

sect 6-3 fig 7.xmcd

worksheet 6.3.2 page 1

$$V_{\text{gen}} := 10 \quad R_o := 100 \quad \underline{T} := 100 \cdot 10^{-9} \quad R_g := 1000 \quad R_L := 10^7$$

$$N_1 := 100 \quad \underline{dt} := \frac{T}{N_1} \quad N_2 := 30 \cdot N_1 \quad \underline{T} := 100 \cdot 10^{-9}$$

$$\begin{array}{l|l} \text{send}(\text{INPUT}, V_{\text{gen}}) := & \begin{array}{l} \text{Ini} \leftarrow \text{INPUT}_2 \\ \text{Ina} \leftarrow \frac{2 \cdot R_o \cdot \text{Ini} + V_{\text{gen}}}{R_g + R_o} \\ \text{Inr} \leftarrow \text{Ina} - \text{Ini} \\ \left(\begin{array}{c} \text{Ina} \\ \text{Inr} \end{array} \right) \end{array} \\ \text{recv}(\text{INPUT}) := & \begin{array}{l} \text{Ifi} \leftarrow \text{INPUT}_1 \\ \text{Ifa} \leftarrow \frac{2 \cdot R_o \cdot \text{Ifi}}{R_L + R_o} \\ \text{Ifr} \leftarrow \text{Ifa} - \text{Ifi} \\ \left(\begin{array}{c} \text{Ifa} \\ \text{Ifr} \end{array} \right) \end{array} \end{array}$$

$$\text{point}(n) := \begin{array}{l} m \leftarrow \text{mod}(n, N_1) \\ m \leftarrow N_1 \quad \text{if } m = 0 \end{array}$$

$$\begin{array}{l|l} \text{Iline} := & \begin{array}{l} \text{data}_2, N_1 \leftarrow 0 \\ \text{for } i \in 1 \dots N_2 \\ \quad p \leftarrow \text{point}(i) \\ \quad \text{INPUT} \leftarrow \text{data}^{\langle p \rangle} \\ \quad \left(\begin{array}{c} \text{Ina} \\ \text{Inr} \end{array} \right) \leftarrow \text{send}(\text{INPUT}, V_{\text{gen}}) \\ \quad \left(\begin{array}{c} \text{Ifa} \\ \text{Ifr} \end{array} \right) \leftarrow \text{recv}(\text{INPUT}) \\ \quad \text{OUTPUT} \leftarrow \left(\begin{array}{c} \text{Inr} \\ \text{Ifr} \end{array} \right) \\ \quad \text{data}^{\langle p \rangle} \leftarrow \text{OUTPUT} \\ \quad I_i \leftarrow \text{Ina} \end{array} \\ \text{I} \end{array}$$

$$n := 1 \dots N_2 \quad t_n := (n - 1) \cdot dt$$

worksheet 6.3.2 page 2

(page 1 of this worksheet is a copy of figure 6.2.5 with the value of R_L set to $10 \text{ M}\Omega$)

$$R_g = 1 \times 10^3 \quad \Omega$$

$$R_L = 1 \times 10^7 \quad \Omega$$

$$T = 1 \times 10^{-7} \quad \text{s}$$

$$dt = 1 \times 10^{-9} \quad \text{s}$$

$$C := \frac{T}{R_o} = 1 \times 10^{-9} \quad \text{F}$$

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Icap := | Q ← 0
        | for i ∈ 1 .. N2
        |   | Ic ←  $\frac{1}{R_g} \cdot \left( V_{\text{gen}} - \frac{Q}{C} \right)$ 
        |   | Q ← Q + Ic · dt
        |   | Ii ← Ic
        | I

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Figure 6.3.7 Calculating the transient current in the 1 nF capacitor

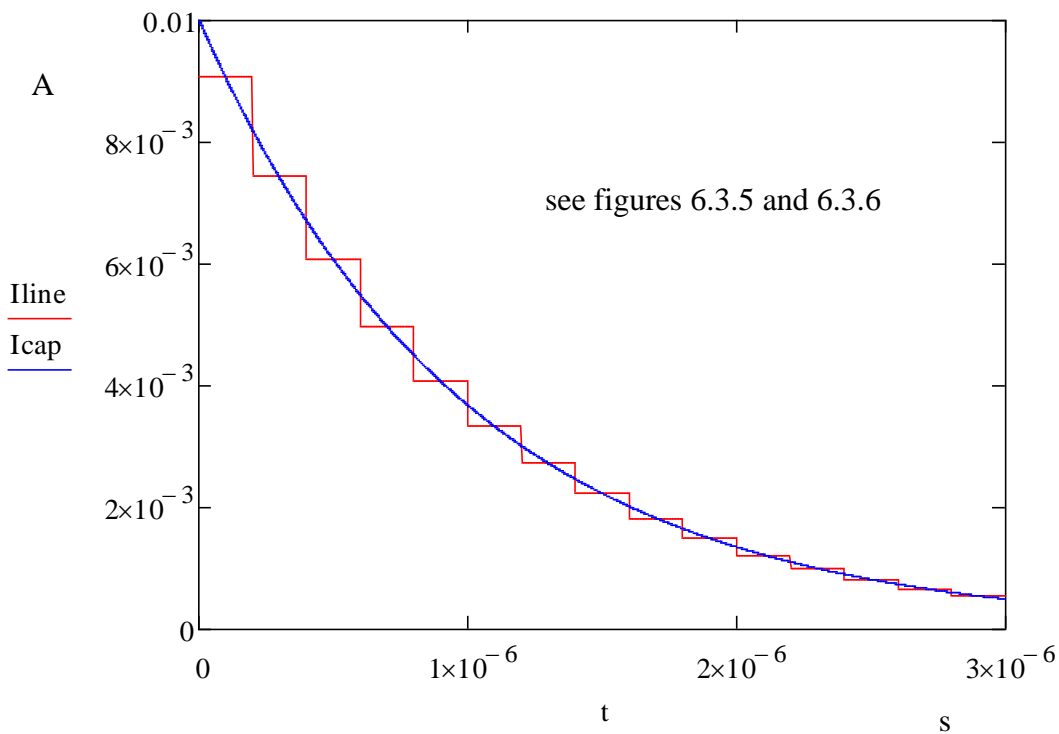


Figure 6.3.8 Response of open-circuited line compared to that of a capacitor