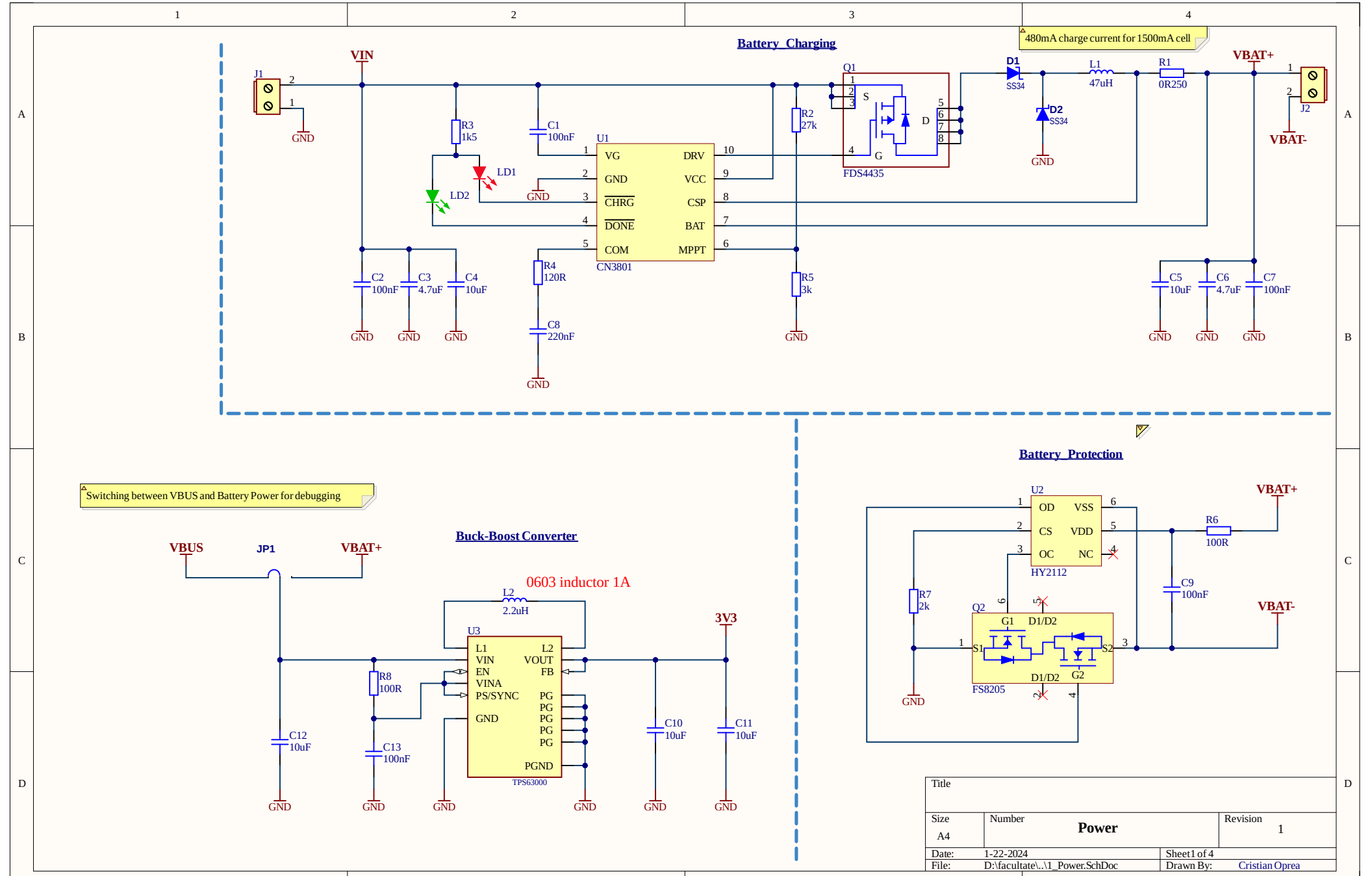
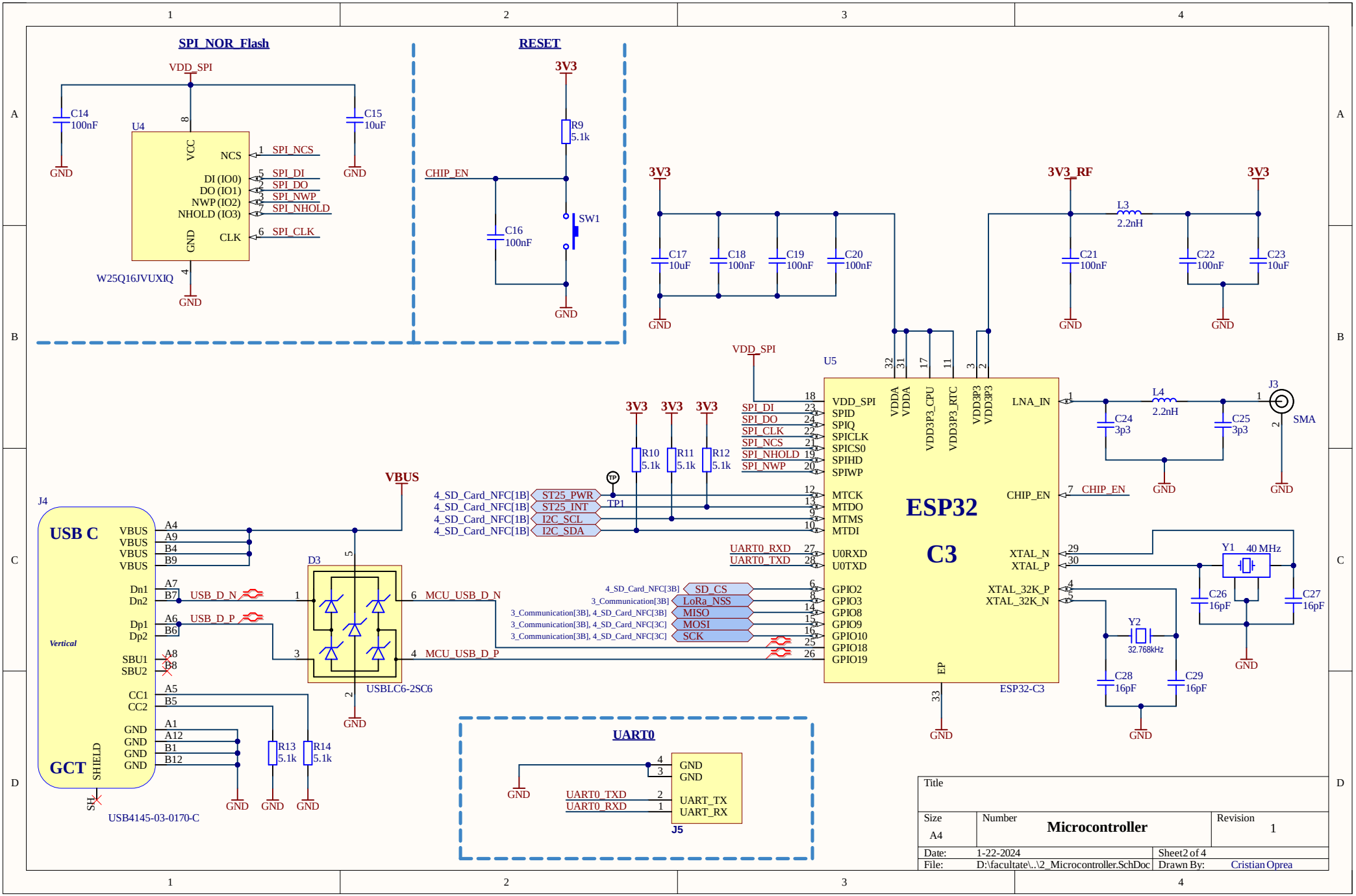
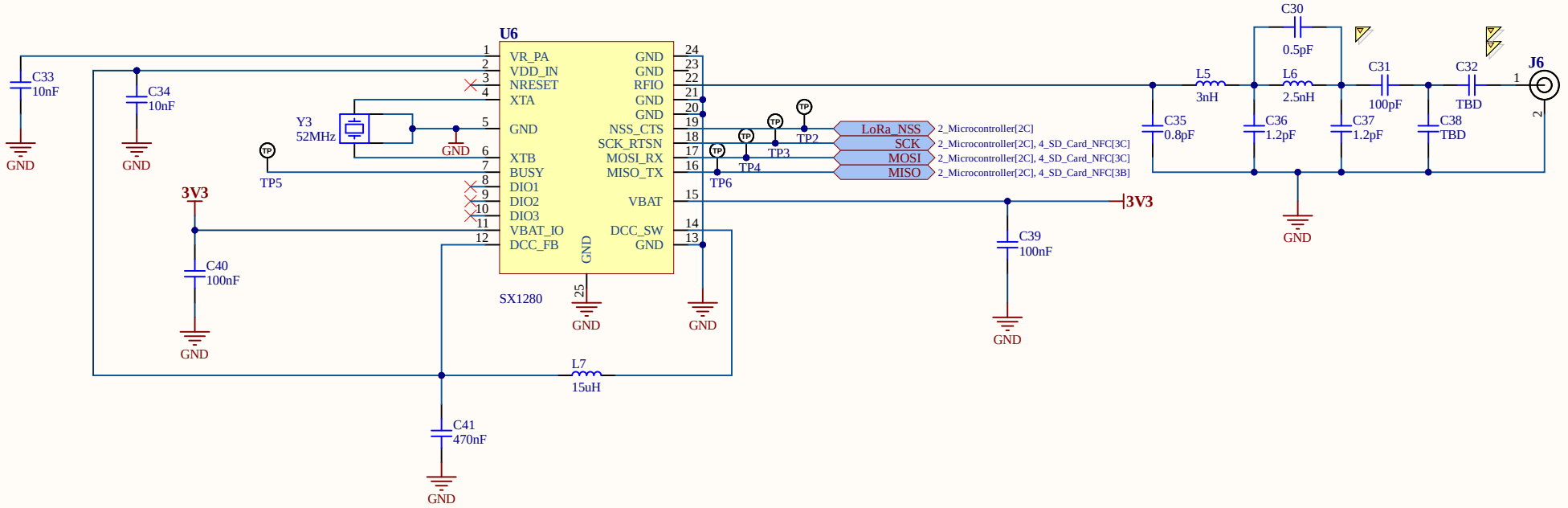
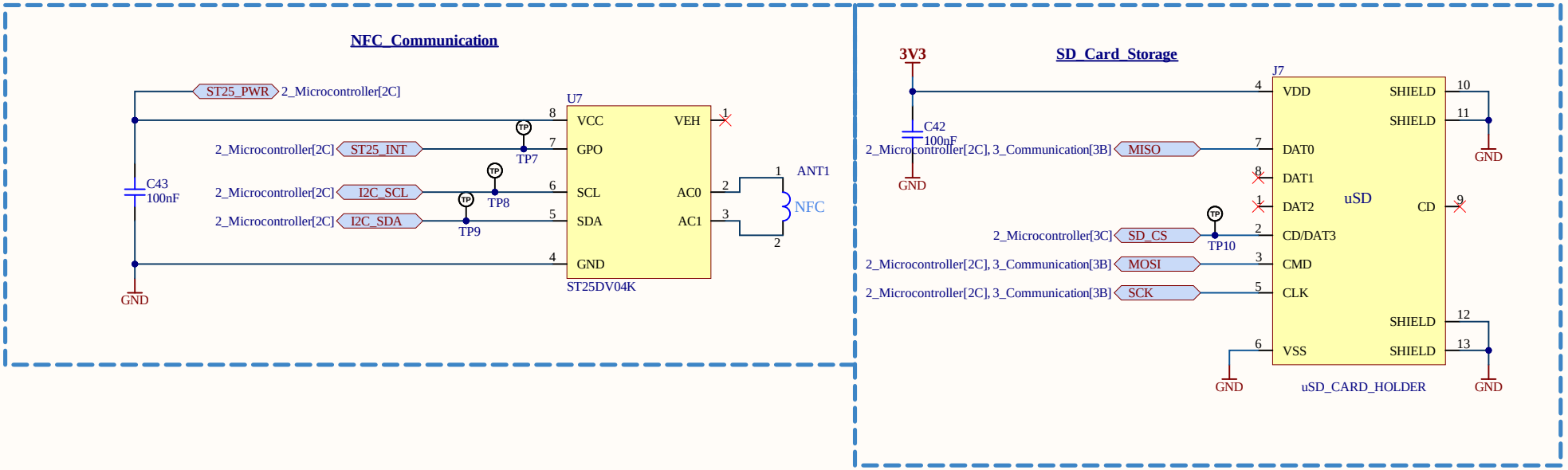

Battery_Charging
480mA charge current for 1500mA cell
VIN
VBAT+
VBAT-
J1
J2
GND
R3
1k5
C1
100nF
U1
VG
GND
CHRG
DONE
COM
DRV
VCC
CSP
BAT
MPPT
CN3801
LD1
LD2
R2
27k
Q1
FDS4435
D1
SS34
D2
SS34
L1
47uH
R1
0R250
C2
100nF
C3
4.7uF
C4
10uF
R4
120R
C8
220nF
R5
3k
C5
10uF
C6
4.7uF
C7
100nF
Switching between VBUS and Battery Power for debugging
VBUS
JP1
Buck-Boost Converter
0603 inductor 1A
L2
2.2uH
U3
L1
VIN
EN
VINA
PS/SYNC
GND
L2
VOUT
FB
PG
PGND
TPS63000
3V3
R8
100R
C12
10uF
C13
100nF
C10
10uF
C11
10uF
Battery_Protection
U2
OD
CS
OC
VSS
VDD
NC
HY2112
R6
100R
C9
100nF
R7
2k
Q2
G1
D1/D2
S1
S2
G2
FS8205
Title
Size
A4
Number
Power
Revision
1
Date:
1-22-2024
Sheet1 of 4
File:
D:\facultate\..\1_Power.SchDoc
