

diffpair_test_routed

Design Report

kicad-tools 0.14.0

Rev 1 | 2026-07-09 | jlcpb

Board Summary

Property	Value
Layers	4 copper (F.Cu, In1.Cu, In2.Cu, B.Cu)
Footprints	7 (5 SMD, 2 THT, 0 other)
Nets	26
Traces	1328 segments
Vias	167
Board Size	100.0 x 80.0 mm

Design Overview

Theory of Operation

Differential Pair Test Board

Multi-protocol HSDI regression testbench

Epic #2556 Phase 4L (issue #2658); wired netlist #4012

Communication Interfaces

Protocol	Signals
USB	USB2_D+, USB2_D-, VBUS_USB

Power Architecture

Power Rails: PWR_FLAG

Assembly Notes

- 4 fine-pitch components
- **Fine-pitch components:** 4 (U1, U4, U3, U2)

ERC Status

Metric	Count
Errors	0
Warnings	0

Status: SKIPPED – ERC skipped by user request

Schematic Overview

Schematic: diffpair_test



Figure 1: Schematic: diffpair_test

PCB Layout

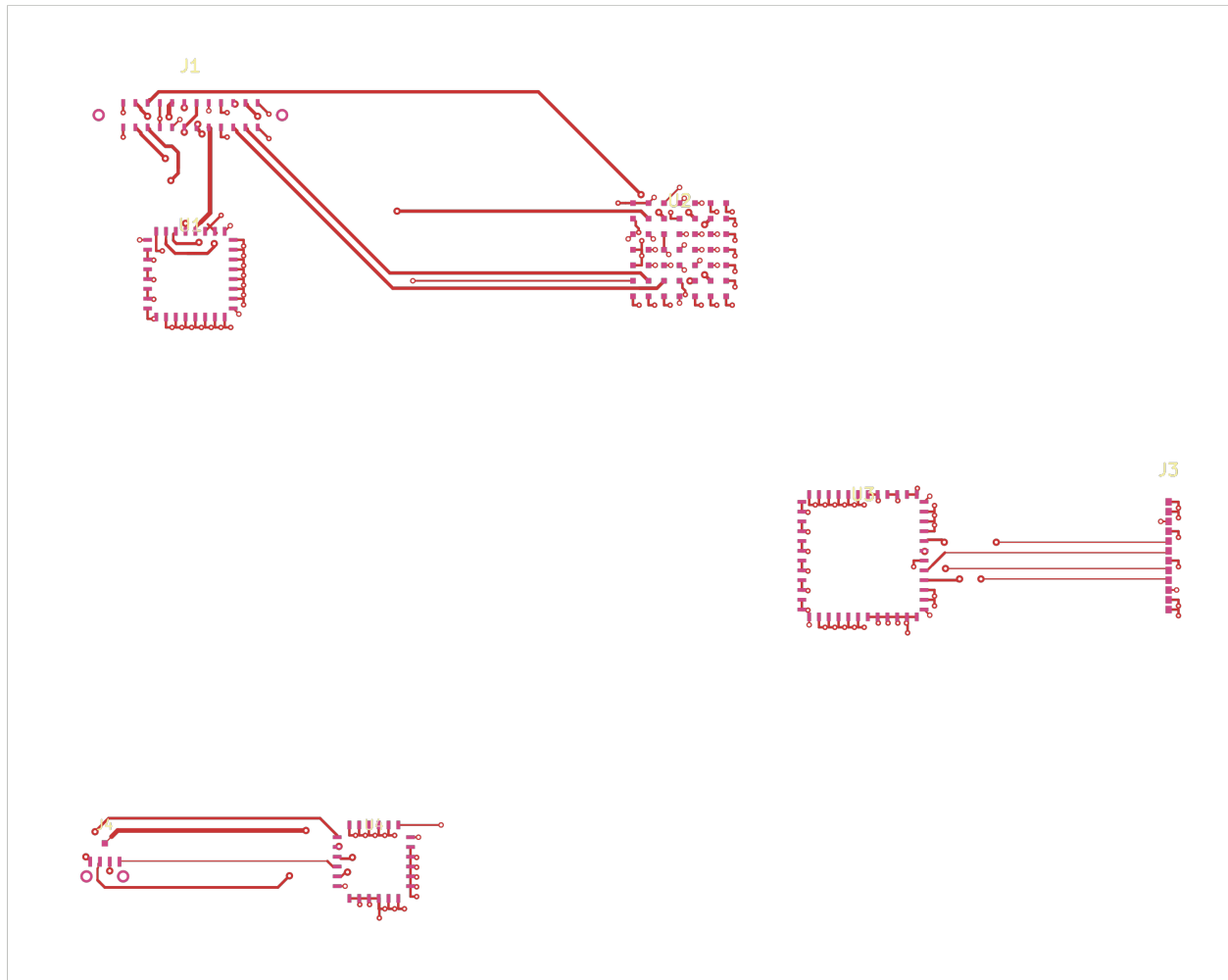


Figure 2: PCB Front

Copper

Assembly

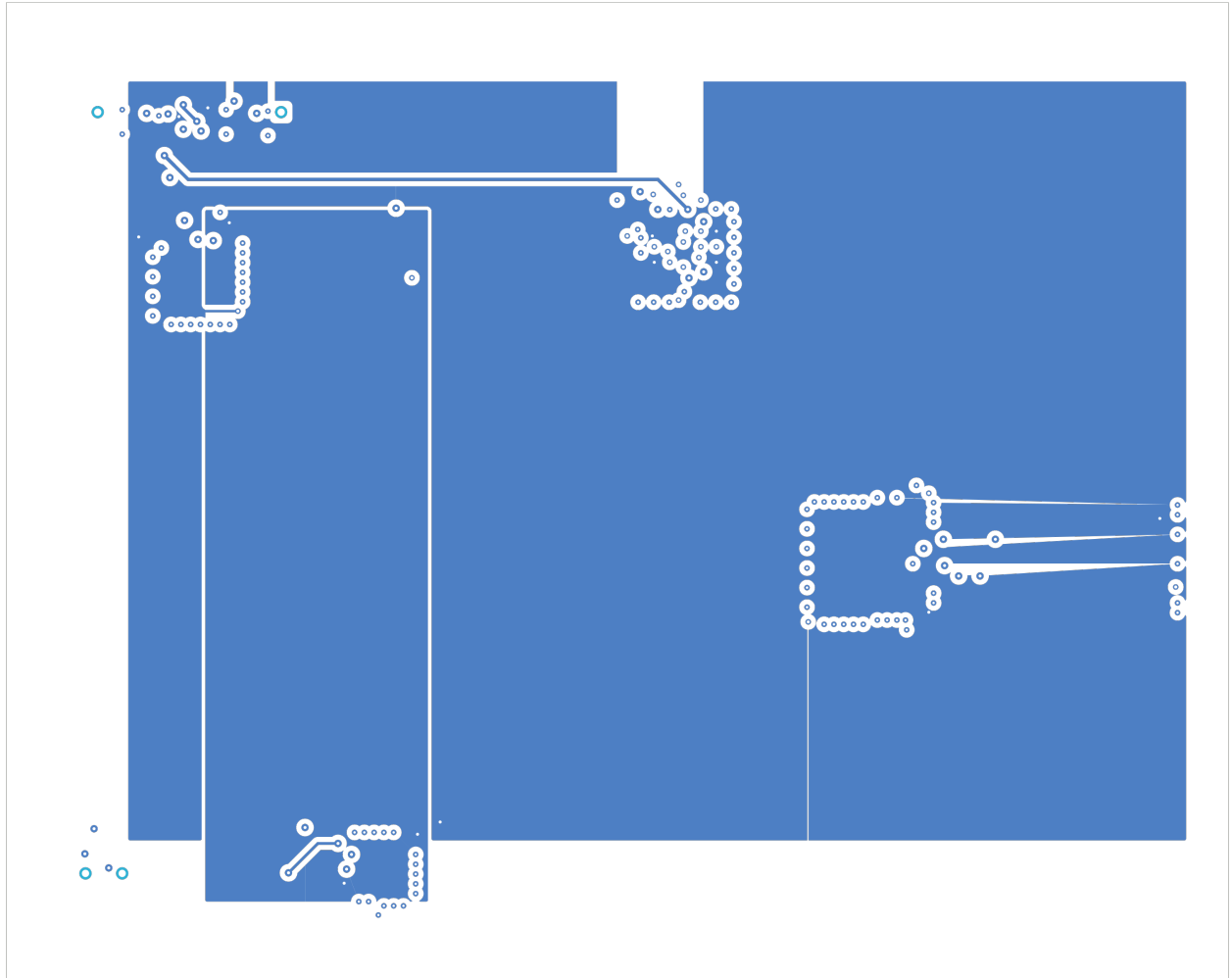


