

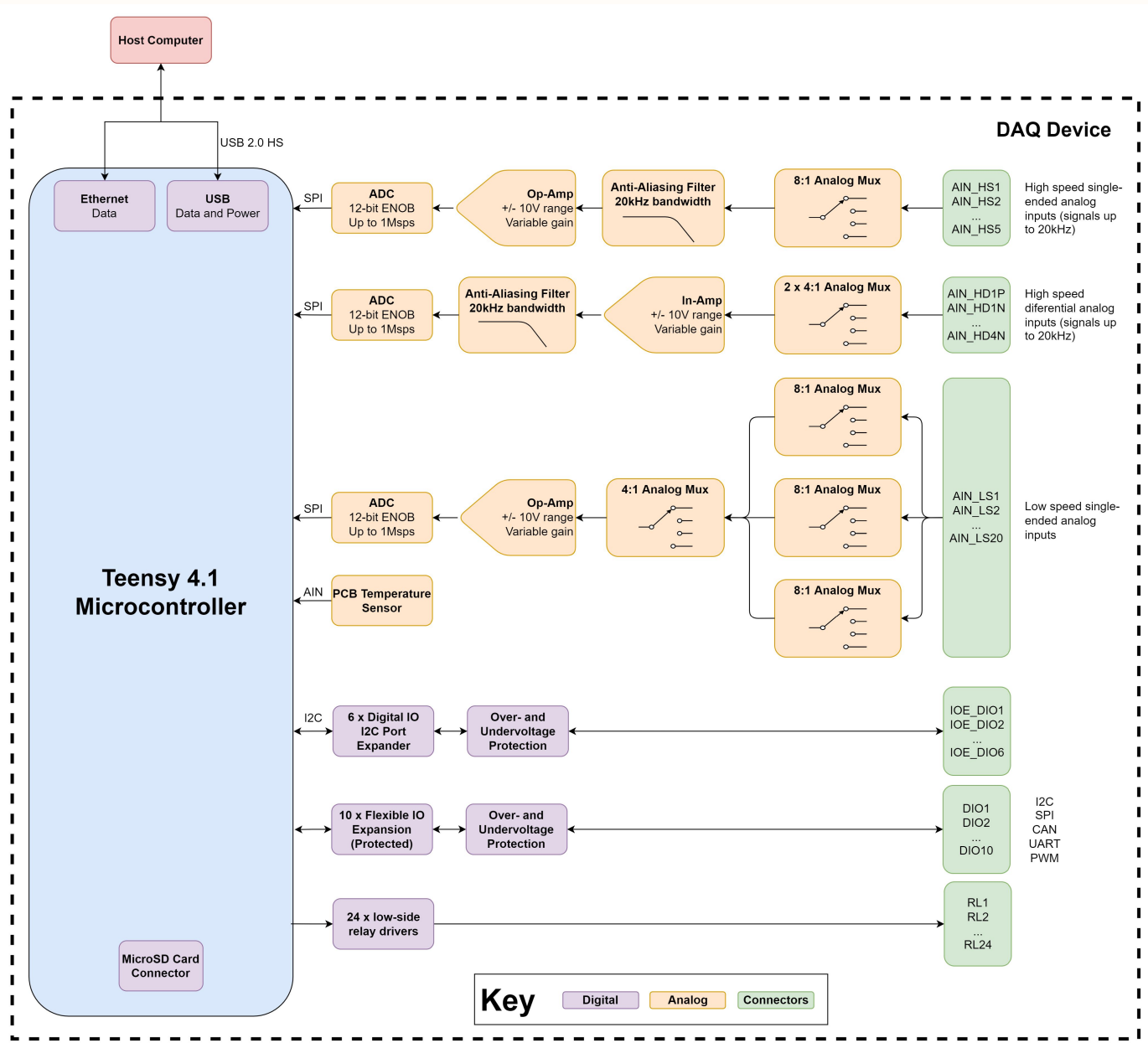
# ECSE478 - DAQ Device

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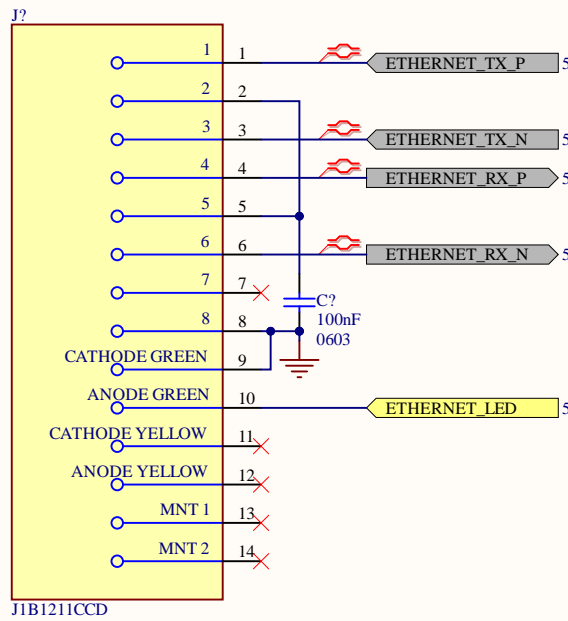
## Port Colors