Drawn By:
Cristian Oprea

Antenna connected on SMA connector



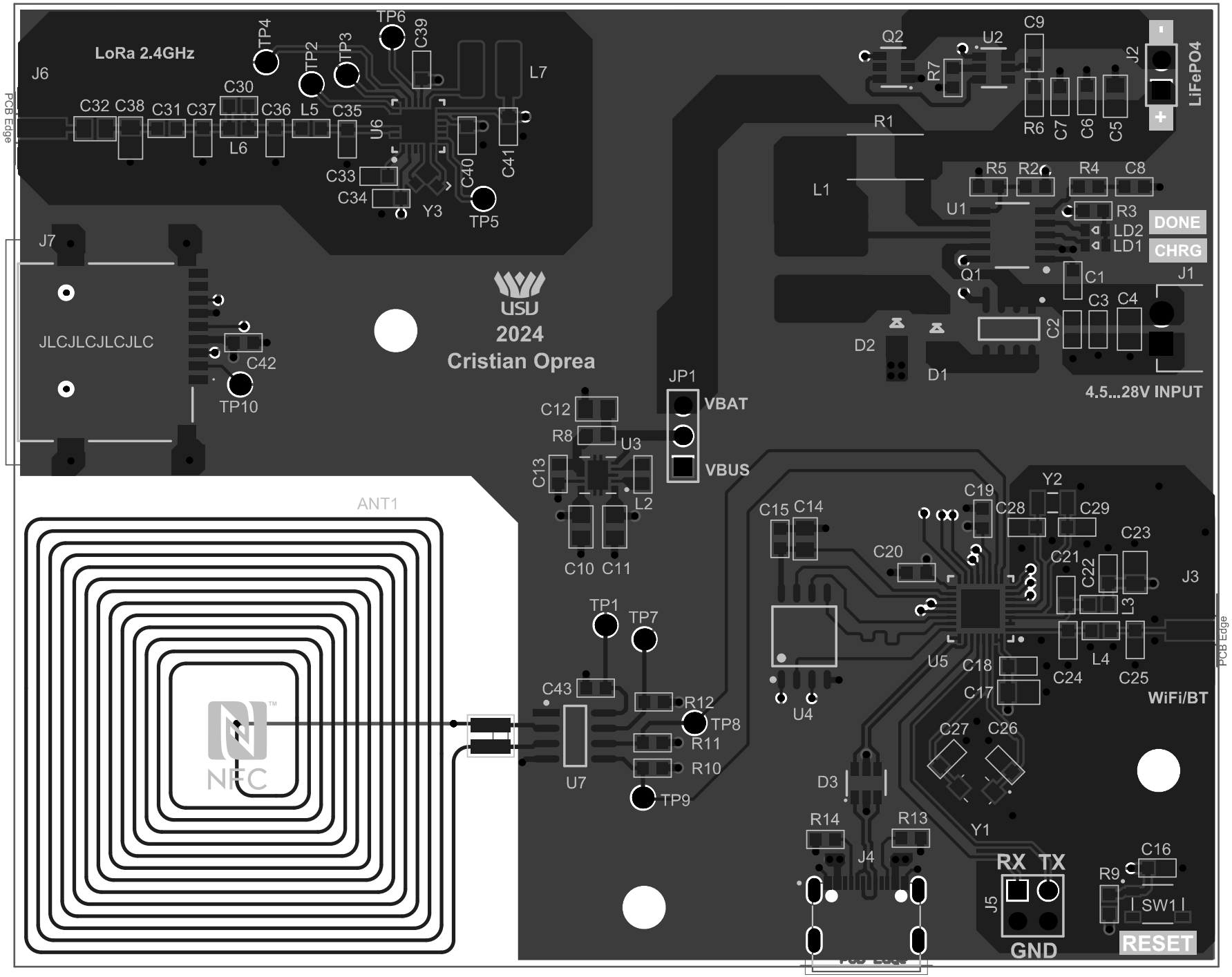


Title			
Size: A4	Number: **Communication**		Revision: 1
Date: 1-22-2024		Sheet 3 of 4	
File: D:\facultate\..\3_Communication.SchDoc		Drawn By: Cristian Oprea	



Title			
Size: A4	Number: SD Card and NFC		Revision: 1
Date: 1-22-2024		Sheet4 of 4	
File: D:\facultate\..\4_SD_Card_NFC.SchDoc		Drawn By: Cristian Oprea	

1.8 V to 5.5 V


LoRa 2.4GHz
J6
TP4
TP2
TP3
TP6
C39
L7
C30
C32
C38
C31
C37
C36
L5
C35
L6
U6
C33
C34
Y3
C40
C41
TP5
PCB Edge
J7
JLCJLCJLCJLC
C42
TP10
USV
2024
Cristian Oprea
Q2
U2
C9
R7
R6
C7
C6
C5
J2
LiFePO4
R1
L1
R5
R2
R4
C8
U1
R3
LD2
LD1
DONE
CHRG
Q1
C1
J1
C3
C4
C2
D2
D1
4.5...28V INPUT
JP1
VBAT
VBUS
C12
R8
U3
C13
L2
C10
C11
ANT1
NFC
TP1
TP7
C43
R12
TP8
R11
R10
U7
TP9
C15
C14
C19
Y2
C28
C29
C20
C23
C21
C22
J3
L3
L4
C24
C25
U5
