

# diffpair\_test\_routed

Design Report

Rev 1 | 2026-06-12 | jlpcb

kicad-tools 0.13.0

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## 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	936 segments
Vias	172
Board Size	100.0 x 80.0 mm

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## Design Overview

### Theory of Operation

Differential Pair Test Board

Multi-protocol HSDI regression testbench

Epic #2556 Phase 4L (issue #2658)

## Communication Interfaces

Protocol	Signals
UART	PCIE_RX-, PCIE_TX+
USB	USB2_D+, USB2_D-, VBUS_USB

## Power Architecture

Power Rails: PWR\_FLAG

## Assembly Notes

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4 fine-pitch components

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

## ERC Status

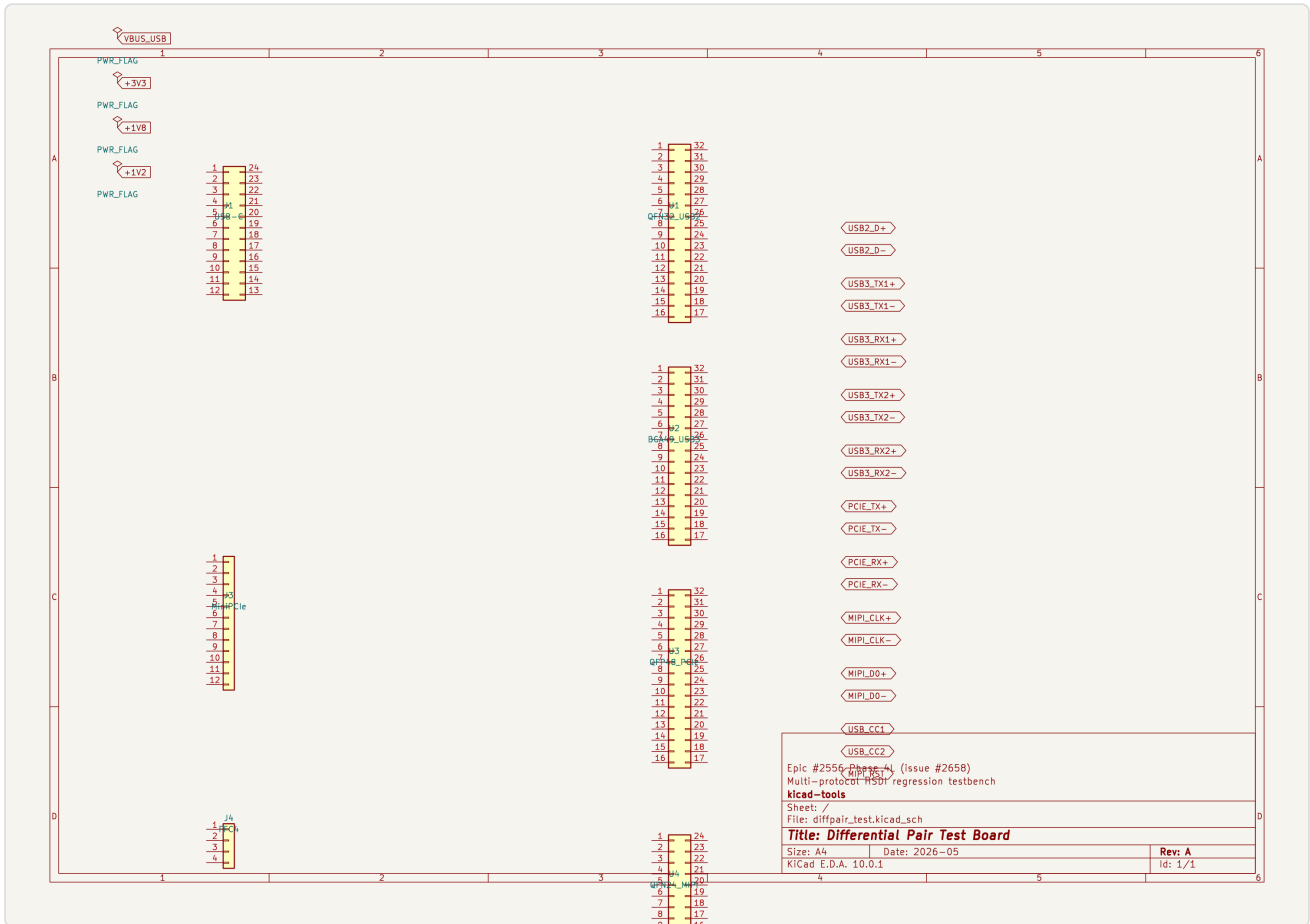
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Metric	Count
Errors	0
Warnings	0

