BJT Amplifier Overview (H.9)

20170512

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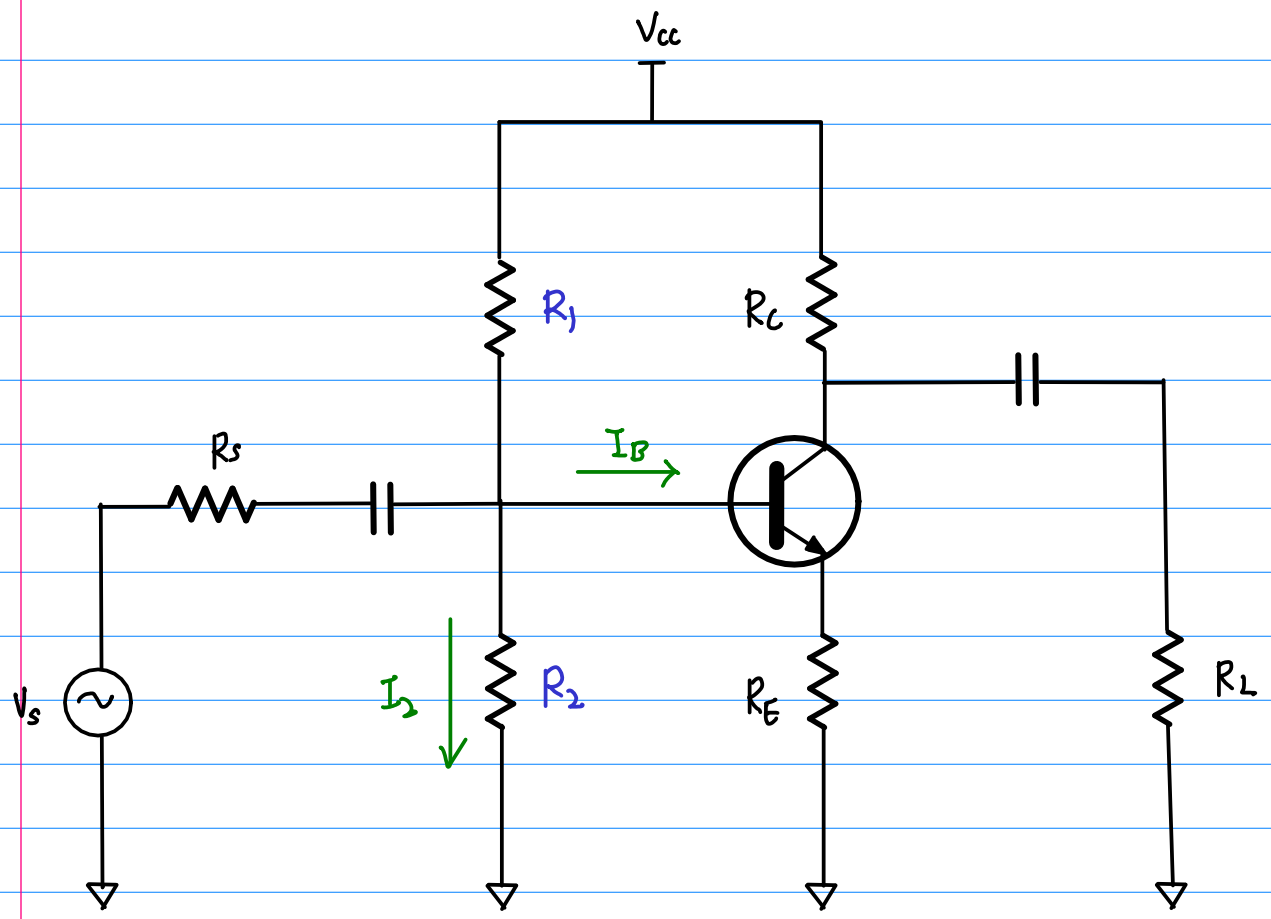
References

