

Connector

File: Connector.kicad_sch

MCU

File: MCU.kicad_sch

Comms

File: Comms.kicad_sch

I/O

File: IO.kicad_sch

Power

File: Power.kicad_sch

HOUT

File: HOUT.kicad_sch

LOUT, PWM

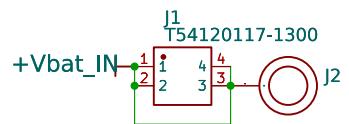
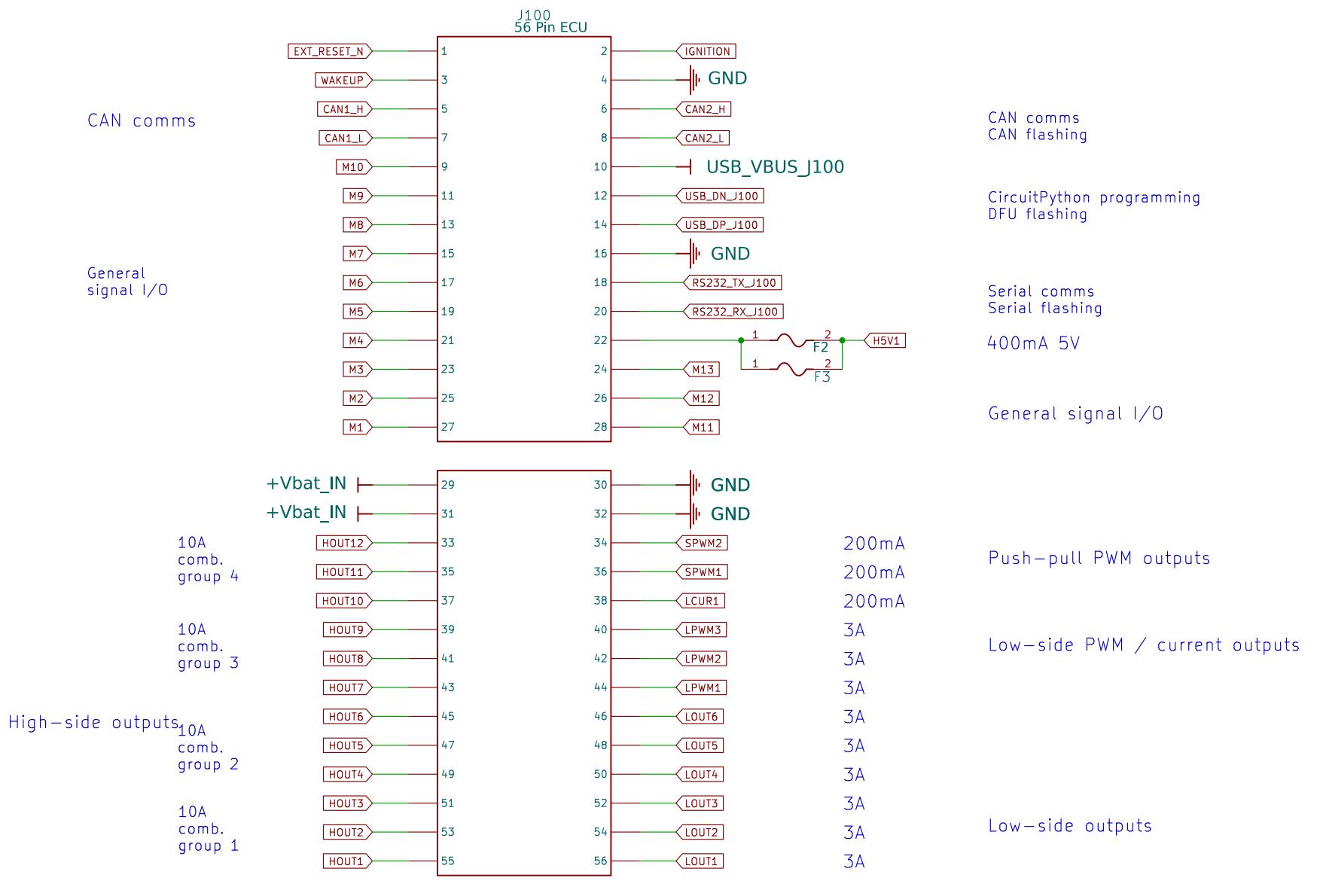
File: LOUT, PWM.kicad_sch

