Avionics

File: Avionics.kicad_sch

Connectors

File: Connectors.kicad_sch

Power

File: Power.kicad_sch

Burn Wires

File: Burn_Wires.kicad_sch

RF

File: RF_and_GPS.kicad_sch

Watchdog

File: watchdog.kicad_sch

Ethan Brinser

Stanford Student Space Initiative

PiCubed

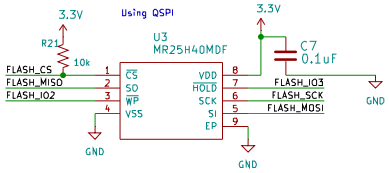
Sheet: /
File: mainboard.kicad_sch

Title: PyCubed Mainboard

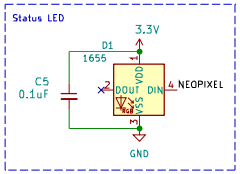
Size: A4	Date: 2025-03-18	**Rev: v6.4**
KiCad E.D.A. 8.0.4		Id: 1/7

TODO:
– Check RF module for wakeup pins

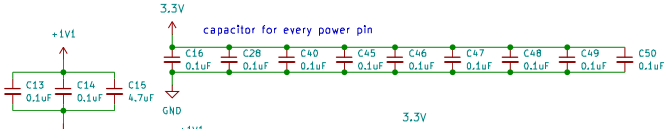
MRAM – Nonvolatile Memory
(4Mbit storage)



