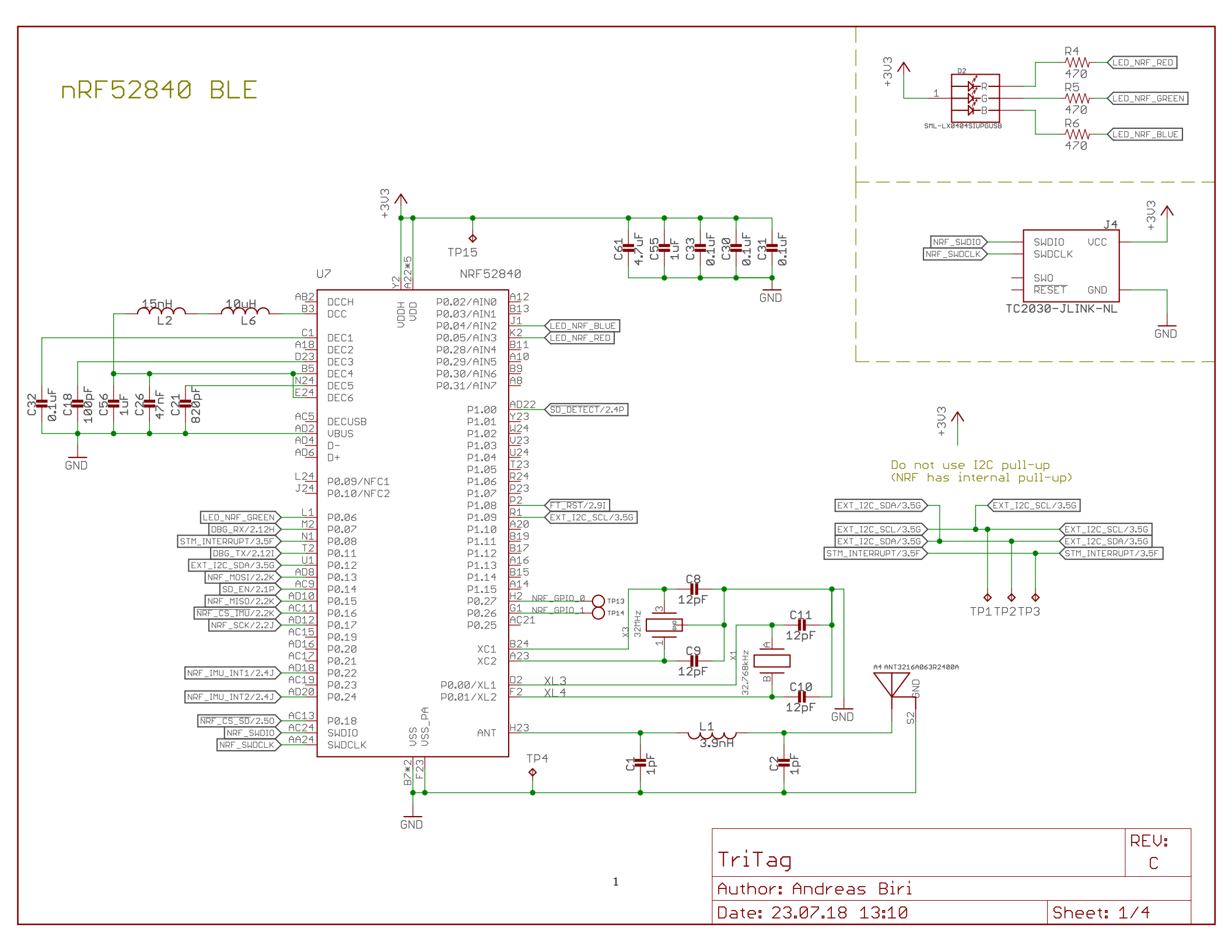
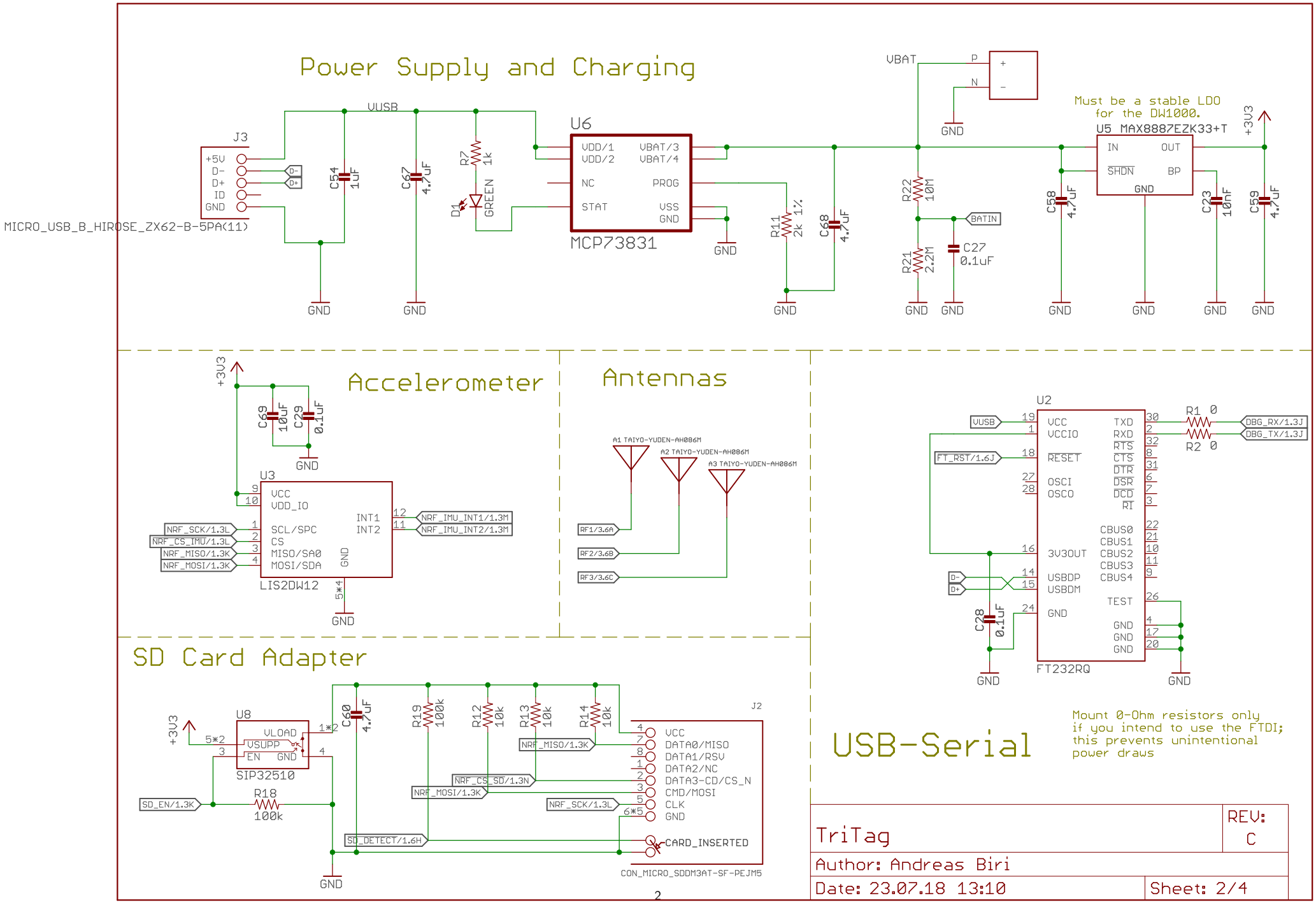
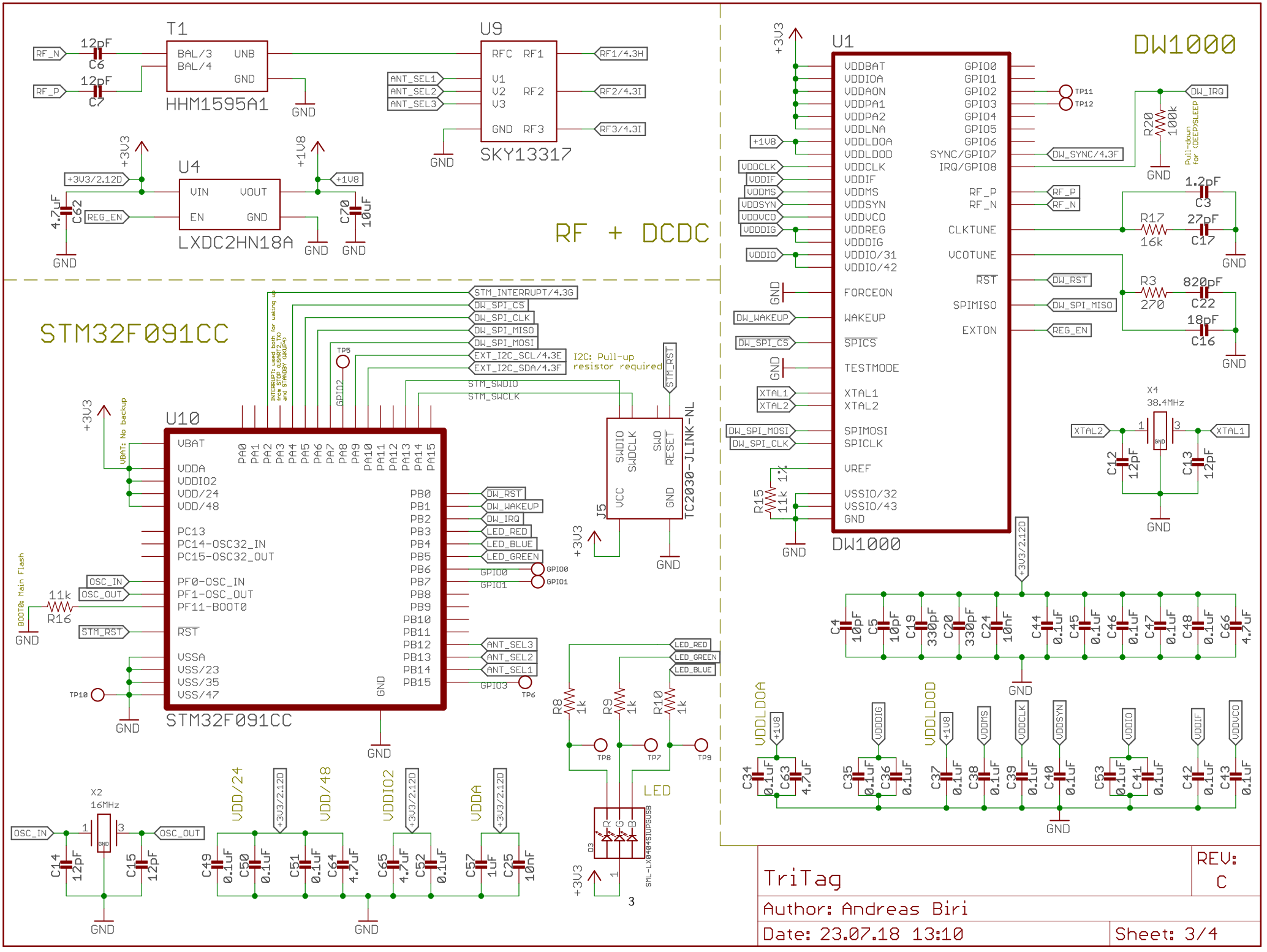
nRF52840 BLE



