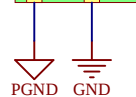
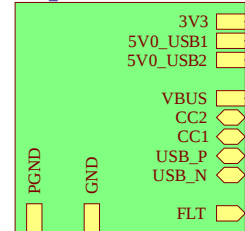


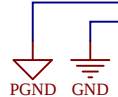
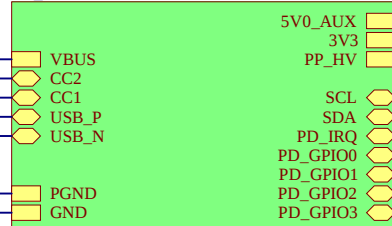
I2C Addresses:		
PD Controller:	0b01000000	0x40
Charger:	0b00010010	0x12
Balancer:	0b01101100	0x6C
(Balancer_2:	0b00010110	0x16)
Display:	0b01111000	0x78

Adjust Pullups for I2C if bus capacitance gets to high!

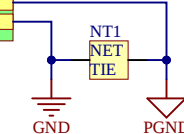
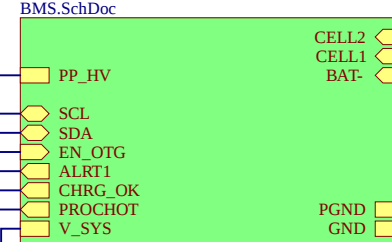
USB Interface
USB_IO.SchDoc



Controller Power Delivery
PD_Controller.SchDoc



Battery Management
BMS.SchDoc

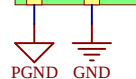
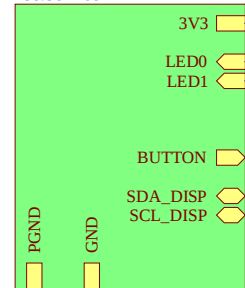


PGND:
Is only used for the high current (>1A) paths.

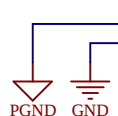
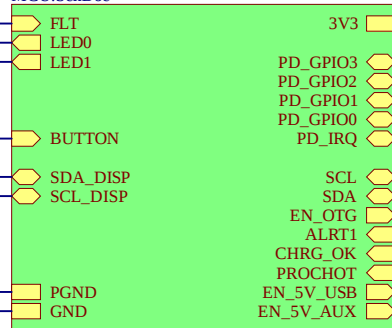
Everything else is GND.

Connect the Net Tie close to the logic PSU.

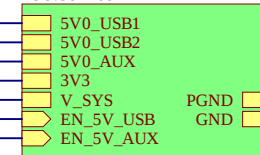
Front Panel Interface
IOs.SchDoc



Microcontroller
MCU.SchDoc



Power Supply
PSU.SchDoc



oBank - Power Bank with PD
Copyright (c) 2021 Sebastian Oberschwendtner

This hardware is open hardware: you can redistribute it and/or modify it under the terms of the open hardware guidelines.

This hardware is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

Title **OTP-20 Block Diagram**

Sebastian Oberschwendtner
github: knuffel-v2

Size: **A4**

Number: **OTP-20-D1**

Revision: **A**

Date: **31.07.2021**

Time: **15:55:09**

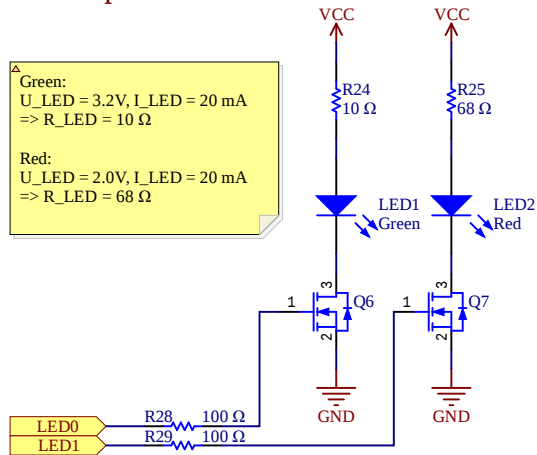
Sheet 1 of 9

File: **Block_Diagram.SchDoc**

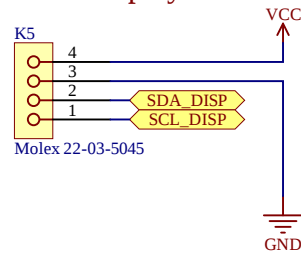
LED Output

Green:
 $U_{LED} = 3.2V$, $I_{LED} = 20\text{ mA}$
 $\Rightarrow R_{LED} = 10\ \Omega$

