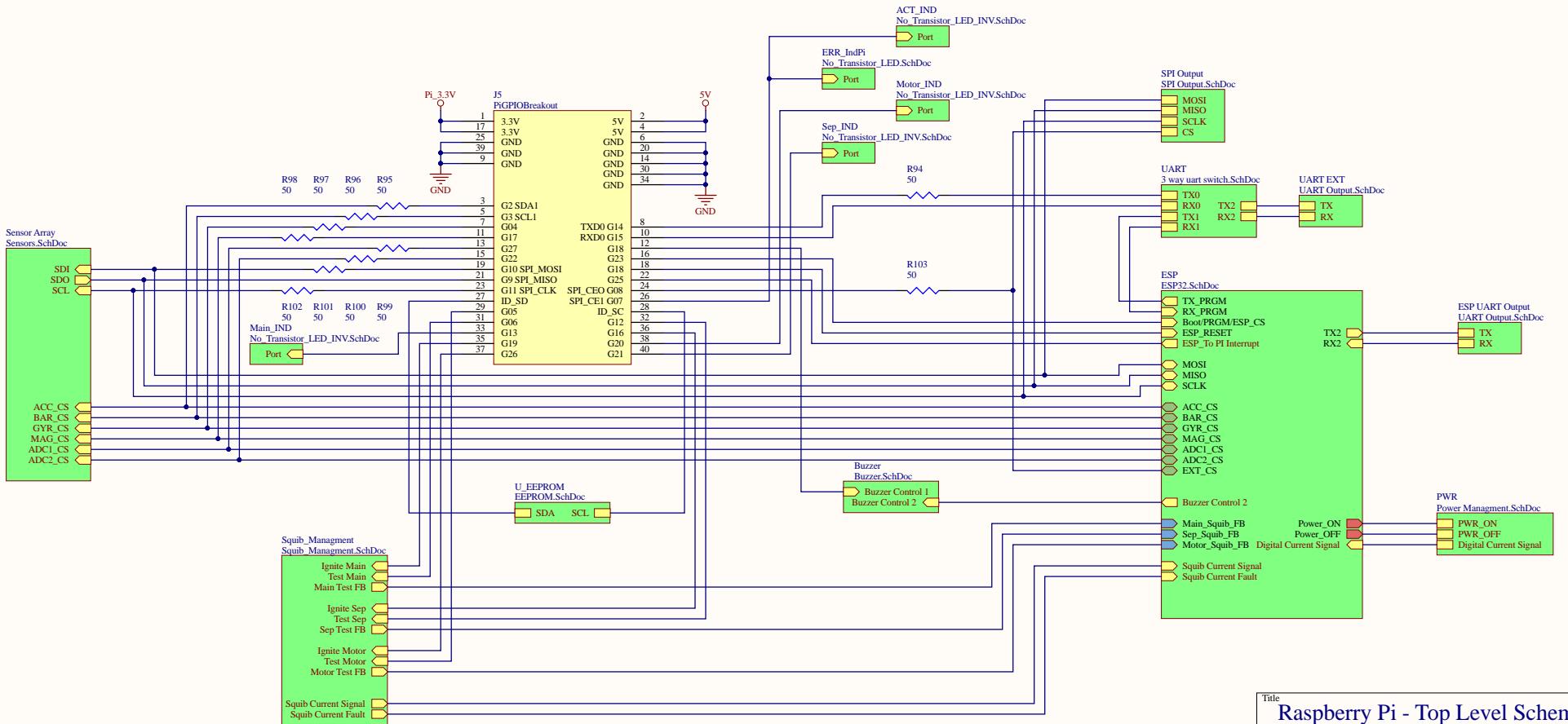
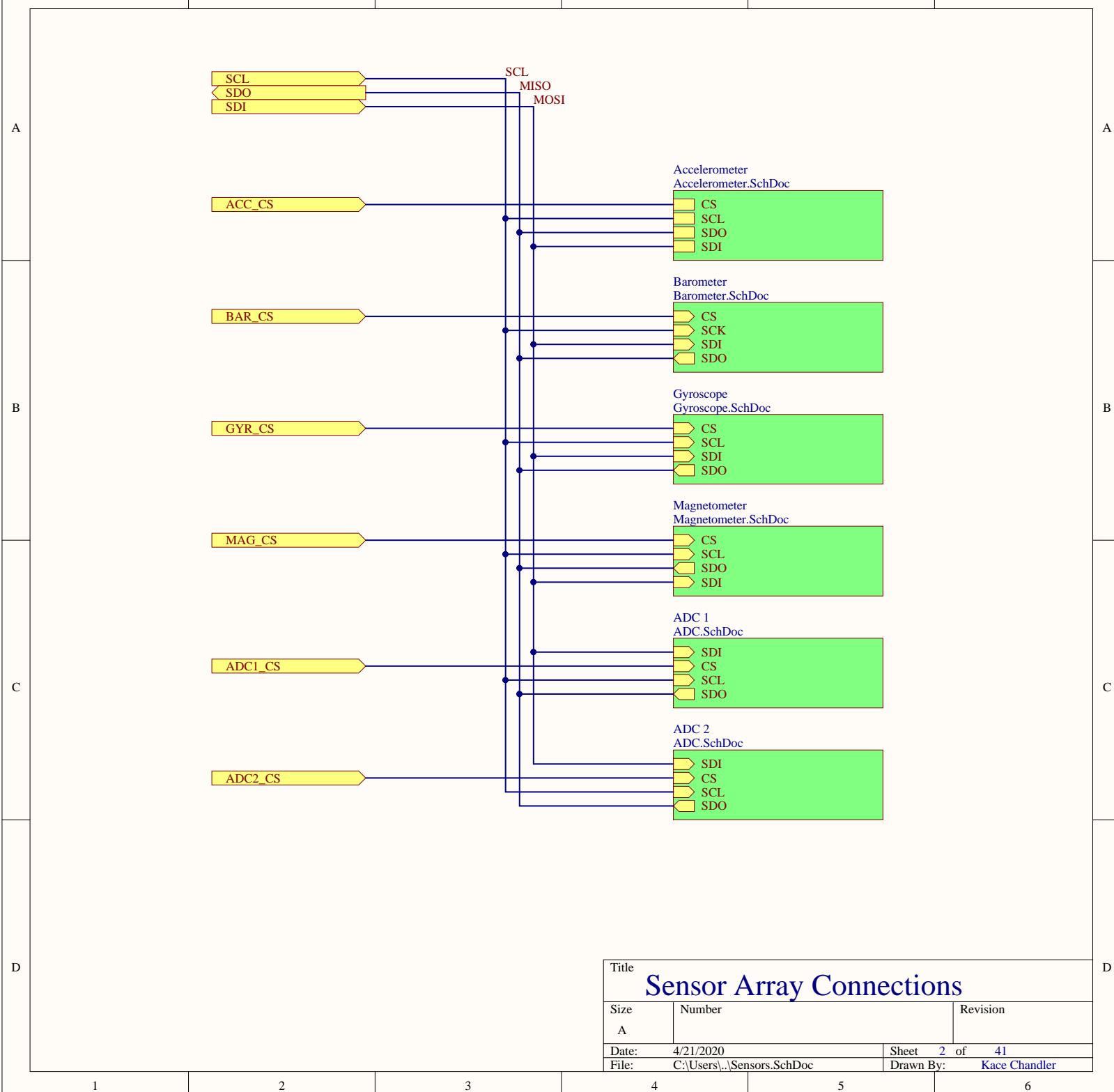


1 2 3 4 5 6



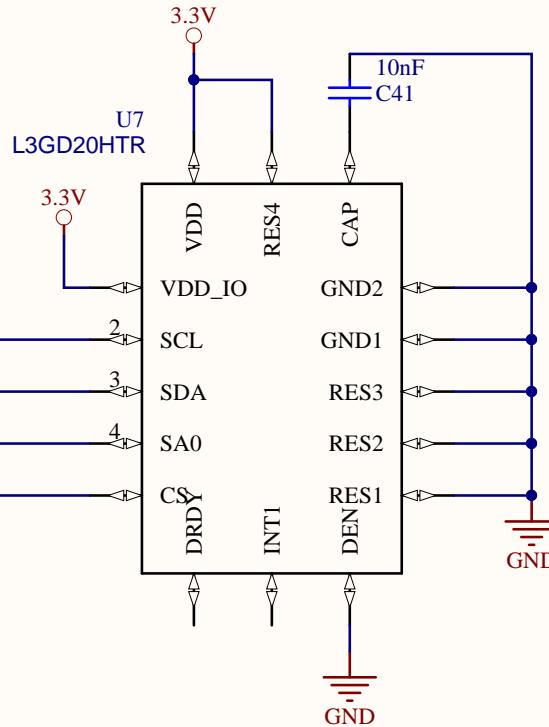
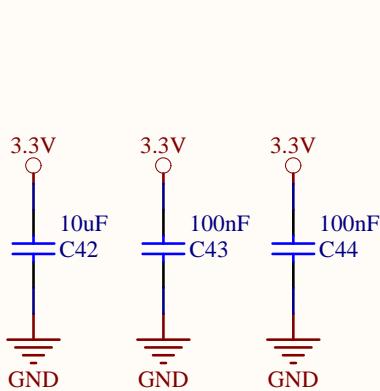
Title: Raspberry Pi - Top Level Schematic			
Size	Number	Revision	
C			
Date:	4/21/2020	Sheet 1	of 41
File:	C:\Users\...\Main.SchDoc	Drawn By:	Kace Chandler

1 2 3 4 5 6



1 2 3 4 5 6

A



B

GND

GND

GND

A

C

B

C

D

Title		
Size		Number
A		
Date:		Revision
Date:	4/21/2020	
File:	C:\Users\..\Gyroscope.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

D

1 2 3 4 5 6

A

B

C

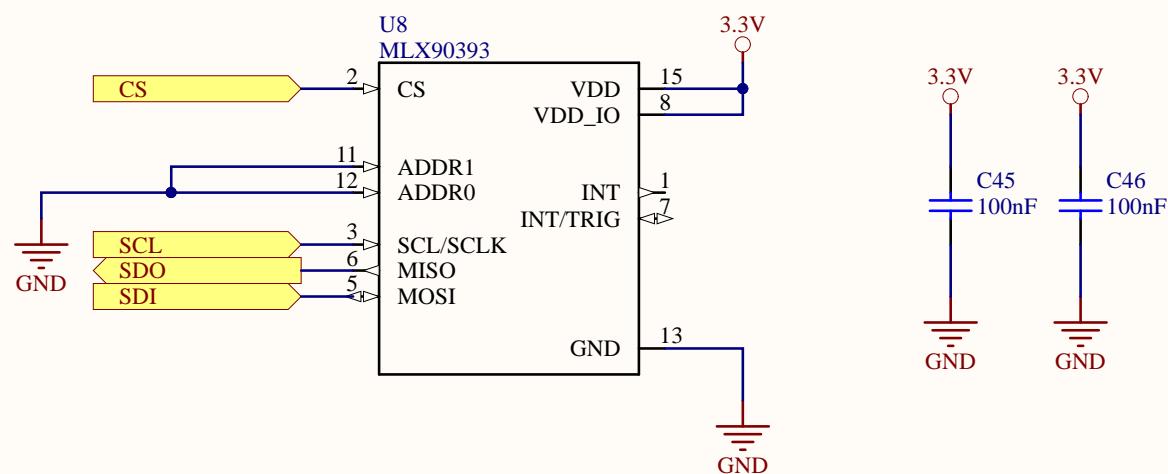
D

A

B

C

D



Title		
Size		Number
A		Revision
Date:	4/21/2020	Sheet 4 of 41
File:	C:\Users\...\Magnetometer.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

A

A

B

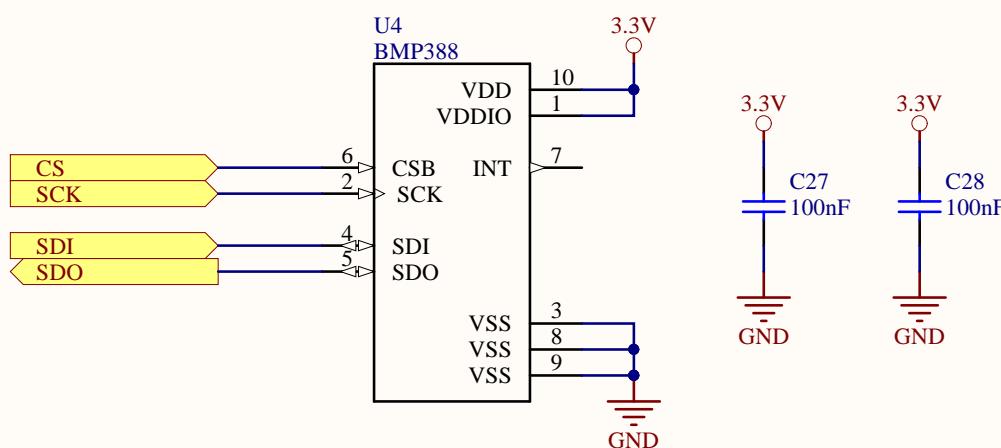
B

C

C

D

D



## Title

**Barometer**

Size

A

Number

Revision

Date: 4/21/2020

Sheet 5 of 41

File: C:\Users\..\Barometer.SchDoc

Drawn By: Kace Chandler

1 2 3 4 5 6

A

A

B

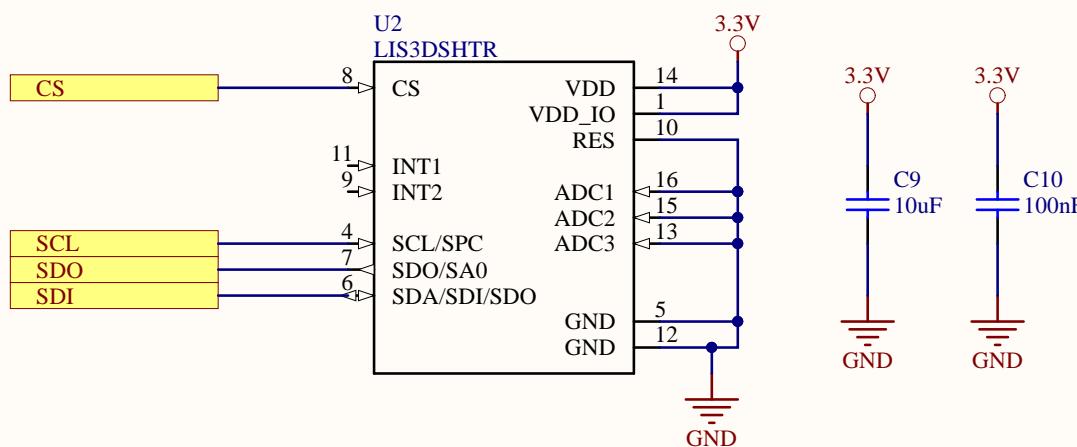
B

C

C

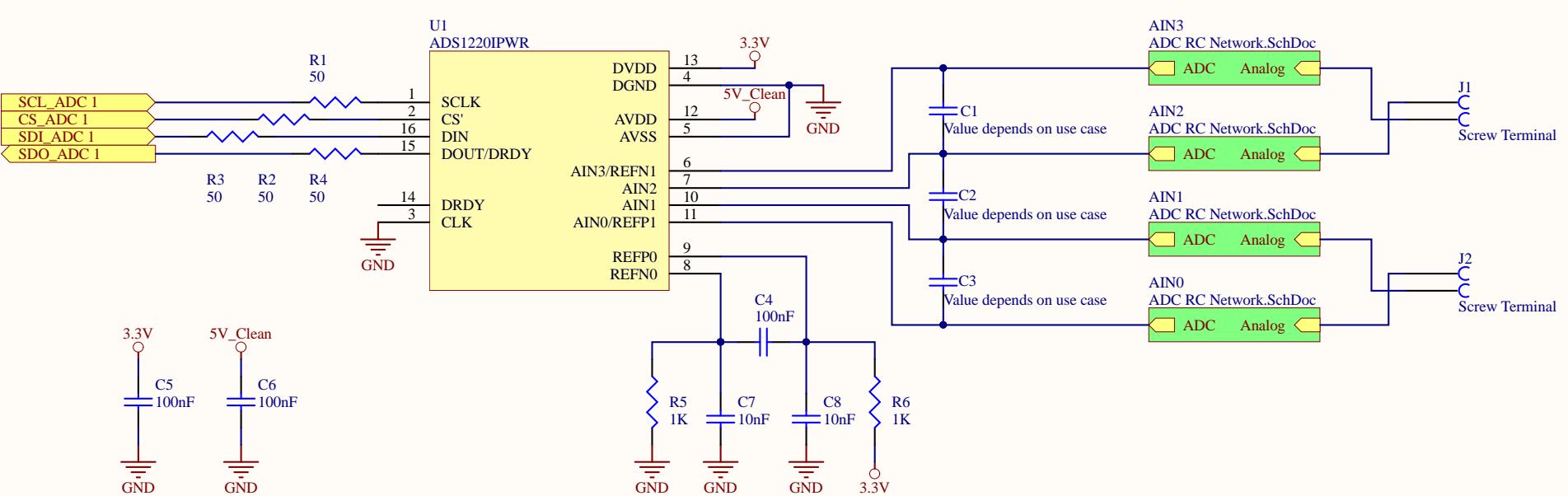
D

D



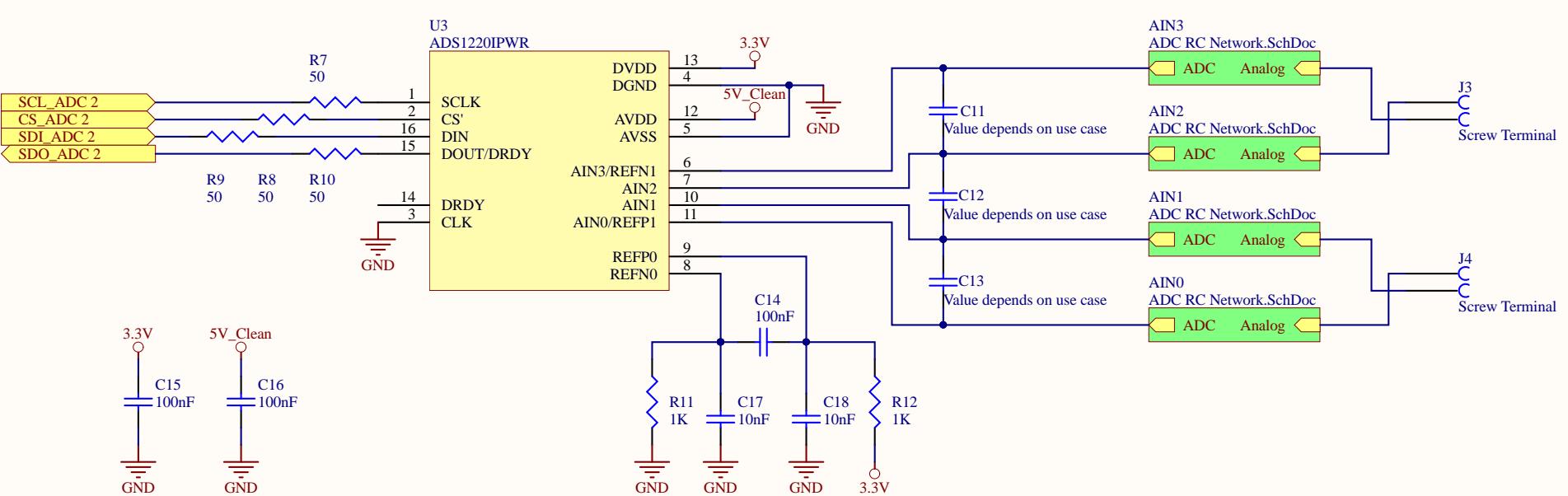
Title Accelerometer		
Size A	Number	Revision
Date: 4/21/2020	Sheet 6 of 41	
File: C:\Users..\Accelerometer.SchDoc	Drawn By: Kace Chandler	

1 2 3 4 5 6



Title		
Size	Number	Revision
A		
Date: 4/21/2020	Sheet 7.1 of 41	Drawn By: Kace Chandler
File: C:\Users\..\ADC.SchDoc		

1 2 3 4 5 6



Title		
Size	Number	Revision
A		
Date: 4/21/2020	Sheet 7.2 of 41	Drawn By: Kace Chandler
File: C:\Users\..\ADC.SchDoc		

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

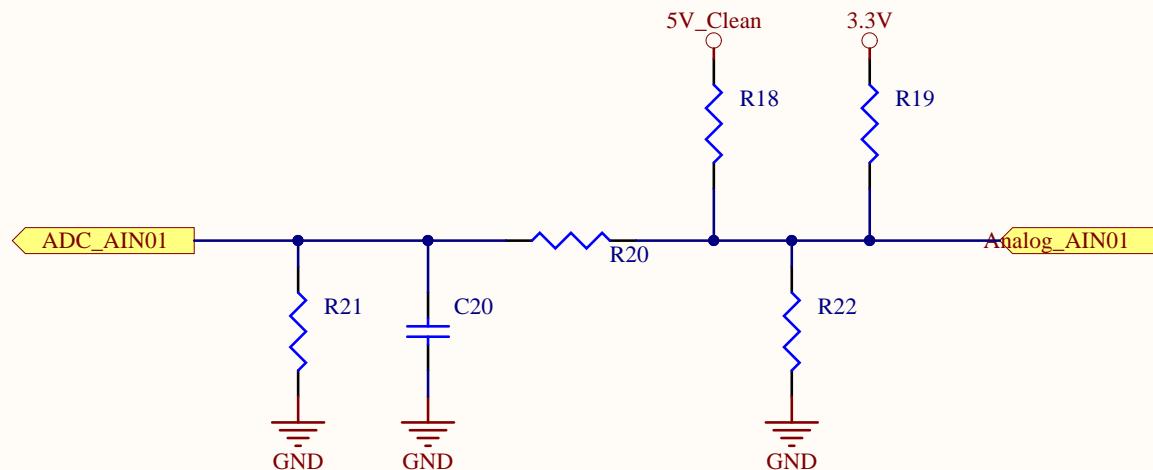
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.1.dff 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

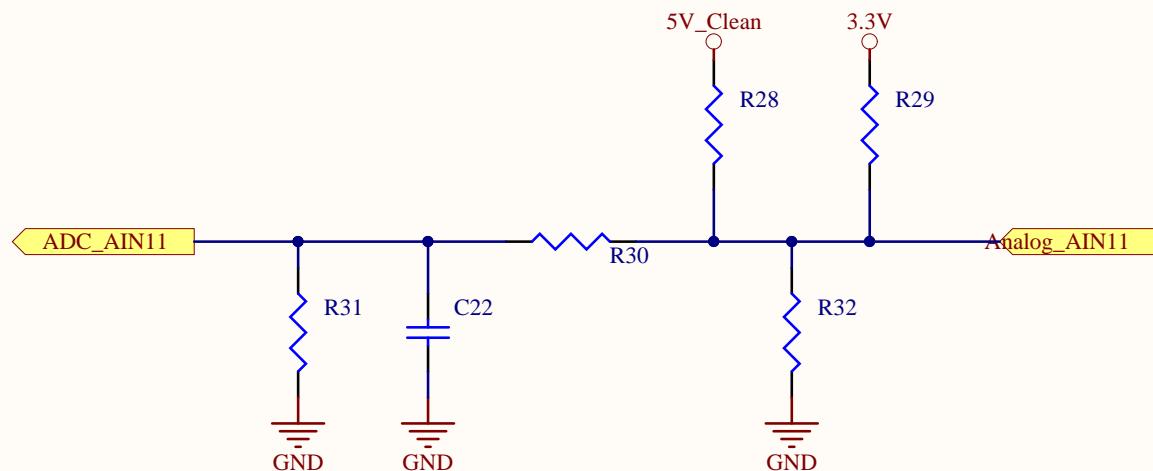
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.1 of 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

