

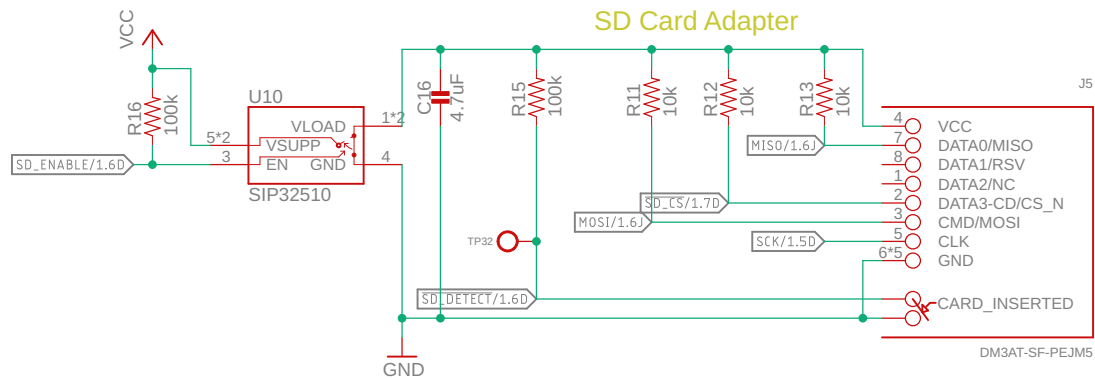
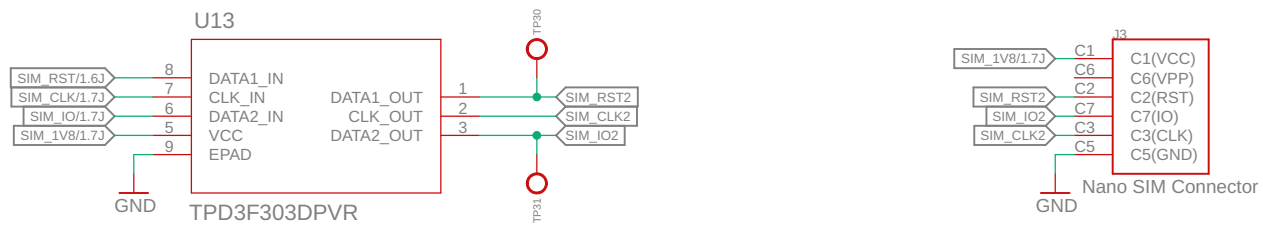
The schematic diagram illustrates the NRF9160 module, which is a LoRaWAN module. It features a main board and an RTC (Real-Time Clock) sub-board.

Main Board Components:

- U5: NRF9160** - The main module, showing various pins and their connections.
- U4: BGA725L6** - A SiGe LNA for GNSS, connected to the GPS pin of U5.
- U3: TC2030-JLINK-NL** - A JTAG/SWD interface, connected to the MAGPIO0, MAGPIO1, and MAGPIO2 pins of U5.
- Antenna (ANT1)** - A 1462350001 antenna connected to the ANT pin of U5.
- Power Regulation:** VCC, GND, and VBAT pins are connected to a power source. A 10k resistor (R10) is connected to VCC. A 4.7uF capacitor (C13) is connected to GND.
- GPIOs:** Various pins are connected to external components like LEDs (LED_RED/5.8C, LED_GREEN/5.8D), switches (S1), and other modules (U1, U2, U3, U4, U5, U6, U7, U8, U9, U10, U11, U12, U13, U14, U15, U16, U17, U18, U19, U20, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, U31, U32, U33, U34, U35, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U46, U47, U48, U49, U50, U51, U52, U53, U54, U55, U56, U57, U58, U59, U60, U61, U62, U63, U64, U65, U66, U67, U68, U69, U70, U71, U72, U73, U74, U75, U76, U77, U78, U79, U80, U81, U82, U83, U84, U85, U86, U87, U88, U89, U90, U91, U92, U93, U94, U95, U96, U97, U98, U99, U100).

RTC Sub-board Components:

- U1: AB1815-T3** - The RTC module, showing various pins and their connections.
- Power Regulation:** VCC, GND, and VBAT pins are connected to a power source. A 10k resistor (R9) is connected to VCC. A 4.7uF capacitor (C10) is connected to GND.
- GPIOs:** Various pins are connected to external components like LEDs (LED_RED/5.8C, LED_GREEN/5.8D), switches (S1), and other modules (U1, U2, U3, U4, U5, U6, U7, U8, U9, U10, U11, U12, U13, U14, U15, U16, U17, U18, U19, U20, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, U31, U32, U33, U34, U35, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U46, U47, U48, U49, U50, U51, U52, U53, U54, U55, U56, U57, U58, U59, U60, U61, U62, U63, U64, U65, U66, U67, U68, U69, U70, U71, U72, U73, U74, U75, U76, U77, U78, U79, U80, U81, U82, U83, U84, U85, U86, U87, U88, U89, U90, U91, U92, U93, U94, U95, U96, U97, U98, U99, U100).



