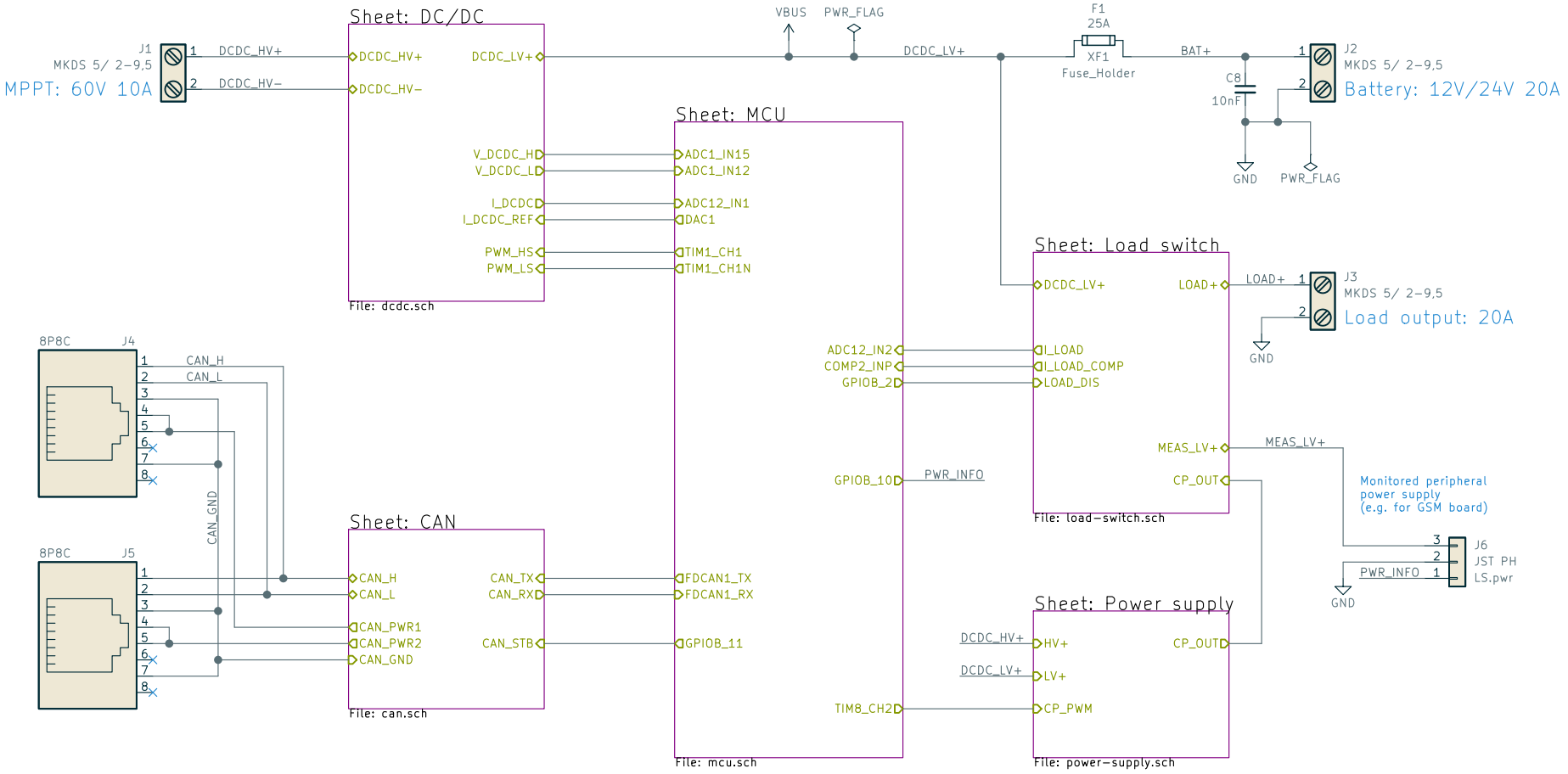
MPPT charge controller with HS load switch and CAN



