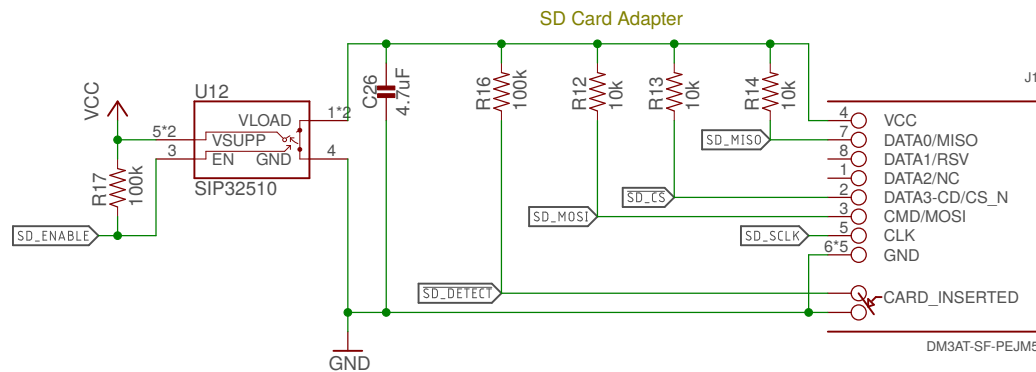
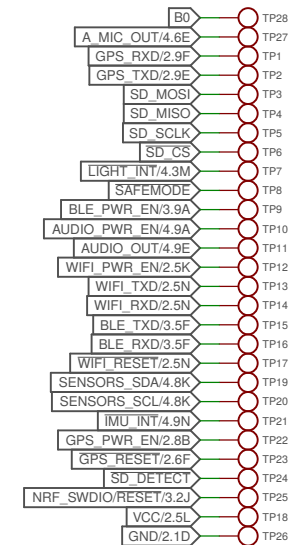
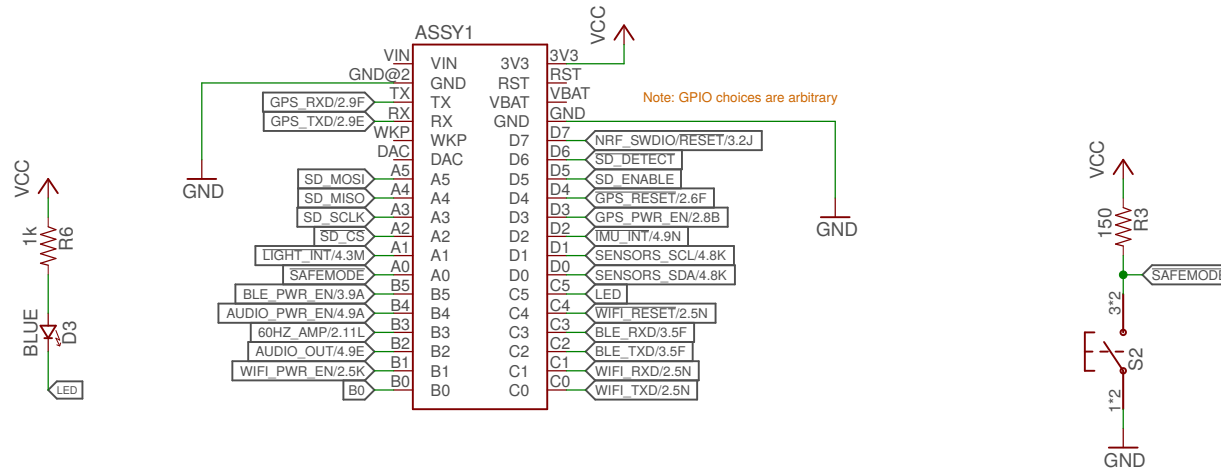


