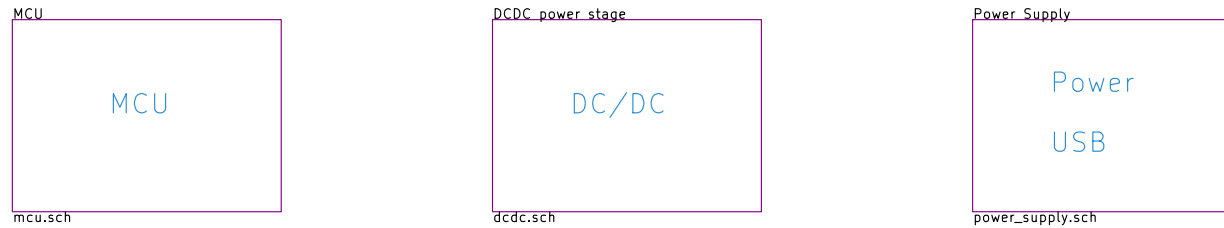
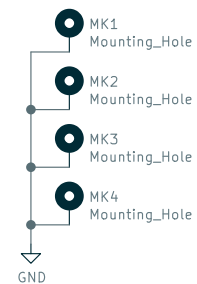


12V / 10A MPPT Solar Charge Controller with USB



Main Specifications

- 12V battery voltage
- 10A max. charge current
- 55V max. solar input
- 32bit ARM MCU (STM32L072)
- Expandable via Olimex Universal Extension Connector (UEXT) featuring I2C, Serial and SPI interface (e.g. used for display, WIFI communication, etc.)
- USB charging
- High-side load switching



