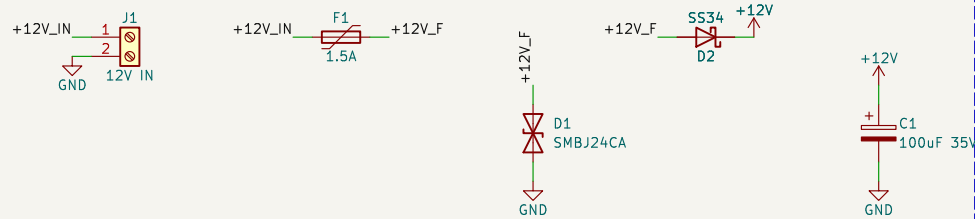
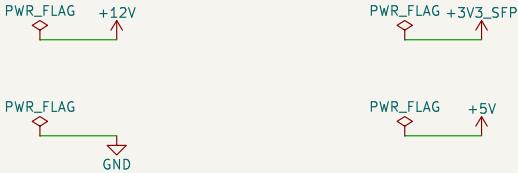




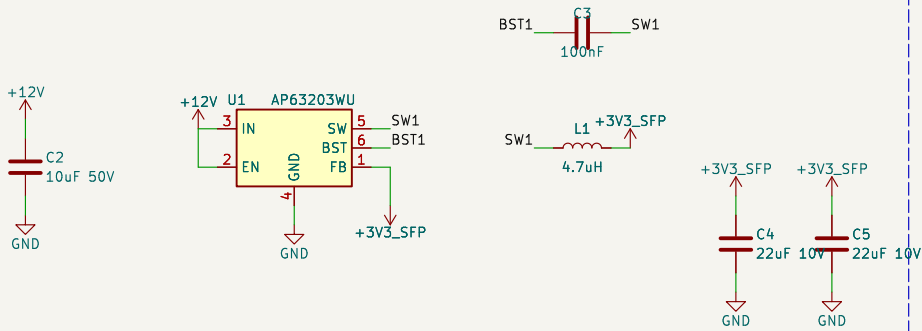
INPUT PROTECTION



POWER FLAGS (ERC only, no parts)



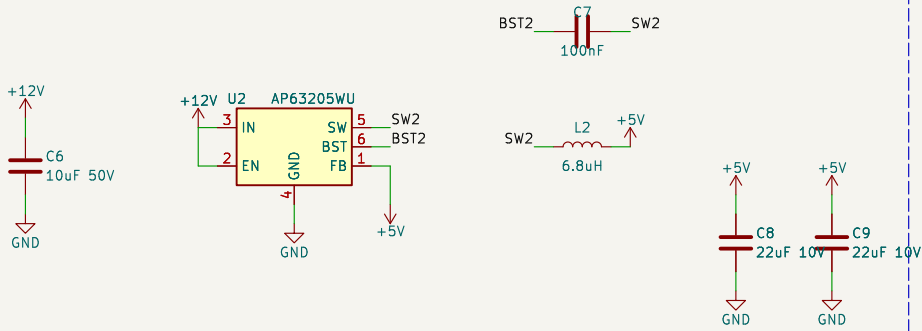
SFP SUPPLY 12 V -> 3.3 V, 2 A



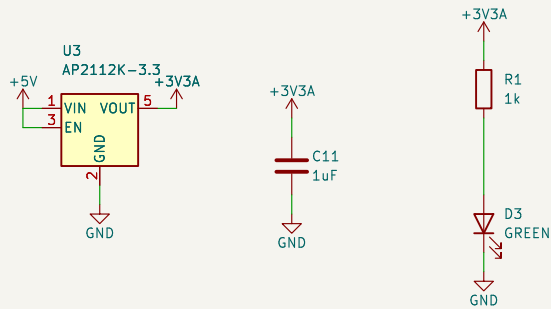
RAILS
+12V cabinet 12 V after fuse, TVS and reverse-polarity diode
+3V3_SFP SFP laser modules only (about 0.6 A for 2 modules)
+5V relay coils, radio module header
+3V3A MCU, op-amps, comparators, DAC (quiet rail from LDO)

