

**19/10/2021**

## **MINI PROJECT**

**Aim:** To create LM386 Audio Amplifier Circuit

**Apparatus:** Hardware component : Desktop/ Laptop

Software Tools : Ki – CAD software (For simulation)

### **Theory:**

LM386 Audio Amplifier Circuit is a very low cost audio amplifier and can power any speaker. For the cost and size of the circuit, the sound from the LM386 Audio Amplifier can be adequately loud.

There are many Audio Amplifier Circuits designed using LM386 IC. The main problem with these circuits is noise and interference. The noise from the Amplifier Circuit designed in this project is considerably less and if designed on a proper circuit board, this will make a great Audio Amplifier.

The Audio Amplifier using LM386 is a low power circuit that can deliver a maximum power of 1 Watt (1W) and can be used in a wide range of applications like portable speakers, laptop speakers, etc.

**1.** Pins 1 and 8 are Gain Control Pins. By default, the Gain of the LM386 Amplifier is set to a factor of 20. When a capacitor is placed between pins 1 and 8, it bypasses the internal resistor (which is responsible for setting the gain to 20) and increases the gain to 200.

**2.** Pins 2 and 3 are the inverting and non – inverting inputs of the amplifier (internally, they are connected to an OP-AMP). Audio input from devices like microphone, mobile phones, laptops, etc. is given through these pin.

**3.** The inverting input (Pin 2) of LM386 is usually connected to Ground.

**4.** Pins 6 and 4 are the power supply pins. The maximum power supply to LM386 is 15V. We have used a 12V Power supply in this project.

5. Pin 7 sets the path for decoupling and a capacitor must be connected between Pin 7 and Ground. Pin 5 is the output pin. Proper filtering must be done before connecting the output to a speaker as any DC signal might permanently damage the speaker.

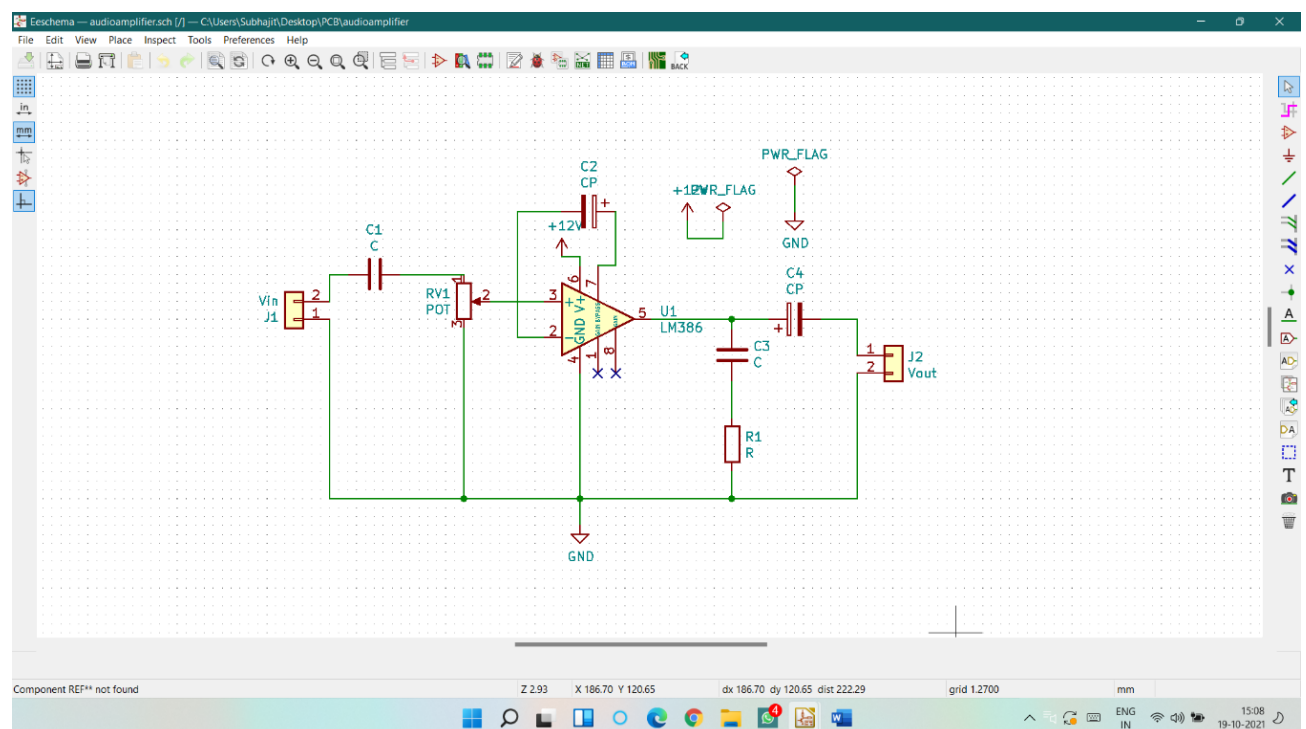
One of the main problems with audio amplifiers like LM386 is the noise. Surprisingly, even though the circuit is built on a breadboard, there was very less noise from the speaker.