Red:
 $U_{LED} = 2.0V$, $I_{LED} = 20\text{ mA}$
 $\Rightarrow R_{LED} = 68\ \Omega$



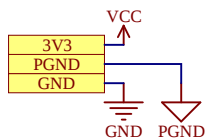
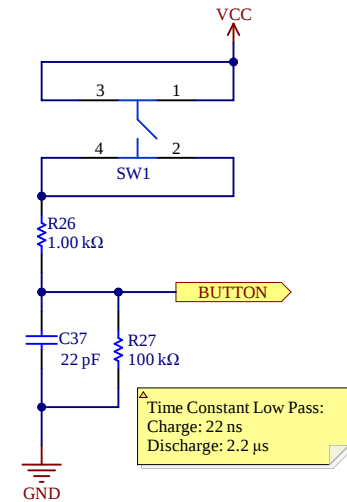
OLED Display

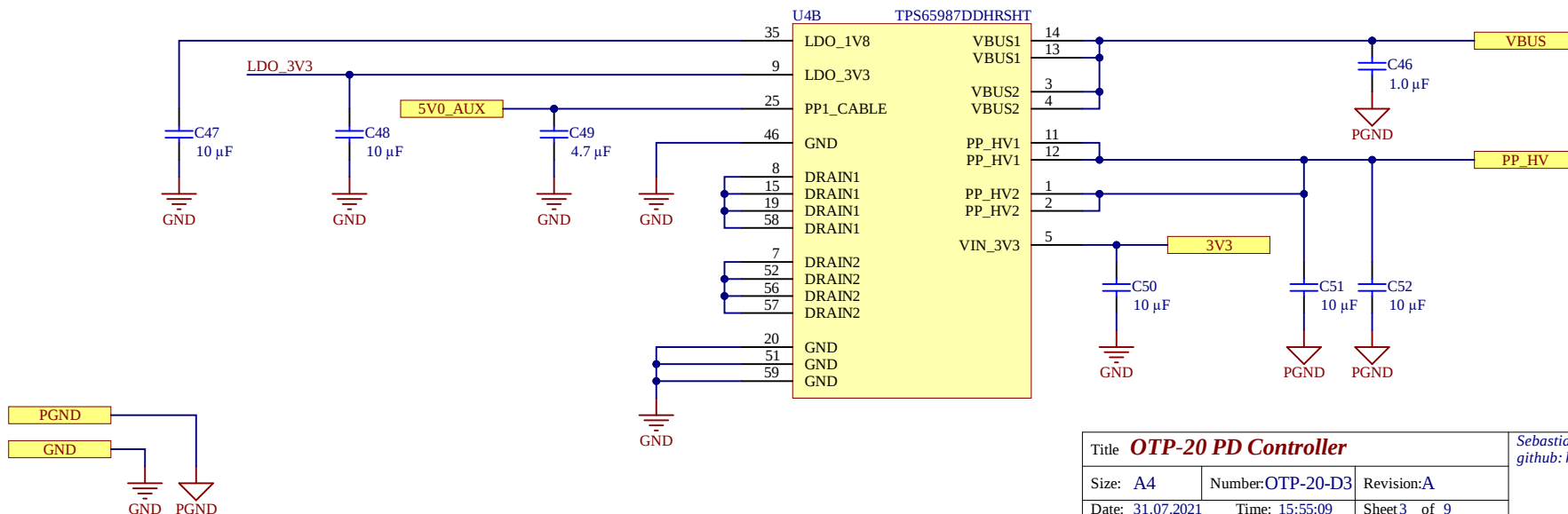
