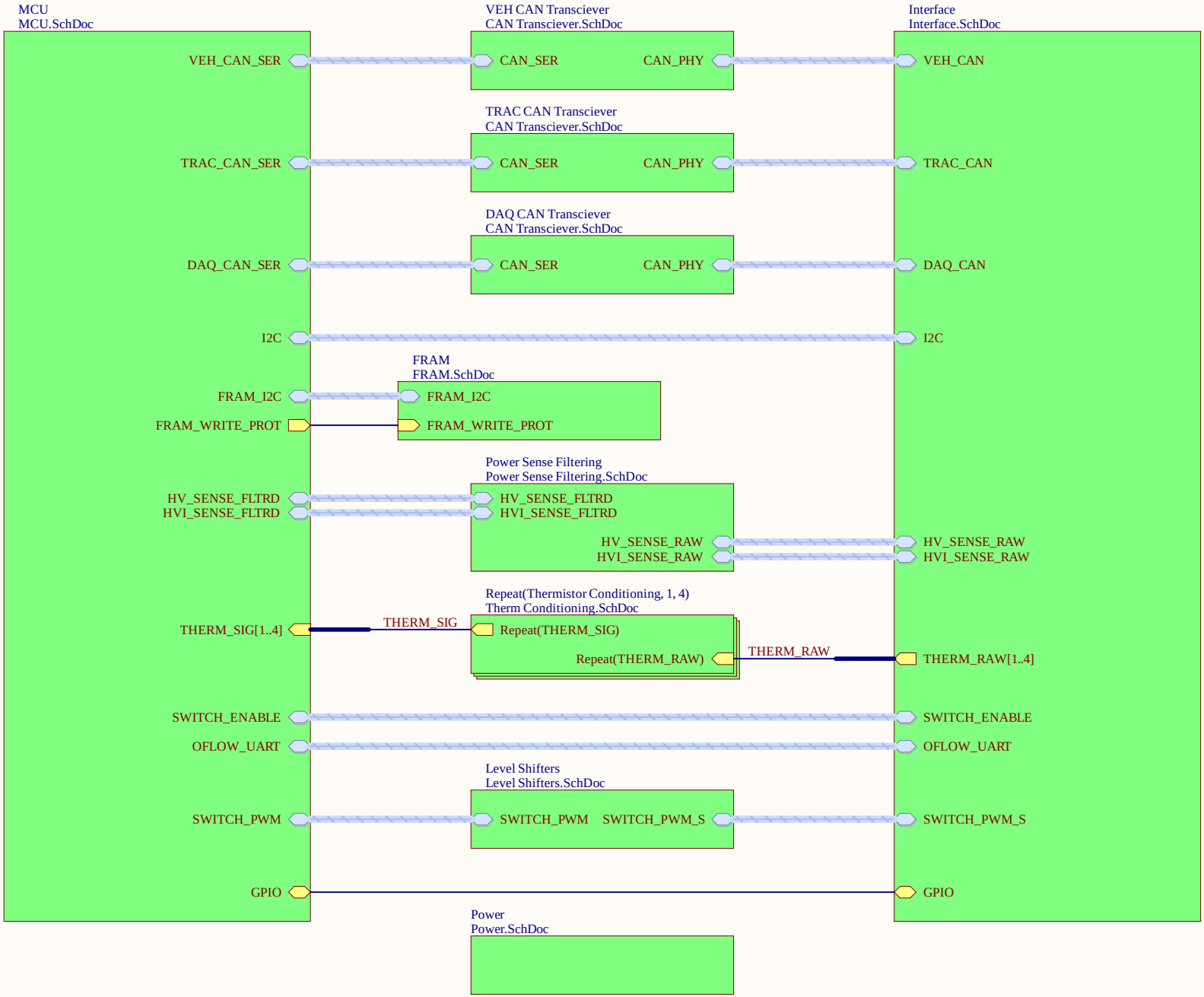
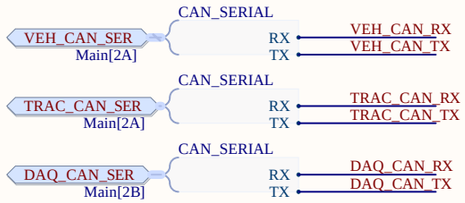
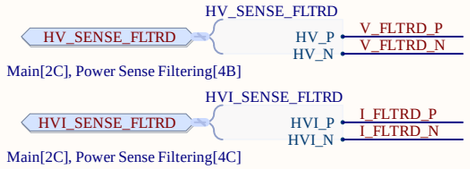

