

A

A

B

B

C

C

D

D

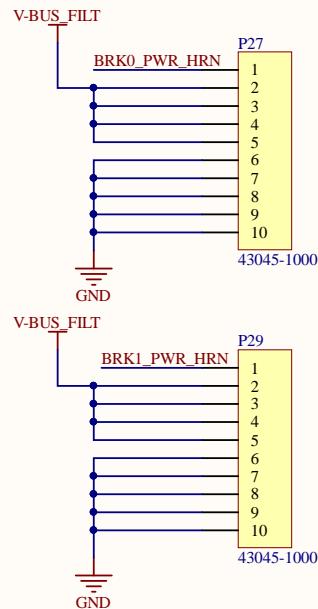
MAIN IO

POD 5

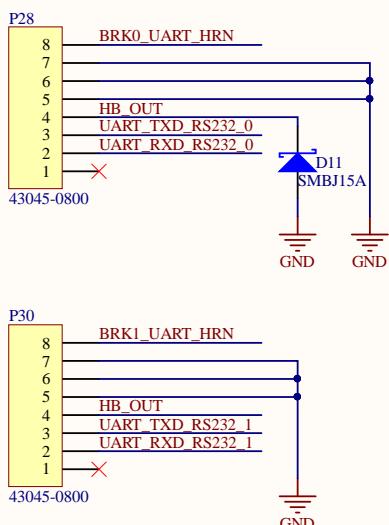
REV 1

Title Main IO		Badgerloop Electrical 133 Engineering Research Building 1500 Engineering Drive Madison, Wi 53706	BADGER LOOP
Engineer:	Revision:	Date: 8/26/2020 Time: 4:52:00 PM Sheet 1 of	

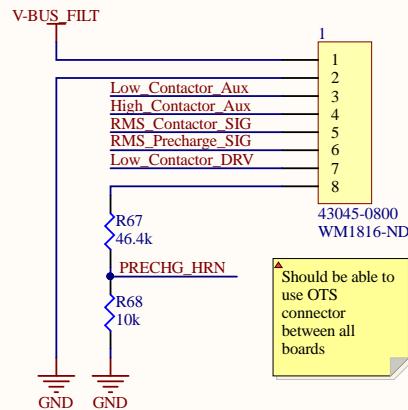
BrakingIO PWR



BrakingIO UART



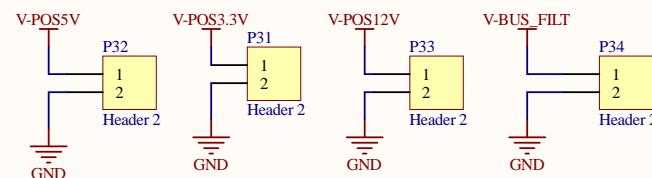
Precharge Board



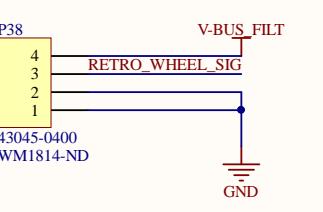
BMS & RMS

See respective schematics

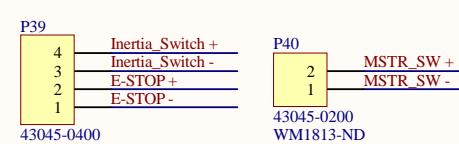
Debug



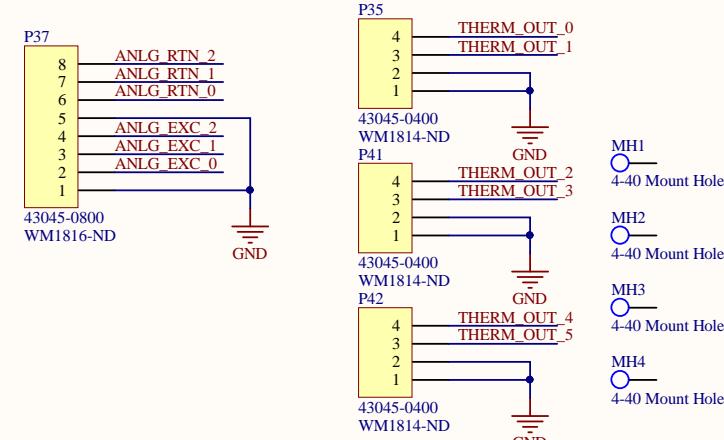
Retro Sensors



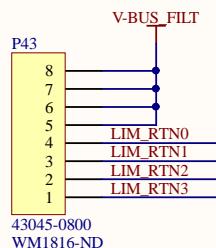
Shutdown Circuit Inputs



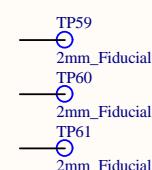
Analog Sensors



Limit Switches



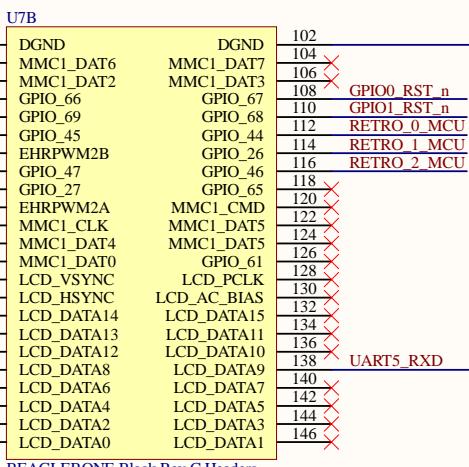
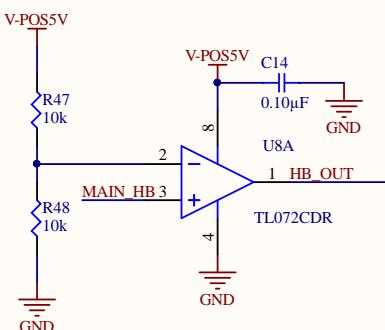
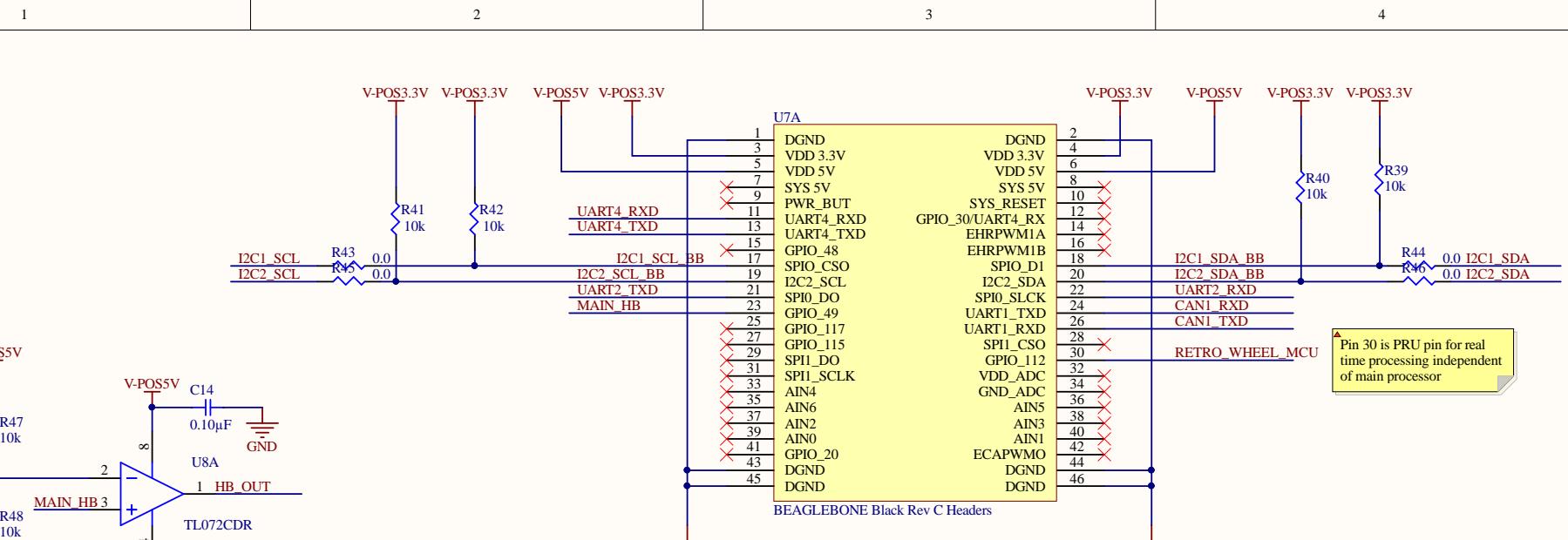
Fiducials



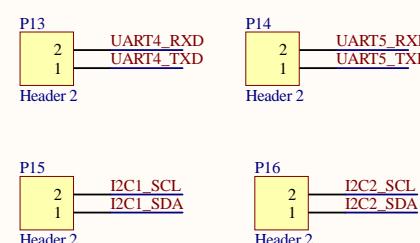
Connectors

Engineer:	Revision:	Badgerloop Electrical 133 Engineering Research Building 1500 Engineering Drive Madison, Wi 53706
Date: 8/26/2020	Time: 4:52:00 PM	Sheet 2 of
File: connectors.SchDoc		