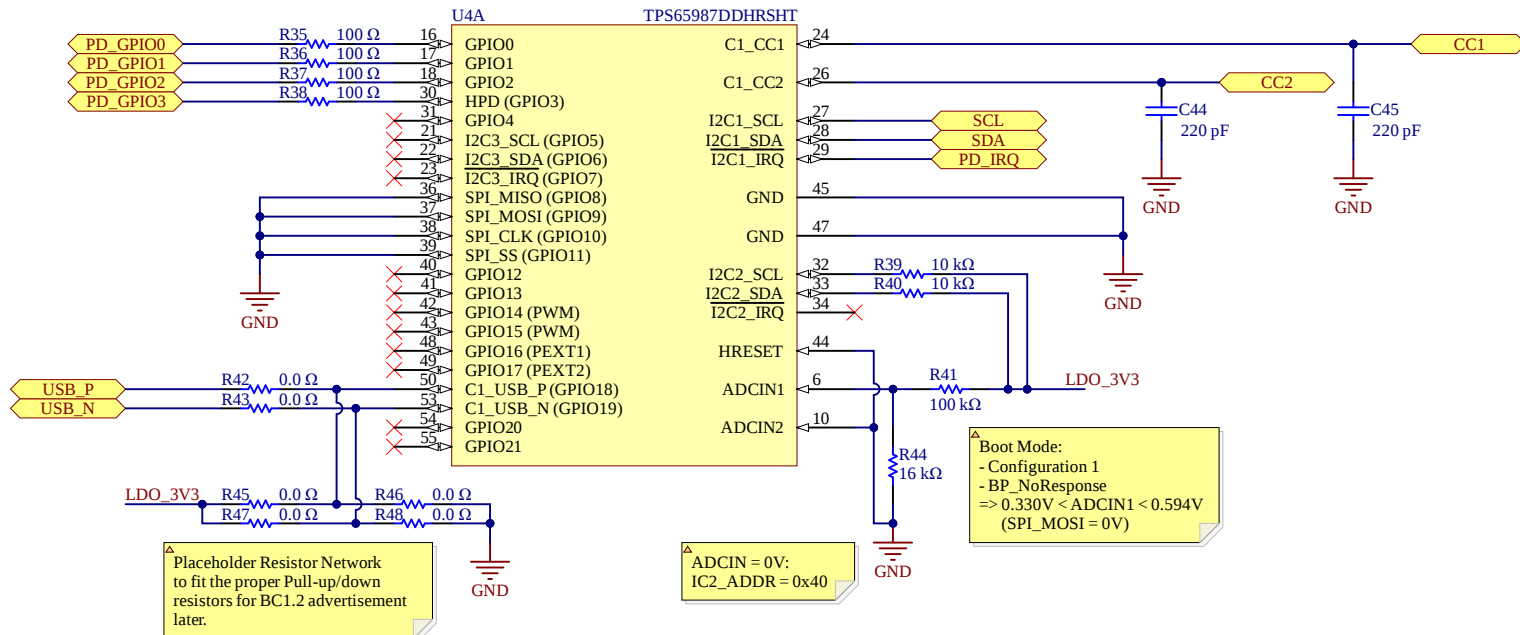


Display: Waveshare 0.91inch OLED Module

Pin 1: SCL (Internal 4k7 Pullup to regulated 3.3V)
Pin 2: SDA (Internal 4k7 Pullup to regulated 3.3V)
Pin 3: GND
Pin 4: VCC (3.3V - 5.0V)