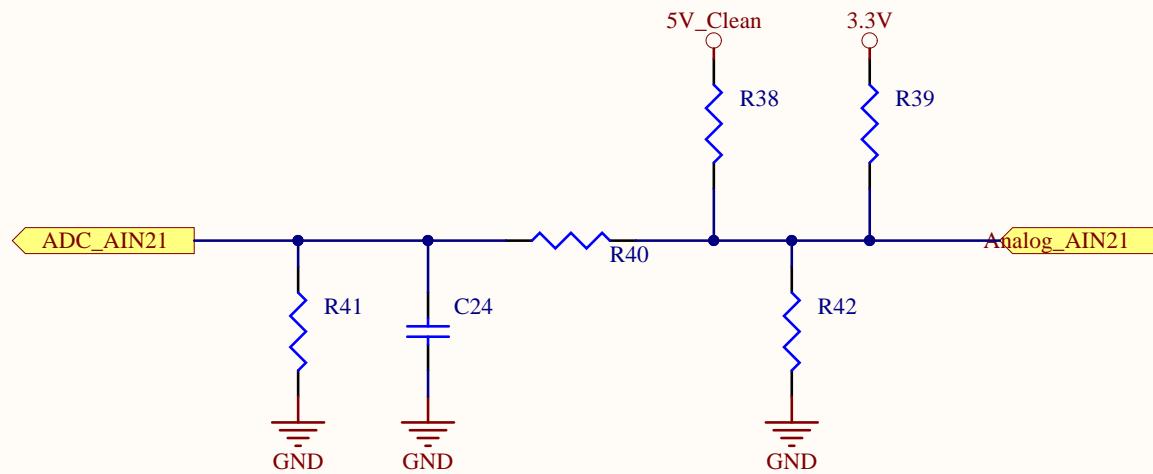
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.1 of 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

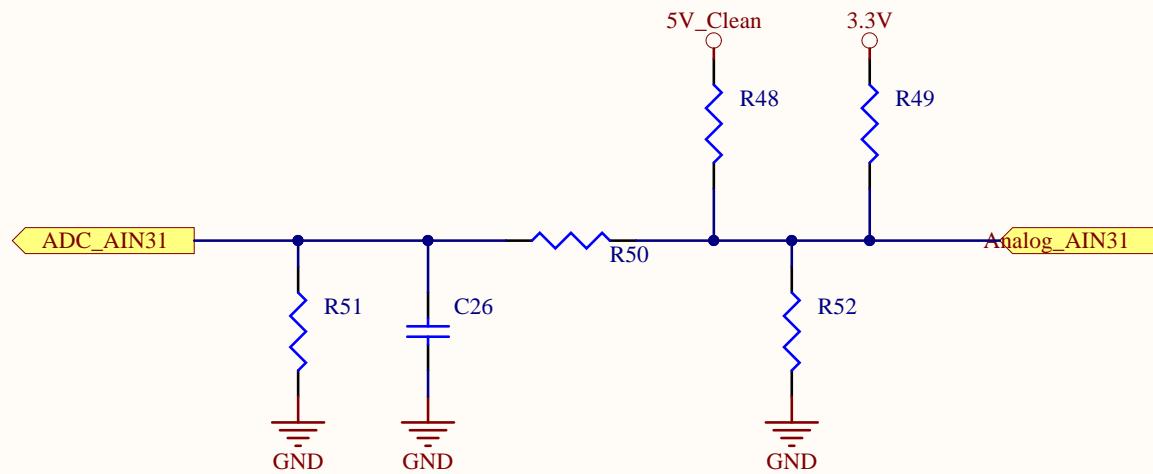
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size

A

Number

Revision

Date: 4/21/2020

Sheet 8.1 off 41

File: C:\Users\..\ADC RC Network.SchDoc

Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

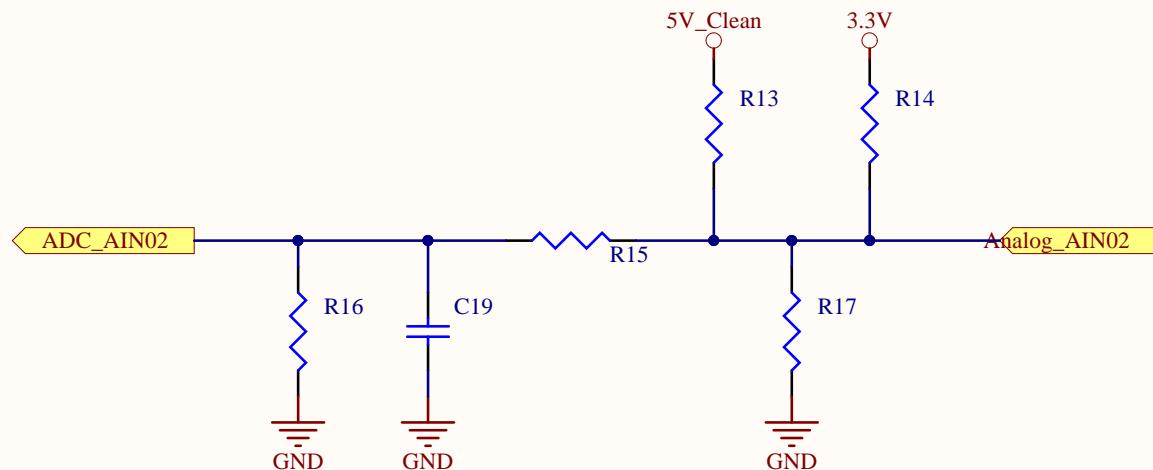
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.2df 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

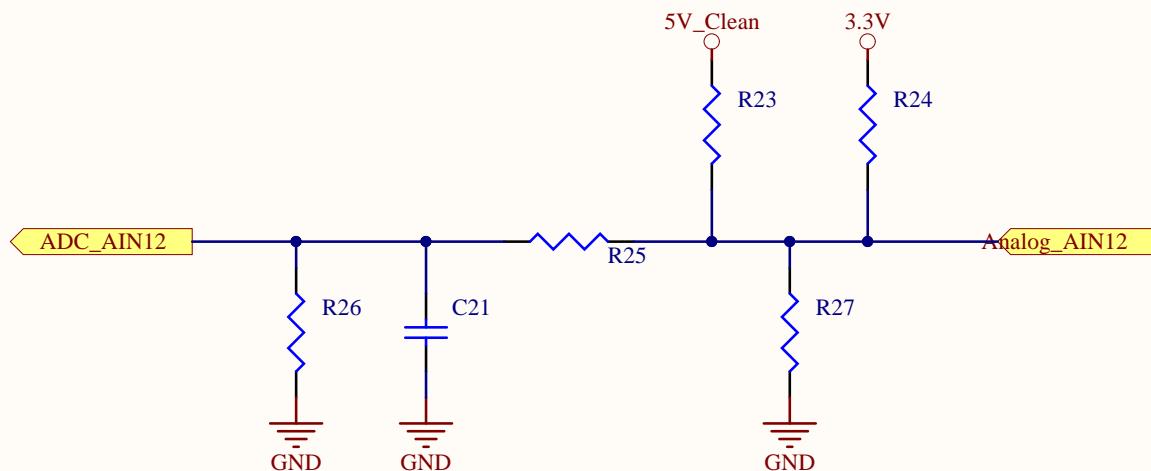
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.2 of 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

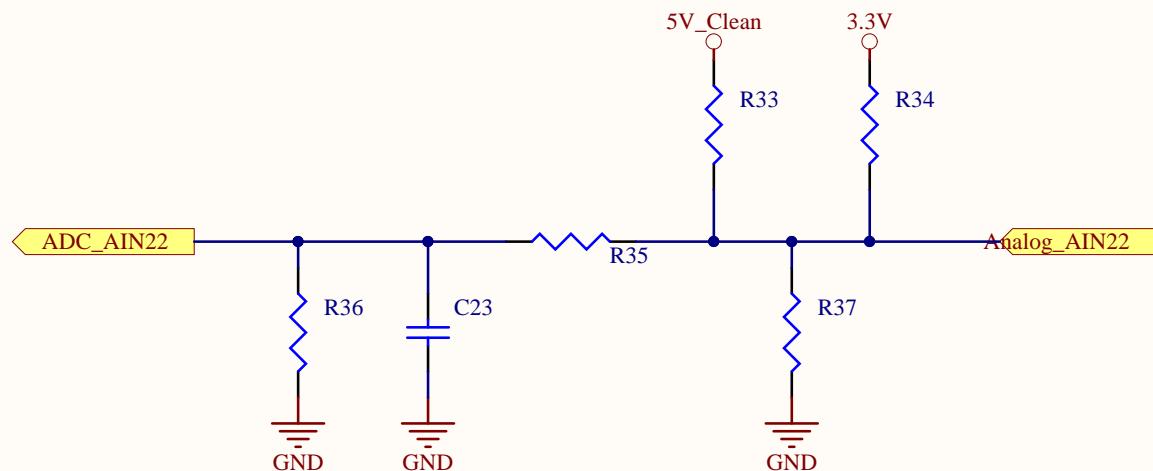
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.2 of 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

B

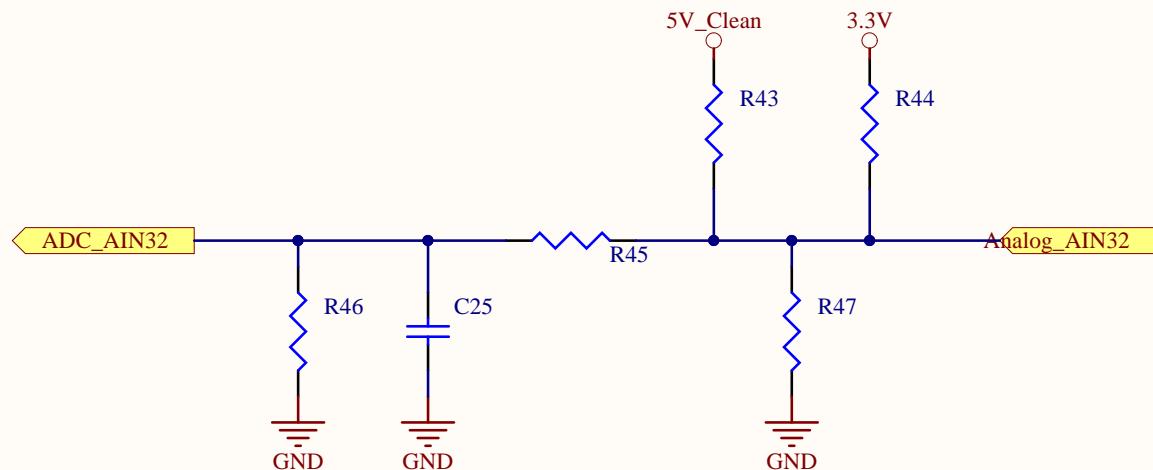
C

C

D

D

Component values all depend on use case  
Components will need to be omitted for any use case



Title

## ADC Input Network

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 8.2 off 41
File:	C:\Users\..\ADC RC Network.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1	2	3	4	5	6
---	---	---	---	---	---

A

A

B

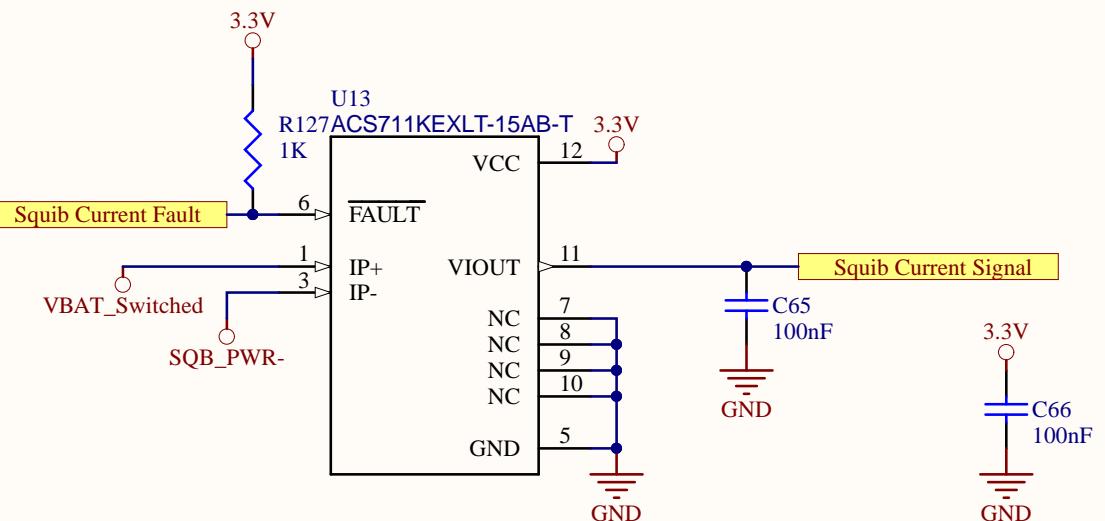
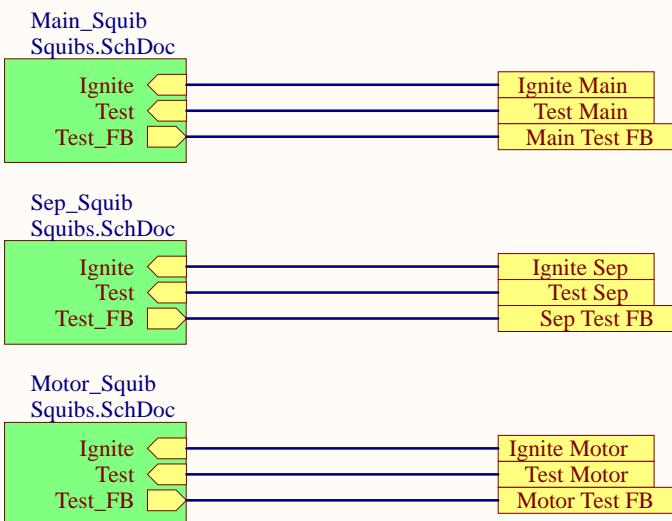
B

C

C

D

D



Title

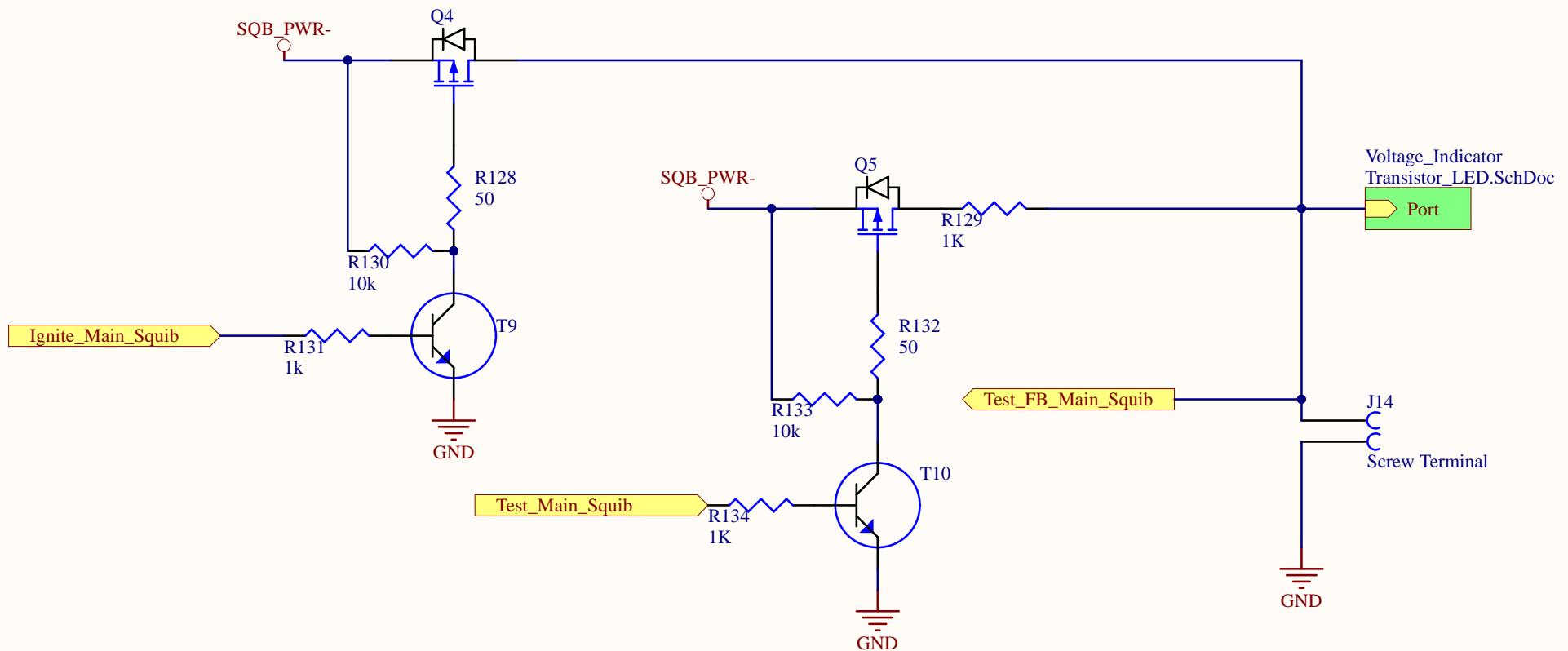
# Squib Management

Size	Number	Revision
A		
Date: 4/21/2020	Sheet 9 of 41	
File: C:\Users\...\Squib_Managment.SchDoc		Drawn By: Kace Chandler

1	2	3	4	5	6
---	---	---	---	---	---

1 2 3 4 5 6

A



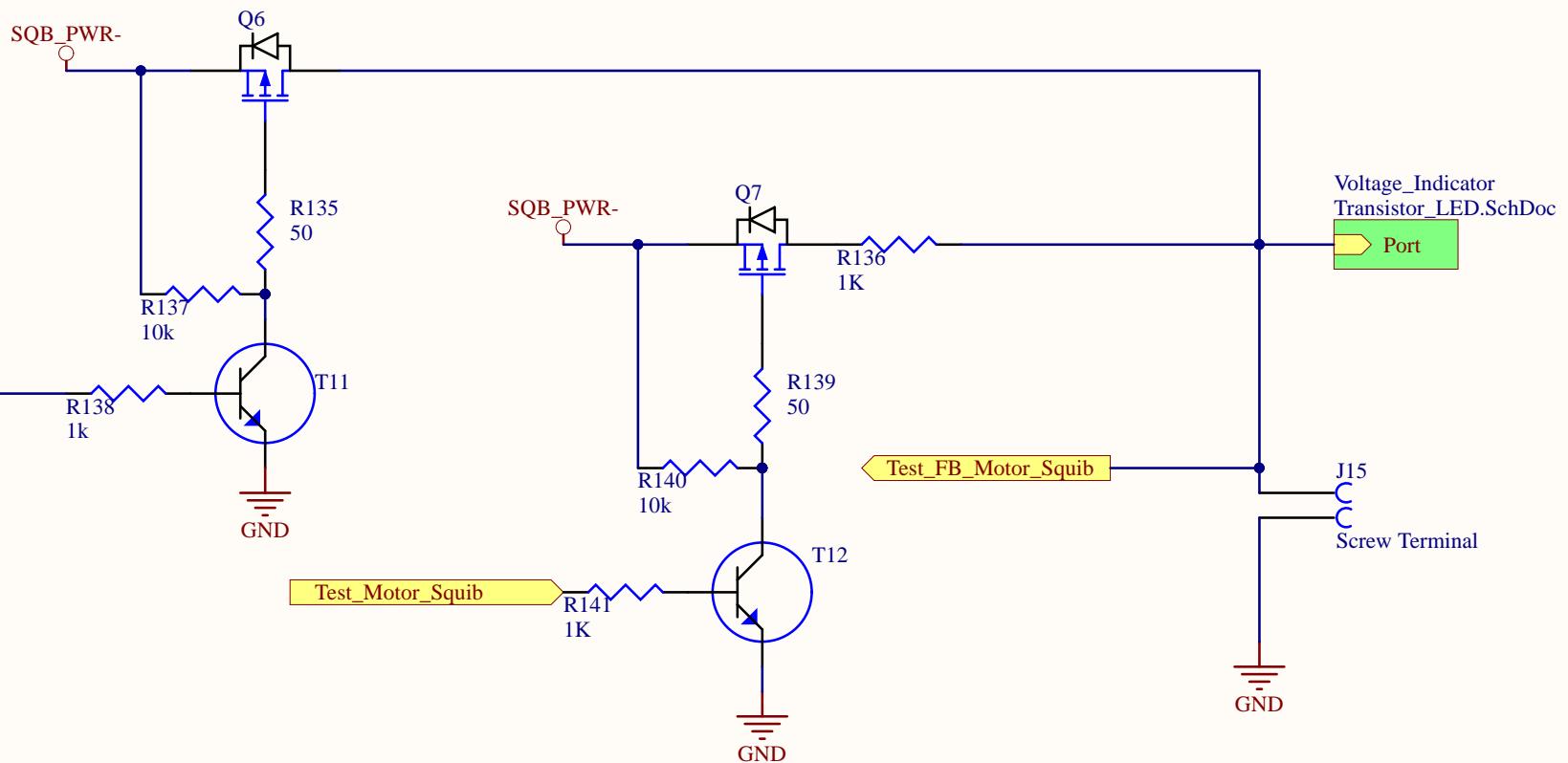
Title

# Single Squib Connection

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 10.1 of 41
File:	C:\Users\...\Squibs.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6