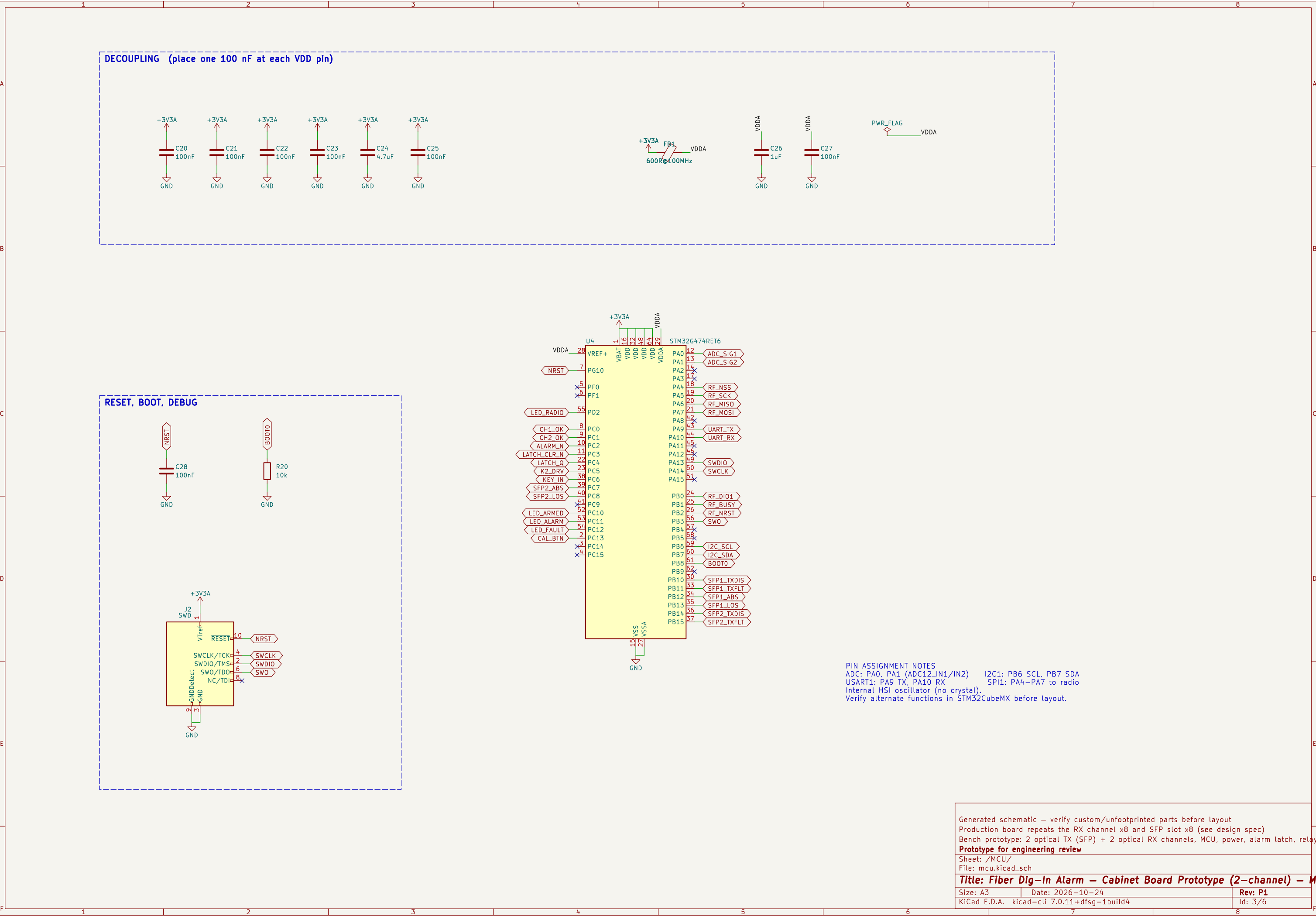
Inductor values follow the AP6320x datasheet table; confirm before layout.
Production board (8 SFPs) needs a 3 A buck for +3V3_SFP (e.g. LMR33630).