Connector
Digital
Analog
Communication

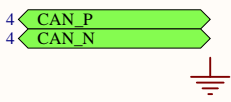


# Connectors

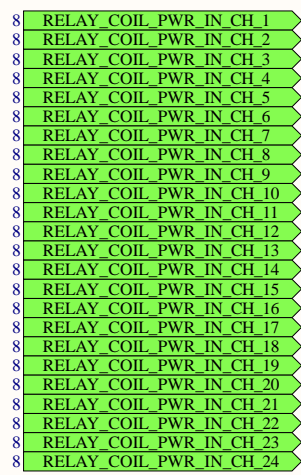
## Ethernet



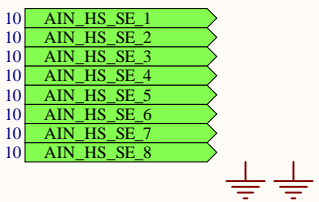
## Expansion



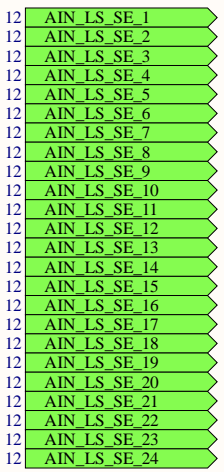
## Relay Drivers



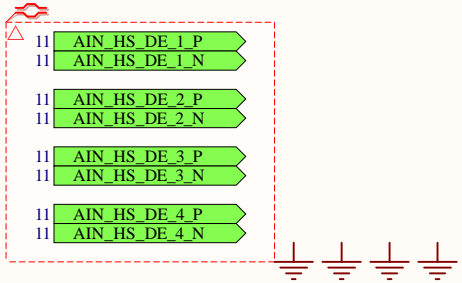
## High Speed SE Analog



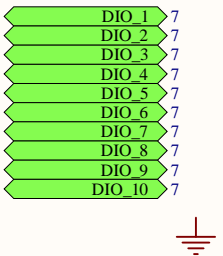
## Low Speed SE Analog



## High Speed DE Analog



## Digital IO Pins



# Power

+12V    -12V

Need to do a power budget for +12/-12V rails to see if we can boost from USB power on Teensy. Consider expansion to provide +12/-12V on connector for external usage up to X mA.

+5V (CAN)


+5V\_A (Analog)

Δ Voltage reference IC. keep away from noisy sources, place close to ADCs.

+3V3 (from Teensy :))

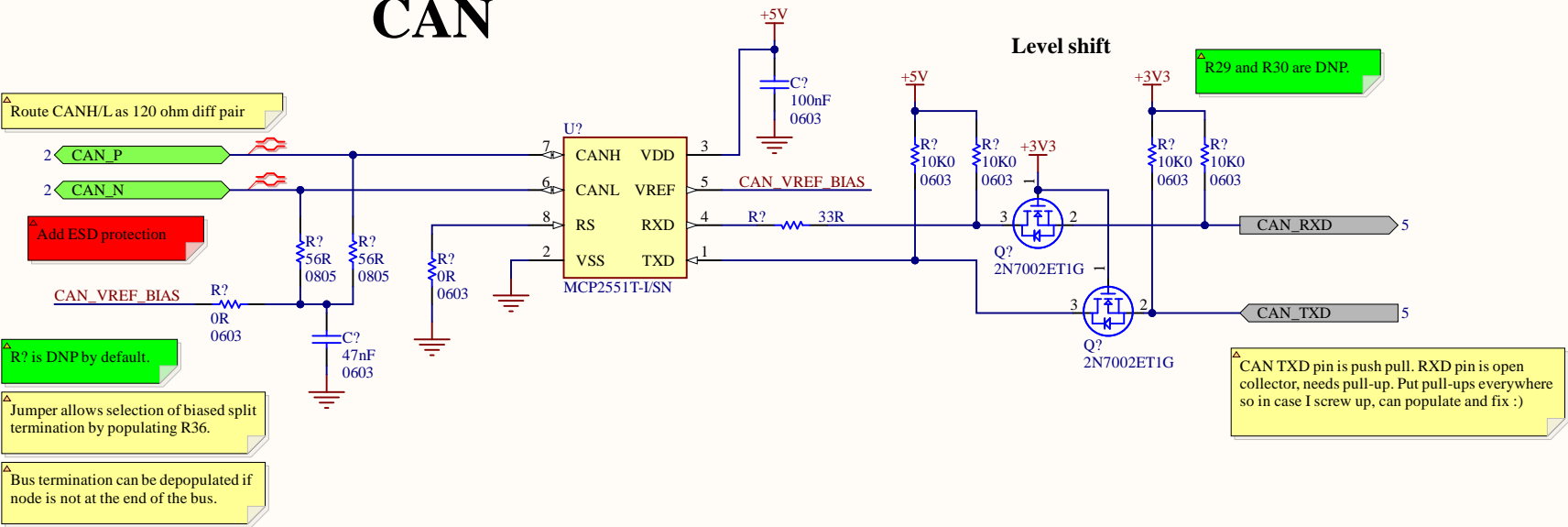
Δ Voltage reference IC. keep away from noisy sources, place close to ADCs.

+1V8 (ADC)

Title			<i>Avionics</i> <i>McGill Rocket Team</i> <i>McGill University</i> <i>Montreal, Quebec</i>	
<i><b>Power</b></i>				
Size: <b>B</b>	Revision: <b>*</b>	Drawn By: <b>Jasper Yun</b>		
Date: <b>2022-11-23</b>	Time: <b>4:30:02 PM</b>	Sheet <b>3</b> of <b>15</b>		
File: <b>C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\Power.SchDoc</b>				

