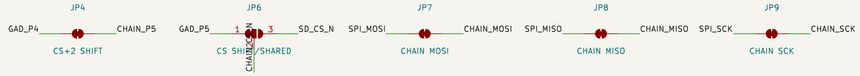
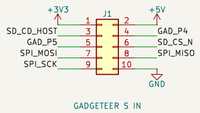
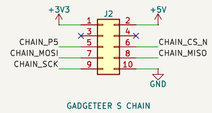
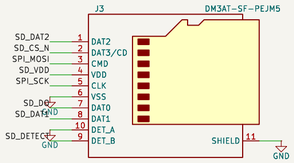
## 01 / GADGETEER S SOCKET J1 (IN), CHAIN JUMPERS JP4 JP6 JP7 JP8 JP9, CHAIN SOCKET J2

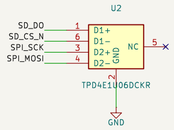


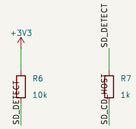

## 02 / MICROSD SOCKET J3, ESD CLAMP U2, CARD-SIDE PULL-UPS R3 R4 R5, CARD DETECT R6 R7



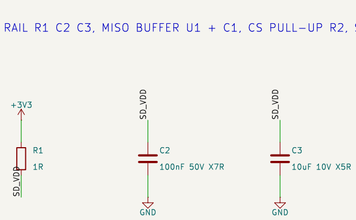



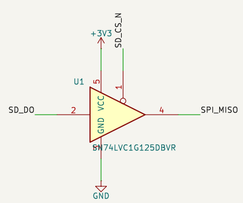


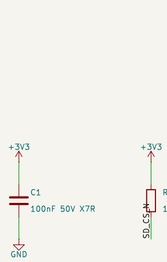





## 03 / CARD RAIL R1 C2 C3, MISO BUFFER U1 + C1, CS PULL-UP R2, SEL LED D1 + R8

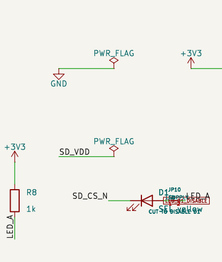












## 04 / TEST PADS TP1..TP8 (BOTTOM SIDE, OBSERVE ONLY)




## 05 / CURRENT CONTRACT AND QUALIFICATION NOTES

SOCKET MAP (D1, CLAUDE.md S row: J1 = IN, J2 = CHAIN). Host net per pin:
1 +3V3 | 2 +5V | 3 SD_CD_HOST | 4 GAD_P4 | 5 GAD_P5 | 6 SD_CS_N | 7 SPI_MOSI | 8 SPI_MISO | 9 SPI_SCK | 10 GND
J2 pins: 1 +3V3, 2 +5V, 10 GND direct; 3 and 4 OPEN (no copper); 5 = CHAIN_P5 (from J1.4 via JP4); 6 = CHAIN_CS_N (from J1.5 via JP6 pads 1-2); 7/8/9 via JP7/JP8/JP9.
CHAIN POLICY: CS barrel shift. This board CS = socket pin 6; next board gets host pin 5 on its pin 6, the third gets host pin 4. Up to three SD boards. Defaults: JP4, JP7, JP8, JP9 bridged: JP6 pads 1-2 bridged (SHIFT), pad 3 open.
SHARED CS (JP6 pads 2-3) is NOT supported when the next board also drives MISO. +5V is forwarded to J2 only: 0 mA local, never reaches the card.
SPI MODE 0, SCK <= 10 MHz (calculated, not tested), total cable <= 150 mm, card init at 100-400 kHz. Card rail 3.3 V ONLY (SD_VDD behind R1 1 ohm, C3 10 uF, C2 100 nF).
U1 74LVC1G125: card DO reaches SPI_MISO only while SD_CS_N is low (Hi-Z otherwise). R2 10k keeps CS high while the host pin floats. DO/DAT1/DAT2 pulled up to SD_VDD (R3-R5 10k).
U2 TPD4E1U06DCKR: ESD clamp on CS, CLK, DI, DO at the card entry. Socket shell tied to GND. Card detect: DET_B -> SD_DETECT (R6 10k pull-up). DET_A -> GND; R7 1k to J1.3: polarity ASSUMED low = card present.
NO HOT-PLUG of the ribbon. Card insertion transient on the host 3.3 V is UNVERIFIED (qualification Q-F). Host 3.3 V allocation unknown: planning allowance 108 mA continuous / 208 mA peak, excluding insertion inrush, at most one SD board per host 3.3 V switch.
Firmware: no SPI SD driver in the SmoothieV2 snapshot (hardware only). Physical V2 header pinout vs canonical table UNRESOLVED (wiki differs): check pin 1 and rails before connecting.
Variants: SD-SPI-A all fitted; SD-SPI-B = R8 DNP (LED dark). PWR_FLAG on SD_VDD is added in the schematic (J3.4 is a power input fed through R1: contract gap, logged in questions.md).
No external power input: the 12-24 V / Gadgeteer-5V jumper rule does not apply. CERN-OHL-S-2.0 | KiCad only | black solder mask, white silkscreen | v17 study, not fabrication-ready, not built or tested.
POWER LIMITS: 100/200 mA card load is an assumption. Actual host allocation, card peak, R1 pulse rating and host droop remain unqualified.
Removing R1 does not isolate host signal phantom paths. The ideal 3.3 V / 1 ohm charging peak is 3.3 A, not a qualified inrush limit.

Prototype: physical qualification pending
A2 notes: current and inrush limits unqualified
**Smoothieware / CERN-OHL-S-2.0**

Sheet: /
File: sd-card-breakout.kicad_sch

***Title: Smoothie SD card breakout (microSD, SPI mode)***

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|---|---|---|
| Size: A2 | Date: 2026-10-01 | **Rev: v17** |
| KiCad E.D.A. 9.0.8 | | Id: 1/1 |