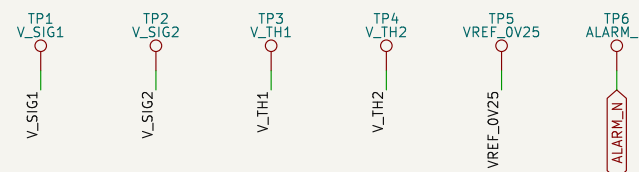
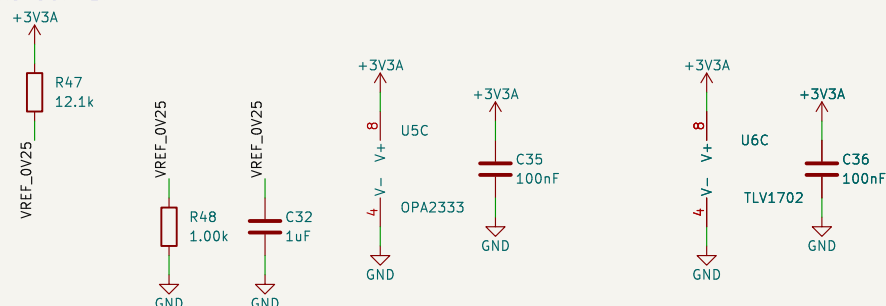
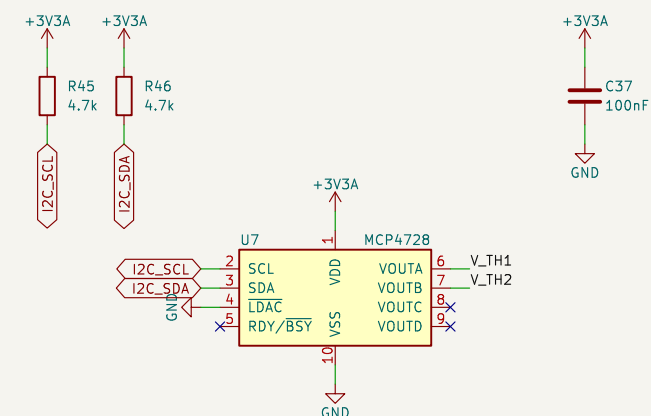
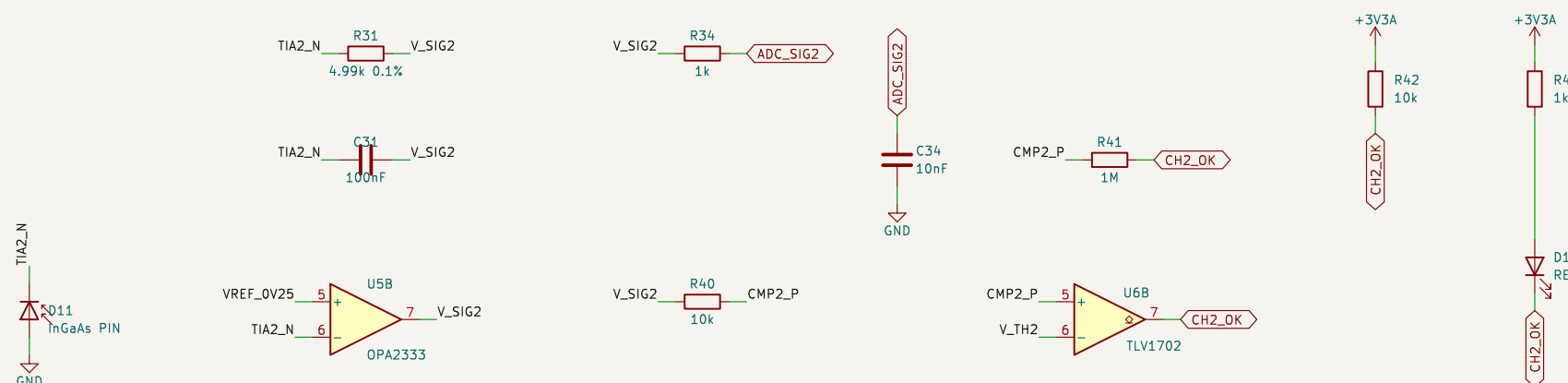
