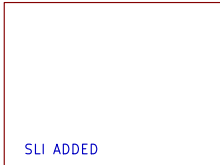
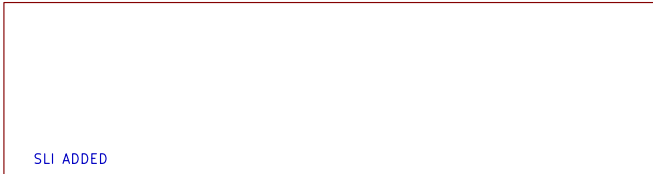
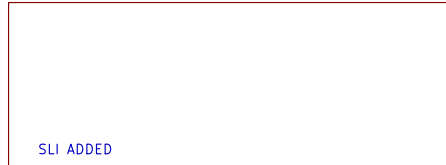
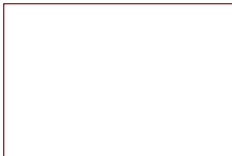
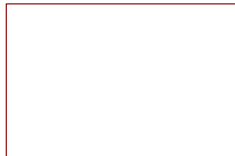
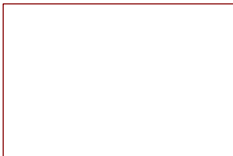
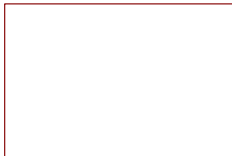
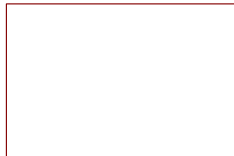
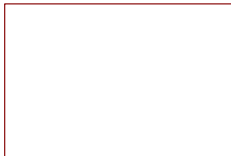
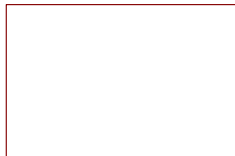
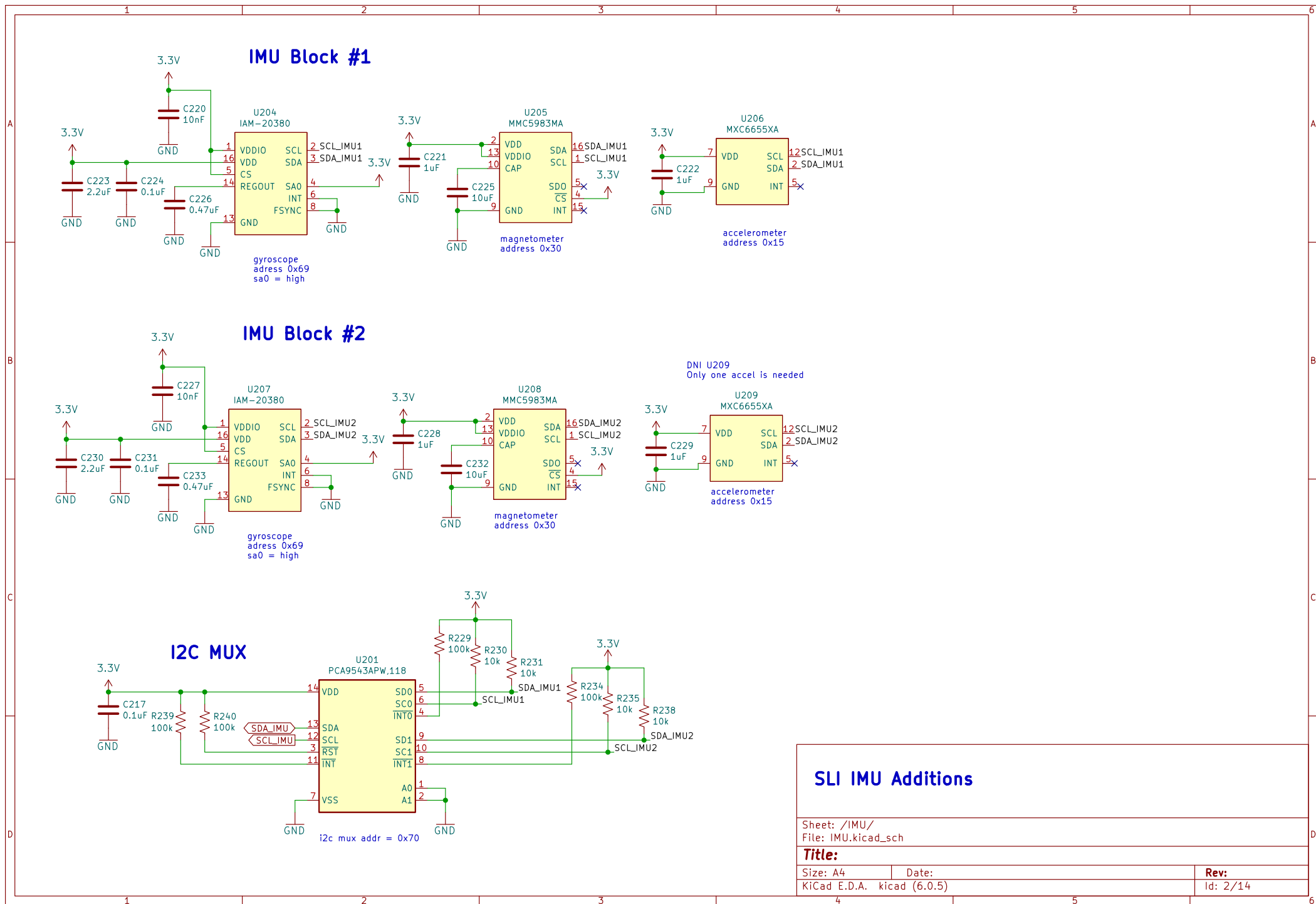
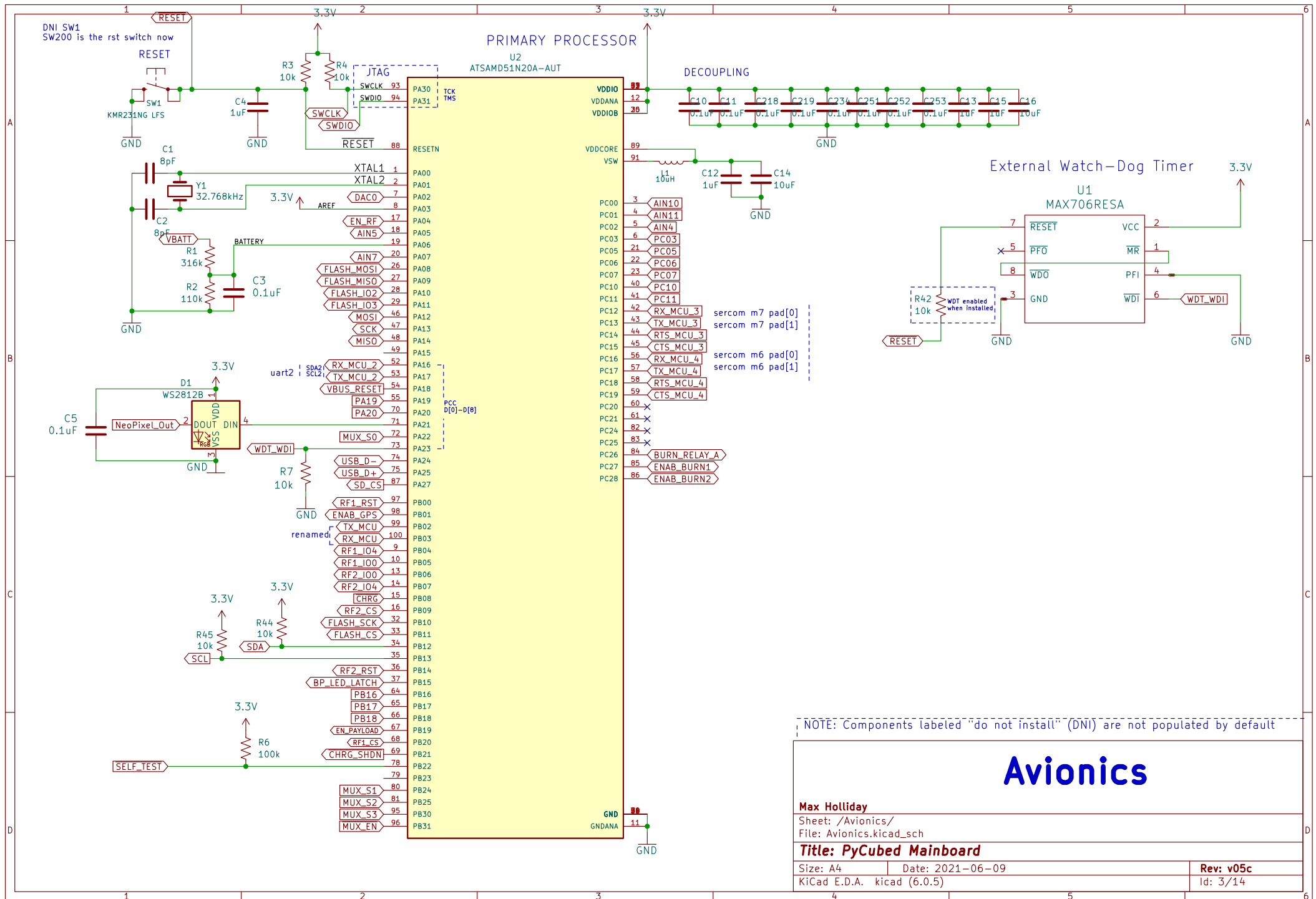


