

Kondensatoren

$$E_{pot} = \frac{Q^2}{2C} = C \frac{U^2}{2}$$

Serienschaltung

$$C = E \cdot \frac{A}{d_1 + d_2} = \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

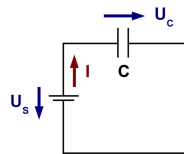
$$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} \implies C = \left(\frac{1}{C_1} + \frac{1}{C_2} \right)^{-1}$$

Parallelschaltung

$$C = E \cdot \frac{A_1 + A_2}{d} = C_1 + C_2$$

$$C = C_1 + C_2$$

Wechselspannung



$$U_S(t) = U_S \cos(\omega t) \text{ (Wechselspannungsquelle)}$$

$$U_c(t) = U_S e^{i\omega t} = U_S \cos(\omega t)$$

$$Q(t) = C U_S e^{i\omega t} = C U_S \cos(\omega t)$$

$$I(t) = i\omega C U_S e^{i\omega t} = -\omega C U_S \sin(\omega t)$$

$$\frac{U_c(t)}{I(t)} = \frac{1}{i\omega C} \Rightarrow Z = \frac{1}{i\omega C}$$