

DIFFERENTIAL AMPLIFIER USING OP-AMP

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Introduction:

The differential amplifier is designed using three terminal device called operational amplifier and it amplifies the difference between two input signals. The first input is connected to inverting terminal and the second input is connected to the non-inverting terminal. The output resultant voltage will be a difference of these input voltages. It can be obtained by using superposition principle. The main feature of this differential amplifier is high voltage gain, high CMRR, low common mode gain and wider band width.

Schematic diagram:

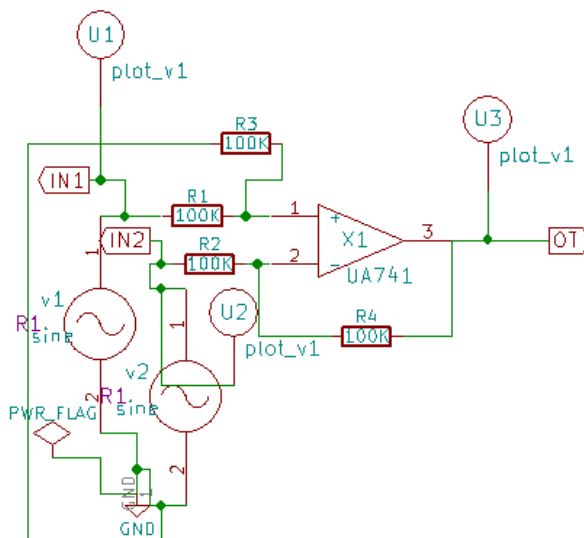


Figure1: Schematic diagram of differential amplifier

Python plot:

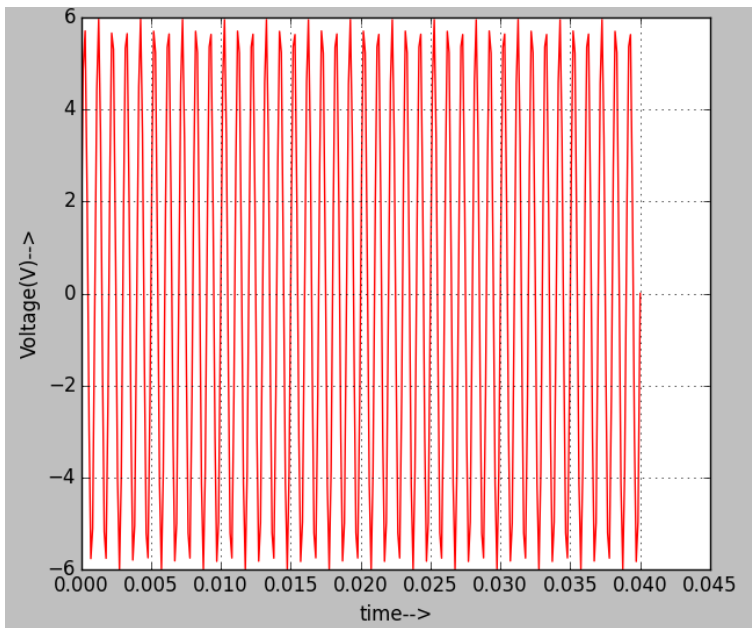


Figure 2: Python input-1 plot

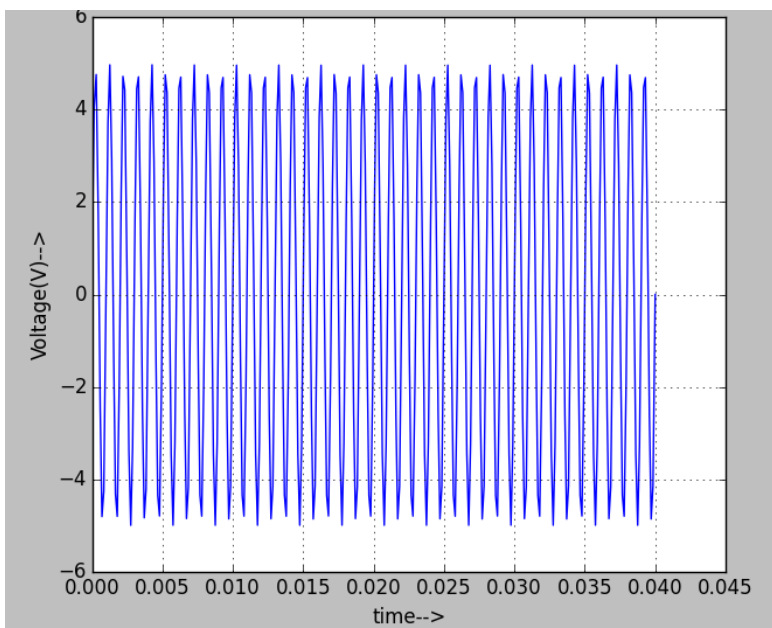


Figure 3: Python input-2 plot

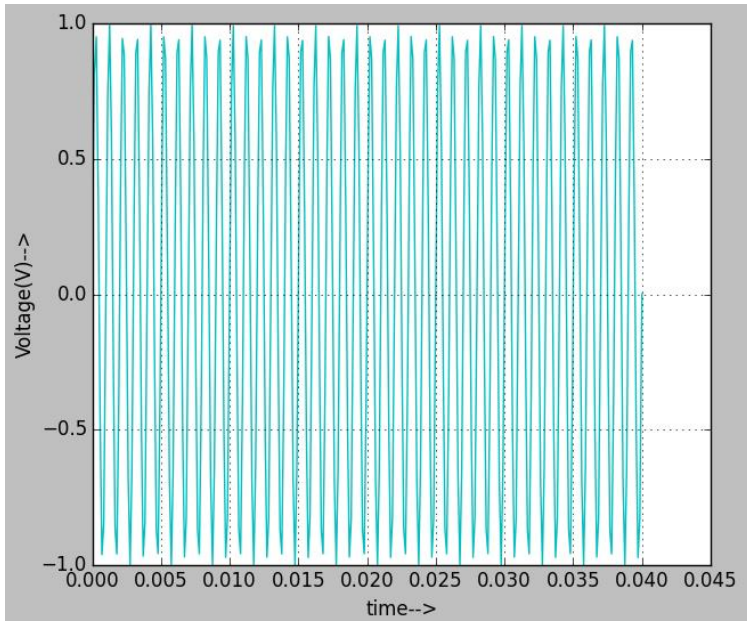


Figure 4: Python output plot

Ngspice plot:

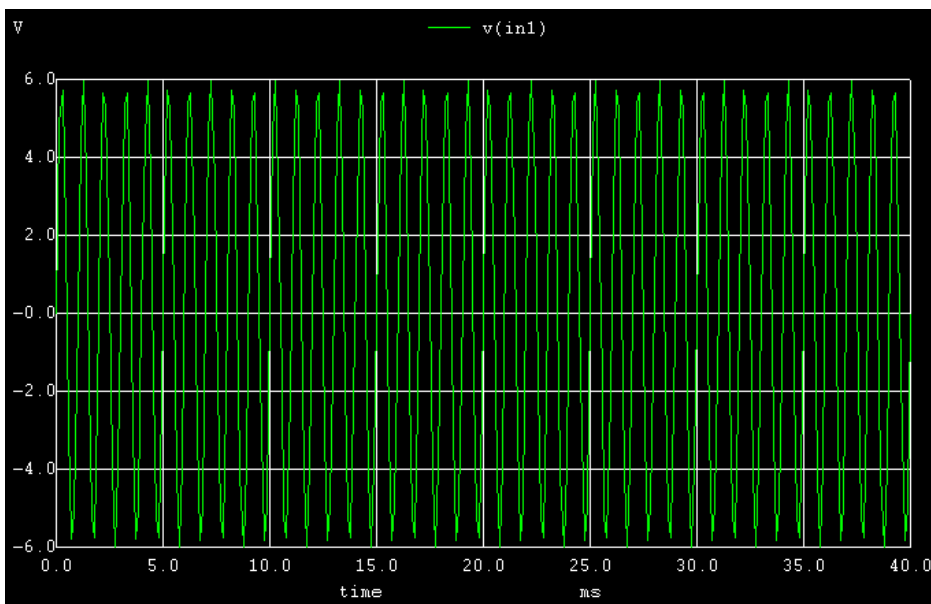


Figure 5: Ngspice input-1 plot

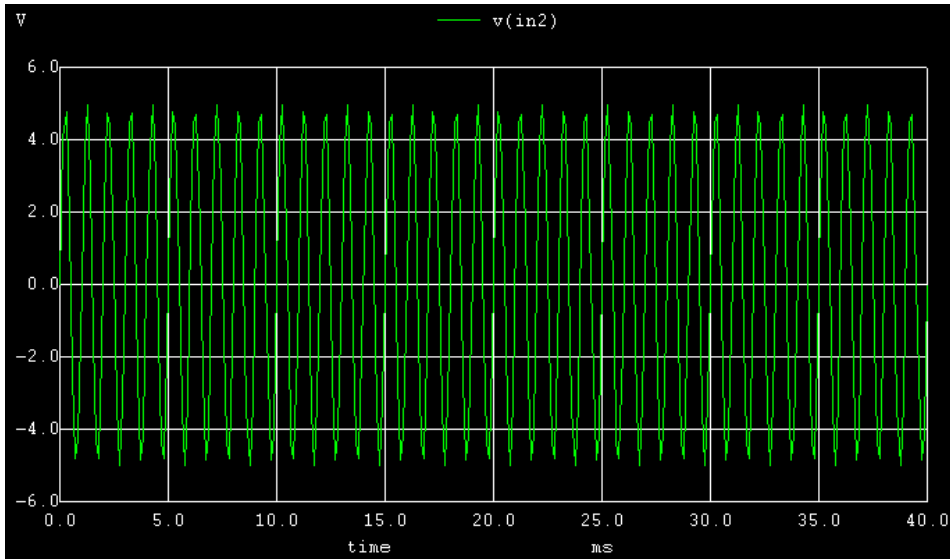


Figure 6: Ngspice input-2 plot

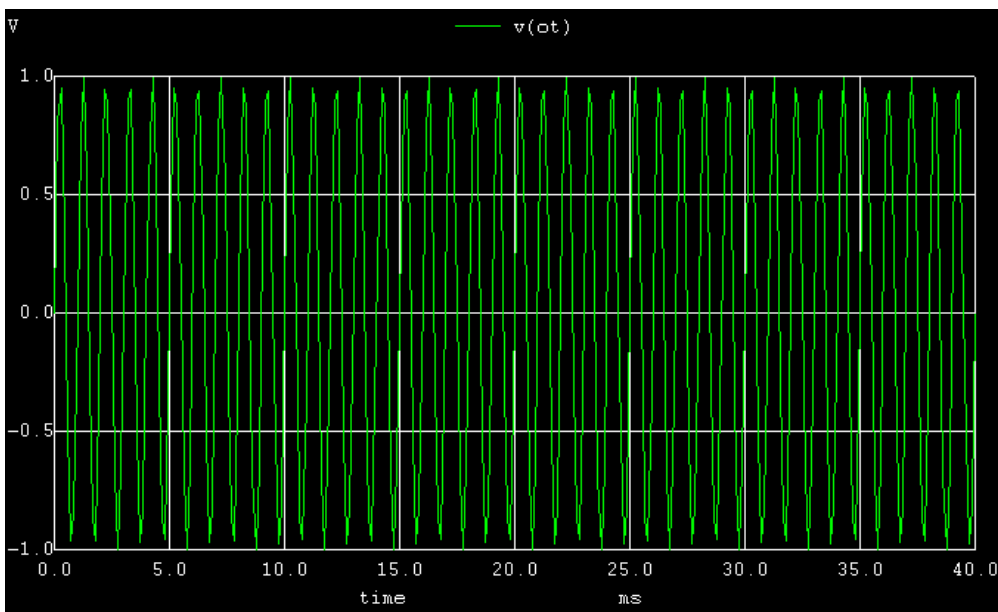


Figure 7: Ngspice output plot

Conclusion:

Thus, the differential amplifier circuit was designed and implemented using eSim software and we got the appropriate input and output waveform.

Reference:

<https://www.elprocus.com/what-is-differential-amplifier-and-equation/>