

## EE 322: ANALOG & MIXED SIGNAL CIRCUITS

INDIAN INSTITUTE OF TECHNOLOGY, GANDHINAGAR



1st November, 2025

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# Project Report: PCB Design Submission

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Submitted by,

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## Schematic Diagram:

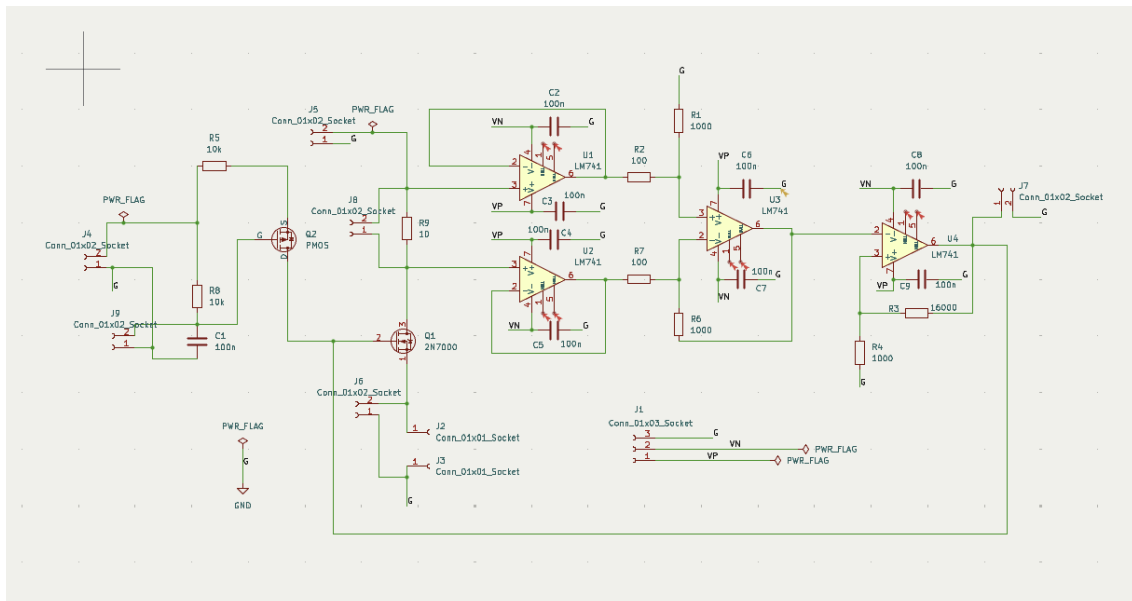


Figure 1 - Schematic Diagram of the Circuit

## Simulation:

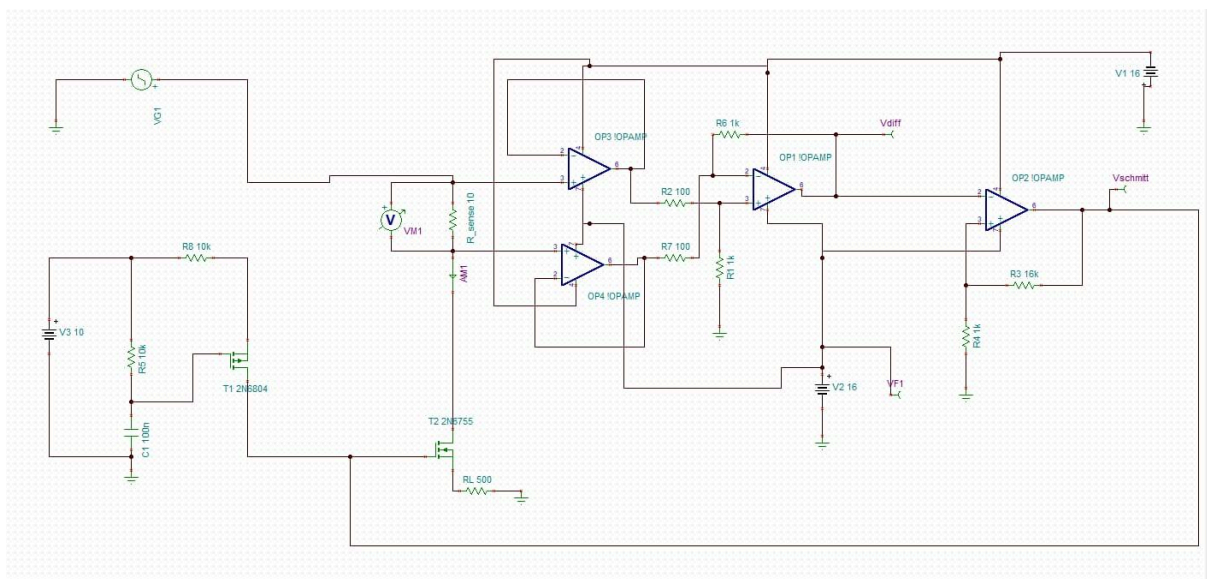


Figure 2 (a) - TINA Schematic

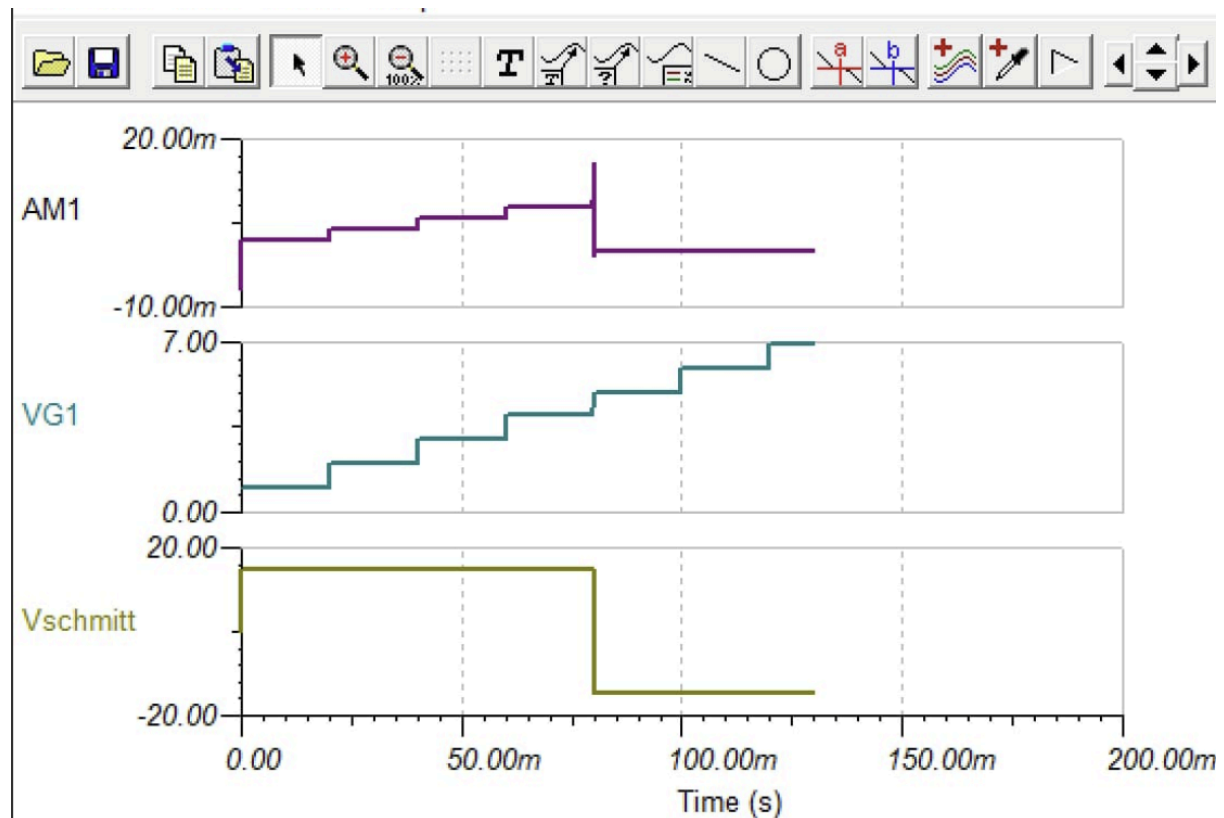


Fig 2 (b) - Simulation Results

## Footprints:

Symbol : Footprint Assignments		
1	C1 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
2	C2 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
3	C3 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
4	C4 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
5	C5 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
6	C6 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
7	C7 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
8	C8 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
9	C9 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
10	J1 - Conn_01x03_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x03_P2.54mm_Vertical
11	J2 - Conn_01x01_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x01_P2.54mm_Vertical
12	J3 - Conn_01x01_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x01_P2.54mm_Vertical
13	J4 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
14	J5 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
15	J6 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
16	J7 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
17	J8 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
18	J9 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Vertical
19	Q1 -	2N7000 : Package_TO_SOT_THT:TO-92_Inline
20	Q2 -	PMOS : Package_TO_SOT_THT:TO-39-3
21	R1 -	1000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
22	R2 -	100 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
23	R3 -	16000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
24	R4 -	1000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
25	R5 -	10k : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
26	R6 -	1000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
27	R7 -	100 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
28	R8 -	10k : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
29	R9 -	10 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
30	U1 -	LM741 : Package_DIP:DIP-8_W7.62mm