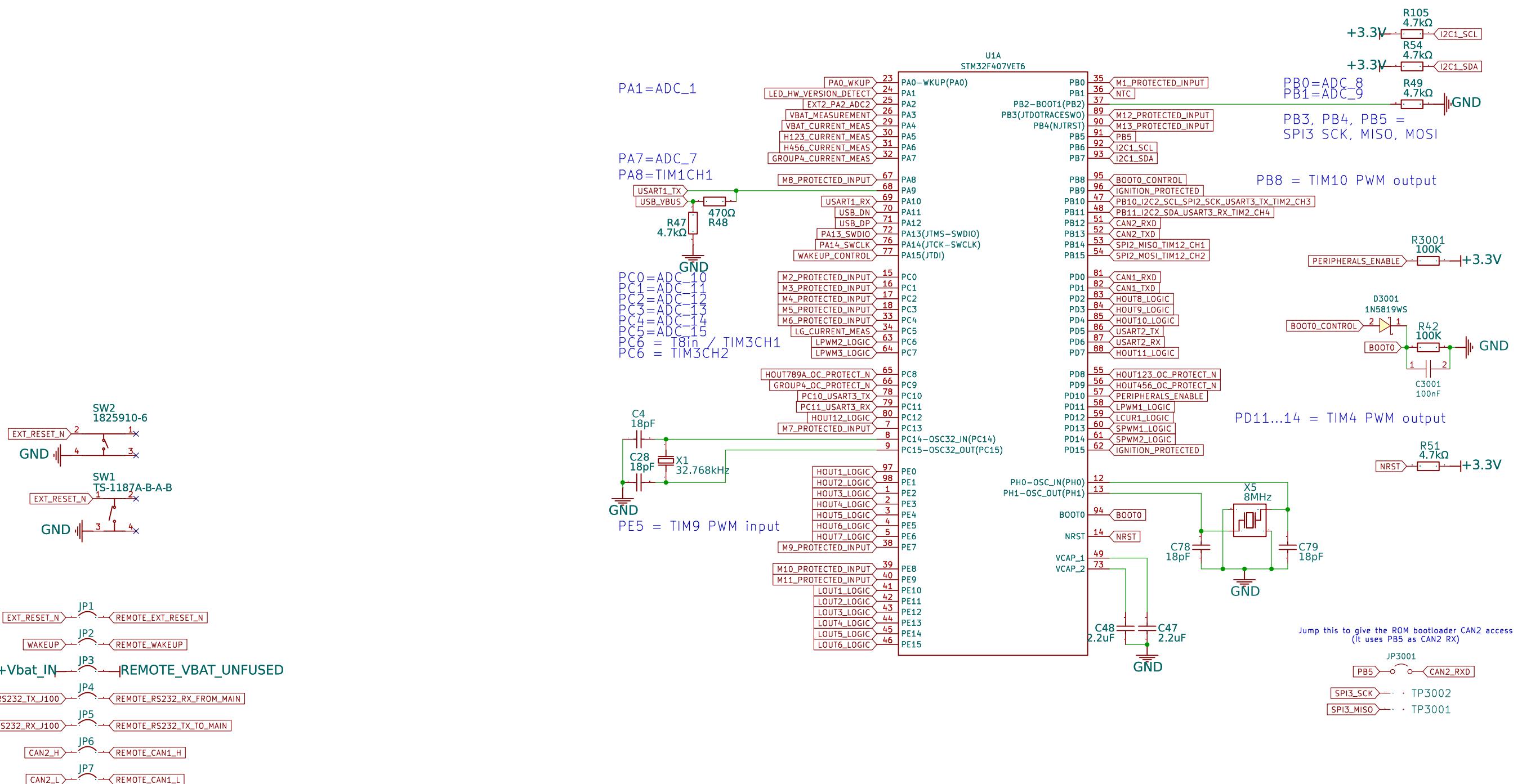
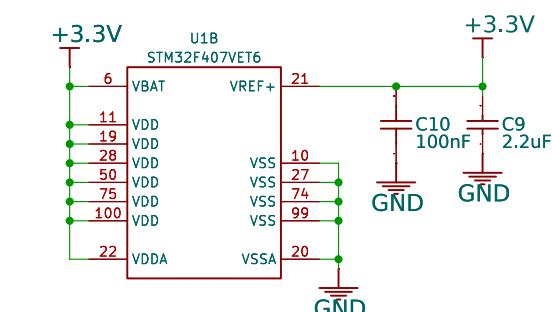
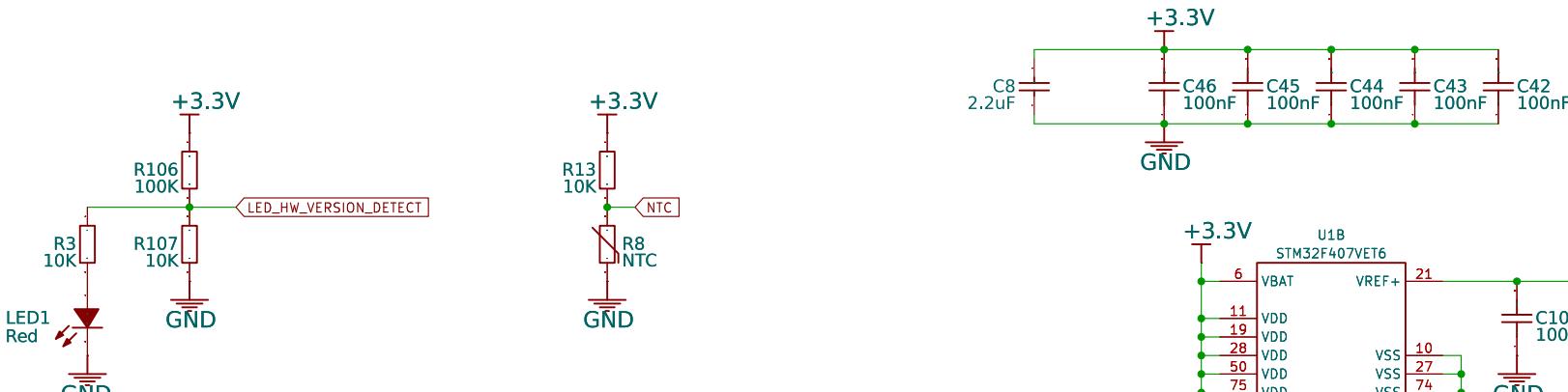
Reset

File: Reset.kicad_sch

Remote

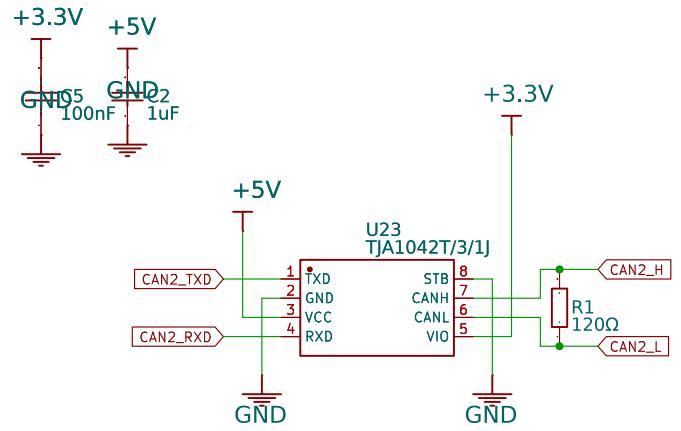
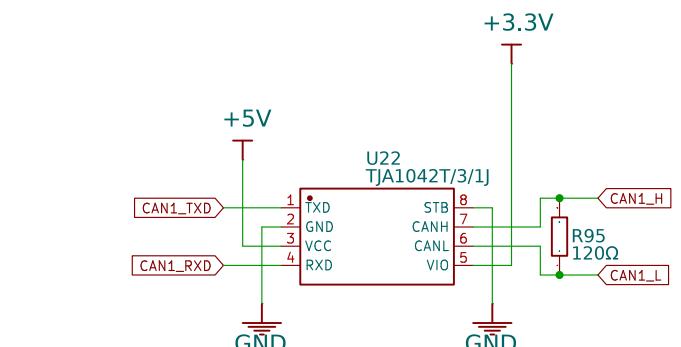
File: Remote.kicad_sch



