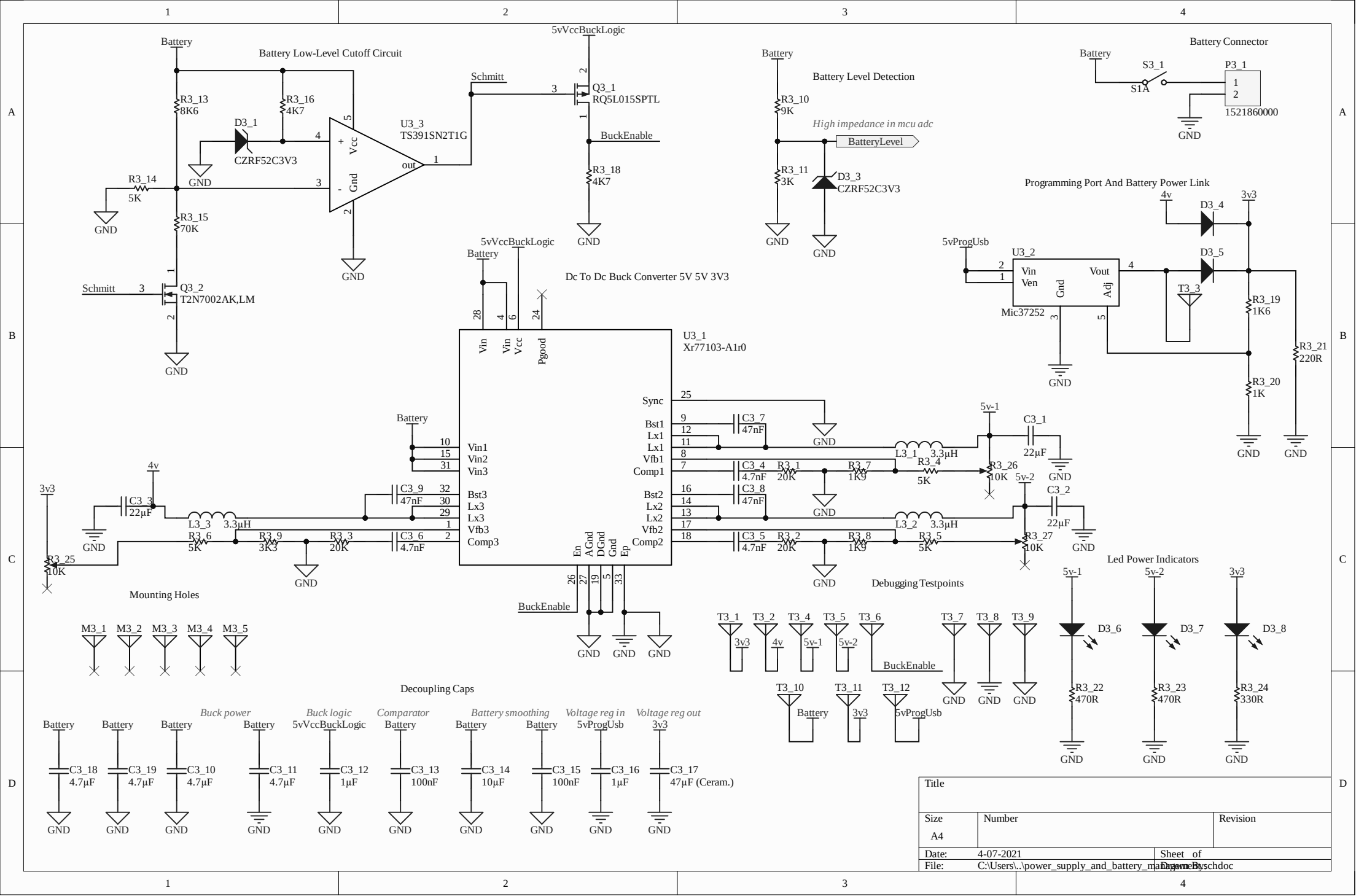
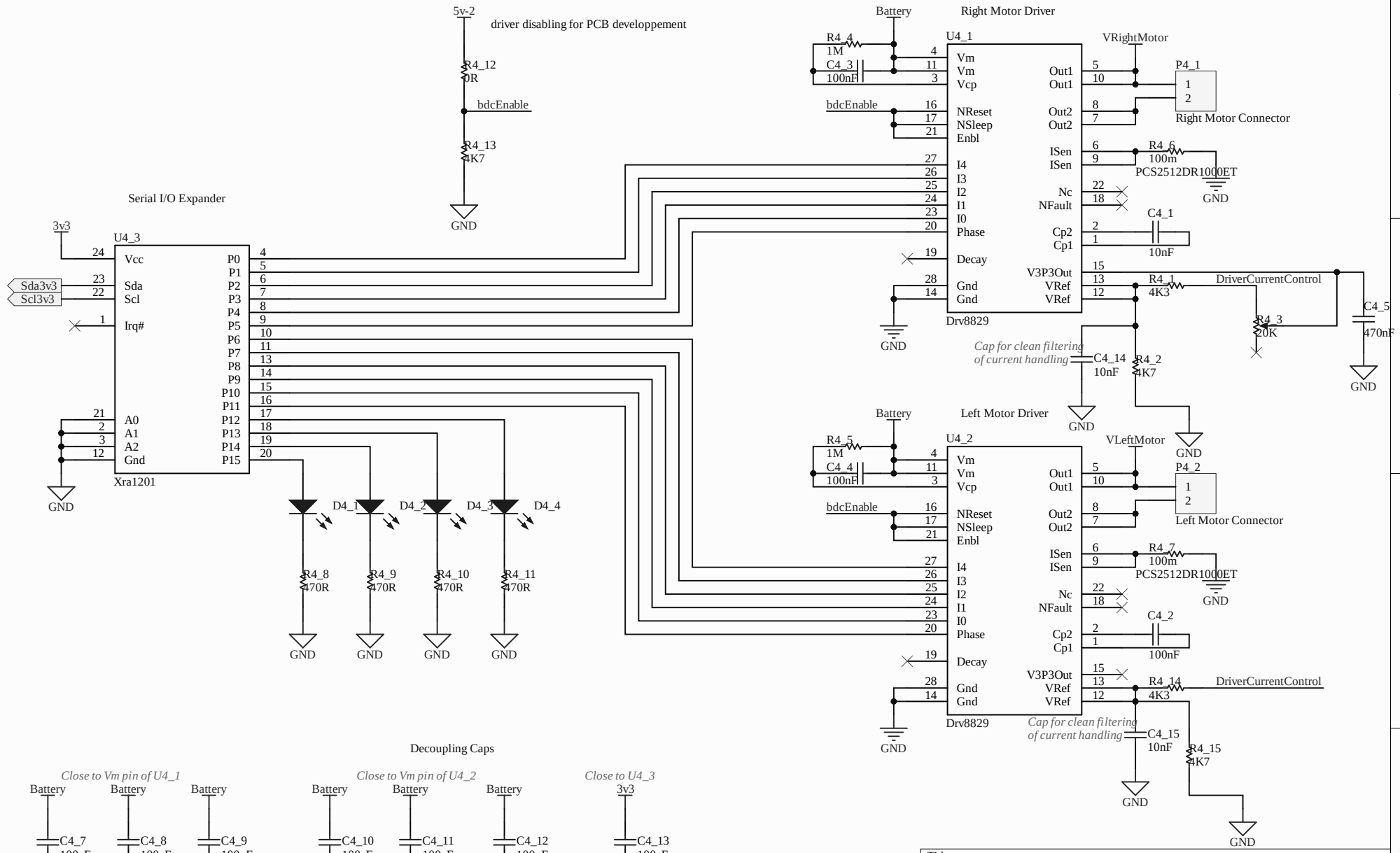
