EE322: Analog and Mixed Signal Circuits
Project Report
Team: Waveform Wizards

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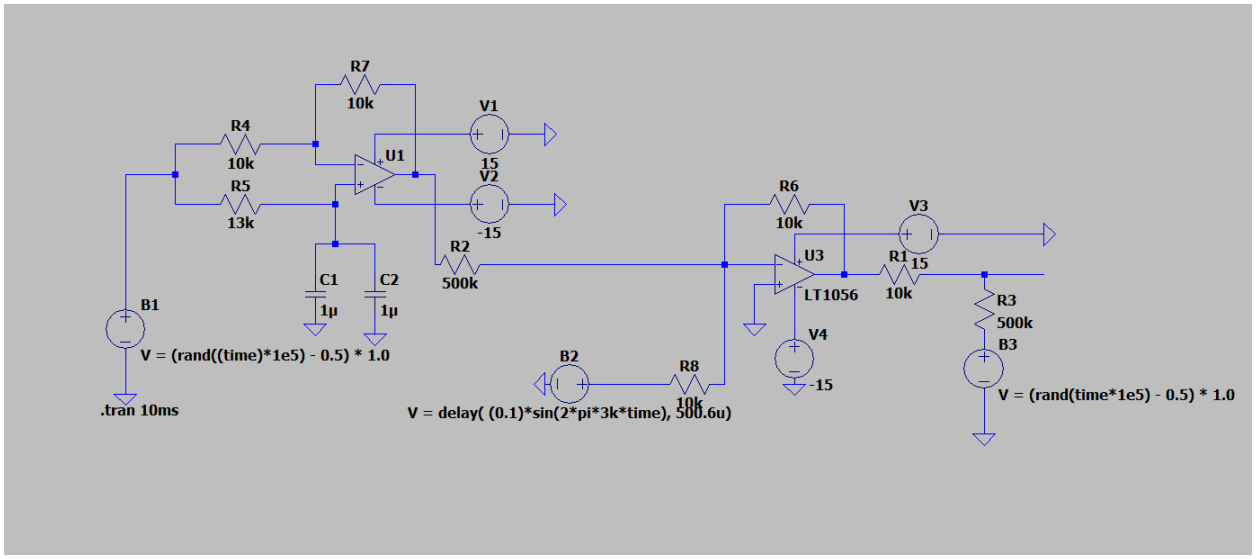
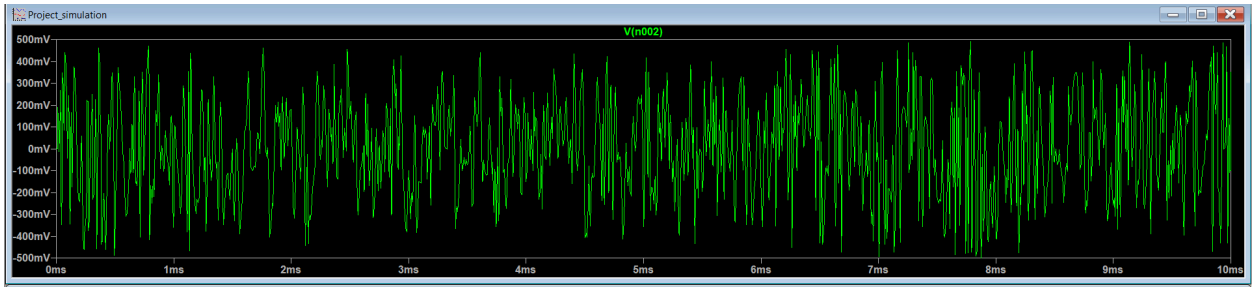
Project Title: Analog Noise Cancellation