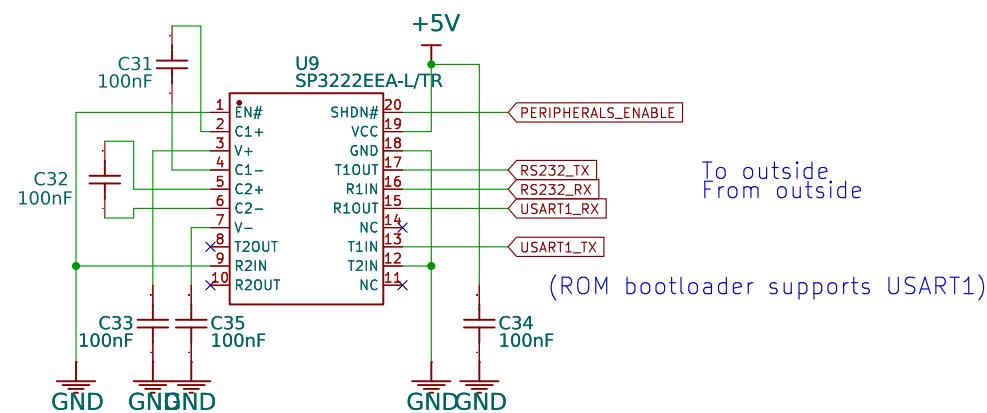


CAN

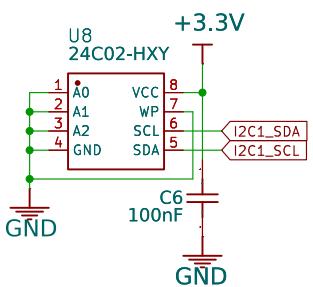
NOTE: Desolder the termination resistor if you don't need it



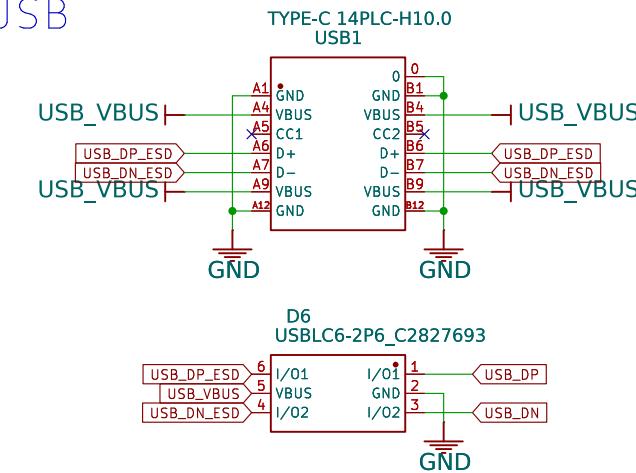
RS232



EEPROM



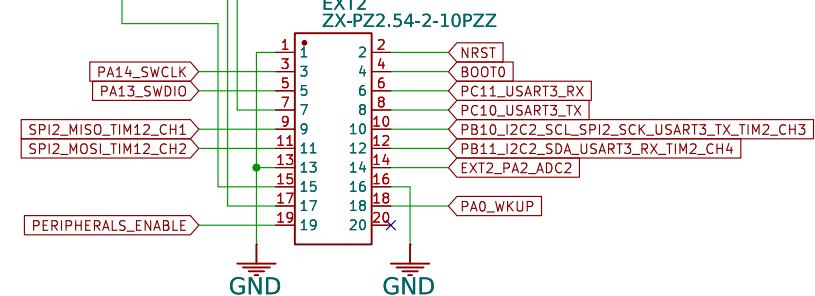
USB



Trying to provide via partially overlapping MCU pins:
100%

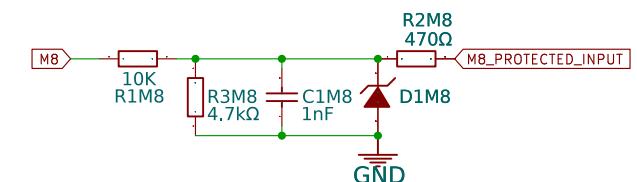
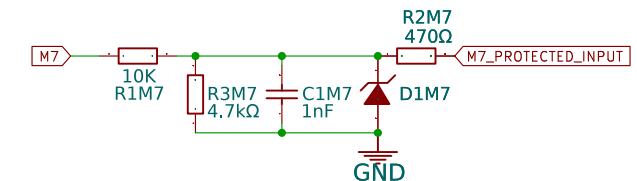
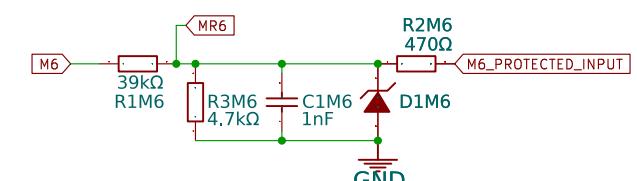
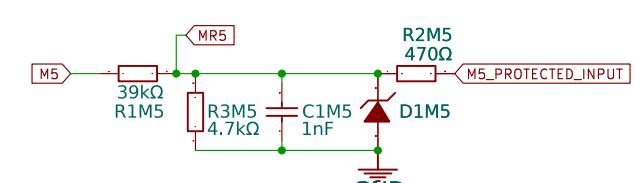
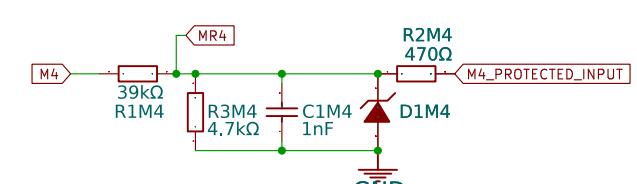
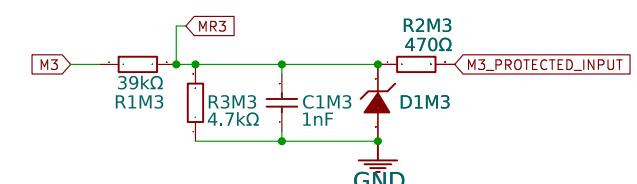
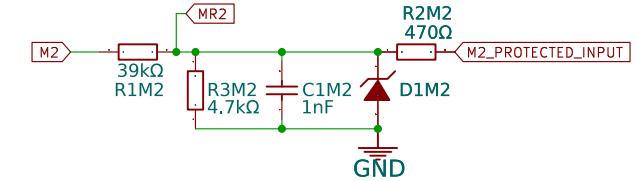
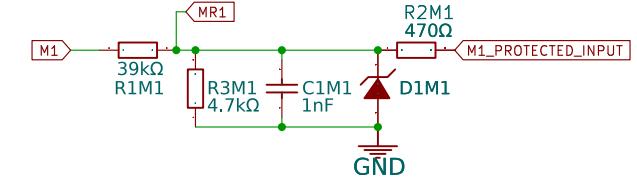
- I_C2 +V_{bat}
 - SPI2 +5V 3.3V
 - TIM2 T T T