TriTag	REV: C
Author: Andreas Biri	
Date: 23.07.18 13:10	Sheet: 1/4


Power Supply and Charging
VUSB
J3
+5V
D-
D+
ID
GND
MICRO_USB_B_HIROSE_ZX62-B-5PA(11)
C54 1uF
C67 4.7uF
R7 1k
D1 GREEN
U6
VDD/1
VDD/2
NC
STAT
VBAT/3
VBAT/4
PROG
VSS
GND
MCP73831
R11 2k 1%
C68 4.7uF
VBAT
P
N
R22 10M
R21 2.2M
BATIN
C27 0.1uF
Must be a stable LDO
for the DW1000.
U5 MAX8887EZK33+T
IN
OUT
SHDN
BP
C58 4.7uF
C23 10nF
C59 4.7uF
+3V3
Accelerometer
C69 10uF
C29 0.1uF
U3
VCC
VDD_IO
SCL/SPC
CS
MISO/SA0
MOSI/SDA
INT1
INT2
GND
LIS2DW12
NRF_SCK/1.3L
NRF_CS_IMU/1.3L
NRF_MISO/1.3K
NRF_MOSI/1.3K
NRF_IMU_INT1/1.3M
NRF_IMU_INT2/1.3M
Antennas
A1 TAIYO-YUDEN-AH086M
A2 TAIYO-YUDEN-AH086M
A3 TAIYO-YUDEN-AH086M
RF1/3.6A
RF2/3.6B
RF3/3.6C
U2
VUSB
FT_RST/1.6J
VCC
VCCIO
RESET
OSCI
OSCO
3V3OUT
USBDP
USBDM
GND
TXD
RXD
RTS
CTS
DTR
DSR
DCD
RI
CBUS0
CBUS1
CBUS2
CBUS3
CBUS4
TEST
FT232RQ
R1 0
R2 0
DBG_RX/1.3J
DBG_TX/1.3J
C28 0.1uF
SD Card Adapter
U8
VLOAD
VSUPP
EN
GND
SIP32510
SD_EN/1.3K
R18 100k
C60 4.7uF
R19 100k
R12 10k
R13 10k
R14 10k
J2
VCC
DATA0/MISO
DATA1/RSV
DATA2/NC
DATA3-CD/CS_N
CMD/MOSI
CLK
GND
CARD_INSERTED
SD_DETECT/1.6H
CON_MICRO_SDDM3AT-SF-PEJM5
USB-Serial
Mount 0-Ohm resistors only
if you intend to use the FTDI;
this prevents unintentional
power draws
TriTag
REV: C
Author: Andreas Biri
Date: 23.07.18 13:10
Sheet: 2/4
2


T1
HHM1595A1
U9
SKY13317
U4
LXDC2HN18A
RF + DCDC
STM32F091CC
U10
STM32F091CC
U1
DW1000
TC2030-JLINK-NL
LED
TriTag
REV: C
Author: Andreas Biri
Date: 23.07.18 13:10
Sheet: 3/4

EXTERNAL SIGNALS

The following signals must be integrated into all designs using the design block:

Signals

- EXT_I2C_SCL/3.5G
- EXT_I2C_SDA/3.5G

Note: Additional I2C pull-up resistors required to +3V3

- DW_SYNC/3.10C
- STM_INTERRUPT/3.5F

Antennas

- RF1/3.6A
- RF2/3.6B
- RF3/3.6C

Guarantee 120° offset in-between antennas to maximize polarization difference and antenna diversity

RF traces should respect the keepout zones and be surrounded by a via shield.
Furthermore, try to keep them as short and straight as possible