Figure 3: PCB Back

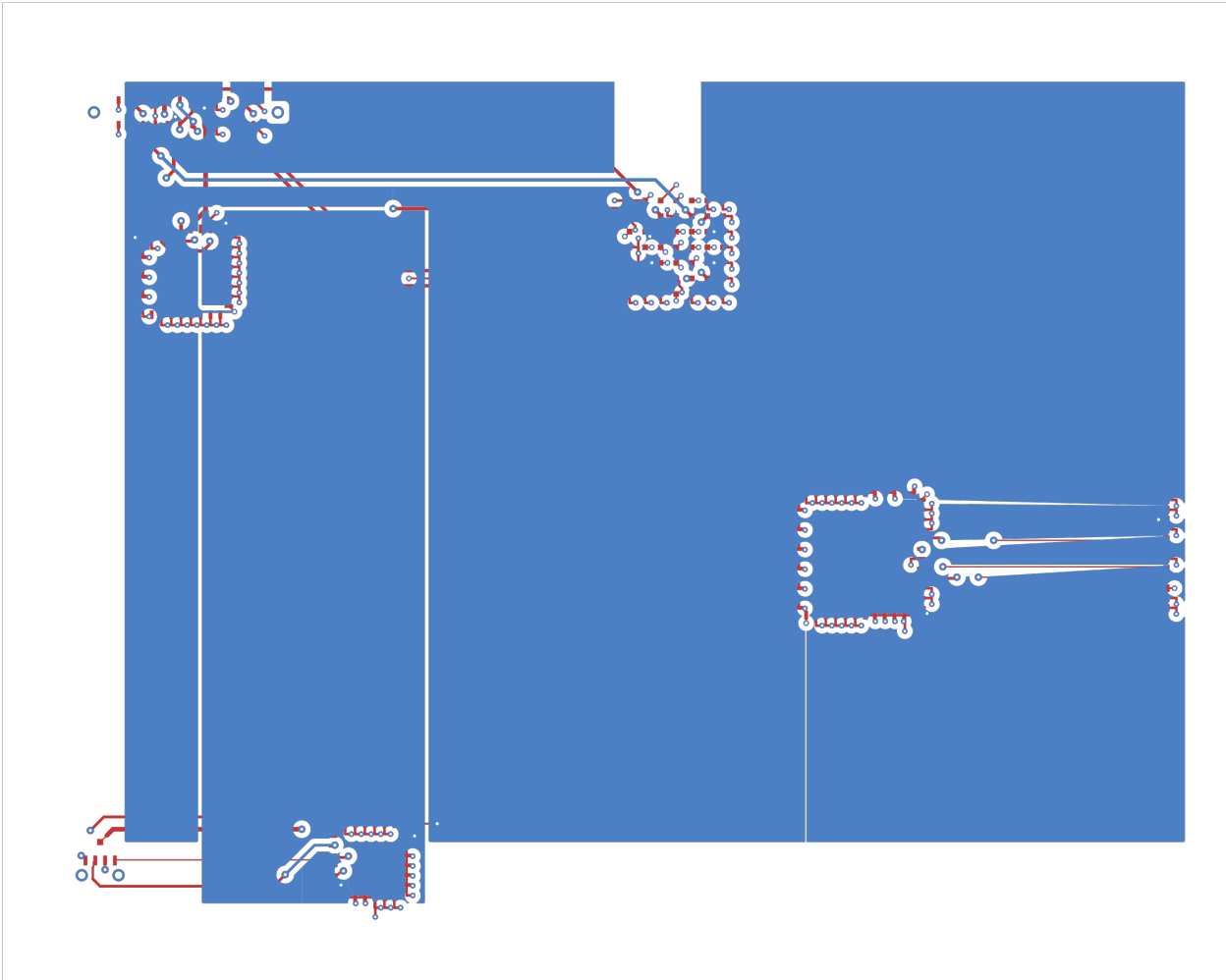


Figure 4: PCB Copper

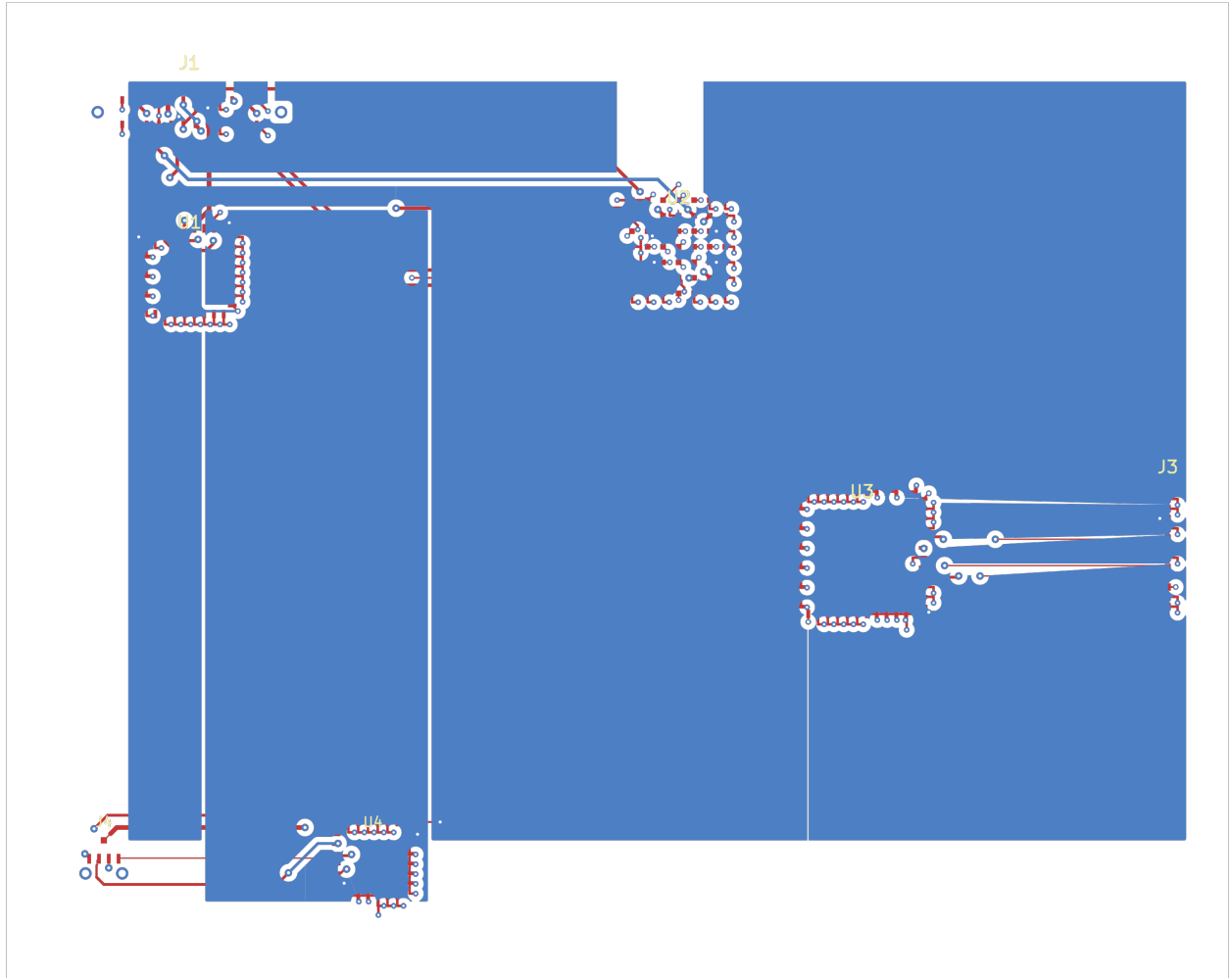


Figure 5: Assembly

Copper Layers

F.Cu

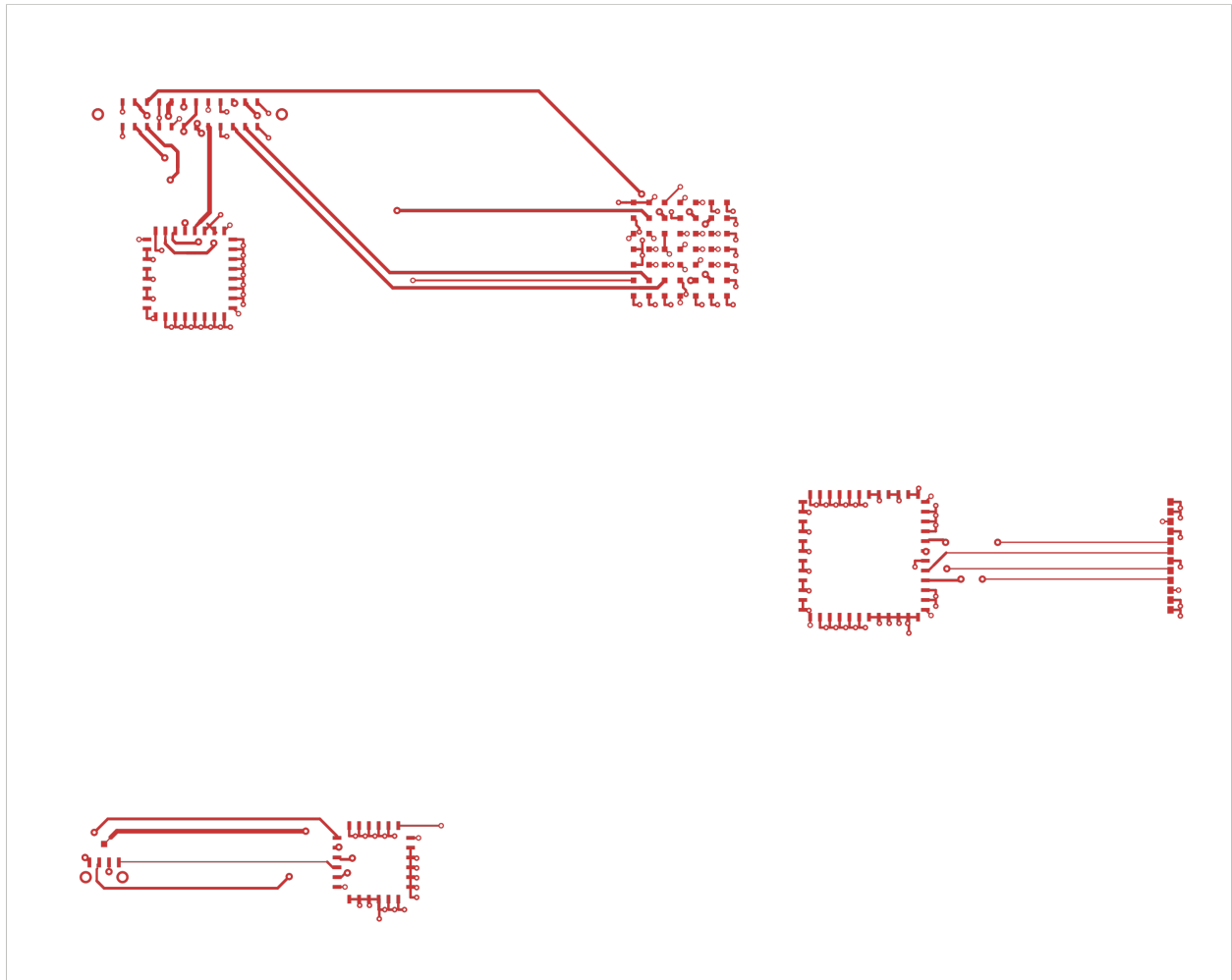


Figure 6: F.Cu

In1.Cu

In2.Cu

B.Cu

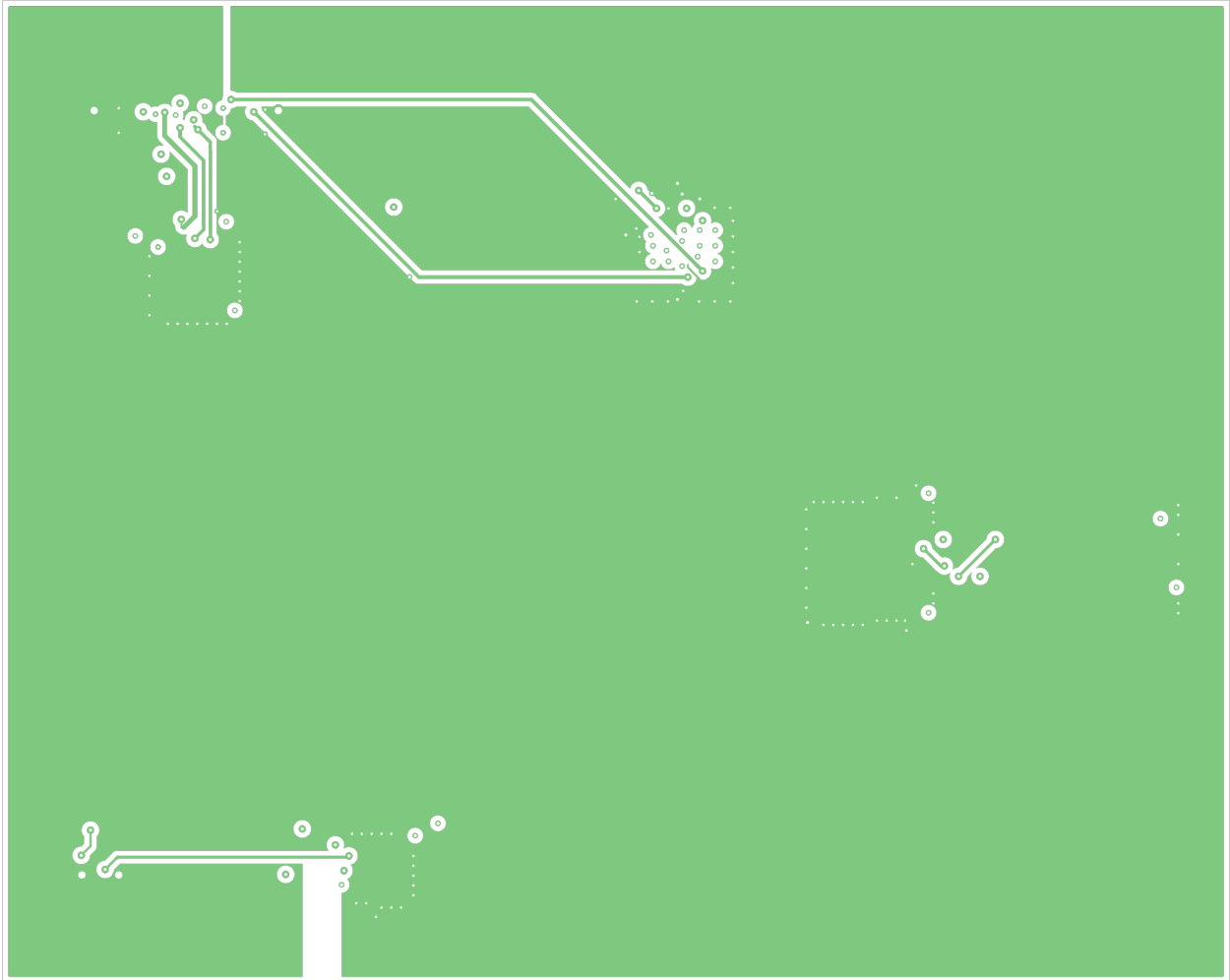


Figure 7: In1.Cu

