MCP33151-10 Eval Board

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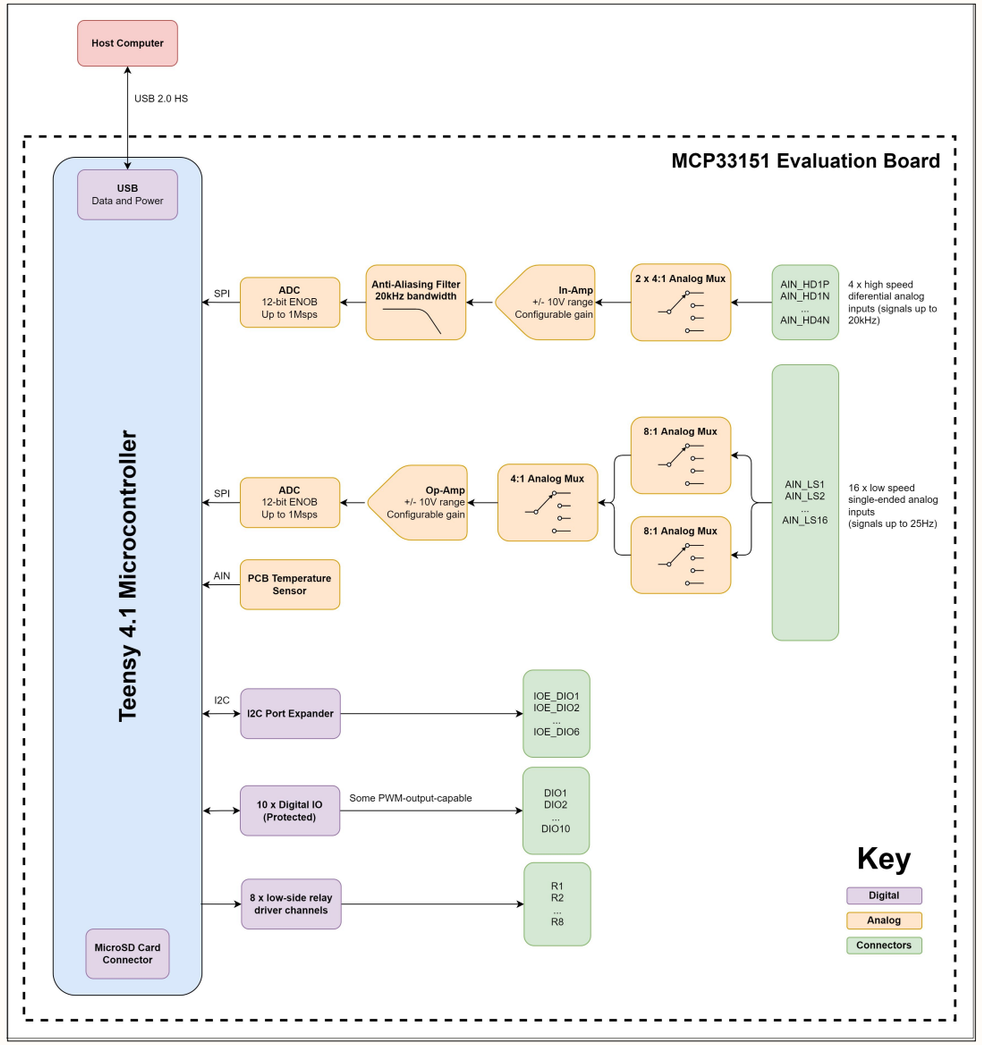
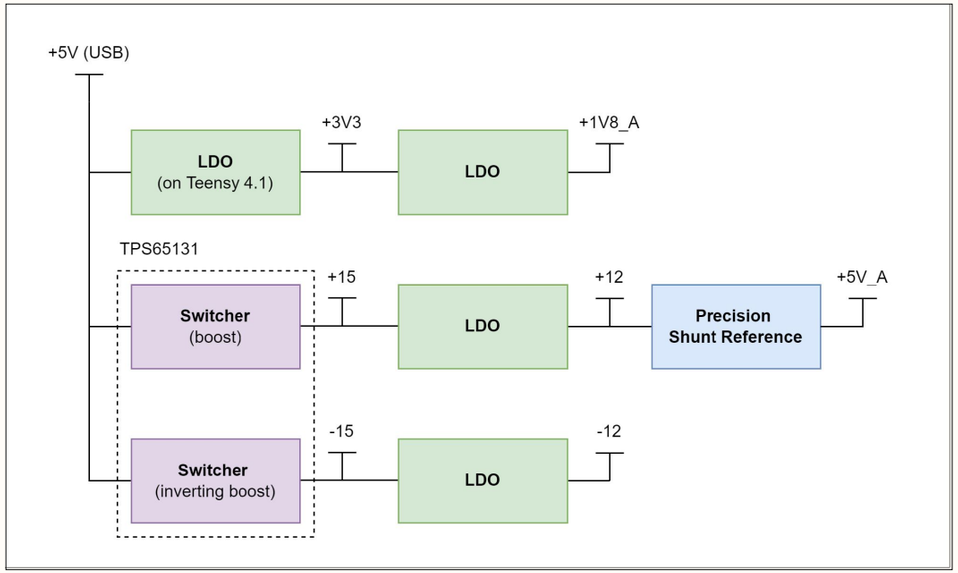
Main Block Diagram



