

DESIGN OF SECOND ORDER LOWPASS FILTER CIRCUIT USING OP-AMP

A.MATHIYAZHAGAN

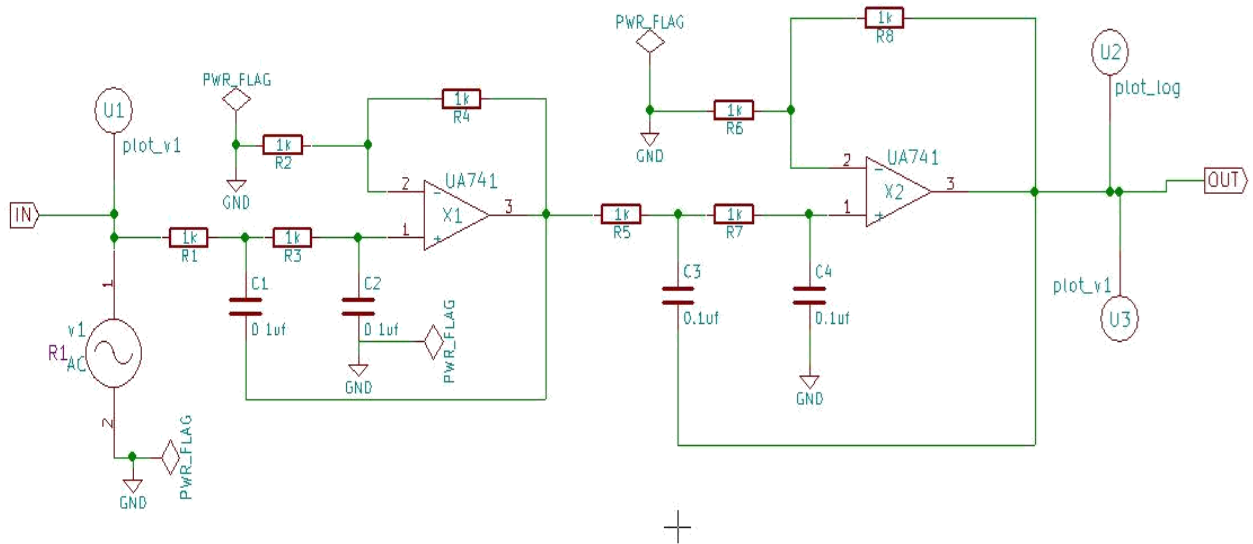
Department of Electronics and Communication Engineering

Dr. Mahalingam College Of Engineering and
Technology, Pollachi

INTRODUCTION:

The most common and easily understood active filter is the **Active Low Pass Filter**. Its principle of operation and frequency response is exactly the same as those for the previously seen passive filter, the only difference this time is that it uses an op-amp for amplification and gain control. This first-order low pass active filter, consists simply of a passive RC filter stage providing a low frequency path to the input of a non-inverting operational amplifier. The frequency response of the circuit will be the same as that for the passive RC filter, except that the amplitude of the output is increased by the pass band gain, A_F of the amplifier.

RTL Schematic using esim Software:



ANALYSIS:

Three types of response

AC

DC

Transient

Transient analysis is generated to see the response of the clamper to generate the output.

Design parameters:

$$= \frac{1}{(2\pi \cdot RC)\text{Hz}}$$

Value of capacitor is $C1=C2=0.1\mu\text{F}$.

Value of resistor is $R1=R2=R3=R4=1\text{k}$.