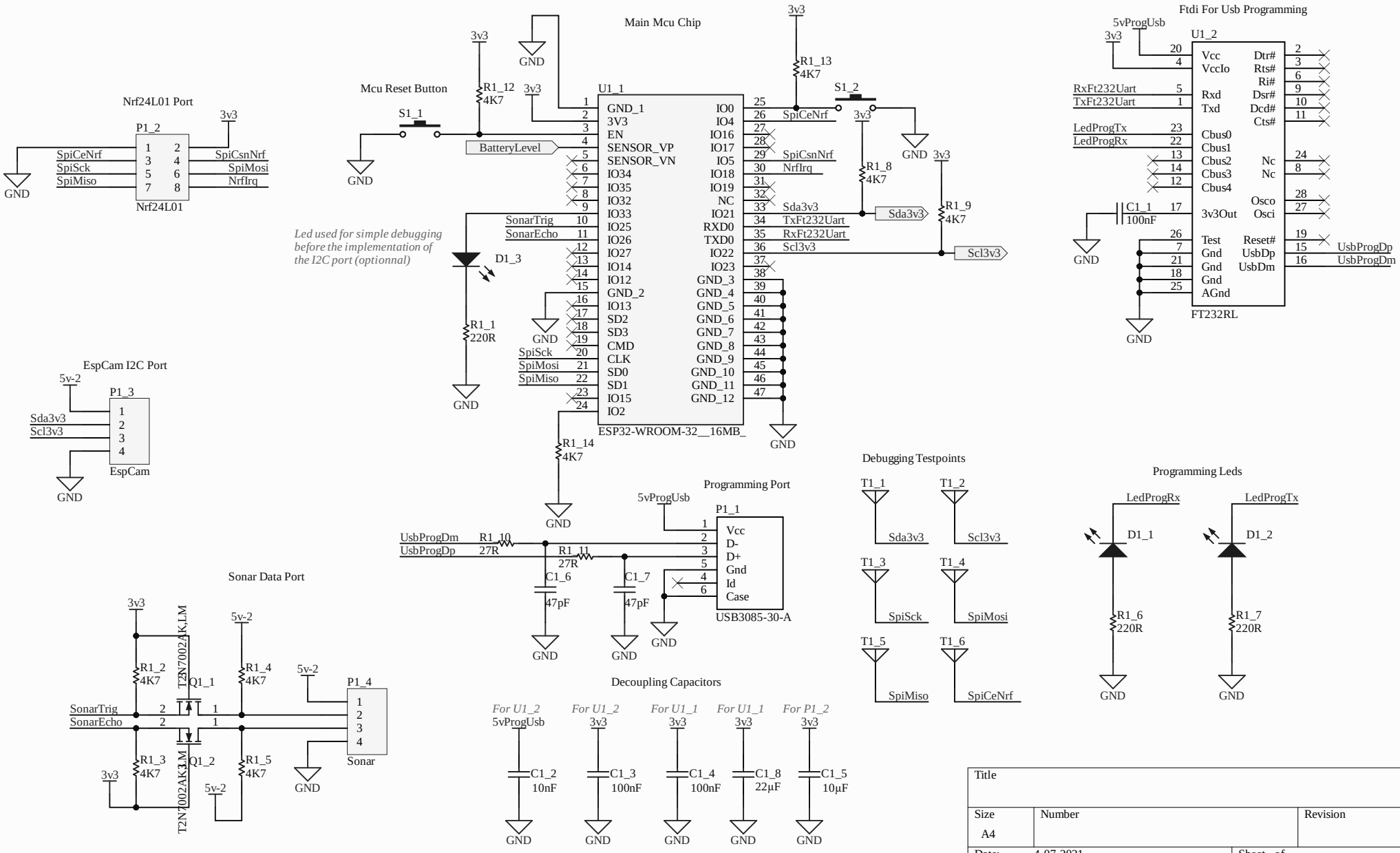
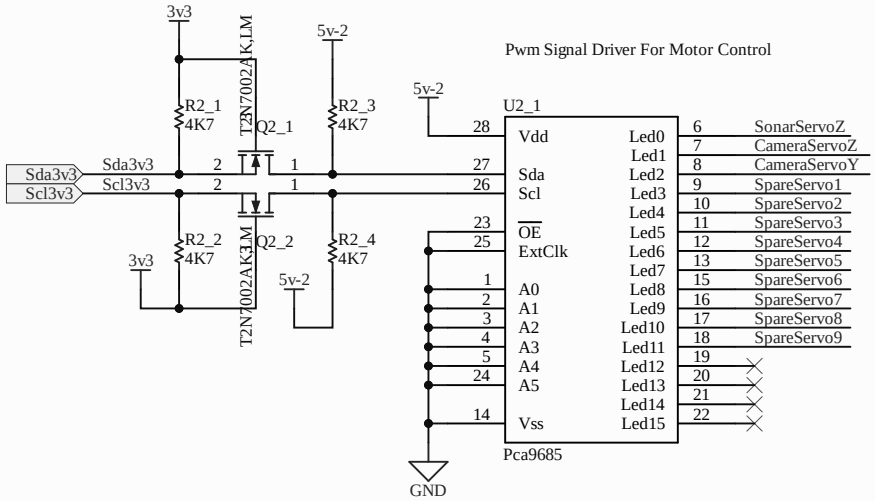