# Communication

## CAN




## SPI

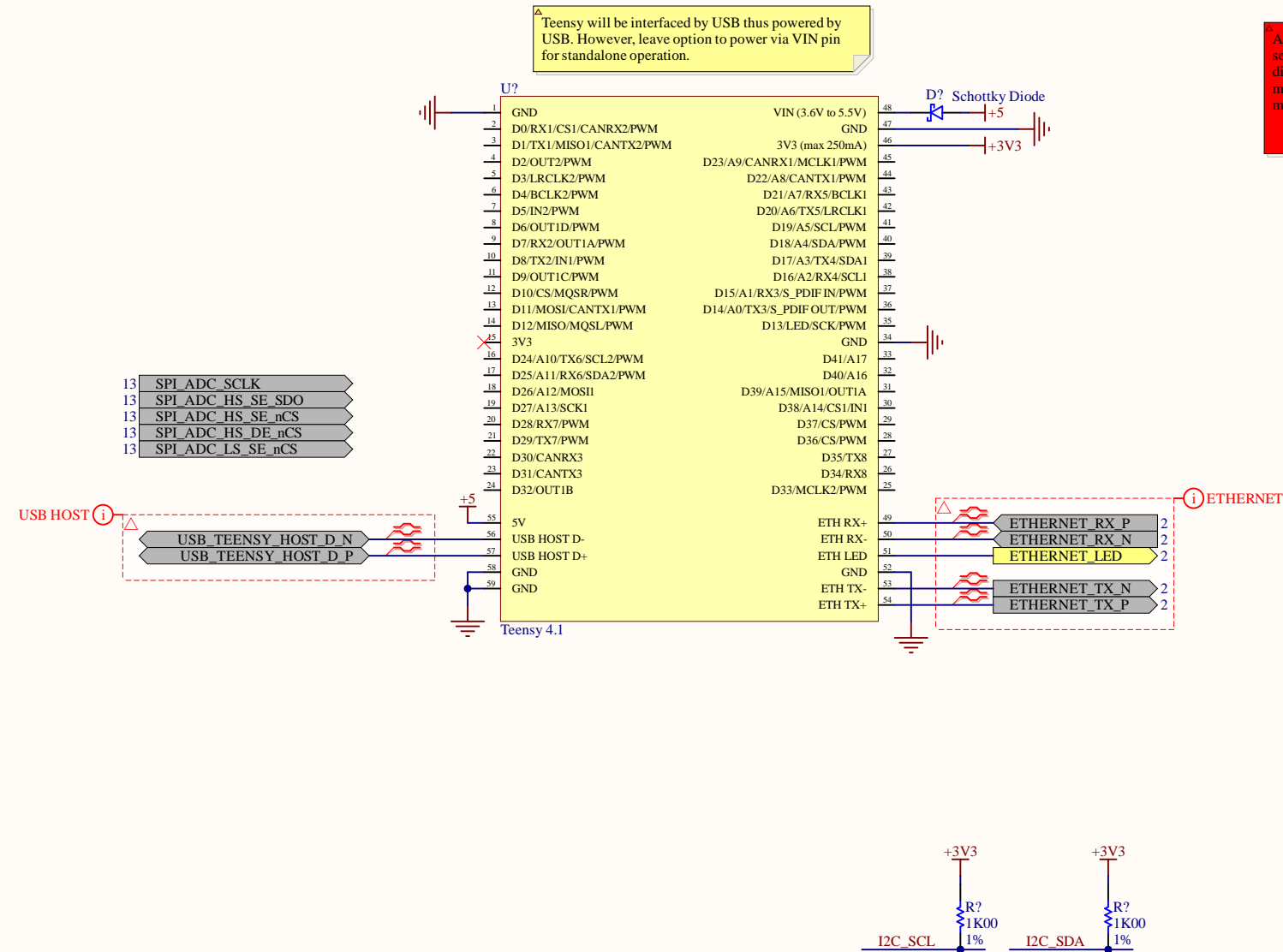
## UART

## I2C

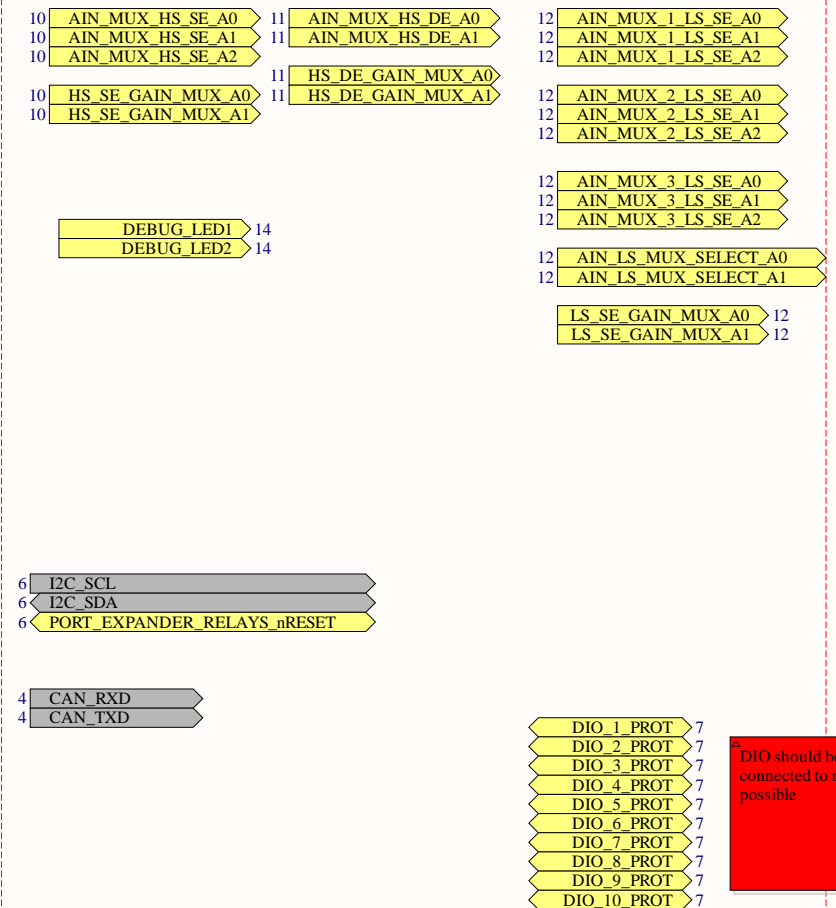
## USB

Title <i>Communication</i>			Avionics McGill Rocket Team McGill University Montreal, Quebec	
Size: B	Revision: *	Drawn By:		
Date: 2022-11-23	Time: 4:30:02 PM	Sheet 4 of 15		
File: C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\Communication.SchDoc				