Button





Title **OTP-20 PD Controller**

Sebastian Oberschwendtner
 github: knuffel-v2

Size: **A4**

Number: **OTP-20-D3**

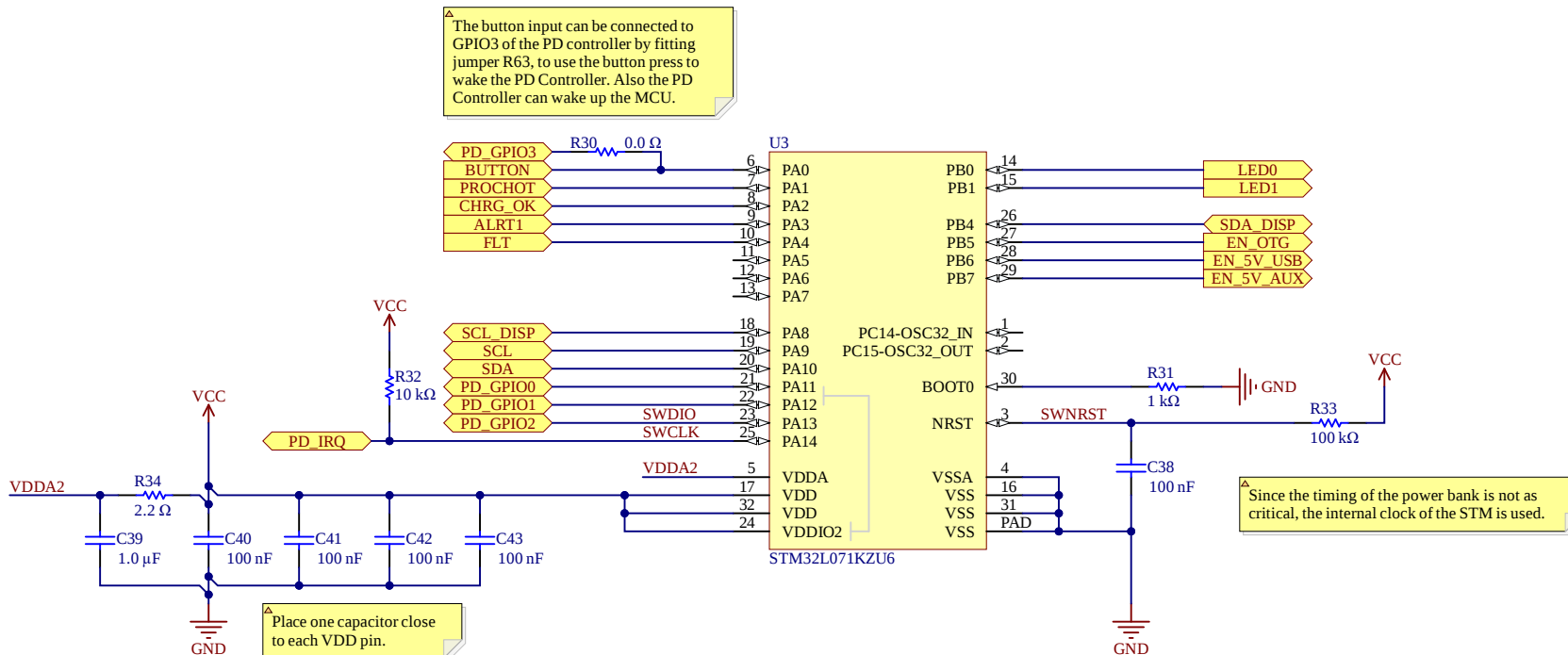
Revision: **A**

Date: **31.07.2021**

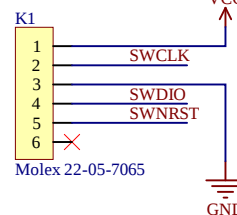
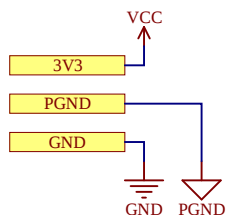
Time: **15:55:09**

