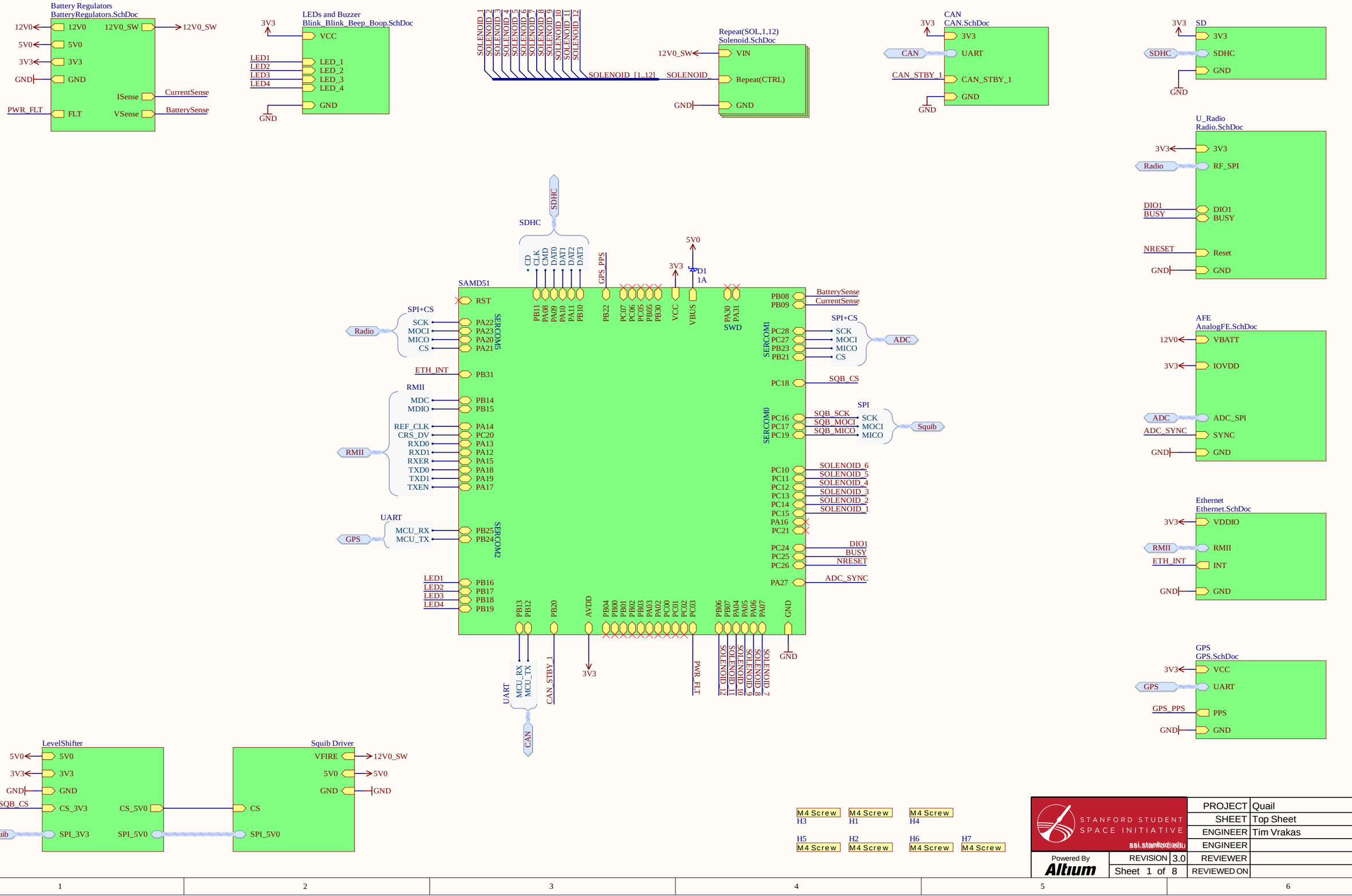
Battery Regulators
BatteryRegulators.SchDoc
12V0
5V0
3V3
GND
12V0_SW
ISense
FLT
VSense
CurrentSense
BatterySense
PWR_FLT
LEDs and Buzzer
Blink_Blink_Beep_Boop.SchDoc
LED1
LED2
LED3
LED4
LED_1
LED_2
LED_3
LED_4
Repeat(SOL,1,12)
Solenoid.SchDoc
SOLENOID_1
SOLENOID_2
SOLENOID_3
SOLENOID_4
SOLENOID_5
SOLENOID_6
SOLENOID_7
SOLENOID_8
SOLENOID_9
SOLENOID_10
SOLENOID_11
SOLENOID_12
SOLENOID_[1..12]
SOLENOID_
VIN
Repeat(CTRL)
CAN
CAN.SchDoc
UART
CAN_STBY_1
SD
SDHC
U_Radio
Radio.SchDoc
RF_SPI
DIO1
BUSY
NRESET
Reset
SAMD51
RST
SERCOM5
SPI+CS
SCK
MOCI
MICO
CS
PA22
PA23
PA20
PA21
ETH_INT
PB31
RMII
MDC
MDIO
PB14
PB15
REF_CLK
CRS_DV
RXD0
RXD1
RXER
TXD0
TXD1
TXEN
PA14
PC20
PA13
PA12
PA15
PA18
PA19
PA17
SERCOM2
PB25
PB24
LED1
LED2
LED3
LED4
PB16
PB17
PB18
PB19
SDHC
CD
CLK
CMD
DAT0
DAT1
DAT2
DAT3
PB11
PA08
PA09
PA10
PA11
PB10
GPS_PPS
PB22
PC07
PC06
PC05
PB05
PB30
VCC
VBUS
5V0
D1
1A
3V3
PA30
PA31
SWD
PB08
PB09
BatterySense
CurrentSense
SERCOM1
PC28
PC27
PB23
PB21
ADC
PC18
SQB_CS
SERCOM0
PC16
PC17
PC19
SQB_SCK
SQB_MOCI
SQB_MICO
SPI
Squib
PC10
PC11
PC12
PC13
PC14
PC15
PA16
PC21
SOLENOID_6
SOLENOID_5
SOLENOID_4
SOLENOID_3
SOLENOID_2
SOLENOID_1
PC24
PC25
PC26
DIO1
BUSY
NRESET
PA27
ADC_SYNC
PB13
PB12
PB20
AVDD
PB04
PB00
PB01
PB02
PB03
PA03
PA02
PC00
PC01
PC02
PC03
PB06
PB07
PA04
PA05
PA06
PA07
GND
UART
MCU_RX
MCU_TX
CAN_STBY_1
3V3
PWR_FLT
SOLENOID_12
SOLENOID_11
SOLENOID_10
SOLENOID_9
SOLENOID_8
SOLENOID_7
CAN
AFE
AnalogFE.SchDoc
VBATT
IOVDD
ADC_SPI
SYNC
Ethernet
Ethernet.SchDoc
VDDIO
RMII
INT
GPS
GPS.SchDoc
PPS
LevelShifter
CS_3V3
CS_5V0
SPI_3V3
SPI_5V0
Squib Driver
VFIRE
12V0_SW
M4 Screw
H3
H1
H4
H5
H2
H6
H7
STANFORD STUDENT SPACE INITIATIVE
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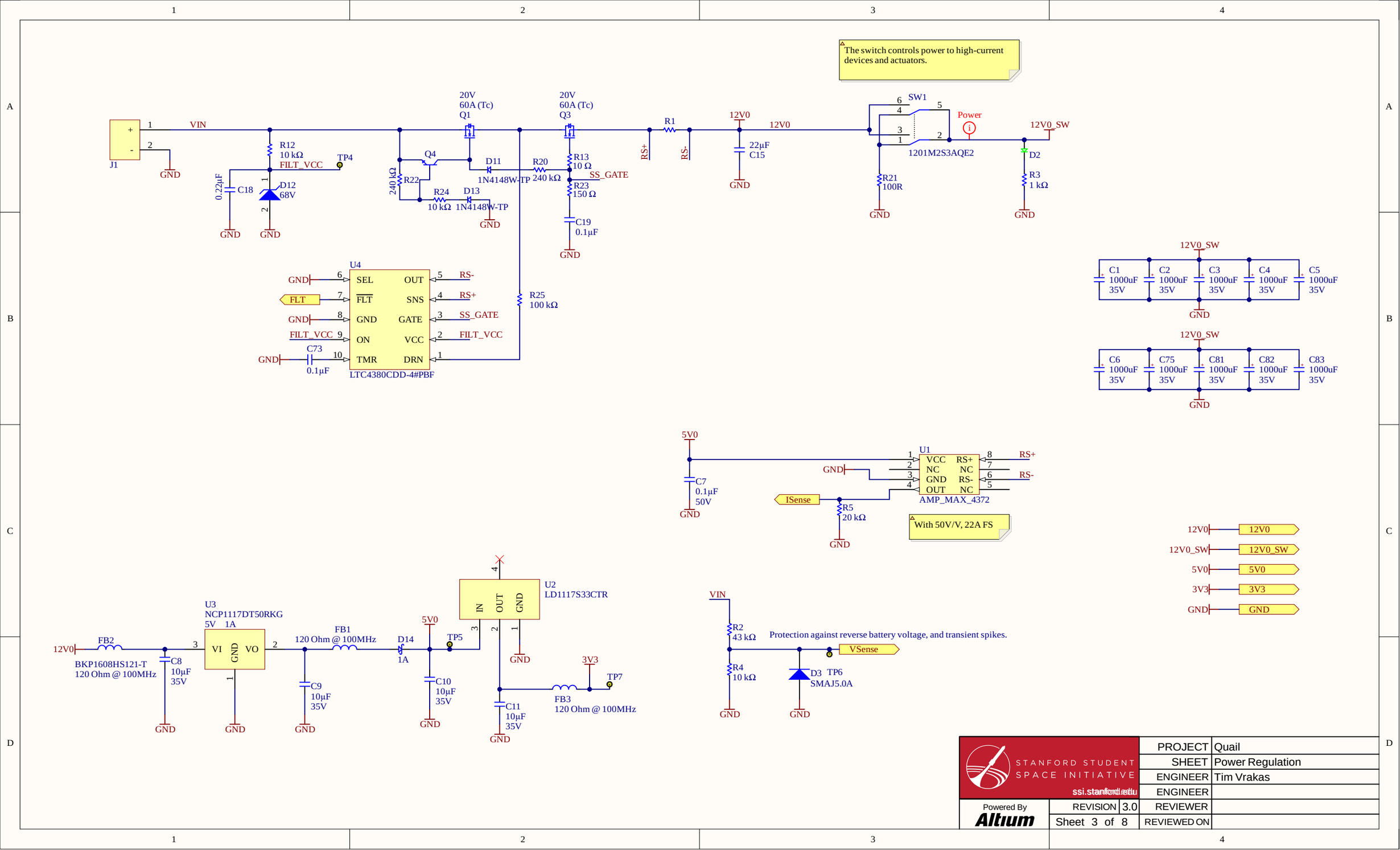
Altium
PROJECT Quail
SHEET Top Sheet
ENGINEER Tim Vrakas
ENGINEER
REVISION 3.0
REVIEWER
Sheet 1 of 8
REVIEWED ON



