Filter for the ADC/DAC

Caps for STM32 supply

SWD connector

I2C SSD1306 Display

Oled display pinout:
1: GND
2: VCC
3: SCL
4: SDA

UART CONNECTOR

CAN HEADER

Static discharge USB protection

Rotary encoder/switch
with a debouncing circuit

Resonator

Debug LED indicators

TIM2 ENC MODE

TIM3 ENC MODE

TIM4 ENC MODE

Motor wiring:
Pin | Color | Function
1 Red: Motor power
2 Black: Motor power
3 Green: Encoder ground
4 Blue: Encoder Vcc (3.5 V to 20 V)
5 Yellow: Encoder A output
6 White: Encoder B output

Power to the
on-board computer

Motor driver 0

Motor driver 1

Motor driver 2

File: motor_driver.kicad_sch

File: leds.kicad_sch

File: ext_devices.kicad_sch

File: power_mgmnt.kicad_sch

File: dc_dc_ext.kicad_sch

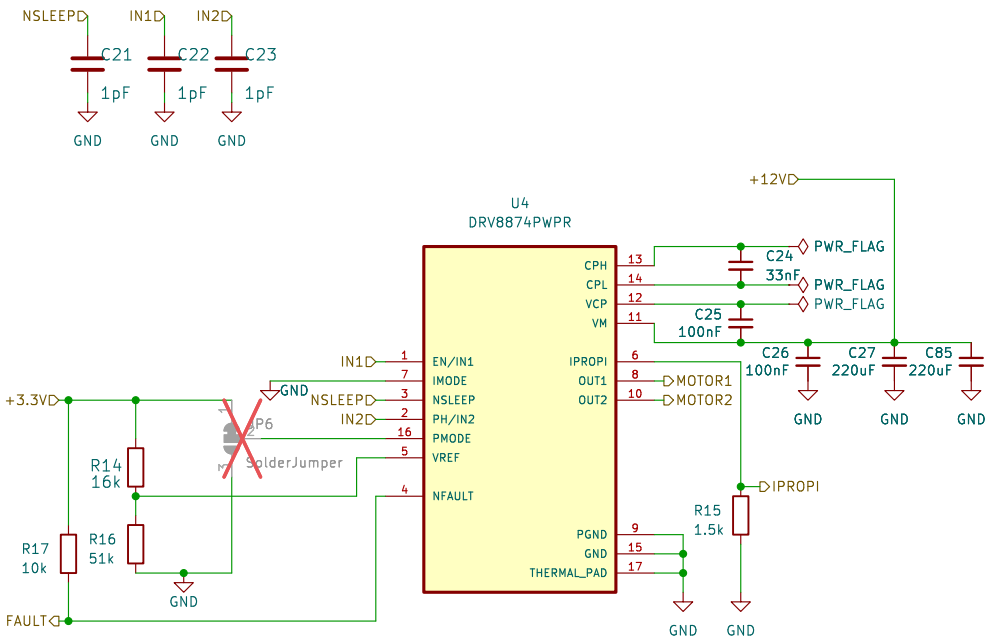
File: dc_dc_12v_motors.kicad_sch

File: dc_dc_3V3_pm.kicad_sch

Licensed under CERN-OHL-P
University of Tartu
Sheet: /
File: mainboard.kicad_sch

Title: Robotont mainboard

Size: A3	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 1/16



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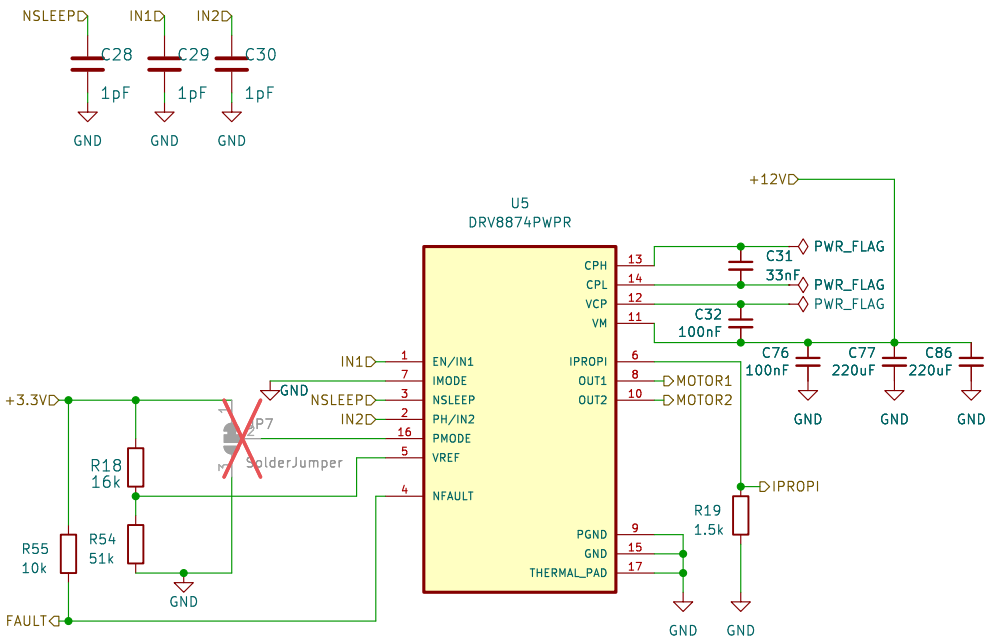
Sheet: /Motor driver 0/
File: motor_driver.kicad_sch

Title: Motor driver

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 2/16



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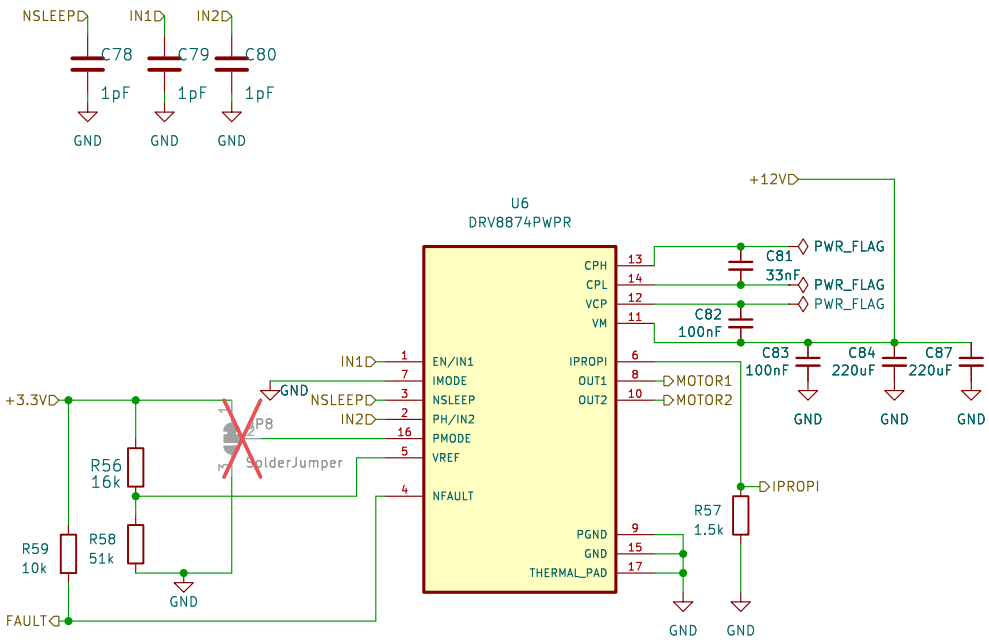
Sheet: /Motor driver 1/
File: motor_driver.kicad_sch