Battery Low-Level Cutoff Circuit
Battery
R3_13
8K6
R3_16
4K7
D3_1
CZRF52C3V3
U3_3
TS391SN2T1G
Vcc
Gnd
out
R3_14
5K
R3_15
70K
GND
Schmitt
Q3_2
T2N7002AK,LM
5vVccBuckLogic
Q3_1
RQ5L015SPTL
BuckEnable
R3_18
4K7
Battery Level Detection
R3_10
9K
High impedance in mcu adc
BatteryLevel
R3_11
3K
D3_3
CZRF52C3V3
Battery Connector
S3_1
S1A
P3_1
1521860000
Programming Port And Battery Power Link
5vProgUsb
U3_2
Mic37252
Vin
Ven
Vout
Gnd
Adj
4v
3v3
D3_4
D3_5
T3_3
R3_19
1K6
R3_20
1K
R3_21
220R
Dc To Dc Buck Converter 5V 5V 3V3
U3_1
Xr77103-A1r0
Vin
Vcc
Pgood
Sync
Bst1
Lx1
Vfb1
Comp1
Bst2
Lx2
Vfb2
Comp2
Vin1
Vin2
Vin3
Bst3
Lx3
Vfb3
Comp3
En
AGnd
DGnd
Ep
C3_7
47nF
C3_4
4.7nF
C3_8
C3_5
C3_9
C3_6
C3_3
22µF
C3_1
C3_2
L3_1 3.3µH
L3_2 3.3µH
L3_3 3.3µH
R3_1
20K
R3_2
R3_3
R3_4
5K
R3_5
R3_6
R3_7
1K9
R3_8
R3_9
3K3
R3_25
10K
R3_26
R3_27
5v-1
5v-2
Mounting Holes
M3_1
M3_2
M3_3
M3_4
M3_5
Debugging Testpoints
T3_1
T3_2
T3_4
T3_5
T3_6
T3_7
T3_8
T3_9
T3_10
T3_11
T3_12
Led Power Indicators
D3_6
D3_7
D3_8
R3_22
470R
R3_23
470R
R3_24
330R
Decoupling Caps
Buck power
Buck logic
Comparator
Battery smoothing
Voltage reg in
Voltage reg out
C3_18
4.7µF
C3_19
4.7µF
C3_10
4.7µF
C3_11
4.7µF
C3_12
1µF
C3_13
100nF
C3_14
10µF
C3_15
100nF
C3_16
1µF
C3_17
47µF (Ceram.)
Title
Size
A4
Number
Revision
Date:
4-07-2021
Sheet of
File:
C:\Users\..\power_supply_and_battery_management.SchDoc
Drawn By:


5v-2
driver disabling for PCB developpement
R4_12
0R
bdcEnable
R4_13
4K7
GND
Serial I/O Expander
3v3
U4_3
Vcc
Sda
Scl
Irq#
A0
A1
A2
Gnd
P0
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
P13
P14
P15
Xra1201
Sda3v3
Scl3v3
D4_1
D4_2
D4_3
D4_4
R4_8
R4_9
R4_10
R4_11
470R
Battery
Right Motor Driver
U4_1
R4_4
1M
C4_3
100nF
VRightMotor
Vm
Vcp
Out1
Out2
NReset
NSleep
Enbl
I4
I3
I2
I1
I0
Phase
Decay
Gnd
ISen
Nc
NFault
Cp2
Cp1
V3P3Out
VRef
P4_1
Right Motor Connector
R4_6
100m
PCS2512DR1000ET
C4_1
10nF
R4_1
4K3
DriverCurrentControl
R4_3
20K
C4_5
470nF
Drv8825
Cap for clean filtering
of current handling
C4_14
10nF
R4_2
4K7
Left Motor Driver
U4_2
R4_5
C4_4
VLeftMotor
P4_2
Left Motor Connector
R4_7
C4_2
100nF
R4_14
C4_15
R4_15
Decoupling Caps
Close to Vm pin of U4_1
C4_7
C4_8
C4_9
100µF
Close to Vm pin of U4_2
C4_10
C4_11
C4_12
Close to U4_3
C4_13
Title
Size
A4
Number
Revision
Date:
4-07-2021
Sheet of
File:
C:\Users\..\brushed_motor_drivers.SchDocDrawn By:


Nrf24L01 Port
P1_2
SpiCeNrf
SpiSck
SpiMiso
SpiCsnNrf
SpiMosi
NrfIrq
Nrf24L01
Main Mcu Chip
Mcu Reset Button
S1_1
S1_2
R1_12 4K7
R1_13 4K7
R1_8 4K7
R1_9 4K7
BatteryLevel
U1_1
ESP32-WROOM-32__16MB_
Led used for simple debugging before the implementation of the I2C port (optionnal)
D1_3
R1_1 220R
SonarTrig
SonarEcho
SpiSck
SpiMosi
SpiMiso
Sda3v3
Scl3v3
TxFt232Uart
RxFt232Uart
R1_14 4K7
Ftdi For Usb Programming
5vProgUsb
U1_2
FT232RL
RxFt232Uart
TxFt232Uart
LedProgTx
LedProgRx
C1_1 100nF
UsbProgDp
UsbProgDm
EspCam I2C Port
P1_3
EspCam
Programming Port
P1_1
USB3085-30-A
R1_10 27R
R1_11 27R
C1_6 47pF
C1_7 47pF
Debugging Testpoints
T1_1
T1_2
T1_3
T1_4
T1_5
T1_6
Programming Leds
D1_1
D1_2
R1_6 220R
R1_7 220R
Sonar Data Port
P1_4
Sonar
Q1_1
Q1_2
T2N7002AK.LM
R1_2 4K7
R1_3 4K7
R1_4 4K7
R1_5 4K7
Decoupling Capacitors
For U1_2
For P1_2
C1_2 10nF
C1_3 100nF
C1_4 100nF
C1_8 22µF
C1_5 10µF
Title
Size
A4
Number
Revision
Date:
4-07-2021
File:
C:\Users\..\main_control.SchDoc
Sheet of
Drawn By:

Pwm Signal Driver For Motor Control

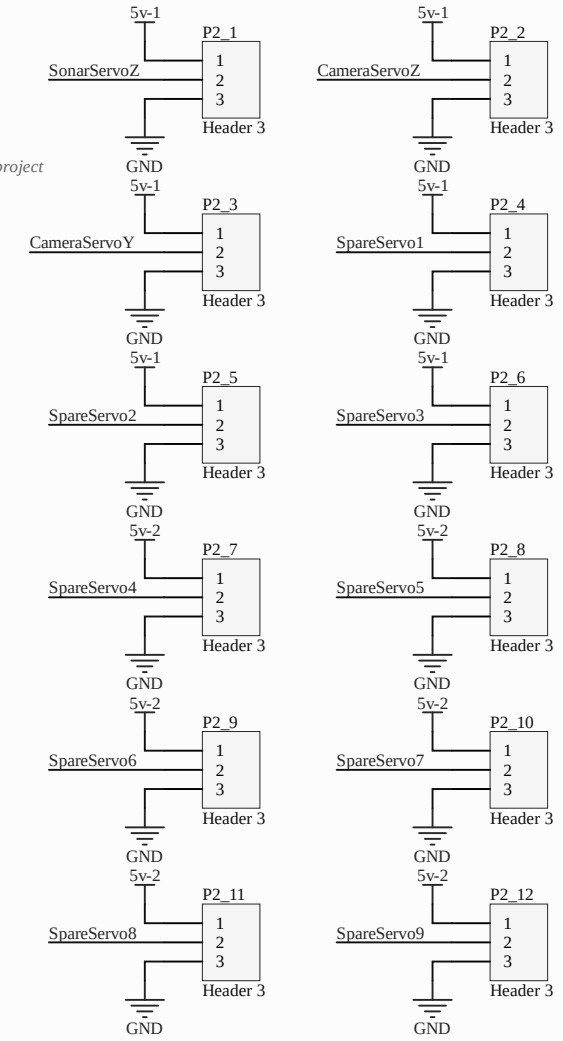


P2_[1..3] are used by servos

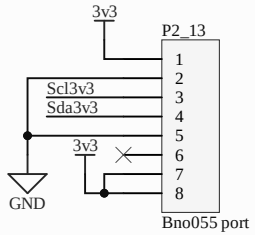
The othe ports are there only to route the remainning pwm signals

