#

12 Sep 2017

(1) For amplification, transistor has to be in **Forward Active** region

J_E : FB

J_C : RB

(2) Appropriate biasing has to be applied to the transistor.

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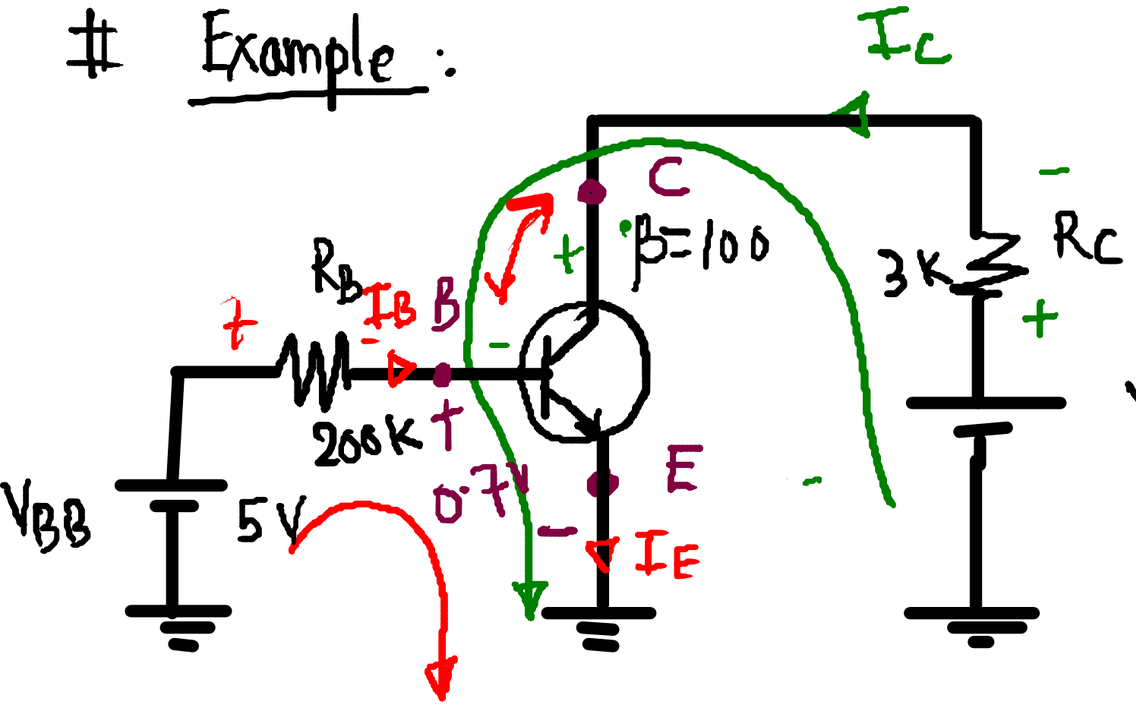
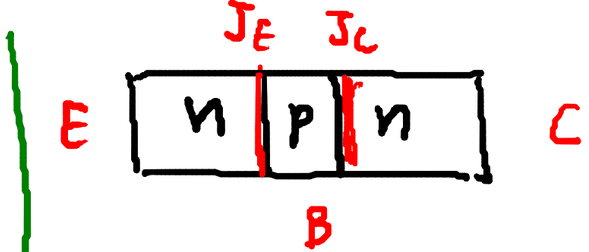
dc. voltage

Example :



Step ①:

$V_{BE} = 0.7\,V$



$V_{BE} \geq 0.7$

$V_{CB} \geq 0$

$V_{CB} = V_C - V_B$

$V_{BB} - I_B R_B - 0.7 = 0$ (V_{BE})