ROM bootloader supports USART3 (PB11, PB10 and PC10, PC11)
USART3 can also be used for programming
another ipdm56v2 when connected via an
RS232 extension board to its USART1



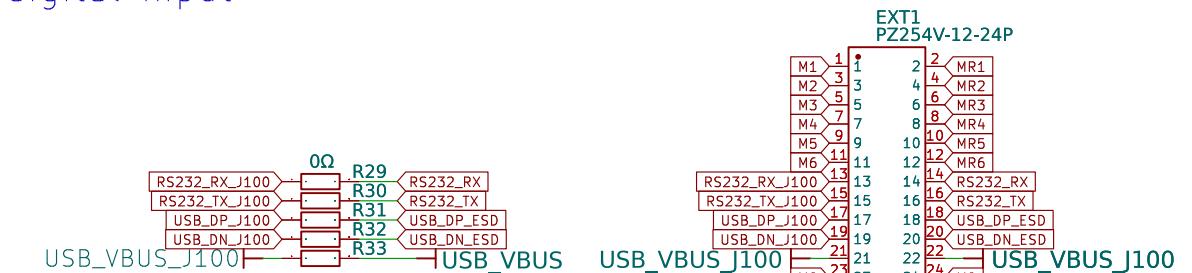
NOTE: The STM32's digital input levels at 3.3 V supply are:

- Low: possibly < 1.23 V or maybe < 1.1 V
- High: possibly > 1.88 V or maybe > 2.2 V

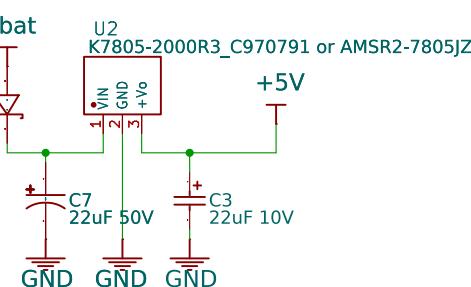
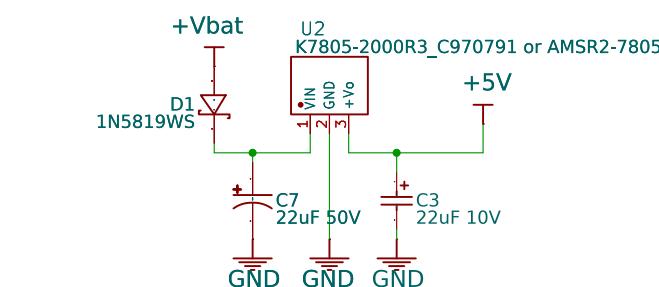
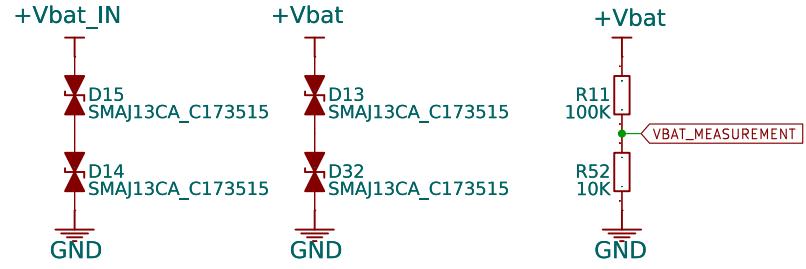


- NOTE: R1M* value:
- 39k: Good for analog input
 - 10k: Good for digital input

Internal breakout/extension connect



Vbat transient voltage suppression
 Permanent 5V supply:
 NOTE: There is a 3A PPTC in series with Vbat. Nothing for Vbat > 2.0 A, quiescent: 0.5 mA max: 200 mA, quiescent: 1 uA
 Stacking two SMAJ13CA results in Vbr=29...32V, Vmax=43V, Ipp=19A



