

$$\omega_{C1} := 2 \cdot \pi \cdot 50 \cdot 10^3 \quad \text{Lowest frequency allowed}$$

$$\omega_{C2} := 2 \cdot \pi \cdot 500 \cdot 10^3 \quad \text{Highest frequency allowed}$$

$$T(s) = \left(\frac{s}{s + \omega_{C1}} \right) \cdot (K_G) \cdot \left(\frac{\omega_{C2}}{s + \omega_{C2}} \right)$$

$$T(s) = \left(\frac{s}{s + \frac{1}{R_1 \cdot C_1}} \right) \cdot \left(\frac{R_3 + R_2}{R_2} \right) \cdot \left(\frac{\frac{1}{R_4 \cdot C_2}}{s + \frac{1}{R_4 \cdot C_2}} \right)$$

High Pass Filter:

deciding "random" capacitor to find resistor:

$$C_1 := 1 \cdot 10^{-9}$$

$$\frac{1}{R_1 \cdot C_1} = \omega_{C1} \text{ solve, } R_1 \rightarrow \frac{10000}{\pi} = 3.183 \times 10^3$$

Low Pass Filter:

deciding "random" capacitor to find resistor:

$$C_2 := 180 \cdot 10^{-12}$$

$$\left(\frac{\omega_{C2}}{s + \omega_{C2}} \right) = \left(\frac{\frac{1}{R_4 \cdot C_2}}{s + \frac{1}{R_4 \cdot C_2}} \right)$$

$$\frac{1}{R_4 \cdot C_2} = \omega_{C2} \text{ solve, } R_4 \rightarrow \frac{50000}{9 \cdot \pi} = 1.768 \times 10^3$$