PROJECT	Quail
SHEET	Power Regulation
ENGINEER	Tim Vrakas
ENGINEER	
REVISION	3.0
REVIEWER	
Sheet 3 of 8	
REVIEWED ON	

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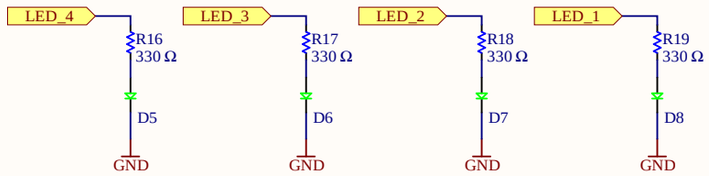
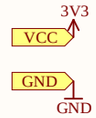
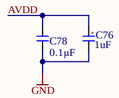
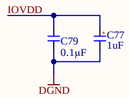
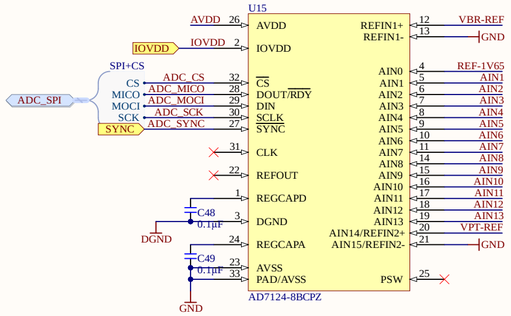


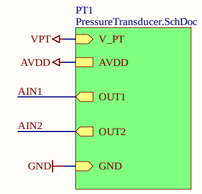


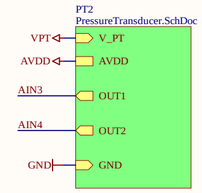
STANFORD STUDENT SPACE INITIATIVE ssi.stanford.edu		PROJECT	Quail
		SHEET	Blinks and Boops
		ENGINEER	Tim Vrakas
		ENGINEER	
Powered By Altium	REVISION 3.0	REVIEWER	
	Sheet 8 of 8	REVIEWED ON	

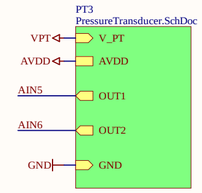


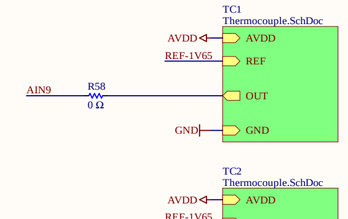


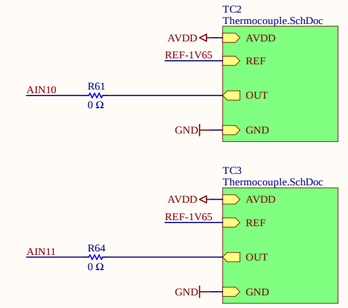


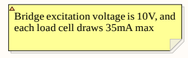


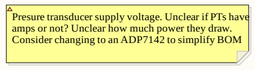


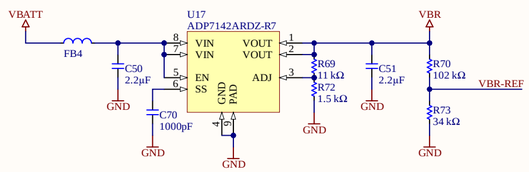


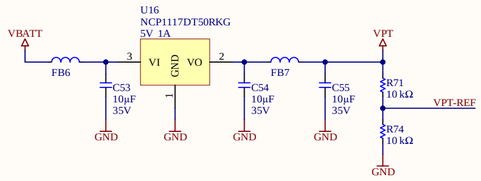


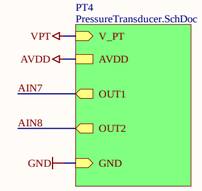


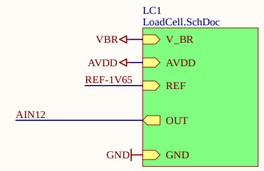


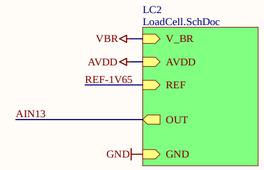


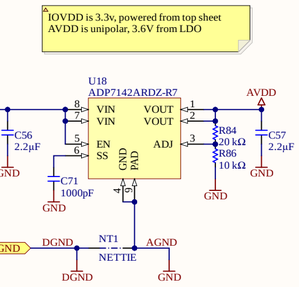


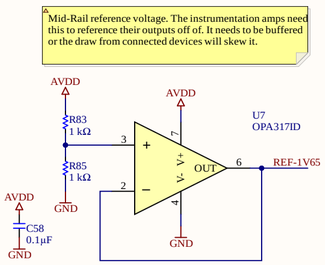












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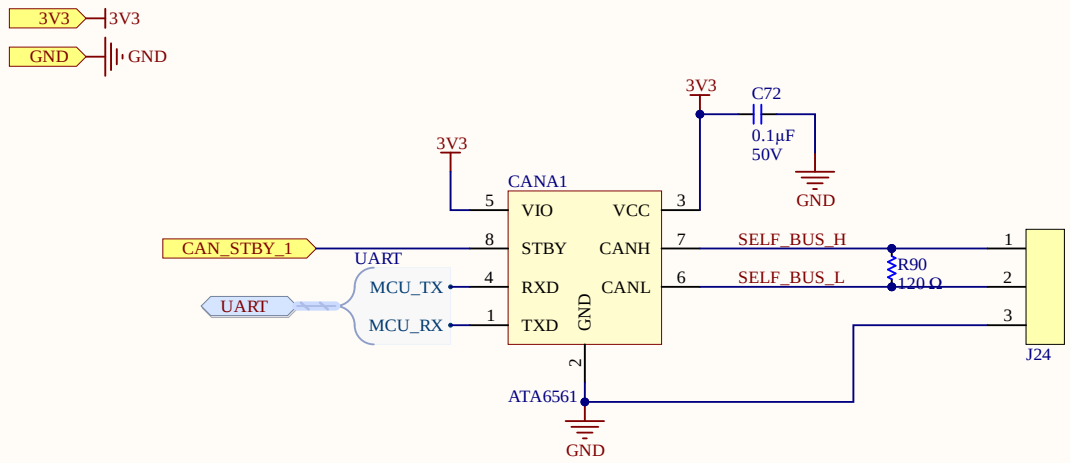

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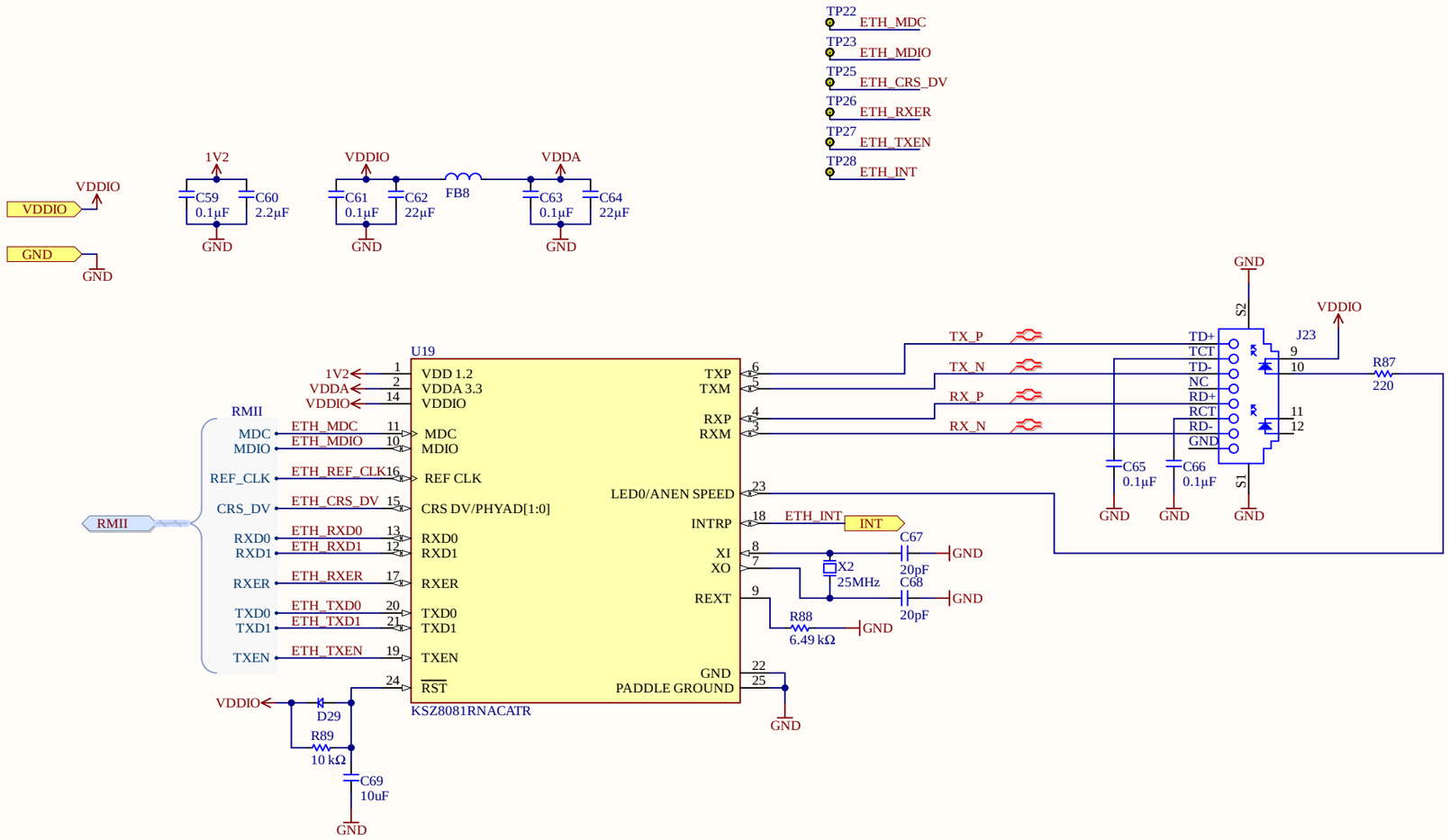

