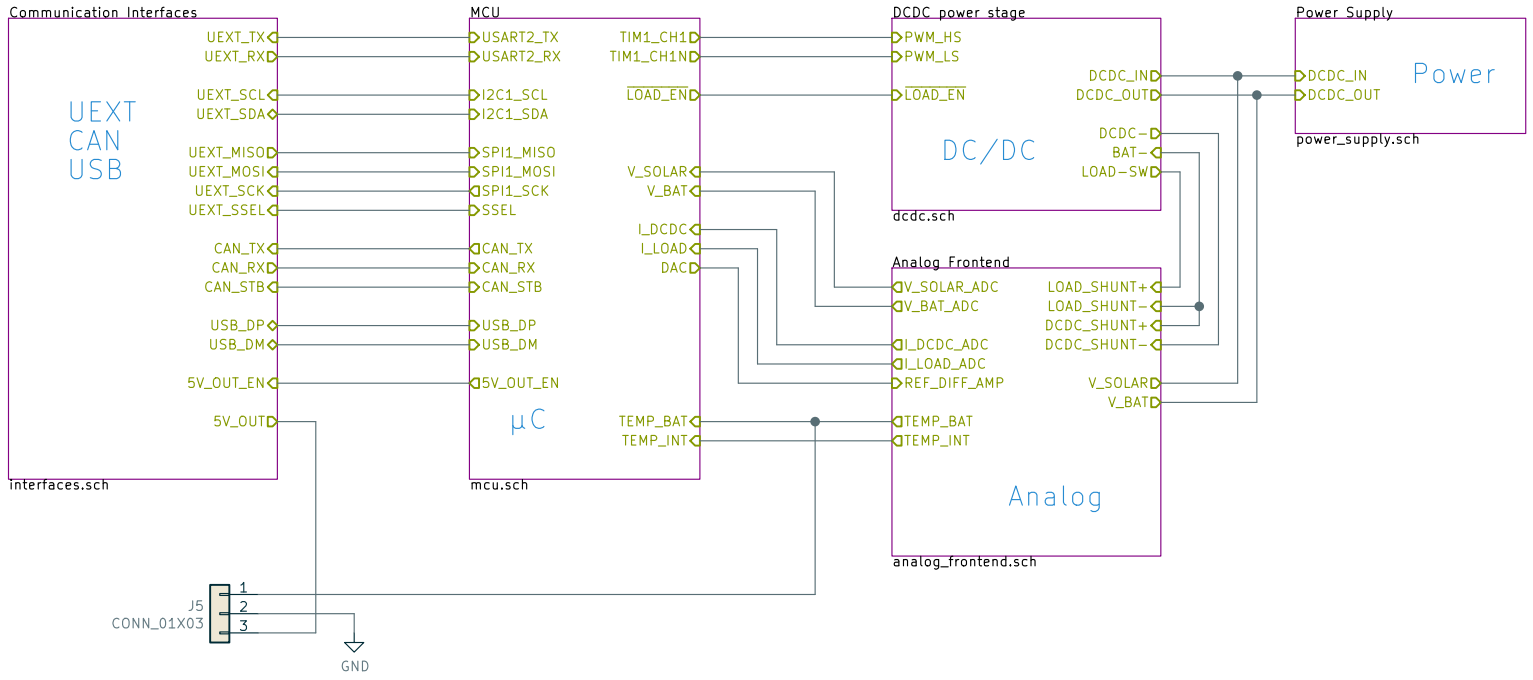
Libre Solar MPPT Charge Controller (20A)



