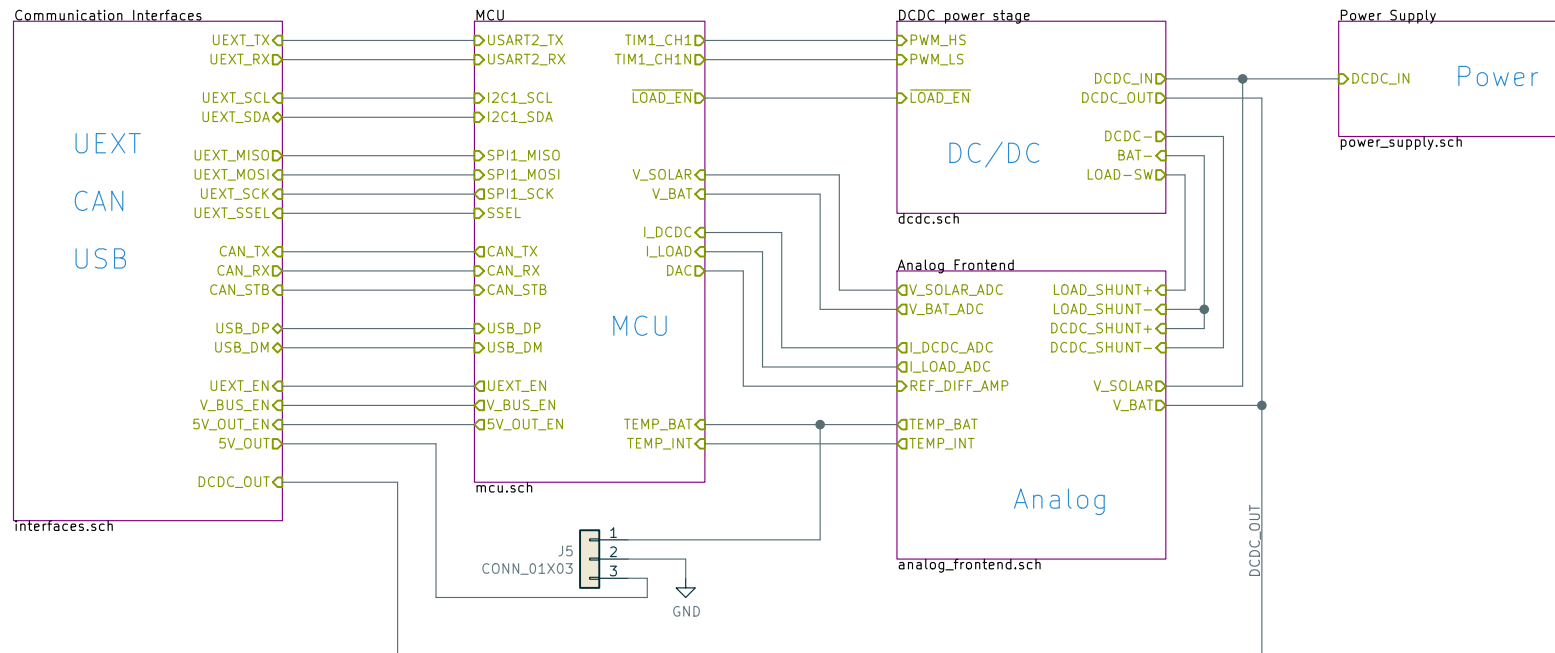


# Libre Solar MPPT Charge Controller (20A)




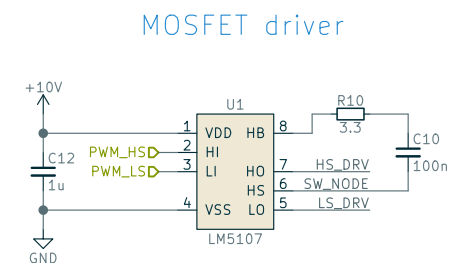
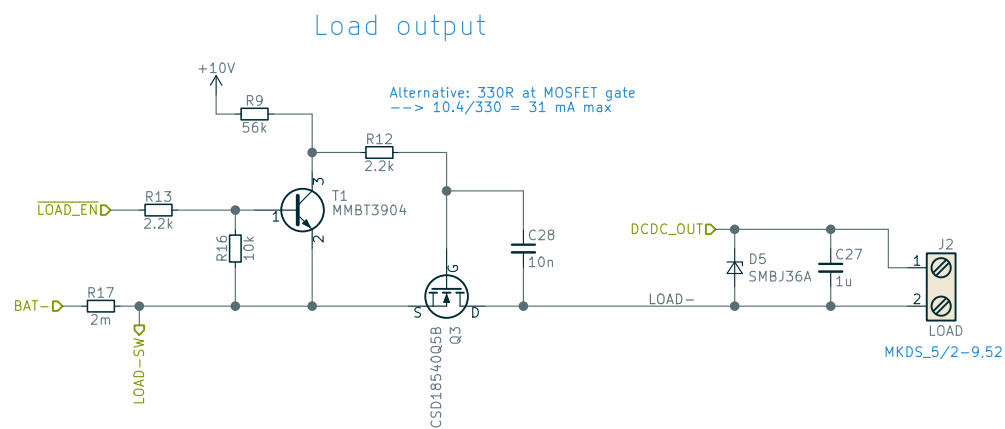
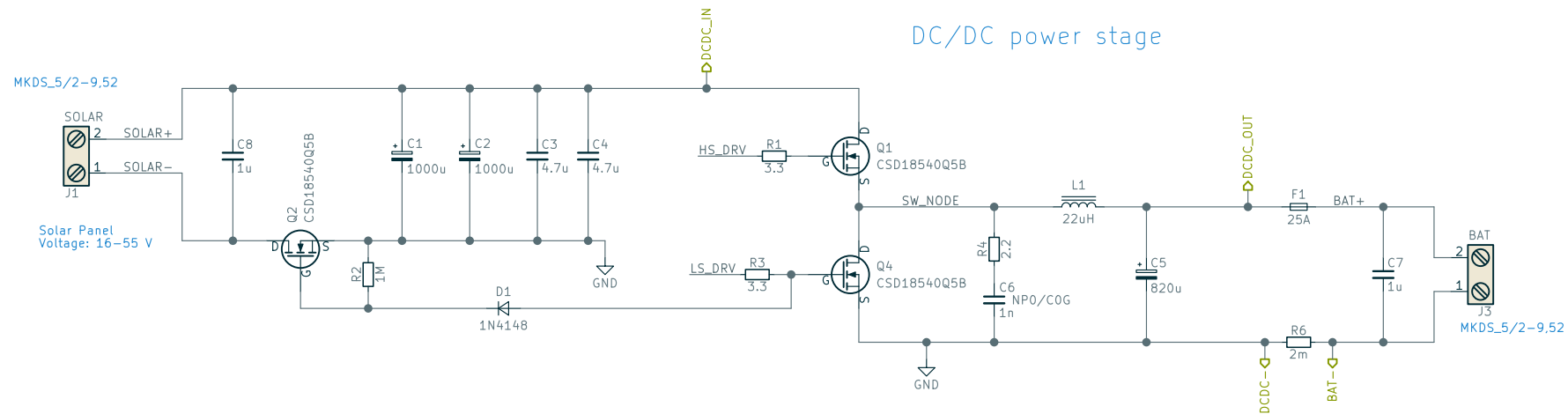
## Main Specification

- 12V or 24V battery voltage
- 20A max. charge current
- 55V max. solar input
- External temperature sensor input
- 32bit ARM MCU (STM32F072)
- CAN communication interface RJ45 jacks incl. bus power supply
- Expandable via Olimex Universal Extension Connector (UEXT) featuring I2C, Serial and SPI interface (e.g. used for display, WIFI communication, etc.)
- Prepared for Hammond Mfg. 1591XXCFL enclosure

- MK1 Mounting\_Hole
- MK2 Mounting\_Hole
- MK3 Mounting\_Hole



MPPT Charger 20A		 <b>LIBRESOLAR</b>
Libre Solar Website: <a href="http://libre.solar">http://libre.solar</a>		
Sheet: / File: MPPT_charger_20A.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-12-11	Rev: 0.9
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 1/6



## MPPT Charger 20A

Libre Solar  
 Website: <http://libre.solar>  
 Sheet: /DCDC power stage/  
 File: dcdc.sch

