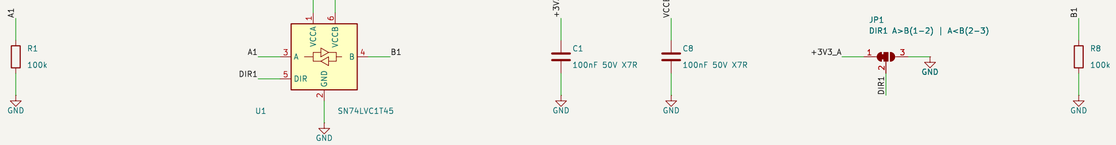
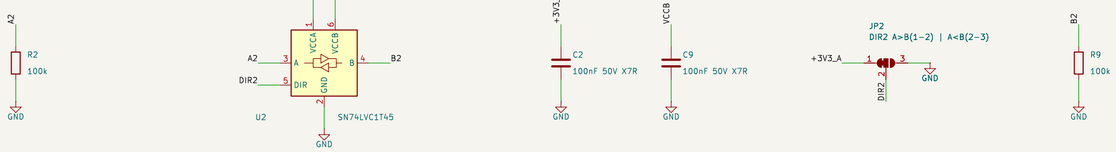
Y LEVEL SHIFTER v02 / PP7 — 7 channels, static direction per channel (JPn: pads 1–2 = A to B host drives peripheral, pads 2–3 = B to A)

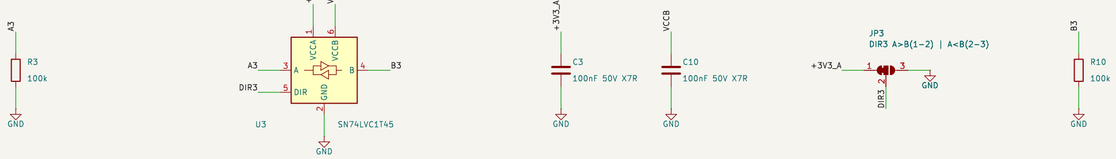
01 / CH1 A1 <–> B1 (U1, JP1)



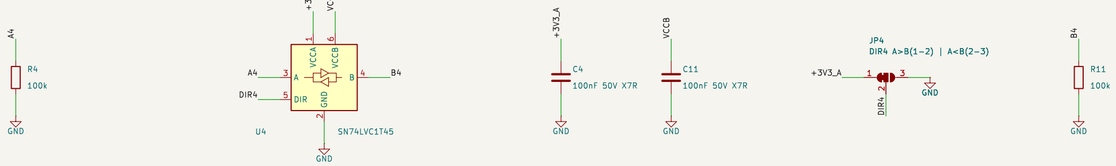
02 / CH2 A2 <–> B2 (U2, JP2)



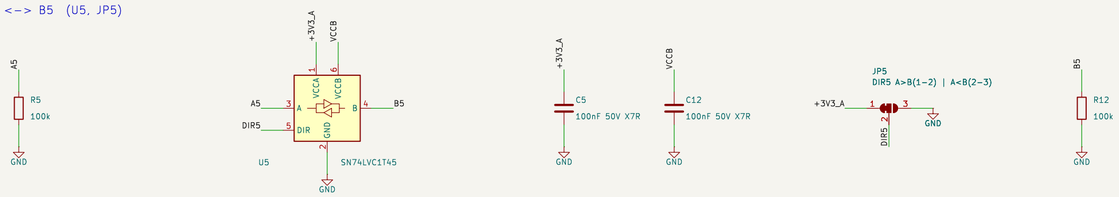
03 / CH3 A3 <–> B3 (U3, JP3)



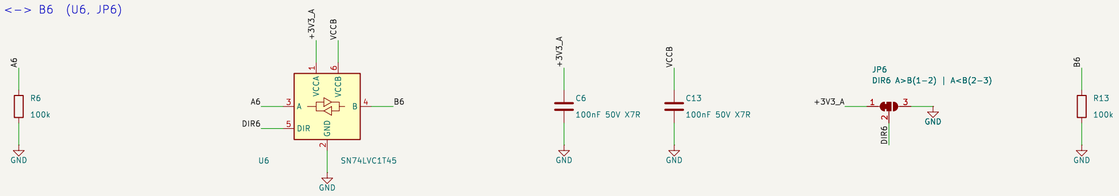
04 / CH4 A4 <–> B4 (U4, JP4)



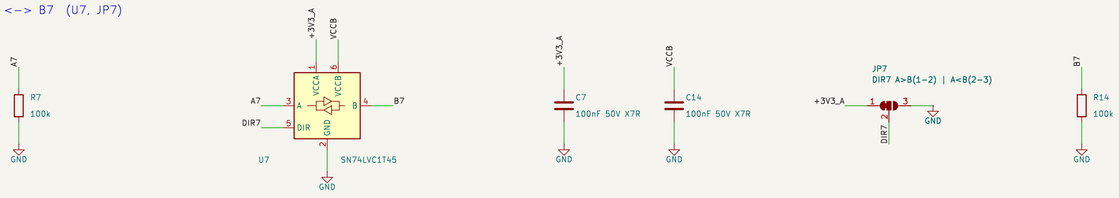
05 / CH5 A5 <–> B5 (U5, JP5)



