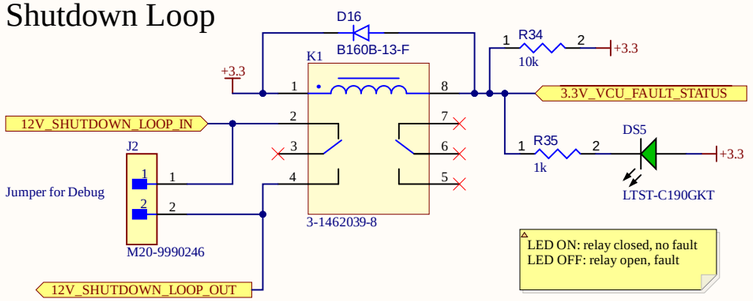
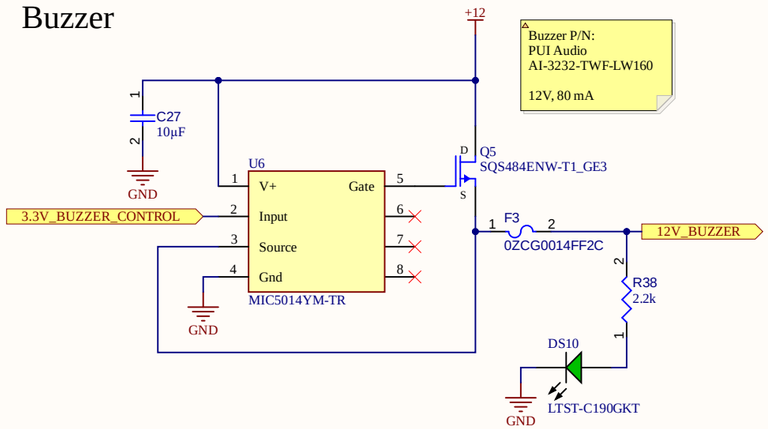
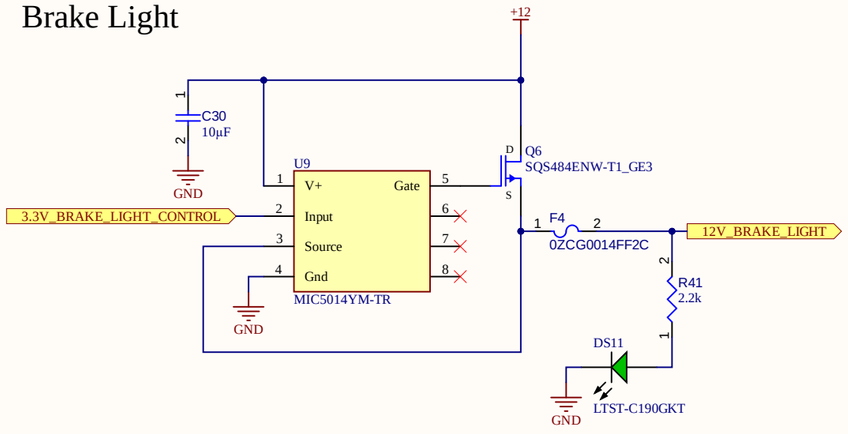
Shutdown Loop



