complex signal

=

component
frequencies

low-pass
filter

in   out

high-pass
filter

in   out

band-pass
filter

in   out

notch
filter

in   out

passed   blocked

attenuation

frequency

blocked   passed
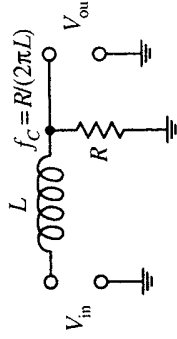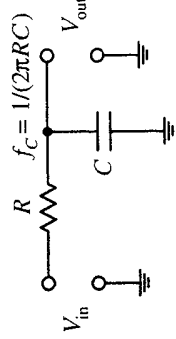
attenuation

frequency

band

attenuation
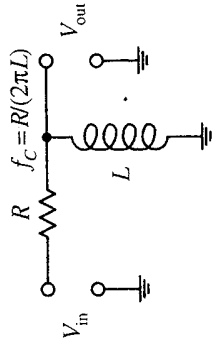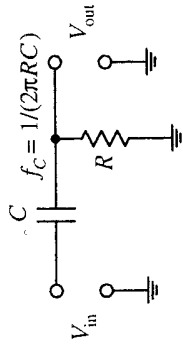
frequency

notch

attenuation

frequency

FIGURE 8.1

Low-pass filters

High-pass filters
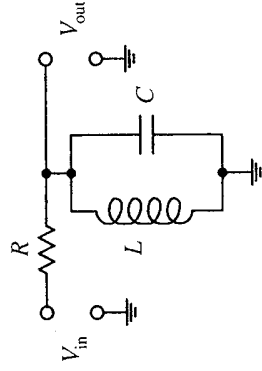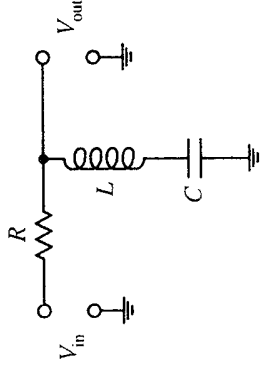
Bandpass filter

Notch filters

V_{in} R $f_c = 1/(2\pi RC)$ C V_{out}

V_{in} L $f_c = R/(2\pi L)$ R V_{out}

V_{in} C $f_c = 1/(2\pi RC)$ R V_{out}

V_{in} R $f_c = R/(2\pi L)$ L V_{out}

V_{in} R L C V_{out} $f_0 = \dfrac{1}{2\pi\sqrt{LC}}$

V_{in} R L C V_{out} $f_0 = \dfrac{1}{2\pi\sqrt{LC}}$

FIGURE 8.3

Low-pass

High-pass

Bandpass

Notch

attenuation −3 dB passband stop band frequency f_C f_S

attenuation −3 dB stop band passband f_S f_C

attenuation −3 dB passband B.W. stopband B.W. f_1 f_0 f_2

attenuation −3 dB passband B.W. stopband B.W. f_1 f_0 f_2

FIGURE 8.2