

Physical Quantity	Symbol	Units	Definition
Charge	Q	Coulomb (C)	$1\text{C} = 6.241 \times 10^{18}$ electrons
Current	I	Ampere (A)	$1\text{A} = 1\text{C} / \text{sec}$
Resistance	R	Ohm (Ω)	$1\Omega = 1\text{V}/1\text{A}$
Voltage	V	Volt (V)	$1\text{V} = 1\text{A} \times 1\Omega$
Power	P	Watt (W)	$1\text{W} = 1\text{V} \times 1\text{A}$
Energy	E	Joule (J)	$1\text{J} = 1\text{W} \times 1\text{sec}$
Capacitance	C	Farad (F)	$1\text{F} = (1\text{A} \times 1\text{sec}) / 1\text{V}$
Inductance	L	Henry (H)	$1\text{H} = (1\text{V} \times 1\text{sec}) / 1\text{A}$

Ohm's Law $I = \frac{V}{R}$ $V = IR$

Kirchhoff's Current Law (KCL) $\sum_{\text{node}} I = 0$

Kirchhoff's Voltage Law (KVL) $\sum_{\text{loop}} V = 0$

Resistance $R = \rho \frac{l}{A}$ $P = \frac{V^2}{R}$ $P = I^2 R$
 $\rho = \text{resistivity}$ $A = \text{cross sectional area}$ $l = \text{length}$

Capcitanace

$Q = CV$ $C = \epsilon \frac{A}{d}$ $\epsilon = k\epsilon_0$

$I = C \frac{dV}{dt}$ $V = \frac{1}{C} \int I dt$ $E = \frac{1}{2} CV^2$

$\epsilon = \text{permittivity}$, $\epsilon_0 = \text{permittivity of free space}$, $k = \text{dielectric constant}$
 $A = \text{area of plates}$, $d = \text{distance between plates}$

Inductance

$L_{\text{solenoid}} = \mu \frac{N^2 A}{\ell}$

$V = L \frac{dI}{dt}$ $I = \frac{1}{L} \int V dt$ $E = \frac{1}{2} L I^2$

$\mu = \text{permeability}$, $\mu_0 = \text{permeability of free space}$,
 $N = \text{number of turns}$, $A = \text{area within solenoid}$, $\ell = \text{length of solenoid}$

Series $R_S = R_1 + R_2$ $C_S = \frac{C_1 C_2}{C_1 + C_2}$ $L_S = L_1 + L_2$

Parallel $R_P = \frac{R_1 R_2}{R_1 + R_2}$ $C_P = C_1 + C_2$ $L_P = \frac{L_1 L_2}{L_1 + L_2}$