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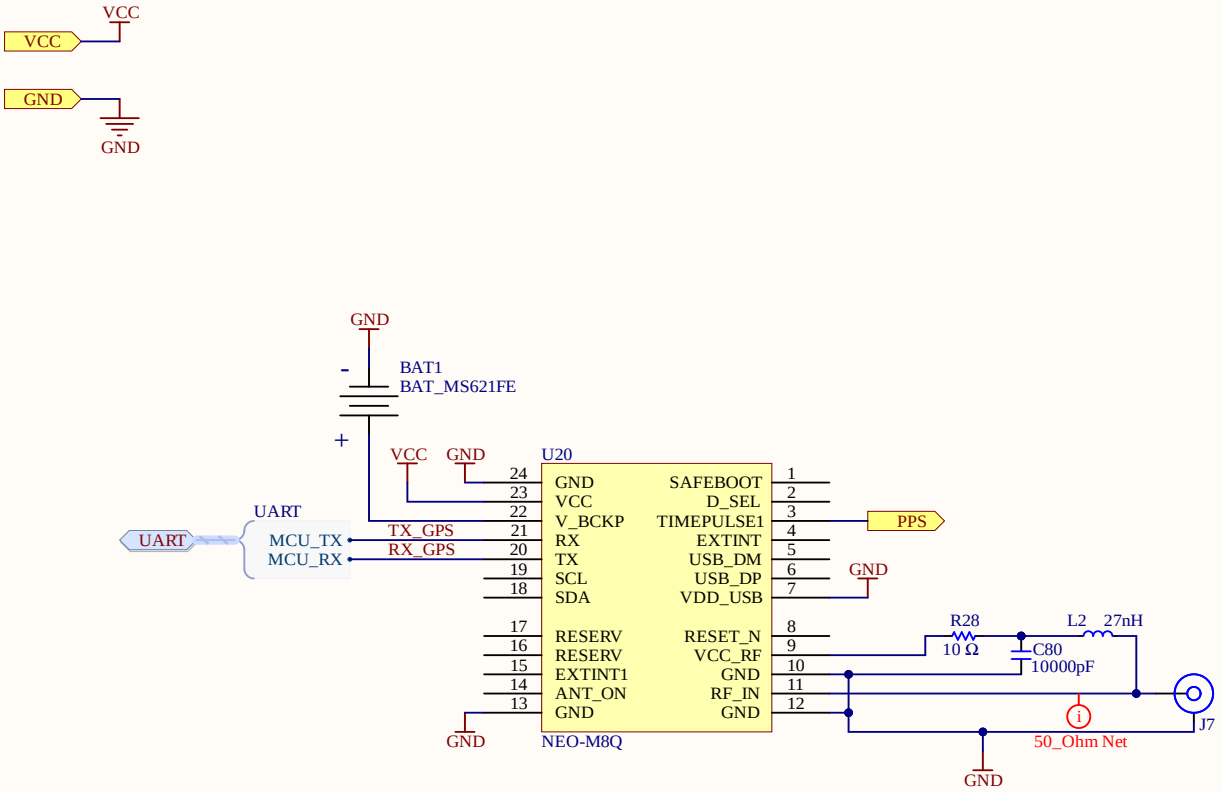
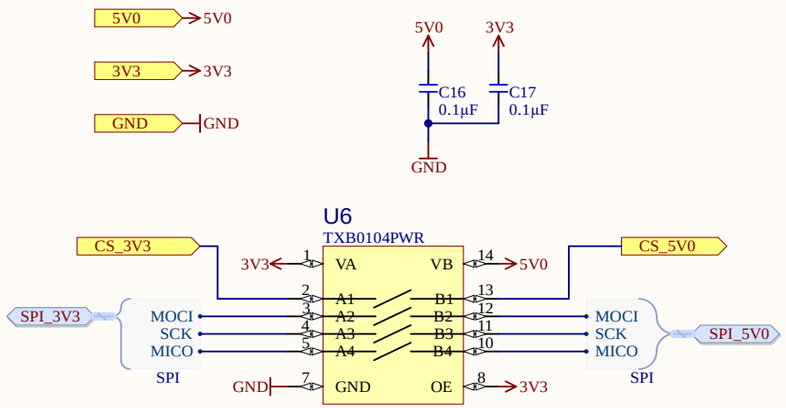


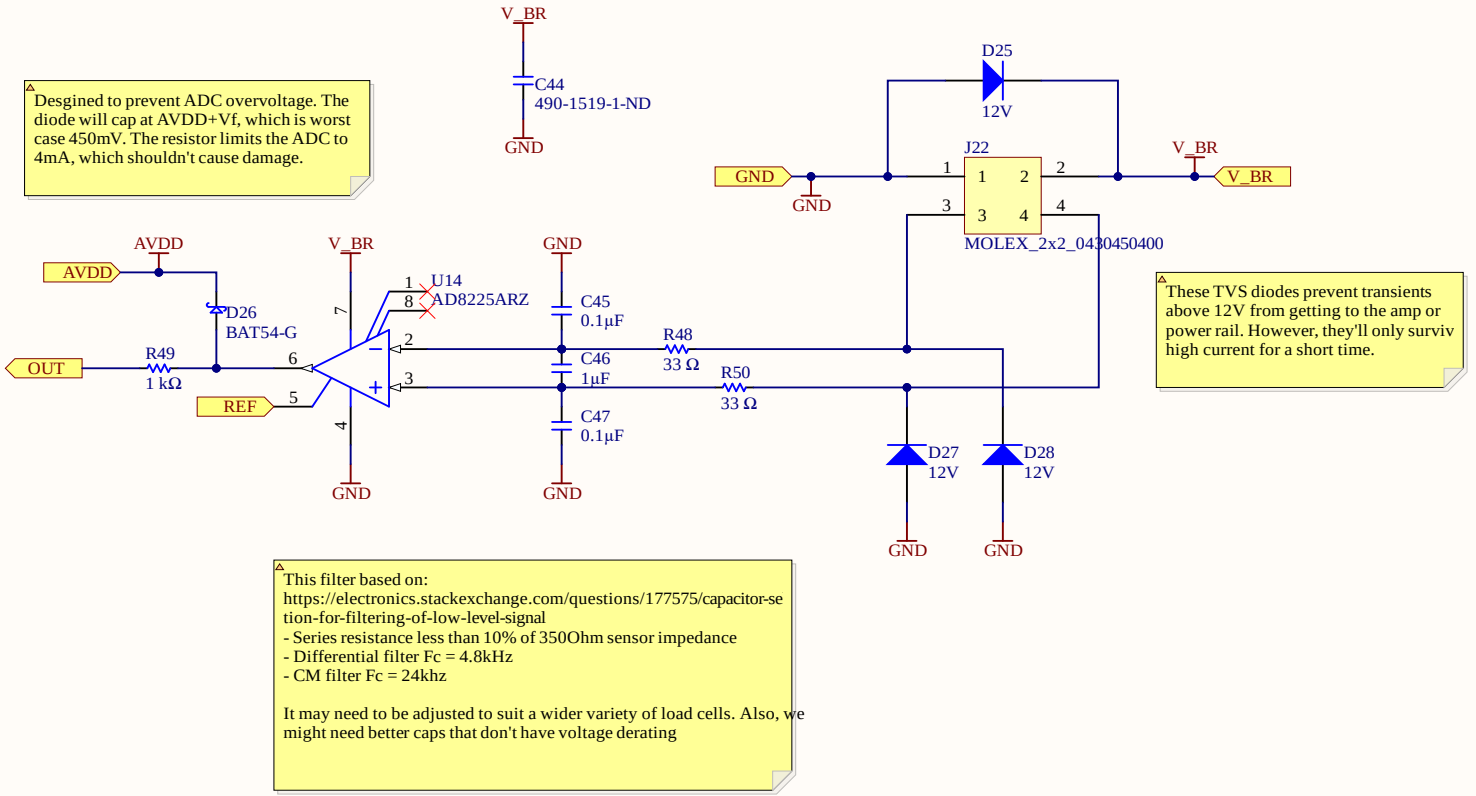
Title			
Size A	Number		Revision
Date:	4/08/2022	Sheet of	
File:	C:\Users\..\GPS.SchDoc	Drawn By:	

Level Shifters

The Squib Drivers operates using 5V logic, the MCU (SAMD51) uses 3.3V so the SPI interface between them needs to be converted



STANFORD STUDENT SPACE INITIATIVE ssi.stanford.edu		PROJECT	Quail
		SHEET	Misc
		ENGINEER	Tim Vrakas
		ENGINEER	
Powered By Altium	REVISION 3.0	REVIEWER	
	Sheet n of m	REVIEWED ON	

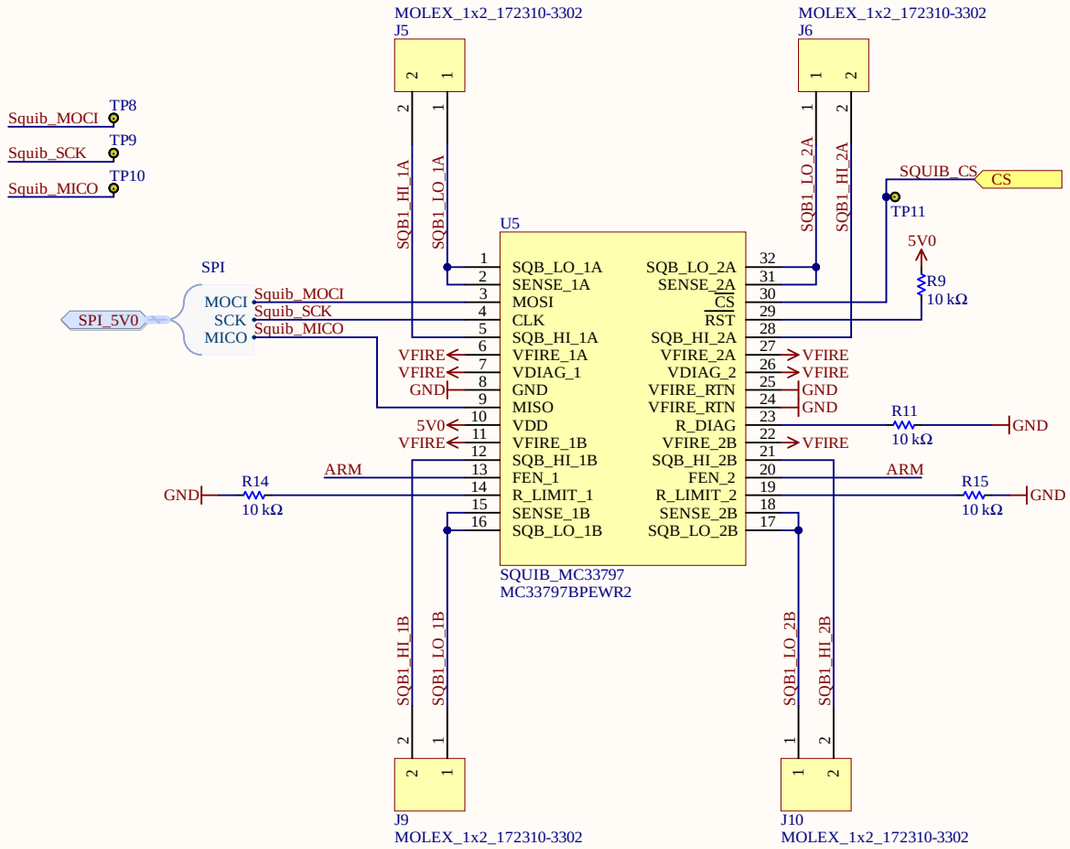


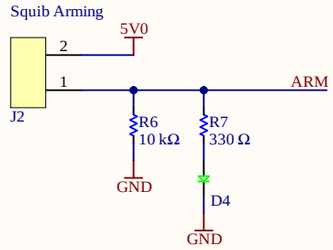
Title		
Size A	Number	Revision
Date: 4/08/2022		Sheet of
File: C:\Users\..\LoadCell.SchDoc		Drawn By:

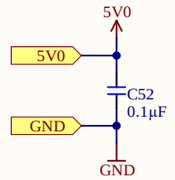
Squib Drivers

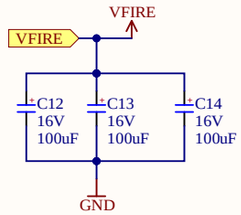
Pin 2 is Lo and Pin 1 is High on all connectors

R Limit Calc: Ematch R=2ohm, wire is around 2-5ohm depending on length.
Recomended current is around 1 A
RSet = 10k sets limit to 1.4A

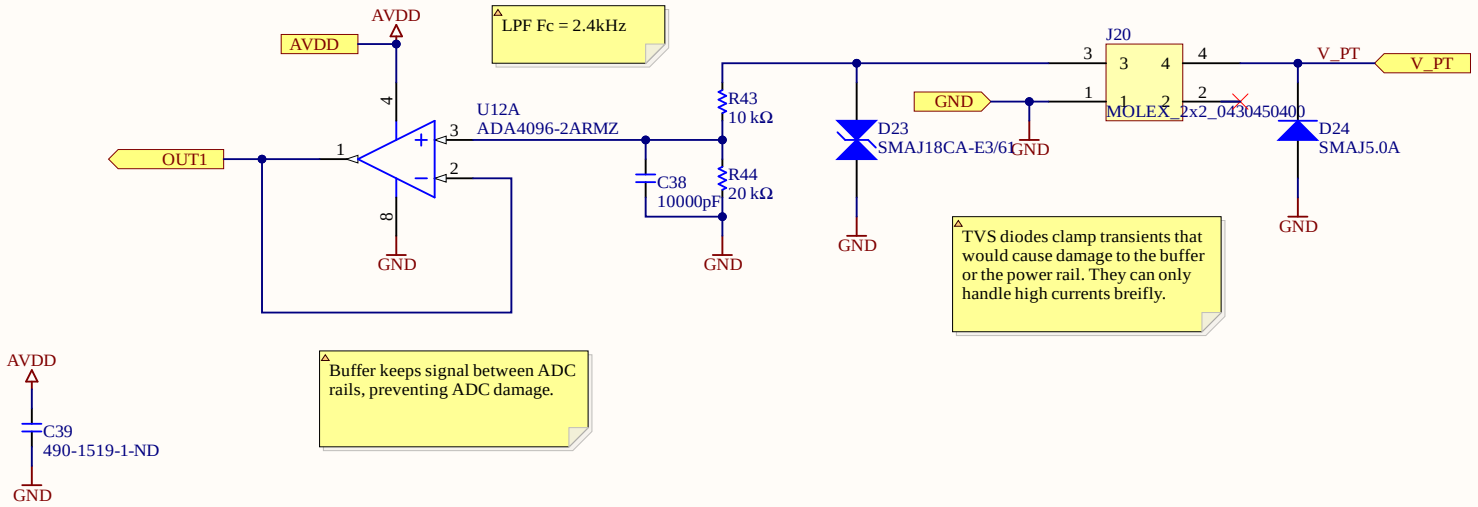








STANFORD STUDENT SPACE INITIATIVE ssi.stanford.edu		PROJECT	Quail
		SHEET	Squibs
		ENGINEER	Tim Vrakas
		ENGINEER	
Powered By Altium	REVISION 3.0	REVIEWER	
	Sheet n of m	REVIEWED ON	



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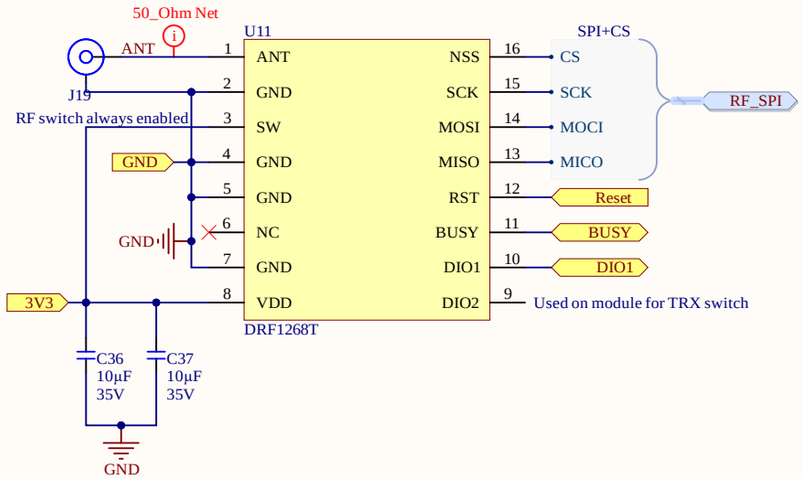
Size: A	Number	Revision
Date: 4/08/2022		Sheet of
File: C:\Users\..\PressureTransducer.SchDoc		Drawn By:

Radio Module

TODO

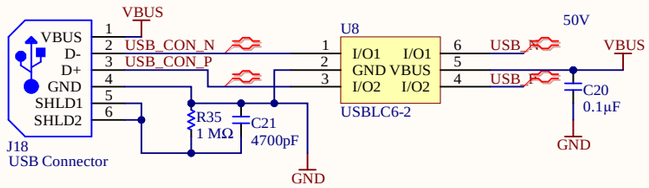
Swap Out with DRF Module

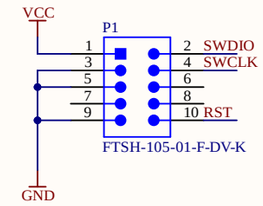
Radio for wireless communiactions
Dorji DRF1268T being used
Mainly on Tims Recomendation

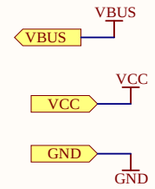


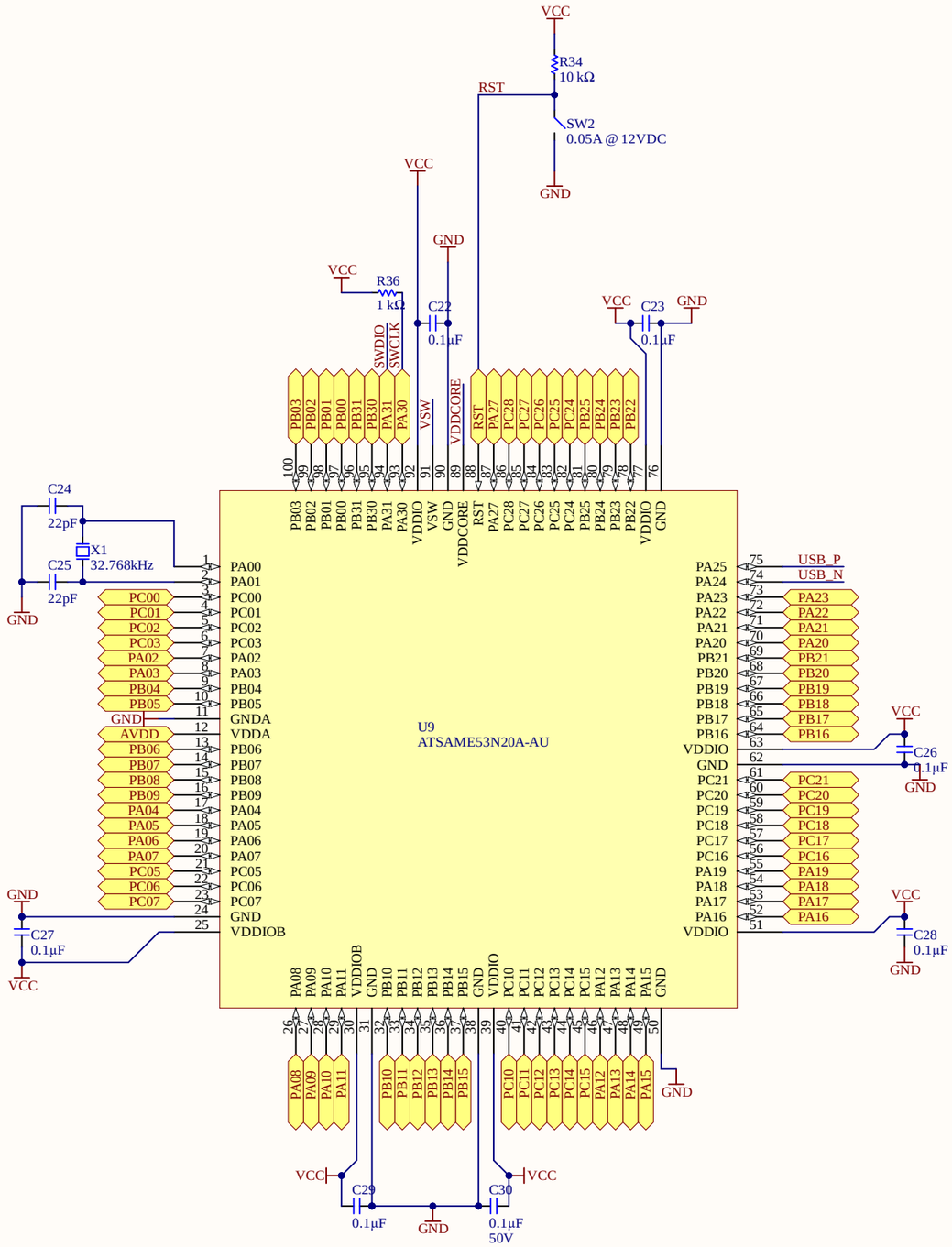
(G)FSK/4(G)FSK/LoRa Modulation
433Mhz transceiver
Max.22dBm output power
-147dBm sensitivity
Standard SPI interface
Low RX current: 5.7 mA
Automatic RF sense and CAD monitor
Data Rate: <300 kbps
Standby current: <1uA
Supply voltage: 3.3V