LT Spice Schematic:-

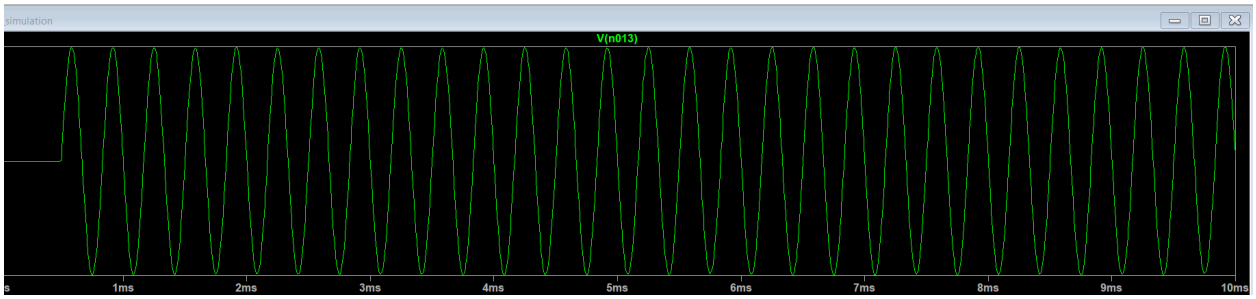


LTSPICE Simulation Results

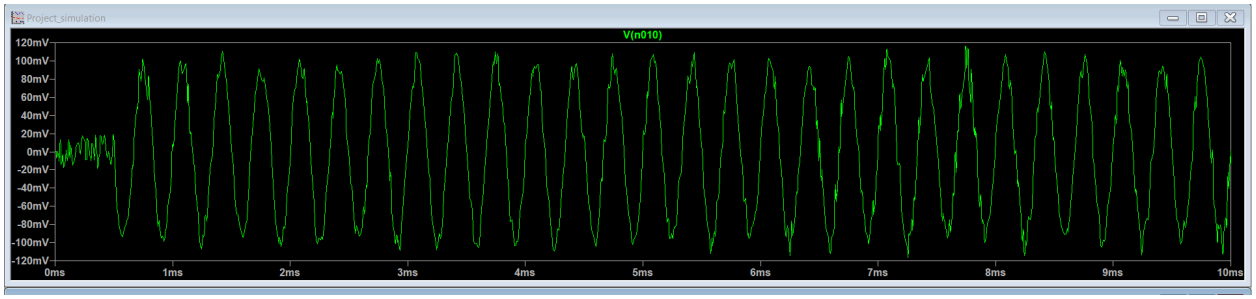
Ambient Noise -



Music Signal -

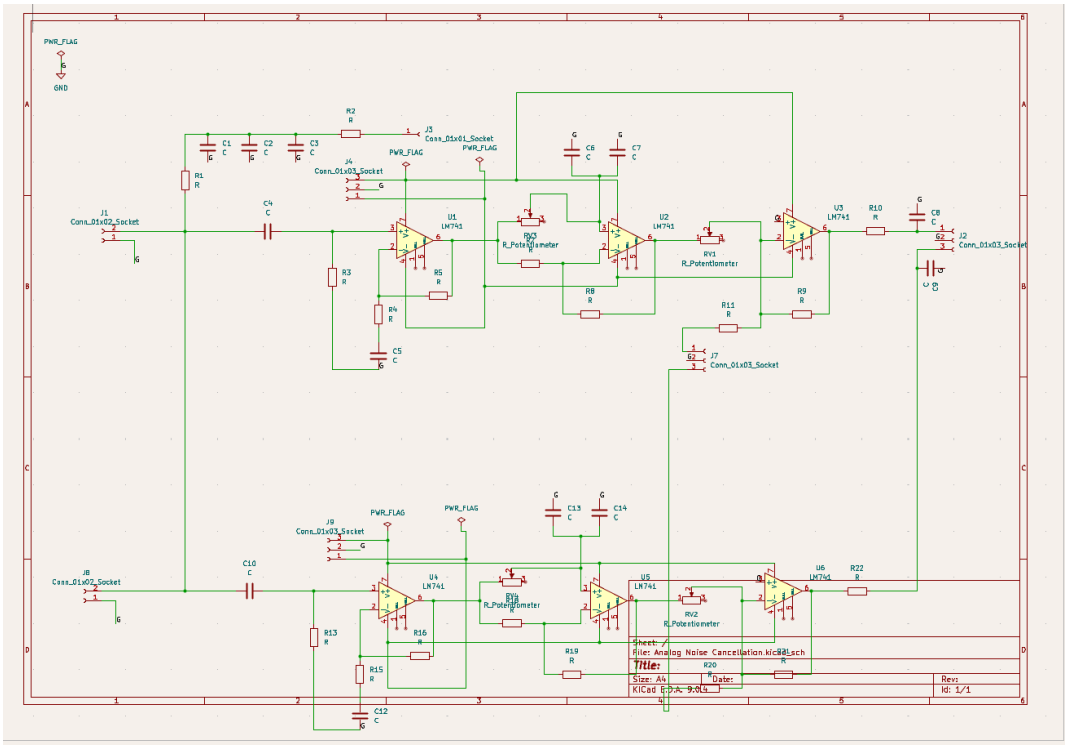


Music after Analog Active Noise Cancellation(Some Noise is Still There)

