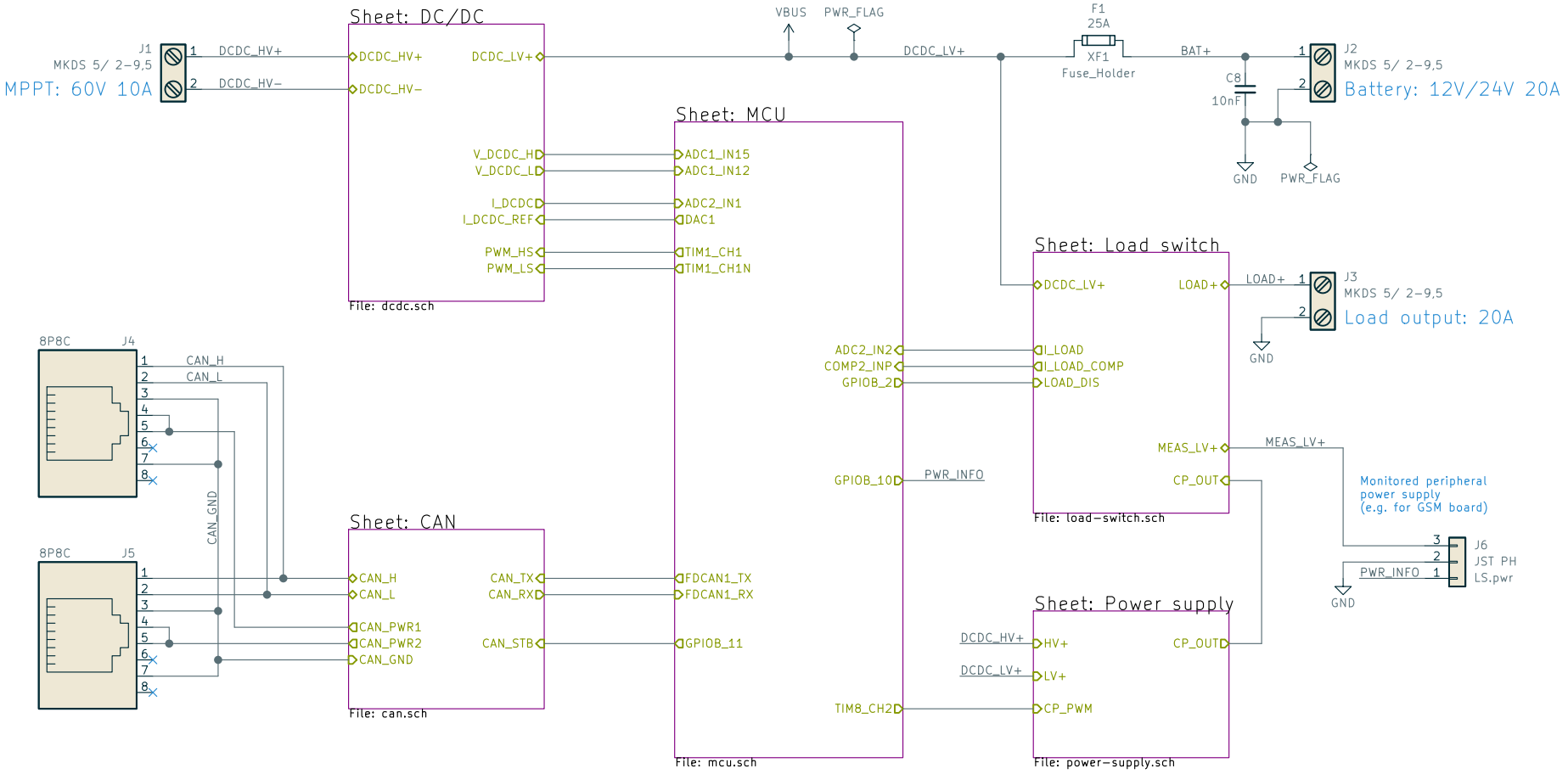
# MPPT charge controller with HS load switch and CAN