Main Specification

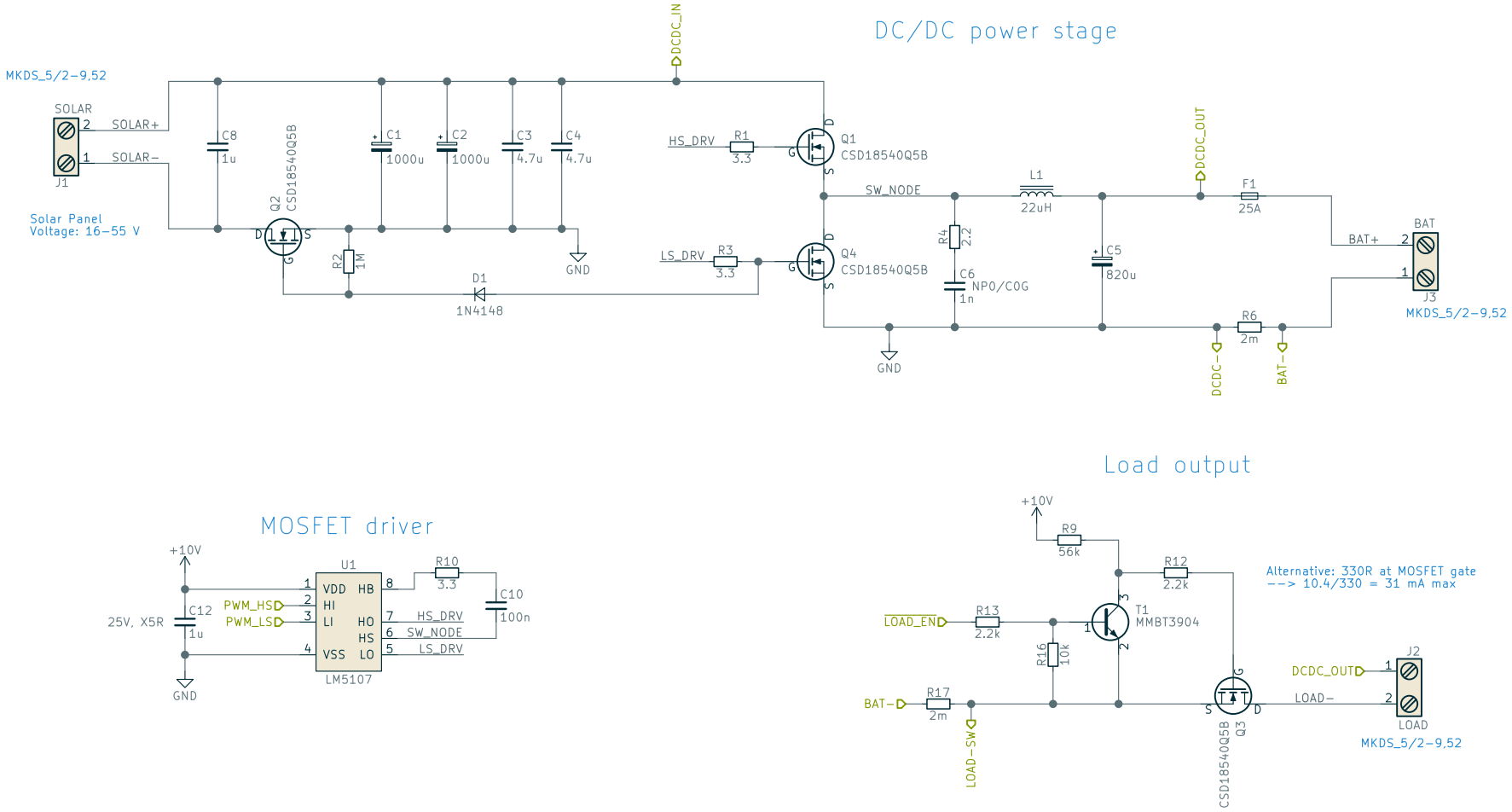
- 20A max. charge current
- 55V max PV input
- 12V or 24V battery output
- External temperature sensor input
- 32bit ARM MCU (STM32F072)
- CAN communication interface RJ45 jacks or screw terminal
- Expandable via Olimex Universal Extension Connector (UEXT) featuring I2C, Serial and SPI interface (e.g. used for display, WIFI communication, etc.)
- DIN rail housing compatible (Phoenix Contact EH series)