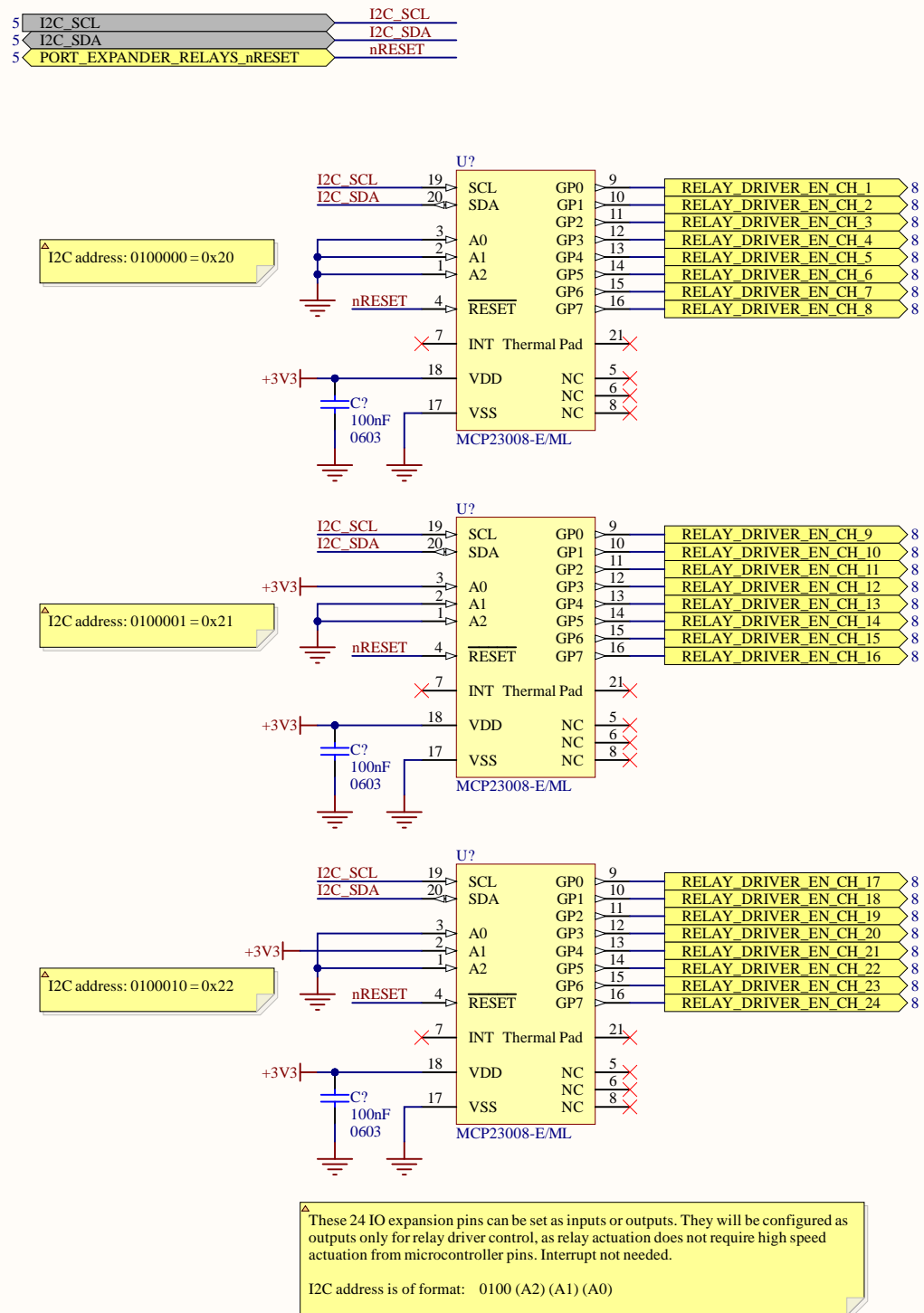
# Microcontroller




# IO to assign

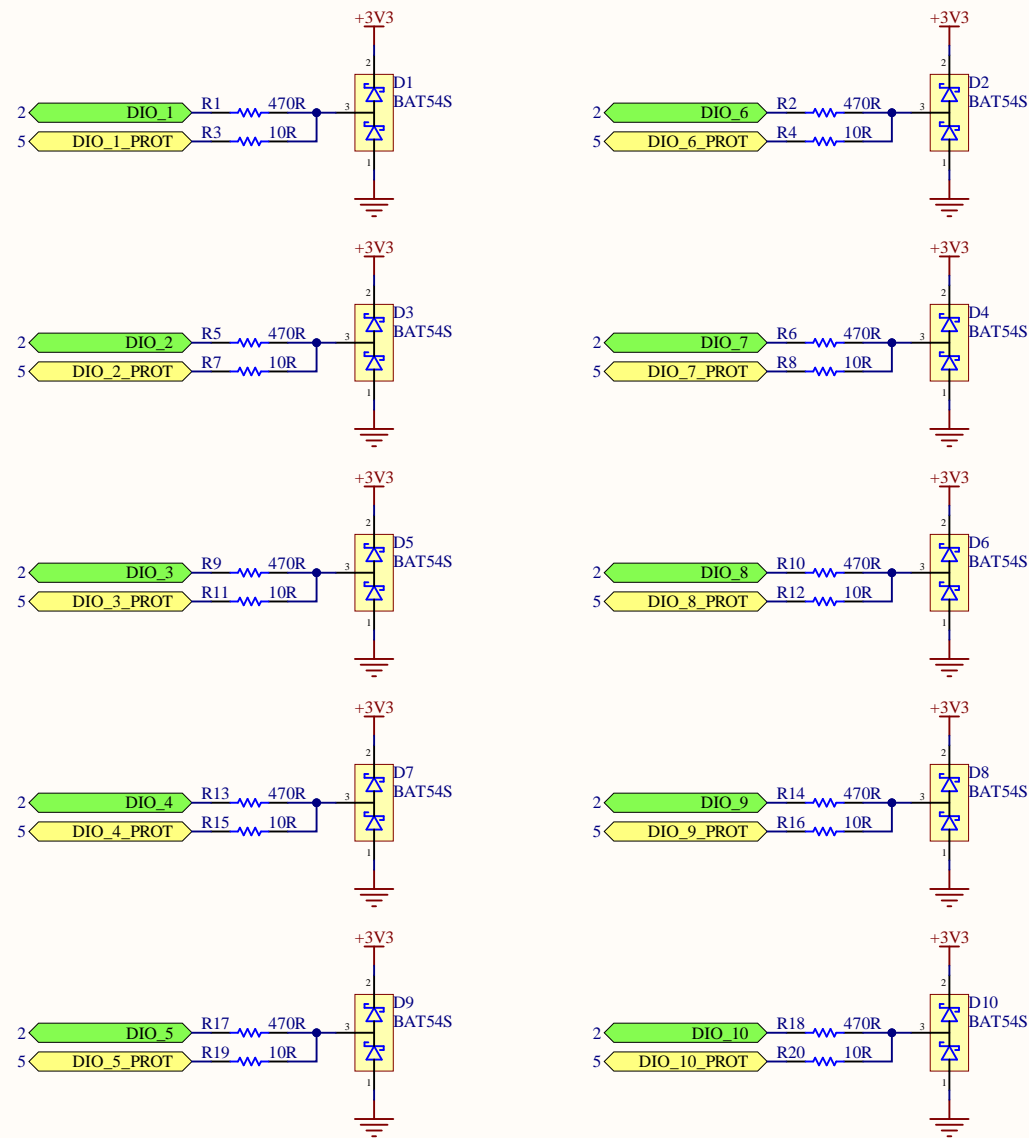


# IO Expansion



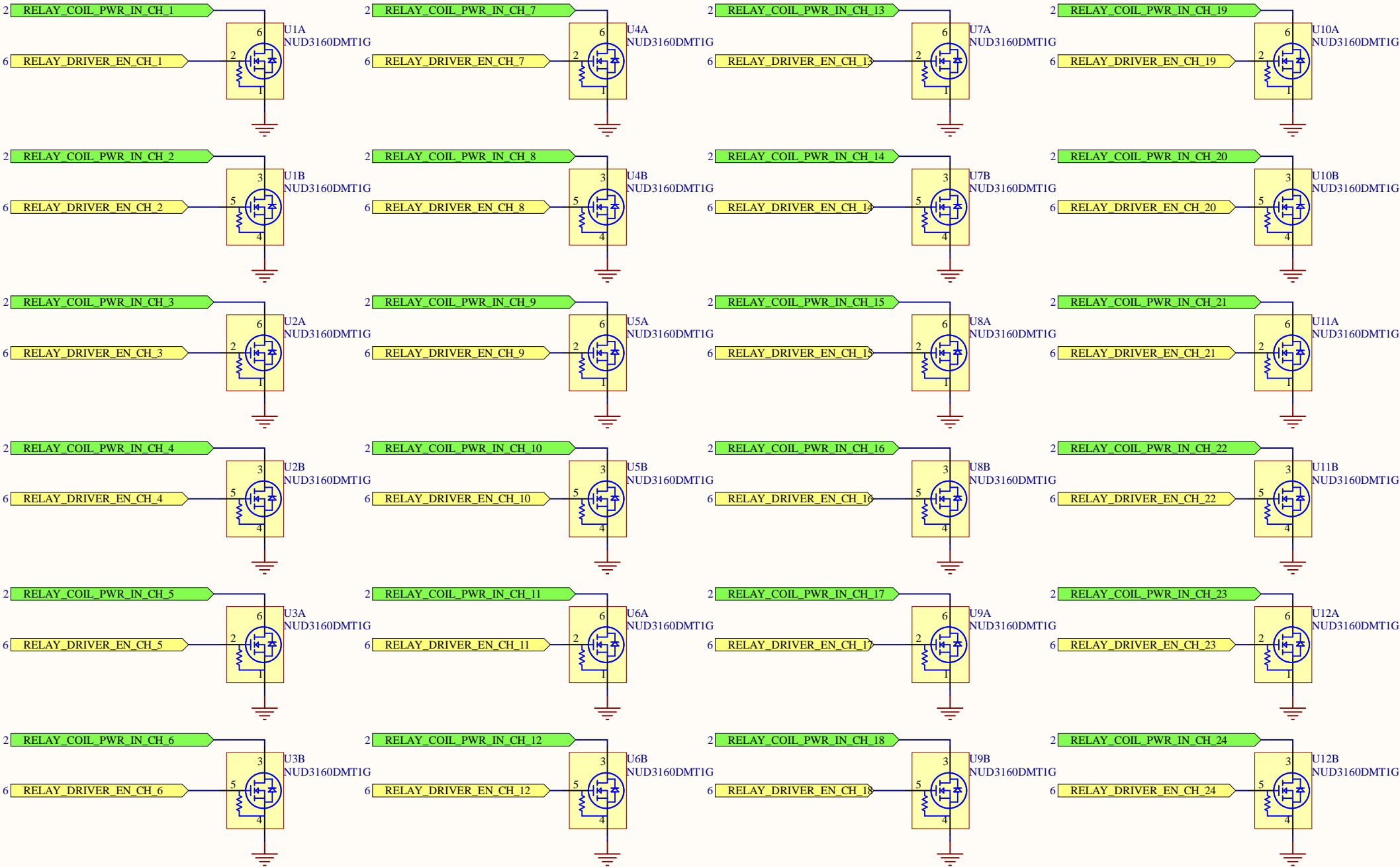
Title <i><b>IO Expansion</b></i>				<i>Avionics          McGill Rocket Team          McGill University          Montreal, Quebec</i>	
Size: <b>B</b>	Revision: *	Drawn By: <b>Jasper Yun</b>			
Date: <b>2022-11-23</b>	Time: <b>4:30:02 PM</b>	Sheet <b>6</b> of <b>15</b>			
File: <b>C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\IO Expansion\SchDoc</b>					