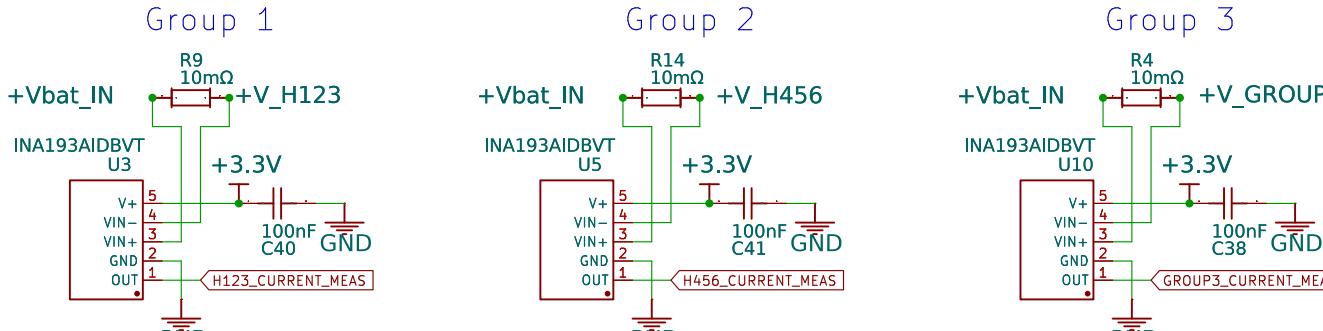
Current measurement

INA193 gain: 20

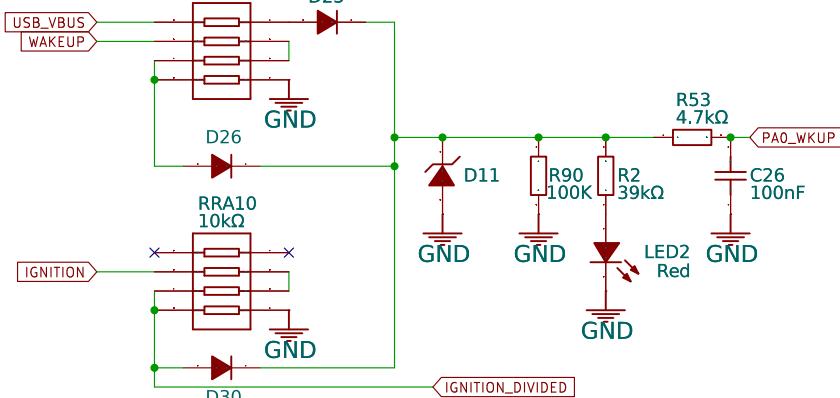
With the 10 mOhm resistor, the full scale to 3.3V is 0...16.5A

The HOUT overcurrent protection circuit compares the output with a static voltage. If higher, it shuts down the corresponding output transistors for a moment.