1	2	3	4	5	6		
A							
IMU		SLI_Card		Solar Charge Regulator			
							
File: IMU.kicad_sch		File: SLI-Backplane-Blank-Card-KiCad.kicad_sch		File: Solar Charge Regulator.kicad_sch			
adc_mux							
							
File: analog_mux.kicad_sch							
SLI CHANGES ~~~							

Avionics		Connectors		Power			
							
File: Avionics.kicad_sch		File: Connectors.kicad_sch		File: Power.kicad_sch			
				Burn Wires			
							
				RF and GPS			
							
				File: RF_and_GPS.kicad_sch			
Bus Protection							
							
File: Bus_Protection.kicad_sch							
D							
PyCubed							
Max Holliday							
Sheet: /							
File: mainboard.kicad_sch							
Title: PyCubed Mainboard							
Size: A4				Date: 2021-06-09			
KiCad E.D.A. kicad (6.0.5)				Rev: v05c			
				Id: 1/14			
1	2	3	4	5	6		





NOTE: Components labeled "do not install" (DNI) are not populated by default

Avionics

Max Holliday

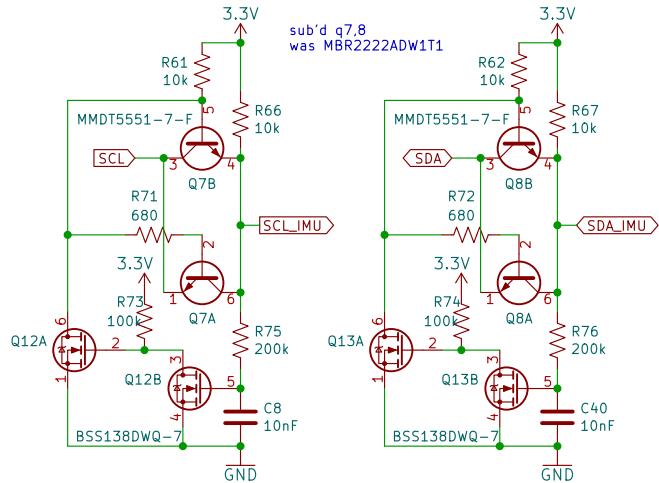
Sheet: /Avionics/
File: Avionics.kicad_sch

Title: PyCubed Mainboard

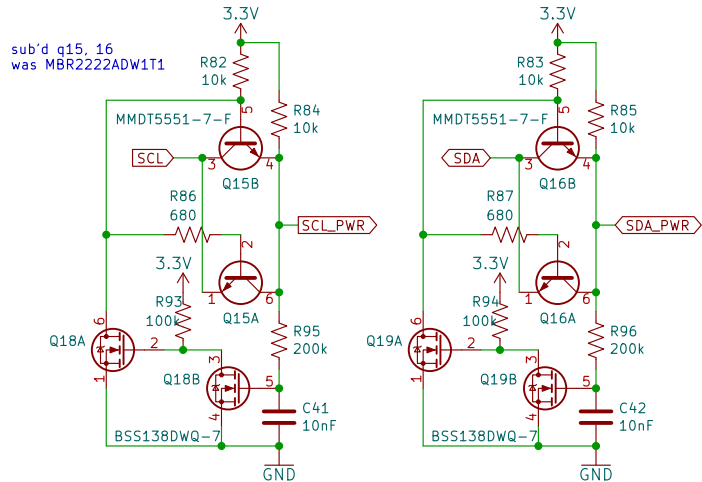
Size: A4 Date: 2021-06-09
KiCad E.D.A. kicad (6.0.5)

