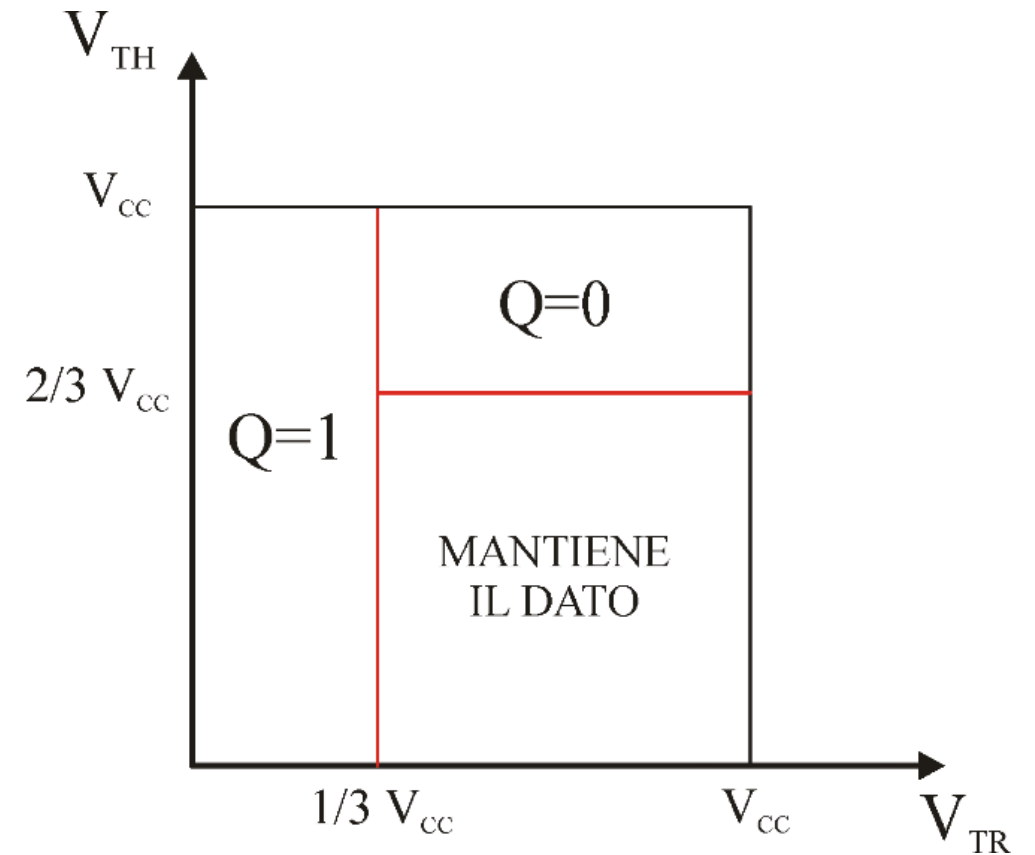
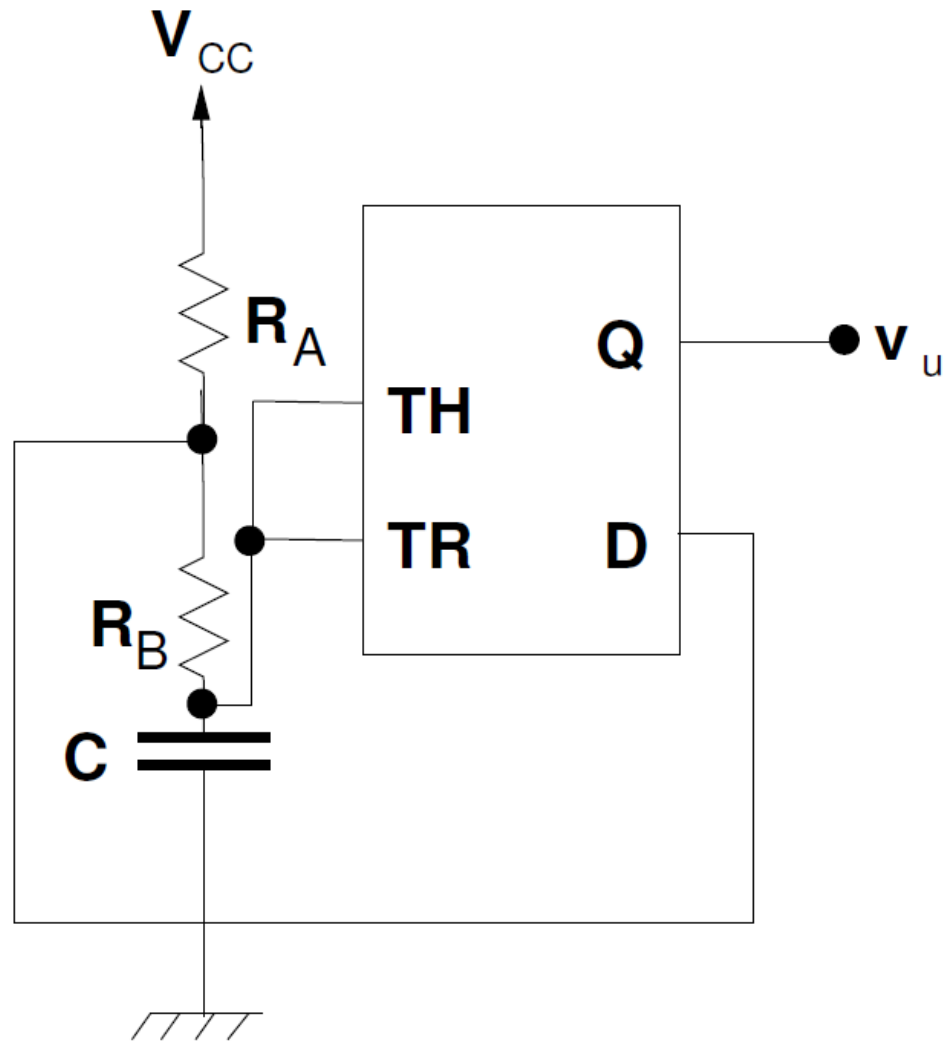


