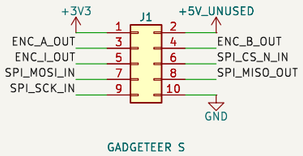
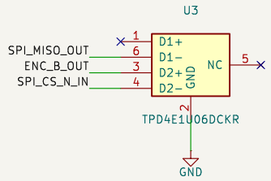
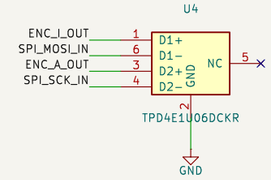
01 / GADGETEER S SOCKET J1 (viewed from the top, notch toward the board interior: pin 1 = bottom-left, 2 = bottom-right, 3 = middle-left, ... 10 = top-right)

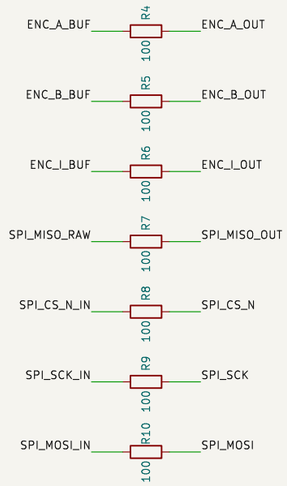


02 / ESD ARRAY U3 = south pad row (A, I, MOSI, SCK), U4 = south pad row (B, CS, MISO)

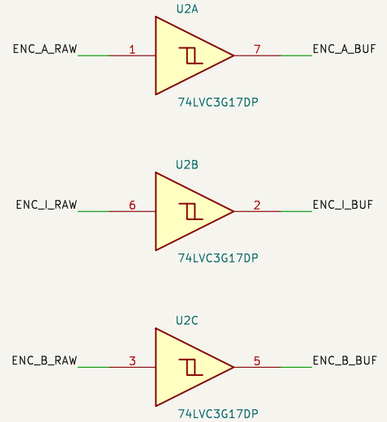


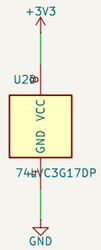


03 / 100 Ω SERIES RESISTORS (J1 side = *_OUT / *_IN nets, IC side = 74LVC1G17 SCHMITT-BUFFER U2 (gates A, B, I and the power unit), C3 bypass



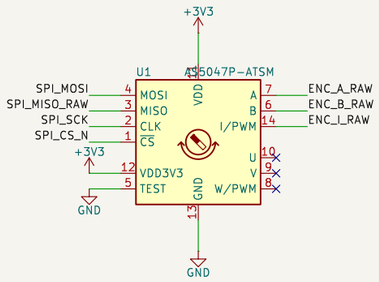
04 / 74LVC1G17 SCHMITT-BUFFER U2

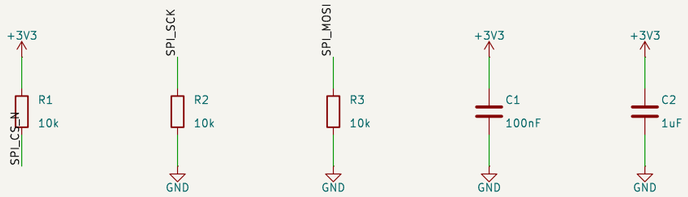




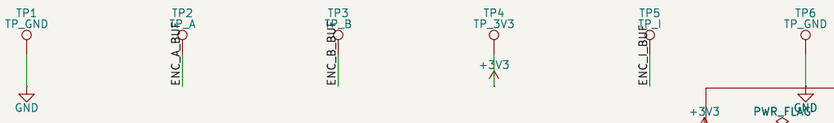


05 / AS5047P SENSOR U1 (3.3 V mode: VDD and VDD3V3 tied to +3V3), SPI BIAS R1–R3, C1 100 nF, C2 1 uF





06 / BOTTOM TEST PADS TP1–TP6 (observe only, never drive)





Pin map (D1): 1 +3V3, 2 +5V (no copper, 0 mA), 3 ENC_A, 4 ENC_B, 5 ENC_I, 6 CS, 7 MOSI, 8 MISO, 9 SCK, 10 GND. S-type socket; also plugs into a Y header (6–9 are then plain GPIO).

J1.2 +5V is carried on net +5V_UNUSED and reaches no component: the AS5047P runs in 3.3 V mode (VDD and VDD3V3 on +3V3, datasheet Figure 10).

A, B, I are buffered by U2 and all seven J1 signal lines have a TPD4E1U06 channel at the connector plus a 100 ohm series resistor. Unused TVS channel U3 D1+ (pin1) is flagged no-connect.

Power-up: A, B and I are high for up to 10 ms (tpon). SPI mode 1 (CPOL 0, CPHA 1), 1 MHz recommended with a cable of at most 0.3 m. NO HOT-PLUG.

Magnet: diametric NdFeB 8 x 3 mm (N35H or better) centred over U1, air gap 2 mm (1.5–2.5), 35–70 mT at the die. No steel within 10 mm of the sensor (design assumption).

Budget: 25 mA from +3V3 (worst case 15.9 mA), 0 mA from +5V. 1 pulse/rev = 4000 steps/rev at the unprogrammed default of 1000 ppr.

CERN-OHL-S-2.0 | KiCad only | black solder mask, white silkscreen | v10 is a rejected engineering study: generated and CAD-checked only, not built or tested.

Generated from design_contract.json by tools/create_schematic.py; v01 is a study, not fabrication-rea
Contactless filament encoder: AS5047P + 74LVC3G17, Gadgeteer S socket

Smoothieware / CERN-OHL-S-2.0

Sheet: /
File: filament-encoder.kicad_sch

Title: *Smoothie filament encoder*

Size: A3	Date: 2026-10-01	**Rev: v10**
KiCad E.D.A. 9.0.8		Id: 1/1