10A MPPT Charge Controller with USB

Libre Solar / Connected Energy
Website: <https://libre.solar>

Sheet: /
File: mppt-1210-hus.sch

Author: Martin Jäger

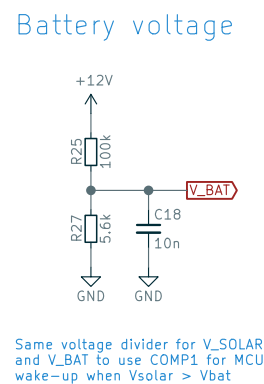
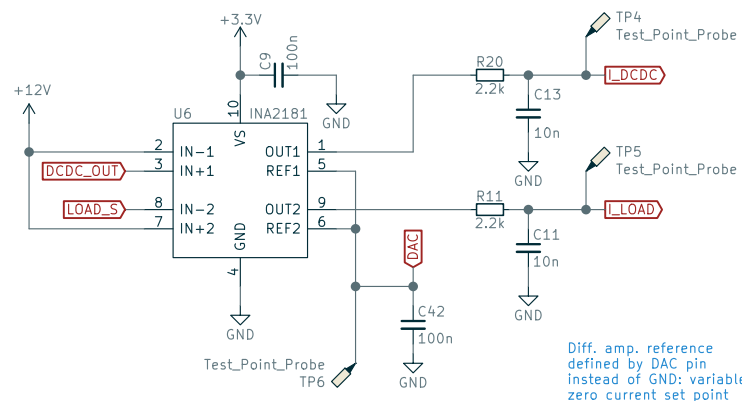
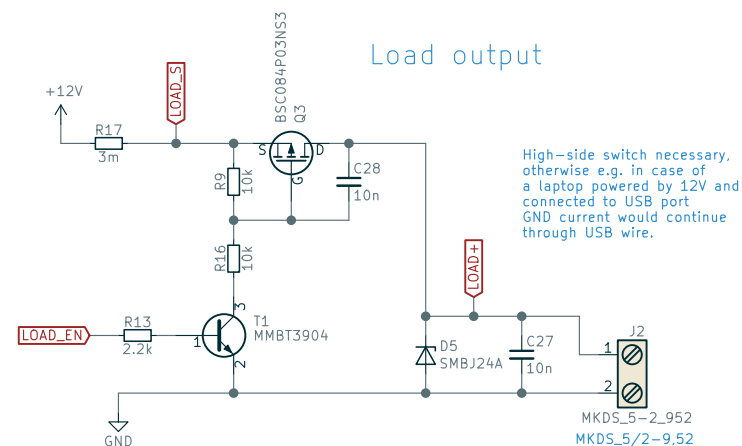
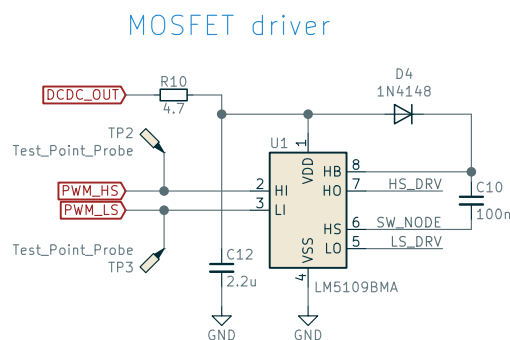
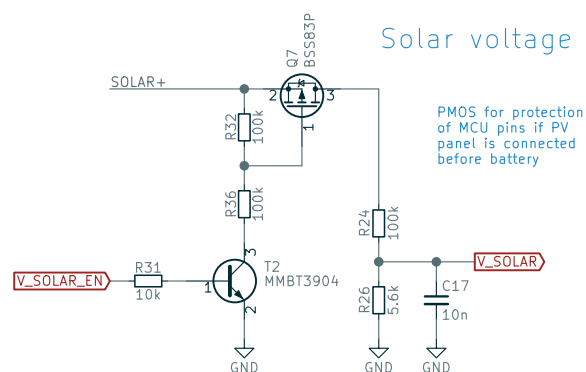
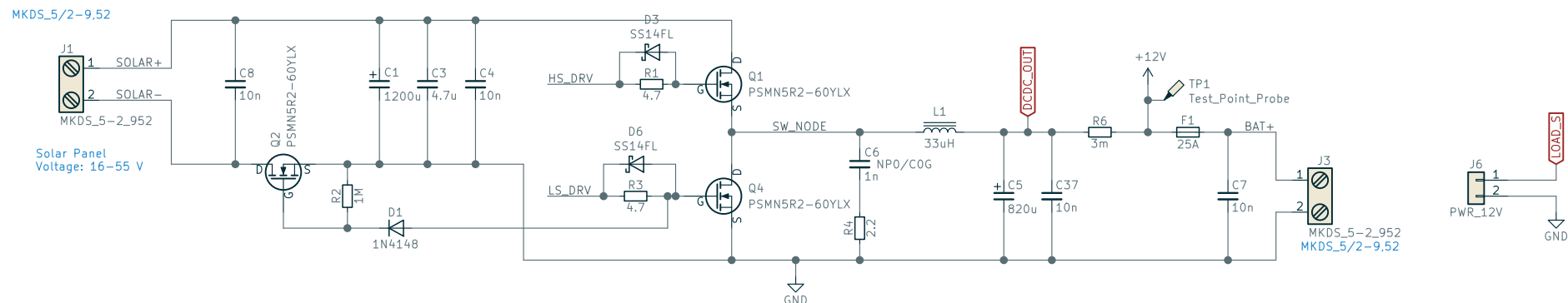
Size: A4 | Date: 2019-06-03

KiCad E.D.A. | kicad 5.1.0



Rev: 0.6.1

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10A MPPT Charge Controller with USB



