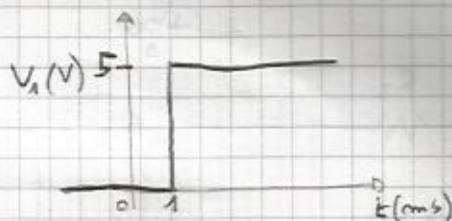
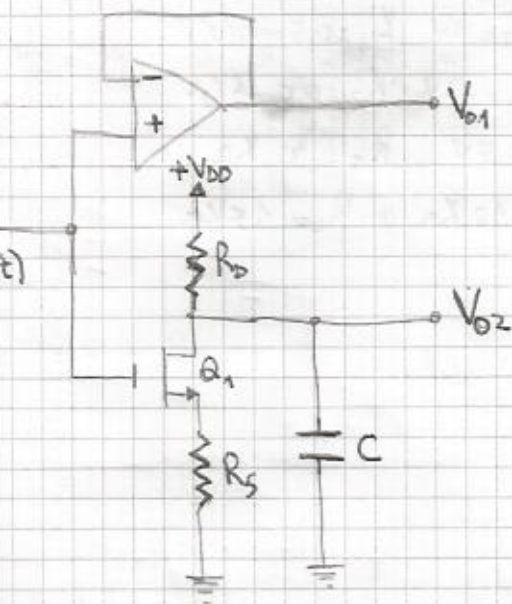


20/09/2012



$$|L^+| = |L^-| = 10\mu\text{m}$$

$$V_T = 1\text{V} \quad K = 0.5\text{mA/V}^2$$

$$R_S = 1\text{k}\Omega \quad R_D = 2\text{k}\Omega \quad V_{DD} = 10\text{V} \quad C = 0.1\mu\text{F}$$

$$V_{OUT} = V_{O1} - V_{O2} = \dots ?$$

$t < 1$

$$V_{O1} = 0\text{V}$$

$$V_{O2} = 10\text{V} = V_{DD} \rightarrow \text{TRANSISTOR INTERDETTO}$$

$$V_{OUT} = -10\text{V}$$

$t > 1$

$$V_{IN} = 5\text{V}$$

$$V_{O1} = V_{IN} = 5\text{V} = V_G$$

$$V_{GS} = V_G - V_S \quad \begin{cases} 2I_D = (V_G - V_T)^2 \\ I_D = K(V_{GS} - V_T)^2 \end{cases} \Rightarrow \begin{cases} 2I_D = (5 - 1)^2 \\ I_D = 0.5(V_{GS} - 1)^2 \end{cases} \Rightarrow \begin{cases} 2I_D = 16 \\ I_D = 8 \end{cases}$$

$$I_D = 2\text{mA}$$

$$V_{GS} = 5 - 2 \cdot 1 = 3\text{V}$$

$$V_{O2} = V_D = V_{DD} - R_D I_D = 10 - 2 \cdot 2 = 6\text{V}$$

$$V_{OUT} = V_{O1} - V_{O2} = 5 - 6 = -1\text{V}$$



$$\tau = R_D \cdot C = 2 \cdot 10^3 \cdot 0.1 \cdot 10^{-6} = 0.2 \cdot 10^{-3} = 0.2\text{ms}$$

$$\text{Transizione a } 5\tau = 0.2 \cdot 5 = 1\text{ms}$$