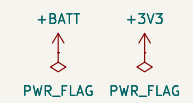
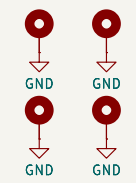
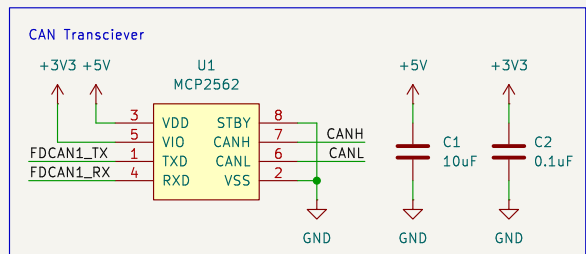
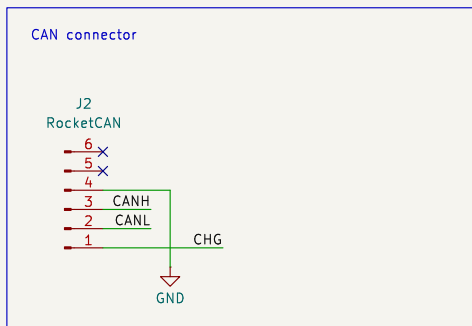
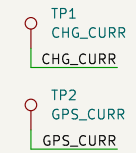
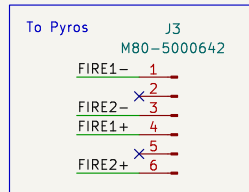
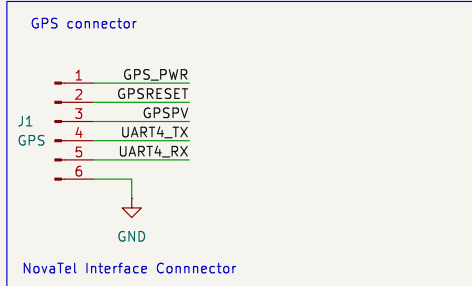
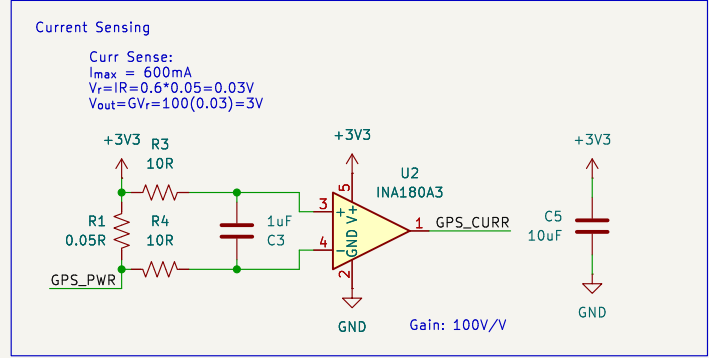
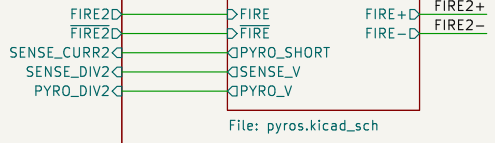
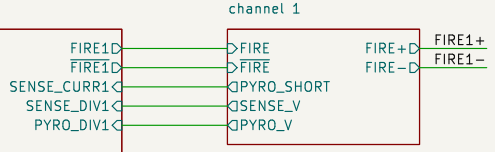


