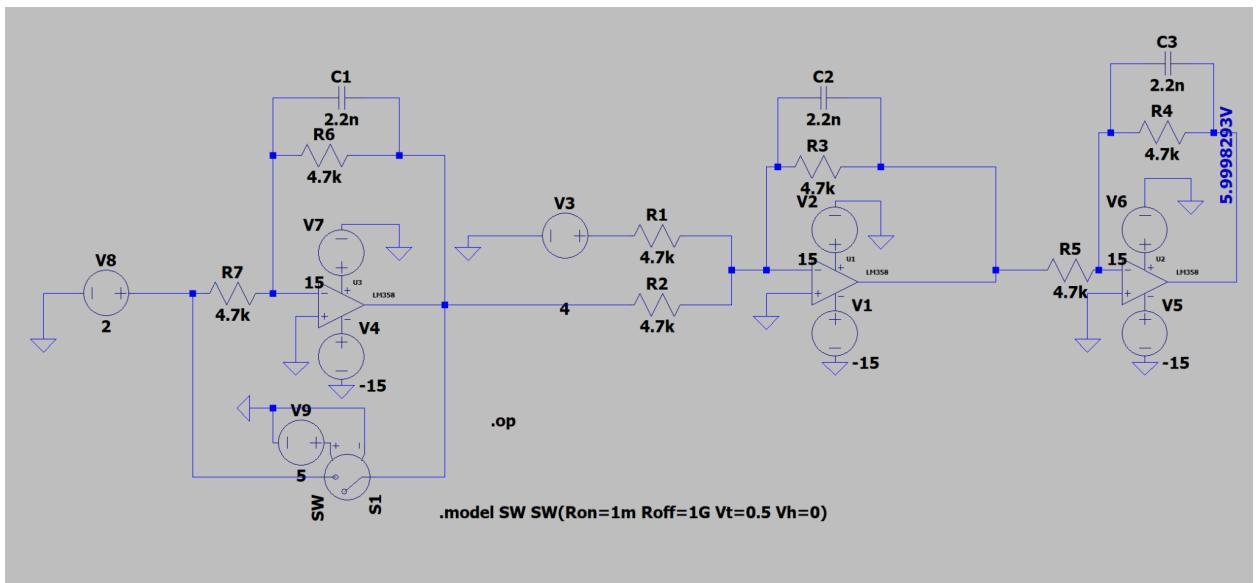


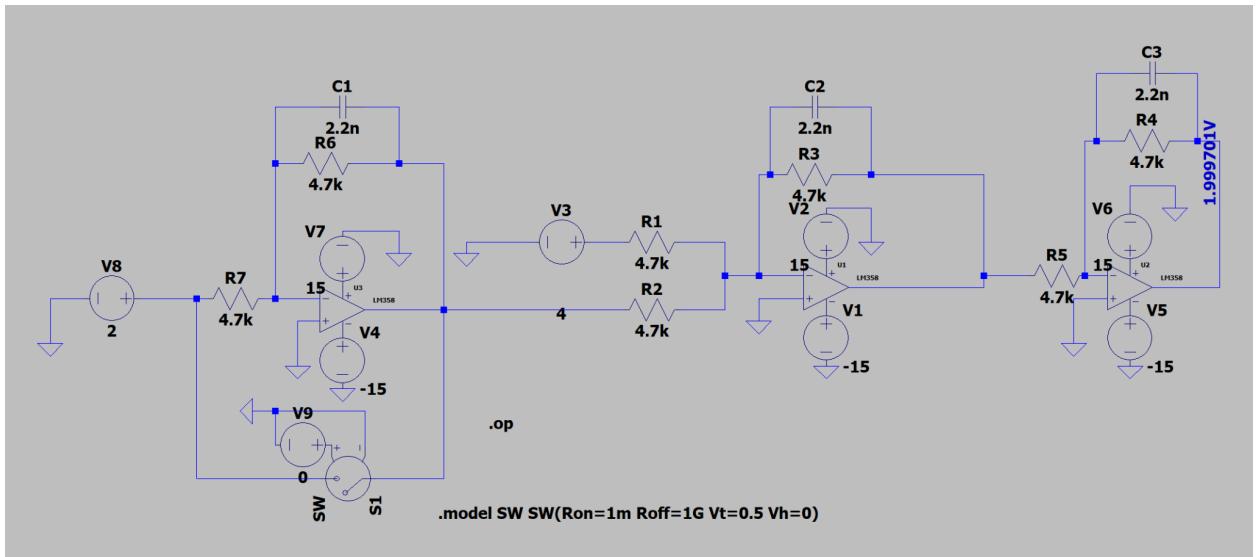
Analog Calculator

LT SPICE CIRCUIT & SIMULATION

1. ADDER/SUBTRACTOR

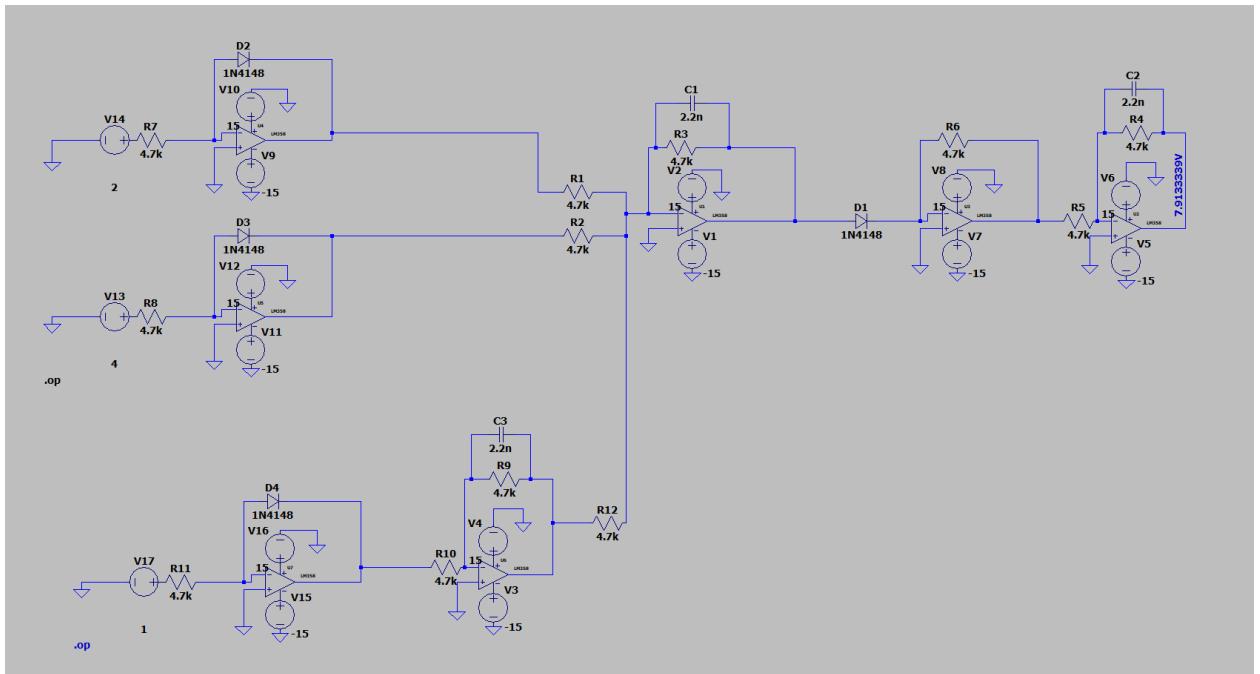


$$4+2=5.99$$

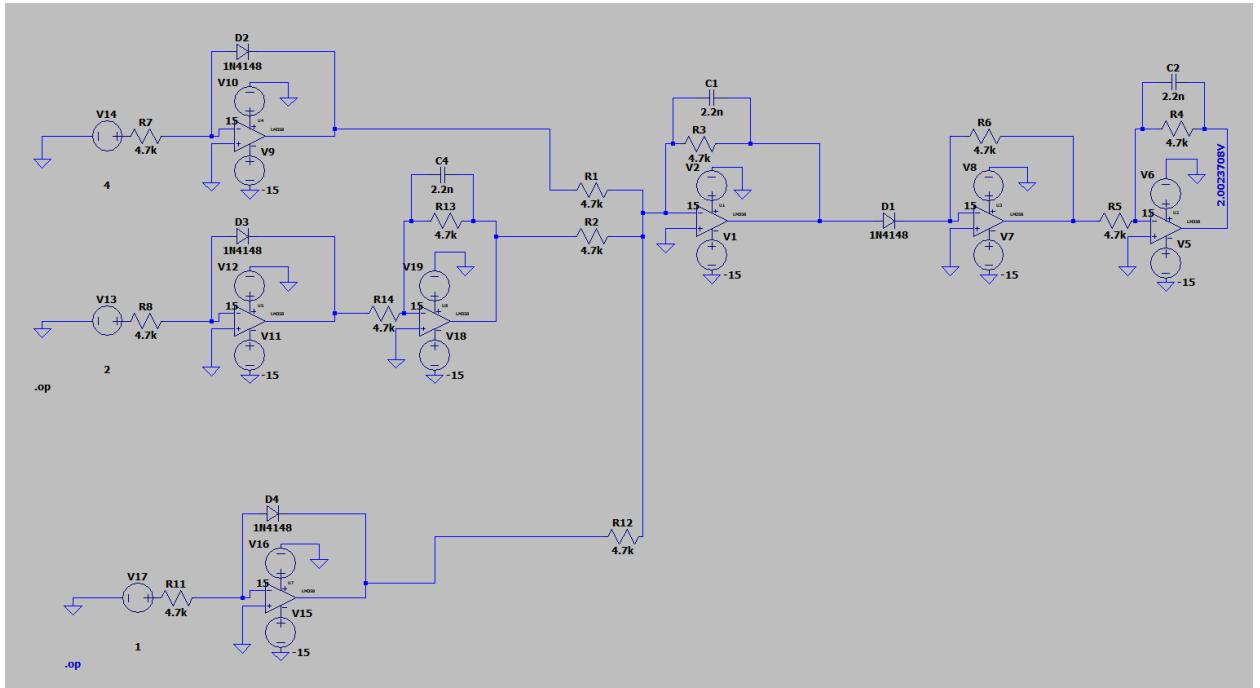


$$4-2=1.99$$

