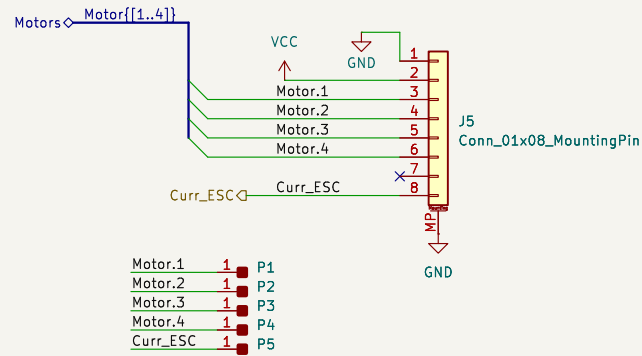




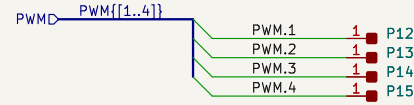


ESC

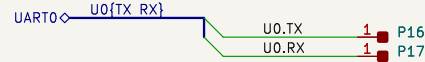
uses Mamba pinout



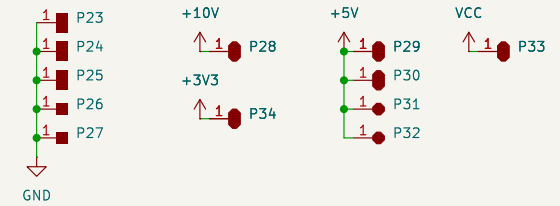
ELRS PWM outputs



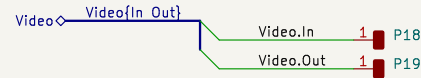
ELRS UART



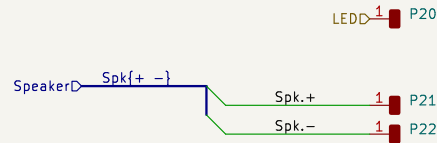
Power, GND



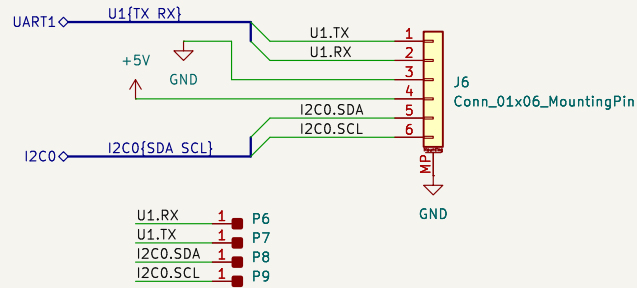
Analog Video



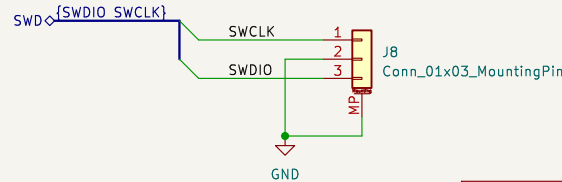
LED, Speaker



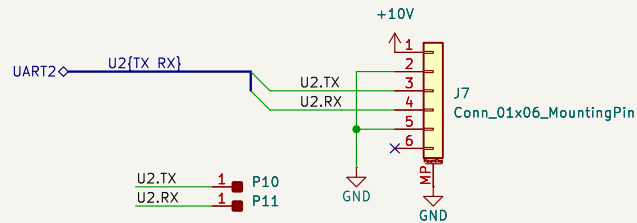
GPS



SWD



Digital VTX



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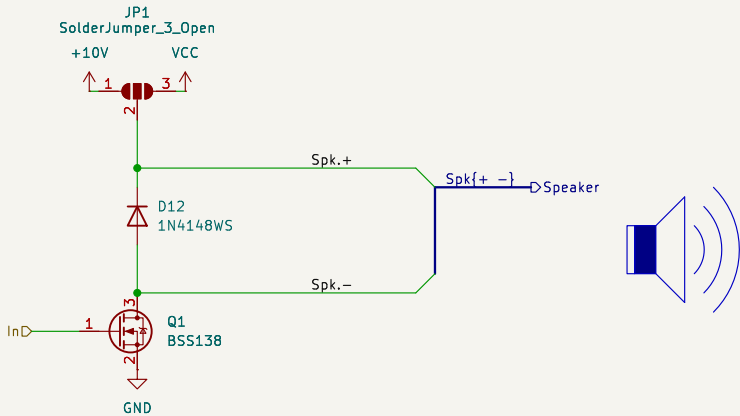
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KiCad E.D.A. 9.0.0

Date:

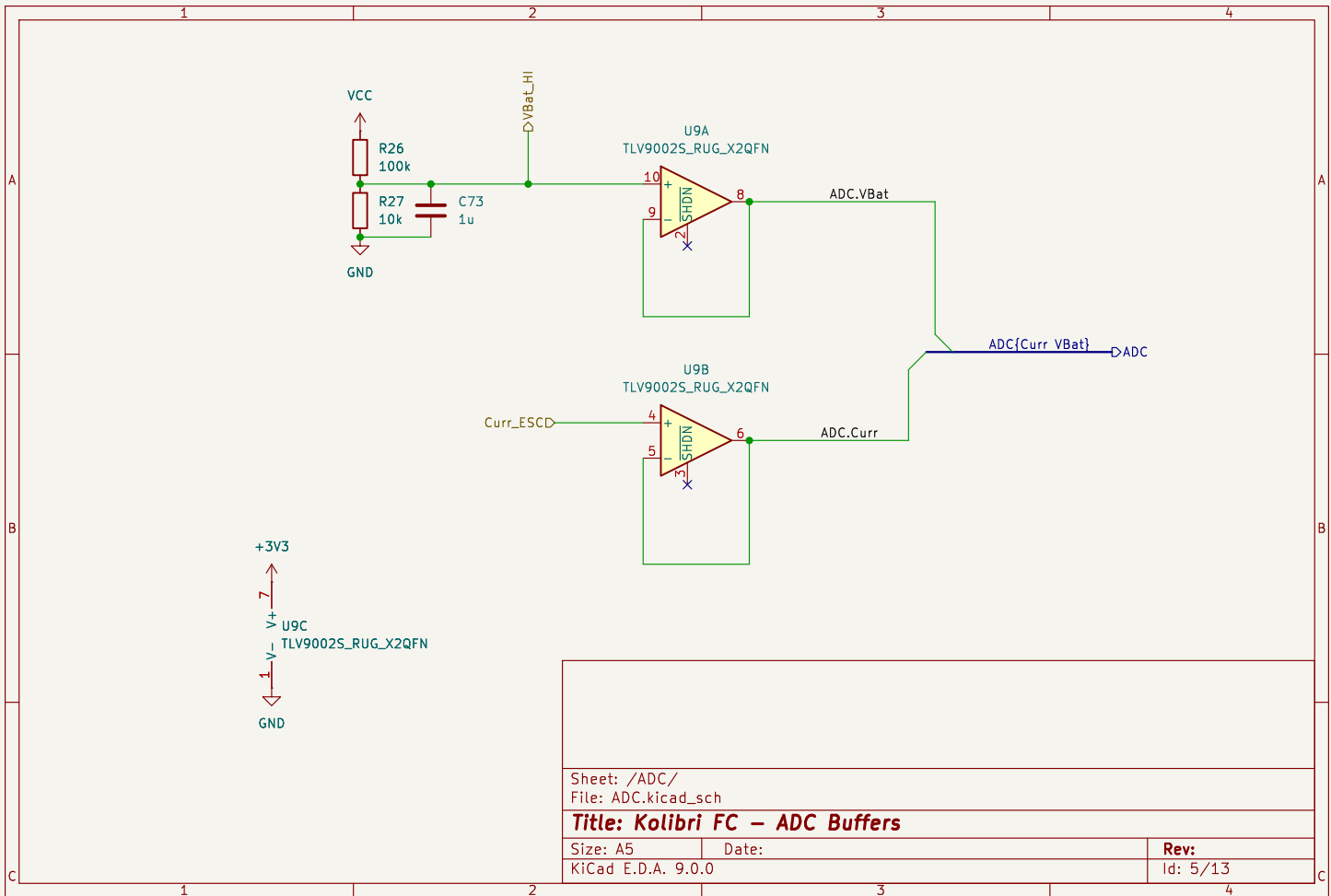
Rev:
Id: 3/13

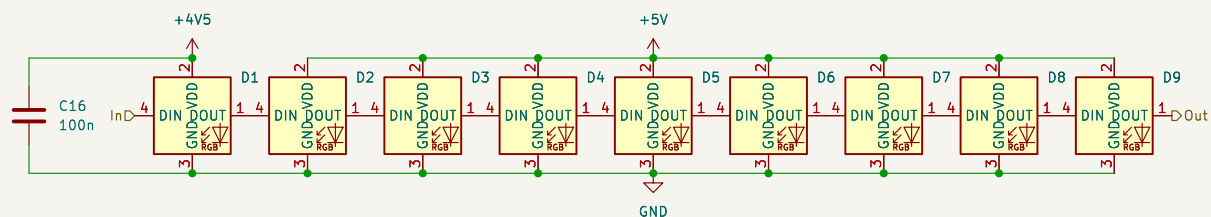
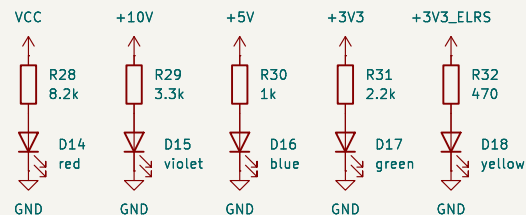
PWM Speaker driver

Q1 acts as a pulldown, D12 is the flyback. Q1's gate is PWMed at 44.1kHz. By adjusting the duty cycle of the PWM, we can either pull Spk.- lower (higher duty cycle) or higher (lower duty cycle), to write our sound samples to Spk.-. This way, we get a DAC without proper DAC hardware. Alternatively, we can PWM at lower frequencies to write a raw rectangle wave.