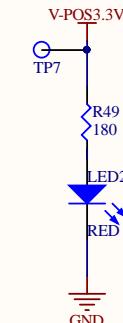
BADGER
LOOP



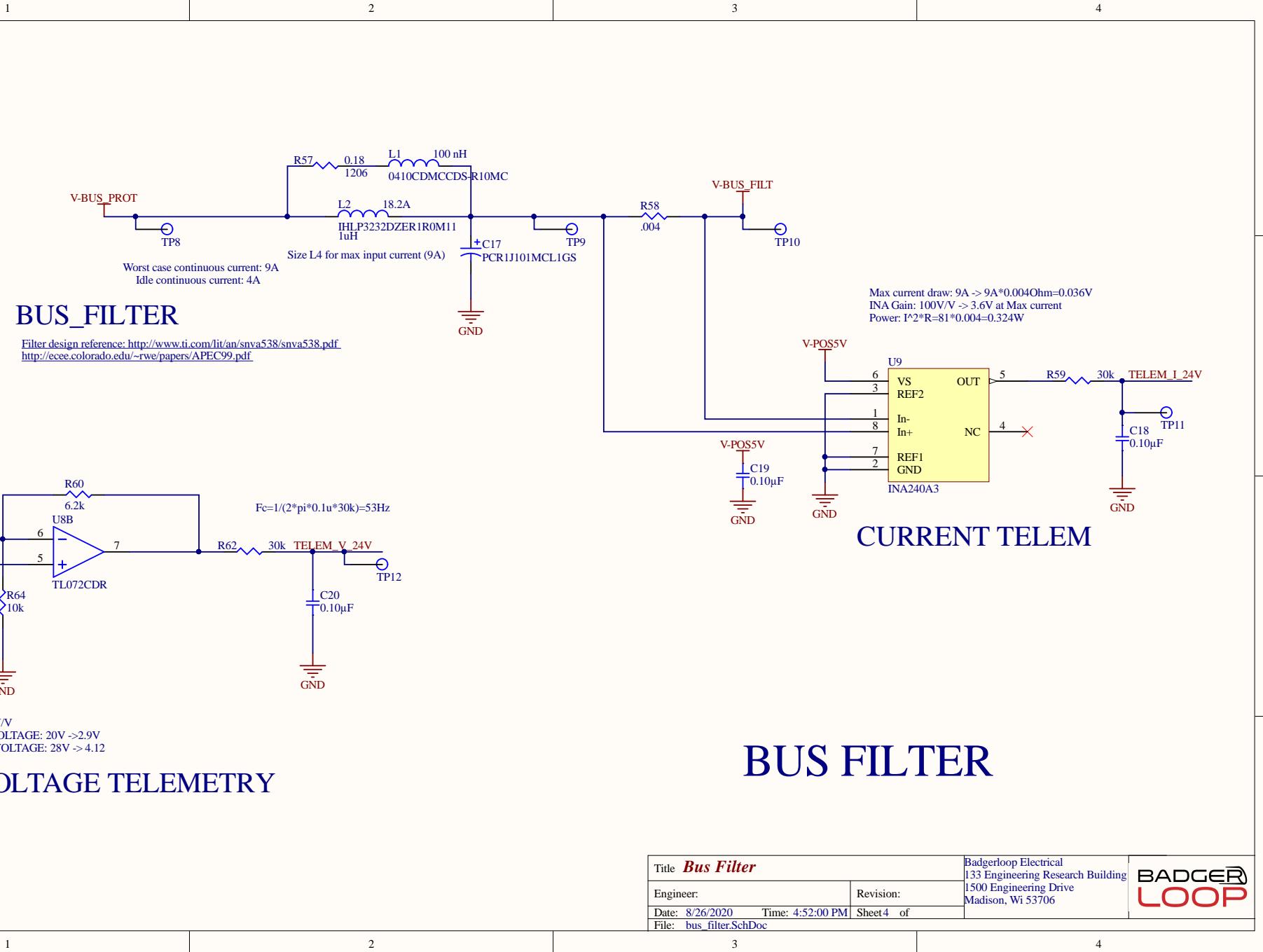
Beaglebone Headers



Debug Header



Title Beaglebone		Badgerloop Electrical 133 Engineering Research Building 1500 Engineering Drive Madison, WI 53706
Engineer:	Revision:	
Date: 8/26/2020	Time: 4:52:00 PM	Sheet 3 of
File: beaglebone.SchDoc		BADGER LOOP



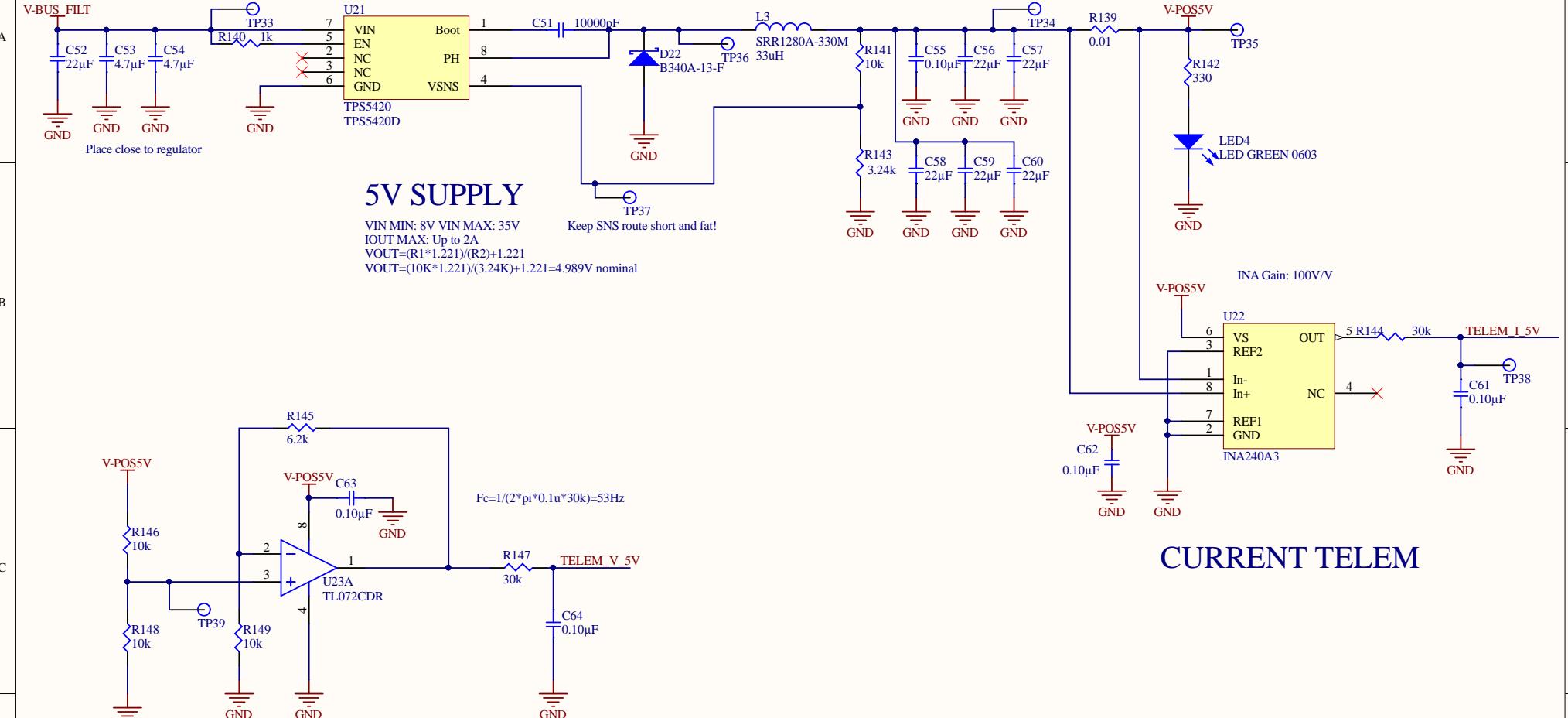
1

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VBUS -> 5V



Gain = 1.62 --> MAX ADC VOLTAGE = 4.05V

VOLTAGE TELEMETRY

Title VBUS		Badgerloop Electrical
Engineer:	Revision:	133 Engineering Research Building
Date: 8/26/2020	Time: 4:52:01 PM	1500 Engineering Drive
File: power_5V.SchDoc		Madison, Wi 53706