Sheet **3** of **9**

File: **PD_Controller.SchDoc**



Programming Port

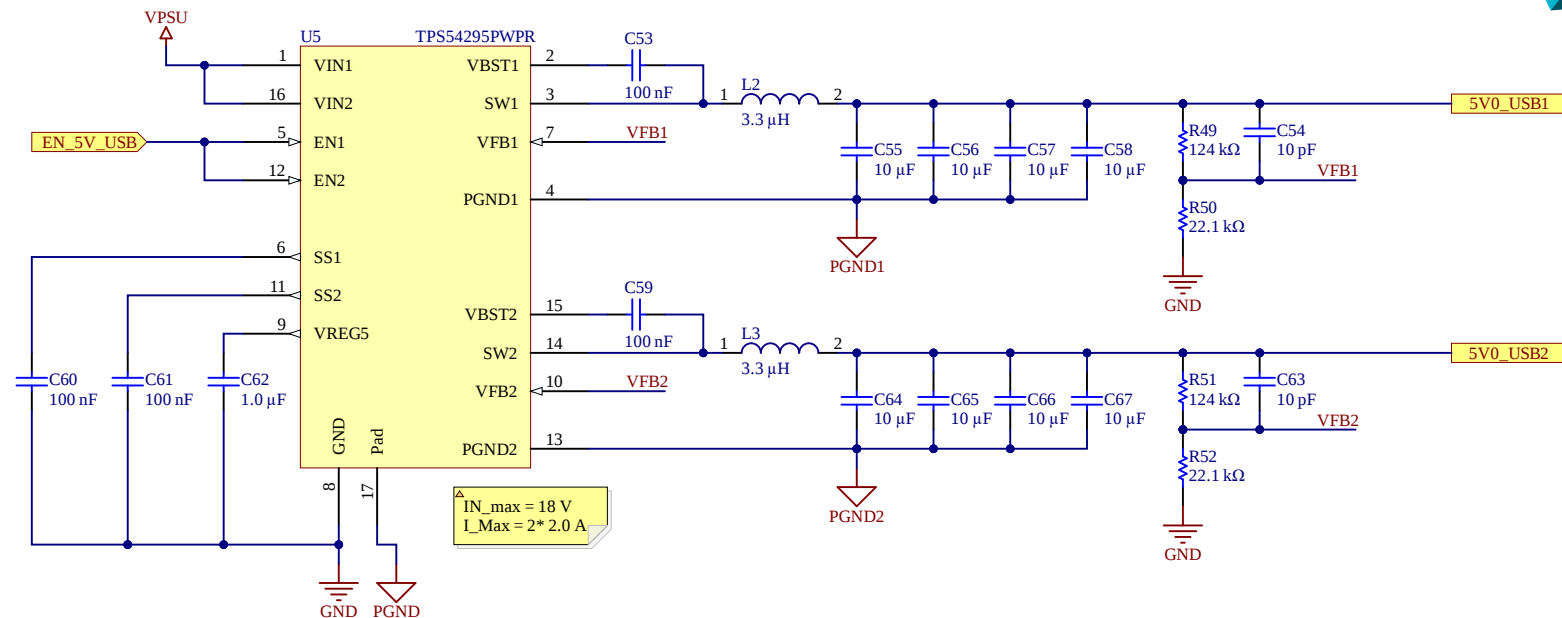


Title OTP-20 Microcontroller			Sebastian Oberschwendner github: knuffel-v2		
Size: A4	Number: OTP-20-D4	Revision: A			
Date: 31.07.2021	Time: 15:55:09	Sheet 4 of 9			
File: MCU.SchDoc					