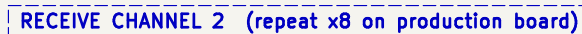
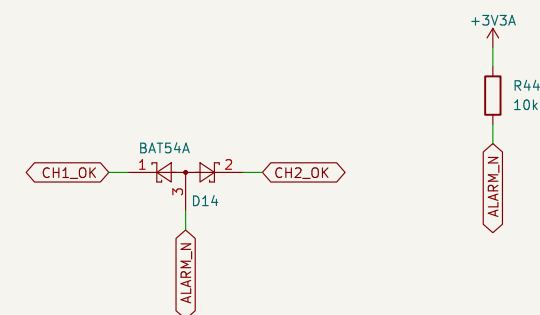
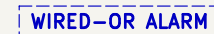
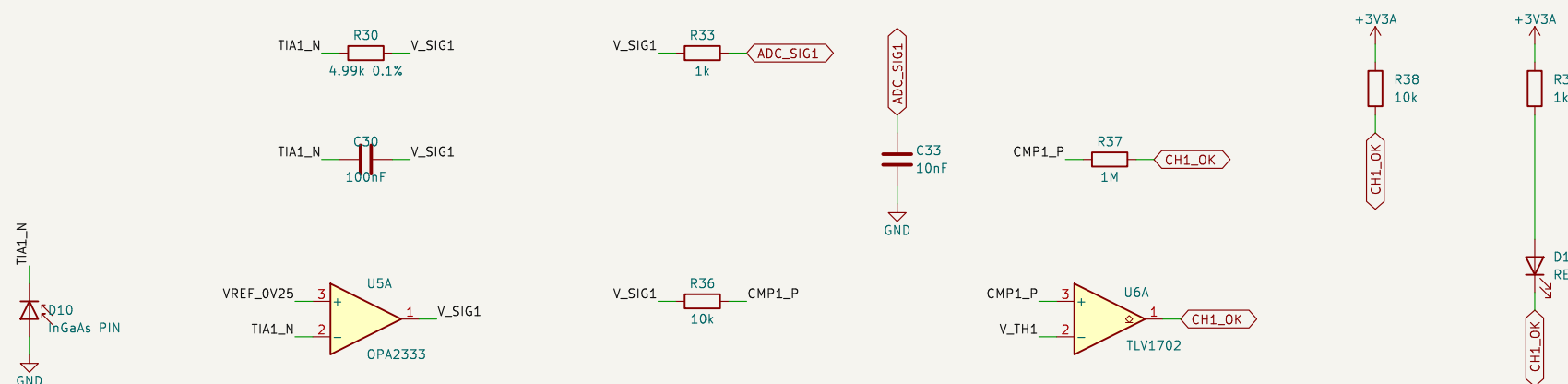
RELAY / RADIO SUPPLY 12 V -> 5 V, 2 A