Power Architecture



Title: *MCP33151-10 Eval Board*			*Avionics* *McGill Rocket Team* *McGill University* *Montreal, Quebec*
Size: B	Revision: *	Drawn By: Jasper Yun	
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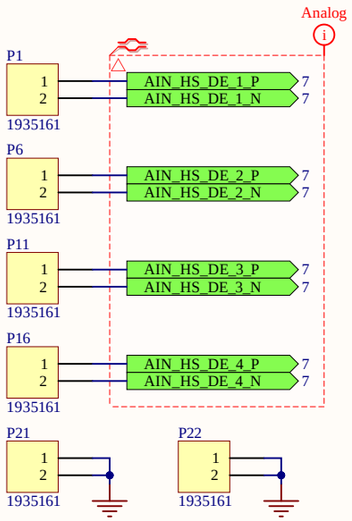
Connectors

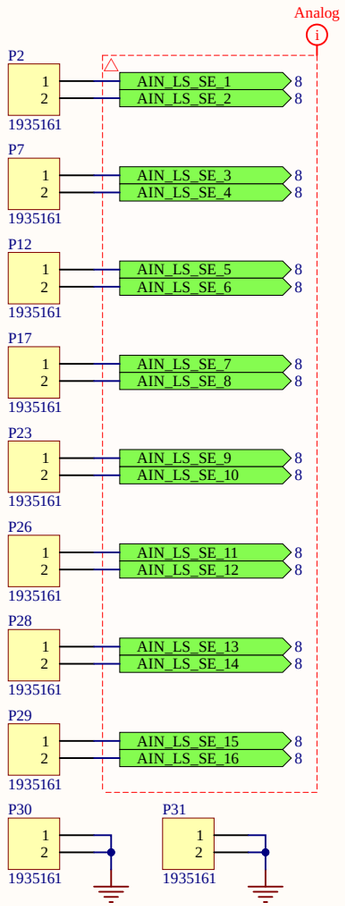
All terminal blocks for ease of prototyping.

