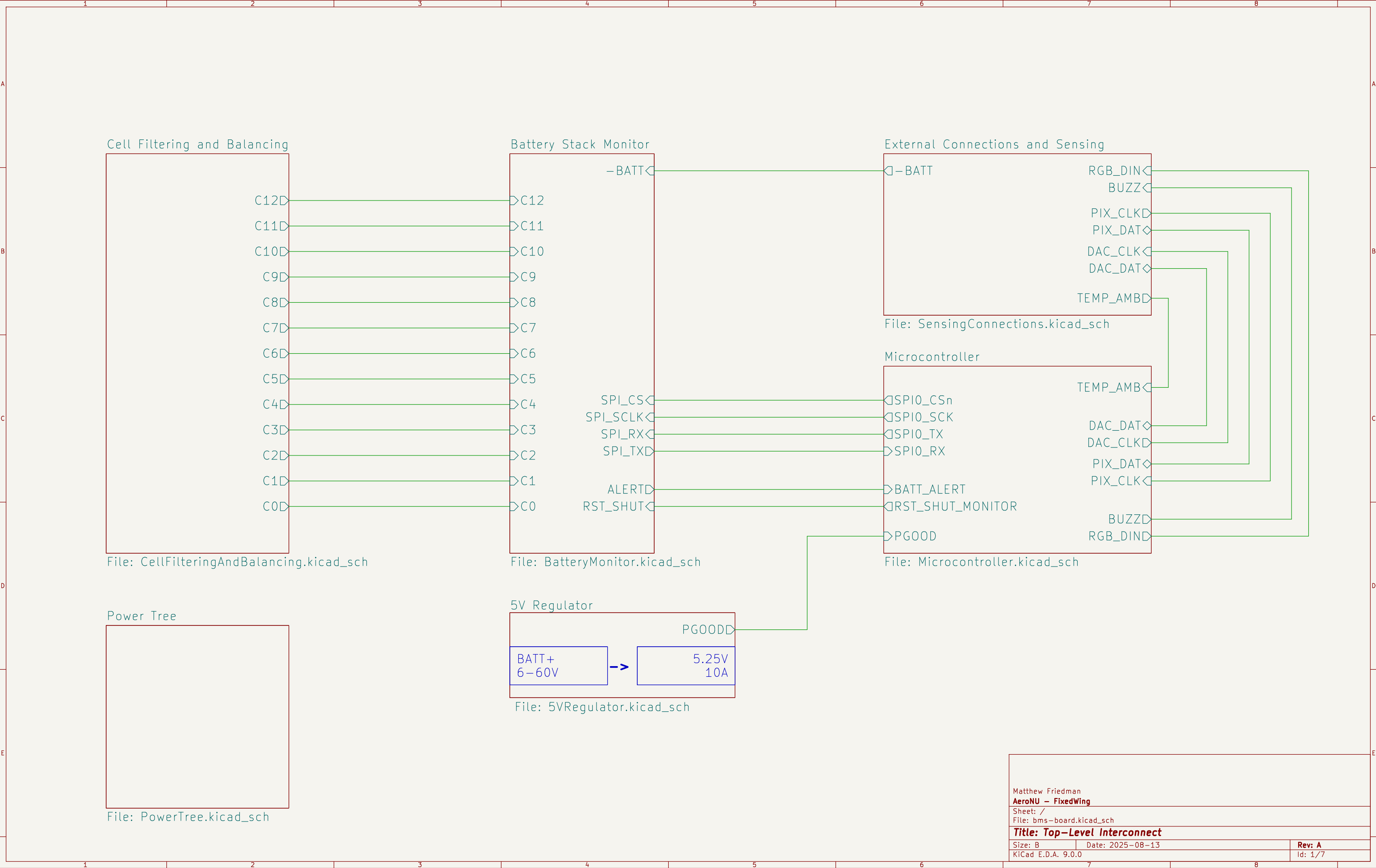