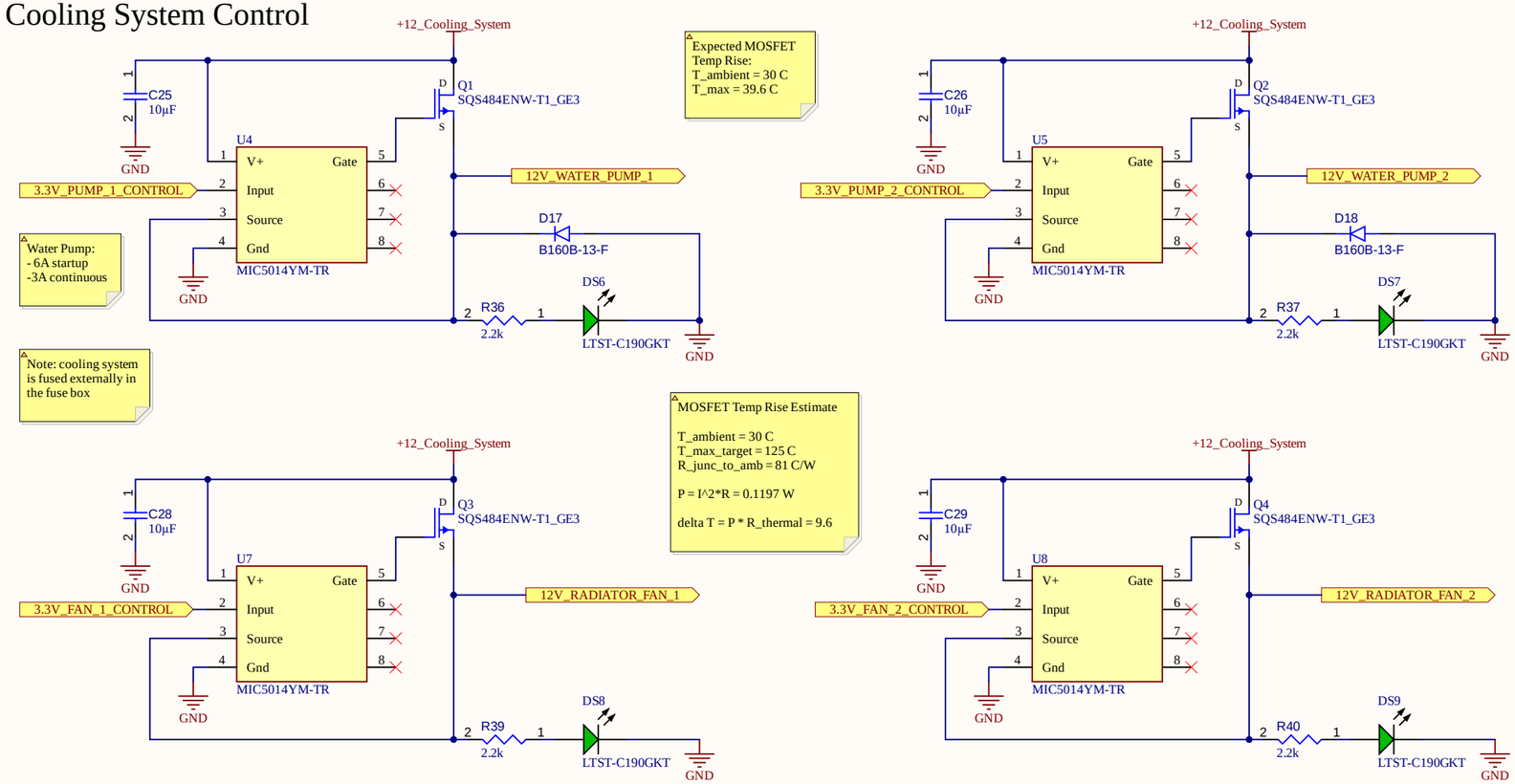
Buzzer



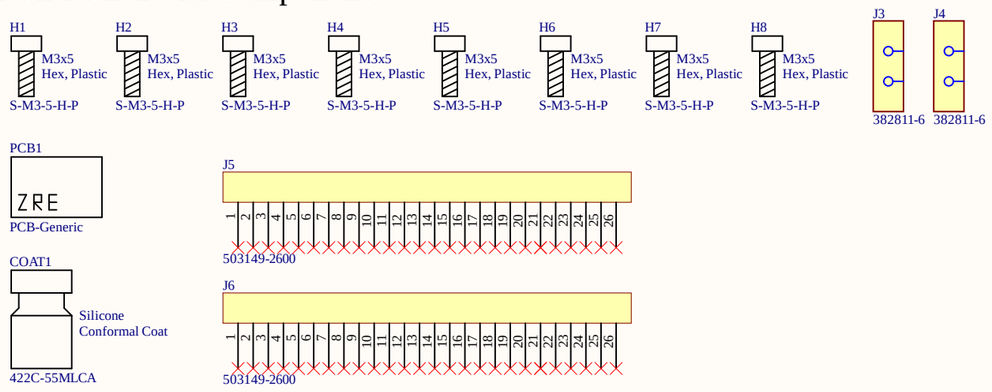
Brake Light



Cooling System Control



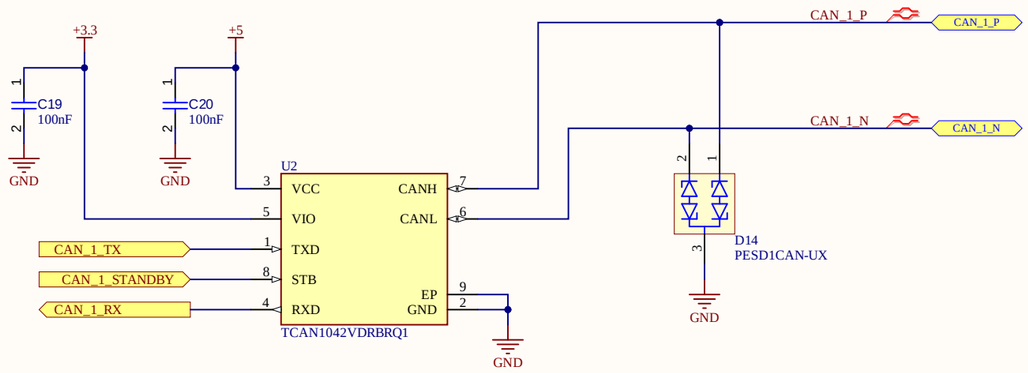
Non-PCB BOM Components



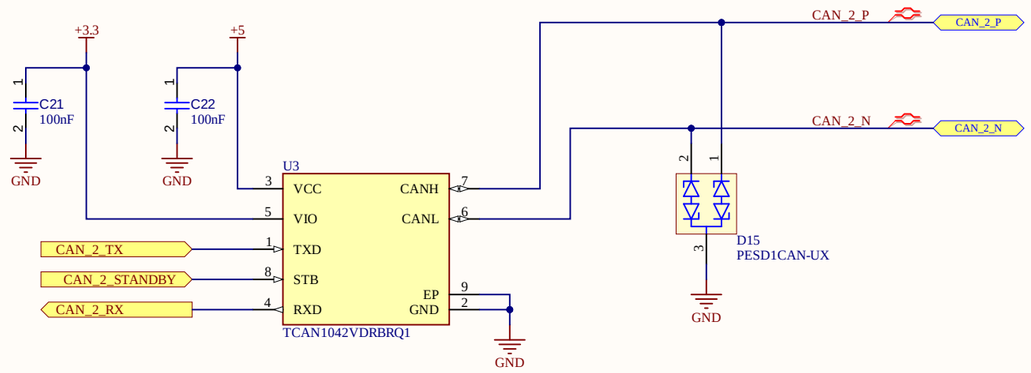
THE UNIVERSITY OF AKRON				
ZIPS RACING ELECTRIC THE UNIVERSITY OF AKRON	SHEET SIZE	TITLE	PART NUMBER	REVISION
	ANSI B	Vehicle Control Unit	ZR25-VCU	2
		LAST UPDATE 1/28/2025 7:24:45 PM	SHEET * of *	