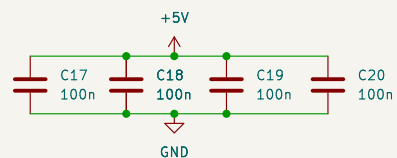


Sheet: /Speaker/		
File: speaker.kicad_sch		
Title: Kolibri FC – Speaker Driver		
Size: A5	Date:	Rev:
KiCad E.D.A. 9.0.0		Id: 4/13





D1 is the status LED. It is powered from ca. 4.2V so its second use is a level shifter for the next 8 diodes (placed on the border of the PCB as illumination). The color on the status LED is irrelevant, so the fact that blue is dimmer on that one doesn't really matter. But the 3.3V logic of the RP2350 would theoretically not be ok with the 5V logic of the LEDs (min 0.7*VDD for V_{IH}). All the others get one decoupling capacitor per two diodes (they're next to each other).



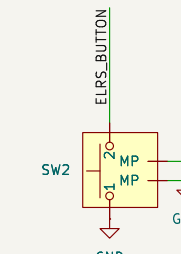
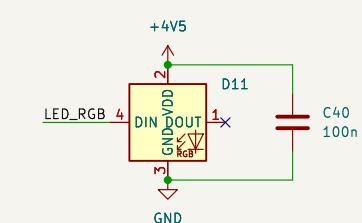
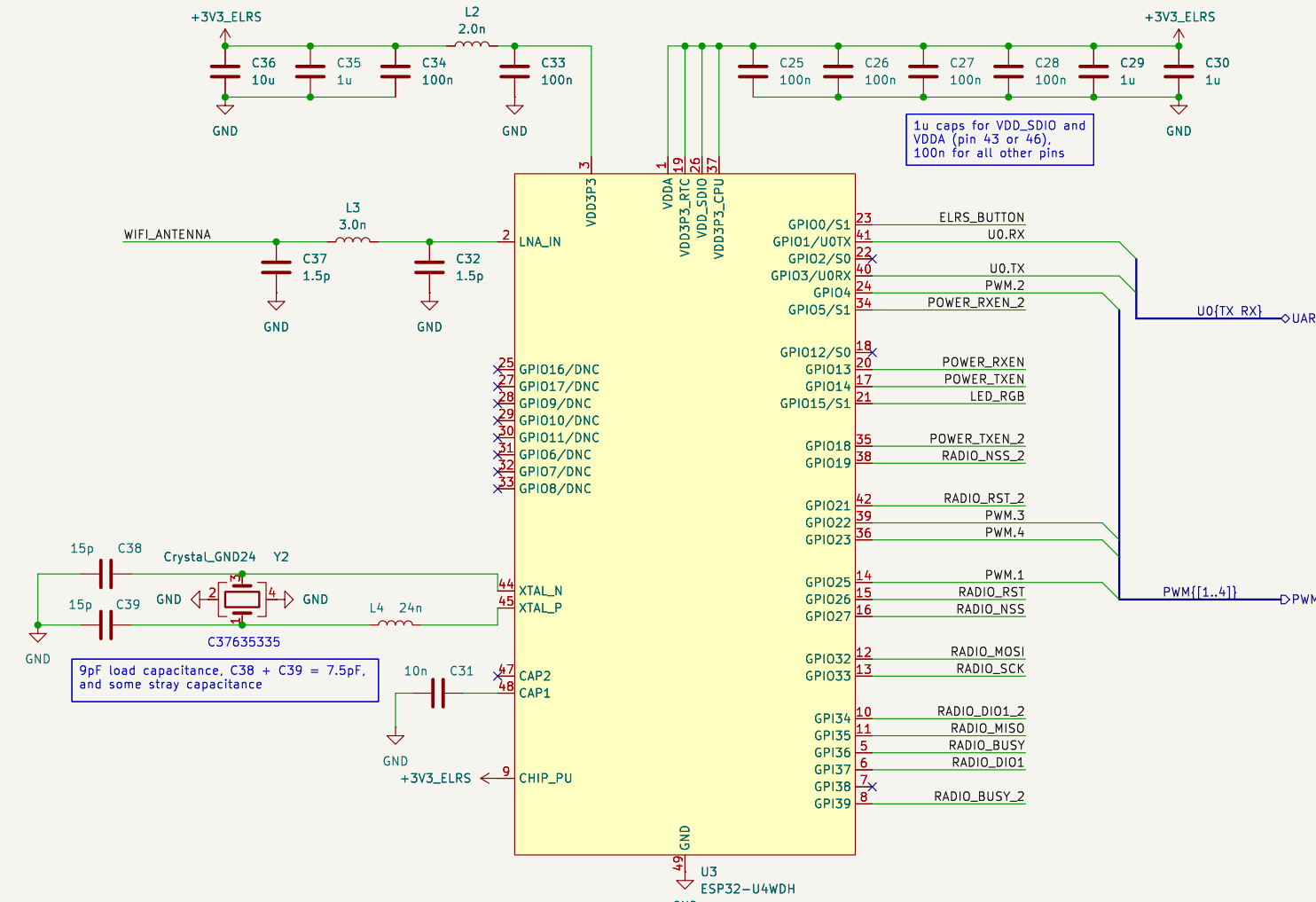


Table 3-3. Chip Boot Mode Control

Boot Mode	GPIO0	GPIO2
SPI Boot Mode	1	Any value
Joint Download Boot Mode ²	0	0

MTDI = 12, MTD0 = 15

Table 3-5. Timing Control of SDIO Slave

Edge behavior	MTD0	GPIO2
Falling edge sampling, falling edge output	0	0
Falling edge sampling, rising edge output	0	1
Rising edge sampling, falling edge output	1	0
Rising edge sampling, rising edge output	1	1