LOGO1 LIBRE_SOLAR

LOGO2 OPEN_HARDWARE

FID1 Fiducial
FID2 Fiducial
FID3 Fiducial

MK1 Mounting_Hole
MK2 Mounting_Hole
MK3 Mounting_Hole
MK4 Mounting_Hole

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Size: A4 | Date: 2021-01-06	Rev: 0.2.3
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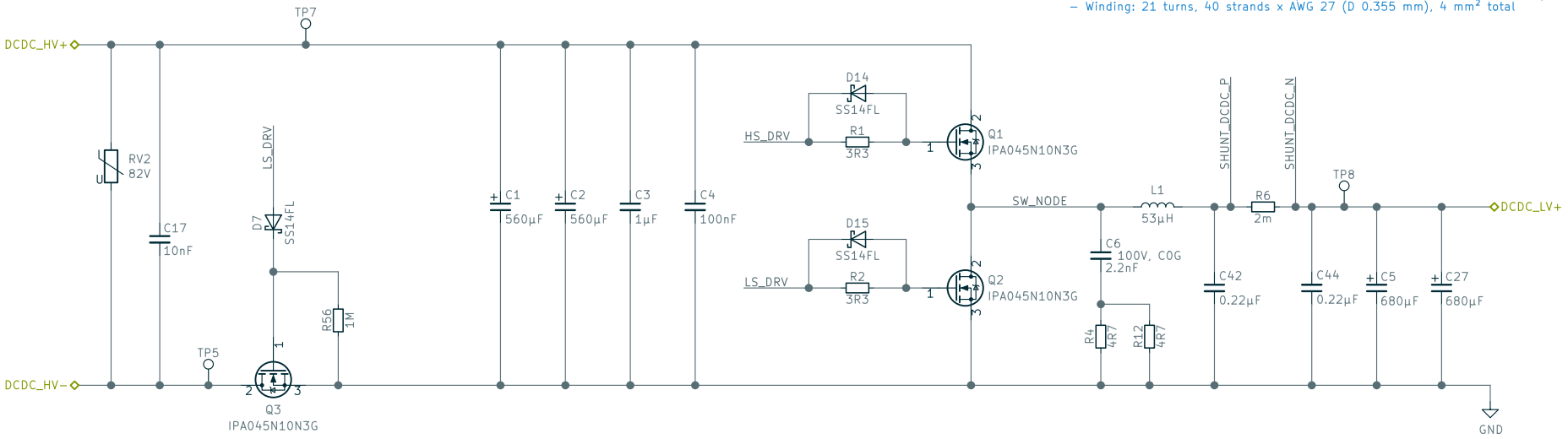
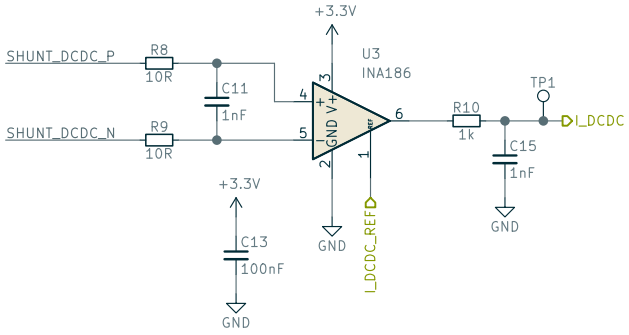
DC/DC power stage

Main inductor L1 layout:
- Core: 2x stacked MS-130060-2 (Sendust 60µ, OD 33 mm, AL 61 nH/T²)
- Winding: 21 turns, 40 strands x AWG 27 (D 0.355 mm), 4 mm² total