Elettronica Digitale

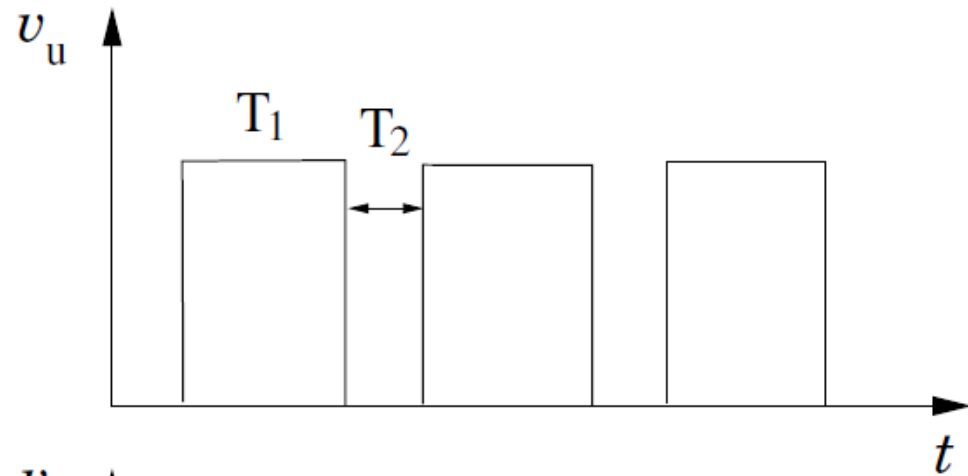
A.A. 2020-2021

Lezione 19/05/2021

Circuito integrato NE555 – Circuito astabile

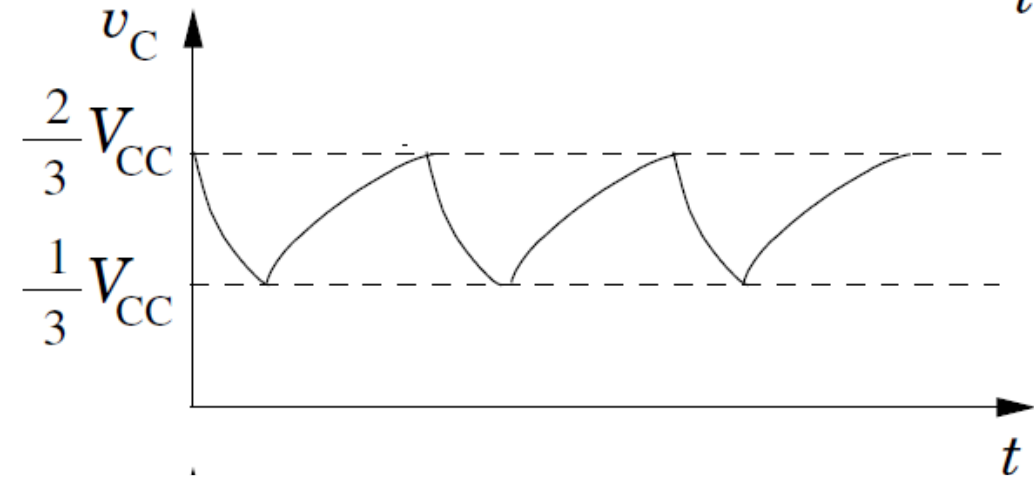


Circuito integrato NE555 – Circuito astabile



Calcolo di T_1

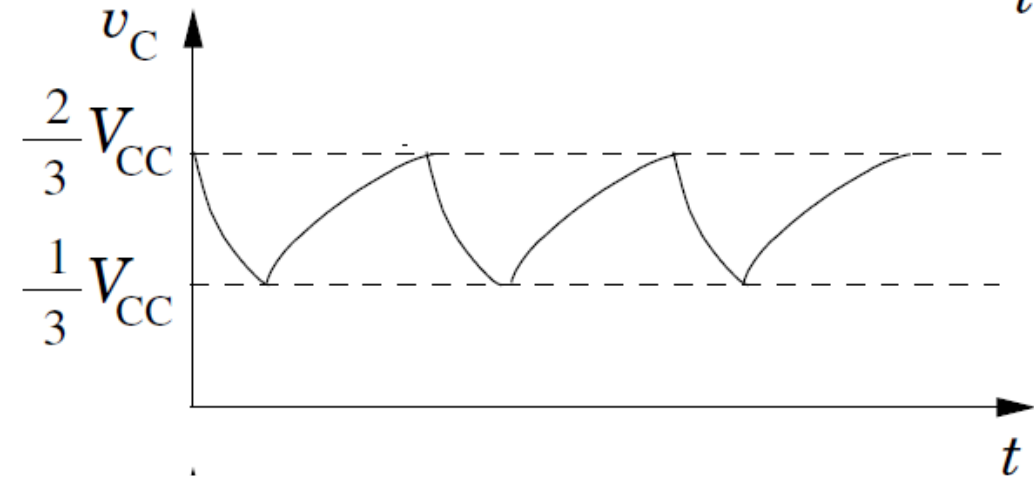
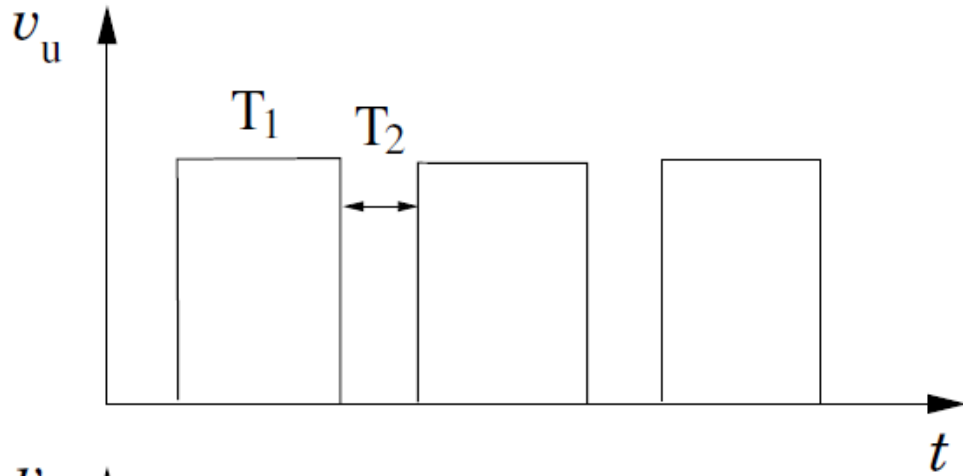
$$v(t) = V_f + (V_i - V_f) \exp\left(-\frac{t}{\tau}\right)$$