Author: Martin Jäger

Size: A4 Date: 2017-12-11

KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg

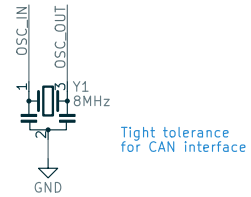
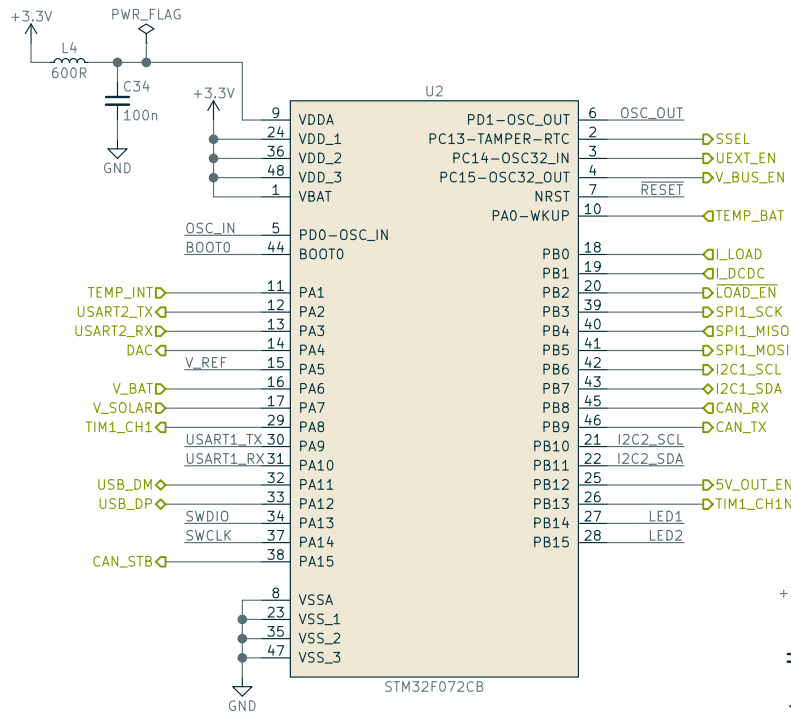


