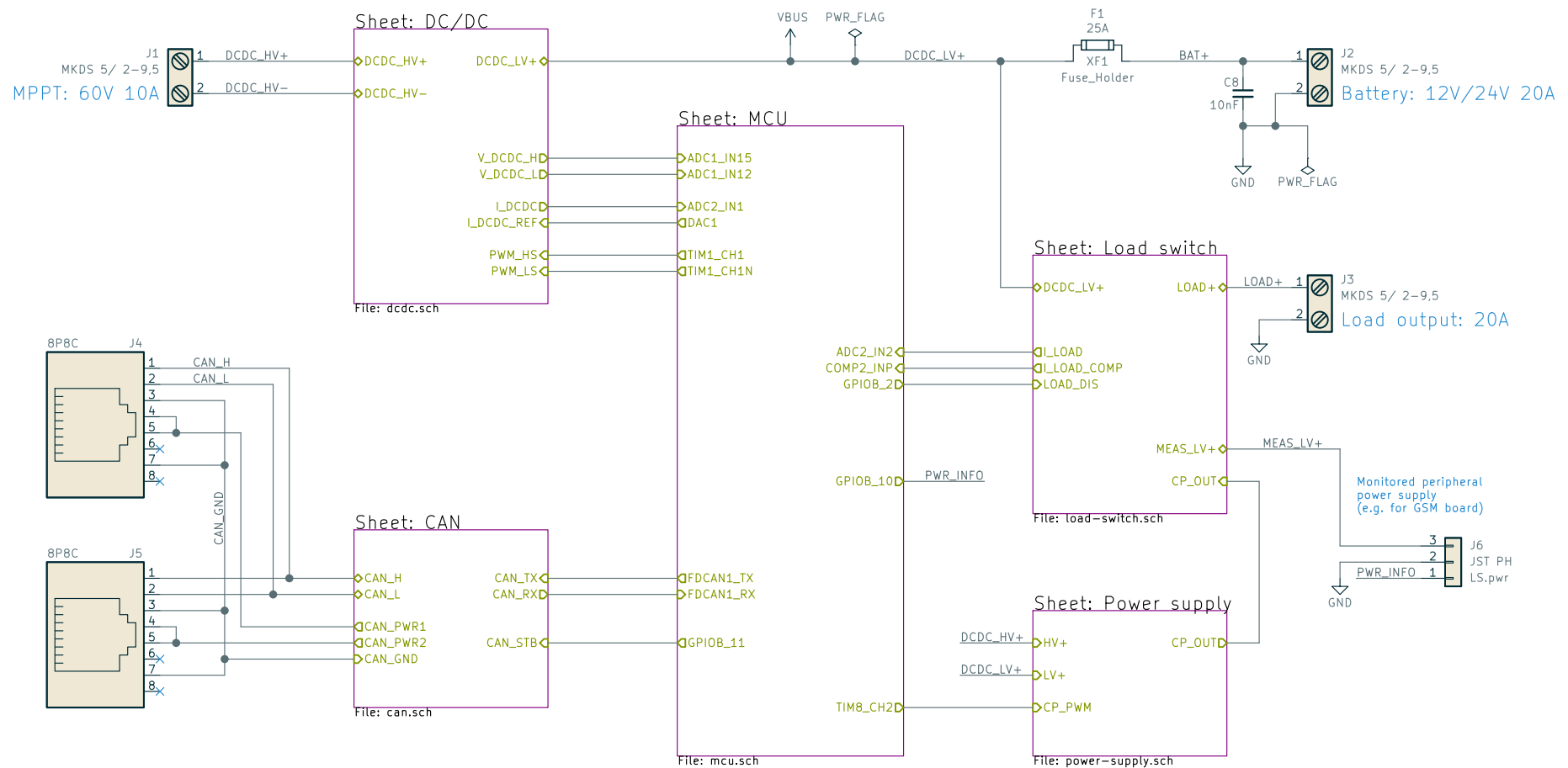


MPPT charge controller with HS load switch and CAN



MPPT 2420 HC

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Sheet: /
File: mppt-2420-hc.sch