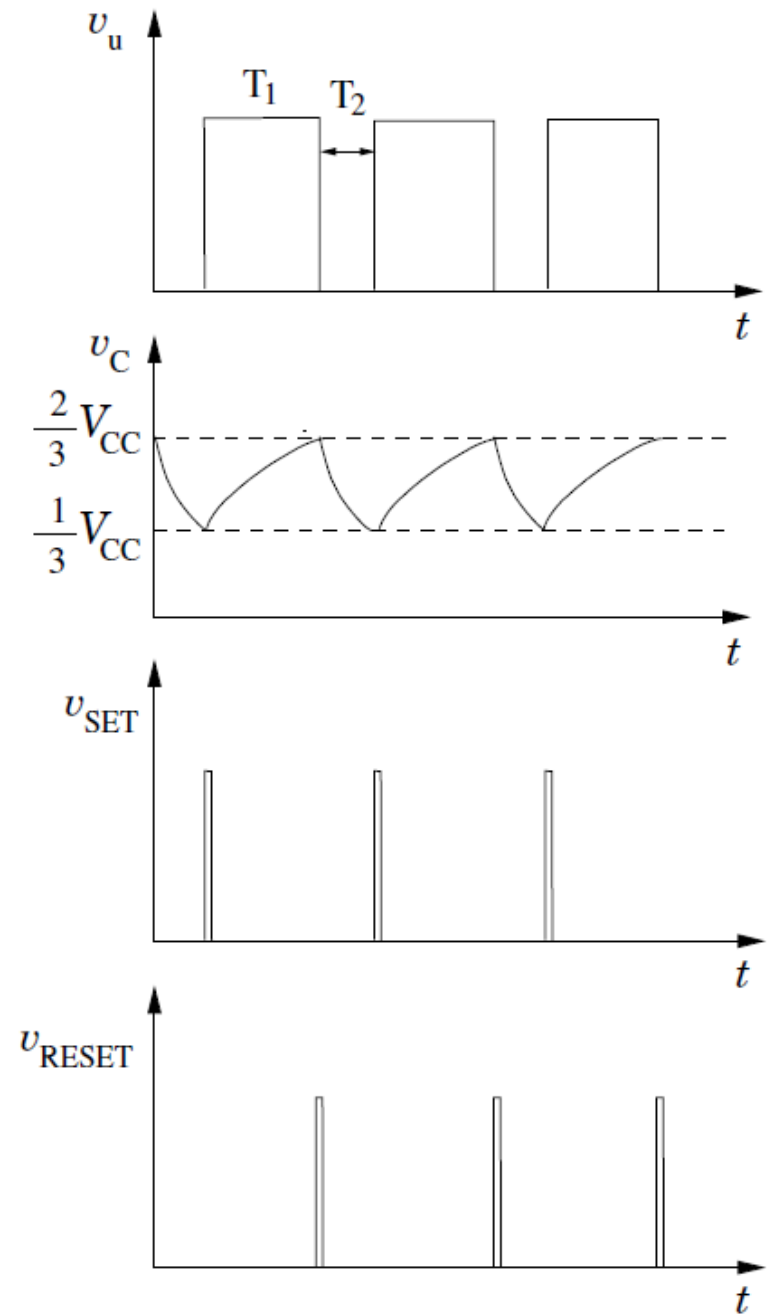
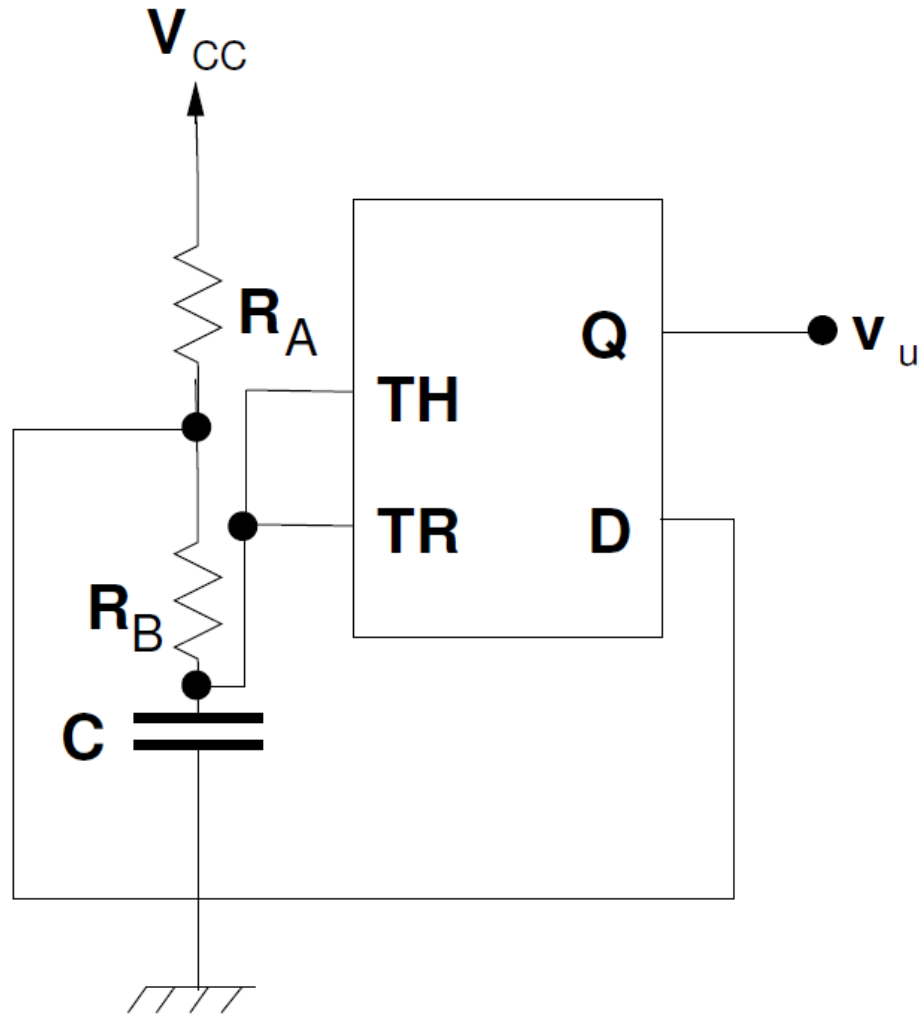
Circuito integrato NE555 – Circuito astabile

Calcolo di T_2

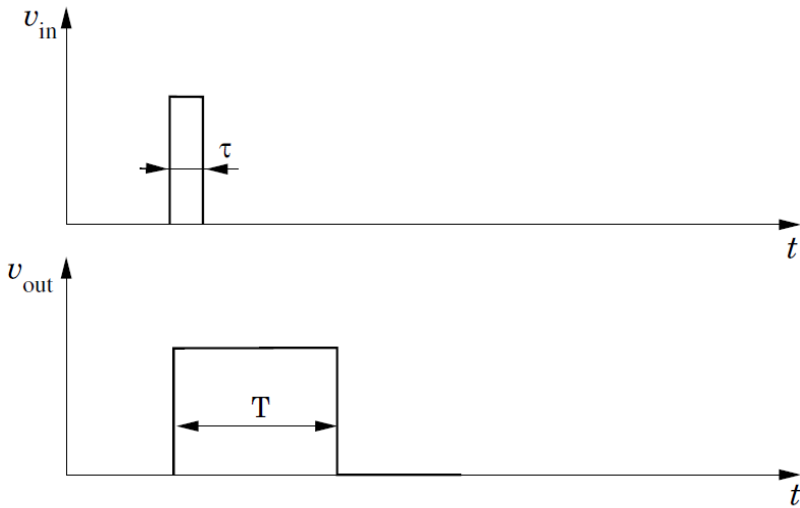
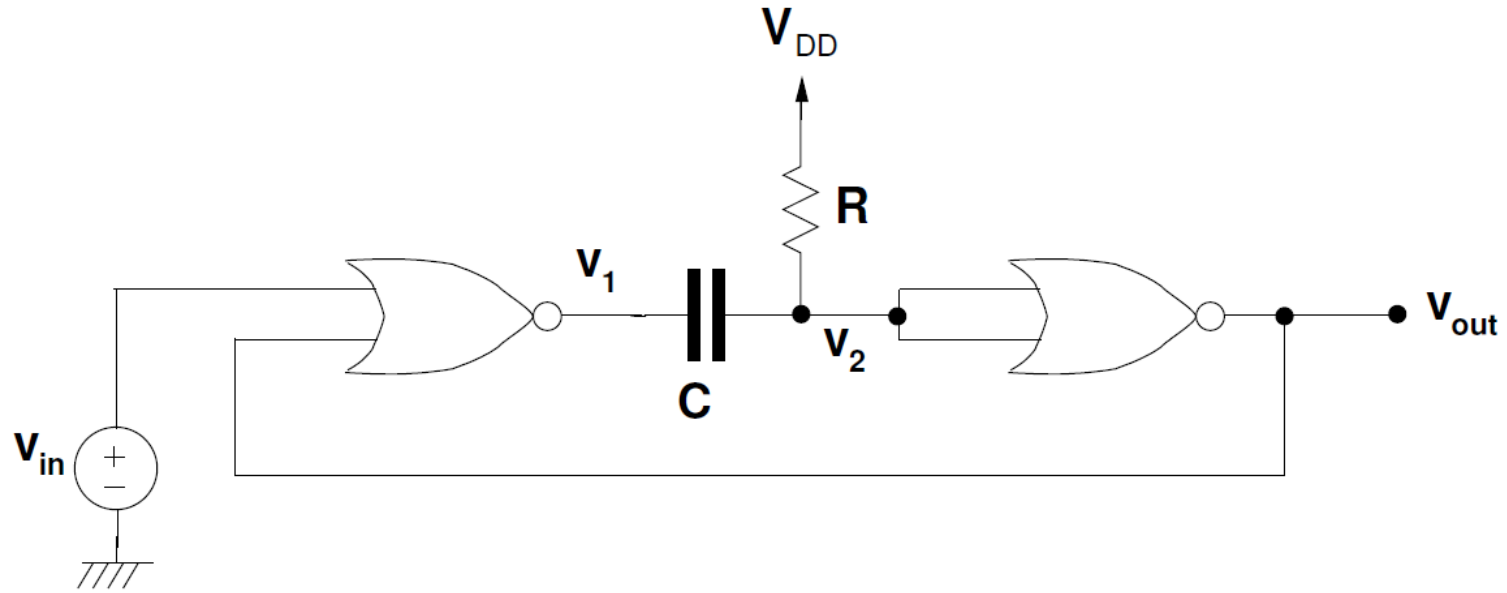
$$v(t) = V_f + (V_i - V_f) \exp\left(-\frac{t}{\tau}\right)$$