Figure 3 (a) - Footprint Assignment table

File Edit Preferences Help			
Footprint Filters:			
Footprint Libraries	Symbol : Footprint Assignments		
Audio_Module	5	C5 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
Battery	6	C6 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
Button_Switch_Keyboard	7	C7 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
Button_Switch_SMD	8	C8 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
Button_Switch_THT	9	C9 -	100n : Capacitor_THT:C_Disc_D7.5mm_W5.0mm_P7.50mm
Buzzer_Beeper	10	J1 - Conn_01x03_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x03_P2.54mm_Veritical
Calibration_Scale	11	J2 - Conn_01x01_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x01_P2.54mm_Veritical
Capacitor_SMD	12	J3 - Conn_01x01_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x01_P2.54mm_Veritical
Capacitor_Tantalum_SMD	13	J4 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Veritical
Capacitor_THT	14	J5 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Veritical
Connector	15	J6 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Veritical
Connector_AMASS	16	J7 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Veritical
Connector_Amphenol	17	J8 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Veritical
Connector_Audio	18	J9 - Conn_01x02_Socket	: Connector_PinSocket_2.54mm:PinSocket_1x02_P2.54mm_Veritical
Connector_BarrelJack	19	Q1 -	2N7000 : Package_TO_SOT_THT:TO-92_Inline
Connector_Card	20	Q2 -	PMOS : Package_TO_SOT_THT:TO-39-3
Connector_Coaxial	21	R1 -	1000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_DIN	22	R2 -	100 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_Dsub	23	R3 -	16000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_FFC-FPC	24	R4 -	1000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_Harting	25	R5 -	10k : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_Harwin	26	R6 -	1000 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_Hirose	27	R7 -	100 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_Hirose_FX8	28	R8 -	10k : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_IDC	29	R9 -	10 : Resistor_THT:R_Axial_DIN0309_L9.0mm_D3.2mm_P12.70mm_Horizontal
Connector_JAE	30	U1 -	LM741 : Package_DIP:DIP-8_W7.62mm
Connector_JAE_WP7B	31	U2 -	LM741 : Package_DIP:DIP-8_W7.62mm
Connector_JST	32	U3 -	LM741 : Package_DIP:DIP-8_W7.62mm
Connector_Molex	33	U4 -	LM741 : Package_DIP:DIP-8_W7.62mm
Filtered by Library: 14664 matching footprints			
Library location: unknown			
Apply, Save Schematic & Continue			OK Cancel