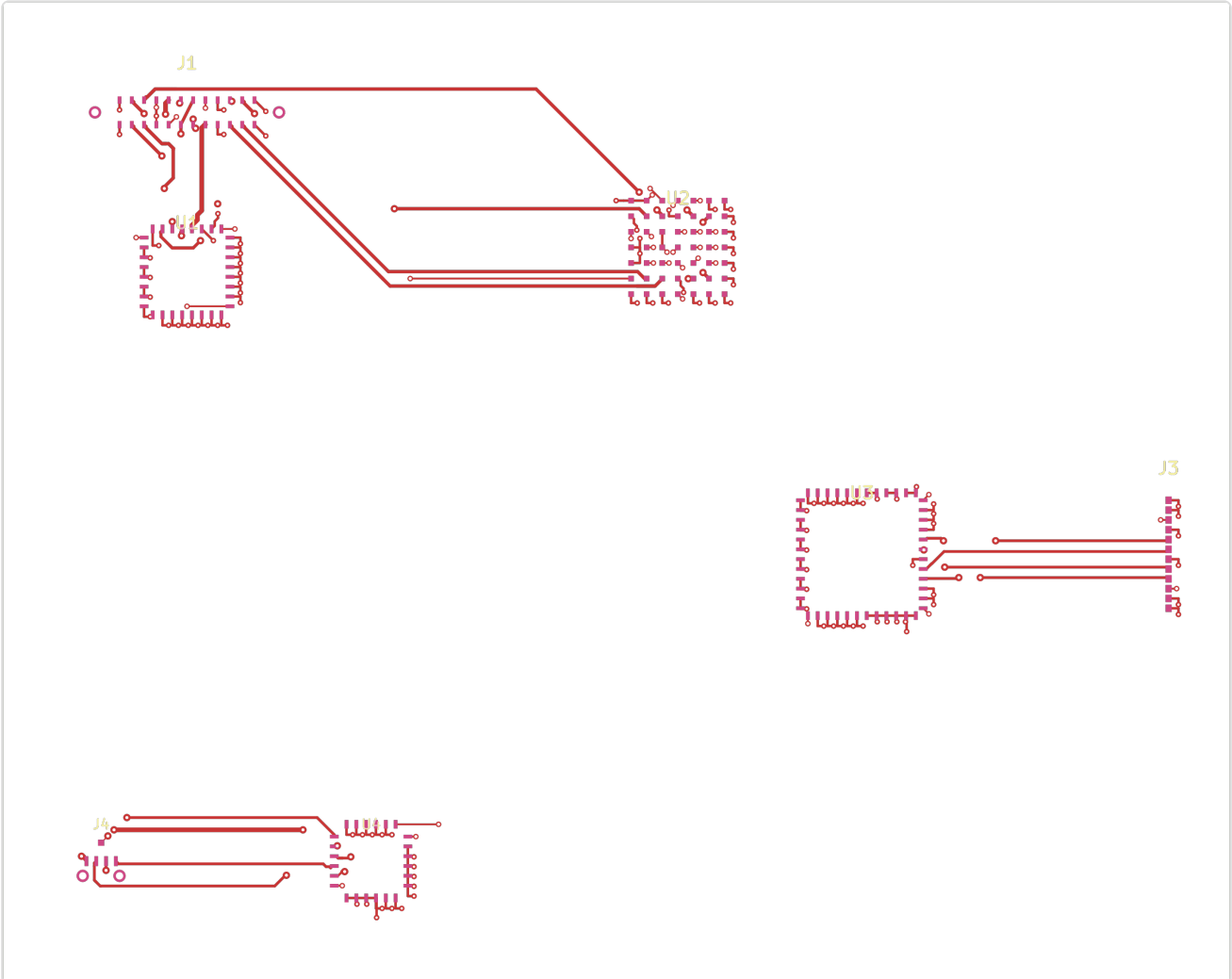
**Status:** SKIPPED -- ERC skipped by user request

