

RC Lowpass

$$H(s) = \frac{\frac{1}{s \cdot C}}{R + \frac{1}{s \cdot C}} = \frac{1}{R \cdot C \cdot s + 1} = \frac{\frac{1}{R \cdot C}}{s + \frac{1}{R \cdot C}}$$

$$s = 2 \cdot \pi \cdot F \cdot j$$

$$H(F) = \frac{\frac{1}{R \cdot C}}{2 \cdot \pi \cdot F \cdot j + \frac{1}{R \cdot C}}$$

Magnitude

$$|H(F)| = \frac{\frac{1}{R \cdot C}}{\sqrt{(2 \cdot \pi \cdot F)^2 + \frac{1}{(R \cdot C)^2}}}$$

RC Highpass

$$H(s) = \frac{R}{R + \frac{1}{s \cdot C}} = \frac{C \cdot R \cdot s}{R \cdot C \cdot s + 1} = \frac{s}{s + \frac{1}{R \cdot C}}$$

$$s = 2 \cdot \pi \cdot F \cdot j$$

$$H(F) = \frac{2 \cdot \pi \cdot F \cdot j}{2 \cdot \pi \cdot F \cdot j + \frac{1}{R \cdot C}}$$

Magnitude

$$|H(F)| = \frac{2 \cdot \pi \cdot F}{\sqrt{(2 \cdot \pi \cdot F)^2 + \frac{1}{(R \cdot C)^2}}}$$

RL Lowpass

$$H(s) = \frac{R}{R + s \cdot L} = \frac{\frac{R}{L}}{s + \frac{R}{L}}$$

$$s = 2 \cdot \pi \cdot F \cdot j$$

$$H(F) = \frac{\frac{R}{L}}{2 \cdot \pi \cdot F \cdot j + \frac{R}{L}}$$

Magnitude

$$|H(F)| = \frac{\frac{R}{L}}{\sqrt{(2 \cdot \pi \cdot F)^2 + \left(\frac{R}{L}\right)^2}}$$

RL Highpass

$$H(s) = \frac{s \cdot L}{R + s \cdot L} = \frac{s}{s + \frac{R}{L}}$$

$$s = 2 \cdot \pi \cdot F \cdot j$$

$$H(F) = \frac{2 \cdot \pi \cdot F \cdot j}{2 \cdot \pi \cdot F \cdot j + \frac{R}{L}}$$

Magnitude

$$|H(F)| = \frac{2 \cdot \pi \cdot F}{\sqrt{(2 \cdot \pi \cdot F)^2 + \left(\frac{R}{L}\right)^2}}$$