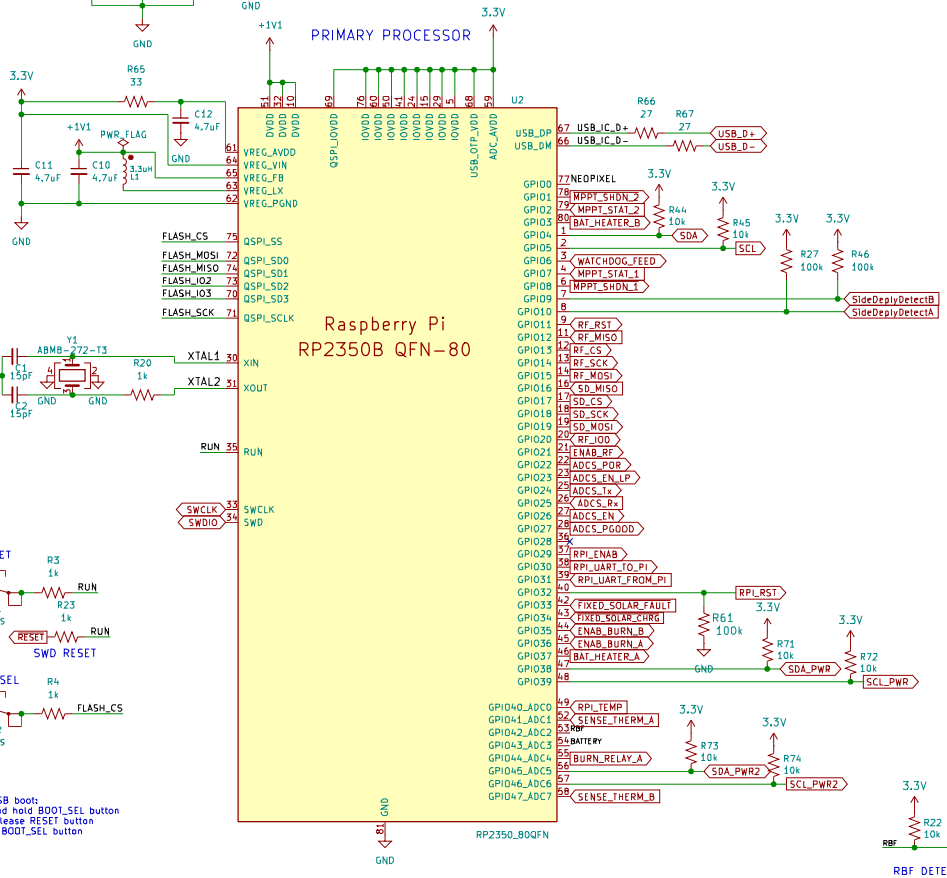
Status LED

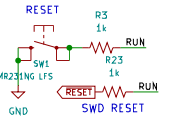


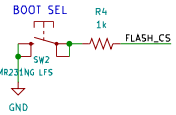
capacitor for every power pin



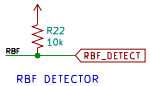
PRIMARY PROCESSOR



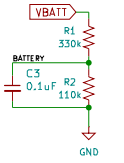




To enter USB boot:
1. Press and hold BOOT_SEL button
2. Press release RESET button
3. Release BOOT_SEL button



RBF DETECTOR



BATTERY MONITOR

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

Avionics

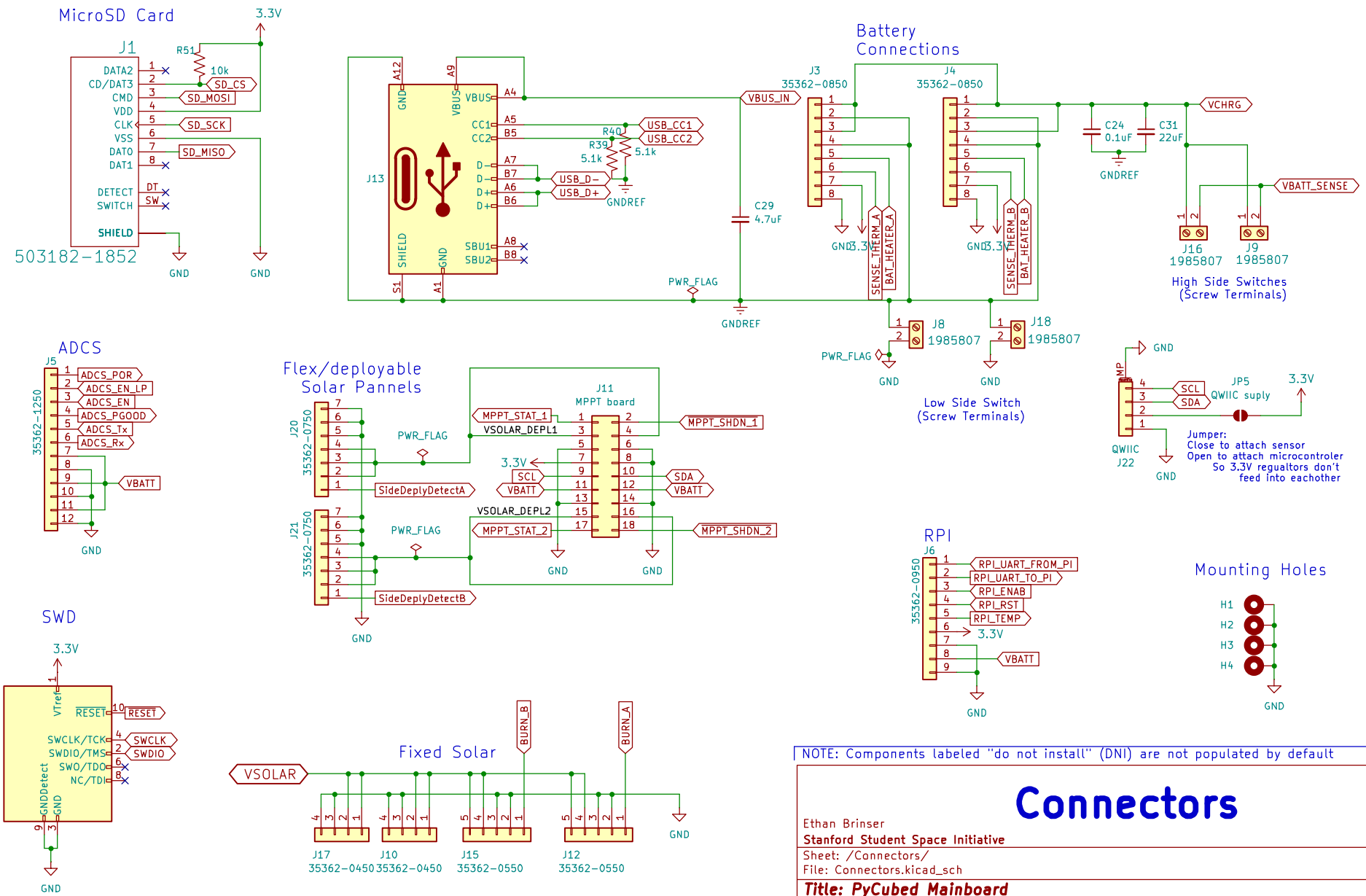
Ethan Brinser
Stanford Student Space Initiative

