
```
close all; clear; clc;
```

```
R = 330; %Ohm
C1 = 1*10^-6; %F
C2 = 1*10^-7; %F
```

```
[f0,Q] = SallenKey(R,C1,C2);
```

Function

```
function [f0,Q] = SallenKey(R,C1,C2)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% This function takes in capacitor and resistor values for a Sallen-Key
% filter and determines cutoff frequency and Q value.

% Inputs:
% R - The value of the resistor in Ohms
% C1 - The capacitance of the feedback capacitor in Farads
% C2 - The capacitance of the ground capacitor in Farads

% Outputs:
% Q - Magnification factor of the filter (unitless)
% f0 - Cutoff frequency of the filter in Hz

% This function also generates a plot that shows the cutoff and gain of the
% filter for several different input frequencies ranging from DC to 60kHz
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

    % Calculating the Magnification factor
    Q = 1/2*sqrt(C1/C2);

    %Calculating frequency and angular velocity for cutoff
    omega0 = 1/(R*sqrt(C1*C2)); %rad/s
    f0 = omega0/(2*pi); %hz

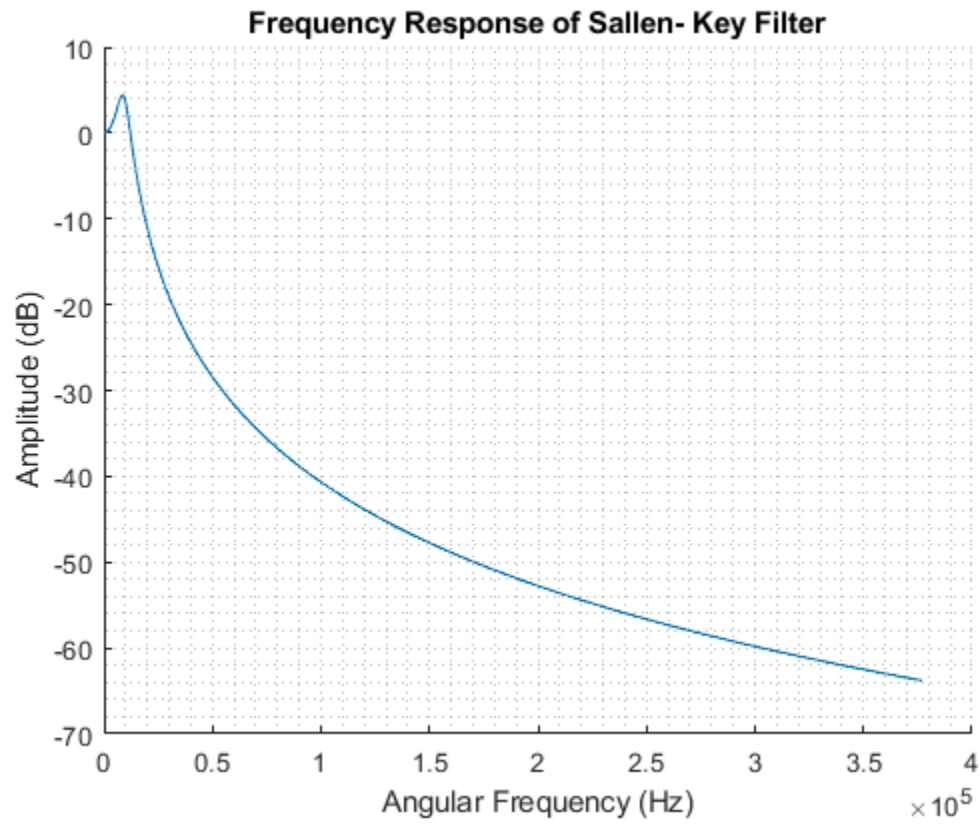
    % Setting a vector of frequencies to find gain
    f = 0:1:60000; %Hz
    omega = f*2*pi; % rad/s

    % Calculating Vout/Vin
    vRatio = omega0^2./sqrt((omega0^2-omega.^2).^2+(omega0^2*omega.^2)./Q^2);

    vRatiodB = 20*log10(vRatio);

    figure()
    hold on;
    semilogx(omega,vRatiodB,"Linewidth",1)
    % set('gca','xscale','log')
    % plot(omega,vRatiodB,'Linewidth',1)
    grid minor;
    xlabel('Angular Frequency (Hz)')
    ylabel('Amplitude (dB)')
```

```
title('Frequency Response of Sallen- Key Filter');  
end
```



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