

1

2

3

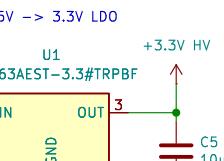
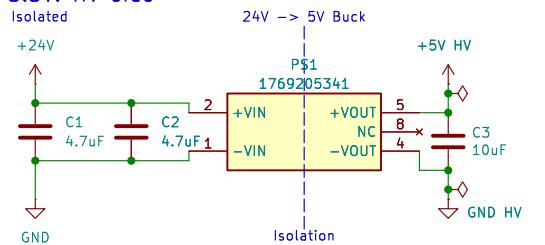
4

5

6

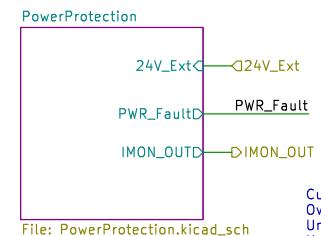
## Power

### 3.3V: HV side



### Power Protection

Taken from PSOM

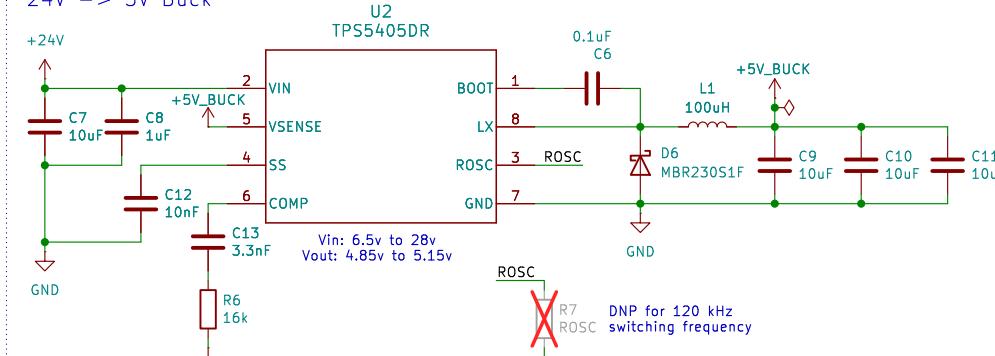