C18
C17
WiFi/BT
U4
C27
C26
D3
Y1
R14
R13
J4
RX
TX
J5
GND
C16
R9
SW1
RESET
PCB Edge

Comment	Description	Designator	Footprint	LibRef	Quantity
NFC_ANTENNA		ANT1	ANT16	NFC_ANTENNA	1
100nF	Capacitor SMD 0603	C1, C2, C7, C9, C13, C14, C16, C18, C19, C20, C21, C22, C39, C40, C42, C43	C0603	CAP_0603	16
4.7uF	Capacitor SMD 0603	C3, C6	C0603	CAP_0603	2
10uF	Capacitor SMD 0805	C4, C5, C10, C11, C12, C15, C17, C23	C0805	CAP_0805	8
220nF	Capacitor SMD 0603	C8	C0603	CAP_0603	1
3p3	Capacitor SMD 0603	C24, C25	C0603	CAP_0603	2
16pF	Capacitor SMD 0603	C26, C27, C28, C29	C0603	CAP_0603	4
0.5pF	Capacitor SMD 0603	C30	C0603	CAP_0603	1
100pF	Capacitor SMD 0603	C31	C0603	CAP_0603	1
TBD	Capacitor SMD 0805	C32, C38	C0805	CAP_0603	2
10nF	Capacitor SMD 0603	C33, C34	C0603	CAP_0603	2
0.8pF	Capacitor SMD 0805	C35	C0603	CAP_0805	1
1.2pF	Capacitor SMD 0603	C36, C37	C0603	CAP_0603	2
