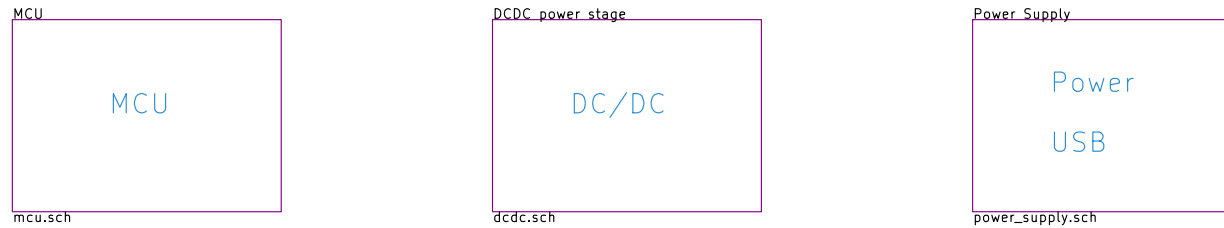
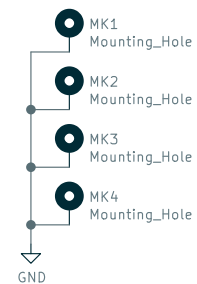


# 10A MPPT Solar Charge Controller with USB



## 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-10a.sch

Author: Martin Jäger

Size: A4 | Date: 2019-04-09

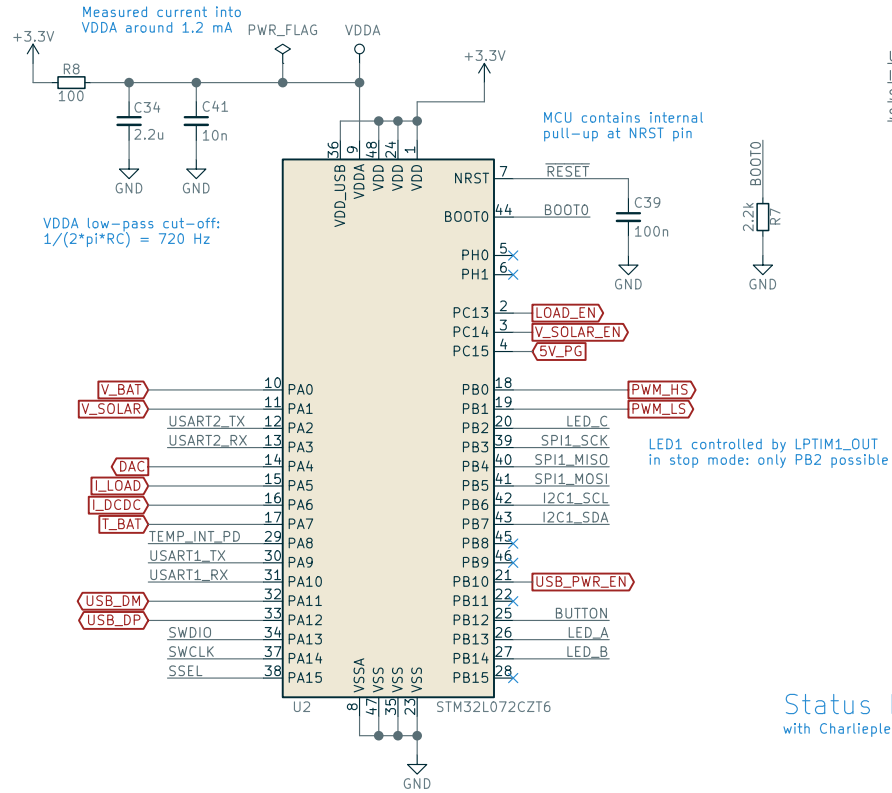
KiCad E.D.A. | kicad 5.1.0



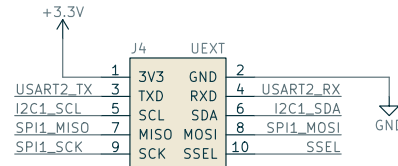
Rev: 0.6  
Page: 1/4



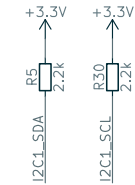
## MCU STM32L072



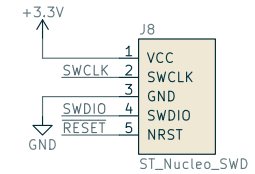
## UEXT connector



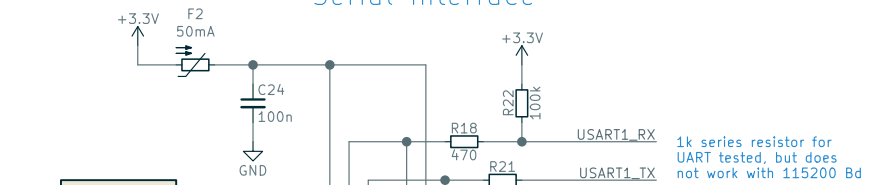
## I2C pull-ups



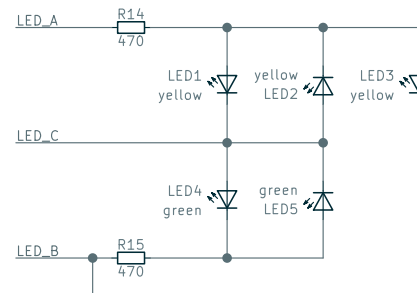
## STM Nucleo SWD



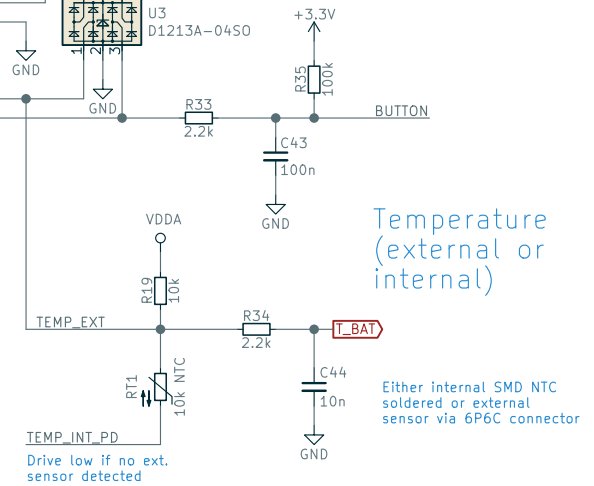