### 3.3V: LV side

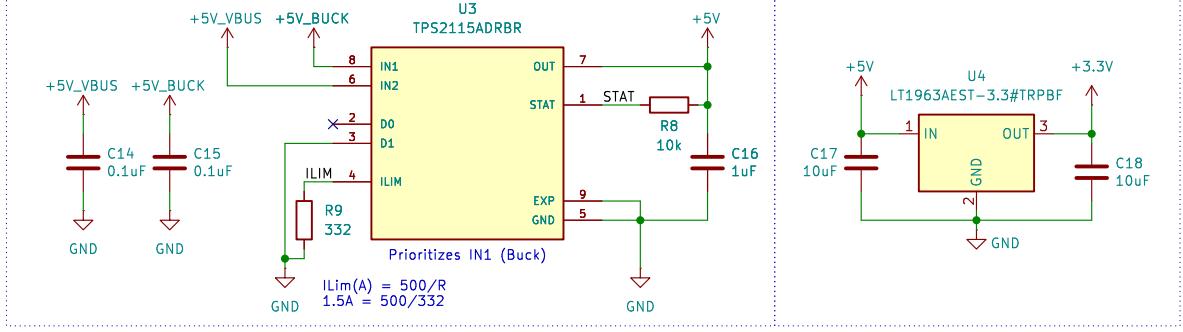
MCU, CAN

Taken from PSOM

#### 24V → 5V Buck

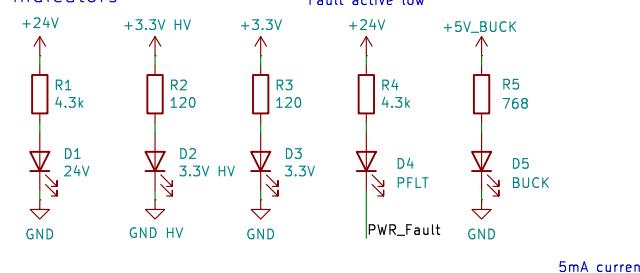


#### 5v Power Mux

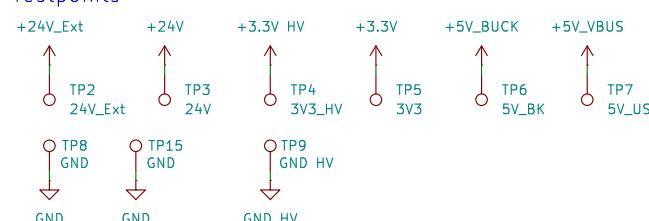


### Indicators

Fault active low



### Testpoints



Sheet: /Power/  