Rev: 0.9

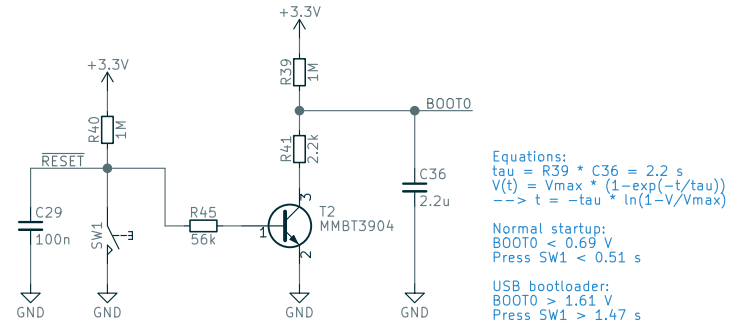
Page: 2/6

If not stated otherwise, all MLCC 50V X7R

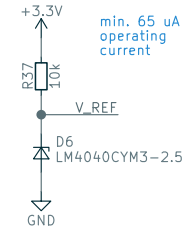
## MCU STM32F072



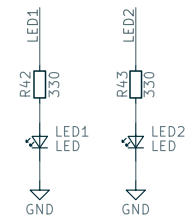
## Reset and boot circuit



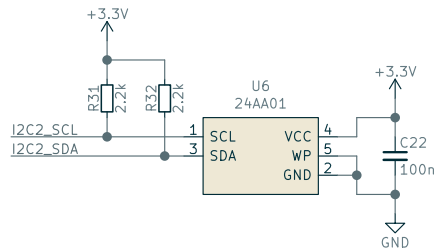
## Voltage reference



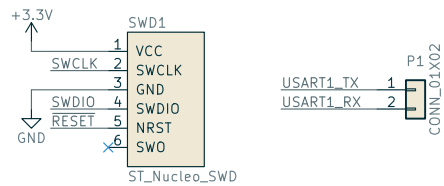
## Status LEDs



## EEPROM



## STM Nucleo SWD and USART



If not stated otherwise, all MLCC 50V X7R

## MPPT Charger 20A

Libre Solar  
Website: <http://libre.solar>

Sheet: /MCU/  
File: mcu.sch

Author: Martin Jäger

Size: A4	Date: 2017-12-11
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KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg
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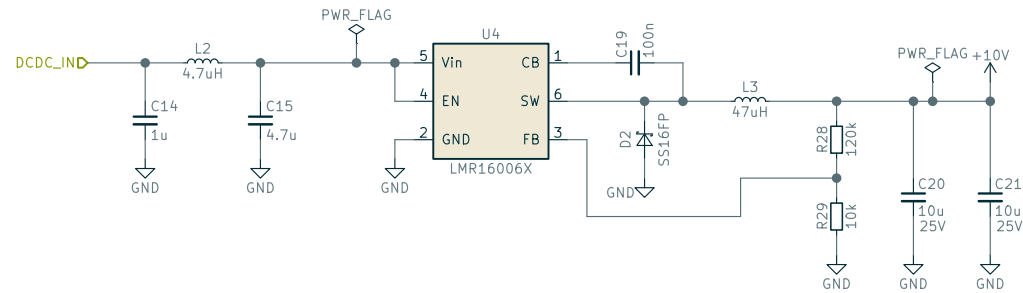


LIBRESOLAR

Rev: 0.9

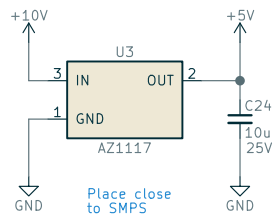
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## Solar/Battery to 10V (SMPS)

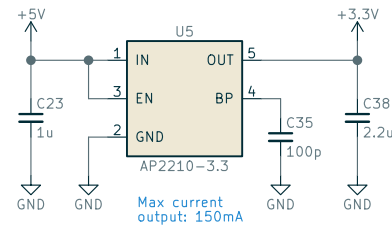


DCDC\_IN chosen as input  
in to stay alive if solar  
goes down for boost mode  
operation (battery on high side)

## 10V to 5V (LDO)



## 5V to 3.3V (LDO)



## MPPT Charger 20A

Libre Solar  
Website: <http://libre.solar>

Sheet: /Power Supply/  
File: power\_supply.sch

Author: Martin Jäger

Size: A4 Date: 2017-12-11

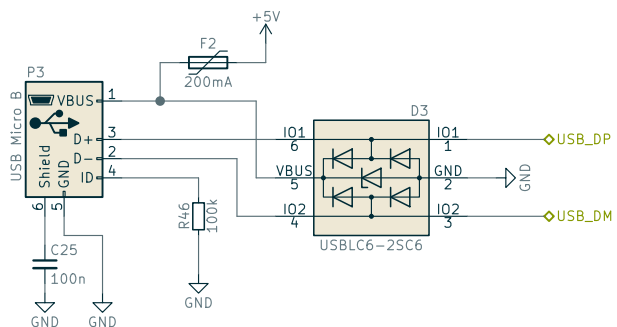
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg



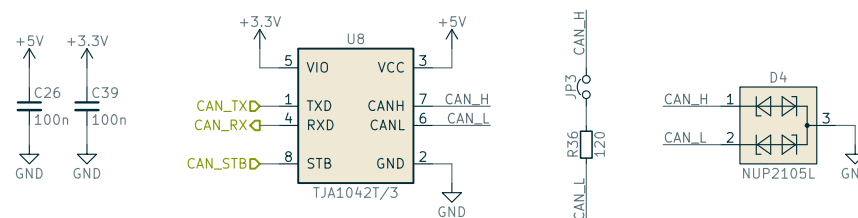
Rev: 0.9  
Page: 4/6

If not stated otherwise, all MLCC 50V X7R

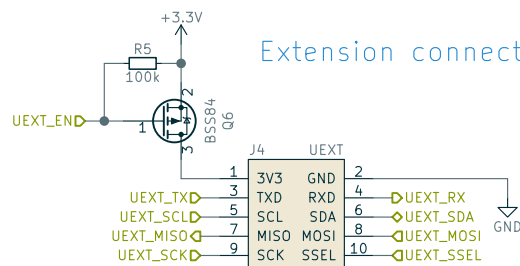
## USB connector



## CAN interface



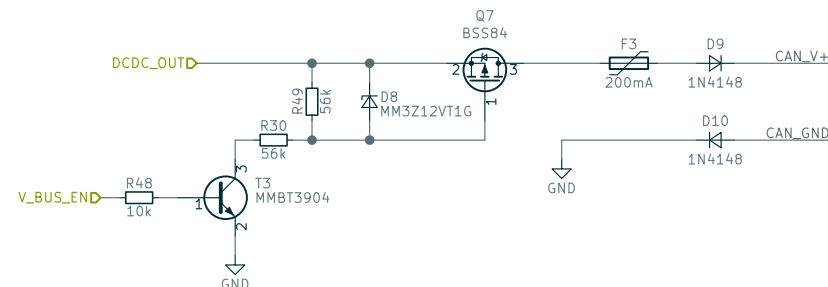
## Extension connector



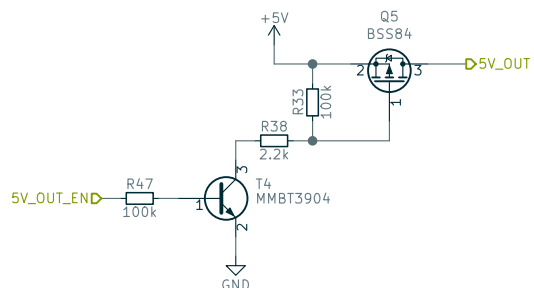
## I2C pull-ups



## Bus power supply



## 5V signal output



## MPPT Charger 20A



LIBRESOLAR

Website: <http://libre.solar>

Sheet: /Communication Interfaces/  
File: interfaces.sch

Author: Martin Jäger

Size: A4 Date: 2017-12-11

Rev: 0.9

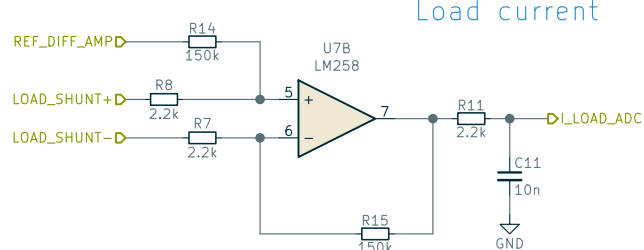
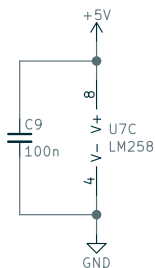
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg

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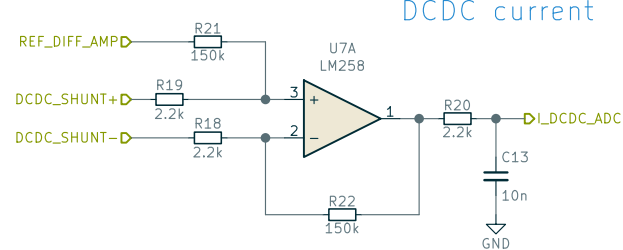
If not stated otherwise, all MLCC 50V X7R



Diff. amp. reference defined by DAC pin instead of GND: variable zero current set point

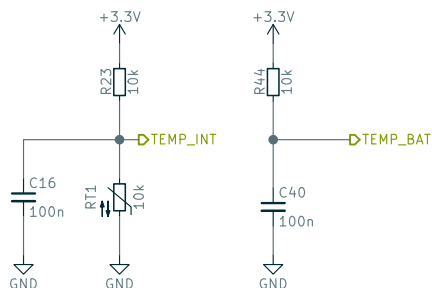


Load current

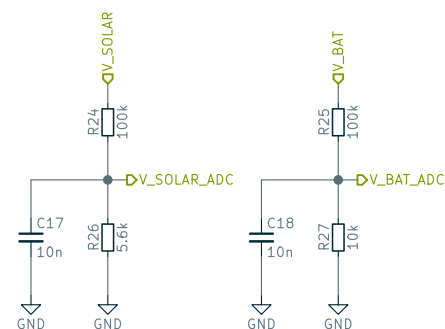


DCDC current

Temperature (ext./int.)



Solar and battery voltage



## MPPT Charger 20A

Libre Solar  
Website: <http://libre.solar>

Sheet: /Analog Frontend/  
File: analog\_frontend.sch

Author: Martin Jäger

Size: A4 Date: 2017-12-11

KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg



Rev: 0.9

Page: 6/6

If not stated otherwise, all MLCC 50V X7R