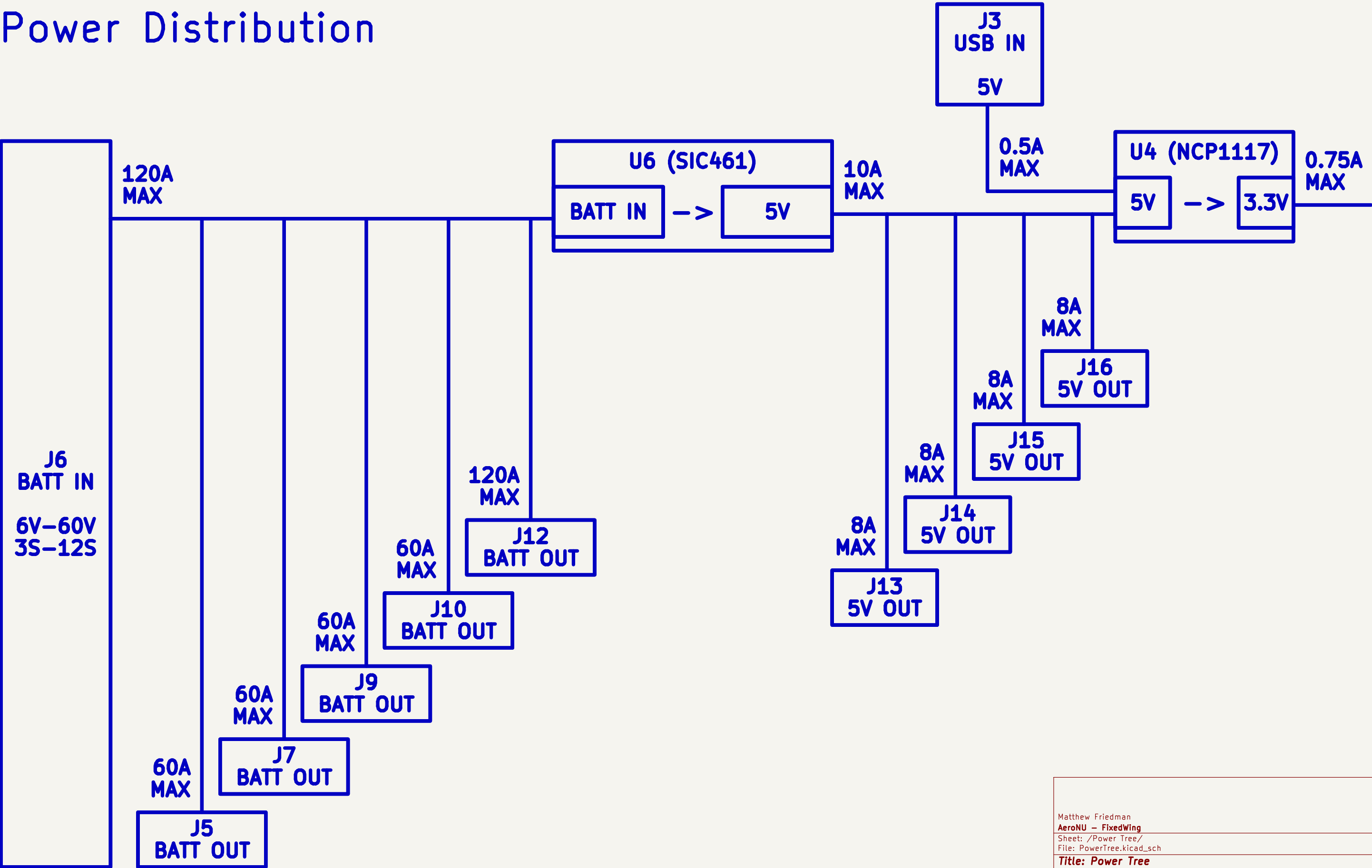
