

RC Circuit

τ = time constant, amount of time for q to reach 63.2% of εC

$$q_{\max} = \varepsilon C$$

$$i_{\max} = \frac{\varepsilon}{R}$$

$$\tau = RC$$

Equations

$$q = Q_0 e^{-t/\tau}$$

$$i = \frac{\varepsilon}{R} e^{-t/\tau}$$

$$i = -\frac{Q_0}{\tau} e^{-t/\tau}$$

$$i = I_0 e^{-t/\tau}$$

$$V = V_0 e^{-t/\tau}$$

Charging

$$q = \varepsilon C (1 - e^{-t/\tau})$$

Discharging

$$q = \varepsilon C e^{-t/\tau}$$