

Title of the Experiment:

Analysis of Low Pass Filter using eSim.

Theory:

A low-pass filter is a filter that passes signals with a frequency lower than a certain cutoff frequency and attenuates signals with frequencies higher than the cutoff frequency. The amount of attenuation for each frequency depends on the filter design.

A simple passive RC Low Pass Filter or LPF, can be easily made by connecting together in series a single Resistor with a single Capacitor as shown below. In this type of filter arrangement the input signal (V_{in}) is applied to the series combination (both the Resistor and Capacitor together) but the output signal (V_{out}) is taken across the capacitor only.

Schematic Diagram:

The circuit schematic of Low pass filter register in eSim is as shown below:

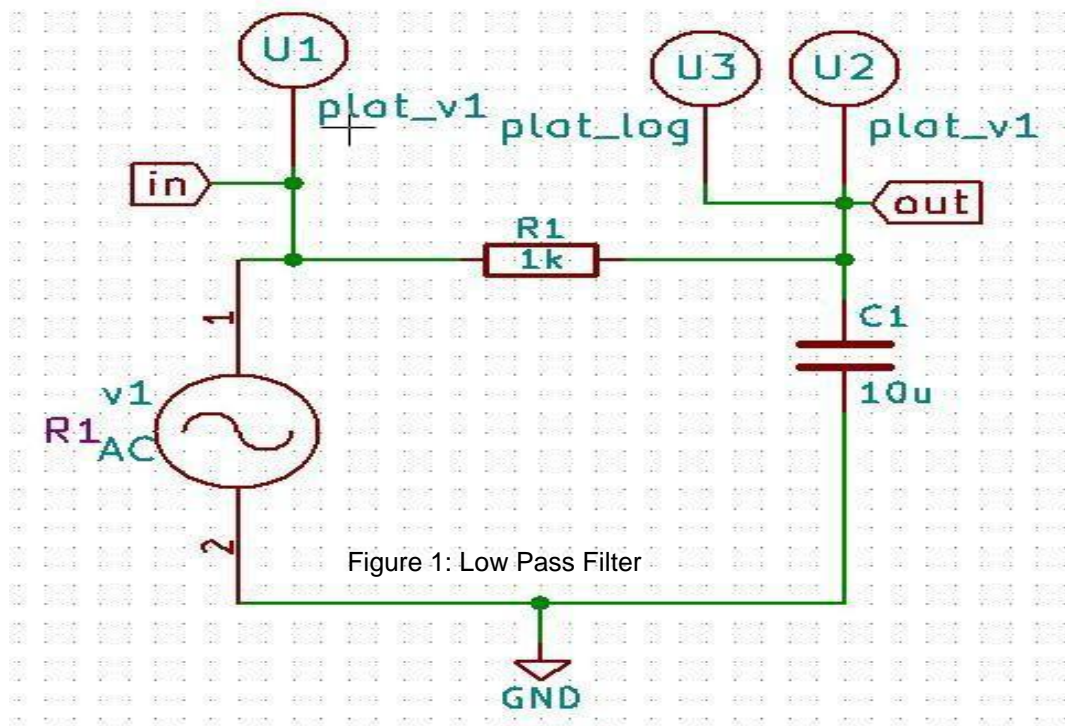


Fig 1. Low pass filter circuit

Simulation Results:

1. Python plot:

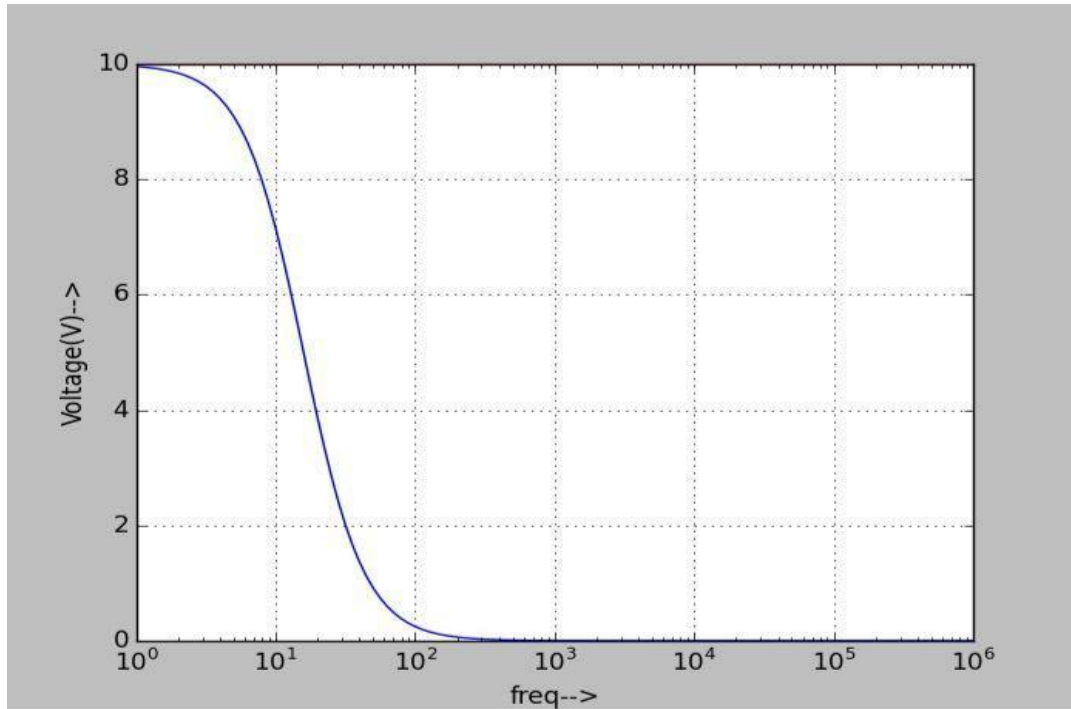


Figure 2: Python Plot

2. Ngspice plots:

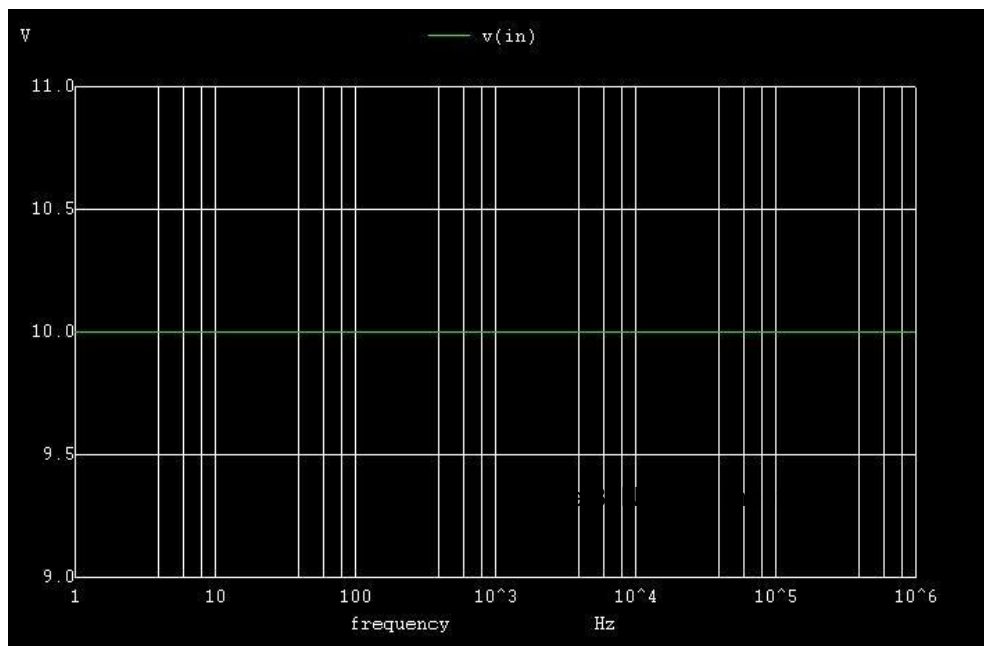


Fig 3. ngspice input plot(Vin)

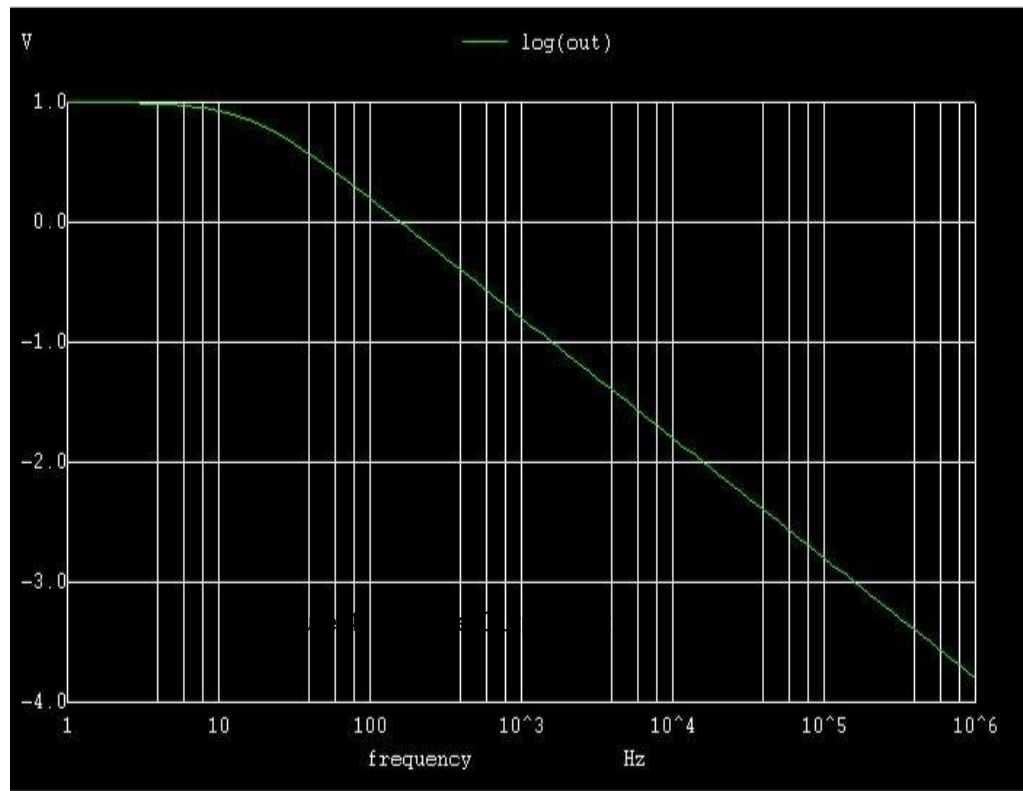


Fig 4. ngspice output plot(Vout)

Reference:

[1] http://www.electronics-tutorials.ws/filter/filter_2.html referred on 14/03/2017.