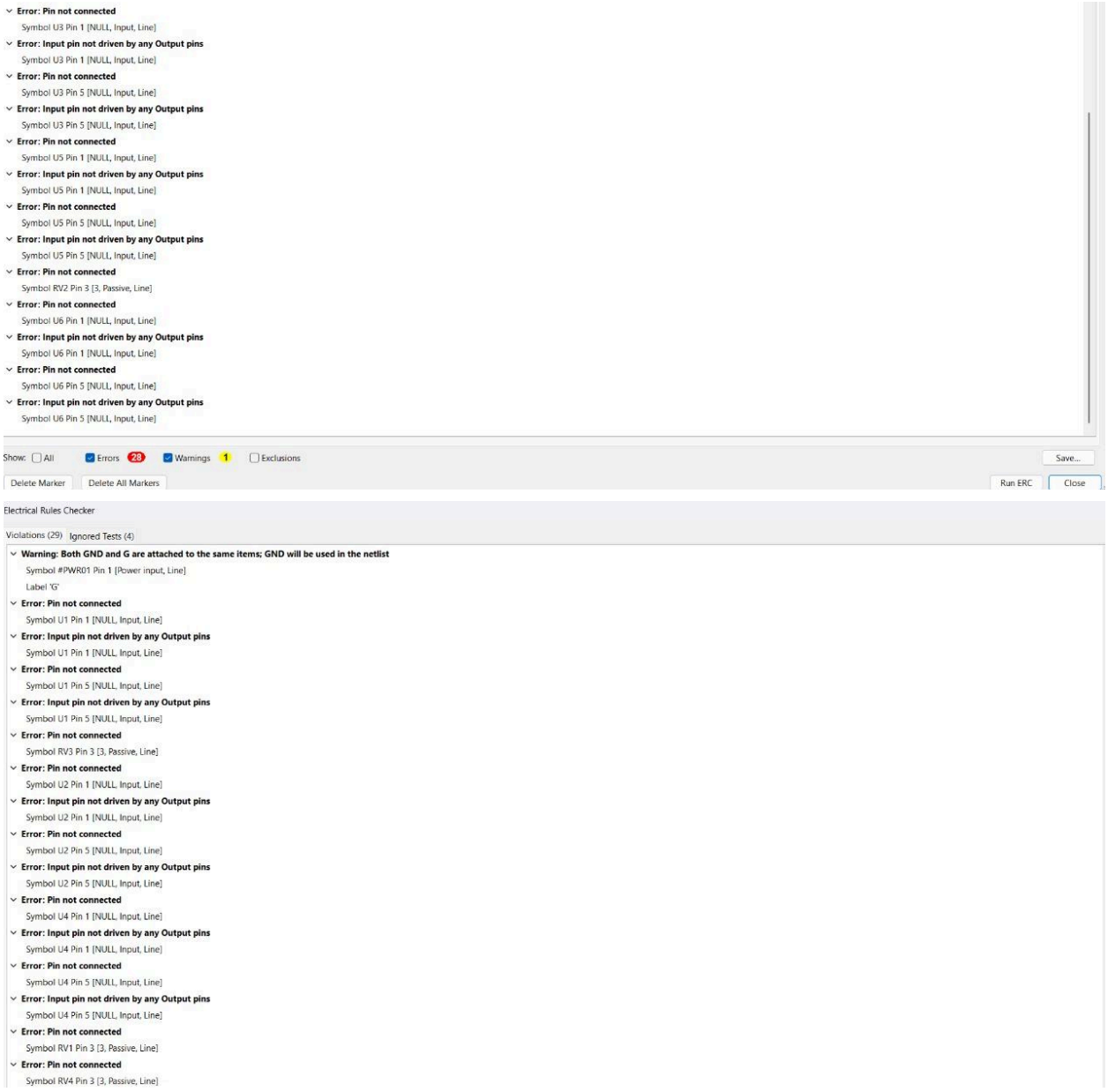


PCB Design:-

Following Image shows the Schematic(contains both stereo channels):-



ERC Error screenshot(Some Unconnected Pins Error like NULL pin in LM741 can be ignored)



