

HIGH PASS FILTER WITH OP-AMP USING eSim

THEORY:

Frequency response of high pass filter allows us to know the working high pass filters with help of its magnitude response. High pass filter allows high frequencies greater than cut-off frequency and attenuate the other frequency lower than cut-off frequency. Working principle is same as the passive filter but the difference in using op-amp will produce amplification in output signal. It can also be known as active high pass filter which means an active element(op-amp) is used in the circuit for amplification. Active high pass is obtained by connecting passive RC high pass filter to the non-inverting terminal of op-amp. The frequency response analysis of active high pass filter is shown by plotting its gain, using logarithmic frequency scale along the x-axis.

SCHEMATIC DIAGRAM:

The circuit schematic of high pass filter with op-amp in eSim is show in the figure below:

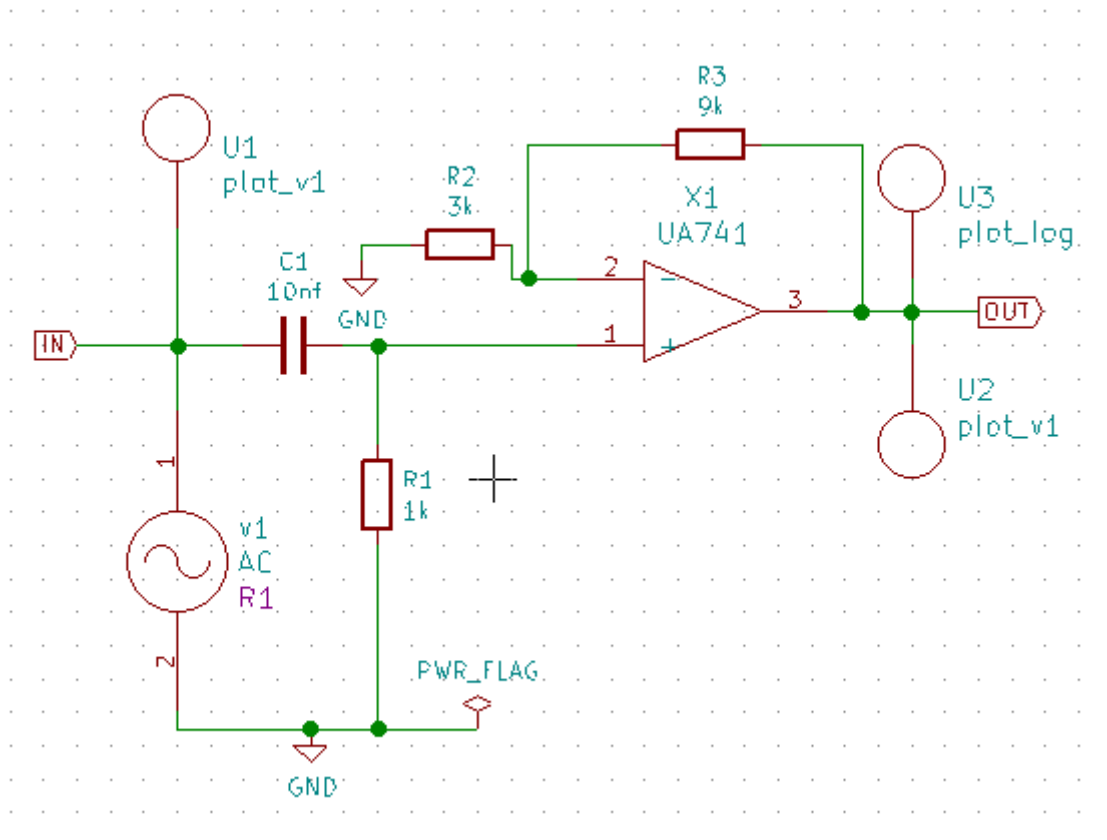


Figure 1: schematic diagram of high pass filter with op-amp

SIMULATION RESULT:

1. NGSPICE PLOT:

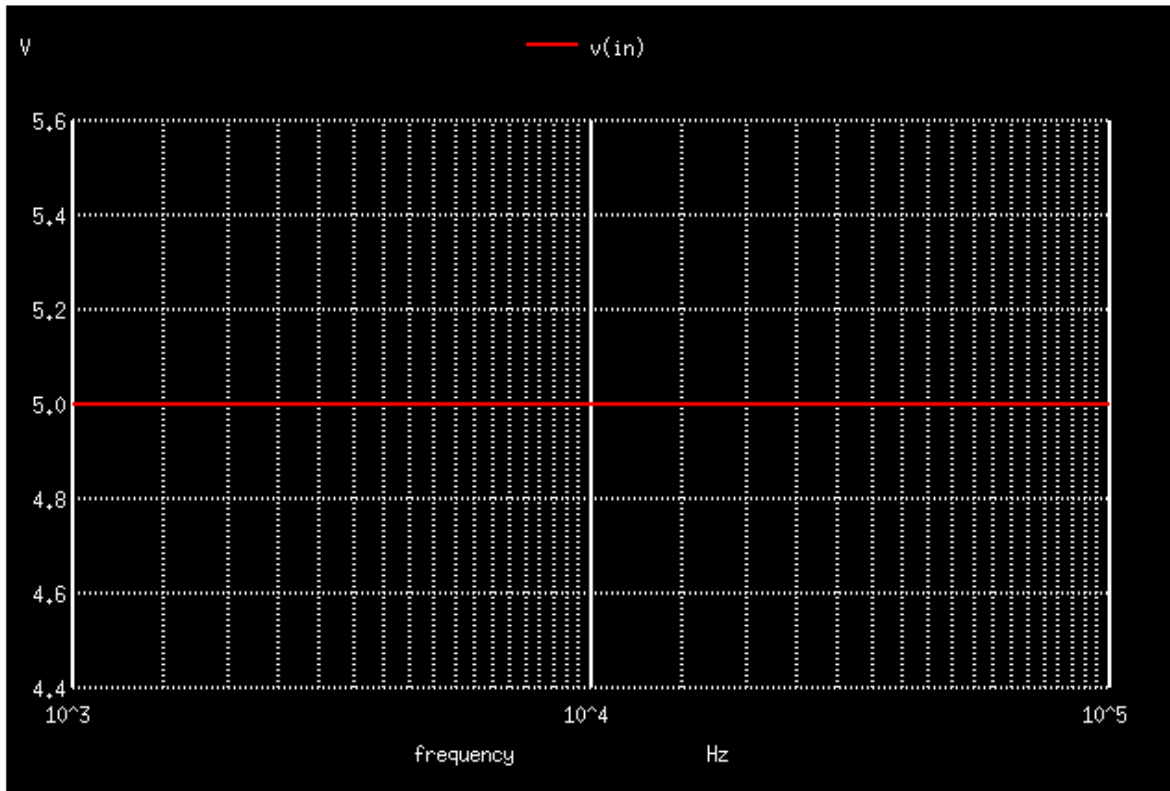


Figure 2: NgSpice input plot

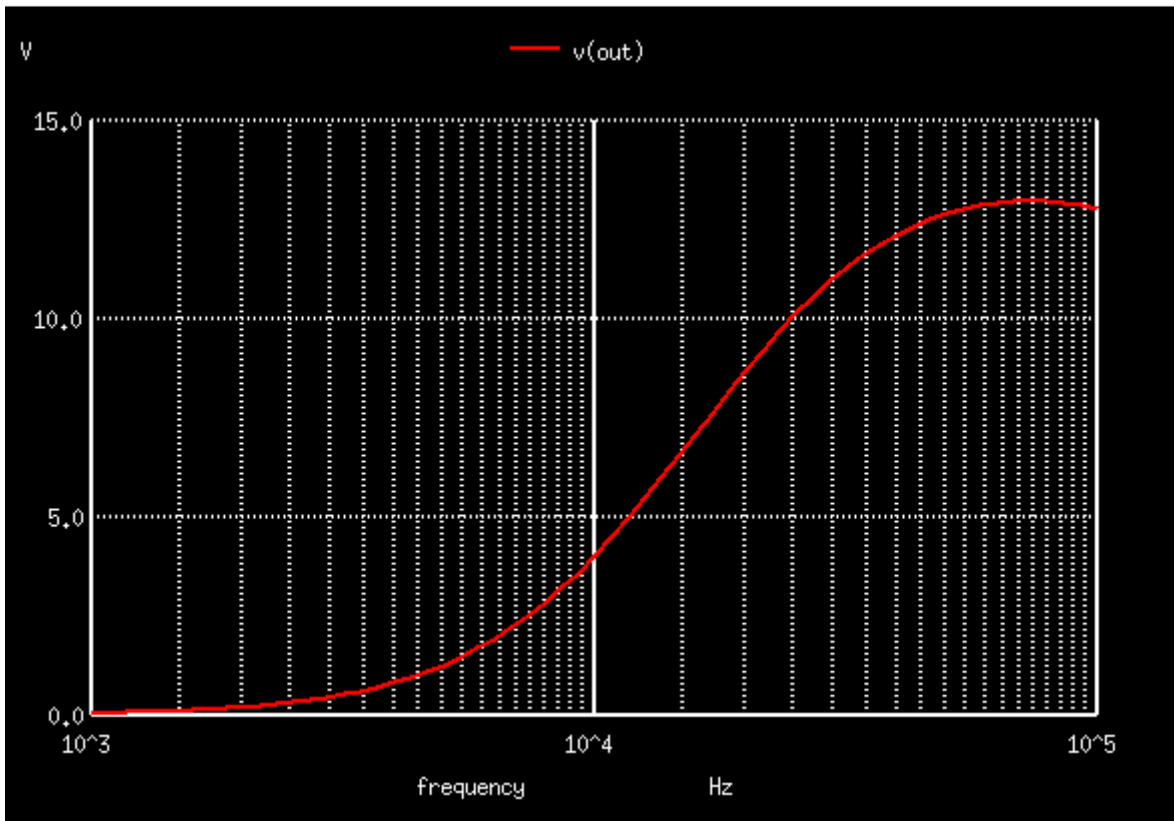


Figure 3: NgSpice output plot

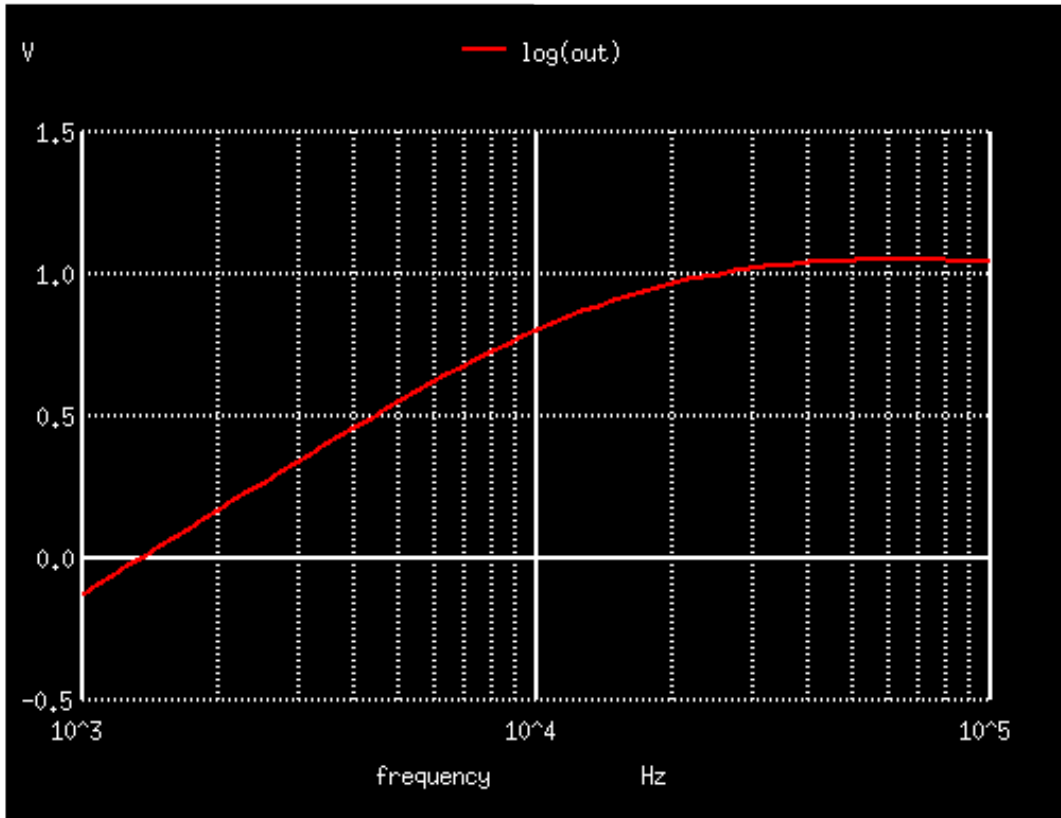


Figure 4: NgSpice frequency plot

2. PYTHON PLOT:

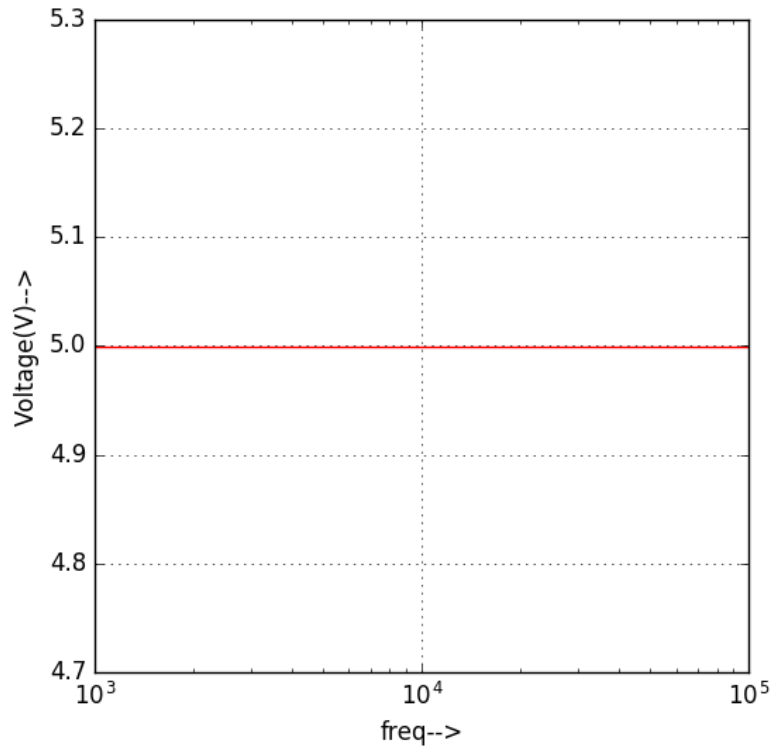


Figure 5: python input plot

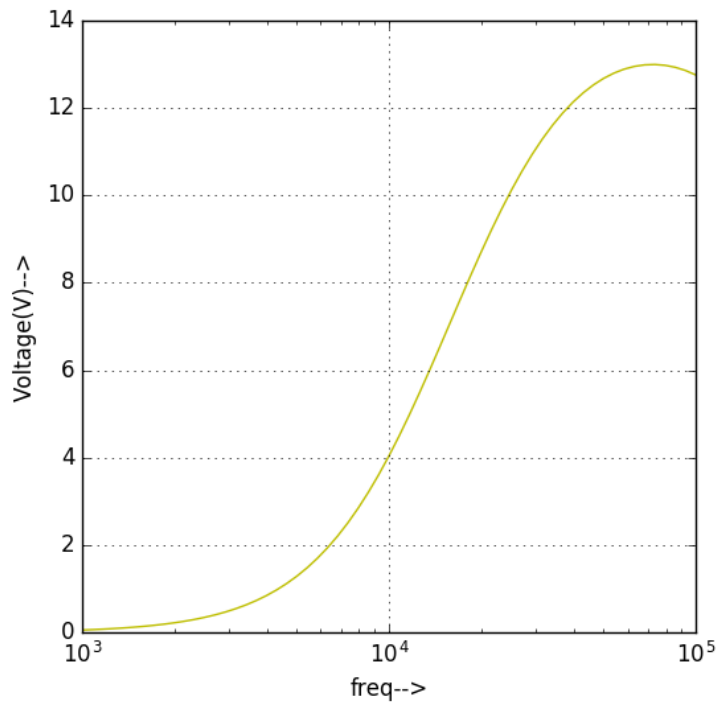


Figure 6: python output plot

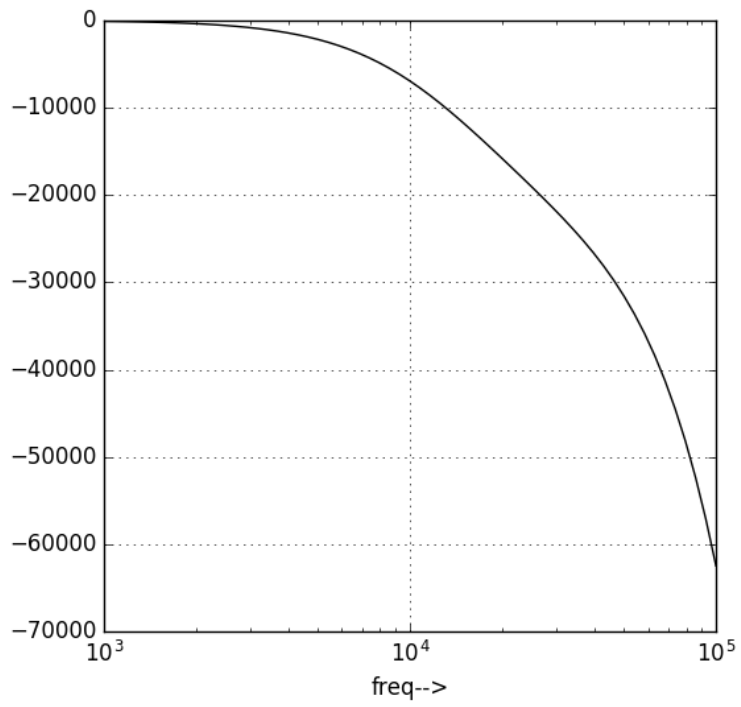


Figure 7: python frequency plot

CONCLUSION:

Thus we have studied the frequency response of the High pass filter with Op-Amp using eSim and then simulated to get the appropriate waveforms.

REFERENCES:

1. https://www.electronics-tutorials.ws/filter/filter_6.html
2. <https://www.electronicshub.org/active-high-pass-filter/>