DE = differential-ended
SE = single-ended

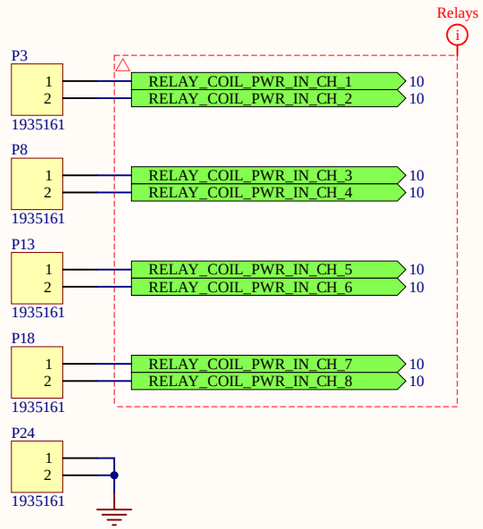
High Speed DE Analog



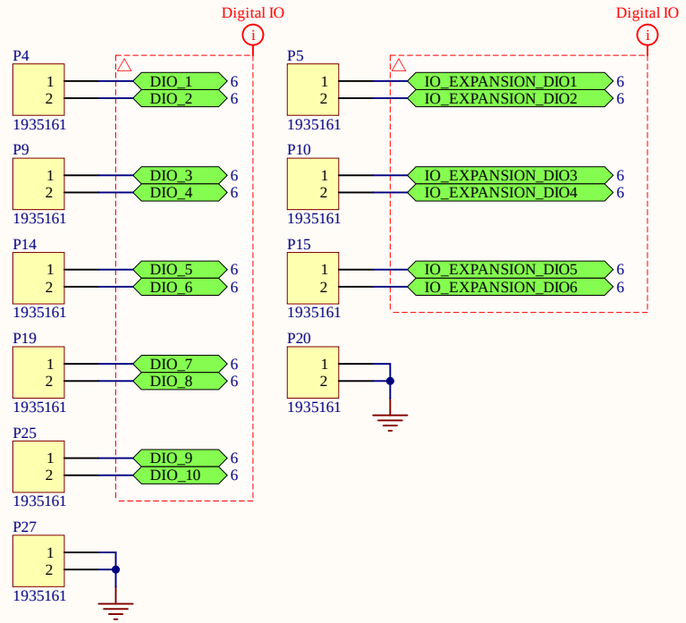
Low Speed SE Analog



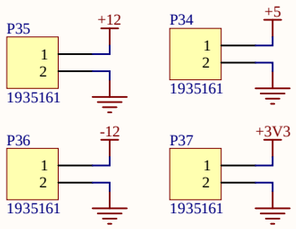
Relay Coils (Low Side)



Digital IO Pins



Power



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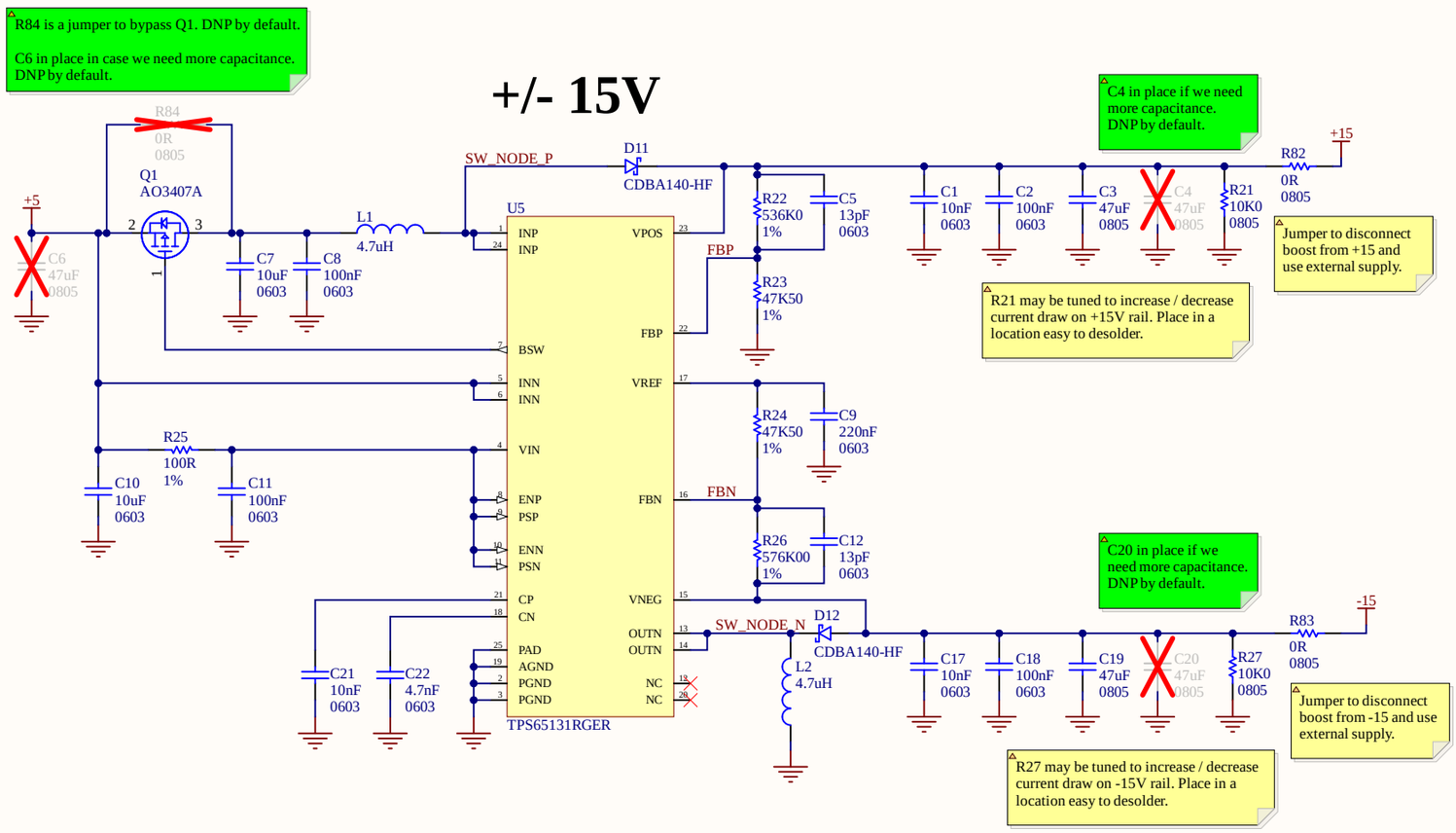
Power