MCU
MCU.SchDoc
VEH_CAN_SER
TRAC_CAN_SER
DAQ_CAN_SER
I2C
FRAM_I2C
FRAM_WRITE_PROT
HV_SENSE_FLTRD
HVI_SENSE_FLTRD
THERM_SIG[1..4]
SWITCH_ENABLE
OFLOW_UART
SWITCH_PWM
GPIO
VEH CAN Transciever
CAN Transciever.SchDoc
CAN_SER
CAN_PHY
TRAC CAN Transciever
CAN Transciever.SchDoc
CAN_SER
CAN_PHY
DAQ CAN Transciever
CAN Transciever.SchDoc
CAN_SER
CAN_PHY
FRAM
FRAM.SchDoc
FRAM_I2C
FRAM_WRITE_PROT
Power Sense Filtering
Power Sense Filtering.SchDoc
HV_SENSE_FLTRD
HVI_SENSE_FLTRD
HV_SENSE_RAW
HVI_SENSE_RAW
Repeat(Thermistor Conditioning, 1, 4)
Therm Conditioning.SchDoc
THERM_SIG
Repeat(THERM_SIG)
Repeat(THERM_RAW)
THERM_RAW
Level Shifters
Level Shifters.SchDoc
SWITCH_PWM
SWITCH_PWM_S
Power
Power.SchDoc
Interface
Interface.SchDoc
VEH_CAN
TRAC_CAN
DAQ_CAN
I2C
HV_SENSE_RAW
HVI_SENSE_RAW
THERM_RAW[1..4]
SWITCH_ENABLE
OFLOW_UART
SWITCH_PWM_S
GPIO

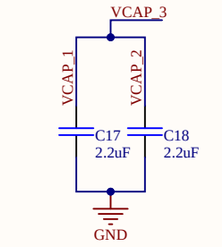
CAN Interfaces



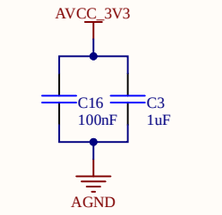
Power Sense



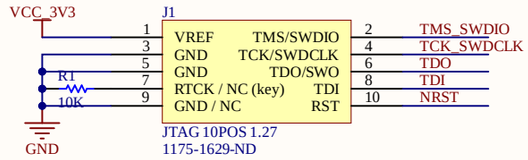
VCAP Decoupling



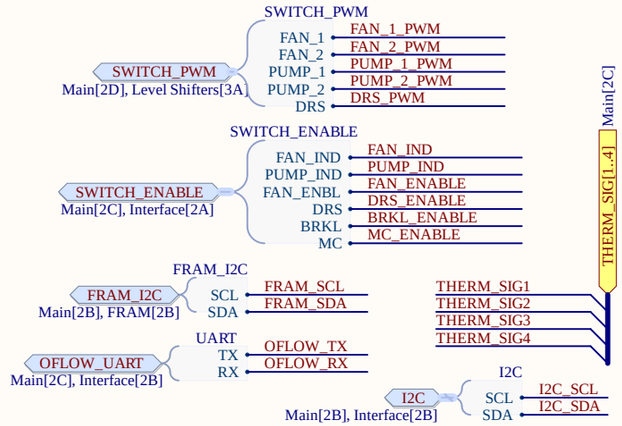
AVCC Decoupling



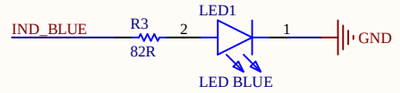
JTAG



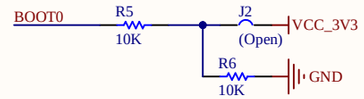
Buses/Harnesses



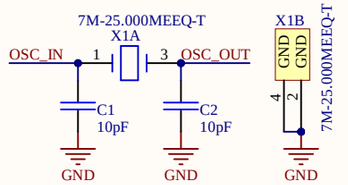
Status LED



Boot Selection



XTAL

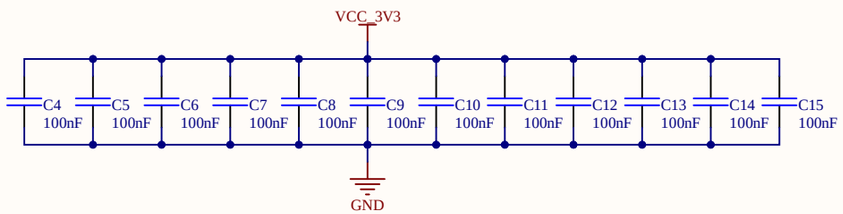


NRST

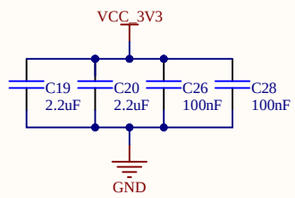
I2C Pullups

FRAM Write Protect

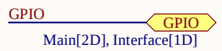
VDD Decoupling Caps (1-10, 12-13)



