

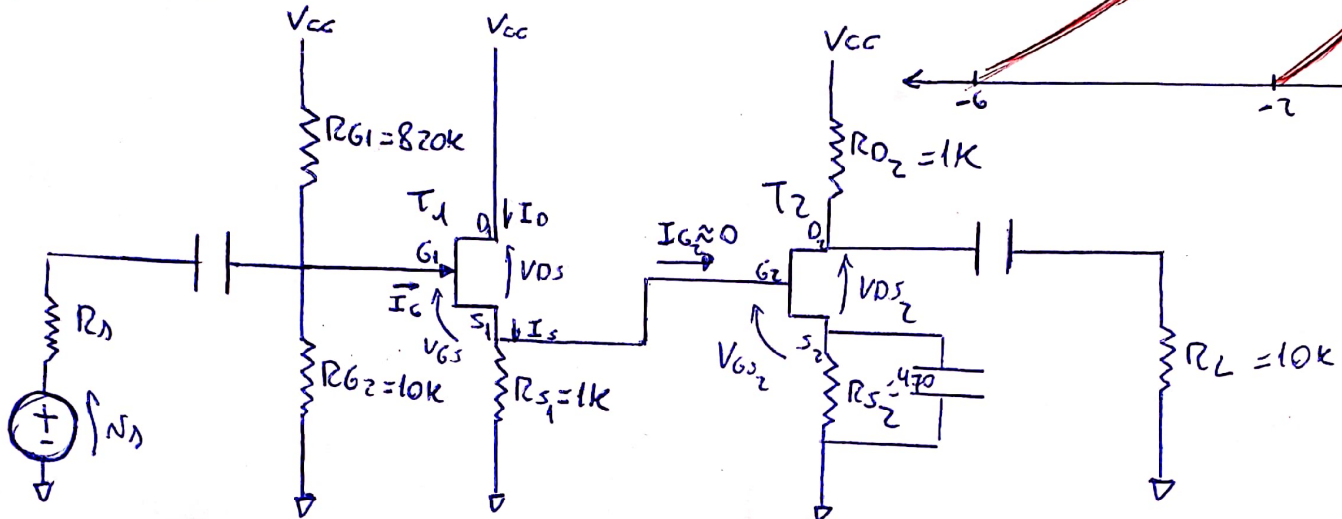
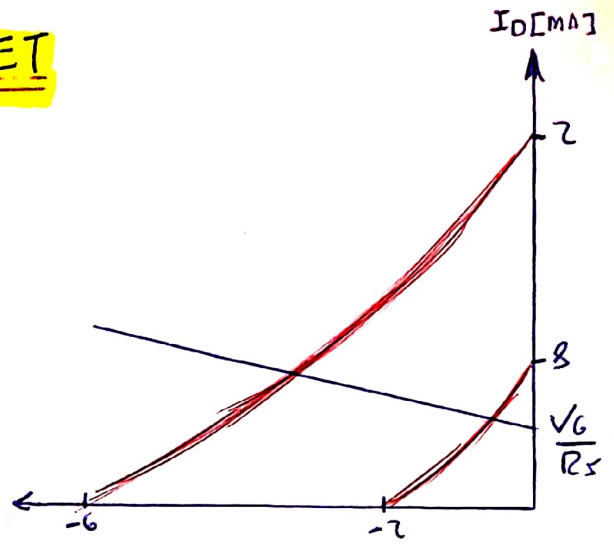
2N5486 - NJFET

Multietapa

$$I_{DSS} = [8, 20] \text{ mA}$$

$$V_{CC} = 12 \text{ V}$$

$$V_P = [-2, -6] \text{ V}$$



Polarización Transistor 1

$$V_{G1} = V_{CC} \cdot \frac{R_{G2}}{R_{G1} + R_{G2}} = 0,145 \text{ V}$$

$$R_{G1} = \frac{10 \text{ k} \cdot 820 \text{ k}}{820 \text{ k} + 10 \text{ k}} = 9,88 \text{ k}$$

$$\begin{cases} V_{GG} - V_{GS} - I_{DQ} \cdot R_S = 0 \\ I_{DQ1} = I_{DSS} \left(1 - \frac{V_{GS}}{V_P} \right)^2 \end{cases}$$