Rev: v05c
Id: 3/14

I2C Bus Protection – IMU



I2C Bus Protection – Power Monitor & USB Charger



NOTE

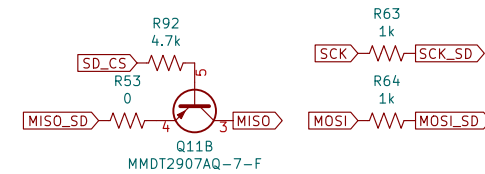
These novel bus protection circuits prevent traditional I2C/SPI failure modes where a single slave failure can disable the entire bus.

Learn more:
<https://doi.org/10.36227/techrxiv.15166620>

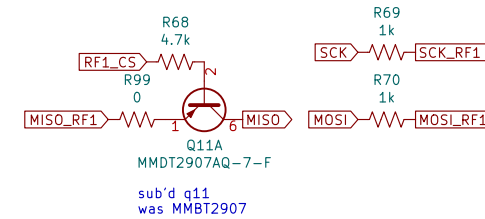
By default, slave clock and/or data lines can be held low and the Master (SAMD51) will still be able to communicate with the remainder of the bus.

They can individually be bypassed by removing the transistor(s) and soldering the 0ohm the jumpers below.

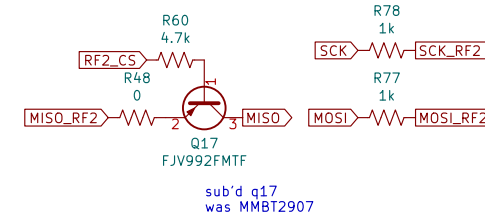
SPI Bus Protection – SD Card and Payloads



SPI Bus Protection – Radio 1



SPI Bus Protection – Radio 2



Bus Protection – Bypass Jumpers



NOTE: Components labeled "do not install" (DNI) are not populated by default

Bus Protection

Max Holliday

Sheet: /Bus Protection/
File: Bus_Protection.kicad_sch

Title: PyCubed Mainboard

Size: A4 Date: 2021-06-09

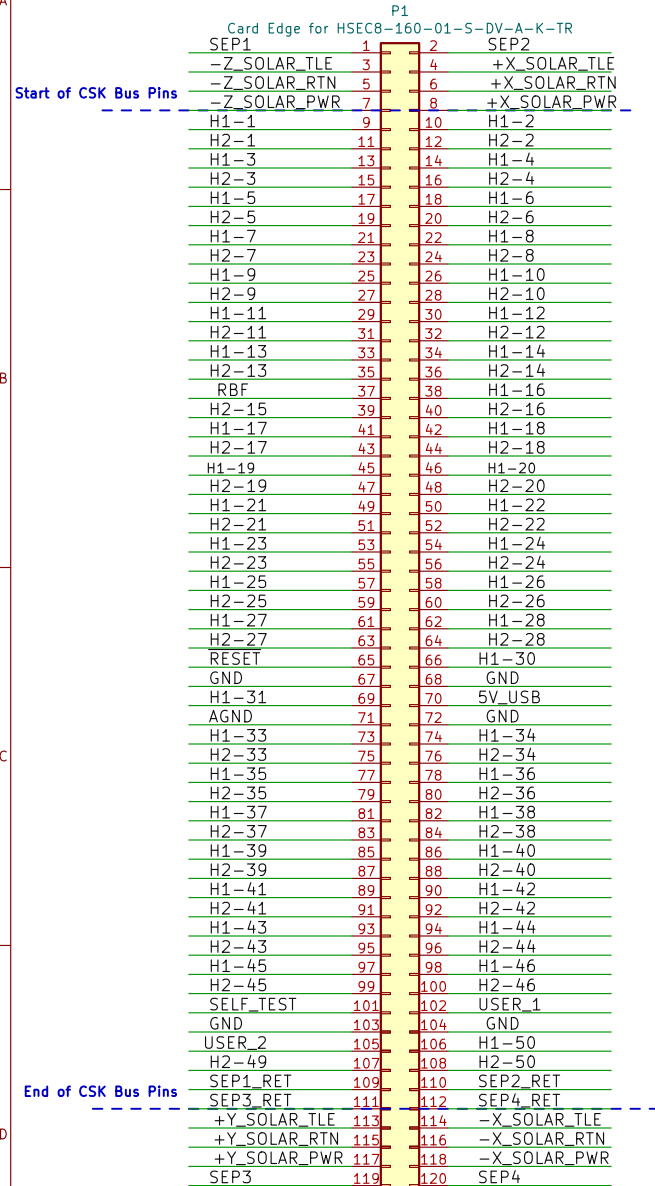
KiCad E.D.A. kicad (6.0.5)