Power Supply

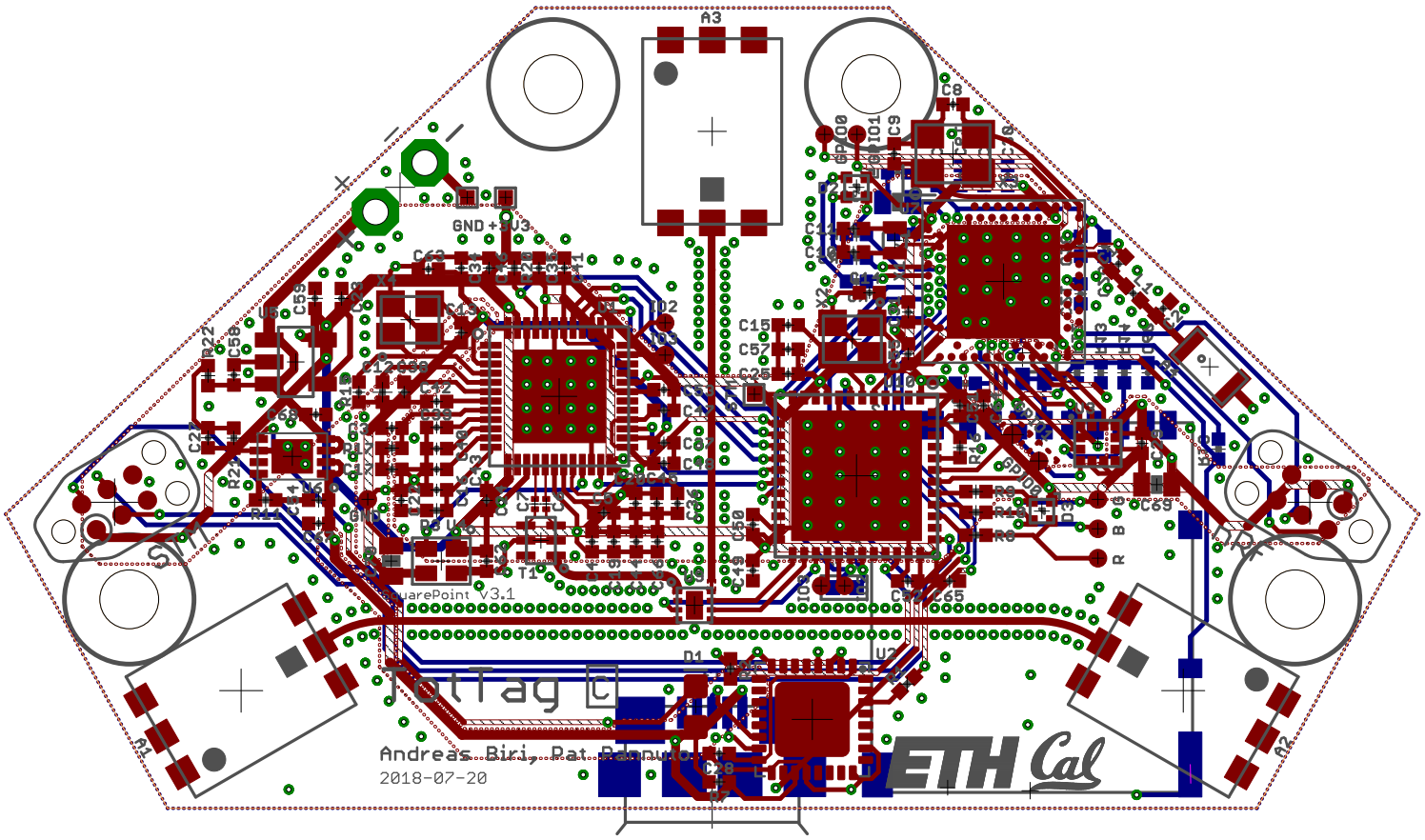
- +3V3/3.10K

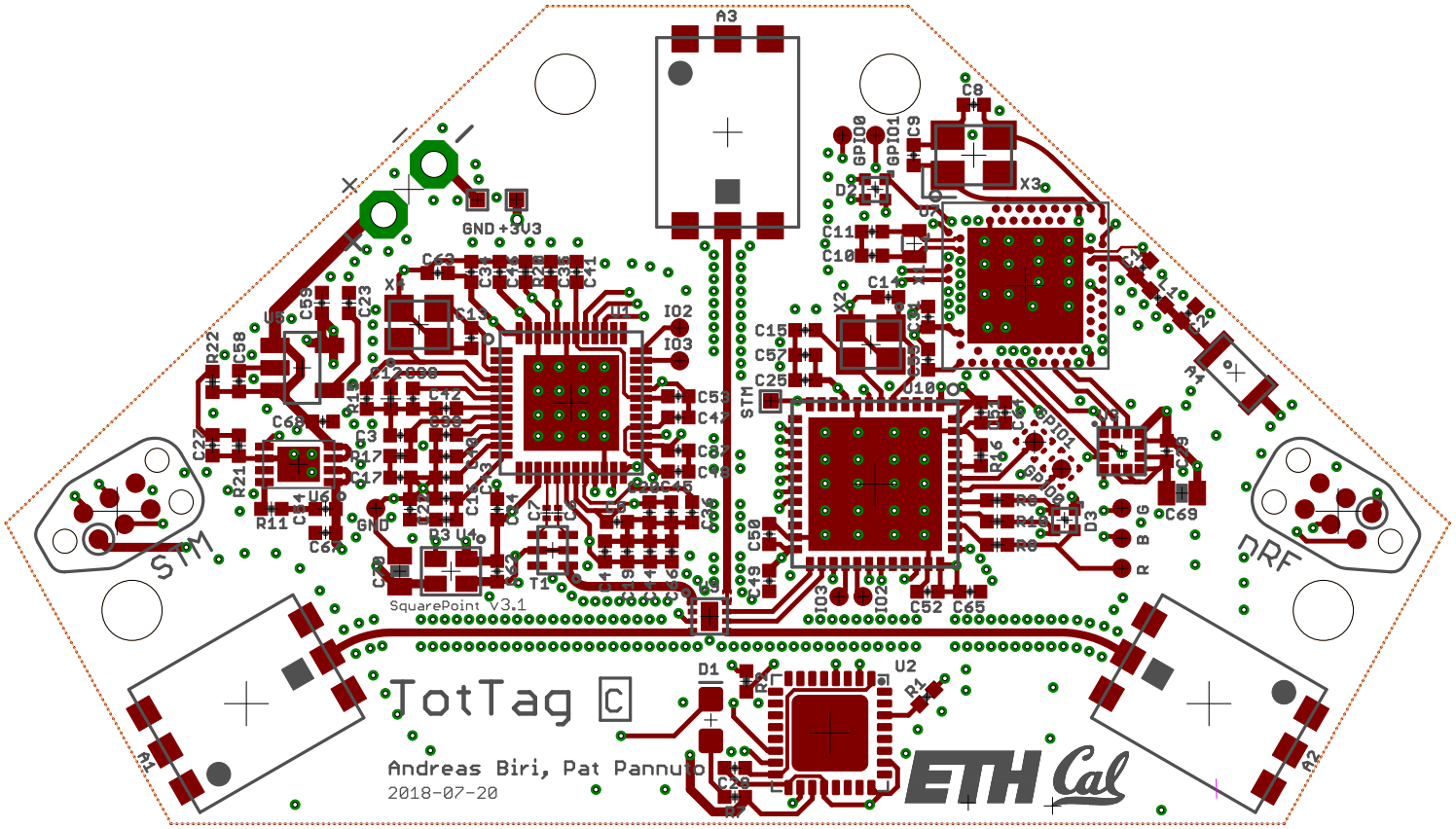
Be aware that the DecaWave is very sensitive regarding its power supply.

We suggest using the "MAX8887EZK33+T" from Maxim Integrated.
You can find a reference layout at github.com/lab11/polypoint/pcb/tritag.