Author: Martin Jäger

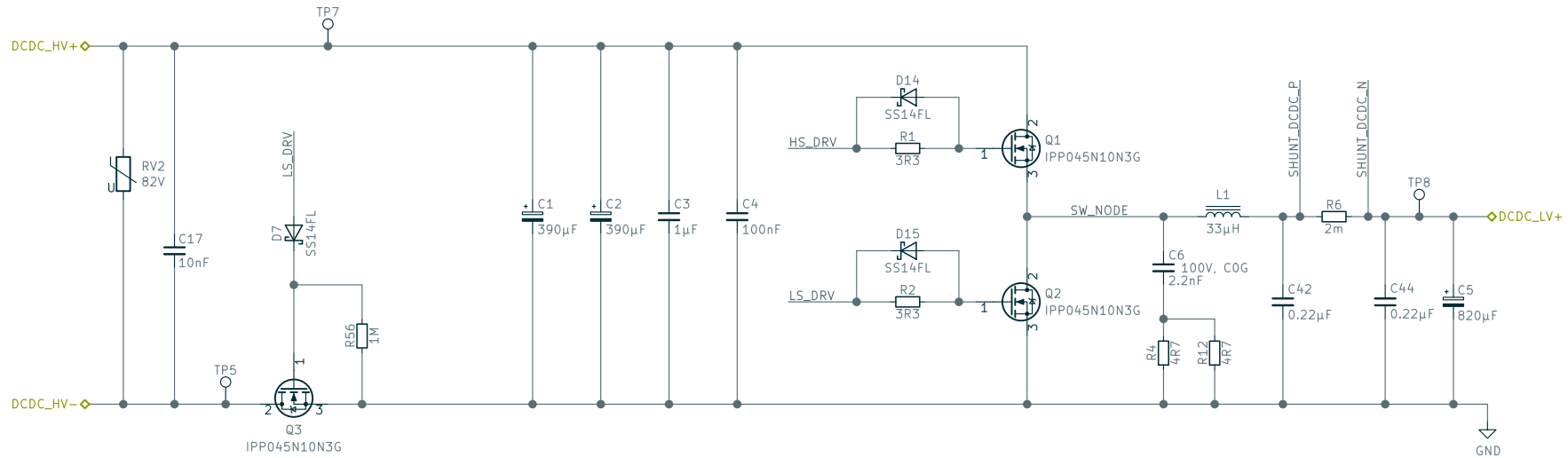
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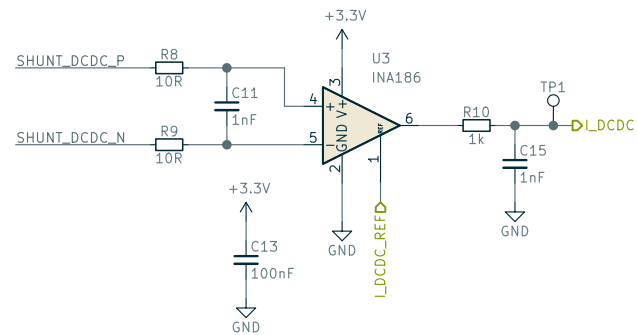
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DC/DC power stage

