

charlieplex_3x3_routed

Design Report

kicad-tools 0.14.0

Rev 1 | 2026-07-09 | jlcpcb-tier1

Board Summary

Property	Value
Layers	2 copper (F.Cu, B.Cu)
Footprints	14 (13 SMD, 1 THT, 0 other)
Nets	10
Traces	197 segments
Vias	24
Board Size	50.0 x 55.0 mm

Design Overview

Theory of Operation

Charlieplex LED Grid

3x3 LED matrix using charlieplexing technique

9 LEDs driven by 4 GPIO pins

Power Architecture

Power Rails: GND, PWR_FLAG, VCC

Assembly Notes

9 polarized components

- **Polarized components:** 9 – check orientation markings

ERC Status

Metric	Count
Errors	0
Warnings	0

Status: SKIPPED – ERC skipped by user request

Schematic Overview

Schematic: charlieplex_3x3

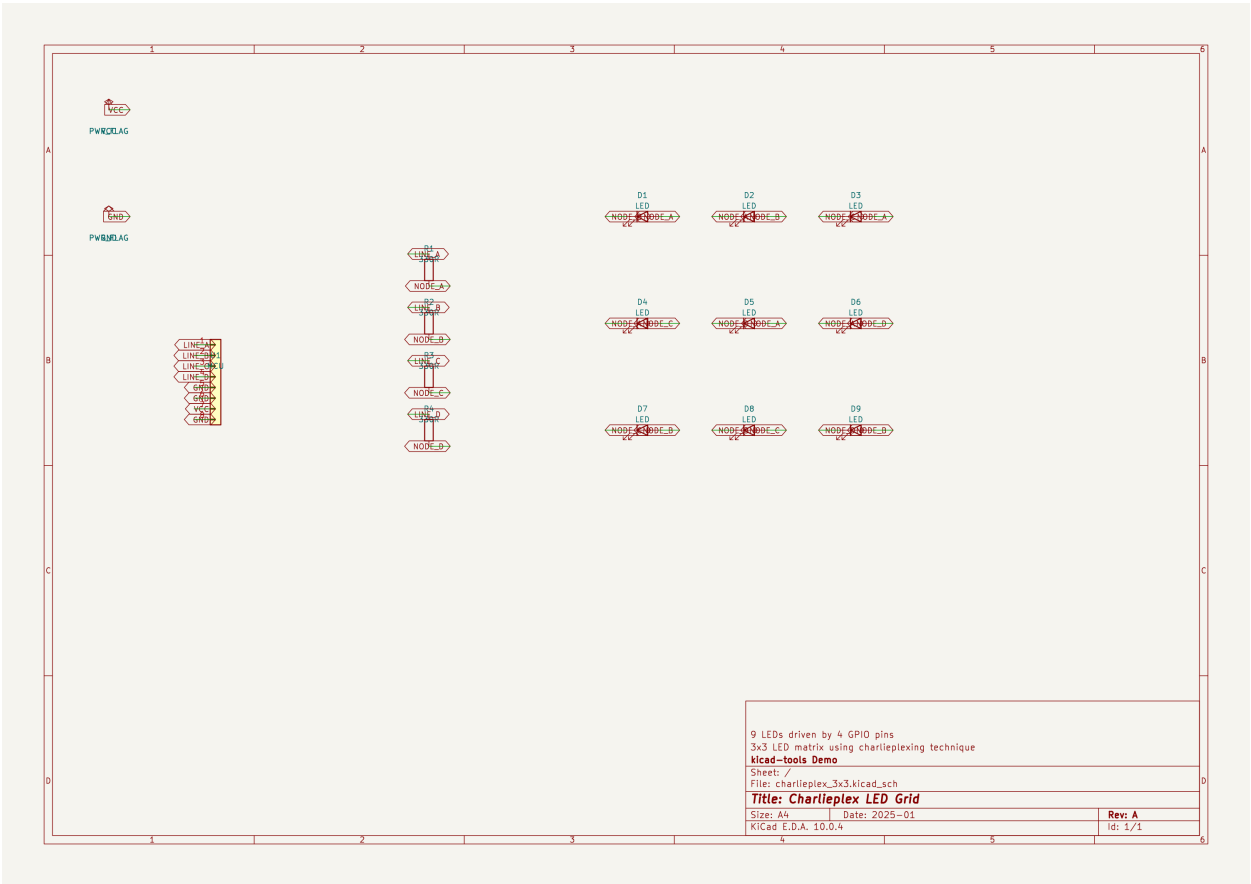


