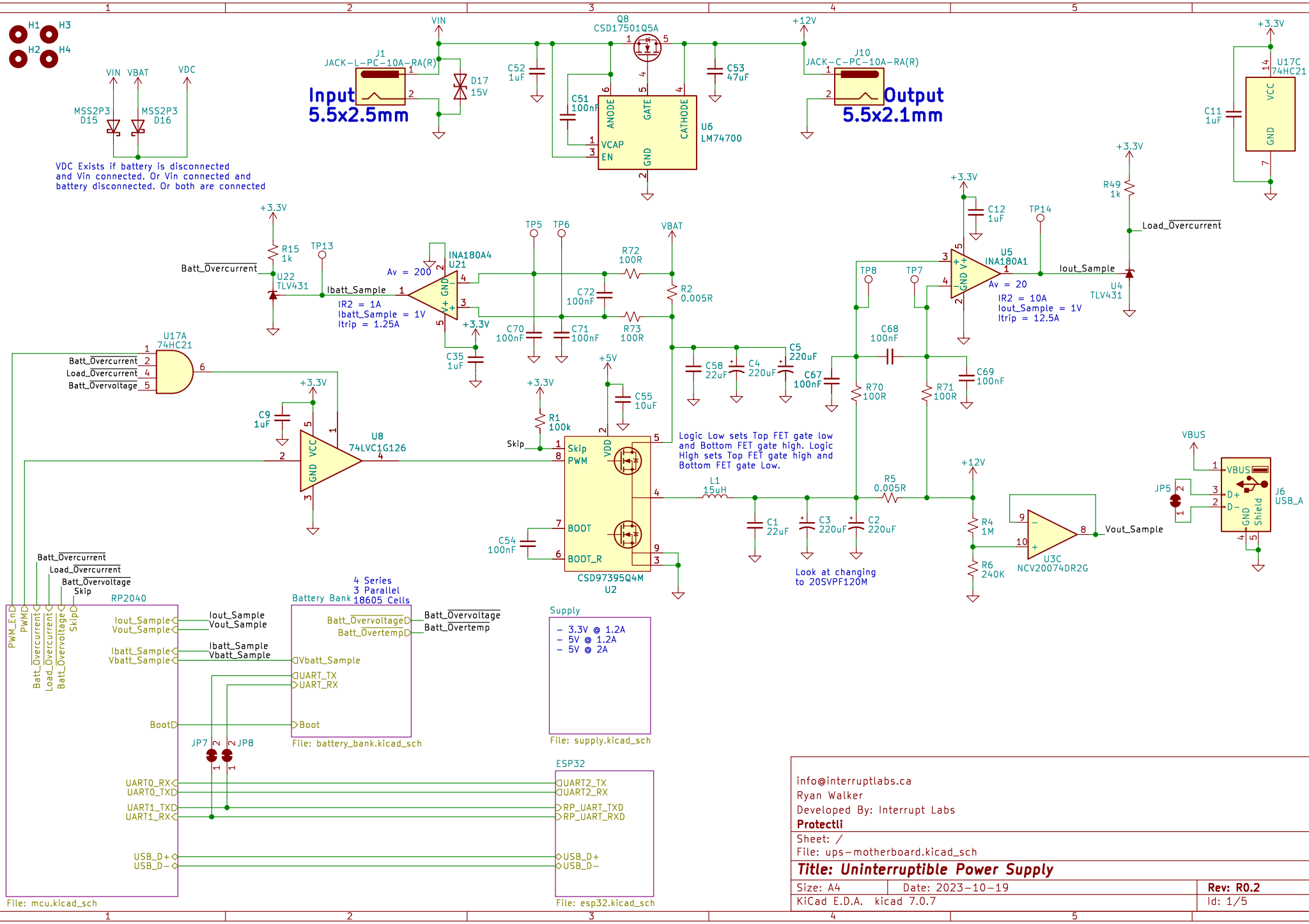