2. MULTIPLIER/DIVIDER

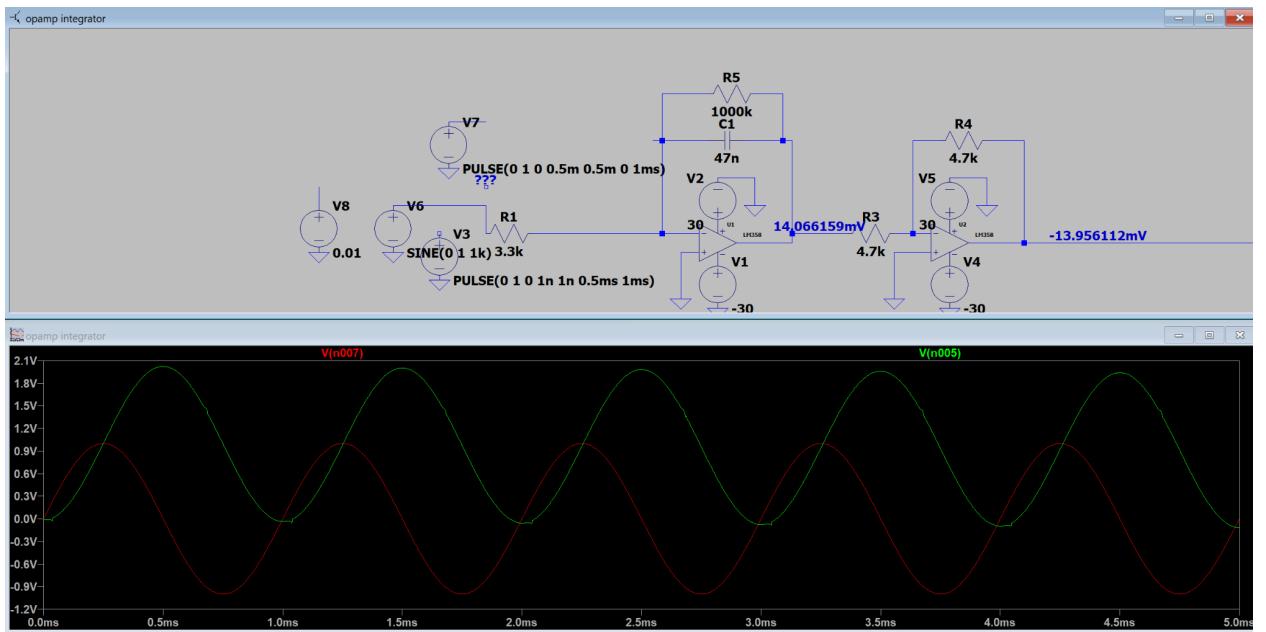


$$2*4=7.91 \text{ NOTE } 1V \text{ IS TAKEN AS REFERENCE}$$

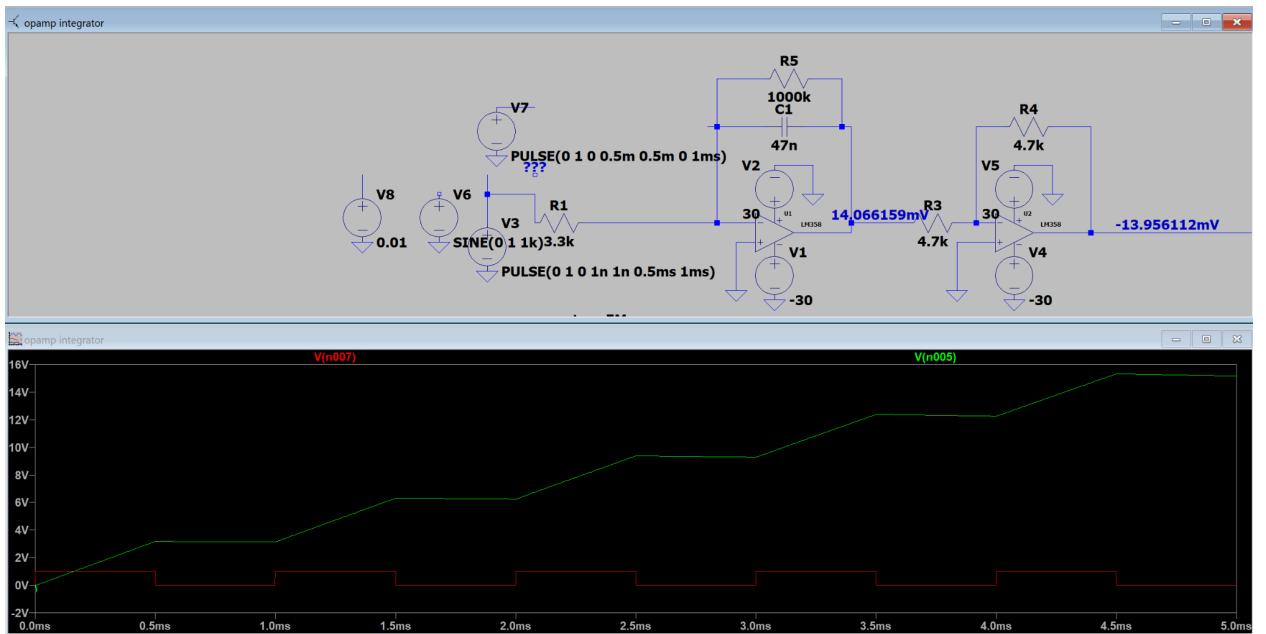


$$4/2=2 \text{ NOTE } 1V \text{ IS TAKEN AS REFERENCE}$$

3. INTEGRATOR

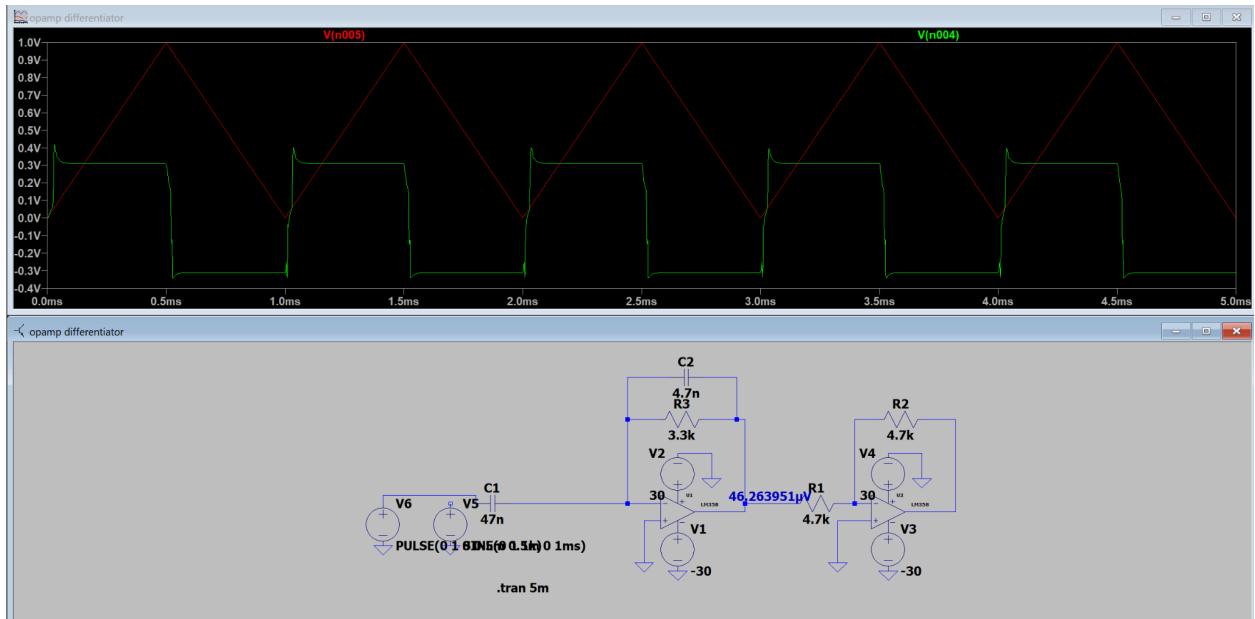