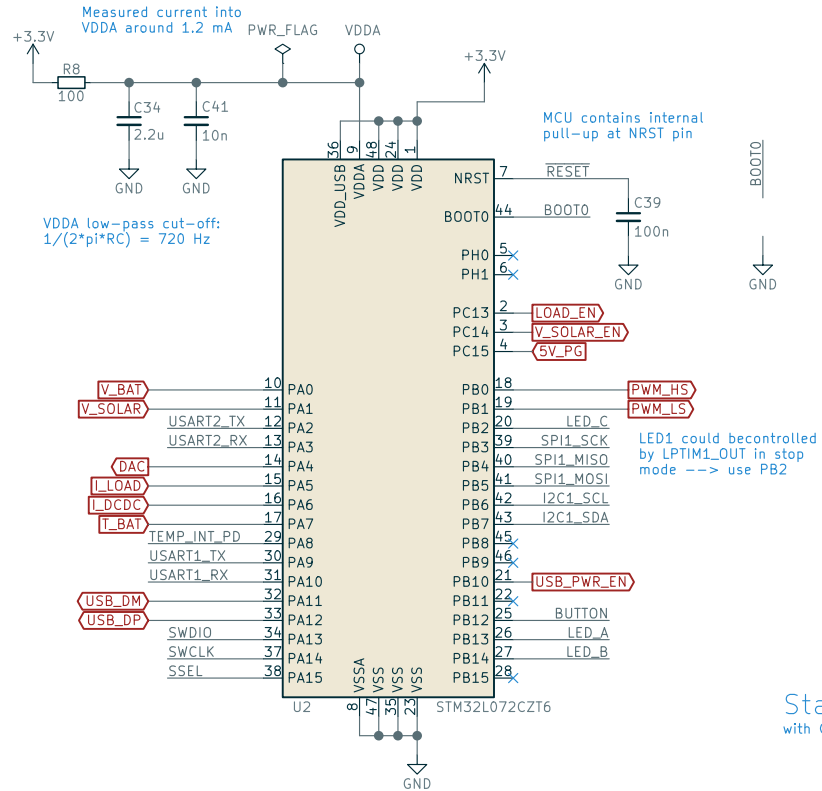
LIBRESOLAR

Author: Martin Jäger

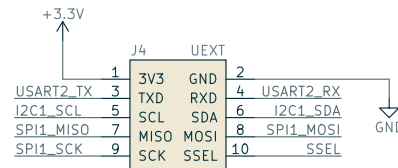
Rev: 0.6.1

Page: 2/4

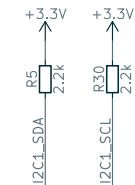
MCU STM32L072



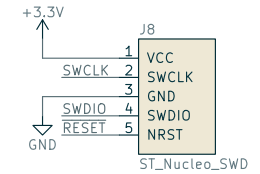
UEXT connector



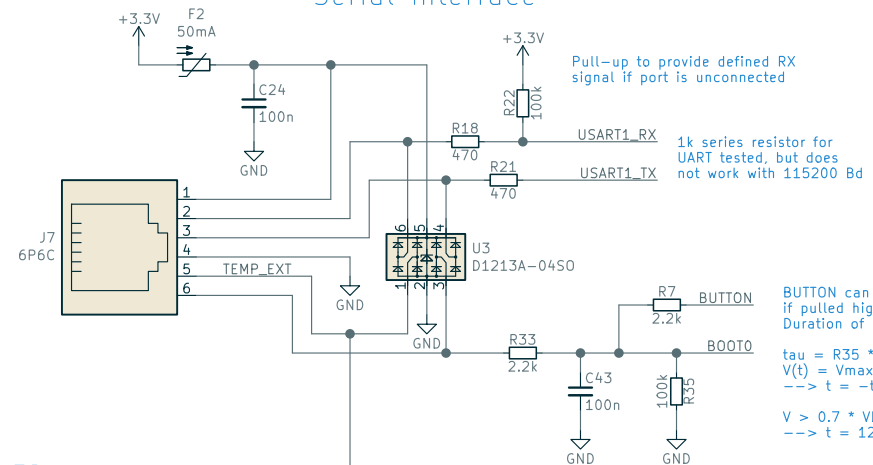
I2C pull-ups



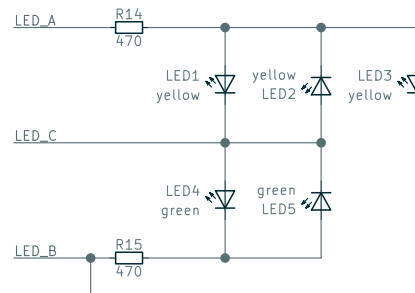
STM Nucleo SWD



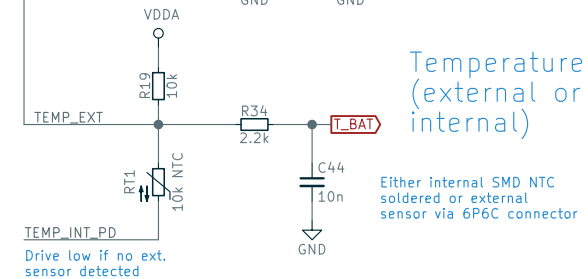
Serial interface



Status LEDs with Charlieplexing



Temperature (external or internal)



