_\pi}$