470nF	Capacitor SMD 0603	C41	C0603	CAP_0603	1
SS34	Diode	D1, D2	DO-214AC	DIODE_SCHOTTKY	2
USBLC6-2SC6	Low-Capacitance ESD Protection USB	D3	SOT23-6	USBLC6-2SC6	1
PLUGIN_TERMINAL	Screw terminal or plug terminal for power	J1	2.54_pluggable_terminal	Power_Connector	1
PLUGIN_TERMINAL	Screw terminal or plug terminal for power	J2	HEADER_1x2_2.54	Power_Connector	1
SMA	RF Connector SMA Female 50 Ohms 18 GHz PCB Edge Mount	J3	CON_SMA-EDGE-S	CON-SMA-EDGE-S	1
USB4145-03-0170-C	USB Connector Type C SMT 16 Pin Vertical	J4	VALCON_CSP-USC16-TR	USB4145-03-0170-C	1
Header1x4		J5	HEADER_2x2_2.54	Header1x4	1
SMA_EDGE_CONN	RF Connector SMA Female 50 Ohms 18 GHz PCB Edge Mount	J6	CON_SMA-EDGE-S	CON-SMA-EDGE-S	1
uSD_CARD_HOLDER		J7	TF115BCP9	uSD_CARD	1
JUMPER_3PIN		JP1	HEADER_1x3_2.54	JUMPER_3PIN	1
47uH	Inductor SMD 0603	L1	IND_5_7	IND_0603	1
2.2uH	Inductor SMD 1008	L2	L0603	IND_1008	1