PERMAMOTE_LTE

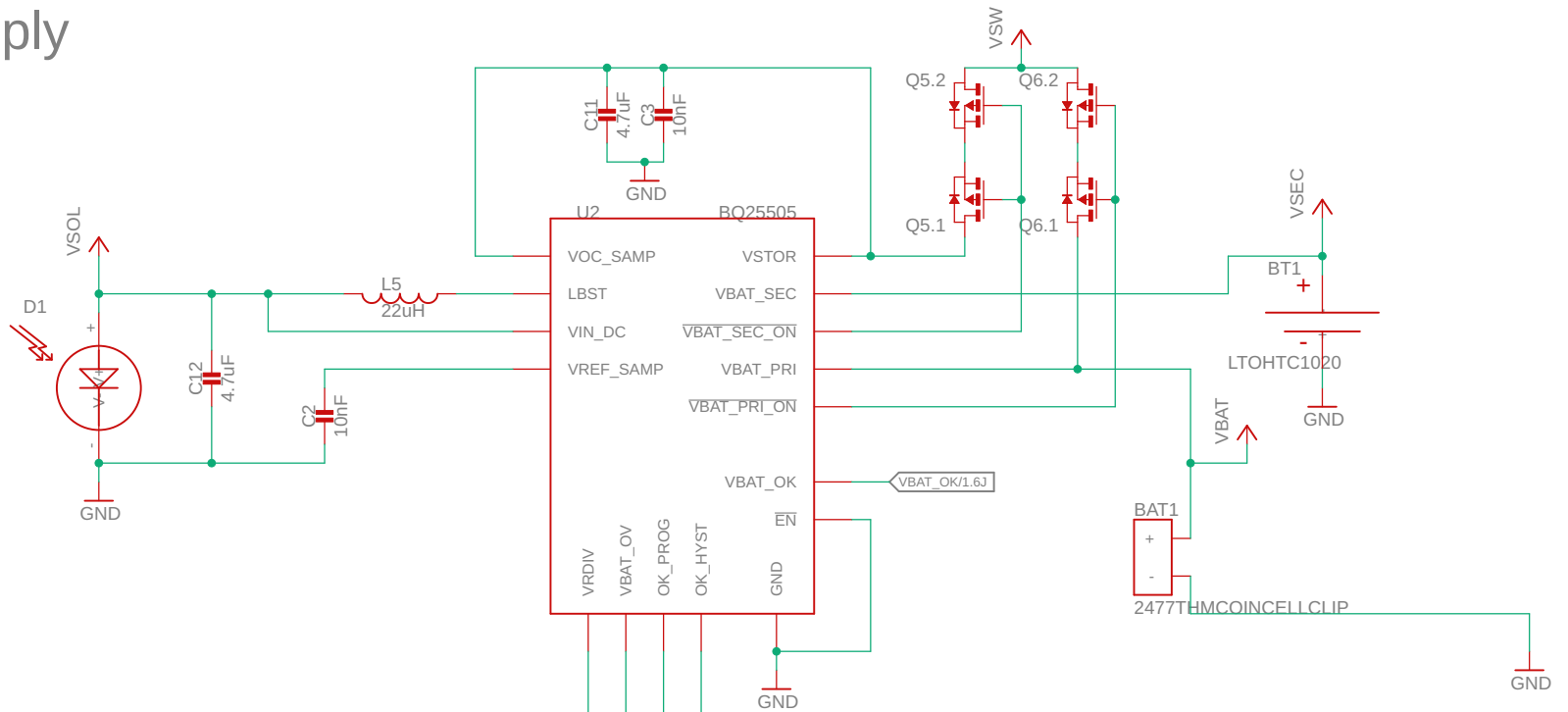
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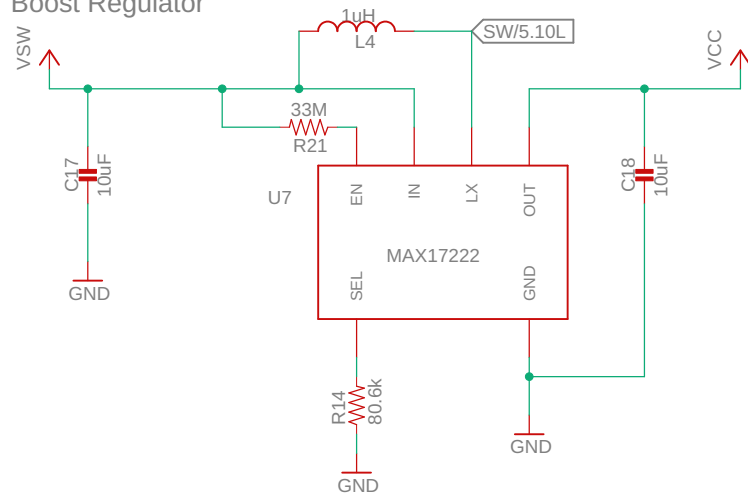
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Power Supply