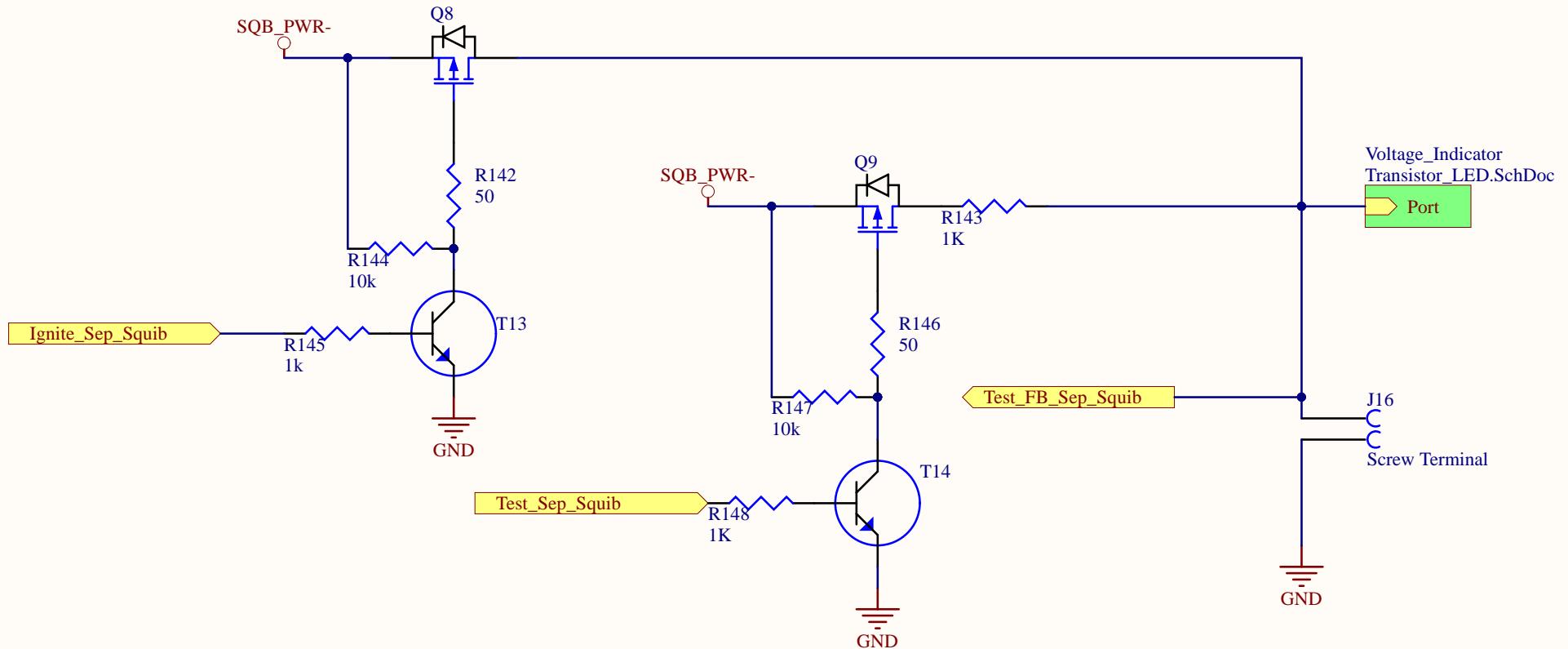
Title  
**Single Squib Connection**

Size	Number	Revision
A		
Date: 4/21/2020	Sheet 10.2 of 41	Drawn By: Kace Chandler
File: C:\Users\...\Squibs.SchDoc		

1 2 3 4 5 6

1 2 3 4 5 6

A



B

C

D

A

B

C

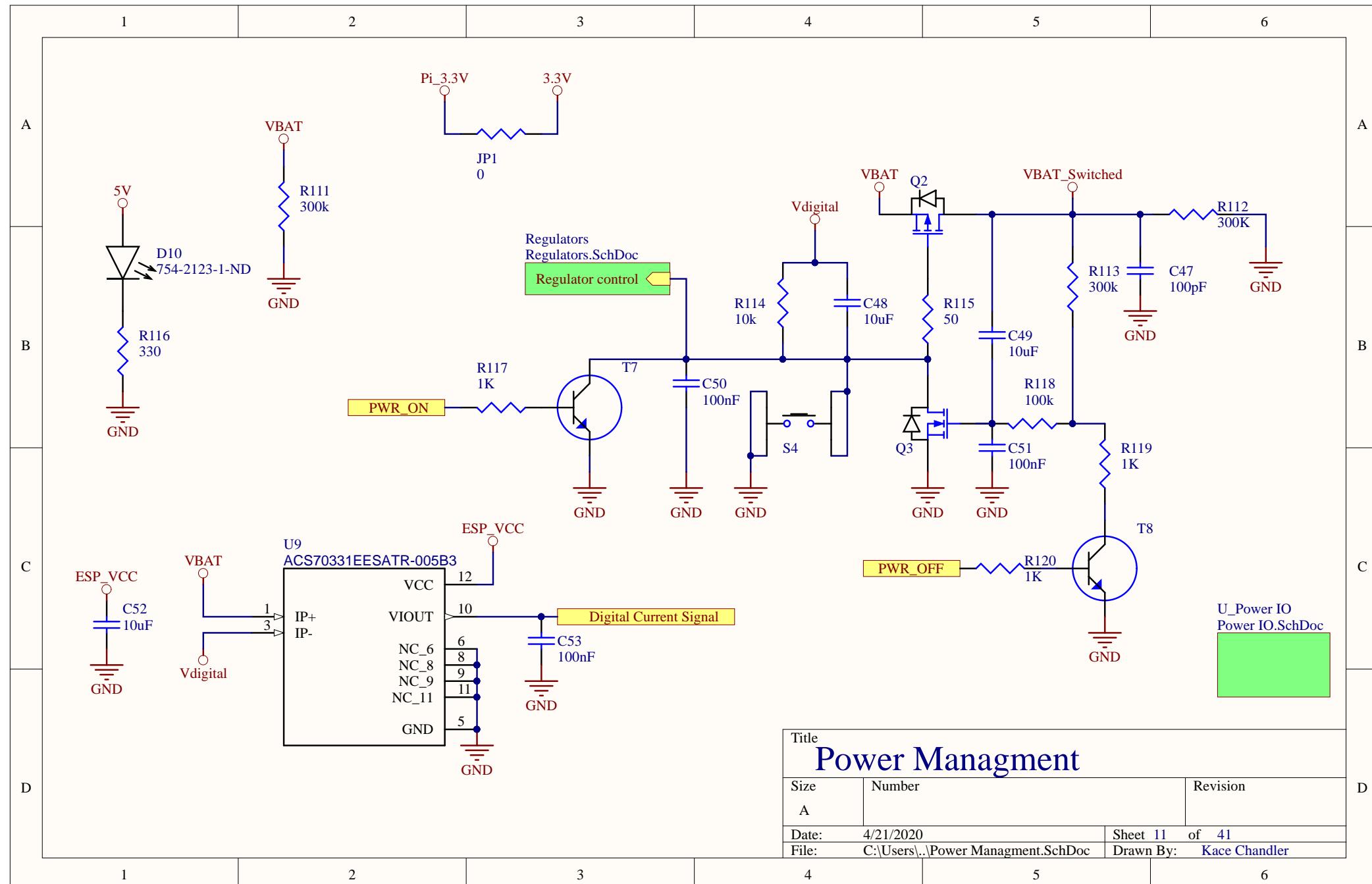
D

Title

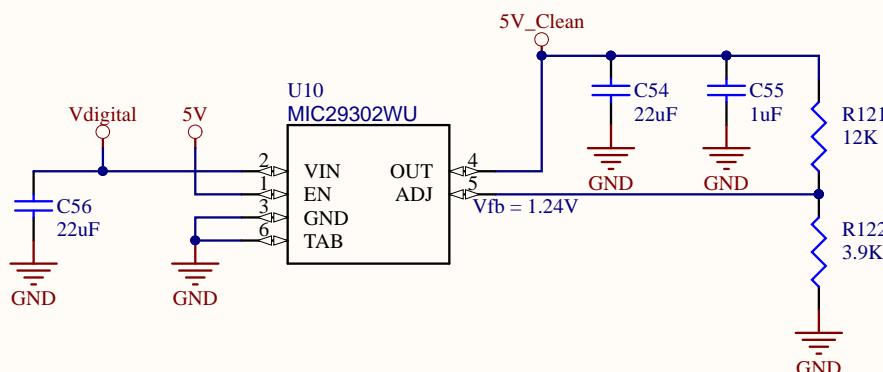
# Single Squib Connection

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 10.3 of 41
File:	C:\Users\...\Squibs.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

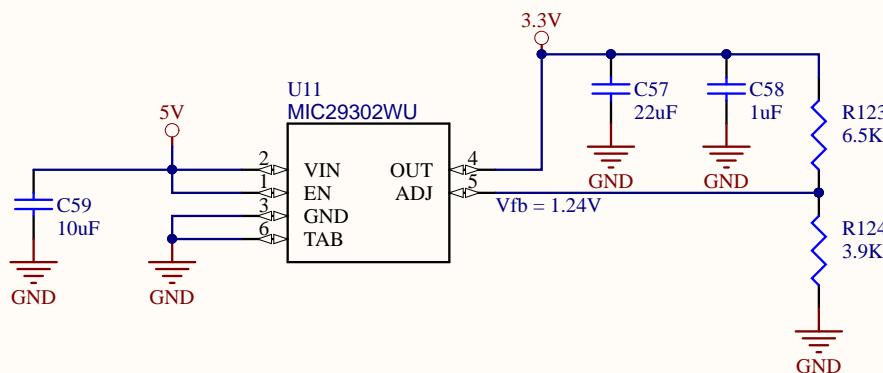


A



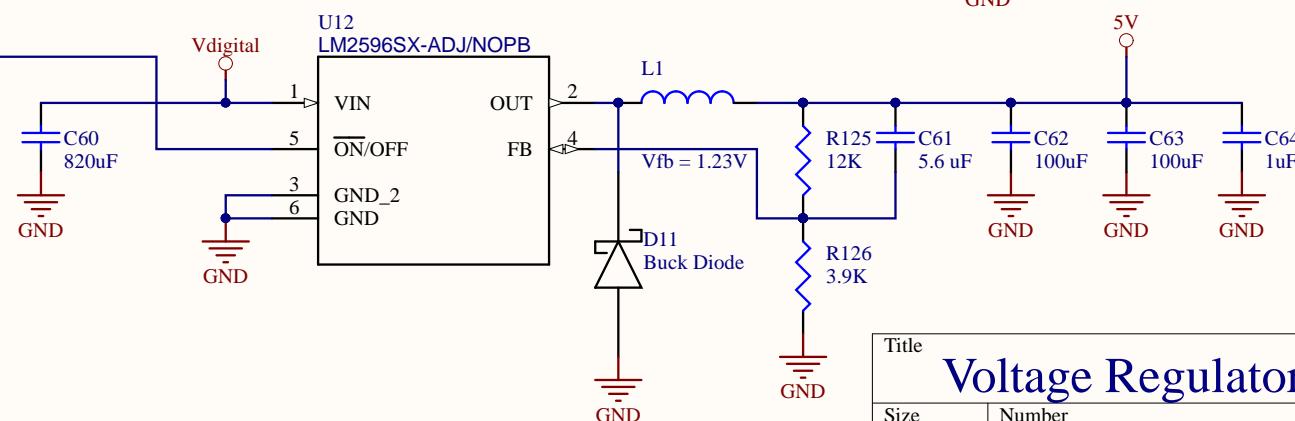
A

B



B

C



C

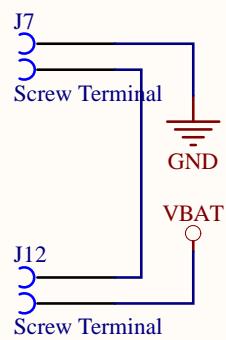
D

Title  
**Voltage Regulators**

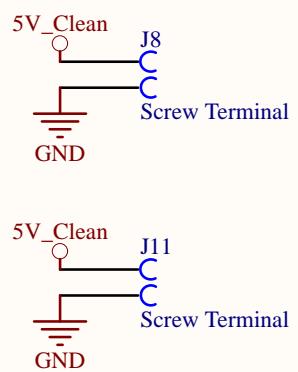
Size	Number	Revision
A2		
Date:	4/21/2020	Sheet 12 of 41
File:	C:\Users\.\Regulators.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

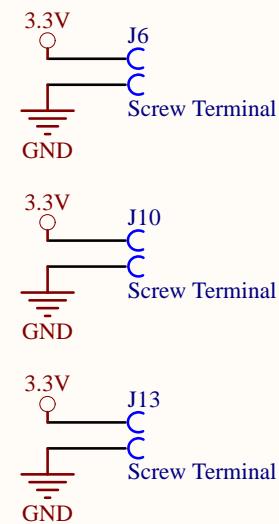
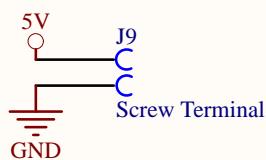
A



B



C

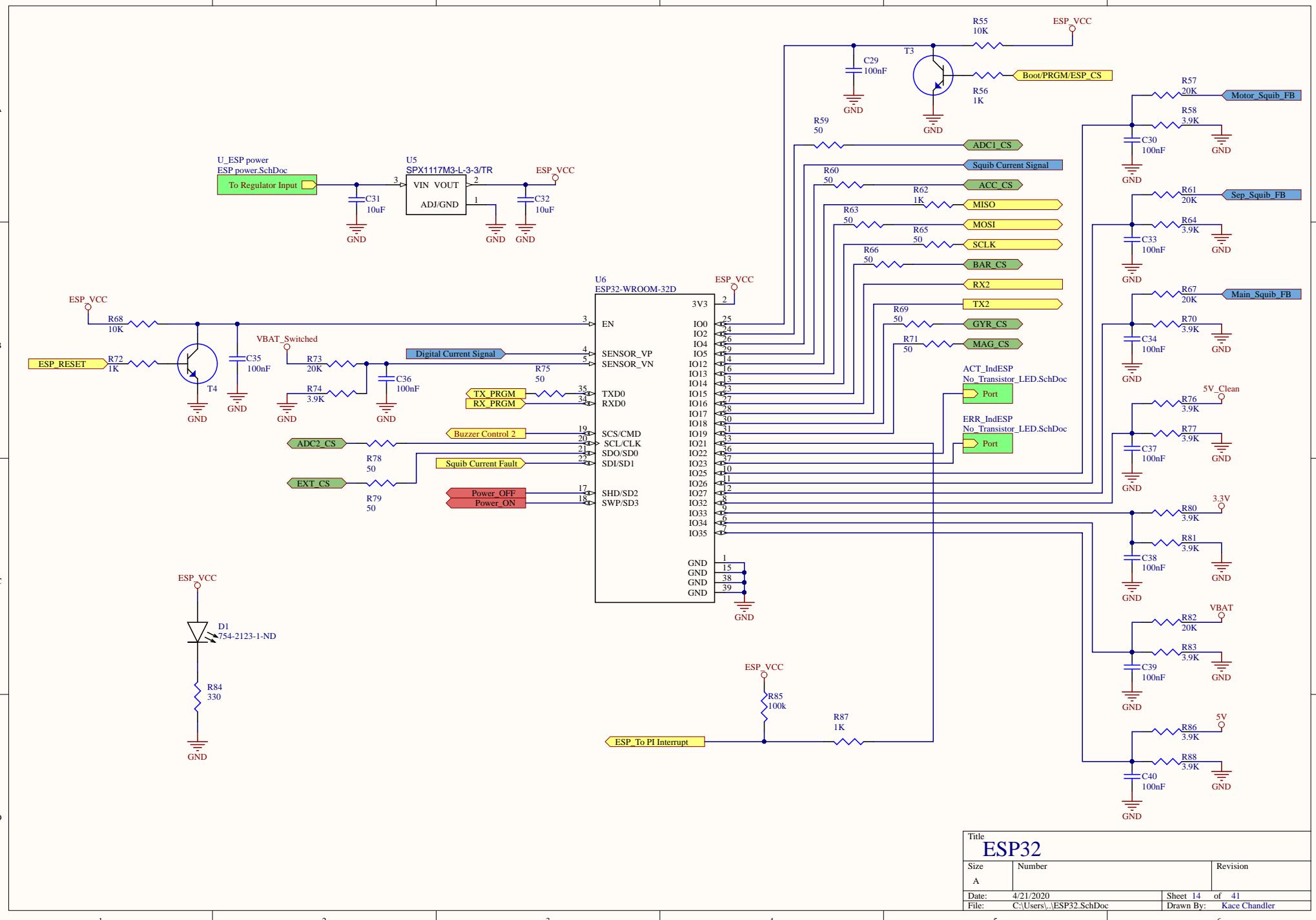


D

Title <b>Power Input/Output</b>		
Size A2	Number	Revision
Date: 4/21/2020	Sheet 13 of 41	
File: C:\Users\..\Power IO.SchDoc	Drawn By: Kace Chandler	

1 2 3 4 5 6

1 2 3 4 5 6



1 2 3 4 5 6

A

A

B

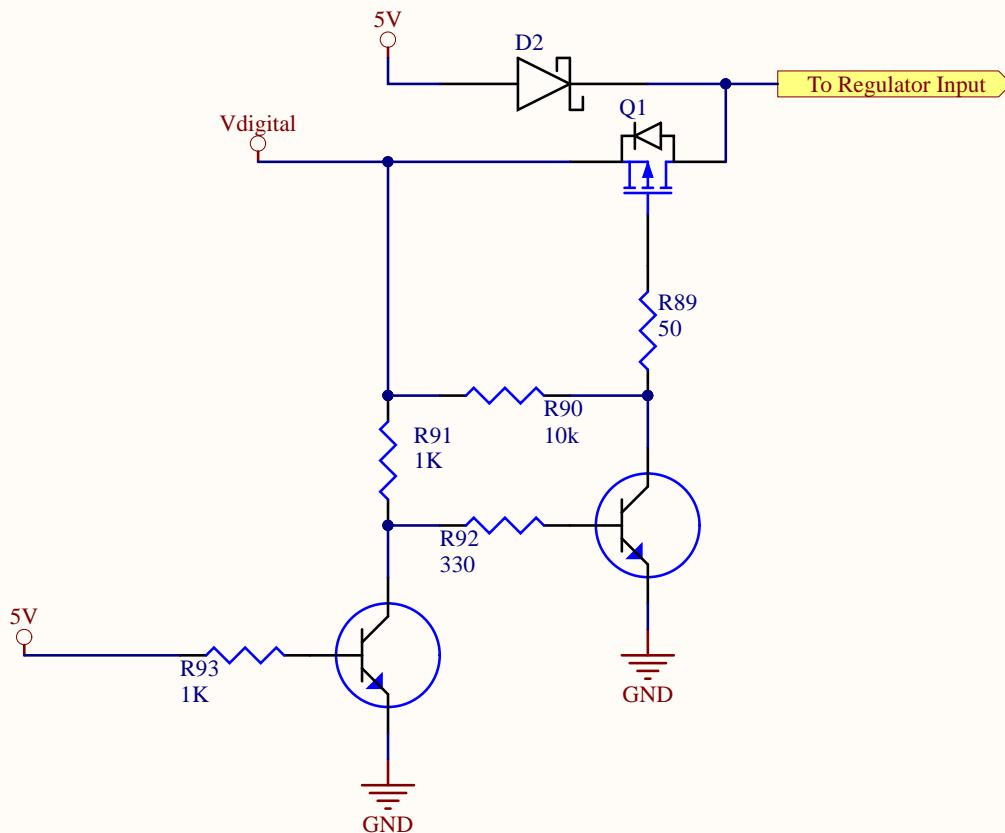
B

C

C

D

D



Title ESP Power Management		
Size A	Number	Revision
Date: 4/21/2020	Sheet 15 of 41	
File: C:\Users\..\ESP power.SchDoc	Drawn By: Kace Chandler	

1 2 3 4 5 6

1

2

3

4

5

6

A

A

B

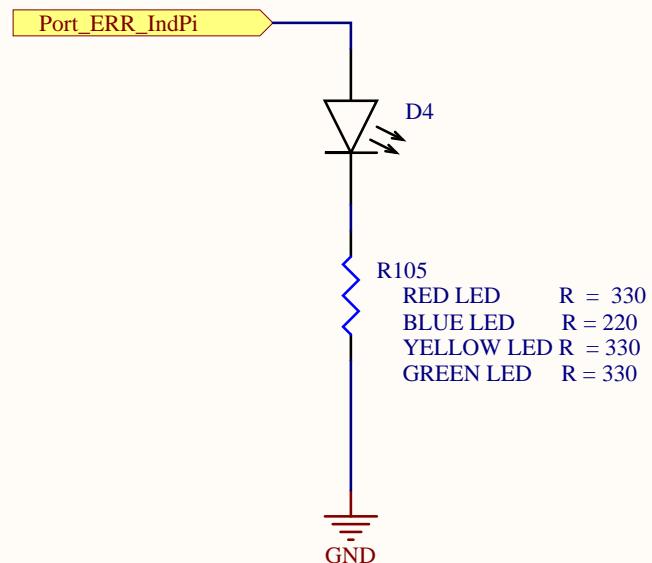
B

C

C

D

D



## Title

**LED**

Size

A

Number

Revision

Date: 4/21/2020

Sheet 16 of 41

File: C:\Users\..\No\_Transistor\_LED.SchDoc Drawn By: Kace Chandler

1

2

3

4

5

6

1

2

3

4

5

6

A

A

B

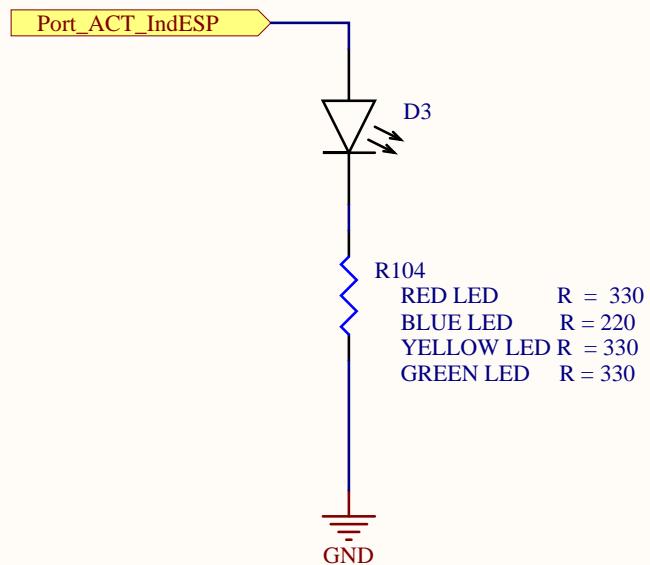
B

C

C

D

D



## Title

**LED**

Size

A

Number

Revision

Date: 4/21/2020

Sheet 16.1 of 41

File: C:\Users\..\No\_Transistor\_LED.SchDoc Drawn By: Kace Chandler

1

2

3

4

5

6

1

2

3

4

5

6

A

A

B

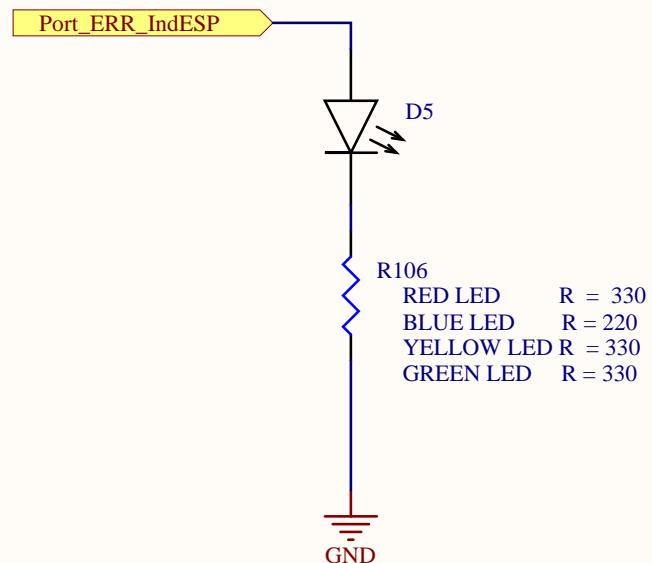
B

C

C

D

D



## Title

**LED**

Size

A

Number

Revision

Date: 4/21/2020

Sheet 16.2 of 41

File: C:\Users\..\No\_Transistor\_LED.SchDoc Drawn By: Kace Chandler

1

2

3

4

5

6

1 2 3 4 5 6

A

B

C

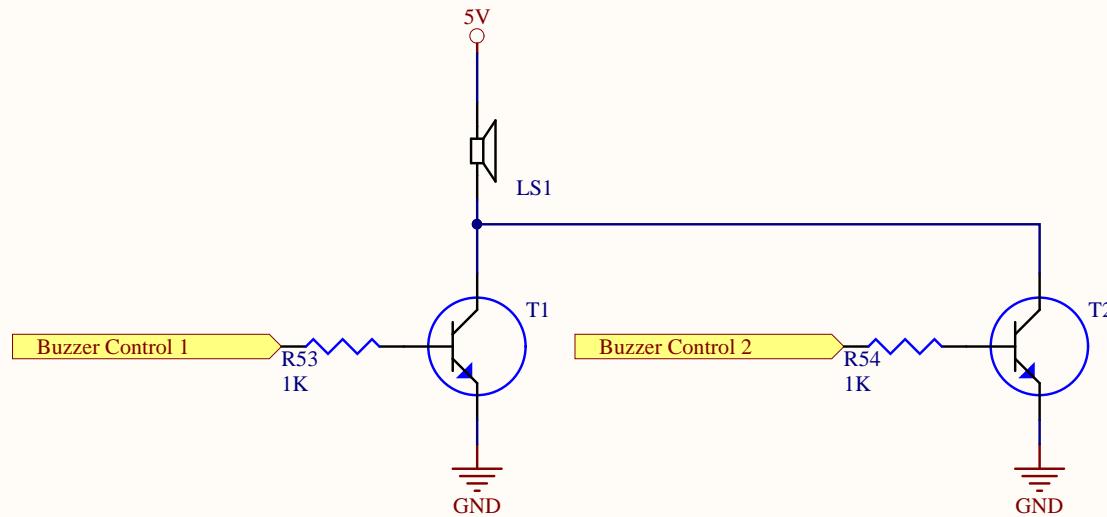
D

A

B

C

D



Title		
Size	Number	Revision
A		
Date: 4/21/2020	Sheet 17 of 41	Drawn By: Kace Chandler
File: C:\Users\..\Buzzer.SchDoc		

