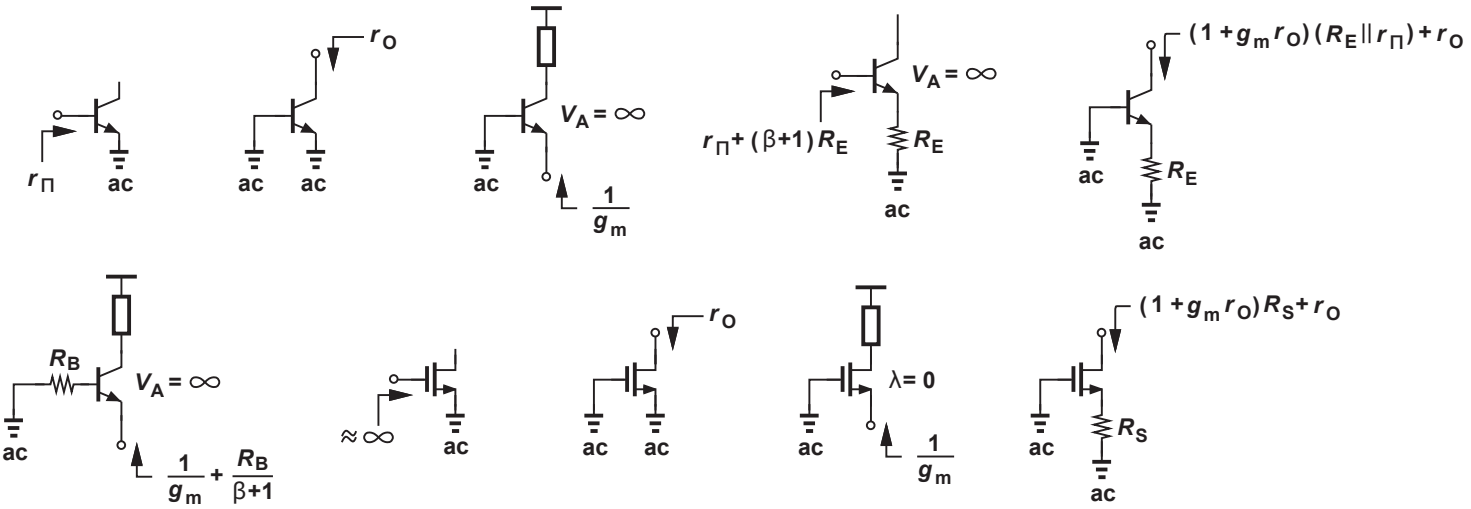
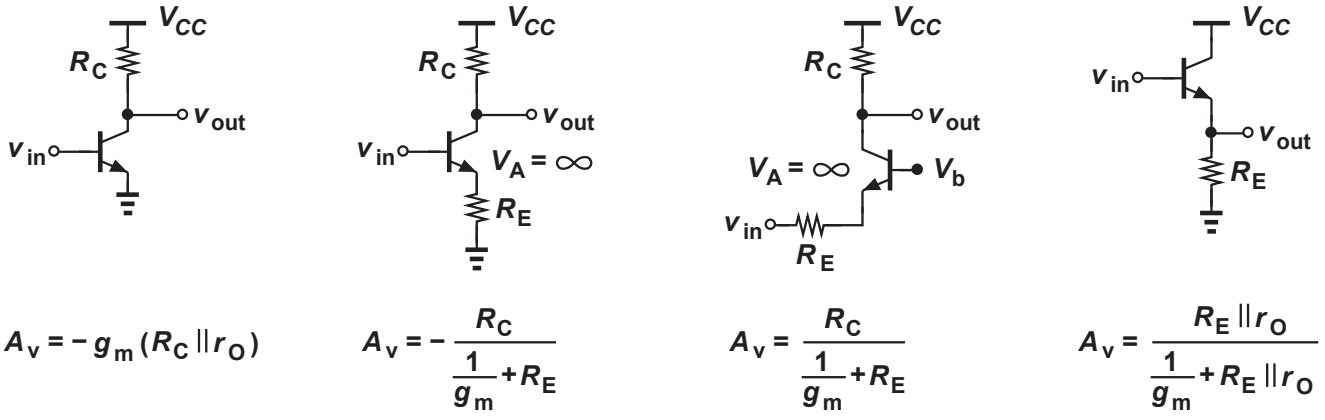
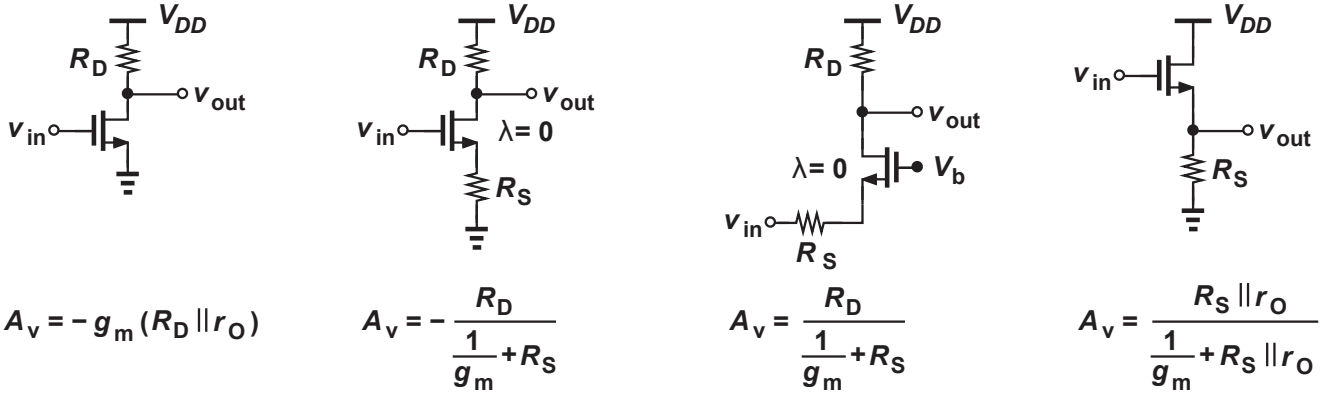
Impedancias de Entrada y Salida