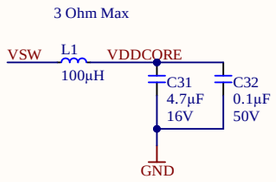
STANFORD STUDENT SPACE INITIATIVE ssi.stanford.edu		PROJECT	Quail
		SHEET	*
		ENGINEER	Tim Vrakas
		ENGINEER	
Powered By Altium	REVISION 3.0	REVIEWER	
	Sheet * of *	REVIEWED ON	

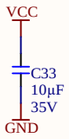

VBUS
VBUS
D-
D+
GND
SHLD1
SHLD2
USB_CON_N
USB_CON_P
R35
1 MΩ
C21
4700pF
GND
J18
USB Connector
U8
I/O1 I/O1
GND VBUS
I/O2 I/O2
USBLC6-2
USB_P
USB_N
50V
VBUS
C20
0.1µF
GND

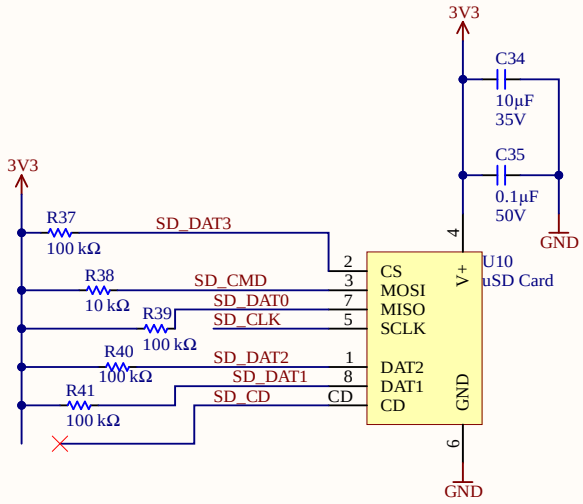

VCC
P1
SWDIO
SWCLK
RST
FTSH-105-01-F-DV-K
GND

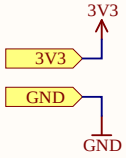

VBUS
VBUS
VCC
VCC
GND
GND

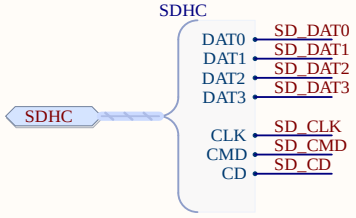

VCC
R34
10 kΩ
RST
SW2
0.05A @ 12VDC
GND
VCC
GND
VCC
R36
1 kΩ
C22
0.1µF
SWDIO
SWCLK
VCC
C23
GND
0.1µF
PB03 PB02 PB01 PB00 PB31 PB30 PA31 PA30
VSW
VDDCORE
RST PA27 PC28 PC27 PC26 PC25 PC24 PB25 PB24 PB23 PB22
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76
PB03 PB02 PB01 PB00 PB31 PB30 PA31 PA30 VDDIO VSW GND VDDCORE RST PA27 PC28 PC27 PC26 PC25 PC24 PB25 PB24 PB23 PB22 VDDIO GND
C24
22pF
X1
C25
32.768kHz
22pF
GND
PC00 PC01 PC02 PC03 PA02 PA03 PB04 PB05
AVDD PB06 PB07 PB08 PB09 PA04 PA05 PA06 PA07 PC05 PC06 PC07
GND
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
PA00 PA01 PC00 PC01 PC02 PC03 PA02 PA03 PB04 PB05 GNDA VDDA PB06 PB07 PB08 PB09 PA04 PA05 PA06 PA07 PC05 PC06 PC07 GND VDDIOB
U9
ATSAME53N20A-AU
PA25 PA24 PA23 PA22 PA21 PA20 PB21 PB20 PB19 PB18 PB17 PB16 VDDIO GND PC21 PC20 PC19 PC18 PC17 PC16 PA19 PA18 PA17 PA16 VDDIO
75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51
USB_P
USB_N
PA23 PA22 PA21 PA20 PB21 PB20 PB19 PB18 PB17 PB16
PC21 PC20 PC19 PC18 PC17 PC16 PA19 PA18 PA17 PA16
VCC
C26
0.1µF
GND
VCC
C28
0.1µF
GND
GND
C27
0.1µF
VCC
PA08 PA09 PA10 PA11 VDDIOB GND PB10 PB11 PB12 PB13 PB14 PB15 GND VDDIO PC10 PC11 PC12 PC13 PC14 PC15 PA12 PA13 PA14 PA15 GND
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
PA08 PA09 PA10 PA11
PB10 PB11 PB12 PB13 PB14 PB15
PC10 PC11 PC12 PC13 PC14 PC15 PA12 PA13 PA14 PA15
GND
VCC
VCC
C29
0.1µF
GND
C30
0.1µF
50V
VCC


3 Ohm Max
VSW
L1
100µH
VDDCORE
C31
4.7µF
16V
C32
0.1µF
50V
GND


VCC
C33
10µF
35V
GND







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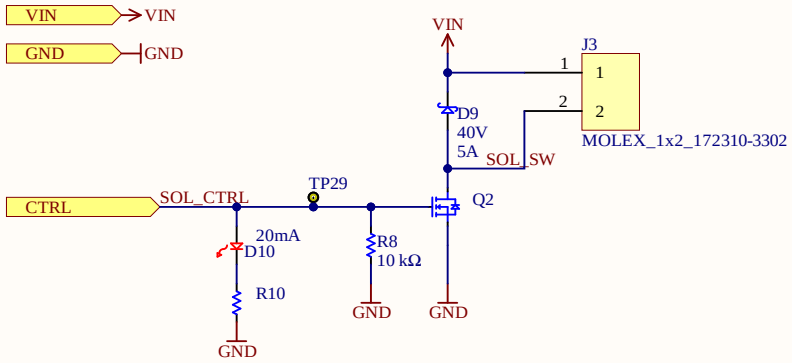

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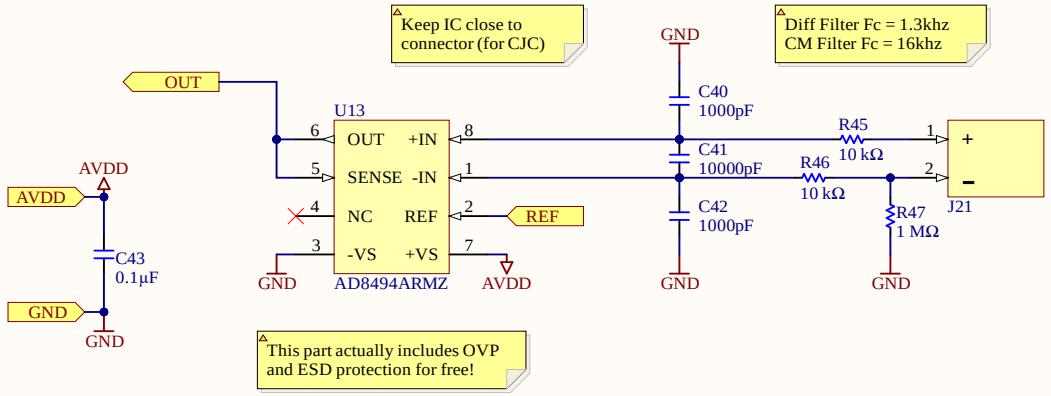