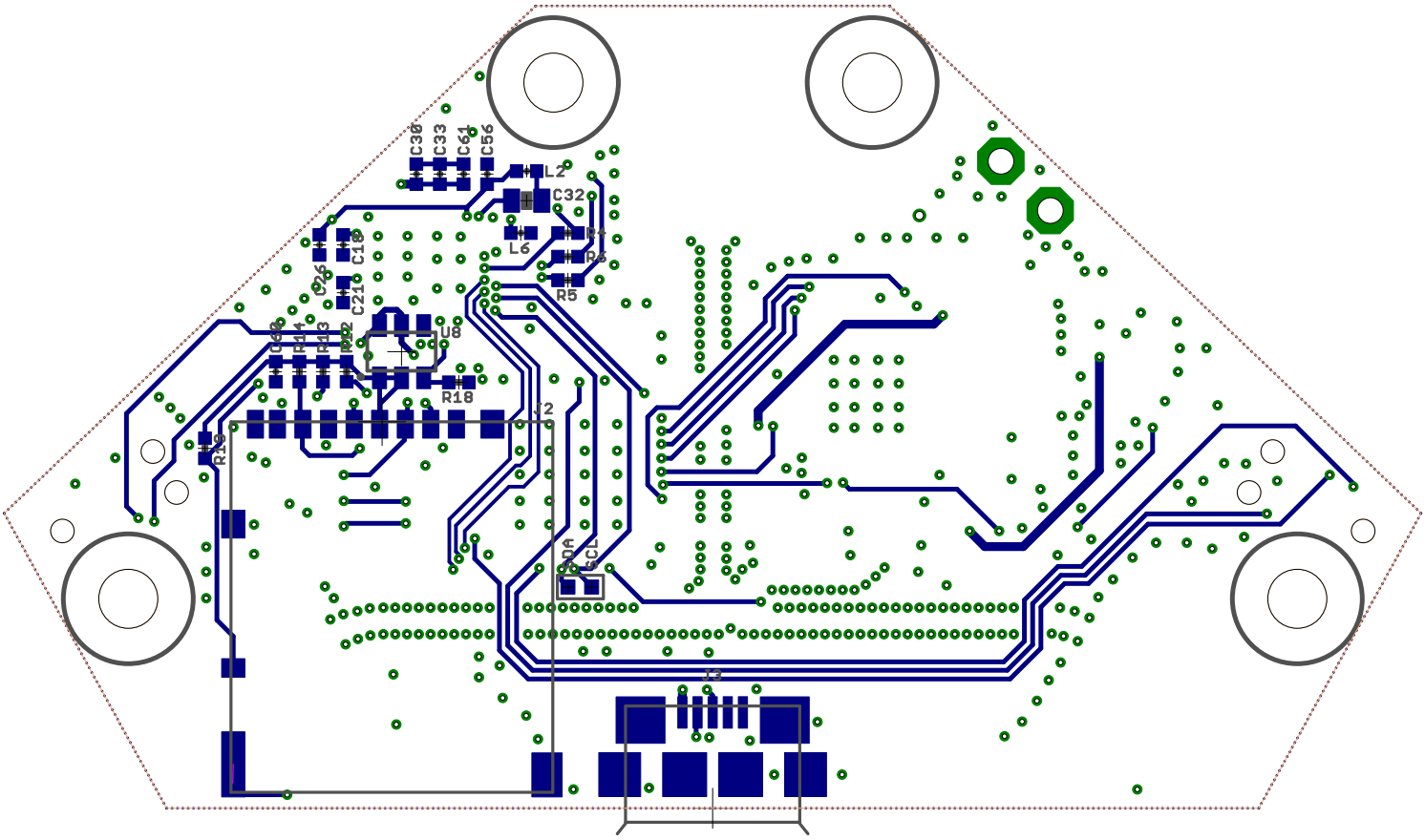
TriTag	REV: C
Author: Andreas Biri	
Date: 23.07.18 13:10	Sheet: 4/4

Top and Bottom Layers

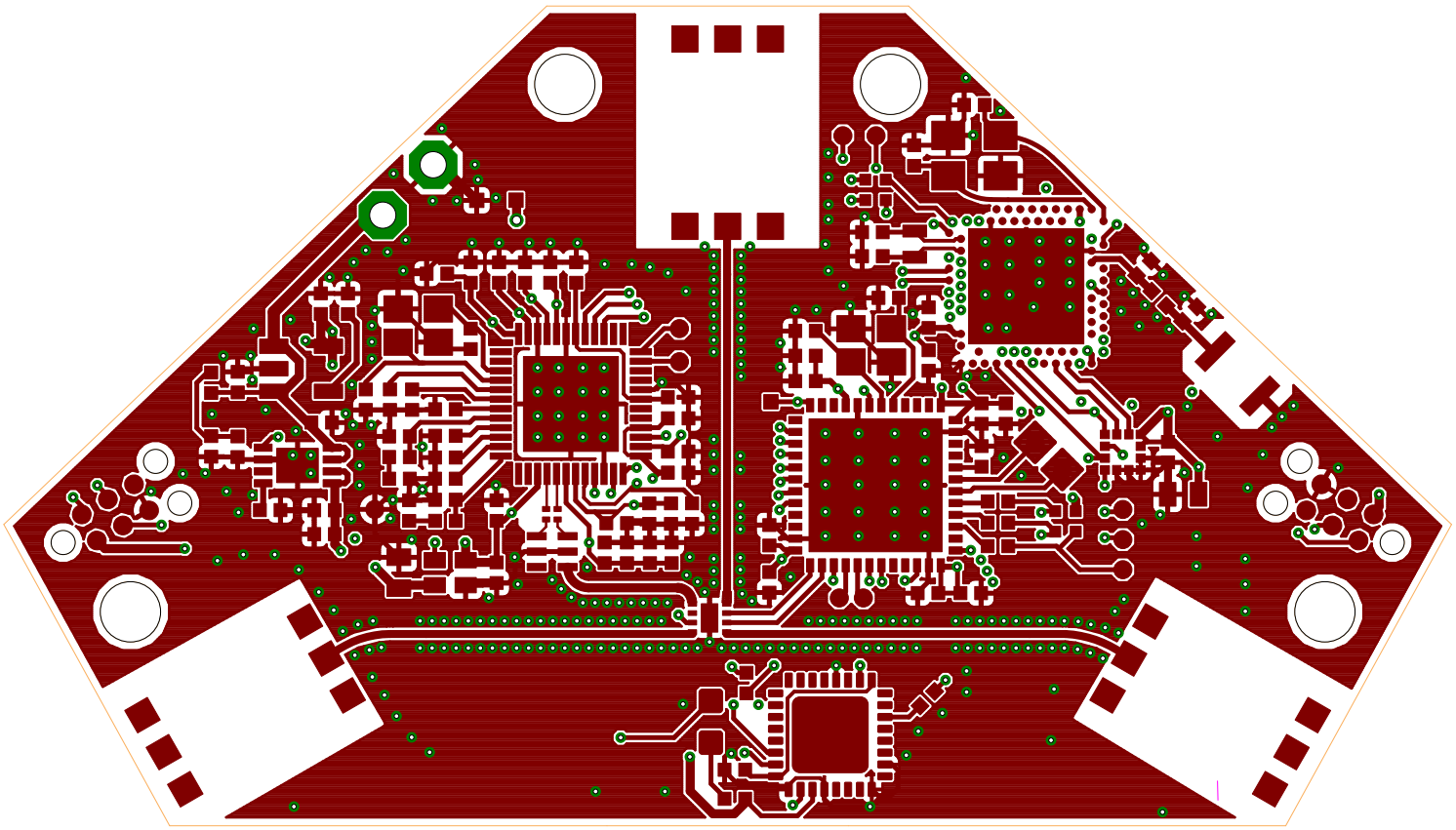



TotTag
Andreas Biri, Pat Pannuto
2018-07-20
SquarePoint V3.1
ETH Cal
STM
DRF
GND
+3V3