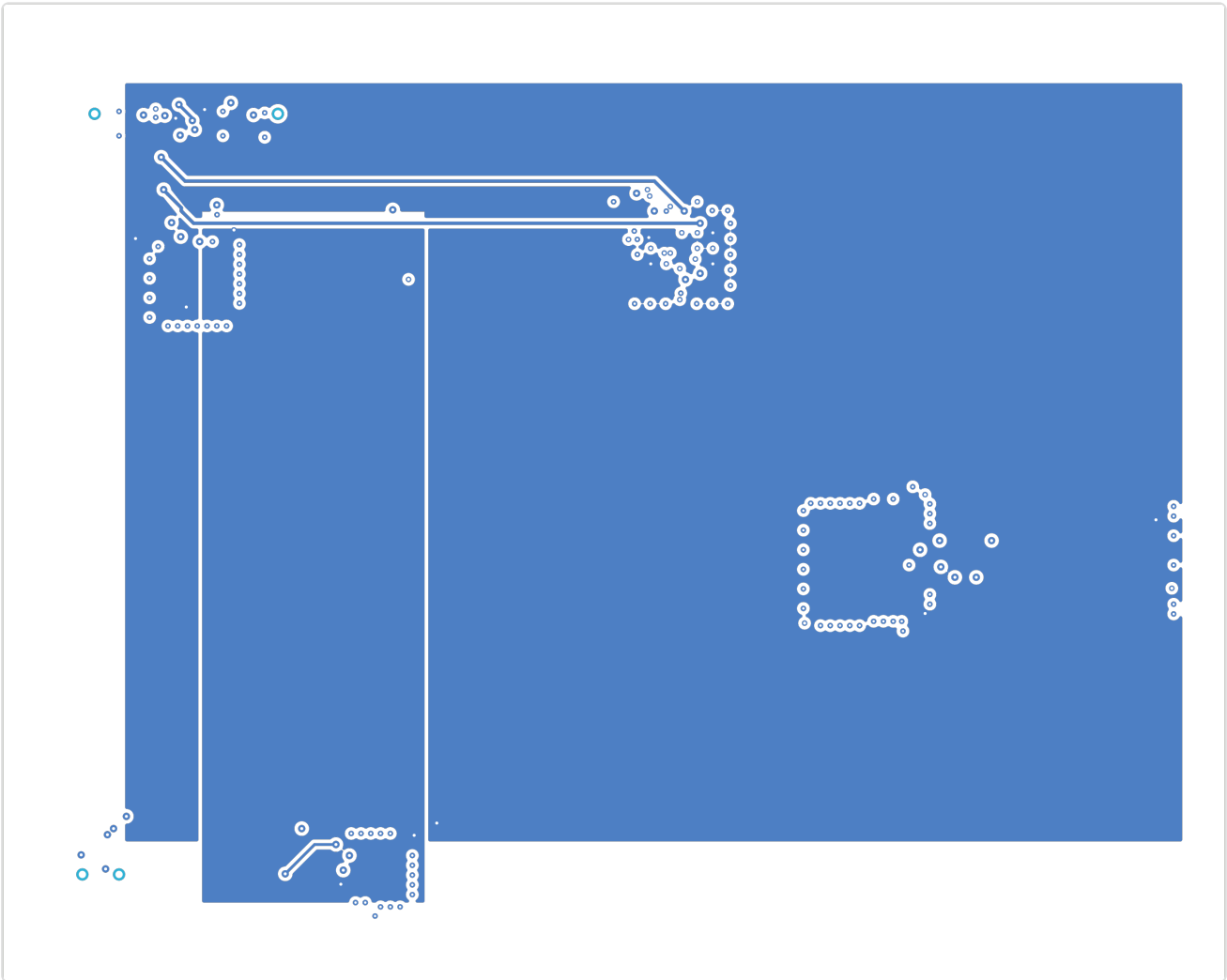
# Schematic Overview

## Schematic: diffpair\_test

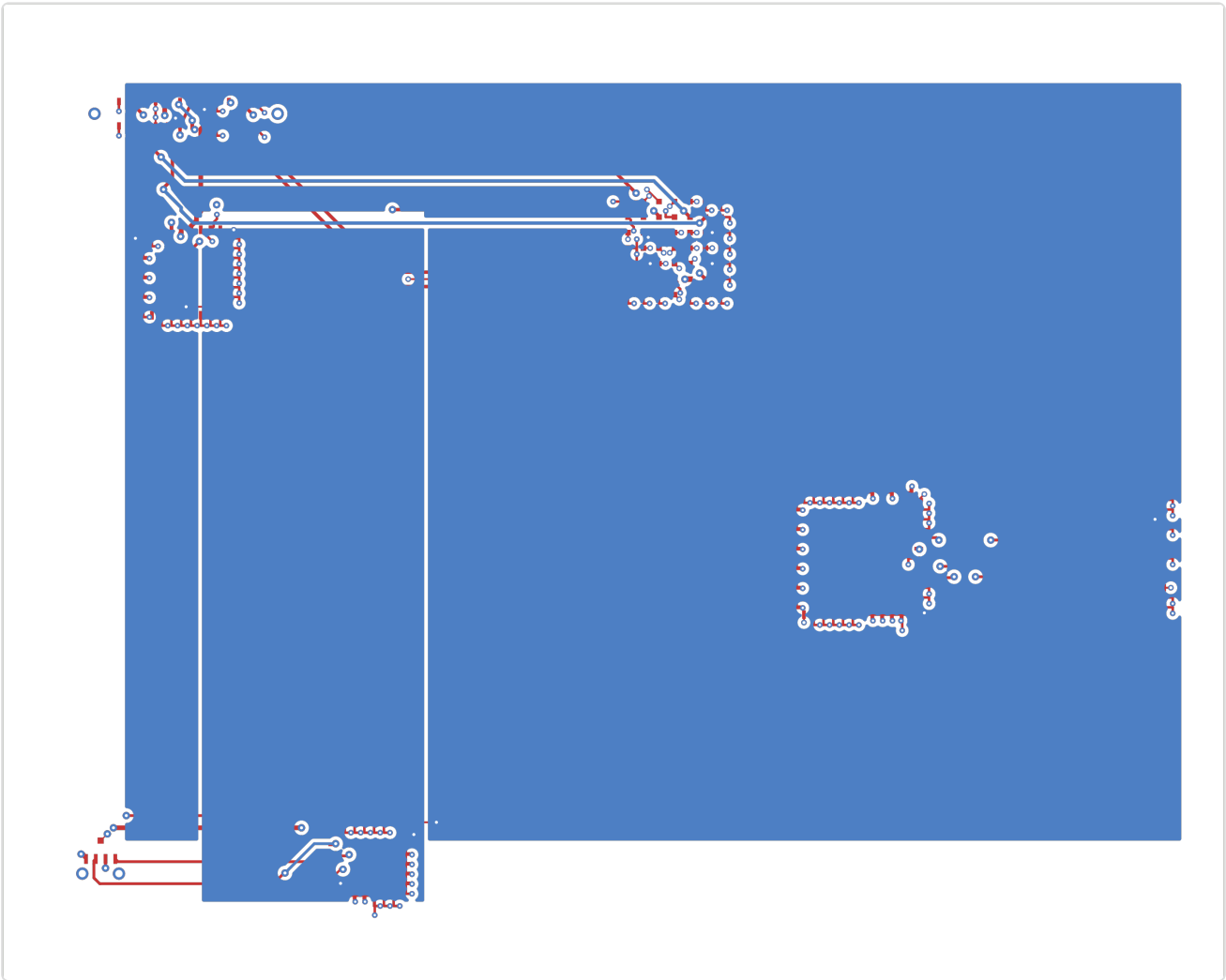


# PCB Layout

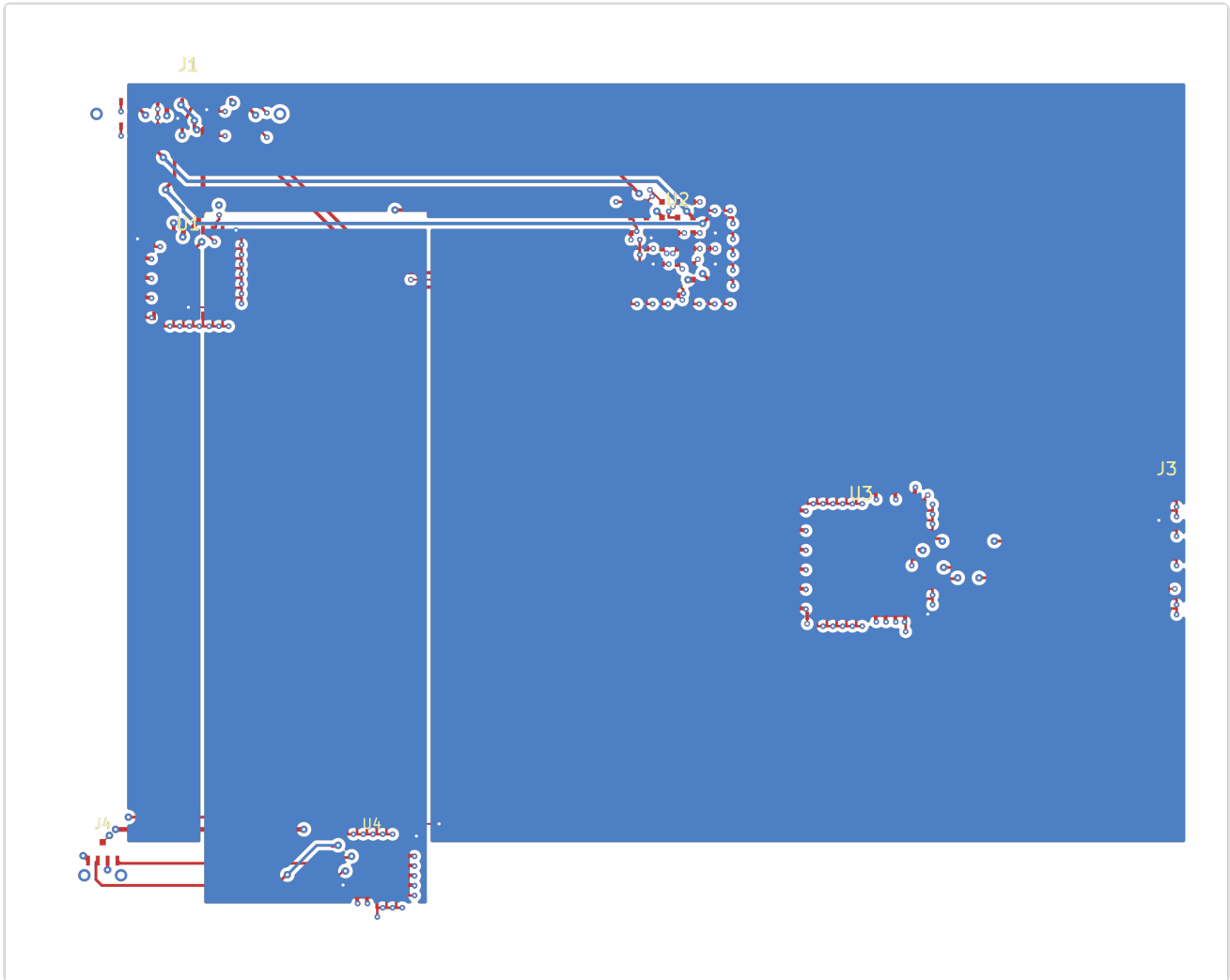




# Copper

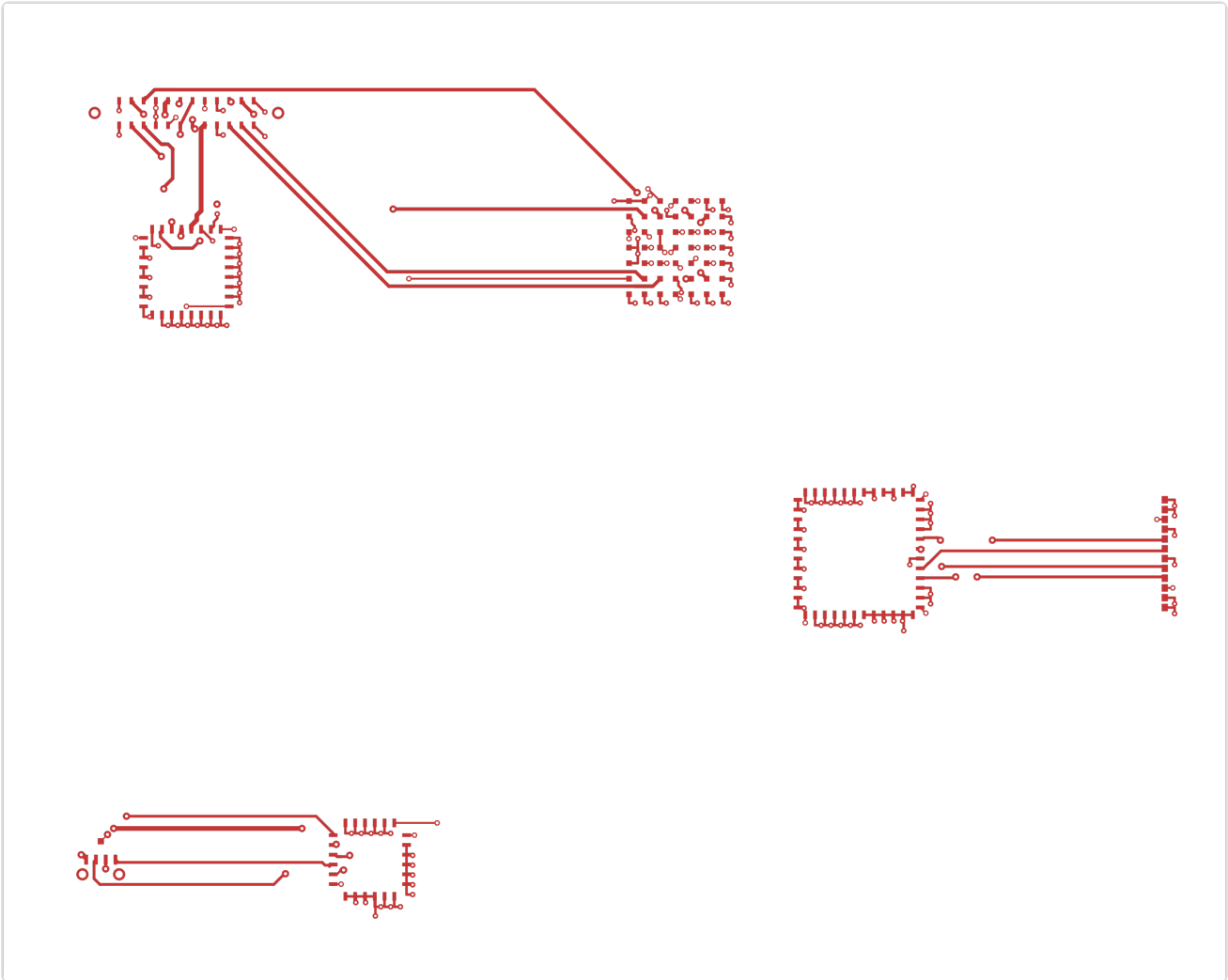


# Assembly

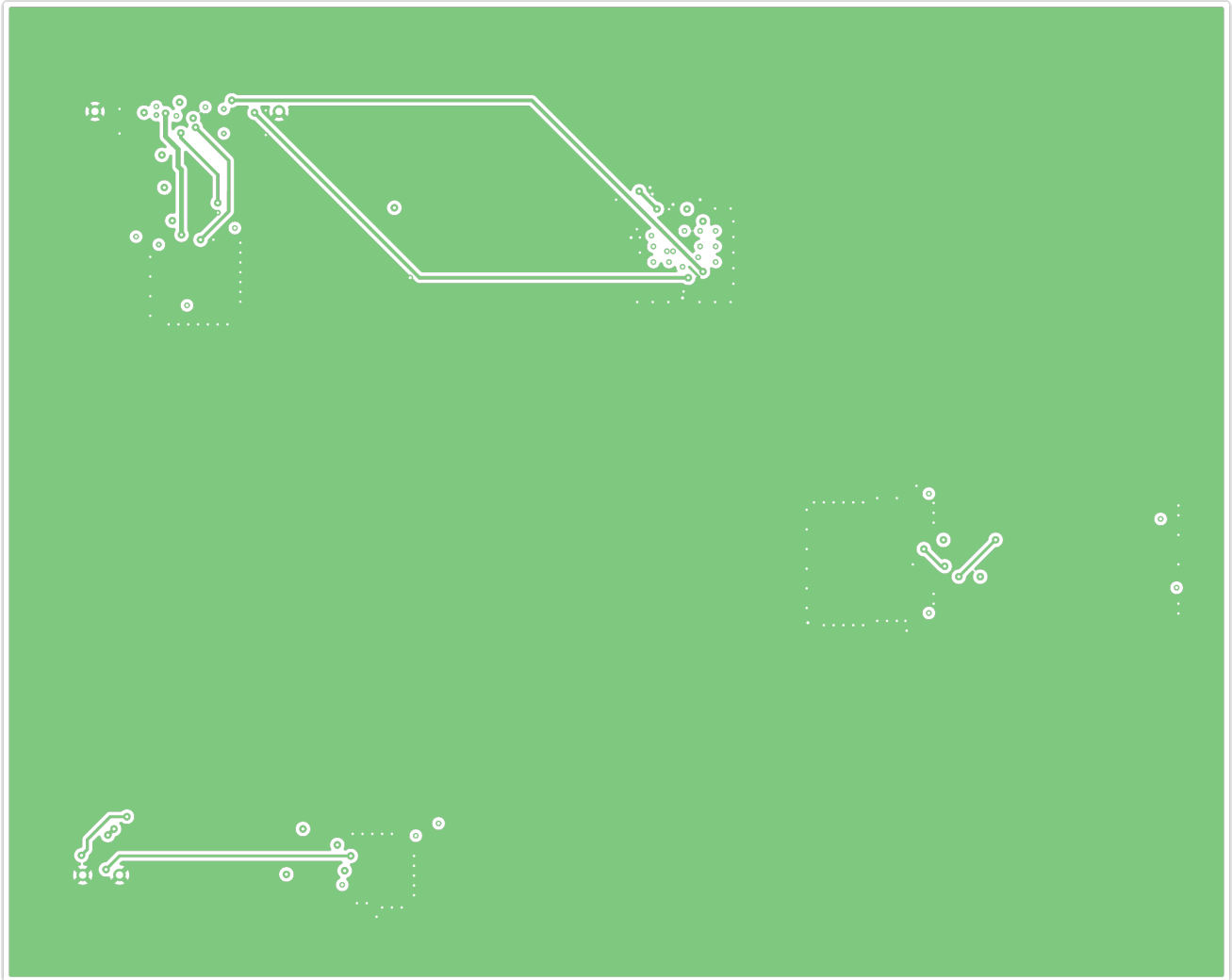