1 2 3 4 5 6

A

A

B

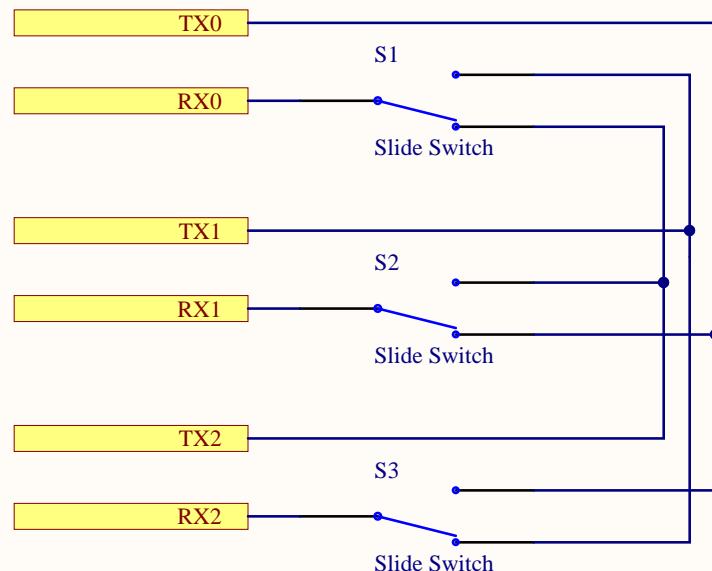
B

C

C

D

D



## Title

**UART Switching**

Size

A

Number

Revision

Date: 4/21/2020

Sheet 18 of 41

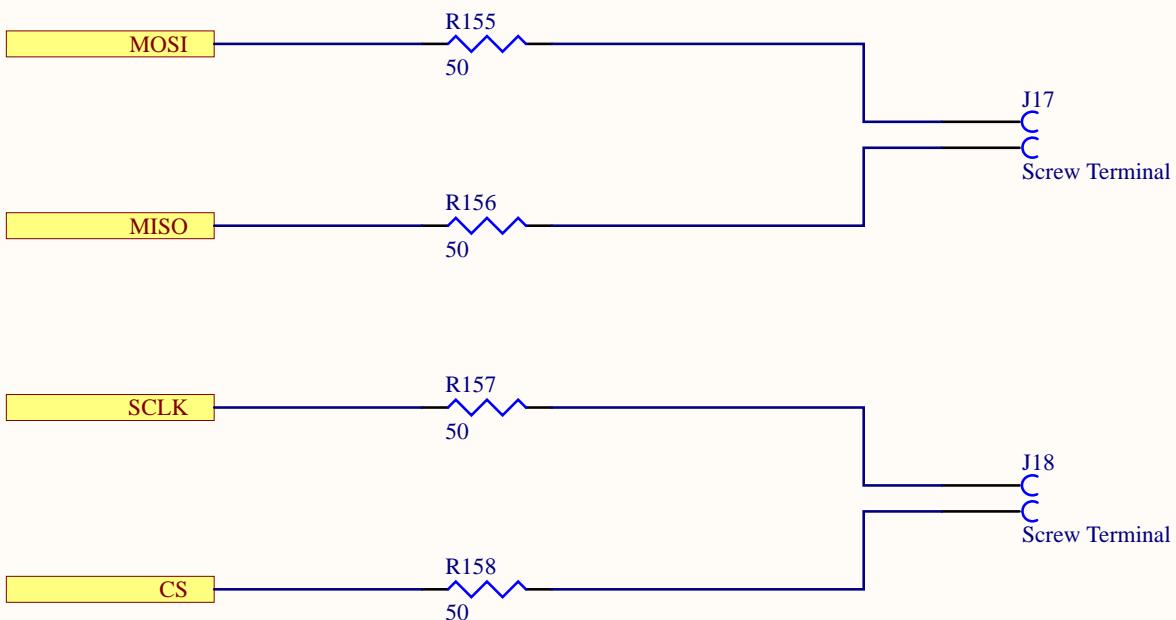
File: C:\Users\..\3 way uart switch.SchDoc

Drawn By: Kace Chandler

1 2 3 4 5 6

A

A



B

B

C

C

D

D

Title		
SPI Output		
Size	Number	Revision
A		
Date:	4/21/2020	Sheet 19 of 41
File:	C:\Users\..\SPI Output.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

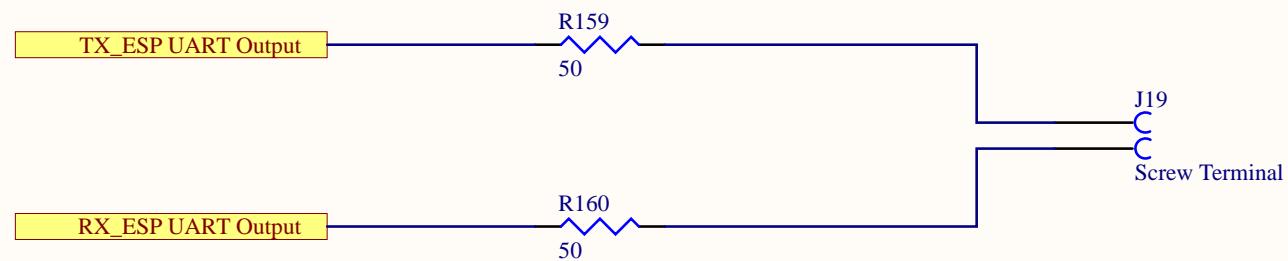
B

C

C

D

D



Title		
Size		Number
A		
Date:		Sheet 20.1 of 41
File:		Drawn By: Kace Chandler

1 2 3 4 5 6

1 2 3 4 5 6

A

A

B

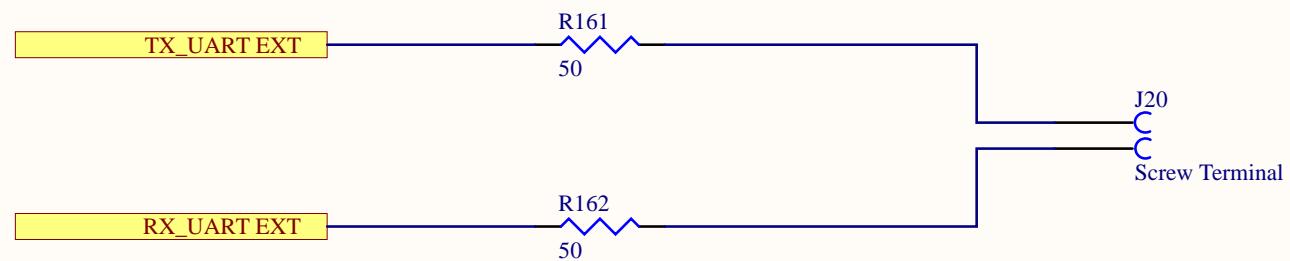
B

C

C

D

D



Title		
Size	Number	Revision
A		
Date: 4/21/2020	Sheet 20.2 of 41	File: C:\Users\..\UART Output.SchDoc Drawn By: Kace Chandler

1 2 3 4 5 6

A

A

B

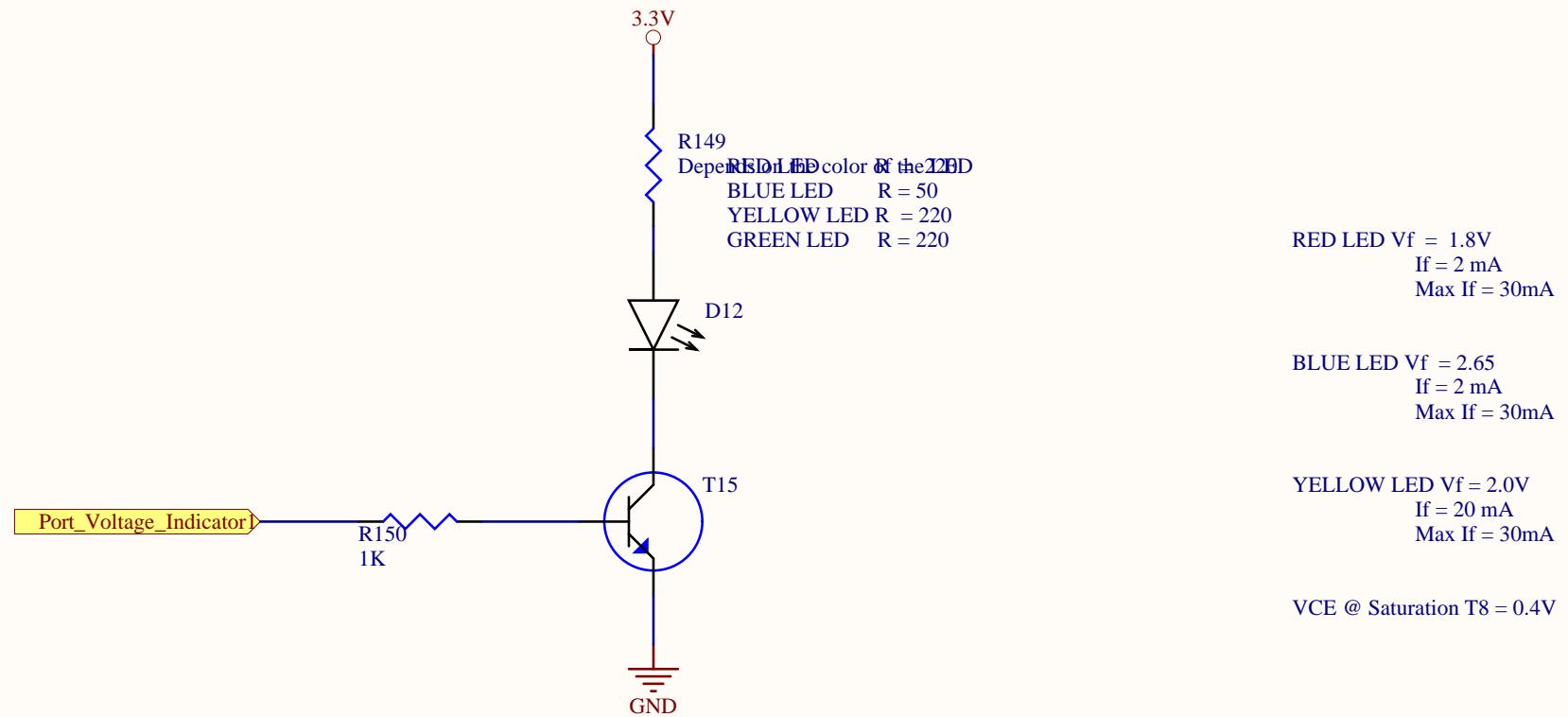
B

C

C

D

D



## Title

**LED with Transistor**

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 21.1.1 of 41
File:	C:\Users\.\Transistor_LED.SchDoc	Drawn By: Kace Chandler

A

A

B

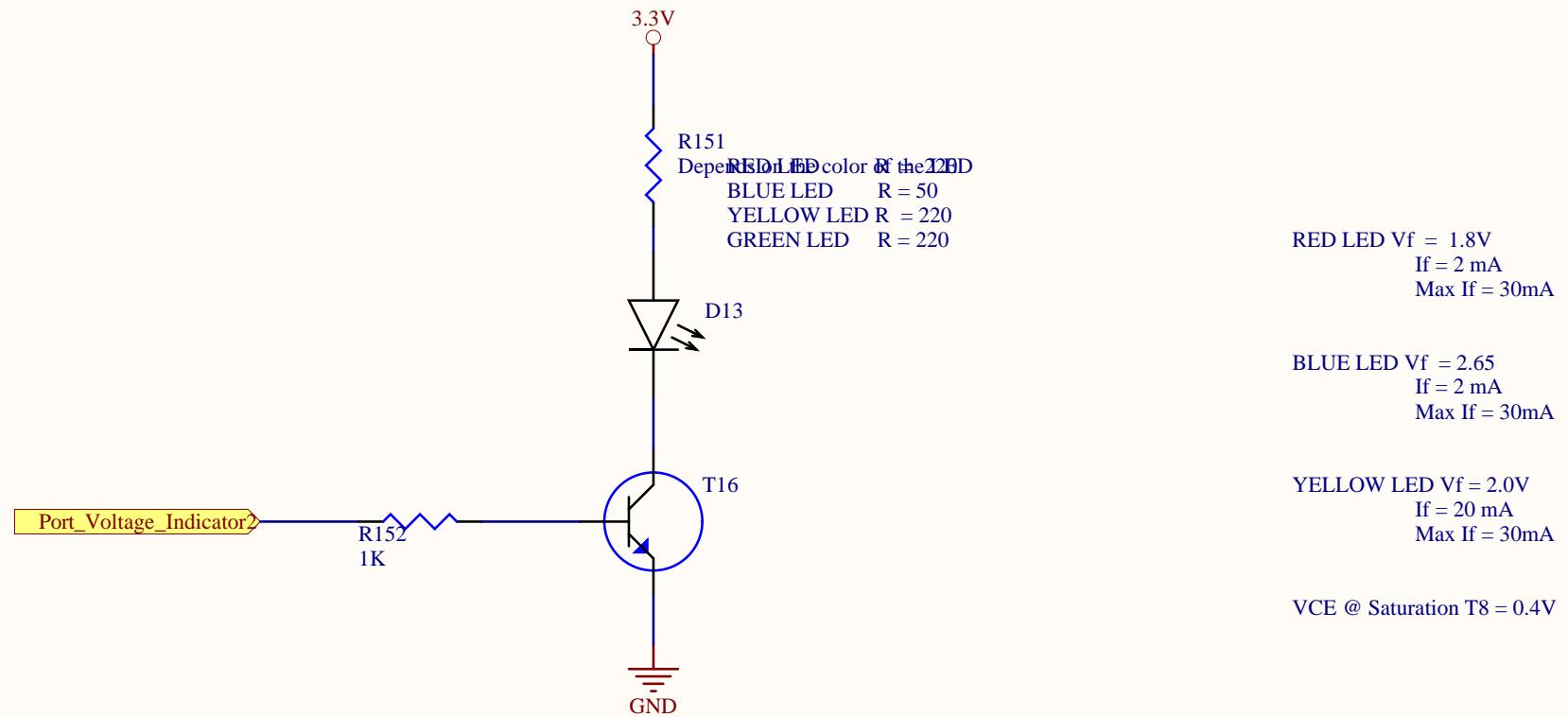
B

C

C

D

D



## Title

**LED with Transistor**

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 21.2.1 of 41
File:	C:\Users\.\Transistor_LED.SchDoc	Drawn By: Kace Chandler

A

A

B

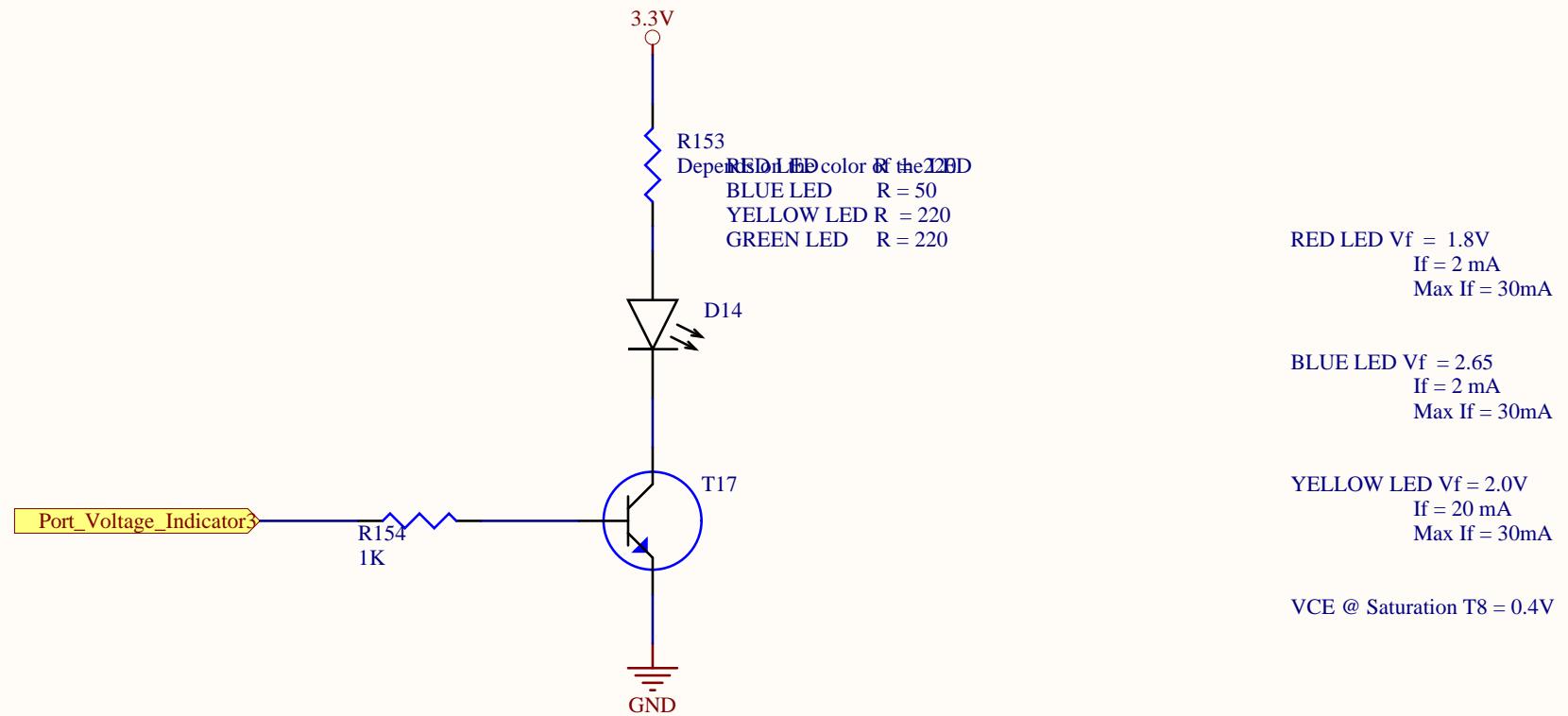
B

C

C

D

D



## Title

**LED with Transistor**

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 21.3.1 of 41
File:	C:\Users\.\Transistor_LED.SchDoc	Drawn By: Kace Chandler

1	2	3	4	5	6
---	---	---	---	---	---

A

B

C

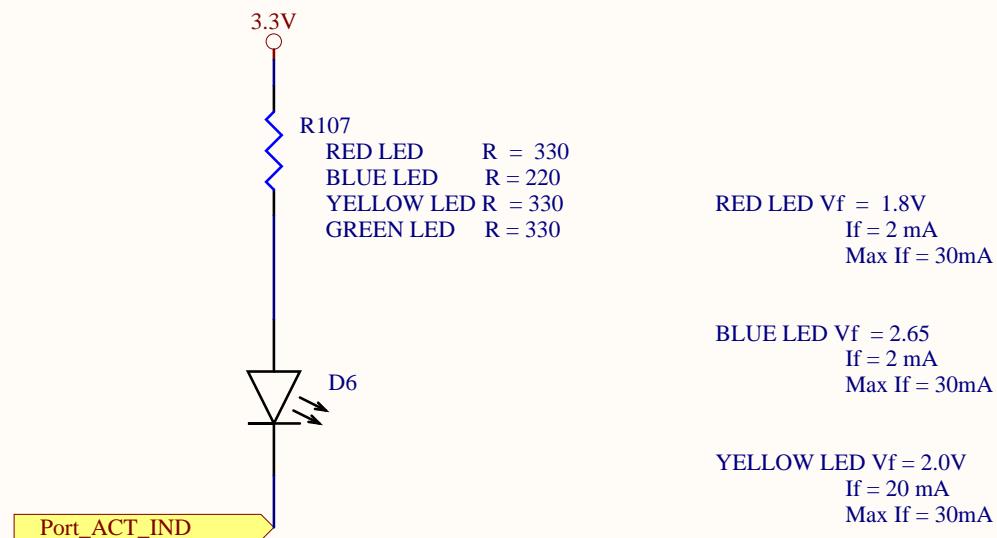
D

A

B

C

D



Title <b>Inverted LED</b>		
Size	Number	Revision
A		
Date:	4/21/2020	Sheet 22.1 of 41
File:	C:\Users\..\No_Transistor_LED_INV.Sch	Drawn By: Kace Chandler

1	2	3	4	5	6
---	---	---	---	---	---

1	2	3	4	5	6
---	---	---	---	---	---

A

B

C

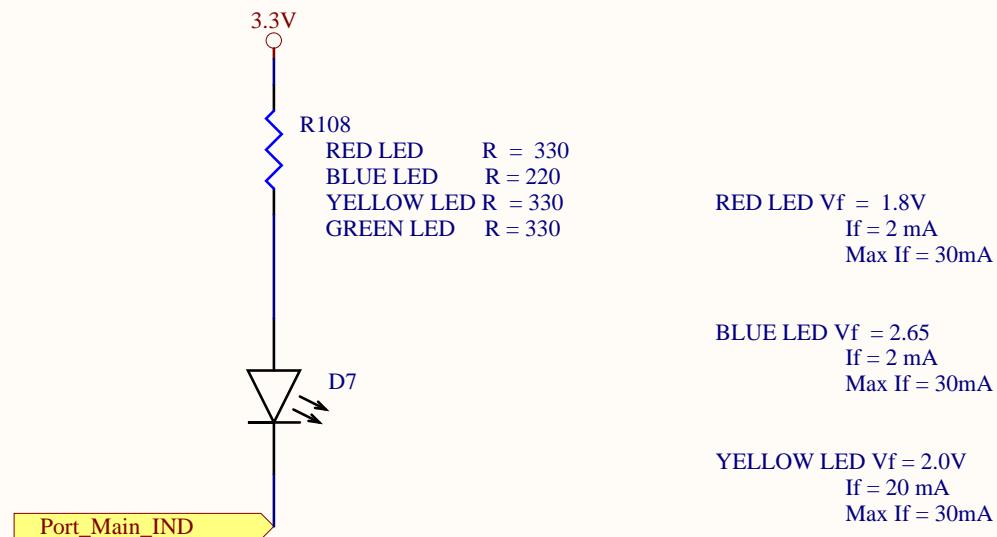
D

A

B

C

D



Title

## Inverted LED

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 22.2 of 41
File:	C:\Users\..\No_Transistor_LED_INV.Sch	Drawn By: Kace Chandler