Based

[1] Floyd, Electronic Devices 7th ed
[2] Cook,

[2] en.wikipedia.org

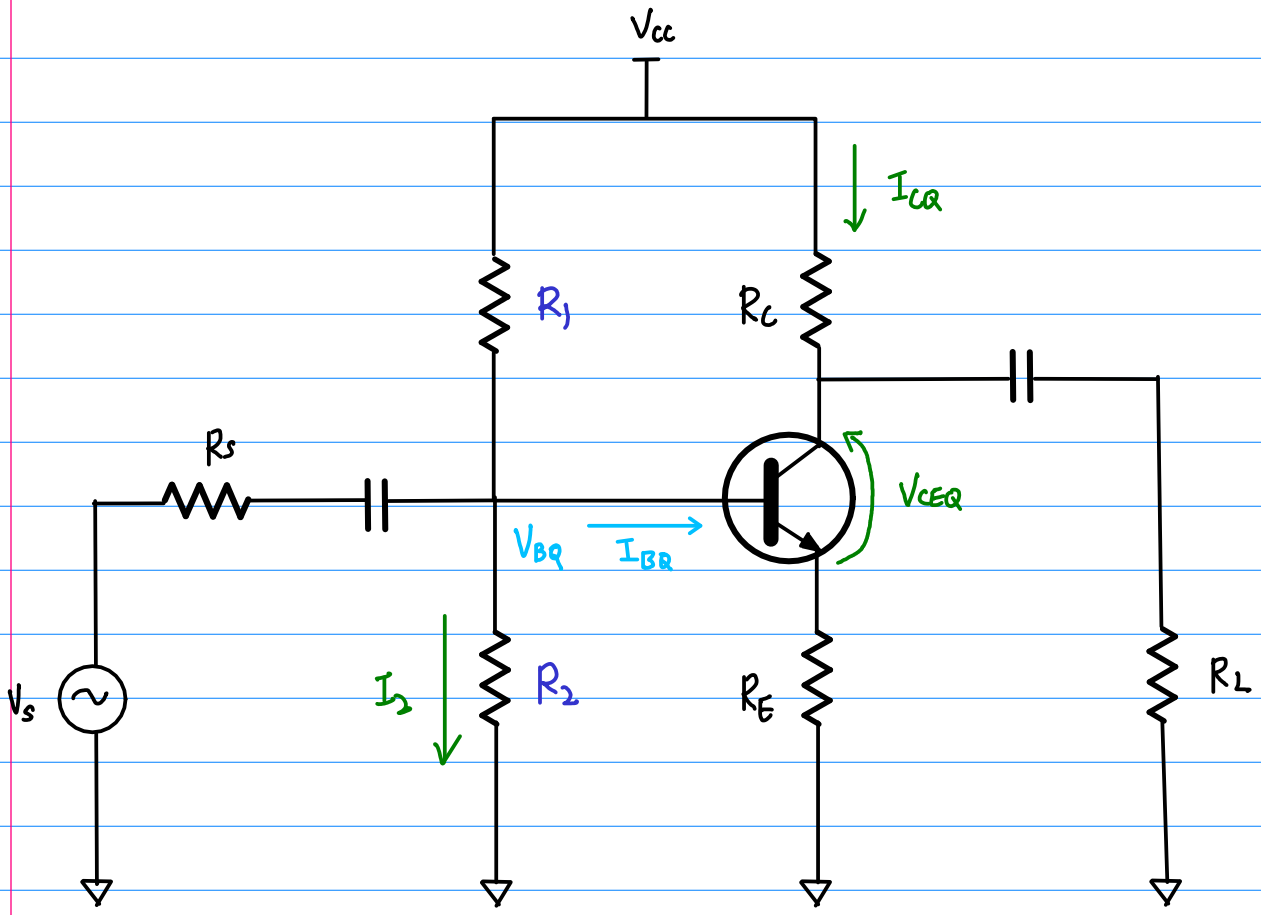

Vcc
R1
RC
Rs
IB
Vs
I2
R2
RE
RL

I_C	I_c
I_E	I_e
I_B	I_b
V_{CE}	V_{ce}

I_C	I_E	I_B	V_{CE}	DC quantities
I_c	I_e	I_b	V_{ce}	ac quantities (rms, peak, peak-to-peak)
i_c	i_e	i_b	v_{ce}	instantaneous quantities