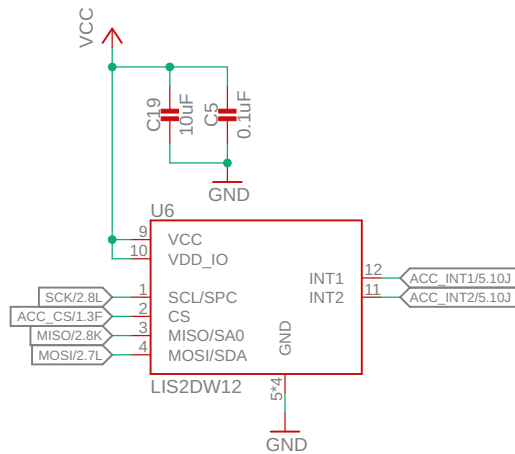


Boost Regulator

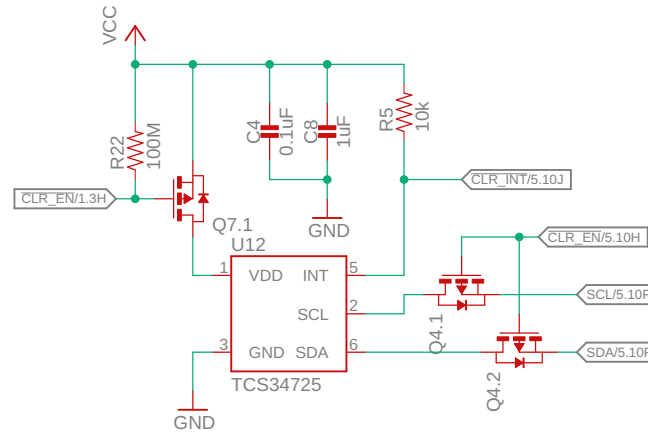


Sensors

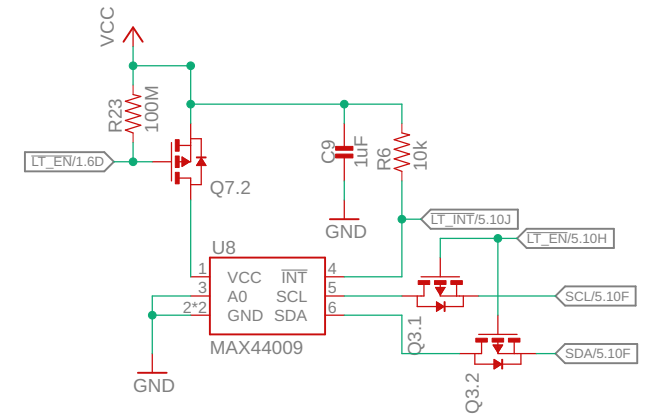
Accelerometer



Light Color

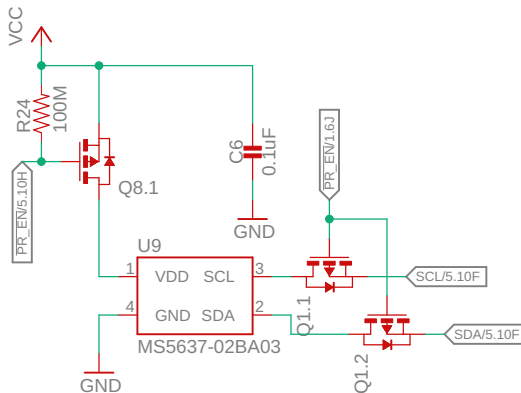


Light Ambient Light

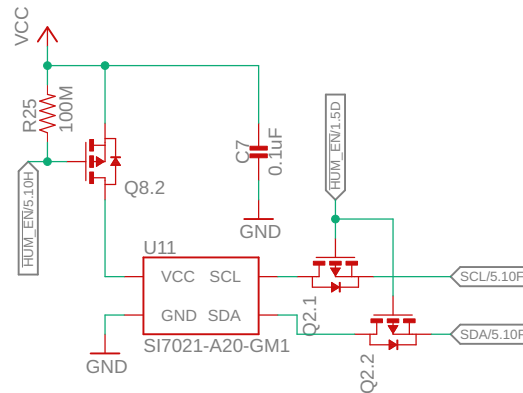


Temperature

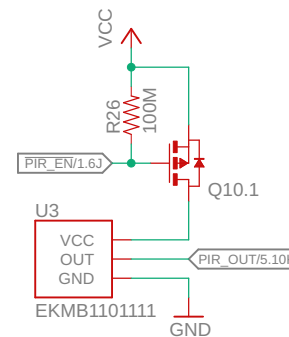
Pressure



Humidity



Occupancy