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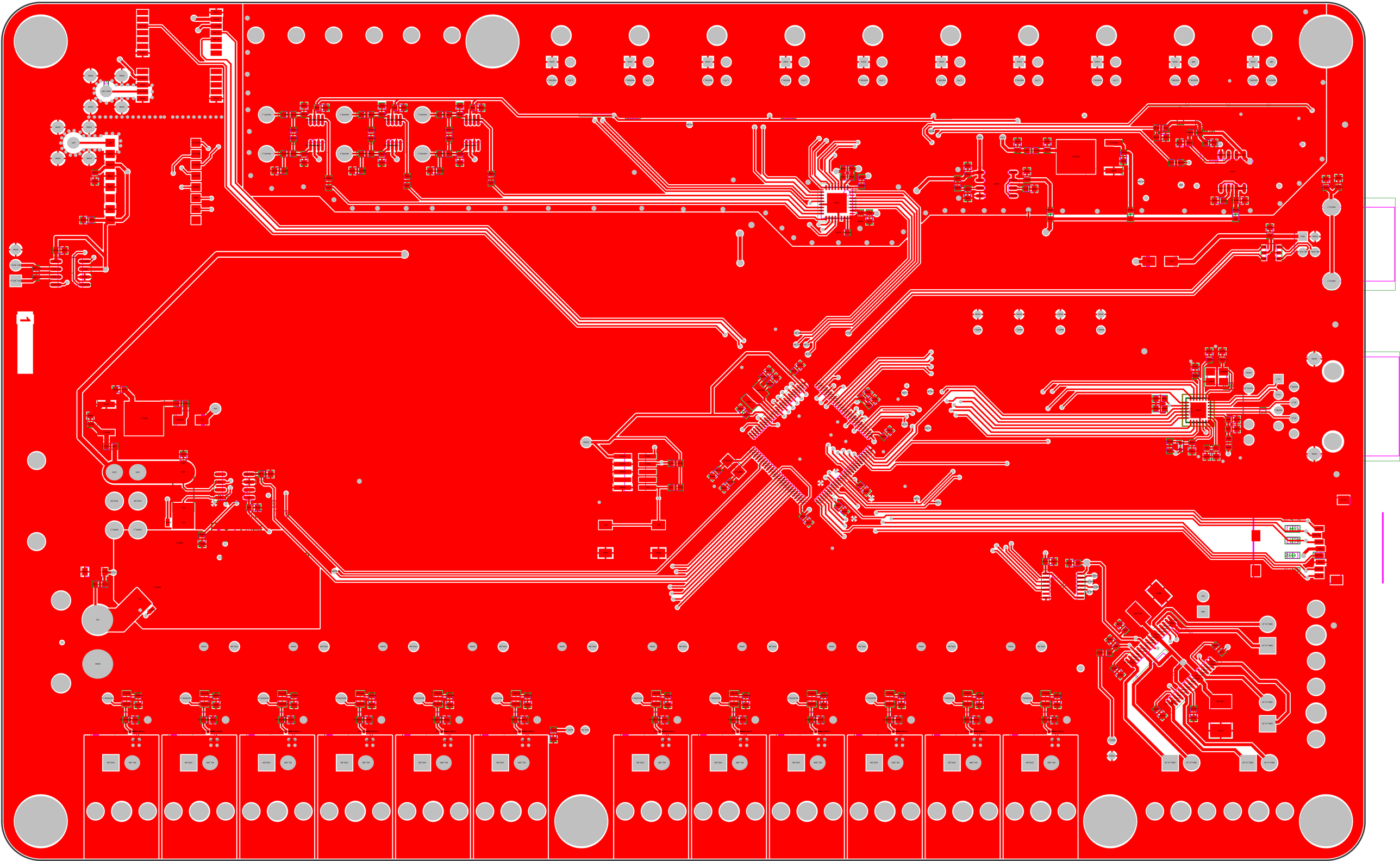
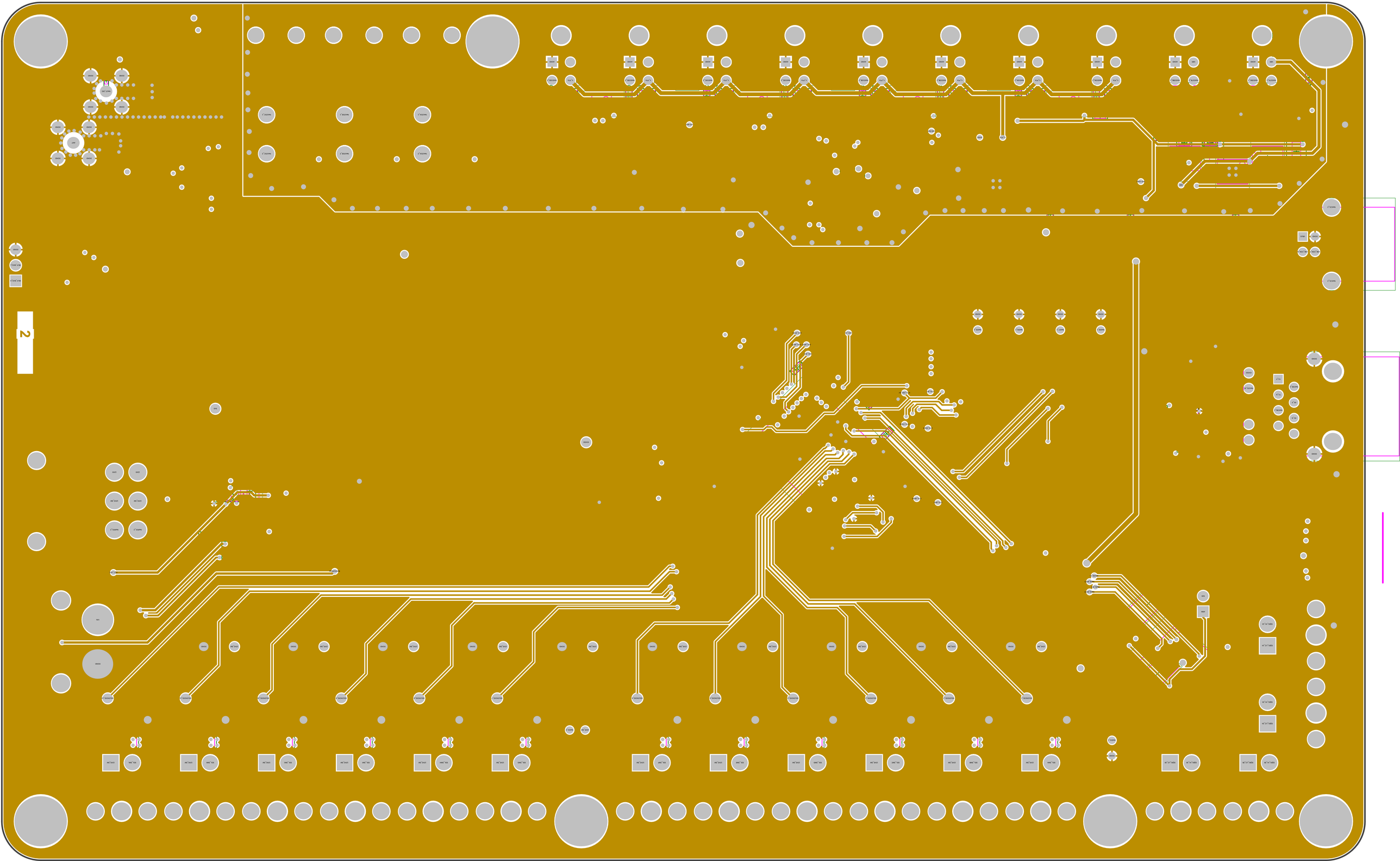
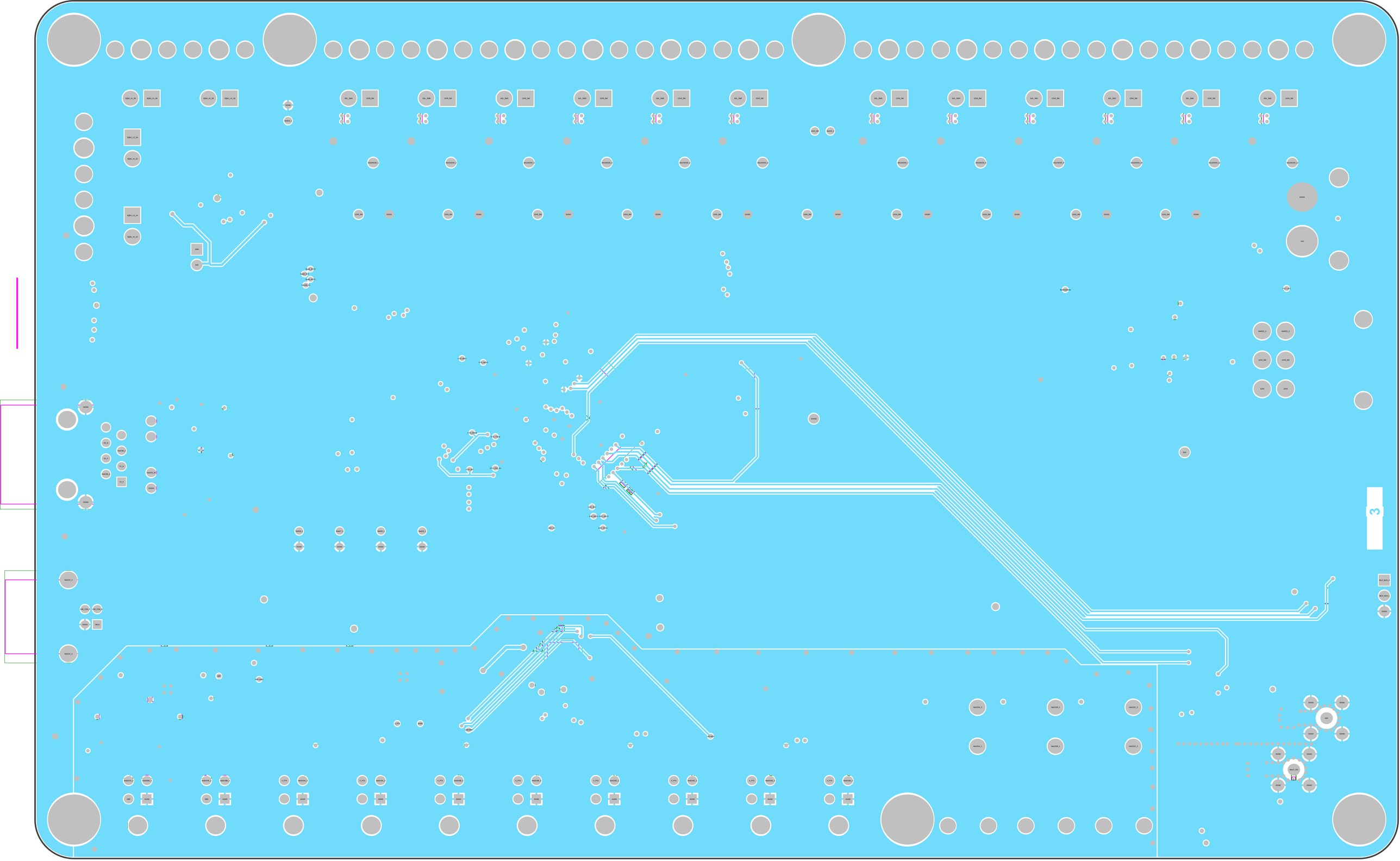
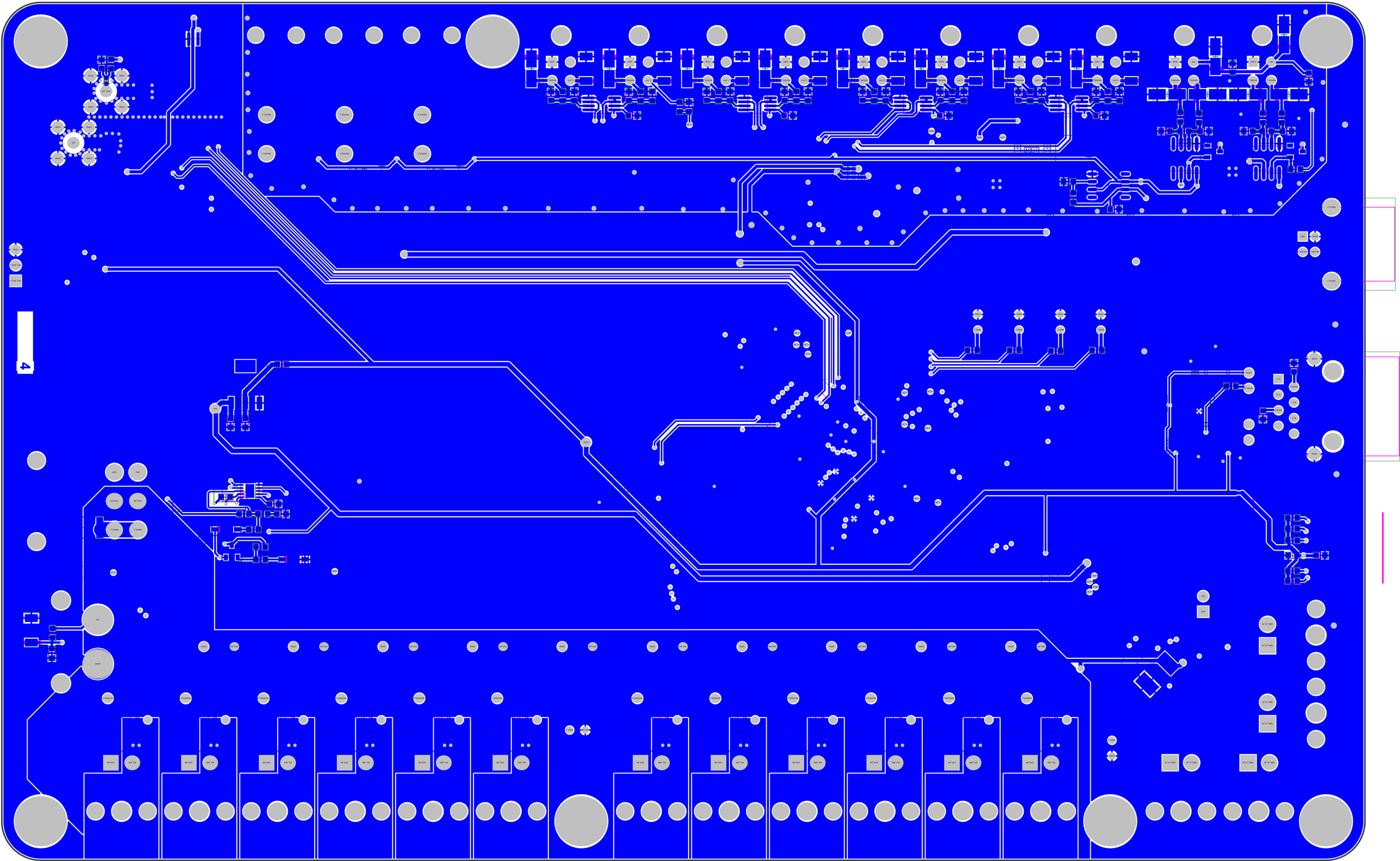








