

# Circuit Simulation Project

<https://esim.fossee.in/circuit-simulation-project>

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**Title of the circuit :Small Signal Power Amplifier**

## **Theory/Description :**

Audio signal amplifiers are electronic amplifiers which are used to amplify or boost the weak audio signals from an input like a microphone to high amplitude signals to be reproduced through speakers with high volume.

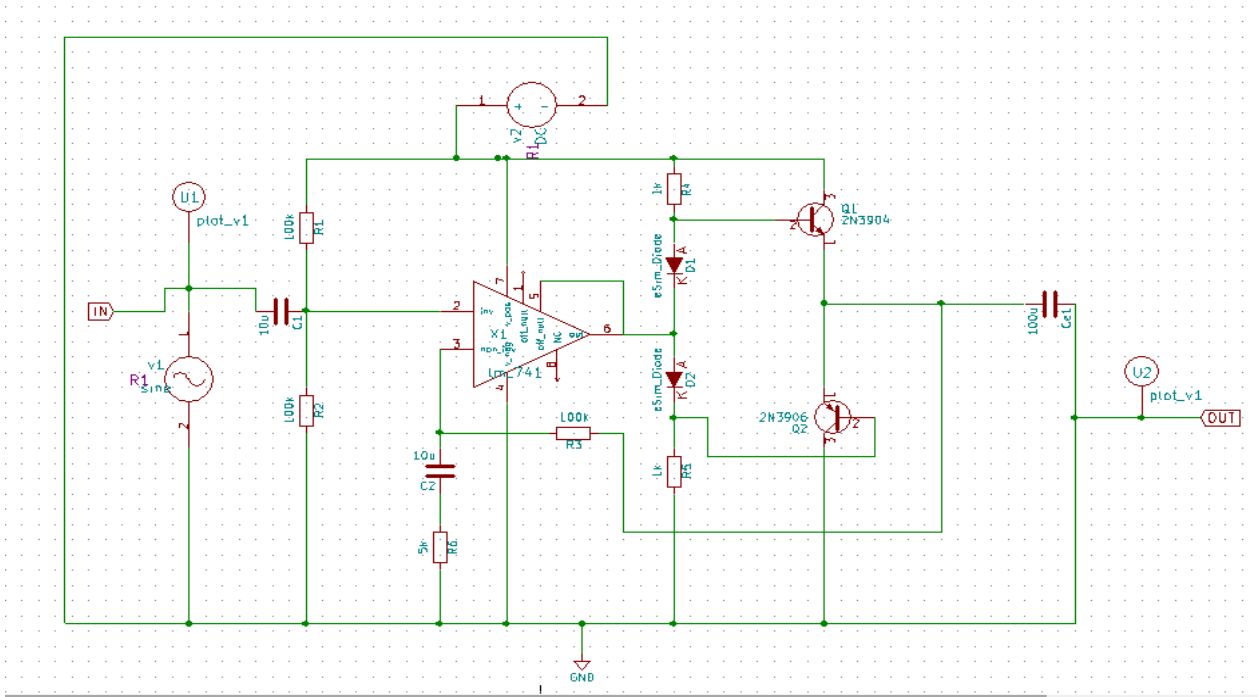
Here We use this application to hear micro sounds in a very high volumes which are really required in these times, which is powered through the coupled transistors.

Using two small transistors (2N3904 and 2N3906), we can build small power amplifier which deliver several hundreds milliwatts. The basic circuit is a totem pole transistor pair with small biasing circuit configuration to give small leakage idle-current. Here we use the transient analysis method in order to get the efficiency.

Here we use LM386-NPN Transistor which stands as amplifier through which signal passes through and send to the coupled transistors 2N3904 and 2N3906. So here audio will get mixed with a noise signal in the process and when the output is provided, noise signal will be removed by the power transistor in order to improve the efficiency of the output. So the efficiency here provided is 85.049%.

This signal is then sent to a speaker to get the minimum audio signal at its efficiency provided in a higher volume.