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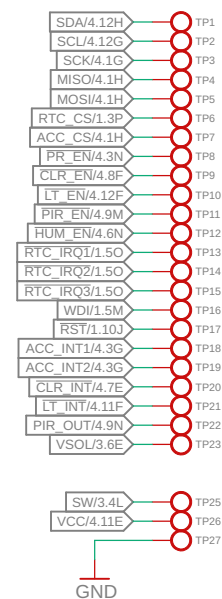
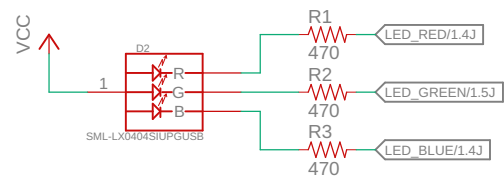
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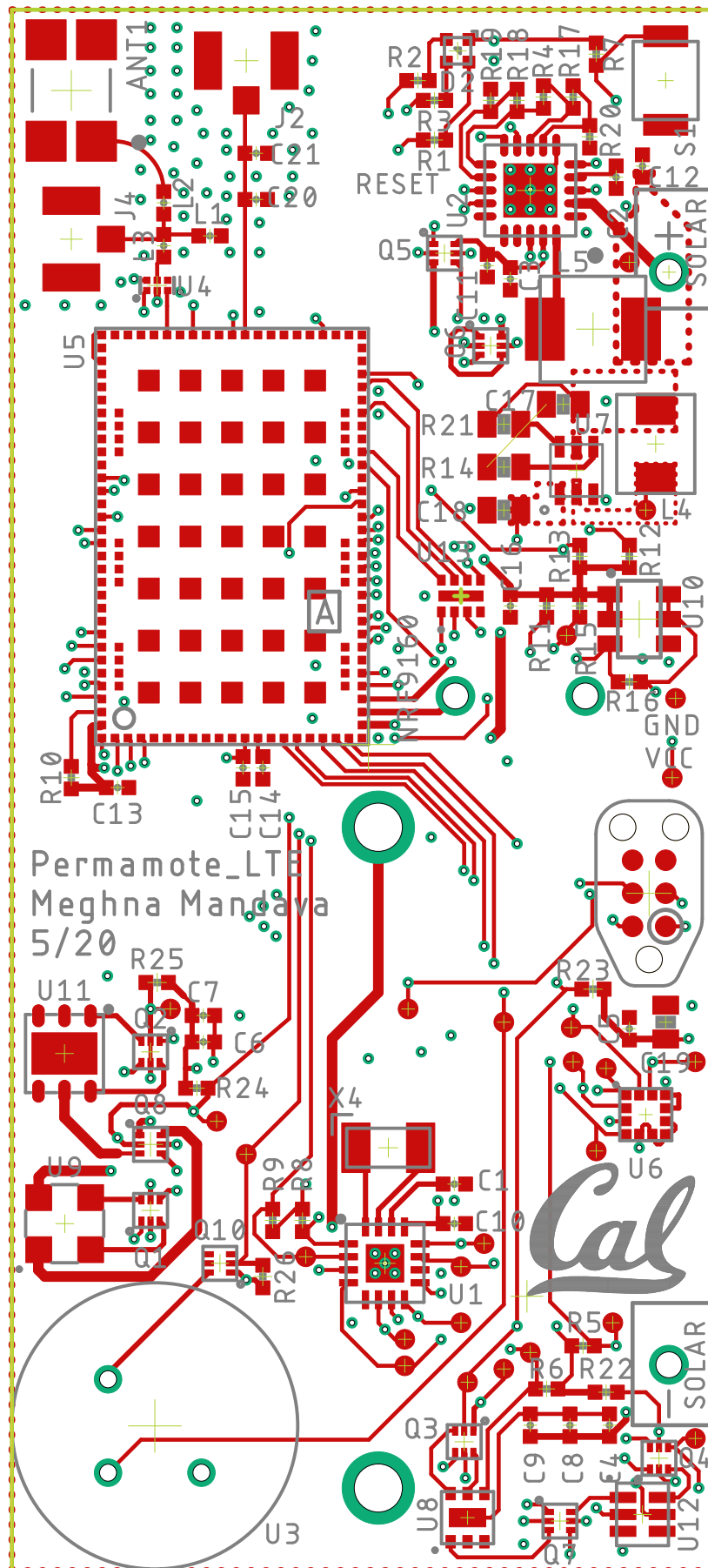
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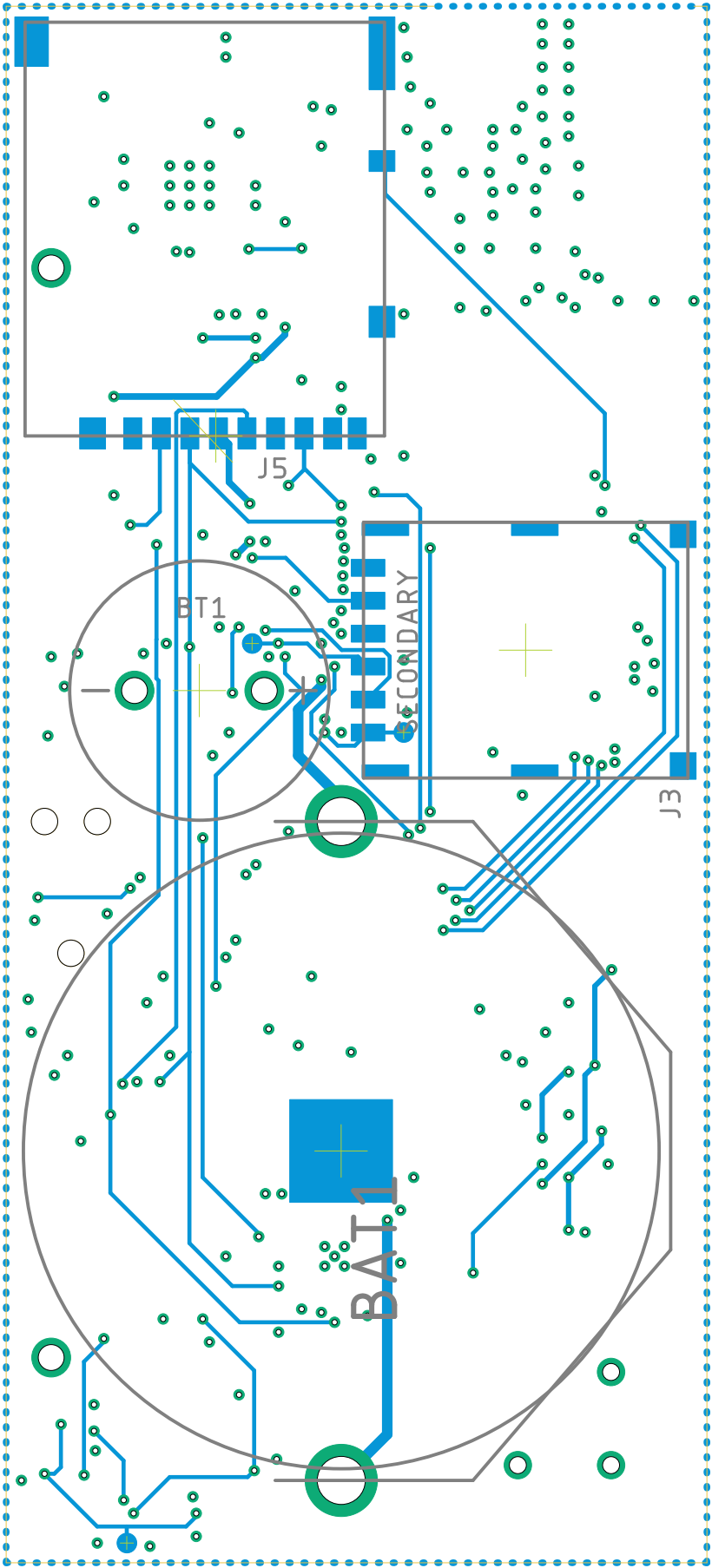
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Debugging