Headers

Electron headers



PlugWatch

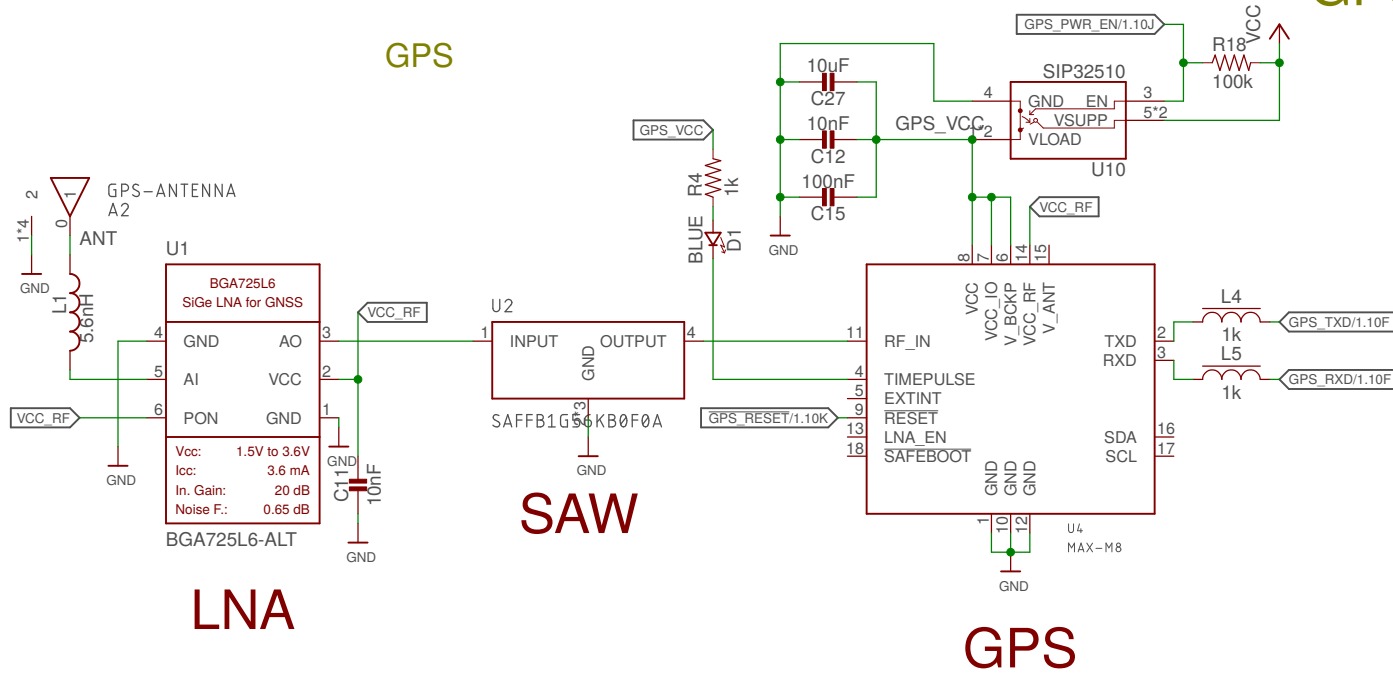
Author: Noah Klugman

Date: 2/21/18 2:12 PM

REV:
C

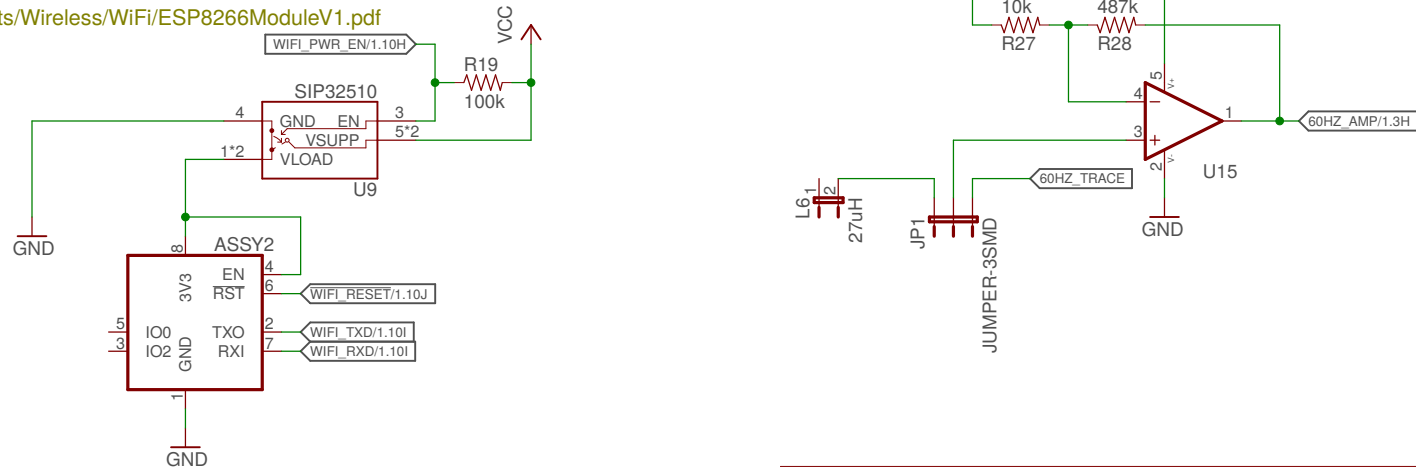
Sheet: 1/4

GPS and WiFi Radios



WiFi

<https://cdn.sparkfun.com/datasheets/Wireless/WiFi/ESP8266ModuleV1.pdf>



PlugWatch

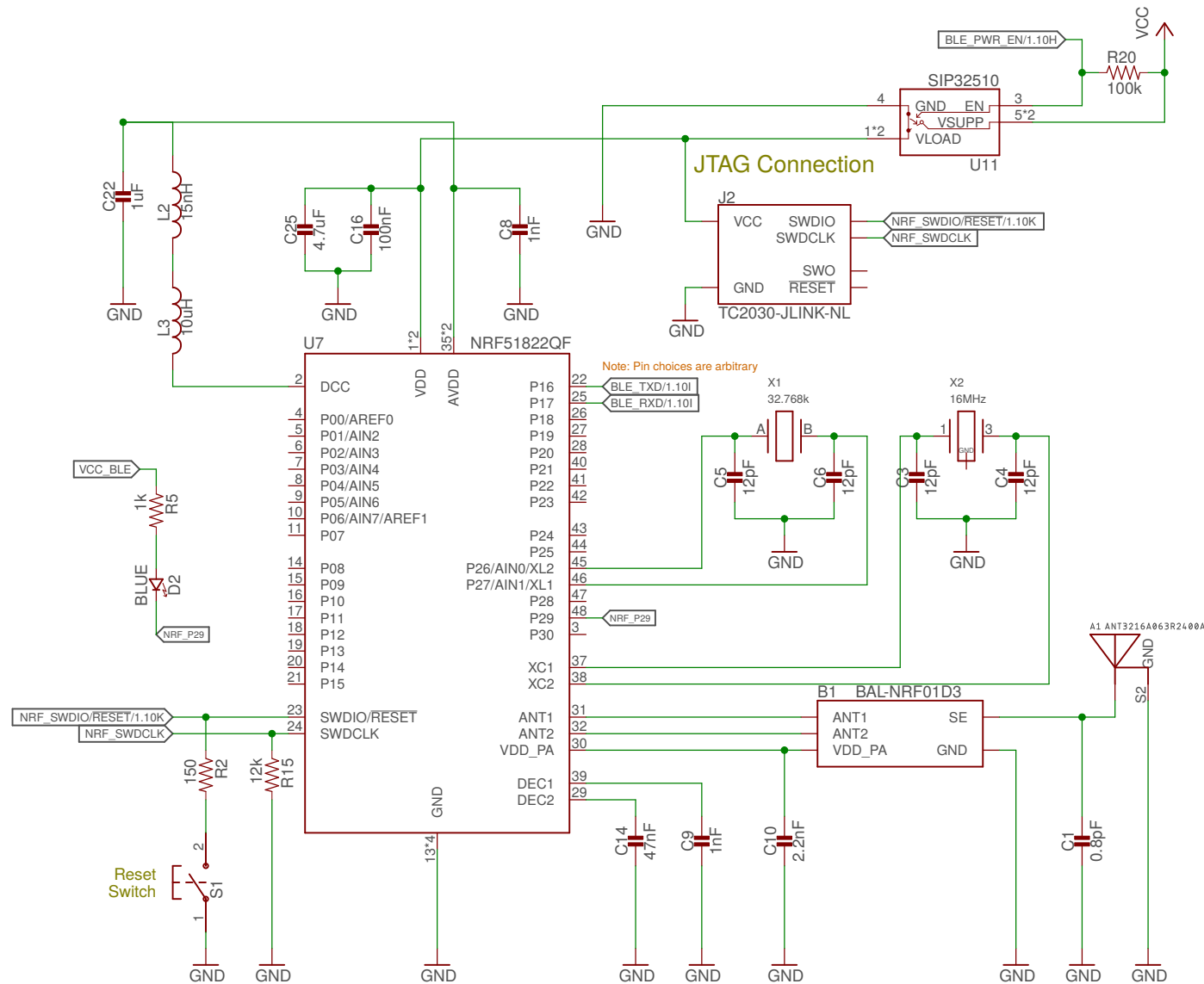
REV:
C

Author: Noah Klugman

Date: 2/21/18 2:12 PM

Sheet: 2/4

BLE Radio



BLE Radio

PlugWatch