1	2	3	4	5	6
---	---	---	---	---	---

1	2	3	4	5	6
---	---	---	---	---	---

A

B

C

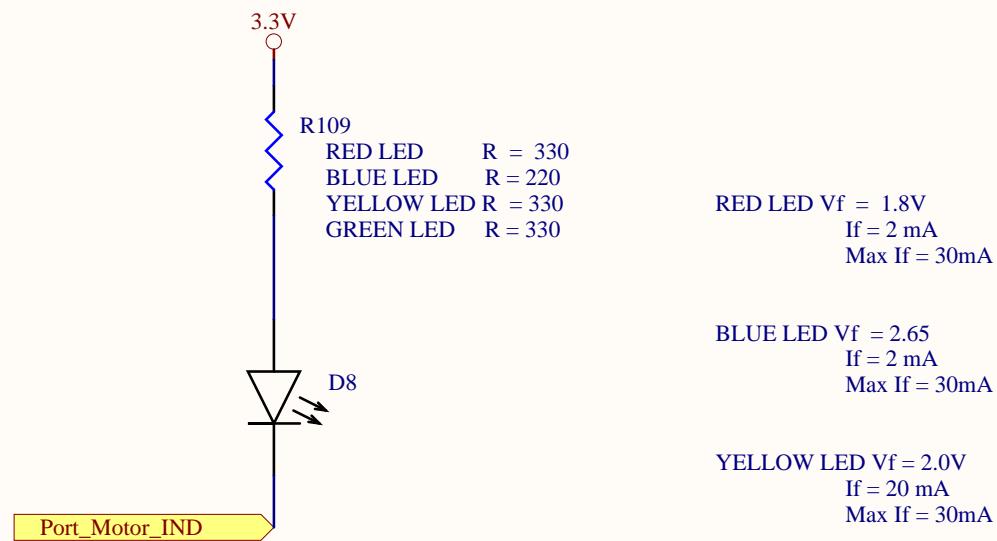
D

A

B

C

D



Title

## Inverted LED

Size	Number	Revision
A		
Date:	4/21/2020	Sheet 22.3 of 41
File:	C:\Users\..\No_Transistor_LED_INV.Sch	Drawn By: Kace Chandler

1	2	3	4	5	6
---	---	---	---	---	---

1	2	3	4	5	6
---	---	---	---	---	---

A

B

C

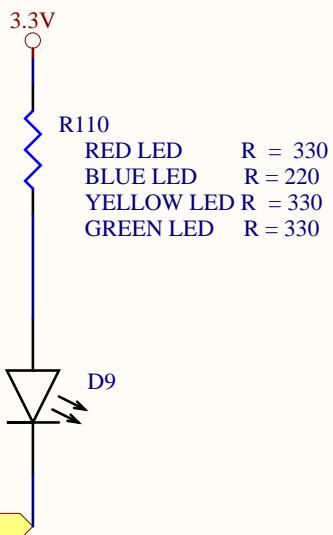
D

A

B

C

D



3.3V  
R110  
RED LED      R = 330  
BLUE LED      R = 220  
YELLOW LED R = 330  
GREEN LED      R = 330

RED LED Vf = 1.8V  
If = 2 mA  
Max If = 30mA

BLUE LED Vf = 2.65  
If = 2 mA  
Max If = 30mA

YELLOW LED Vf = 2.0V  
If = 20 mA  
Max If = 30mA

Title <b>Inverted LED</b>		
Size	Number	Revision
A		
Date:	4/21/2020	Sheet 22.4 of 41
File:	C:\Users\...\No_Transistor_LED_INV.Sch	Drawn By: Kace Chandler

1	2	3	4	5	6
---	---	---	---	---	---

1 2 3 4 5 6

A

B

C

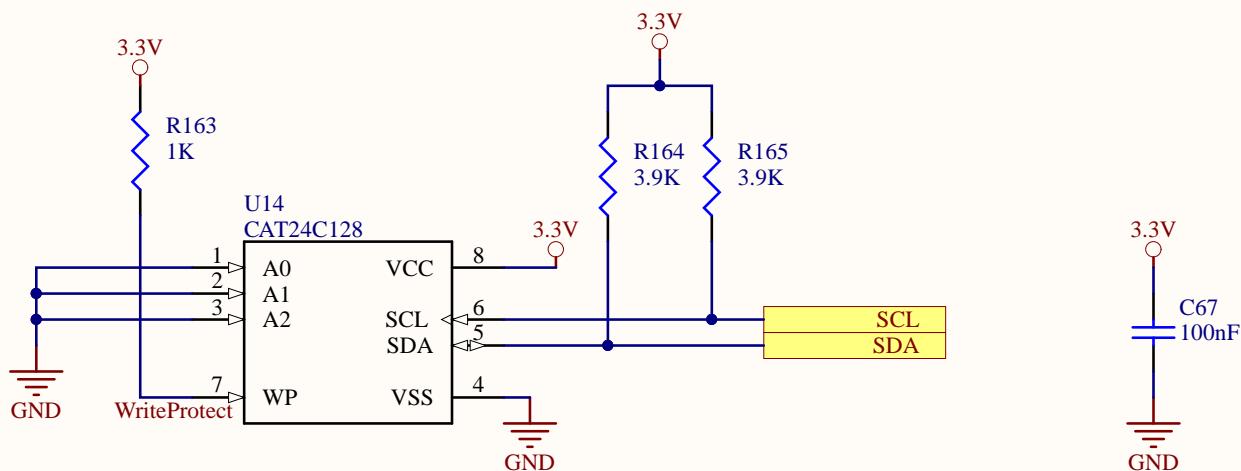
D

A

B

C

D



Title  
**Raspberry Pi EEPROM**

Size	Number	Revision
A2		
Date:	4/21/2020	Sheet * of 41
File:	C:\Users\...\EEPROM.SchDoc	Drawn By: Kace Chandler

1 2 3 4 5 6

ESP  
ERR  
ACT  
PWR

BYU-Idaho Rocket Dynamics  
Designed By Kace Chandler  
[github.com/byui-rocket-dynamics](https://github.com/byui-rocket-dynamics)

No.

R74 R73 R83 R82  
R88 R86 R77 R76  
R81 R80 R57 R58  
R61 R64 R67 R70

L1

POWER  
7-18V

Q2

3V3 TX RX

R123 R124  
U11  
LIN3V3  
R121 R122  
U10  
LIN5V

IP

TEAM

V2.0

C63 R125 R126  
C64 C62 C61

R94  
U9  
C52  
U12 BUCK 5V

PI ON PI  
PWR ACT ERR

RX TX

5V

MOSI

SCK CS

EEPROM Write Protect

5V

U8

MAG

C46

U13

ACC

C47

MOTOR

U4

BAR

C9

C10

C27

U7

GYR

C41

C42

C43

C44

MAIN

D1

R8

R63

D7

R64

R165

R163

ADC0 ADC1

PI

UART

Switches

EXT

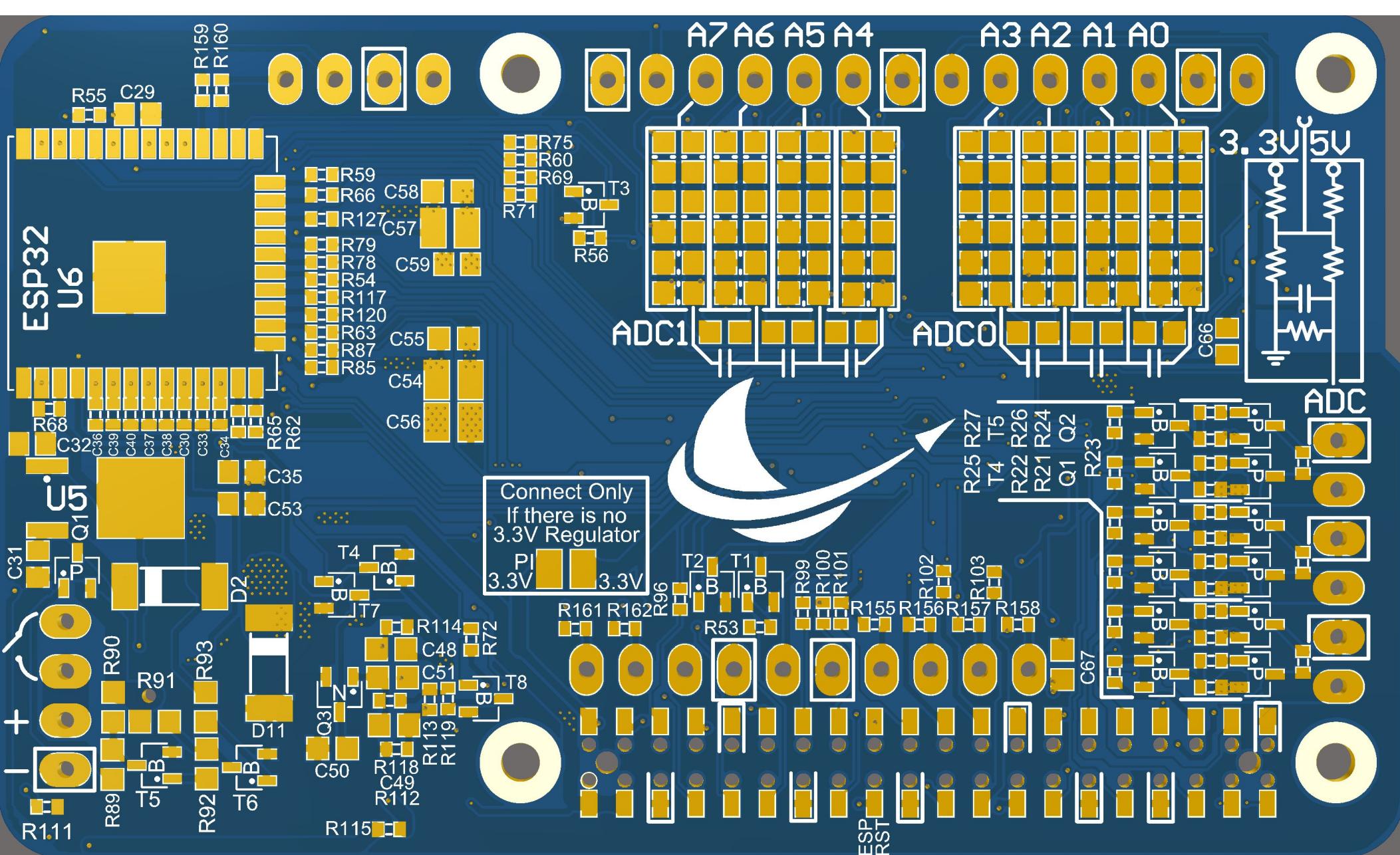
BUZZER

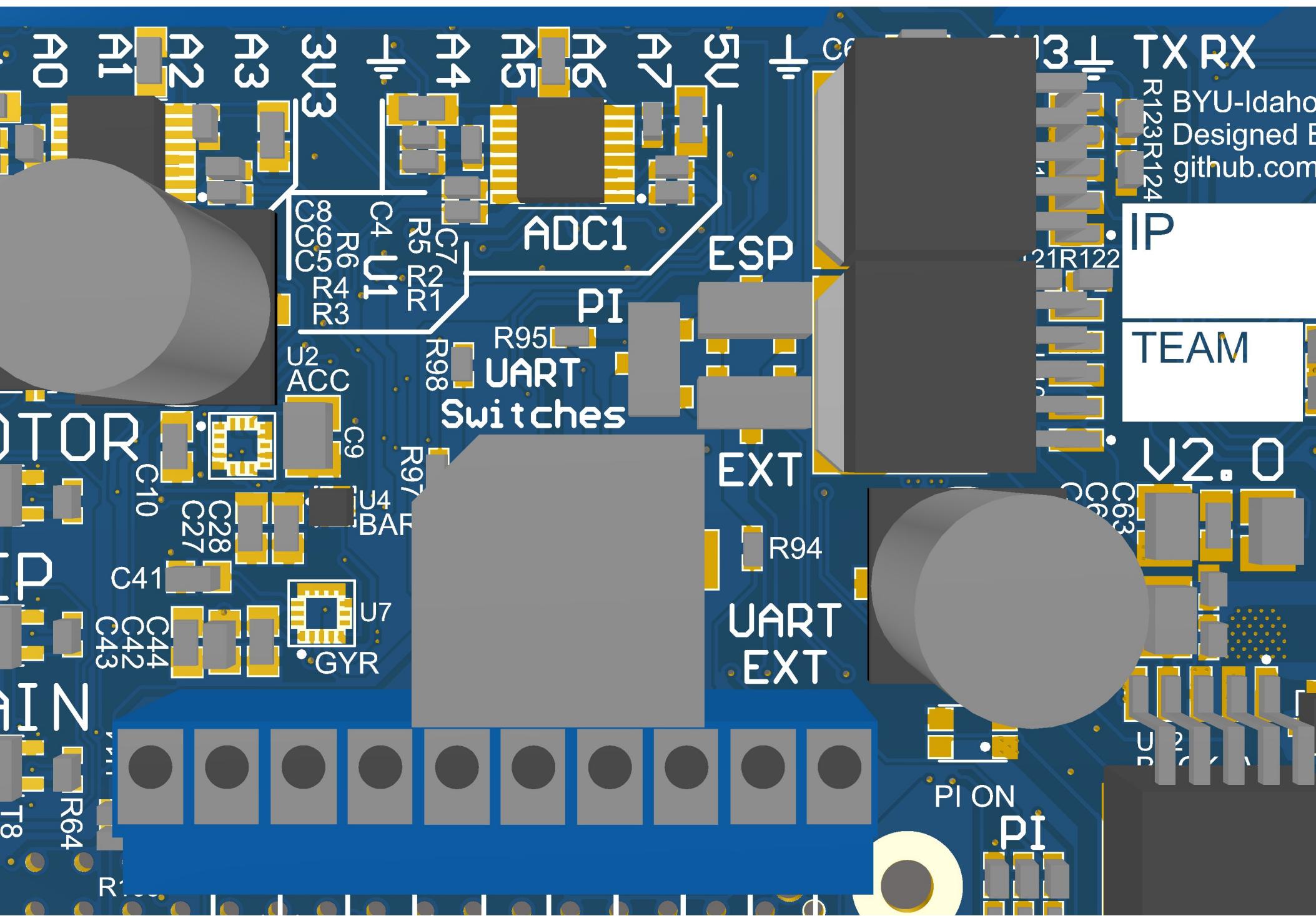
UART EXT

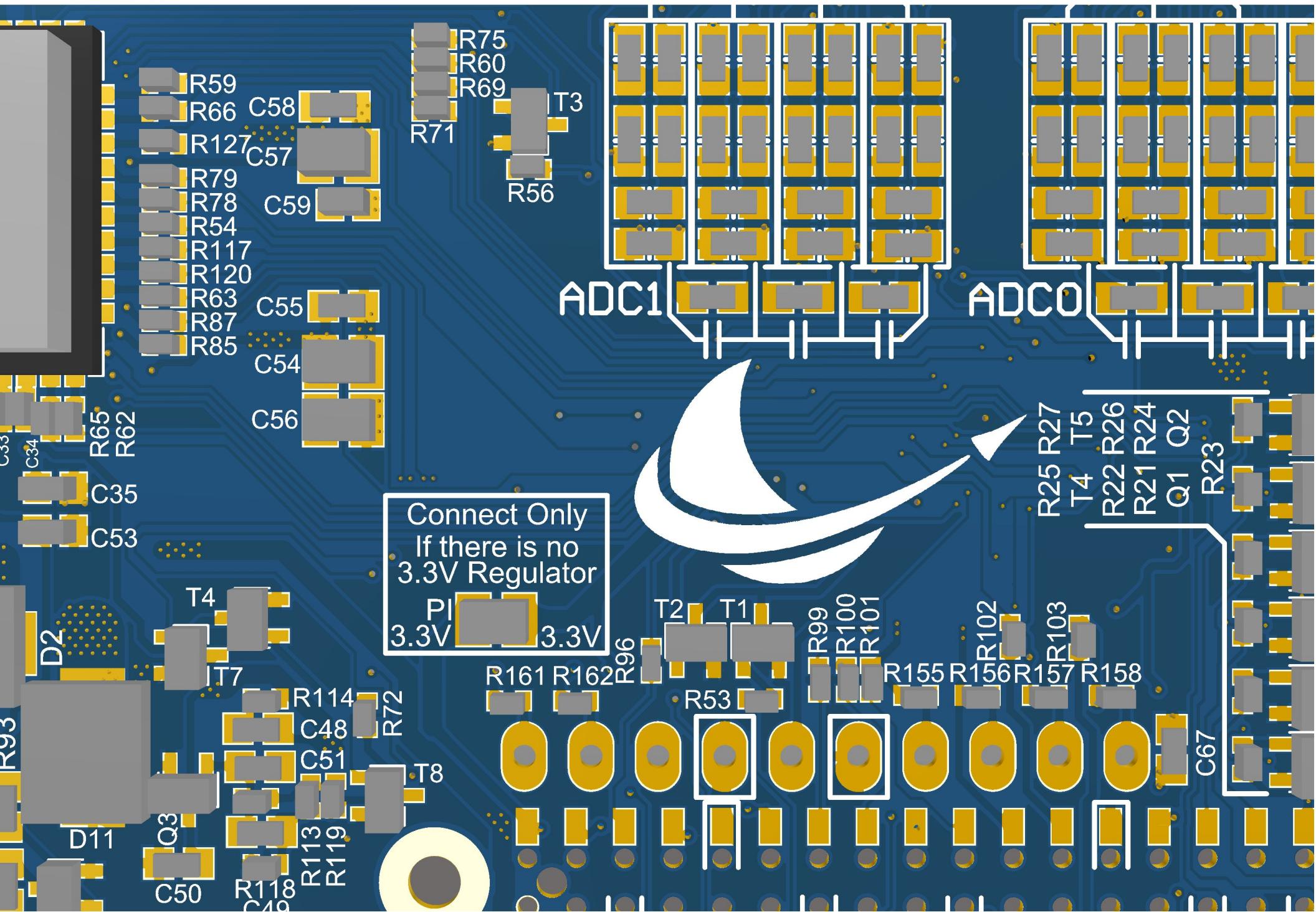
EXT

JLCJLCJLCJLC









ESP  
ERR  
ACT  
PWR

BYU-Idaho Rocket Dynamics  
Designed By Kace Chandler  
[github.com/byui-rocket-dynamics](https://github.com/byui-rocket-dynamics)

No.