LOGO1 LIBRE_SOLAR

LOGO2 OPEN_HARDWARE

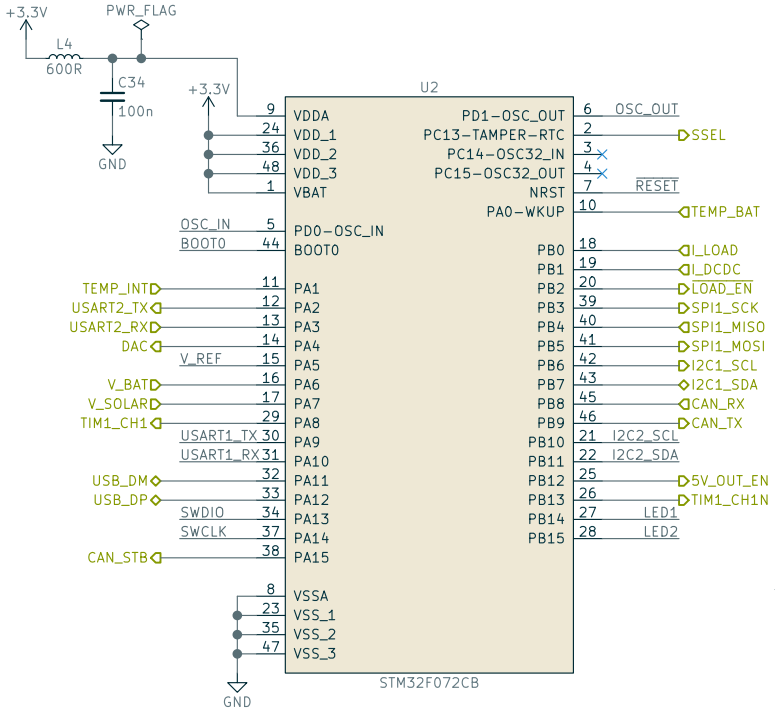
MK1 Mounting_Hole
MK2 Mounting_Hole
MK3 Mounting_Hole

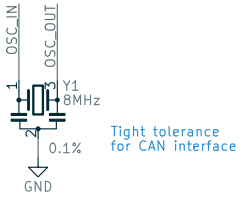
MPPT Charger 20A		LIBRESOLAR
Libre Solar Website: http://libre.solar		
Sheet: / File: MPPT_charger_20A.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-03-06	Rev: 0.7
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 1/6

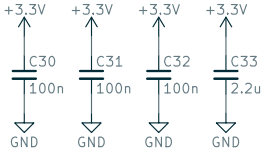


MPPT Charger 20A		LIBRESOLAR
Libre Solar Website: http://libre.solar		
Sheet: /DCDC power stage/ File: dcdc.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-03-06	Rev: 0.8
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 2/6