Author: Noah Klugman

Date: 2/21/18 2:12 PM

Sheet: 3/4

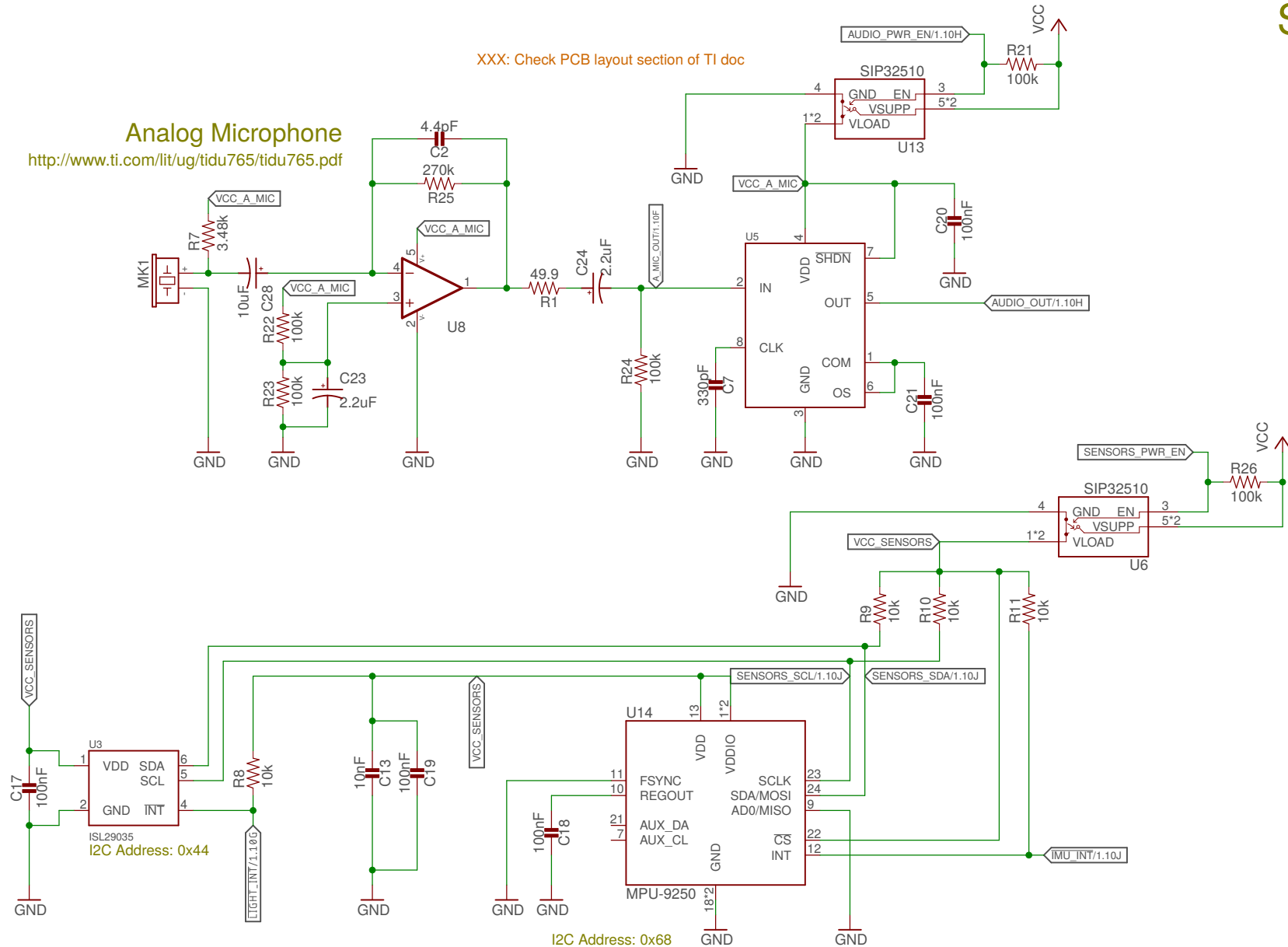
REV:
C

Sensors

XXX: Check PCB layout section of TI doc

Analog Microphone

<http://www.ti.com/lit/ug/tidu765/tidu765.pdf>



Light Sensor

Accelerometer/Magnetometer

PlugWatch

Author: Noah Klugman

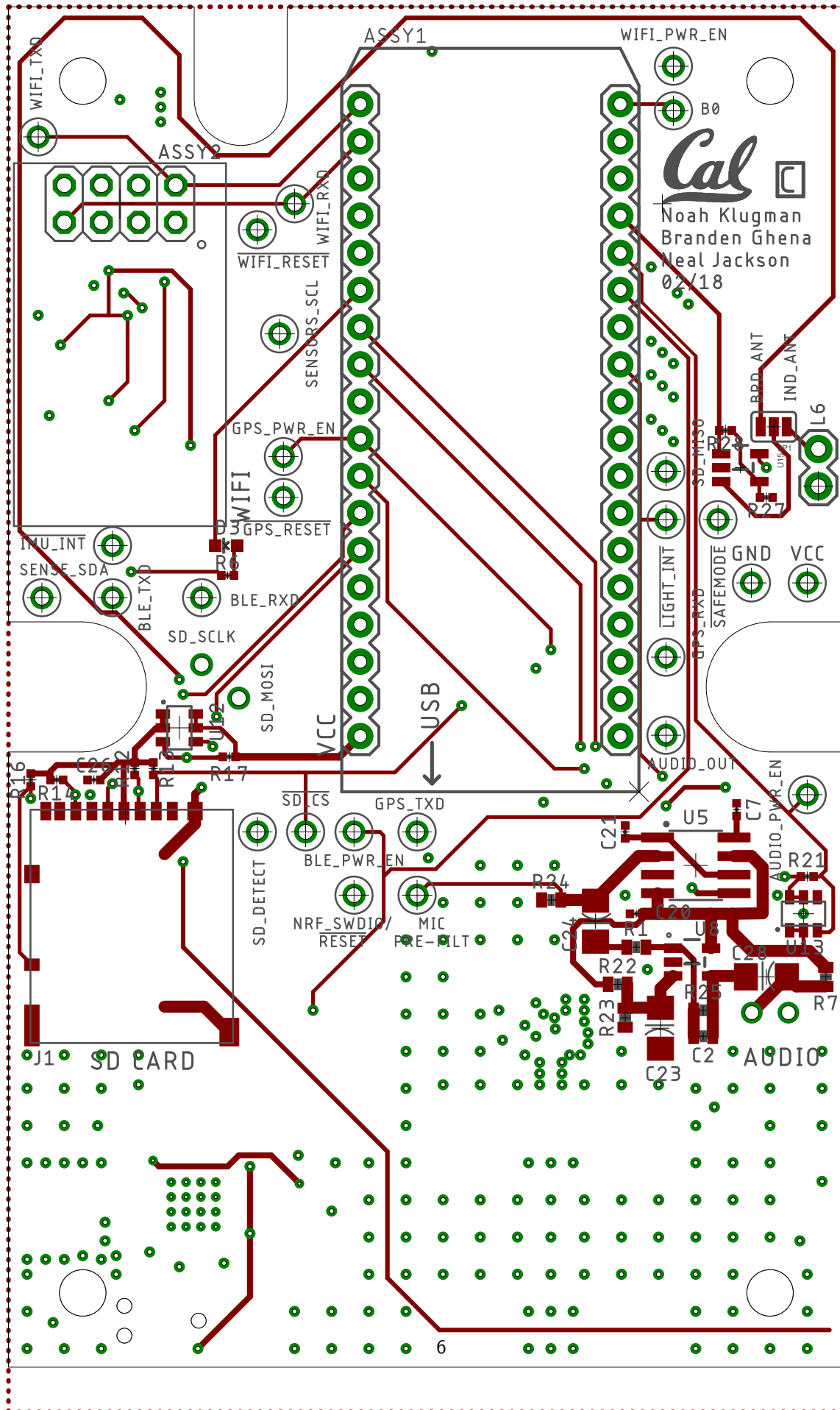
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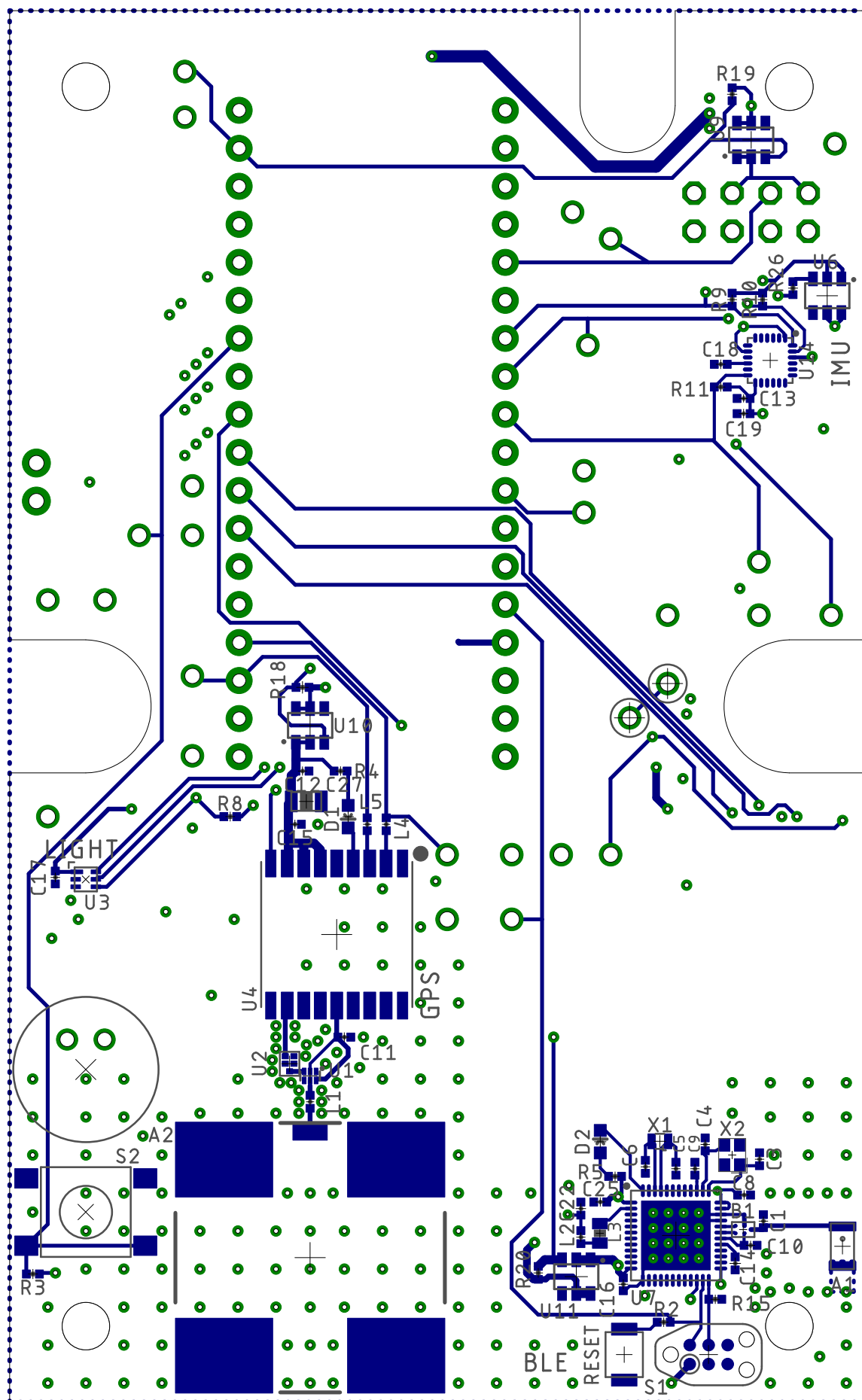
Sheet: 4/4