QUIET 3.3 V (MCU + ANALOG)



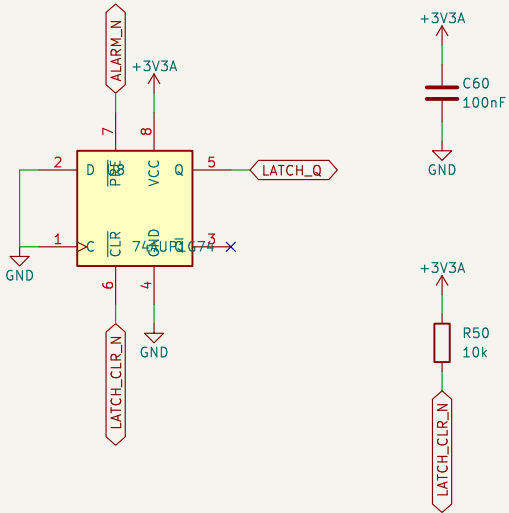




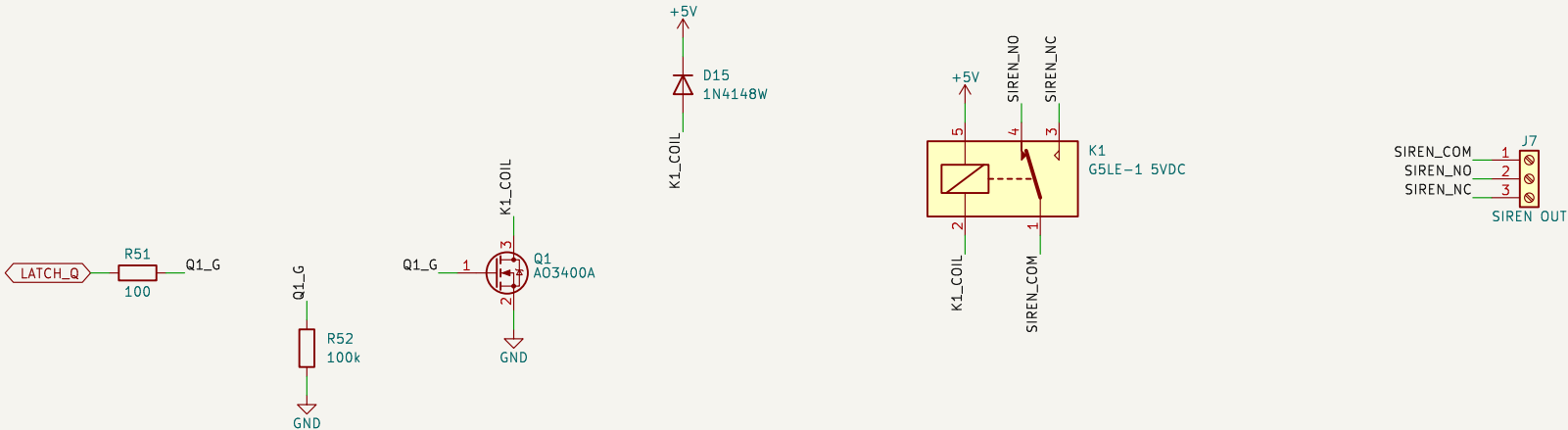
CHANNEL MATH
 $V_SIG = 0.25\text{ V} + I_pdx \times 4.99k$ (about 0.94–2.42 V)
 Calibrate: $V_TH = 0.25\text{ V} + 0.5 \times (V_SIG - 0.25\text{ V})$ (–3 dB)
 $V_SIG < V_TH \rightarrow$ comparator LOW $\rightarrow$ ALARM_N LOW
 Dark, no power or pulled cord $\rightarrow$ alarm (fail–safe)

Generated schematic – verify custom/unfootprinted parts before layout	
Production board repeats the RX channel x8 and SFP slot x8 (see design spec)	
Bench prototype: 2 optical TX (SFP) + 2 optical RX channels, MCU, power, alarm latch, relays	
Prototype for engineering review	
Sheet: /Optical RX/	
File: optical_rx.kicad_sch	
Title: Fiber Dig-In Alarm – Cabinet Board Prototype (2–channel) – Opt	
Size: A3	Date: 2026–10–24
KiCad E.D.A. kicad-cli 7.0.11+dfsg-1build4	Rev: P1 Id: 5/6