Figure 3 (b) – Footprint Assignment table

## Electrical Rules Checker:

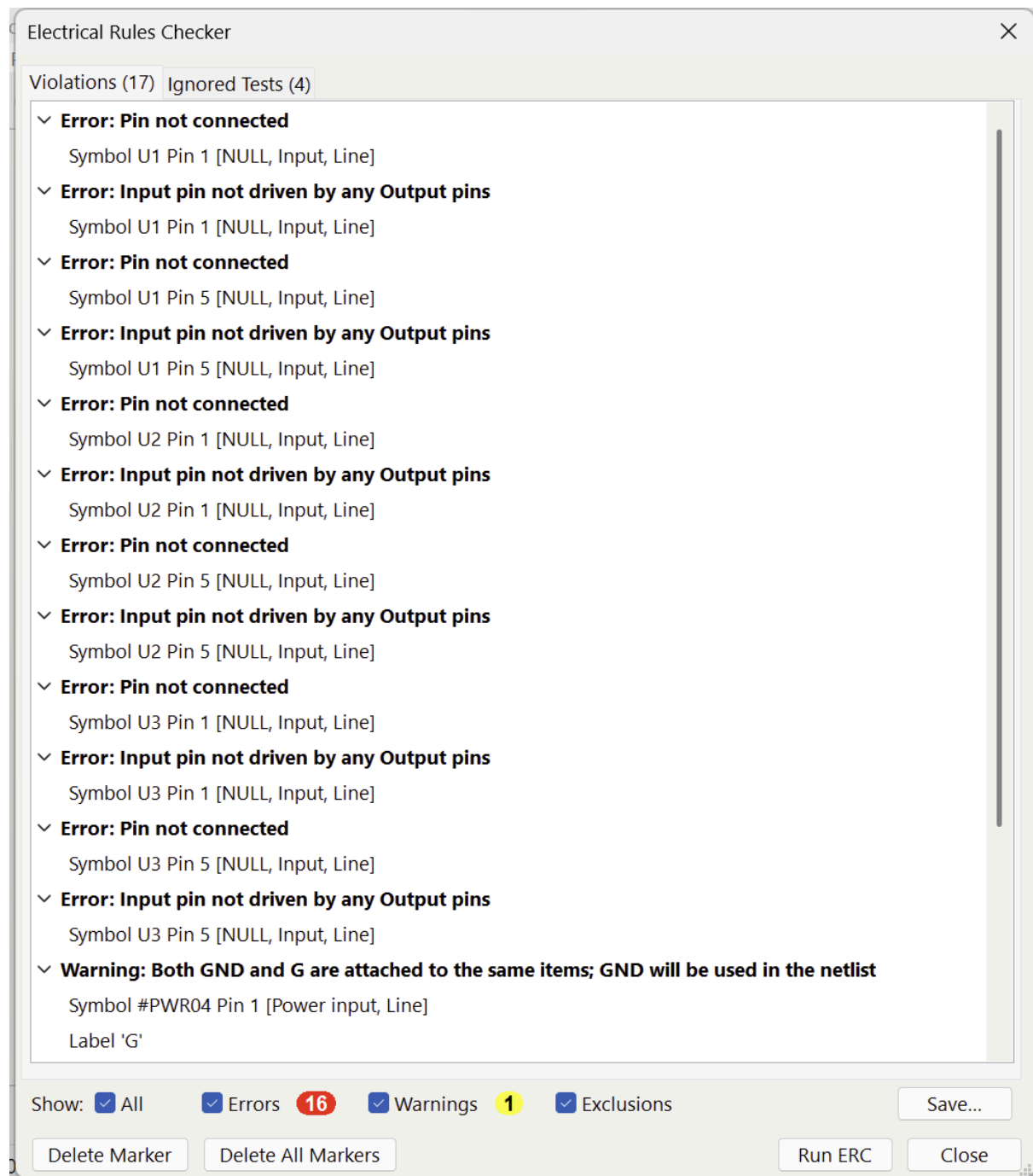
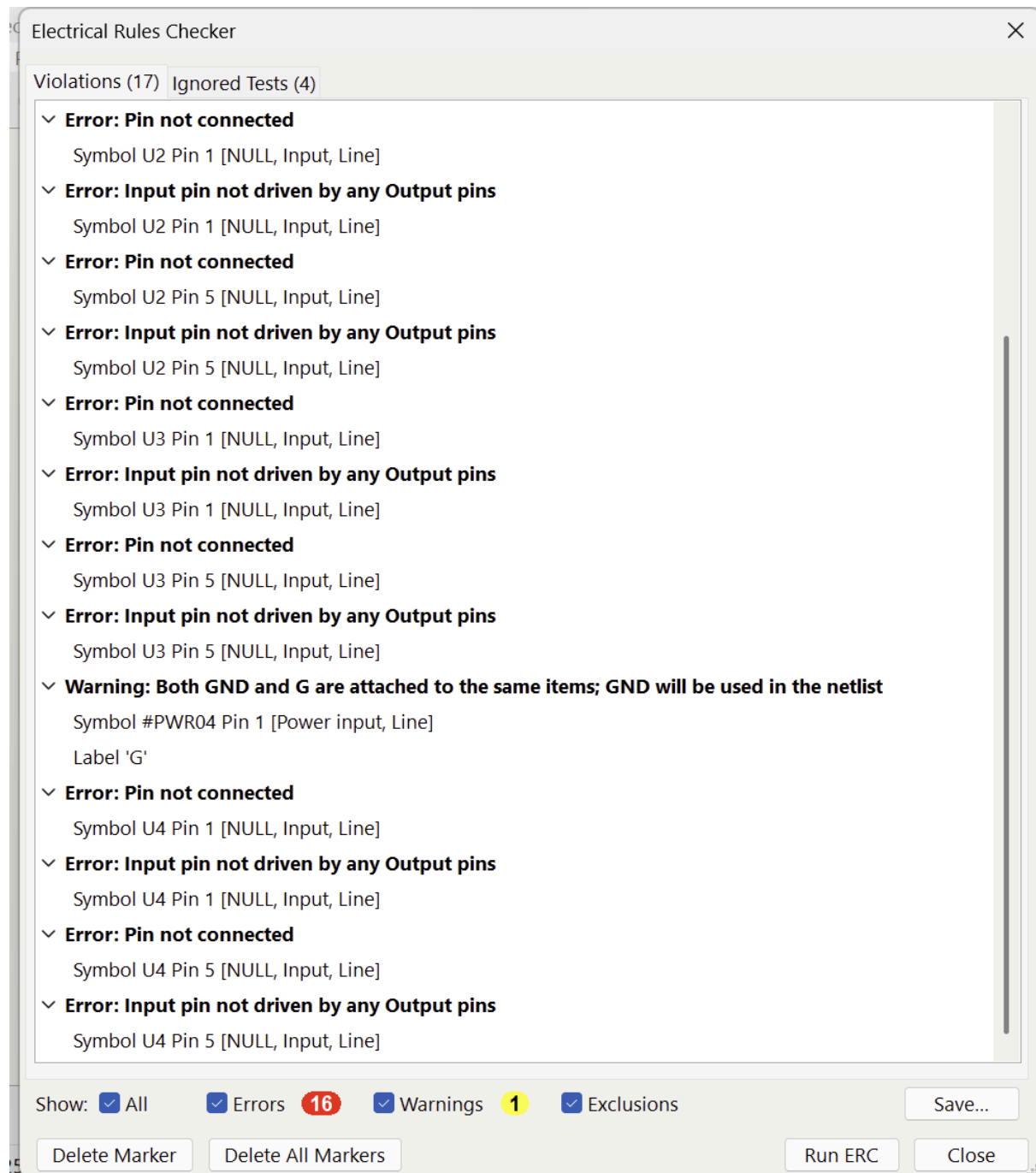