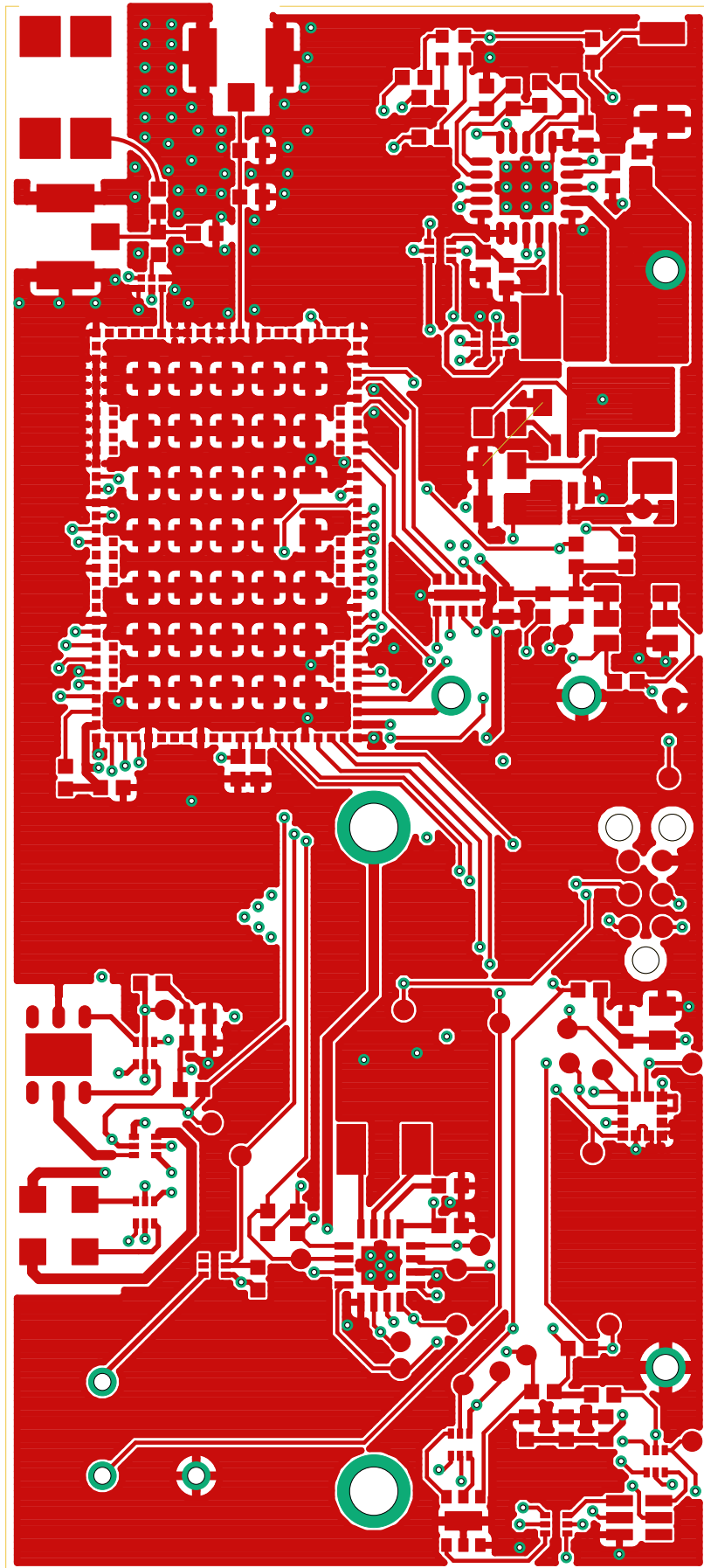




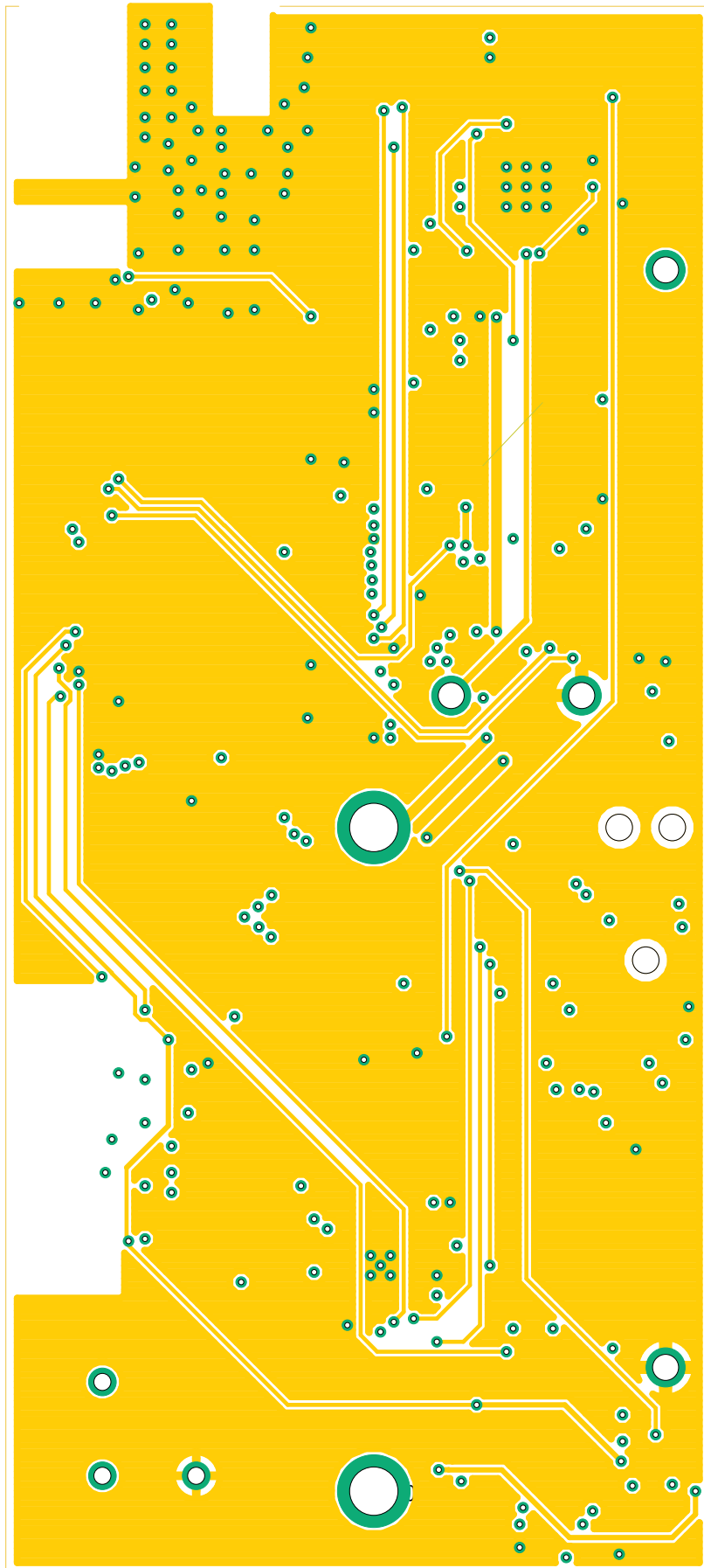
Bottom Layer



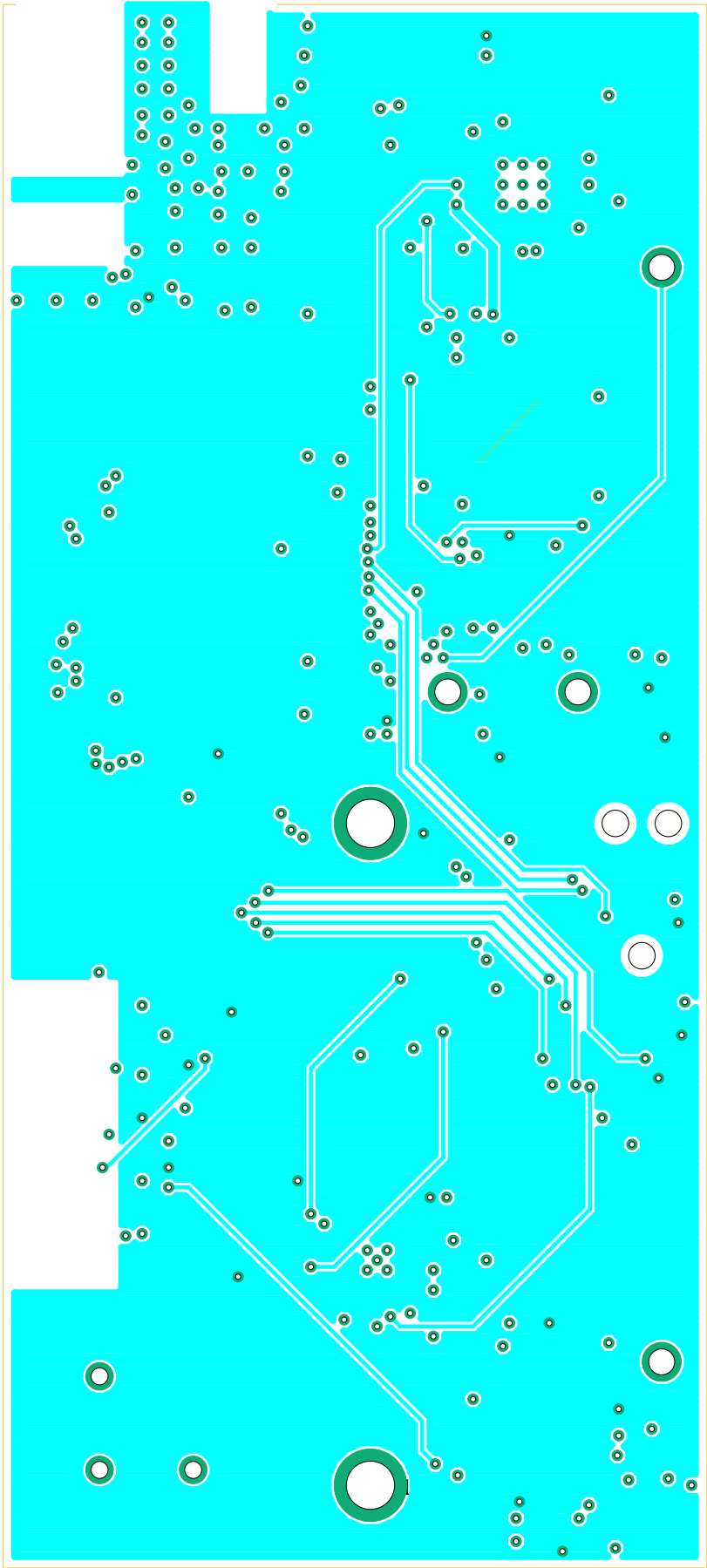
Top Copper Layer



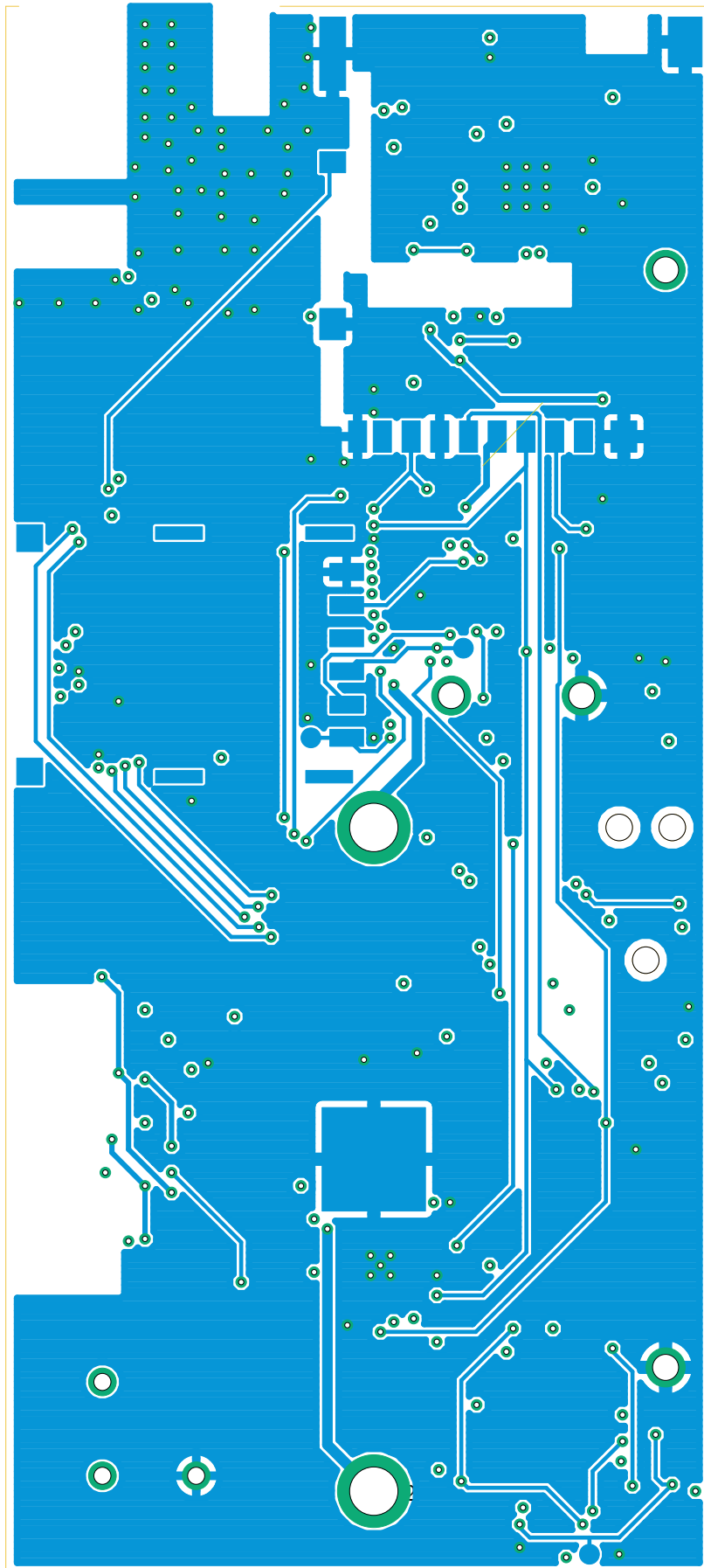
Layer 2 Copper

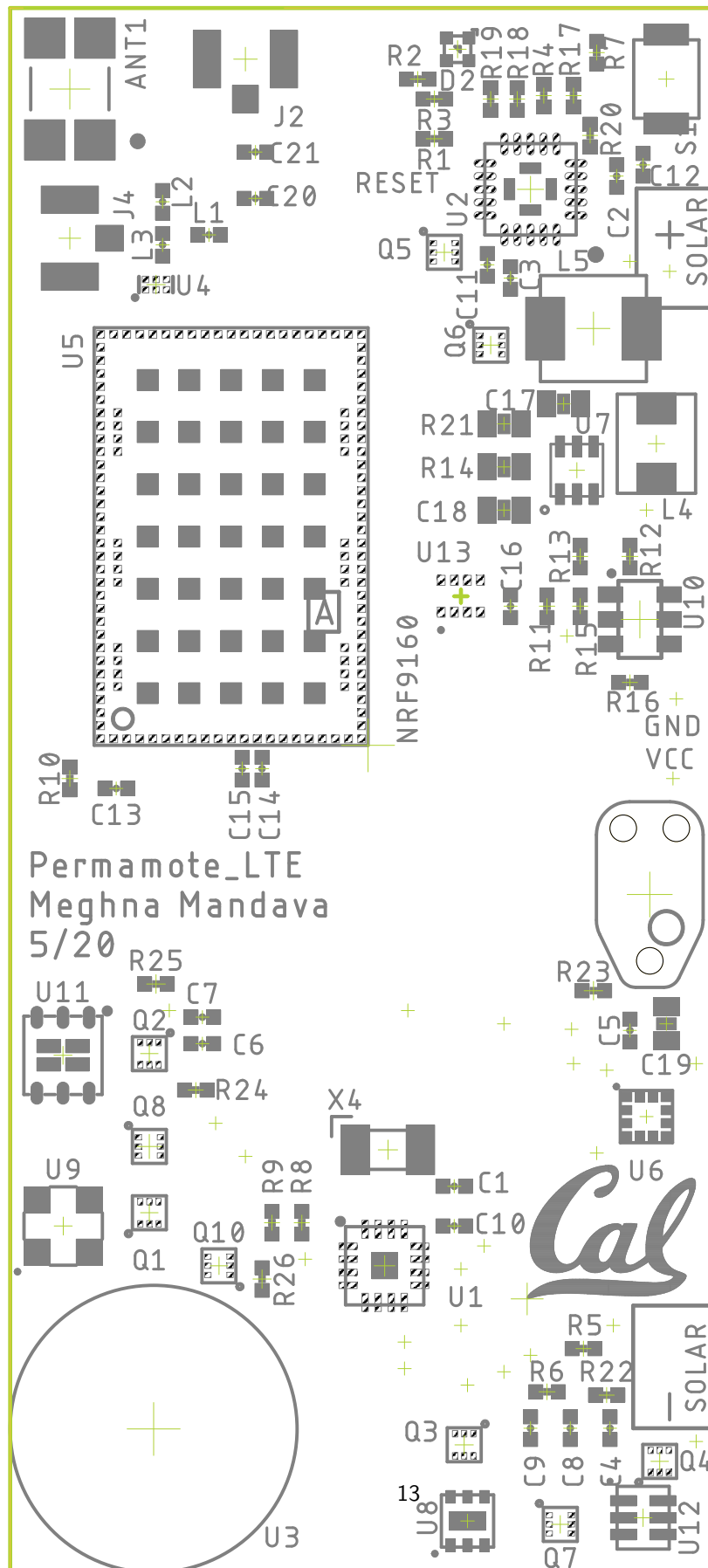


Layer 3 Copper

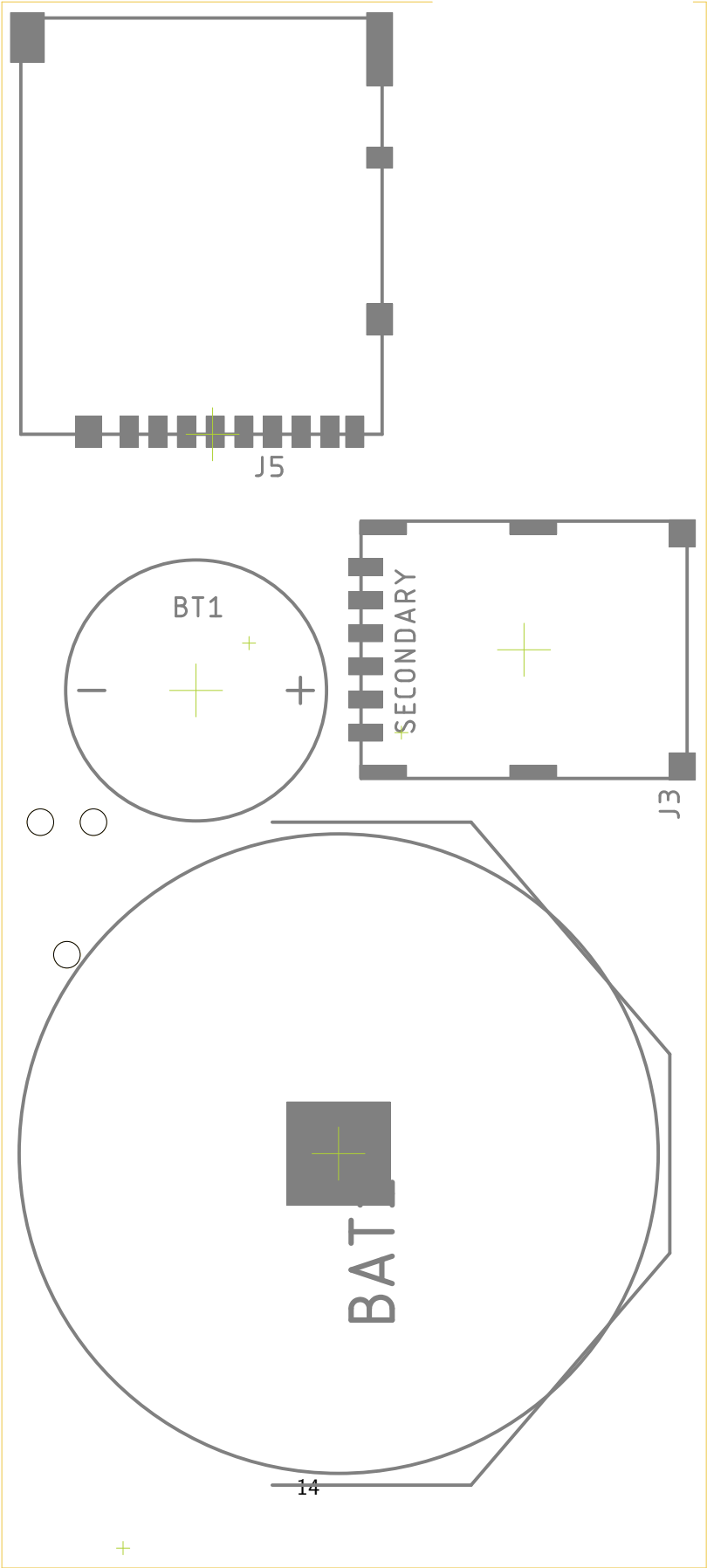


Bottom Copper Layer

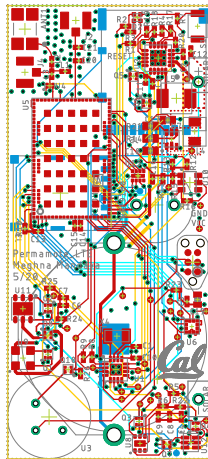


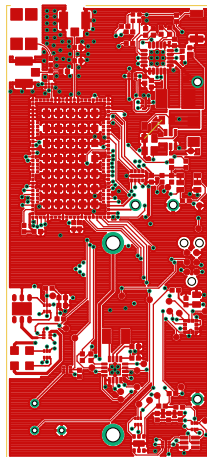


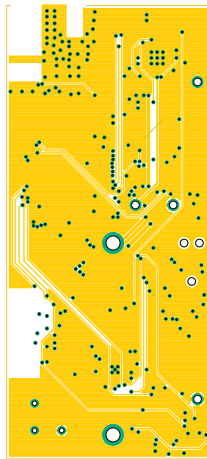
Bottom Paste Layer with Silkscreen

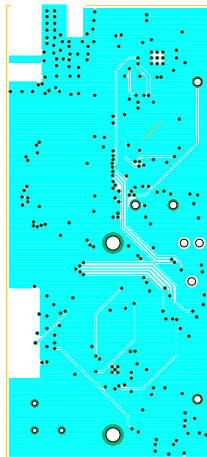


Top and Bottom Layers 1:1 Scale

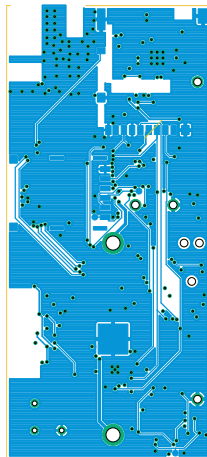








Bottom Copper Layer 1:1 Scale



Qty	Value	Device	Package	Parts	Description	DESCRIPTION
1		FXUB65.07.0180C		ANT2	RF ANT 829MHZ/2.2GHZ FLAT PATCH	