Sheet: /Avionics/
File: Avionics.kicad_sch

Title: PyCubed Mainboard

Size: USLedger	Date: 2024-11-24	Rev: v06c
KiCad E.D.A. 8.0.4		Id: 1/7

Power Connectors: USB-C Power Delivery to 2S Li-ion Battery



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

Connectors

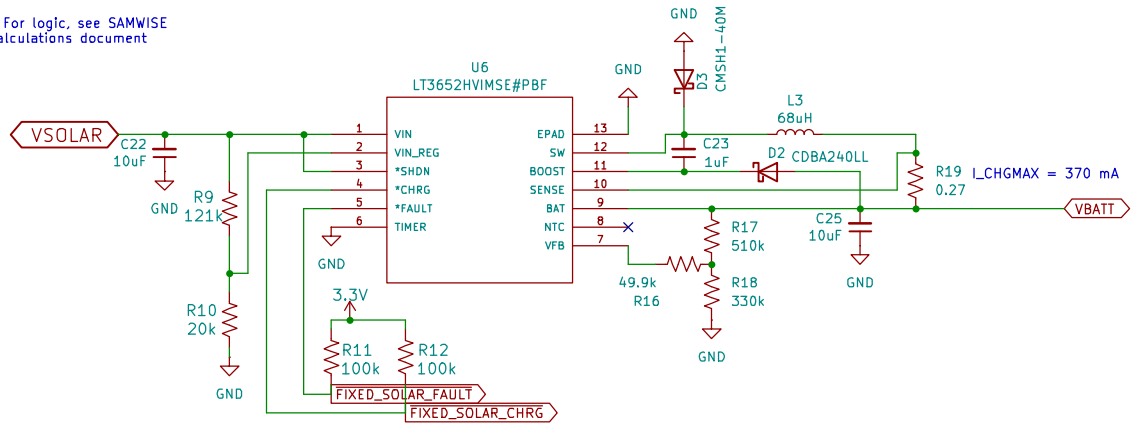
Ethan Brinser
Stanford Student Space Initiative

Sheet: /Connectors/
File: Connectors.kicad_sch

Title: PyCubed Mainboard

Size: A4	Date: 2024-11-24	**Rev: v06c**
KiCad E.D.A. 8.0.4		Id: 1/7

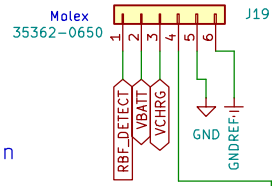
V_FPPT = 19.035. For logic, see SAMWISE
X panel LT3652 Calculations document
in Google Drive



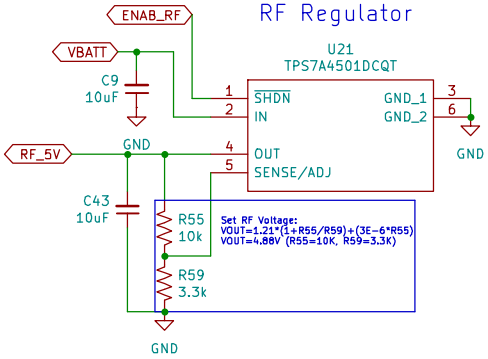
RBF Jumpers

RBF jumpers features:
- Turn on system:
  - "GND" bypasses ground switch. On J19 short 5 & 6. On J14 short 5 & 6
  - "VCC" bypasses power switch. On J19 short 2 & 3. On J14 short 4 & 5 or (3 & 4 and 5 & 6)
- "VUSB" enables USB charging. On J19 short 3 & 4. On J14 short 5 & 6
- "RFB_DET" tells RP2350 status of RBF connector. On J19 short 1 & 5. On J14 short 1 & 2