Figure 4 (a) - Electrical Rules Checker

*Figure 4 (b) - Electrical Rules Checker*

## Layout Screenshot:

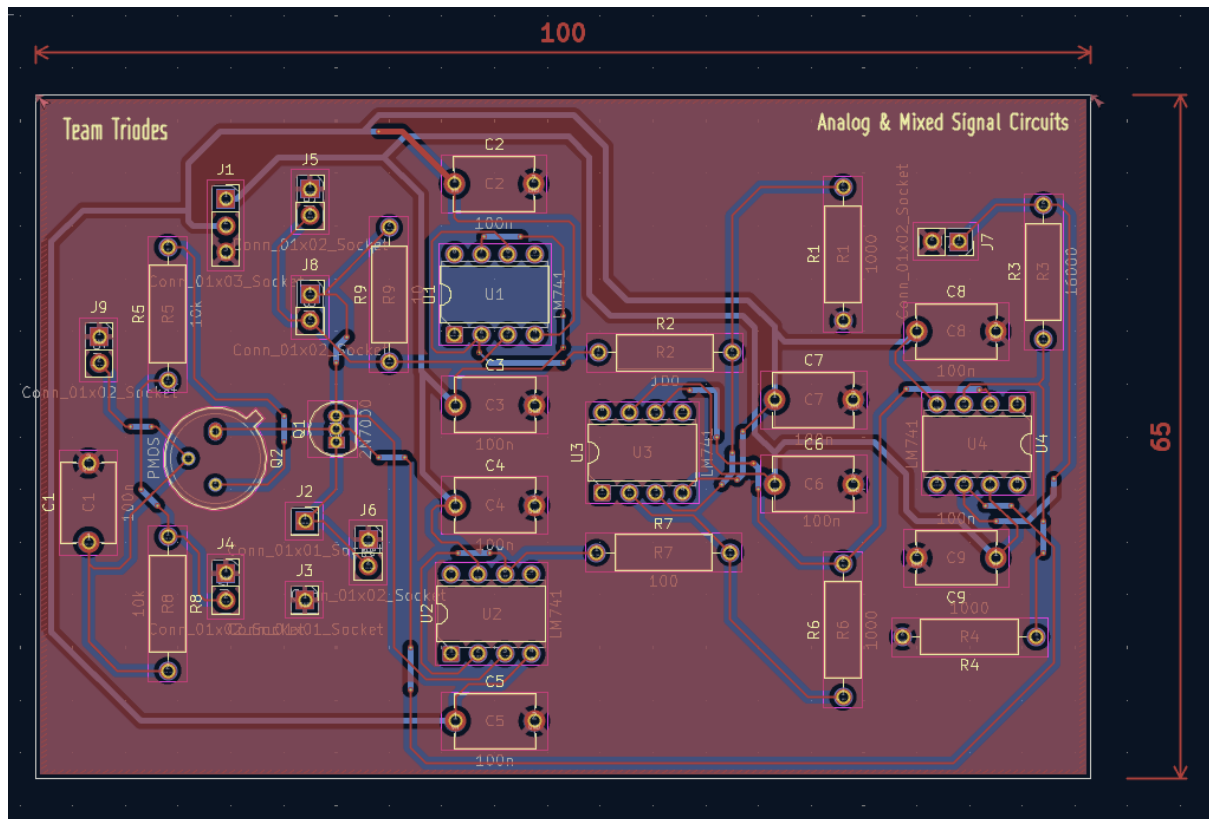
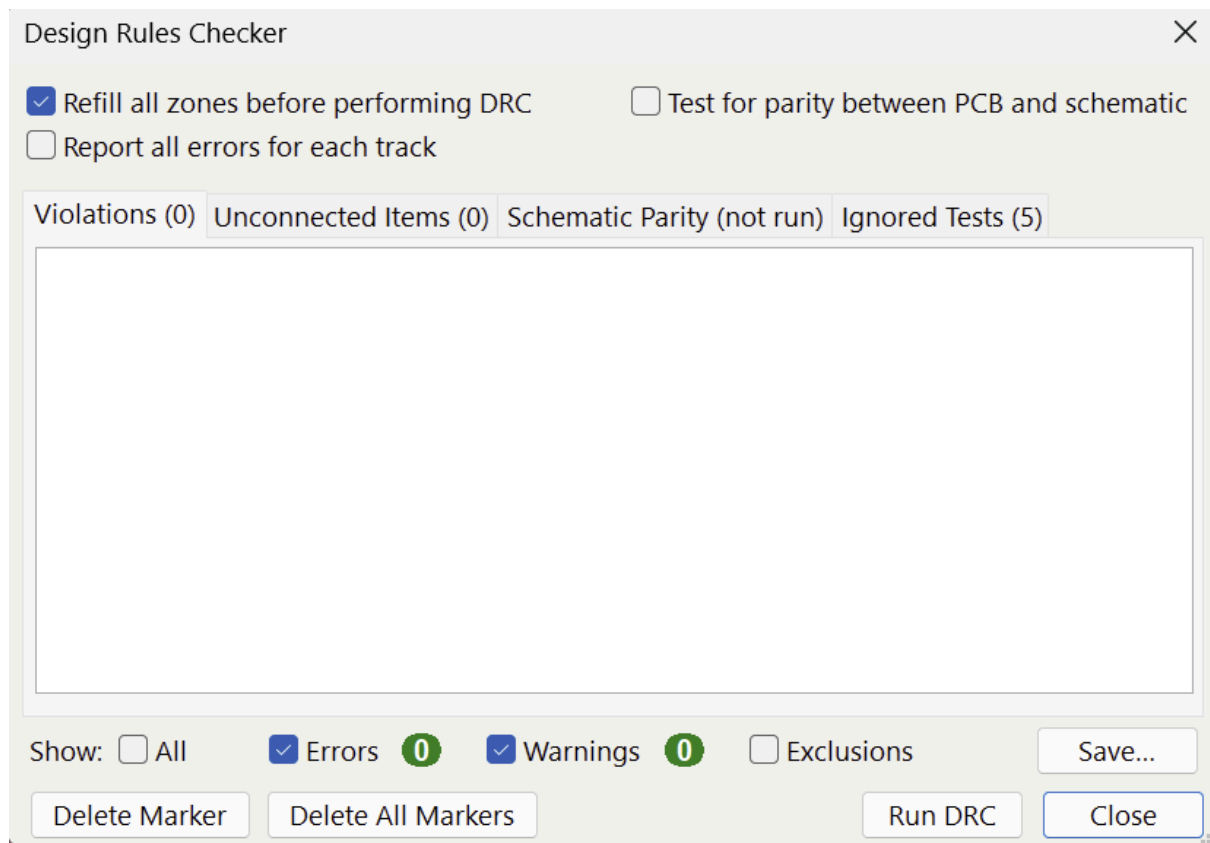


Figure 5 - PCB Layout

The size of the layout is 100 mm x 65 mm.