Internal consumption is measured as part of group 1



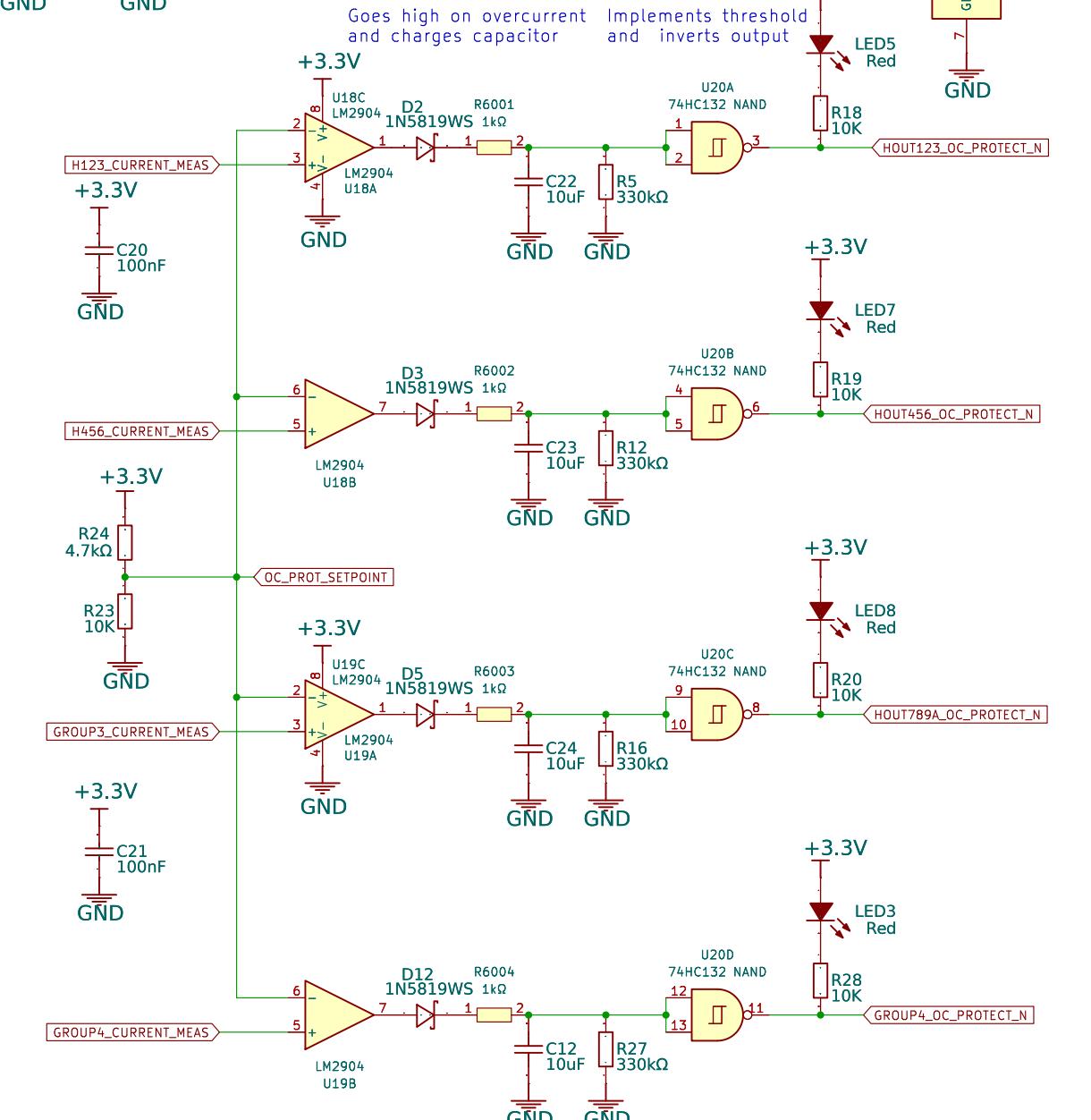
Wakeup



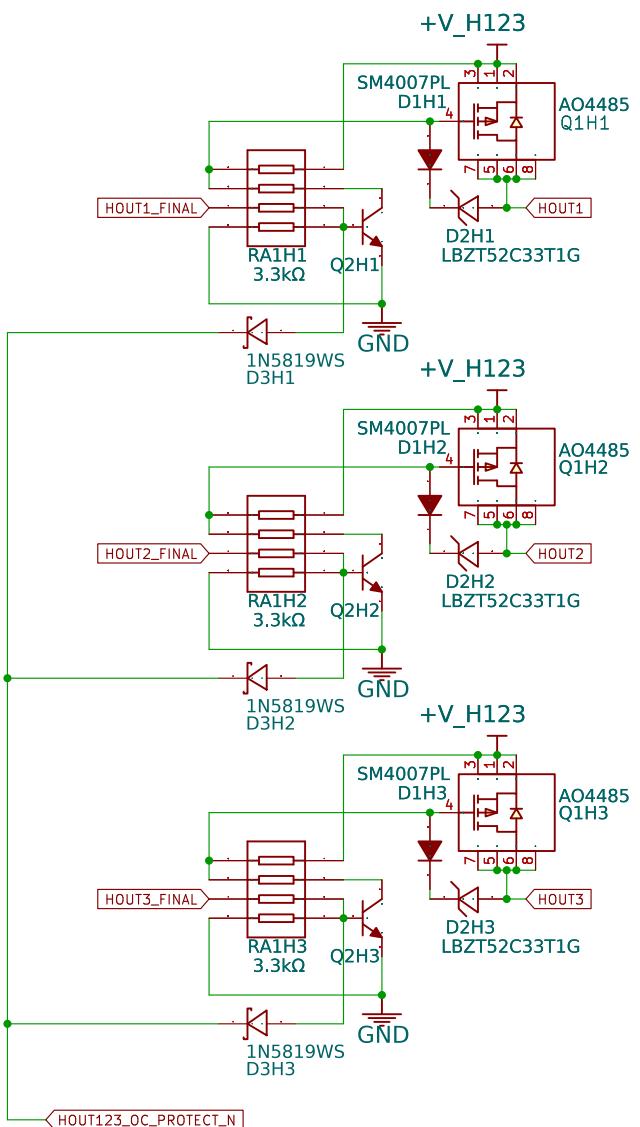
Permanent 3.3V supply:

NOTE: There is a 3A PPTC in series with Vbat. Nothing for Vbat > 2.0 A, quiescent: 0.5 mA max: 200 mA, quiescent: 1 uA