# Digital IO Protection




# Relay Drivers

Relay drivers are low-side nFETs which are rated to 60V drain-source. Relay coil outputs are connected to RELAY\_COIL\_PWR\_IN\_CH\_XY.






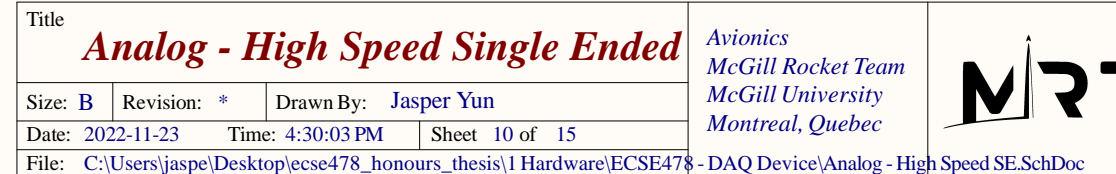
	1	2	3	4	5	6
A	<div><h1>Data Storage</h1><div>SD card connector is provided on Teensy 4.1 and interfaces over 4-bit SDIO.</div></div>					
B						
C						
D						

Title			<i><b>Data Storage</b></i>			<i>Avionics McGill Rocket Team McGill University Montreal, Quebec</i>					
Size: <b>B</b>		Revision: <b>*</b>		Drawn By: <b>Jasper Yun</b>							
Date: 2022-11-23		Time: 4:30:03 PM		Sheet 9 of 15							
File: C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\Data Storage.SchDoc											

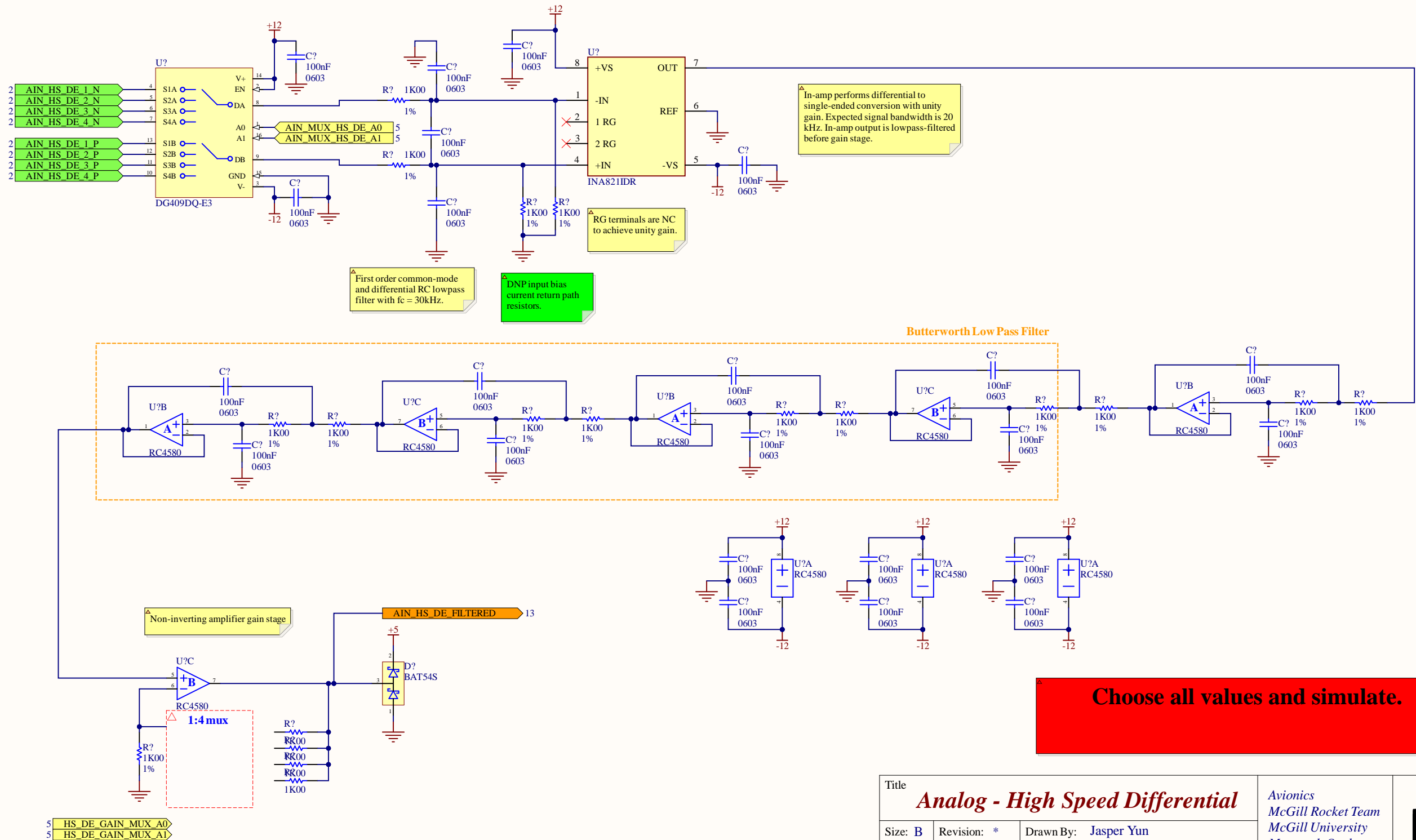
SD card connector is provided on Teensy 4.1 and interfaces over 4-bit SDIO.