+/- 15V



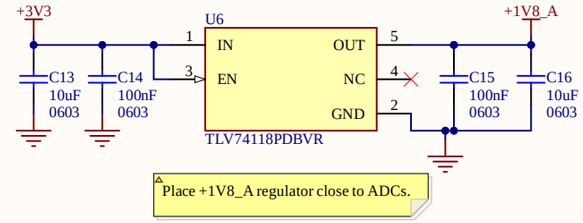
+5V (from USB port on Teensy :))

Nothing to be done.

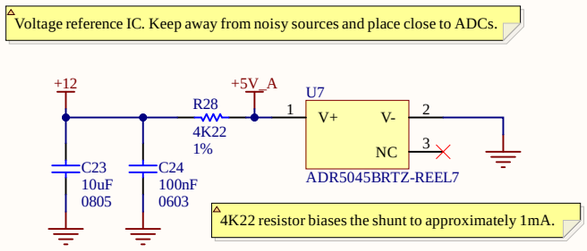
+3V3 (from Teensy :))

Nothing to be done.

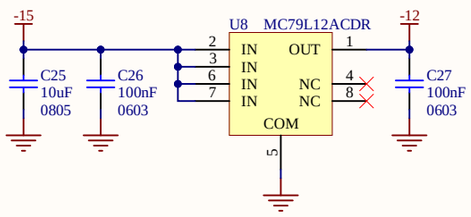
+1V8_A (ADC)



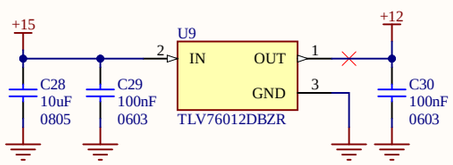
+5V_A (Analog Reference)



-12V



+12V



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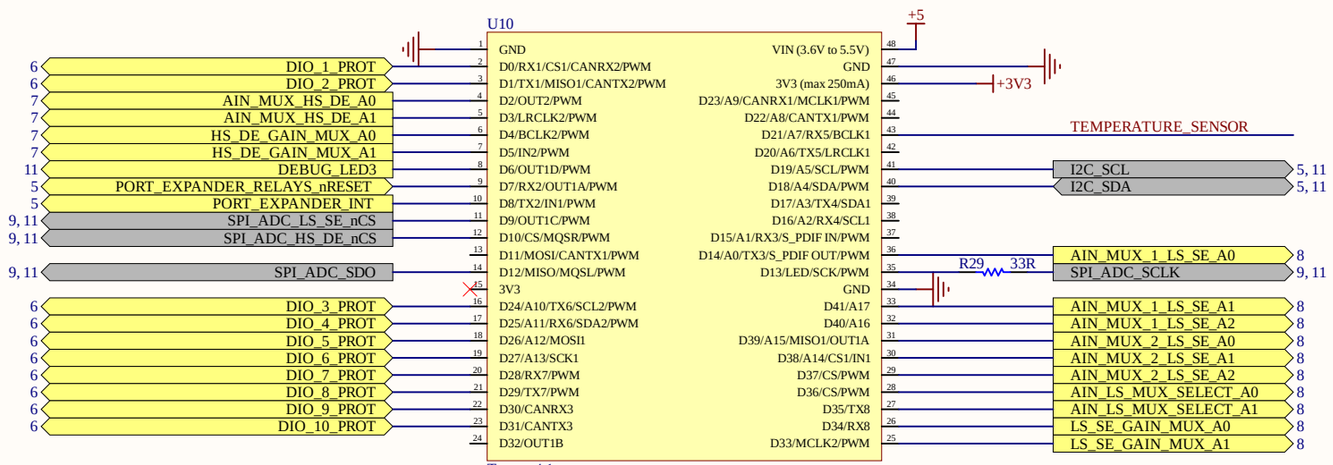
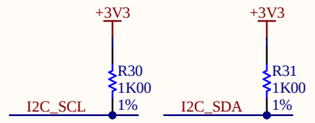
Microcontroller

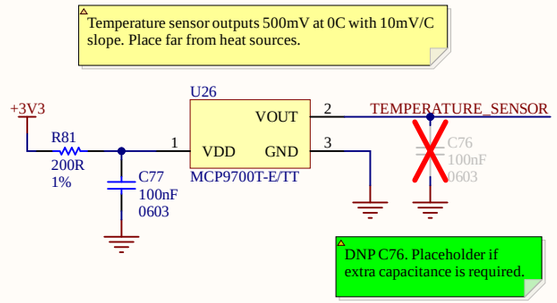
Teensy will be interfaced by USB thus powered by USB. Board is thus limited to 500mA from the +5V rail.