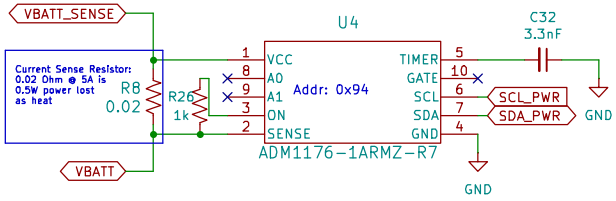
RBF_DET should only be removed once in launch pod
All jumpers should be removed prior to flight



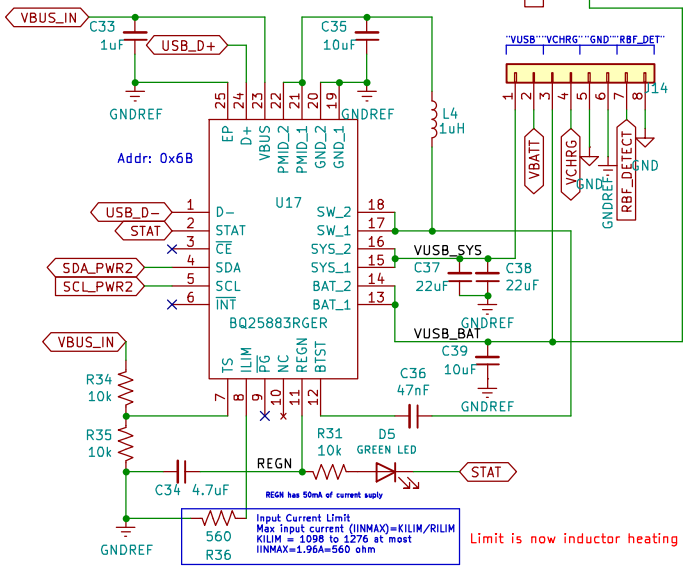
RF Regulator



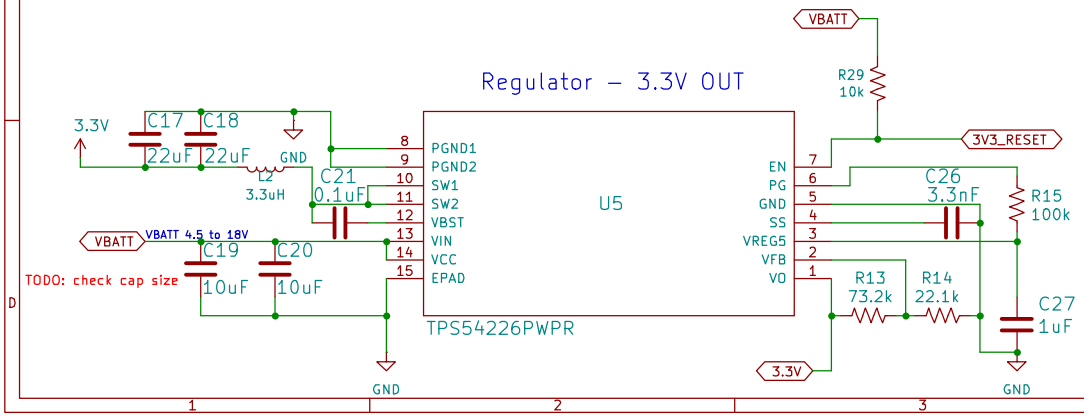
Battery Power Monitor



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



Regulator - 3.3V OUT



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

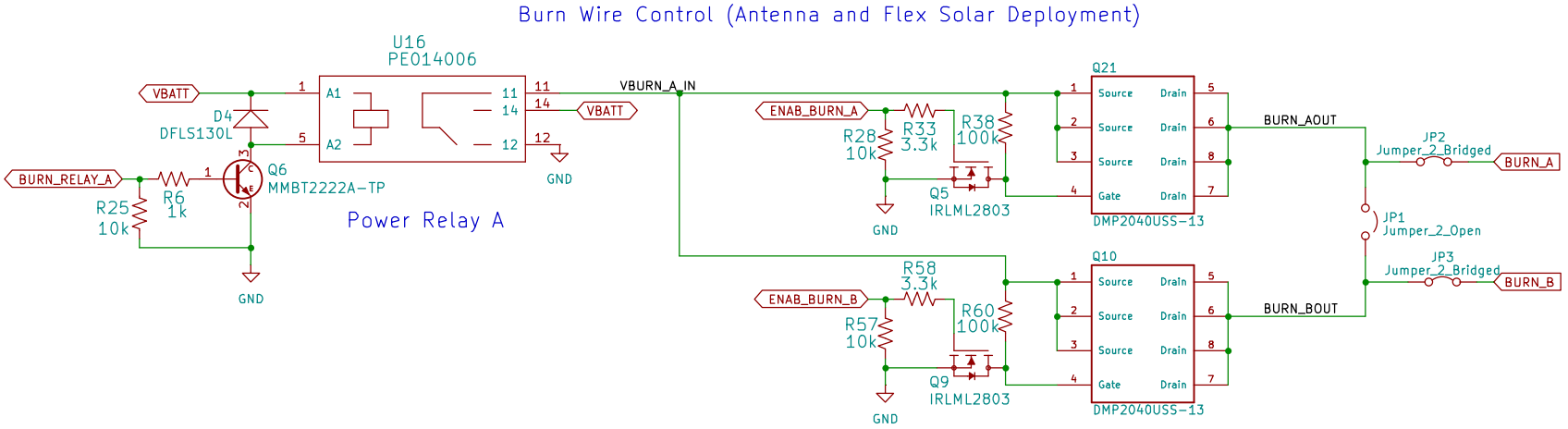
Power

Ethan Brinser
Stanford Student Space Initiative

Sheet: /Power/
File: Power.kicad_sch

Title: PyCubed Mainboard

Size: A4	Date: 2024-11-24	Rev: v06c
KiCad E.D.A. 8.0.4		Id: 1/7