Footprints Assignments

Below Screenshot shows the footprint assignments , all the components used are THT components(to be soldered separately)

Symbol : Footprint Assignments

```
 1      C1 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
 2      C2 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
 3      C3 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
 4      C4 -               C : Capacitor_THT:C_Rect_L7.0mm_W6.0mm_P5.00mm
 5      C5 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
 6      C6 -               C : Capacitor_THT:C_Rect_L7.0mm_W6.0mm_P5.00mm
 7      C7 -               C : Capacitor_THT:C_Rect_L7.0mm_W6.0mm_P5.00mm
 8      C8 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
 9      C9 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
10     C10 -               C : Capacitor_THT:C_Rect_L7.0mm_W6.0mm_P5.00mm
11     C12 -               C : Capacitor_THT:CP_Radial_D5.0mm_P2.50mm
12     C13 -               C : Capacitor_THT:C_Rect_L7.0mm_W6.0mm_P5.00mm
13     C14 -               C : Capacitor_THT:C_Rect_L7.0mm_W6.0mm_P5.00mm
14      J1 - Conn_01x02_Socket : Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
15      J2 - Conn_01x03_Socket : Connector_PinSocket_2.54mm:PinSocket_1x03_P2.54mm_Vertical
16      J3 - Conn_01x01_Socket : Connector_PinSocket_2.54mm:PinSocket_1x01_P2.54mm_Vertical
17      J4 - Conn_01x03_Socket : Connector_PinSocket_2.54mm:PinSocket_1x03_P2.54mm_Vertical
18      J7 - Conn_01x03_Socket : Connector_PinSocket_2.54mm:PinSocket_1x03_P2.54mm_Vertical
19      J8 - Conn_01x02_Socket : Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
20      J9 - Conn_01x03_Socket : Connector_PinSocket_2.54mm:PinSocket_1x03_P2.54mm_Vertical