INTEGRATION OF $\sin x = -\cos x$

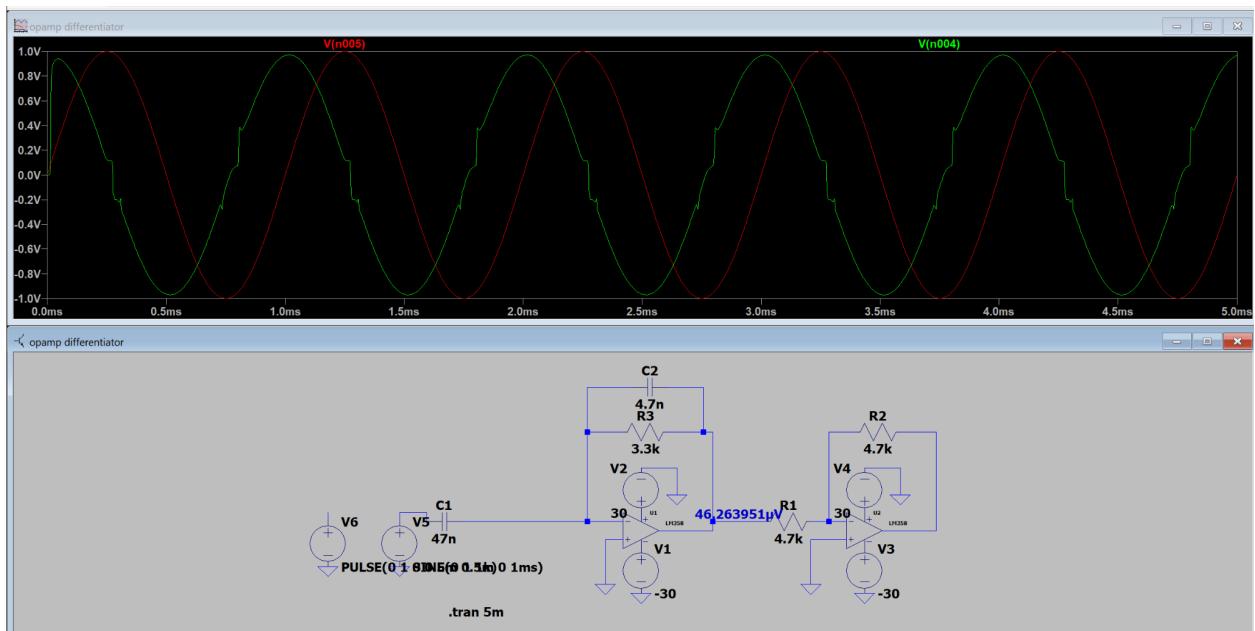


INTEGRATION OF SQUARE WAVE = CONSTANT INCREASE FUNCTION

4. DIFFERENTIATOR

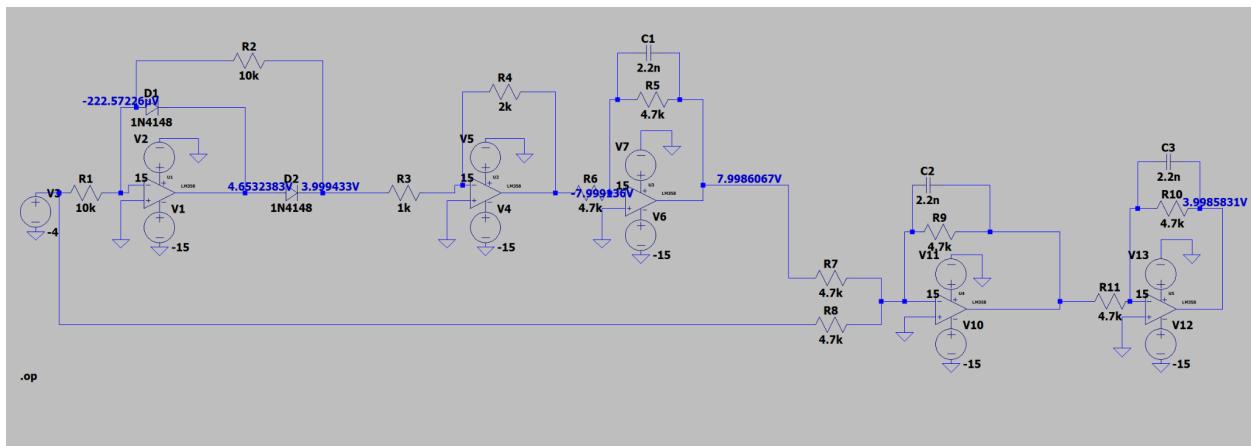


DIFFERENTIATION OF TRIANGLE WAVE = SQUARE WAVE

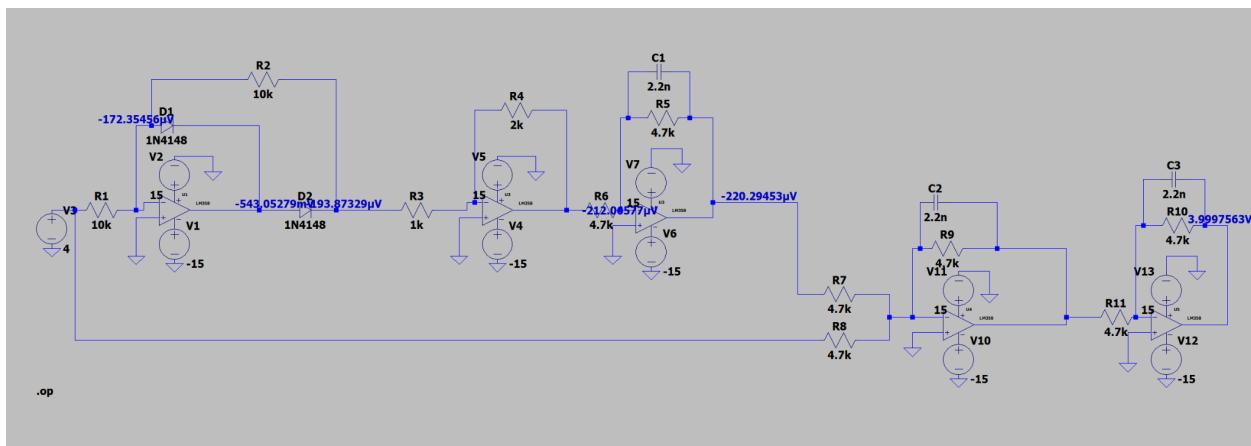