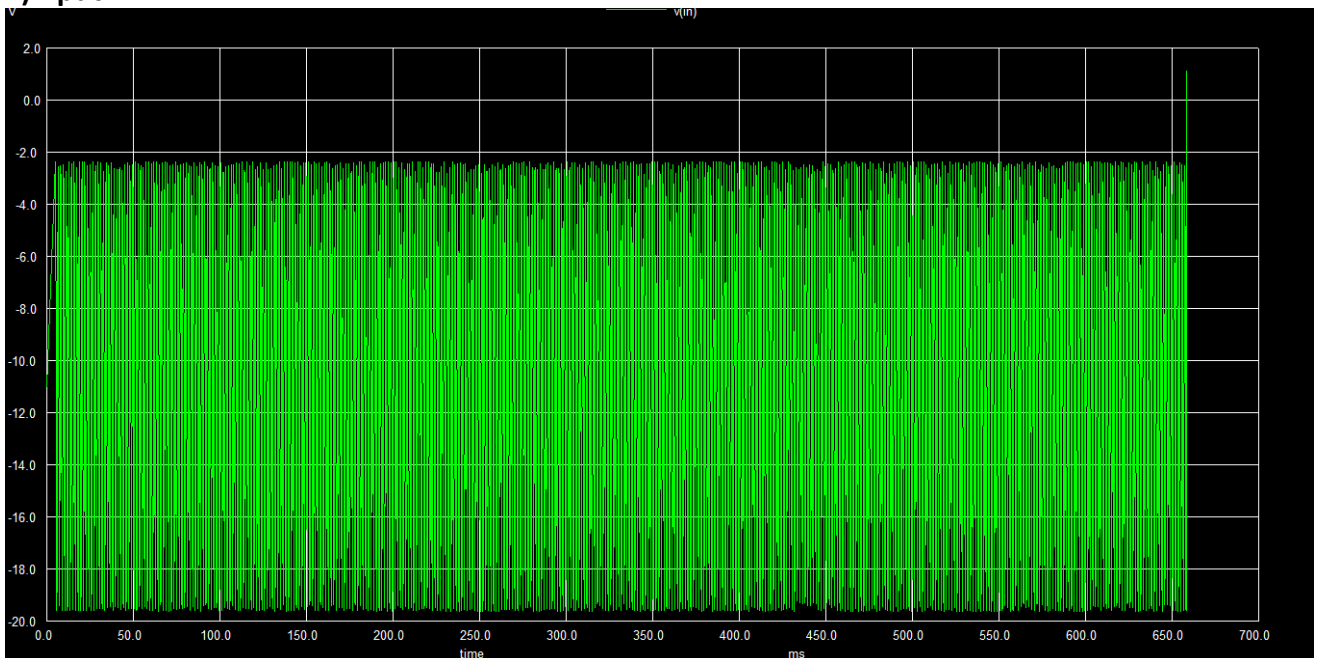
## **Circuit Diagram :**



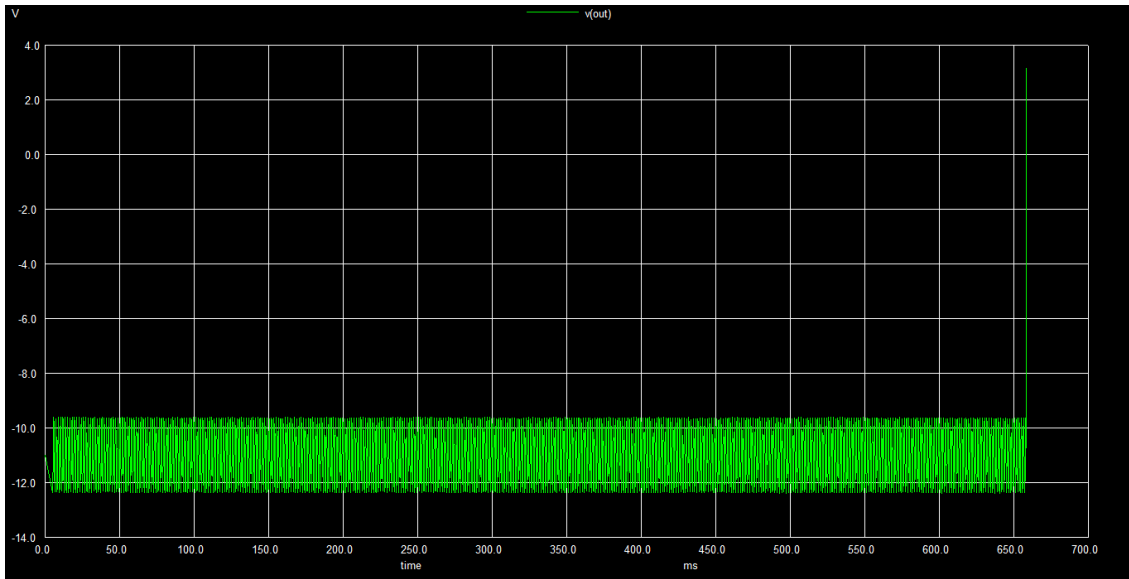
**Results (Input, Output waveforms and Multimeter readings) :**