Title: Motor driver

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 3/16



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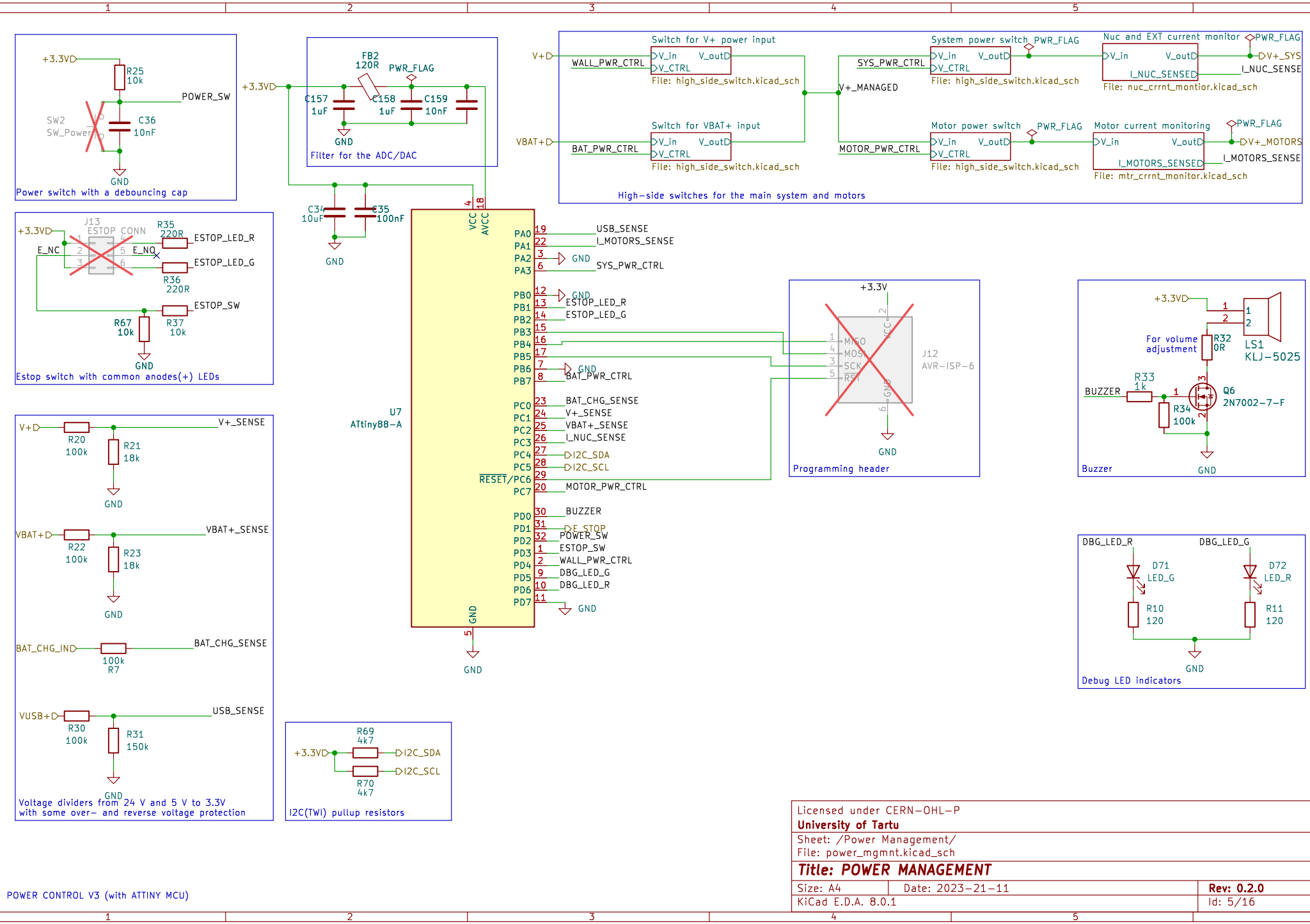
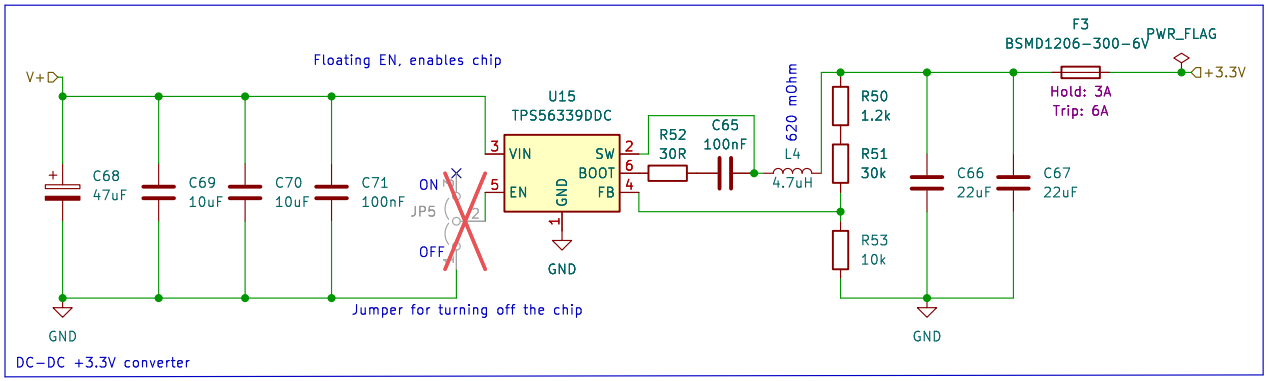
Sheet: /Motor driver 2/
File: motor_driver.kicad_sch