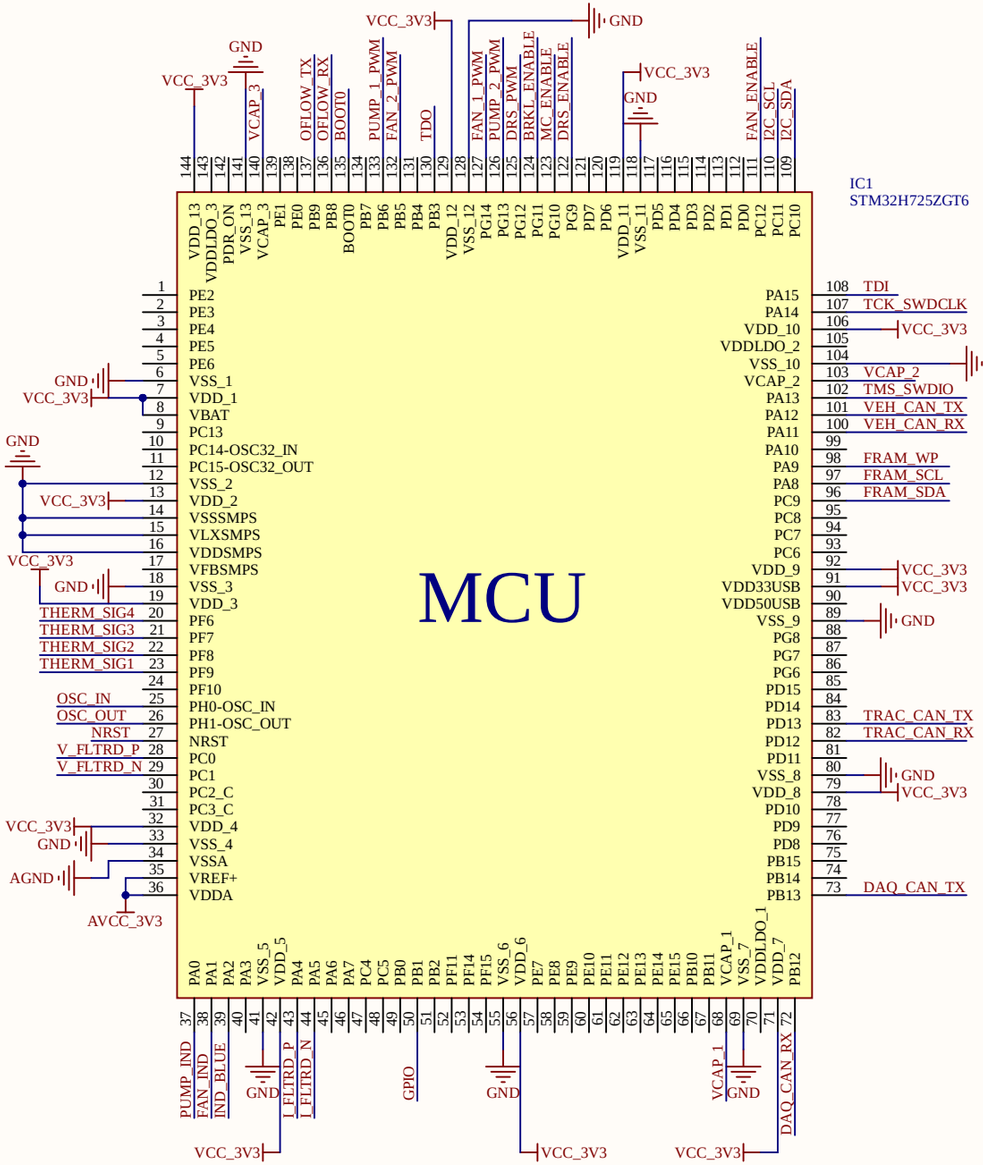
VDD Decoupling Caps (11)



GPIO

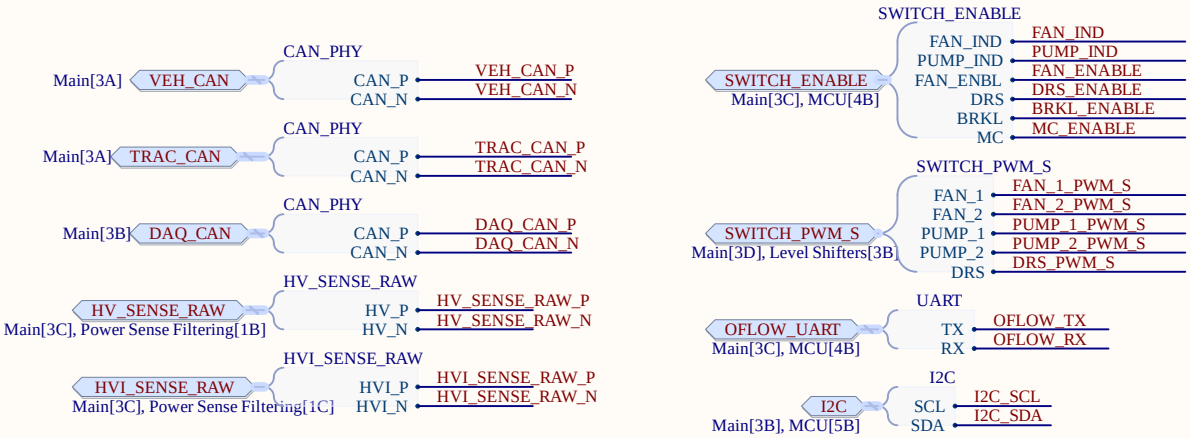


MCU

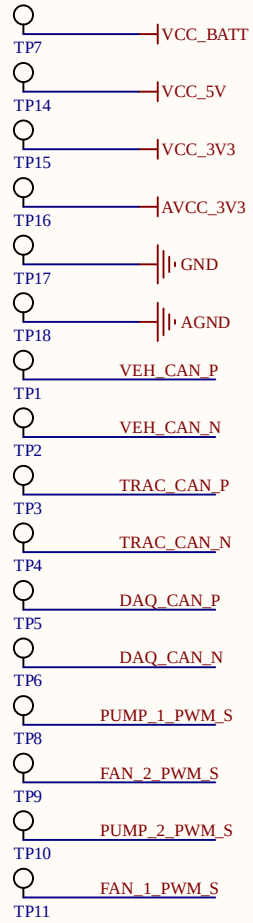


Title	MCU		
Size	Number		Revision
A			
Date:	12/16/2025	Sheet of	
File:	C:\Users\..\MCU.SchDoc	Drawn By:	