Figure 1: Schematic: charlieplex_3x3

PCB Layout

Copper

Assembly

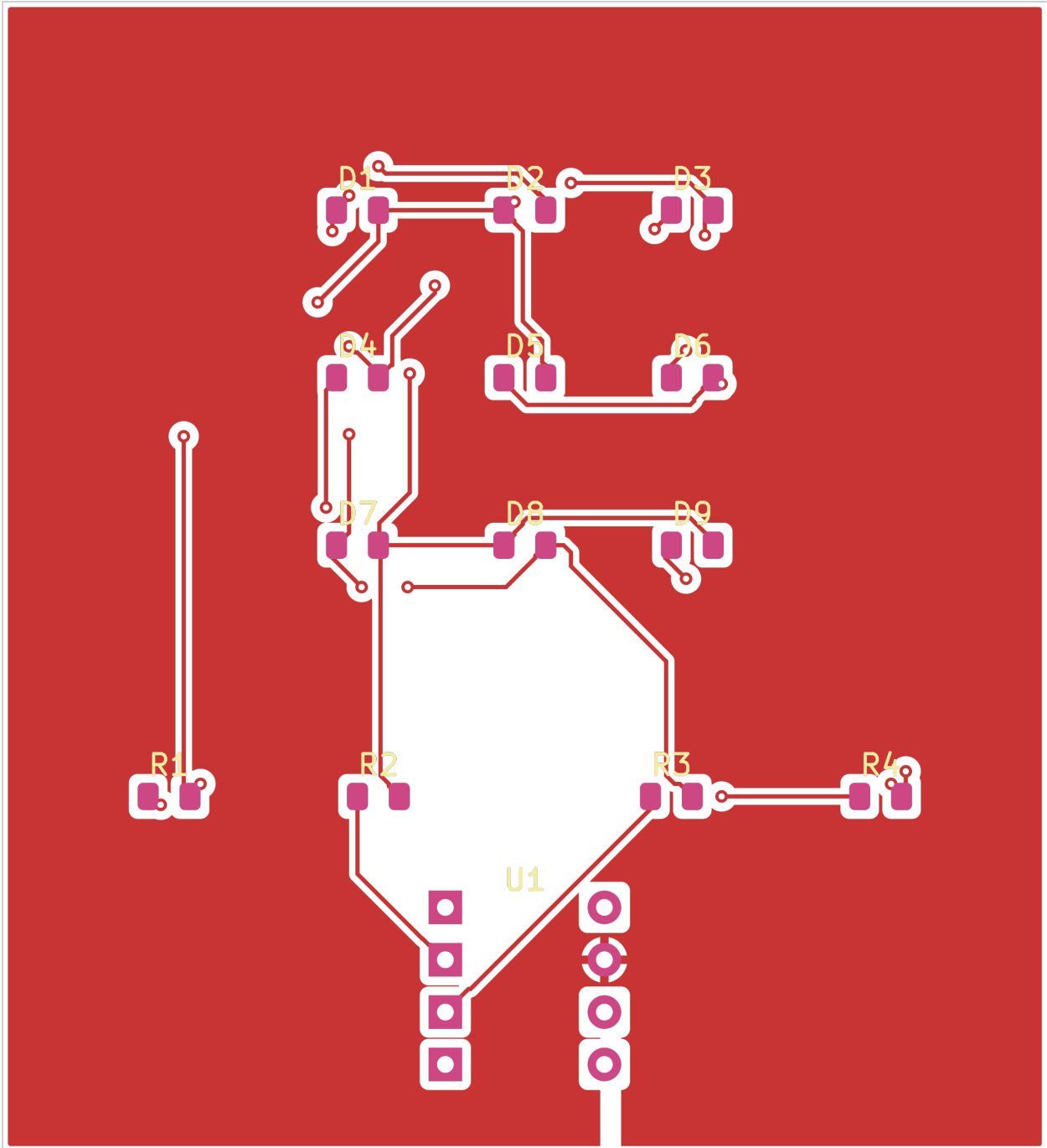


Figure 2: PCB Front

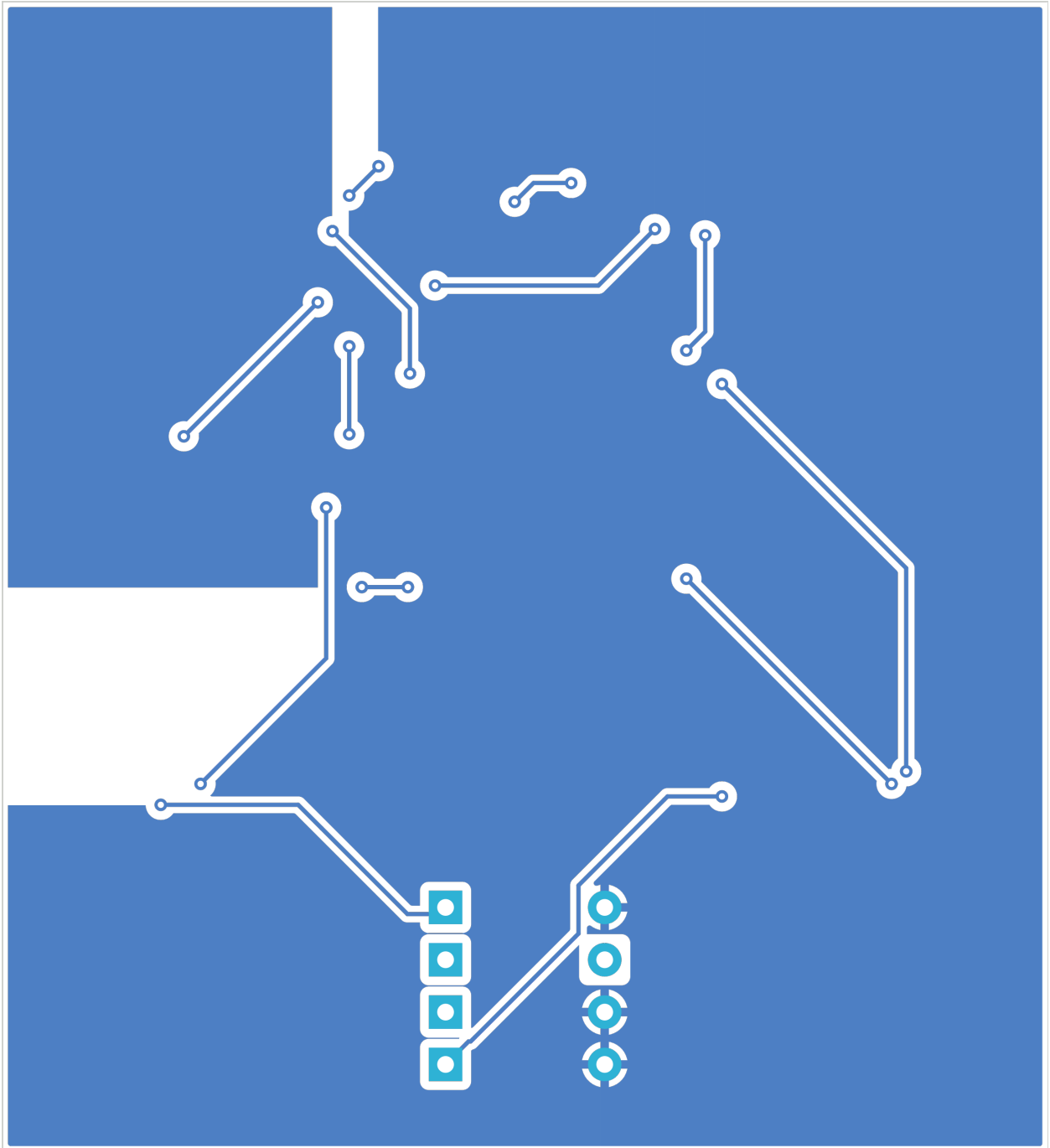


Figure 3: PCB Back

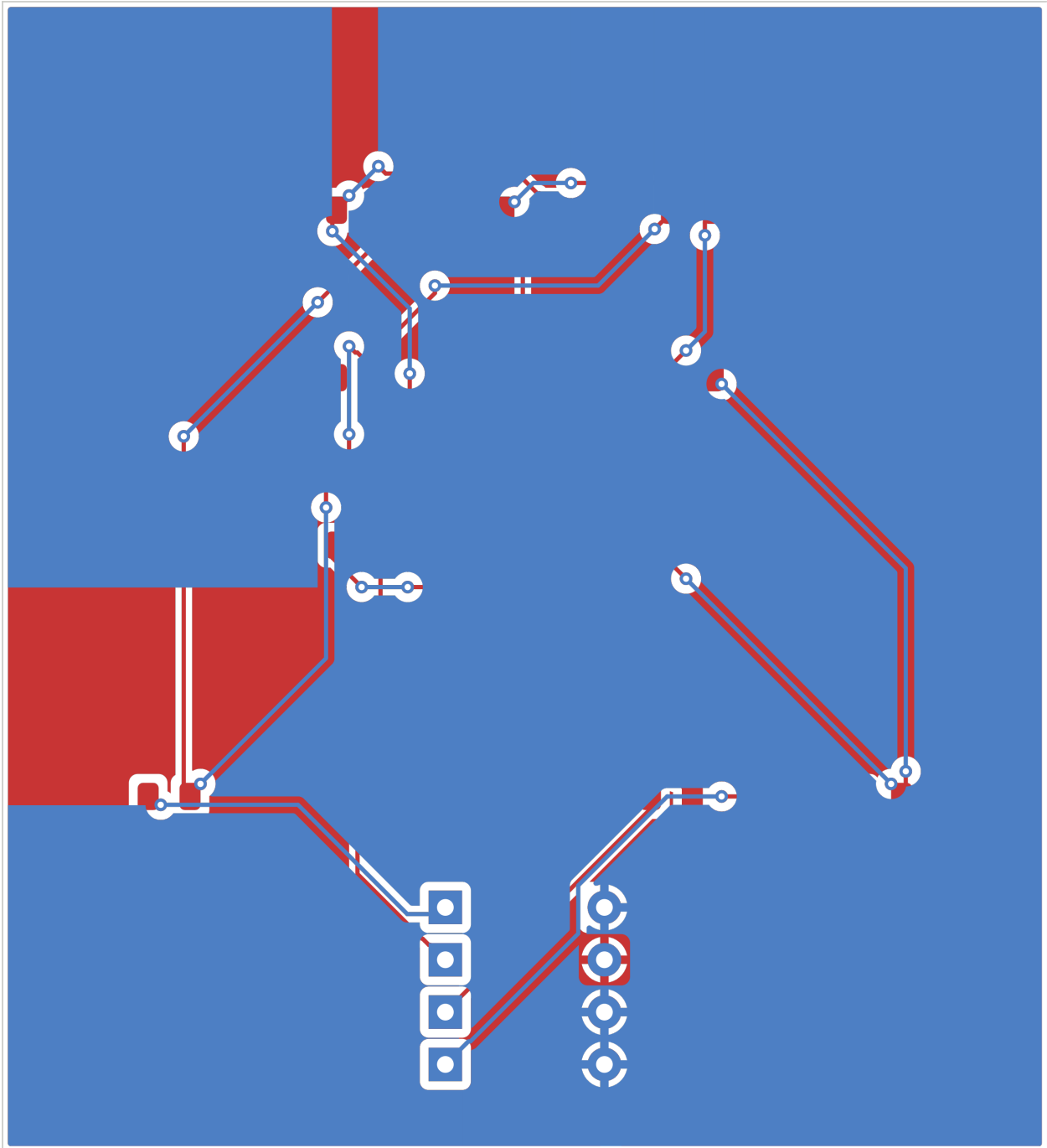


Figure 4: PCB Copper

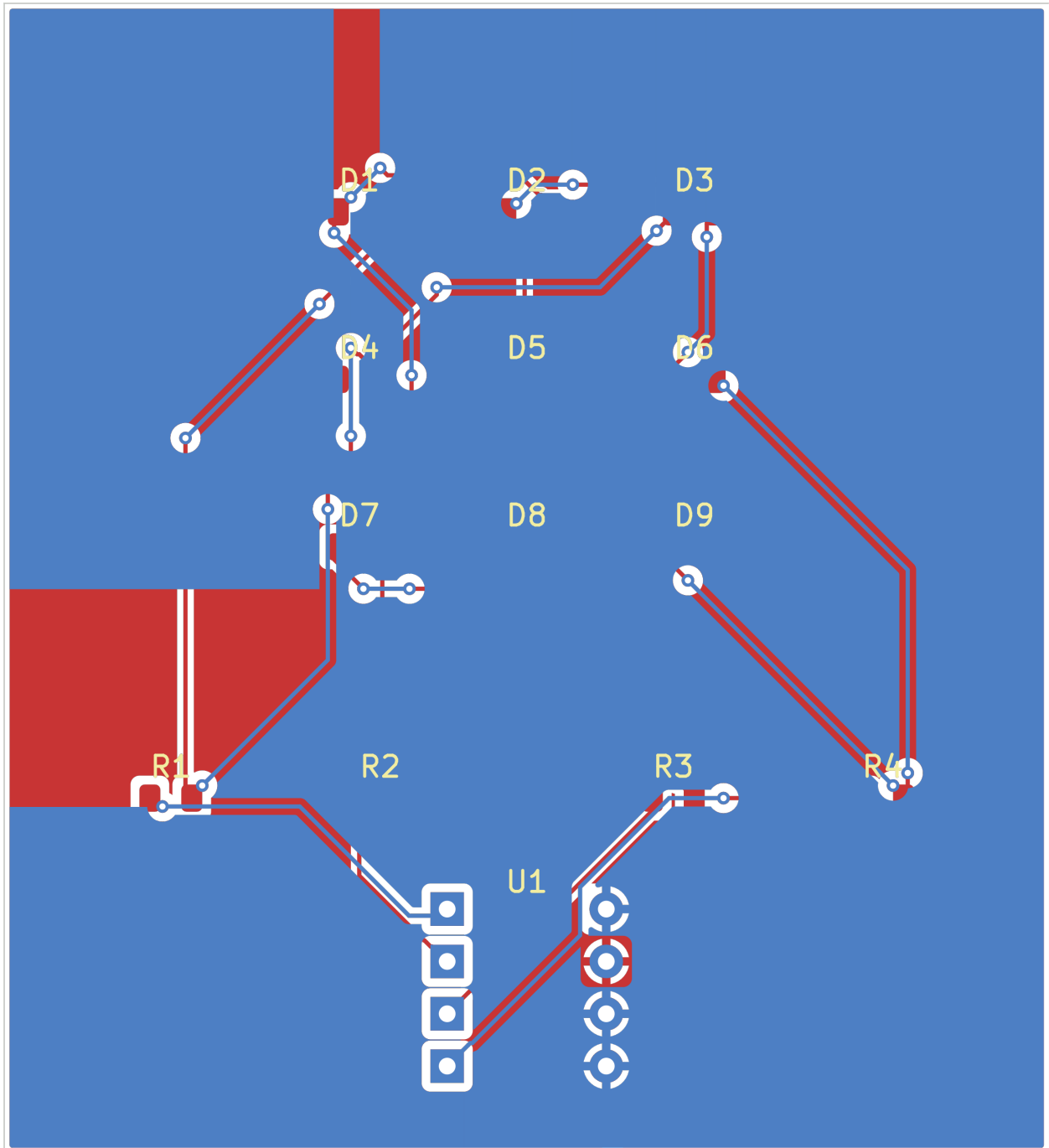


Figure 5: Assembly

Copper Layers

F.Cu

B.Cu

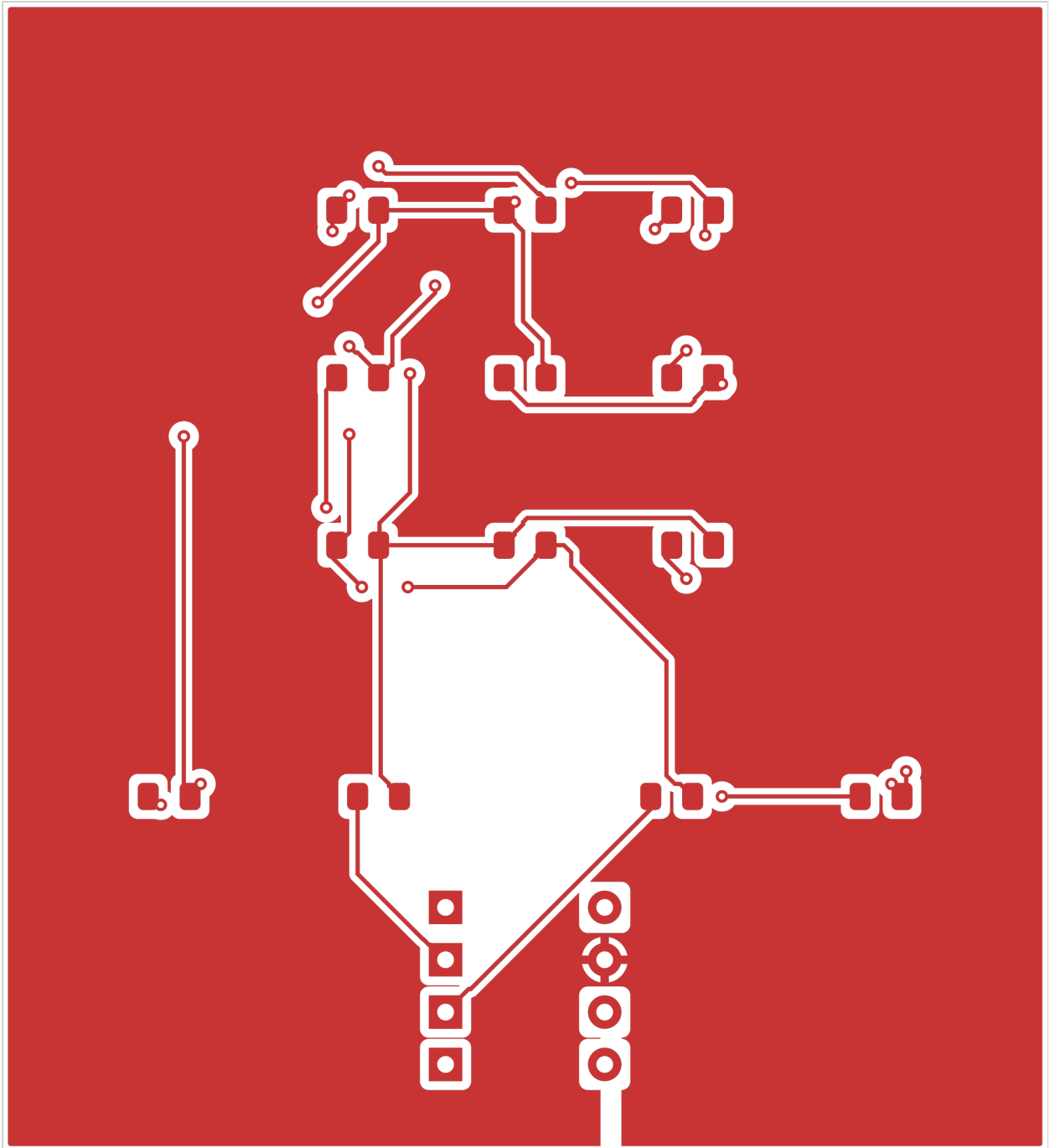