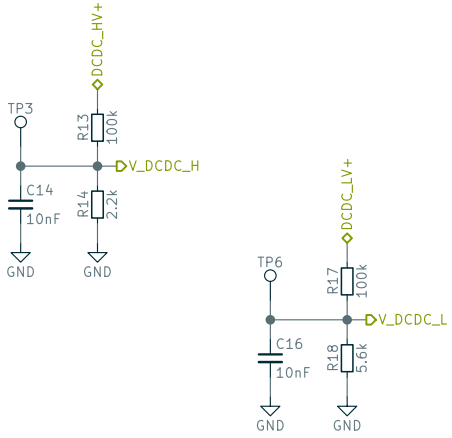


Reverse polarity protection and
PV reverse current blocking

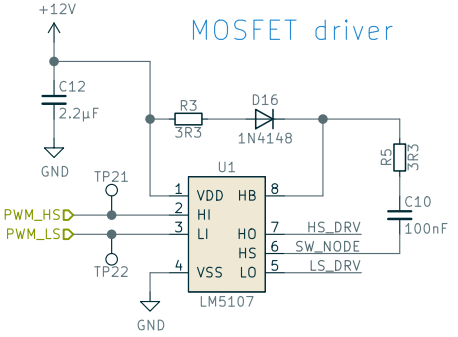
Inductor current measurement



Voltage measurement



MOSFET driver



If not stated otherwise, all MLCC 50V X7R

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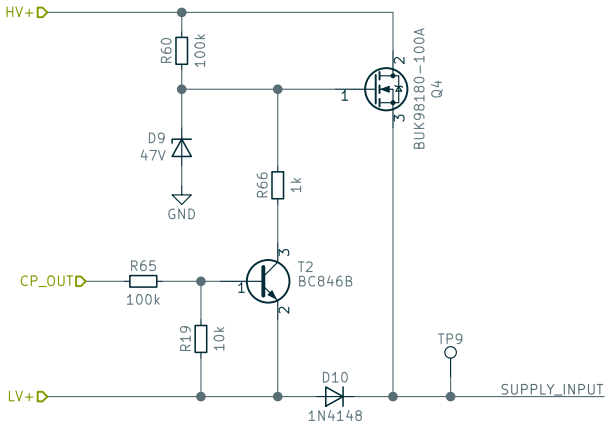
Supply rail selection

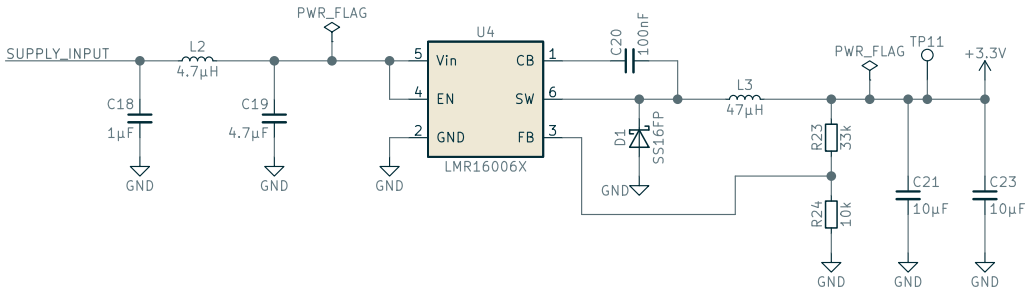


Some applications (e.g. Li-ion batteries) require an internal power supply from the high voltage side (e.g. solar panel input).

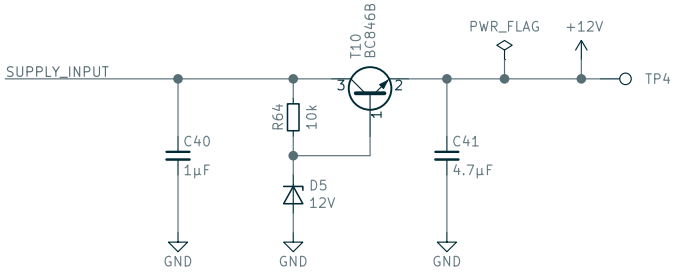
The source follower with Q4 limits the supply input below 60V.

T2 selects LV+ as supply to increase efficiency as soon as the charge pump is on.

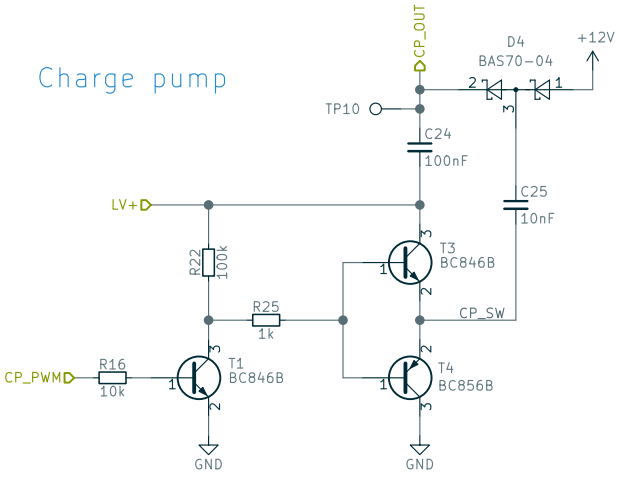
HV/LV side to 3.3V (SMPS)



12V MOSFET driver supply voltage (emitter follower)