Use Teensy 4.1 Ethernet kit to add Ethernet capability to the board.

Teensy 4.1 has built-in SD card which interfaces using 4-bit SDIO. No need for SD card on this board.







Title: *Microcontroller*			*Avionics* *McGill Rocket Team* *McGill University* *Montreal, Quebec*
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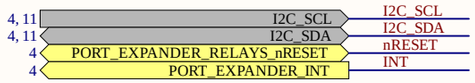
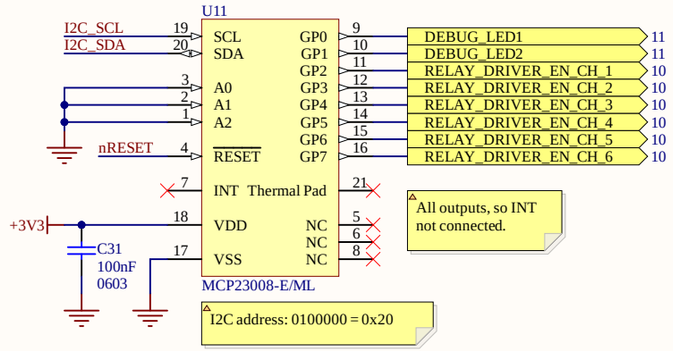
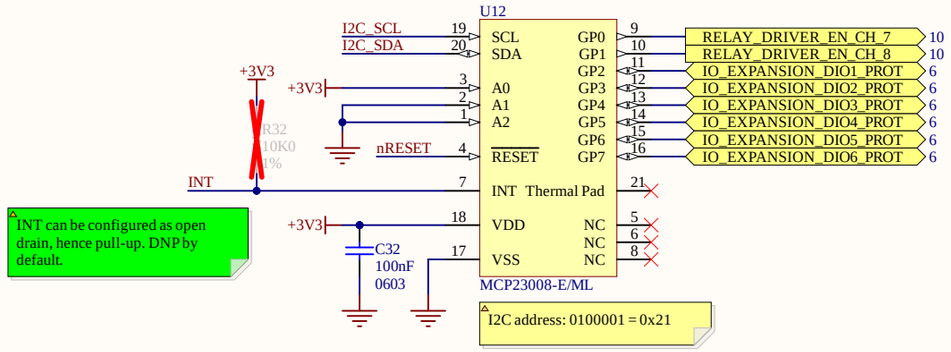
IO Expansion







These 24 IO expansion pins can be set as inputs or outputs. They will be configured as outputs only for relay driver control, as relay actuation does not require high speed actuation from microcontroller pins. Interrupt not needed.

I2C address is of format: 0100 (A2) (A1) (A0)

Title: *IO Expansion*			*Avionics* *McGill Rocket Team* *McGill University* *Montreal, Quebec*
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Digital IO Protection