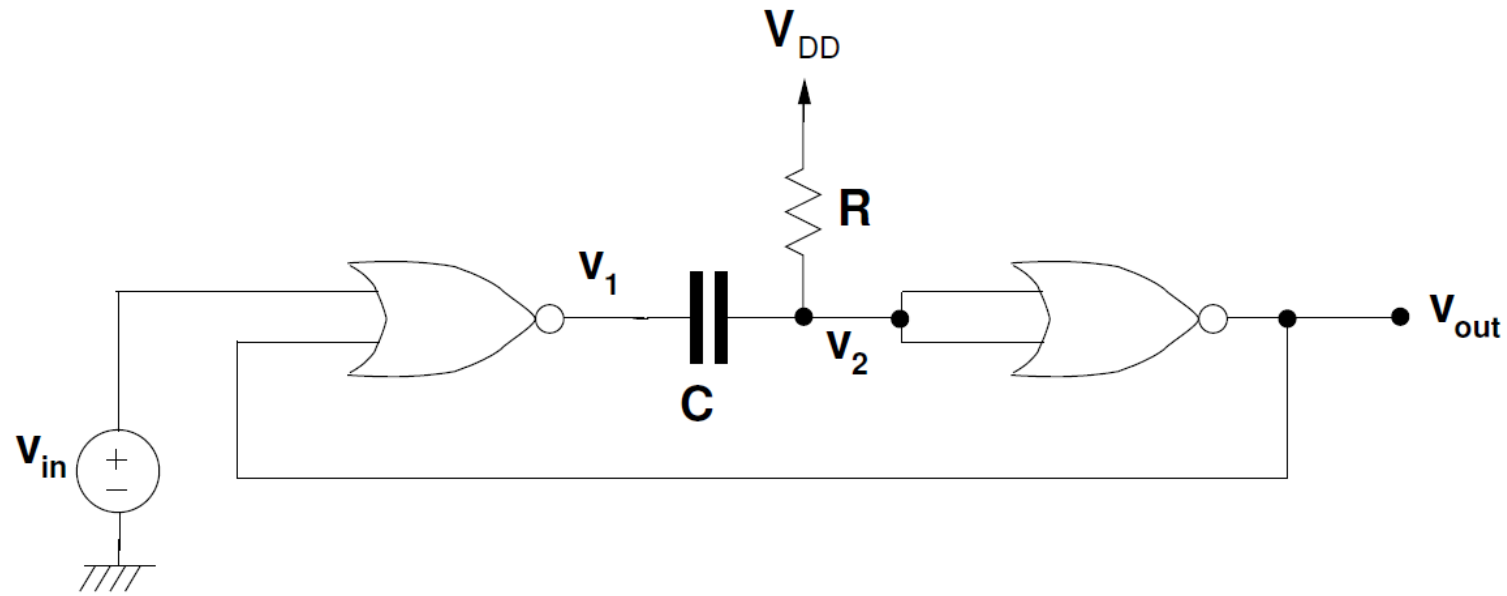
Circuito integrato NE555 – Circuito astabile



Multivibratore monostabile a porte logiche CMOS



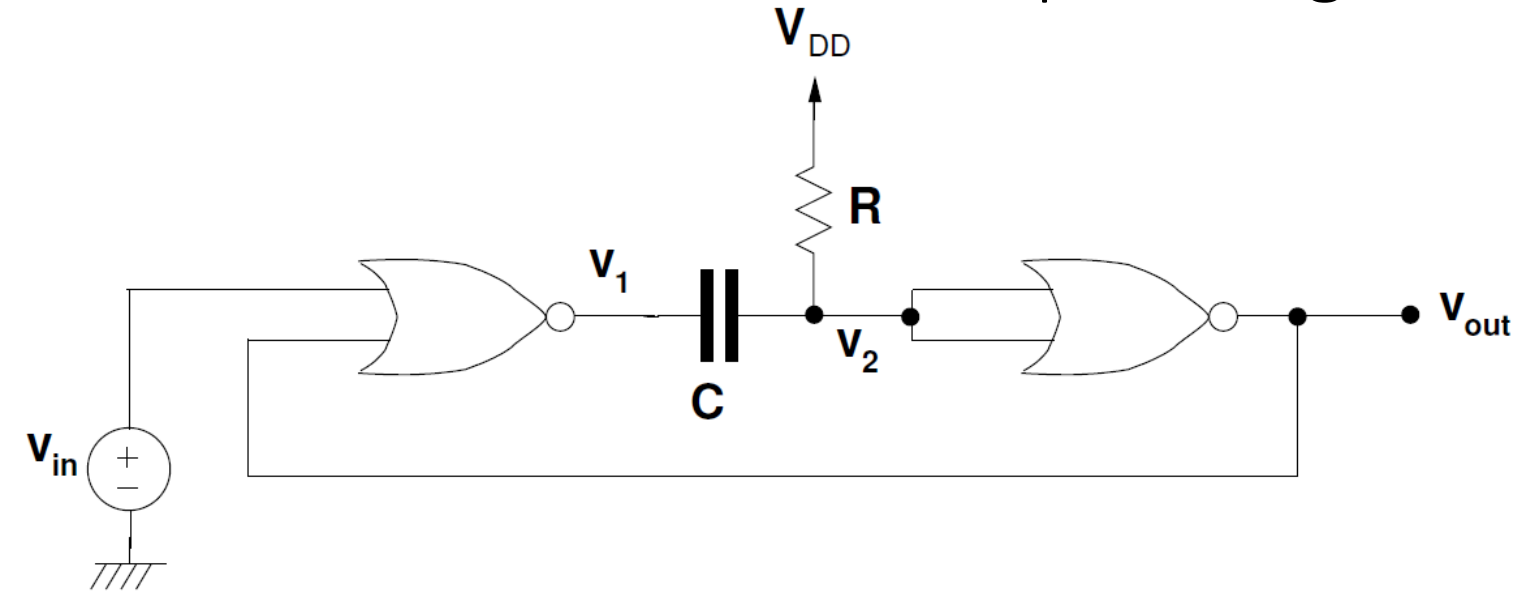
Multivibratore monostabile a porte logiche CMOS