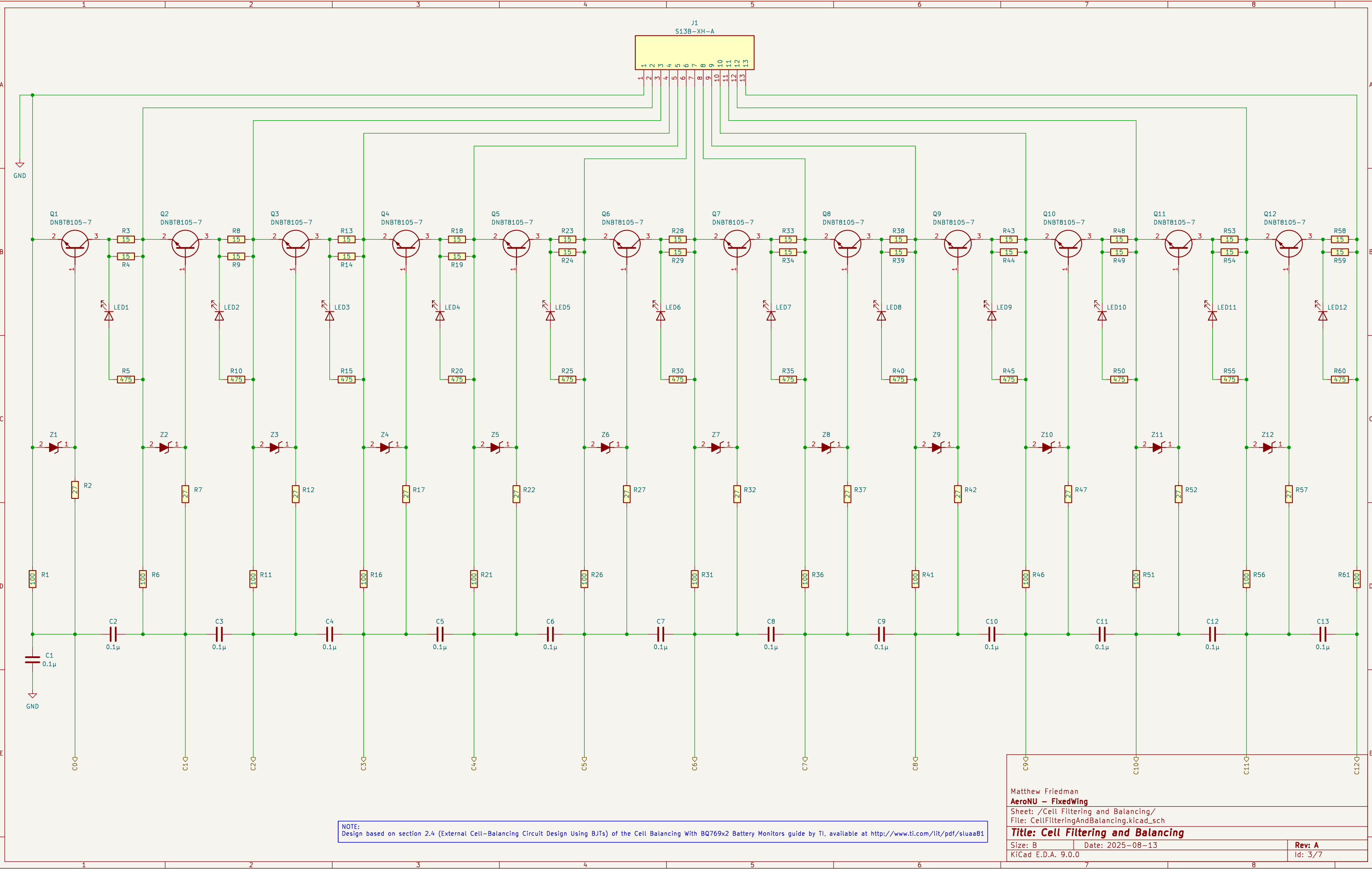