File: Power.kicad\_sch

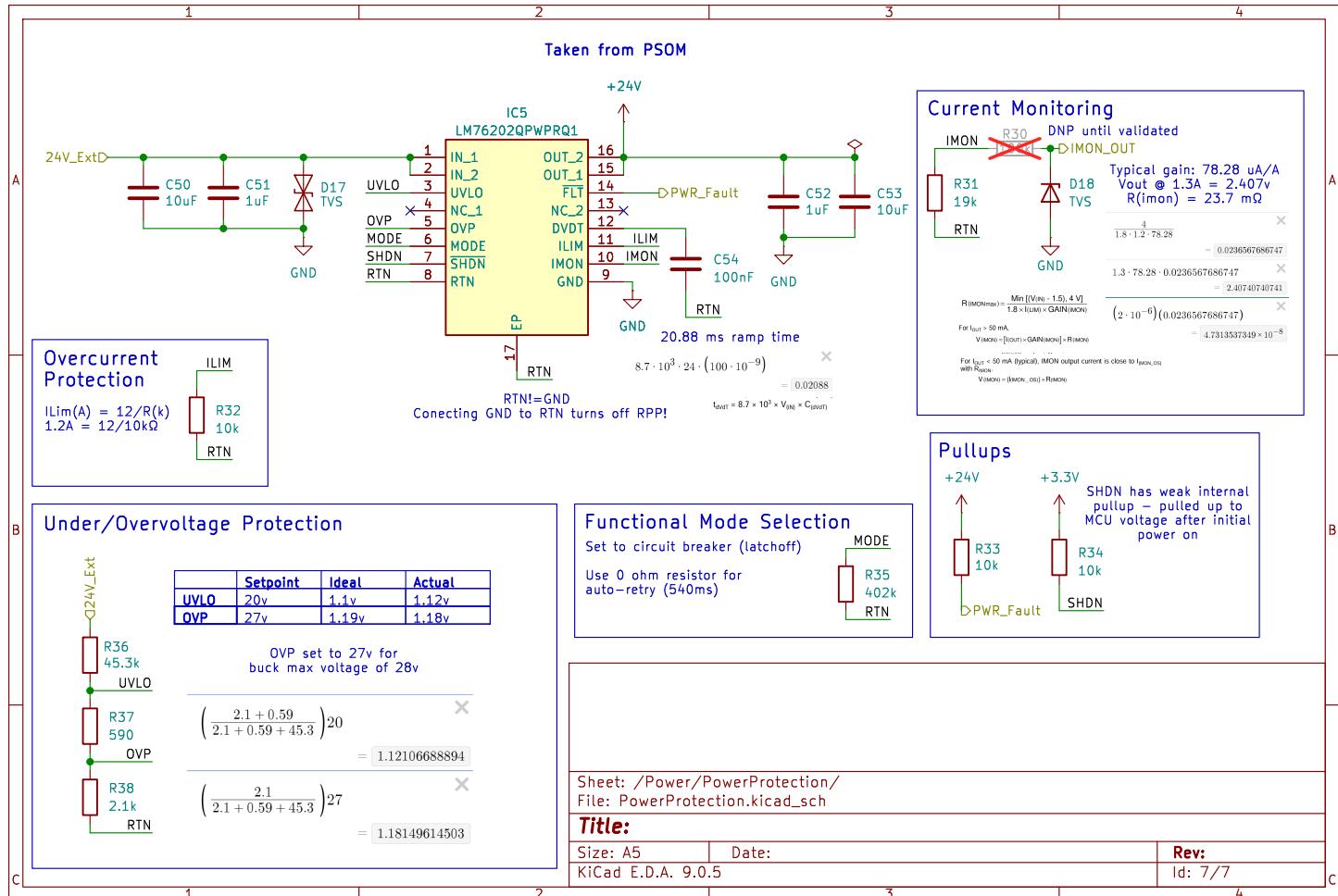
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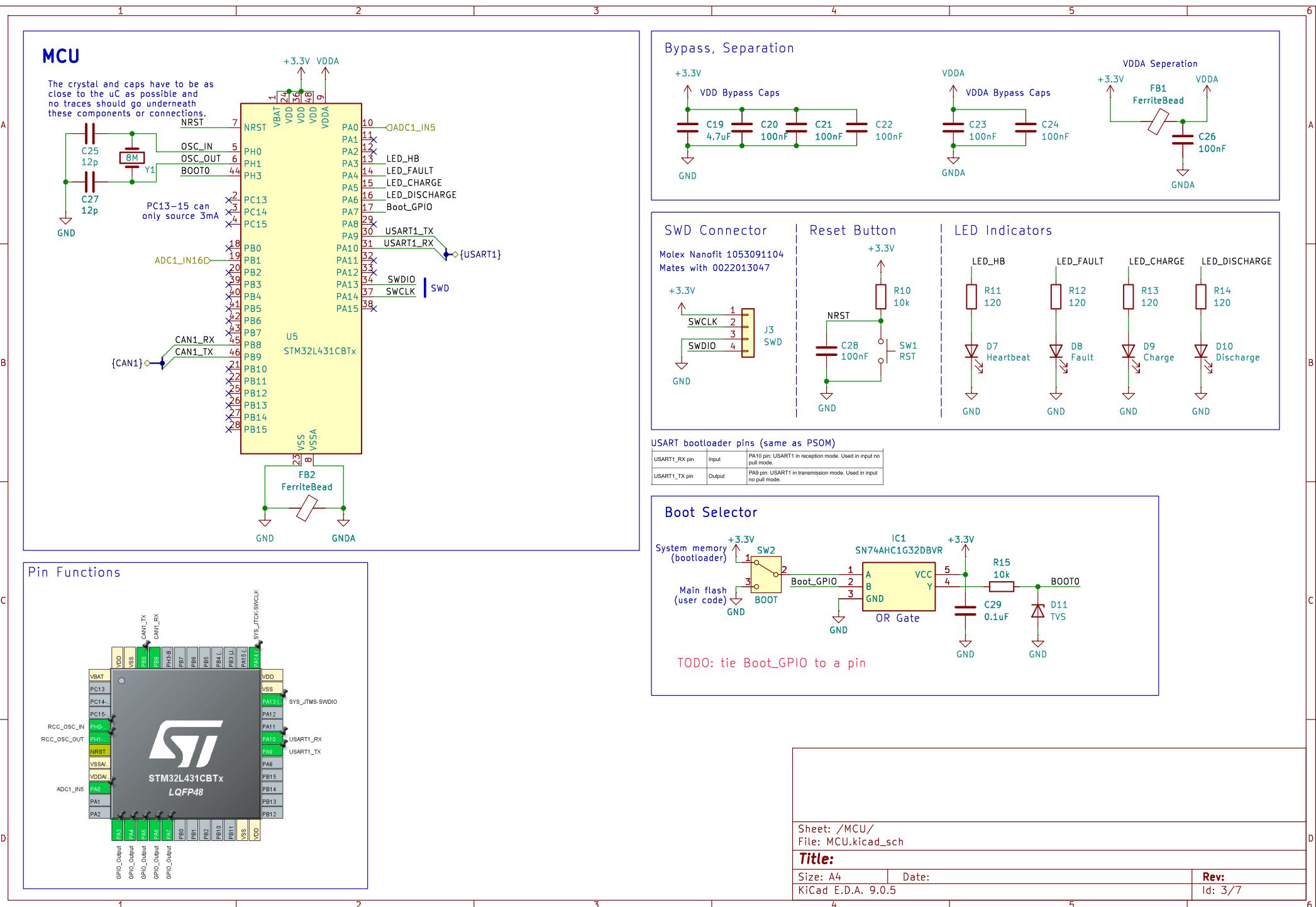
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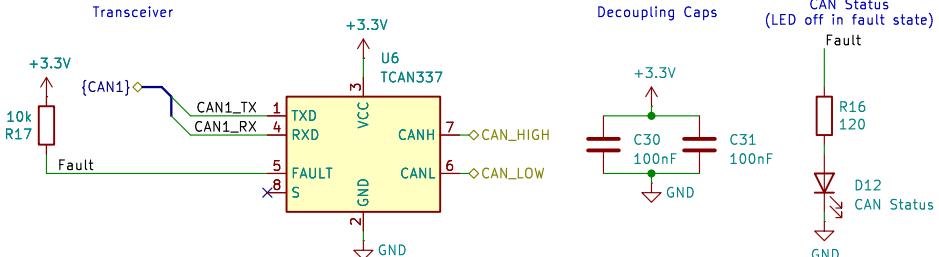
KiCad E.D.A. 9.0.5