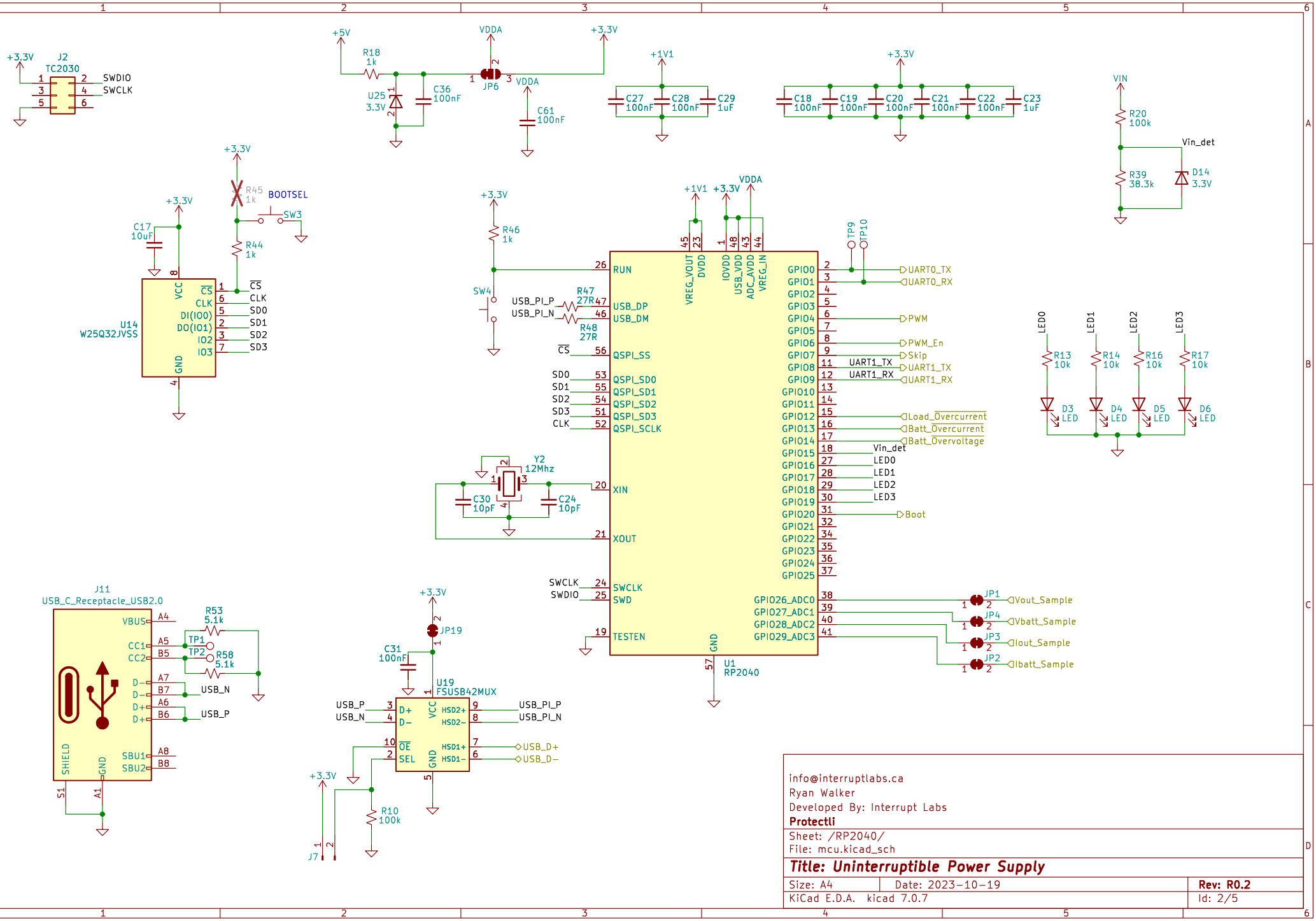