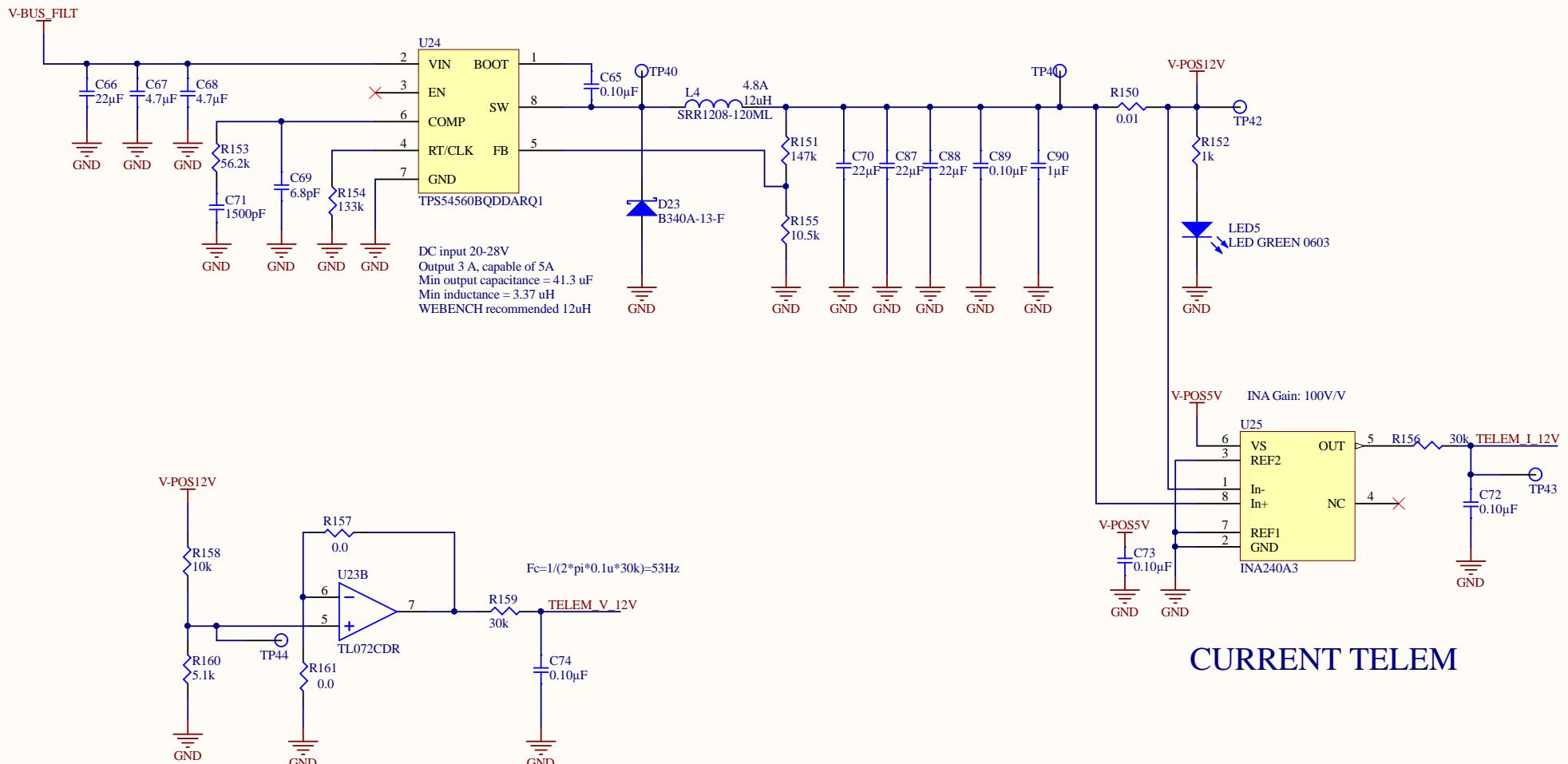
1

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VBUS -> 12V



VOLTAGE TELEMETRY

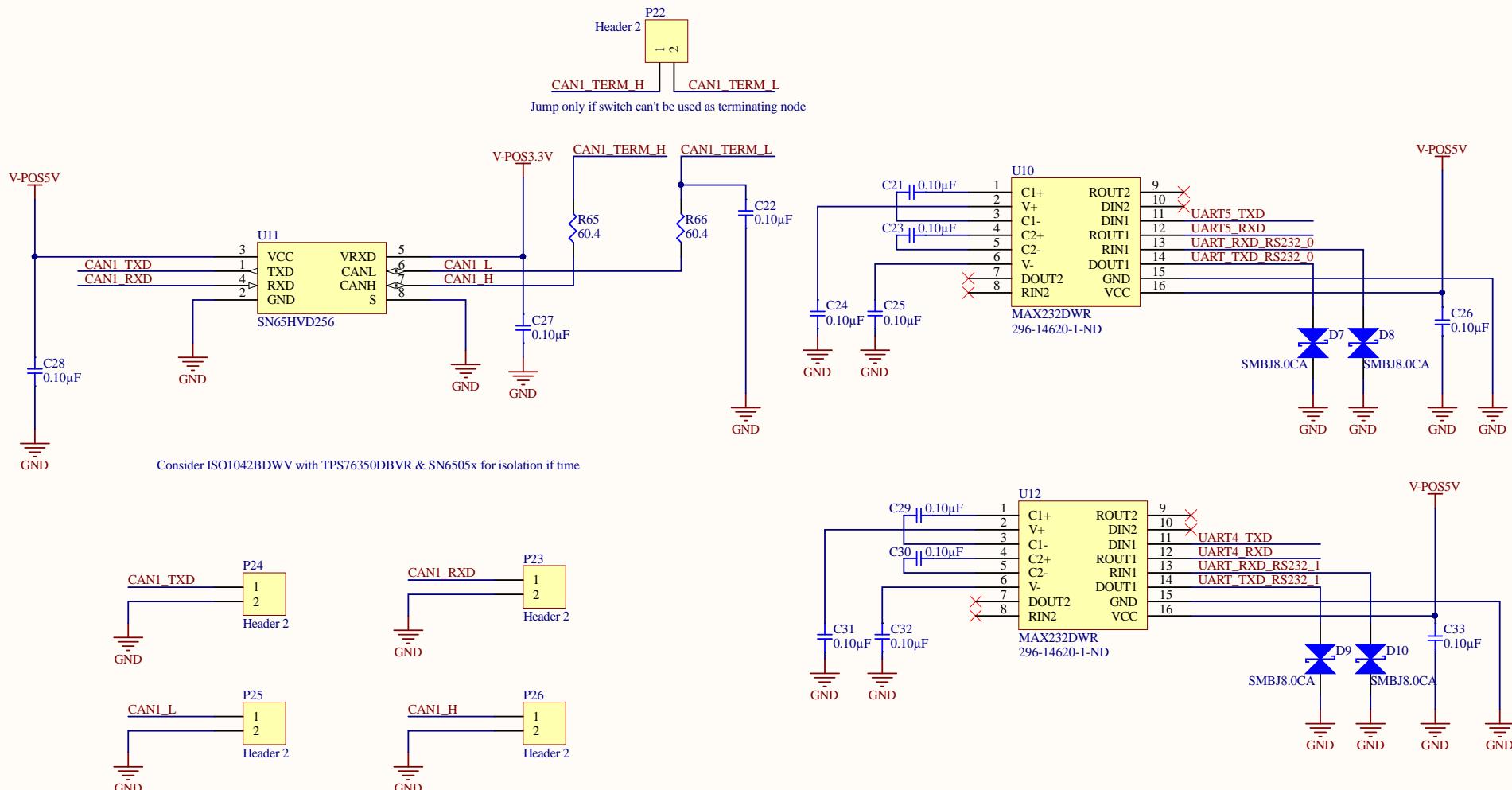
Title 12V PWR		Badgerloop Electrical 133 Engineering Research Building 1500 Engineering Drive Madison, Wi 53706
Engineer:	Revision:	
Date: 8/26/2020	Time: 4:52:01 PM	Sheet 6 of
File: power_12V.SchDoc		BADGER LOOP

1

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4

CAN**UART (x2)**Title **CAN and UART Interfaces**

Engineer:

Date: 8/26/2020

File: can_uart.SchDoc

 Badgerloop Electrical
 133 Engineering Research Building
 1500 Engineering Drive
 Madison, Wi 53706