Rev:

Id: 2/7

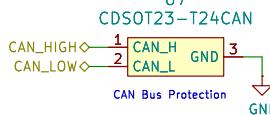




**CAN**

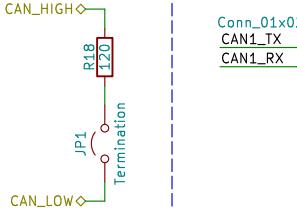
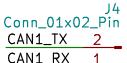
A

A

**Protection**

B

B

**Termination****CAN Breakout**

C

C

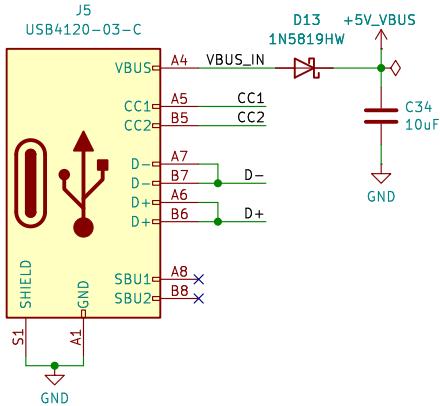
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**Title:**

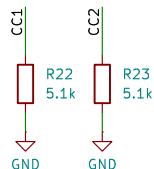
Size: A5	Date:
KiCad E.D.A. 9.0.5	Rev: 4/7

## USB-C

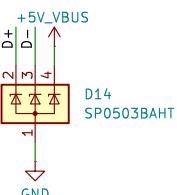
### Vertical USB C Port



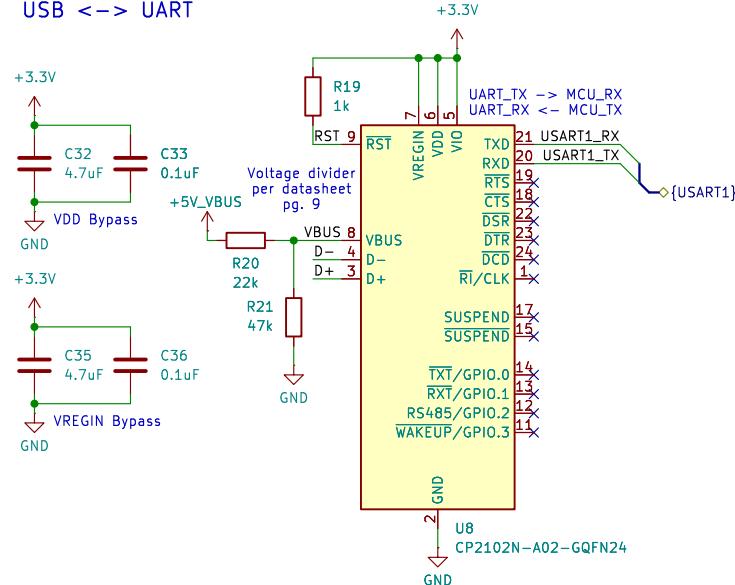
### CCx Pulldown



### USB Protection



## USB <-> UART



Sheet: /USB/  
File: USB.kicad\_sch

Title:

Size: A5 Date:  
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Rev:  
Id: 5/7

