Tabela 5.1 Amplificadores transistorizados com TBJ sem carga.

Configuração	$Z_i$	$Z_o$	$A_{\nu}$	$A_i$
Polarização fixa:	Média (1 kΩ)	Média (2 kΩ)	Alta (-200)	Alta (100)
$\begin{array}{c c} I_i & V_{CC} \\ \hline & R_B & R_C \\ \hline & V_o \\ \hline & V_i & Z_i \\ \end{array}$	$= \boxed{R_B \  \beta r_e}$ $\cong \boxed{\beta r_e}$	$= \boxed{R_C \  r_o}$ $\cong \boxed{R_C}$	$= -\frac{(R_C \  r_o)}{r_e}$	$= \frac{\beta R_B r_o}{(r_o + R_C)(R_B + \beta r_e)}$
	$(R_B \ge 10\beta r_e)$	$(r_o \ge 10R_C)$	$\cong \left[ -\frac{R_C}{r_e} \right]$ $(r_o \ge 10R_C)$	$ \begin{array}{c} \cong  \boxed{\beta} \\ (r_o \ge 10R_C, \\ R_B \ge 10\beta r_e) \end{array} $
Polarização por	Média (1 kΩ)	Média (2 kΩ)	Alta (-200)	Alta (50)
divisor de tensão: $R_1 \qquad \qquad V_{CC}$ $R_C \qquad \qquad R_C$	$= \left[ R_1 \  R_2 \  \beta r_e \right]$	$= \begin{bmatrix} R_C \  r_o \end{bmatrix}$ $\cong \begin{bmatrix} R_C \end{bmatrix}$	$= -\frac{R_C \  r_o}{r_e}$	$= \frac{\beta(R_1    R_2) r_o}{(r_o + R_C)(R_1    R_2 + \beta r_e)}$
$V_i$ $Z_i$ $R_E$ $Z_o$ $C_E$		$(r_o \ge 10R_C)$	$\cong \left[ -\frac{R_C}{r_e} \right]$ $(r_o \ge 10R_C)$	$\cong \left[ \frac{\beta(R_1    R_2)}{R_1    R_2 + \beta r_e} \right]$ $(r_o \ge 10R_C)$
Polarização de	Alta (100 kΩ)	Média (2 kΩ)	Baixa (-5)	Alta (50)
emissor sem desvio: $V_{CC}$ $R_{B}$ $I_{o}$ $R_{C}$ $I_{o}$ $R_{C}$ $I_{o}$	$= \boxed{R_B \  Z_b}$ $Z_b \cong \beta(r_e + R_E)$ $\cong \boxed{R_B \  \beta R_E}$ $(R_E \gg r_e)$	$= \boxed{R_C}$ (qualquer nível de $r_o$ )	$= \boxed{-\frac{R_C}{r_e + R_E}}$ $\cong \boxed{-\frac{R_C}{R_E}}$ $(R_E \gg r_e)$	$\cong \left[ -rac{eta R_B}{R_B + Z_b}  ight]$
Seguidor de emissor:	Alta (100 kΩ)	Baixa (20 Ω)	Baixa (≅1)	Alta (-50)
$\begin{array}{c c} & & & & & & & & & & & & & & & & & & &$	$= \boxed{R_B \  Z_b}$ $Z_b \cong \beta(r_e + R_E)$ $\cong \boxed{R_B \  \beta R_E}$ $(R_E \gg r_e)$	$= \boxed{\begin{array}{c} R_E \  r_e \\ \\ \cong \boxed{\begin{array}{c} r_e \\ \\ \end{array}} \\ (R_E \gg \ r_e) \end{array}}$	$= \boxed{\frac{R_E}{R_E + r_\epsilon}}$ $\cong \boxed{1}$	$\cong \left[ -\frac{\beta R_B}{R_B + Z_b} \right]$
Base-comum:	Baixa (20 Ω)	Média (2 kΩ)	Alta (200)	Baixa (-1)
$ \begin{array}{c c} I_i \\ V_i \\ \hline Z_i \\ \hline V_{EE} \end{array} $ $ \begin{array}{c c} I_o \downarrow \\ \hline Z_o \\ V_o \end{array} $	$= \boxed{R_E \  r_e}$ $\cong \boxed{r_e}$ $(R_E \gg r_e)$	$=$ $R_C$	$\cong \left[ \frac{R_C}{r_e} \right]$	≅ −1
Realimentação do coletor:	Média (1 kΩ)	Média (2 kΩ)	Alta (-200)	Alta (50)
$\begin{array}{c} I_{o} \downarrow \begin{matrix} \downarrow \\ R_{F} \end{matrix} \\ \downarrow \begin{matrix} \downarrow \\ R_{C} \end{matrix} \\ \downarrow \begin{matrix} \downarrow \\ Z_{o} \end{matrix} \\ V_{o} \end{matrix}$	$= \boxed{\frac{r_e}{\frac{1}{\beta} + \frac{R_C}{R_F}}}$ $(r_o \ge 10R_C)$	$\cong \boxed{R_C \  R_F}$ $(r_o \ge 10R_C)$	$\cong \boxed{-\frac{R_C}{r_e}}$ $(r_o \ge 10R_C)$ $(R_F \gg R_C)$	$= \boxed{\frac{\beta R_F}{R_F + \beta R_C}}$ $\cong \boxed{\frac{R_F}{R_C}}$

Tabela 5.2 Amplificadores transistorizados com TBJ incluindo o efeito de  $R_s$  e  $R_L$ .