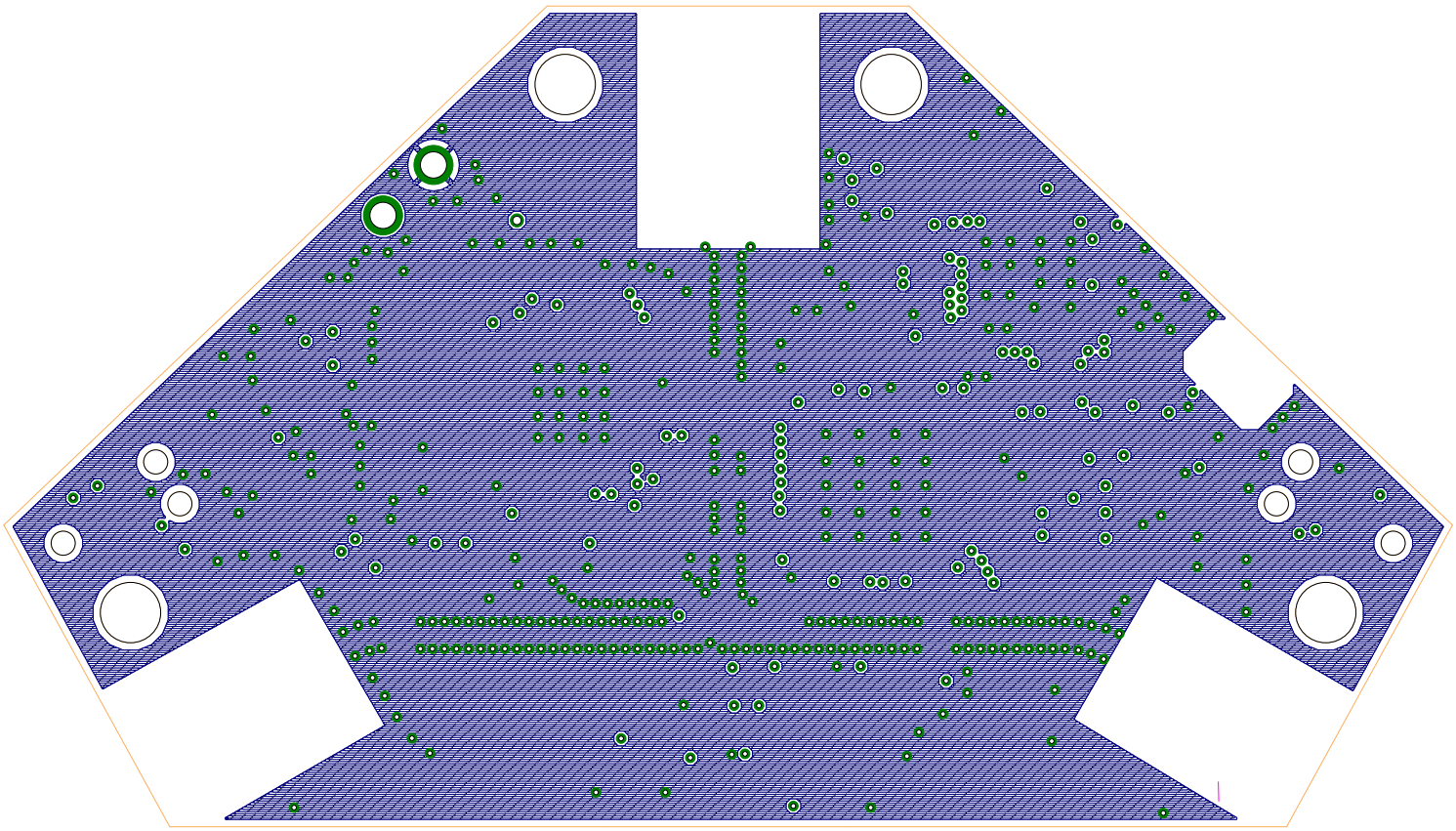
Bottom Layer



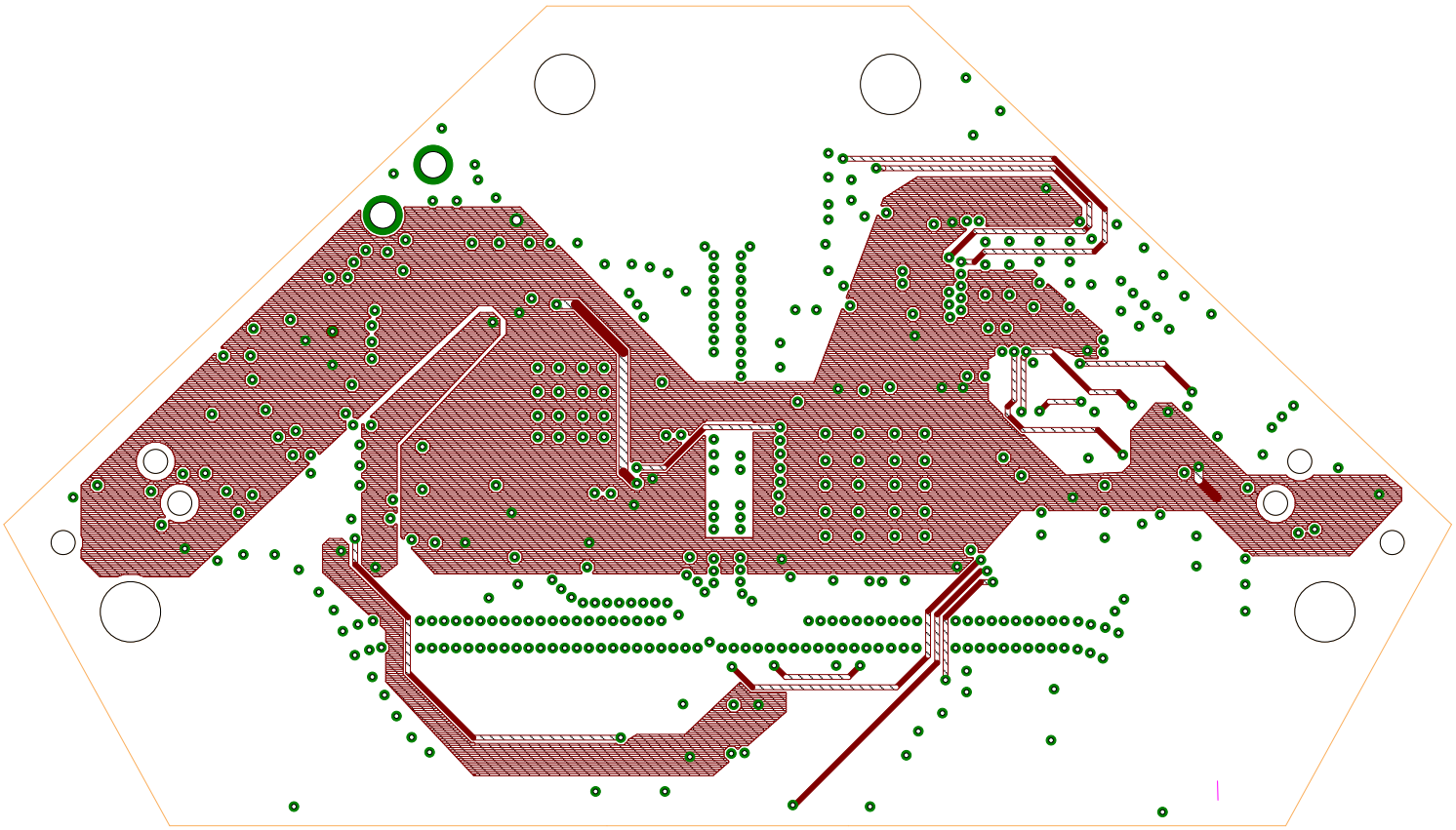
Top Copper Layer



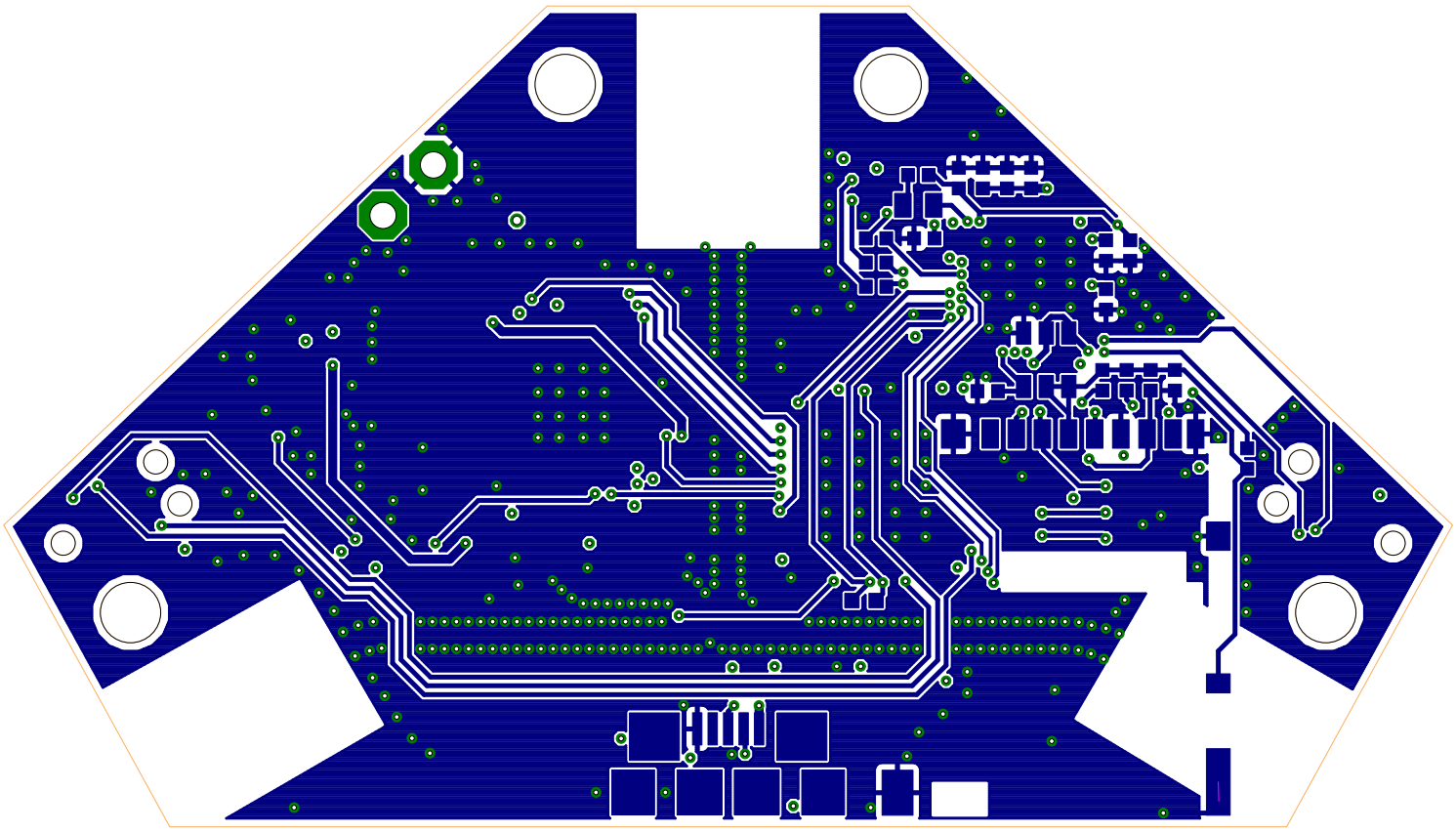
Layer 2 Copper



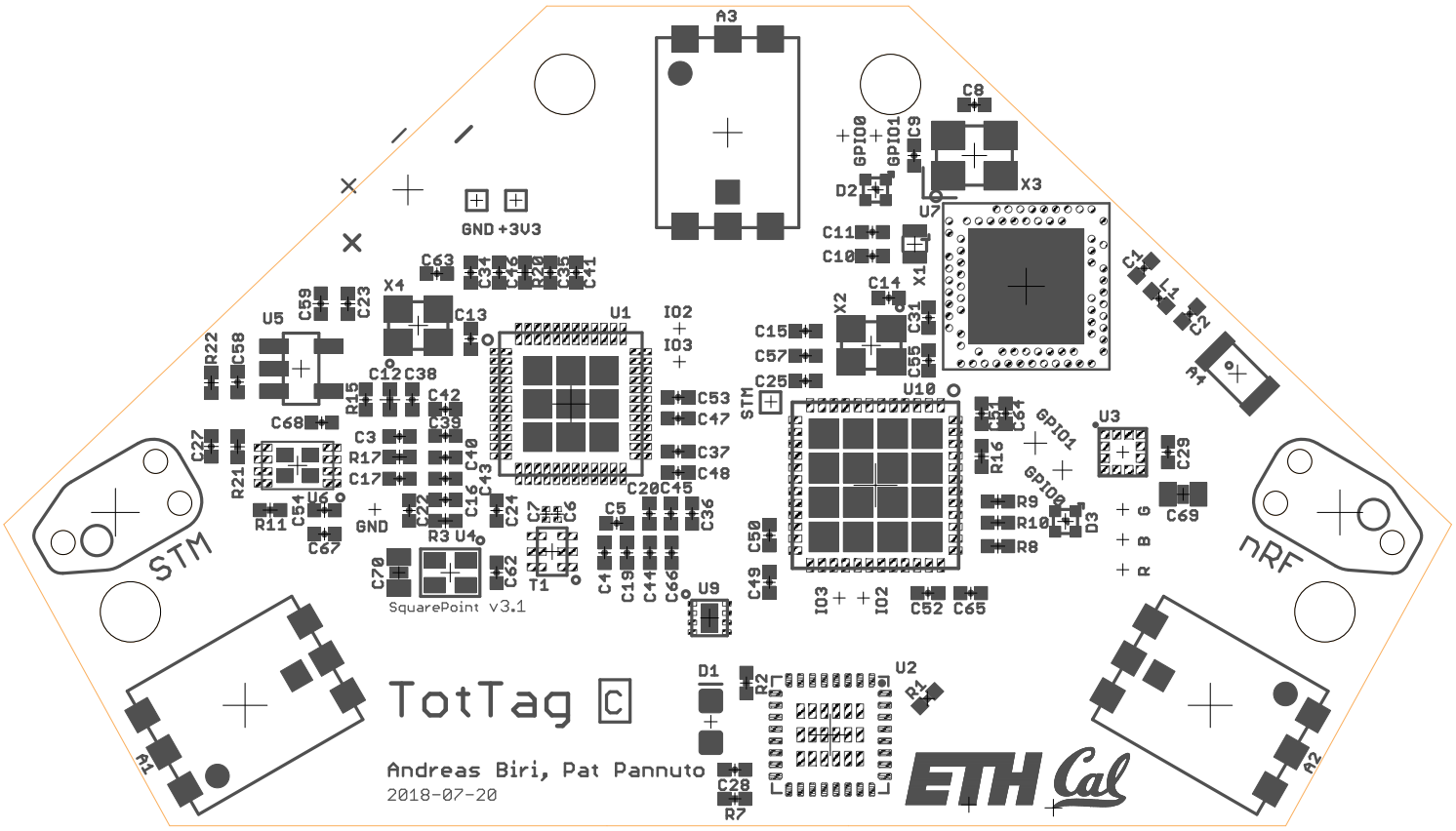
Layer 3 Copper



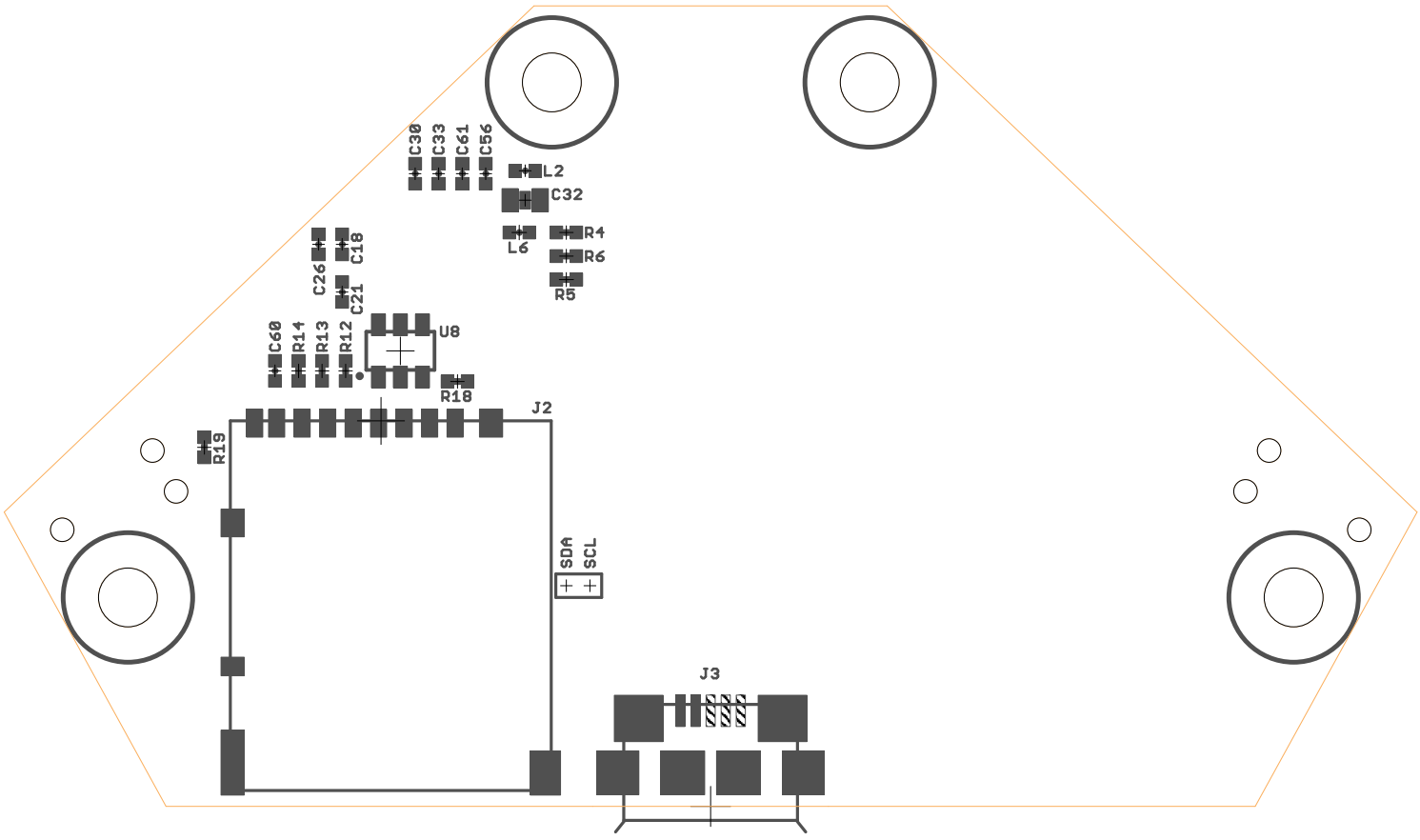
Bottom Copper Layer



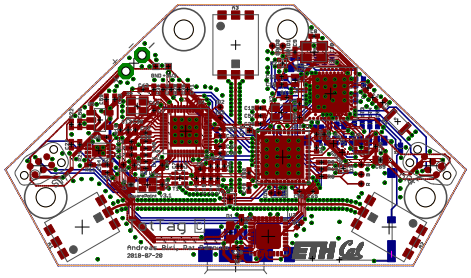
Top Paste Layer with Silkscreen



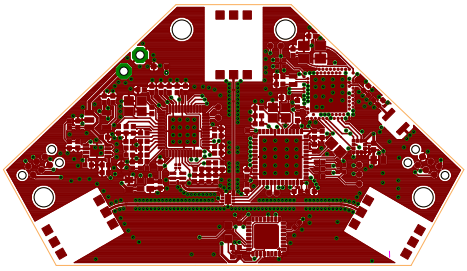
Bottom Paste Layer with Silkscreen



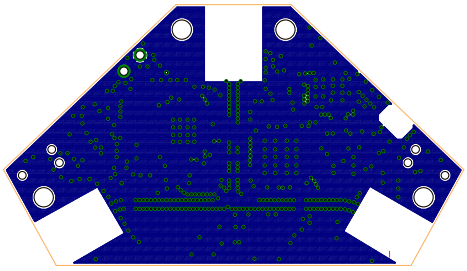
Top and Bottom Layers 1:1 Scale



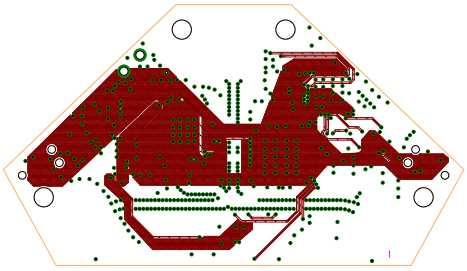
Top Layer 1:1 Scale



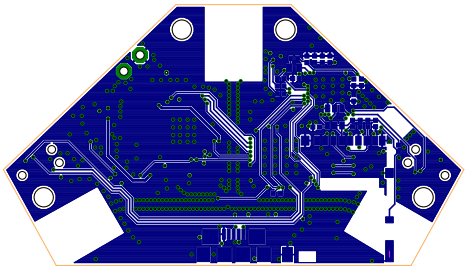
Layer 2 Copper 1:1 Scale



Layer 3 Copper 1:1 Scale



Bottom Copper Layer 1:1 Scale



Qty	Value	Device	Package
3	TAIYO-YUDEN-AH086M	TAIYO-YUDEN-AH086M	TAIYO-YUDEN-AH0
1	ANT3216A063R2400A	ANT3216A063R2400A	ANT3216A063R240
2	1pF	CAPACITOR0402_CAP	0402_CAP
1	1.2pF	CAPACITOR0402_CAP	0402_CAP
2	10pF	CAPACITOR0402_CAP	0402_CAP
2	12pF	CAPACITOR0201_CAP	0201_CAP
8	12pF	CAPACITOR0402_CAP	0402_CAP
1	18pF	CAPACITOR0402_CAP	0402_CAP
1	27pF	CAPACITOR0402_CAP	0402_CAP
1	100pF	CAPACITOR0402_CAP	0402_CAP
2	330pF	CAPACITOR0402_CAP	0402_CAP
2	820pF	CAPACITOR0402_CAP	0402_CAP
3	10nF	CAPACITOR0402_CAP	0402_CAP
1	47nF	CAPACITOR0402_CAP	0402_CAP
27	0.1uF	CAPACITOR0402_CAP	0402_CAP
4	1uF	CAPACITOR0402_CAP	0402_CAP
11	4.7uF	CAPACITOR0402_CAP	0402_CAP
2	10uF	CAPACITOR0603_CAP	0603_CAP
1	GREEN	LED0603	LED-0603