LOGO1 LIBRE_SOLAR

LOGO2 OPEN_HARDWARE

FID1 Fiducial

FID2 Fiducial

MK1 Mounting_Hole

MK2 Mounting_Hole

MK3 Mounting_Hole

MK4 Mounting_Hole

| | | |
|---|---|---|
| MPPT 2420 HC | | LIBRESOLAR |
| Libre Solar Technologies GmbH<br>Website: http://libre.solar | | |
| Sheet: /<br>File: mppt-2420-hc.sch | | |
| Author: Martin Jäger | | |
| Size: A4 | Date: 2020-11-18 | Rev: 0.1.1 |
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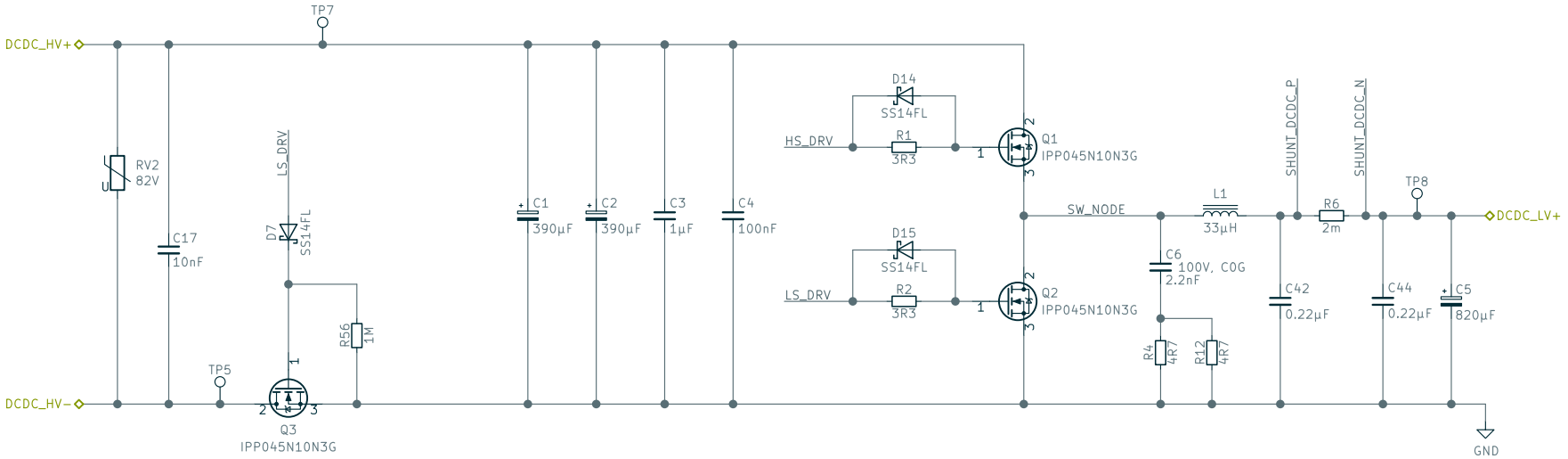
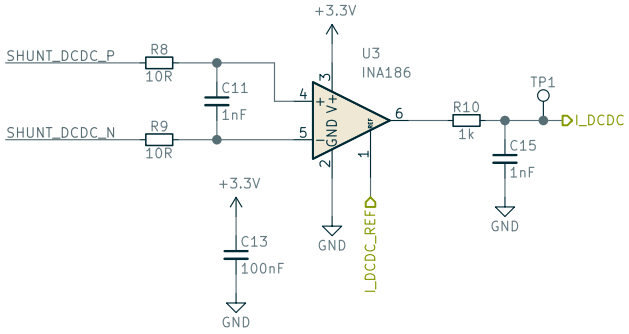
## DC/DC power stage