Charge pump



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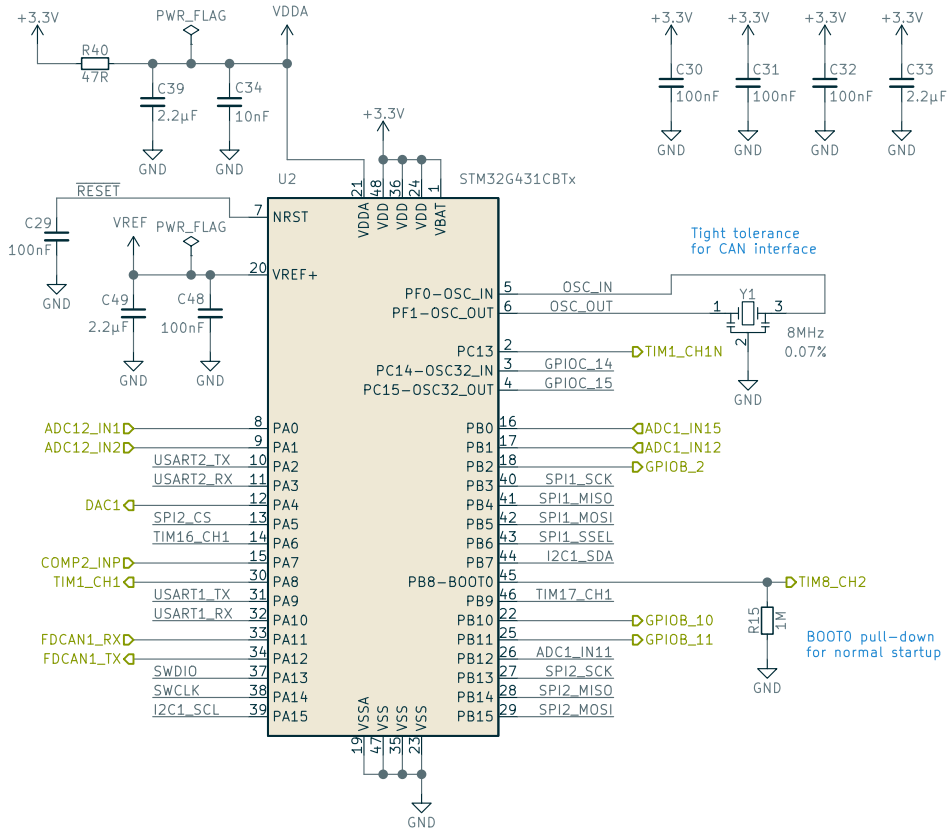
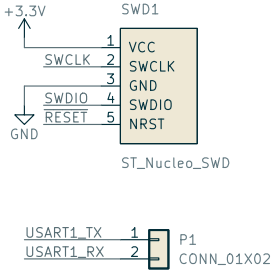
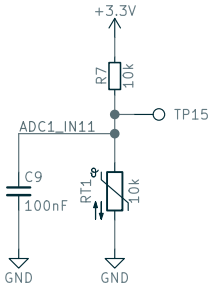
MCU STM32G431