H1
H2
H3
H4
VIN
VBAT
VDC
MSS2P3
D15
MSS2P3
D16
VDC Exists if battery is disconnected
and Vin connected. Or Vin connected and
battery disconnected. Or both are connected
J1
JACK-L-PC-10A-RA(R)
Input
5.5x2.5mm
D17
15V
C52
1uF
Q8
CSD17501Q5A
C53
47uF
C51
100nF
U6
LM74700
ANODE
GATE
CATHODE
VCAP
EN
GND
+12V
J10
JACK-C-PC-10A-RA(R)
Output
5.5x2.1mm
+3.3V
U17C
74HC21
C11
1uF
VCC
GND
R15
1k
TP13
Batt_Overcurrent
U22
TLV431
Ibatt_Sample
IR2 = 1A
Ibatt_Sample = 1V
Itrip = 1.25A
INA180A4
U21
Av = 200
C35
1uF
TP5
TP6
VBAT
R72
100R
R2
0.005R
C72
100nF
C70
100nF
C71
100nF
R73
100R
C58
22uF
C4
220uF
C5
220uF
C12
1uF
TP14
R49
1k
Load_Overcurrent
U5
INA180A1
Av = 20
IR2 = 10A
Iout_Sample = 1V
Itrip = 12.5A
Iout_Sample
U4
TLV431
TP8
TP7
C68
100nF
C67
100nF
R70
100R
R71
100R
C69
100nF
U17A
74HC21
Batt_Overcurrent
Load_Overcurrent
Batt_Overvoltage
C9
1uF
U8
74LVC1G126
+5V
C55
10uF
R1
100k
Skip
Logic Low sets Top FET gate low
and Bottom FET gate high. Logic
High sets Top FET gate high and
Bottom FET gate Low.
L1
15uH
R5
0.005R
C1
22uF
C3
220uF
C2
220uF
C54
100nF
CSD97395Q4M
U2
Look at changing
to 20SVPF120M
R4
1M
R6
240K
U3C
NCV20074DR2G
Vout_Sample
VBUS
JP5
J6
USB_A
Shield
RP2040
PWM_En
PWM
Batt_Overcurrent
Load_Overcurrent
Batt_Overvoltage
Skip
Iout_Sample
Vout_Sample
Ibatt_Sample
Vbatt_Sample
Boot
File: mcu.kicad_sch
4 Series
3 Parallel
18605 Cells
Battery Bank
Batt_Overvoltage
Batt_Overtemp
Vbatt_Sample
UART_TX
UART_RX
Boot
File: battery_bank.kicad_sch
Supply
– 3.3V @ 1.2A
– 5V @ 1.2A
– 5V @ 2A
File: supply.kicad_sch
JP7
JP8
ESP32
UART0_RX
UART0_TX
UART1_TX
UART1_RX
UART2_TX
UART2_RX
RP_UART_TXD
RP_UART_RXD
USB_D+
USB_D–
File: esp32.kicad_sch
info@interruptlabs.ca
Ryan Walker
Developed By: Interrupt Labs
Protectli
Sheet: /
File: ups-motherboard.kicad_sch
Title: Uninterruptible Power Supply
Size: A4
Date: 2023-10-19
Rev: R0.2
KiCad E.D.A. kicad 7.0.7
Id: 1/5


