

BJT Bias

Voltage Divider Bias (H.5)

20170119

Copyright (c) 2016 - 2017 Young W. Lim.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

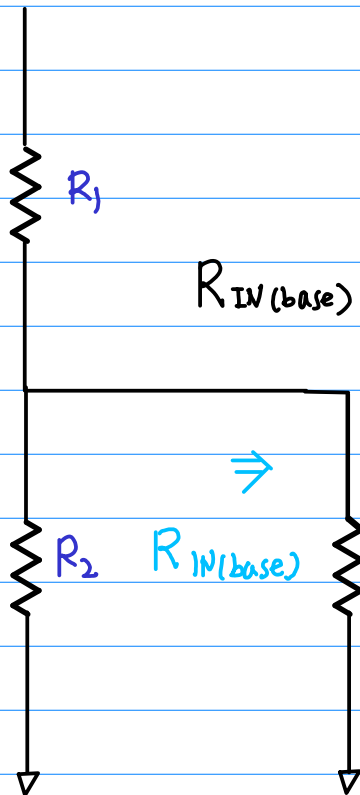
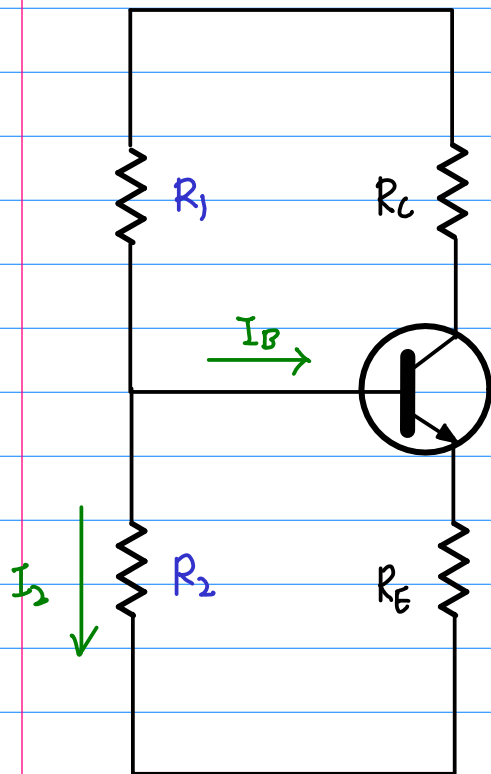
References