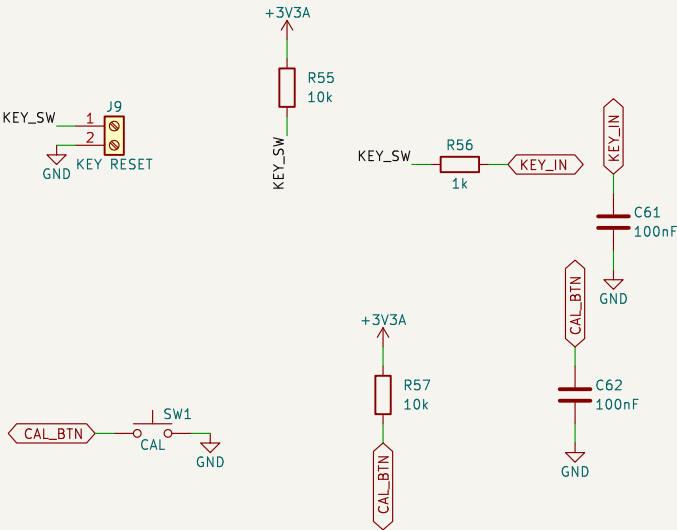
HARDWARE ALARM LATCH



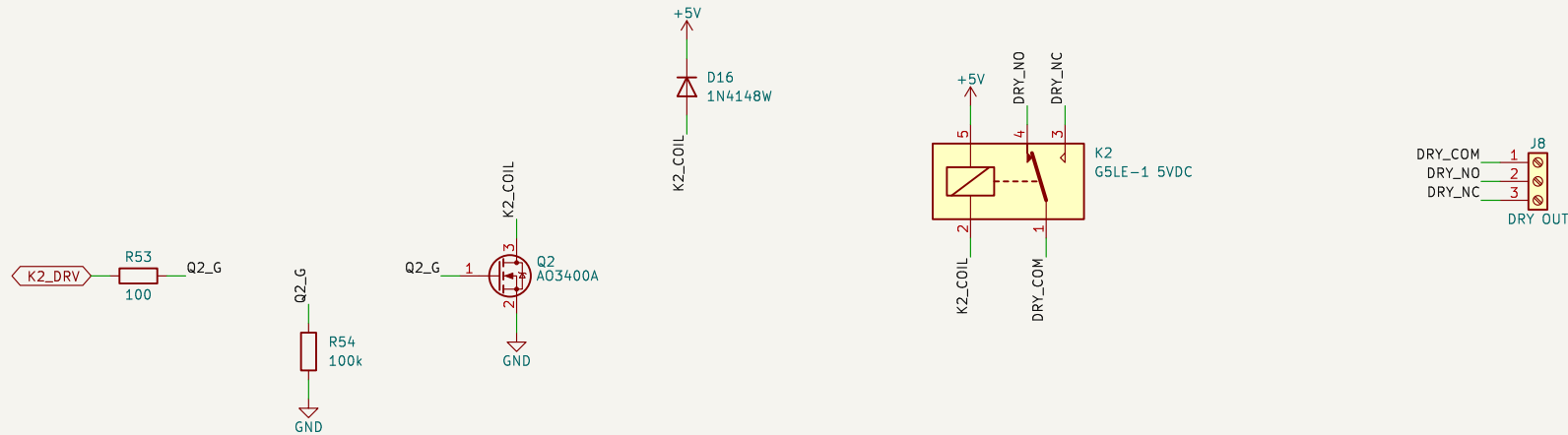
SIREN RELAY (driven by latch)



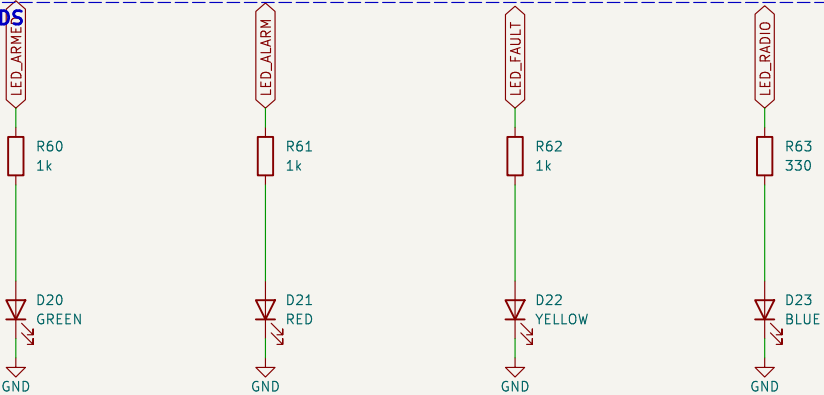
KEY RESET AND CAL BUTTON



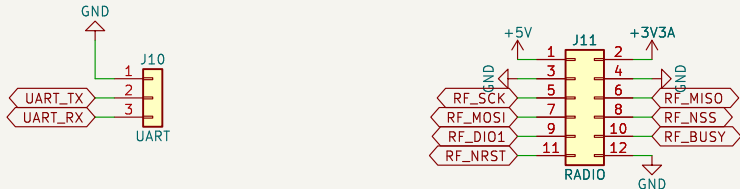
DRY-CONTACT RELAY (driven by MCU)



STATUS LEDs



SERVICE AND RADIO HEADERS



ALARM PATH (no firmware in the loop)
Any RX channel low -> ALARM_N low -> U8 -PRE sets Q
-> Q1 -> K1 -> siren. Q stays set until the MCU pulses
LATCH_CLR_N, which firmware allows only after the
keyed reset input (J9) is operated.
At power-up ALARM_N is low until light arrives, so the
siren sounds until the board is armed (fail-safe).
Relay contacts 1 COM, 3 NC, 4 NO: confirm against
the Omron G5LE datasheet before layout.