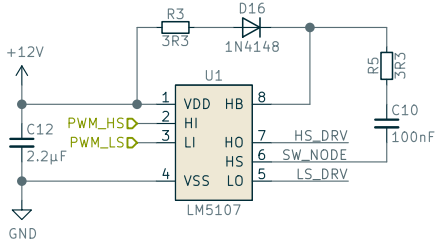



Reverse polarity protection and
PV reverse current blocking

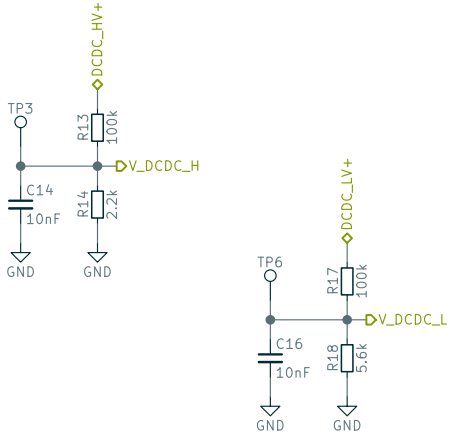
## Inductor current measurement




## MOSFET driver




## Voltage measurement




If not stated otherwise, all MLCC 50V X7R

| | | |
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| Sheet: /DC/DC/<br>File: dcdc.sch | | |
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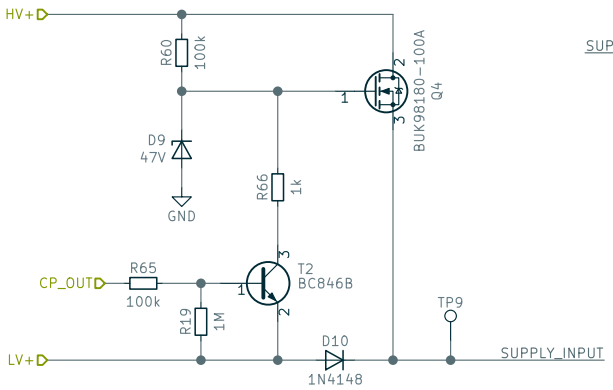
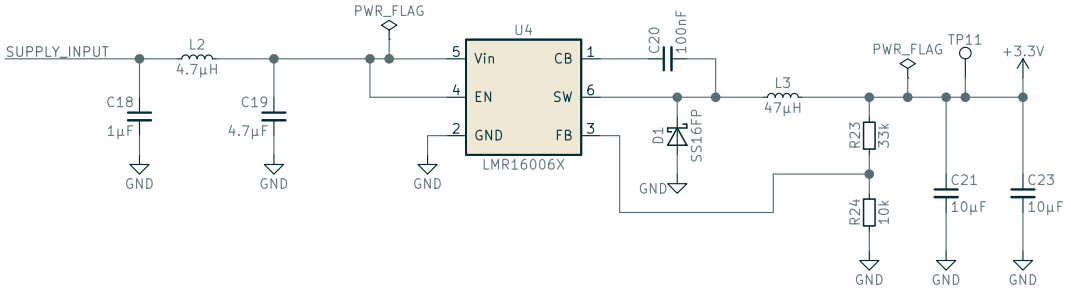
## Supply rail selection




## HV/LV side to 3.3V (SMPS)

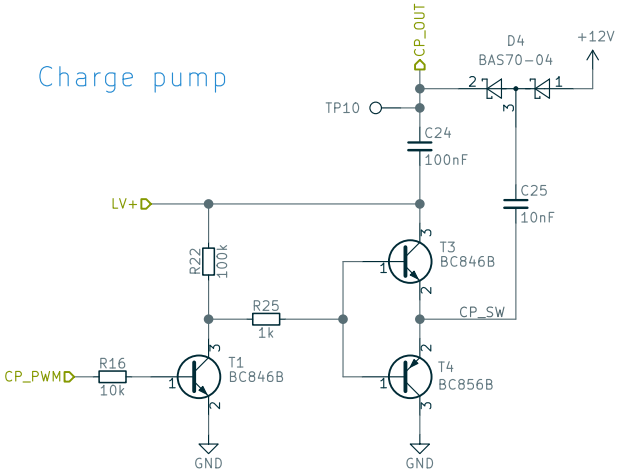



Some applications (e.g. Li-ion batteries) require an internal power supply from the high voltage side (e.g. solar panel input).