Based

[1] Floyd, Electronic Devices 7th ed

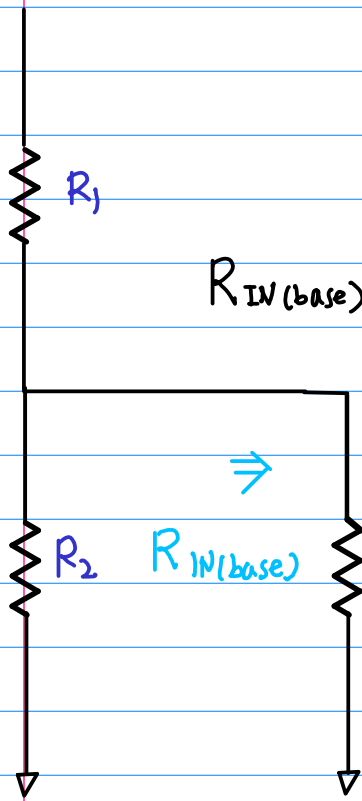
[2] Cook,

[2] en.wikipedia.org

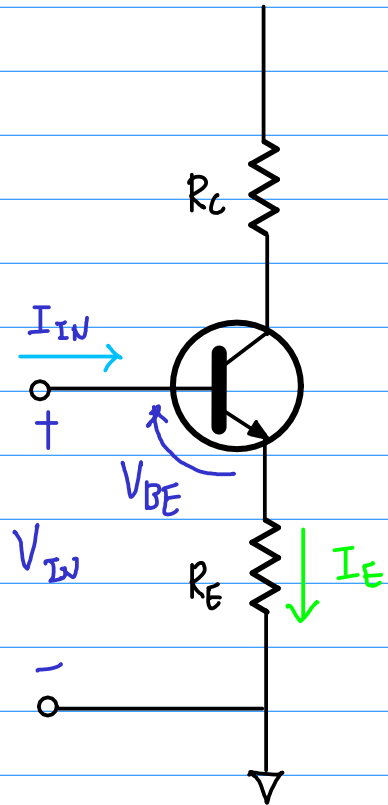


$$R_{IN(base)} = \frac{V_{IN}}{I_{IN}}$$

\Rightarrow

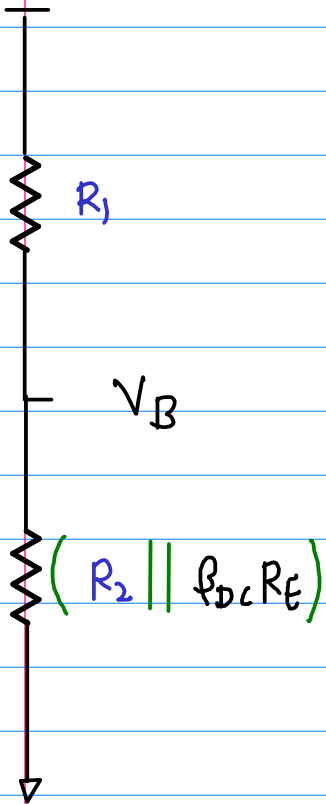
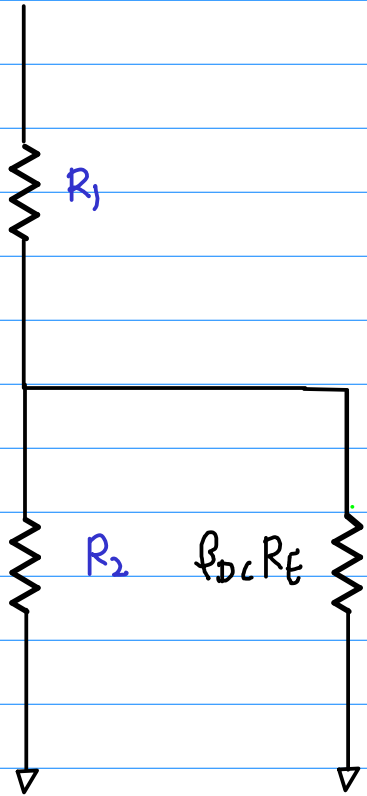
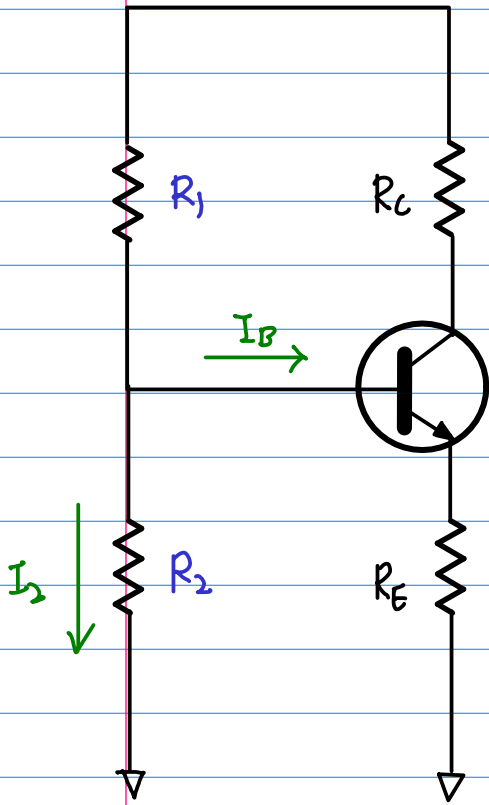


$$R_{IN(base)} = \frac{V_{IN}}{I_{IN}}$$



$$\begin{aligned} V_{IN} &= V_{BE} + I_E R_E \\ &\approx I_E R_E \\ &\approx \beta_{DC} I_B R_E \end{aligned}$$

$$R_{IN(base)} = \frac{V_{IN}}{I_{IN}} = \frac{\beta_{DC} I_B R_E}{I_B} = \beta_{DC} R_E$$



$$V_B = \frac{(R_2 \parallel \beta_{DC} R_E)}{R_1 + (R_2 \parallel \beta_{DC} R_E)} \cdot V_{CC}$$

$$\approx \frac{R_2}{R_1 + R_2} \cdot V_{CC}$$

$$R_2 \ll \beta_{DC} R_E \quad (R_2 \parallel \beta_{DC} R_E) \approx R_2$$