### Lab Procedure:

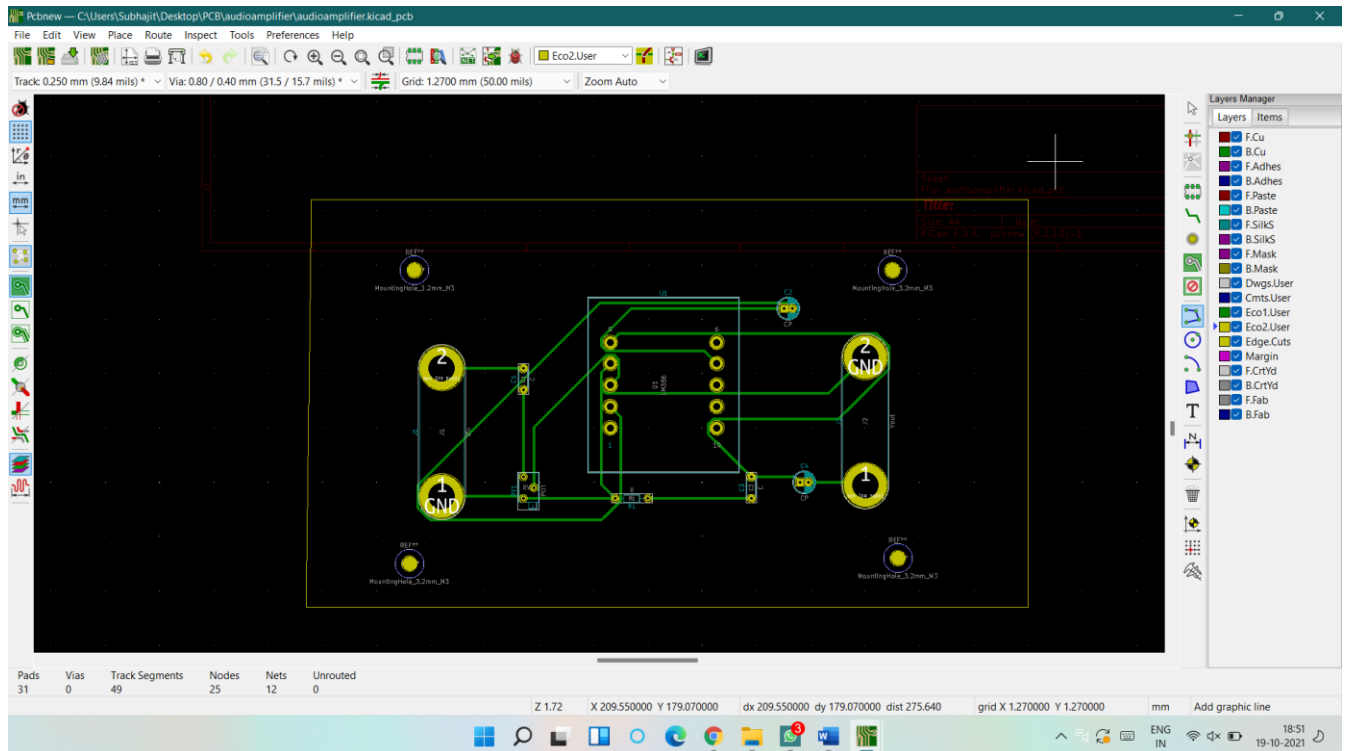
- 1.) To start, install KiCad, select File -> New Project, and name it as your wish. 2.) From the main KiCad window, open up the Electronic Schematic Editor. 3.) To add a component, press 'A' and bring up the list of hotkeys.
- 4.) For each of those components, press 'A' to add a part, search for the part, and drop it onto the schematic.
- 5.) With all the wires drawn, it's time to label these wires to connect them into 'nets'. The Annotate Schematic tool automatically assigns a letter (D for diodes, L for inductors, R for resistors, Q for transistors...) to each part, along with a number.
- 6.) With that, schematic is done.