Quail v3.1

Tim Vrakas

Bay Area CIRCUITS

KEYSIGHT TECHNOLOGIES

STANFORD STUDENT SPACE INITIATIVE

HARWiN

AUTODESK

Altium

E1 E2 E3 E4

S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12

12V IN

ON | OFF

RESET

SWD

ETHERNET

USB

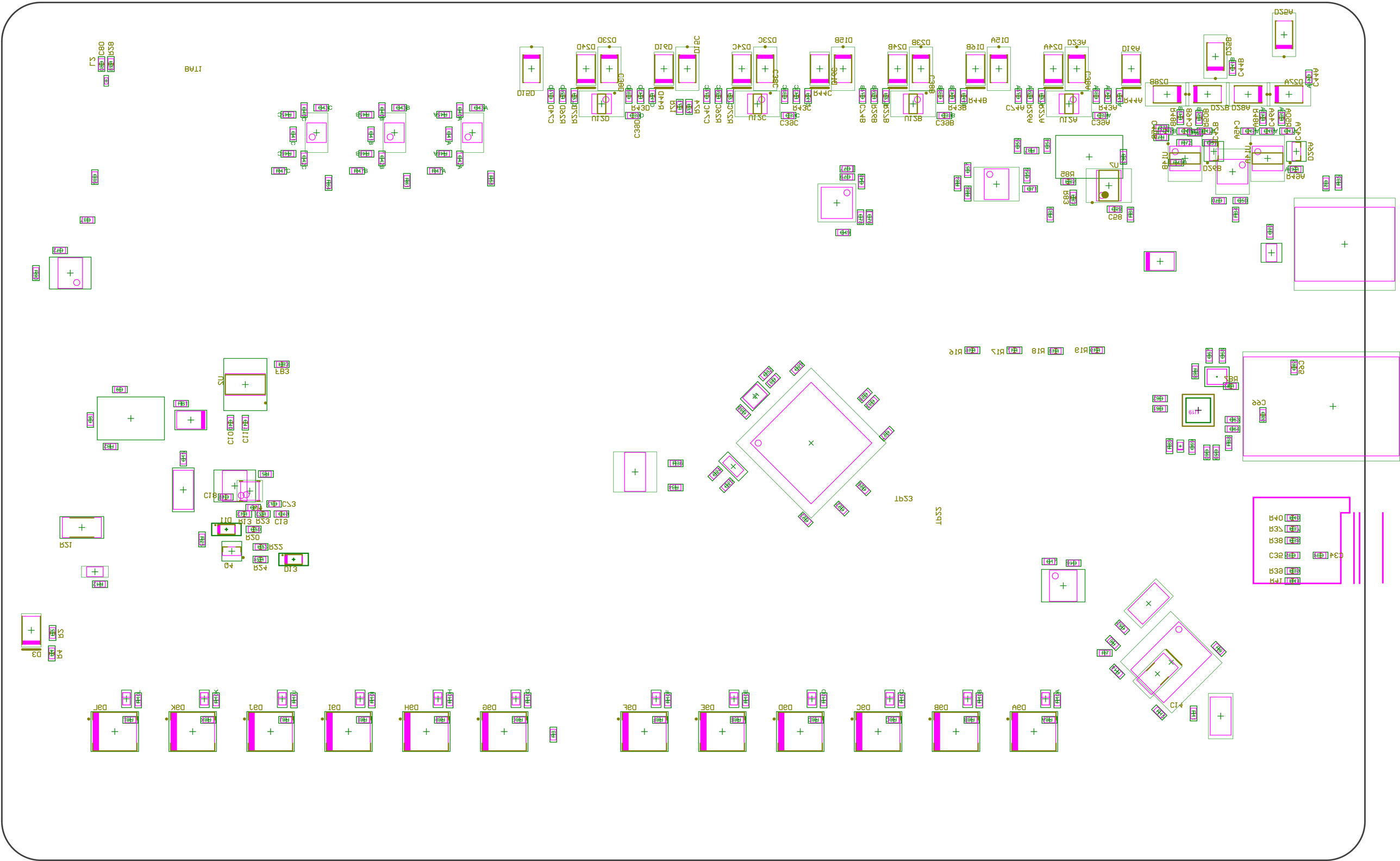