Title: Motor driver

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 4/16


Power switch with a debouncing cap
Filter for the ADC/DAC
High-side switches for the main system and motors
Switch for V+ power input
System power switch
Nuc and EXT current monitor
Switch for VBAT+ input
Motor power switch
Motor current monitoring
Estop switch with common anodes(+) LEDs
Programming header
Buzzer
Debug LED indicators
Voltage dividers from 24 V and 5 V to 3.3V
with some over- and reverse voltage protection
I2C(TWI) pullup resistors
U7
ATtiny88-A
Licensed under CERN-OHL-P
University of Tartu
Sheet: /Power Management/
File: power_mgmnt.kicad_sch
Title: POWER MANAGEMENT
Size: A4
Date: 2023-21-11
Rev: 0.2.0
KiCad E.D.A. 8.0.1
Id: 5/16
POWER CONTROL V3 (with ATTINY MCU)

Required current max ~200mA
TODO: look for more efficient solution



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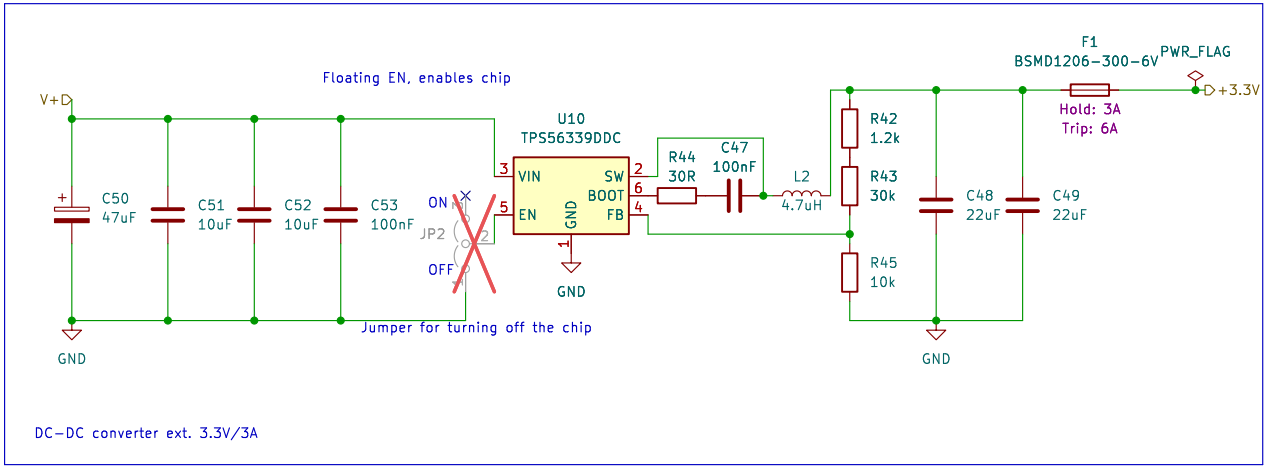
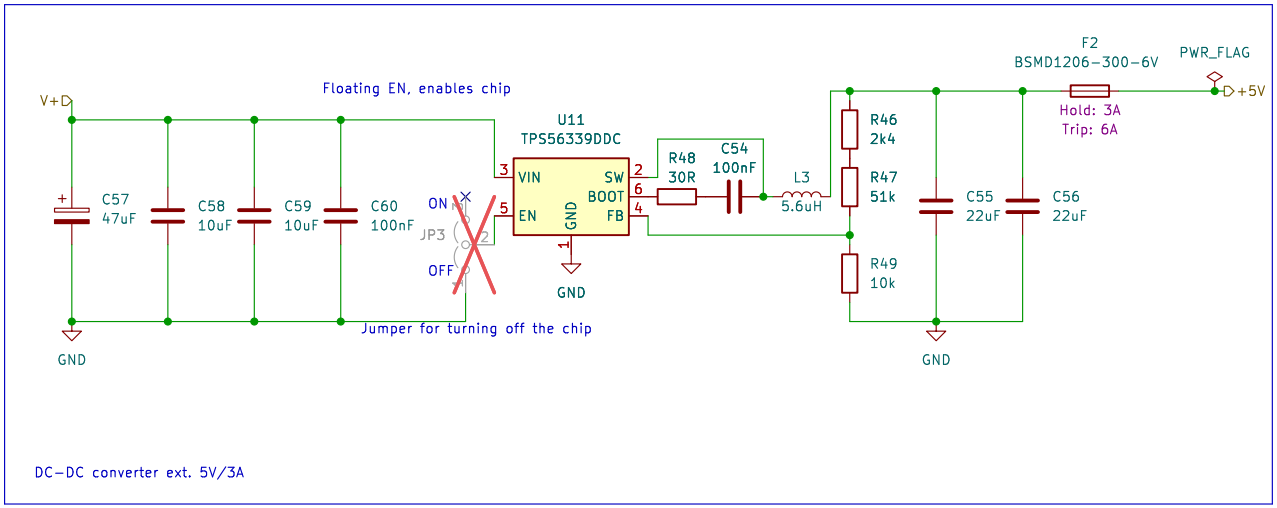
Sheet: /DC-DC 3V3 for Power Management/
File: dc_dc_3V3_pm.kicad_sch