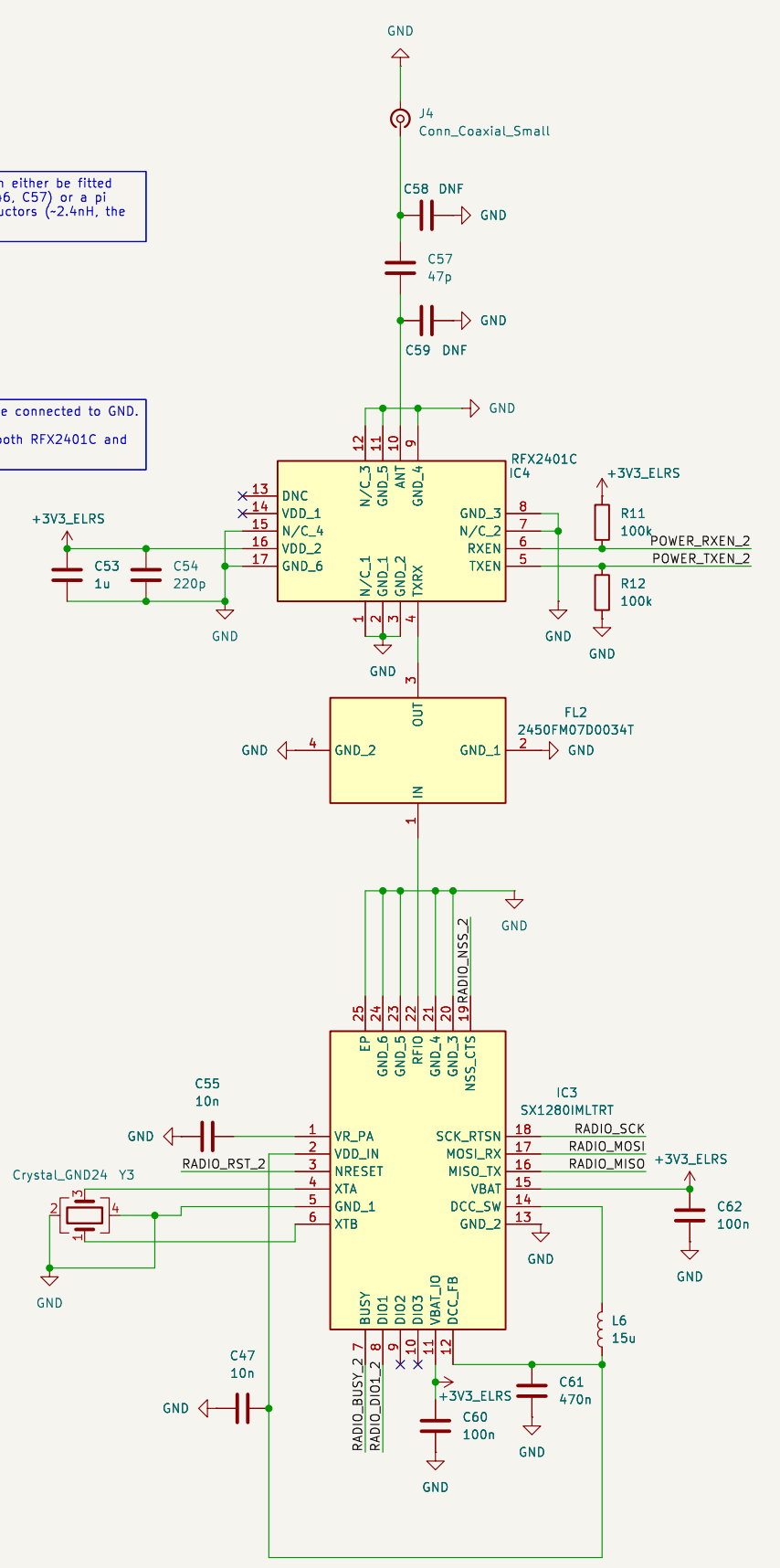
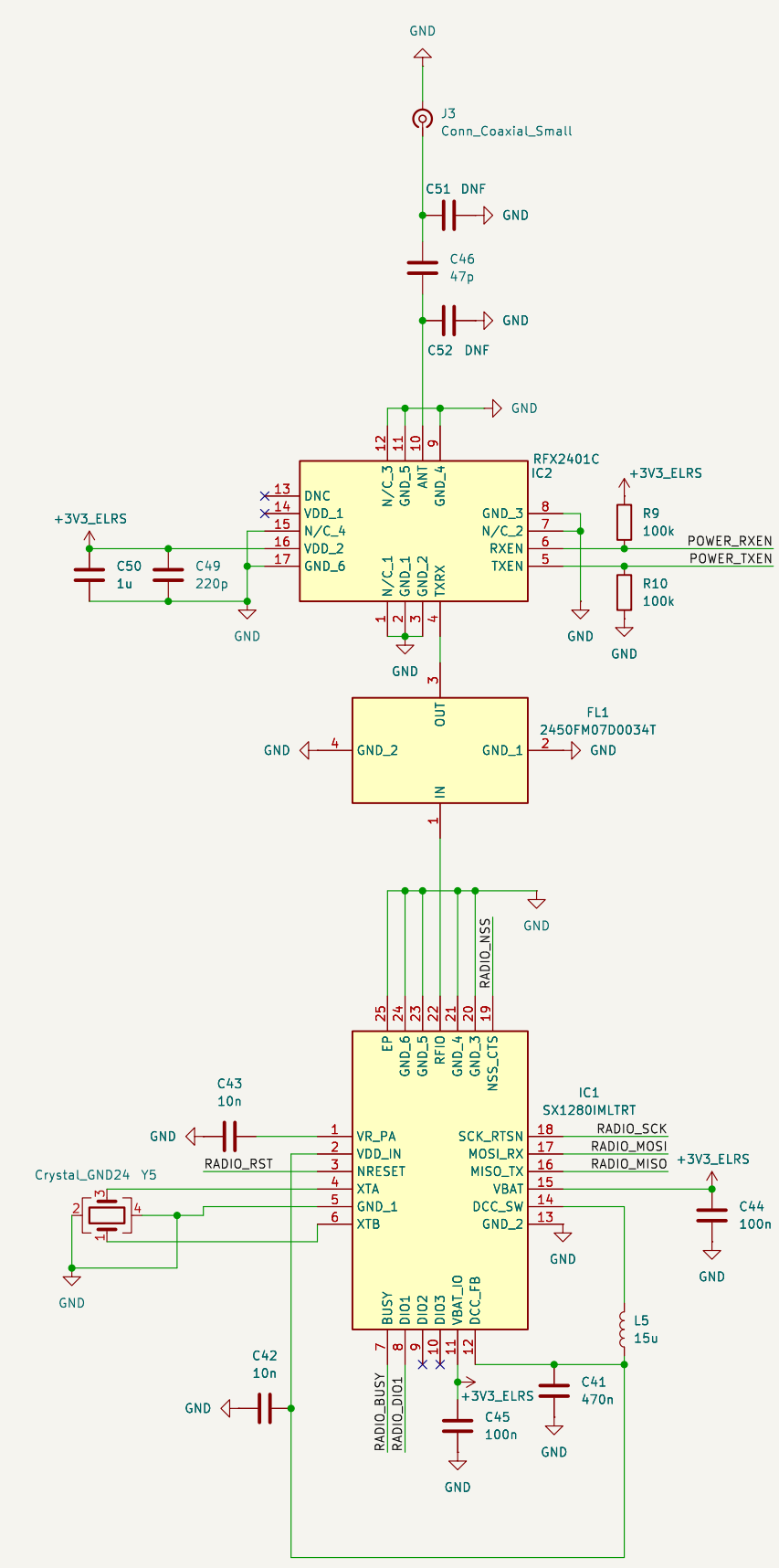
Table 3-4. UART0 Pinning Control

