Circuits, Spring 2014 Notes

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Contents

Chapter 1

LRC

1.1 Inductors

Current can not change instantaneously.

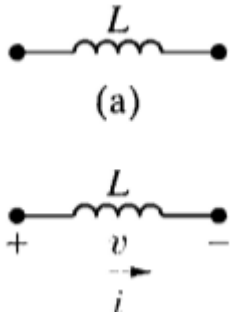

Figure 1.1: Inductor Sign Conventions

$$v = L\frac{di}{dt}$$
$$it = \frac{1}{L}\int_0^t vdt + i(t_0)$$

Power in an inductor:

$$p = Li\frac{di}{dt}$$

Energy in an inductor:

$$w = \frac{1}{2}Li^2$$

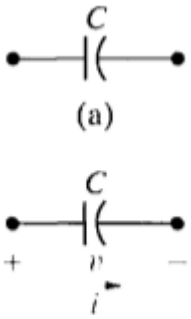

Figure 1.2: Capacitor Sign Conventions

1.2 Capacitors

Voltage can not change instantaneously.

$$i = C\frac{dv}{dt}$$
$$v(t) = \frac{1}{C}\int_{t_0}^{t} idt + v(t_0)$$
$$p = Cv\frac{dv}{dt}$$
$$w = \frac{1}{2}Cv^2$$