## Design Rules Checker:



*Figure 6 - Design Rules Checker*



### 3D rendering:

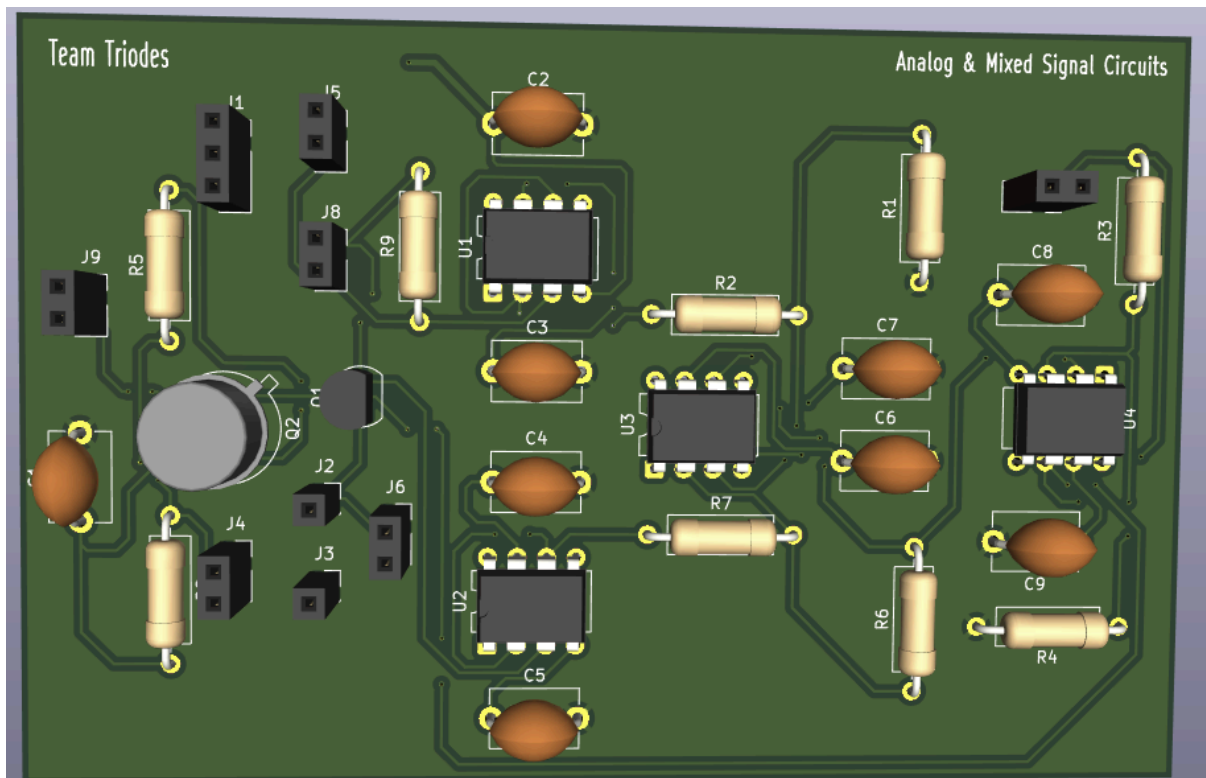


Figure 7 (a) - 3D View

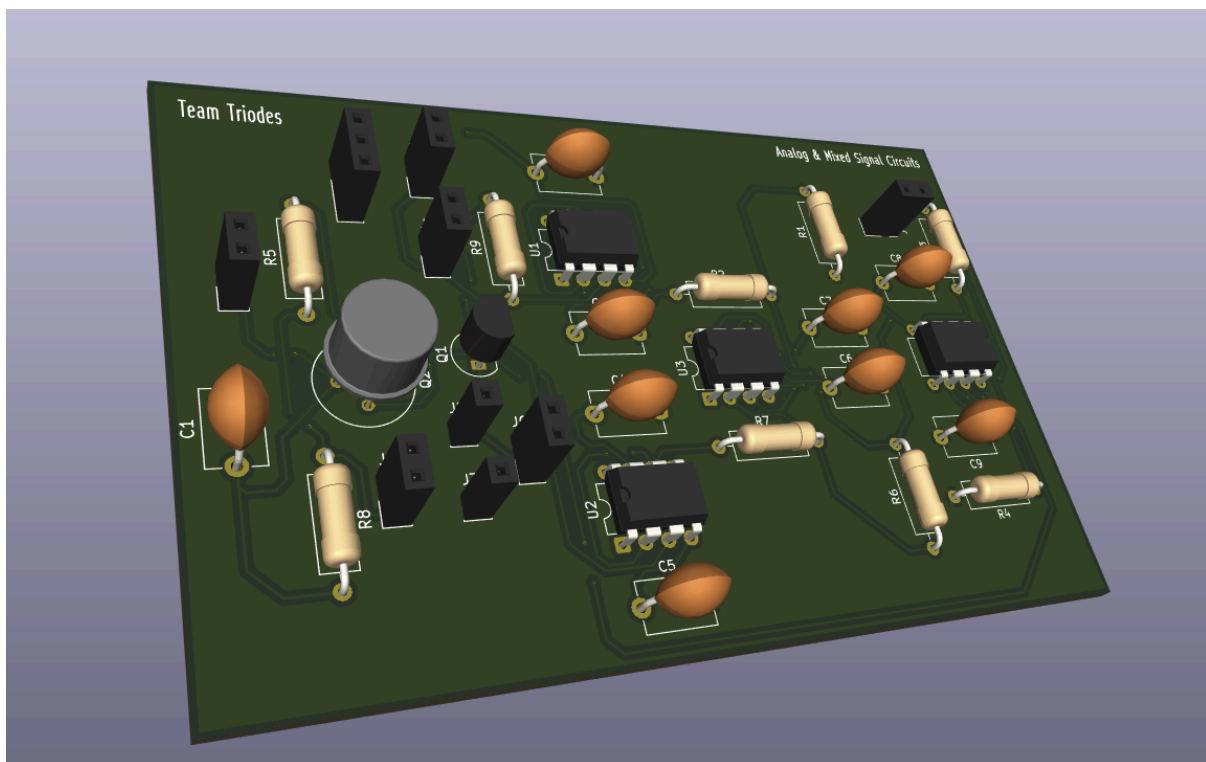


Figure 7 (b) - 3D View

## Gerber Files Screenshot

project_3-B_Mask.gbr	02-11-2025 16:16	GBR File	5 KB
project_3-B_Paste.gbr	02-11-2025 16:16	GBR File	1 KB
project_3-B_SilkS.gbr	02-11-2025 16:16	GBR File	1 KB
project_3-Back.gbr	02-11-2025 16:16	GBR File	192 KB
project_3-Edge_Cuts.gbr	02-11-2025 16:16	GBR File	1 KB
project_3-F_Mask.gbr	02-11-2025 16:16	GBR File	5 KB
project_3-F_Paste.gbr	02-11-2025 16:16	GBR File	1 KB
project_3-F_SilkS.gbr	02-11-2025 16:16	GBR File	68 KB
project_3-Front.gbr	02-11-2025 16:16	GBR File	186 KB
project_3-job.gbrjob	02-11-2025 16:16	GBRJOB File	3 KB
project_3-NPTH.drl	02-11-2025 16:17	DRL File	1 KB
project_3-PTH.drl	02-11-2025 16:17	DRL File	3 KB

Fig. 8 – Gerber Files Screenshot

## Zip Gerber files uploaded on the [lioncircuits.com](https://lioncircuits.com):

**Your Instant Quotation Process Made Easy!**  
Our Streamlined Process Ensures Instant, Accurate Quotations For Your Project.

Project Name\*  
Gerber\_Zip

Project Description  
Enter Project Description

File Format : Zip  
Size Limit : 50MB or less  
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Your File is Secure And Confidential.

Gerber\_Zip.zip

Reset

Base Material: FR4

Layers: 2, 4, 6, 8, 10, 12, 14, 16, 20, 22

Dimensions: 100 x 65 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

Mask Color: Green, White, Red, Blue, Black

PCB Finish: HASL Finish, Lead Free HASL, ENIG

Copper Thickness: 1 oz (35 um), 2 oz (70 um), 3 oz (105 um)

**Charge Details**

Make In India

**Price Estimate**

Per Unit Cost: ₹250.20 × 5

NRE Cost: ₹0

Sub Total: ₹1251

**Build Time**

5-6 Days (Selected) 4-5 Days

**Shipping Method**

DTDC Standard 2-3 Working Days (Selected) DTDC Plus 1-2 Working Days

New Sub Total: ₹1251

GST: ₹225

Shipping Cost: ₹0

Total Cost: ₹1476

Save to Cart

Figure 9 – zip Gerber file uploaded on [lioncircuits.com](https://lioncircuits.com)

Price in INR: Rs. 1476 for 5 units.