21      R1 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
22      R2 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
23      R3 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
24      R4 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
25      R5 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
26      R7 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
27      R8 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
28      R9 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
29     R10 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
30     R11 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
31     R13 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
32     R15 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
33     R16 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
34     R18 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
35     R19 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
36     R20 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
37     R21 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
38     R22 -               R : Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P10.16mm_Horizontal
39     RV1 - R_Potentiometer : Potentiometer_THT:Potentiometer_Bourns_3386P_Vertical
40     RV2 - R_Potentiometer : Potentiometer_THT:Potentiometer_Bourns_3386P_Vertical
41     RV3 - R_Potentiometer : Potentiometer_THT:Potentiometer_Bourns_3386P_Vertical
42     RV4 - R_Potentiometer : Potentiometer_THT:Potentiometer_Bourns_3386P_Vertical
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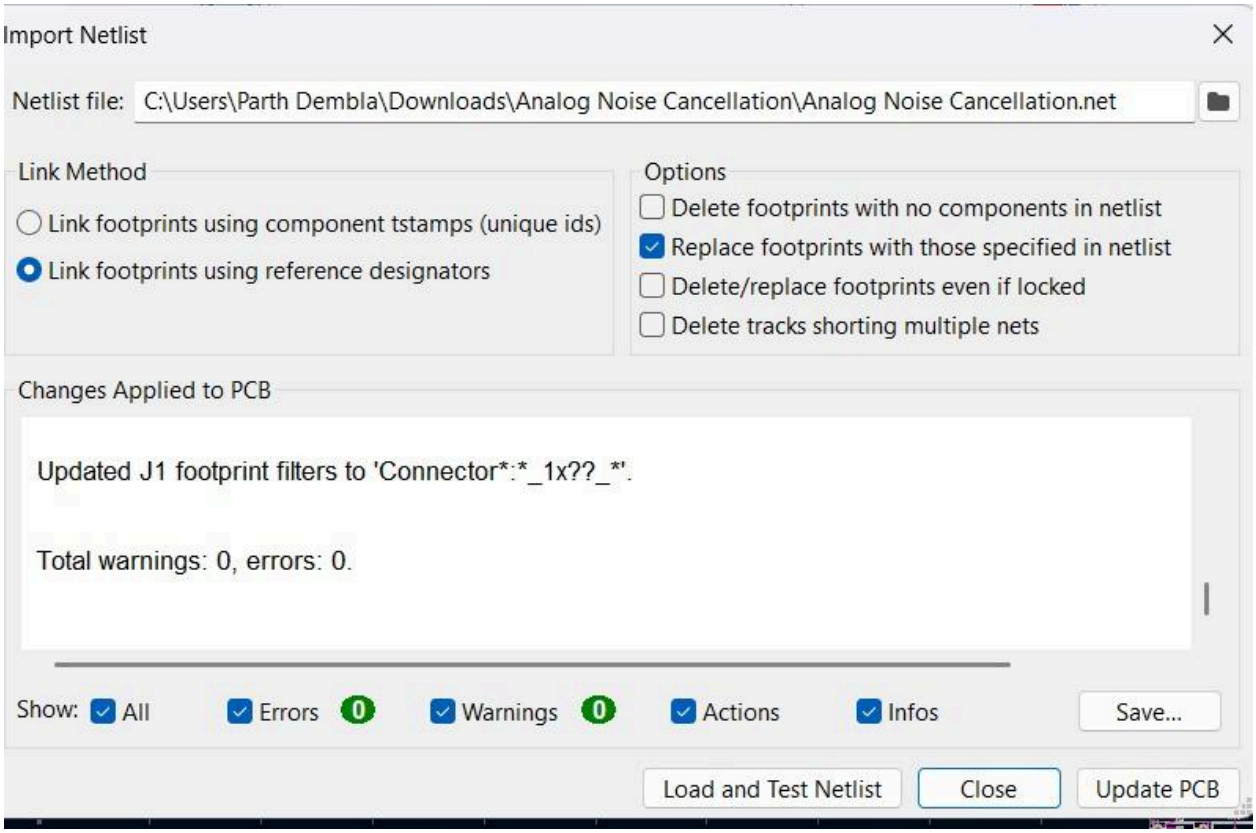
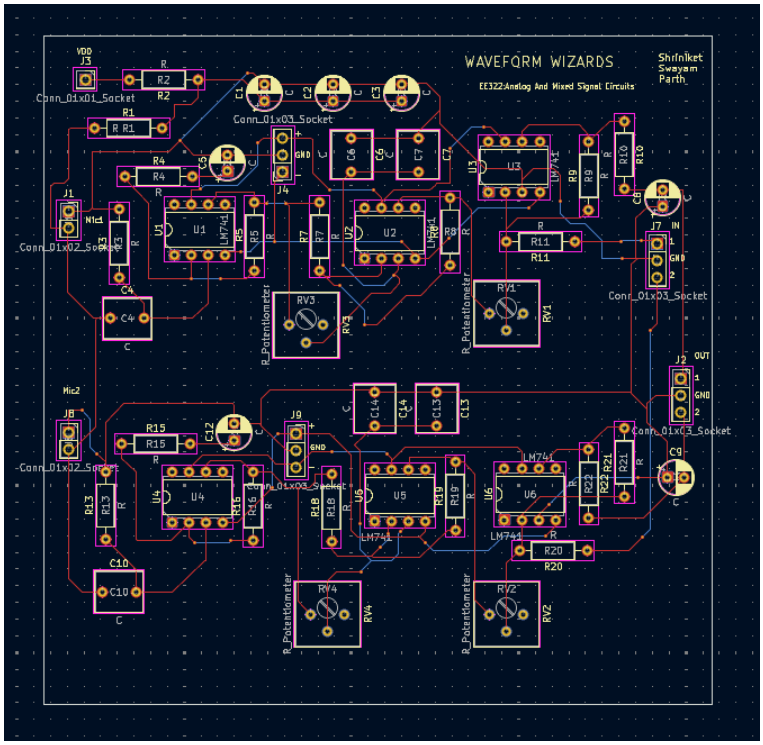
```
43      U1 -            LM741 : Package_DIP:DIP-8_W7.62mm