Title	***Digital IO Protection***		*Avionics* *McGill Rocket Team* *McGill University* *Montreal, Quebec*
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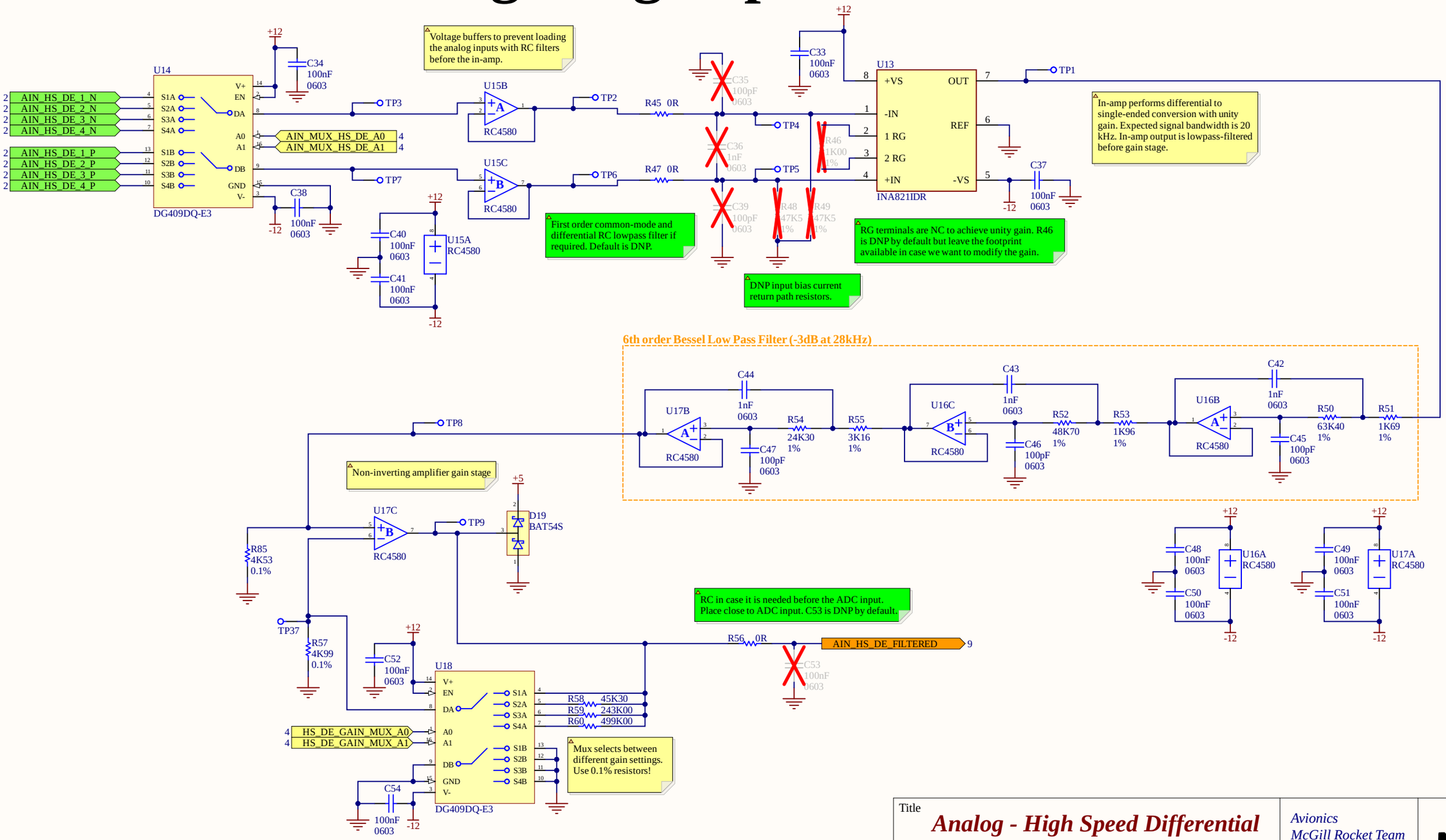
Analog - High Speed Differential



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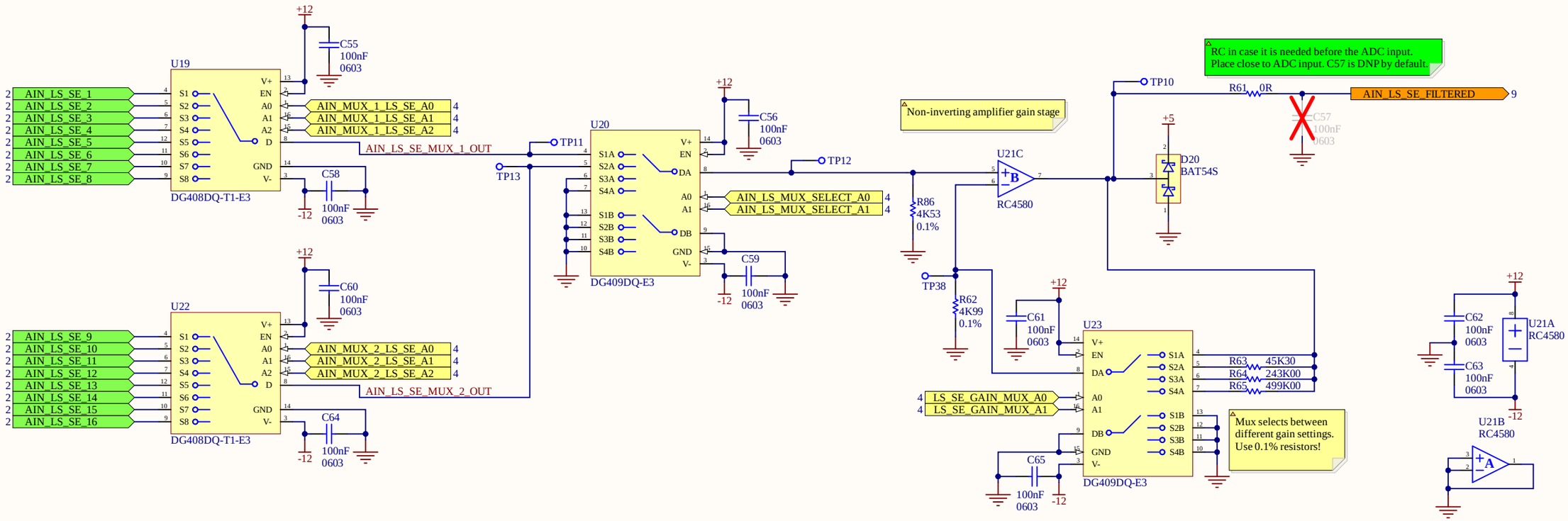
McGill University
Montreal, Quebec

