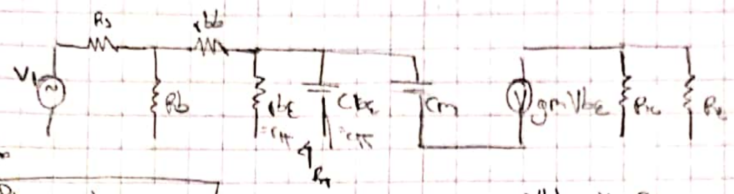
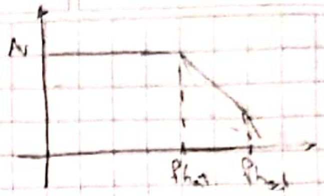
Rta en frec.

Alta





Circ de entrada

$f_{h_{E1}} = \frac{1}{2\pi R_{eq} \cdot C_T}$

$C_T = C_m + C_{b\varepsilon}$

$C_m = C_{bc}(1 + g_m R_L') = c_{bc}(A_v + 1)$

$g_m = \frac{I_{CQ}}{25mV} = \frac{h_{fe}}{r_{b\varepsilon}}$

$I_{CQ} = \frac{V_{bb} - V_{b\varepsilon}}{R_b/\beta + R_\varepsilon} = 25mV \frac{h_{fe}}{h_{ie}} \sim I_{EQ} \sim h_{oE}$

$V_{bb} = \frac{V_{cc} R_1}{R_1 + R_2}$

$r_{b\varepsilon} = \frac{25mV \cdot h_{fe}}{I_{CQ}}$

$C_{b\varepsilon} = \frac{g_m}{\omega_T} = \frac{g_m}{2\pi f_T}$

$R_L' = R_c // R_L$

$R_T = [(R_s // R_b) + r_{bb}] // r_{b\varepsilon}$

$A_v = \frac{R_c}{\frac{r_{be}}{h_{fe}} + R_{E_1}}$

Si tiene un capacitor en // no agrega términos

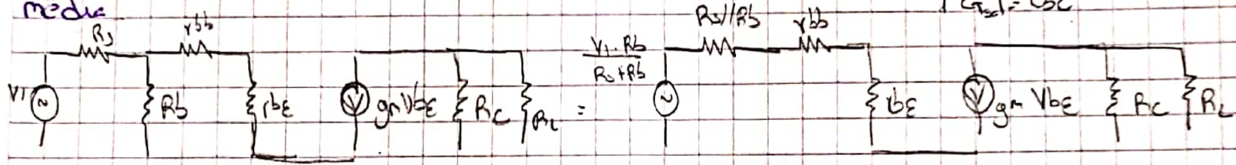
$\omega_h = \frac{1}{r_{b\varepsilon} \cdot C_T}$

$f_{h_{sal}} = \frac{1}{2\pi R_{eq_{sal}} C_{T_{sal}}}$

$R_{eq_{sal}} = R_c // R_L$

$C_{T_{sal}} = C_{bc}$

Media



$A_v = \frac{V_L}{V_1} = \frac{V_L}{V_{b\varepsilon}} \frac{V_{b\varepsilon}}{V_1}$

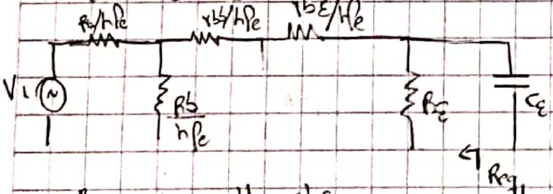
$-g_m (R_c // R_L) V_{b\varepsilon} = V_L \rightarrow \frac{V_L}{V_{b\varepsilon}} = -g_m (R_c // R_L)$

$\frac{V_1 R_b}{R_s + R_b} \frac{1}{R_s // R_b + r_{bb} + r_{b\varepsilon}} r_{b\varepsilon} = V_{b\varepsilon} \rightarrow \frac{V_{b\varepsilon}}{V_1} = \frac{R_b}{R_s + R_b} \frac{r_{b\varepsilon}}{R_s // R_b + r_{bb} + r_{be}}$

Baja

Polo dominante C_ε

$C_b \rightarrow$ corto

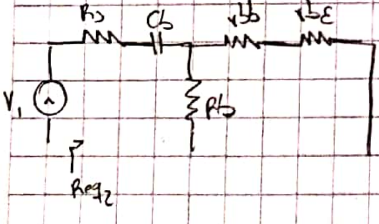


$f_L = \frac{1}{2\pi R_{eq_1} C_\varepsilon}$

$R_{eq_1} = \left[\frac{(R_s // R_b) + (r_{bb} + r_{b\varepsilon})}{h_{fe}}\right] // R_\varepsilon$

C_ε circuito abierto

$C_\varepsilon \rightarrow$ corto



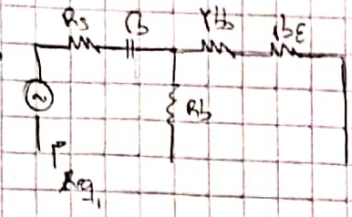
$\frac{f_L}{10} = \frac{1}{2\pi R_{eq_2} C_b}$