CAN Transceiver - Bus 1

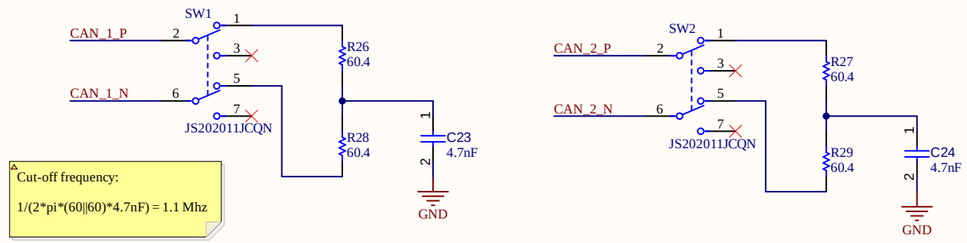
CAN Bus Physical Layer Specifications Doc



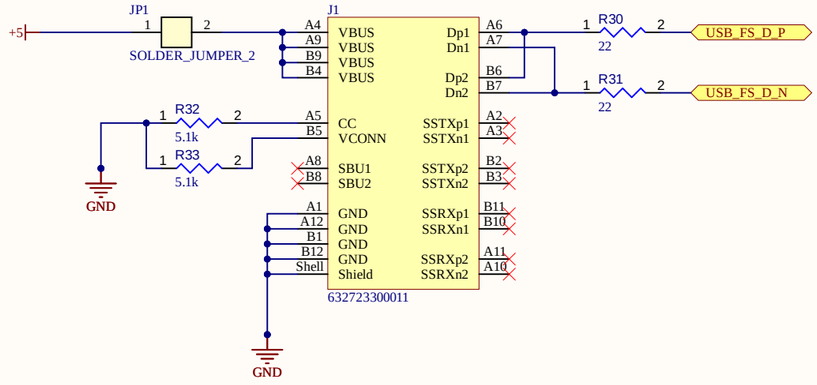
CAN Transceiver - Bus 2



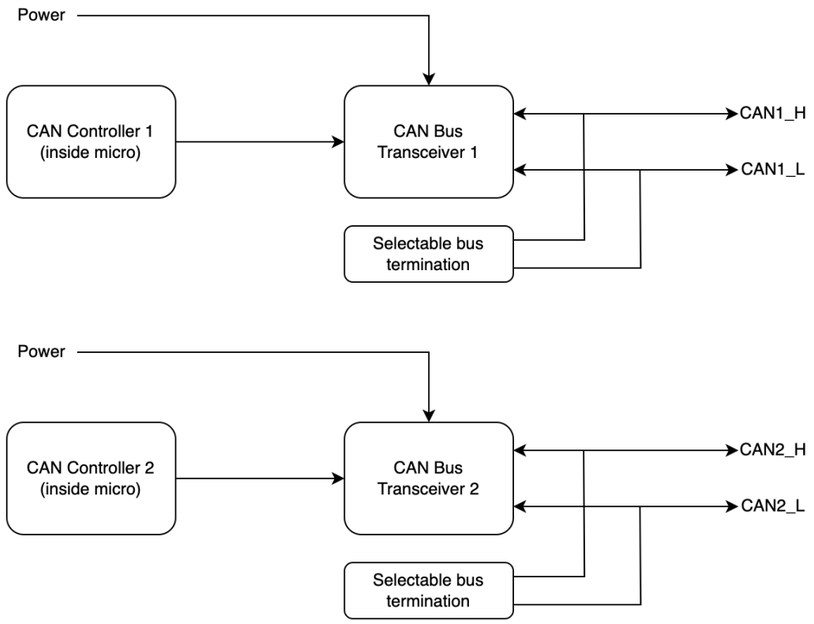
Split Termination



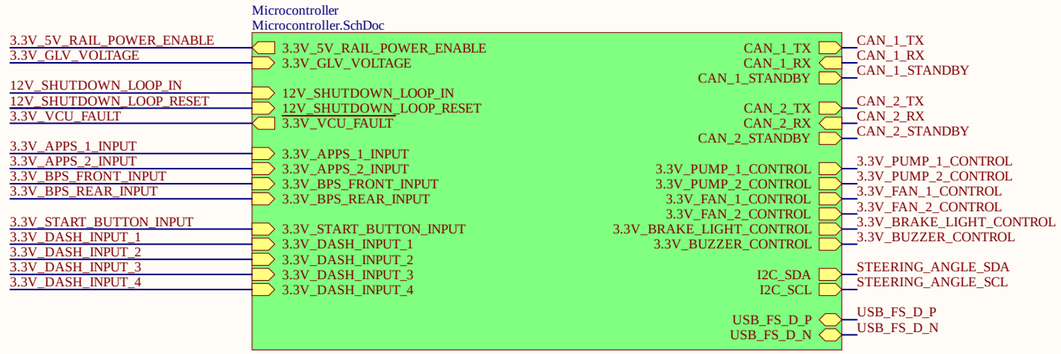
USB-C FS 2.0 Communication Device

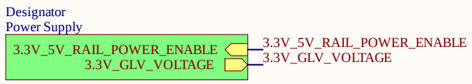


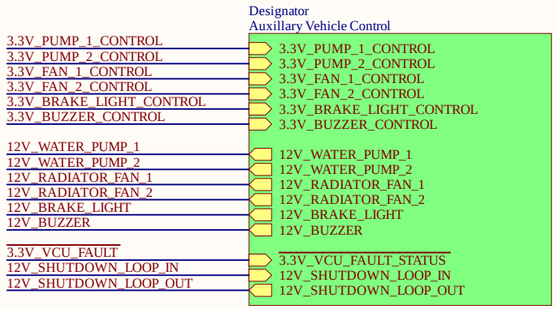
Level 2 CAN Bus Interface Block Diagram

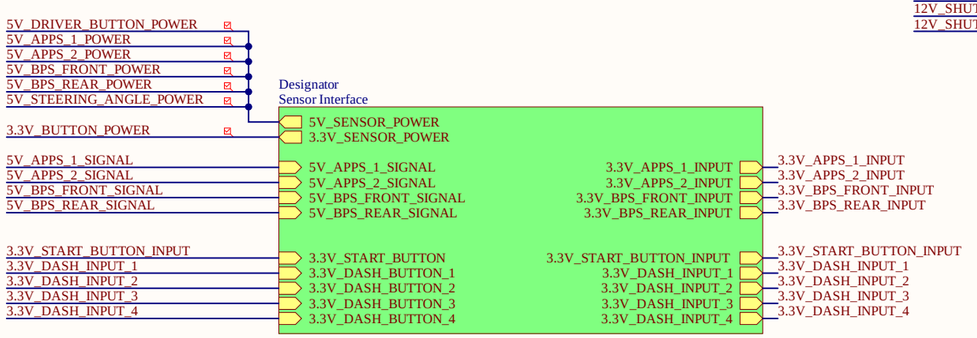


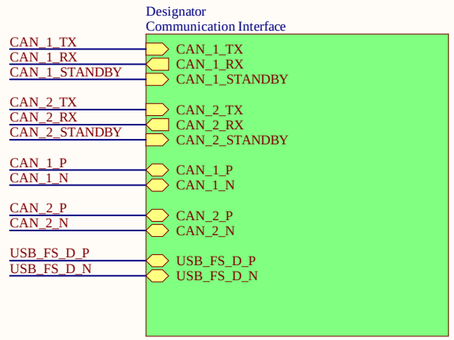