BADGER
LOOP

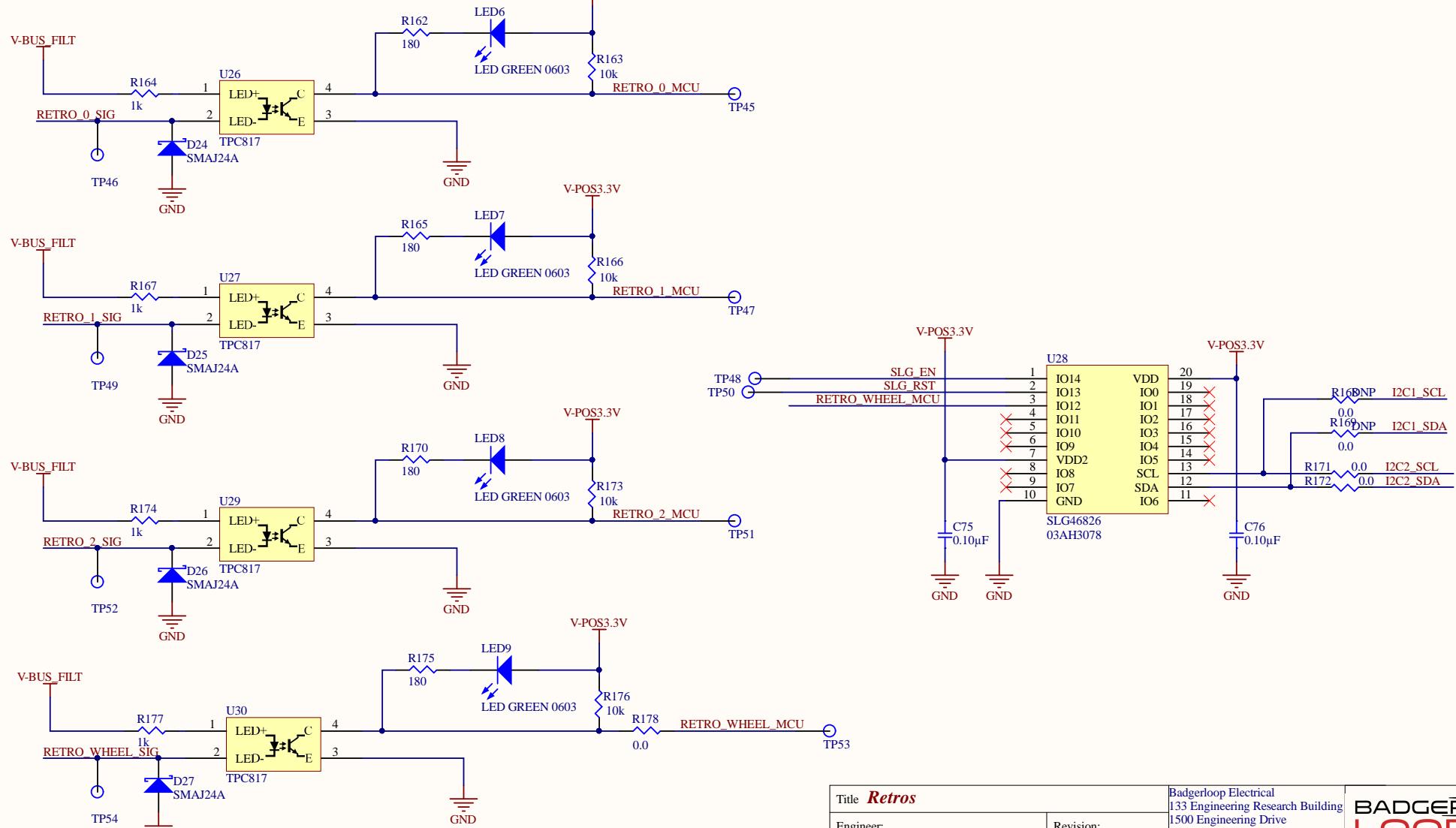
1

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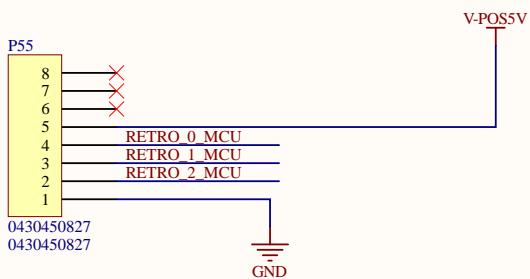
Retros & Non-driven Wheel Sensor



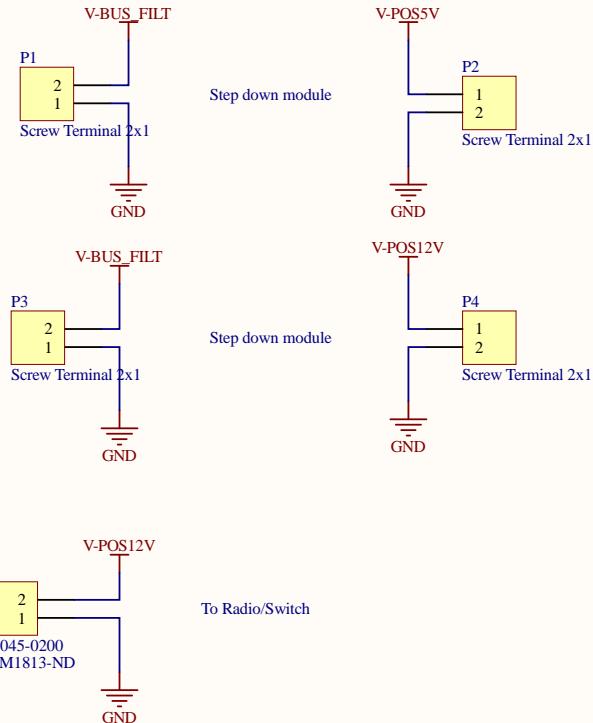
Title <i>Retros</i>		Badgerloop Electrical 133 Engineering Research Building 1500 Engineering Drive Madison, Wi 53706	BADGER LOOP
Engineer:		Revision:	
Date: 8/26/2020	Time: 4:52:01 PM	Sheet 8 of	
File: retros.SchDoc			

Arduino Interface

Only if SX still requires this

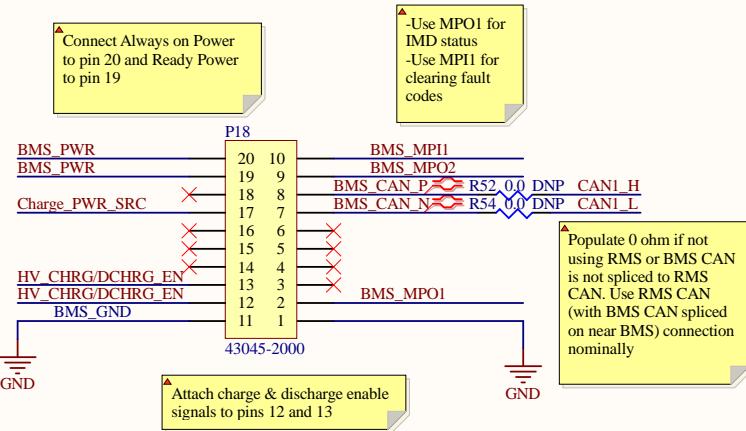


OTS Device Connections

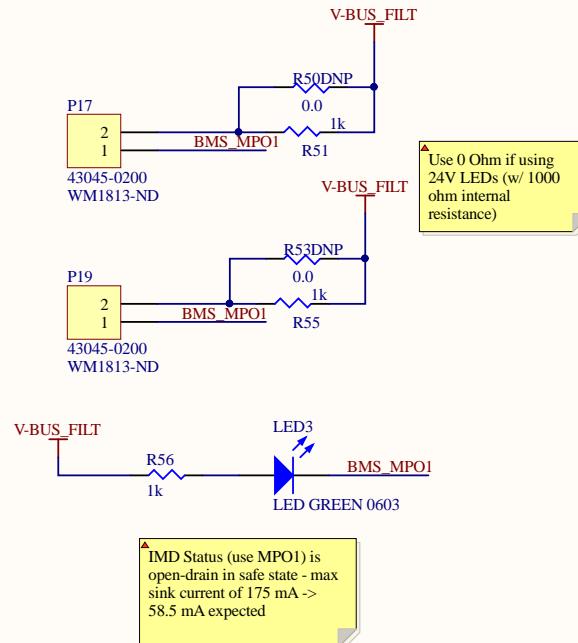


BMS Interface

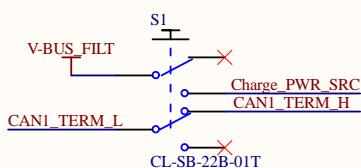
BMS/Term Main Connectors



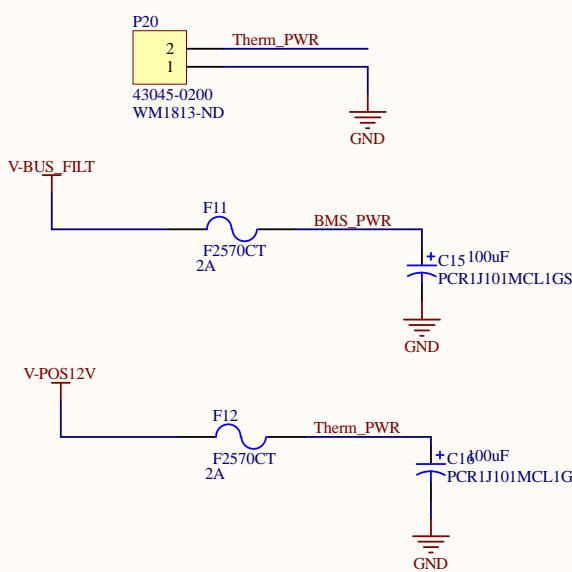
IMD Light circuit



Charge Enable & Termination Resistors



-Turn on in defined charging/balancing state
-When not in charging state, board is end node and has term. res.
-When in charging state, charger is end node and should house term. res.