### Output:

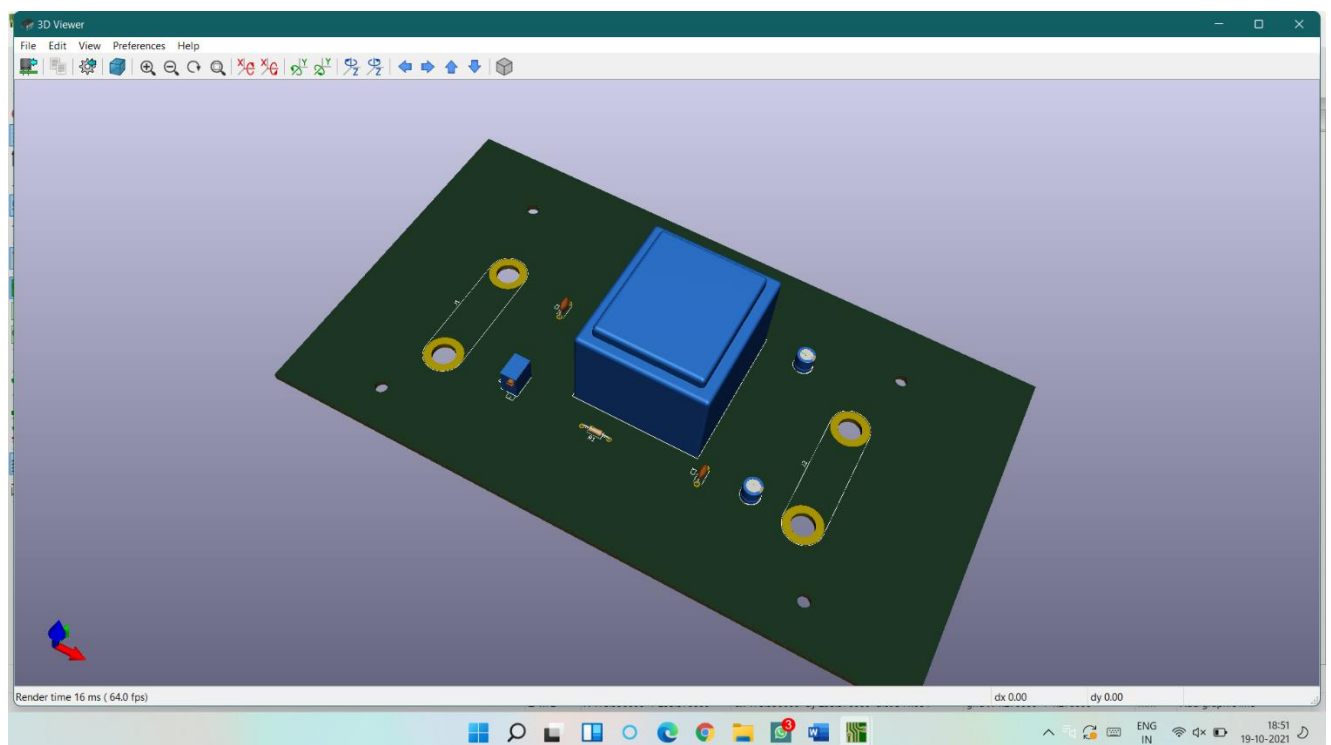
Schematic diagram:



## PCB layout:



## 3D viewer:



**RESULT:** Audio amplifier circuit using LM386 is created along with pc layout and studied.