DIFFERENTIATION OF SINX = COSX

5. MODE

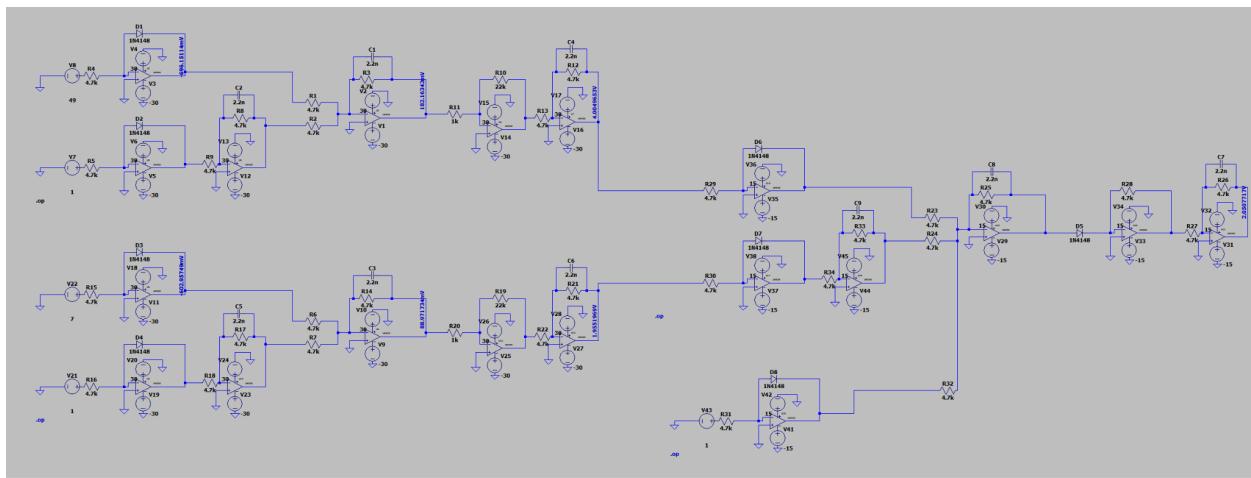


MODE OF -4 = 3.99



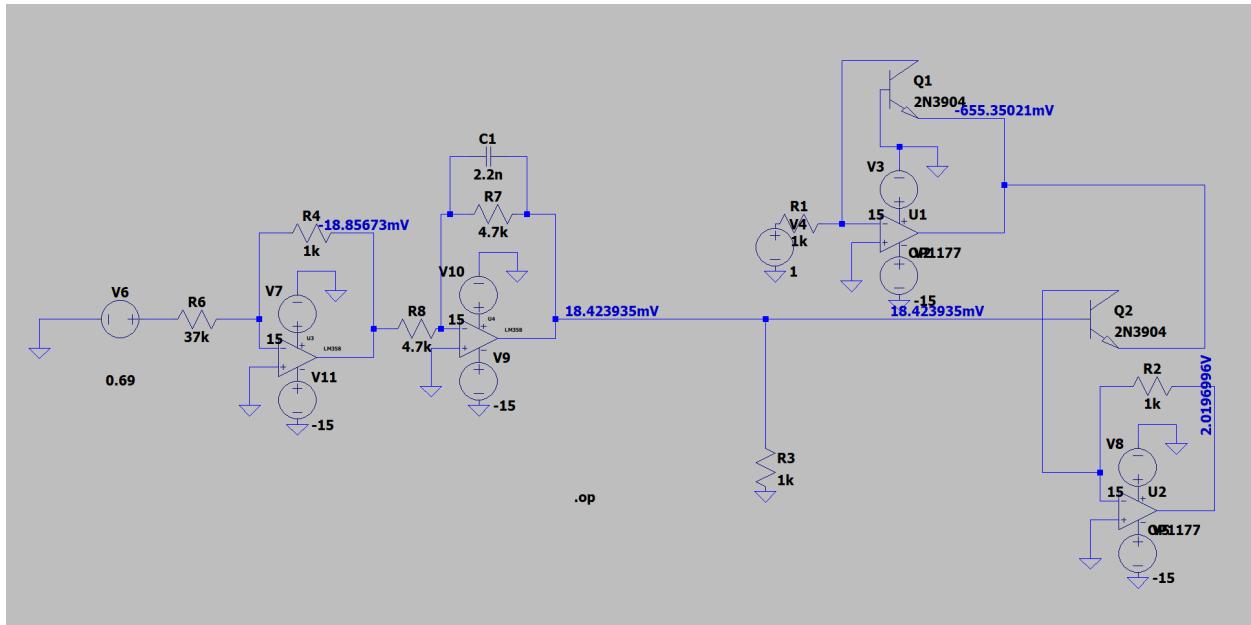
MODE OF 4 = 3.99

6. LOG



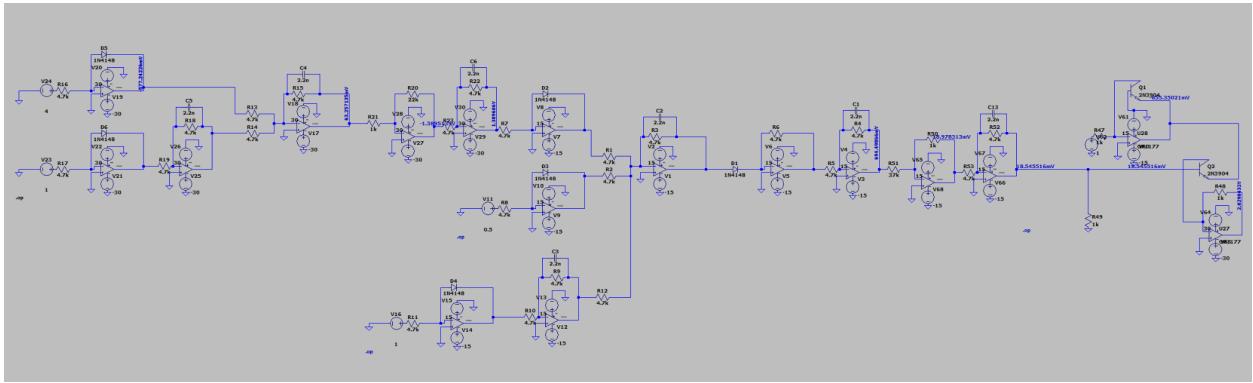
LOG 7 BASE 49 = 2.05 NOTE 1 IS TAKEN AS REFERENCE

