

Med 3 RC-led

$$Gain_{dB} := 8 \cdot 2.62 = 20.96$$

$$R_i := 10 \text{ k}\Omega$$

$$f_{High} := 1000 \text{ Hz}$$

$$f_{Low} := 20 \text{ Hz}$$

Solve these values

$$G_0 := 1$$
$$20 \cdot \log(G_0) = Gain_{dB}$$

$$G_0 := \text{Find}(G_0) = 11.1686$$

$$G_0 = 11.169$$

$$R_f := R_i \cdot G_0 = 111.686 \text{ k}\Omega$$

$$G_{0.6} := Gain_{dB} \cdot \frac{2}{3} = 13.973$$

$$G_{0.3} := Gain_{dB} \cdot \frac{1}{3} = 6.987$$

Solve these values

$$G_1 := 1$$
$$20 \cdot \log(G_1) = G_{0.6}$$

$$G_1 := \text{Find}(G_1) = 4.9965$$

$$G_1 := 10^{\frac{G_{0.6}}{20}} = 4.9965$$

$$G_1 = 4.9965$$

Solve these values

$$G_2 := 1$$
$$20 \cdot \log(G_2) = G_{0.3}$$

$$G_2 := \text{Find}(G_2) = 2.2353$$

$$G_2 := 10^{\frac{G_{0.3}}{20}} = 2.2353$$

$$G_2 = 2.2353$$

Solve these values

$$G_3 := 1$$
$$20 \cdot \log(G_3) = 0$$

$$G_3 := \text{Find}(G_3) = 1$$

$$G_3 := 10^{\frac{0}{20}} = 1$$

$$G_3 = 1$$

$$R_{f'} := G_1 \cdot R_i = 49.965 \text{ k}\Omega$$

$$R_{f''} := G_2 \cdot R_i = 22.353 \text{ k}\Omega$$

$$R_{f'''} := G_3 \cdot R_i = 10 \text{ k}\Omega$$

$$R_1 := \frac{R_f \cdot R_{f'}}{R_f - R_{f'}} = 90.413 \text{ k}\Omega$$

$$R2 := \frac{Rf' \cdot Rf''}{Rf' - Rf''} = 40.448 \text{ } \mathbf{k\Omega}$$

$$R3 := \frac{Rf'' \cdot Rf'''}{Rf'' - Rf'''} = 18.095 \text{ } \mathbf{k\Omega}$$

$$Rf' := \frac{R1 \cdot Rf}{R1 + Rf} = 49.965 \text{ } \mathbf{k\Omega}$$

$$Rf'' := \frac{R2 \cdot Rf'}{R2 + Rf'} = 22.353 \text{ } \mathbf{k\Omega}$$

$$Rf''' := \frac{R3 \cdot Rf''}{R3 + Rf''} = 10 \text{ } \mathbf{k\Omega}$$

$$R1 = 90.413 \text{ } \mathbf{k\Omega} \quad Rf = 111.686 \text{ } \mathbf{k\Omega}$$

$$R2 = 40.448 \text{ } \mathbf{k\Omega}$$

$$R3 = 18.095 \text{ } \mathbf{k\Omega}$$

$$fHigh := 1000 \text{ } \mathbf{Hz} \quad fLow := 55 \text{ } \mathbf{Hz}$$

$$f\_logstep := \frac{1}{3} \log \left( \frac{fHigh}{fLow} \right) = 0.42$$

$$p1 := fLow = 55 \text{ } \mathbf{Hz}$$

$$p2 := p1 \cdot 10^{1 \cdot f\_logstep} = 144.624 \text{ } \mathbf{Hz}$$

$$p3 := p1 \cdot 10^{2 \cdot f\_logstep} = 380.295 \text{ } \mathbf{Hz}$$

$$p4 := p1 \cdot 10^{3 \cdot f\_logstep} = 1000 \text{ } \mathbf{Hz}$$

$$C1 := \frac{1}{(R1 + Rf) \cdot 2 \cdot \pi \cdot p1} = 14.318 \text{ } \mathbf{nF}$$

$$C2 := \frac{1}{(R2 + Rf') \cdot 2 \cdot \pi \cdot p2} = 12.172 \text{ } \mathbf{nF}$$

$$C3 := \frac{1}{(R3 + Rf'') \cdot 2 \cdot \pi \cdot p3} = 10.347 \text{ } \mathbf{nF}$$