The image shows a complex PCB layout for a custom board. The top layer features a dense network of traces in red, blue, and yellow, connecting various components. Key components include a microcontroller (U1), memory (U2), and various sensors and connectors. The bottom layer shows the component footprints and pads. The board is labeled with 'Cal' and the names 'Noah Klugman', 'Branden Ghena', and 'Neal Jackson'. The layout includes a USB port, SD card slot, and various digital and analog pins. The board is also labeled with 'ASSY1', 'WIFI_PWR_EN', 'WIFI_TXD', 'WIFI_RXD', 'WIFI_RESET', 'SENSORS_STL', 'GPS_PWR_EN', 'GPS_RESET', 'BLE_TXD', 'BLE_RXD', 'SD_SCLK', 'SD_MOSI', 'SD_CS', 'SD_DETECT', 'GPS_TXD', 'GPS_RXD', 'LIGHT_INT', 'SAFE_MODE', 'GND', 'VCC', 'B0', 'L6', 'R24', 'R22', 'R23', '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', 'R53', 'R54', 'R55', 'R56', 'R57', 'R58', 'R59', 'R60', 'R61', 'R62', 'R63', 'R64', 'R65', 'R66', 'R67', 'R68', 'R69', 'R70', 'R71', 'R72', 'R73', 'R74', 'R75', 'R76', 'R77', 'R78', 'R79', 'R80', 'R81', 'R82', 'R83', 'R84', 'R85', 'R86', 'R87', 'R88', 'R89', 'R90', 'R91', 'R92', 'R93', 'R94', 'R95', 'R96', 'R97', 'R98', 'R99', 'R100', 'R101', 'R102', 'R103', 'R104', 'R105', 'R106', 'R107', 'R108', 'R109', 'R110', 'R111', 'R112', 'R113', 'R114', 'R115', 'R116', 'R117', 'R118', 'R119', 'R120', 'R121', 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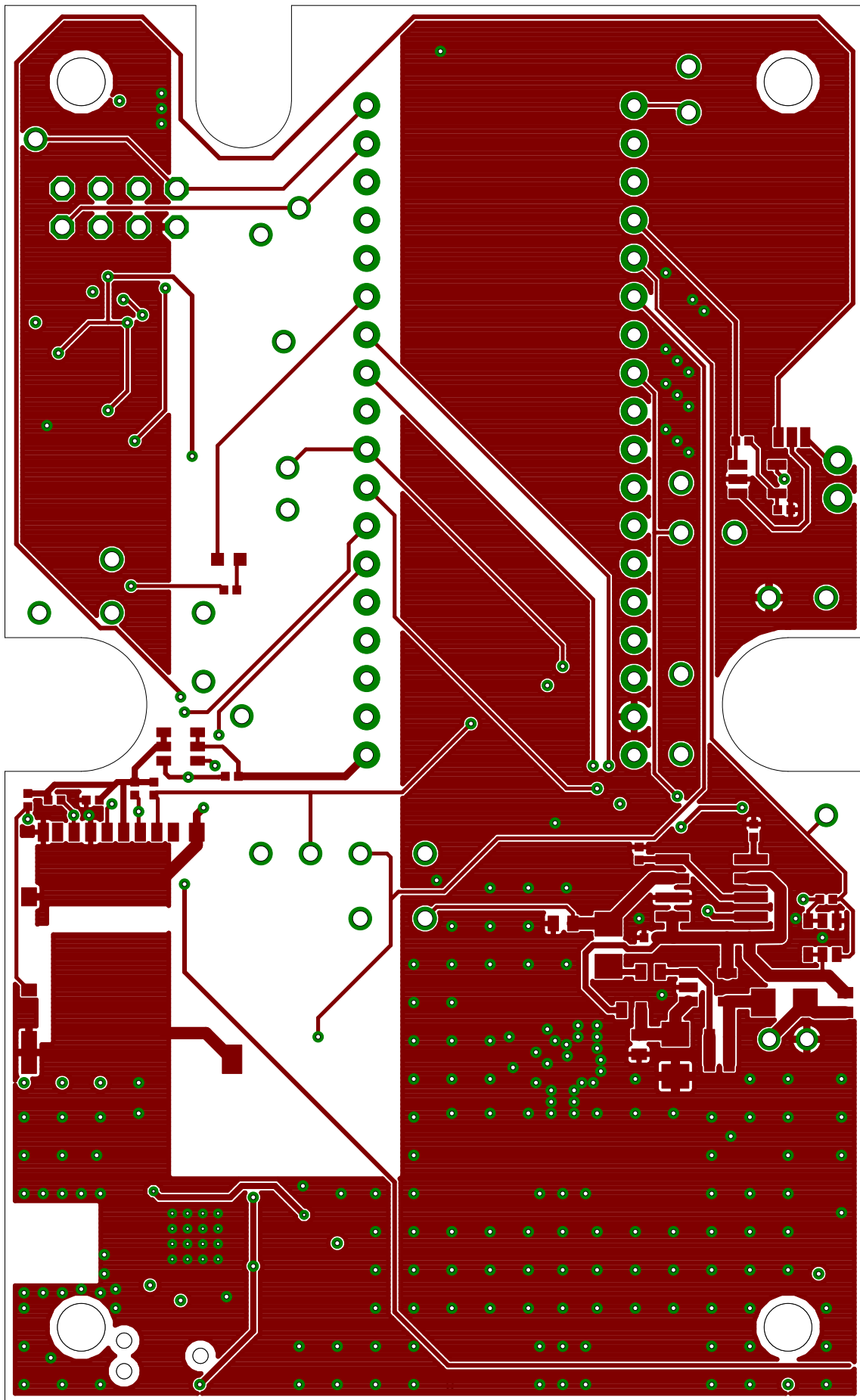
Top Layer