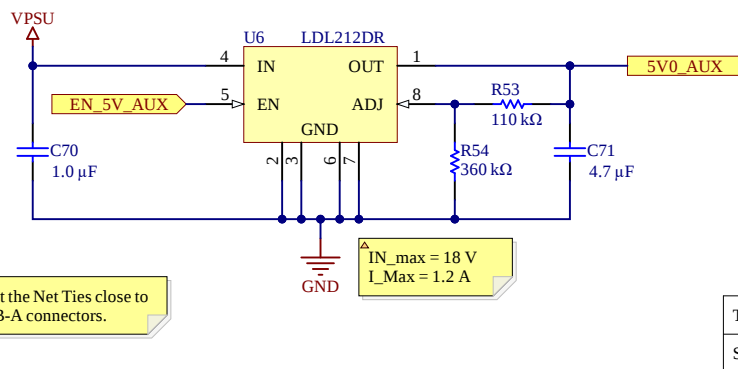
PSU for USB Outputs, 2x 5.0V

Switching PSU Parameters per Channel:
 U_IN = 5.6 V - 8.4 V
 U_OUT = 5.0 V
 I_OUT = 2.0 A
 f_sw = 700 kHz
 I_Inductor_Peak = 2.46 A
 I_Cap_RMS = 0.253 A
 Softstart = 10 ms

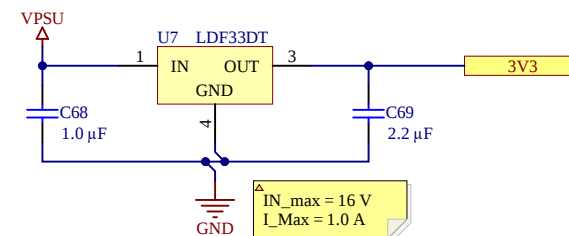
LDO Quiescent Current (nominal):		
Device	Active	Idle
LDF33	200 μ A	30.0 μ A
LDL212	250 μ A	0.3 μ A
TPS54295	1300 μ A	80.0 μ A