# Copper Layers

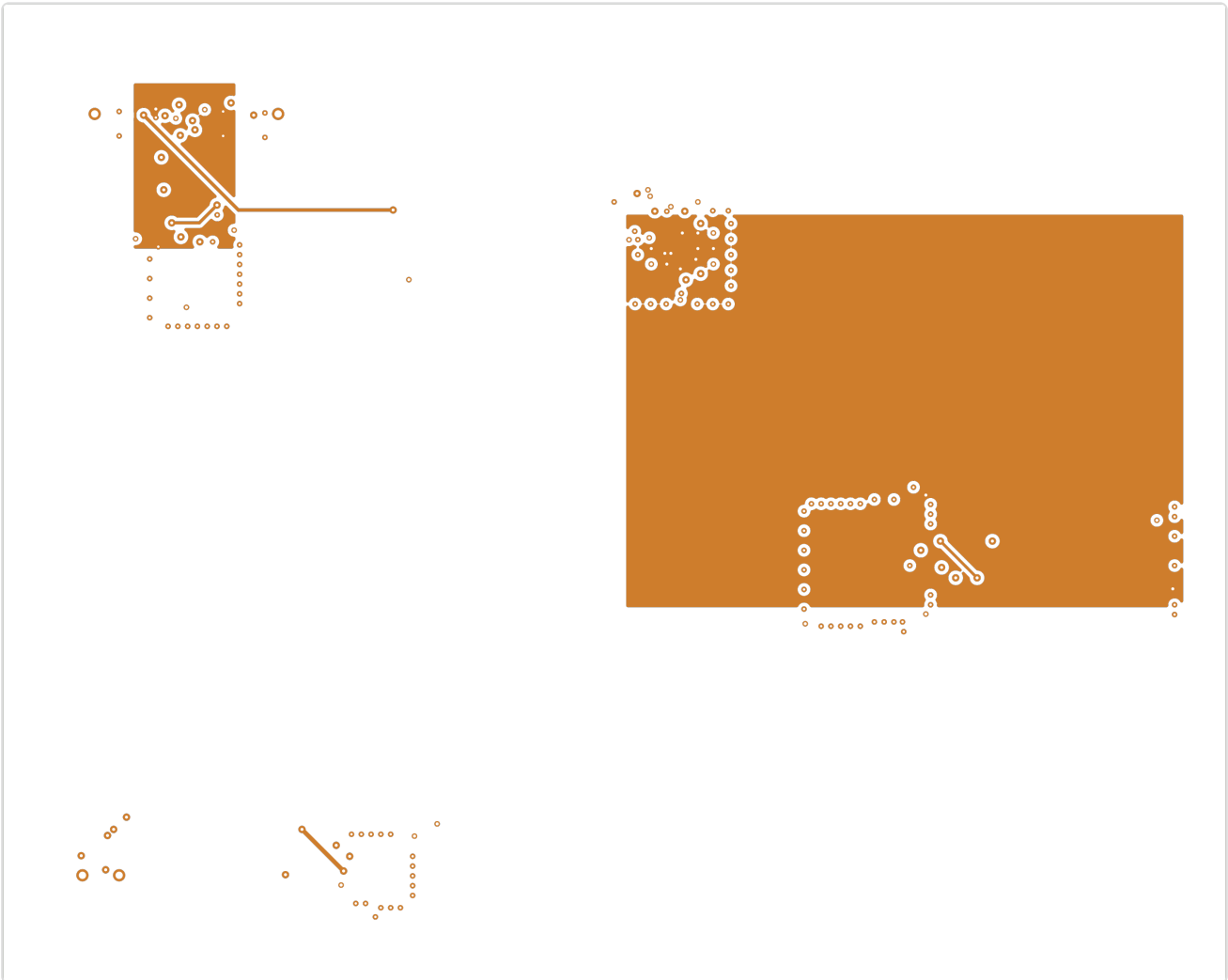
## F.Cu



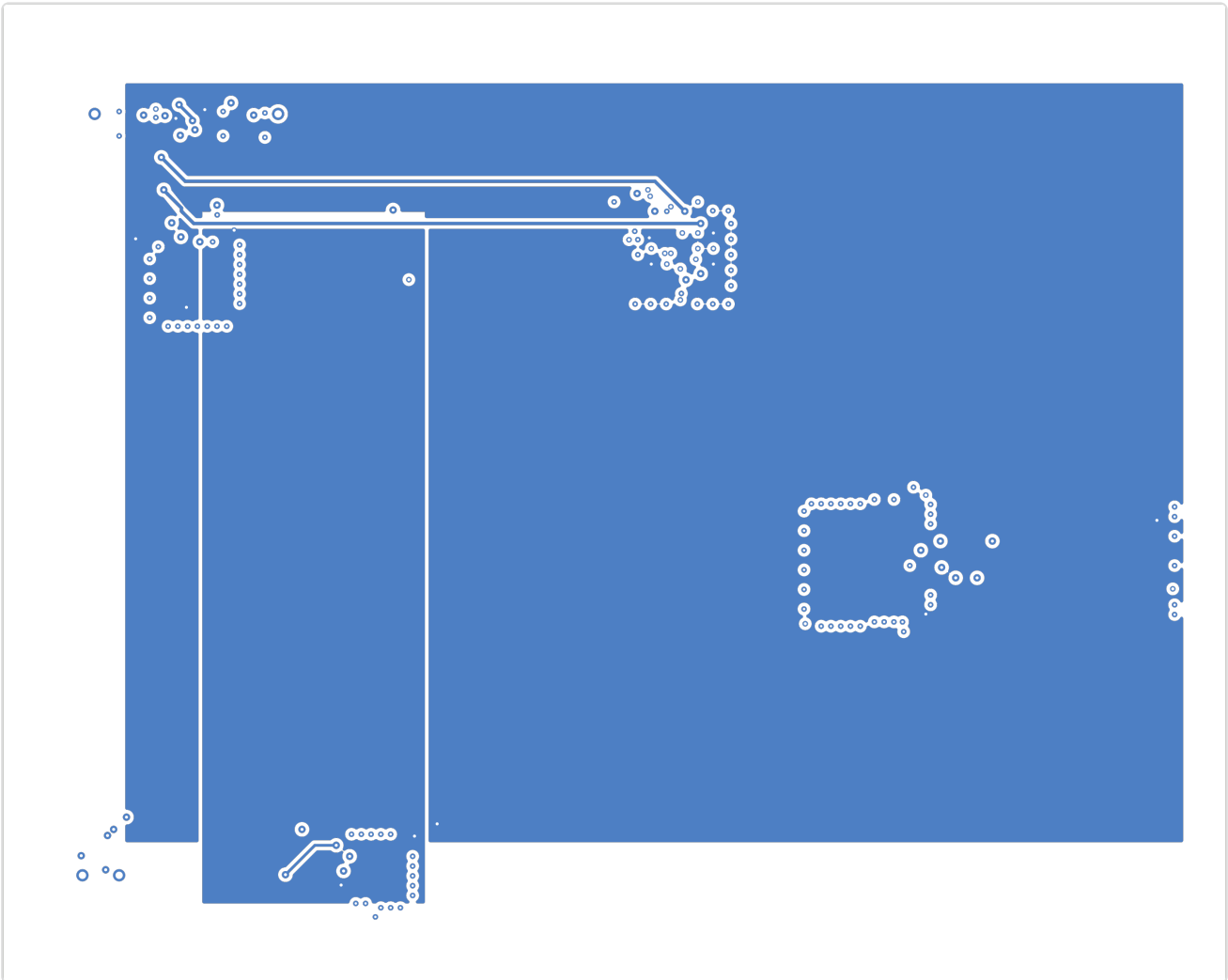
# In1.Cu



## In2.Cu



## B.Cu



## Bill of Materials

Value	Package	Qty	References
FFC4	FFC_4P_0.5mm	1	J4
MiniPCle	PCIE_Mini_Edge	1	J3