Power Distribution



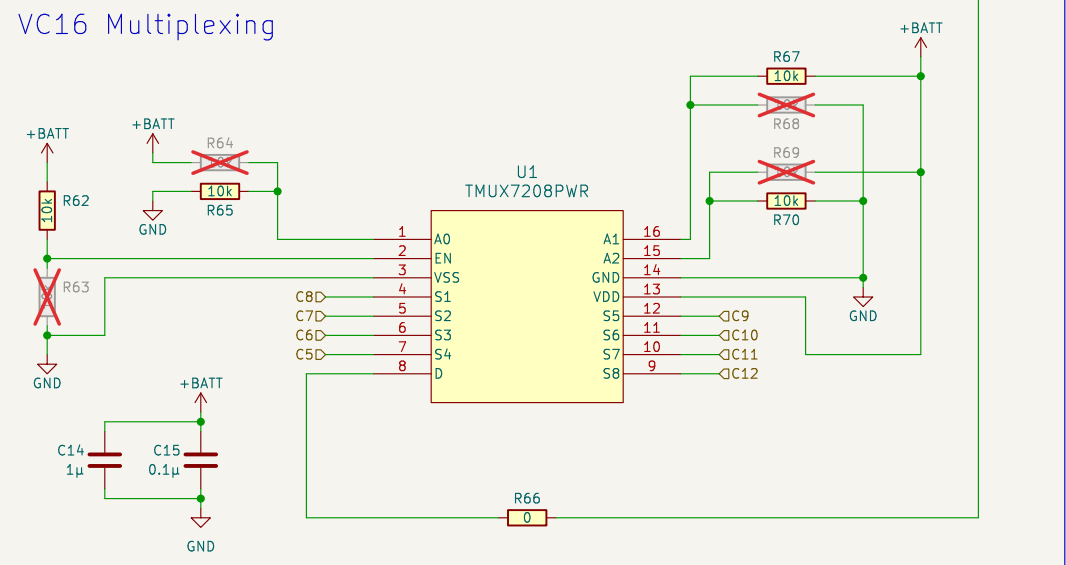
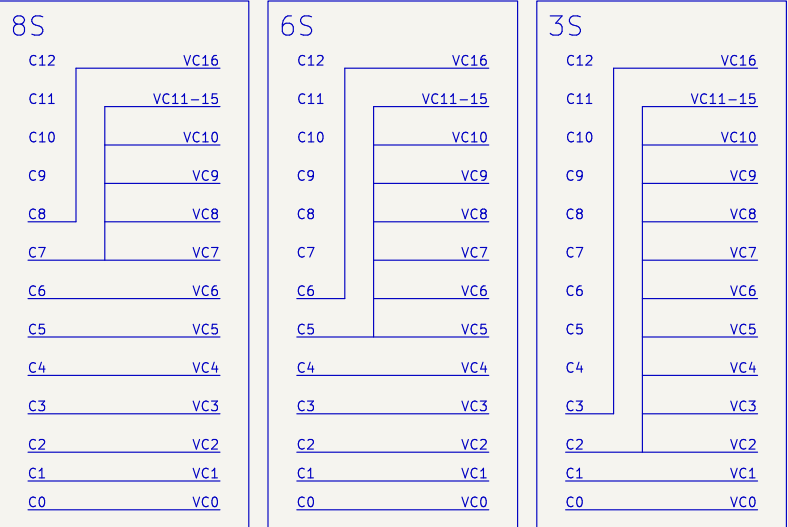
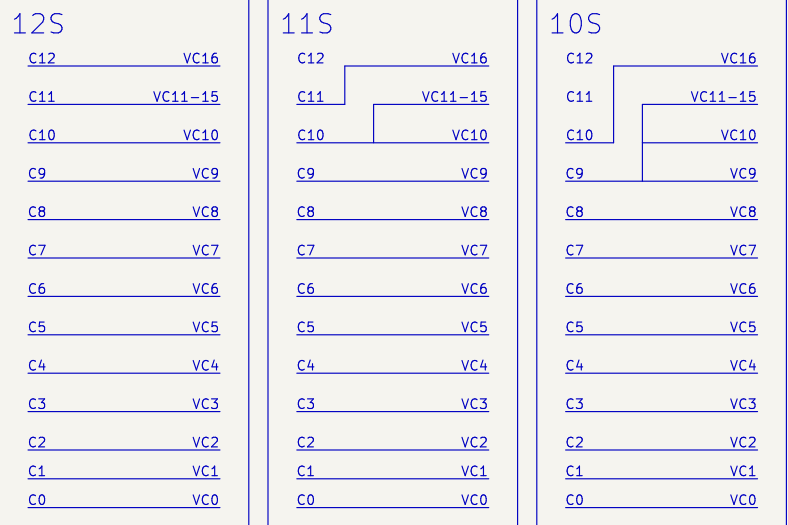


NOTE:
Design based on section 2.4 (External Cell-Balancing Circuit Design Using BJTs) of the Cell Balancing With BQ769x2 Battery Monitors guide by TI, available at <http://www.ti.com/lit/pdf/sluaa81>

Matthew Friedman		
AeroNU - FixedWing		
Sheet: /Cell Filtering and Balancing/		
File: CellFilteringAndBalancing.kicad_sch		
Title: Cell Filtering and Balancing		
Size: B	Date: 2025-08-13	Rev: A
KiCad E.D.A. 9.0.0		Id: 3/7

CONFIGURATION:

- The 0Ω jumpers along with the multiplexer allow for board-specific configurations for varying cell counts from 3S through 12S, as shown in the drawings below. The current schematic is DNP'd for a 6S configuration.
- The jumpers allow users to tie unused pins together correctly, while the multiplexer ensures that the topmost VC pin (VC16) is connected to the correct cell input.
- It is highly important that users who are populating the jumpers and pull-up/down resistors on the select lines for the multiplexer understand the underlying circuitry for their desired cell count, as there exists a real risk of causing a short.



NOTE:
Battery monitor voltage input tied to top of stack through decoupling RC (100Ω/1μF) to allow for operation shortly after full pack shorts, per p.65 of BQ76972 datasheet.

