

usb_joystick_routed

Design Report

Rev 1 | 2026-06-12 | jlpcb

kicad-tools 0.13.0

Board Summary

| Property | Value |
|------------|-----------------------------|
| Layers | 2 copper (F.Cu, B.Cu) |
| Footprints | 19 (17 SMD, 2 THT, 0 other) |
| Nets | 16 |
| Traces | 582 segments |
| Vias | 15 |
| Board Size | 80.0 x 60.0 mm |

Design Overview

Theory of Operation

USB Joystick Controller

USB game controller with analog joystick

Demonstrates autolayout functionality

Communication Interfaces

| Protocol | Signals |
|----------|----------------|
| USB | USB_D+, USB_D- |

Power Architecture

Power Rails: +5V, GND, PWR_FLAG

Assembly Notes

1 fine-pitch component

- **Fine-pitch components:** 1 (U1)

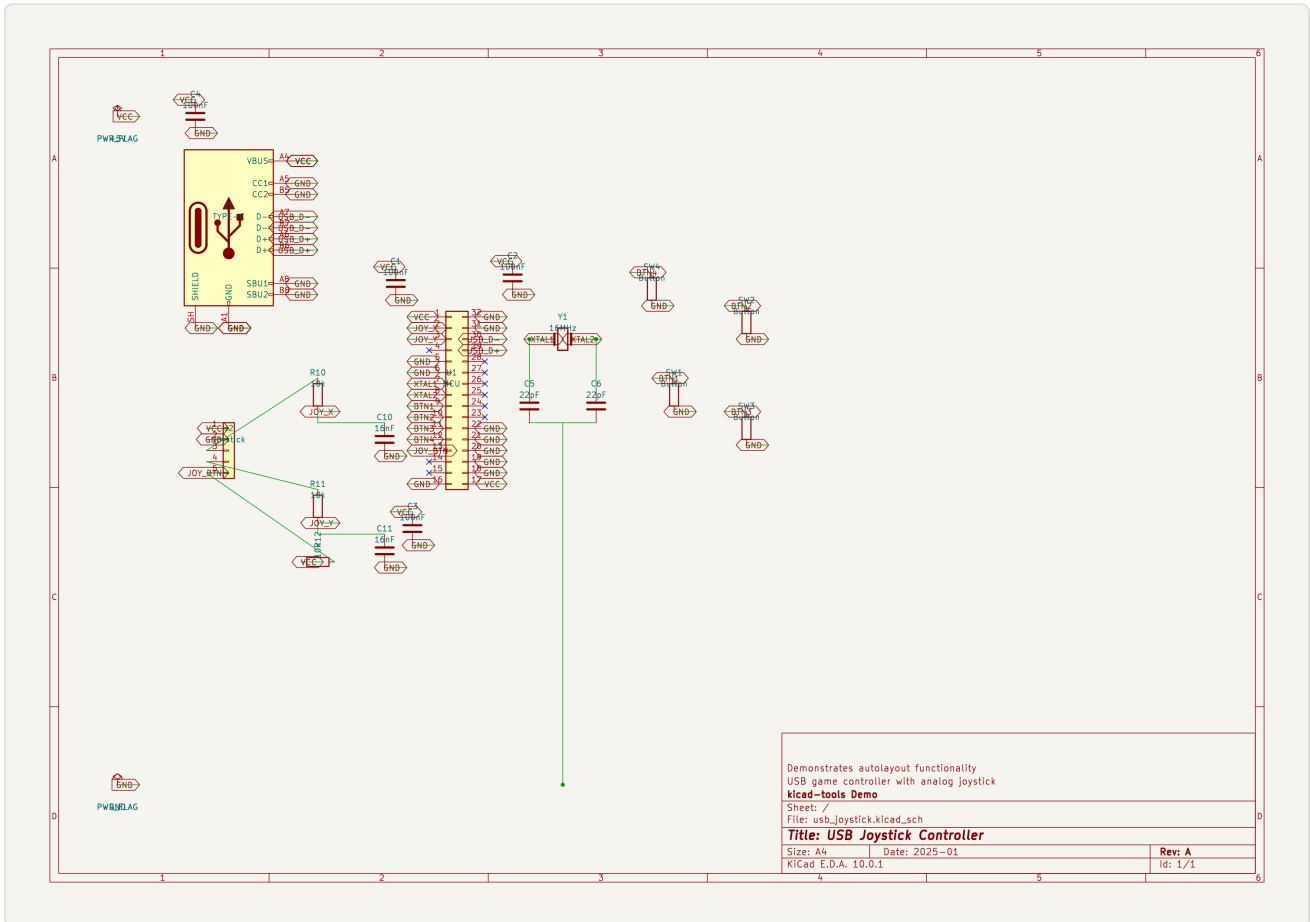
ERC Status

| Metric | Count |
|----------|-------|
| Errors | 0 |
| Warnings | 0 |

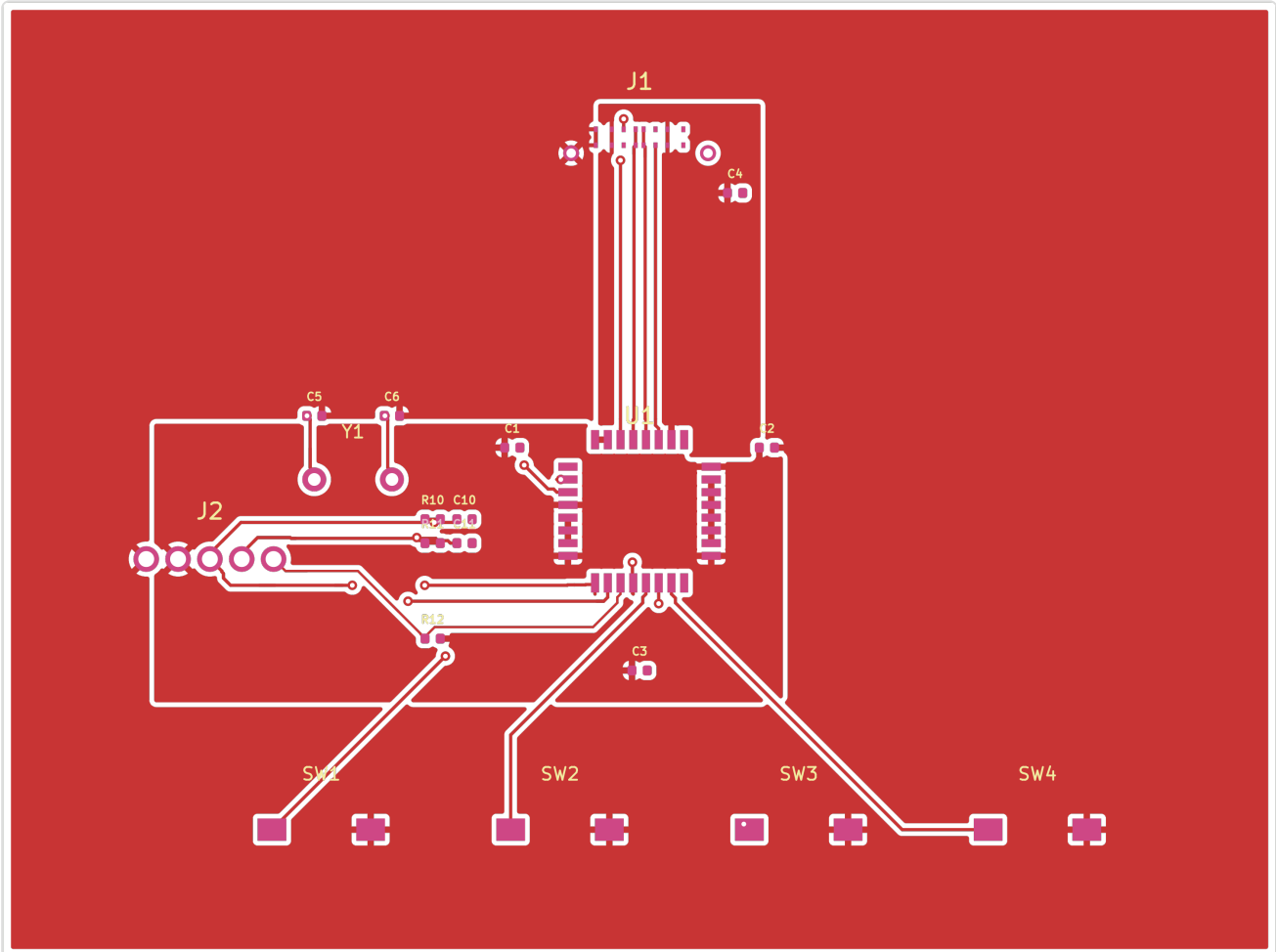
Status: SKIPPED -- ERC skipped by user request