Title: DC-DC converter for the power management subsystem

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 6/16





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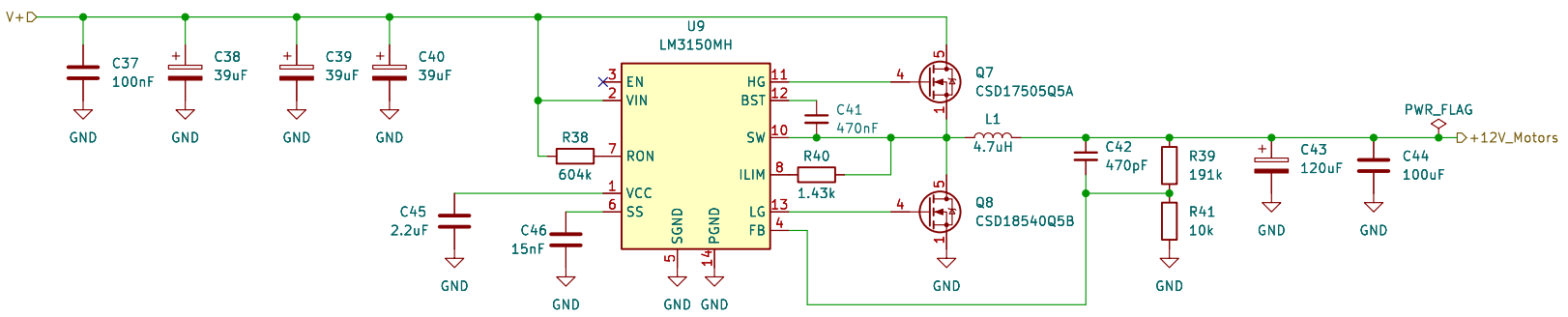
Sheet: /DC-DC for EXT, MCU, and LEDs/
File: dc_dc_ext.kicad_sch