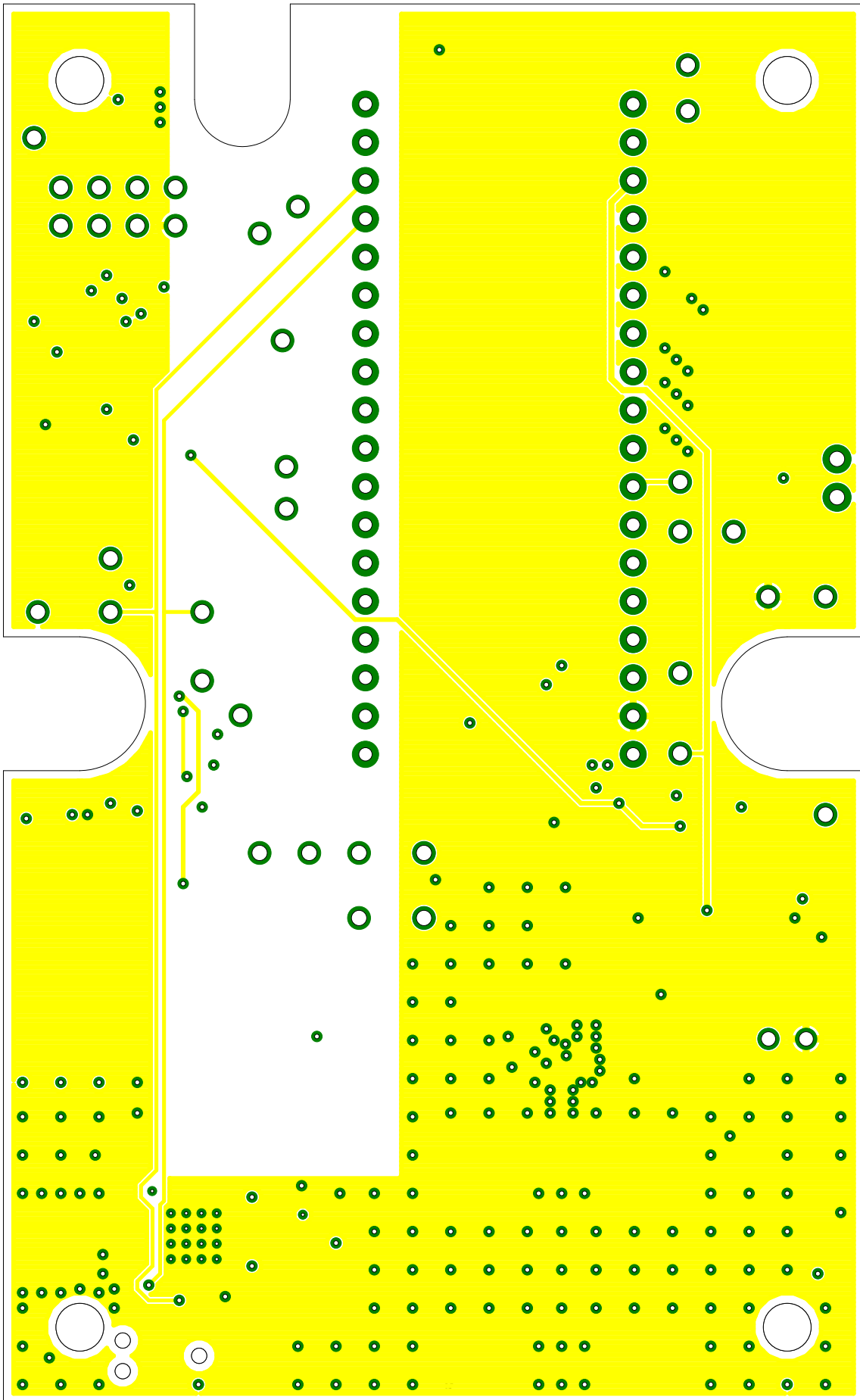
Bottom Layer



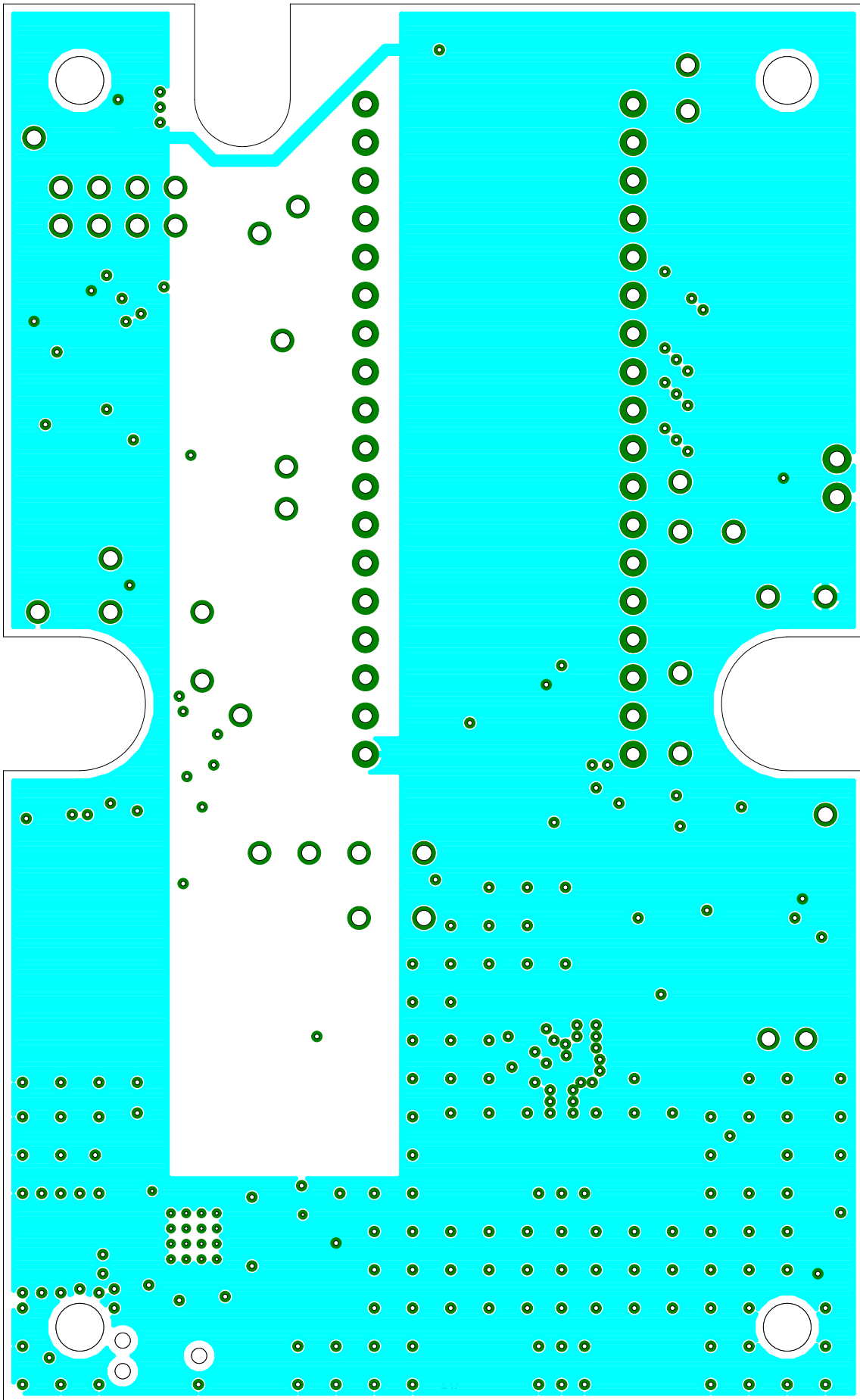
Top Copper Layer



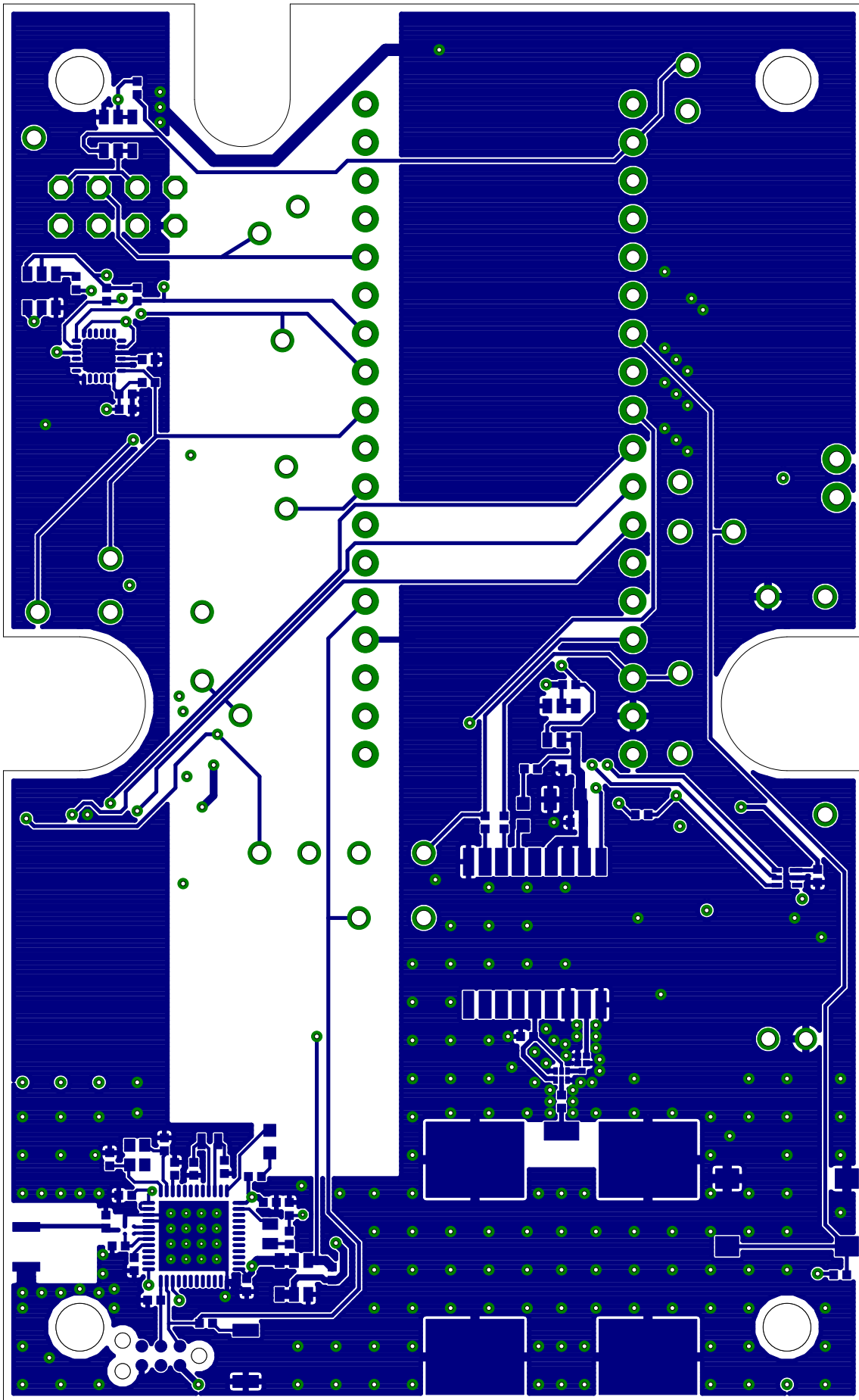
Layer 2 Copper



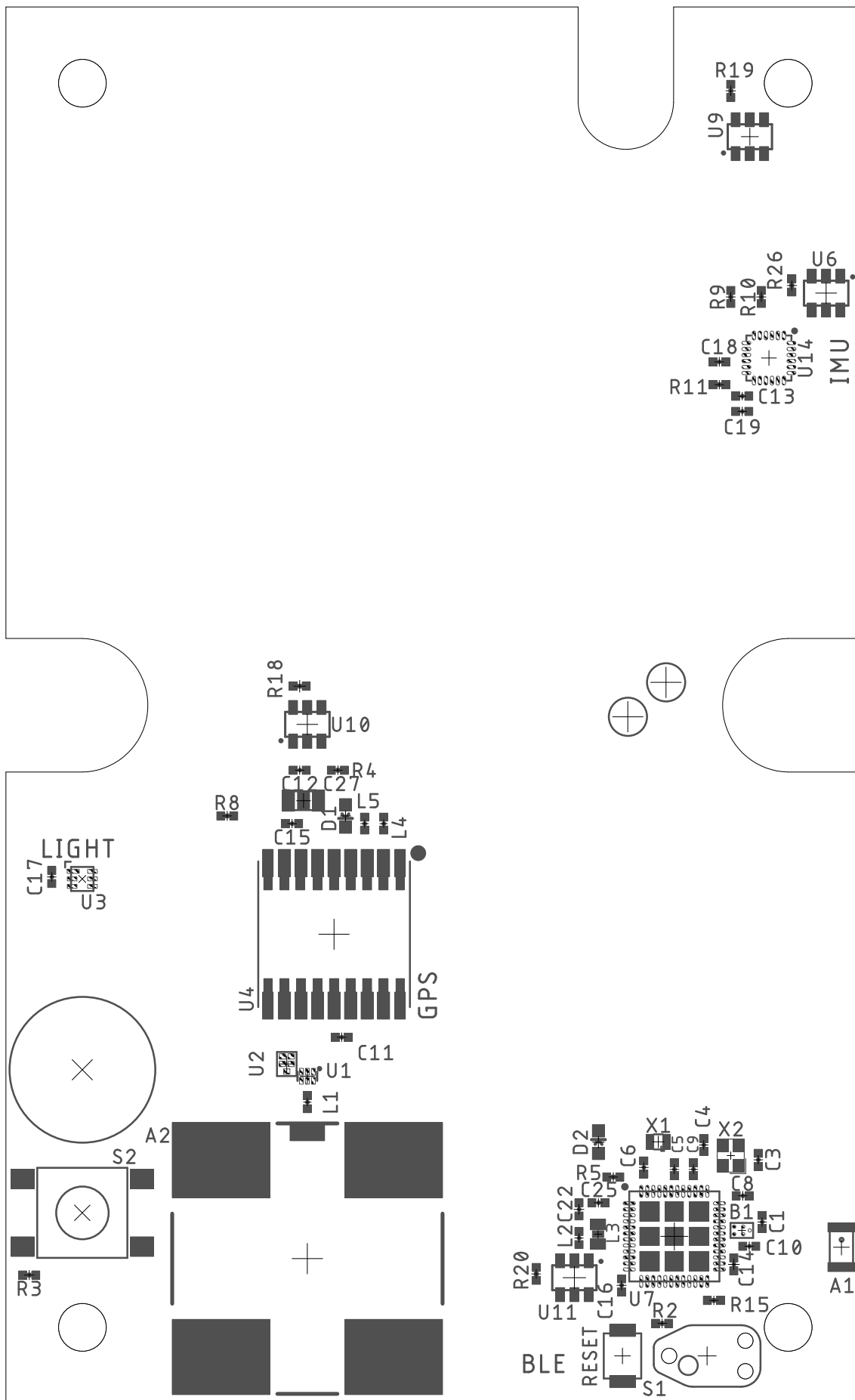
Layer 3 Copper



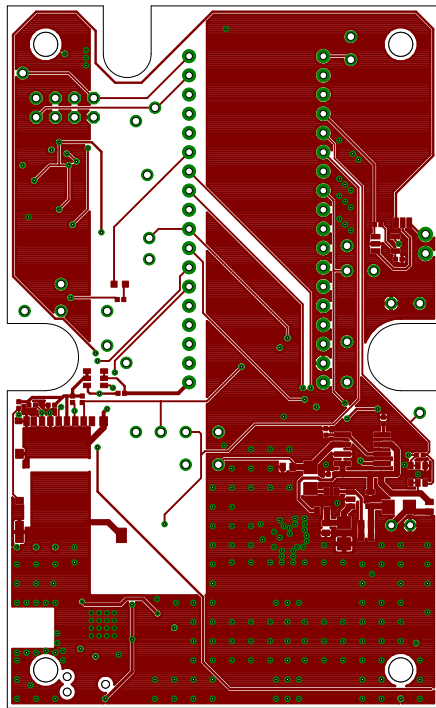
Bottom Copper Layer

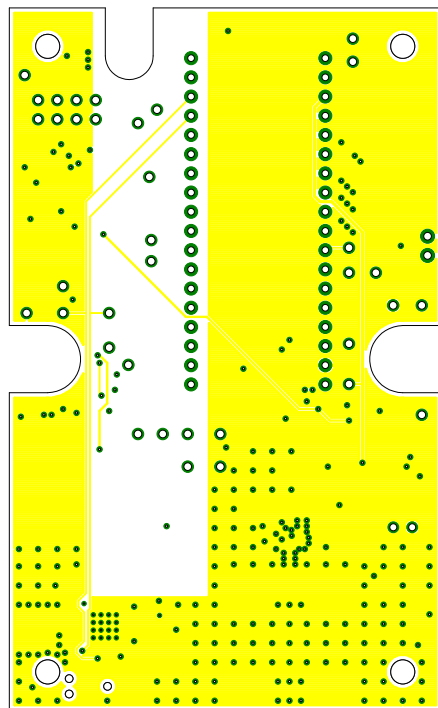


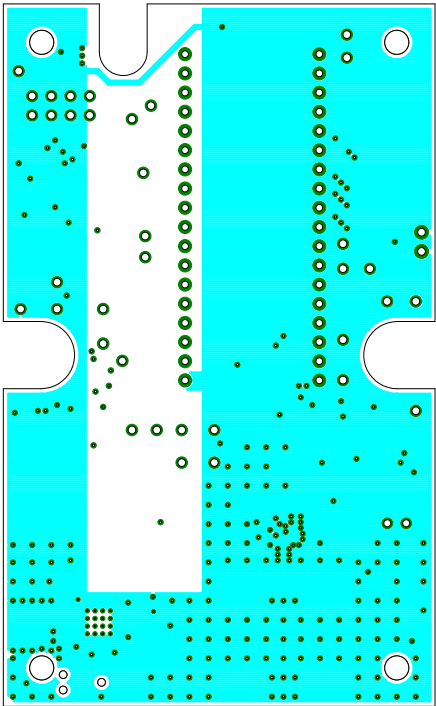
Bottom Paste Layer with Silkscreen



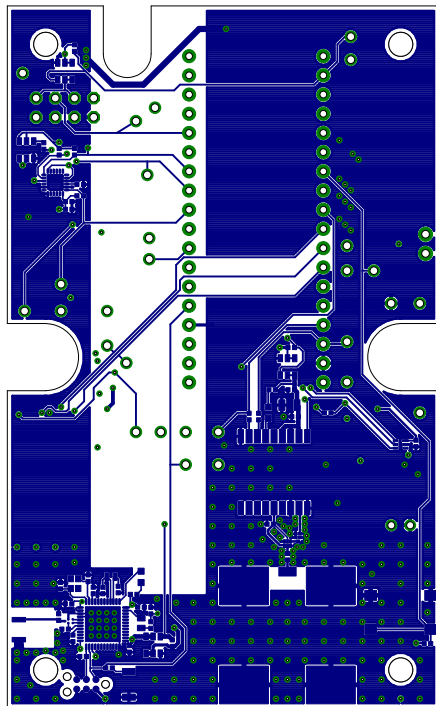
Top Layer 1:1 Scale







Bottom Copper Layer 1:1 Scale



plugwatch_bom

Qty	Value	Device	Package	
1		B3U-1000P	B3U-1000P	
1	0.8pF	CAPACITOR0402_CAP	0402_CAP	
7	100k	RESISTOR0402_RES	0402_RES	
3	100k	RESISTOR0603_RES	0603-RES	
7	100nF	CAPACITOR0402_CAP	0402_CAP	
8	10k	RESISTOR0402_RES	0402_RES	