They may or may not be used in the project

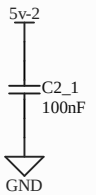
Servomotor Ports



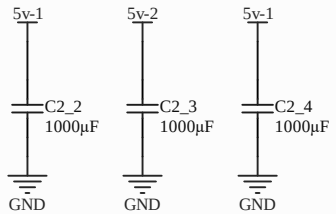
Bno055 Header



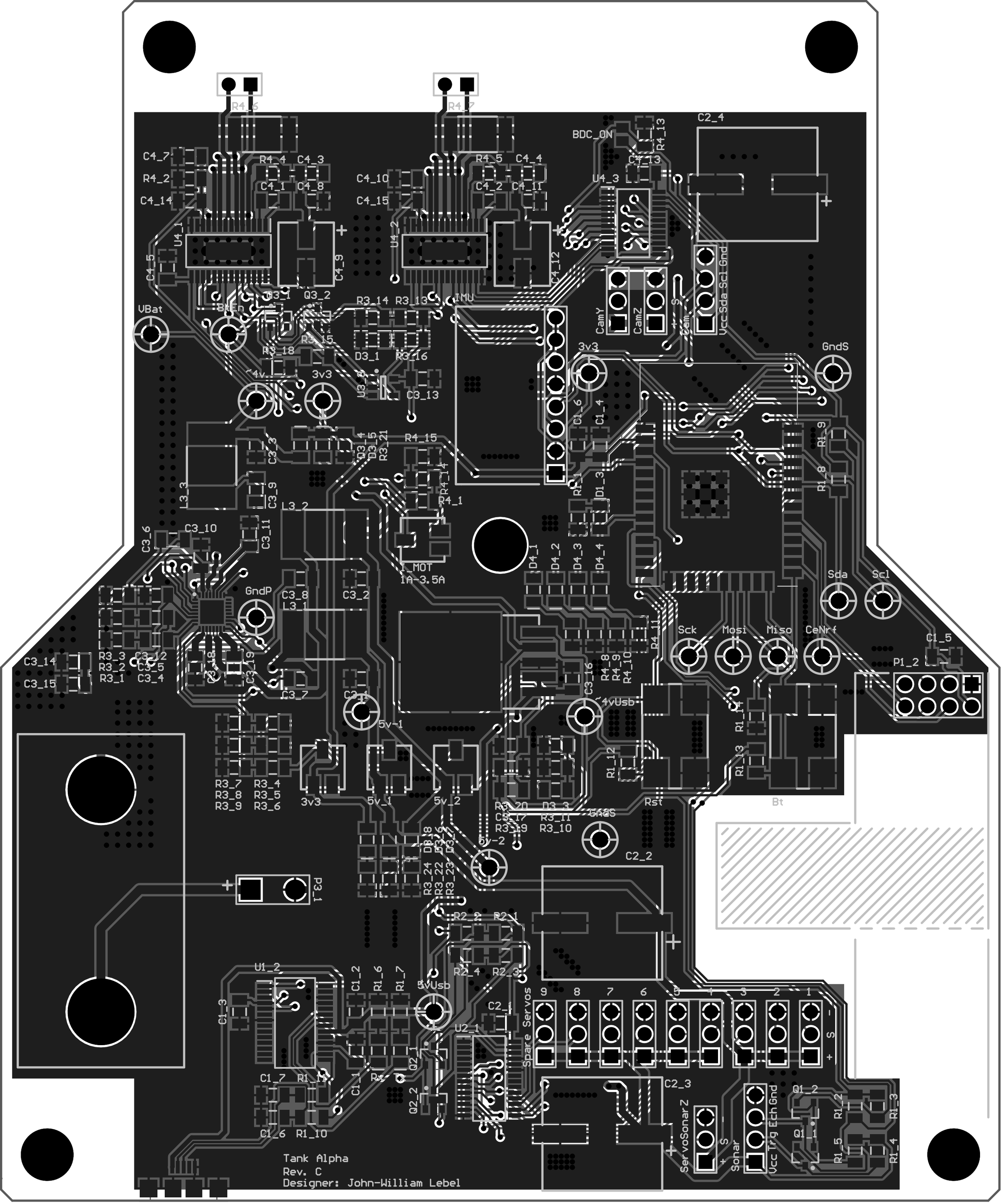
Decoupling Cap For Pca9685

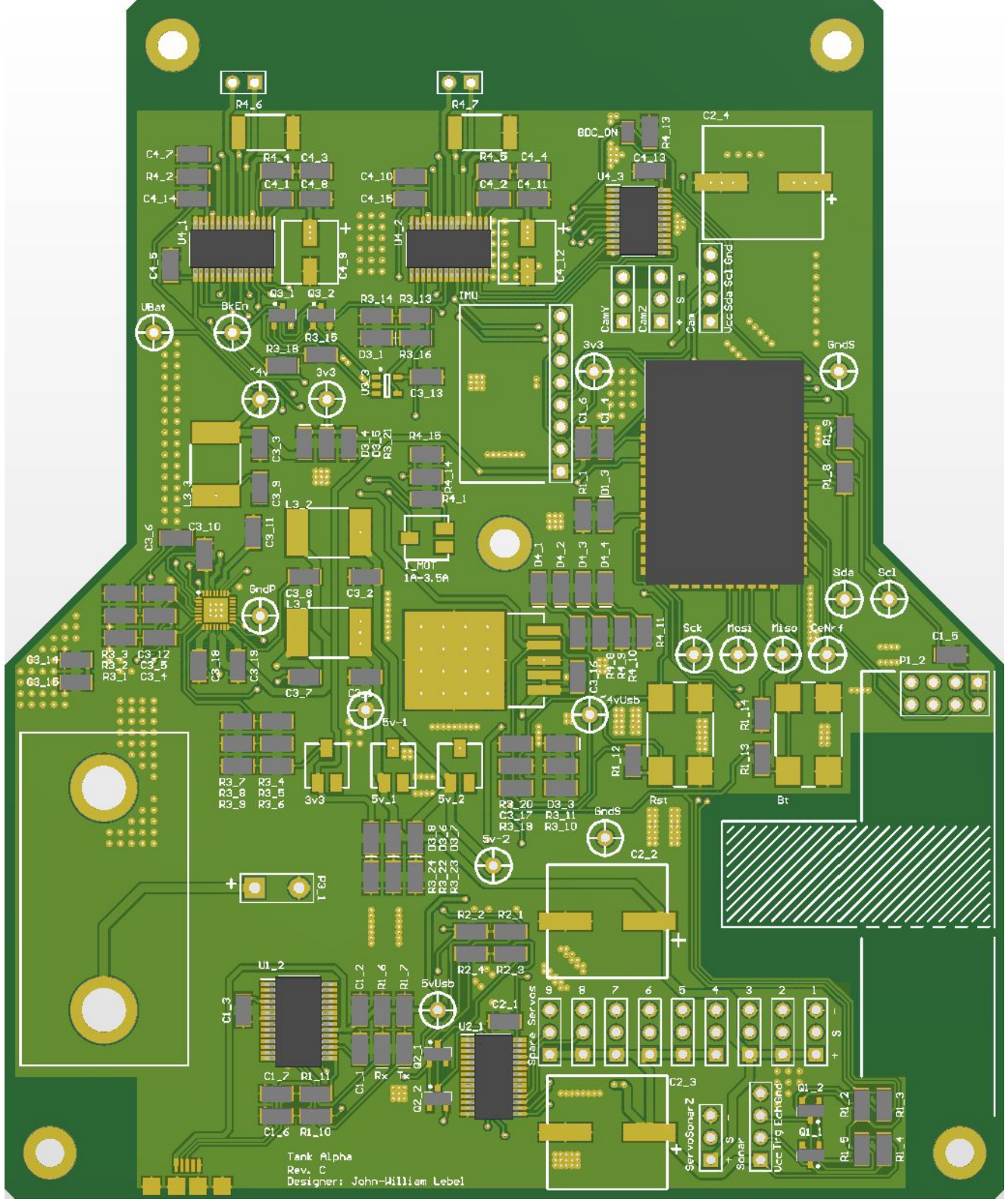


Decoupling Cap Servos



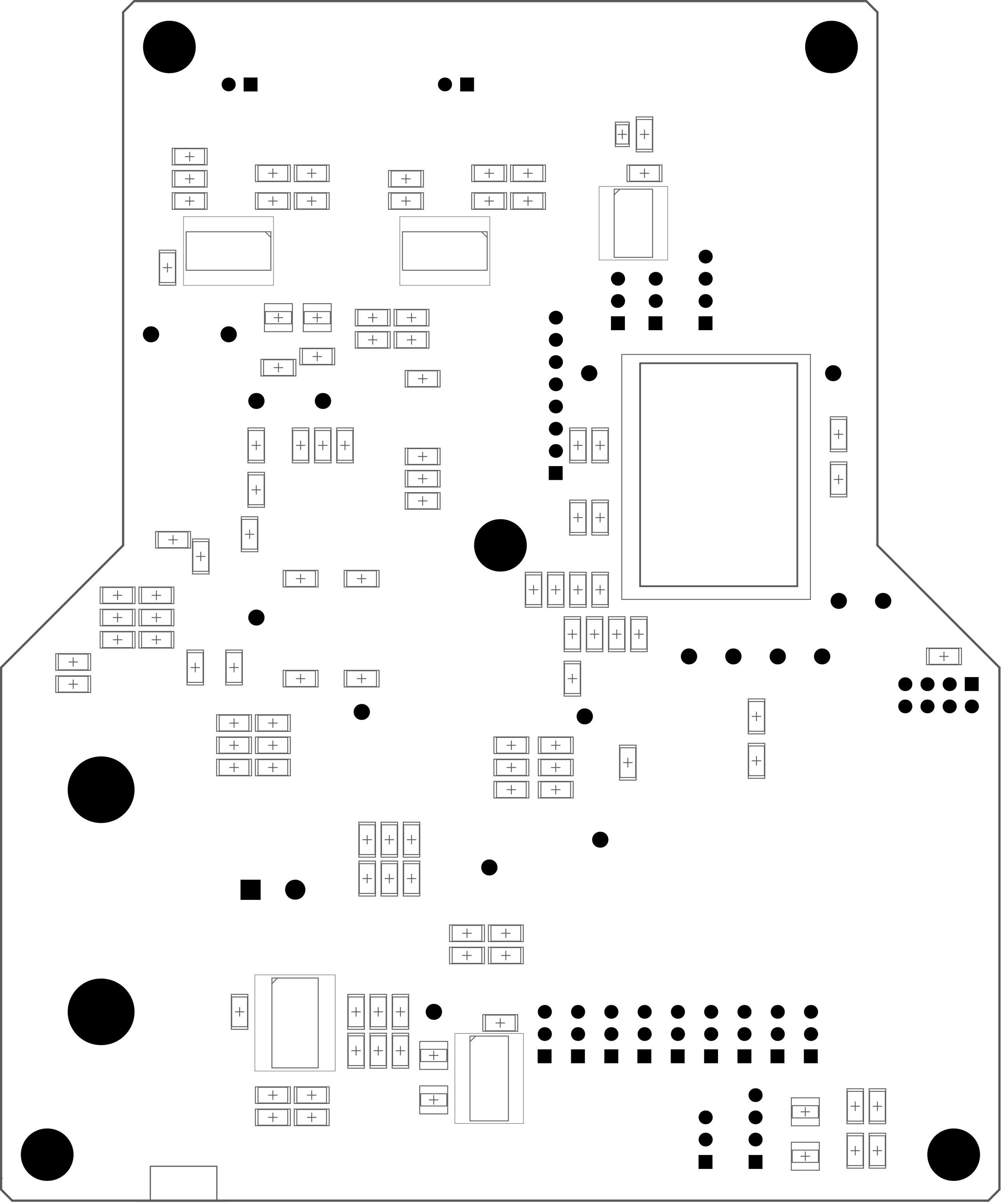
Title		
Size: A4	Number	Revision
Date: 4-07-2021	Sheet of	
File: C:\Users\..\servo_driver_and_imu_device.SchDoc	Drawn By:	