Charger Connector

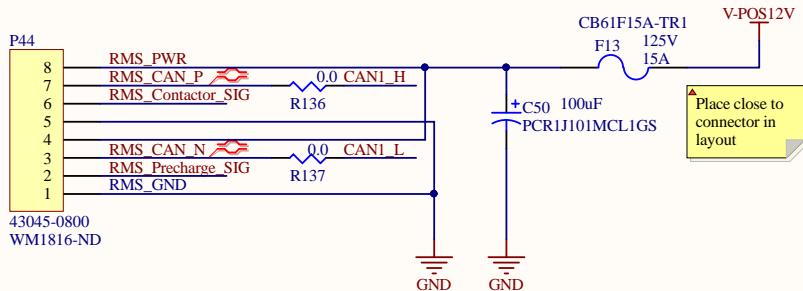
Title BMS Interface		Badgerloop Electrical
Engineer: Shelby Riggelman	Revision:A	133 Engineering Research Building
Date: 8/26/2020	Time: 4:52:01 PM	1500 Engineering Drive
File: bms_interface.SchDoc		Madison, Wi 53706



A

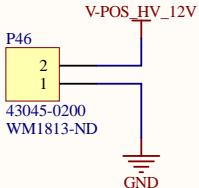
A

Motor Controller Interface



B

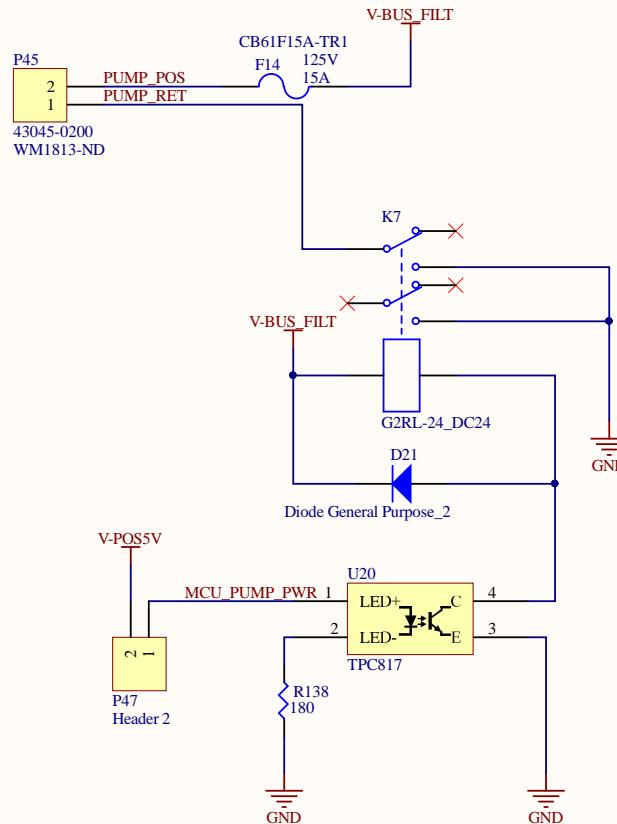
B



C

C

Pump Power



D

D

Title **RMS & Precharge Interface**

Engineer: Shelby Riggleman

Date: 8/26/2020

File: motor_controller_interface.SchDoc

Badgerloop Electrical
133 Engineering Research Building
1500 Engineering Drive
Madison, Wi 53706

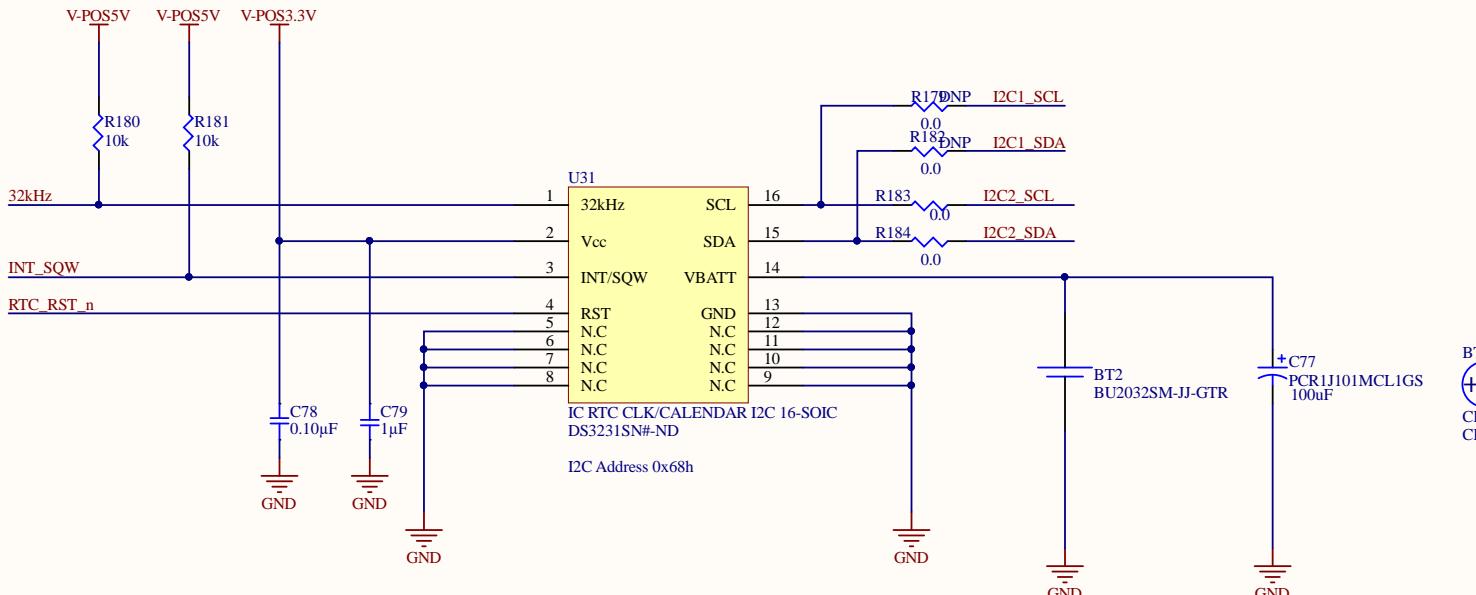


Real Time Clock & Coin Cell

A

A

Function determined by INTCN bit in OEh - SQW if 0, Active low interrupt if 1 and alarm enabled
Default = interrupt, but alarm is disabled