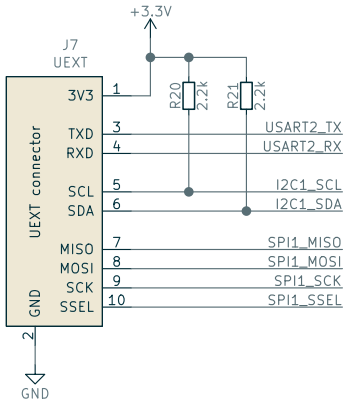
STM Nucleo SWD and USART



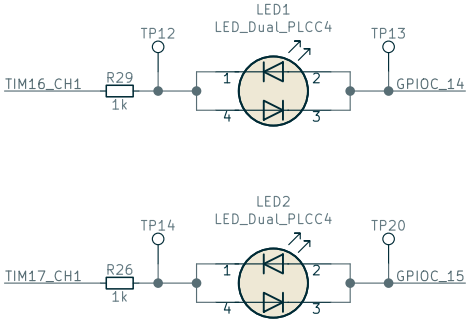
Internal temperature



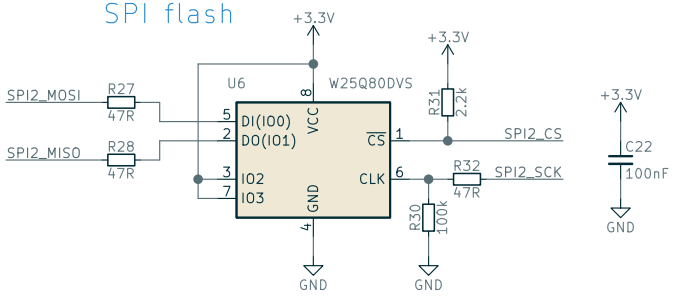
UEXT



Status LEDs



SPI flash



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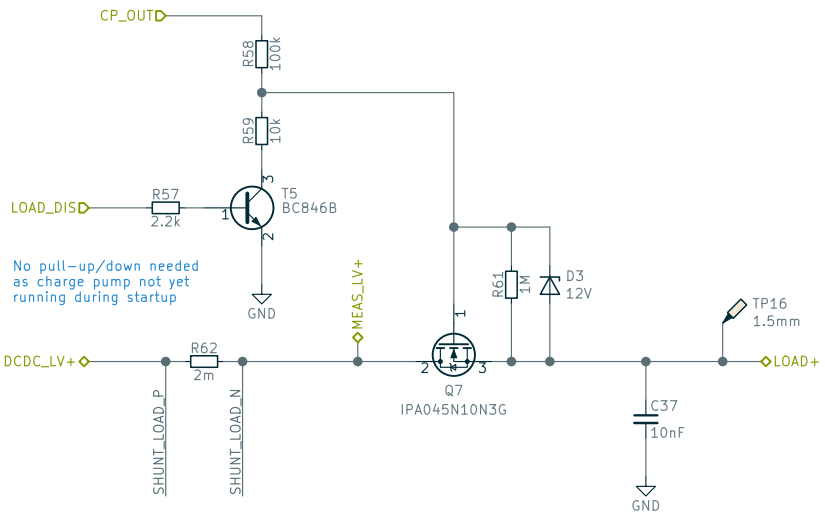
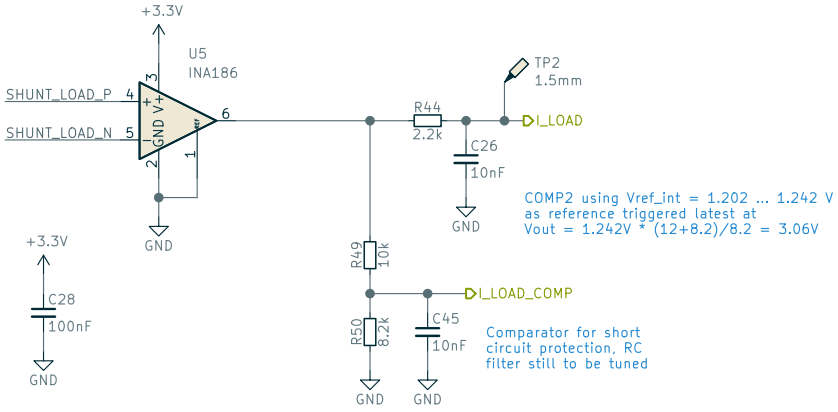
High-side load switch



Load current monitoring



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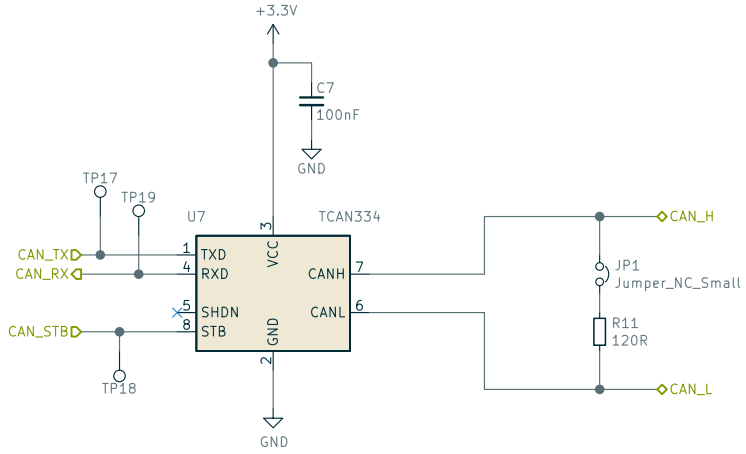

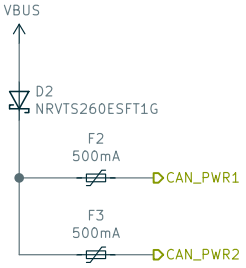

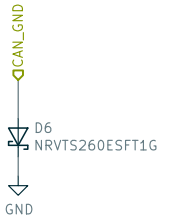

CAN bus power supply
– 10V–32V
– 600 mA (like PoE)

Diodes necessary to prevent separate GND loops.

Polyfuse to prevent over–current in daisy–chained bus with multiple sources and sinks.

MPPT 2420 HC

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File: can.sch

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