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

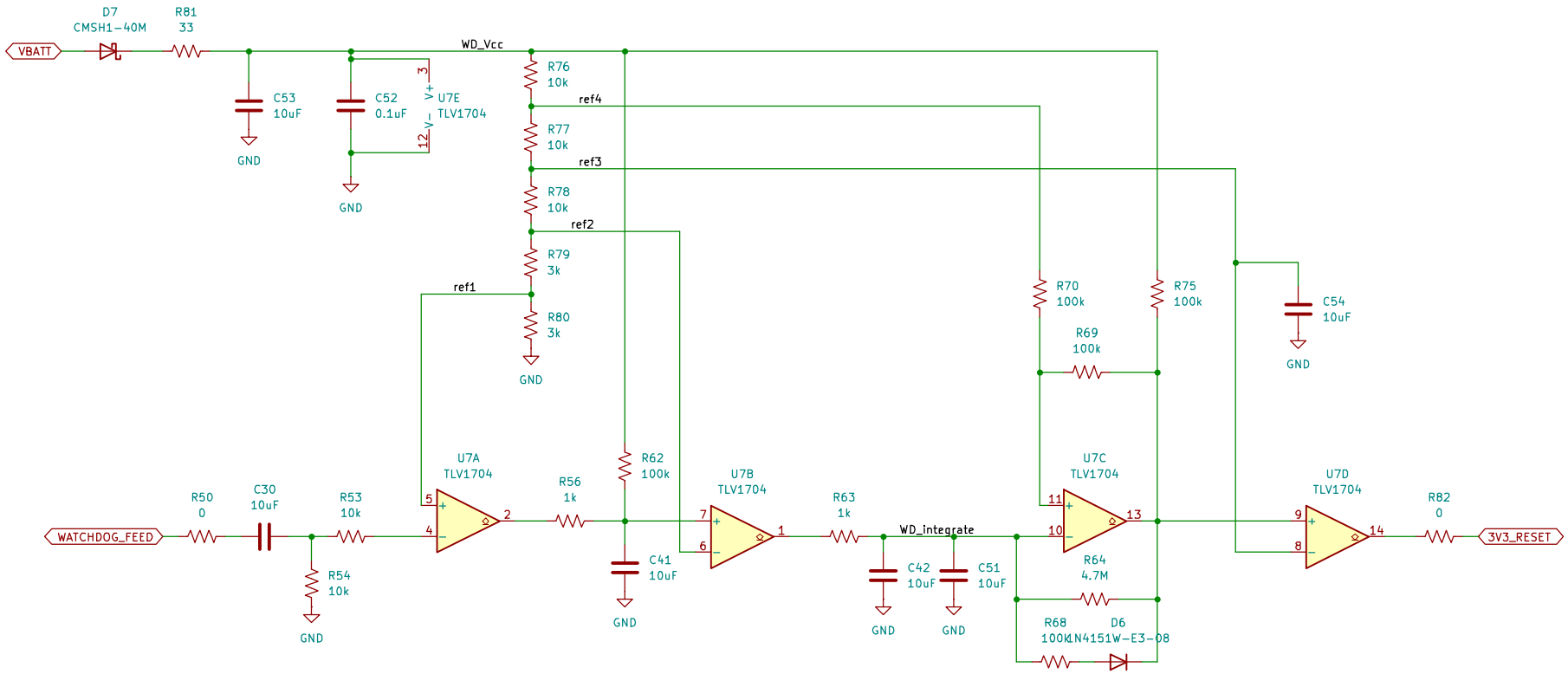
Burn Wires

Ethan Brinser
Stanford Student Space Initiative

Sheet: /Burn Wires/
File: Burn_Wires.kicad_sch

Title: PyCubed Mainboard

Size: A4	Date: 2024-11-24	Rev: v06c
KiCad E.D.A. 8.0.4		Id: 1/7

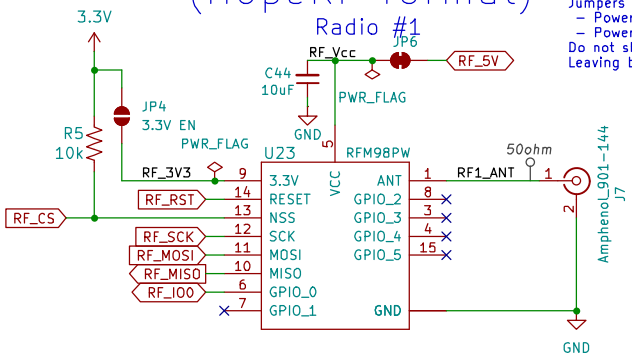


Circuit based on Oresat's watchdog circuit:
https://github.com/oresat/oresat-c3-hardware/blob/master/kicad/oresat-c3-sch-watchdog.kicad_sch

Ethan Brinser
Stanford Student Space Initiative

Sheet: /Watchdog/		
File: watchdog.kicad_sch		
Title: PyCubed Mainboard		
Size: USLetter	Date: 2024-11-24	**Rev: v06c**
KiCad E.D.A. 8.0.4		Id: 1/7

Modular Radio (HopeRF format)



Jumpers for power select:
- Power from 5V LDO (defualt), short JP6, open JP4, lower power supply noise and power control
- Power from 3.3V switcher, open JP6, short JP4, higher effiency but always on

Do not short both JP4 and JP6 at the same time
Leaving both JP4 and JP6 leaves the radio unpowered

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

Radio, GPS, Payloads

Ethan Brinser
Stanford Student Space Initiative

Sheet: /RF/
File: RF_and_GPS.kicad_sch

Title: PyCubed Mainboard

Size: A4	Date: 2024-11-24	Rev: v06c
KiCad E.D.A. 8.0.4		Id: 1/7