B

B

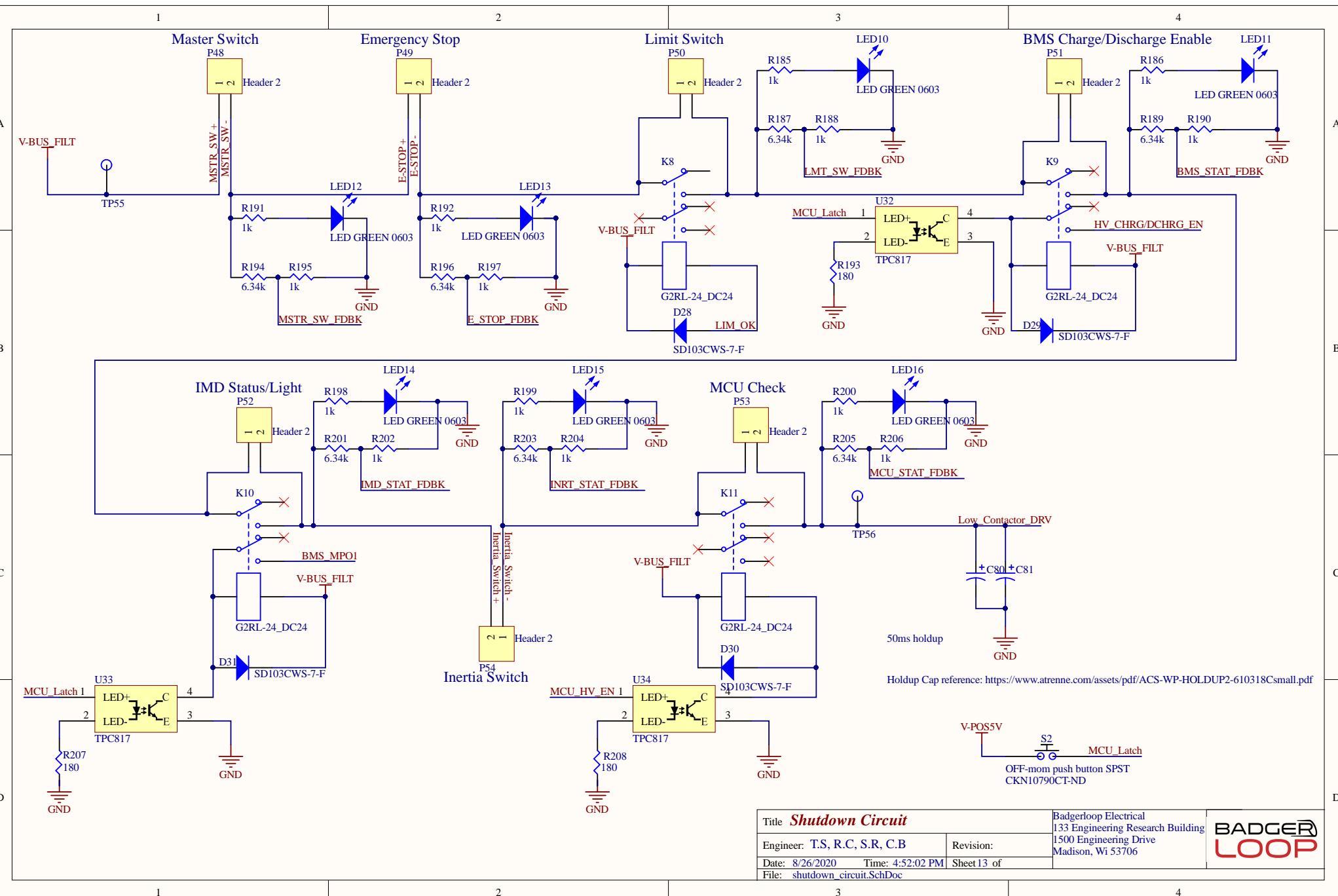
C

C

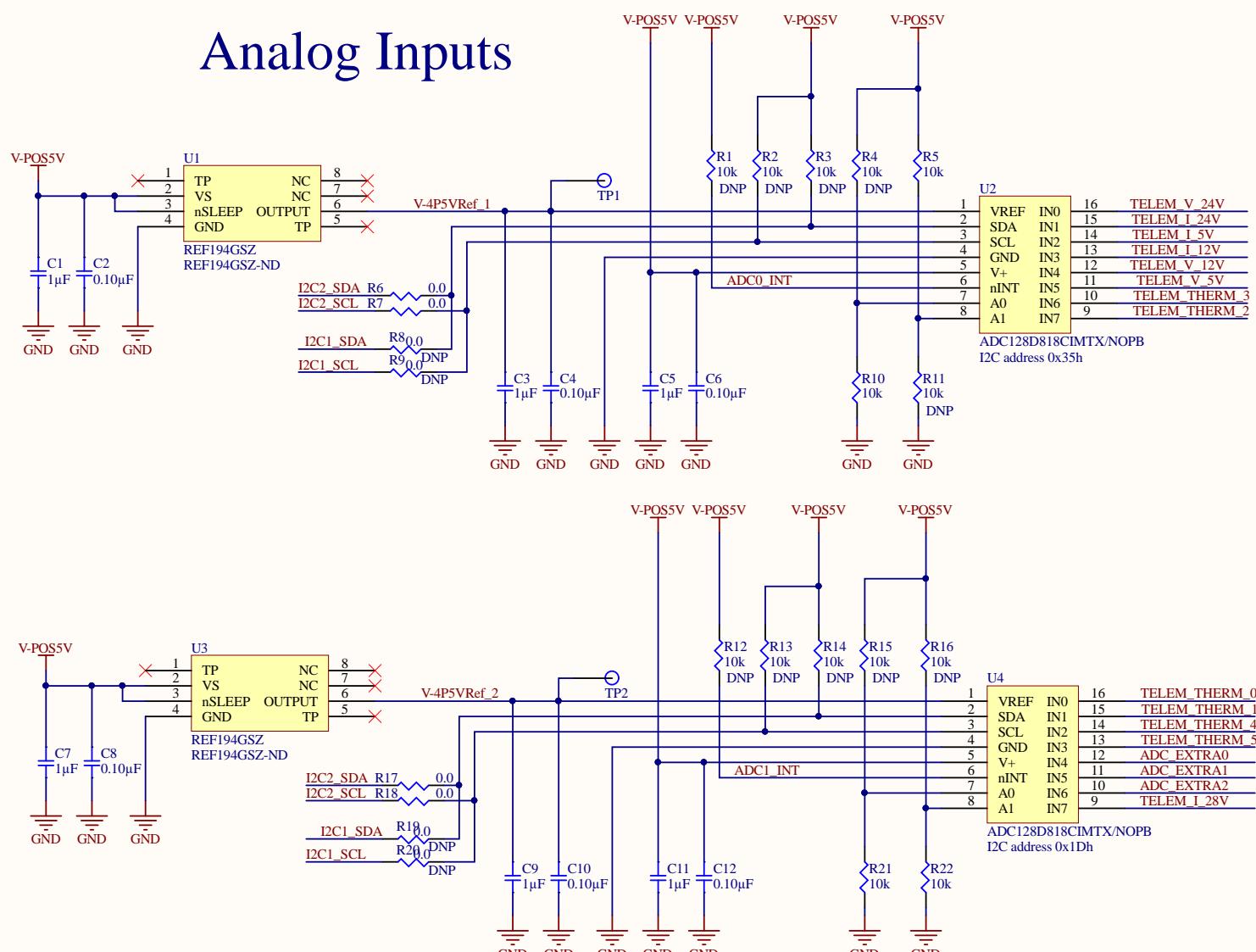
D

D

Title RTC			<i>Badgerloop</i> 133 Engineering Research Building Madison, WI 53715
Size: A4	Number:	Revision:	BADGER LOOP
Date: 8/26/2020	Time: 4:52:02 PM	Sheet 12 of	
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\RTC.SchDoc			

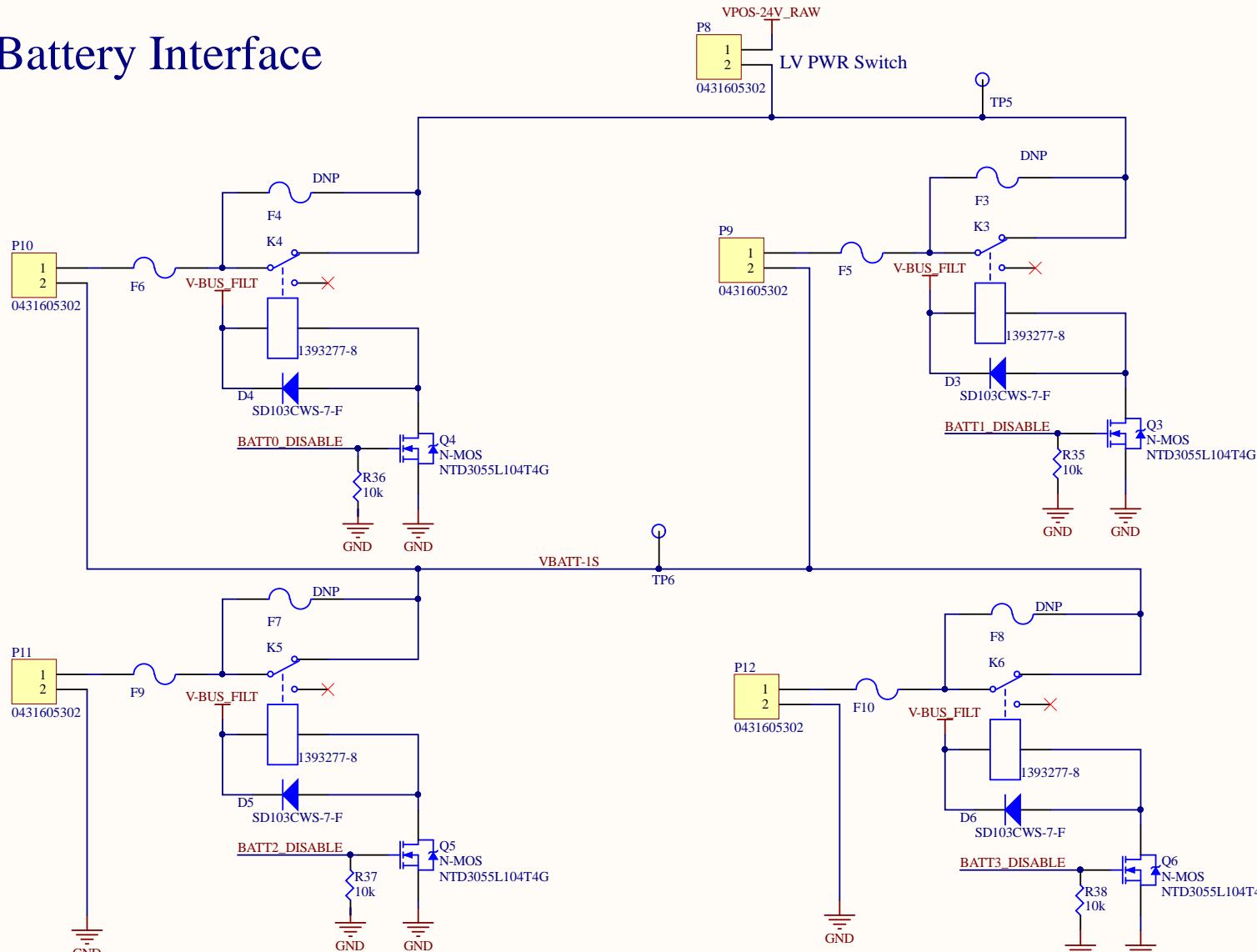


Analog Inputs



Title ADC			<i>Badgerloop 133 Engineering Research Building Madison, WI 53715</i>
Size: A4	Number:	Revision:	
Date: 8/26/2020	Time: 4:52:02 PM	Sheet 14 of	
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\adc.SchDoc			

LV Battery Interface



Title LV Battery Interface			Badgerloop 133 Engineering Research Building Madison, WI 53715	BADGER LOOP
Size: A4	Number:	Revision:		
Date: 8/26/2020	Time: 4:52:02 PM	Sheet 15 of		
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\battery_interface.SchDoc				