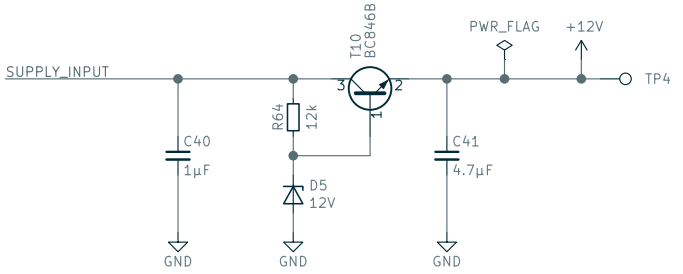
The source follower with Q4 limits the supply input below 60V.

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

## Charge pump




## 12V MOSFET driver supply voltage (emitter follower)

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| Sheet: /Power supply/<br>File: power-supply.sch | | |
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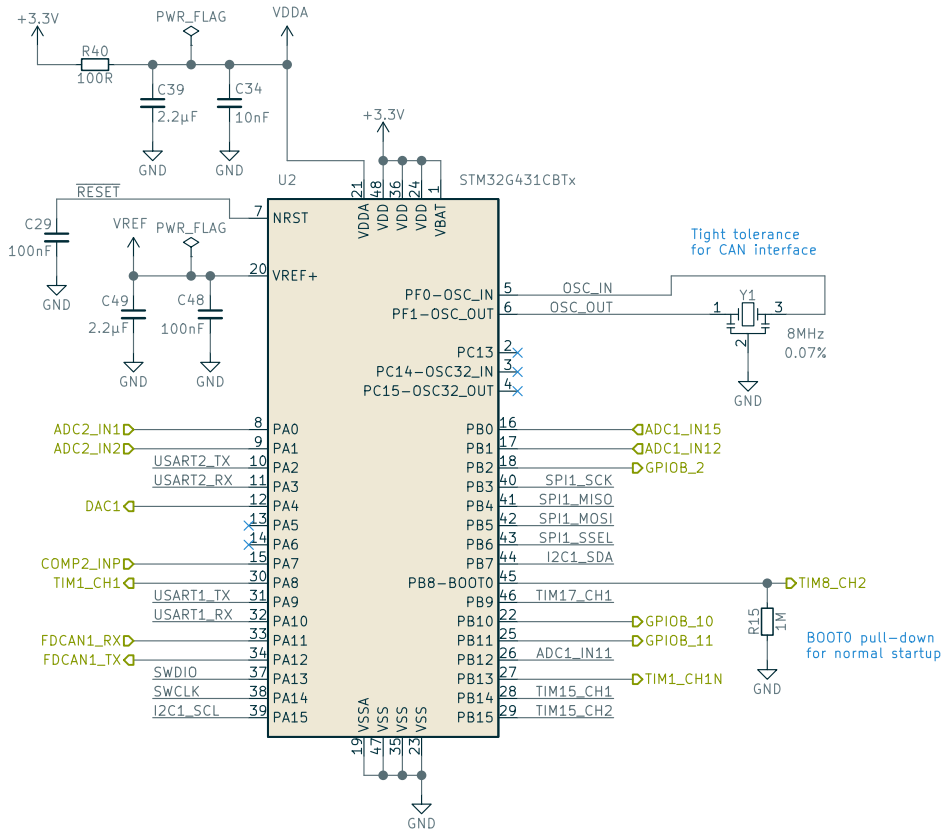