4	0.1uF	CAPACITOR0402_CAP	0402_CAP	C4, C5, C6, C7	SMD Capacitor	
1	1.8uH	INDUCTOR0402	0402_CAP	L1	A very specific inductor	
5	100M	RESISTOR0402_RES	0402_RES	R22, R23, R24, R25, R26	Resistor	
2	100k	RESISTOR0402_RES	0402_RES	R15, R16	Resistor	RES SMD 100K OHM 1% 1/5W
6	10k	RESISTOR0402_RES	0402_RES	R5, R6, R7, R8, R9, R10	Resistor	
3	10k	RESISTOR0402_RES	0402_RES	R11, R12, R13	Resistor	RES SMD 10K OHM 1% 1/16W
2	10nF	CAPACITOR0402_CAP	0402_CAP	C2, C3	SMD Capacitor	
3	10uF	CAPACITOR0603_CAP	0603_CAP	C17, C18, C19	SMD Capacitor	
1	1462350001	1462350001	ANT_1462350001	ANT1	Antenna GPS 1.4dBi Gain 1578MHz SMD T/R	Antenna GPS 1.4dBi Gain 1578
3	1uF	CAPACITOR0402_CAP	0402_CAP	C8, C9, C10	SMD Capacitor	
1	1uH	INDUCTOR1HL	1HL-1212BZ-11	L4	A very specific inductor	
1	22uH	INDUCTOR74437324220	74437324220	L5	A very specific inductor	