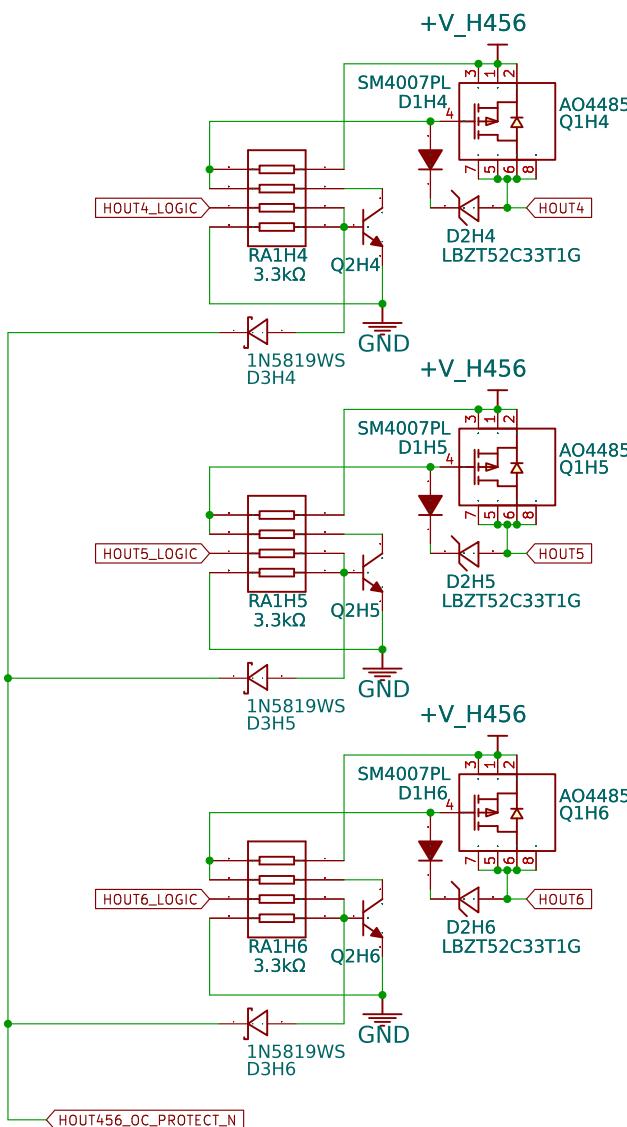
HOUT overcurrent protection



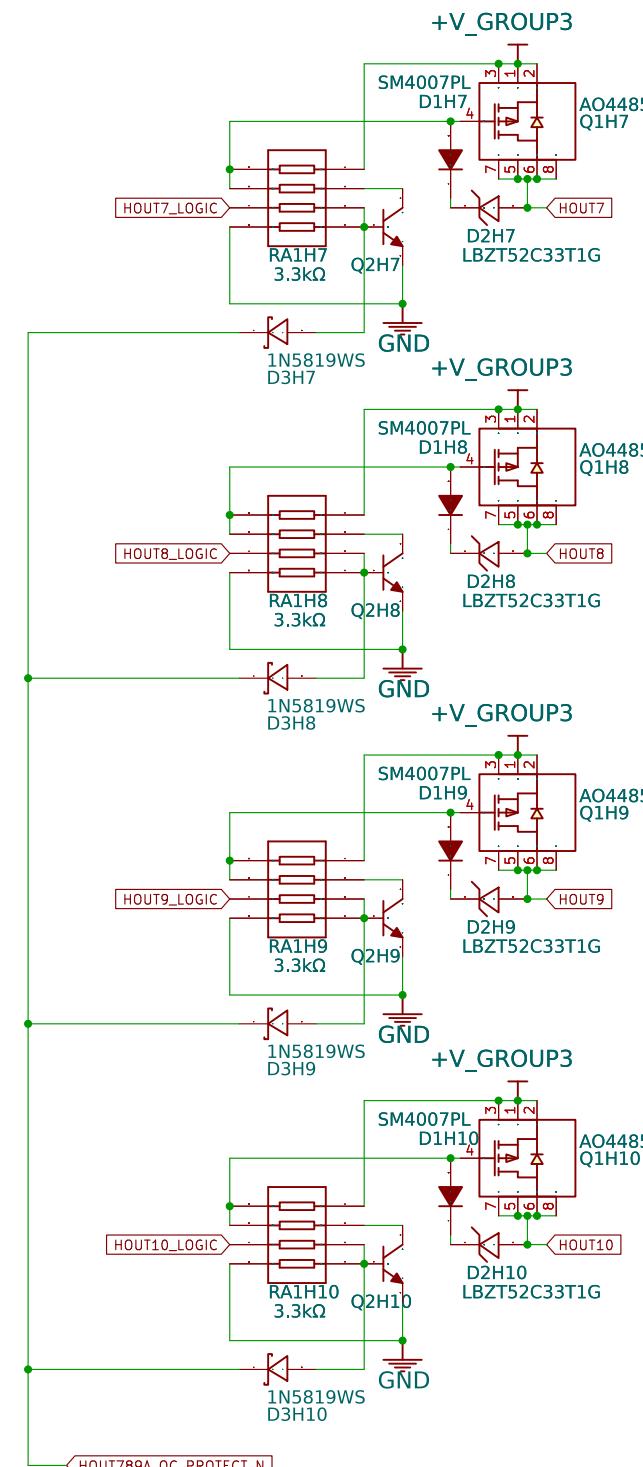
Group 1



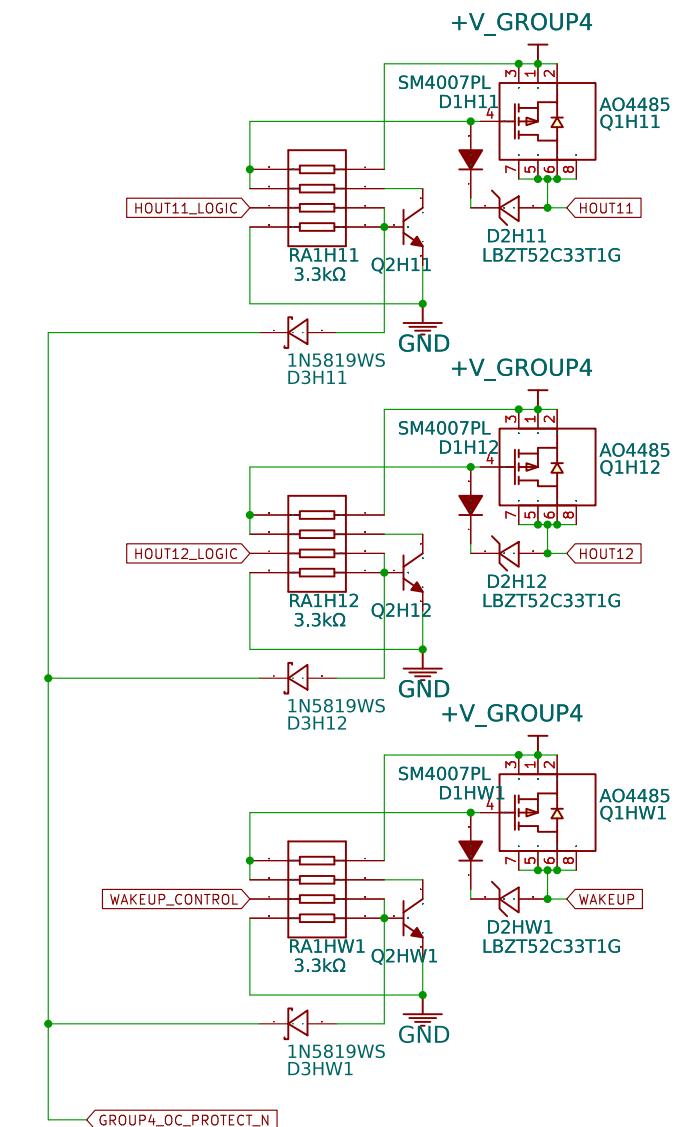
Group 2



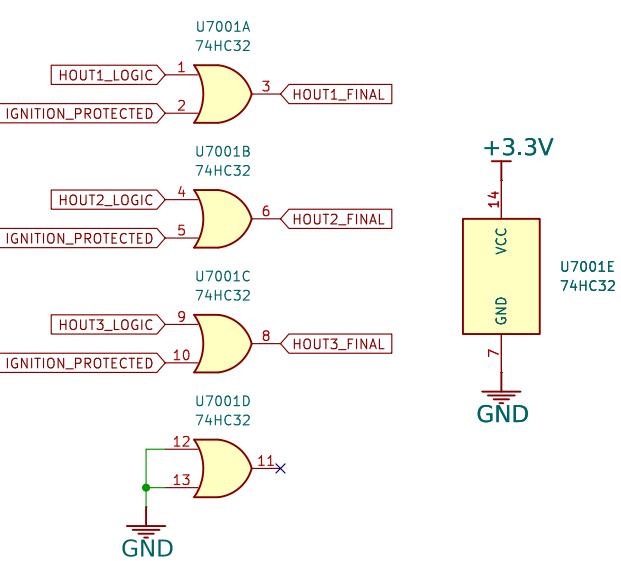
Group 3



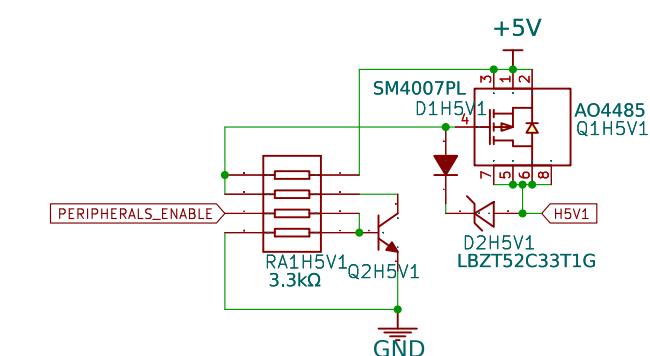
Group 4

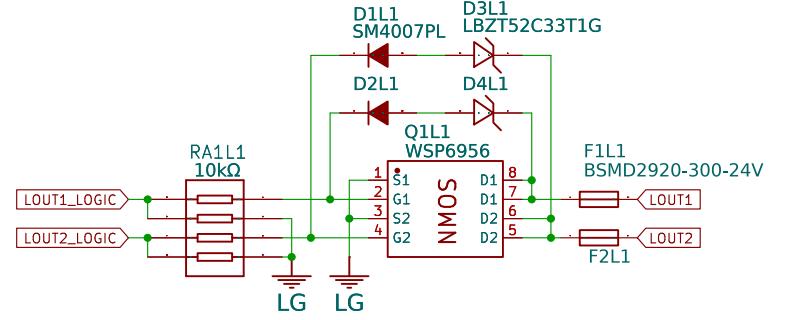


Hardware fallback feature:
HOUT1...3 are forced ON based on IGNITION input

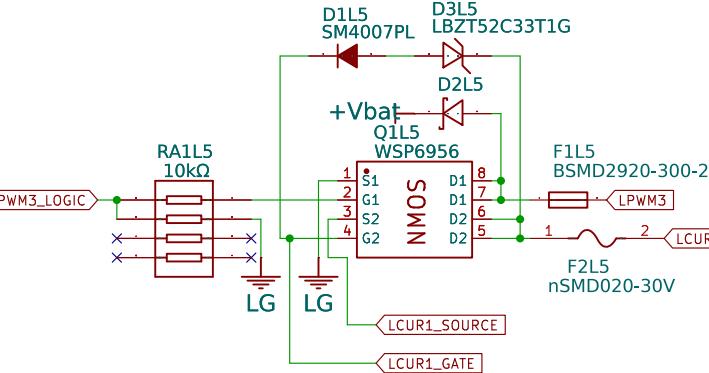
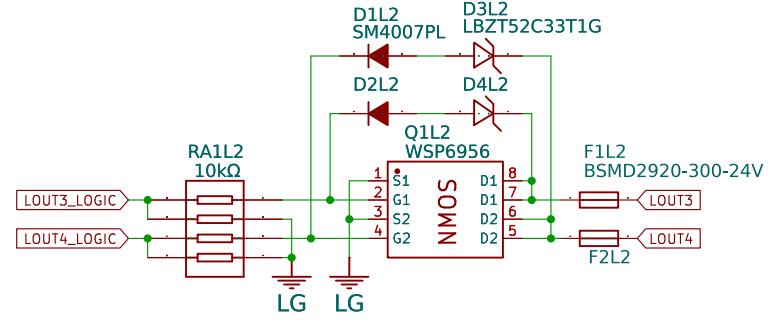
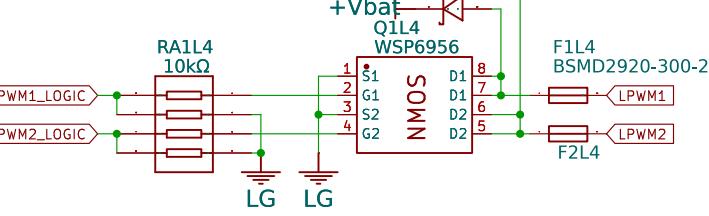