## Serial interface



## 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: 2019-04-09

KiCad E.D.A. kicad 5.1.0



Rev: 0.6

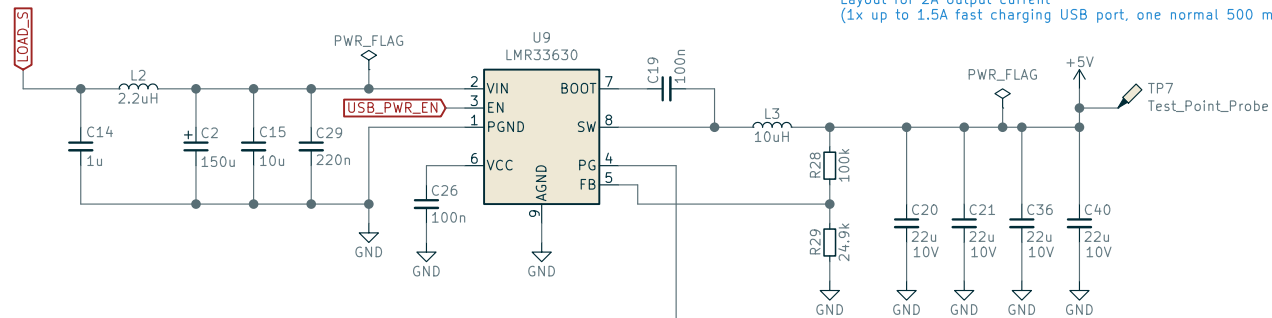
Page: 3/4

If not stated otherwise, all MLCC 50V X7R

Battery to 5V (SMPS)

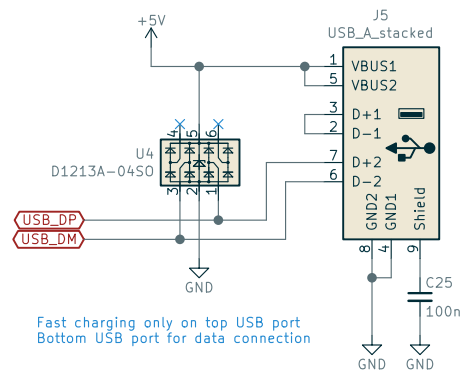
Output voltage:  $0.925 \times (1 + 45.3/10) = 5.12 \text{ V}$

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

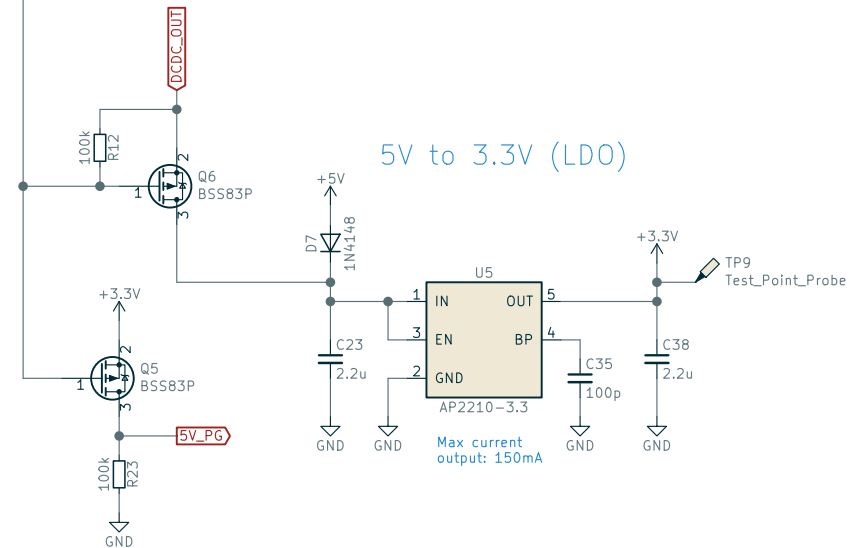


Fall-back power supply  
from 12V rail if 5V is  
not good enough

USB connector and power supply



5V to 3.3V (LDO)



If not stated otherwise, all MLCC 50V X7R

# 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: 2019-04-09
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