10A MPPT Charge Controller with USB

Libre Solar / Connected Energy
 Website: <https://libre.solar>

Sheet: /MCU/
 File: mcu.sch

Author: Martin Jäger

Size: A4 Date: 2019-06-03

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Rev: 0.6.1

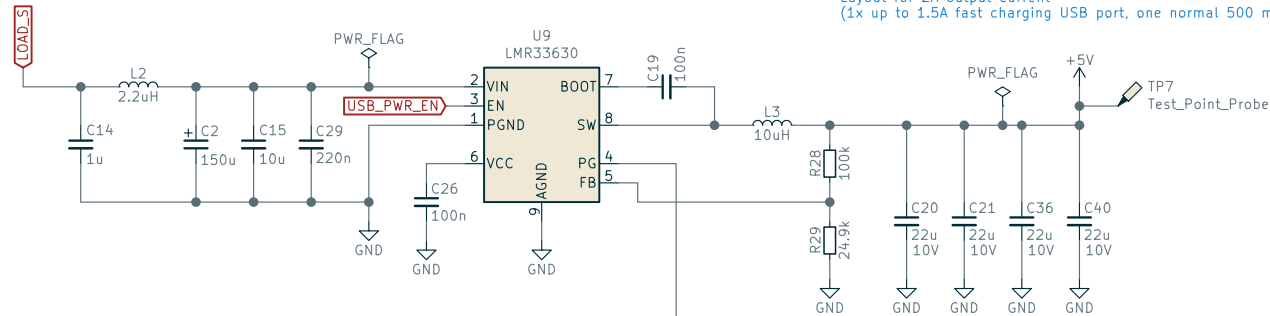
Page: 3/4

If not stated otherwise, all MLCC 50V X7R

Battery to 5V (SMPS)

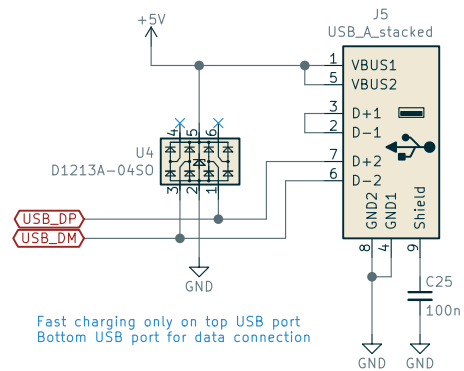
$$\text{Output voltage: } 0.925 \times (1 + 45.3/10) = 5.12 \text{ V}$$

Layout for 2A output current
(1x up to 1.5A fast charging USB port, one normal 500 mA port)

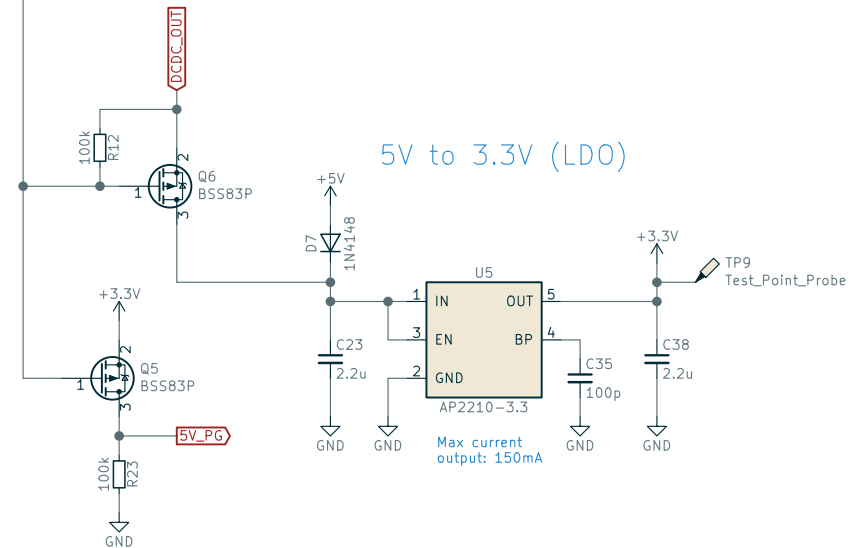


Fall-back power supply
from 12V rail if 5V is
not good enough

USB connector and power supply



5V to 3.3V (LDO)



10A MPPT Charge Controller with USB

Libre Solar / Connected Energy
Website: <https://libre.solar>

Sheet: /Power Supply/
File: power_supply.sch

Author: Martin Jäger

Size: A4 Date: 2019-06-03

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Rev: 0.6.1

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If not stated otherwise, all MLCC 50V X7R