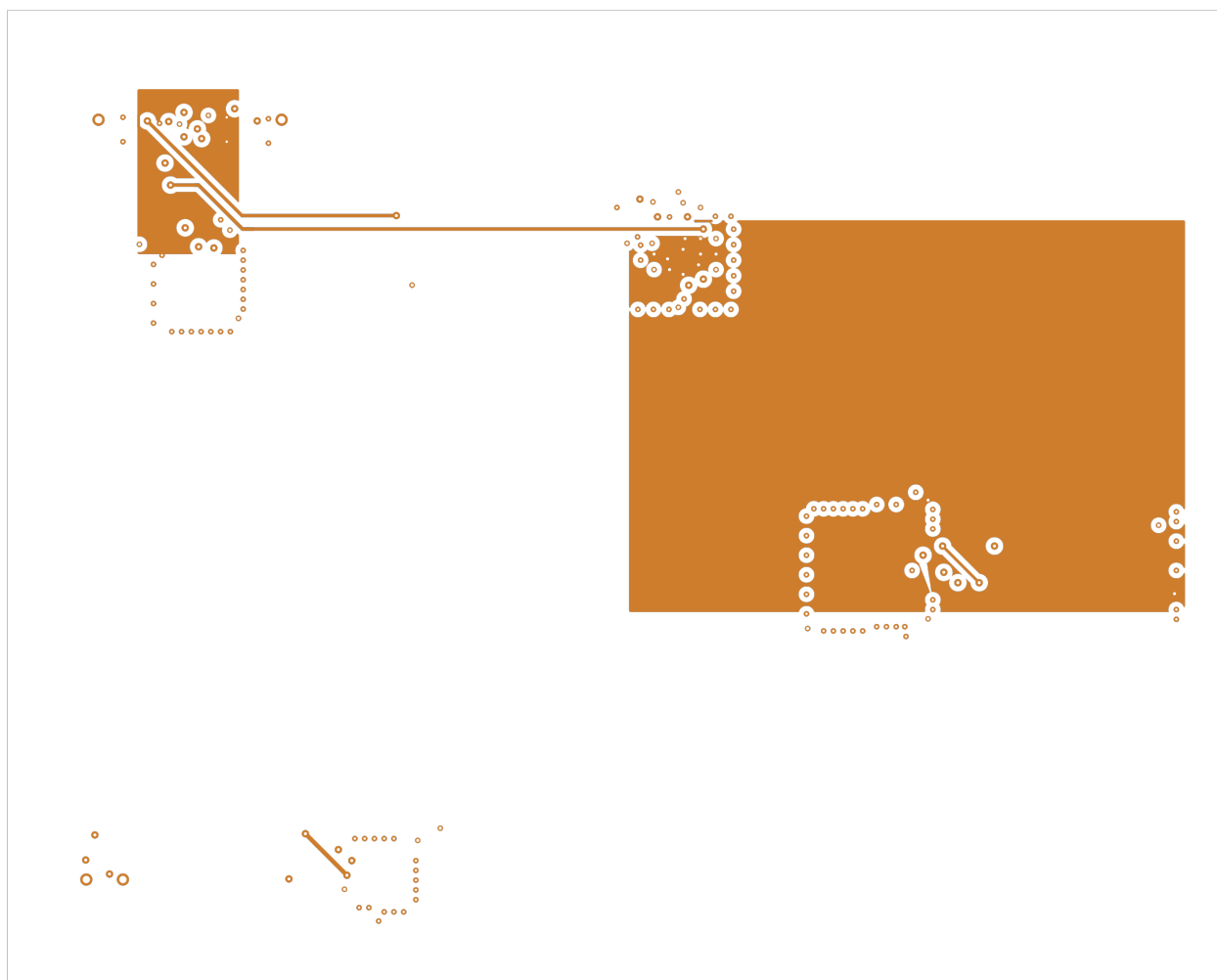


Figure 8: In₂Cu

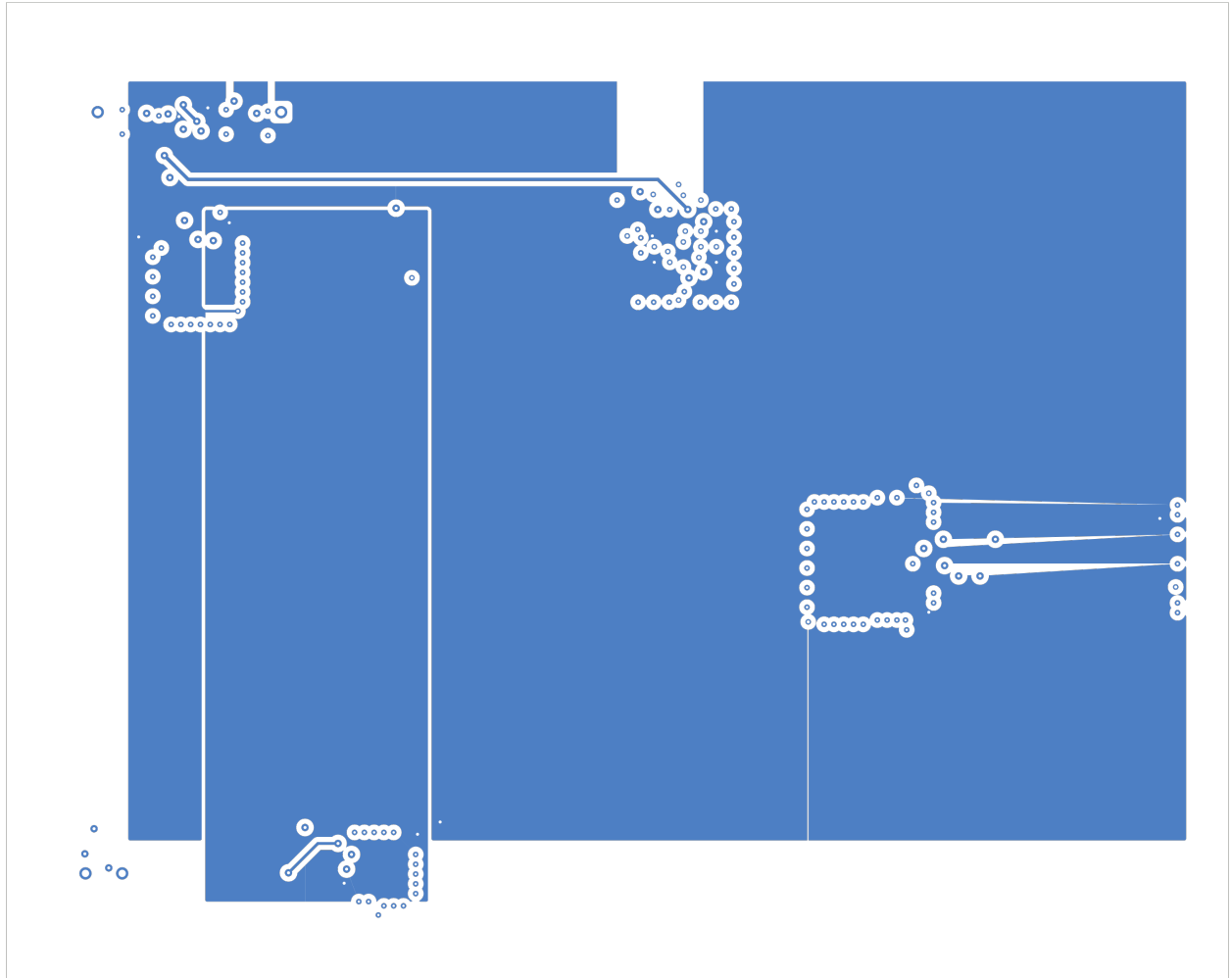


Figure 9: B.Cu

Bill of Materials

Value	Package	Qty	References
FFC4	FFC_4P_0.5mm	1	J4
MiniPCIe	PCIE_Mini_Edge	1	J3
USB-C	USB_C_Receptacle_USB2.0	1	J1
BGA49_USB3	BGA-49_5.0x5.0mm_Layout7x7_P0.5mm	1	U2
