

Capacitors

Capacitors have two wires sticking out of them and have two conductive plates separated by some distance. One plate has charge q and the other has charge $-q$. A capacitor stores energy in an electric field. Capacitors are characterized by the equation

$$q = C v$$

capacitance
voltage across capacitor

Taking the time-derivative, we obtain the elemental equation

$$i = C \frac{dv}{dt}$$

This equation relates the voltage across a capacitor to the current through it. This is typically the relation we are interested to know.

Inductors

Inductors have two wires sticking out of them that connect to a coil of wire that stores energy in a magnetic field. Their elemental equation is

$$v = L \frac{di}{dt}$$

inductance

This equation relates the voltage across an inductor to the current through it. This is typically the relation we are interested to know.