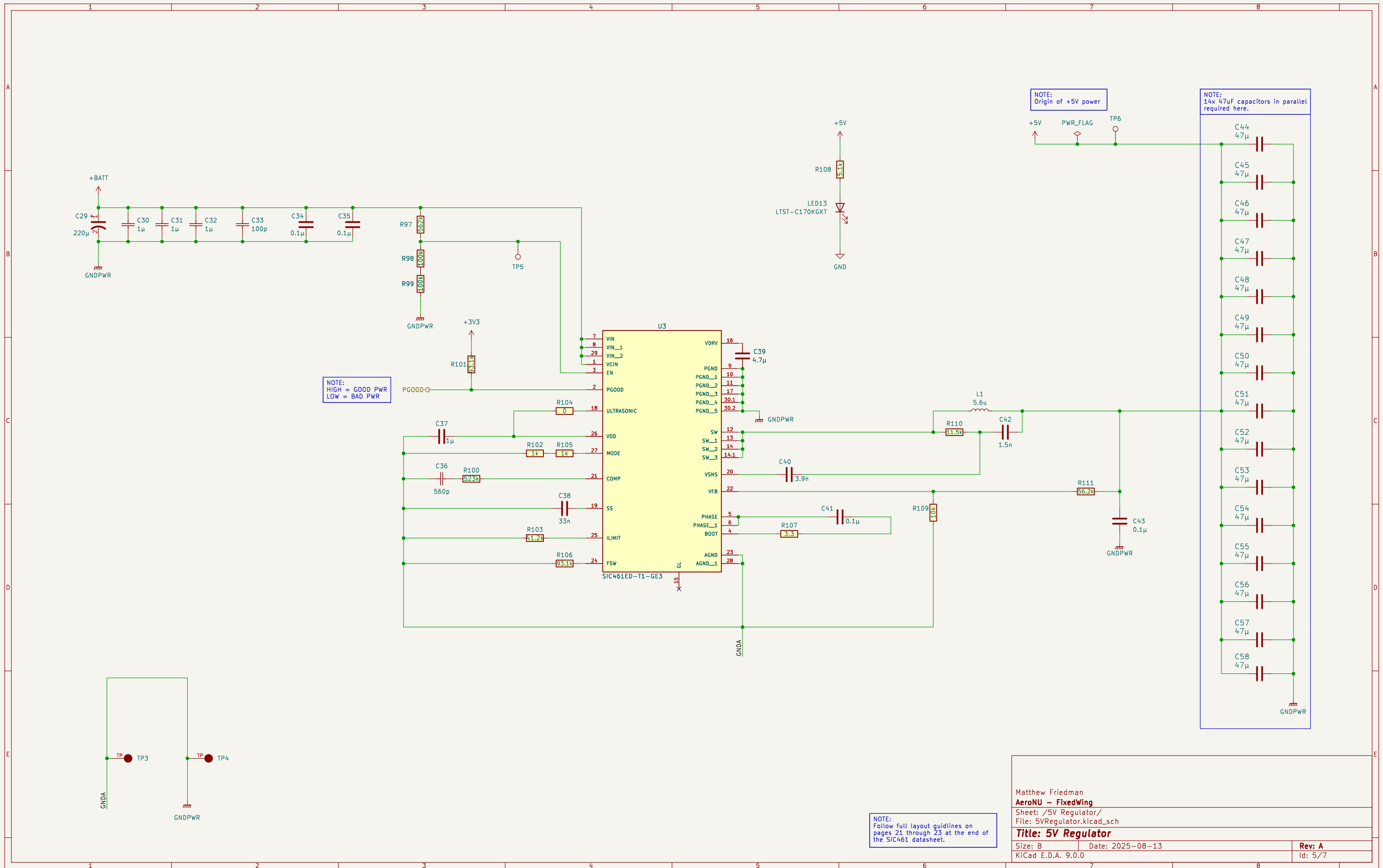
NOTE:
Unused cell pins (VCn) tied to adjacent pins or configurable 0Ω jumpers for variable cell count configurations, per p.35 and p.76 of BQ76972 datasheet.

NOTE:
PACK tied to the top of the stack, per p.66 of BQ76972 datasheet.