STATO STABILE

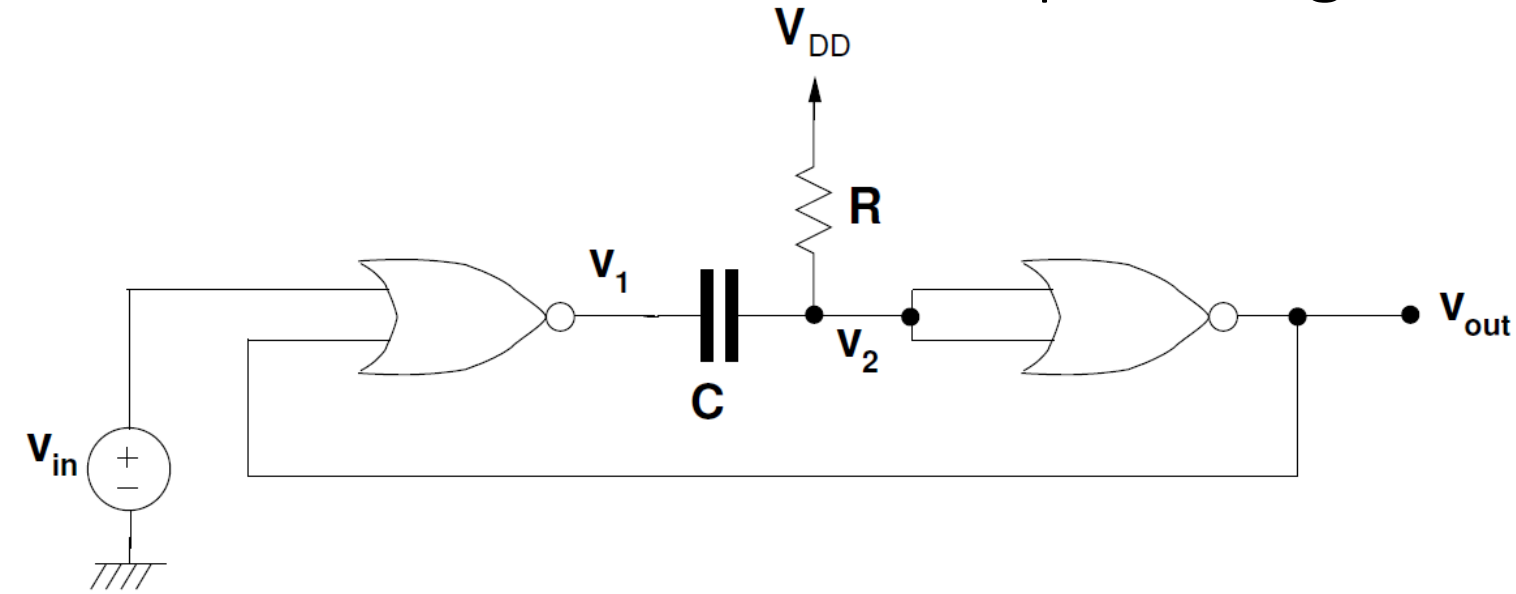
Multivibratore monostabile a porte logiche CMOS