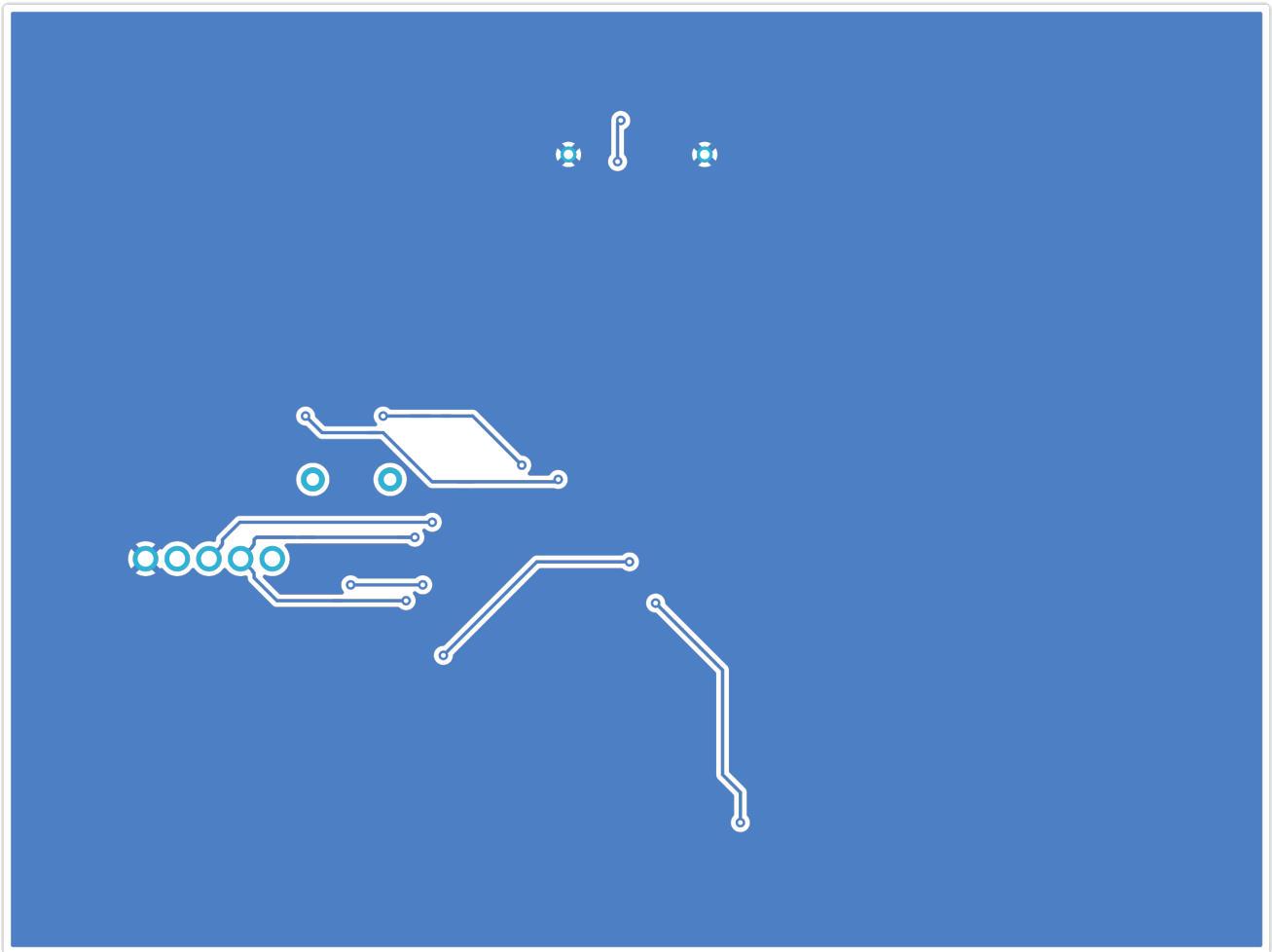
Schematic Overview

Schematic: usb_joystick

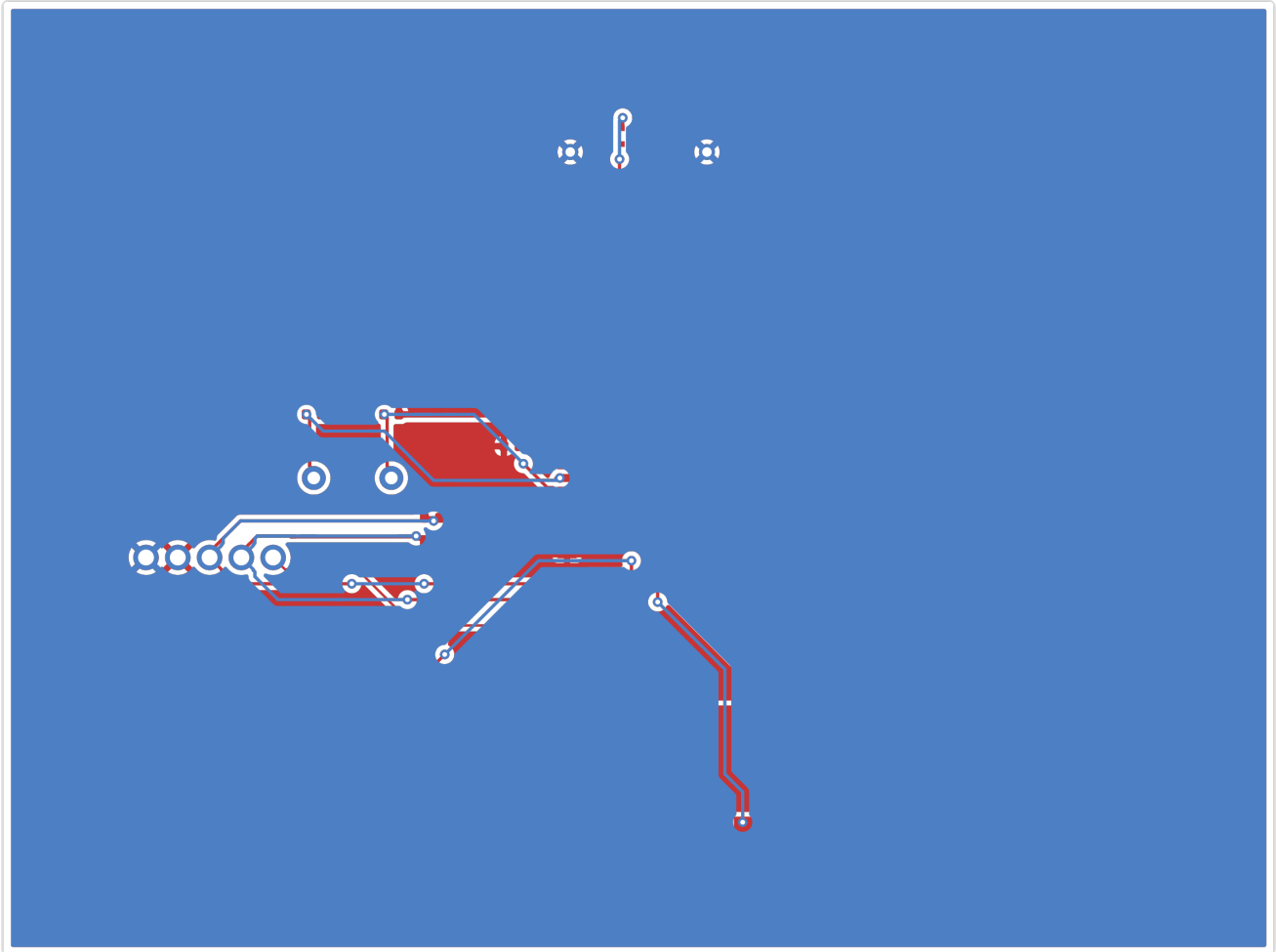


PCB Layout

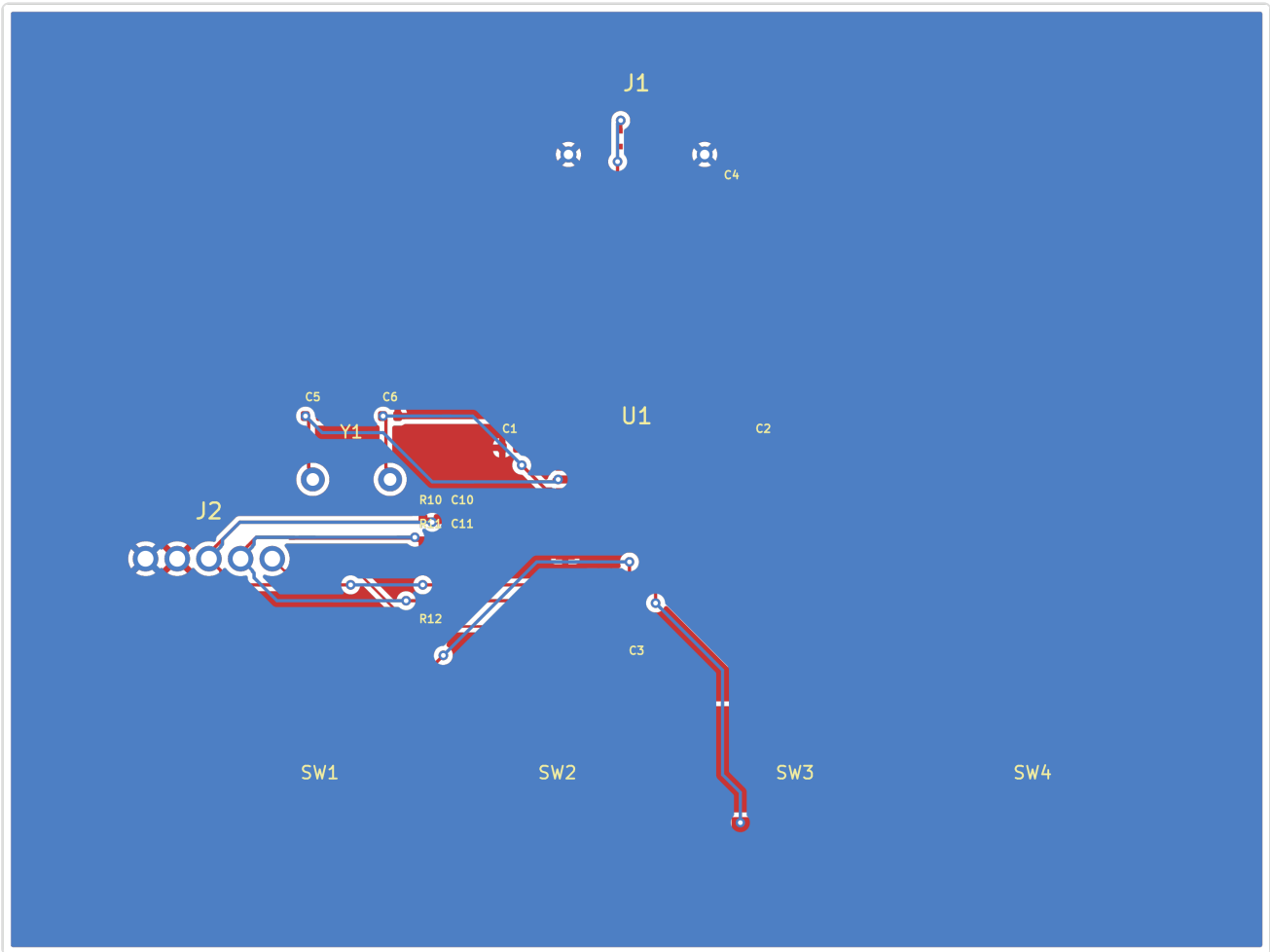




Copper

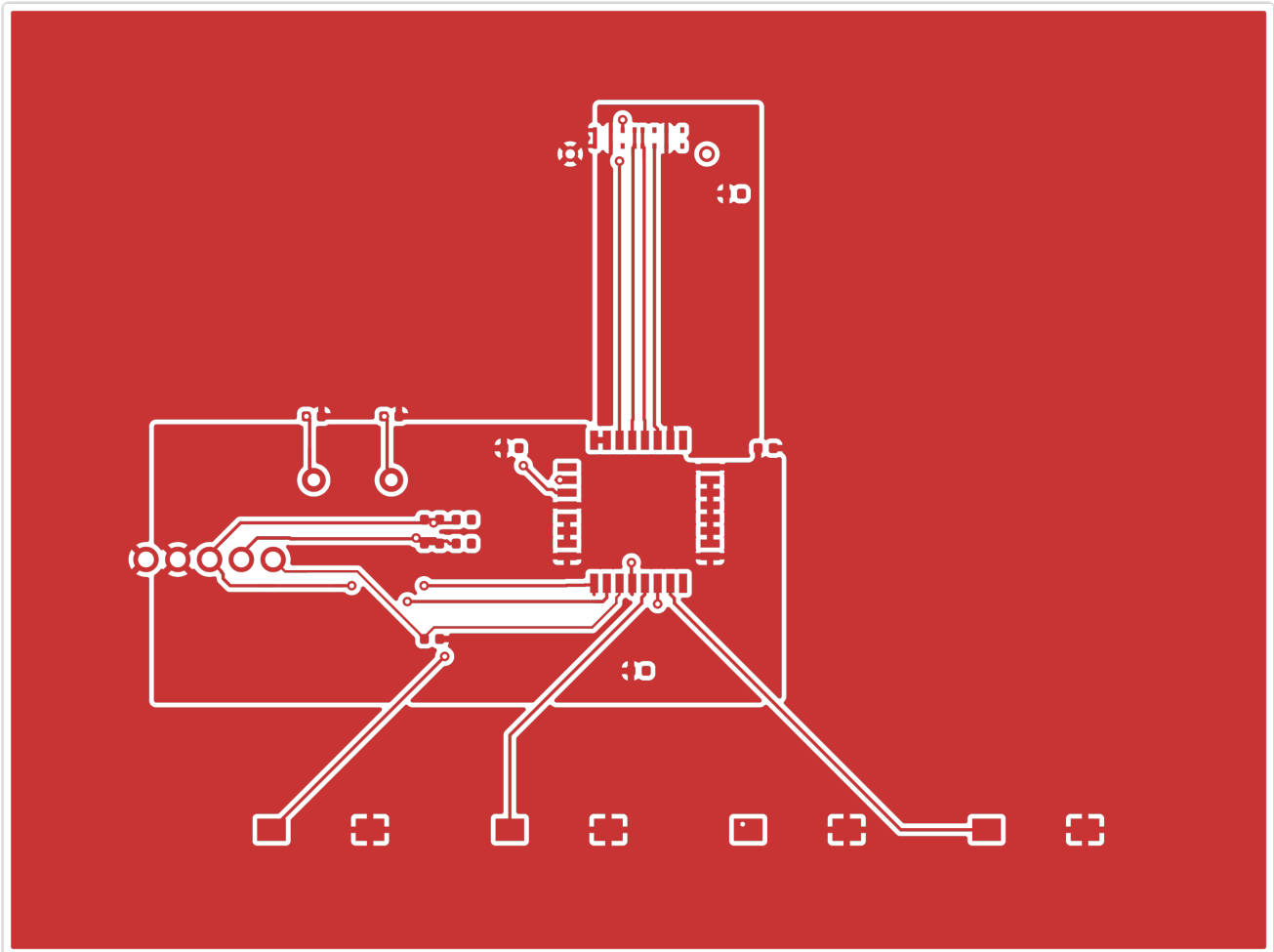


Assembly

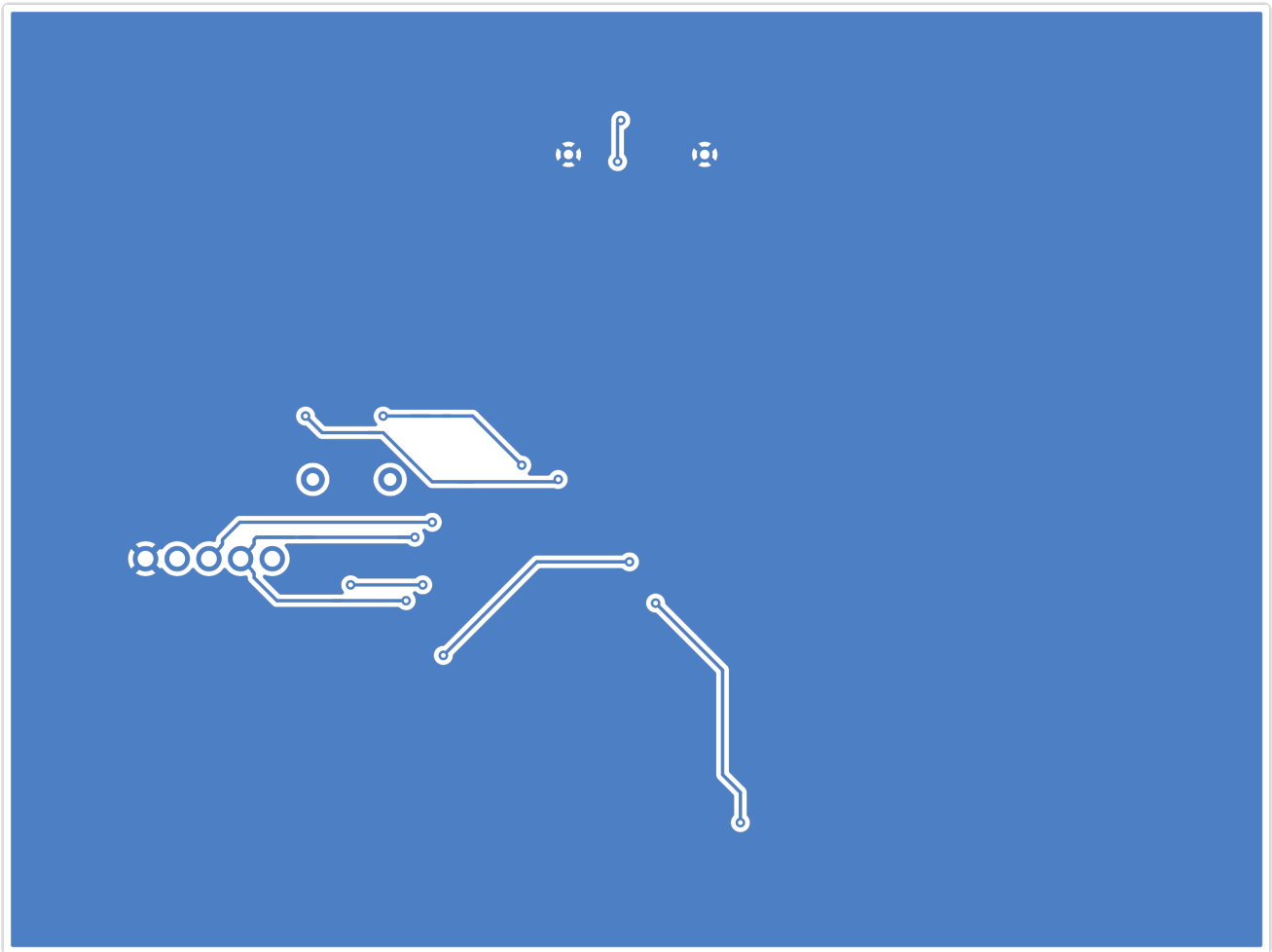


Copper Layers

F.Cu



B.Cu