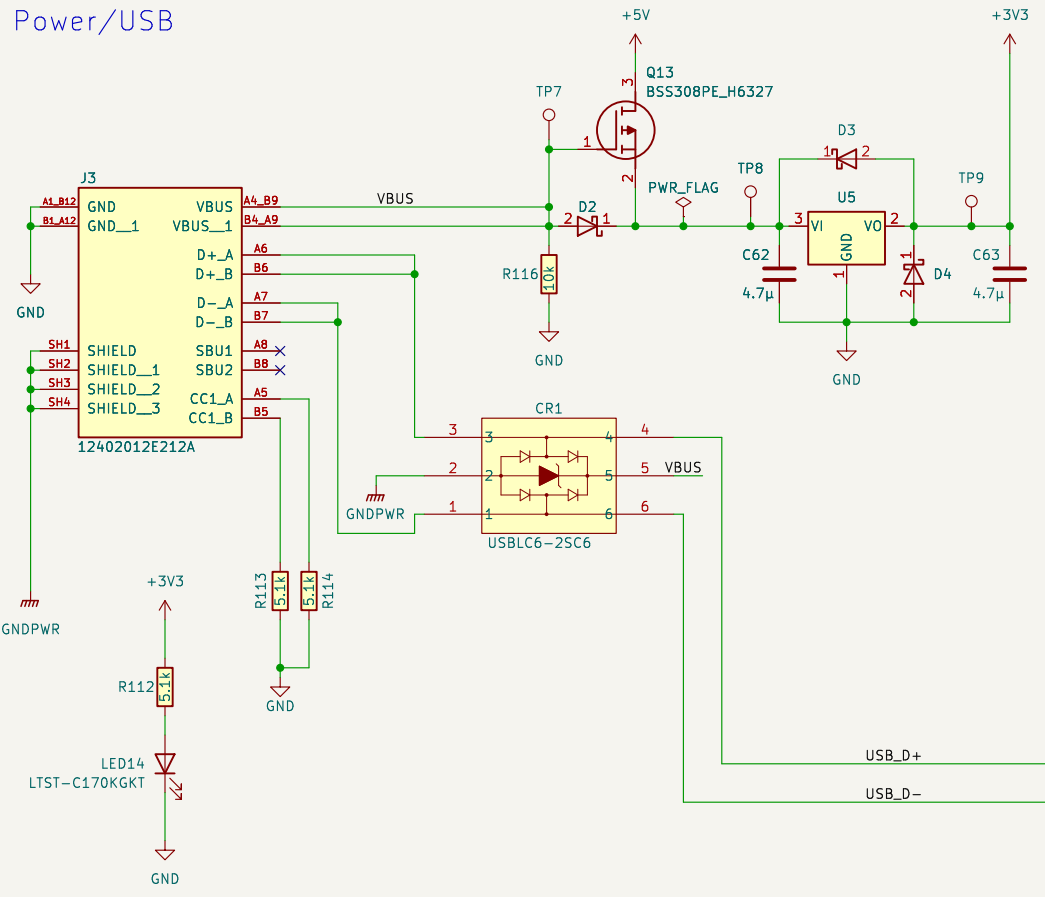
NOTE:
10k thermistor connector direct to BQ76972 pullup, see p.37, p.66 of BQ76972 datasheet for more info.

NOTE:
Current sense resistor selected based on p.70 and SRP/SRN connection is based on p.66 of the BQ76972 datasheet.