$I_B = \dfrac{V_{BB} - V_{BE}}{R_B}$

$I_B = 0.0215\ mA$

Emitter Junction is Forward Bias

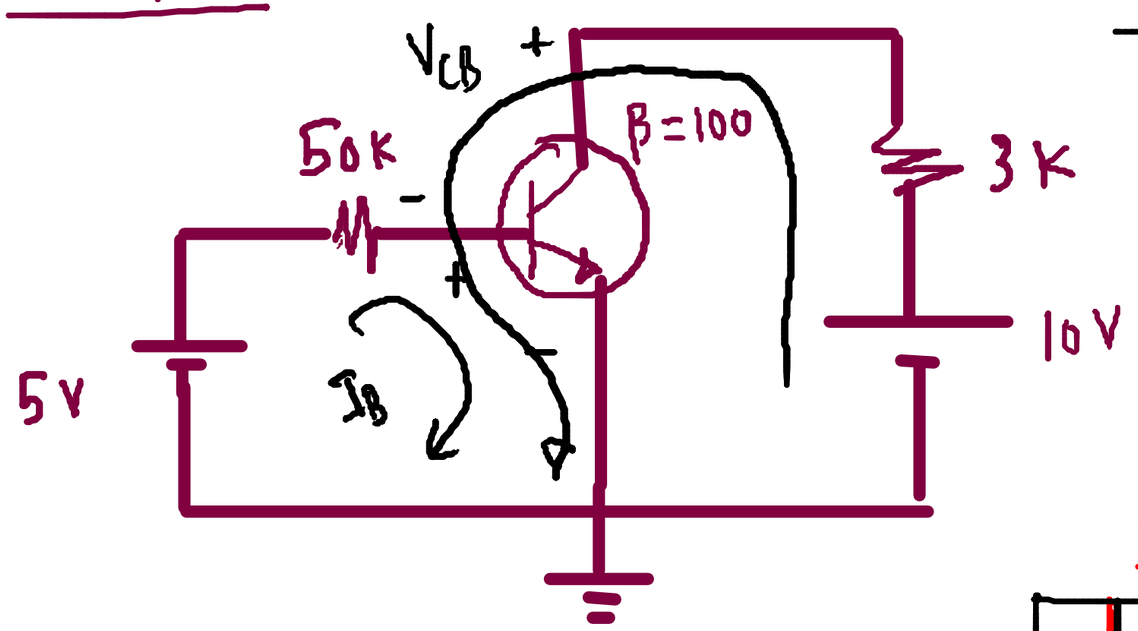
Step ②: $V_{CC} - I_C R_C - V_{CB} - V_{BE} = 0$

$V_{CB} = V_{CC} - (\beta I_B) R_C - V_{BE}$

$V_{CB} = 2.85$

J_C is

Example



Step①:

$I_B = 0.086\ mA$

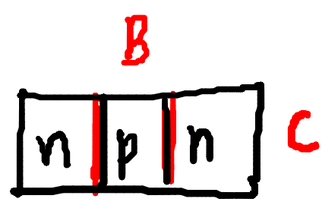
$I_C = 8.6\ mA$

} J_E is (FB)

Step② KVL @ J_C

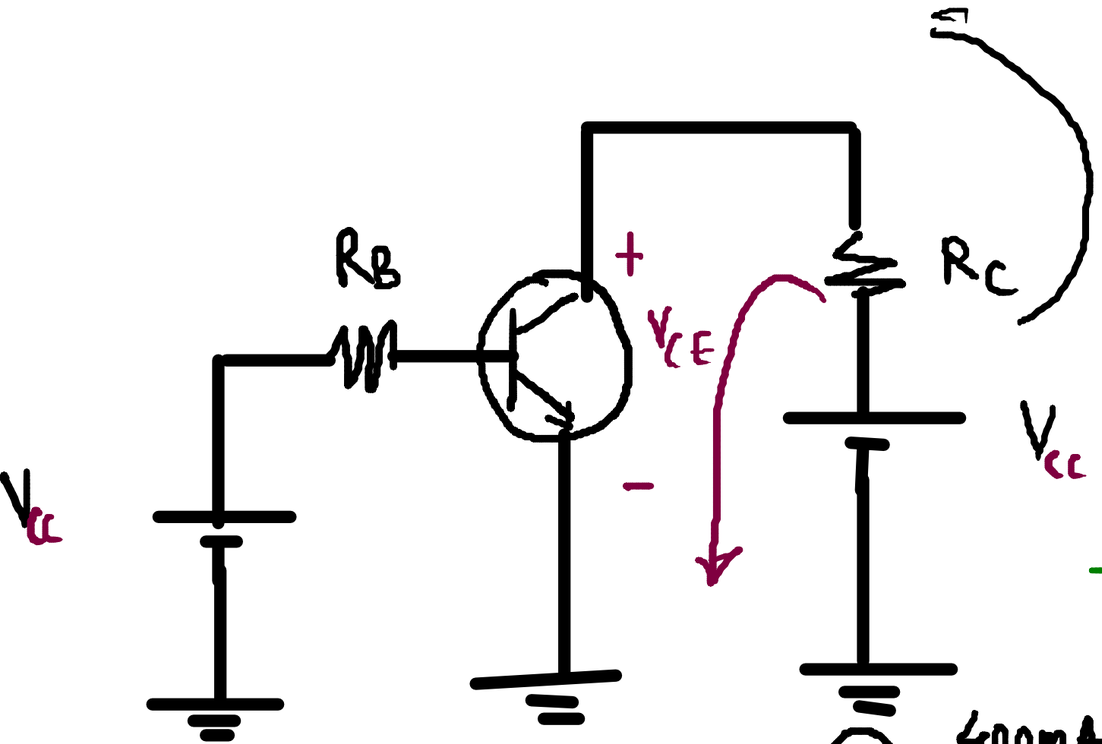
$V_{CB} = -16.5$

} J_C is (FB)



∴ Transistor is in (Saturation.)

Fixed - bias Configuration :



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

X Y