3	10nF	CAPACITOR0402_CAP	0402_CAP	
1	10uF	CAPACITOR0805_CAP	0805_CAP	
1	10uF	CAP_POL1206		1206
1	10uH	INDUCTOR0603	0603_CAP	
1	12k	RESISTOR0402_RES	0402_RES	
4	12pF	CAPACITOR0402_CAP	0402_CAP	
2		150 RESISTOR0402_RES	0402_RES	
1	15nH	INDUCTOR0402	0402_CAP	
1	16MHz	TXC-8Y	TXC-8Y	
2	1k	FERRITE_BEAD0402	0402_CAP	
3	1k	RESISTOR0402_RES	0402_RES	
2	1nF	CAPACITOR0402_CAP	0402_CAP	
1	1uF	CAPACITOR0402_CAP	0402_CAP	
1	2.2nF	CAPACITOR0402_CAP	0402_CAP	
2	2.2uF	CAP_POL1206		1206
1	270k	RESISTOR0603_RES	0603-RES	
1	27uH	JUMPER-2PTH	1X02	
1	3.48k	RESISTOR0603_RES	0603-RES	
1	32.768k	ABS05-32.768KHZ-9-T	ABS05	
1	330pF	CAPACITOR0402_CAP	0402_CAP	
1	4.4pF	CAPACITOR0603_CAP	0603_CAP	
2	4.7uF	CAPACITOR0402_CAP	0402_CAP	