Configuração	$A_{v_L} = V_o/V_i$	$Z_i$	$Z_o$
$V_{CC}$ $R_{S}$ $V_{CC}$ $R_{R}$ $R_{C}$ $R_{R}$ $R_{C}$ $R_{R}$ $R_{C}$ $R_{R}$ $R_{C}$	$\frac{-(R_L \  R_C)}{r_e}$	$R_B \  eta r_e$	$R_C$
	Incluindo $r_o$ : $-\frac{(R_L    R_C    r_o)}{r_e}$	$R_B \  \beta r_e$	$R_C \  r_o$
V <sub>CC</sub> R <sub>1</sub> R <sub>2</sub> R <sub>2</sub> V <sub>C</sub>	$\frac{-(R_L \  R_C)}{r_e}$	$R_1 \  R_2 \  \beta r_e$	$R_C$
$\begin{array}{c c}  & & & & & & & & & \\  & & & & & & & & \\  & & & &$	Incluindo $r_o$ : $\frac{-(R_L \  R_C \  r_o)}{r_e}$	$R_1 \  R_2 \  \beta r_\epsilon$	$R_C \  r_o$
$R_1$	≅ 1	$R_E' = R_L \  R_E$ $R_1 \  R_2 \  \beta(r_e + R_E')$	$R'_{s} = R_{s}   R_{1}  $ $R_{E}  \left(\frac{R'_{s}}{\beta} + r_{o}\right)$
$V_s$ $V_s$ $V_s$ $V_s$ $V_o$	Incluindo $r_o$ : $\cong 1$	$R_1 \  R_2 \  \beta(r_e + R_E')$	$R_E \  \left( \frac{R_s'}{\beta} + r_o' \right) \ $
$\begin{array}{c c} & & & & & & & & & & & & & & & & & & &$	$\cong \frac{-(R_L \  R_C)}{r_e}$	$R_E \  r_e$	$R_C$
	Incluindo $r_o$ : $\cong \frac{-(R_L    R_C    r_o)}{r_e}$	$R_E \  r_e$	$R_C \  r_o$
$V_{CC}$ $R_1$ $R_2$ $R_L$ $R_L$	$\frac{-(R_L \  R_C)}{R_E}$	$R_1 \ R_2\  \beta(r_e + R_E)$	$R_C$
	Incluindo $r_{\sigma}$ : $\frac{-(R_L \  R_C)}{R_E}$	$R_1 \  R_2 \  \beta(r_e + R_e)$	$\cong R_C$

Tabela 5.2 Amplificadores transistorizados com incluindo o efeito de  $R_s$  e  $R_L$  (continuação).

Configuração	$A_{\nu_L} = V_o/V_i$	$Z_i$	$Z_o$
R <sub>B</sub> V <sub>C</sub>	$\frac{-(R_L \  R_C)}{R_{E_1}}$	$R_B \  \beta(r_e + R_{E_i})$	$R_C$
$\begin{array}{c c} + & & \\ \hline \end{array}$	Incluindo $r_o$ : $\frac{-(R_L \  R_C)}{R_{E_e}}$	$R_B \  \beta(r_e + R_E)$	$\cong R_C$
$V_{CC}$ $R_C$	$\frac{-(R_L \  R_C)}{r_e}$	$\beta r_e \  \frac{R_F}{ A_v }$	$R_C$
$\begin{array}{c c} & & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ \end{array}$	Incluindo $r_o$ : $\frac{-(R_L \ R_C\ r_o)}{r_e}$	$eta r_e \ rac{R_F}{ A_v }$	$R_C \ R_F\ _{r_o}$
$R_{F}$	$\frac{-(R_L \  R_C)}{R_E}$	$eta R_E \ rac{R_F}{ A_ u }$	$\cong R_C    R_F$
$\begin{array}{c c} R_{z} & V_{I} \\ V_{z} & Z_{i} \\ \end{array}$ $\begin{array}{c c} R_{E} & Z_{i} \end{array}$	Incluindo $r_o$ : $\cong \frac{-(R_L \  R_C)}{R_E}$	$\cong eta R_E \  rac{R_F}{ A_ u }$	$\cong R_C   R_F$