2.2nH	Inductor SMD 1008	L3, L4	L0603	IND_1008	2
3nH	Inductor SMD 0603	L5	L0603	IND_0603	1
2.5nH	Inductor SMD 0603	L6	L0603	IND_0603	1
15uH	Inductor SMD 0603	L7	IND_3.2_4	IND_0603	1
LED_RED	Typical BLUE SiC LED	LD1	LED0603RD	LED_RED	1
LED_GREEN	Typical BLUE SiC LED	LD2	LED0603GR	LED_GREEN	1
FDS4435		Q1	SOIC-SN8_N	FDS4435	1
FS8205		Q2	SOT23-6	FS8205	1
0R250	Resistor SMD 0805	R1	R2512	RES_0805	1
27k	Resistor SMD 0603	R2	R0603	RES_0603	1
1k5	Resistor SMD 0603	R3	R0603	RES_0603	1
120R	Resistor SMD 0603	R4	R0603	RES_0603	1
3k	Resistor SMD 0603	R5	R0603	RES_0603	1
100R	Resistor SMD 0603	R6, R8	R0603	RES_0603	2
2k	Resistor SMD 0603	R7	R0603	RES_0603_1	1
5.1k	Resistor SMD 0603	R9, R10, R11, R12, R13, R14	R0603	RES_0603	6
PTS645SM43SMTR92 LFS	Switch	SW1	SW_SKRPACE010	SW-PB	1
CN3801	LiFePO4 charge IC with integrated MPPT and wide input range (4.5 to 28V) with deeply discharged cell revive	U1	SSOP-10	CN3801	1