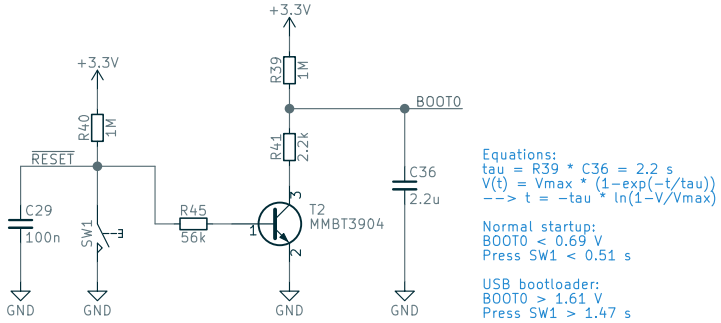
MCU STM32F072



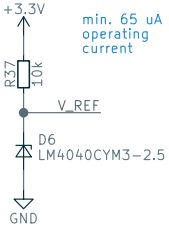




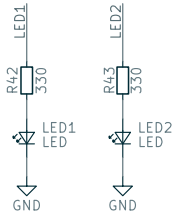
Reset and boot circuit



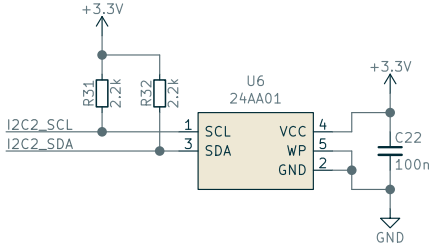
Voltage reference



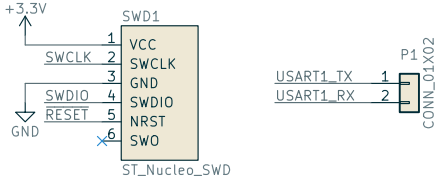
Status LEDs



EEPROM

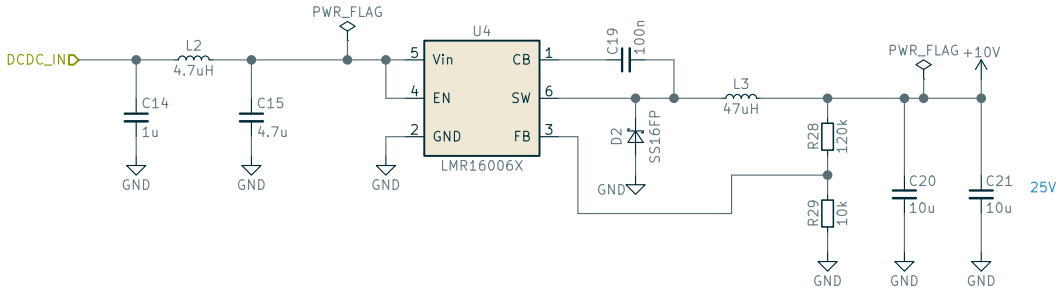


STM Nucleo SWD and USART



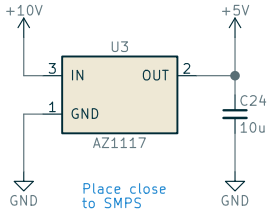
MPPT Charger 20A		LIBRESOLAR
Libre Solar Website: http://libre.solar		
Sheet: /MCU/ File: mcu.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-03-06	Rev: 0.7
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 3/6

Solar/Battery to 10V (SMPS)

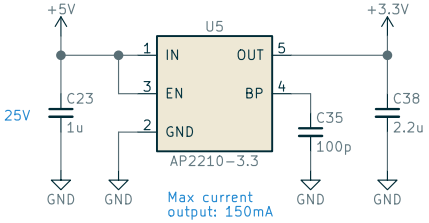


DCDC_IN chosen as input in to stay alive if solar goes down for boost mode operation (battery on high side)

10V to 5V (LDO)

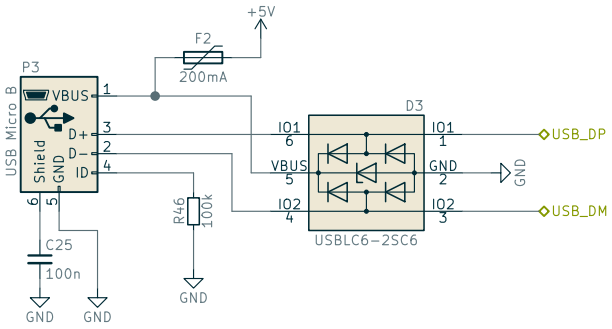


5V to 3.3V (LDO)

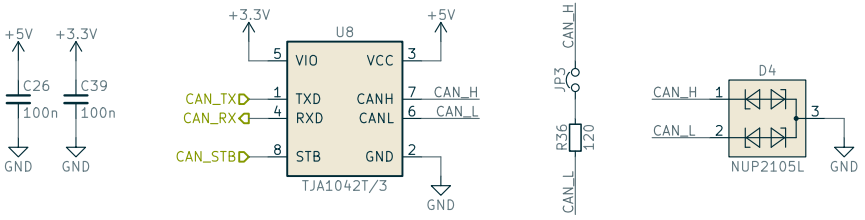


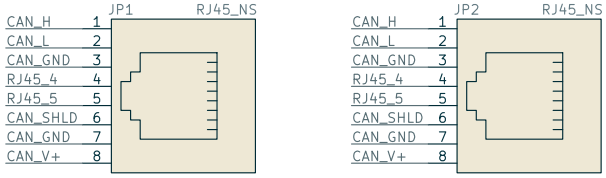
MPPT Charger 20A		
Libre Solar Website: http://libre.solar		
Sheet: /Power Supply/ File: power_supply.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-08-06	Rev: 0.8
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 4/6