44      U2 -            LM741 : Package_DIP:DIP-8_W7.62mm
45      U3 -            LM741 : Package_DIP:DIP-8_W7.62mm
46      U4 -            LM741 : Package_DIP:DIP-8_W7.62mm
47      U5 -            LM741 : Package_DIP:DIP-8_W7.62mm
48      U6 -            LM741 : Package_DIP:DIP-8_W7.62mm
```

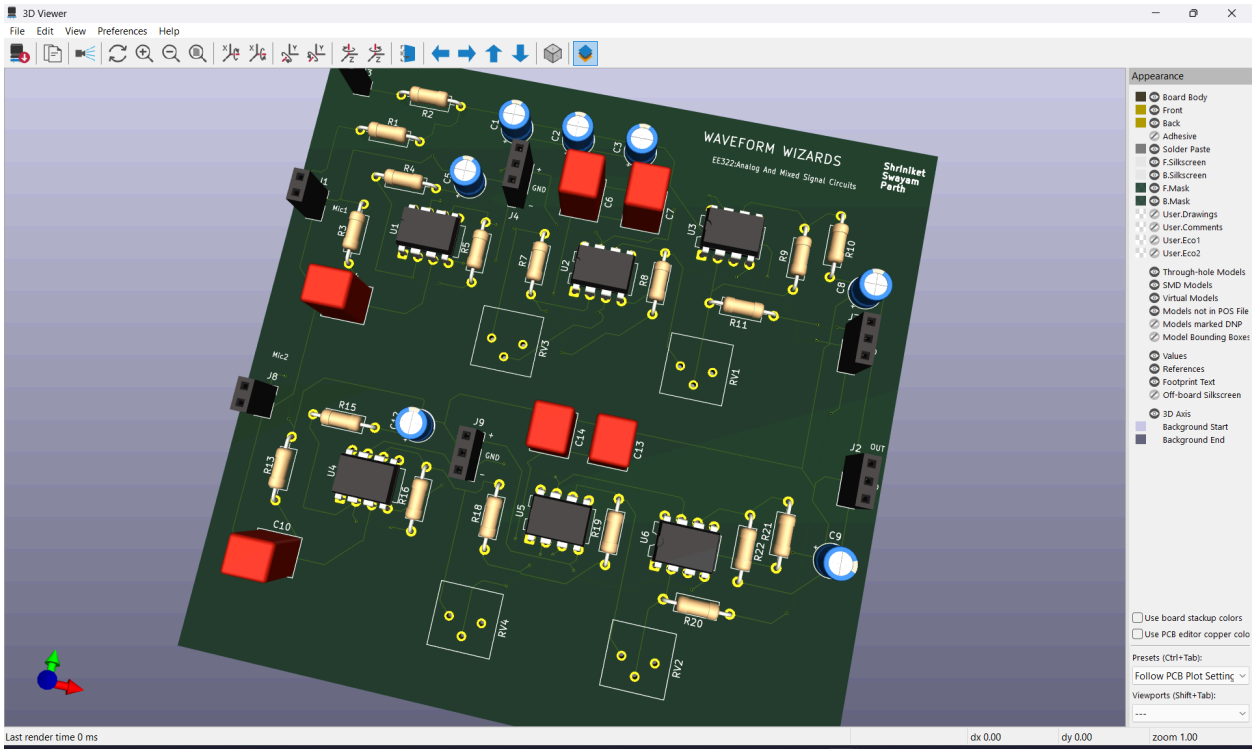
The Netlist is exported



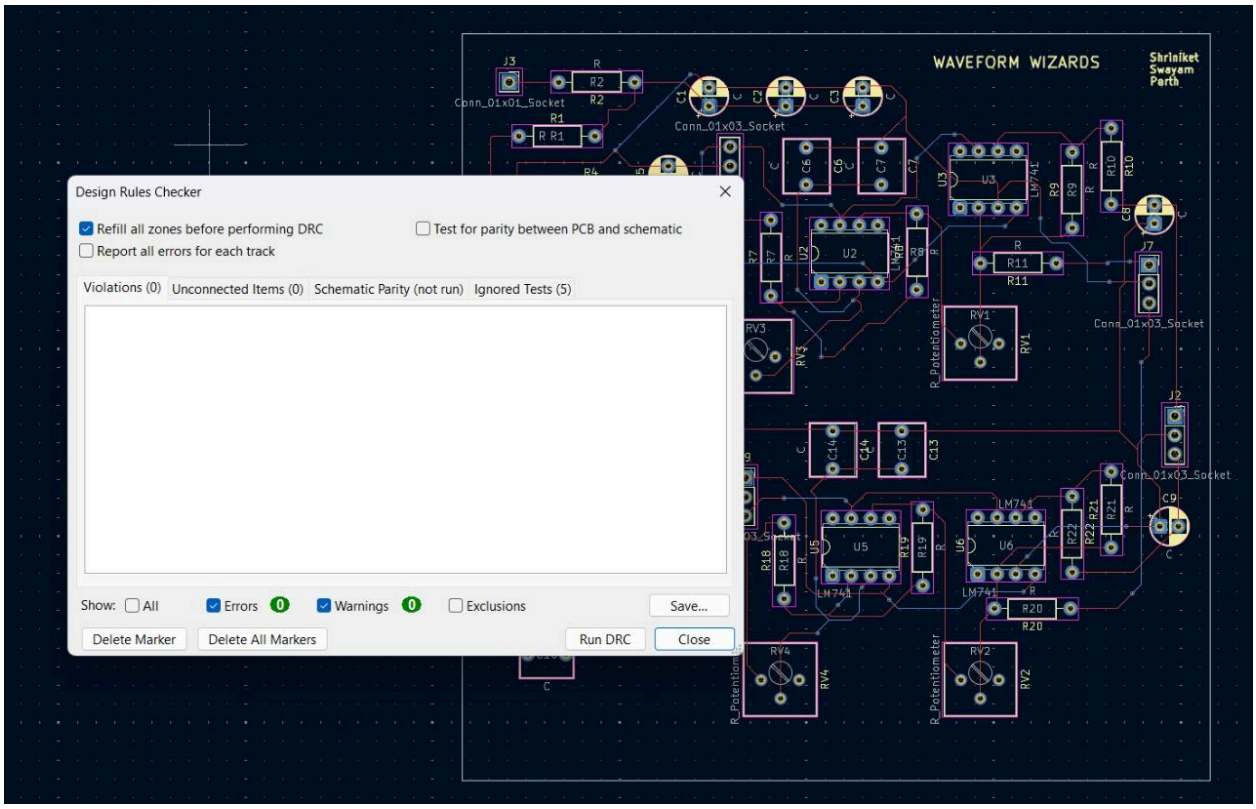
Using the OSHPark board settings in the PCB Editor, the PCB was designed



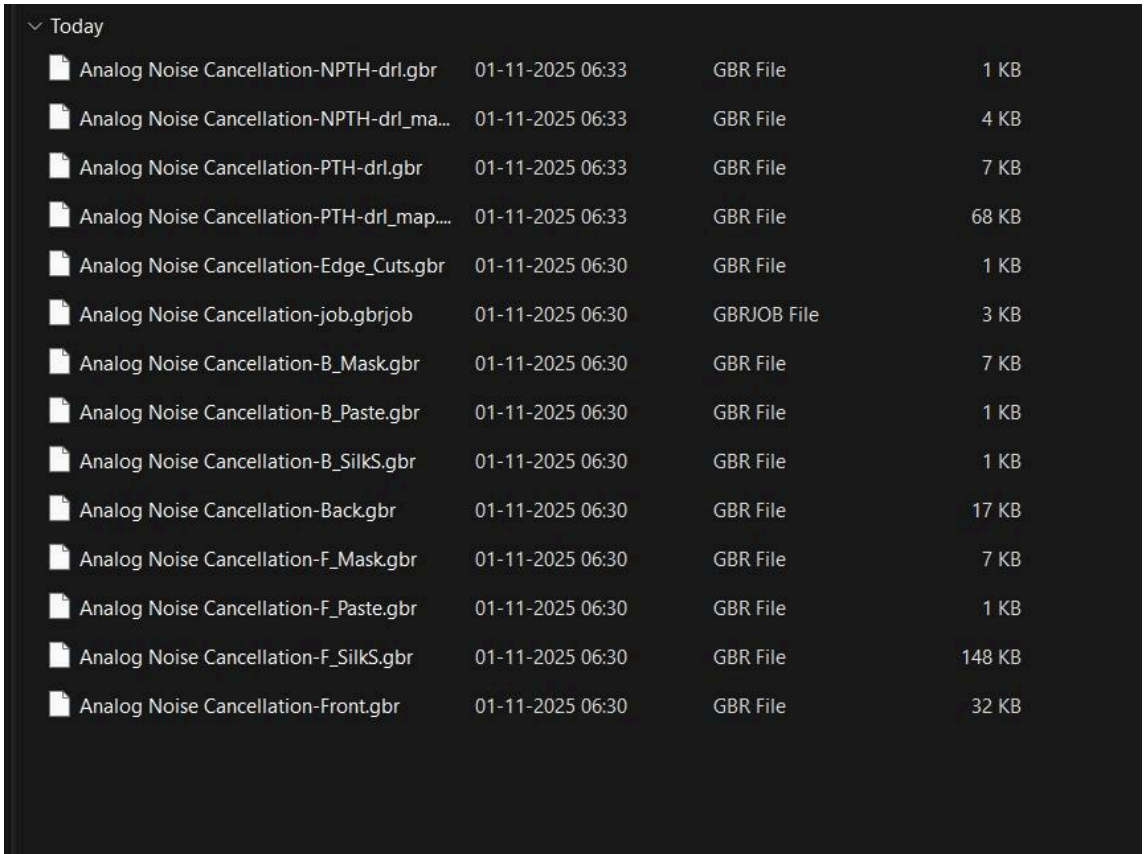
3D Schematic of PCB



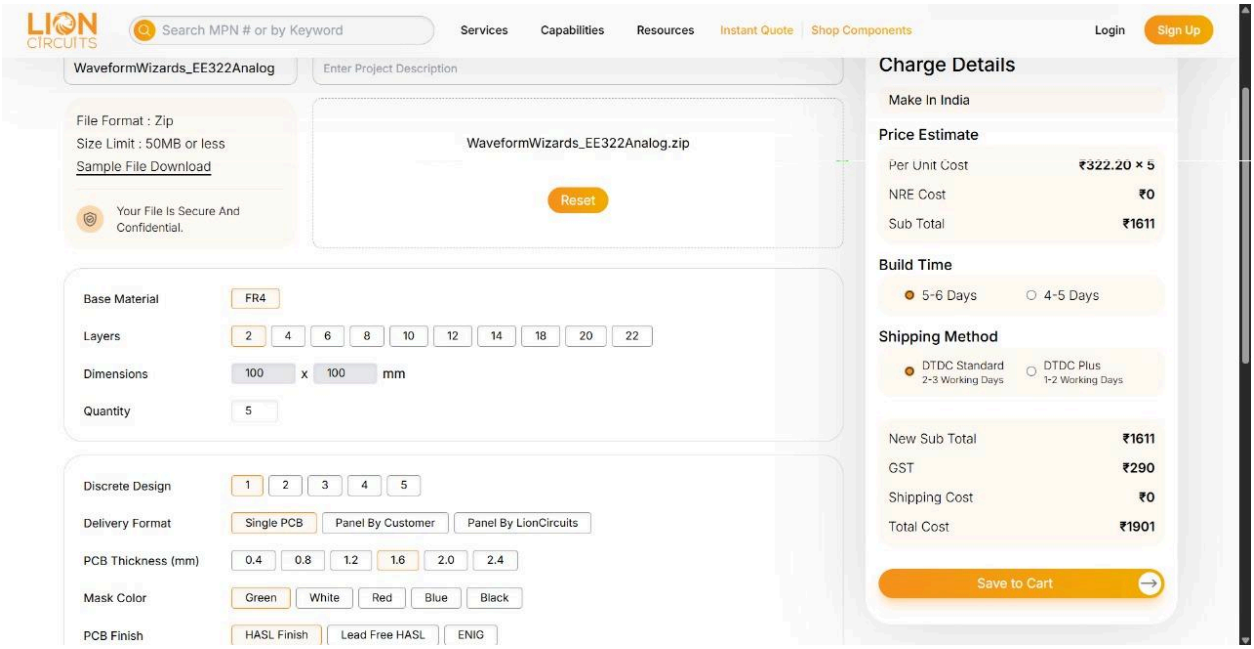
Design Rules Checker was also run and below image shows that there were no errors in the designs



GERBER Files were generated and converted to ZIP



The ZIP File was uploaded on LION CIRCUITS to see the quotation



One unit costs Rs. 322

(Our PCB contains both stereo right and left)