R4_6
R4_7
C4_7
R4_2
C4_14
R4_4
C4_3
C4_1
C4_8
C4_10
C4_15
R4_5
C4_4
C4_2
C4_11
U4_1
U4_2
C4_5
C4_9
C4_12
BDC_ON
R4_13
C4_13
U4_3
C2_4
Vcc Sda Scl Gnd
CamY
CamZ
Cam
VBat
BkEn
Q3_1
Q3_2
R3_14
R3_13
IMU
R3_15
R3_18
D3_1
R3_16
4v
3v3
U3_1
C3_13
C1_6
C1_4
3v3
GndS
R1_9
C3_3
D3_4
D3_5
R3_21
R4_15
R4_14
R4_1
R1_1
D1_3
R1_8
L3_3
C3_9
L3_2
C3_6
C3_10
C3_11
I_MOT
1A-3.5A
D4_1
D4_2
D4_3
D4_4
GndP
C3_8
L3_1
C3_2
Sda
Scl
Sck
Mosi
Miso
CeNrf
C1_5
P1_2
C3_14
C3_15
R3_3
R3_2
R3_1
C3_12
C3_5
C3_4
C3_18
C3_19
C3_7
C3_1
5v-1
C3_16
R4_8
R4_9
R4_10
R4_11
4vUsb
R1_4
R3_7
R3_8
R3_9
R3_4
R3_5
R3_6
3v3
5v_1
5v_2
R3_20
C3_17
R3_19
D3_3
R3_11
R3_10
GndS
Rst
Bt
R1_12
R1_13
C2_2
D3_8
D3_6
D3_7
R3_24
R3_22
R3_23
5v-2
P3_1
R2_2
R2_1
R2_4
R2_3
U1_2
C1_3
C1_2
R1_6
R1_7
5vUsb
C2_1
U2_1
Q2_1
Q2_2
Spare Servos
9 8 7 6 5 4 3 2 1
+ S -
C2_3
ServoSonarZ
+ S -
Sonar
Vcc Trig Ech Gnd
Q1_2
Q1_1
R1_2
R1_3
R1_5
R1_4
C1_7
R1_11
C1_1
R1_
C1_6
R1_10
Tank Alpha
Rev. C
Designer: John-William Lebel


Tank Alpha
Rev. C
Designer: John-William Lebel

R4_6
R4_7
C4_7
R4_2
C4_14
R4_4
C4_3
C4_1
C4_8
C4_10
C4_15
R4_5
C4_4
C4_2
C4_11
BDC_ON
R4_13
C4_13
U4_3
C2_4
U4_1
C4_5
C4_9
U4_2
C4_12
CamY
CamZ
S
-
+
Cam
Vcc Sda Scl Gnd
Q3_1
Q3_2
VBat
BkEn
R3_14
R3_13
IMU
R3_15
R3_18
D3_1
R3_16
3v3
GndS
U3_3
C3_13
C1_6
C1_4
R1_9
R1_8
D3_4
D3_5
R3_21
C3_3
C3_9
L3_3
R4_15
R4_14
R4_1
R1_1
D1_3
L3_2
C3_6
C3_10
C3_11
I_MOT
1A-3.5A
D4_1
D4_2
D4_3
D4_4
Sda
Scl
GndP
C3_8
C3_2
L3_1
Sck
Mosi
Miso
CeNrf
C1_5
P1_2
C3_14
C3_15
R3_3
R3_2
R3_1
C3_12
C3_5
C3_4
C3_18
C3_19
C3_7
C3_1
R4_8
R4_9
R4_10
R4_11
C3_16
5v-1
4vUsb
R3_7
R3_8
R3_9
R3_4
R3_5
R3_6
3v3
5v_1
5v_2
R3_20
C3_17
R3_19
D3_3
R3_11
R3_10
GndS
R1_12
R1_14
R1_13
Rst
Bt
D3_8
D3_6
D3_7
R3_24
R3_22
R3_23
5v-2
C2_2
P3_1
R2_2
R2_1
R2_4
R2_3
U1_2
C1_3
C1_2
R1_6
R1_7
5vUsb
C2_1
U2_1
Spare Servos
9
8
7
6
5
4
3
2
1
C1_7
R1_11
C1_1
Rx
Tx
Q2_1
Q2_2
C1_6
R1_10
C2_3
ServoSonarZ
Sonar
Vcc Trg Ech Gnd
Q1_2
Q1_1
R1_2
R1_3
R1_5
R1_4

Tank Alpha
Rev. C
Designer: John-William Lebel



Design Rules Verification Report

Filename : C:\Users\John\Desktop\altium12\altium12\PCB_Alpha.PcbDoc

Warnings 0
Rule Violations 0

Warnings	
Total	0

Rule Violations	
Clearance Constraint (Gap=0.254mm) (All),(All)	0
Short-Circuit Constraint (Allowed=No) (All),(All)	0
Un-Routed Net Constraint ((All))	0
Modified Polygon (Allow modified: No), (Allow shelved: No)	0
Width Constraint (Min=0.127mm) (Max=1.016mm) (Preferred=0.254mm) (All)	0
Power Plane Connect Rule(Relief Connect)(Expansion=0.508mm) (Conductor Width=0.254mm) (Air Gap=0.254mm)	0
Hole Size Constraint (Min=0.025mm) (Max=5.08mm) (All)	0
Hole To Hole Clearance (Gap=0.254mm) (All),(All)	0
Minimum Solder Mask Sliver (Gap=0mm) (All),(All)	0
Net Antennae (Tolerance=0mm) (All)	0
Height Constraint (Min=0mm) (Max=25.4mm) (Prefered=12.7mm) (All)	0
Total	0

Electrical Rules Check Report

Class	Document	Message
		Successful Compile for PCB_Hydra.PrjPcb