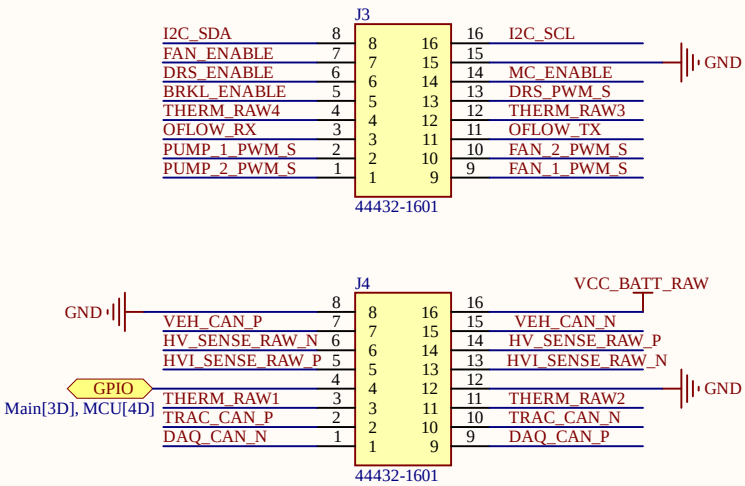
Harnesses



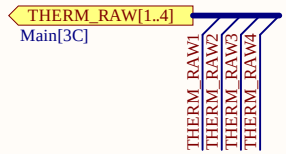
Testpoints



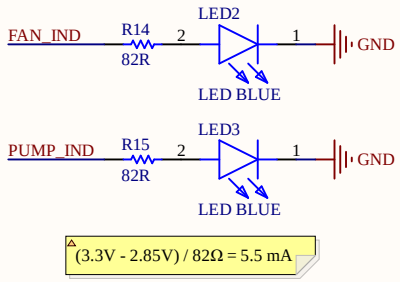
Connectors



Thermistors

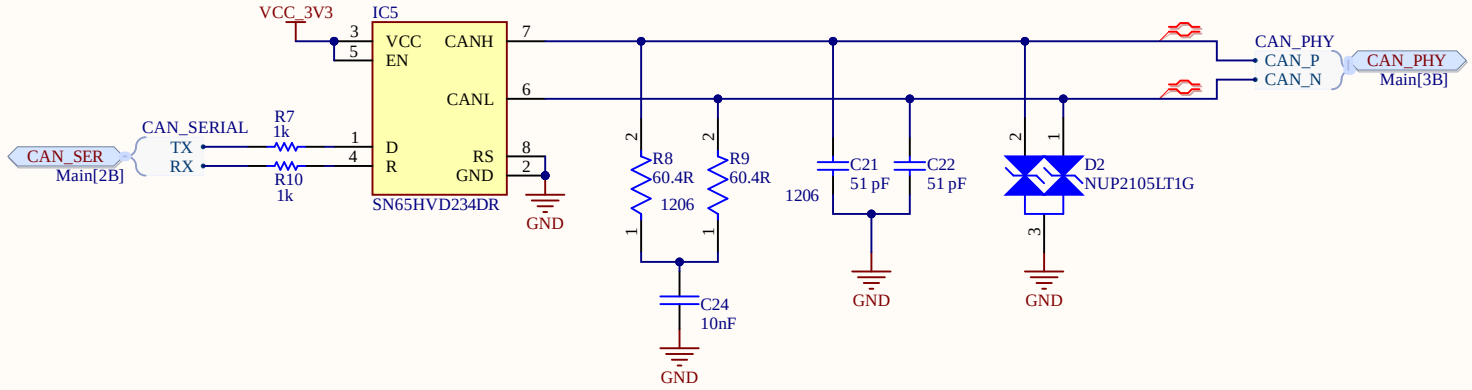


Indicators

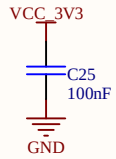


Title: Interface		
Size: A	Number:	Revision:
Date: 12/16/2025		Sheet of
File: C:\Users\..\Interface.SchDoc		Drawn By:

Transciever



Decoupling



Termination Resistor Sizing

http://tinyurl.com/qf5f7hk
- Recommends 0.25W termination resistors

http://tinyurl.com/oldntqy
- Explains why 0.25W termination resistors are recommended for 5V CAN networks

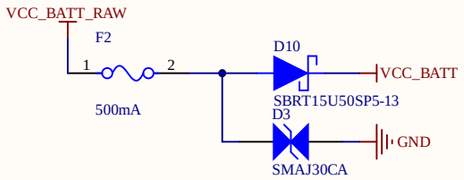
1206 SMT resistors handle 0.25W

ESD Protection Capacitors

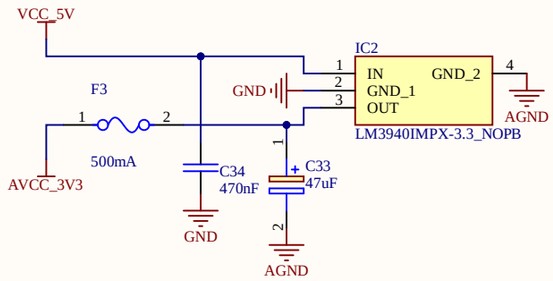
http://www.nxp.com/documents/application_note/AN10211.pdf
- Recommends <=100pF caps