STATO QUASI-STABILE



Multivibratore monostabile a porte logiche CMOS

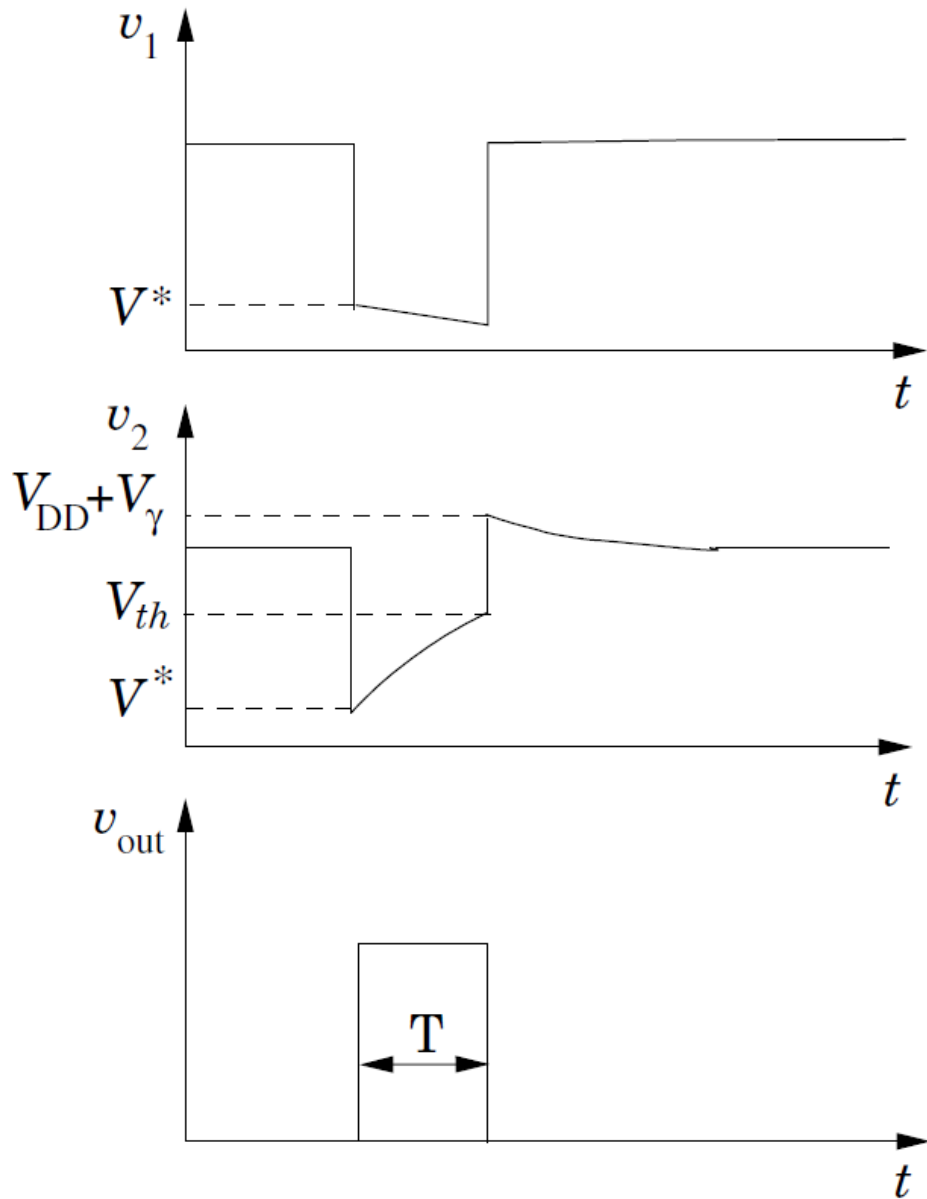
STATO QUASI-STABILE



Multivibratore monostabile a porte logiche CMOS

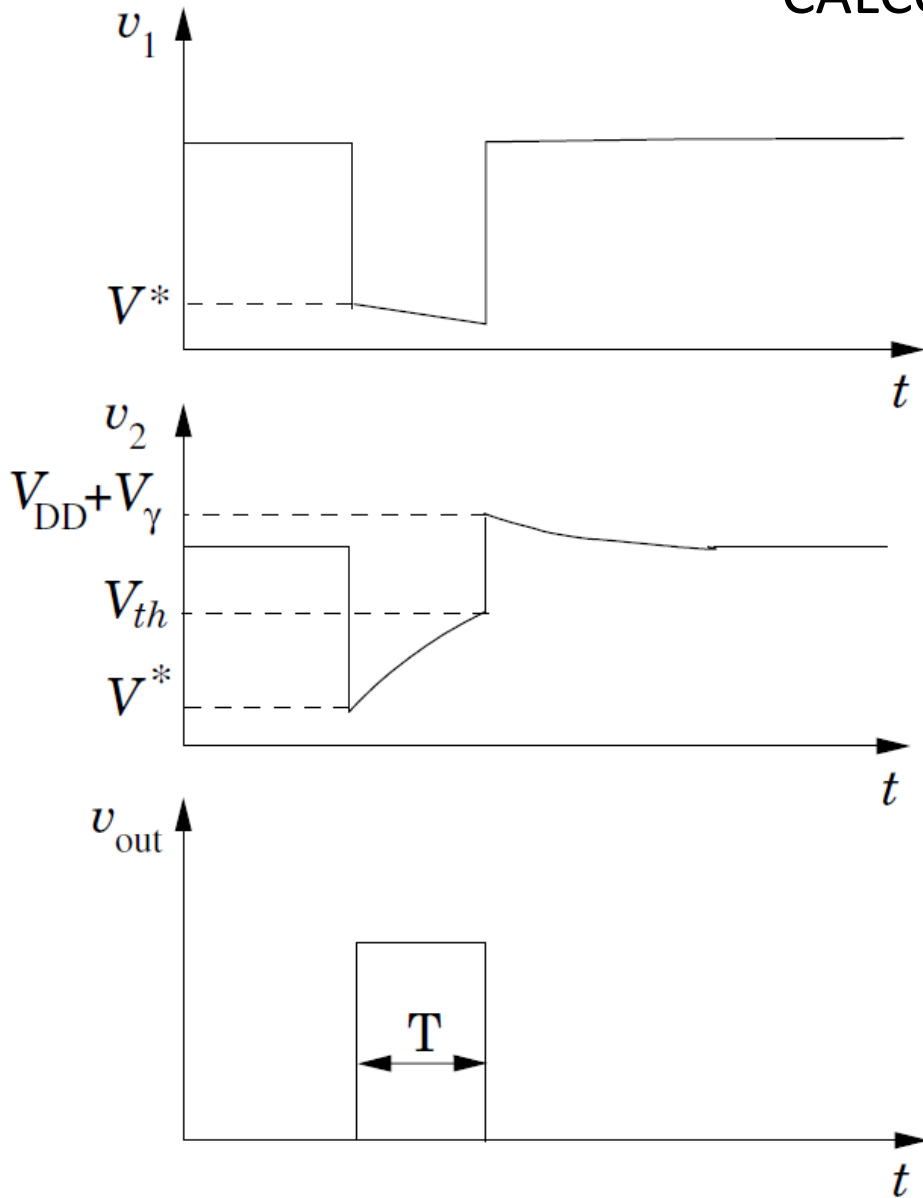
CALCOLO DI T

$$v(t) = V_f + (V_i - V_f) \exp\left(-\frac{t}{\tau}\right)$$



Multivibratore monostabile a porte logiche CMOS

CALCOLO DI T



$$T = \tau \ln \left(\frac{V_{DD}}{V_{DD} - V_{th}} \frac{R}{R + R_{on}} \right)$$

Formula per il calcolo della durata di un transitorio

$$v(t) = V_f + (V_i - V_f) \exp\left(-\frac{t}{\tau}\right)$$

$$v(t_1) = V_{com} = V_f + (V_i - V_f) \exp\left(-\frac{t_1}{\tau}\right)$$

$$\exp\left(-\frac{t_1}{\tau}\right) = \frac{V_{com} - V_f}{V_i - V_f}$$

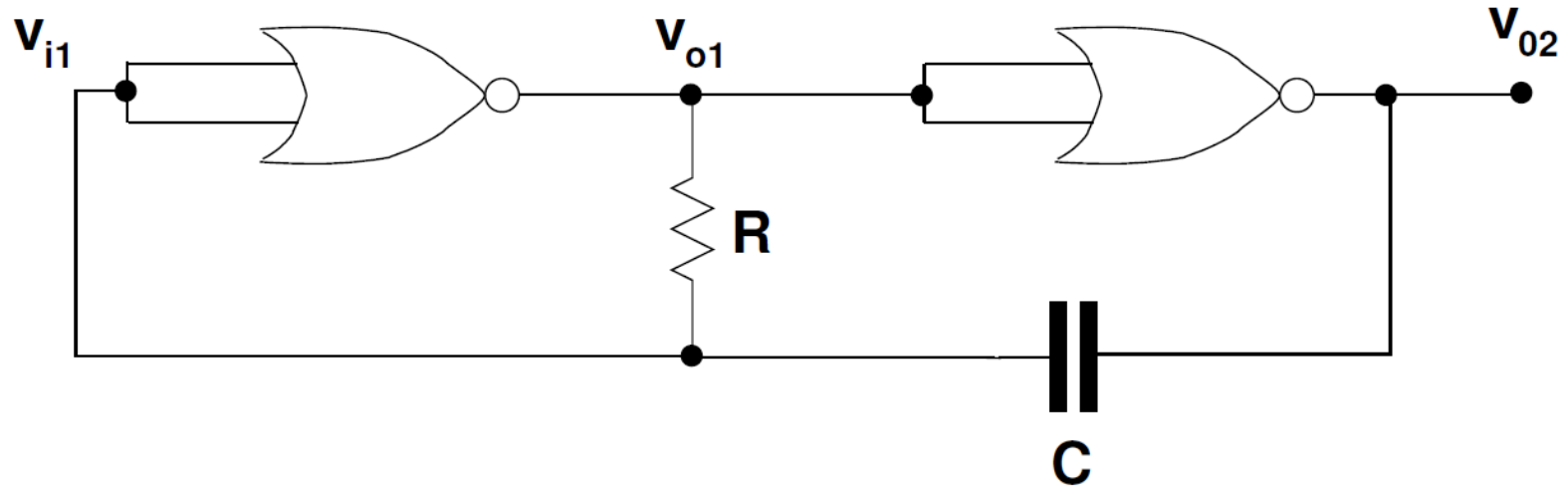
$$\exp\left(\frac{t_1}{\tau}\right) = \frac{V_i - V_f}{V_{com} - V_f}$$

