

Formule 555

Incarcarea unui condensator printr-o rezistenta

$$V_C(t) = V_{cc}(1 - e^{-t/RC})$$

Monostabil: Incarcarea de la 0V la V_{TH} :

$$V_{TH} = V_C(\tau) = V_{cc}(1 - e^{-\tau/RC}) \rightarrow$$
$$\tau = RC \ln(1 - V_{TH}/V_{cc})^{-1}$$

Astabil: Incarcarea intre V_{TR} si V_{TH}

$$V_{TR} = V_C(t_0) = V_{cc}(1 - e^{-t_0/RC});$$

$$V_{TH} = V_C(t_1) = V_{cc}(1 - e^{-t_1/RC}); t_1 - t_0 = T_{inc} = T_H$$

$$\frac{1 - V_{TR}/V_{cc}}{1 - V_{TH}/V_{cc}} = e^{(t_1 - t_0)/RC} = e^{T_{inc}/RC} \rightarrow$$

$$T_{inc} = T_H = RC \ln \left(\frac{V_{cc} - V_{TR}}{V_{cc} - V_{TH}} \right)$$

Descarcarea unui condensator printr-o rezistenta:

$$V_C(t) = V_{max} e^{-t/RC}$$

$$\text{Astabil: } V_{TR} = V_C(T_{desc}) = V_{TH} e^{-T_{desc}/RC} \rightarrow$$

$$T_{desc} = T_L = R_B C \ln(V_{TH}/V_{TL})$$

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Monostabil:

$$\tau_{mono} = RC \ln(1 - V_{TH}/V_{CC})^{-1}$$

Astabil: $T_{inc} = T_H = (R_A + R_B)C \ln \left(\frac{V_{CC} - V_{TR}}{V_{CC} - V_{TH}} \right)$

Astabil: $T_{desc} = T_L = R_B C \ln(V_{TH}/V_{TL})$