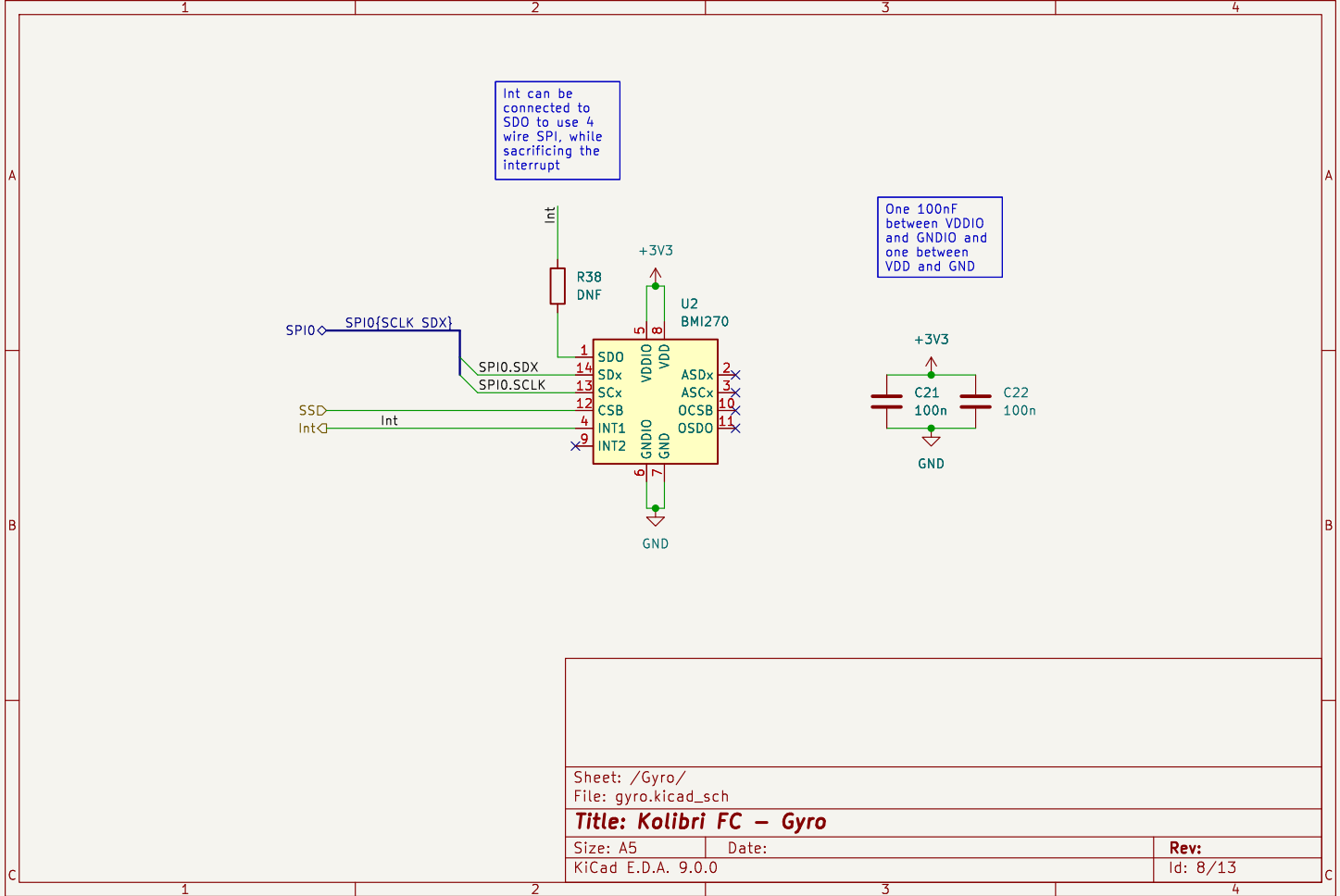
UART0 Pinning Control	MTD0
Enabled	1
Disabled	0