R74 R73 R83 R82  
R88 R86 R77 R76  
R81 R80 R57 R58  
R61 R64 R67 R70

1  
C60  
U2.0  
C62 C64 C63  
R125 R126  
C52 U12 BUCK 5V  
U9 PI ON  
POWER 7-18V  
Q2 d

3V3 TX RX

IP  
TEAM  
LIN 3v3  
LIN 5v

PWR ACT ERR

RX TX

5V

5V

3V3

CS

MISO

SCK

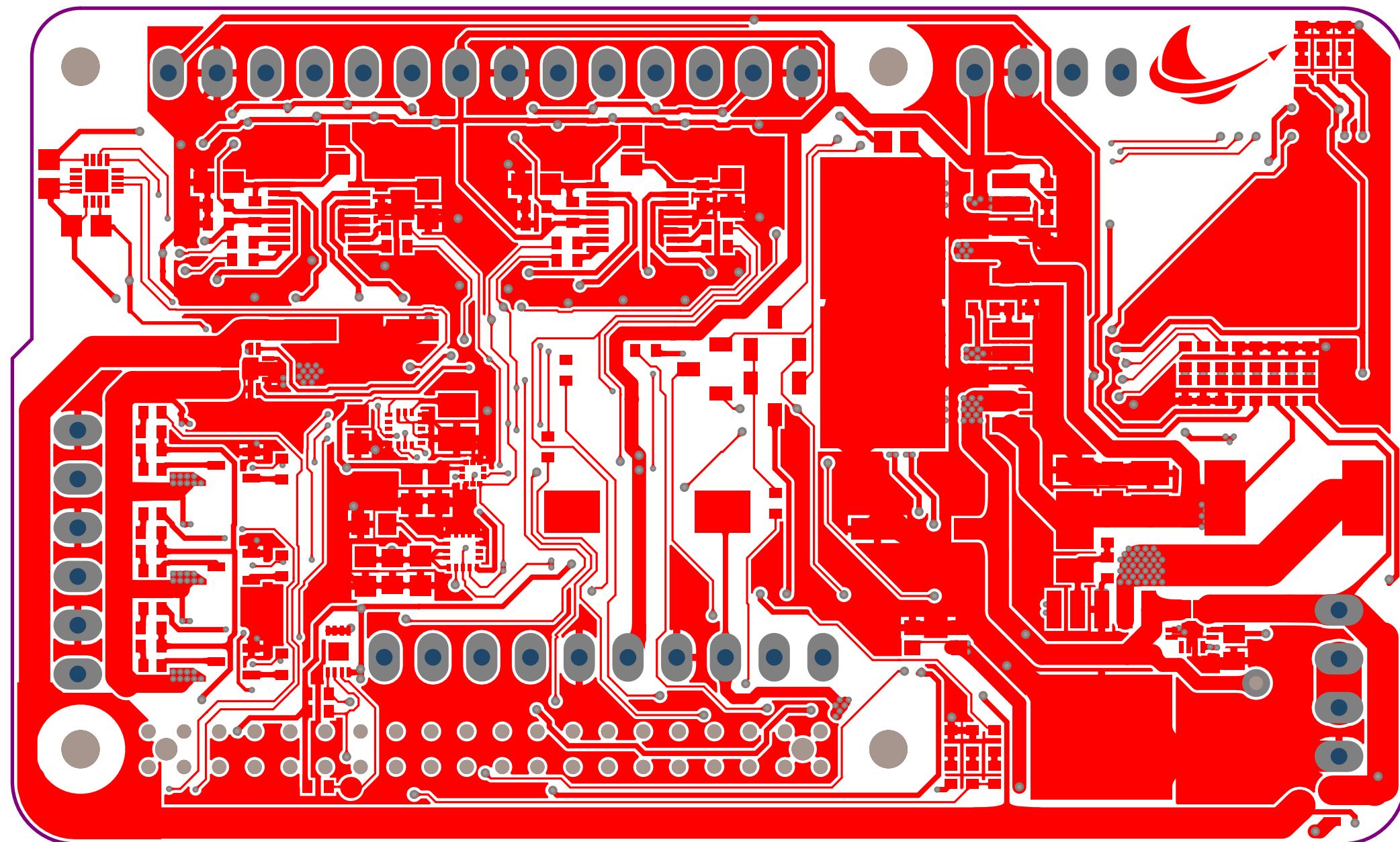
MOSI

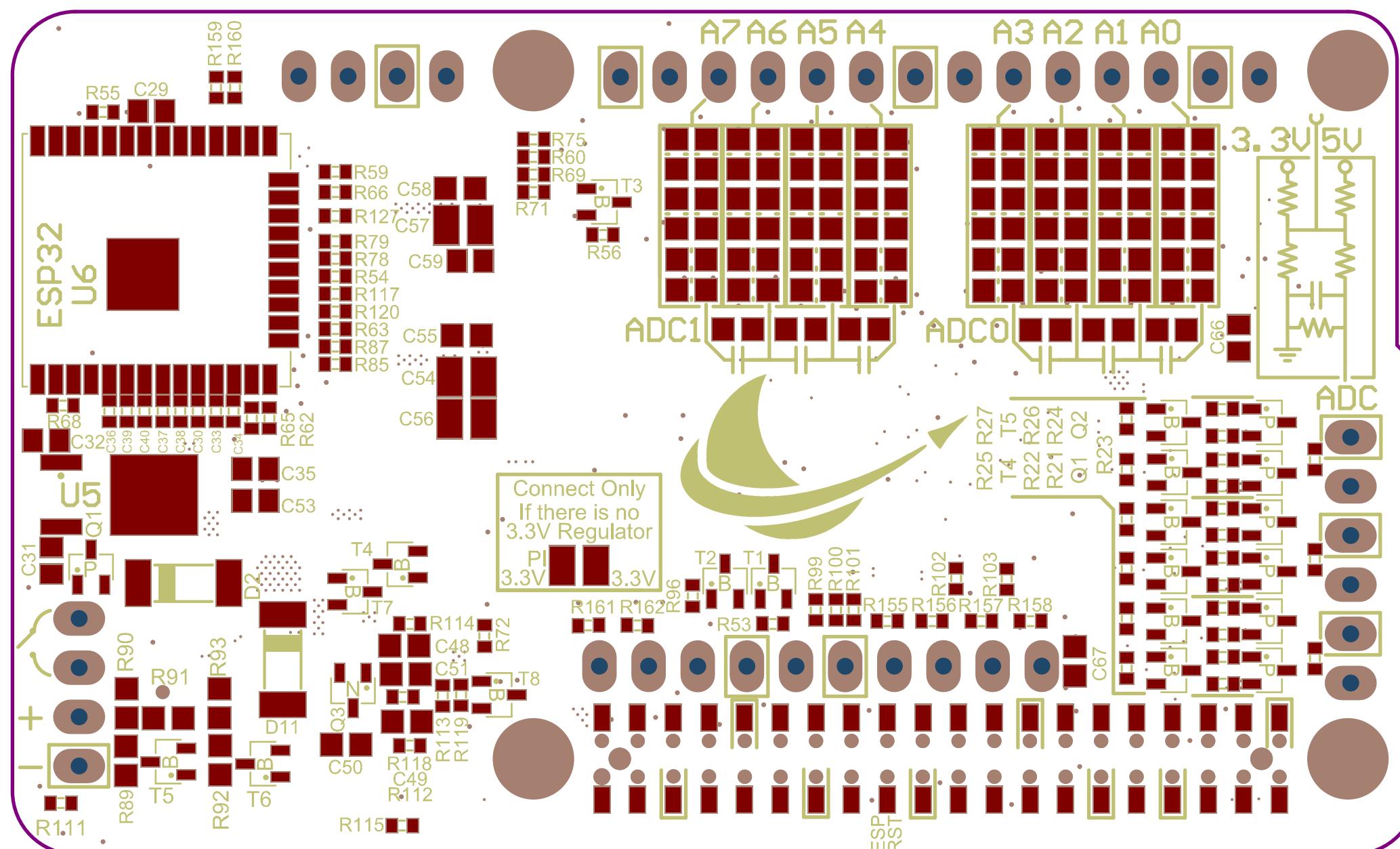
EEPROM Write Protect

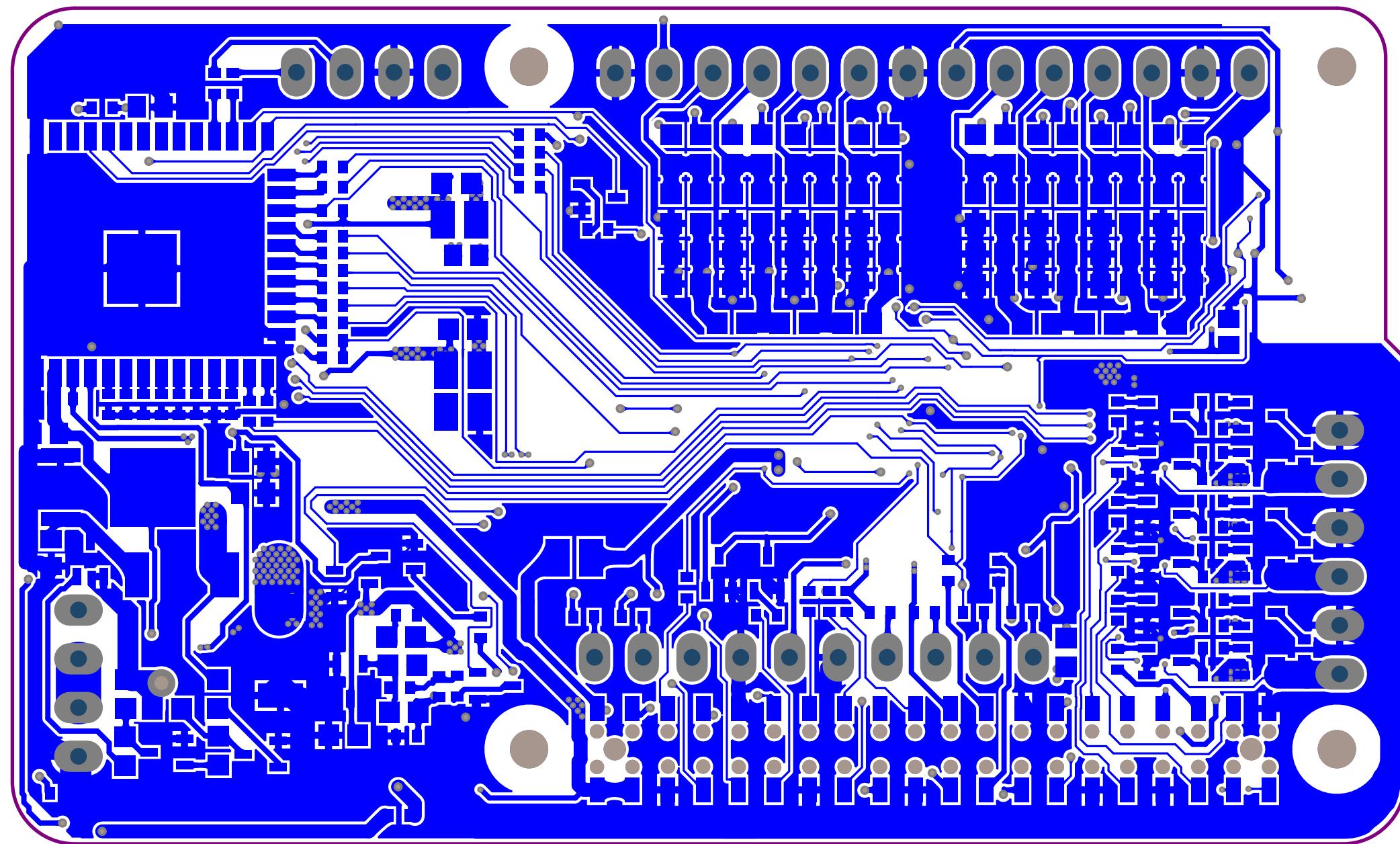
JLC JLC JLC JLC  
C45 U8 MAG C46  
AO A1 A2 A3 A4 A5 A6 A7  
5V 3V3 5V  
ADC0 ADC1 PI  
U1 U2 ACC  
R95 R98  
R6 R4 R3  
C8 C65 C7 R2 R1  
C4  
C47  
U13  
MOTOR  
C9  
C10  
C28  
U4 BAR  
C27  
C41  
C43  
C44  
U7 GYR  
SEP  
MAIN  
D1 R8 R63  
T8  
R64  
R165  
R163  
PI  
JLC JLC JLC JLC