2	SML-LX0404SIUPGUSB	SML-LX0404SIUPGUSB	1MM_SQ_4PAD
1	CON_MICRO_SDDM3AT-SF-PEJM5	CON_MICRO_SDDM3AT-SF-PEJ	DM3AT-SF-PEJM5
1	MICRO_USB_B_HIROSE_ZX62-B-5PA(11)	MICRO_USB_B_HIROSE_ZX62-E	USB_MICRO_B-HIF
1	3.9nH	INDUCTOR0402	0402_CAP
1	15nH	INDUCTOR0402	0402_CAP
1	10uH	INDUCTOR0603	0603_CAP
2	0	RESISTOR0402_RES	0402_RES
1	270	RESISTOR0402_RES	0402_RES
3	470	RESISTOR0402_RES	0402_RES
4	1k	RESISTOR0402_RES	0402_RES
1	2k 1%	RESISTOR0402_RES	0402_RES
3	10k	RESISTOR0402_RES	0402_RES
2	11k 1%	RESISTOR0402_RES	0402_RES
1	16k	RESISTOR0402_RES	0402_RES
3	100k	RESISTOR0402_RES	0402_RES
1	2.2M	RESISTOR0402_RES	0402_RES
1	10M	RESISTOR0402_RES	0402_RES
1	HHM1595A1	HHM1595A1	EIA-0805
1	DW1000	DW1000	QFN-48-DW1000
1	FT232RQ	FT232RQ	QFN32
1	LIS2DW12	LIS2DW12	LGA-12
1	LXDC2HN18A	LXDC2HN18A	LXDC2HN
1	MAX8887EZK33+T	MAX8887EZK33+T	SOT-23-5
1	MCP73831	MCP73831	DFN-8-MCP
1	NRF52840	NRF52840	AQFN73
1	SIP32510	SIP32510	TSOT23-6
1	SKY13317	SKY13317	MLPQ-UT-8
1	STM32F091CC	STM32F091CC	UFQFPN-48
1	32.768kHz	ABS05-32.768KHZ-9-T	ABS05
1	16MHz	FA-20H	FA-20H
1	32MHz	7V-32.000MAHV-T	TXC-7V
1	38.4MHz	FA-20H	FA-20H

Parts	Description	DATASHEET	DESCRIP
A1,A2,A3	UWB Antenna - 3.1-8GHz		
A4	Yageo 2.4GHz		
C1,C2	SMD Capacitor		
C3	SMD Capacitor		
C4,C5	SMD Capacitor		
C6,C7	SMD Capacitor		
C8,C9,C10,C11,C12	SMD Capacitor		
C16	SMD Capacitor		
C17	SMD Capacitor		
C18	SMD Capacitor		
C19,C20	SMD Capacitor		
C21,C22	SMD Capacitor		
C23,C24,C25	SMD Capacitor		