$R_{eq_2} = [(r_{bb} + r_{b\varepsilon}) // R_b] + R_s$

NOTA

Polo donnek Cb

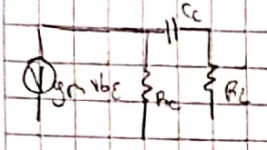
CE comun



$$f_L = \frac{1}{2\pi R_{eq_1} C_b}$$

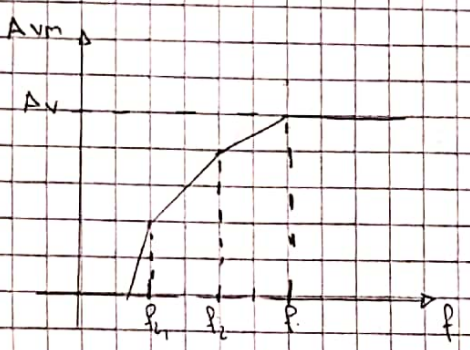
$$R_{eq_1} = \left[(r_{bb} + r_{be}) // R_b \right] + R_s$$

Capacitor Cc



$$f_L = \frac{1}{2\pi R_{eq} C_c}$$

$$R_{eq} = R_c // R_L$$



NOTA

HOJA N°

FECHA

Amplificador de potencia

$V_{cc} = \frac{3 V_{EO}}{2}$

Si me dan V_{1rms} → lo paso a $\hat{V}_1$

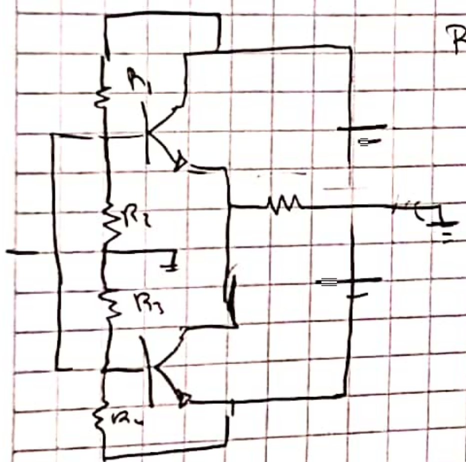
$\hat{V}_1 = V_{1rms}\sqrt{2}$

$I_{c\,max} = \frac{V_{cc}}{R_L}$ $I_L = I_{c\,max} \frac{\hat{V}_1}{V_{cc}}$ $R'_L = N^2 R_L$

$P_L = \left(\frac{I_L}{\sqrt{2}}\right)^2 \cdot R_L$ $P_L = \frac{V_{cc}^2}{2R'_L}$ $\eta = \frac{P_L}{P_{cc}} = \frac{\pi}{4}$

$P_{cc} = \frac{2}{\pi} I_L V_{cc}$ $P_{cc} = \frac{2}{\pi}\frac{V_{cc}^2}{R'_L}$ $F_m = \frac{P_C}{P_L} = \frac{2}{\pi^2}$

2. $P_C = P_{cc} - P_L$ $P_C = \frac{V_{cc}^2}{\pi^2 R'_L}$



Red de Polarización

$0,7 = \frac{V_{cc}\, R_2}{R_1 + R_2}$

$R_1 = R_4 \simeq 20K$ lo elijo

$R_2 = R_3 = \frac{0,7 \cdot R_1}{V_{cc} - 0,7}$

Si tiene capacitor de acoplamiento multiplico las fórmulas de Pot por $\frac{1}{4}$

Realimentación negativa

$h_{ib} = \frac{h_{ie}}{h_{fe}}$

$D = 1 + \beta G_{mm}$

Tensión - Serie

$A_V = \frac{V_L}{V_S}$ $A_{Vf} = \frac{A_V}{D}$

$Z_{f1} = \frac{V_f}{I_f}\Big|_{V_{sf}=0} = R_{f1} \| R_{f2}$

$Z_{fe} = \frac{V_{sf}}{I_f}\Big|_{I_f=0} = R_{f1} + R_{f2}$

$Z_{if} = Z_i D$ $Z_{of} = \frac{Z_o}{D}$

$\beta = \frac{V_s}{V_L}\Big|_{I_f=0} = \frac{R_{E1}}{R_f + R_{E1}}$

Tensión Paralelo

$R_m = \frac{V_L}{I_S}$ $R_{mf} = \frac{R_m}{D}$

$Z_{if} = \frac{Z_i}{D}$

$Z_{of} = \frac{Z_o}{D}$

$\beta = \frac{I_s}{V_L}\Big|_{V_f=0} \left[\frac{1}{\Omega}\right] = -\frac{1}{R_f}$

Corriente serie

$G_m = \frac{I_L}{V_S}$ $G_{mf} = \frac{G_m}{D}$

$Z_{if} = Z_i D$

$Z_{of} = \frac{Z_o}{D}$

$\beta = \frac{V_s}{I_L}\Big|_{I_f=0} [\Omega] = -R_E$

Corriente paralelo

$A_I = \frac{I_L}{I_S}$ $A_{If} = \frac{A_I}{D}$

$Z_{if} = \frac{Z_i}{D}$

$Z_{of} = Z_o \cdot D$

$Z_{f1} = \frac{V_f}{I_f}\Big|_{I_{sf}=0} = R_{f1} + R_{f2}$

$Z_{fe} = \frac{V_{sf}}{I_{sf}}\Big|_{V_f=0} = R_{f1} \| R_{f2}$

$\beta = \frac{I_f}{I_{sf}}\Big|_{V_f=0} = \frac{R_{E2}}{R_f + R_{E2}}$

NOTA