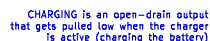


Battery & battery charger

The circuit diagram illustrates a USB-powered battery charger. It features a yellow integrated circuit (IC) labeled "U? XT4054K421MR-G". The IC has several pins connected as follows:

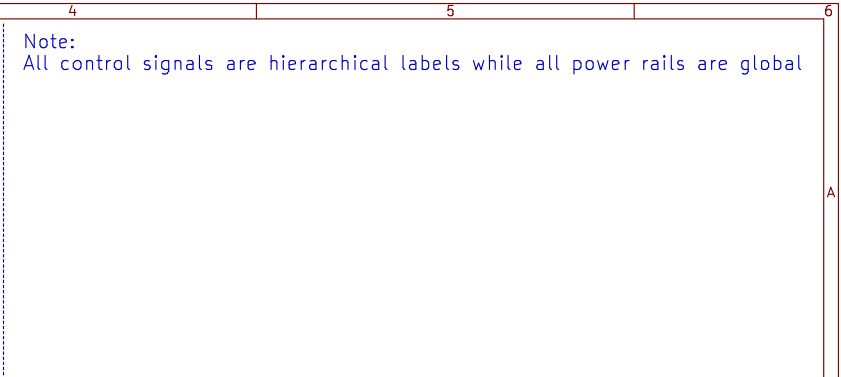
- VUSB**: Connected to pin 4.
- C?**: A capacitor connected between VUSB and GND.
- R?**: A resistor connected between VUSB and pin 5.
- GND**: Connected to pins 2 and 6.
- PROG**: Connected to pin 5.
- VSS**: Connected to pin 2.
- VDD**: Connected to pin 4.
- STAT**: Connected to pin 1.
- CHARGING**: An output signal from pin 1.
- +3.3V**: A regulated output voltage connected to pin 3 via a resistor R? (10k).
- VBAT**: Connected to pin 3.
- C?**: A capacitor connected between +3.3V and GND.
- BT?**: A battery symbol connected between +3.3V and GND.

A note at the bottom right states: "CHARGING is an open-drain output that gets pulled low when the charger is active (charging the battery)".



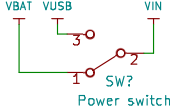
Switched power: 3.3v for SDCARD

The diagram shows a MOSFET circuit for switching a 3.3V power supply to an SDCARD. The MOSFET is labeled SY6280AAC and has pins numbered 1 through 5. Pin 5 is connected to +3.3V. Pin 4 is connected to PWR_SDCARD_ENABLED through a 10kΩ resistor. Pin 3 is connected to GND through a 10kΩ resistor. Pin 1 is connected to PWR_SDCARD. Pin 2 is connected to GND. The MOSFET is labeled U? and SY6280AAC. The output of the MOSFET is labeled OUT. The current I_{set} is calculated as 0.68A = 6800 / 10kOhm.

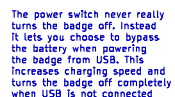


Power switch

The power switch never really turns the badge off. Instead it lets you choose to bypass the battery when powering the badge from USB. This increases charging speed and turns the badge off completely when USB is not connected.

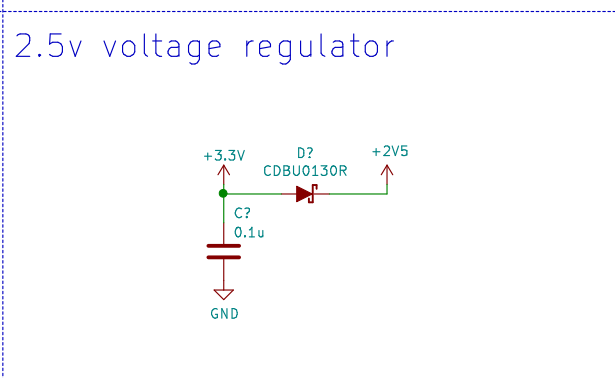


The diagram shows a circuit for a power switch. It features three input terminals at the top: VBAT, USB, and VIN. A green wire connects VBAT to a terminal labeled '1'. A red wire connects USB to a terminal labeled '2'. A red wire also connects VIN to terminal '2'. A red wire connects terminal '1' to terminal '2'. Below this red wire is the label 'SW?'. Below the entire diagram is the label 'Power switch'.



Switched power: Vin for LEDs

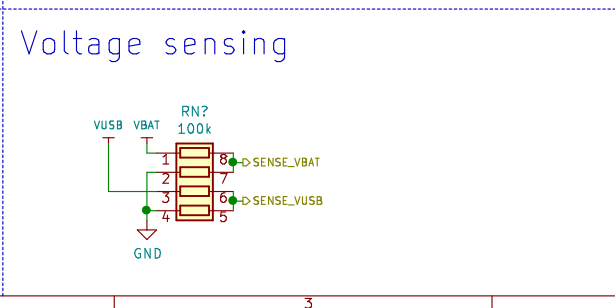
3.3v voltage regulator



2.5v voltage regulator

The diagram shows a circuit for a 2.5V voltage regulator. It consists of a 3.3V input connected to a diode (CDBU0130R) in series with a 0.1uF capacitor (C?). The output of the diode is connected to a 2.5V output terminal. The diode is oriented with its cathode towards the 3.3V input and its anode towards the 2.5V output. The capacitor is connected in parallel with the diode's anode. The ground connection is labeled GND.

1.2v voltage regulator



Voltage sensing

The diagram shows a 100k resistor network (RN?) connected to VUSB and VBAT. The network consists of a vertical stack of four resistors. The top terminal (1) is connected to VUSB. The bottom terminal (4) is connected to GND. The middle terminals (2, 3, 5, 6, 7, 8) are connected to VBAT. The output signals are SENSE_VBAT (connected to terminal 8) and SENSE_VUSB (connected to terminal 6).