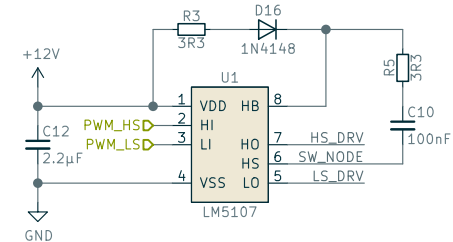


Reverse polarity protection and
PV reverse current blocking

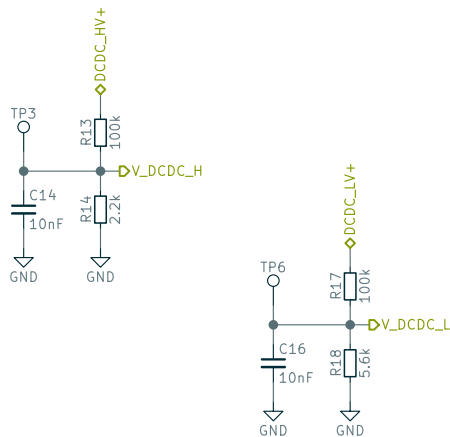
Inductor current measurement



MOSFET driver



Voltage measurement



If not stated otherwise, all MLCC 50V X7R

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

Charge pump

The diagram illustrates a charge pump circuit. It features two NPN transistors, T1 (BC846B) and T4 (BC856B), connected to ground. T1's base is connected to CP_PWM through resistor R16 (10k). T1's emitter is grounded, and its collector is connected to a 100k resistor R22. The other end of R22 is connected to the base of T4 and to a 1k resistor R25. The other end of R25 is connected to the emitter of T4. T4's collector is connected to a 100nF capacitor C24, which is also connected to TP10. The other end of C24 is connected to the base of T3 (BC846B). T3's emitter is grounded, and its collector is connected to a 10nF capacitor C25. The other end of C25 is connected to the positive terminal of a diode D4 (BAS70-04). The negative terminal of D4 is connected to the emitter of T3. The positive terminal of D4 is connected to the +12V supply. The circuit is labeled with various components: R16 (10k), R22 (100k), R25 (1k), C24 (100nF), C25 (10nF), T1 (BC846B), T3 (BC846B), T4 (BC856B), and D4 (BAS70-04). The output of the charge pump is labeled CP_SW.