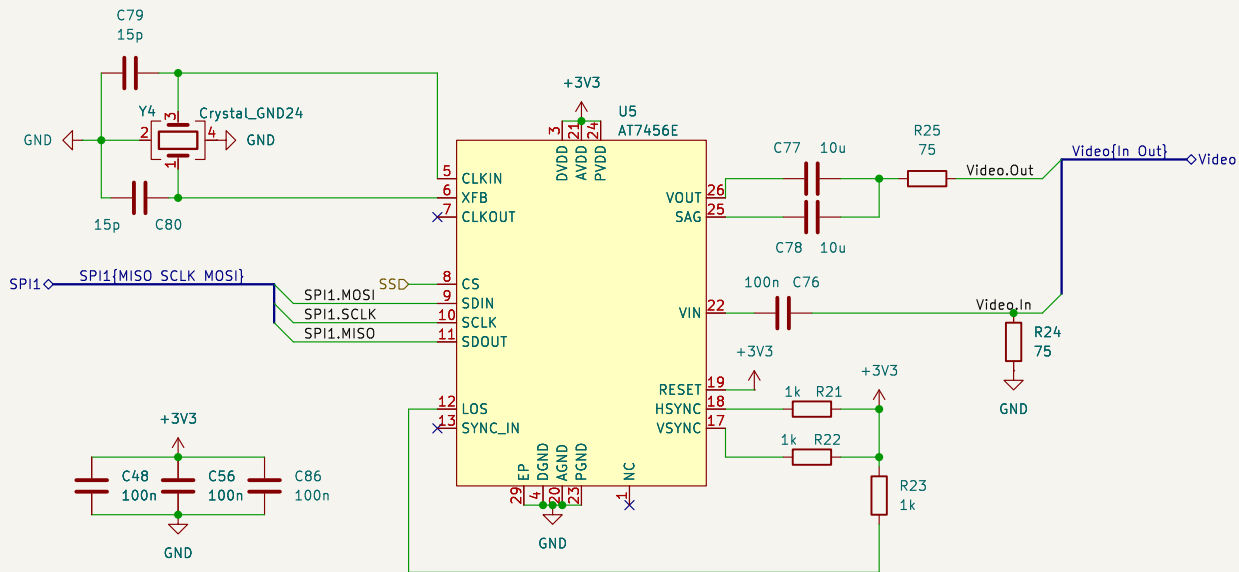
MTDI is used to select the VDD_SDIO power supply voltage at reset:

- MTDI = 0 (by default), VDD_SDIO pin is powered directly from VDD3P3_RTC. Typically this voltage is 3.3 V. For more information, see Section 2.5.2 Power Scheme.
- MTDI = 1, VDD_SDIO pin is powered from internal 1.8 V LDO.

VDD_SDIO connects to the output of an internal LDO whose input is VDD3P3_RTC. When VDD_SDIO is connected to the same PCB net together with VDD3P3_RTC, the internal LDO is disabled automatically.