Title: CAN Transciever		
Size: A	Number:	Revision:
Date: 12/16/2025		Sheet of
File: C:\Users\..\CAN Transciever.SchDoc		Drawn By:

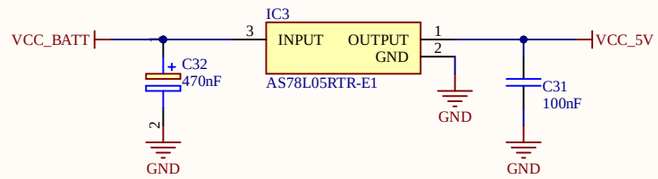
Power Filtering



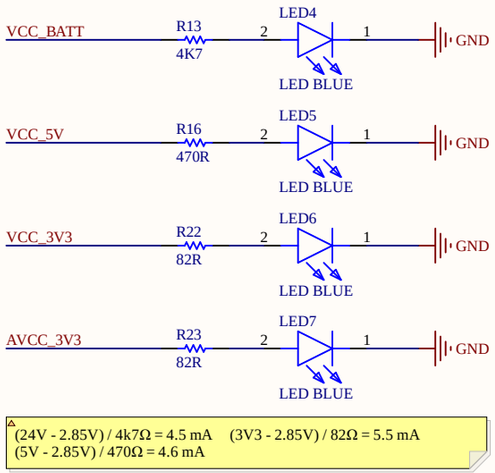
5V - A3V3 LDO



24V - 5V LDO

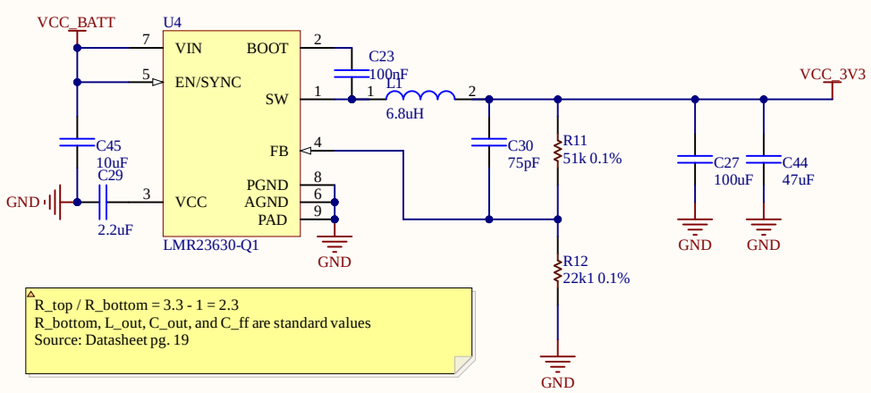


Power Indicators



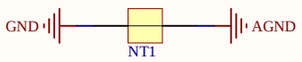
(24V - 2.85V) / 4k7Ω = 4.5 mA (3V3 - 2.85V) / 82Ω = 5.5 mA
(5V - 2.85V) / 470Ω = 4.6 mA

24V - 3V3 Buck



R_top / R_bottom = 3.3 - 1 = 2.3
R_bottom, L_out, C_out, and C_ff are standard values
Source: Datasheet pg. 19

Net Tie



Power Calcs (3V3):
- STM32H7: 220 mA * 3.3V = 726 mW
- LED (x4): 5.5mA * 3.3V * 4 = 59.4 mW
- CAN Transceiver: 10mA * 3.3V = 33 mW
- FRAM: 0.71 mA * 3.3V = 2.34 mW
Total: 844 mW

Power into 24V-3V3 buck:
P = 844 mW / 0.8 = 1055 mW

Power Calcs (A3V3):
- LED: 5.5 mA * 3.3V = 18.15 mW
- STM32H7: 13.5uA * 3.3V = 0.04 mW
Total: 18 mW

Power into 5V-A3V3 LDO:
P = 18 mW / (3.3V / 5V) = 27 mW

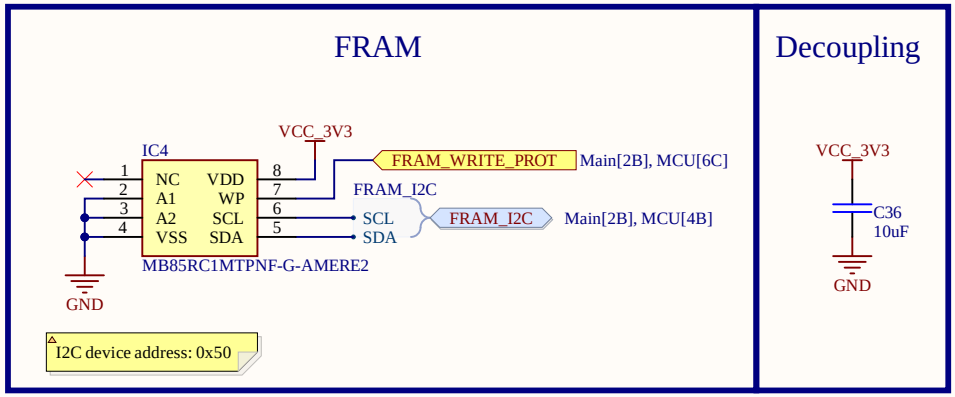
Power Calcs (5V):
- 5V-A3V3 LDO: 27 mW
- MOSFET (x5): 5V^2 / 10kΩ = 2.5 mW
- LED: 4.6 mA * 5V = 23 mW
Total: 53 mW