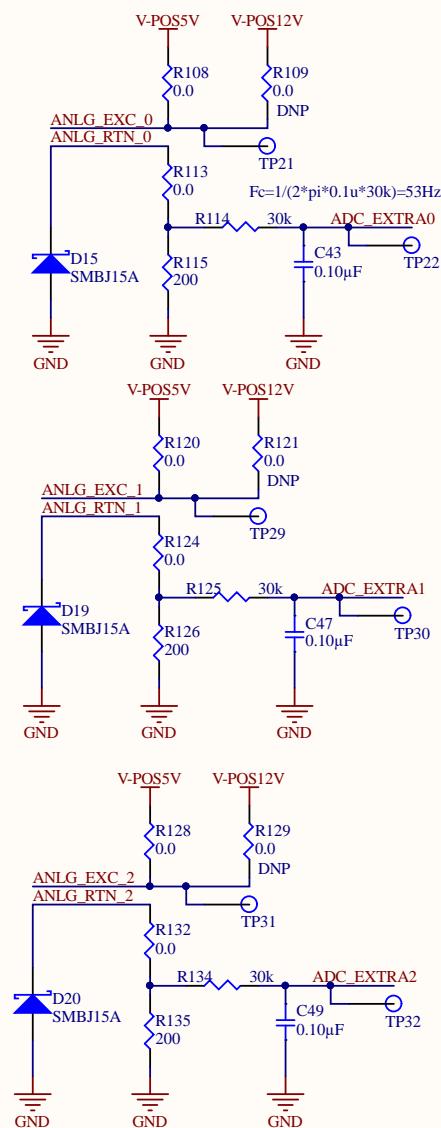
1

2

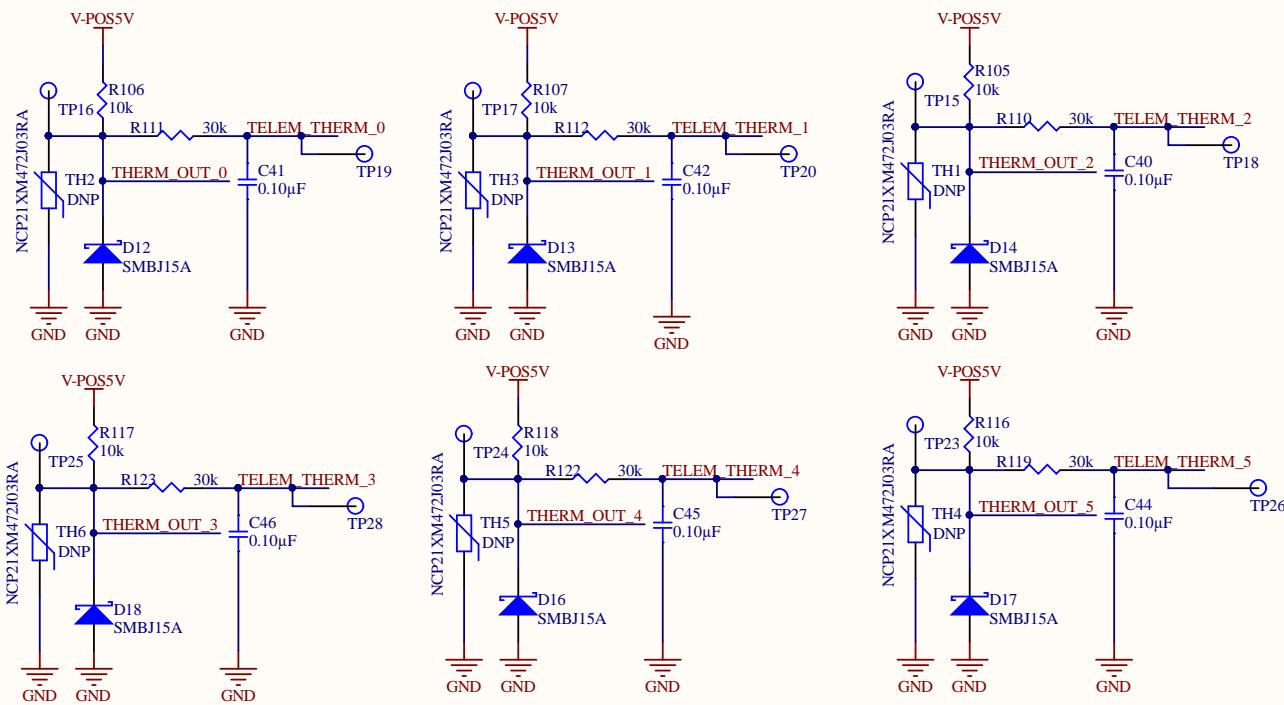
3

4

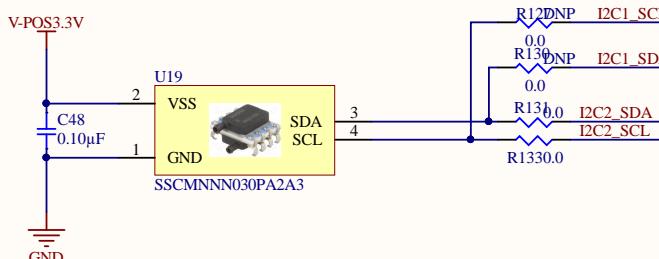
Extra Analog Sensors



Thermistors



Ambient Pressure Sensor



Title: Sensors			Badgerloop 133 Engineering Research Building Madison, WI 53715	BADGER LOOP
Size: A4	Number:	Revision:		
Date: 8/26/2020	Time: 4:52:03 PM	Sheet 16 of		
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\misc_sensors.SchDoc				

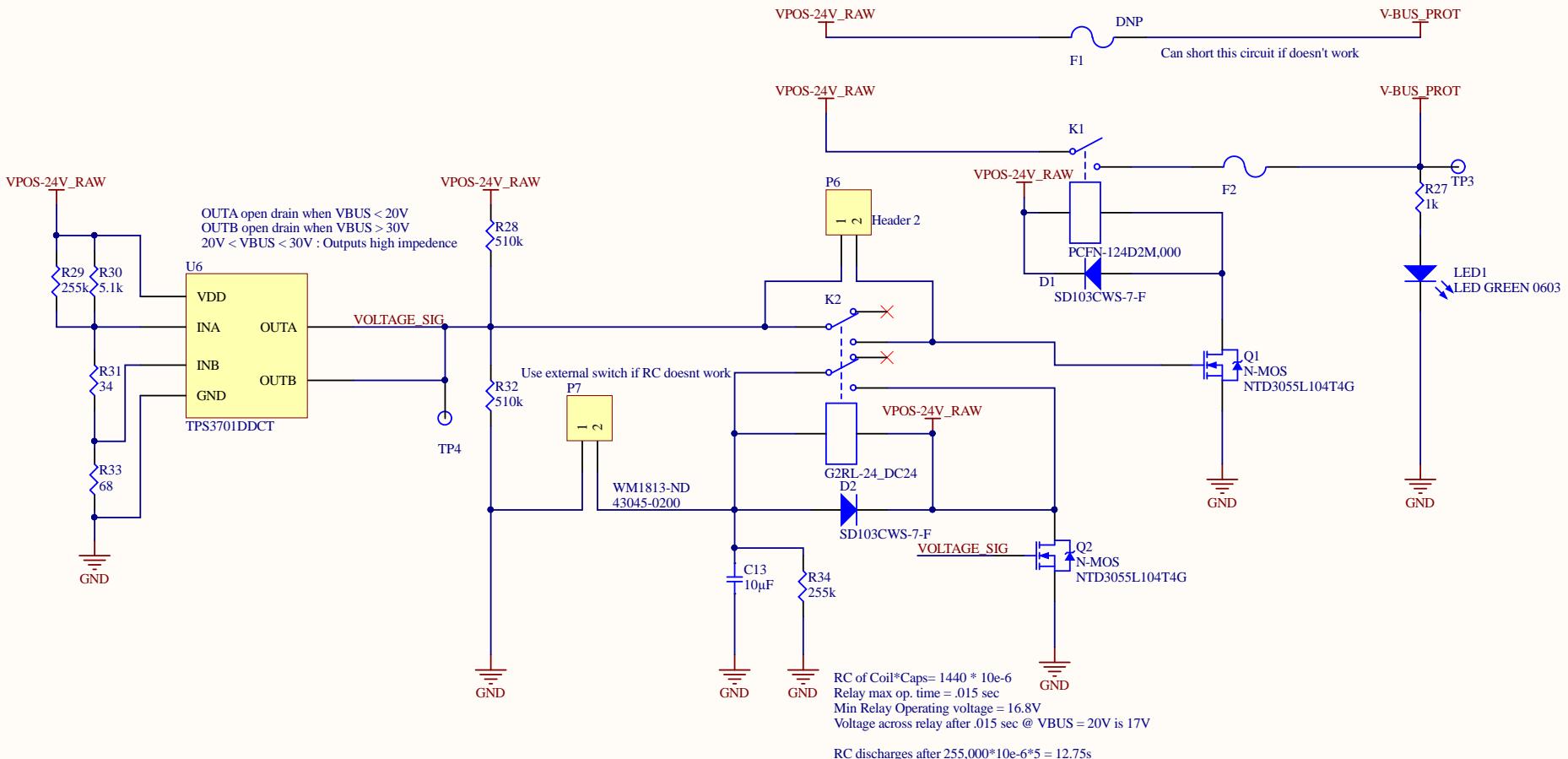
1

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BATTERY PROTECTION



Title Battery Protection			Badgerloop 133 Engineering Research Building Madison, WI 53715	BADGER LOOP
Size: A4	Number:	Revision:		
Date: 8/26/2020	Time: 4:52:03 PM	Sheet 17 of		
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\batt_protection.SchDoc				