CAN

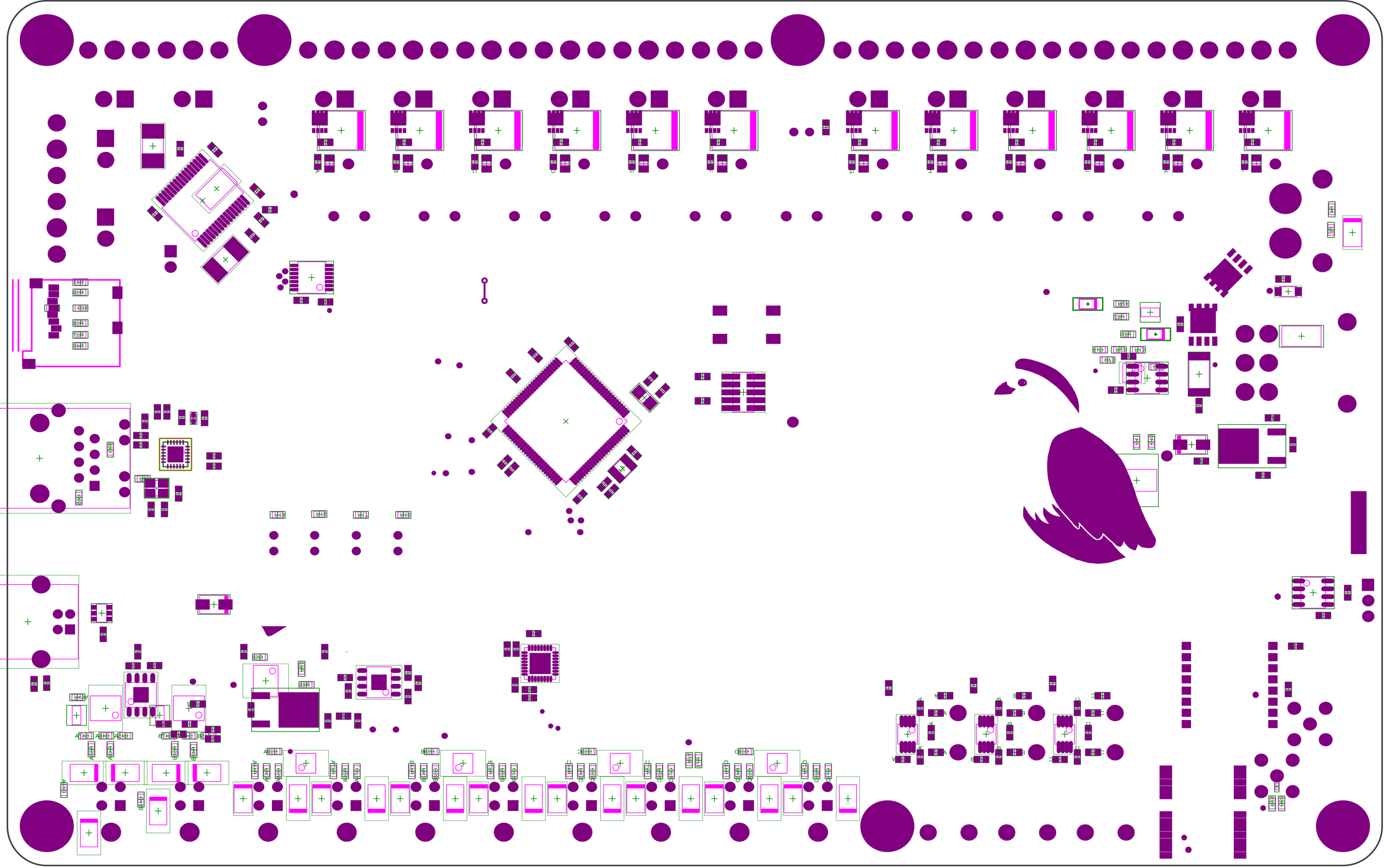
TELEM

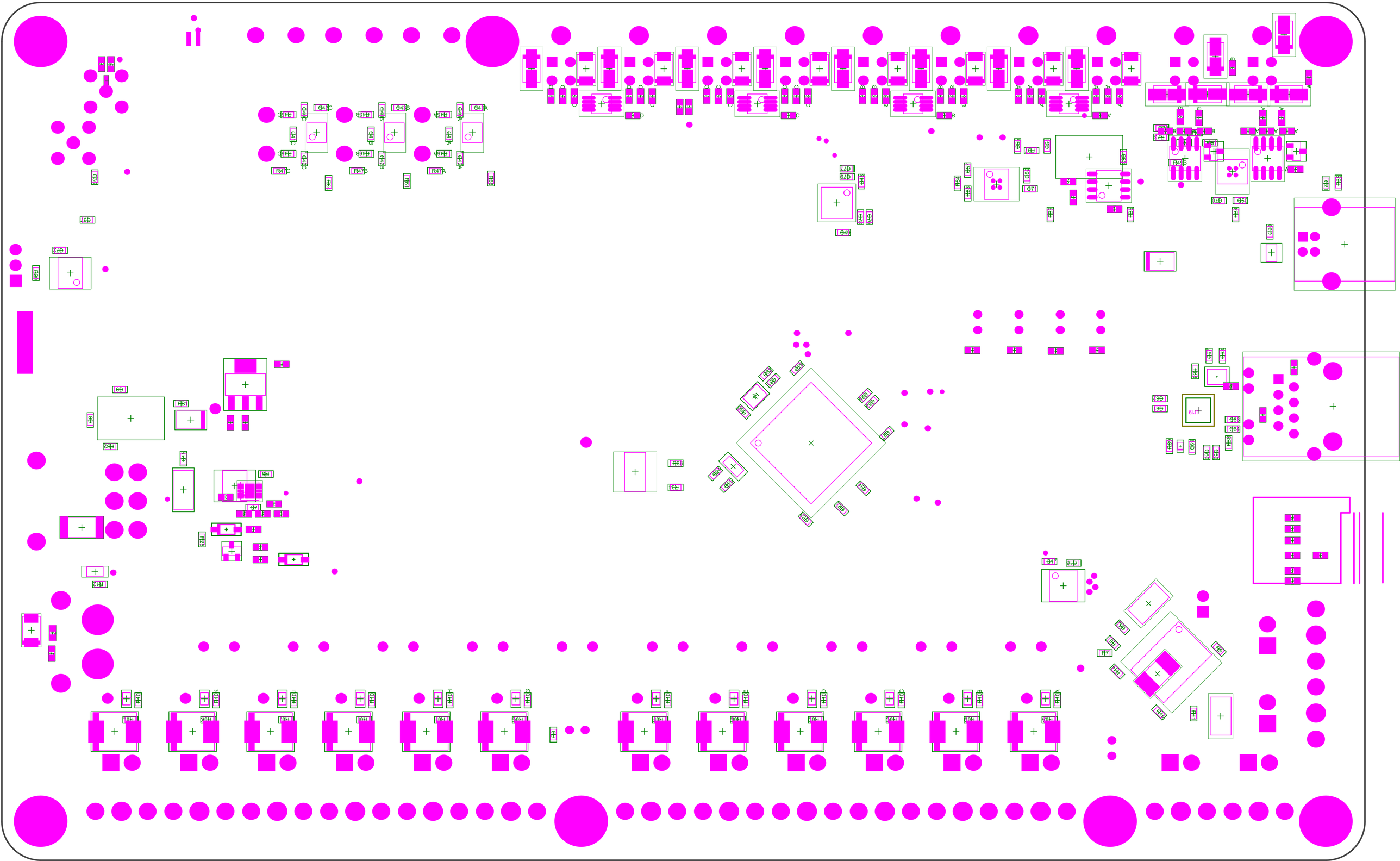
GPS

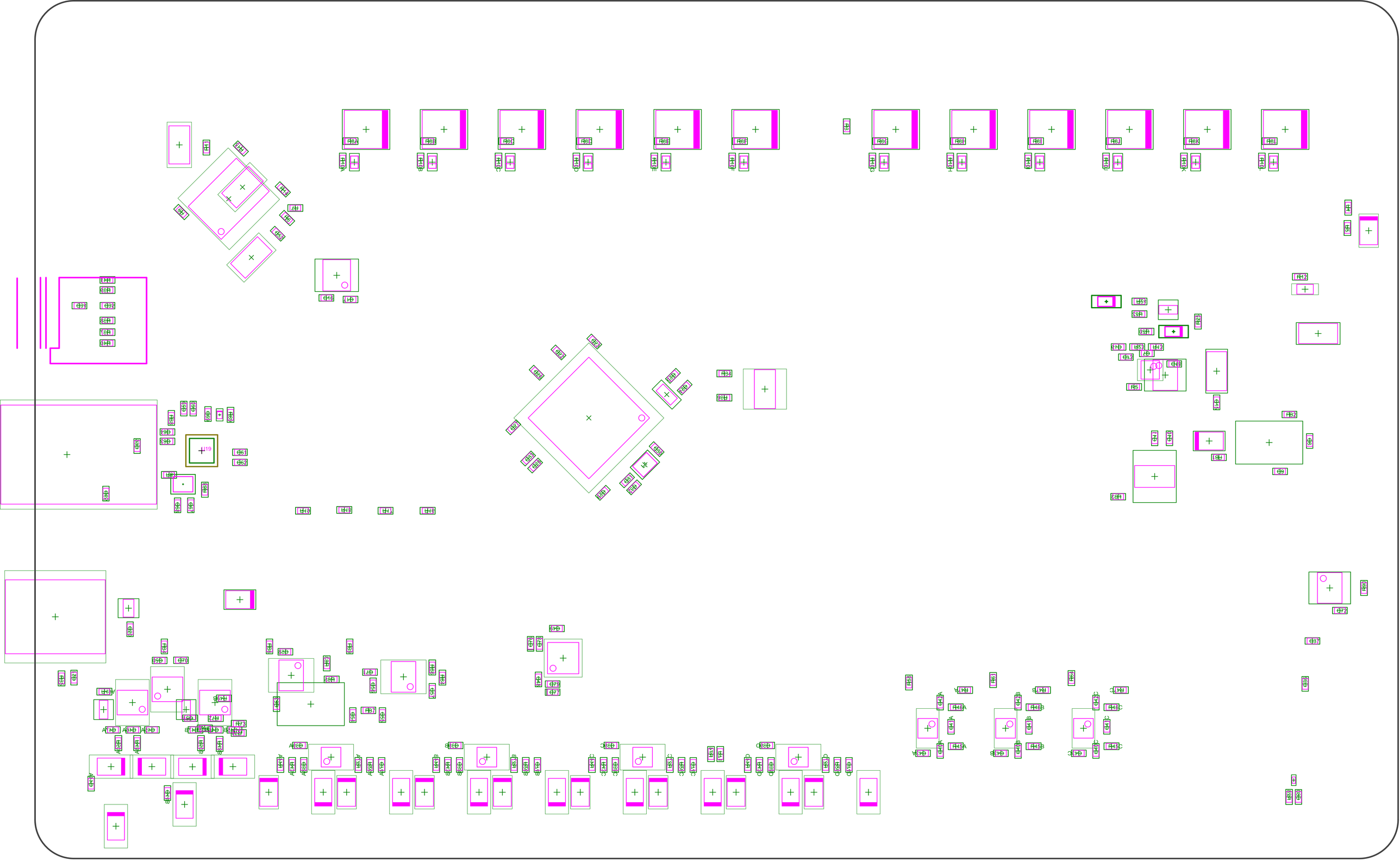
TC1 TC2 TC3

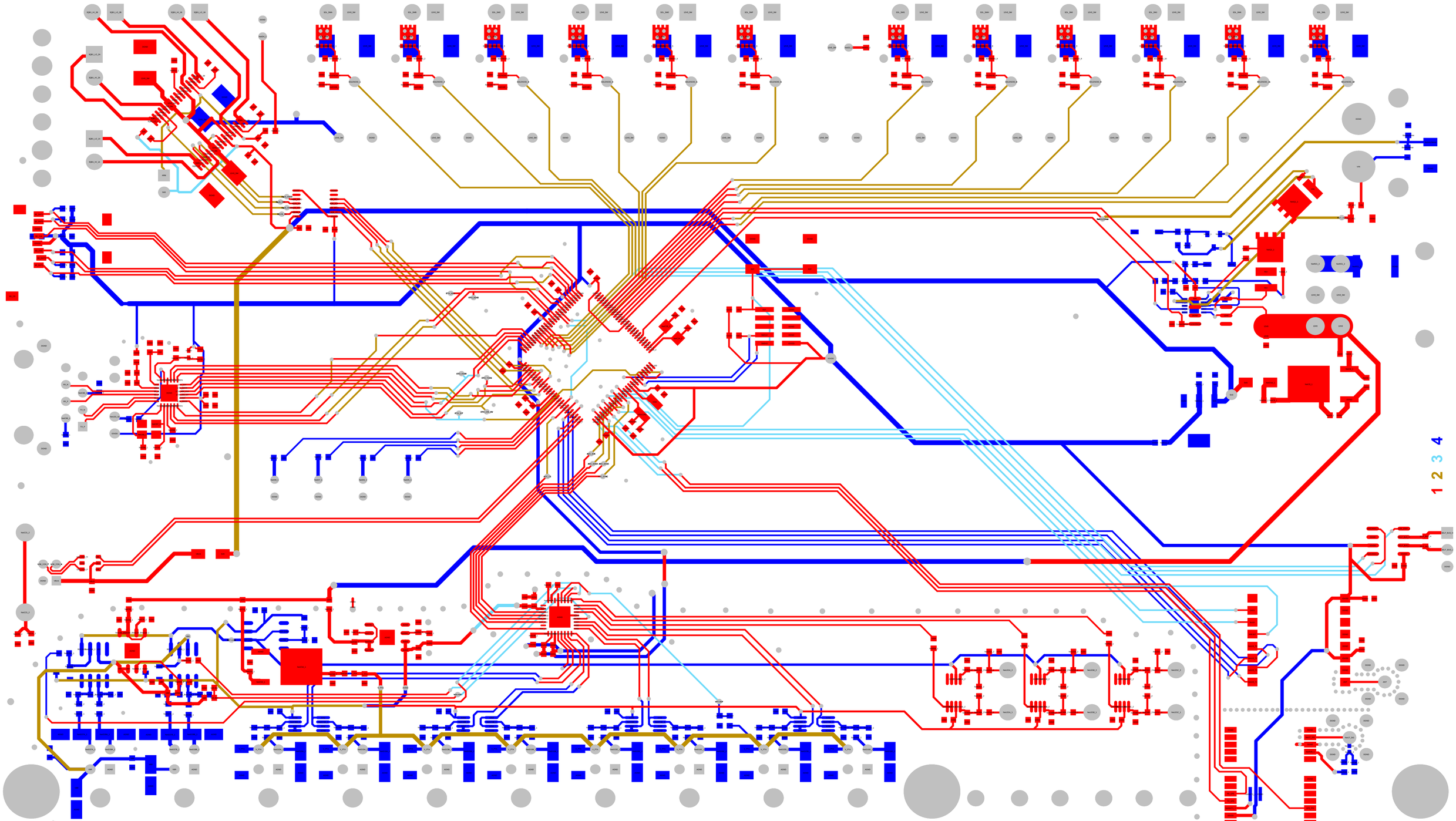
PT1 PT2 PT3 PT4 PT5 PT6 PT7 PT8







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