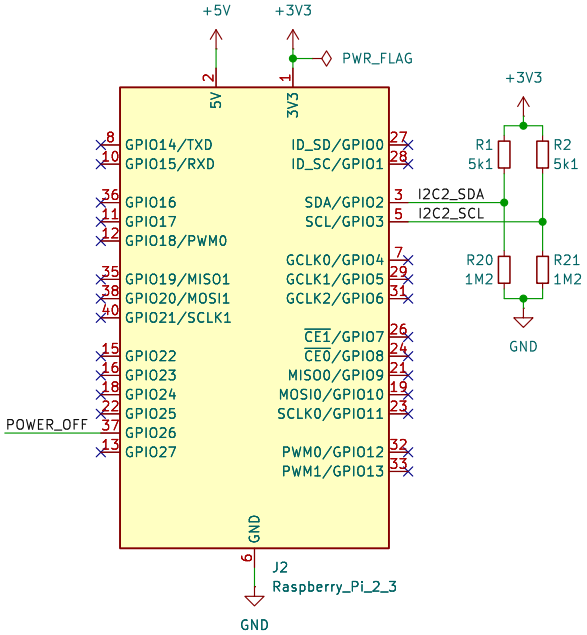
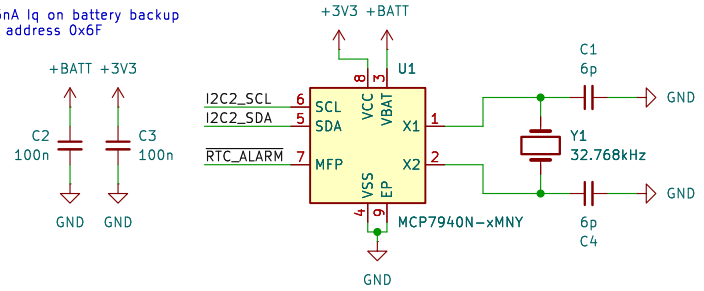
Raspberry Pi

- I2C pullups plus very weak pull downs
- Prevent I2C engine errors when floating during sleep



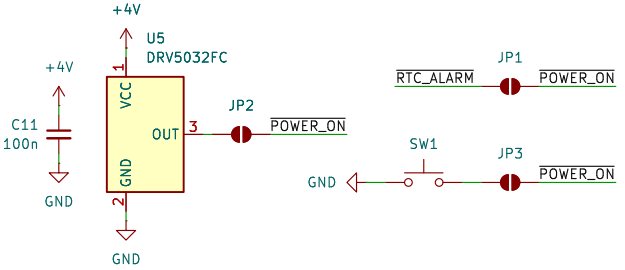
Real Time Clock

- 925nA Iq on battery backup
- I2C address 0x6F



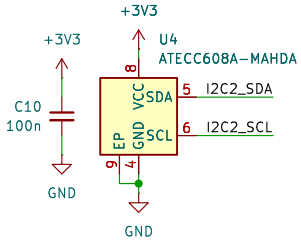
Wakeup Sources

- Open drain interrupts, pull up on $\overline{\text{POWER\_ON}}$ load switch pin



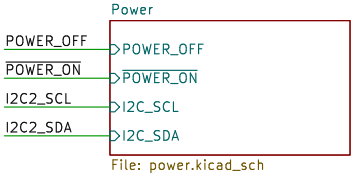
NervesKey

- certificate storage for connection to NervesHub



Mounting Holes

Power Management



A power-management system for Nerves, featuring low-power sleep mode, USB and solar battery charging, manual wake-from-sleep and support for NervesHub

Designed by Gus Workman

Protolux Electronics

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Title: Soleil

Size: A4	Date: 2024-08-01	**Rev:**
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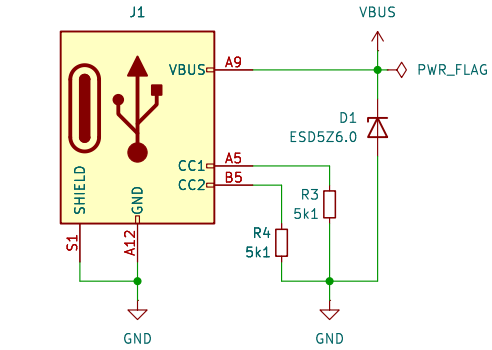
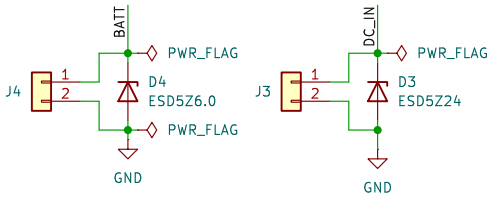
Connectors