1	47nF	CAPACITOR0402_CAP	0402_CAP	
1	487k	RESISTOR0402_RES	0402_RES	
1		49.9 RESISTOR0603_RES	0603-RES	
1	5.6nH	INDUCTOR0402	0402_CAP	
1	ANT3216A063R2400A	ANT3216A063R2400A	ANT3216A063R2400A	
1	AOM-4546P-R	AOM-4546P-R	MIC_AOM-4546P-R	
1	BAL-NRF01D3	BAL-NRF01D3	BAL-NRF01D3	
1	BGA725L6-ALT	BGA725L6-ALT	LNA-TSLP-6-2-ALT	
3	BLUE	LED0603	LED-0603	
1	DM3AT-SF-PEJM5	DM3AT-SF-PEJM5	DM3AT-SF-PEJM5	
1	ELECTRON	ELECTRON	ELECTRON_SINGLE-ROW	
1	GPS-ANTENNA	GPS-ANTENNA	ANT1818B00BT1516S	
1	ISL29035	ISL29035	ODFN-6-1.5MMX1.6MM	
1	JUMPER-3SMD	JUMPER-3SMD	SJ_3	
1	MAX-M8	MAX-M8	MAX-M8	
1	MAX740XESA	MAX740XESA	SOIC-8	
1	MPU-9250	MPU-9250	QFN-24/3MM	
1	NRF51822QF	NRF51822QF	QFN-48-6MM	
2	OPA322AIDBVT	OPA322AIDBVT	SOT23-5	
1	PTS645SM43SMTR92	PTS645SM43SMTR92	PTS645	