7. ANTI LOG

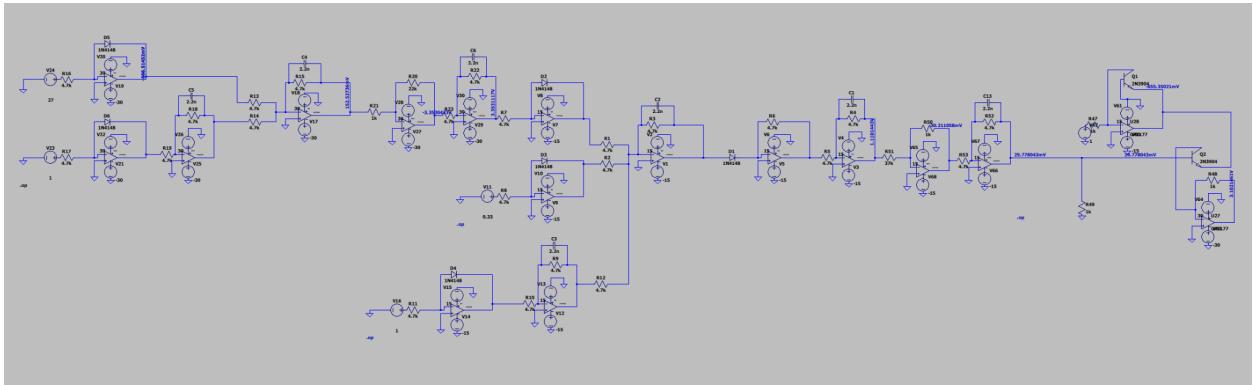


ANTILOG OF 0.69 (LN2) = 2.01

8. ANY ROOT

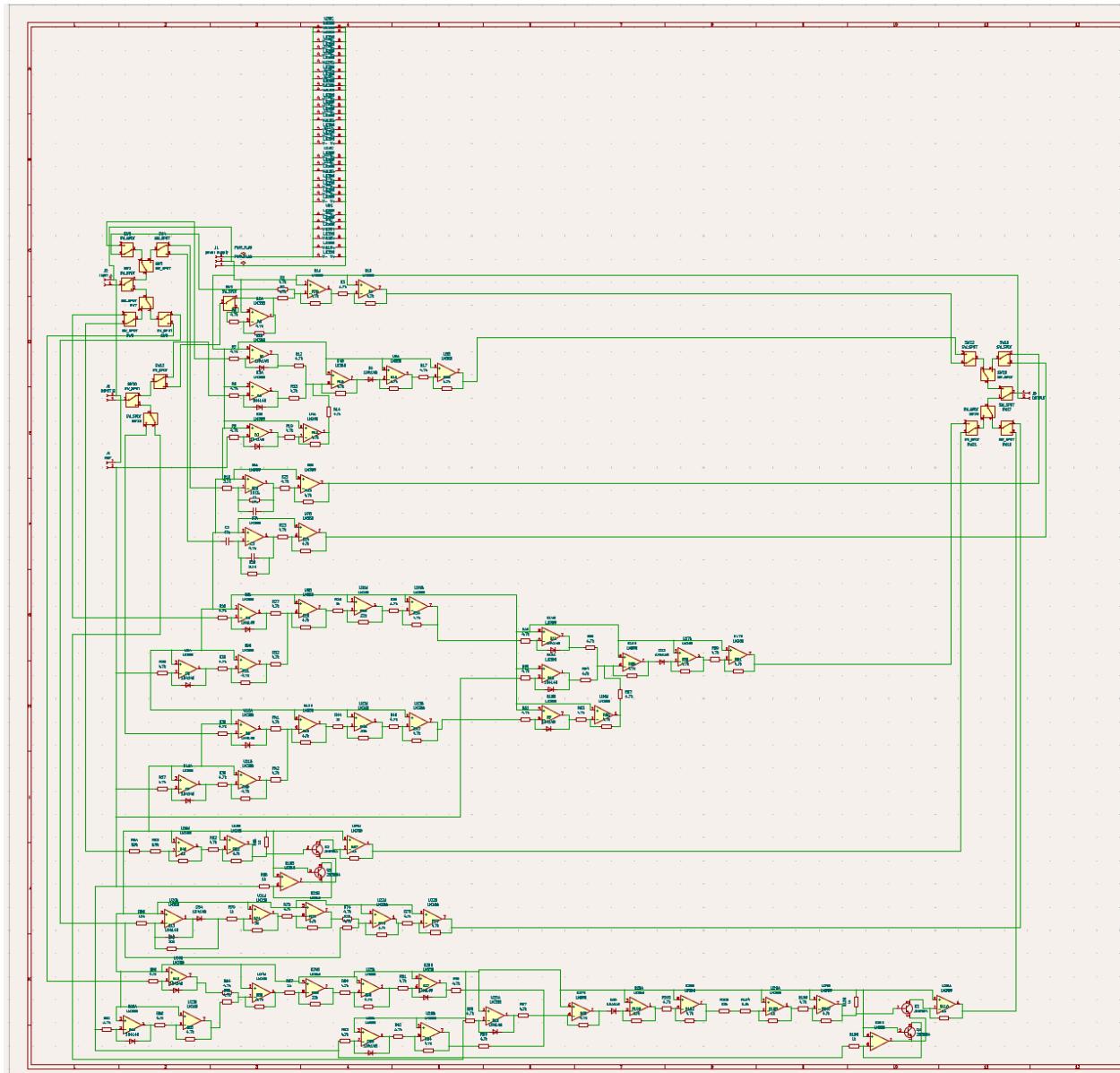


SQUARE ROOT OF 4 = 2.02



CUBE ROOT OF 27 = 3.1

1. SCHEMATIC DESIGN:



2. FOOTPRINT ASSIGNMENTS:

Symbol : Footprint Assignments	
1	C1 -
2	C2 -
3	C3 -
4	D1 -
5	D2 -
6	D3 -
7	D4 -
8	D5 -
9	D6 -
10	D7 -
11	D8 -
12	D9 -
13	D10 -
14	D11 -
15	D12 -
16	D13 -
17	D14 -
18	D15 -
19	D16 -
20	D17 -
21	D18 -
22	D19 -
23	D20 -
24	J1 - power supply
25	J2 - input A
26	J3 - INPUT B
27	J4 - REF
28	J5 - OUTPUT
29	Q1 - 2N3904
30	Q2 - 2N3904
31	Q3 - 2N3904
32	Q4 - 2N3904
33	R1 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
34	R2 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
35	R3 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
36	R4 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
37	R5 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
38	R6 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
39	R7 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
40	R8 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
41	R9 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
42	R10 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
43	R11 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
44	R12 - 4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder

Symbol : Footprint Assignments

43	R11 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
44	R12 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
45	R13 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
46	R14 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
47	R15 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
48	R16 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
49	R17 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
50	R18 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
51	R19 -	3.3K : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
52	R20 -	1MEG : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
53	R21 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
54	R22 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
55	R23 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
56	R24 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
57	R25 -	3.3K : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
58	R26 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
59	R27 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
60	R28 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
61	R29 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
62	R30 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
63	R31 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
64	R32 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
65	R33 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
66	R34 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
67	R35 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
68	R36 -	22k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
69	R37 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
70	R38 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
71	R39 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
72	R40 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
73	R41 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
74	R42 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
75	R43 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
76	R44 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
77	R45 -	22k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
78	R46 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
79	R47 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
80	R48 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
81	R49 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
82	R50 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
83	R51 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
84	R52 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
85	R53 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
86	R54 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder

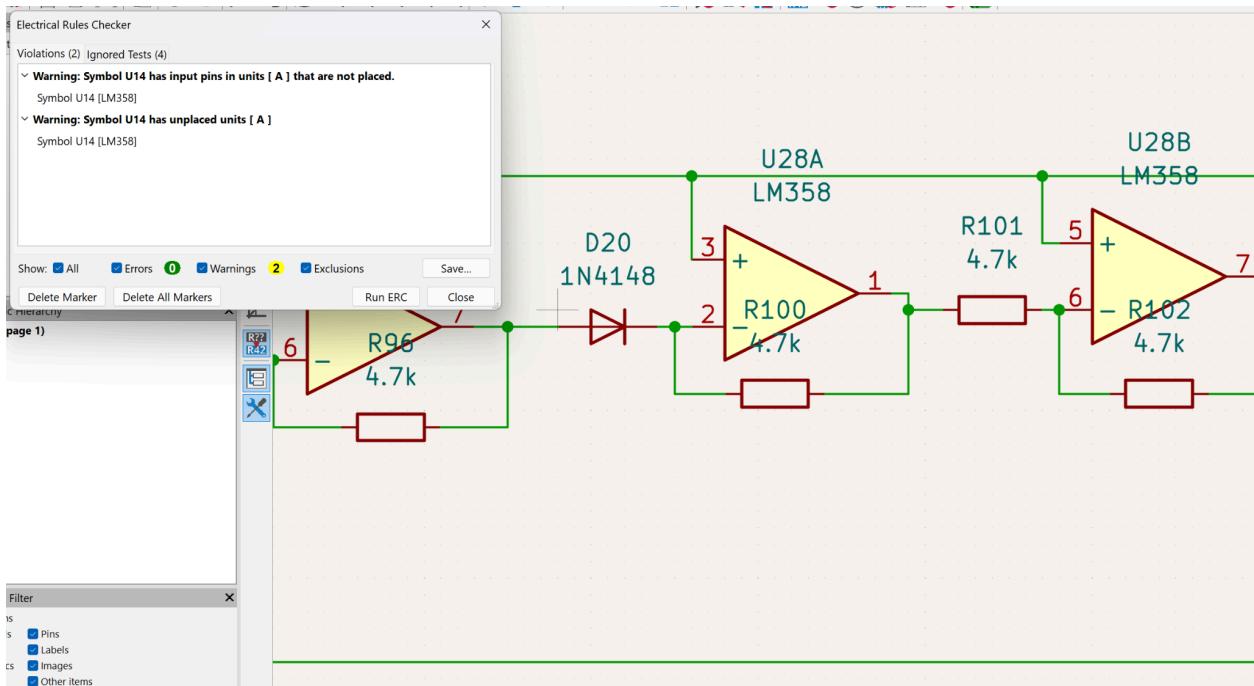
Symbol : Footprint Assignments

85	R53 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
86	R54 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
87	R55 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
88	R56 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
89	R57 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
90	R58 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
91	R59 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
92	R60 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
93	R61 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
94	R62 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
95	R63 -	3.9k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
96	R64 -	33k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
97	R65 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
98	R66 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
99	R67 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
100	R68 -	10k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
101	R69 -	10k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
102	R70 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
103	R71 -	2k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
104	R72 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
105	R73 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
106	R74 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
107	R75 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
108	R76 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
109	R77 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
110	R78 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
111	R79 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
112	R80 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
113	R81 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
114	R82 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
115	R83 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
116	R84 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
117	R85 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
118	R86 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
119	R87 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
120	R88 -	22k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
121	R89 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
122	R90 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
123	R91 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
124	R92 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
125	R93 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
126	R94 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
127	R95 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
128	R96 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder

Symbol : Footprint Assignments

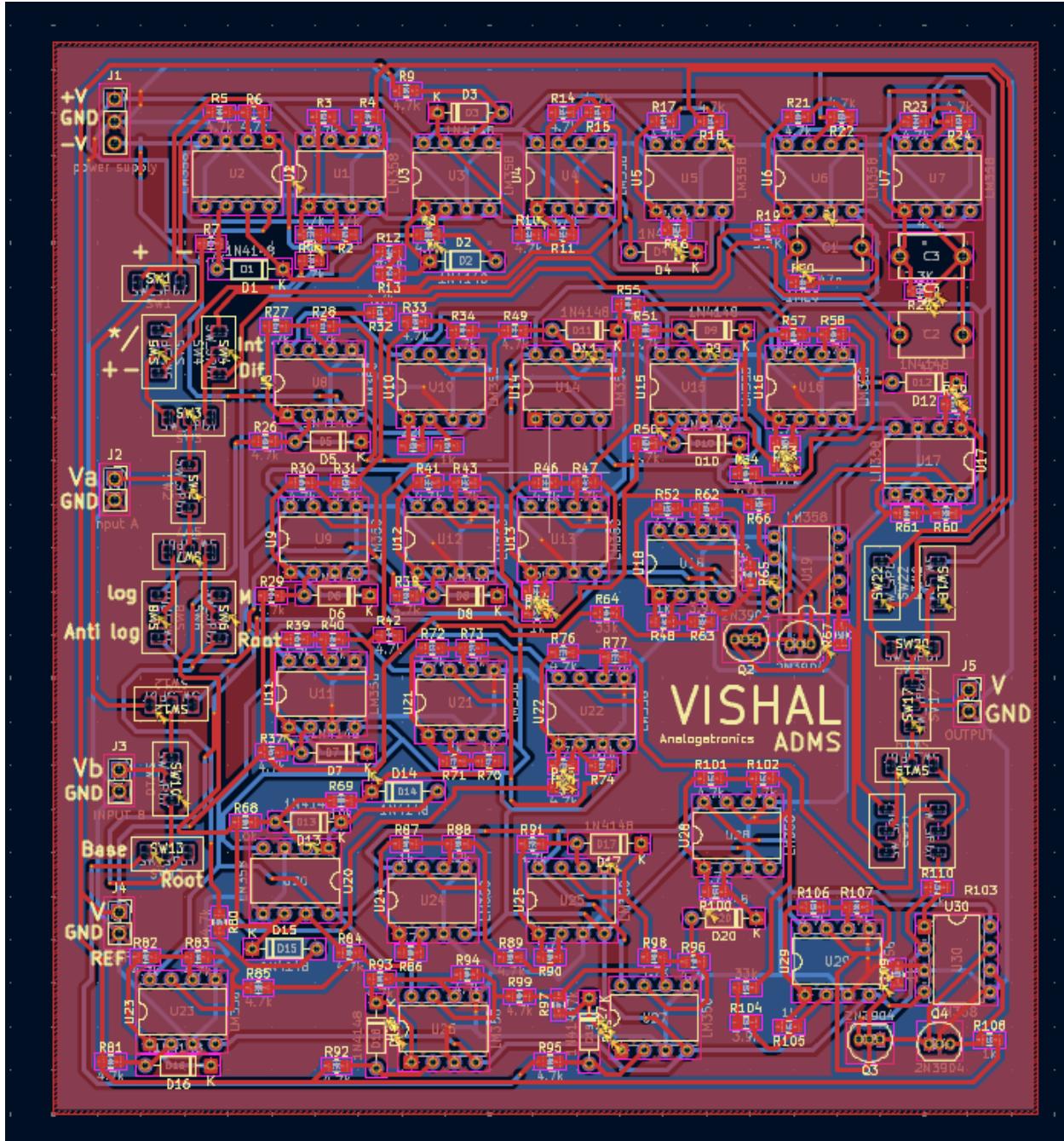
127	R95 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
128	R96 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
129	R97 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
130	R98 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
131	R99 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
132	R100 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
133	R101 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
134	R102 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
135	R103 -	33k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
136	R104 -	3.9k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
137	R105 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
138	R106 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
139	R107 -	4.7k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
140	R108 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
141	R109 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
142	R110 -	1k : Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
143	SW1 -	SW_SPDT : custom_Library_footprint:spdt
144	SW2 -	SW_SPDT : custom_Library_footprint:spdt
145	SW3 -	SW_SPDT : custom_Library_footprint:spdt
146	SW4 -	SW_SPDT : custom_Library_footprint:spdt
147	SW5 -	SW_SPDT : custom_Library_footprint:spdt
148	SW6 -	SW_SPDT : custom_Library_footprint:spdt
149	SW7 -	SW_SPDT : custom_Library_footprint:spdt
150	SW8 -	SW_SPDT : custom_Library_footprint:spdt
151	SW10 -	SW_SPDT : custom_Library_footprint:spdt
152	SW12 -	SW_SPDT : custom_Library_footprint:spdt
153	SW13 -	SW_SPDT : custom_Library_footprint:spdt
154	SW16 -	SW_SPDT : custom_Library_footprint:spdt
155	SW17 -	SW_SPDT : custom_Library_footprint:spdt
156	SW18 -	SW_SPDT : custom_Library_footprint:spdt
157	SW19 -	SW_SPDT : custom_Library_footprint:spdt
158	SW20 -	SW_SPDT : custom_Library_footprint:spdt
159	SW21 -	SW_SPDT : custom_Library_footprint:spdt
160	SW22 -	SW_SPDT : custom_Library_footprint:spdt
161	U1 -	LM358 : Package_DIP:DIP-8_W7.62mm
162	U2 -	LM358 : Package_DIP:DIP-8_W7.62mm
163	U3 -	LM358 : Package_DIP:DIP-8_W7.62mm
164	U4 -	LM358 : Package_DIP:DIP-8_W7.62mm
165	U5 -	LM358 : Package_DIP:DIP-8_W7.62mm
166	U6 -	LM358 : Package_DIP:DIP-8_W7.62mm
167	U7 -	LM358 : Package_DIP:DIP-8_W7.62mm
168	U8 -	LM358 : Package_DIP:DIP-8_W7.62mm
169	U9 -	LM358 : Package_DIP:DIP-8_W7.62mm
170	U10 -	LM358 : Package_DIP:DIP-8_W7.62mm
171	U11 -	LM358 : Package_DIP:DIP-8_W7.62mm
172	U12 -	LM358 : Package_DIP:DIP-8_W7.62mm
173	U13 -	LM358 : Package_DIP:DIP-8_W7.62mm
174	U14 -	LM358 : Package_DIP:DIP-8_W7.62mm
175	U15 -	LM358 : Package_DIP:DIP-8_W7.62mm
176	U16 -	LM358 : Package_DIP:DIP-8_W7.62mm
177	U17 -	LM358 : Package_DIP:DIP-8_W7.62mm
178	U18 -	LM358 : Package_DIP:DIP-8_W7.62mm
179	U19 -	LM358 : Package_DIP:DIP-8_W7.62mm
180	U20 -	LM358 : Package_DIP:DIP-8_W7.62mm
181	U21 -	LM358 : Package_DIP:DIP-8_W7.62mm
182	U22 -	LM358 : Package_DIP:DIP-8_W7.62mm
183	U23 -	LM358 : Package_DIP:DIP-8_W7.62mm
184	U24 -	LM358 : Package_DIP:DIP-8_W7.62mm
185	U25 -	LM358 : Package_DIP:DIP-8_W7.62mm
186	U26 -	LM358 : Package_DIP:DIP-8_W7.62mm
187	U27 -	LM358 : Package_DIP:DIP-8_W7.62mm
188	U28 -	LM358 : Package_DIP:DIP-8_W7.62mm
189	U29 -	LM358 : Package_DIP:DIP-8_W7.62mm
190	U30 -	LM358 : Package_DIP:DIP-8_W7.62mm