Title: DC-DC converter for the MCU, LEDs, and external devices

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 7/16



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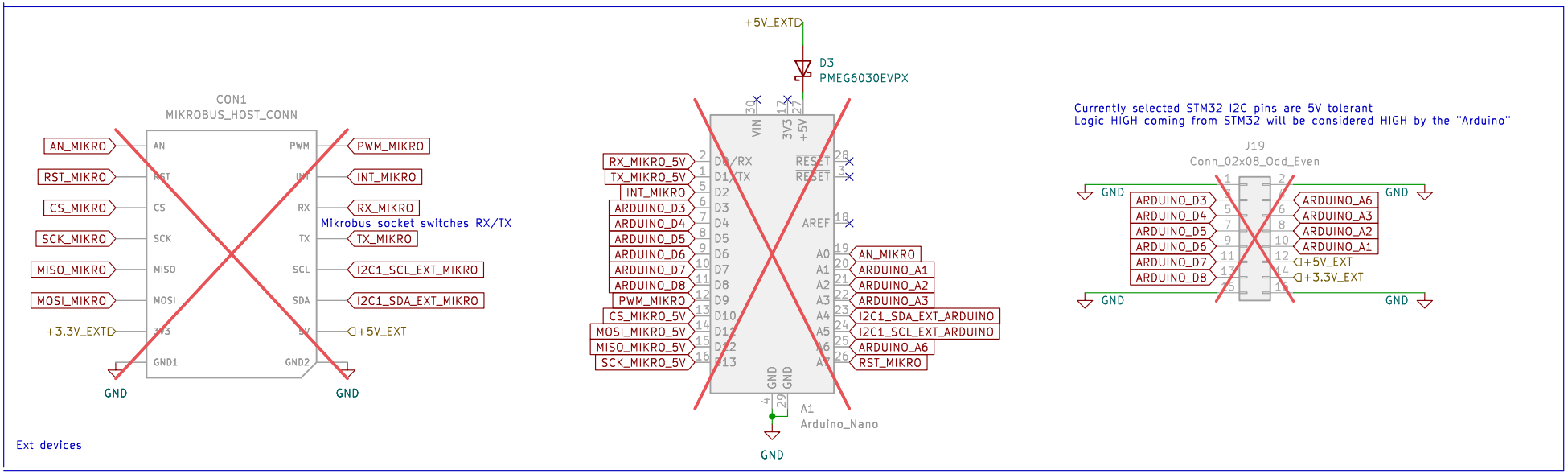
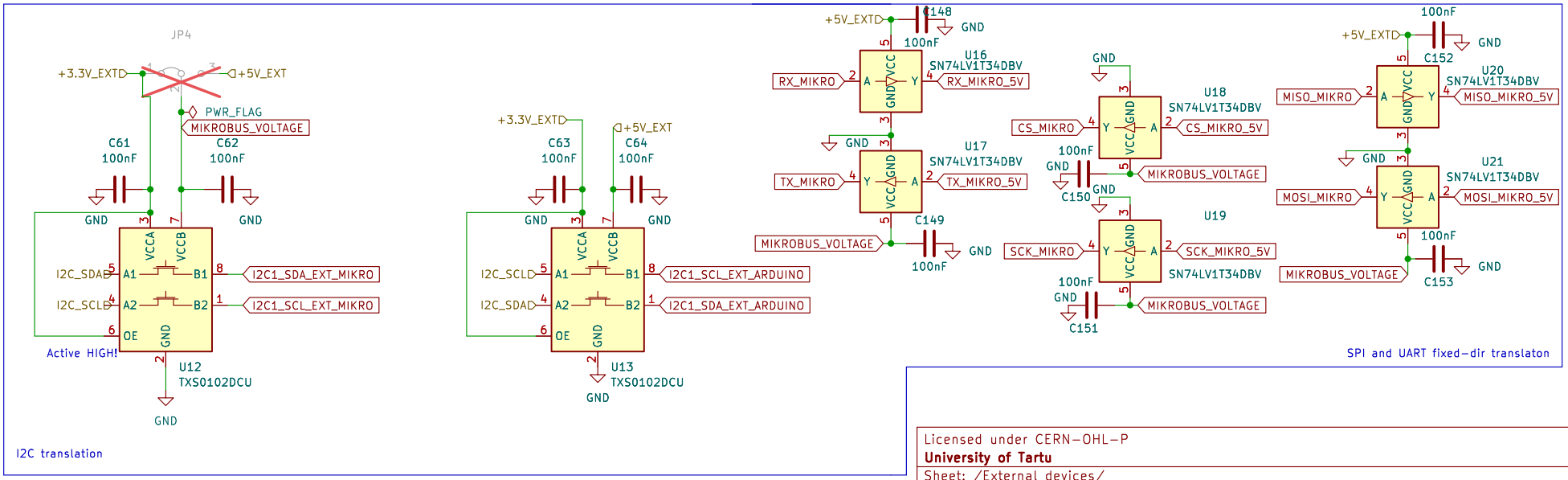
Sheet: /DC-DC 12V for Motors/
File: dc_dc_12v_motors.kicad_sch