Rev: v05c

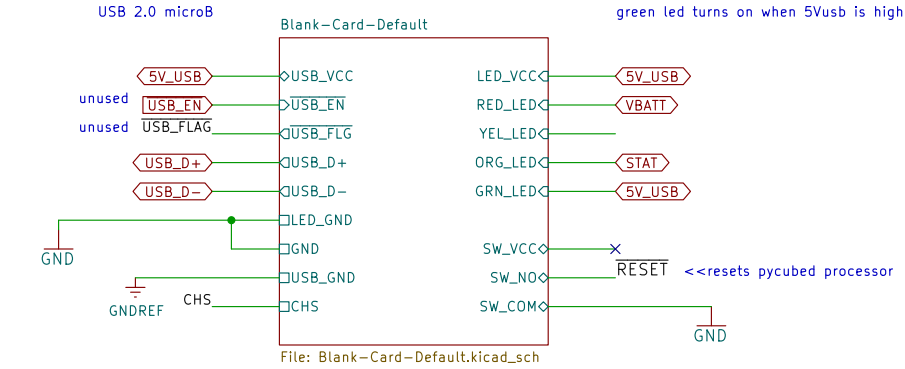
Id: 4/14

SLI Backplane Card Default Edge Connector

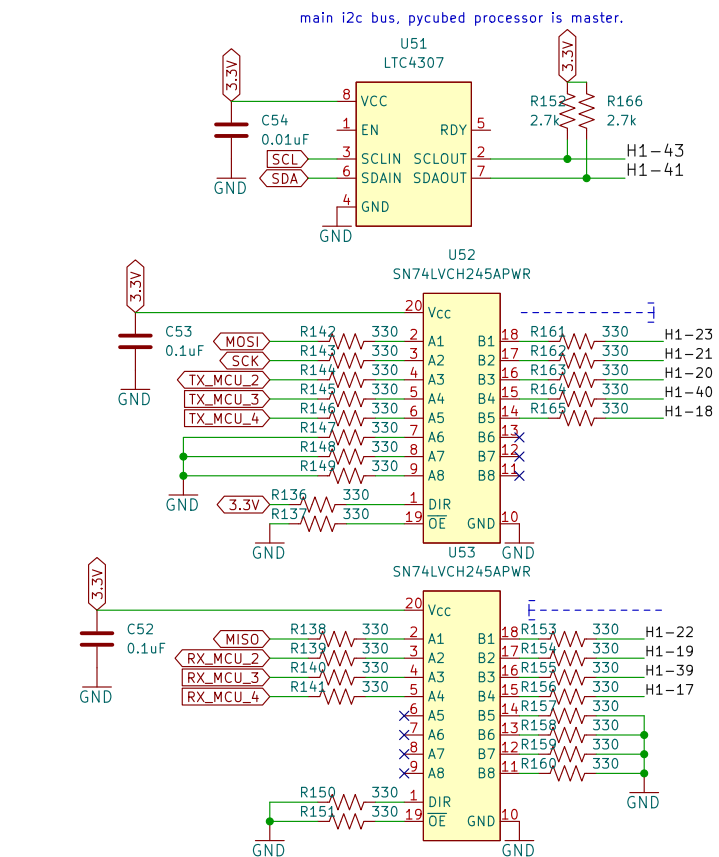
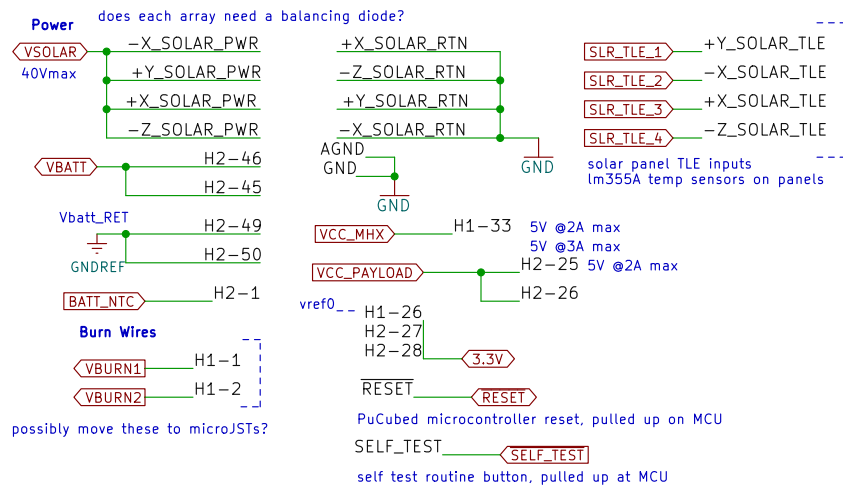
First 104 pins follow pumpkin CSK bus (Rev E) pins
Some user and IO pins have been assigned by SLI
(that are not used by any other functions)