Analog - Low Speed Single-Ended



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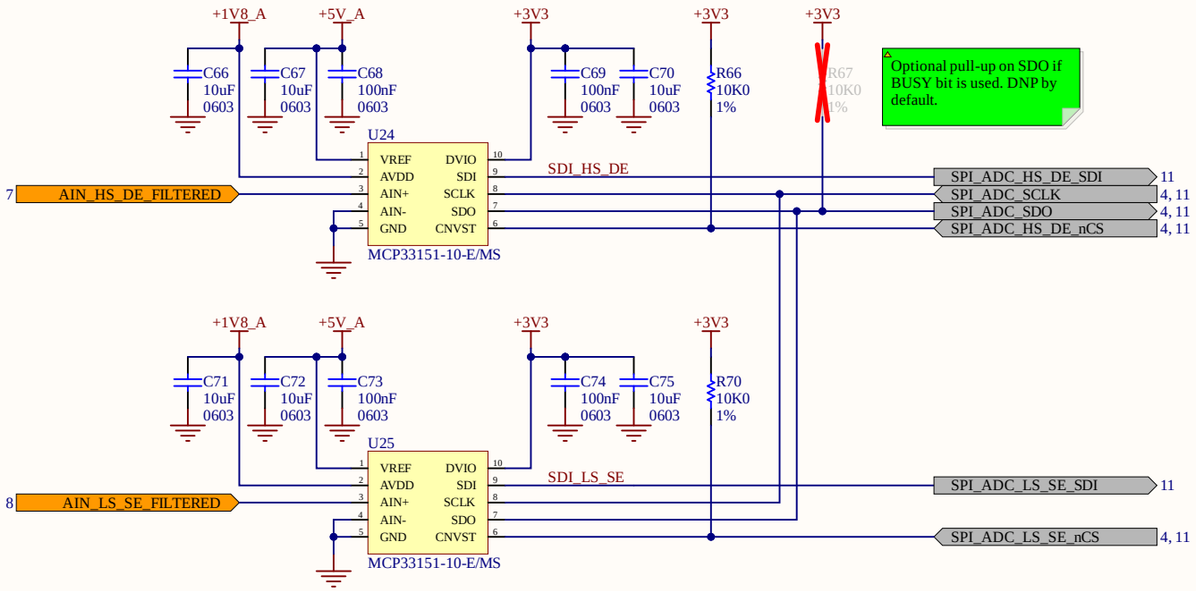
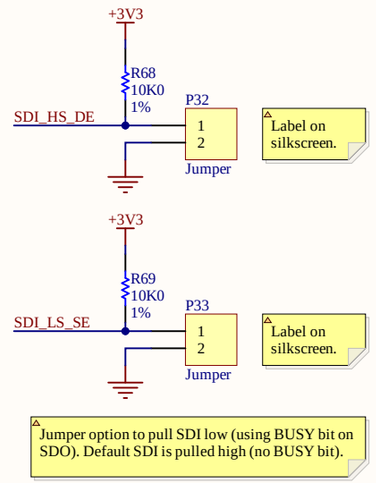
Avionics
McGill Rocket Team
McGill University
Montreal, Quebec