Title: DC-DC converter 12V for motors

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 8/16





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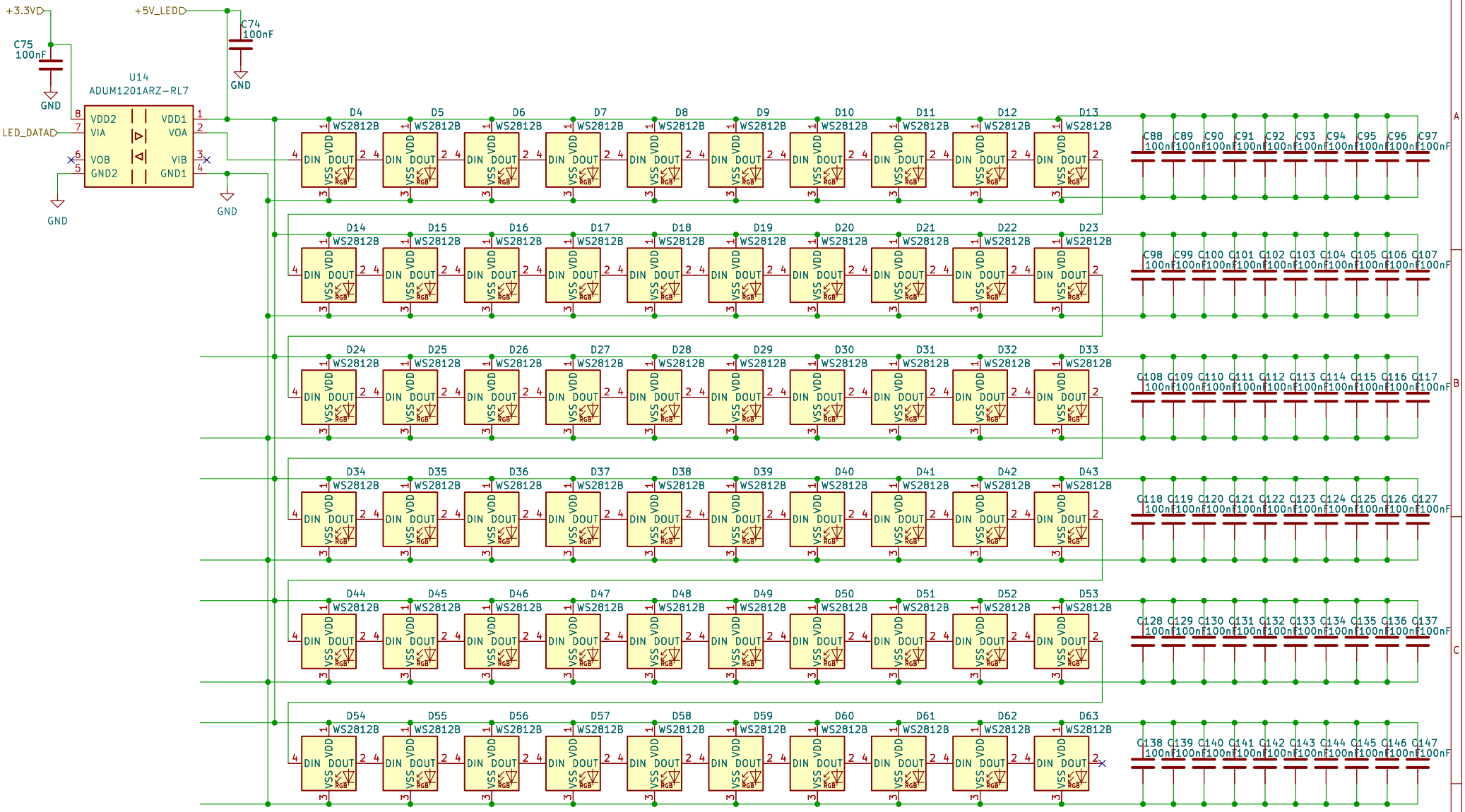
Sheet: /External devices/
File: ext_devices.kicad_sch

Title: External devices

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 9/16



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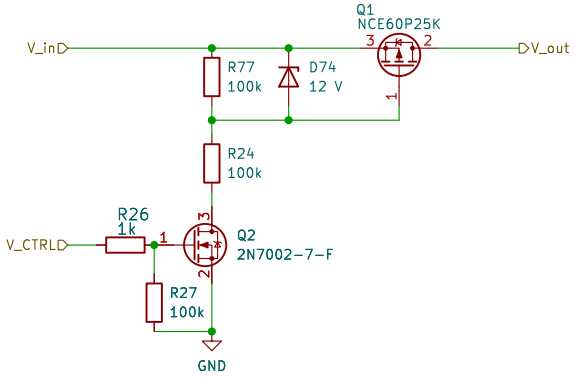
Sheet: /Addressable LEDs around the PCB/
File: leds.kicad_sch