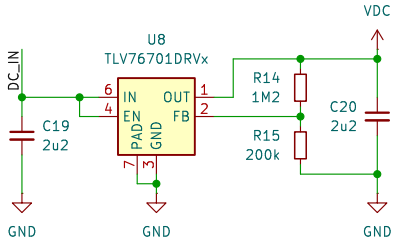
- USB-C charger, JST PH for battery and solar
- Battery cable compatible with Adafruit 1S lipo batteries
- DC_IN optimized for 6V, 1.5W solar panel
- DC_IN can be used with any DC power source up to 16V





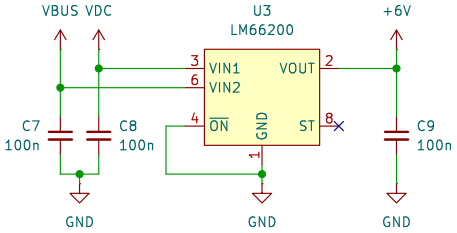
Linear Regulator

- VDC set point to 5.6V
- VDC tracks DC_IN when DC_IN < 5.6 + V_DO
- V_DO is 0.4V @ 500mA
- VDC 2.5V – 16V
- Iout up to 1A
- Iq is 50 uA (1.5uA in shutdown)



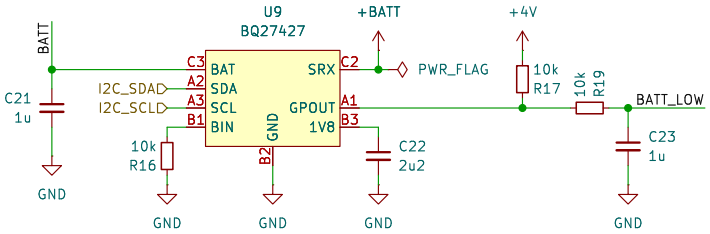
Power Multiplexer

- Input 1.6V – 5.5V
- Up to 2.5A per channel
- 1.32uA Iq



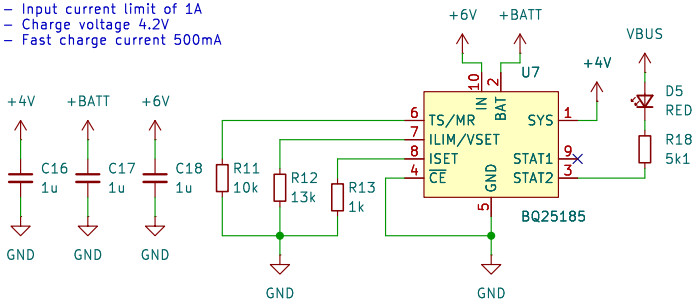
Battery Fuel Gauge

- Integrated sense resistor
- 50uA in normal mode, 9uA in sleep mode
- Auto sleep mode when low current (< 10mA)
- I2C address 0x55
- Lowpass filter on GPOUT to prevent disabling the system on SOC updates (1-ms pulse low)
- RC time constant of 10ms



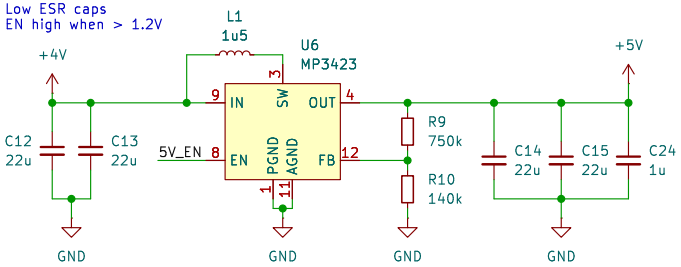
Battery Charger

- Input current limit of 1A
- Charge voltage 4.2V
- Fast charge current 500mA



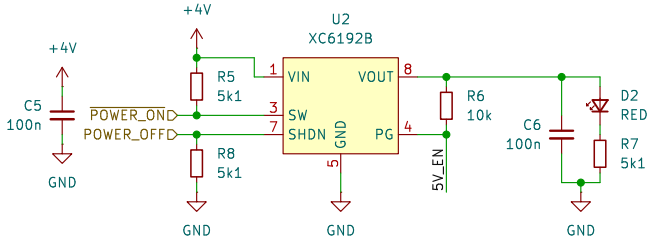
5V Boost Converter

- Output 5.13V, 3A
- 0.807*(1+R1/R2)
- R1 > 600k
- Low ESR caps
- EN high when > 1.2V



Load Switch

- Iq 10nA in shutdown
- POWER_ON pull low to wake from sleep
- Pulse SHDN high to enter sleep mode



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