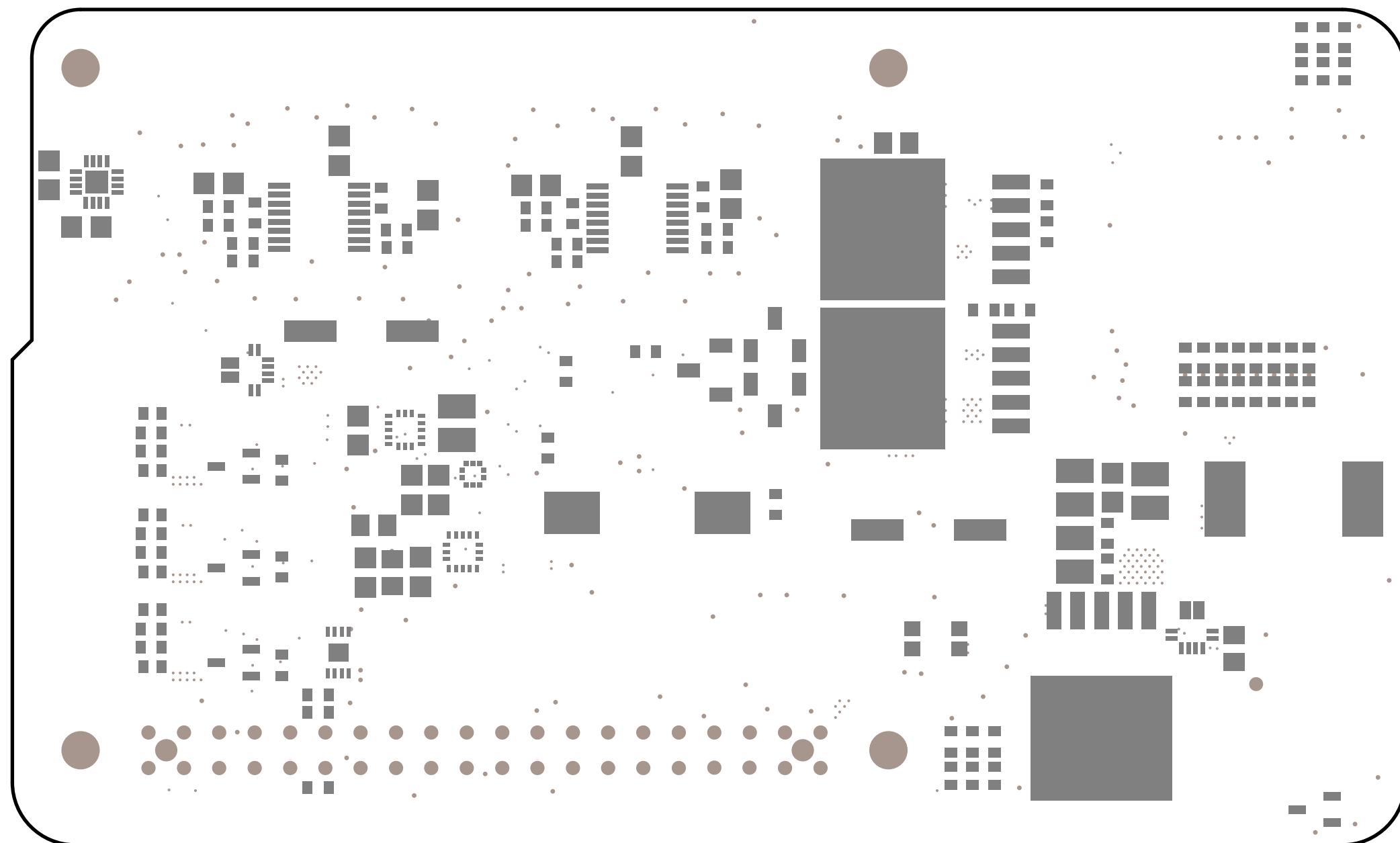
Z+

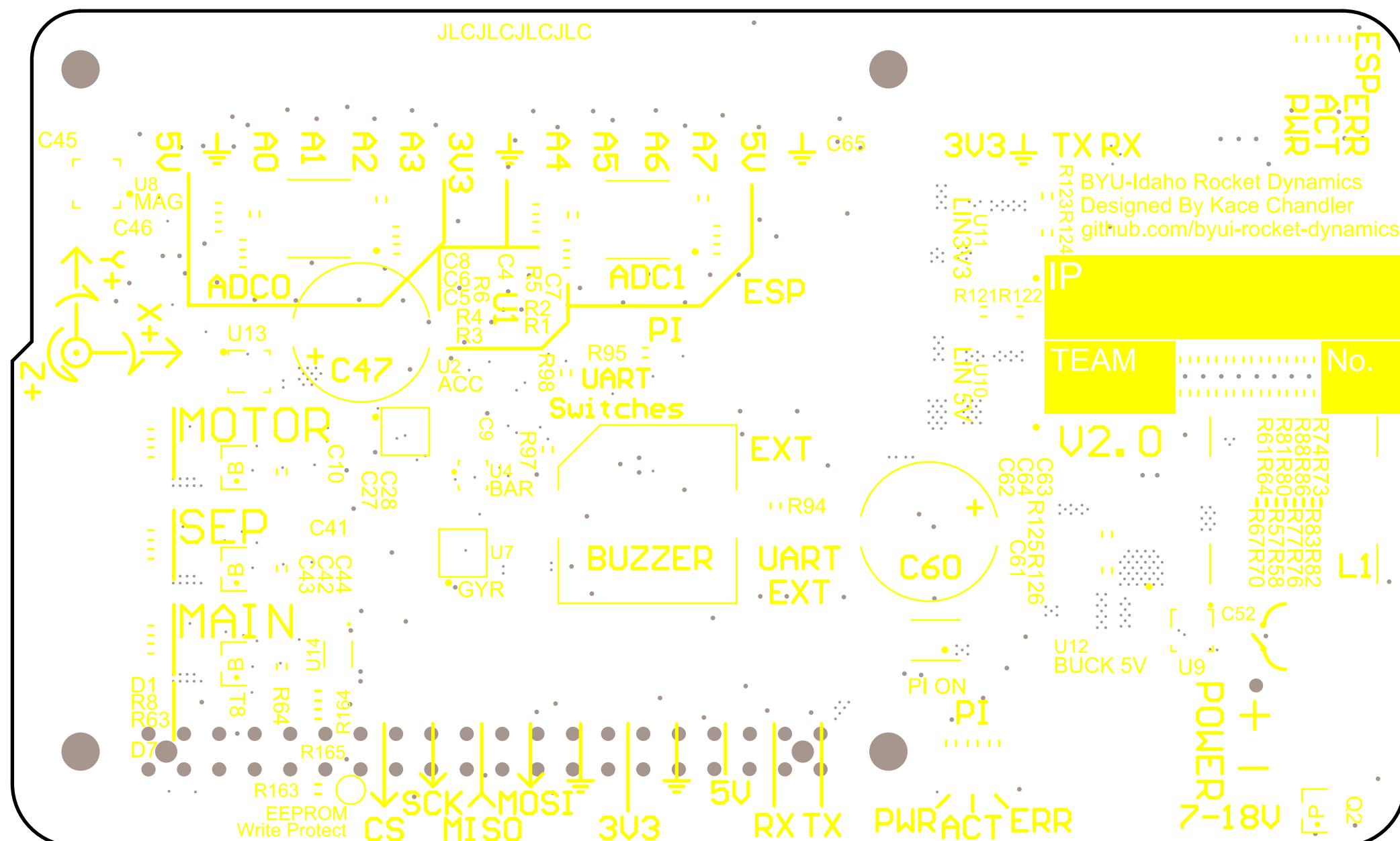
X+ Y+

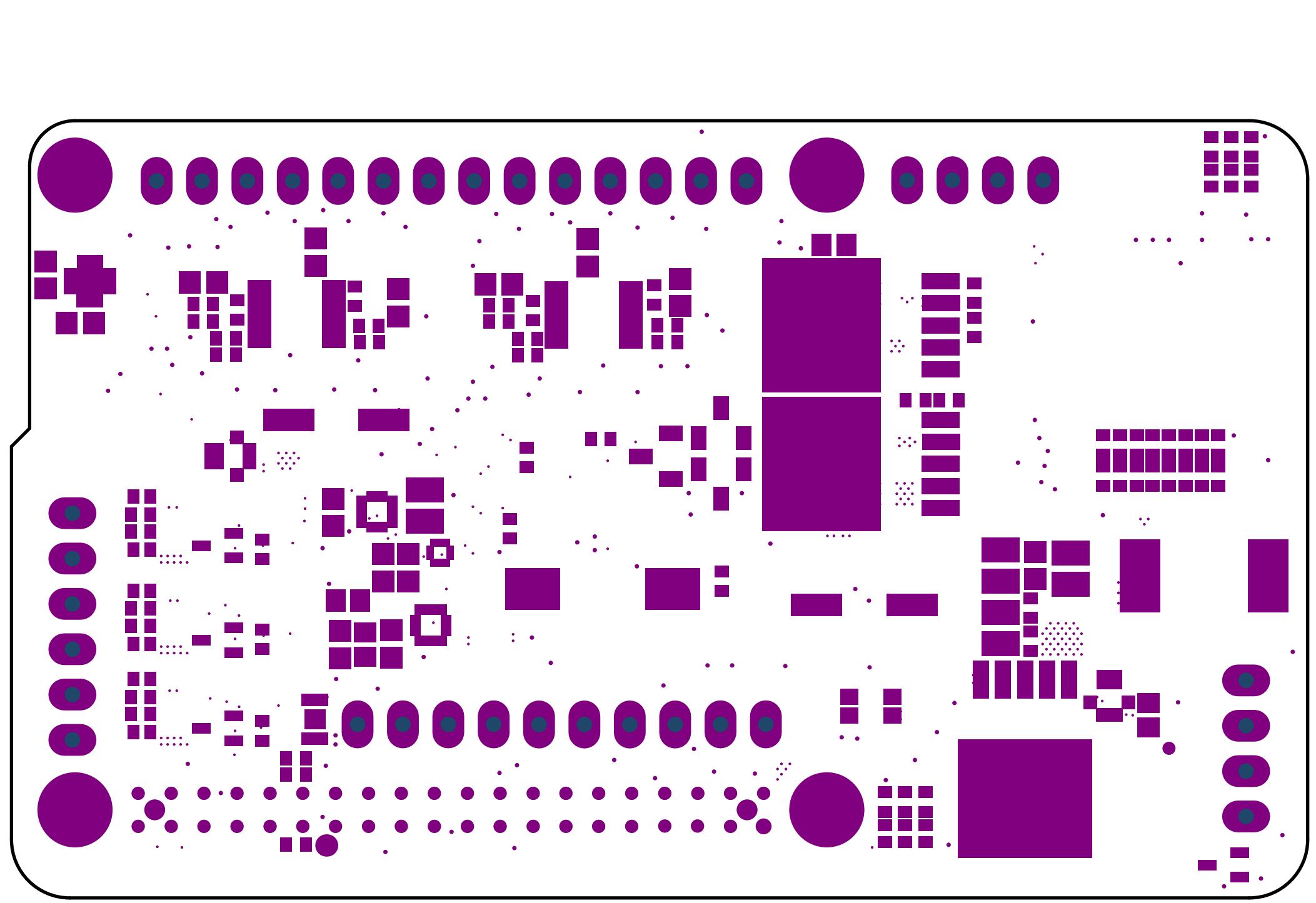


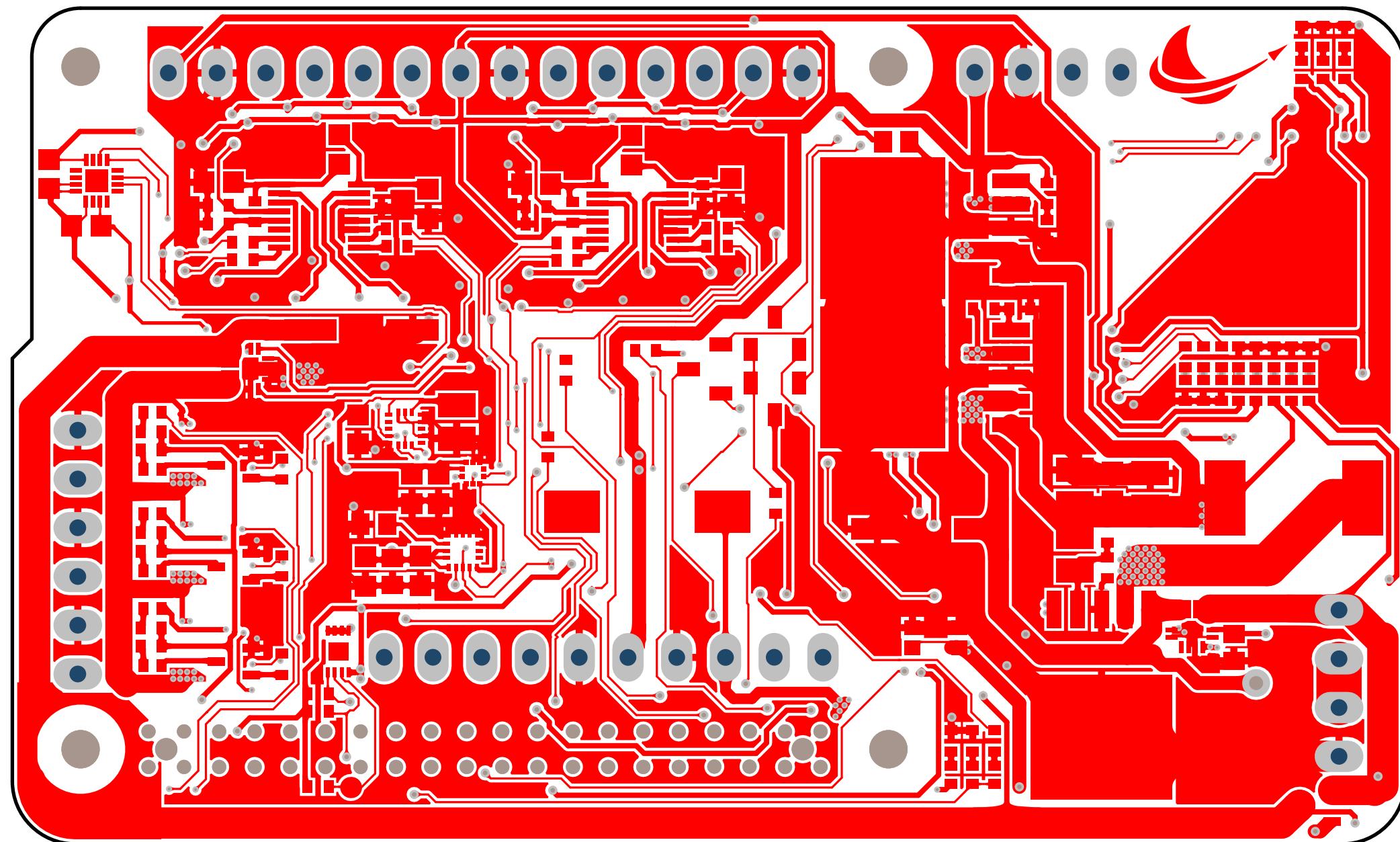


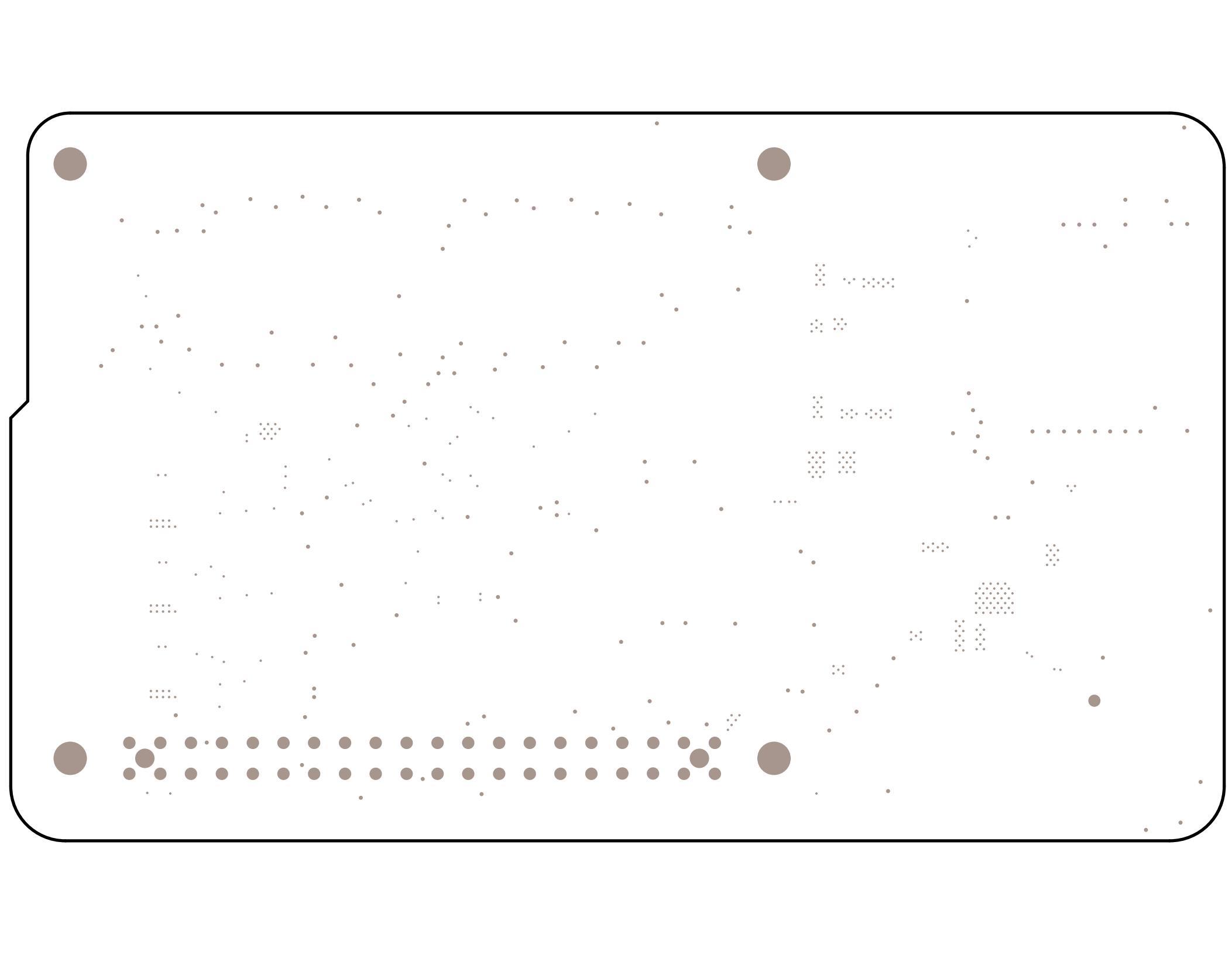


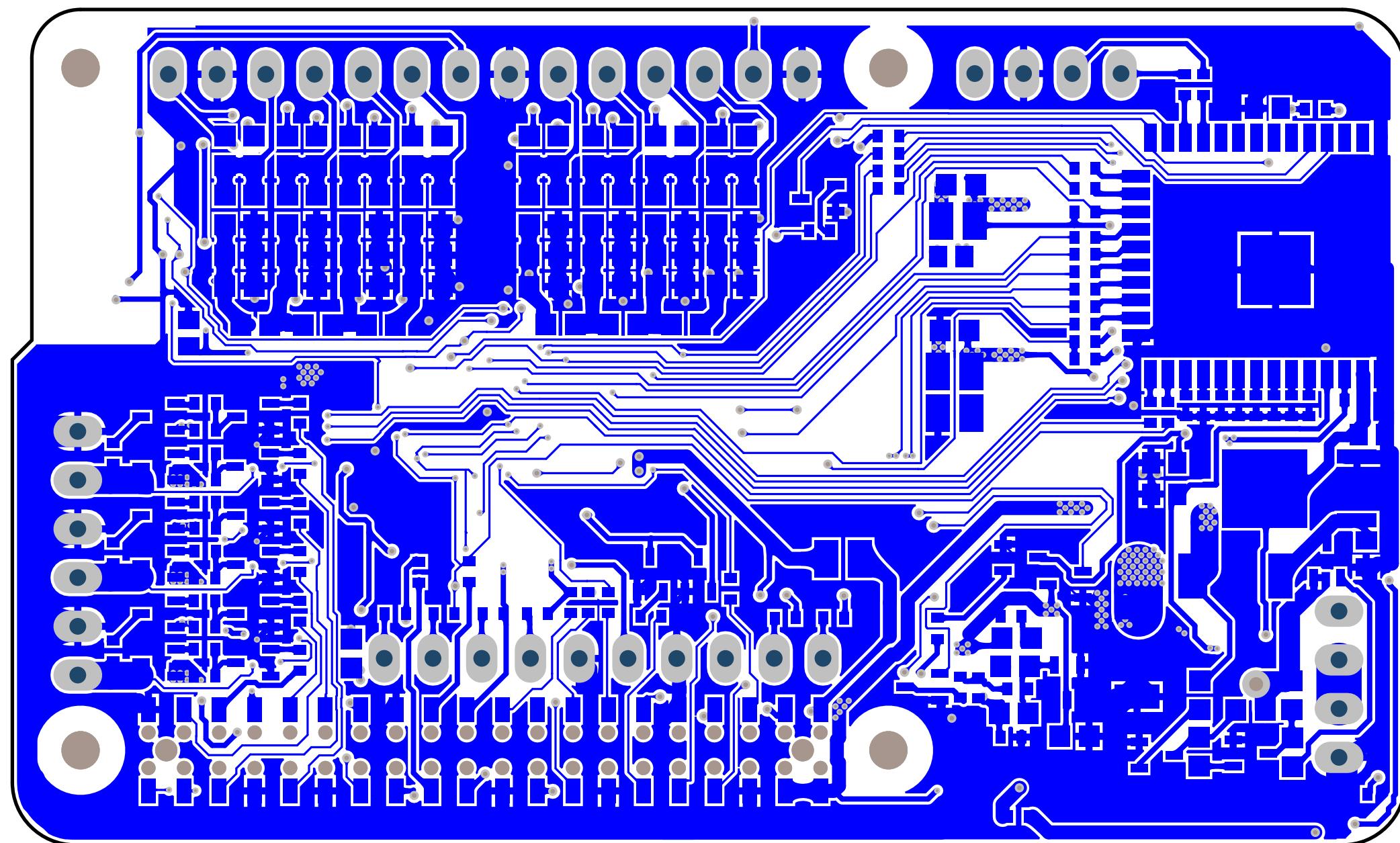


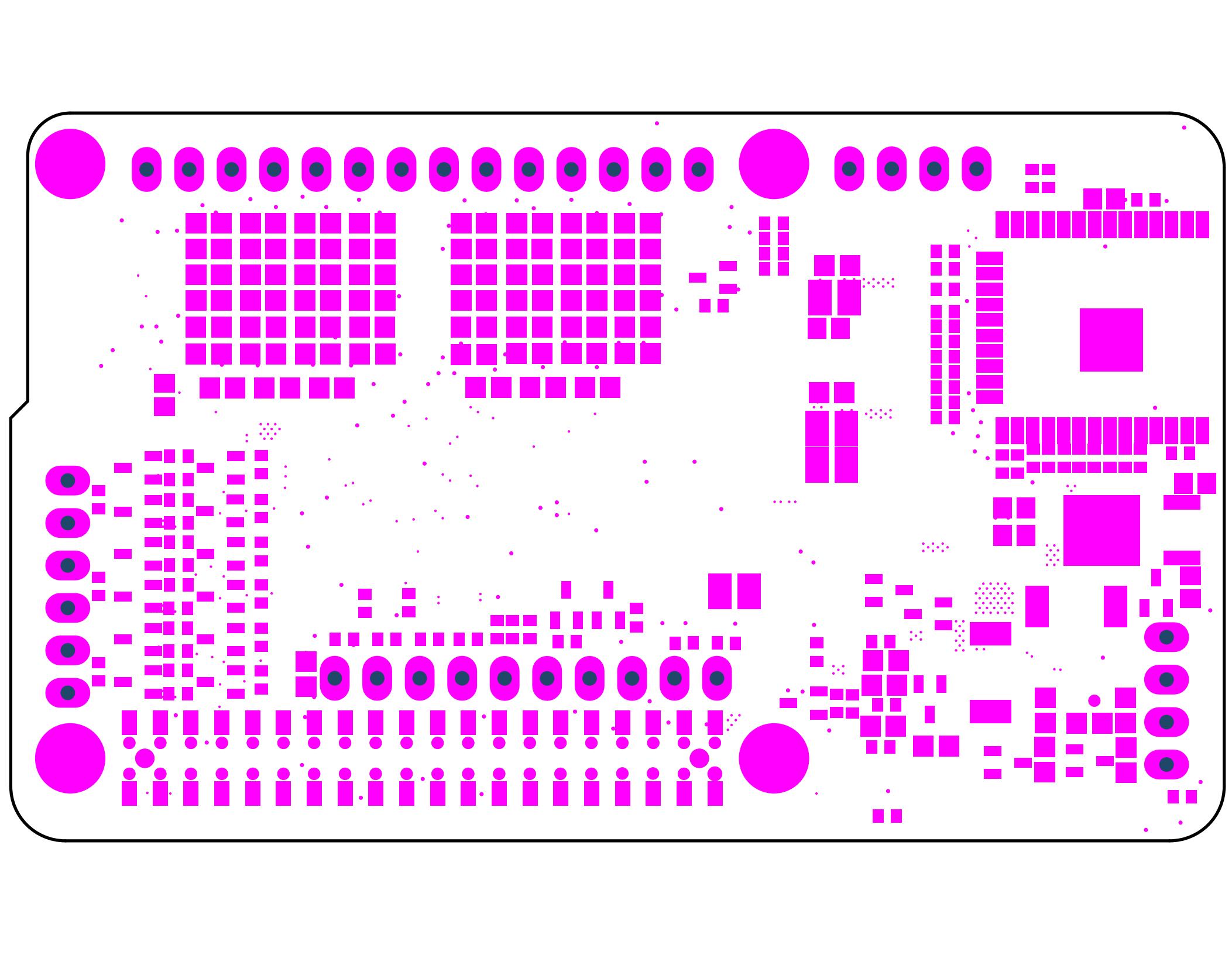


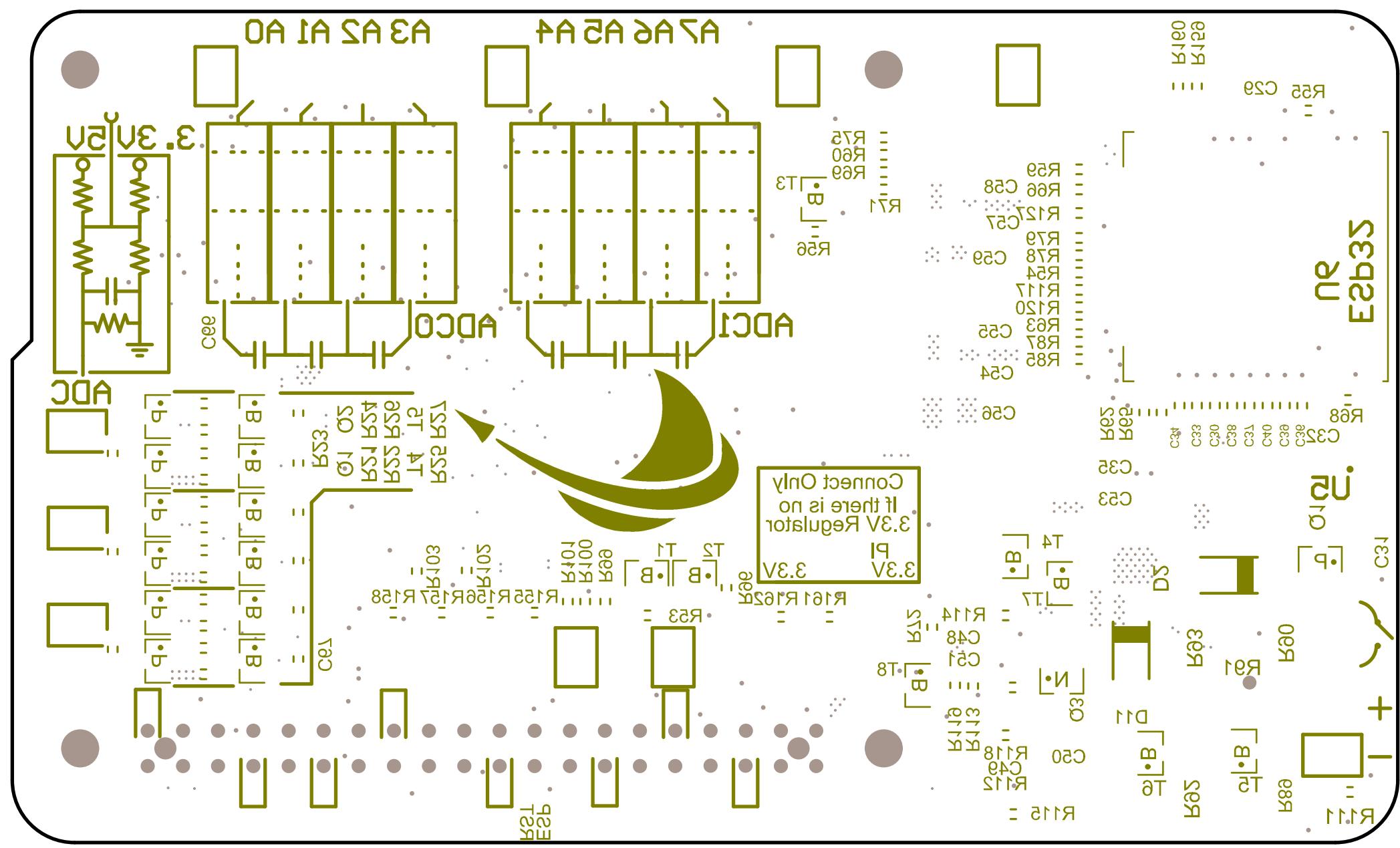


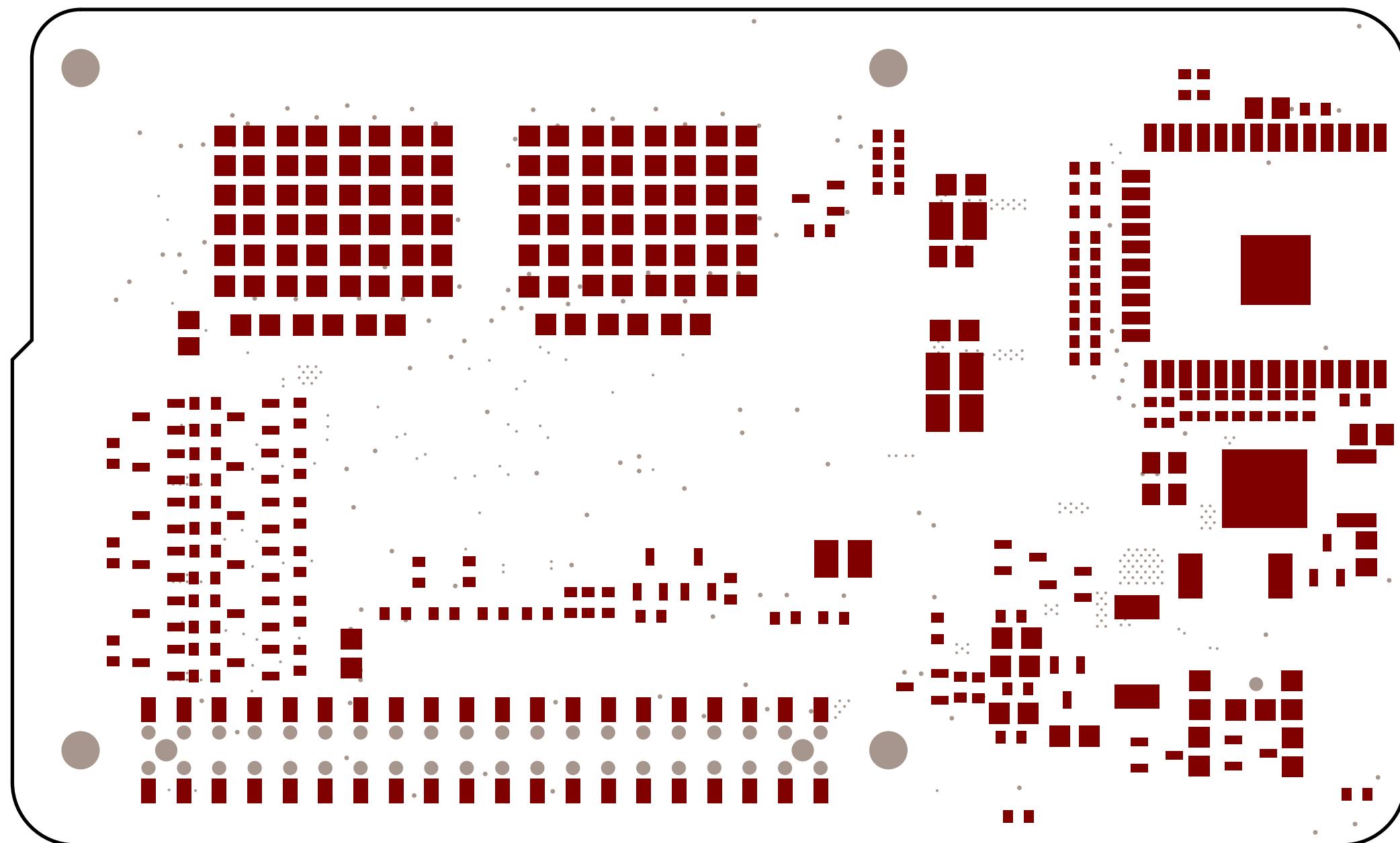












# Bill Of Materials

Designator	Name	Quantity	Value	Supplier PartNo 1
C1, C2, C3, C11, C12, C13, C19, C20, C21, C22, C23, C24, C25, C26	Cap	14	Value depends on use case	
C4, C5, C6, C10, C14, C15, C16, C27, C28, C29, C35, C45, C46, C67	Cap	14	100nF	
C7, C8, C17, C18, C41	Cap	5	10nF	
C9	Cap	1	10uF	
C30, C33, C34, C36, C37, C38, C39, C40, C50, C51, C53, C65, C66	Cap	13	100nF	
C31, C32, C48, C49, C52, C59	Cap	6	10uF	
C42	Cap	1	10uF	
C43	Cap	1	100nF	
C44	Cap	1	100nF	
C47	Cap	1	100pF	
C54, C56, C57	Cap	3	22uF	
C55, C58, C64	Cap	3	1uF	
C60	Cap	1	820uF	
C61	Cap	1	5.6 uF	
C62, C63	Cap	2	100uF	
D1, D3, D4, D5, D6, D7, D8, D9, D10	LED_R	9		
D2, D11	Buck Diode	2		VSSC8L45-M3/9ATGICT-ND
D12, D13, D14	LED_B	3		754-2122-1-ND
J1, J2, J3, J4, J6, J7, J8, J9, J10, J11, J12, J13, J14, J15, J16, J17, J18, J19, J20	Screw Terminal	19		A112762-ND
J5	PiGPIOBreakout	1		952-3218-ND
JP1	Res3	1	0	
L1	7447709330	1		
LS1	CT-1205C-SMT	1		102-1200-1-ND
Q1, Q2, Q4, Q5, Q6, Q7, Q8, Q9	P-Channel	8		SI2343CDS-T1-GE3CT-ND
Q3	N-Channel	1		SI2338DS-T1-GE3CT-ND
R1, R2, R3, R4, R7, R8, R9, R10, R59, R60, R63, R65, R66, R69, R71, R75, R78, R79, R89, R94, R95, R96, R97, R98, R99, R100, R101, R102, R103, R115, R128, R132, R135, R139, R142, R146, R155, R156, R157, R158, R159, R160, R161, R162	Res3	44	50	
R5, R6, R11, R12, R53, R54, R56, R62, R72, R87, R91, R93, R117, R119, R120, R127, R129, R134, R136, R141, R143, R148, R150, R152, R154, R163	Res3	26	1K	
R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52	Res3	40	Value depends on use case	
R55, R68	Res3	2	10K	
R57, R61, R67, R73, R82	Res3	5	20K	
R58, R64, R70, R74, R76, R77, R80, R81, R83, R86, R88, R122, R124, R126, R164, R165	Res3	16	3.9K	
R84, R92, R116	Res3	3	330	
R85, R118	Res3	2	100k	
R90, R114, R130, R133, R137, R140, R144, R147	Res3	8	10k	
R104, R105, R106, R107, R108, R109, R110, R149, R151, R153	Res3	10	Depends on the color of the LED	
R111, R113	Res3	2	300k	
R112	Res3	1	300K	
R121, R125	Res3	2	12K	
R123	Res3	1	6.5K	
R131, R138, R145	Res3	3	1k	
S1, S2, S3	Slide Switch	3		7813J-051ECT-ND
S4	434153017835	1		732-10143-1-ND
T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17	MMBT2222ALT1	17		MMBT2222ATPMSC-ND
U1, U3	Analog to Digital Converter	2		296-39851-1-ND
U2	LIS3DSHTR	1		
U4	BMP388	1		828-1079-1-ND
U5	3.3V Regulator	1		NCP1117DT33T5GOSCT-ND
U6	ESP32-WROOM-32D	1		1904-1023-1-ND
U7	L3GD20H	1		497-13931-1-ND
U8	MLX90393	1		MLX90393ELW-ABA-011-RECT-ND
U9	ACST0331EESATR-005B3	1		
U10, U11	Linear Regulator	2		576-1125-1-ND
U12	LM2596SX-ADJ/NOPB	1		296-35399-1-ND
U13	ACS711KEXLT-15AB-T	1		
U14	CAT24C128	1		CAT24C128HU4IGT3OSDKR-ND

A

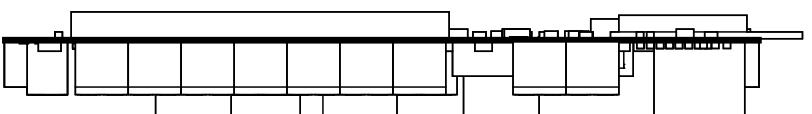
B

C

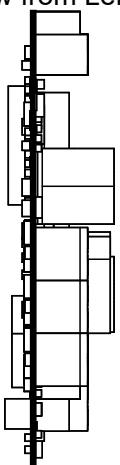
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E