Title				<i>Avionics</i> <i>McGill Rocket Team</i> <i>McGill University</i> <i>Montreal, Quebec</i>		
<i><b>Data Storage</b></i>						
Size: <b>B</b>	Revision: *	Drawn By: <b>Jasper Yun</b>				
Date: <b>2022-11-23</b>	Time: <b>4:30:03 PM</b>	Sheet <b>9</b> of <b>15</b>				
File: C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\Data Storage.SchDoc						


**Choose all values and simulate.**



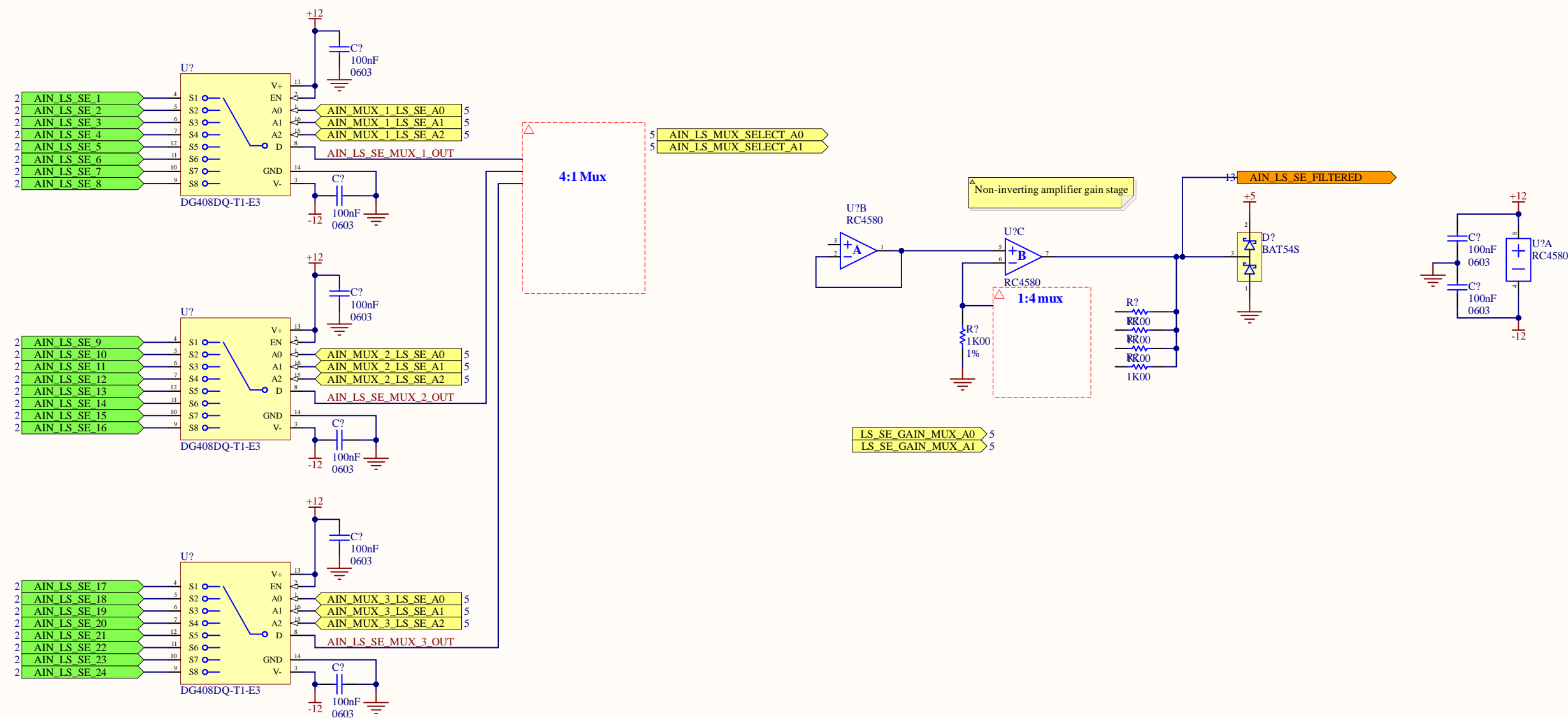
# Analog - High Speed Differential



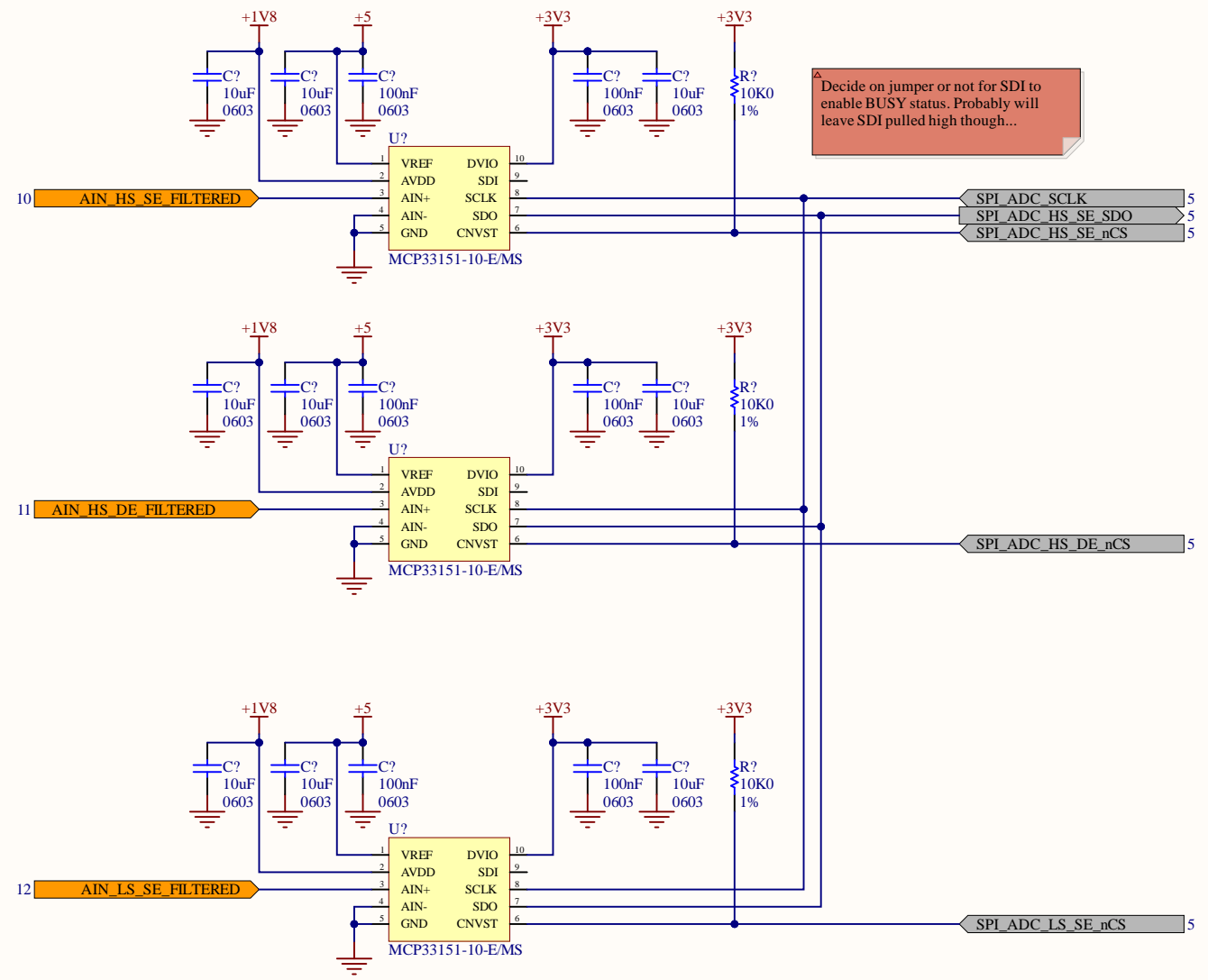
**Choose all values and simulate.**

Title			<i>Analog - High Speed Differential</i>		Avionics McGill Rocket Team McGill University Montreal, Quebec			
Size: B	Revision: *	Drawn By: Jasper Yun						