1

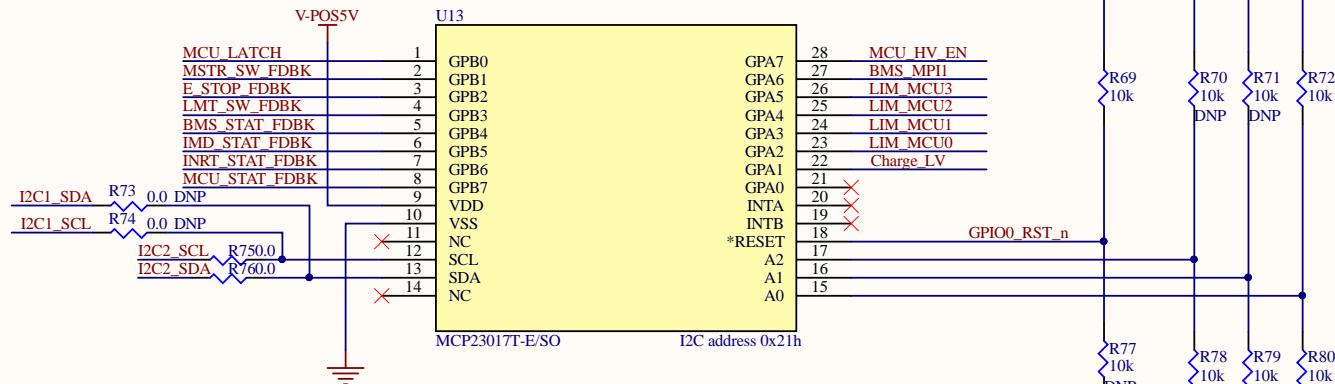
2

3

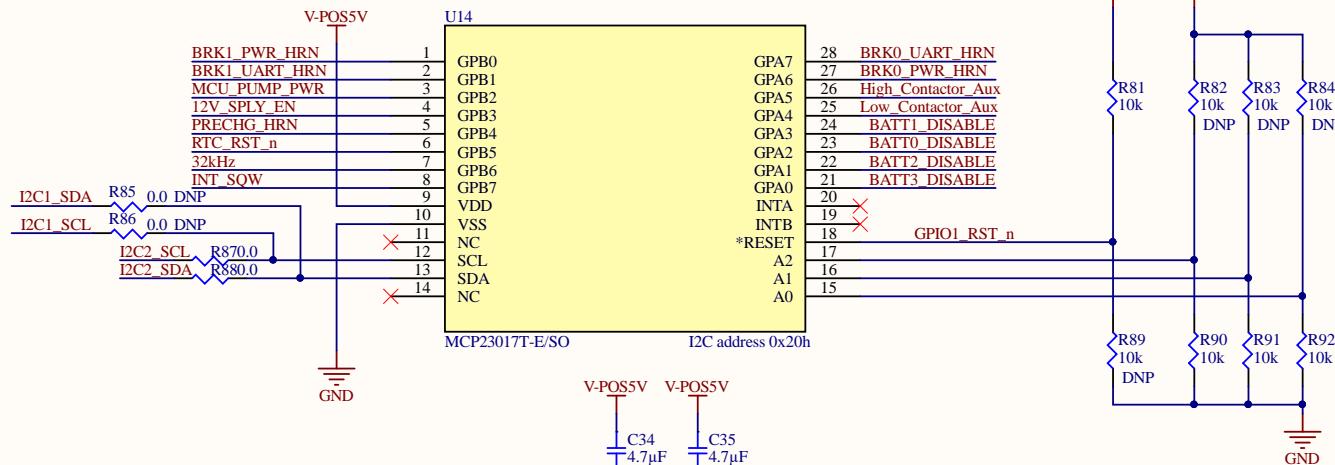
4

GPIO

A

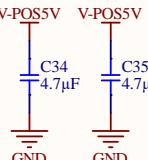


B



C

Place close to U?



Title GPIO			<i>Badgerloop</i> 133 Engineering Research Building Madison, WI 53715
Size: A4	Number:	Revision:	
Date: 8/26/2020	Time: 4:52:03 PM	Sheet 18 of	
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\gpio.SchDoc			BADGER LOOP

1

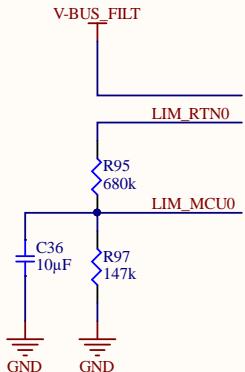
2

3

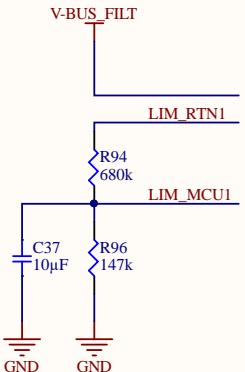
4

Limit Switch Feedback

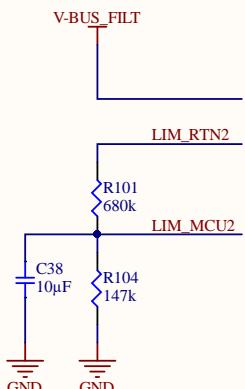
A



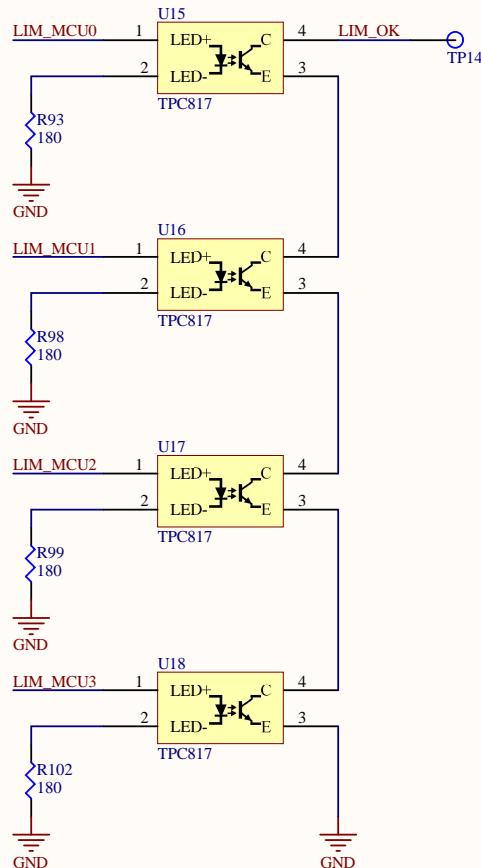
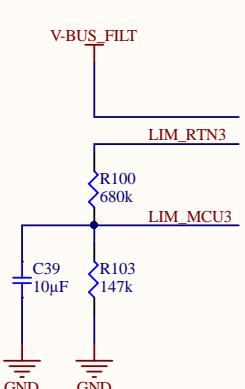
B



C

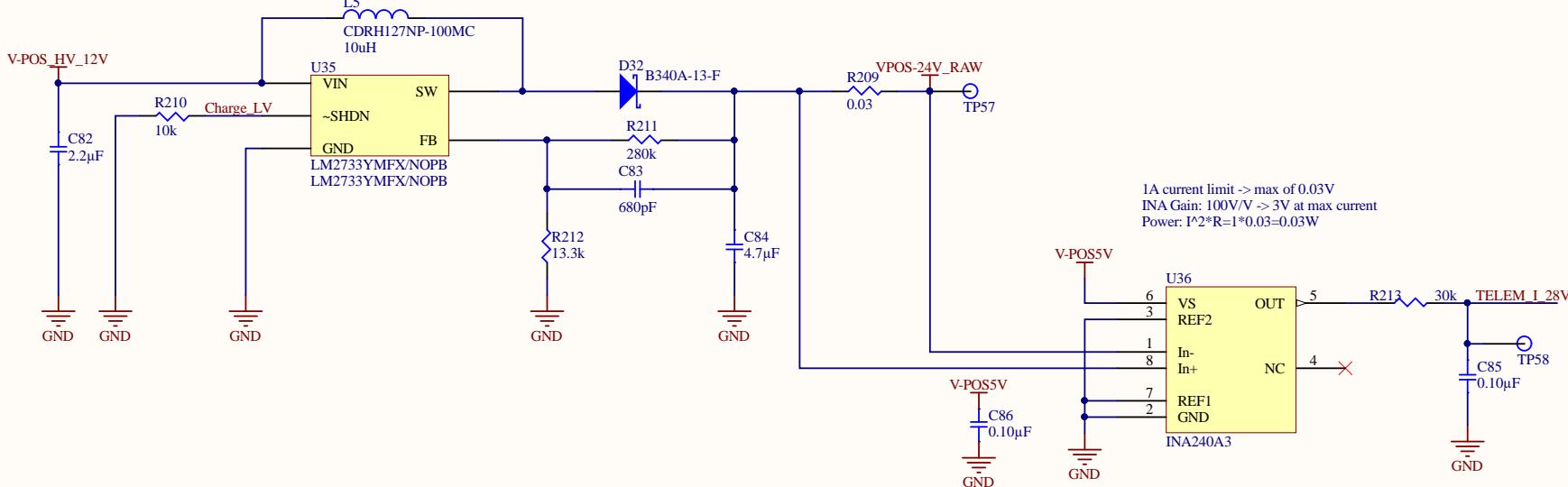


D



Title: Limit Switches	Badgerloop 133 Engineering Research Building Madison, WI 53715
Size: A4	Number:
Date: 8/26/2020	Revision:
Time: 4:52:03 PM	Sheet 19 of
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\limit_switches.SchDoc	

HV Batt 12V -> 28V



CURRENT TELEM

Title 28V Boost			<i>Badgerloop 133 Engineering Research Building Madison, WI 53715</i>	BADGER LOOP
Size: A4	Number:	Revision:		
Date: 8/26/2020	Time: 4:52:04 PM	Sheet 20 of		
File: C:\Users\Windows PC\Desktop\Badgerloop\git_repos\hardware\main_io\power_28V.SchDoc				