USB connector

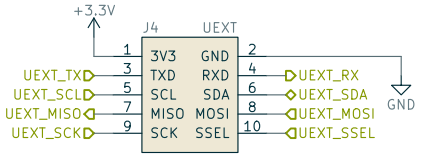


CAN interface

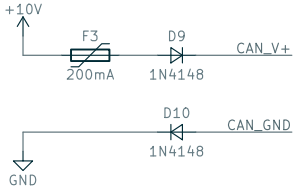




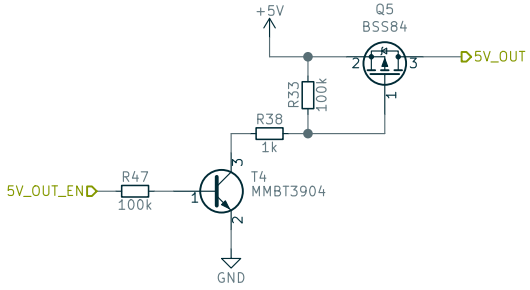
Extension connector



I2C pull-ups

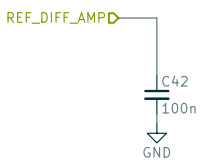


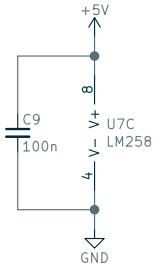
5V signal output



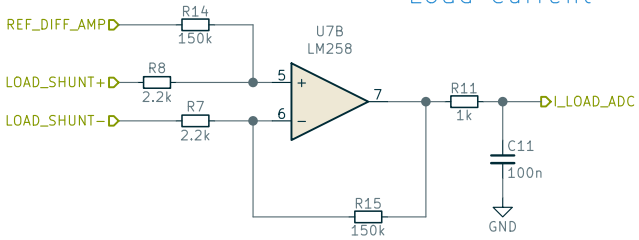
MPPT Charger 20A		LIBRESOLAR
Website: http://libre.solar		
Sheet: /Communication Interfaces/ File: interfaces.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-03-06	Rev: 0.7
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 5/6

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

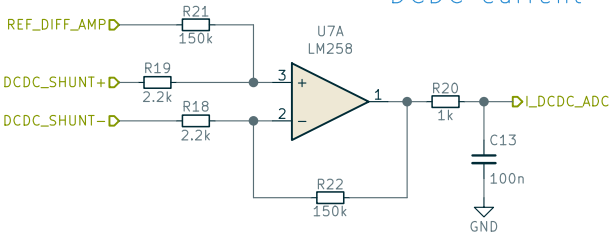




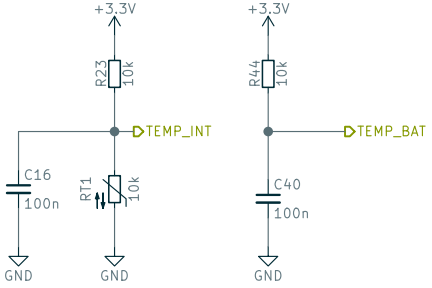
Load current



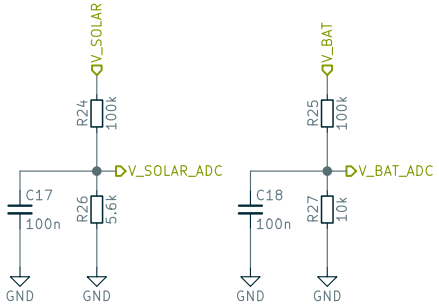
DCDC current



Temperature (ext./int.)



Solar and battery voltage



If not stated otherwise, all MLCC 50V X7R

MPPT Charger 20A		LIBRESOLAR
Libre Solar Website: http://libre.solar		
Sheet: /Analog Frontend/ File: analog_frontend.sch		
Author: Martin Jäger		
Size: A4	Date: 2017-03-06	Rev: 0.7
KiCad E.D.A. kicad (2017-11-18 revision ff5ee05de)-makepkg		Page: 6/6