Figure 6: F.Cu

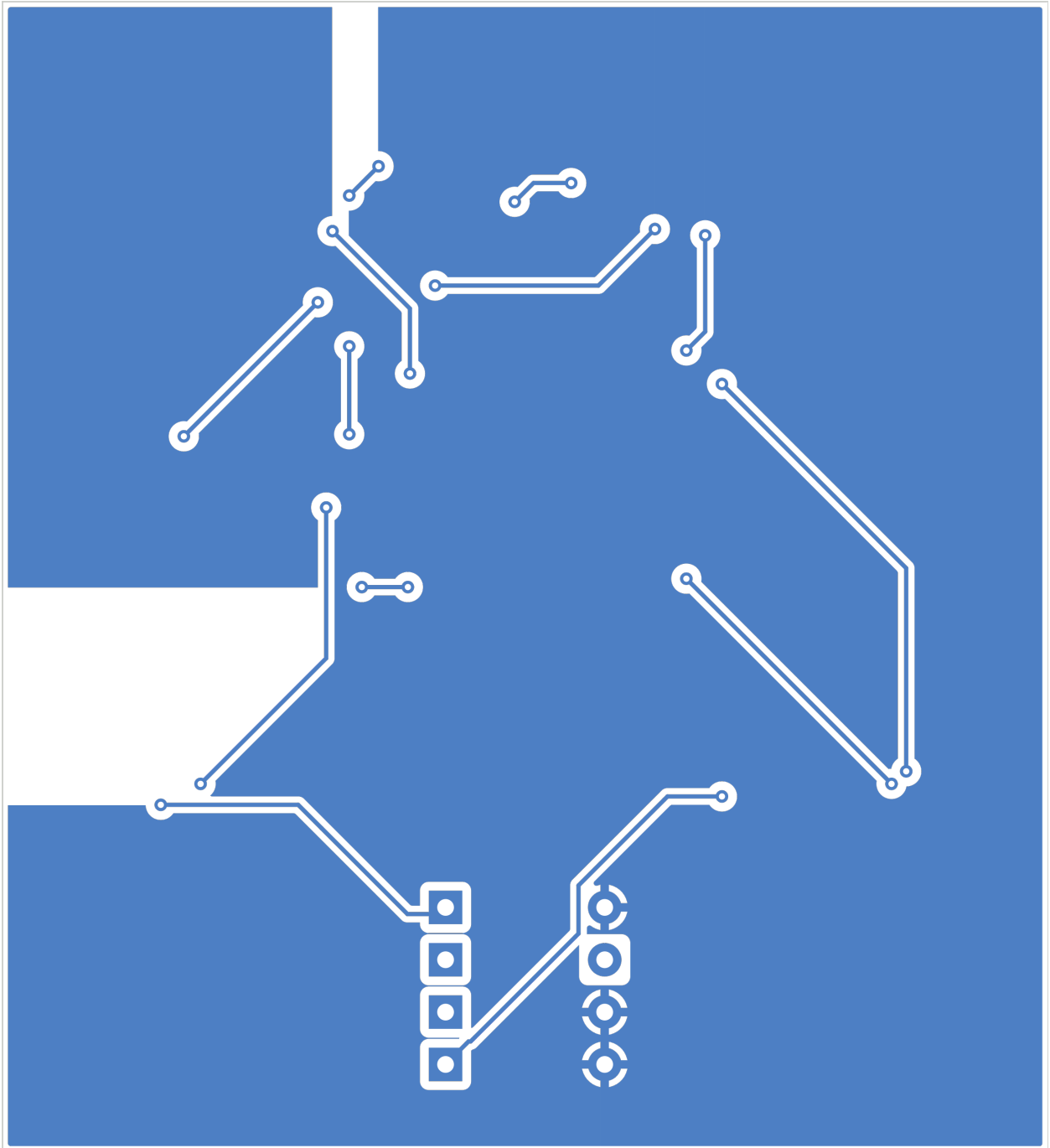


Figure 7: B.Cu

Bill of Materials

Value	Package	Qty	References
LED	LED_0805_2012Metric	9	D1, D2, D3, D4, D5, D6, D7, D8, D9
330R	R_0805_2012Metric	4	R1, R2, R3, R4
MCU	DIP-8_W7.62mm	1	U1

DRC Status

Metric	Count
Errors	0
Warnings	6
Blocking	0

Status: PASS ### Violations by Type

Violation Type	Count