MPPT 2420 HC

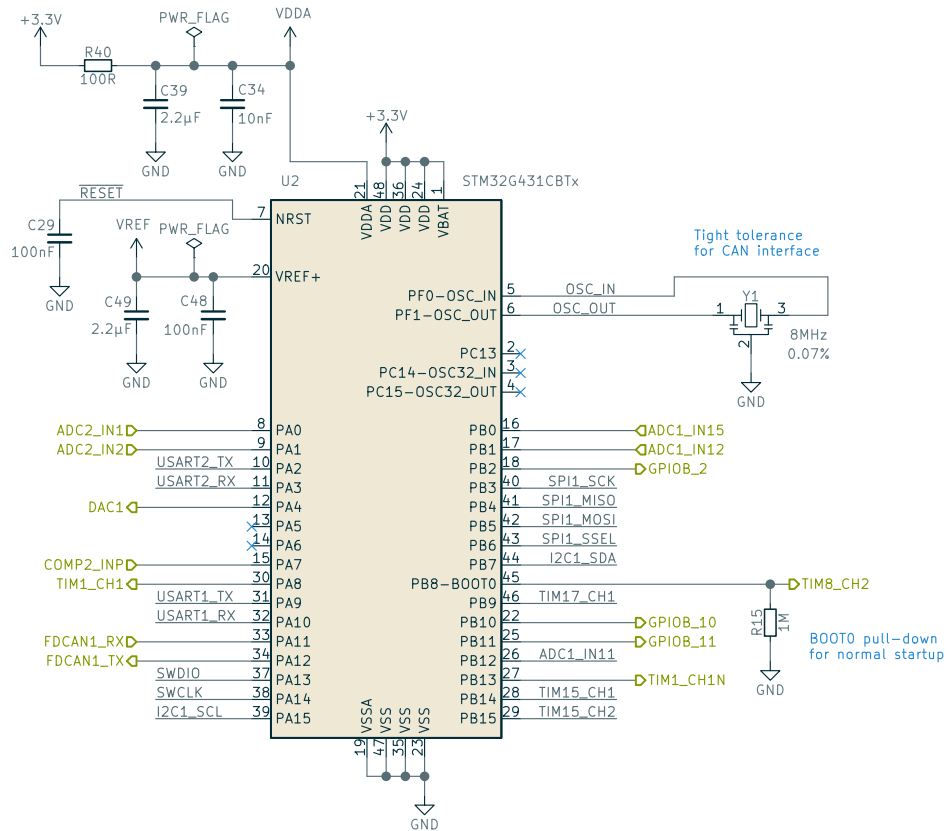


LIBRESOLAR

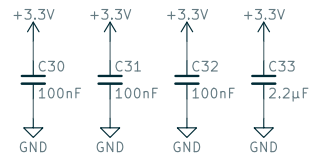
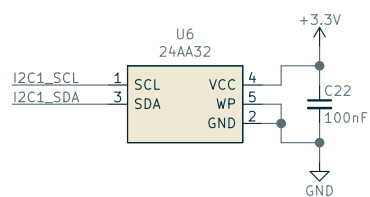
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MCU STM32G431

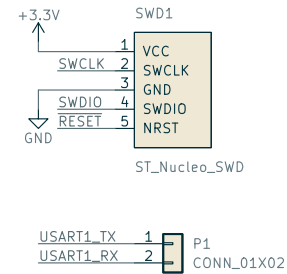


EEPROM

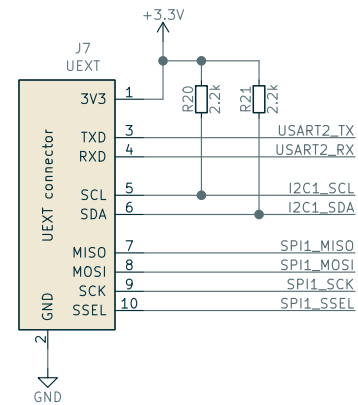


If not stated otherwise, all MLCC 50V X7R

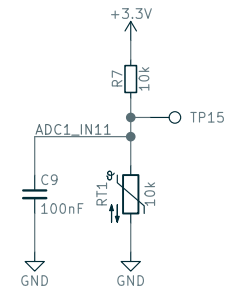
STM Nucleo SWD and USART



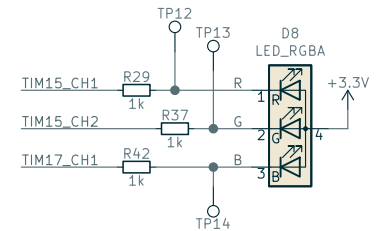
UEXT



Internal temperature



Status LED



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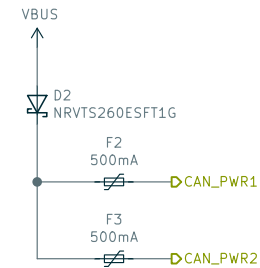
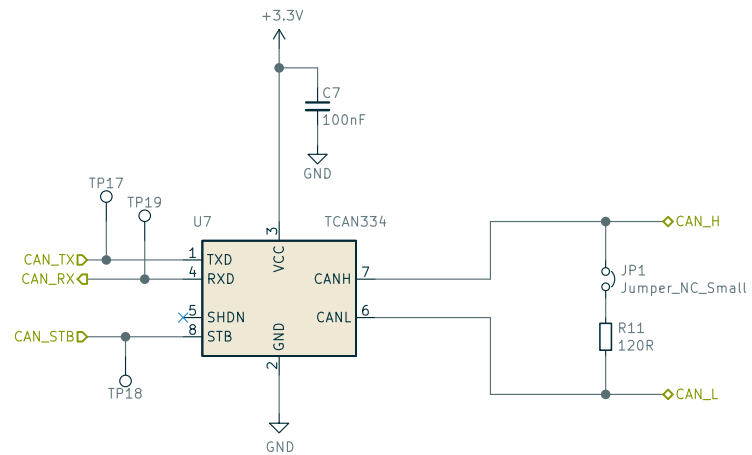


C



If not stated otherwise,
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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		 LIBRESOLAR
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Sheet: /CAN/ File: can.sch		
Author: Martin Jäger		
Size: A4	Date: 2020-11-18	Rev: 0.1.1
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