5V external output



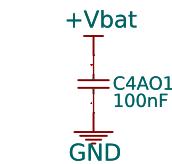
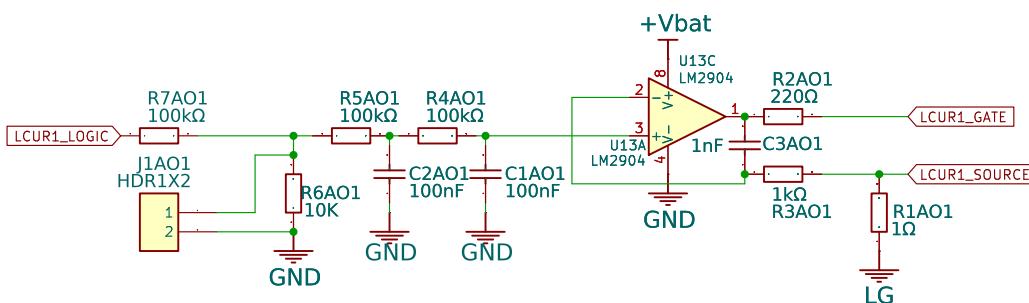


Yes, freewheeling diodes on low-side outputs are annoying, but you can't really do PWM otherwise and Vbat is intended to be always powered.

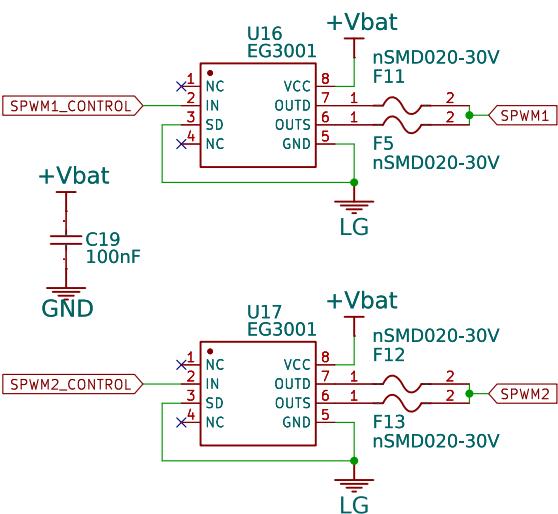


LCUR1: Averaging-PWM low impedance analog output with DC capability

NOTE: At 200mA @ 12V, the MOSFET will generate 2.4W of heat



Push-pull PWM outputs



EXT_RESET_N circuit

Short N pulse: Reset to flash
Long N pulse: Reset to rom