File: mcu.kicad_sch

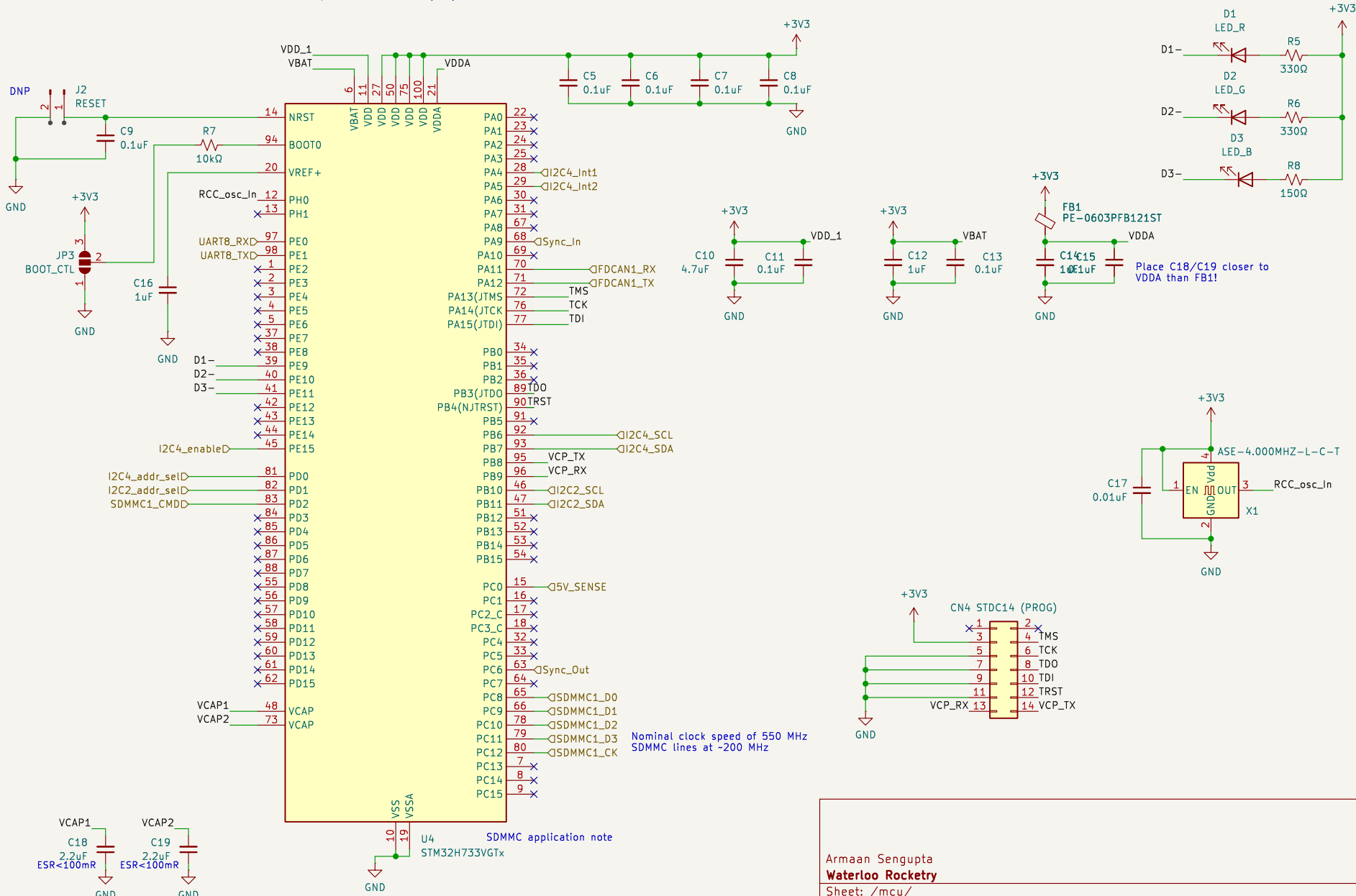


Designer: Ash Lang
Waterloo Rocketry
 Sheet: /
 File: altimeter.kicad_sch

Title: SRAD Altimeter

Size: A4	Date: 2025-02-20	Rev: 1.0
KiCad E.D.A. 9.0.0		Id: 1/6

power conn manual (link)