copper_sliver	6

Manufacturing Readiness

Verdict: WARNING

Action Items

- **[OPTIONAL]** Verify zone fill in KiCad for 1 zone-connected nets
- **[OPTIONAL]** Review 6 DRC warnings
- **[OPTIONAL]** Analog net: LINE__A — audio signal; keep short, away from digital/switching nets
- **[OPTIONAL]** Analog net: LINE__B — audio signal; keep short, away from digital/switching nets
- **[OPTIONAL]** Analog net: LINE__C — audio signal; keep short, away from digital/switching nets
- **[OPTIONAL]** Analog net: LINE__D — audio signal; keep short, away from digital/switching nets

Routing Status

Metric	Value
Signal Net Completion	100.0% (8/8)
Overall Completion	100.0%
Complete Nets	10 / 10
Zone-Connected Nets	2
Single-Pad Nets	1 (no routing needed)
Incomplete Nets	0
Unconnected Pads	0

Zone-Connected Nets

- GND
- VCC

Single-Pad Nets

1 single-pad net (no routing needed) – not listed individually.

Cost Estimate

Metric	Per Board (estimated)
PCB Fabrication	~0.95 USD
Components (estimated)	~0.56 USD
Assembly (estimated)	~2.01 USD
Total (estimated)	~3.52 USD
Batch Quantity	5
Batch Total (estimated)	~17.62 USD