Power into 24V-5V LDO:
P = 53 mW / (5V / 24V) = 254 mW

Power Calcs (24V):
- 24V-5V LDO: 254 mW
- 24V-3V3 LDO: 1055 mW
- LED: 4.5 mA * 24V = 108 mW
Total: 1417 mW

Total Power Draw: 1417 mW

Title: Power		
Size: B	Number:	Revision:
Date: 12/16/2025		Sheet of
File: C:\Users\..\Power.SchDoc		Drawn By:



Title	FRAM		
Size	Number		Revision
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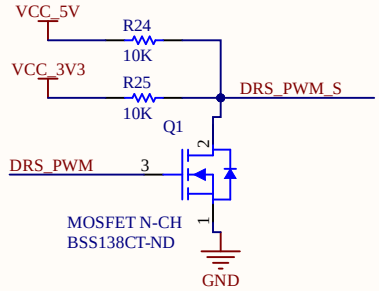
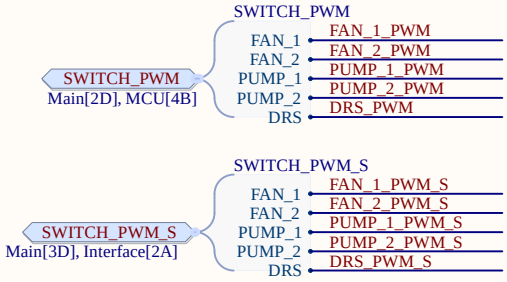
Date:	12/16/2025	Sheet of	
File:	C:\Users\..\FRAM.SchDoc	Drawn By:	

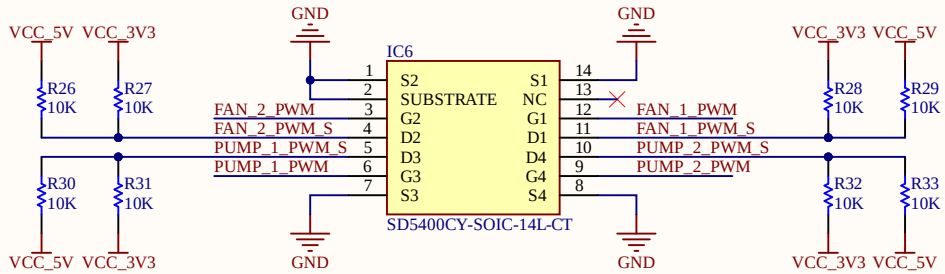
DRS PWM Level Shifter



Harnesses



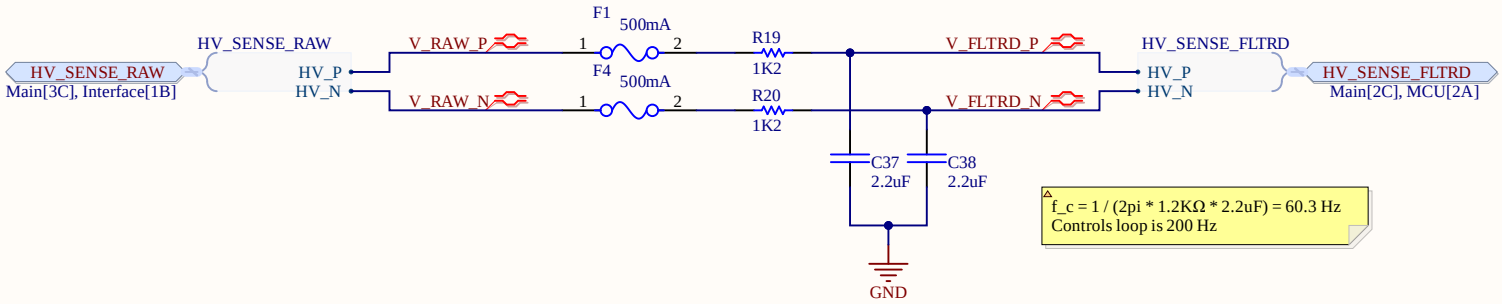
Fan/Pump PWM Level Shifters



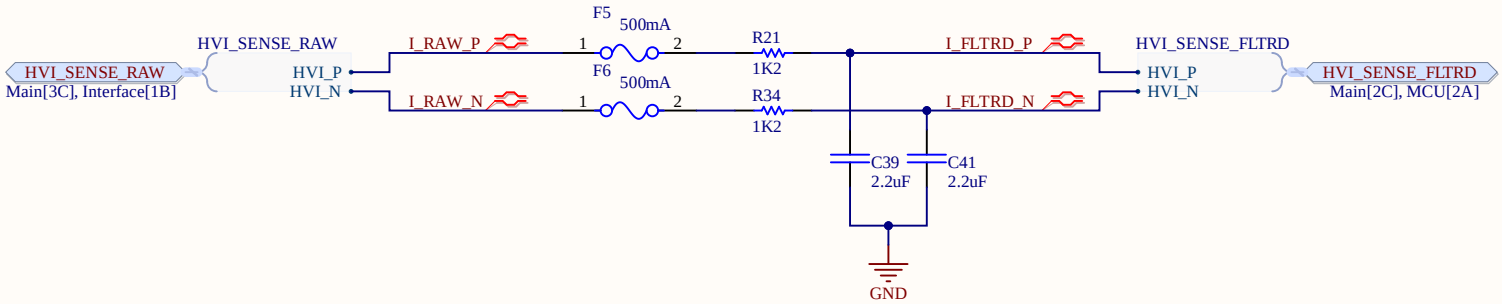
Motor Controller: 2.5A
Brakelight: 400mA
Pump: 3.3A (both: 6.6A)
Fan: max 1.7A (both: 3.4A)
Total: 13A