$$\left(\frac{}{\beta_{DC}} + R_C\right) I_C - V_{CC} - V_{BE}$$

$$I_C = \frac{V_{CC} - V_{BE}}{R_C + R_B/\beta_{DC}}$$

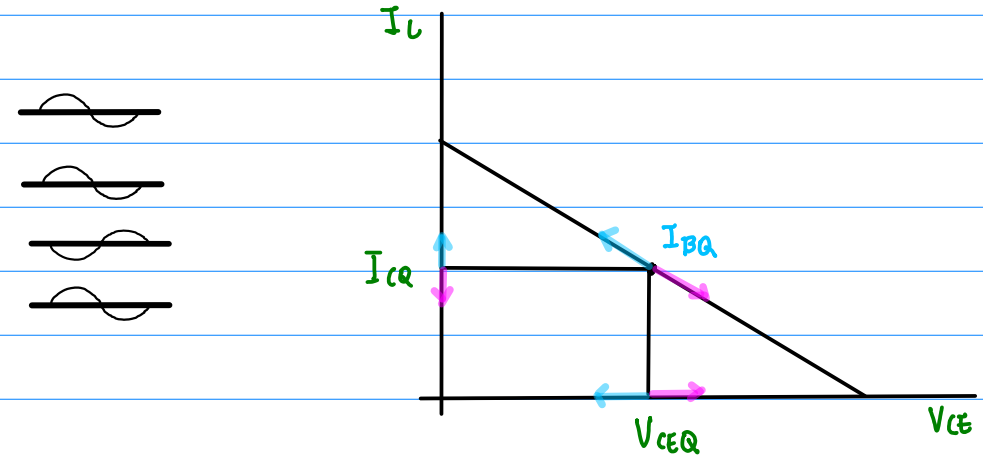


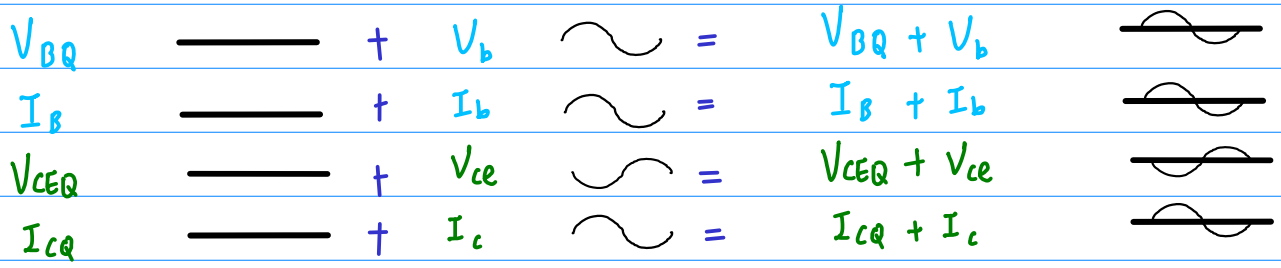
$V_{BQ} + V_b$

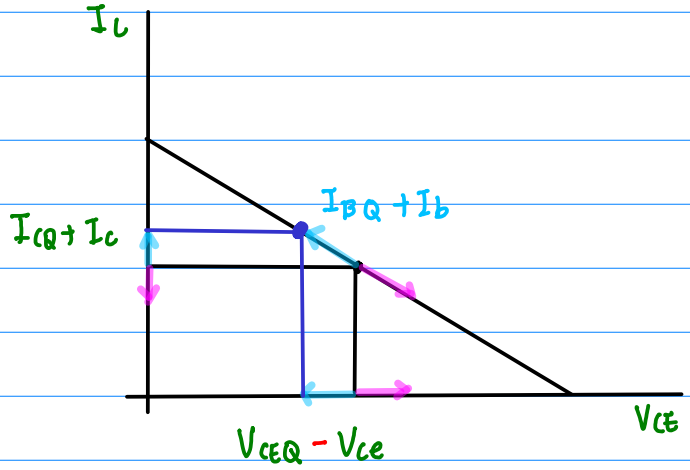
$I_B + I_b$

$V_{CEQ} + V_{ce}$

$I_{CQ} + I_c$




V_{BQ} + v_b = $V_{BQ} + v_b$
I_B + i_b = $I_B + i_b$
V_{CEQ} + v_{ce} = $V_{CEQ} + v_{ce}$
I_{CQ} + i_c = $I_{CQ} + i_c$