C26	SMD Capacitor		
C27,C28,C29,C30,C	SMD Capacitor		
C54,C55,C56,C57	SMD Capacitor		
C58,C59,C60,C61,C	SMD Capacitor		
C69,C70	SMD Capacitor		
D1	LED (Generic)		
D2,D3	1mm^2 RGB LED		
J2	CONN MICRO SD R/A PUSH-PUSH SMD		
J3	Connector Receptacle USB - micro B 2.0		
L1	A very specific inductor		
L2	A very specific inductor		
L6	A very specific inductor		
R1,R2	Resistor		
R3	Resistor		
R4,R5,R6	Resistor		
R7,R8,R9,R10	Resistor		
R11	Resistor		
R12,R13,R14	Resistor		
R15,R16	Resistor		
R17	Resistor		
R18,R19,R20	Resistor		
R21	Resistor		
R22	Resistor		
T1	Description: Sym	https://produc	XFMR BAI
U1	Description: Th	https://www.de	IC RF TXR
U2	Source: http://www.ftdichip.com/Docume		
U3	ultra low power 3 axis accelerometer		
U4	Description: Sym	https://www.m	DC/DC CC
U5	IC REG LDO 3.3V 0.3A TSOT23-5		
U6	Description: Dev	http://ww1.mi	IC CONTR
U7	ultra-low power 2.4 GHz wireless system		
U8	Load switch, slew rate controlled. By Vish		
U9	Description: Dev	http://www.sk	IC SWITCI
U10	Description: ST	https://www.st	IC MCU 32
X1	32.768kHz Crystal		
X2	Description: Osc	https://suppor	16MHz ±1(
X3	TXC CRYSTAL SMD		
X4	Description: Osc	https://suppor	38.4MHz ±

DIGIKEY	MANUFACTURER
587-2204-1-ND	
311-1542-1-ND	YAGEO
490-3083-1-ND	
490-3085-1-ND	
732-12054-1-ND	
712-1208-1-ND	
490-11190-1-ND	
490-14582-1-ND	
1276-1153-1-ND	
490-5922-1-ND	
311-3768-1-ND	
1276-6989-1-ND	
1276-1057-1-ND	
445-1264-1-ND	
1276-1234-1-ND	
1276-6805-1-ND	