1	24777THMCOINCELLCL	24777THMCOINCELLCL	24777THMCOINCLIPBAT1		Battery clip for 2477 Coin Cell	
1	3.9M	RESISTOR0402_RES	0402_RES	R17	Resistor	
1	33M	RESISTOR0603_RES	0603-RES	R21	Resistor	
5	4.7uF	CAPACITOR0402_CAP	0402_CAP	C11, C12, C13, C14, C15	SMD Capacitor	
1	4.7uF	CAPACITOR0402_CAP	0402_CAP	C16	SMD Capacitor	CAP CER 4.7UF 10V X5R 0402
3	470	RESISTOR0402_RES	0402_RES	R1, R2, R3	Resistor	
1	47pF	CAPACITOR0402_CAP	0402_CAP	C1	SMD Capacitor	
1	5.1nH	INDUCTOR0402	0402_CAP	L2	A very specific inductor	
1	6.04k	RESISTOR0402_RES	0402_RES	R4	Resistor	
1	6.2M	RESISTOR0402_RES	0402_RES	R18	Resistor	
1	6.8M	RESISTOR0402_RES	0402_RES	R19	Resistor	
1	7.5nH	INDUCTOR0402	0402_CAP	L3	A very specific inductor	
1	80.6k	RESISTOR0603_RES	0603-RES	R14	Resistor	