Nominal clock speed of 550 MHz
SDMMC lines at ~200 MHz

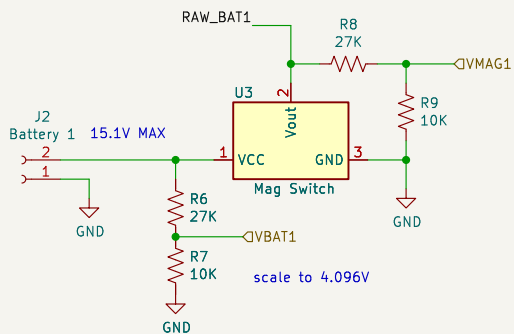
SDMMC application note
U4 STM32H733VGTx

Armaan Sengupta
Waterloo Rocketry
 Sheet: /mcu/
 File: mcu.kicad_sch

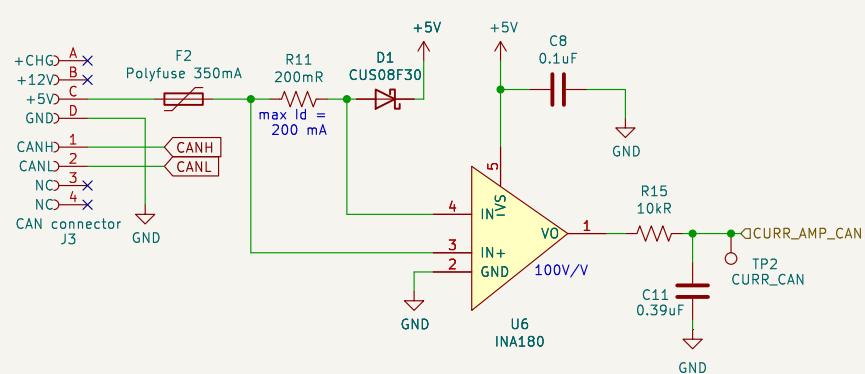
Title: Processor Board 2025

Size: A4	Date: 2024-11-22	Rev:
KiCad E.D.A. 9.0.0		Id: 2/6

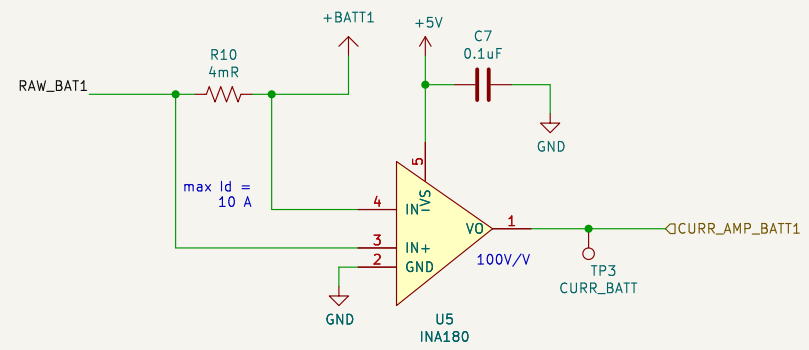
Battery Input



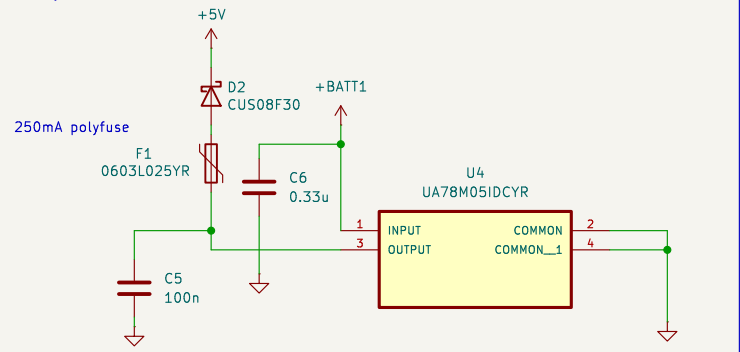
Current Sensing



Low pass filter because there may be noise from being underneath buzzers
 $f_c = 1/(2\pi * R * C)$
 $= 1/(2\pi * 10kR * 0.39uF)$
 $= -40.8 \text{ Hz}$