## Current Sensing

Shunt → current sense → isolation → filter

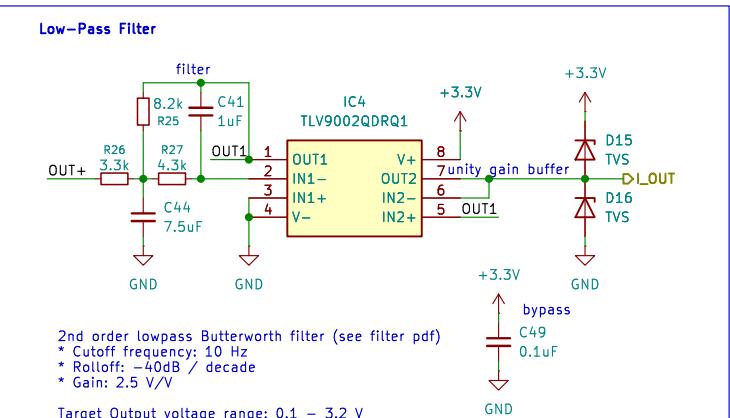
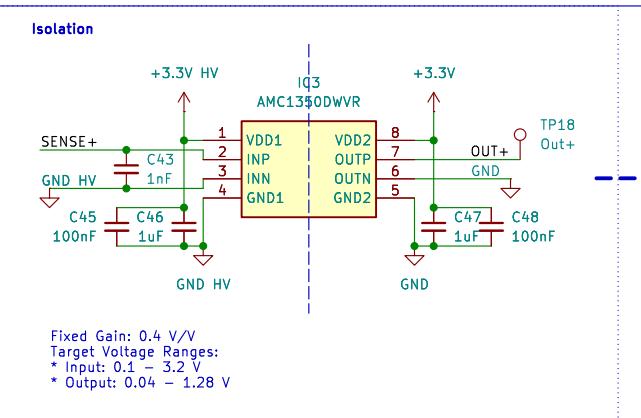
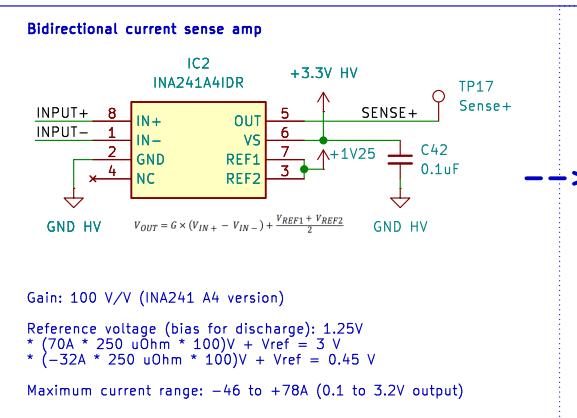
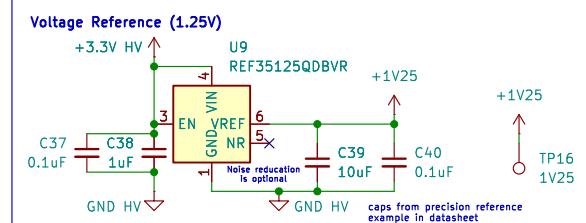
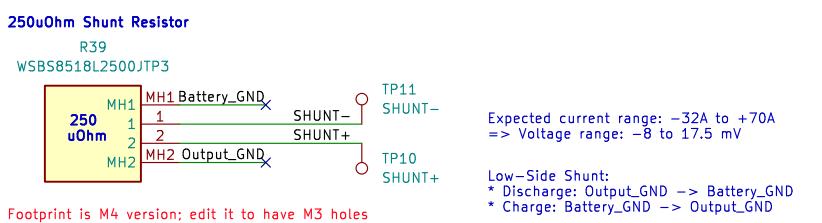


Table 8-1. $R_{SENSE}$ Selection and Power Dissipation (1)	
PARAMETER	EQUATION
RESULTS AT $V_S = 5V$	
G	A1, B1 DEVICES
Vsense	$V_{SENSE} = V_{OUT} / G$
Rsense	$R_{SENSE} = V_{SENSE} / I_{MAX}$
Psense	$P_{SENSE} = R_{SENSE} \times I_{MAX}^2$

Gain: 100 V/V  
 $R_{SENSE} = 250 \mu\text{Ohm}$   
 $P_{SENSE} = R_{SENSE} * (70A)^2 = 1.225 \text{ W}$

Picked shunt first, then adjusted gain to meet ADC range  
If additional gain is needed, tweak filter circuit

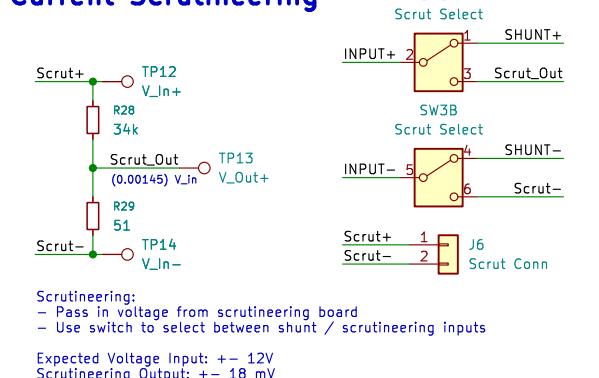
## ADC to Current Conversion

$$\text{Current} = ((\text{ADC} * (3.3 / 4096) - \text{Vref}) / (\text{Shunt} * \text{gain}))$$

$$\text{Vref} = 1.25$$

$$\text{Shunt} * \text{gain} = 250 \mu\text{Ohm} * 100 \text{ V/V} = 0.025$$

## Current Scrutineering



Sheet: /Current Sense/  
File: Current\_Sense.kicad\_sch

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