THE UNIVERSITY OF AKRON			
ZIPS RACING ELECTRIC THE UNIVERSITY OF AKRON	SHEET SIZE	TITLE	PART NUMBER / REVISION
	ANSI B	Vehicle Control Unit	ZR25-VCU / 2
		LAST UPDATE 1/28/2025 7:24:46 PM	SHEET * of *

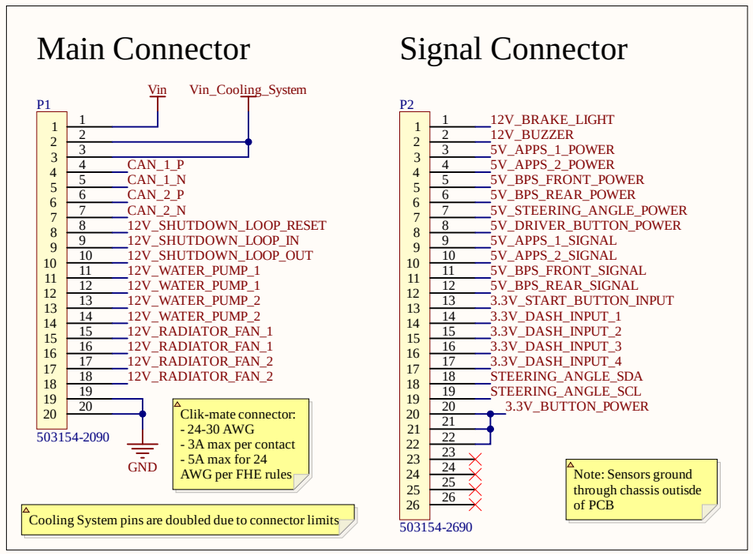


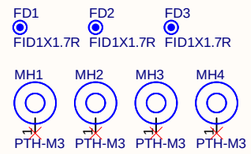


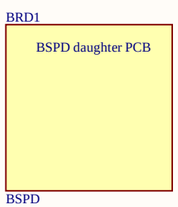






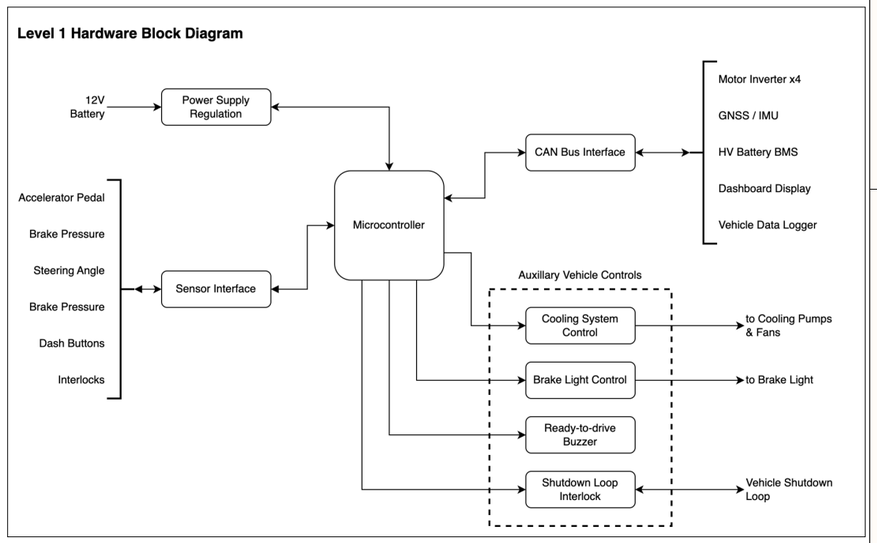






REVISION	DATE	DRAWN BY	COMMENT
1	11-7-2024	BRG	Initial Release
2	12-6-2024		Aux Vehicle Control & Communication Interface