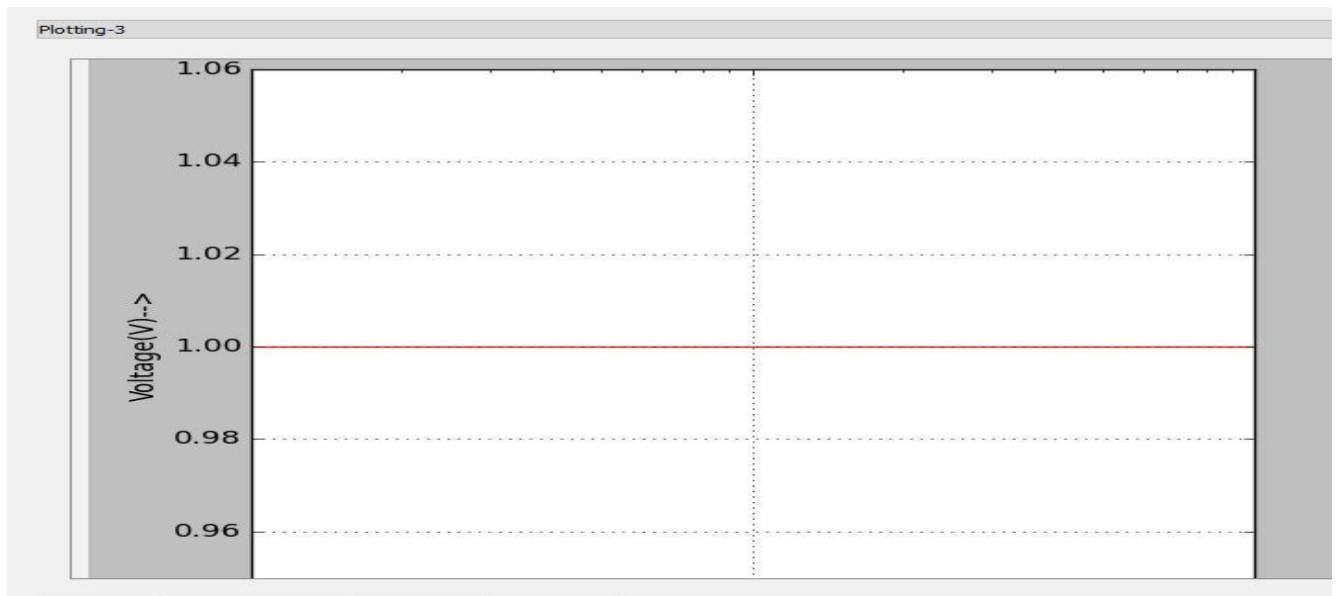
Op-amp (UA741).

Frequency of input signal=1kHz.

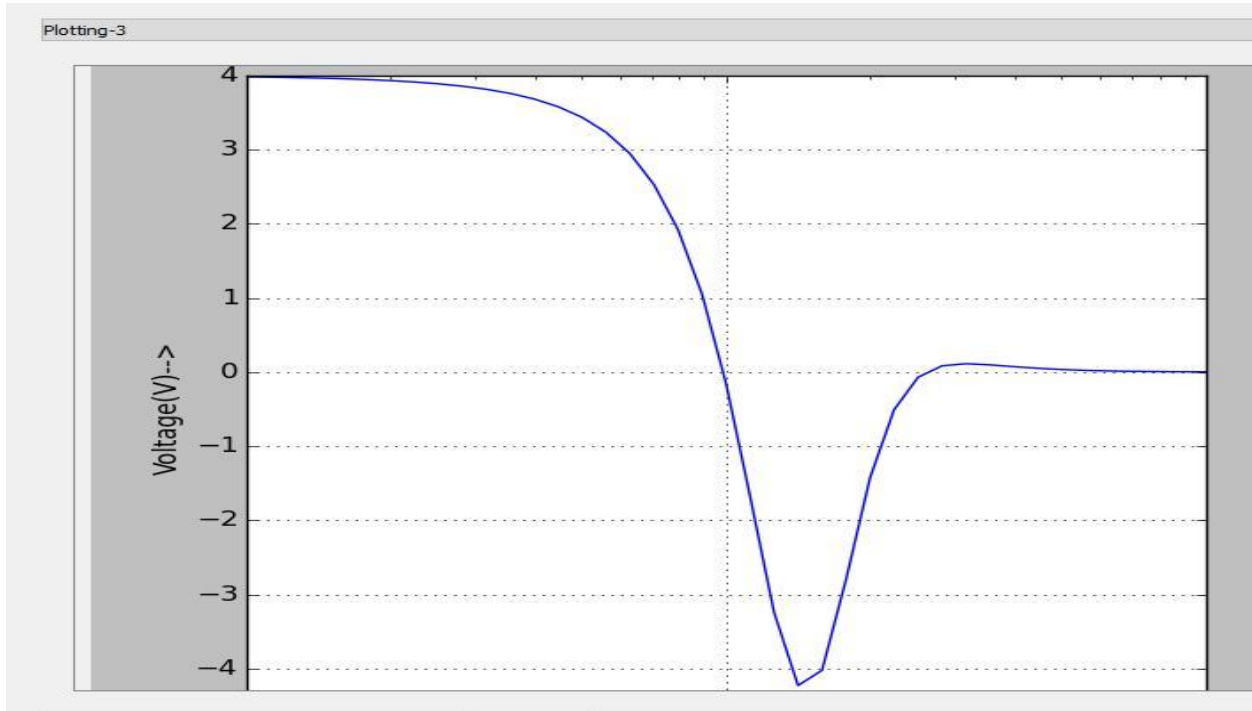
SIMULATION OUTPUT:

PYTHON PLOT:

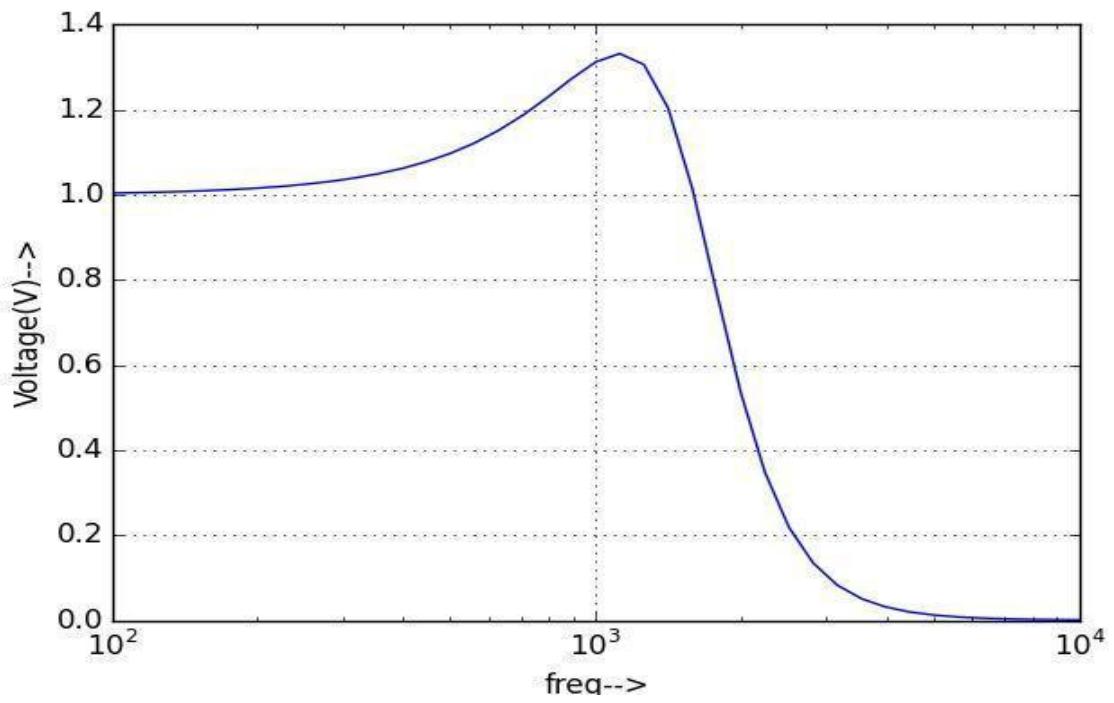
Input:



Output:

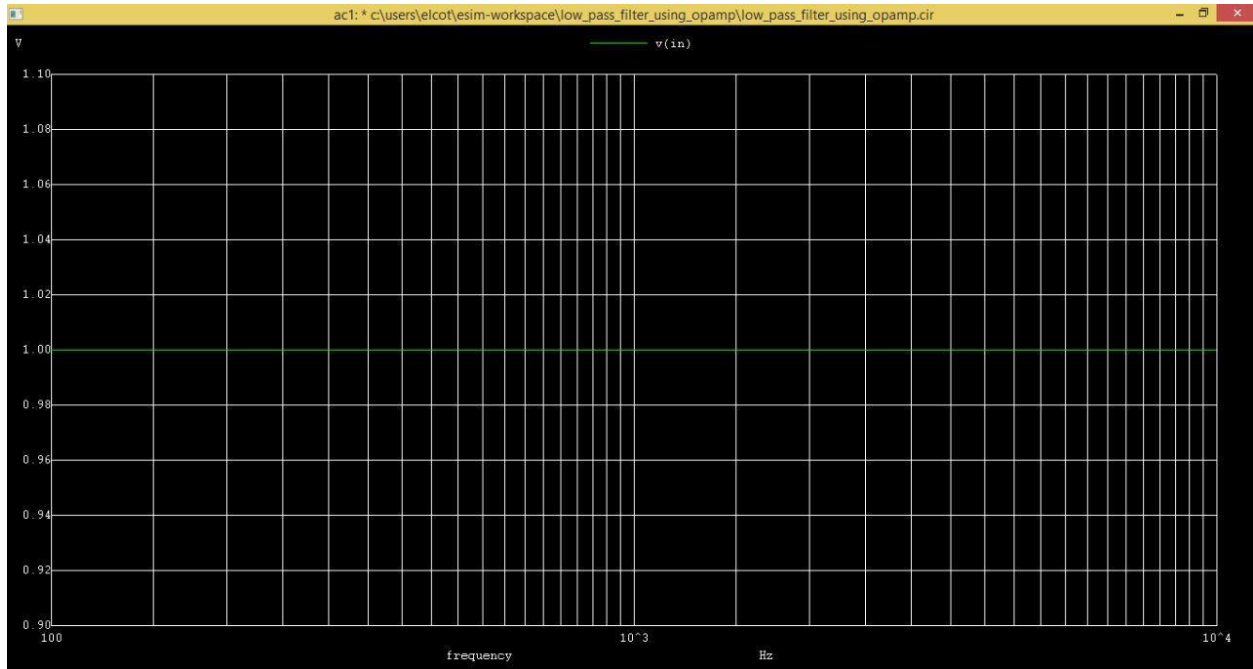


Log output:

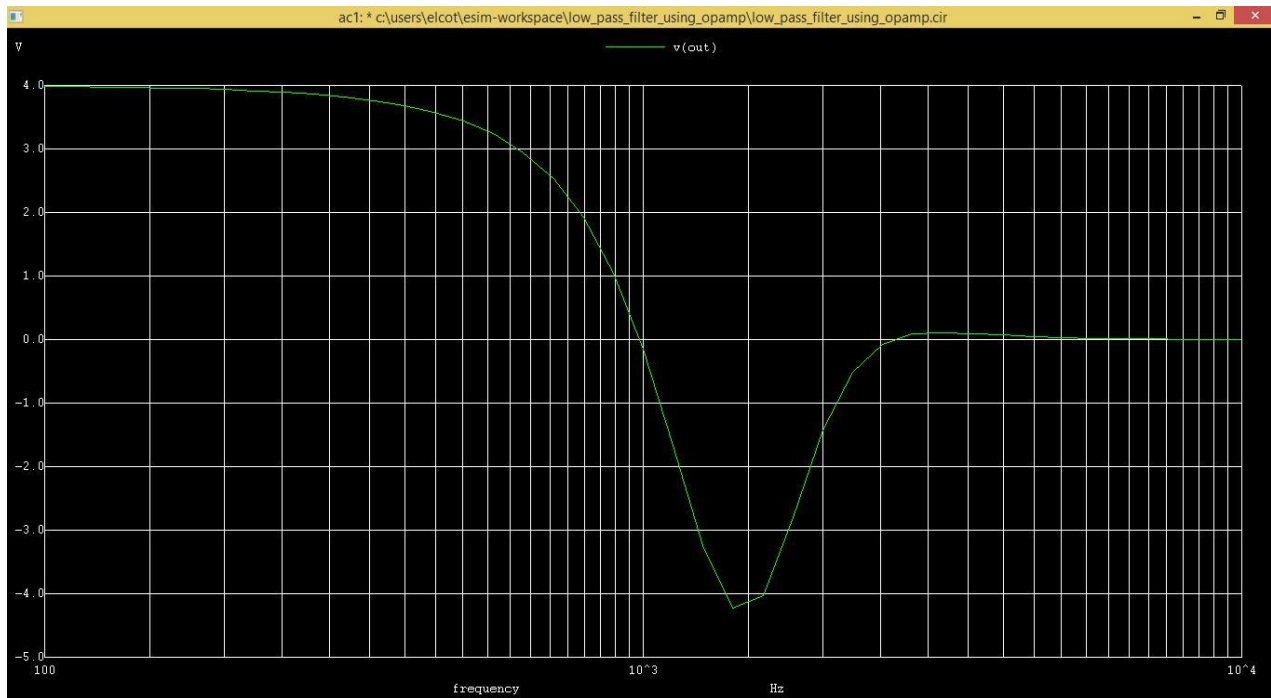


NG SPICE PLOT

Input:



Output:



Log output:



REFERENCE:

https://www.electronics-tutorials.ws/filter/filter_5.html on
15/02/2018