490-14306-1-ND	
490-3896-1-ND	
160-1446-1-ND	
67-2125-1-ND	Lumex Opto
HR1964CT-ND	
H125270CT-ND	
AISC-0402-3N9G-TCT-ND	
587-1521-1-ND	
445-6755-1-ND	
P0.0JCT-ND	
1276-3970-1-ND	
541-4072-1-ND	
541-3240-1-ND	
P2.00KLCT-ND	
P10KJCT-ND	
P11.0KLCT-ND	
YAG5263CT-ND	
541-3960-1-ND	
541-4083-1-ND	
541-4068-1-ND	
445-3387-1-ND	TDK Corporation
1479-1001-1-ND	Decawave Limited
768-1008-1-ND	
497-17718-1-ND	STMicroelectronics
490-12092-1-ND	Murata Electronics North America
MAX8887EZK33+TCT-ND	
MCP73831T-2ACI/MCCT-ND	Microchip Technology
1490-1071-1-ND	NORIDIC SEMICONDUCTOR
SIP32510DT-T1-GE3CT-ND	Vishay
863-1056-1-ND	Skyworks Solutions Inc.
497-15813-ND	STMicroelectronics
535-11897-1-ND	Abracon
SER4201CT-ND	EPSON
887-1913-1-ND	TXC CORPORATION
SER3631CT-ND	EPSON

MF	MOUSER	MPN	NEWARK	OC_FARNELL	OC_NEWARK
		ANT3216A063R2400A			
		GJM1555C1H120FB01D			
		GRM1555C1H101JA01D			
		CL05C821JB5NFNC			
		C1005X7R1C473K050BC			
		GRM188R60J106ME47D			
		LTST-C191KGKT			
		SML-LX0404SIUPGUSB			
		ZX62-B-5PA(33)			
		AISC-0402-3N9G-T			
		HK100515NJ-T			
		MLZ1608N100LT000			
		ERJ-2GE0R00X			
		RC1005F271CS			
	810-HHM1595A1	HHM1595A1			
		DW1000-I-TR13			
		FT232RQ		1146033	91K9919
	511-LIS2DW12TR	LIS2DW12TR			
		LXDC2HN18A-097			
	579-MCP73832T-2ACIMC	MCP73831T-2ACI/MC			
		NRF52840			
		SIP32510DT-T1-GE3			
		SKY13317-373LF			
	511-STM32F091CCU6	STM32F091CCU6			
		FA-20H 16.0000MF10Z-AJ5			
		7M-32.000MAAE-T			

TP_SIGNAL_NAME