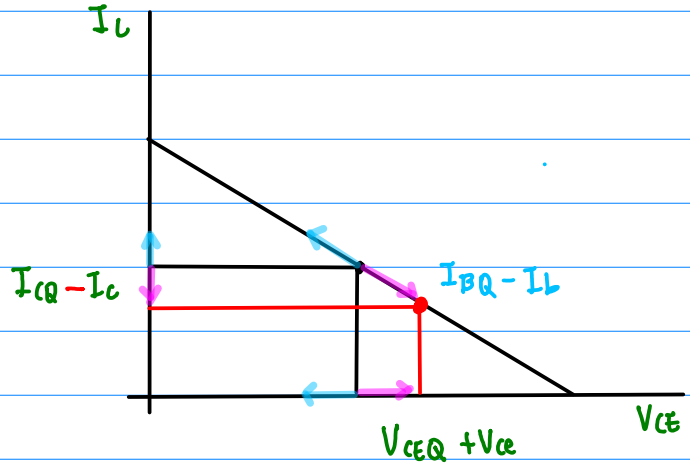


$V_{BQ} + v_b$

$I_B + i_b$

$V_{CEQ} - v_{ce}$

$I_{CQ} + i_c$

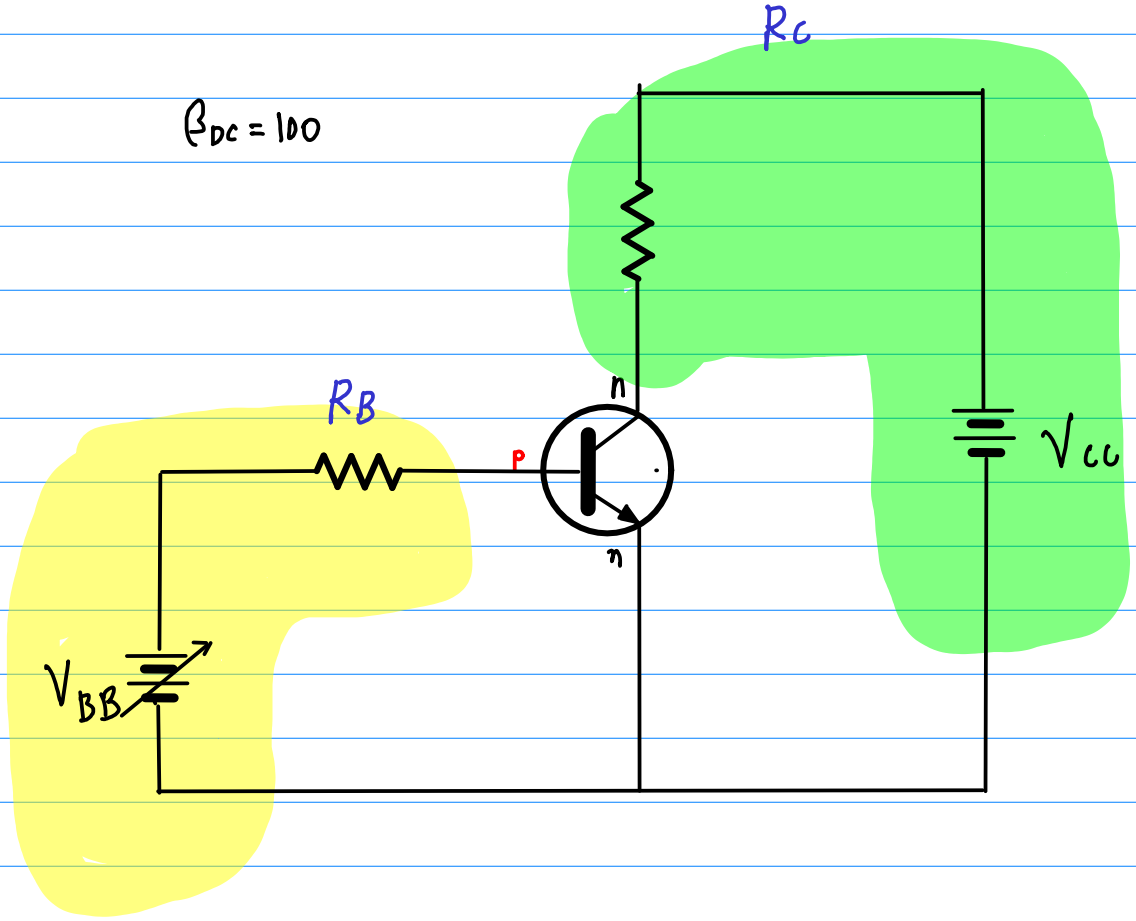


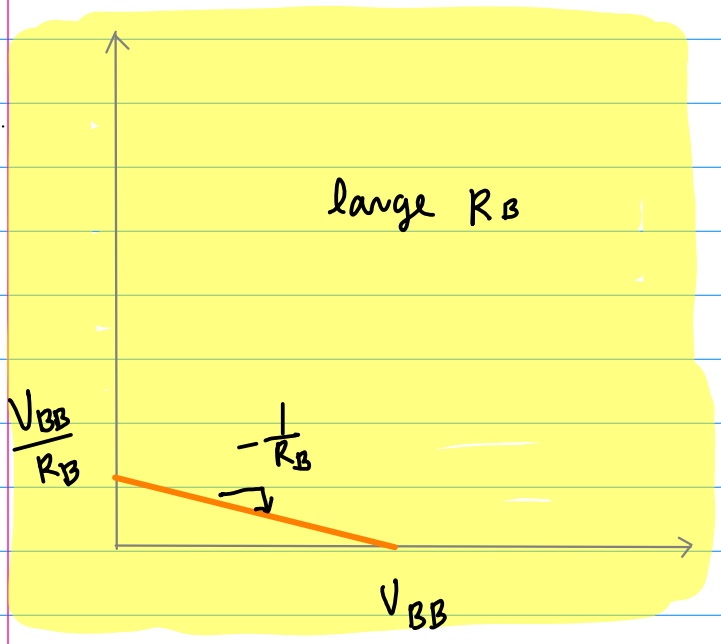
$V_{BQ} - v_b$

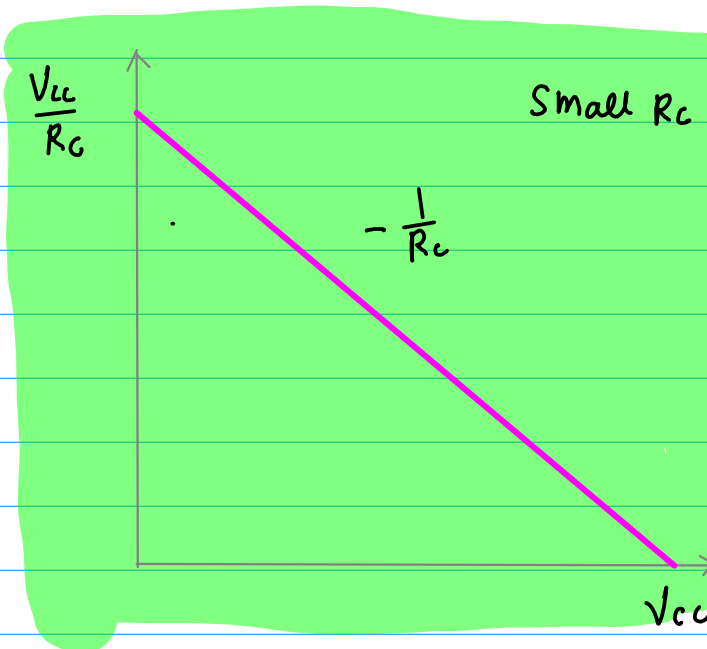