+3.3V
J2
TC2030
SWDIO
SWCLK
+5V
R18
1k
U25
3.3V
C36
100nF
VDDA
JP6
C61
100nF
+1V1
C27
100nF
C28
100nF
C29
1uF
C18
100nF
C19
100nF
C20
100nF
C21
100nF
C22
100nF
C23
1uF
VIN
R20
100k
Vin_det
R39
38.3k
D14
3.3V
+3.3V
R45
1k
BOOTSEL
SW3
C17
10uF
R44
1k
U14
W25Q32JVSS
VCC
GND
CS
CLK
DI(IO0)
DO(IO1)
IO2
IO3
SD0
SD1
SD2
SD3
R46
1k
SW4
R47
27R
R48
27R
USB_PI_P
USB_PI_N
RUN
USB_DP
USB_DM
QSPI_SS
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
QSPI_SCLK
XIN
XOUT
SWCLK
SWD
TESTEN
VREG_VOUT
DVDD
IOVDD
USB_VDD
ADC_AVDD
VREG_IN
GPIO0
GPIO1
GPIO2
GPIO3
GPIO4
GPIO5
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16
GPIO17
GPIO18
GPIO19
GPIO20
GPIO21
GPIO22
GPIO23
GPIO24
GPIO25
GPIO26_ADC0
GPIO27_ADC1
GPIO28_ADC2
GPIO29_ADC3
U1
RP2040
TP9
TP10
UART0_TX
UART0_RX
PWM
PWM_En
Skip
UART1_TX
UART1_RX
Load_Overcurrent
Batt_Overcurrent
Batt_Overvoltage
Vin_det
LED0
LED1
LED2
LED3
Boot
Y2
12Mhz
C30
10pF
C24
10pF
LED0
LED1
LED2
LED3
R13
10k
R14
10k
R16
10k
R17
10k
D3
LED
D4
LED
D5
LED
D6
LED
J11
USB_C_Receptacle_USB2.0
VBUS
CC1
CC2
D-
D-
D+
D+
SHIELD
GND
SBU1
SBU2
S1
A1
R53
5.1k
R58
5.1k
TP1
TP2
USB_N
USB_P
JP19
C31
100nF
U19
FSUSB42MUX
D+
D-
VCC
HSD2+
HSD2-
OE
SEL
GND
HSD1+
HSD1-
USB_D+
USB_D-
R10
100k
J7
JP1
JP4
JP3
JP2
Vout_Sample
Vbatt_Sample
Iout_Sample
Ibatt_Sample
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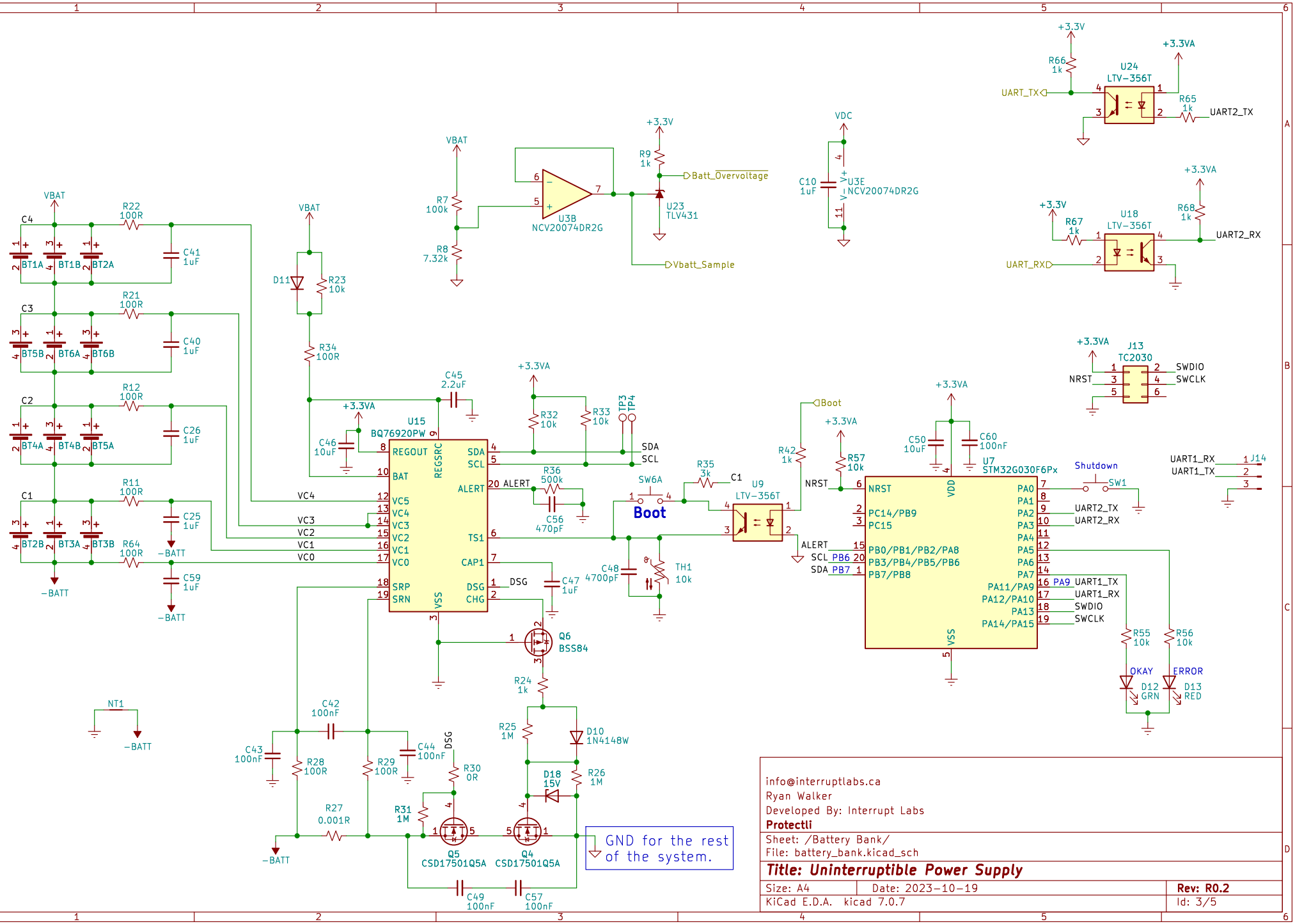
Ryan Walker
Developed By: Interrupt Labs
Protectli
Sheet: /RP2040/
File: mcu.kicad_sch
Title: Uninterruptible Power Supply
Size: A4
Date: 2023-10-19
Rev: R0.2
KiCad E.D.A. kicad 7.0.7
Id: 2/5