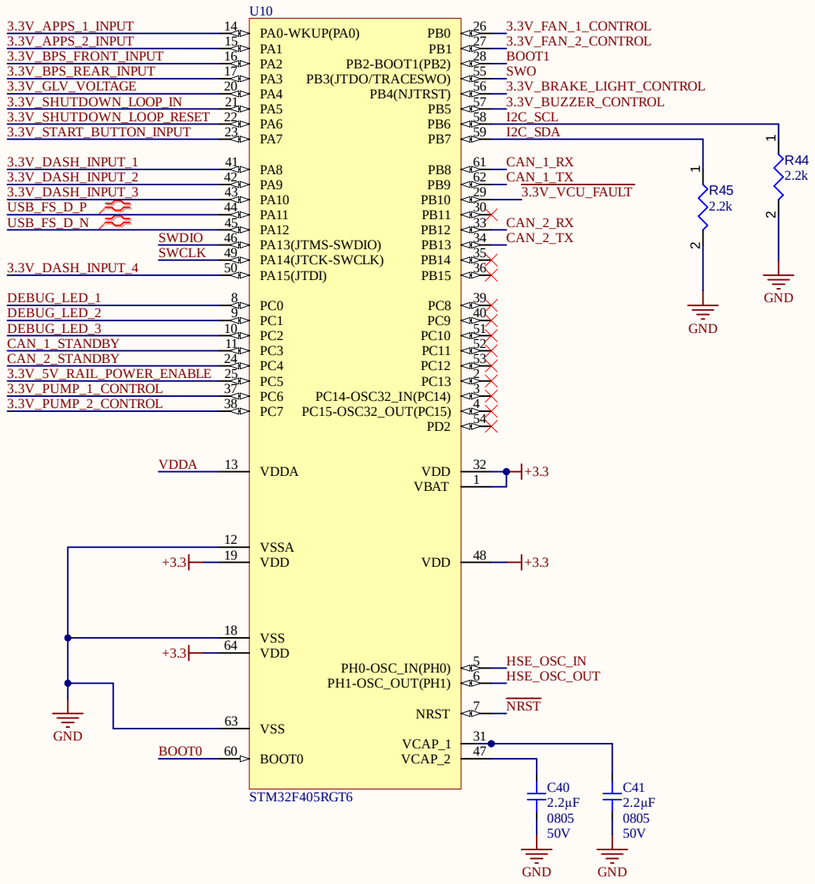
Notes



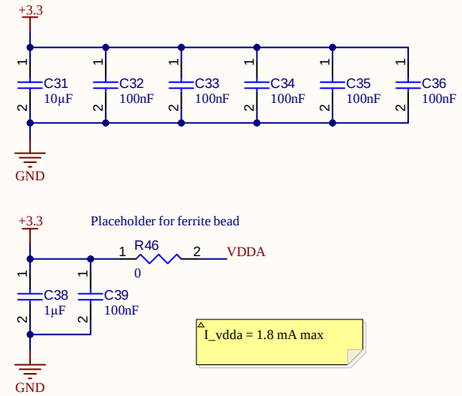
THE UNIVERSITY OF AKRON

SHEET SIZE	TITLE	PART NUMBER	REVISION
ANSI B	Vehicle Control Unit	ZR25-VCU	2
	LAST UPDATE 1/28/2025 7:24:46 PM	SHEET * of *	

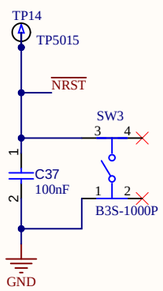
STM32



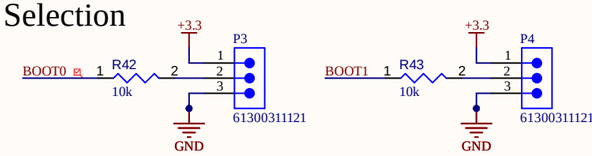
Power Supply



Reset

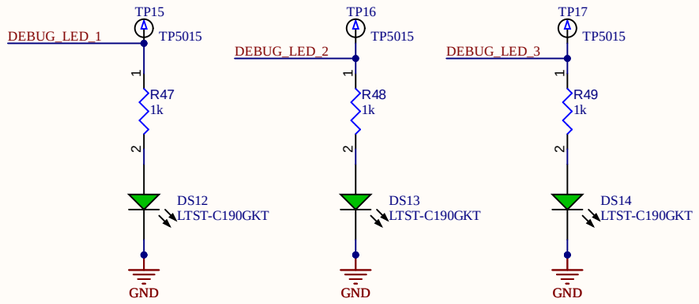


Boot Selection

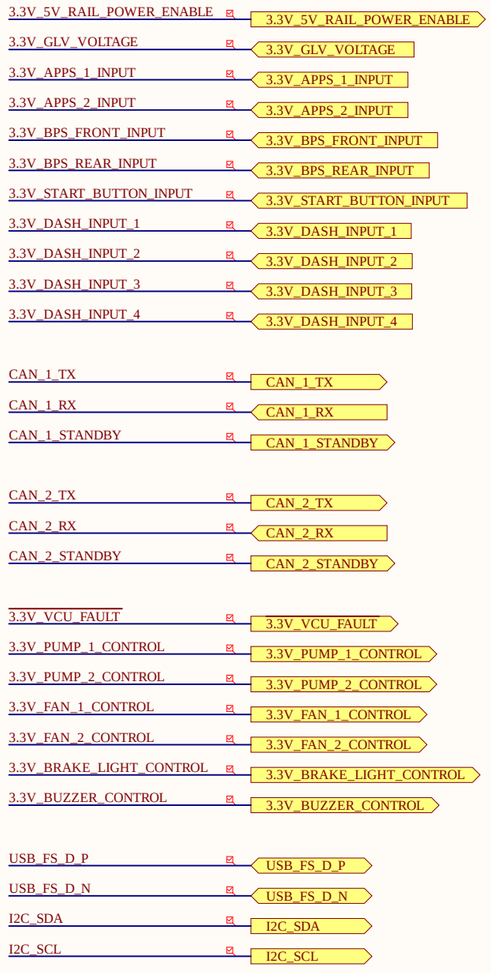


BOOT mode selection pins		Boot mode	Aliasing
BOOT1	BOOT0		
x	0	Main Flash memory	Main Flash memory is selected as boot space
0	1	System memory	System memory is selected as boot space
1	1	Embedded SRAM	Embedded SRAM is selected as boot space