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| Sheet: /MCU/<br>File: mcu.sch | |
| Author: Martin Jäger | |
| Size: A4 / Date: 2020-11-18 | Rev: 0.1.1 |
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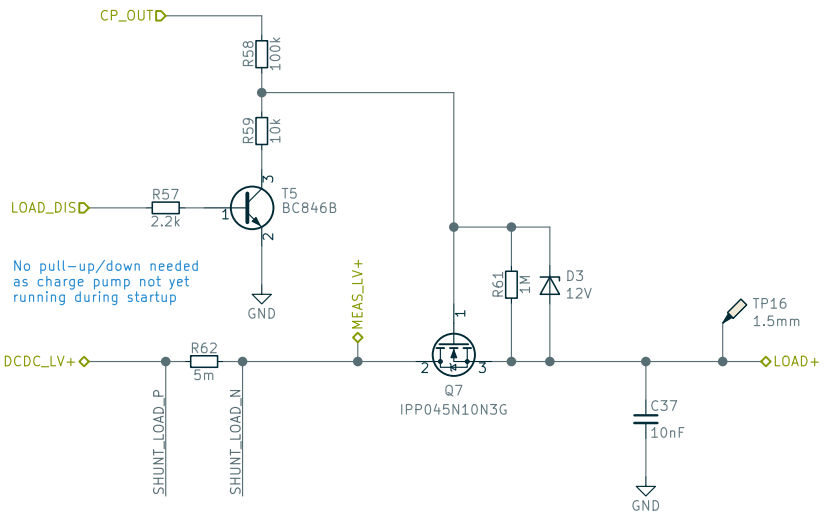
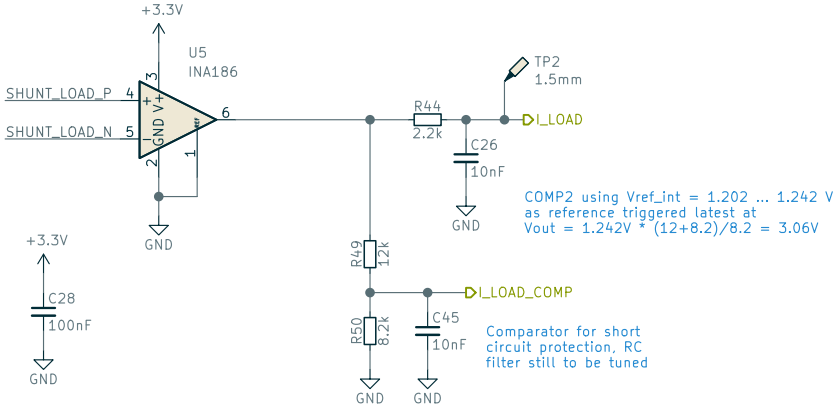
## High-side load switch




## Load current monitoring




If not stated otherwise,
all MLCC 50V X7R

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| Sheet: /Load switch/<br>File: load-switch.sch | | |
| Author: Martin Jäger | | |
| Size: A4 | Date: 2020-11-18 | Rev: 0.1.1 |
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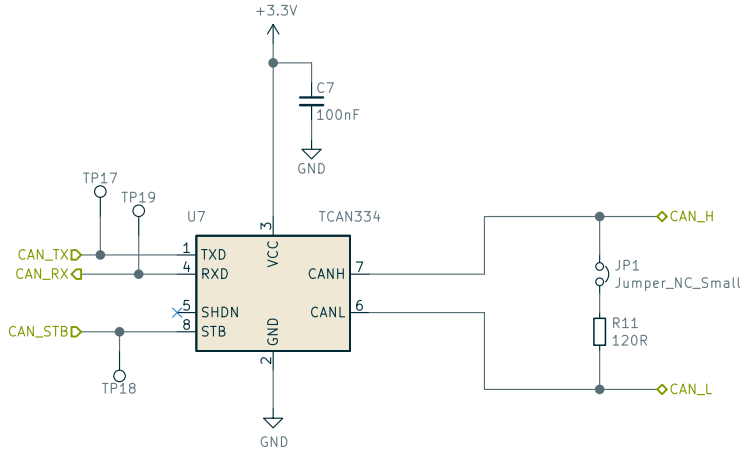


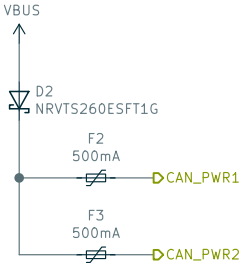


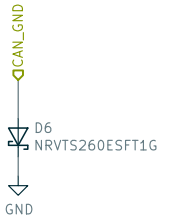


CAN bus power supply
- 10V–32V
- 600 mA (like PoE)

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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| Sheet: /CAN/<br>File: can.sch | | |
| Author: Martin Jäger | | |
| Size: A4 | Date: 2020-11-18 | Rev: 0.1.1 |
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