$$\frac{t_1}{\tau} = \ln\left(\frac{V_i - V_f}{V_{com} - V_f}\right)$$

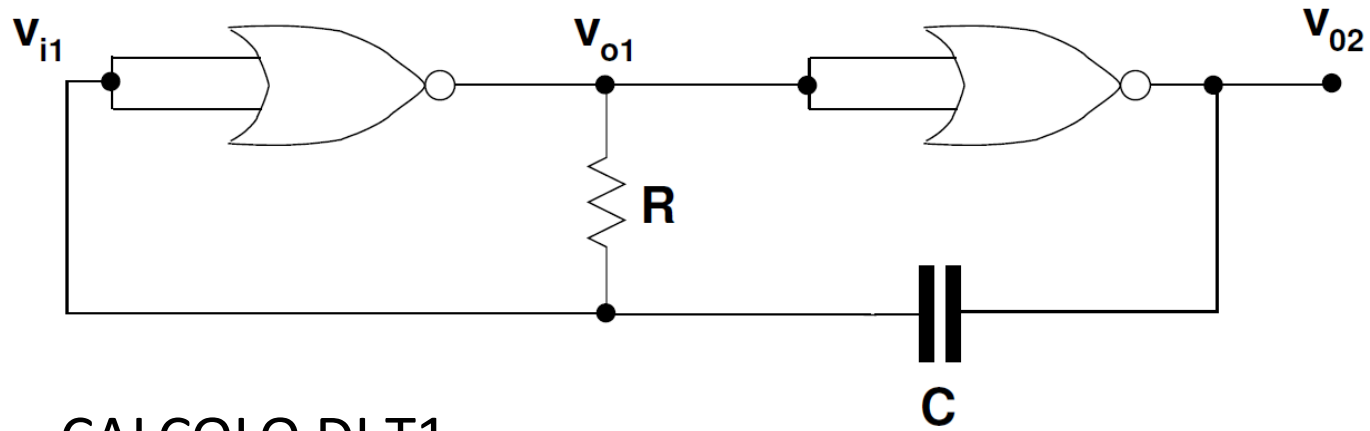


$$t_1 = \tau \ln\left(\frac{V_i - V_f}{V_{com} - V_f}\right)$$

Multivibratore astabile a porte logiche CMOS

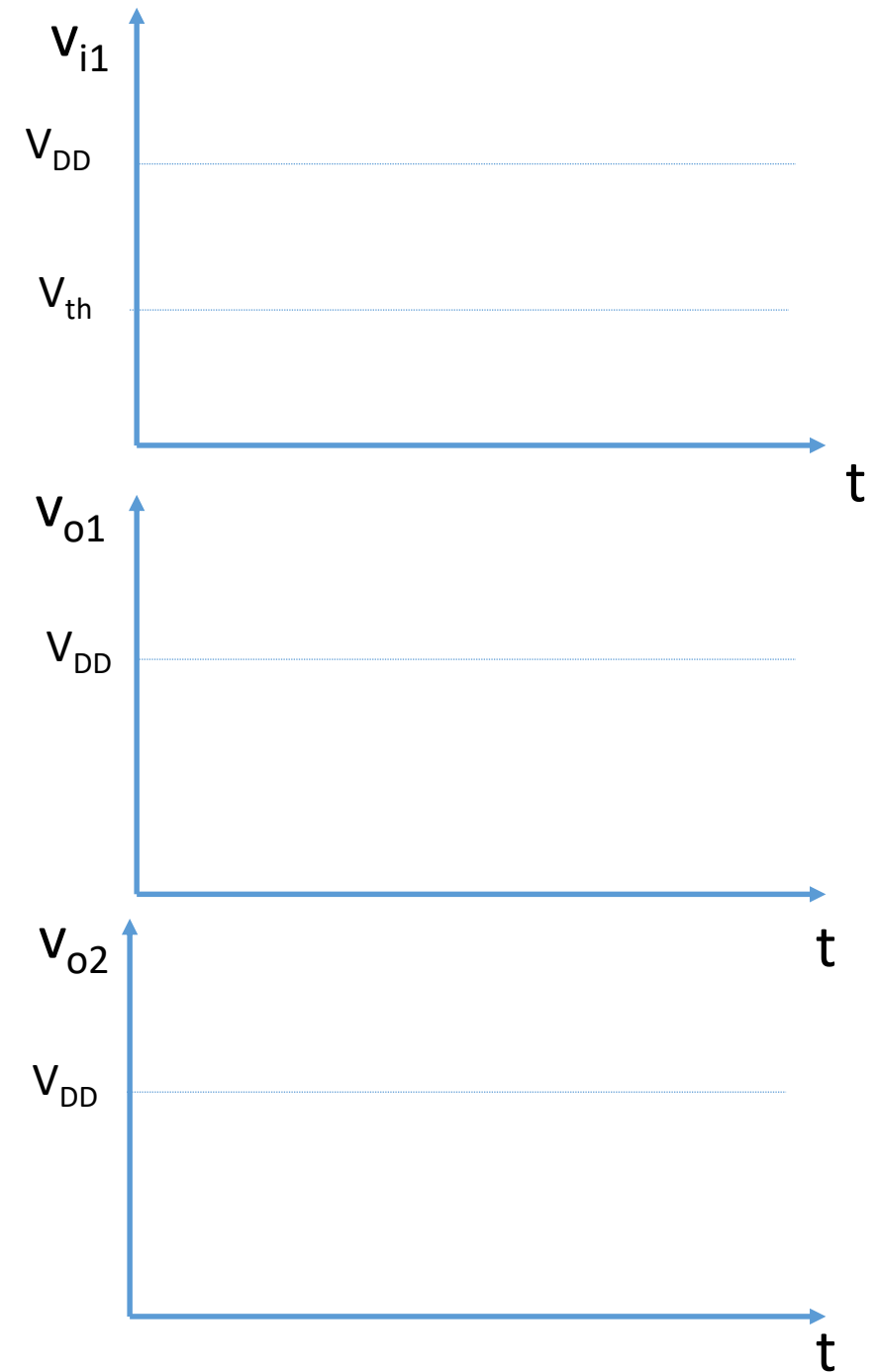


Multivibratore astabile a porte logiche CMOS

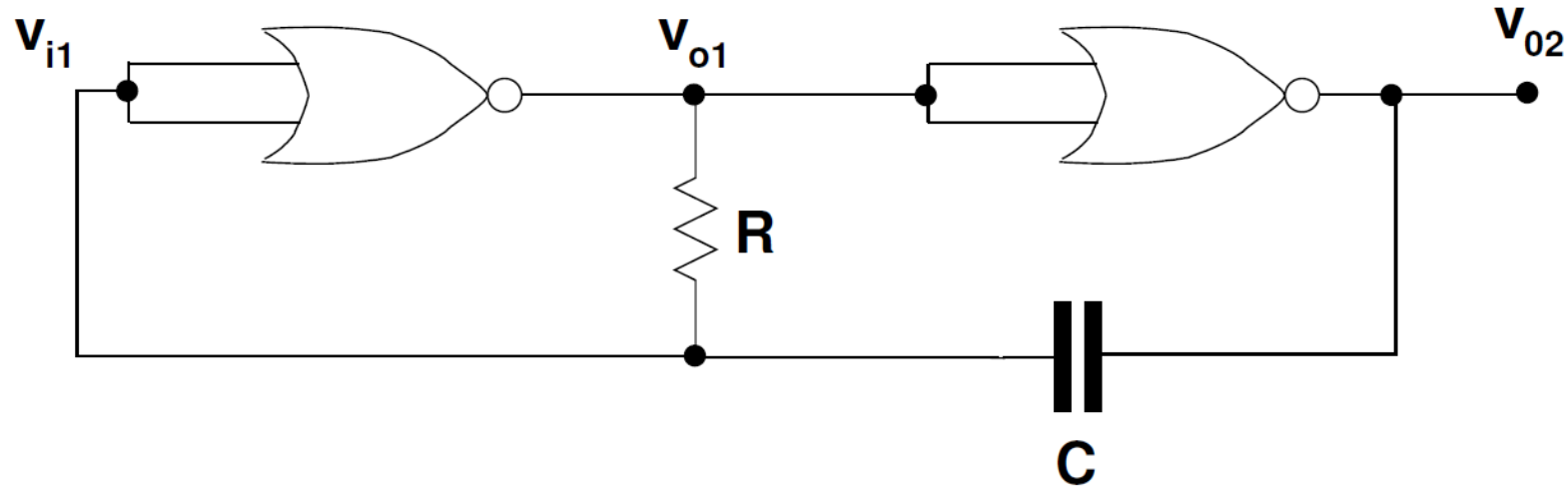


CALCOLO DI T1

$$T = \tau \ln \left(\frac{V_i - V_f}{V_{com} - V_f} \right)$$



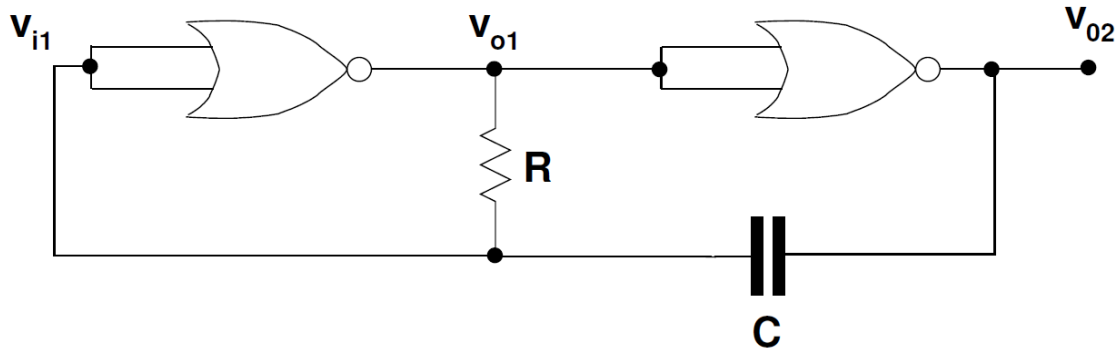