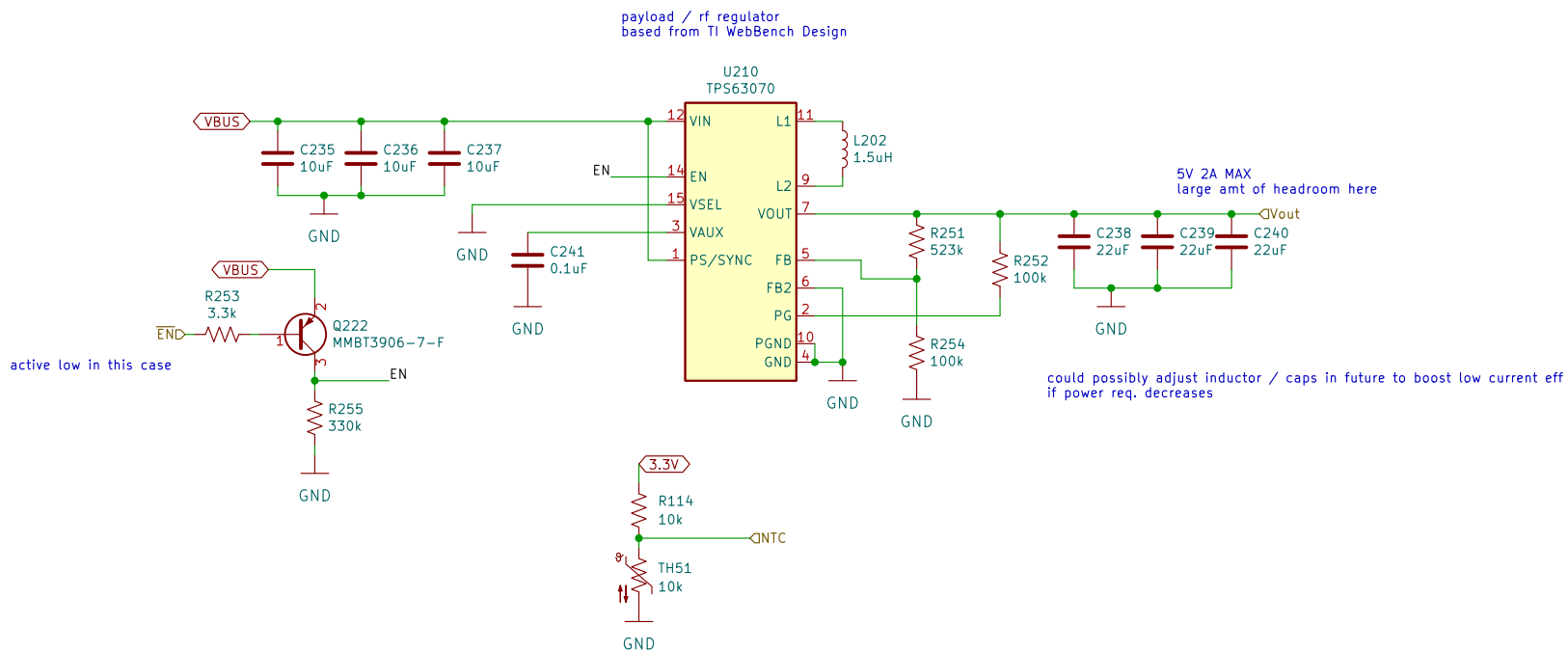


SLI Backplane Card Default Circuitry



Edge Connector to Schematic Signals





Sheet: /SLI_Card/Payload_Regulator/
File: 5V_regulator.kicad_sch

Title:

Size: A4

Date:

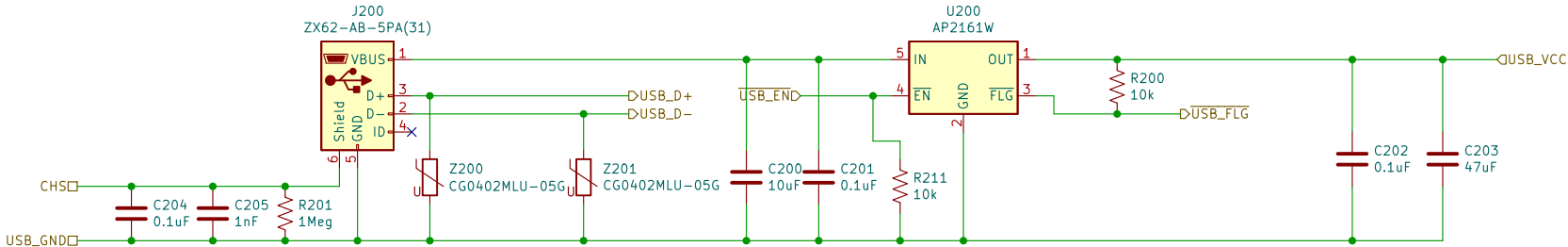
KiCad E.D.A. kicad (6.0.5)

Rev:

Id: 6/14

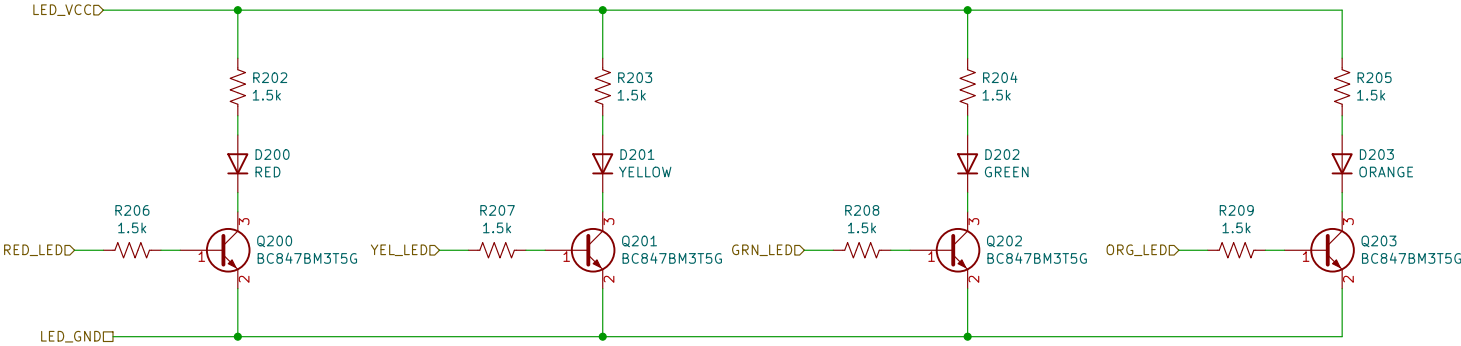
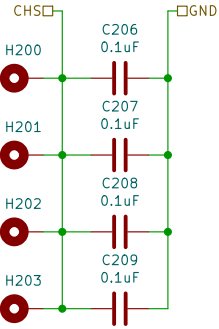
USB protection

U200 limits USB current to 1.5A (1A rec by mfr.)

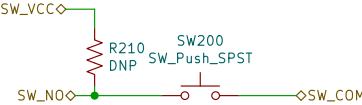


LEDs

Mounting Holes



Switch



Sheet: /SLI_Card/Blank-Card-Default/
File: Blank-Card-Default.kicad_sch

Title:

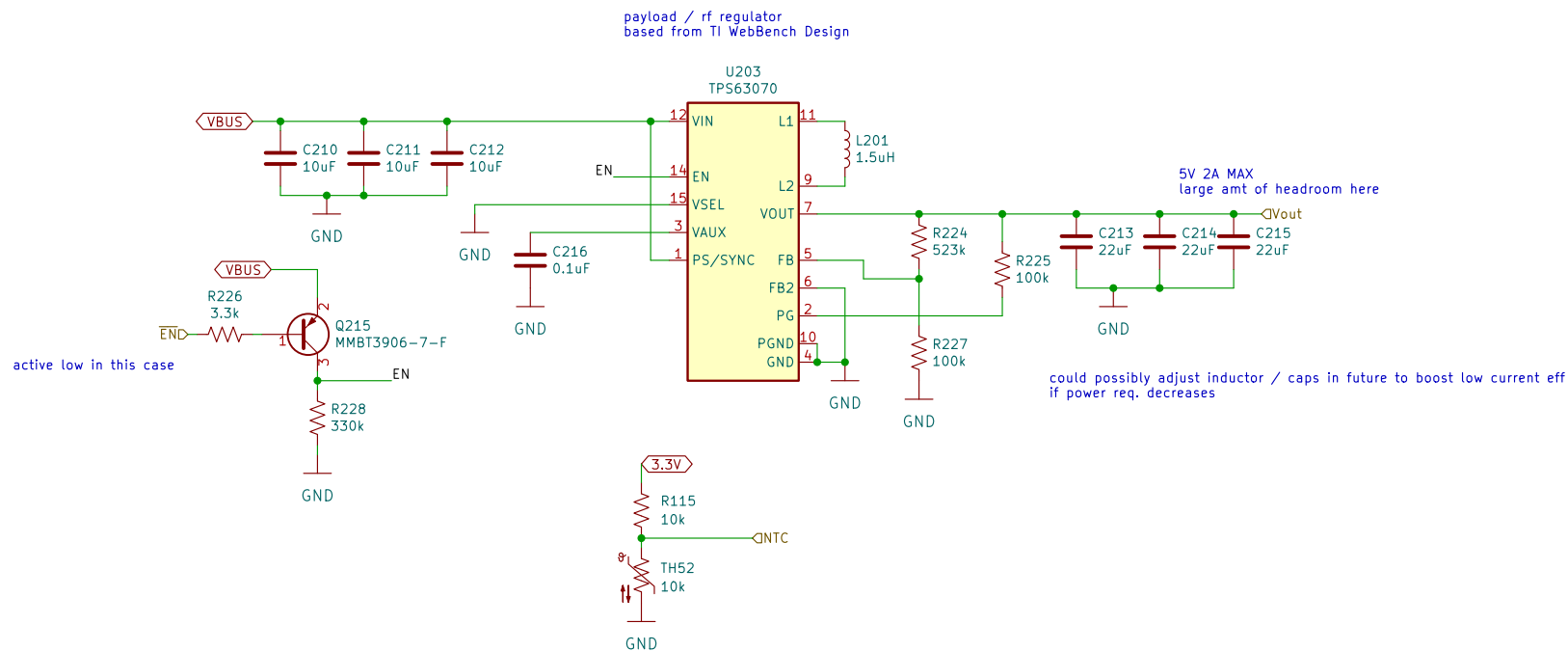
Size: A4

Date:

KiCad E.D.A. kicad (6.0.5)

Rev:

Id: 7/14



Sheet: /SLI_Card/RF_Regulator/
File: 5V_regulator.kicad_sch

Title:

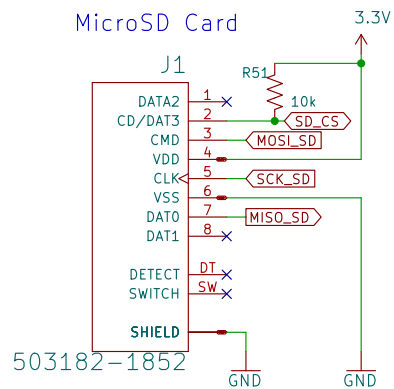
Size: A4

Date:

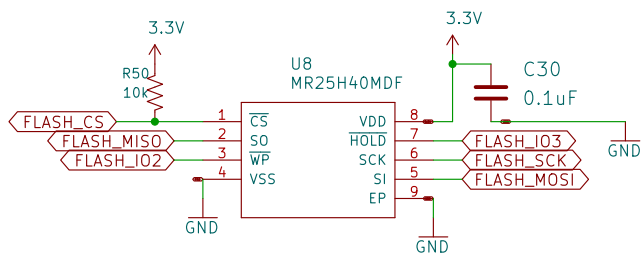
KiCad E.D.A. kicad (6.0.5)

Rev:

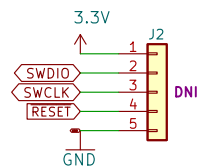
Id: 8/14



MRAM – Nonvolatile Memory
(4MB storage)



JTAG



NOTE: Components labeled "do not install" (DNI) are not populated by default

Connectors

Max Holliday

Sheet: /Connectors/

File: Connectors.kicad_sch

Title: PyCubed Mainboard

Size: A4

Date: 2021-06-09

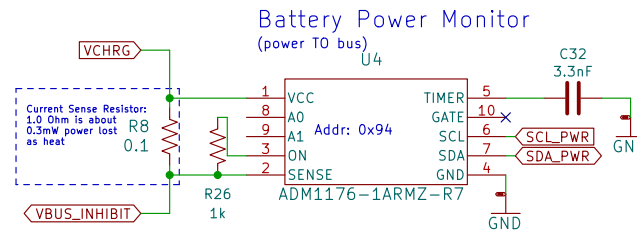
Rev: v05c

KiCad E.D.A. kicad (6.0.5)