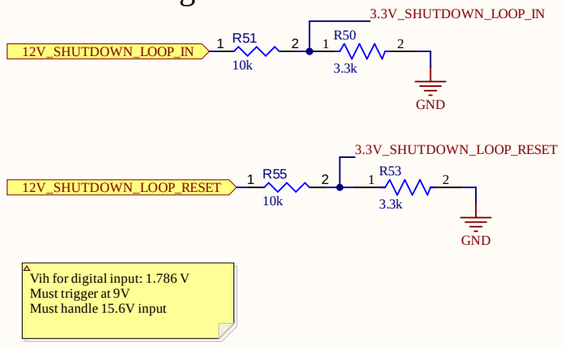
Debug LEDs



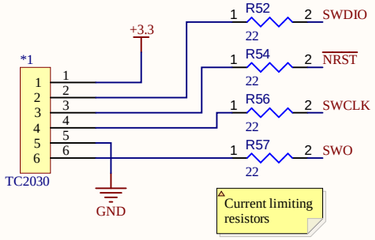
I/O



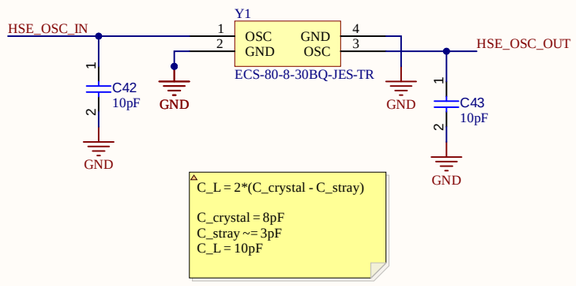
Level Shifting



Programming

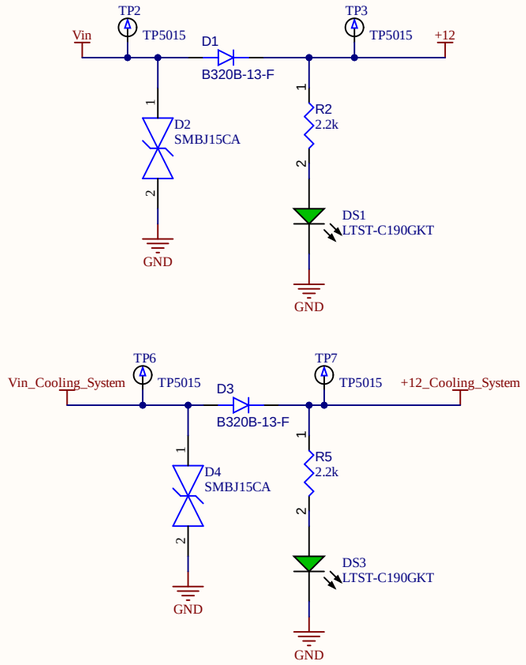


HSE Oscillator

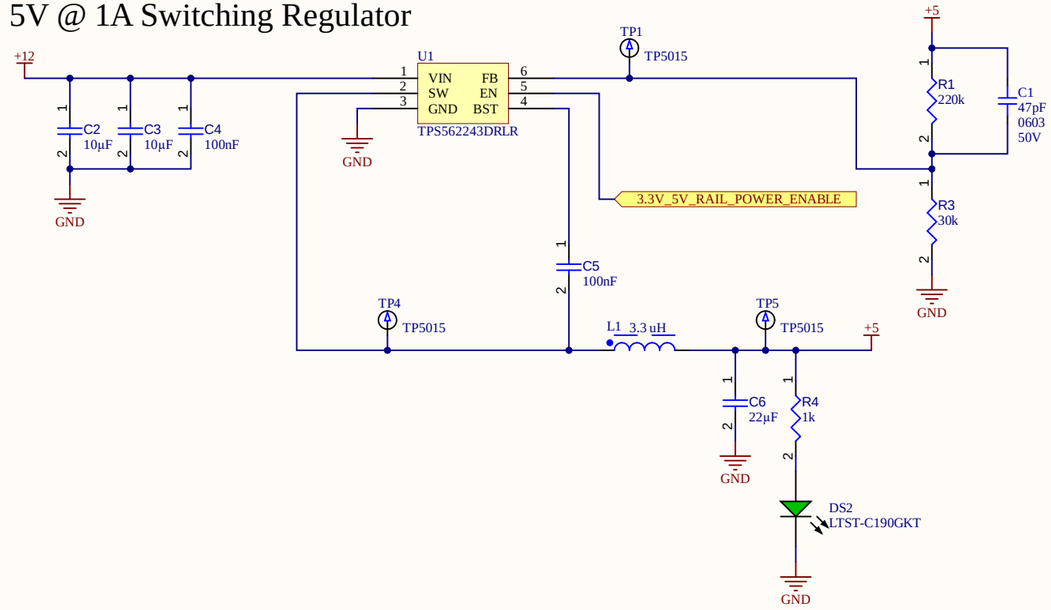


THE UNIVERSITY OF AKRON			
ZIPS RACING ELECTRIC THE UNIVERSITY OF AKRON	SHEET SIZE: ANSI B	TITLE: Vehicle Control Unit	PART NUMBER: ZR25-VCU
		LAST UPDATE: 1/28/2025 7:24:46 PM	SHEET: * of *
			REVISION: 2