3. Electrical Rules Checker

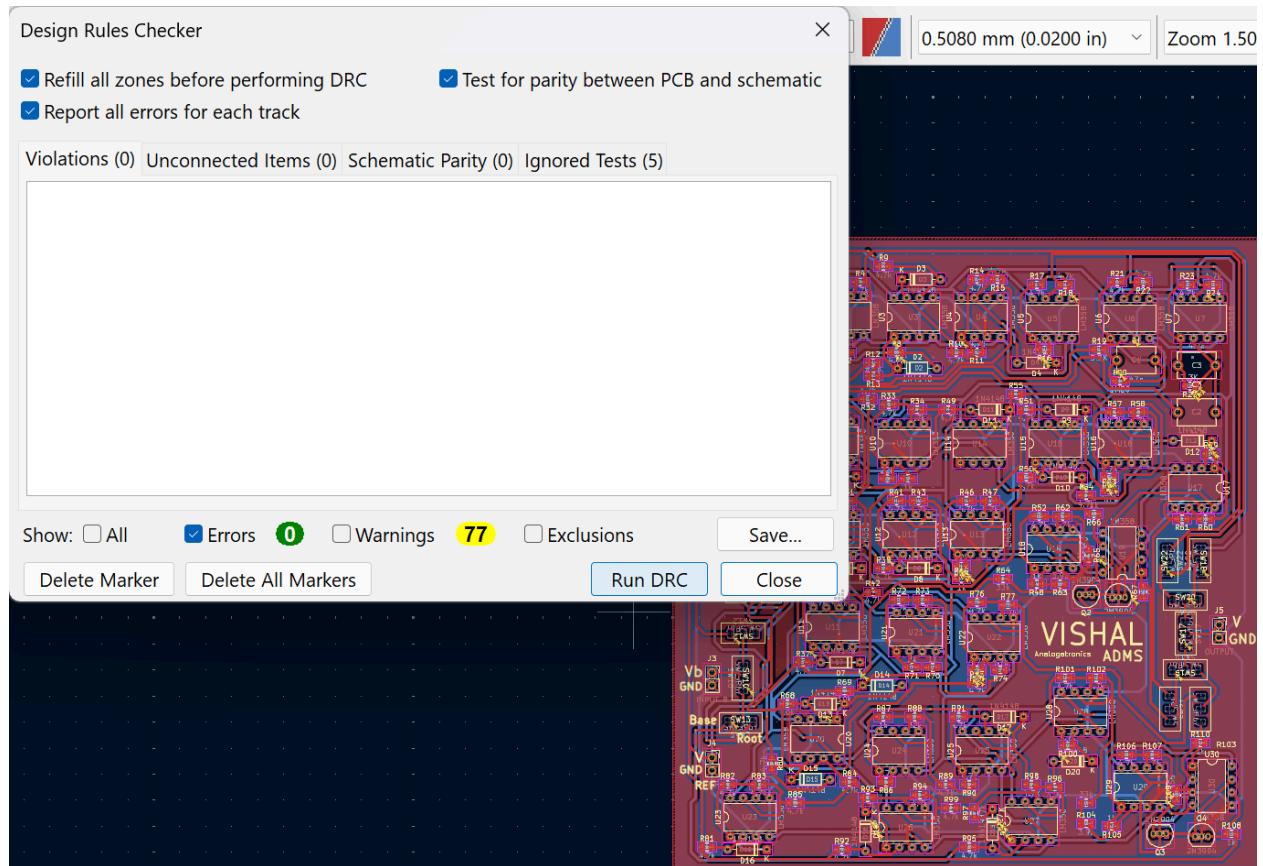


Note: The warning is due to an unplaced component; it is not an error as the number of opamps used is odd, and I have used dual opamp IC LM358, so one opamp is left unused.