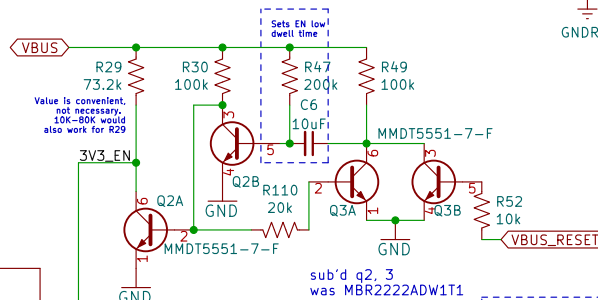
Id: 9/14

Solar Charge Regulator
replaced

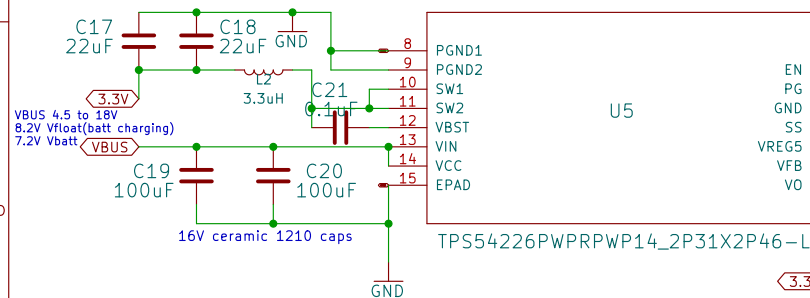
RF Regulator
replaced



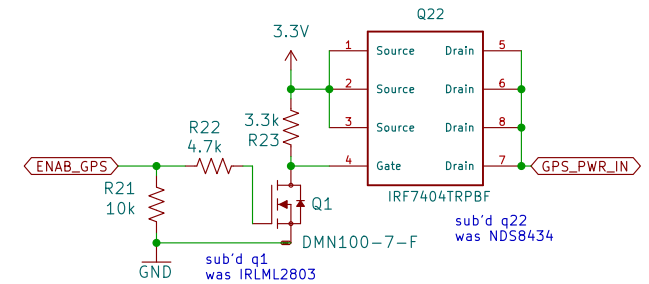
"One Shot" Regulator Reset



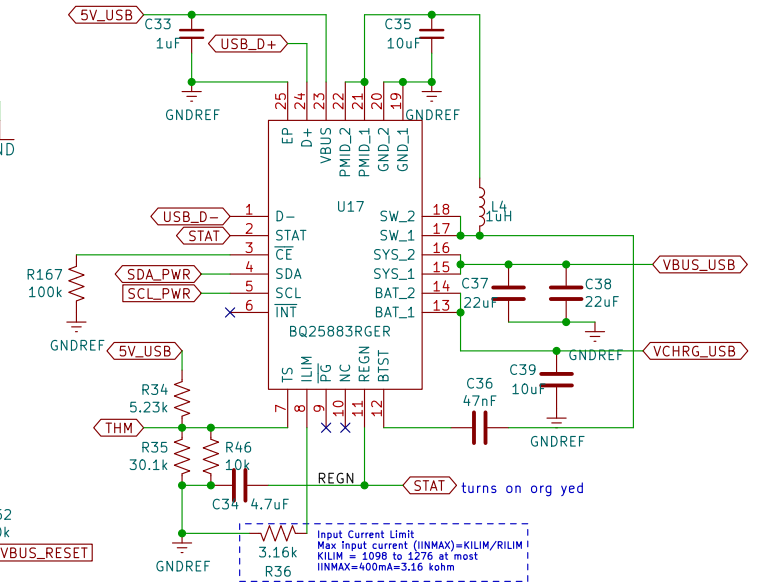
Regulator – 3.3V OUT



GPS Power Switch



USB (Boost) Charging for 2-cell Li-Ion



[NOTE: Components labeled "do not install" (DNI) are not populated by default]

Power

Max Holliday

Sheet: /Power/
File: Power.kicad_sch

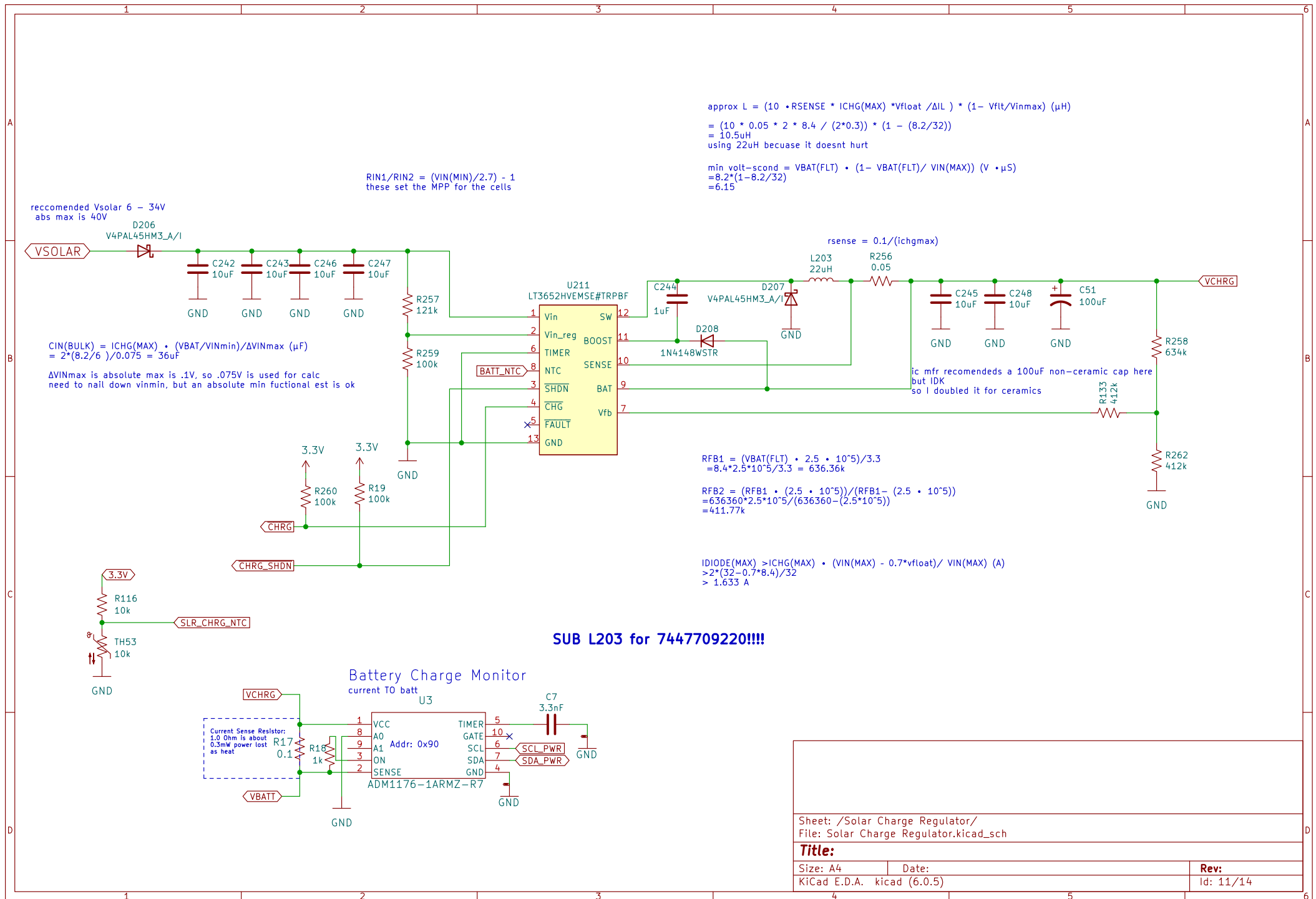
Title: PyCubed Mainboard

Size: A4
KiCad E.D.A. kicad (6.0.5)