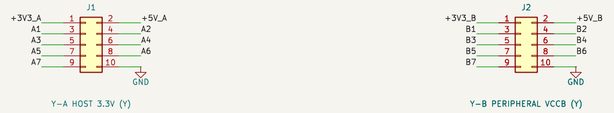
06 / CH6 A6 <–> B6 (U6, JP6)



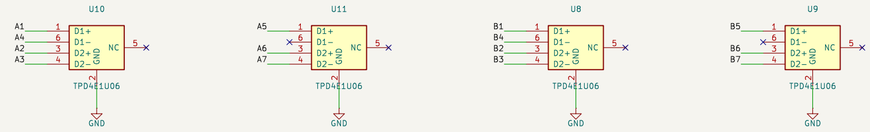
07 / CH7 A7 <–> B7 (U7, JP7)



08 / HOST PORT Y–A (J1) AND PERIPHERAL PORT Y–B (J2)



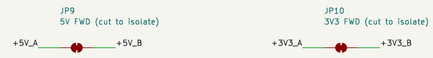
09 / ESD ARRAYS: U10, U11 on Y–A (A1..A7), U8, U9 on Y–B (B1..B7); pin 5 / unused pins not connected



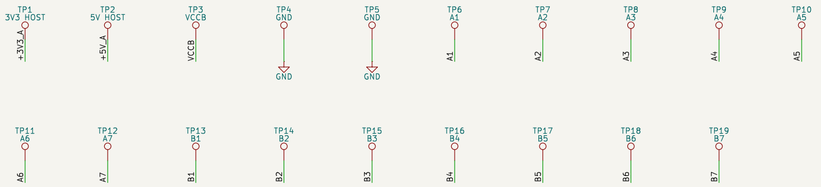
10 / B–DOMAIN SUPPLY: JP8 selects VCCB = host 5 V (1–2, shipped) or EXT (2–3) via D1 and J3



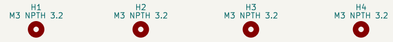
11 / SUPPLY FORWARDING LINKS (cut to isolate Y–B pins)



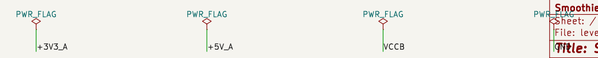
12 / TEST PADS: TP1..TP5 rails (bottom side), TP6..TP12 = A1..A7, TP13..TP19 = B1..B7 (top side, observe only)



13 / MOUNTING HOLES



14 / POWER FLAGS (rails are driven by the host through passive connector pins)



PIN MAP (CLAUDE.md section 3, type Y both ports): 1 +3.3V, 2 +5V, 3–9 GPIO, 10 GND. J1 pins 3..9 = A1..A7 (3.3 V logic). J2 pins 3..9 = B1..B7 (VCCB logic).

Channel n: A_n –> U_n pin 3, U_n pin 4 –> B_n, U_n pin 5 = DIR_n from JP_n pad 2 (pad 1 = +3V3_A = DIR high = A to B shipped, pad 3 = GND = B to A). U_n pin 1 = +3V3_A, pin 6 = VCCB, pin 2 = GND.

R1..R14: 100 k idle pull–downs on every A and B node (shunt, DNP–able). C1..C14: 100 nF 50 V X7R, one per supply pin. U8..U11: TPD4E1U06 ESD arrays at the connector entries (shunt, DNP–able).

Supplies: +3V3_A (J1.1) feeds VCCA and forwards to J2.1 through JP10; +5V_A (J1.2) feeds VCCB through JP8 pad 1 (shipped) and forwards to J2.2 through JP9. GND is common and NOT isolated.

Envelope (calculated, not measured): push–pull CMOS only, <= 20 MHz, <= 150 mm cable, <= 30 pF per pin. NOT for I2C / open–drain / TTL–level outputs. Change jumpers only with all supplies removed. No hot–plug.

CAD–verified design intent only; v01 is a STUDY (placement stage output). CERN–OHL–S–2.0 | KiCad only | black solder mask, white silkscreen.

v01 = study; not fabrication–ready
Variant PP7: 7–channel static–direction push–pull level shifter, Gadgeteer Y to Y
Generated from design–contract.json by tools/create_schematic.py
Smoothieware / CERN–OHL–S–2.0

Sheet: /
File: level–shifter.kicad_sch

Title: Smoothie Y Level Shifter (7–channel, static–direction, push–pull)

Size: A2	Date: 2026–10–01	**Rev: v02**
KiCad E.D.A. 9.0.8		Id: 1/1