QFN24_MIPI	QFN-24-1EP_4x4mm_P0.5mm	1	U4
QFN32_USB2	QFN-32-1EP_5x5mm_P0.5mm	1	U1
QFP48_PCIe	LQFP-48_7x7mm_P0.5mm	1	U3

DRC Status

Metric	Count
Errors	0
Warnings	7
Blocking	0

Status: PASS ### Violations by Type

Violation Type	Count
silk_over_copper	4
silkscreen_text_height	2
silkscreen_over_pad	1

Manufacturing Readiness

Verdict: WARNING

Action Items

- **[OPTIONAL]** Verify zone fill in KiCad for 5 zone-connected nets
- **[OPTIONAL]** Review 7 DRC warnings

Routing Status

Metric	Value
Signal Net Completion	100.0% (21/21)
Overall Completion	84.6%
Complete Nets	22 / 26
Zone-Connected Nets	5
Incomplete Nets	4
Unconnected Pads	18

Zone-Connected Nets

- +1V2
- +1V8
- +3V3
- GND
- VBUS_USB

Incomplete Nets

- +1V2
- +3V3
- GND
- VBUS_USB

Cost Estimate

Metric	Per Board (estimated)
PCB Fabrication	~3.6 USD
Components (estimated)	~2.3 USD
Assembly (estimated)	~2.05 USD
Total (estimated)	~7.95 USD
Batch Quantity	5
Batch Total (estimated)	~39.74 USD