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1 SAFFB1G56KB0F0A	FILTERS	QCS5I
6 SIP32510	SIP32510	TSOT23-6
1 TC2030-JLINK-NL	TC2030-JLINK-NL	TC2030-IDC-NL
28 TEST_POINT_0.040IN	TEST_POINT_0.040IN	TESTPOINT_0.040IN
1 WRL-13678	WRL-13678	WRL-13678

plugwatch_bom

Parts

DNP

S1
C1
R16, R17, R18, R19, R20, R21, R26
R22, R23, R24
C15, C16, C17, C18, C19, C20, C21
R8, R9, R10, R11, R12, R13, R14, R27
C11, C12, C13
C27
C28
L3
R15
C3, C4, C5, C6
R2, R3
L2
X2
L4, L5
R4, R5, R6
C8, C9
C22
C10
C23, C24
R25
L6
R7
X1
C7
C2
C25, C26
C14
R28
R1
L1
A1
MK1
B1
U1
D1, D2, D3
J1
ASSY1
A2
U3
JP1
U4
U5
U14
U7
U8, U15
S2

DNP

plugwatch_bom

U2

U6, U9, U10, U11, U12, U13

J2

DNP

TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TPDNP

ASSY2

plugwatch_bom

Description	DESCRIPTION
Switch	
0402 Capacitor	CAP CER 0.8PF 50V C0G/NP0 0402
Resistor	RES SMD 100K OHM 1% 1/16W 0402
Resistor	RES SMD 100K OHM 1% 1/10W 0603
0402 Capacitor	CAP CER 0.1UF 10V X7R 0402
Resistor	RES SMD 10K OHM 1% 1/16W 0402
0402 Capacitor	CAP CER 10000PF 50V X7R 0402
0402 Capacitor	CAP CER 10UF 10V X7R 0805
	CAP TANT 10UF 20V 10% 1206
A very specific inductor	FIXED IND 10UH 50MA 900 MOHM SMD
Resistor	RES SMD 12K OHM 1% 1/16W 0402
0402 Capacitor	CAP CER 12PF 50V C0G/NP0 0402
Resistor	RES SMD 150 OHM 1% 1/16W 0402
A very specific inductor	FIXED IND 15NH 320MA 460 MOHM
2mmx1.6mm SMD Crystal	CRYSTAL 16.0000MHZ 8PF SMD
	FERRITE BEAD 1 KOHM 0402 1LN
Resistor	RES SMD 1K OHM 1% 1/16W 0402
0402 Capacitor	CAP CER 1000PF 100V 10% X7R 0402
0402 Capacitor	CAP CER 1UF 10V X7S 0402
0402 Capacitor	CAP CER 2200PF 25V 10% X7R 0402
	CAP TANT 2.2UF 16V 10% 1206
Resistor	RES SMD 270K OHM 1% 1/10W 0603
Jumper	
Resistor	RES SMD 3.48K OHM 1% 1/10W 0603
32.768kHz Crystal	
0402 Capacitor	CAP CER 330PF 50V C0G/NP0 0402
0402 Capacitor	CAP CER RF 4.4PF 50V +/-0.1 PF C
0402 Capacitor	CAP CER 4.7UF 6.3V X5R 0402
0402 Capacitor	CAP CER 0.047UF 16V X7R 0402
Resistor	RES 487K OHM 1/16W 1% 0402 SMD
Resistor	RES SMD 49.9 OHM 1% 1/10W 0603
A very specific inductor	FIXED IND 5.6NH 1.77A 40 MOHM
Yageo 2.4GHz	
Electret microphone	
50 ohm nominal input / conjugate match balun to nRF51422-QFAA,	IC AMP MMIC RF LNA 20DB TSLP-6
LED	
CONN MICRO SD R/A PUSH-PUSH SMD	2 Headers per ASSY1
	PATCH ANT GPS/GLO CP SMD
Optical Sensor Ambient 550nm I2C	
	IC RECEIVER GPS/GNSS 18LCC
GYRO/ACCEL/COMPASS/9-AXIS	
Multiprotocol Bluetooth® 4.0 low energy/2.4 GHz RF SoC	
Tactile Switch SPST-NO Top Actuated Surface Mount	

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Load switch, slew rate controlled. By Vishay

0.040in Test Point
ESP8266 WiFi Module

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DIGIKEY	DIGIKEY2	MANUFACTURER	MOUSER
SW1020CT-ND		Omron	
490-6269-1-ND		Murata	
1276-3432-1-ND		Samsung	
541-2972-1-ND		Vishay	
490-10777-1-ND		Murata	
RMCF0402FT10K0CT-ND		Stackpole Electronics	
490-7763-1-ND		Murata	
490-8316-1-ND		Murata	
478-8481-1-ND		AVX	
490-4025-1-ND		Murata	
RMCF0402FT12K0CT-ND		Stackpole Electronics	
490-6197-1-ND		Murata	
RMCF0402FT150RCT-ND		Stackpole Electronics	
587-1521-1-ND		Taiyo Yuden	
887-2003-1-ND		TXC	
490-4003-1-ND		Murata	
RMCF0402FT1K00CT-ND		Stackpole Electronics	
490-6366-1-ND		Murata	
490-14457-1-ND		Murata	
490-5419-1-ND		Murata	
718-1131-1-ND		Vishay	
541-270KHCT-ND		Vishay	
445-173093-ND		TDK	
541-3.48KHCT-ND		Vishay	
535-11897-1-ND		Abracon	
490-6233-1-ND		Murata	
399-16187-1-ND		KEMET	
445-5947-1-ND		TDK	
490-11420-1-ND		Murata	
YAG2372CT-ND		Yageo	
541-3003-1-ND		Vishay	
490-11766-1-ND		Murata	
311-1542-1-ND		YAGEO	
668-1224-ND		PUI Audio	
497-13637-1-ND		STMicroelectronics	511-BAL-NRF01D3
BGA725L6E6327FTSA1CT-ND		Infineon	
160-1837-6-ND		Lite-On	
HR1964CT-ND		Hirose	
S7051-ND	S7051-ND	Sullins	
311-1531-ND		Yageo	
ISL29035IROZ-T7CT-ND		Intersil	
672-1003-1-ND		u-blox	
MAX7405ESA+-ND		Maxim Integrated	
1428-1019-1-ND		TDK Invensense	
1490-1049-1-ND		Nordic Semi	949-NRF51822-QFAC-R7
296-29511-1-ND		Texas Instruments	
CKN9112CT-ND		C&K	

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587-3990-1-ND
SIP32510DT-T1-GE3CT-ND

Taiyo Yuden
Vishay

5001K-ND
1568-1235-ND

Sparkfun

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MPN ROCHESTER_ELECTRONICS

B3U-1000P
GRM1555C1HR80BA01D
RC1005F104CS
CRCW0603100KFKEB
GRM155R71A104JA01D
RMCF0402FT10K0
GRM155R71H103JA88D
GRM21BR71A106ME51L
F951D106KSAAQ2
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MAX-M8Q-0
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MPU-9250
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plugwatch_bom

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WRL-13678