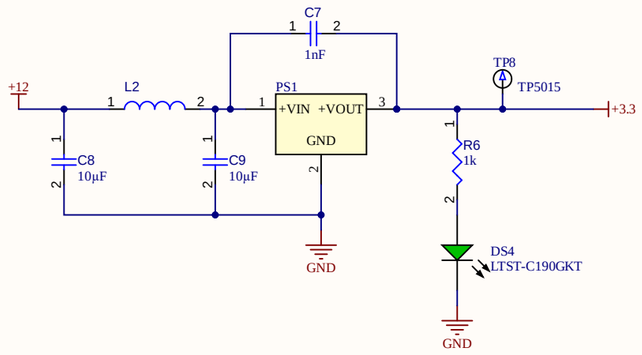
Input Protection



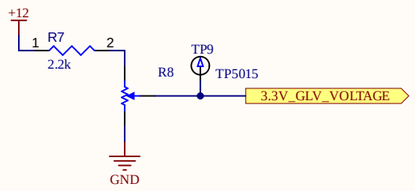
5V @ 1A Switching Regulator



3.3V @ 1A Switching Regulator



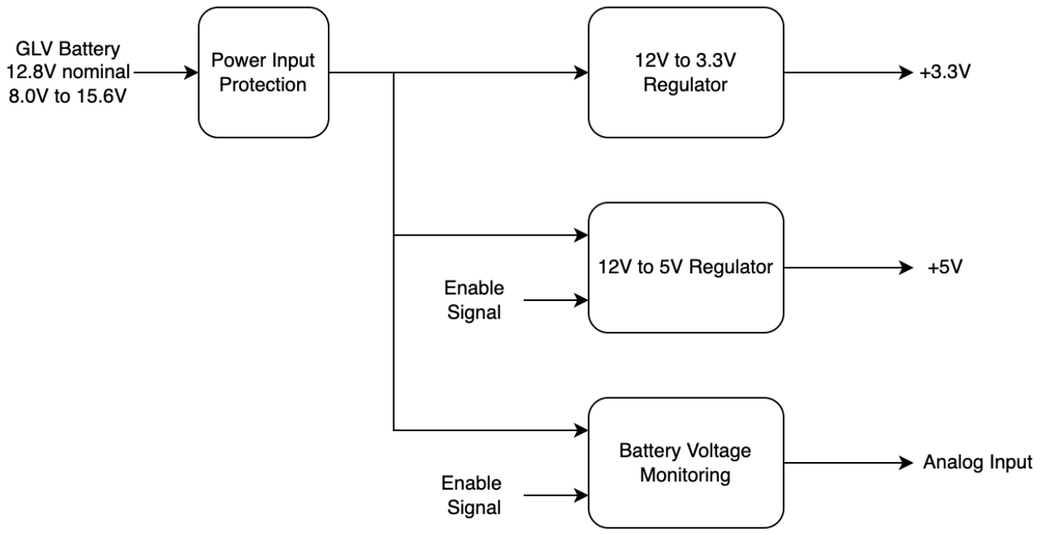
GLV Voltage Measurement



Power Supply Requirements:

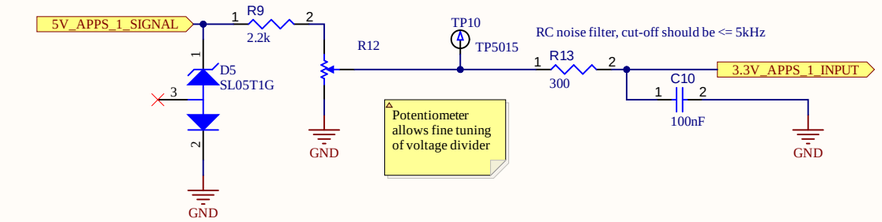
Vin = 9 - 15.6V, 12V nominal
- ESD protection
- over voltage protection
- over current protection
- measurement of the GLV battery voltage

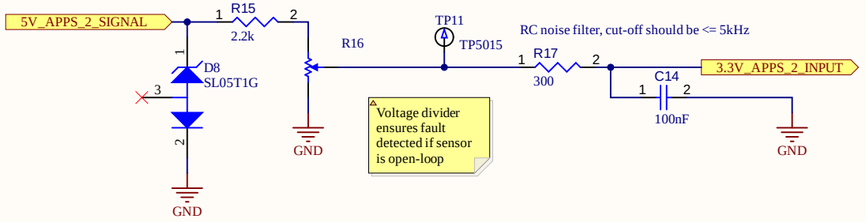
Level 2 Power Supply Regulation Block Diagram

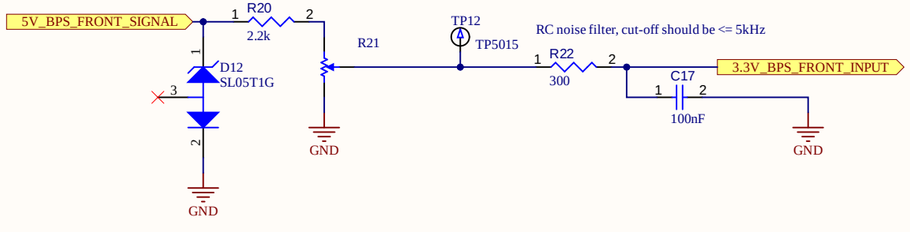


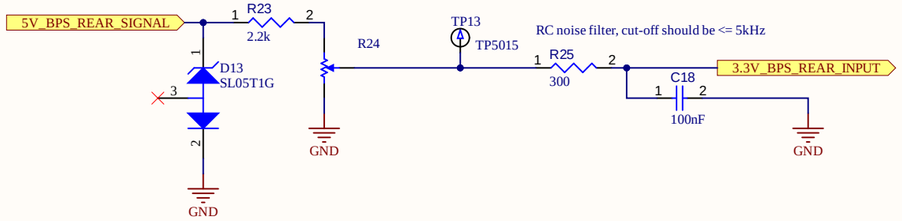
THE UNIVERSITY OF AKRON				
ZIPS RACING ELECTRIC THE UNIVERSITY OF AKRON	SHEET SIZE	TITLE	PART NUMBER	REVISION
	ANSI B	Vehicle Control Unit	ZR25-VCU	2
		LAST UPDATE 1/28/2025 7:24:46 PM	SHEET * of *	