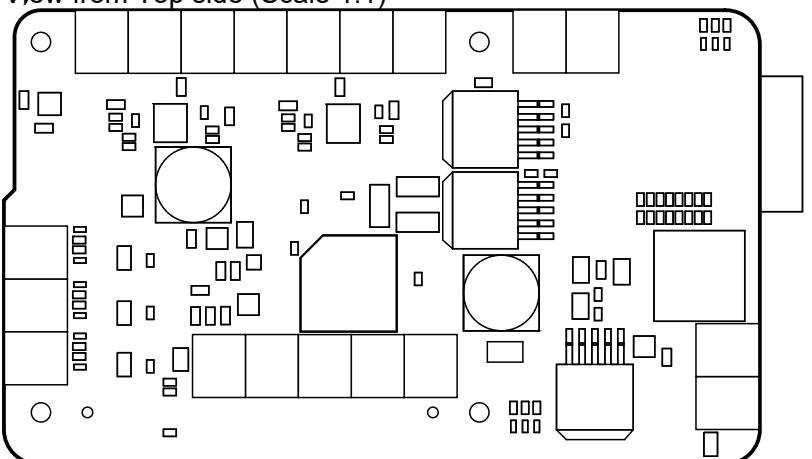
View from Back side (Scale 1:1)



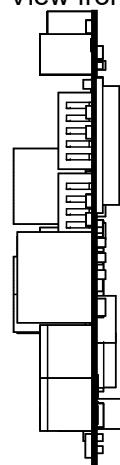
View from Left side (Scale 1:1)



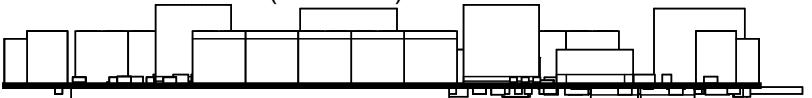
View from Top side (Scale 1:1)



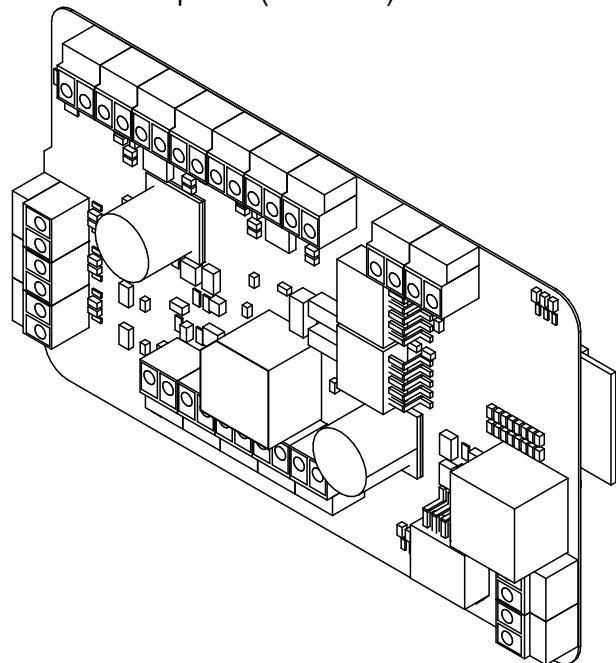
View from Right side (Scale 1:1)



View from Front side (Scale 1:1)



View from Top side (Scale 1:1)



A

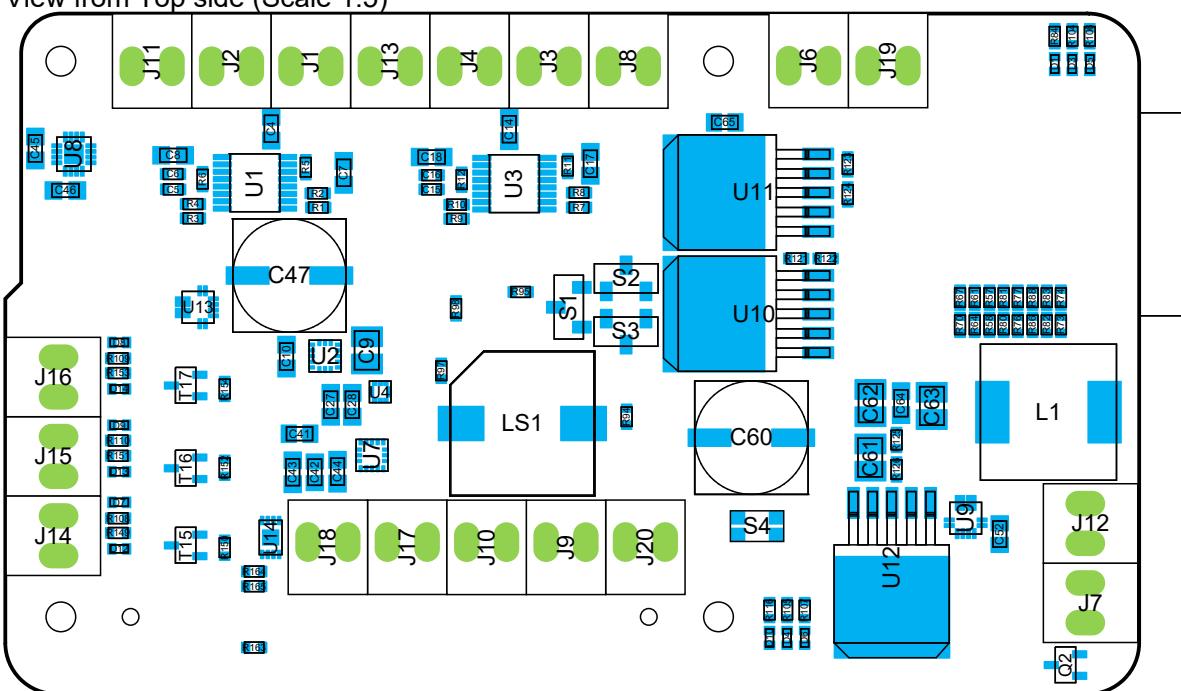
B

C

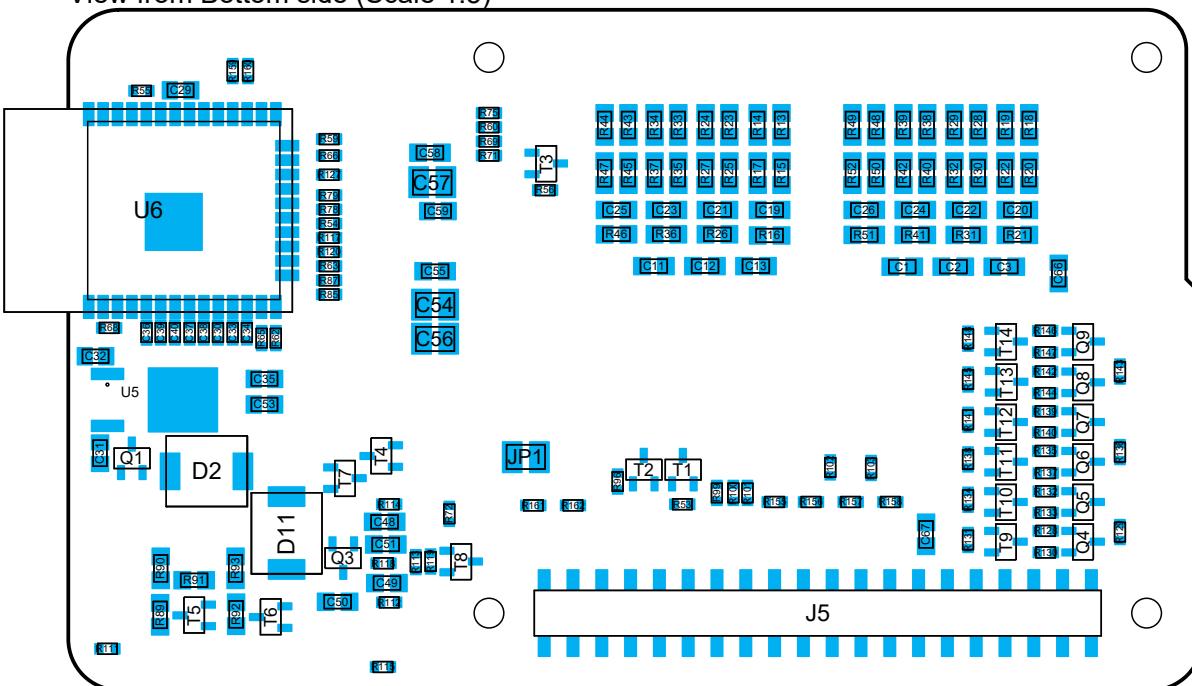
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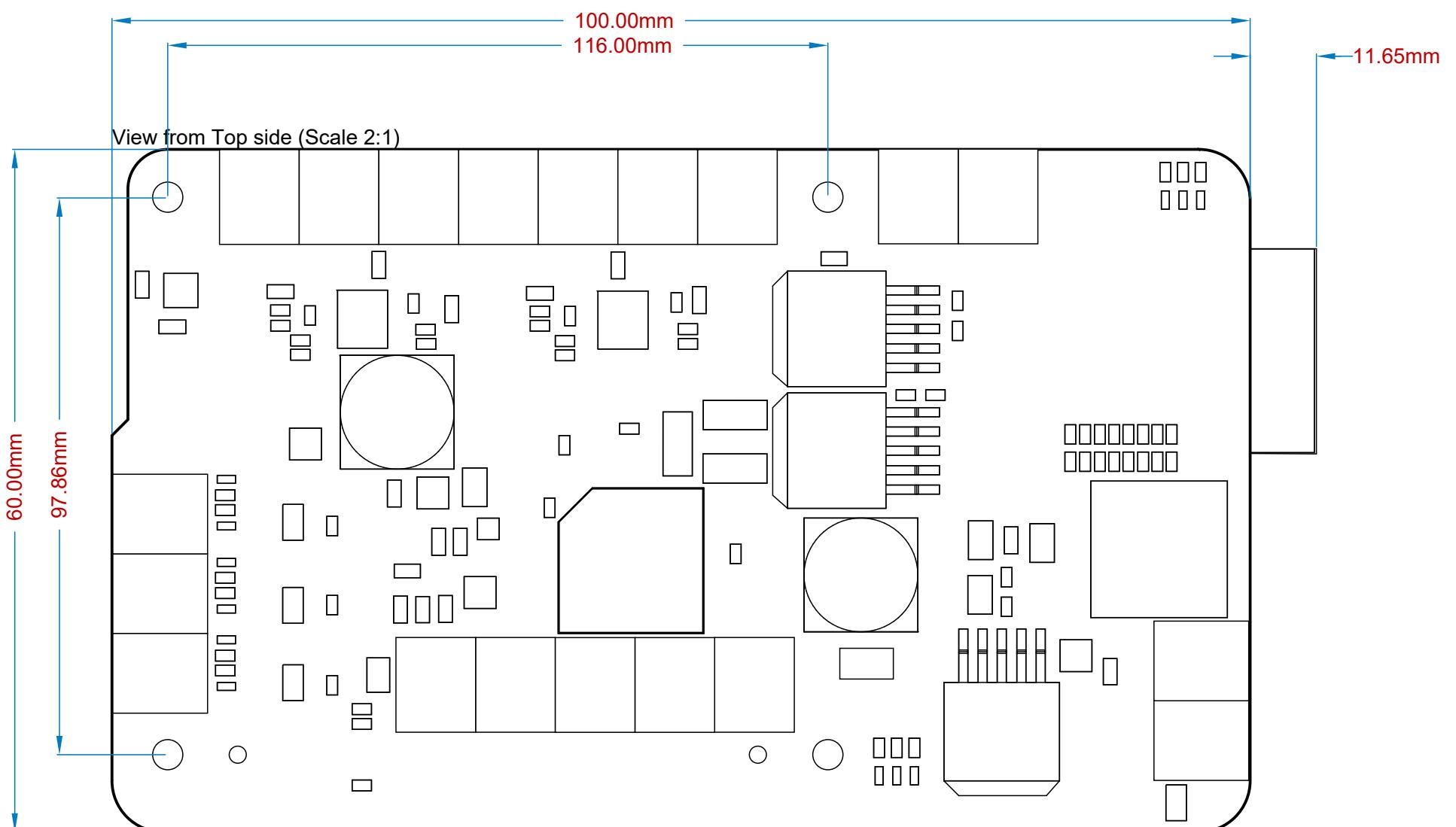
E

View from Top side (Scale 1.5)



View from Bottom side (Scale 1.5)





A

B

C

D

E

A

B

C

D

E

A

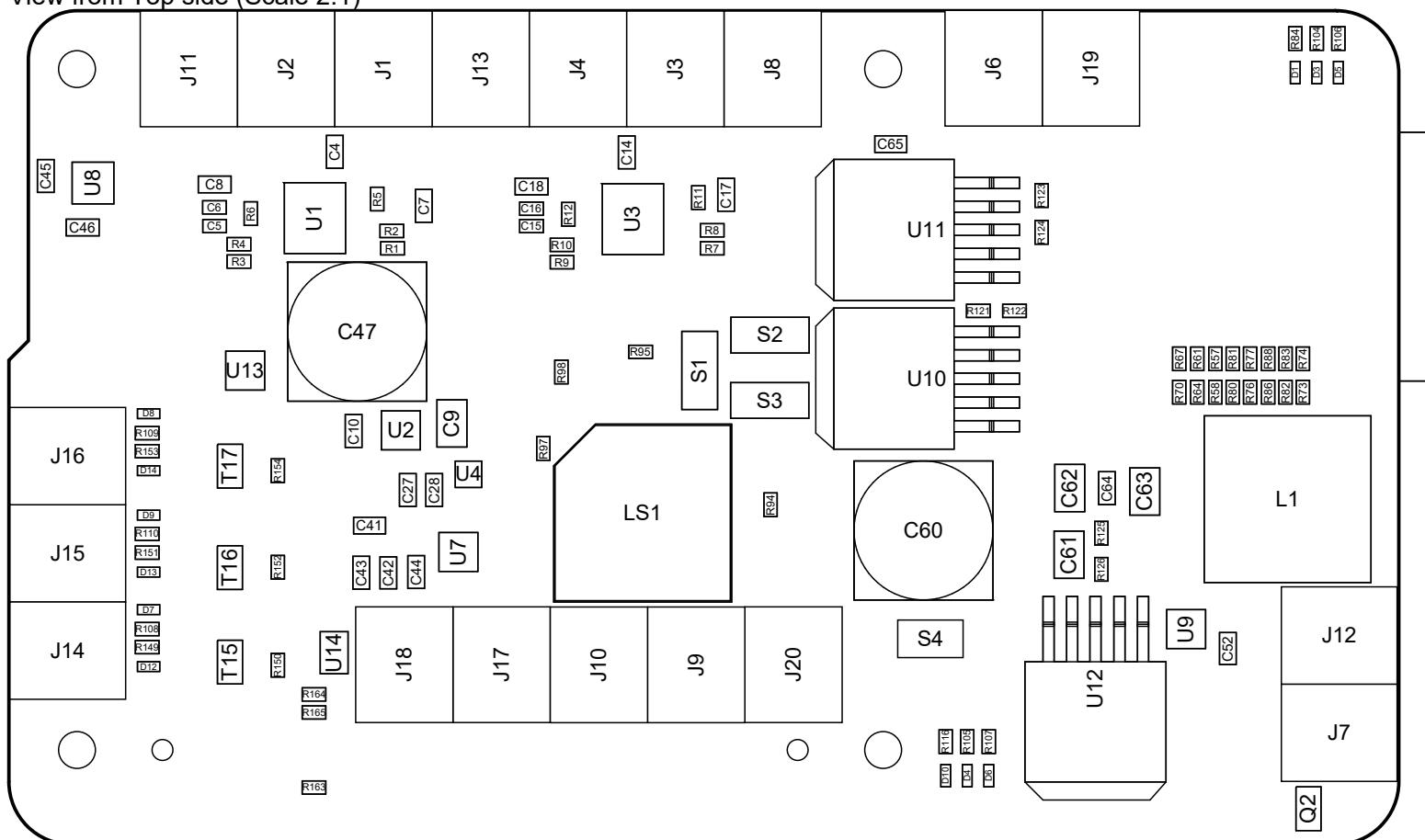
B

C

D

E

View from Top side (Scale 2:1)



A

B

C

D

E

A

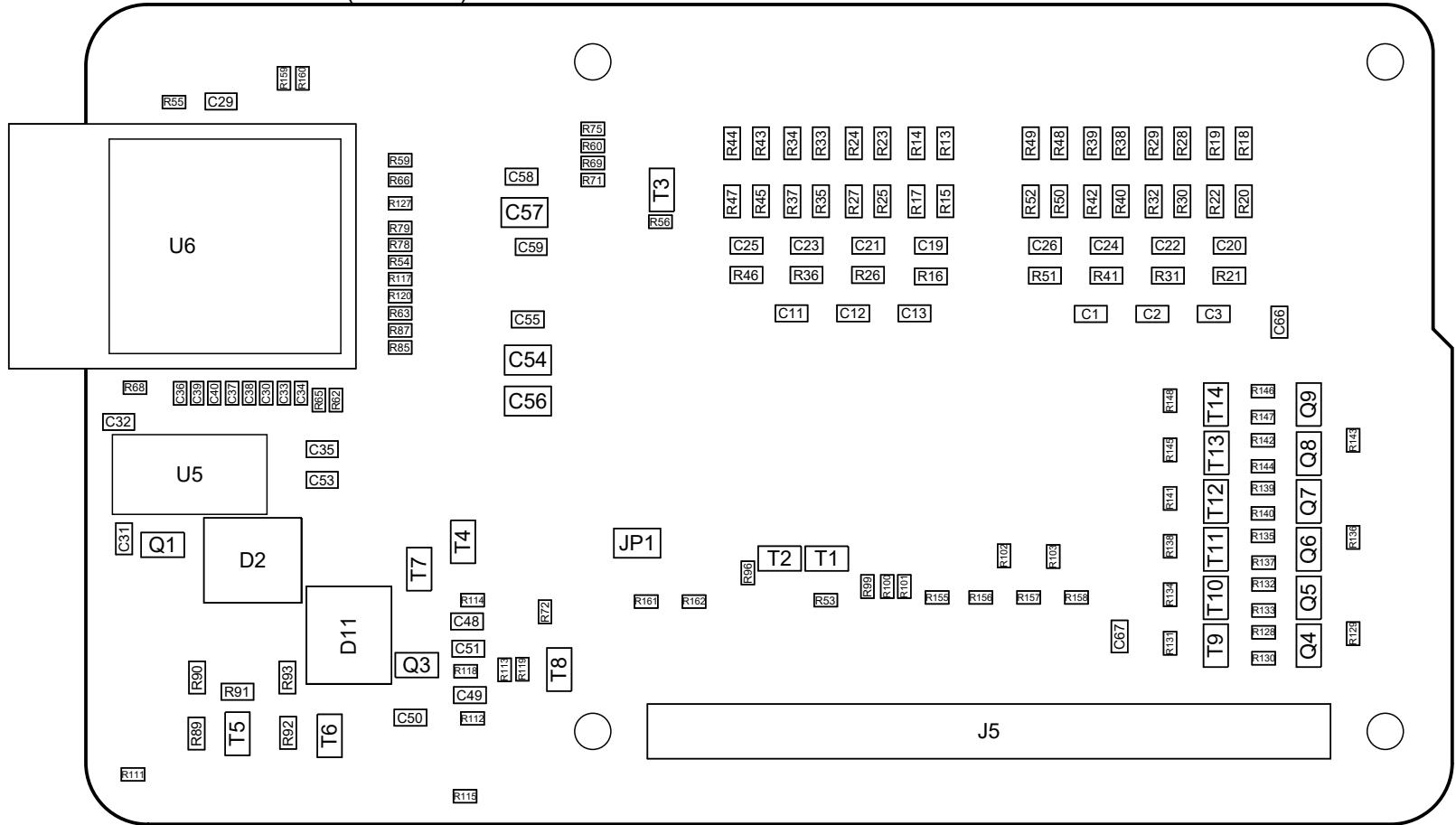
B

C

D

E

View from Bottom side (Scale 2:1)



A

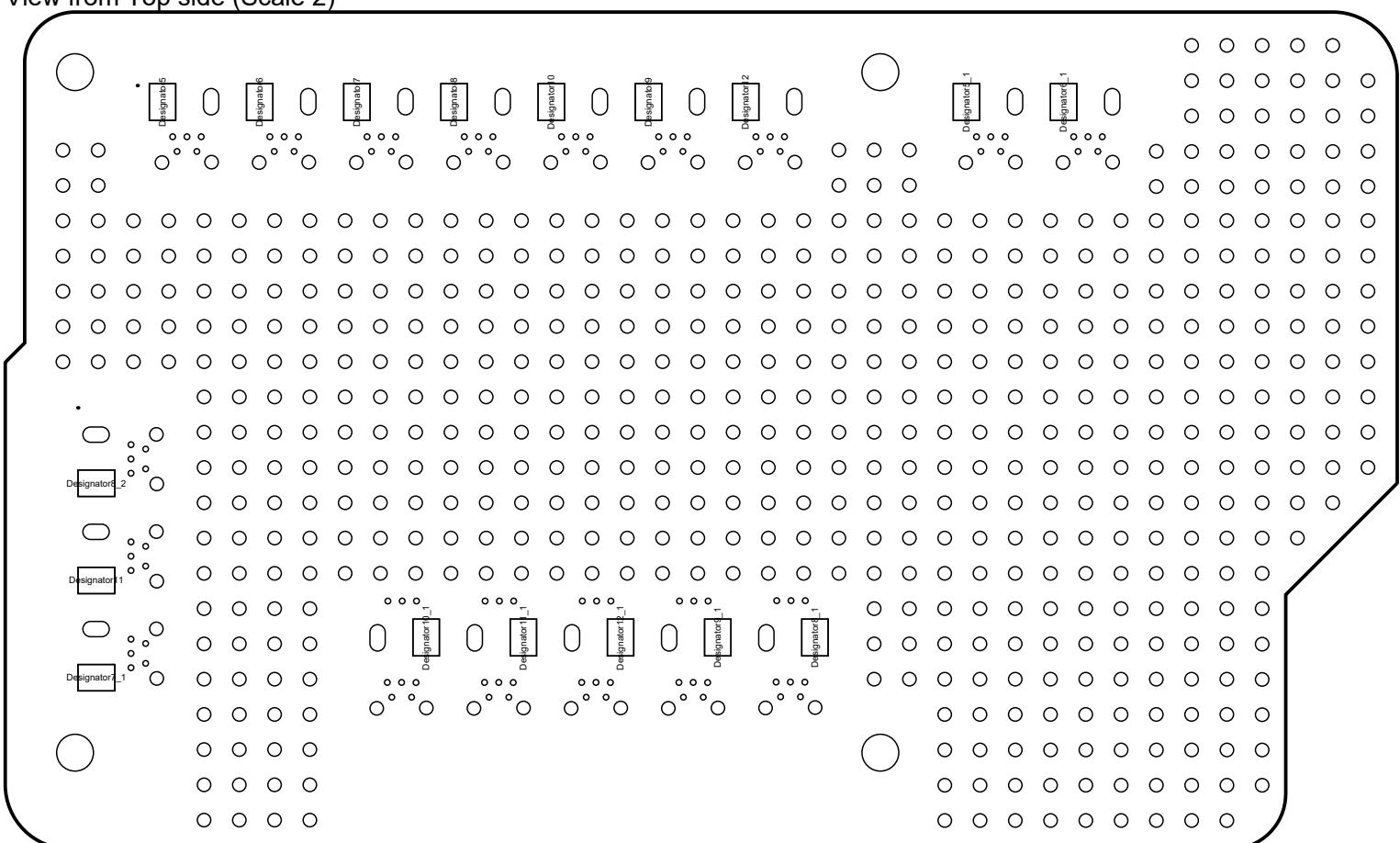
B

C

D

E

View from Top side (Scale 2)



A

B

C

D

E