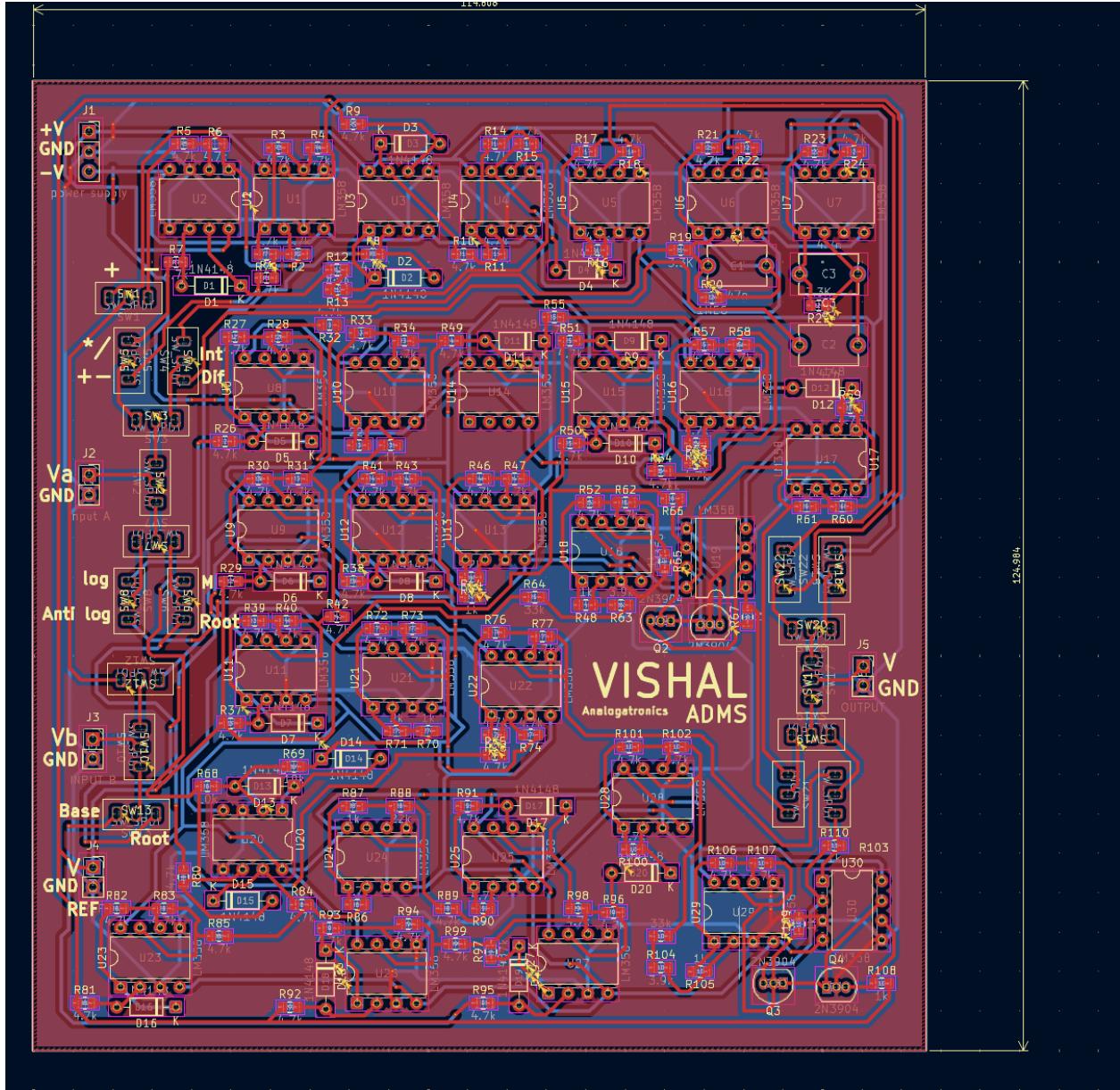
4. Layout Screenshot



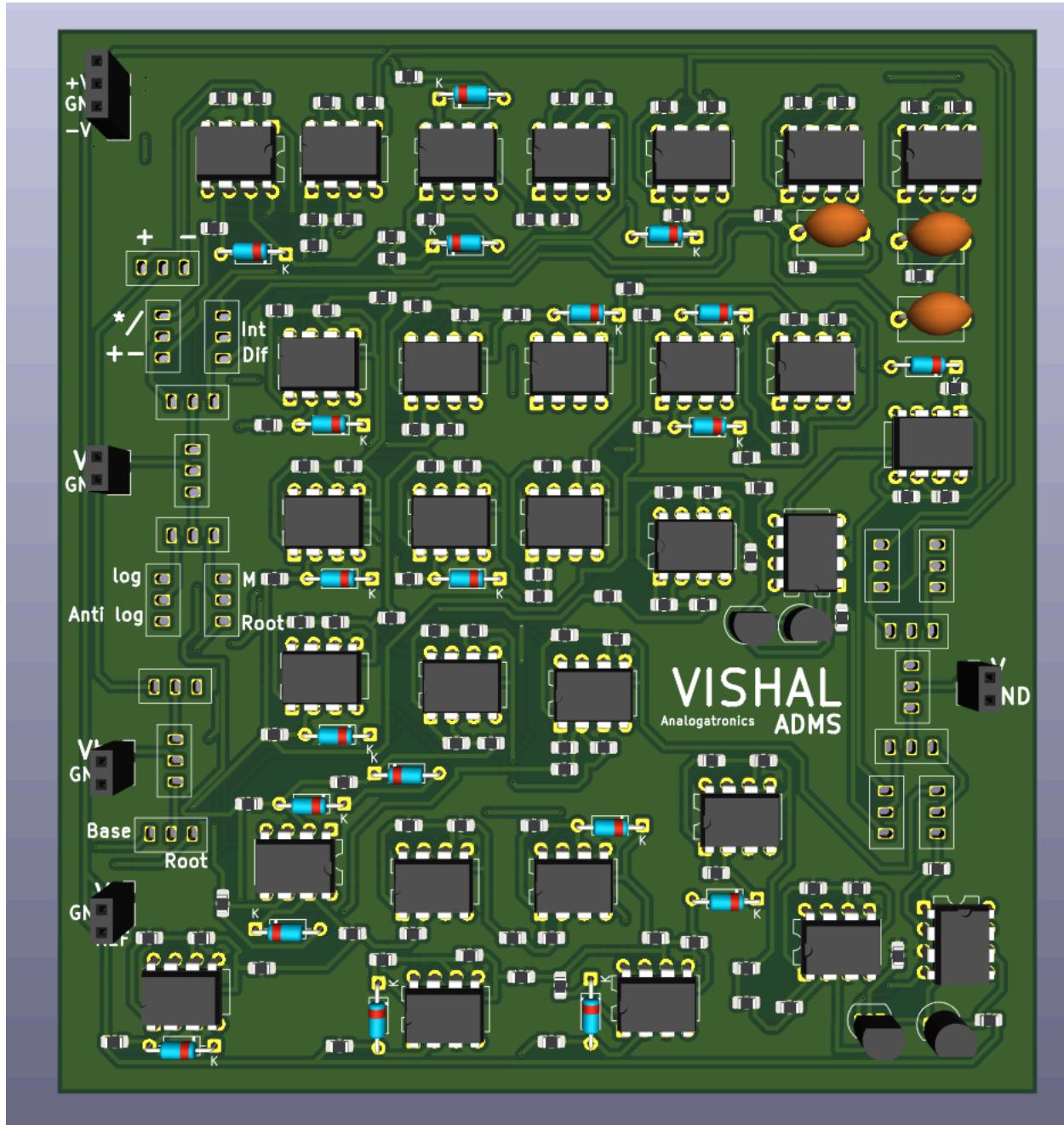
5. DRC report list



6. The size of layout 11.5CM*12.5CM



7. Screenshot of 3D rendering of designed PCB



8. Screenshot of the list of the Generate Gerber Files (including drill files)

Name	Type	Compressed size	Password ...	Size	Ratio	Date modified
analog calc-B_Mask.gbr	GBR File	3 KB	No	15 KB	80%	02-11-2025 18:42
analog calc-B_Paste.gbr	GBR File	1 KB	No	1 KB	32%	02-11-2025 18:42
analog calc-B_SilkS.gbr	GBR File	1 KB	No	1 KB	32%	02-11-2025 18:42
analog calc-Back.gbr	GBR File	161 KB	No	675 KB	77%	02-11-2025 18:42
analog calc-Edge_Cuts.gbr	GBR File	1 KB	No	1 KB	42%	02-11-2025 18:42
analog calc-F_Mask.gbr	GBR File	5 KB	No	23 KB	81%	02-11-2025 18:42
analog calc-F_Paste.gbr	GBR File	3 KB	No	10 KB	78%	02-11-2025 18:42
analog calc-F_SilkS.gbr	GBR File	63 KB	No	418 KB	86%	02-11-2025 18:42
analog calc-Front.gbr	GBR File	199 KB	No	793 KB	75%	02-11-2025 18:42
analog calc-NPTH.drl	DRL File	1 KB	No	1 KB	24%	02-11-2025 18:42
analog calc-PTH.drl	DRL File	3 KB	No	11 KB	74%	02-11-2025 18:42

9. Screenshot of the zip Gerber file uploaded on lioncircuits.com showing the price in INR for their standard 5 PCB service

Price : ₹2432

LION CIRCUITS

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vishal_adms_gerber files

Enter Project Description

Project Name can include alphanumeric, '-' and '_' only

File Format : Zip
Size Limit : 50MB or less
Sample File Download

Your File Is Secure And Confidential.

vishal_adms_gerber files.zip

Reset

Base Material: FR4

Layers: 2 4 6 8 10 12 14 18 20 22

Dimensions: 115 x 125 mm

Quantity: 5

Discrete Design: 1 2 3 4 5

Delivery Format: Single PCB Panel By Customer Panel By LionCircuits

PCB Thickness (mm): 0.4 0.8 1.2 1.6 2.0 2.4

Charge Details

Make In India

Price Estimate

Per Unit Cost	₹412.20 × 5
NRE Cost	₹0
Sub Total	₹2061

Build Time

5-6 Days 4-5 Days

Shipping Method

DTDC Standard 2-3 Working Days DTDC Plus 1-2 Working Days

New Sub Total	₹2061
GST	₹371
Shipping Cost	₹0
Total Cost	₹2432

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