Title: Level Shifters		
Size: A	Number:	Revision:
Date: 12/16/2025		Sheet of
File: C:\Users\..\Level Shifters.SchDoc		Drawn By:

Voltage Sense Filtering



Current Sense Filtering



Title: Power Sense Filtering		
Size: A	Number:	Revision:
Date: 12/16/2025		Sheet of
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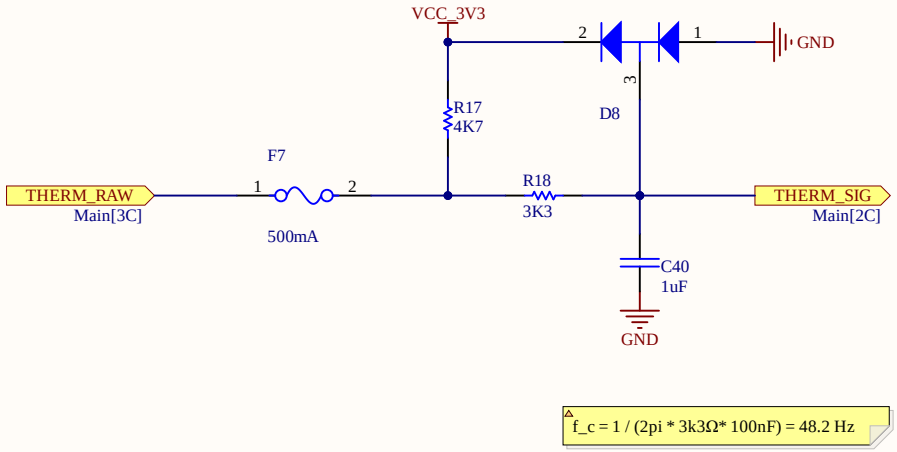
Thermistor Conditioning