VBAT
C4
BT1A
BT1B
BT2A
R22
100R
C41
1uF
C3
BT5B
BT6A
BT6B
R21
100R
C40
1uF
C2
BT4A
BT4B
BT5A
R12
100R
C26
1uF
C1
BT2B
BT3A
BT3B
R11
100R
C25
1uF
R64
100R
C59
1uF
−BATT
D11
R23
10k
R34
100R
C45
2.2uF
+3.3VA
C46
10uF
U15
BQ76920PW
REGOUT
REGSRC
BAT
SDA
SCL
ALERT
TS1
CAP1
DSG
CHG
SRP
SRN
VSS
VC5
VC4
VC3
VC2
VC1
VC0
R32
10k
R33
10k
TP3
TP4
SDA
SCL
R36
500k
C56
470pF
C47
1uF
C48
4700pF
TH1
10k
SW6A
Boot
R35
3k
C1
U9
LTV−356T
R42
1k
R57
10k
Boot
NRST
PC14/PB9
PC15
PB0/PB1/PB2/PA8
PB3/PB4/PB5/PB6
PB7/PB8
VDD
VSS
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA11/PA9
PA12/PA10
PA13
PA14/PA15
U7
STM32G030F6Px
C50
10uF
C60
100nF
Shutdown
SW1
UART2_TX
UART2_RX
UART1_TX
UART1_RX
SWDIO
SWCLK
J13
TC2030
J14
R55
10k
R56
10k
OKAY
ERROR
D12
GRN
D13
RED
Q6
BSS84
R24
1k
R25
1M
D10
1N4148W
D18
15V
R26
1M
C42
100nF
C43
100nF
C44
100nF
R28
100R
R29
100R
R30
0R
R31
1M
R27
0.001R
Q5
CSD17501Q5A
Q4
CSD17501Q5A
C49
100nF
C57
100nF
NT1
GND for the rest of the system.
R7
100k
R8
7.32k
U3B
NCV20074DR2G
R9
1k
Batt_Overvoltage
U23
TLV431
Vbatt_Sample
VDC
C10
1uF
U3E
NCV20074DR2G
R66
1k
U24
LTV−356T
R65
1k
UART_TX
UART2_TX
R67
1k
U18
LTV−356T
R68
1k
UART_RX
UART2_RX
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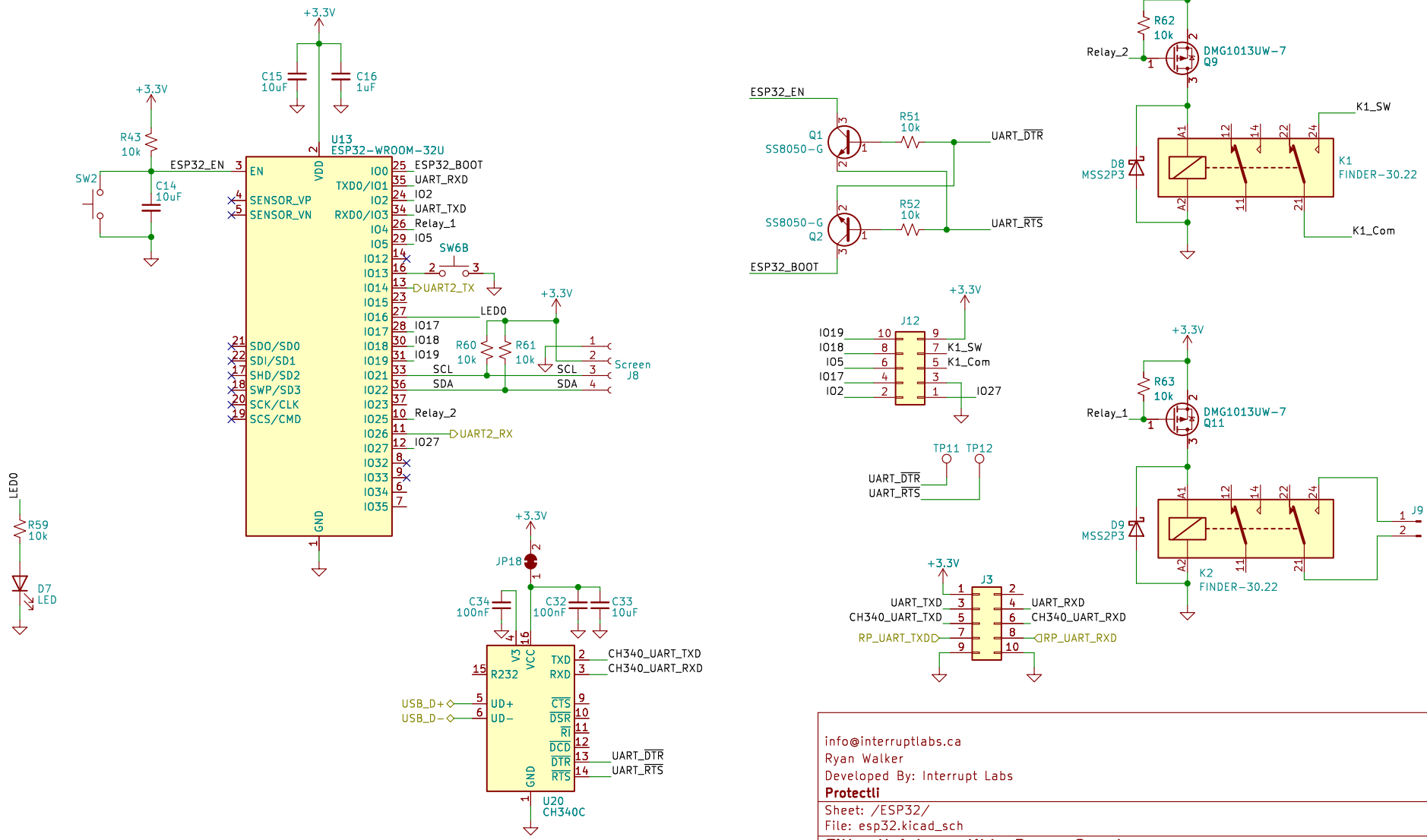
Ryan Walker
Developed By: Interrupt Labs
Protectli
Sheet: /Battery Bank/
File: battery_bank.kicad_sch
Title: Uninterruptible Power Supply
Size: A4
Date: 2023−10−19
Rev: R0.2
KiCad E.D.A. kicad 7.0.7
Id: 3/5