HY2112	LiFePO4 protection IC	U2	SOT23-6	HY2112	1
TPS63000	Buck-Boost Switching Regulator IC Positive Adjustable 1.2V 1 Output 1.6A _Switch_ 10-VFDFN Exposed Pad	U3	VREG_V62/16624-01YE	TPS63000	1
W25Q16JVUXIQ	16M-BIT SERIAL FLASH MEMORY WITH DUAL/QUAD SPI USON-8	U4	SOIC-8N_208mil	W25Q16JVUXIQ	1
ESP32-C3	Ultra-Low-Power SoC with RISC-V Single-Core CPU Supporting IEEE 802.11b/g/n (2.4 GHz Wi-Fi) and Bluetooth® 5 (LE)	U5	QFN-32-5x5x0.85mm	ESP32-C3	1
SX1280	Low power LoRa transceiver operating at 2.4GHz with ranging capability	U6	QFN-24_4x4_0.5	SX1280	1
ST25DV04K	ST25DO4K NFC module with I2C	U7	SOIC-SN8_N	ST25DV04K	1
40 MHz	Crystal SMD 4-Pin 3225x4	Y1	CRYSTAL_ECX-32_3.2x2.5x0.8 - duplicate	XTAL_2016	1
32.768kHz	Crystal	Y2	CRYSTAL_SX-3215	CRYSTAL_1	1
52MHz	Crystal	Y3	CRYSTAL_2016_4P	Crystal	1