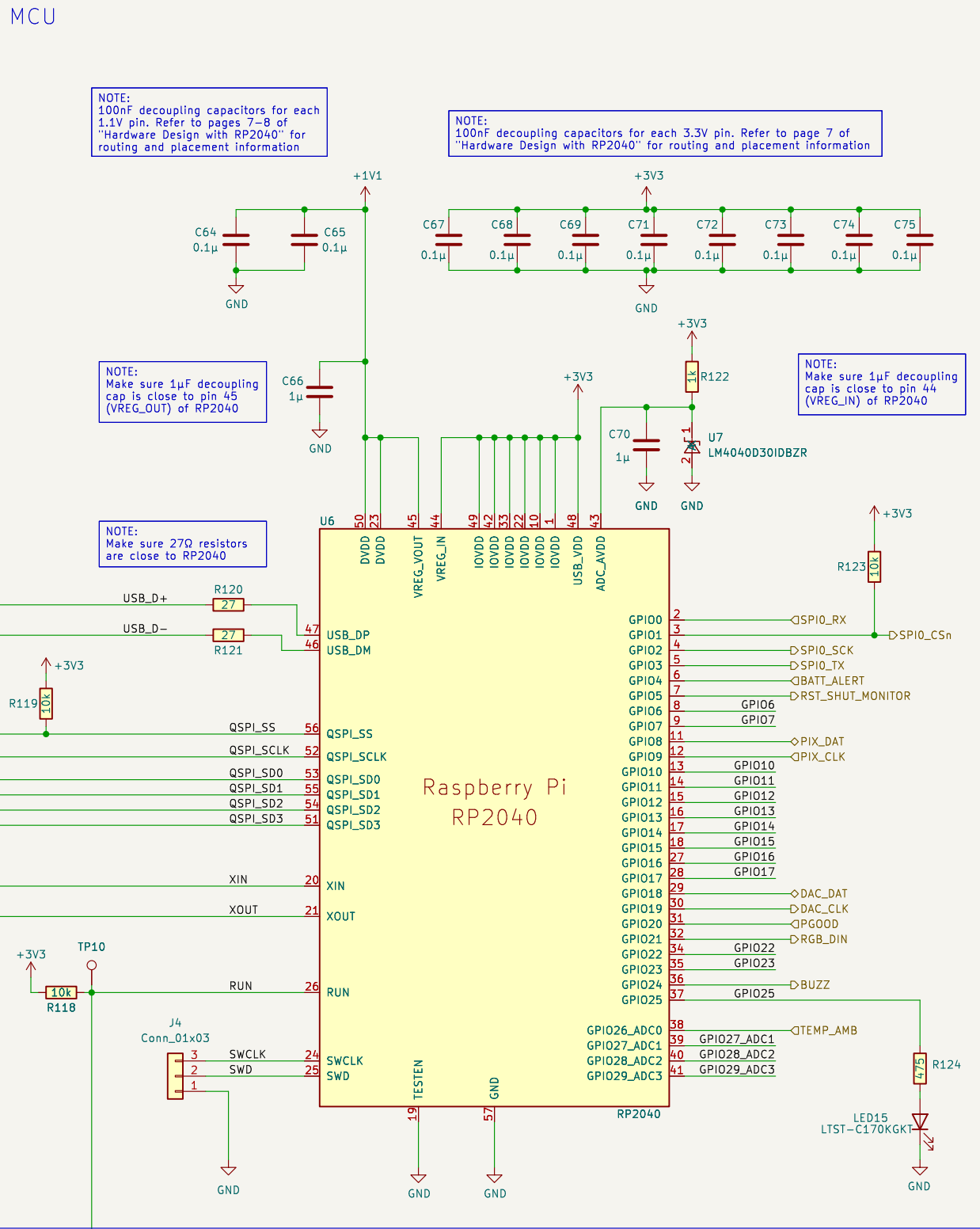
NOTE:
High-current ground connection



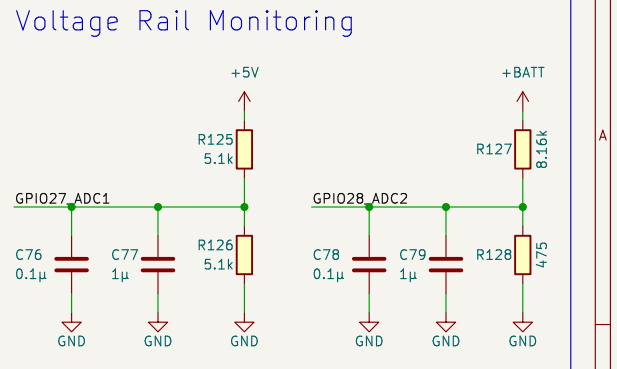
Power/USB



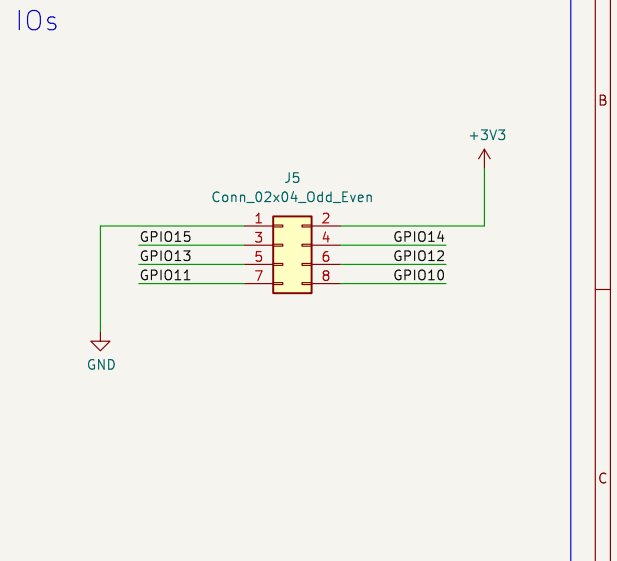
MCU



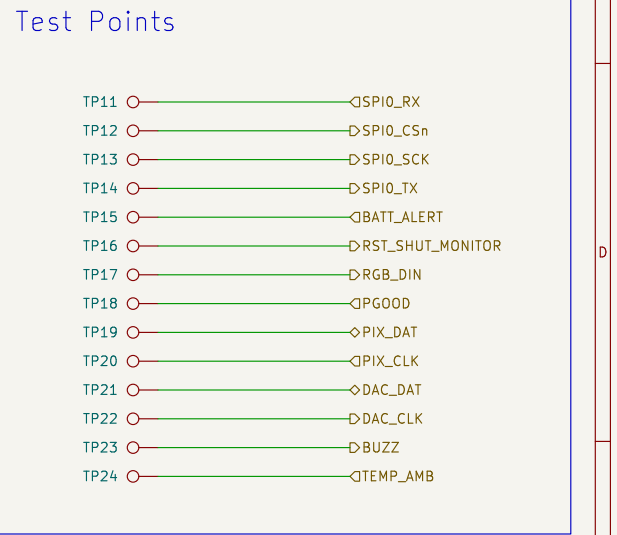
Voltage Rail Monitoring



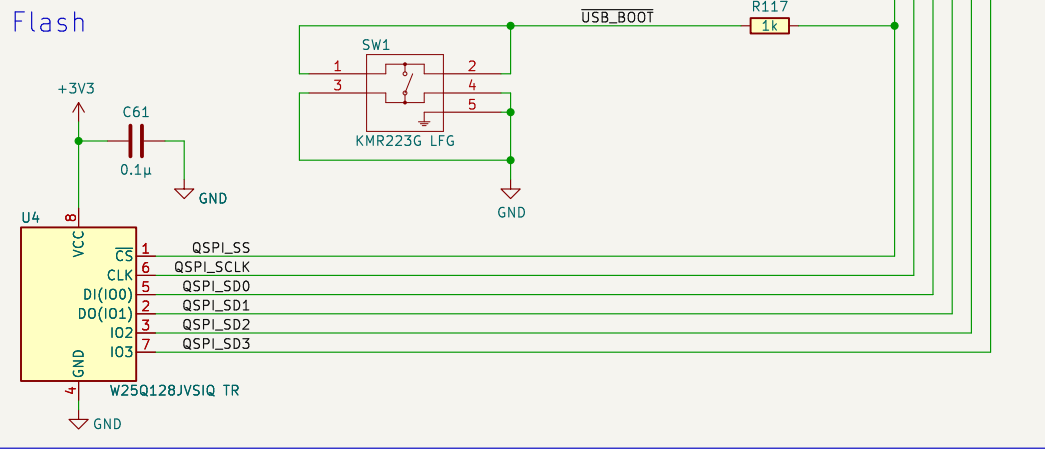
IOs



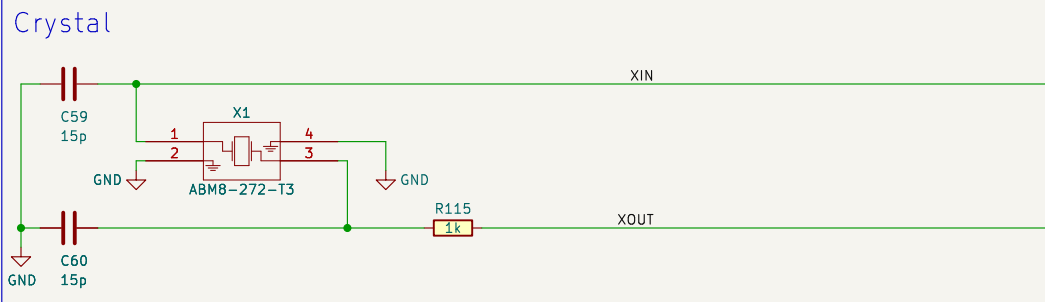
Test Points



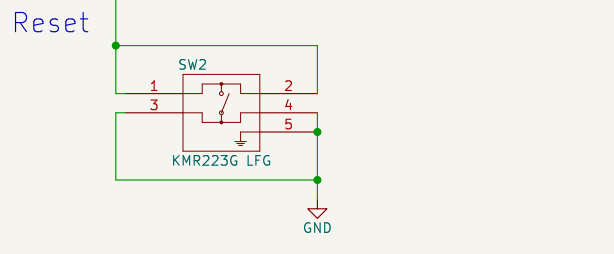
Flash



Crystal



Reset



NOTE:
Design heavily inspired by the following:
– Minimal design example by Raspberry Pi
– Raspberry Pi Pico
– Adafruit Feather RP2040

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Sheet: /Microcontroller/

File: Microcontroller.kicad_sch

Title: **Microcontroller**

Size: B

Date: 2025-08-13

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