### Ngspice Plots

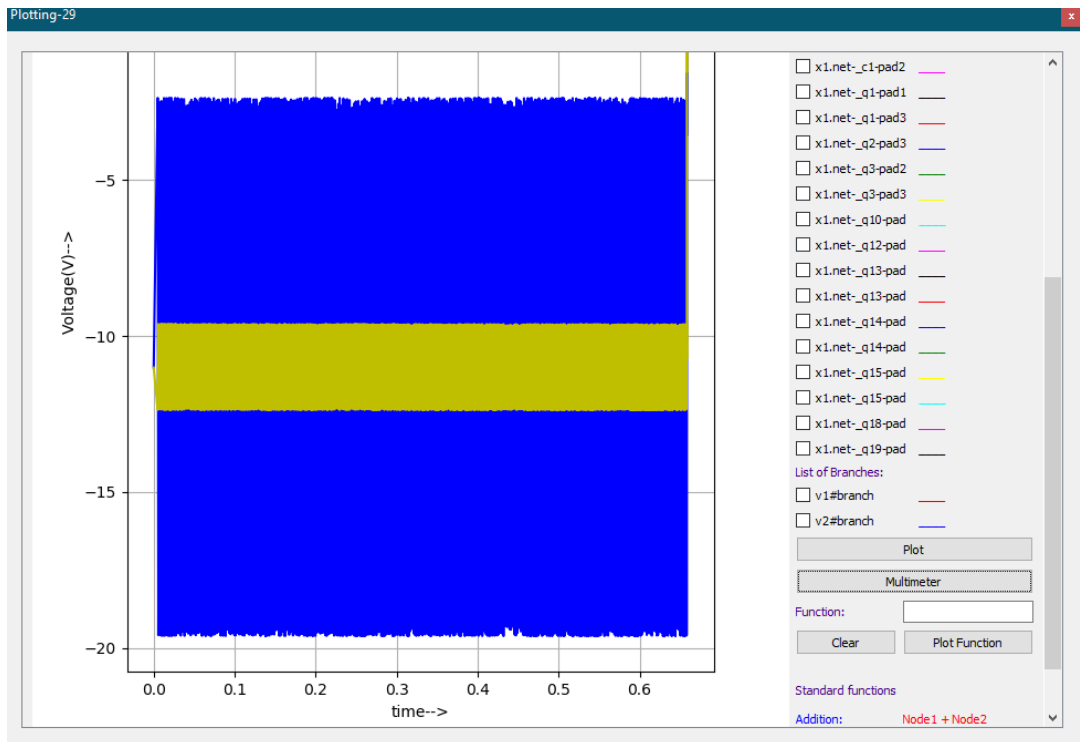
**1) Input:**



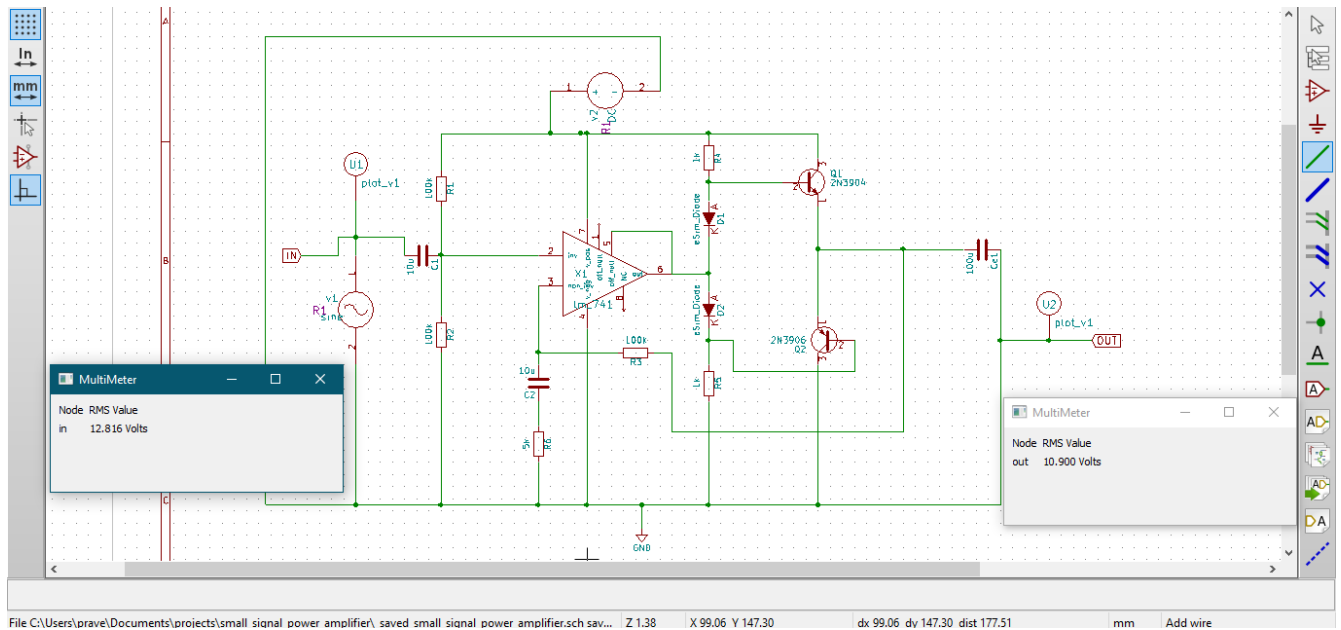
**2) Output:**



## Python Plot:



## Multimeter Readings:



## Conclusion:

Hence designed and Implemented small signal power amplifier.

## Source/Reference(s) :

[https://www.electronics-tutorials.ws/amplifier/amp\\_1.html](https://www.electronics-tutorials.ws/amplifier/amp_1.html)

<https://old.amu.ac.in/emp/studym/100016274.pdf>

<https://inst.eecs.berkeley.edu/~ee105/fa03/handouts/lectures/Lecture16.pdf>