Multivibratore astabile a porte logiche CMOS



CALCOLO DI T2

$$T = \tau \ln \left(\frac{V_i - V_f}{V_{com} - V_f} \right)$$

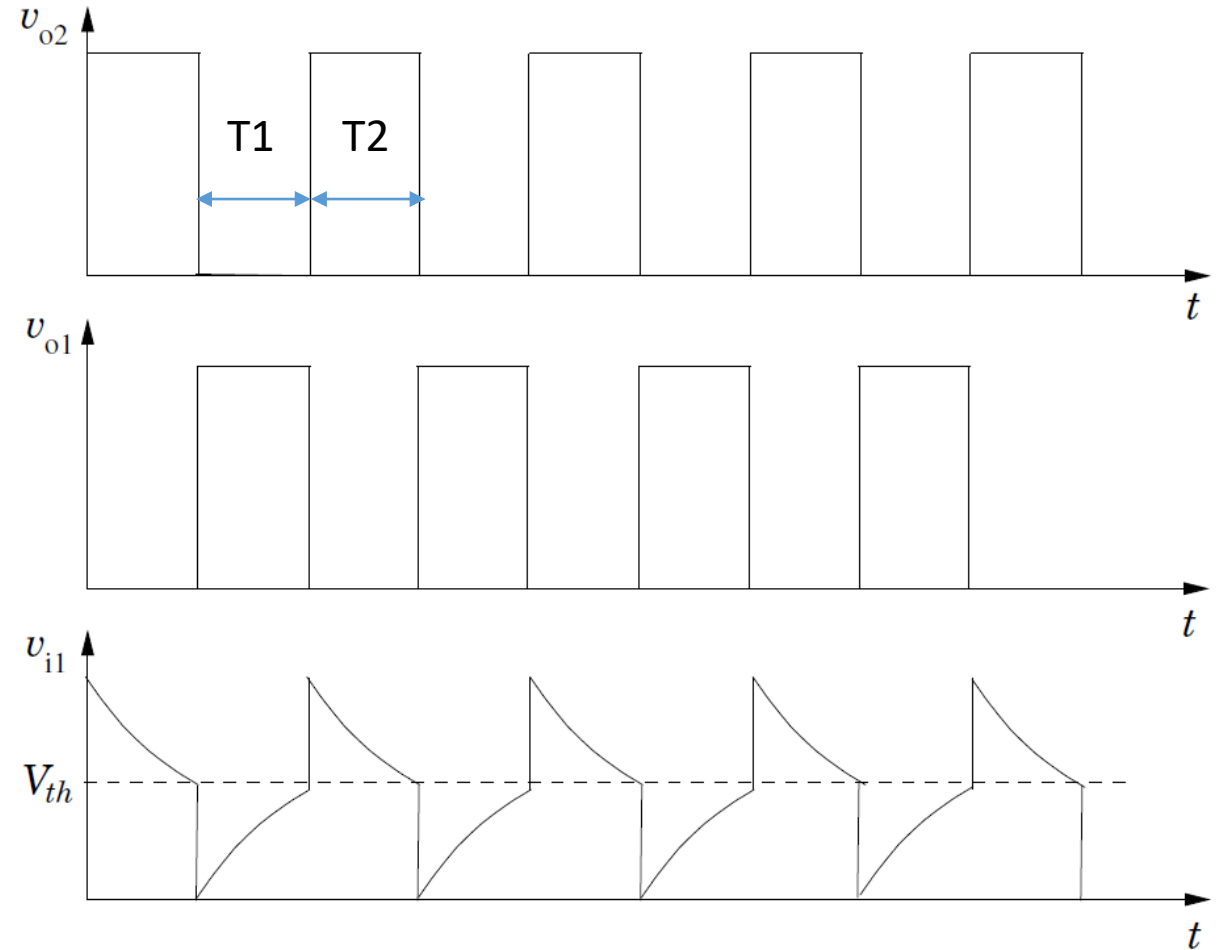
Multivibratore astabile a porte logiche CMOS



$$T_1 = RC \ln \left(\frac{V_{DD}}{V_{DD} - V_{th}} \right)$$

$$T_2 = RC \ln \left(\frac{V_{DD}}{V_{th}} \right)$$

$$T = RC \left[\ln \left(\frac{V_{DD}}{V_{DD} - V_{th}} \frac{V_{DD}}{V_{th}} \right) \right] = \left(\text{se } V_{th} = \frac{V_{DD}}{2} \right) = RC \ln(4)$$



Oscillatore ad anello