Title	Therm Conditioning		
Size	Number		Revision
A			
Date:	12/16/2025	Sheet of	
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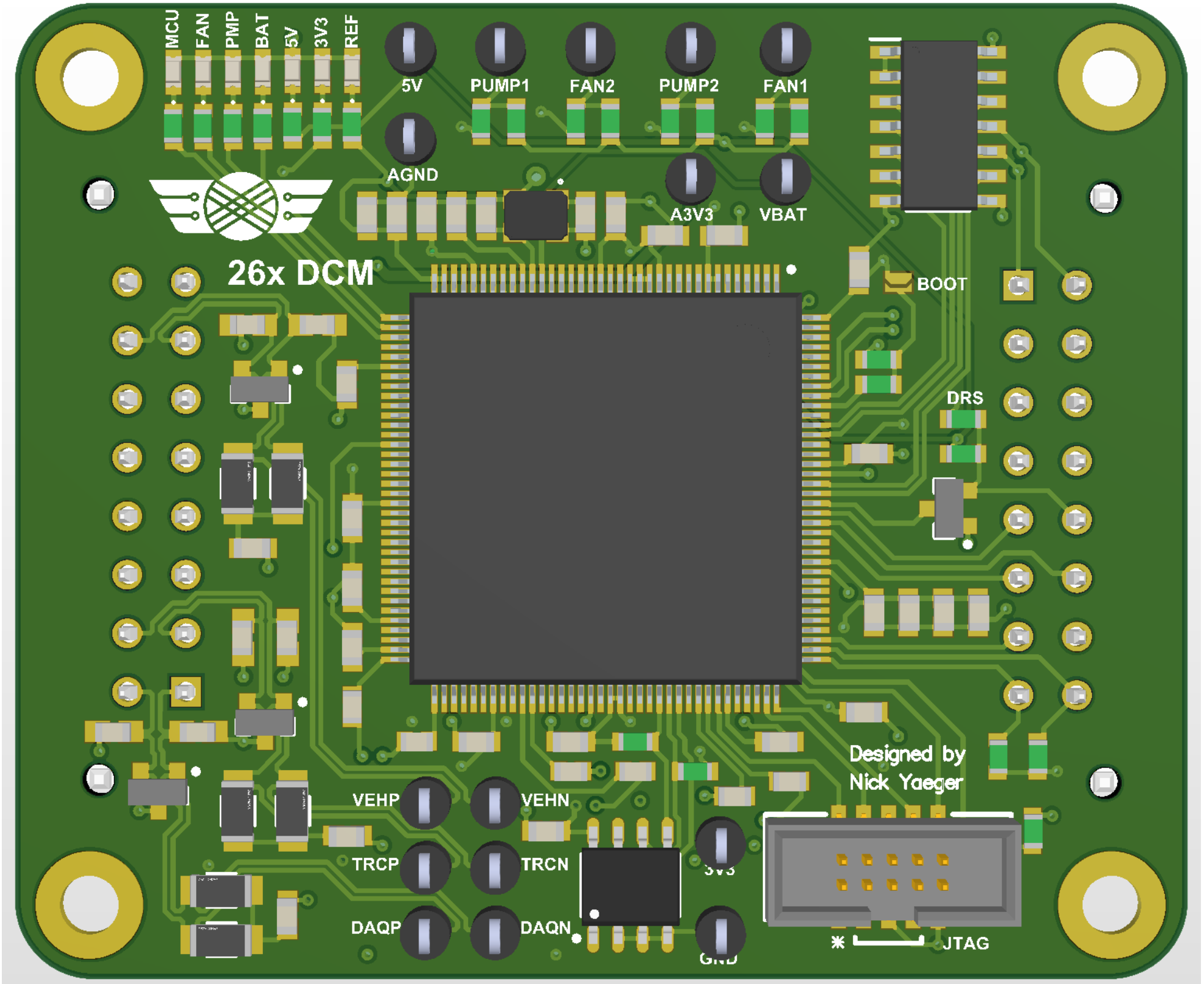
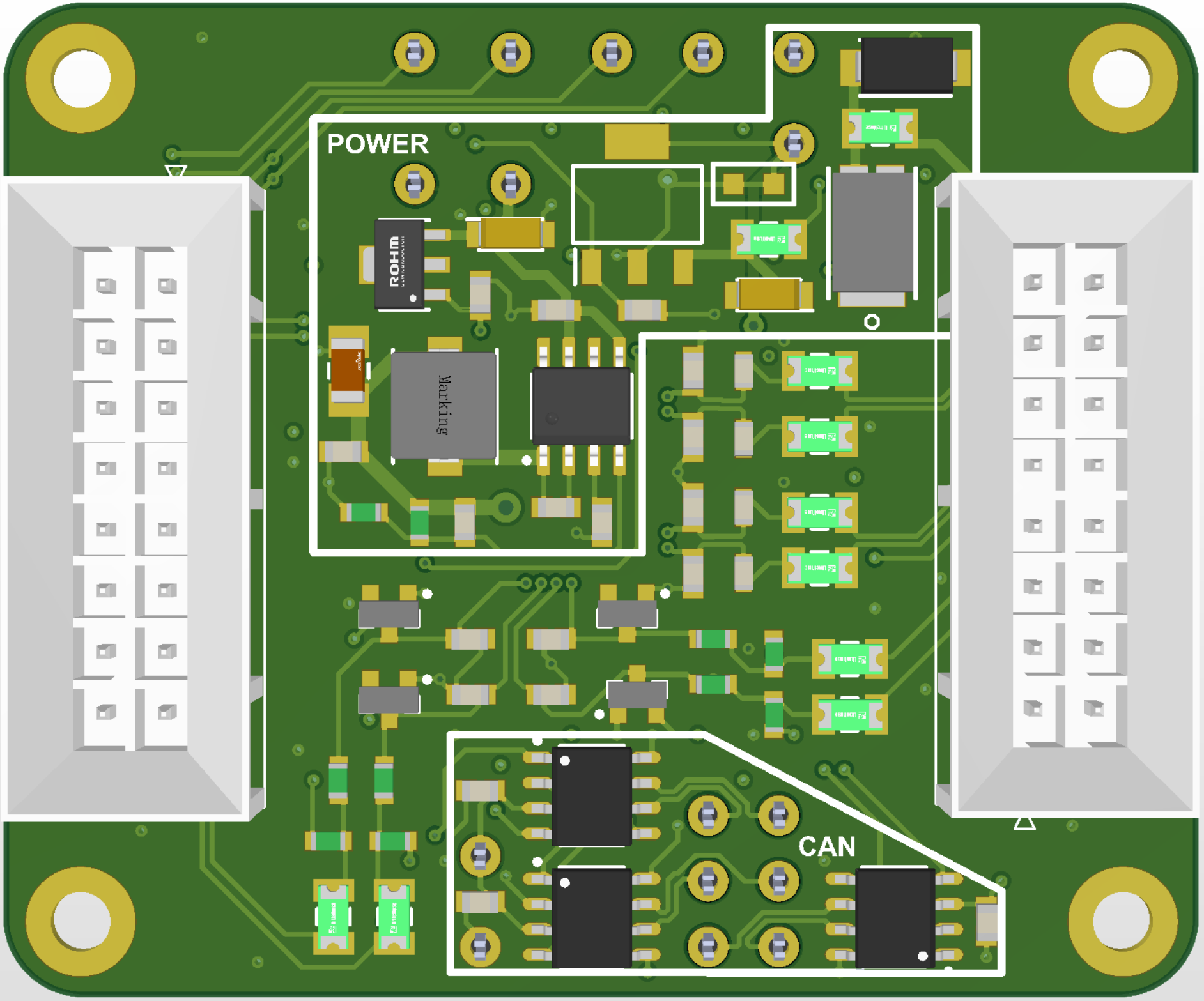

MCU
FAN
PMP
BAT
5V
3V3
REF
5V
PUMP1
FAN2
PUMP2
FAN1
AGND
A3V3
VBAT
26x DCM
BOOT
DRS
Designed by
Nick Yaeger
VEHP
VEHN
TRCP
TRCN
DAQP
DAQN
3V3
GND
JTAG


POWER
ROHM
Marking
CAN