Bill of Materials

| Value | Package | Qty | References |
|----------|----------------------------------|-----|--------------------|
| 100nF | C_0402_1005Metric | 4 | C1, C2, C3, C4 |
| 16nF | C_0402_1005Metric | 2 | C10, C11 |
| 22pF | C_0402_1005Metric | 2 | C5, C6 |
| Joystick | Joystick_Analog | 1 | J2 |
| TYPE-C | USB_C_Receptacle_GC T_USB4105 | 1 | J1 |
| 10k | R_0402_1005Metric | 3 | R10, R11, R12 |
| Button | SW_SPST_TL3342 | 4 | SW1, SW2, SW3, SW4 |
| MCU | TQFP-32_7x7mm_P0.8 mm | 1 | U1 |
| 16MHz | Crystal_HC49-U_Vertical | 1 | Y1 |

DRC Status

| Metric | Count |
|----------|-------|
| Errors | 4 |
| Warnings | 16 |
| Blocking | 4 |

Status: FAIL

Violations by Type

| Violation Type | Count |
|------------------------|-------|
| silkscreen_text_height | 16 |
| via_in_pad | 4 |

Manufacturing Readiness

Verdict: NOT_READY

Action Items

- **[CRITICAL]** Fix 4 blocking DRC violations (via_in_pad (4))
- **[OPTIONAL]** Verify zone fill in KiCad for 3 zone-connected nets
- **[OPTIONAL]** Review 16 DRC warnings

Routing Status

| Metric | Value |
|-----------------------|----------------|
| Signal Net Completion | 100.0% (13/13) |
| Overall Completion | 100.0% |
| Complete Nets | 16 / 16 |
| Zone-Connected Nets | 3 |
| Incomplete Nets | 0 |
| Unconnected Pads | 0 |

Zone-Connected Nets

- GND
- VBUS
- VCC

Cost Estimate

| Metric | Per Board (estimated) |
|--------------------------|-----------------------|
| PCB Fabrication | ~1.36 USD |
| Components (estimated) | ~1.33 USD |
| Assembly (estimated) | ~2.03 USD |
| Total (estimated) | ~4.72 USD |
| Batch Quantity | 5 |
| Batch Total (estimated) | ~23.61 USD |