Title: LEDs around the mainboard

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 10/16



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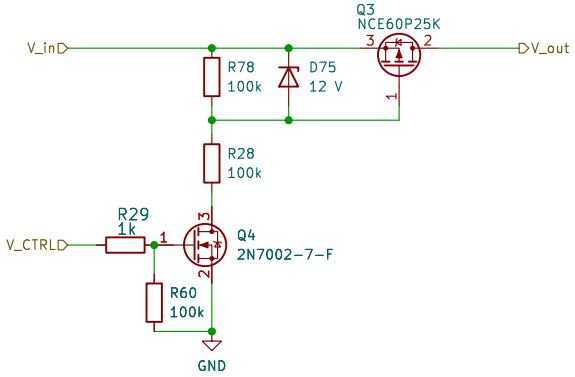
Sheet: /Power Management/Switch for V+ power input/
File: high_side_switch.kicad_sch

Title: High side switch

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 12/16

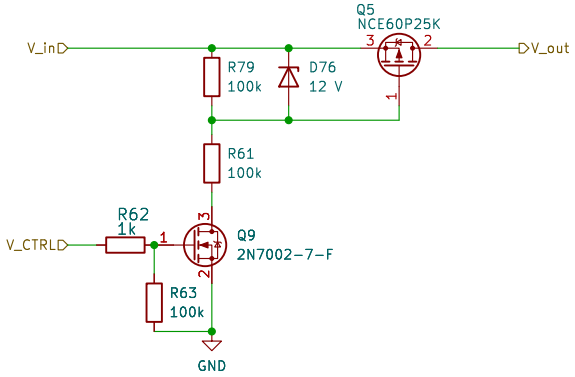


University of Tartu

Sheet: /Power Management/Switch for VBAT+ input/
File: high_side_switch.kicad_sch

Title: High side switch

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 13/16



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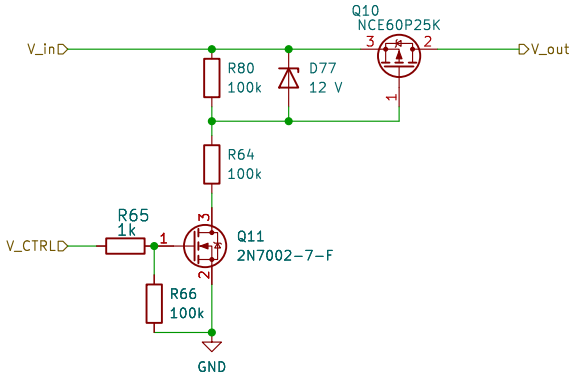
Sheet: /Power Management/System power switch/
File: high_side_switch.kicad_sch

Title: High side switch

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 14/16



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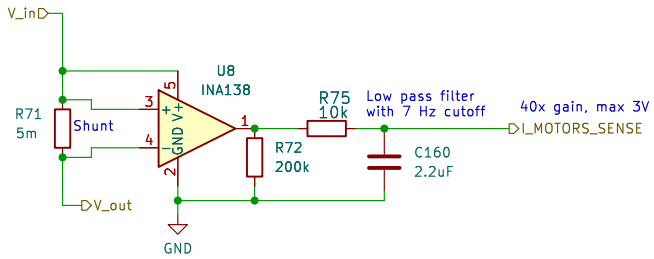
Sheet: /Power Management/Motor power switch/
File: high_side_switch.kicad_sch

Title: High side switch

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 15/16



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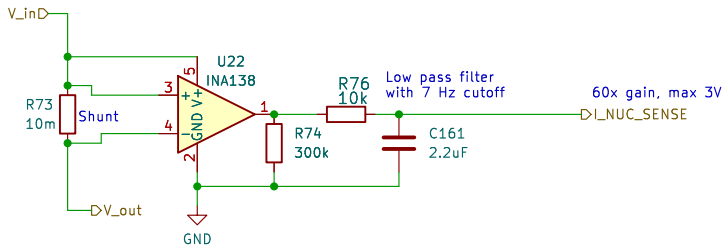
Sheet: /Power Management/Motor current monitoring/
File: mtr_crrnt_monitor.kicad_sch

Title: Motor current sensing circuit

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 17/16



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Sheet: /Power Management/Nuc and EXT current monitor/
File: nuc_crrnt_montior.kicad_sch

Title: Onboard computer current sensing circuit

Size: A4	Date: 2023-21-11	**Rev: 0.2.0**
KiCad E.D.A. 8.0.1		Id: 17/16