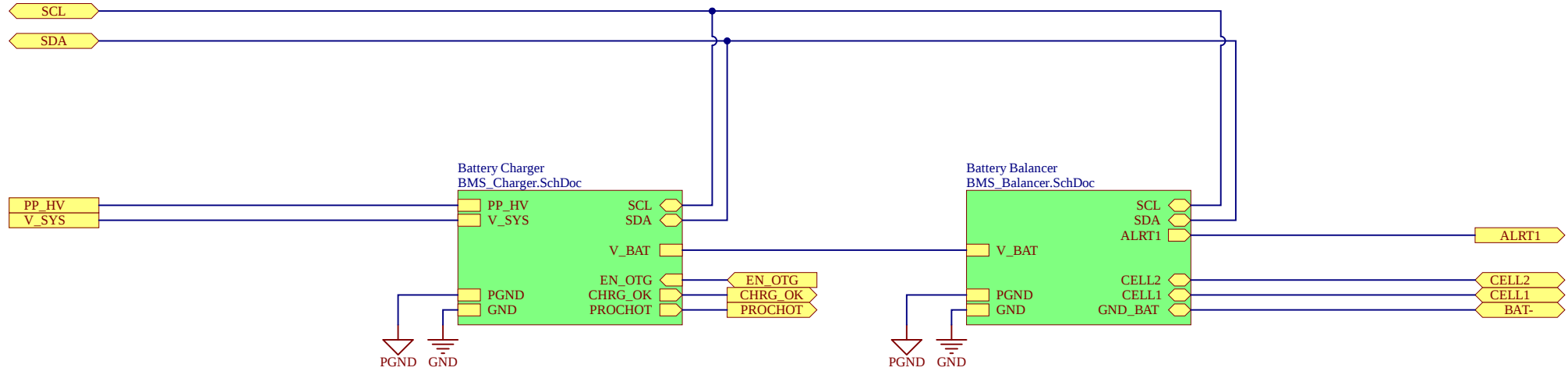


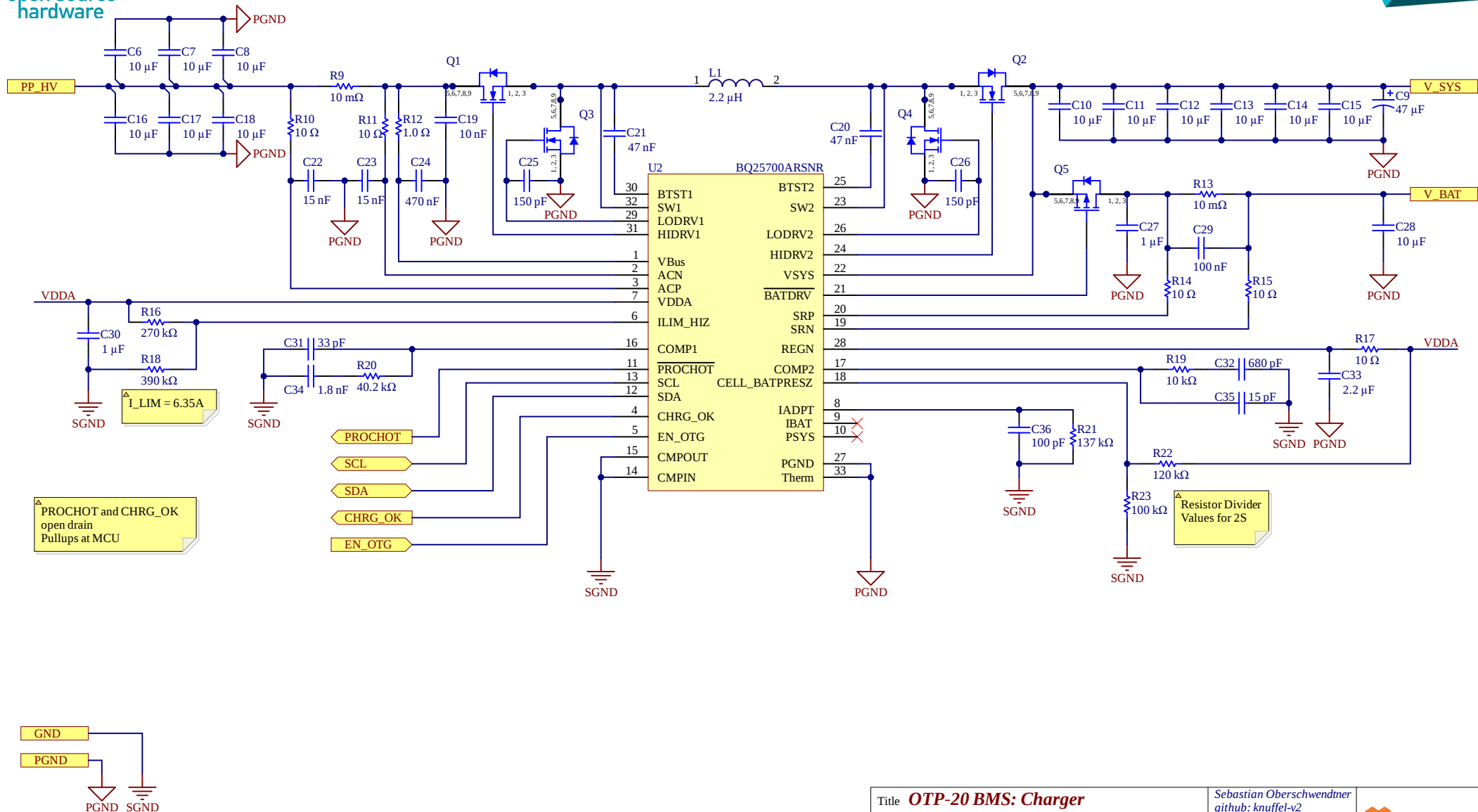
AUX PSU for USB-C Cable, 5.0V



Main Logic PSU, 3.3V







Title **OTP-20 BMS: Charger**

Sebastian Oberschwendtner
github: knuffel-v2

Size: **A4**

Number: **OTP-20-D7**

Revision: **A**

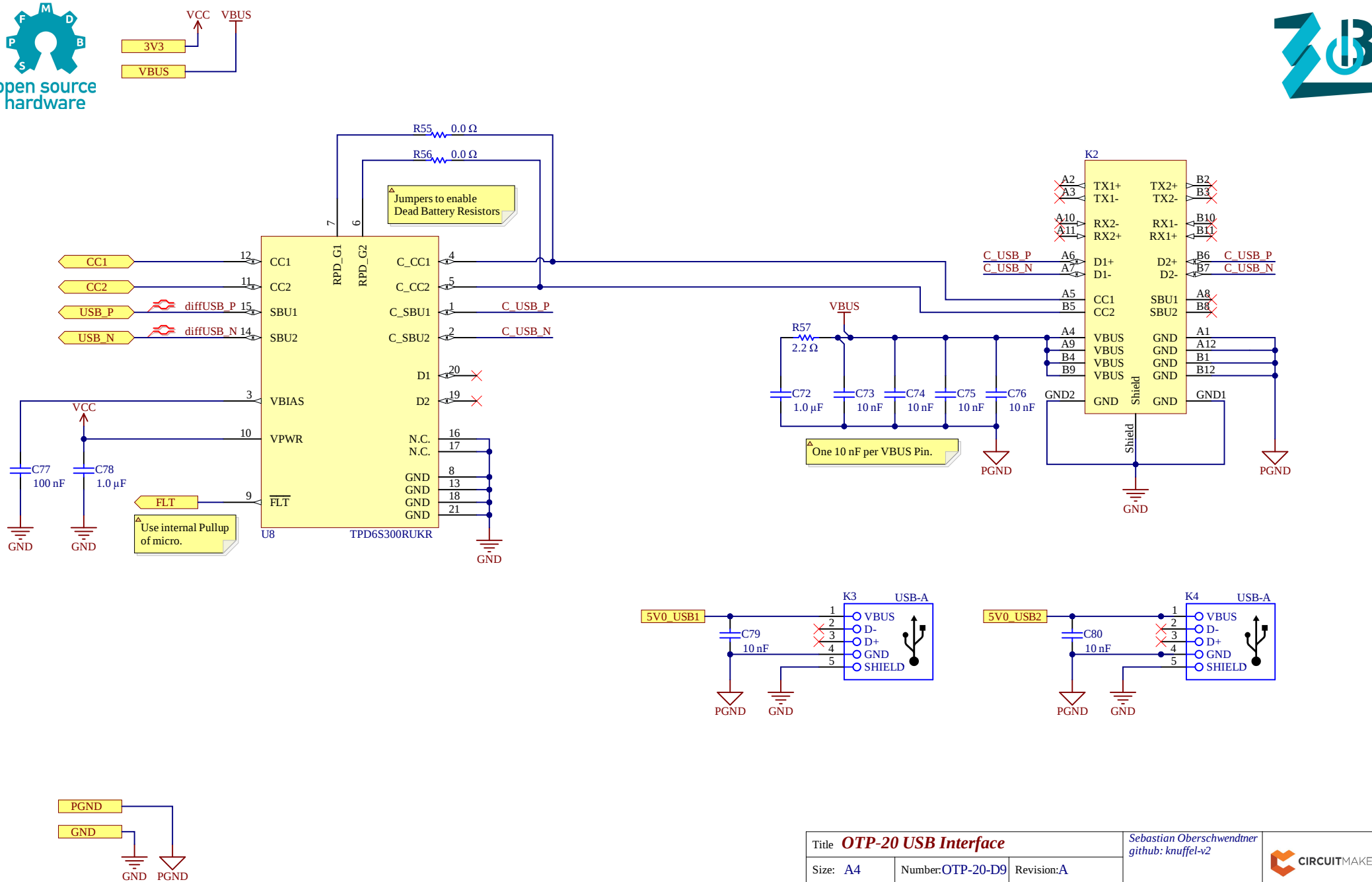
Date: **31.07.2021**

Time: **15:55:09**

Sheet **7** of **9**

File: **BMS_Charger.SchDoc**

D



Title **OTP-20 USB Interface**

Sebastian Oberschwendtner
github: knuffel-v2

Size: **A4**

Number: **OTP-20-D9**

Revision: **A**

Date: **31.07.2021**

Time: **15:55:10**

Sheet **9** of **9**

File: **USB_IO.SchDoc**