Battery to 5V LDO



Sheet: /power/
 File: power.kicad_sch

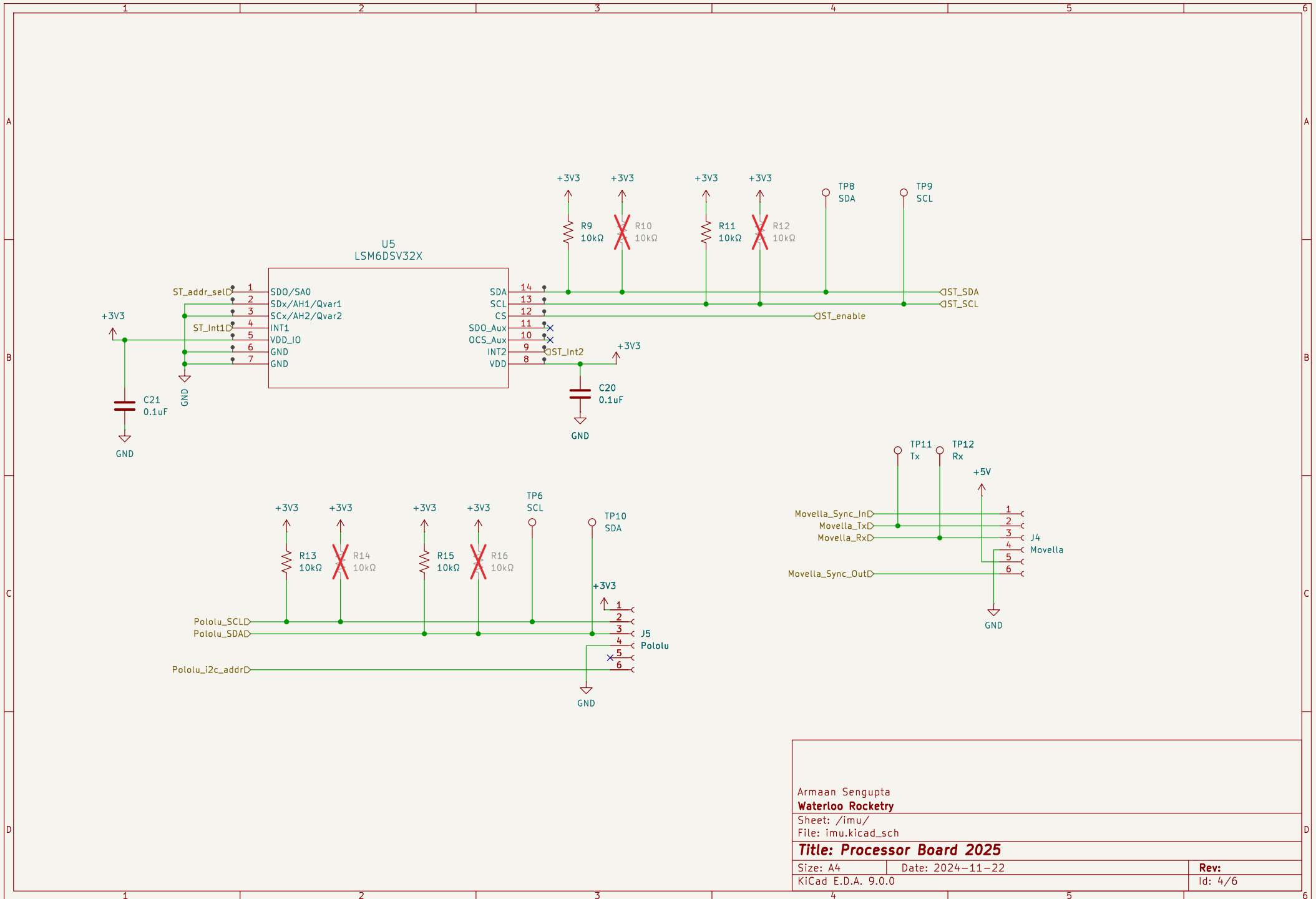
Title:

Size: A4
 KiCad E.D.A. 9.0.0

Date:

Rev:

Id: 3/6

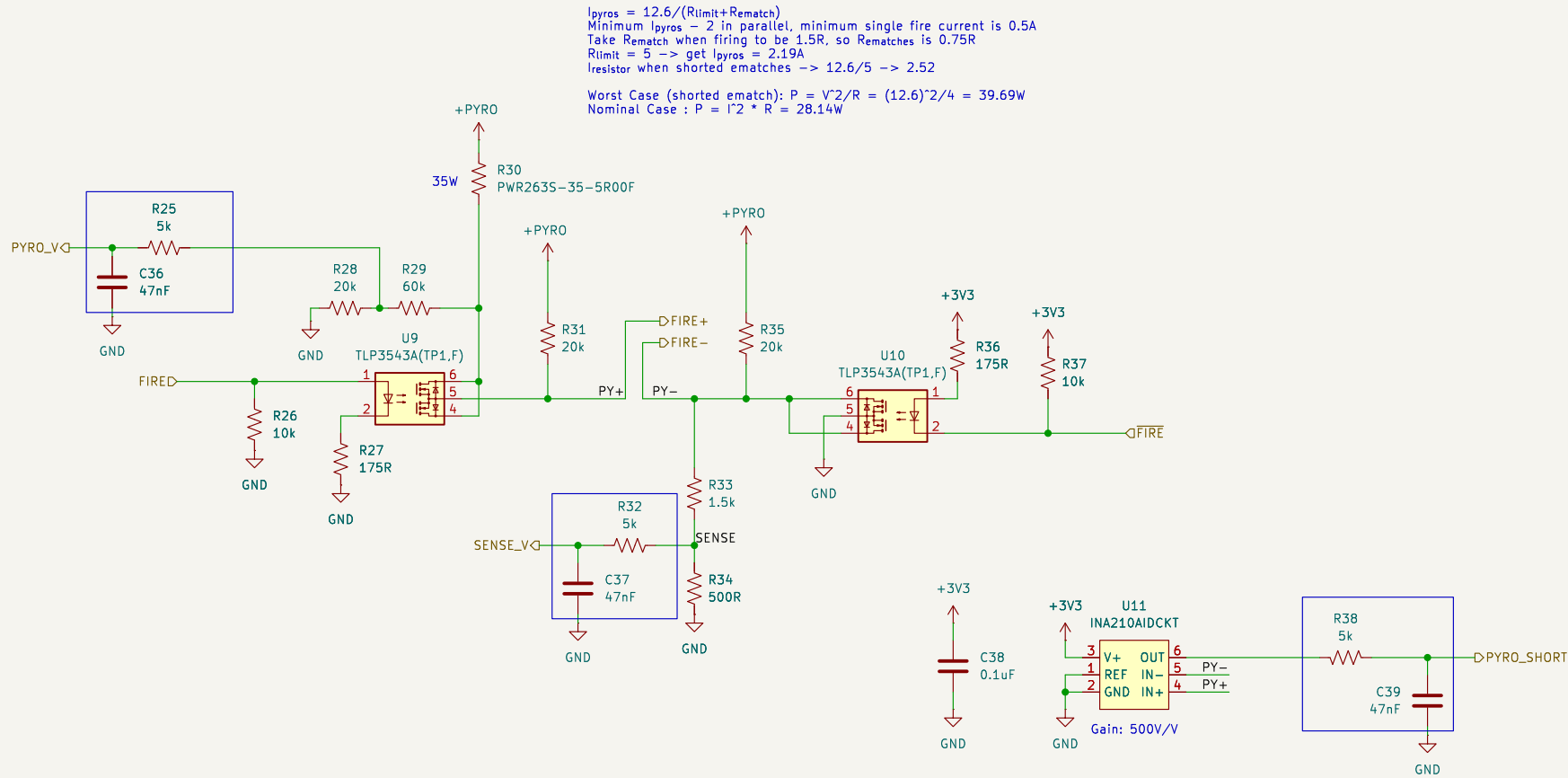


Armaan Sengupta
Waterloo Rocketry
 Sheet: /imu/
 File: imu.kicad_sch

Title: Processor Board 2025

Size: A4 | Date: 2024-11-22
 KiCad E.D.A. 9.0.0

Rev:
 Id: 4/6



$I_{pyros} = 12.6 / (R_{limit} + R_{match})$
 Minimum I_{pyros} - 2 in parallel, minimum single fire current is 0.5A
 Take R_{match} when firing to be 1.5R, so R_{match} is 0.75R
 $R_{limit} = 5 \rightarrow$ get $I_{pyros} = 2.19A$
 Resistor when shorted ematches $\rightarrow 12.6/5 \rightarrow 2.52$
 Worst Case (shorted ematch): $P = V^2/R = (12.6)^2/4 = 39.69W$
 Nominal Case : $P = I^2 * R = 28.14W$

Target Cutoff Frequency = 500Hz
 $f_c = 1/(2\pi RC) \rightarrow RC = 0.00032$
 pick $R = 5k \rightarrow C = 63nF$, round down to 47nF $\rightarrow f_c = 677HZ$