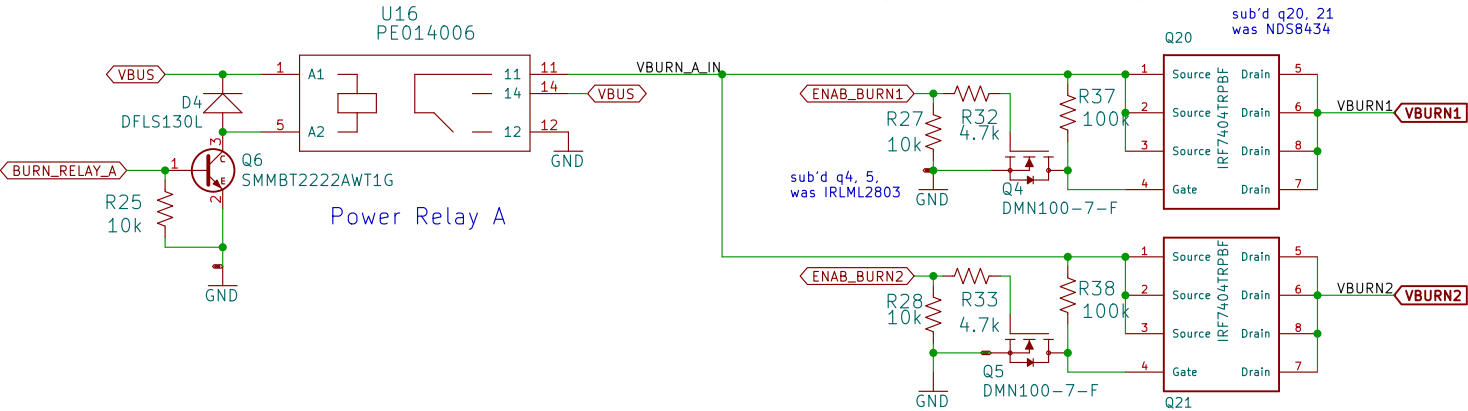
Date: 2021-06-09

Rev: v05c

Id: 10/14



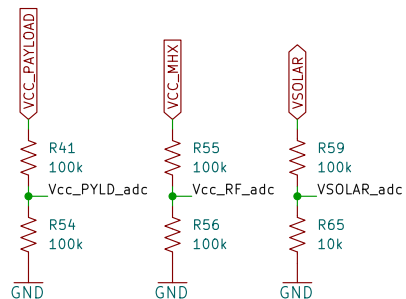
Burn Wire Control (Antenna Depolyment)



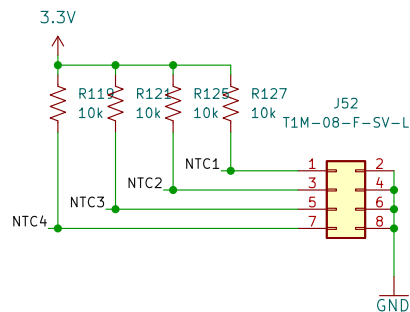
NOTE: Components labeled "do not install" (DNI) are not populated by default

Burn Wires

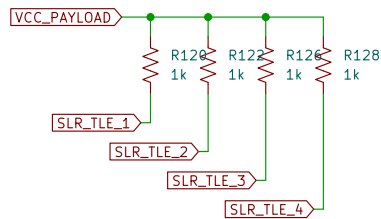
Max Holliday		
Sheet: /Burn Wires/		
File: Burn_Wires.kicad_sch		
Title: PyCubed Mainboard		
Size: A4	Date: 2021-06-09	Rev: v05c
KiCad E.D.A. kicad (6.0.5)		Id: 12/14



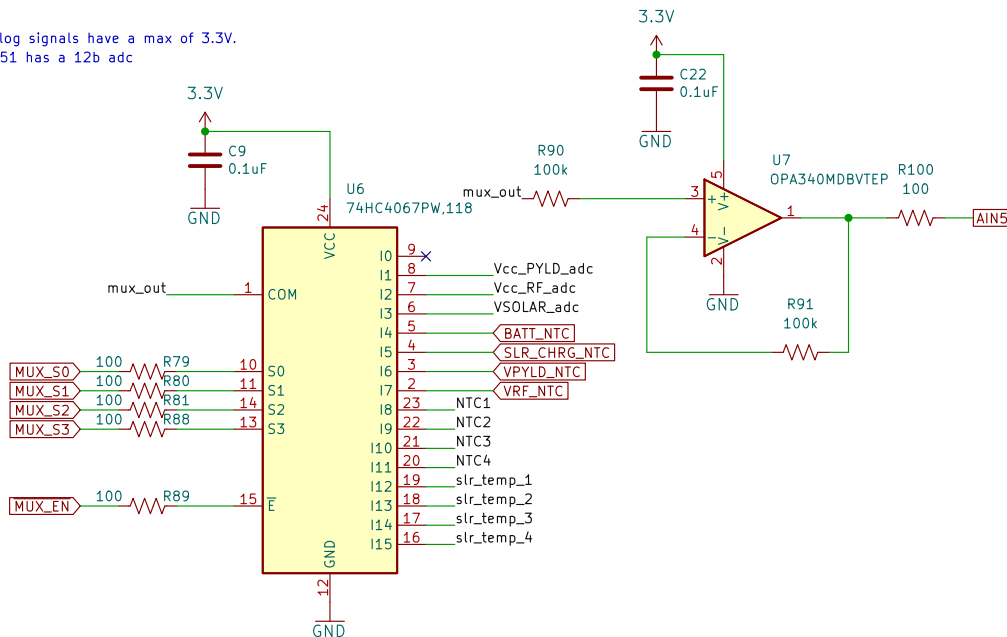
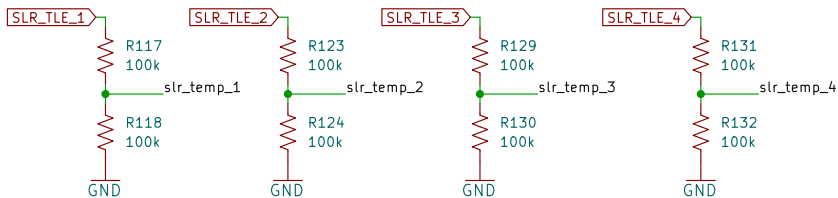
all analog signals have a max of 3.3V.
atdamd51 has a 12b adc



lm355a is rated to 100degC
arbitrarily selecting max temp sensed as 400K - 125C



really should have an op amp here but board space is already constrained



Sheet: /adc_mux/
File: analog_mux.kicad_sch

Title:

Size: A4

Date:

KiCad E.D.A. kicad (6.0.5)

Rev:

Id: 14/14