USB-C	USB_C_Receptacle_US B2.0	1	J1
BGA49_USB3	BGA-49_5.0x5.0mm_La yout7x7_P0.5mm	1	U2
QFN24_MIPI	QFN-24-1EP_4x4mm_P 0.5mm	1	U4
QFN32_USB2	QFN-32-1EP_5x5mm_P 0.5mm	1	U1
QFP48_PCle	LQFP-48_7x7mm_P0.5 mm	1	U3

## DRC Status

Metric	Count
Errors	2
Warnings	3
Blocking	2

**Status:** FAIL

## Violations by Type

Violation Type	Count
clearance_segment_via	2
connectivity	2
silkscreen_text_height	2
silkscreen_over_pad	1

## Manufacturing Readiness

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Verdict: NOT\_READY

### Action Items

- **[CRITICAL]** Fix 2 blocking DRC violations (clearance\_segment\_via (2))
- **[CRITICAL]** Increase min trace width: 0.100mm < 0.102mm required
- **[OPTIONAL]** Verify zone fill in KiCad for 5 zone-connected nets
- **[OPTIONAL]** Review 3 DRC warnings

## Routing Status

Metric	Value
Signal Net Completion	100.0% (21/21)
Overall Completion	92.3%
Complete Nets	24 / 26
Zone-Connected Nets	5
Incomplete Nets	2
Unconnected Pads	15

### Zone-Connected Nets

- +1V2
- +1V8
- +3V3
- GND
- VBUS\_USB

### Incomplete Nets

- +1V2
- GND

## Cost Estimate

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