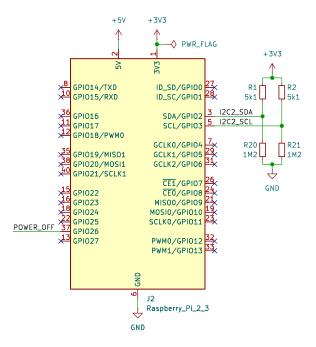
## Raspberry Pi

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



# **Mounting Holes**

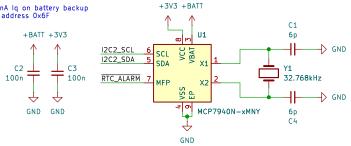


#### Power POWER\_OFF >POWER\_OFF POWER\_ON >POWER ON I2C2\_SCL >I2C\_SCL I2C2\_SDA >12C\_SDA File: power.kicad\_sch

**Power Management** 

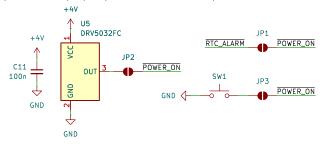
## Real Time Clock

925nA Iq on battery backup12C address 0x6F



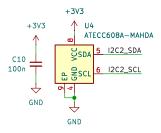
## **Wakeup Sources**

- Open drain interrupts, pull up on POWER\_ON load switch pin



### NervesKey

- certificate storage for connection to NervesHub



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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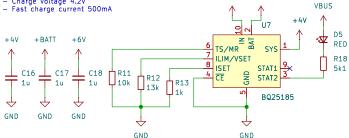
#### Linear Regulator Connectors USB-C charger, JST PH for battery and solar Battery cable compatible with Adafruit 1S lipo batteries DC\_IN optimized for 6V, 1.5W solar panel DC\_IN can be used with any DC power source up to 16V - VDC set point to 5.6V - VDC tracks DC\_IN when DC\_IN < 5.6 + V\_DO - V\_DO is 0.4V @ 500mA - VDC 2.5V - 16V - lout up to 1A - Iq is 50 uA (1.5uA in shutdown) J1 VBUS VDC U8 → PWR\_FLAG TLV76701DRVx R14 D1 本 1M2 C20 ESD5Z6.0 2u2 C19 ± 2u2 R15 CC1 200k SHIELD CC2 5k1 $\rightarrow$ GND GND GND 5k1 GND GND ♦ PWR\_FLAG → PWR\_FLAG Power Multiplexer D3 ESD5Z24 - Input 1.6V - 5.5V 4 ESD5Z6.0 - Up to 2.5A per channel - 1.32uA lq ♦ PWR\_FLAG VBUS VDC U3 +67 GND LM66200 GND VIN1 VOUT /IN2 ŌΝ ST C9 C7 С8 **∓** 100 n 100n 100n **Battery Fuel Gauge** - Integrated sense resistor - 50uA in normal mode, 9uA in sleep mode GND GND GND - 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 U9 +BATT +4V BQ27427 SRX C2 10k ]10k R17 52 A2 SDA I2C\_SDAD-A3 SCL C21 BATT\_LOW I2C\_SCLD-**GPOUT** 1 u B1 BIN GND 1V8 B3 C23 C22 10k 1u R16 2u2 $\Diamond$ GND $\Diamond$ GND GND GND GND

BATT\_LOW

5V\_EN

## **Battery Charger**

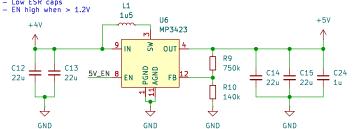
- Input current limit of 1A
- Charge voltage 4.2V



+6V +BATT

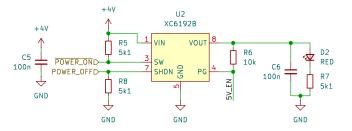
## **5V Boost Converter**

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



## **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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