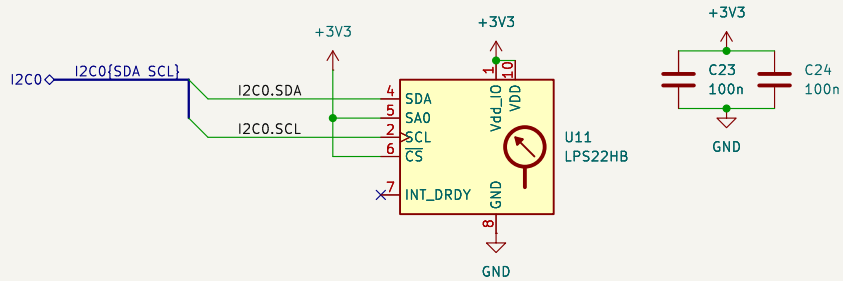




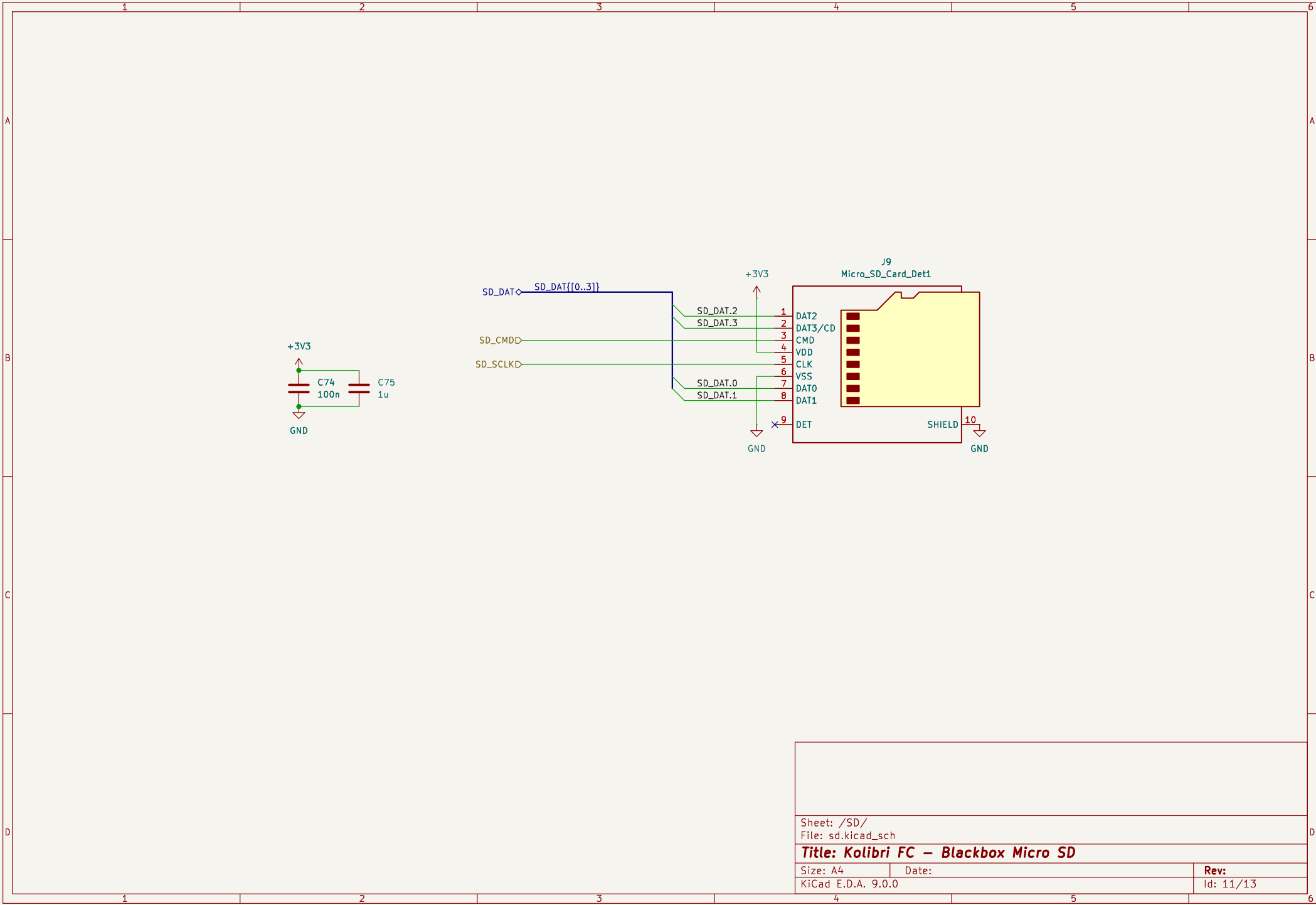


One 100nF decoupling cap
for each VDD combo: DVDD
(3/4), AVDD (20/21), PVDD
(23/24).

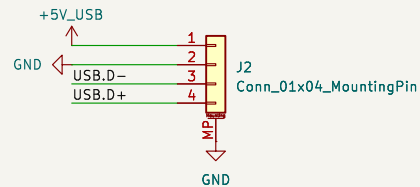
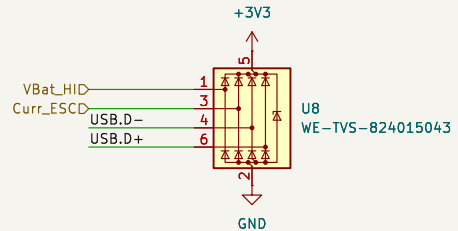
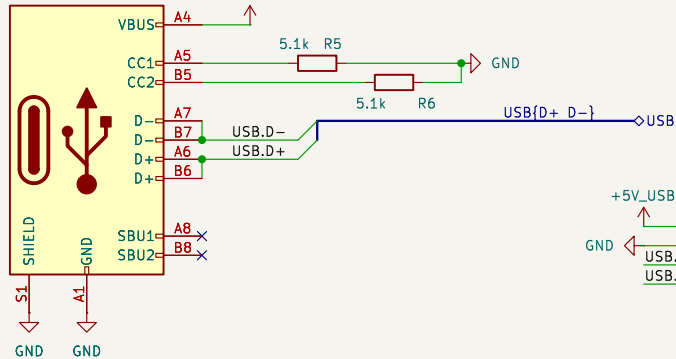
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Size: A5	Date:
KiCad E.D.A. 9.0.0	Rev: 9/13