Ecuaciones de Ganancia de Tensión



$$A_v = -g_m(R_C \| r_O) \qquad A_v = -\frac{R_C}{\frac{1}{g_m} + R_E} \qquad A_v = \frac{R_C}{\frac{1}{g_m} + R_E} \qquad A_v = \frac{R_E \| r_O}{\frac{1}{g_m} + R_E \| r_O}$$



$$A_v = -g_m(R_D \| r_O) \qquad A_v = -\frac{R_D}{\frac{1}{g_m} + R_S} \qquad A_v = \frac{R_D}{\frac{1}{g_m} + R_S} \qquad A_v = \frac{R_S \| r_O}{\frac{1}{g_m} + R_S \| r_O}$$

Transistor bipolar

$$g_m = \frac{I_C}{V_T}$$

$$r_\pi = \frac{\beta}{g_m}$$

$$r_o = \frac{V_A}{I_C}$$

$V_{BE} < V_{CE} \rightarrow$ Activa directa

$$I_C = I_S \cdot e^{V_{BE}/V_T}\left(1 + \frac{V_{CE}}{V_A}\right)$$

Transistor MOSFET

$$g_m = \mu_n C_{ox}\frac{W}{L}(V_{GS} - V_{TH})$$

$$g_m = \sqrt{2\mu_n C_{ox}\frac{W}{L} I_D}$$

$$g_m = \frac{2I_D}{V_{GS} - V_{TH}}$$

$$r_o = \frac{1}{\lambda I_D}$$

Triodo: $V_{DS} < V_{GS} - V_{TH}$

$$I_D = \frac{1}{2}\mu_n C_{ox}\frac{W}{L}(2(V_{GS} - V_{TH})V_{DS} - {V_{DS}}^2)$$

Saturación: $V_{DS} > V_{GS} - V_{TH}$

$$I_D = \frac{1}{2}\mu_n C_{ox}\frac{W}{L}(V_{GS} - V_{TH})^2(1 + \lambda V_{DS})$$