

1 Filters

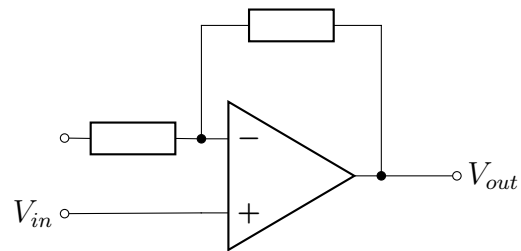


Figure 1: Non inverting op amp

$$\begin{aligned}
 V_- &= \frac{R_1}{R_1 + R_2} V_{out} \\
 V_- &= V_+ = V_{in} \\
 V_{out} &= V_{in} \frac{R_1 + R_2}{R_1} V_{out} = \left(1 + \frac{R_2}{R_1} \right) V_{in}
 \end{aligned} \tag{1}$$

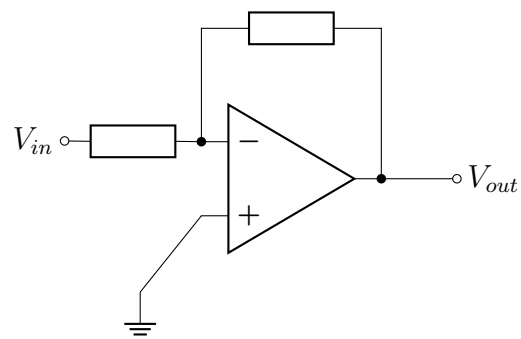


Figure 2: Inverting op amp

$$\begin{aligned}
 V_- &= V_+ = 0V \\
 i_{in} &= \frac{V_{in}}{R_1}; \quad i_f = -\frac{V_{out}}{R_2} \\
 V_{out} &= -\frac{R_2}{R_1} V_{in}
 \end{aligned} \tag{2}$$

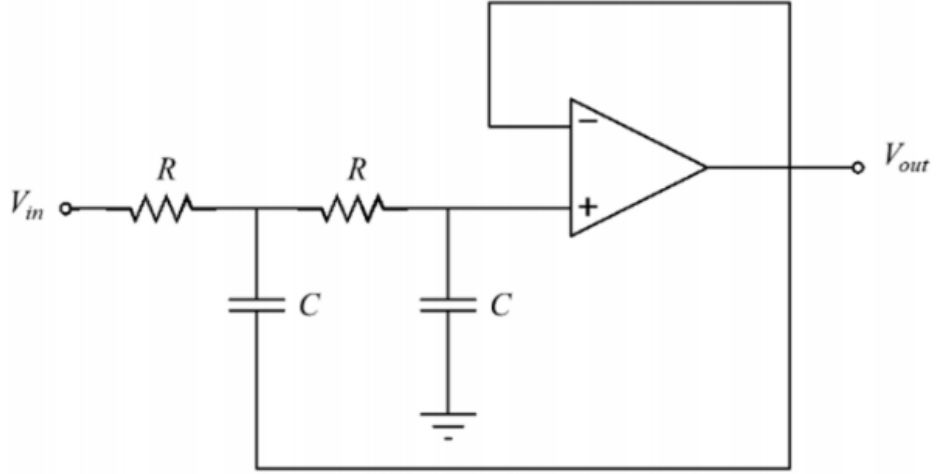


Figure 3: Sallen-key low pass

$$f_c = \frac{1}{2\pi\sqrt{R_1 R_2 C_1 C_2}} \quad (3)$$

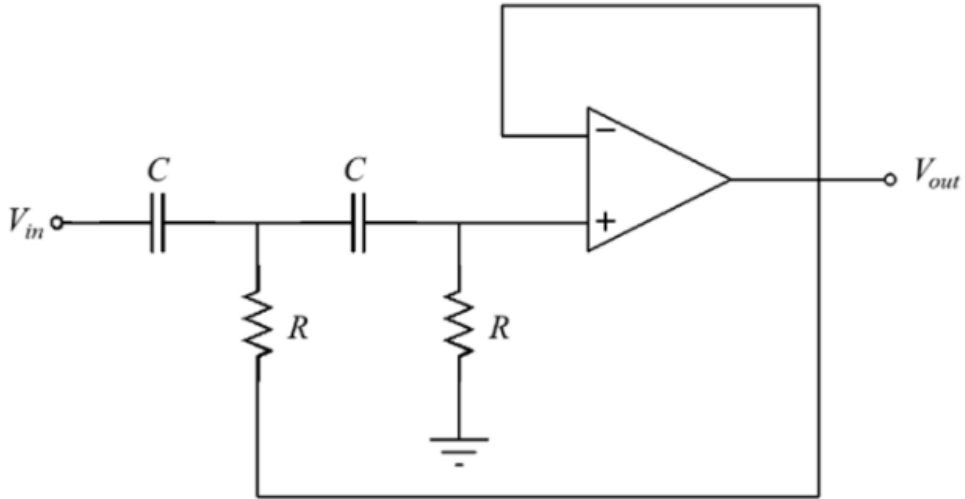


Figure 4: Sallen-key high pass

$$f_c = \frac{1}{2\pi\sqrt{R_1 R_2 C_1 C_2}} \quad (4)$$

2 Methods and Results

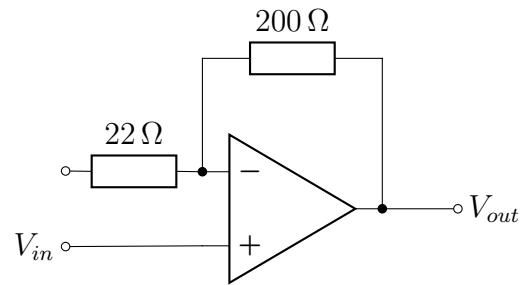


Figure 5: Non inverting op amp