$I_B - i_b$

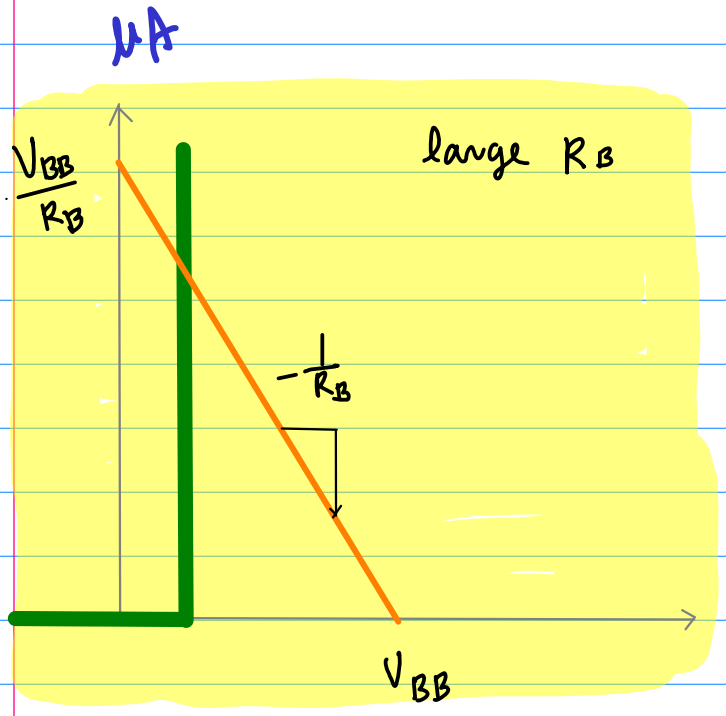
$V_{CEQ} + v_{ce}$

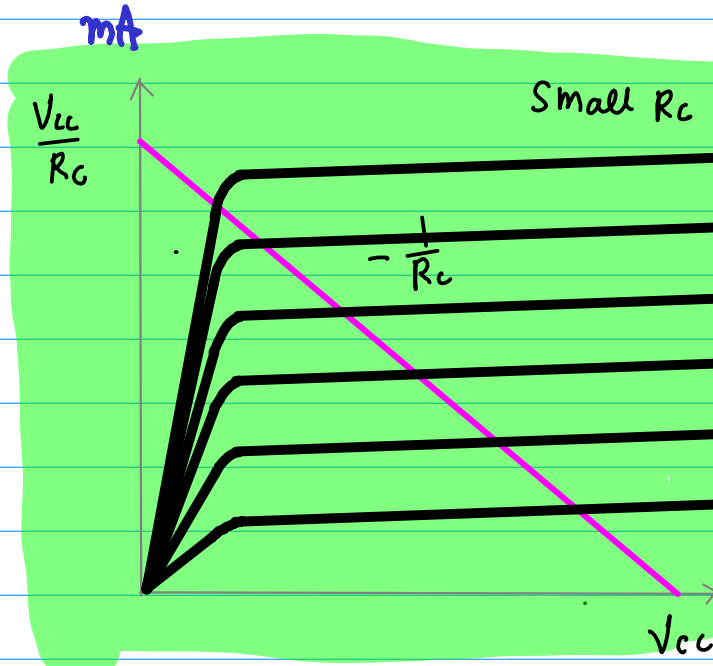
$I_{CQ} - i_c$

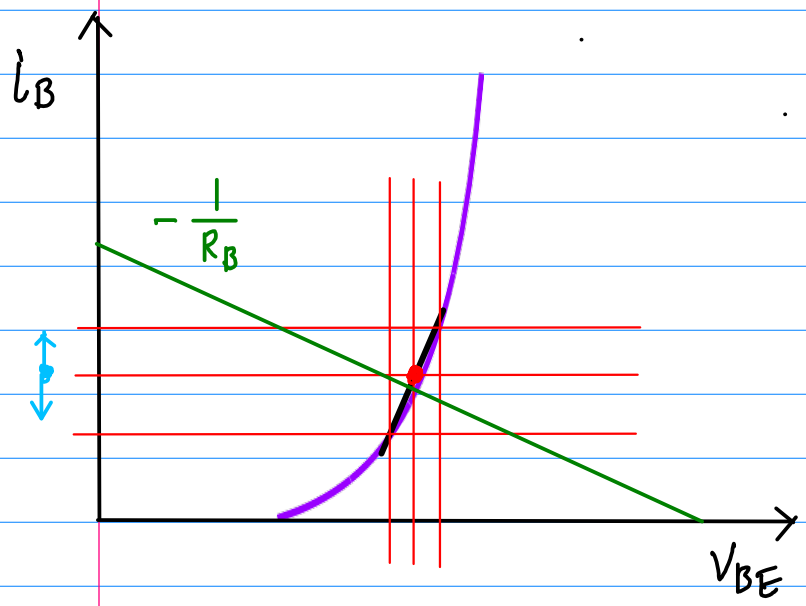

$\beta_{DC} = 100$
R_C
R_B
n
P
n
V_{CC}
V_{BB}


large R_B
$\frac{V_{BB}}{R_B}$
$-\frac{1}{R_B}$
V_{BB}


$\frac{V_{CC}}{R_C}$
Small R_C
$-\frac{1}{R_C}$
V_{CC}


μA
$\frac{V_{BB}}{R_B}$
large R_B
$-\frac{1}{R_B}$
V_{BB}


mA
$\frac{V_{cc}}{R_c}$
Small R_c
$-\frac{1}{R_c}$
V_{cc}


I_B
$-\frac{1}{R_B}$
V_{BE}