Designer: Ash Lang
Waterloo Rocketry

Sheet: /channel 1/
 File: pyros.kicad_sch

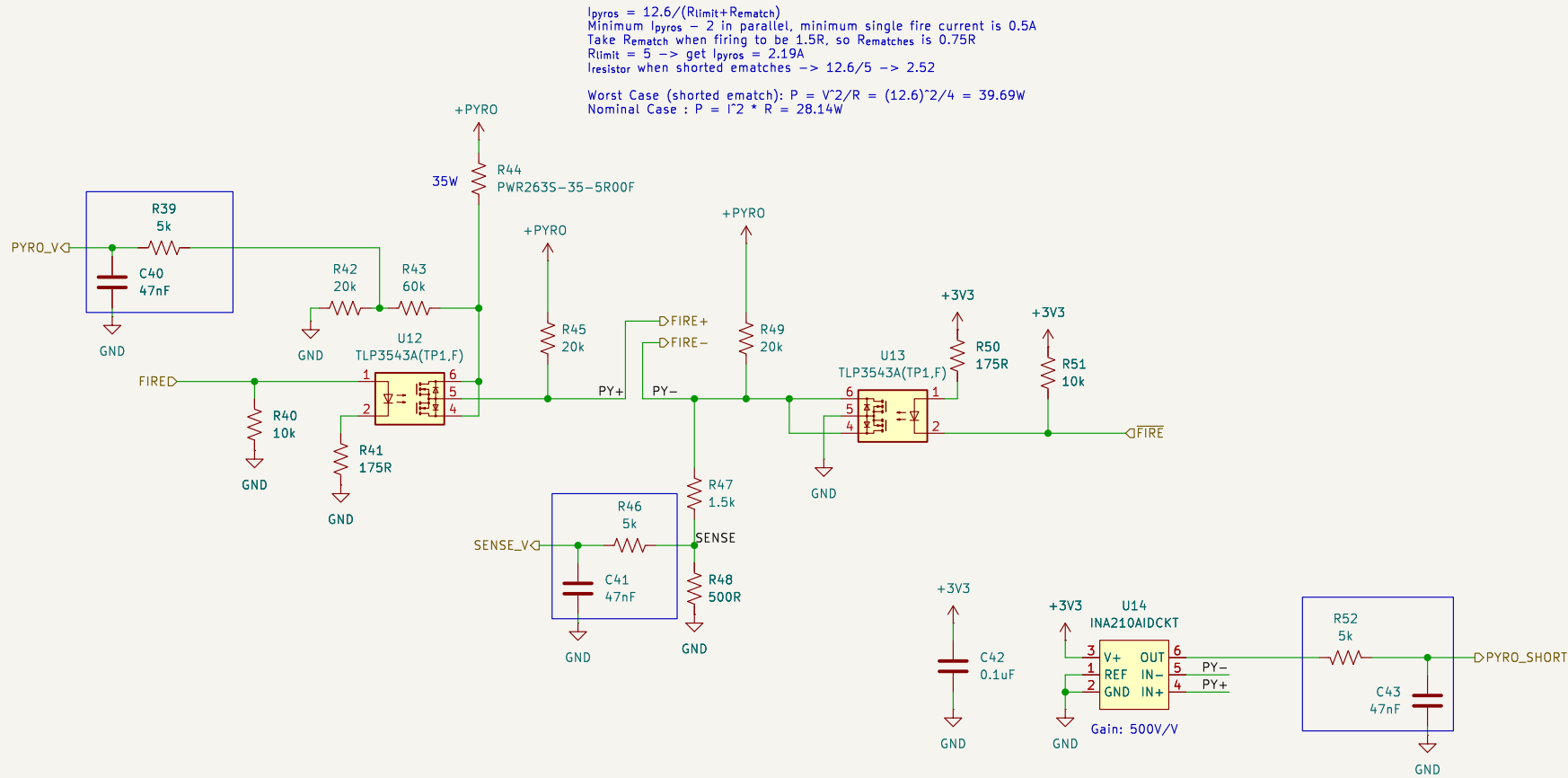
Title: SRAD Altimeter

Size: A4 Date: 2025-02-20

KiCad E.D.A. 9.0.0

Rev:

Id: 5/6



$I_{pyros} = 12.6 / (R_{limit} + R_{match})$
 Minimum $I_{pyros} = 2$ in parallel, minimum single fire current is 0.5A
 Take R_{match} when firing to be 1.5R, so R_{match} is 0.75R
 $R_{limit} = 5 \rightarrow$ get $I_{pyros} = 2.19A$
 Resistor when shorted ematches $\rightarrow 12.6/5 \rightarrow 2.52$
 Worst Case (shorted ematch): $P = V^2/R = (12.6)^2/4 = 39.69W$
 Nominal Case : $P = I^2 * R = 28.14W$

Target Cutoff Frequency = 500Hz
 $f_c = 1 / (2\pi RC) \rightarrow RC = 0.00032$
 pick $R = 5k \rightarrow C = 63nF$, round down to 47nF $\rightarrow f_c = 677HZ$

Designer: Ash Lang	
Waterloo Rocketry	
Sheet: /channel 2/	
File: pyros.kicad_sch	
Title: SRAD Altimeter	
Size: A4	Date: 2025-02-20
KiCad E.D.A. 9.0.0	Rev: 6/6