Analog to Digital Conversion





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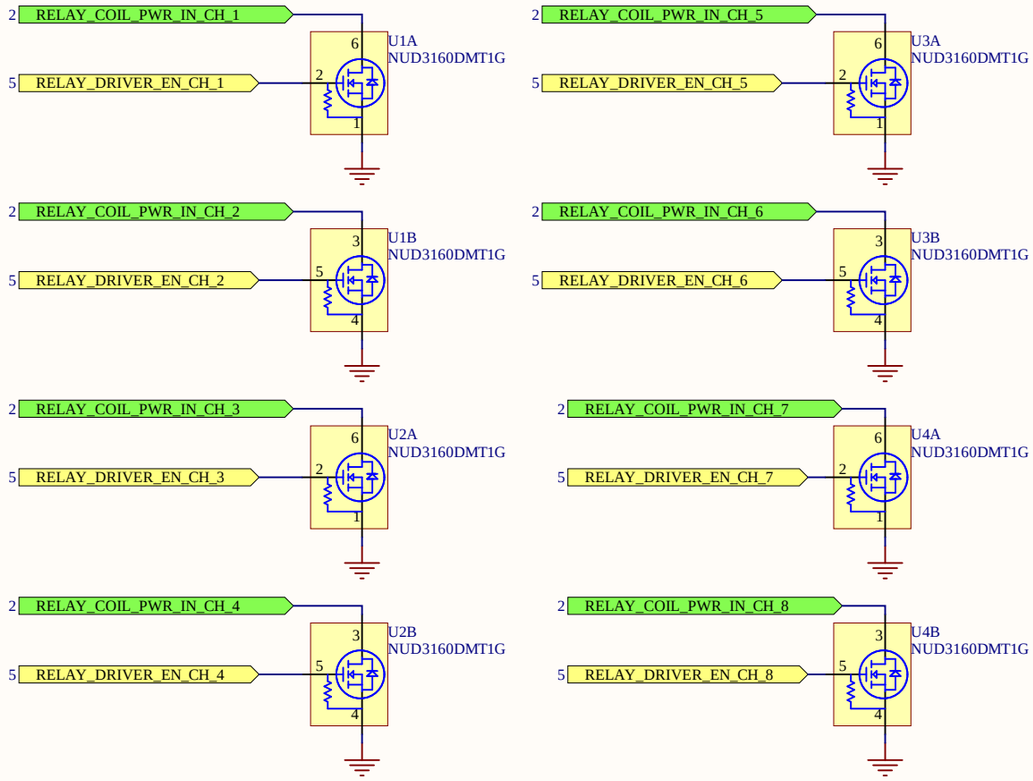
Relay Drivers

> 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.



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Size: B	Revision: *	Drawn By: Jasper Yun	
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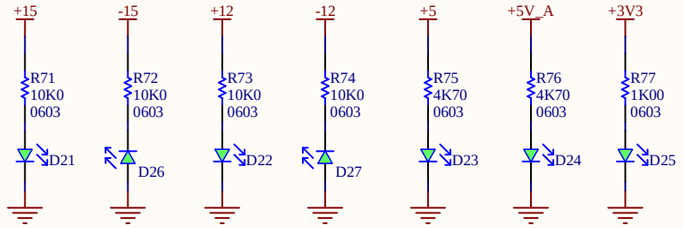
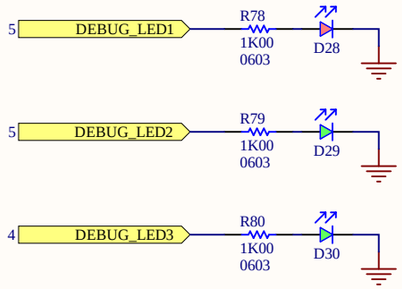
File: C:\Users\jaspe\Desktop\ecse478_honours_thesis\1 Hardware\MCP33151 Eval Board\Relay Drivers.SchDoc			

Debug

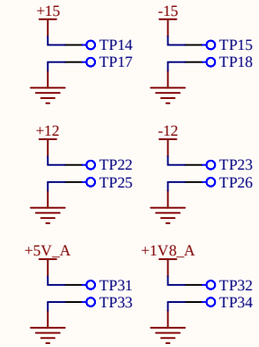
Power LEDs



Program Debug LEDs



Power Rails Test Points

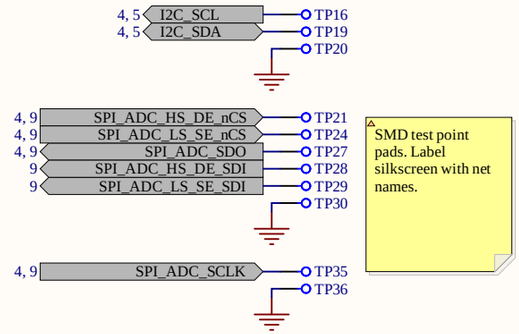


Place close to output of regulators, conducive for probing with oscilloscope + ground spring.

Place test power and ground points close together.

Analog Test Points

See analog sheets.



SMD test point pads. Label silkscreen with net names.

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