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Developed By: Interrupt Labs

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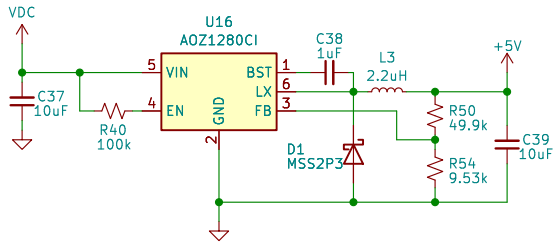
Sheet: /ESP32/
File: esp32.kicad_sch

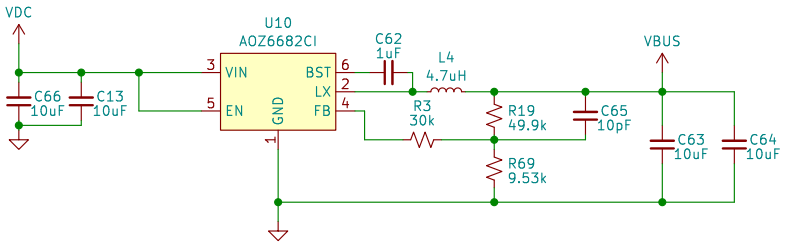
Title: Uninterruptible Power Supply

Size: A4	Date: 2023-10-19	**Rev: R0.2**
KiCad E.D.A. kicad 7.0.7		Id: 4/5

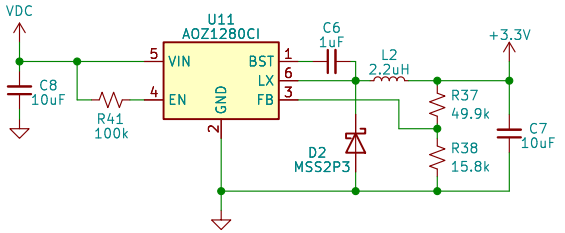
5V @ 1.2A (System)



5V @ 2A (USB)



3.3V @ 1.2A (System)



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Ryan Walker
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Sheet: /Supply/
File: supply.kicad_sch

Title: Uninterruptible Power Supply

Size: A4	Date: 2023-10-19	**Rev: R0.2**
KiCad E.D.A. kicad 7.0.7		Id: 5/5