Sheet: /Baro/ File: baro.kicad_sch			
Title: Kolibri FC – Barometer			
Size: A5	Date:		Rev:
KiCad E.D.A. 9.0.0	Id: 10/13		



J1
USB_C_Receptacle_USB2.0_16P +5V_USB



Sheet: /USB/
File: usb.kicad_sch

Title: Kolibri FC – USB Plug

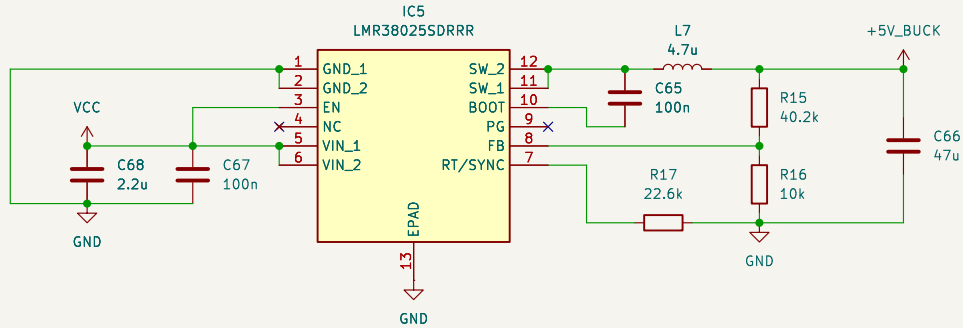
Size: A5
KiCad E.D.A. 9.0.0

Date:

Rev:
Id: 12/13

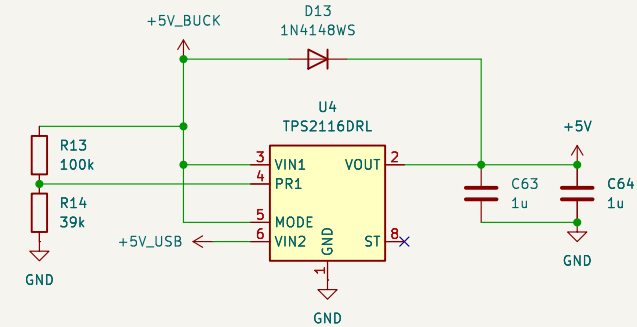
5V SMPS

12-45V -> 5V 2.5A



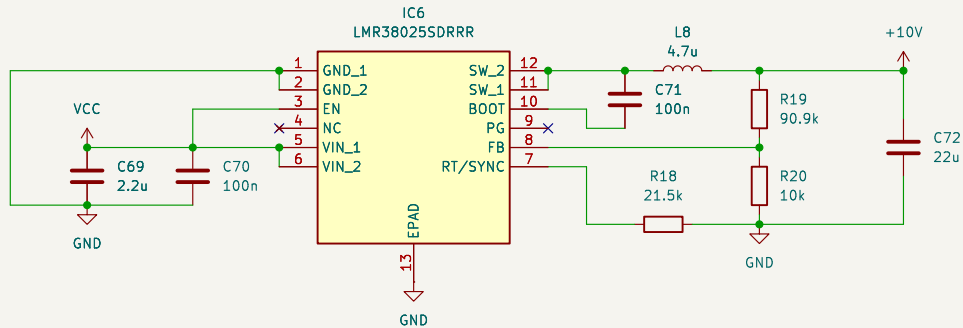
5V Power MUX

Switches up to 4A (TPS2117) from +5V_USB or +5V_BUCK to +5V. Prefers buck over USB, threshold voltage is about 3.5V. The threshold voltage is low to prevent accidental switchover to USB during peak consumption (worst case in flight). Emergency diode for if that happens during flight.

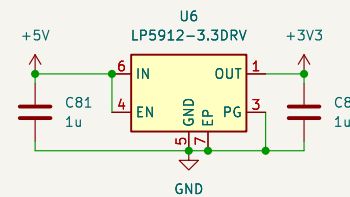


10V SMPS

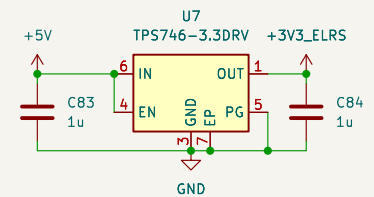
12-45V -> 10V 2.5A (6.8uH inductor recommended, but this works)



3.3V 500mA LDO (main)



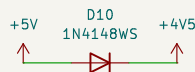
3.3V 1A LDO (ELRS)



Two separate 3.3V-rails to satisfy ELRS's requirement of a separate 3.3V supply. Both LDOs have an almost identical pinout where only PG and GND are swapped, but because both allow PG to be grounded, these can be used interchangeably, once testing is complete (if ELRS is ok with only 500mA).

4.2V Supply

Used for the first RGB LED in each strip, not broken out.



Sheet: /Power/
File: power.kicad_sch

Title: Kolibri FC - DCDC + LDO

Size: A4

Date:

KiCad E.D.A. 9.0.0

Rev:

Id: 13/13