$$I_{DQ1} = 1,33 \text{ mA}$$

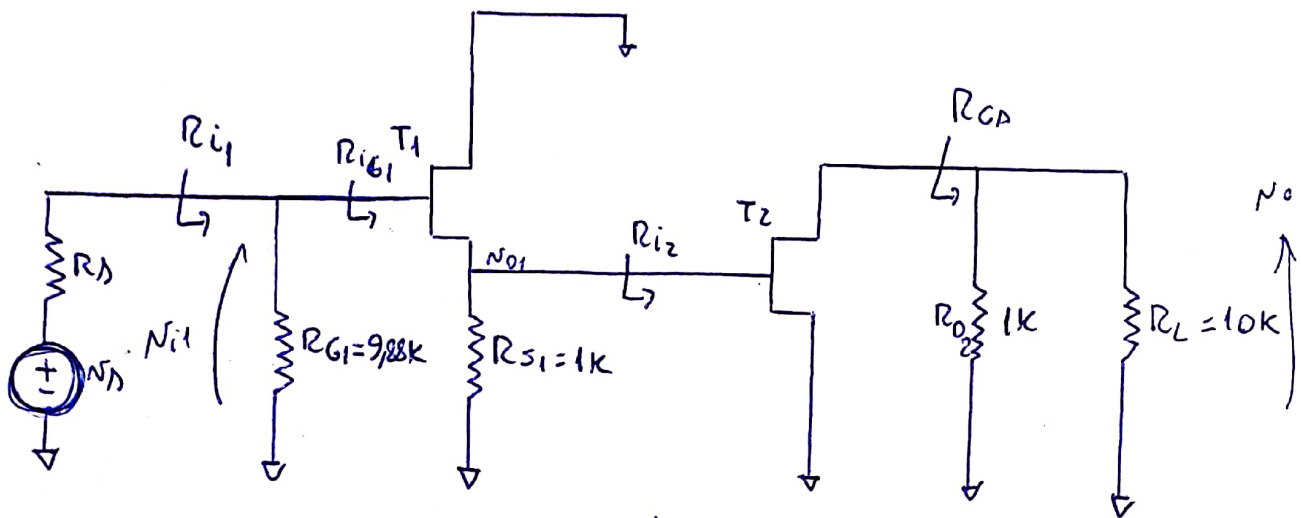
$$V_{S1} = 1,33 \text{ mA} \cdot 1 \text{ k} = 1,33 \text{ V}$$

Polarización Transistor 2

$$V_{S1} = V_{G2} = 1,33 \text{ V}$$

$$\begin{cases} V_{G2} - V_{GS2} - I_{DQ2} \cdot R_{S2} = 0 \\ I_{DQ2} = I_{DSS} \left(1 - \frac{V_{GS2}}{V_P} \right)^2 \end{cases}$$

$$I_{DQ2} = 4 \text{ mA}$$



$$g_{m1} = 3,26 \text{ ms}$$

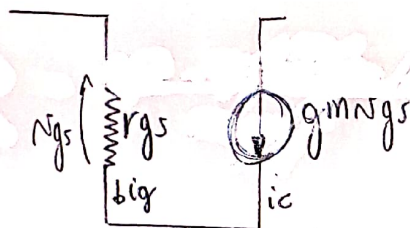
$$R_{SAT} = R_S // R_{i2}$$

$$g_{m2} = 5,65 \text{ ms}$$

$$R_{i2} = r_{gs} = 1 \text{ M}\Omega$$

$$A_{v2} = \frac{N_o}{N_i} = - \frac{g_{m2} \cdot r_{gs} \cdot 1k // 10k}{r_{gs}}$$

$$A_{v2} = -5,14$$



$$R_{SAT} \approx R_S = 1k$$

Reflejado a gate

$$N_i = g_{m1} \cdot r_{gs} \cdot R_S$$

$$N_i = \frac{r_{gs}}{R_S} \cdot R_{SAT}$$

$$g_{m1} \cdot r_{gs} \cdot R_S = \frac{r_{gs}}{R_S} \cdot R_{SAT}$$

$$R_{SAT} = \frac{g_{m1} \cdot r_{gs} \cdot R_S^2}{\beta_{FET}}$$

$$A_{v1} = \frac{g_{m1} \cdot r_{gs} \cdot R_{SAT}}{N_i}$$

$$A_{v1} = \frac{g_{m1} \cdot r_{gs} \cdot \frac{r_{gs}}{g_{m1} \cdot r_{gs} \cdot R_{SAT} + r_{gs}} \cdot R_{SAT}}{N_i}$$

$$A_{v1} = \frac{g_{m1} \cdot R_{SAT}}{1 + g_{m1} \cdot R_{SAT}} = \frac{3,26 \text{ m} \cdot 1k}{1 + 3,26 \cdot 1k}$$

$$A_{v1} = 0,765$$

$$A_v = A_{v1} \cdot A_{v2} = -3,95$$

$$R_{iG1} = r_{gs} + \beta_{FET} \cdot (R_S // R_{i2}) \approx 1 \text{ M}\Omega$$

$$R_{i1} = R_{G1} // R_{iG1} \approx R_{G1} = 9,88k$$