Analog Inputs









Analog Input Protection Scheme:

- TVS for ESD protection
- RC filter reduces noise in signal to relevent frequencies only. Also high impedence R acts as current limiting

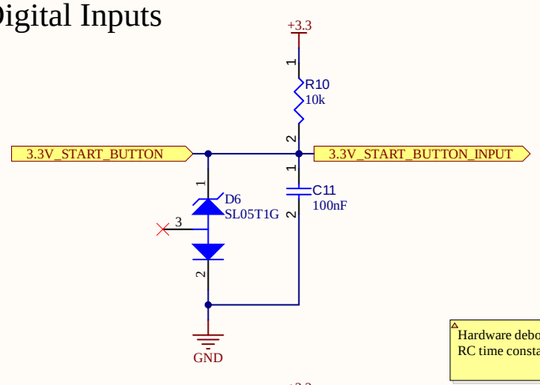
Brake Pedal Force Sensor

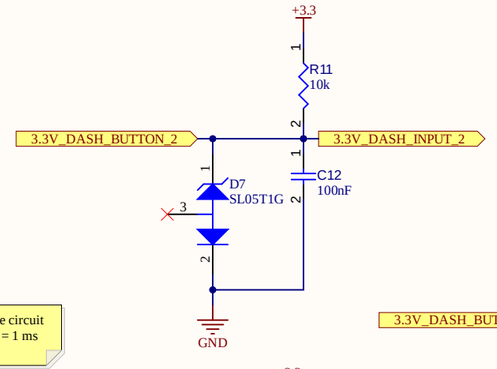
5V, 50 mA each

APPS Sensor: Reventec CC-205-01

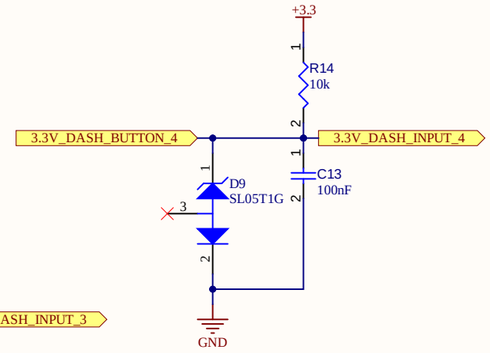
5V, ~50 mA

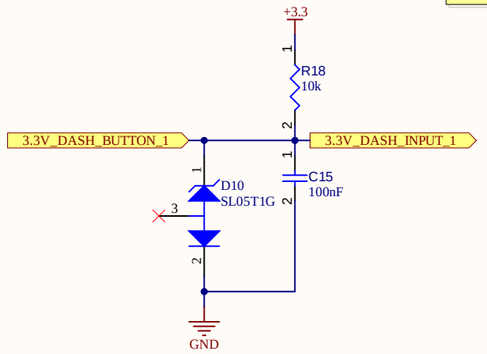
Digital Inputs

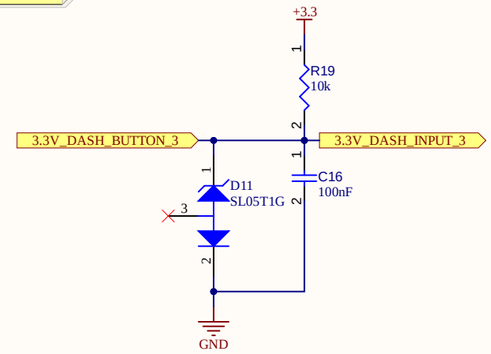




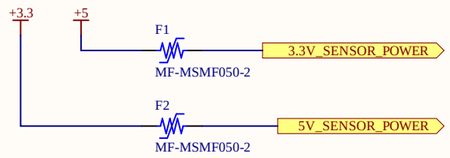
Hardware debouce circuit
RC time constant = 1 ms







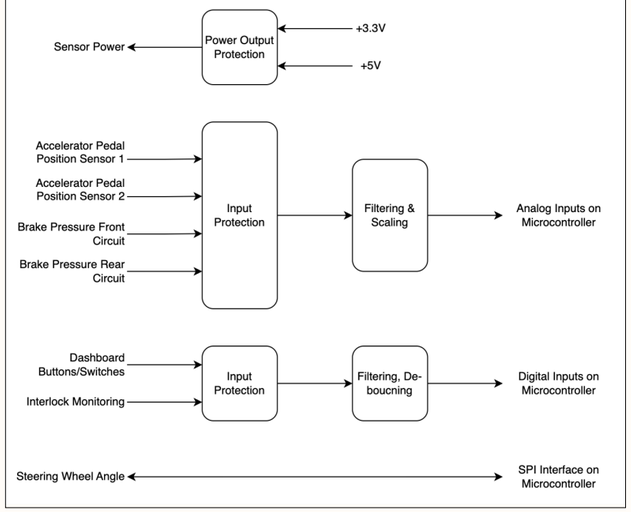
Sensor Power



Sensor Power Protection:

- Short to gnd (poly fuse opens at 500 mA)
- ESD protection via regulator output caps

Level 2 Sensor Interface Hardware Block Diagram



THE UNIVERSITY OF AKRON

SHEET SIZE	TITLE	PART NUMBER	REVISION
ANSI B	Vehicle Control Unit	ZR25-VCU	2
	LAST UPDATE 1/28/2025 7:24:46 PM	SHEET * of *	