Date: 2022-11-23	Time: 4:30:03 PM	Sheet 11 of 15						
File: C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\Analog - High Speed DE.SchDoc								

# Analog - Low Speed Single-Ended

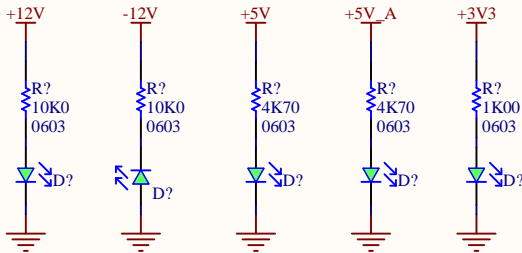


# Analog to Digital Conversion



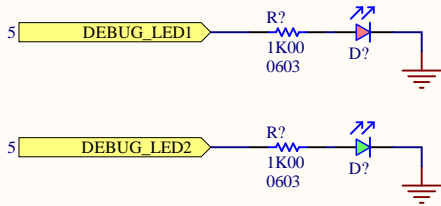
# Debug


## Power LEDs



## Test Points

## Program Debug LEDs



Title				<i>Debug</i>		<i>Avionics McGill Rocket Team McGill University Montreal, Quebec</i>			
Size:	B	Revision:	*	Drawn By:		Jasper Yun			
Date:	2022-11-23		Time:		4:30:04 PM		Sheet		14 of 15
File:	C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\ECSE478 - DAQ Device\Debug.SchDoc								

# Breadboard Prototype Schematic