1	9.1M	RESISTOR0402_RES	0402_RES	R20	Resistor	
1	AB1815-T3	AB1815-T3	QFN-16-3MM	U1	Ultra-low current RTC. 55nA quiescent @ 3V. 1.5-3.6V input.	
1	ABS07-32.768KHZ-7-T	ABS07-32.768KHZ-7-T	2-SMD	X4	32.768kHz Crystal	
1	B3U-1000P	B3U-1000P	B3U-1000P	S1	Switch	
1	BGA725L6	BGA725L6	LNA-TSLP-6-2-OR1QU4		EH front end for switching between primary and secondary cells	
1	BQ25505	BQ25505	S-PVQFN-N20-RGR	U2	IC AMP GPS 1.55-1.615GHZ TSLP6-2	
1	DM3AT-SF-PEJM5	DM3AT-SF-PEJM5	DM3AT-SF-PEJM5	J5	CONN MICRO SD R/A PUSH-PUSH SMD	CONN MICRO SD CARD PUS
2	DNP	CAPACITOR0402_CAP	0402_CAP	C20, C21	SMD Capacitor	
1	EKMB1101111	EKMB1101111	AMN2	U3	Passive infrared human detection sensor with built-in amp.	
1	LIS2DW12	LIS2DW12	LGA-12	U6	ultra low power 3 axis accelerometer	
1	LTOHTC1020	LTOHTC1020	1020	BT1		
1	MAX17222	MAX17222	UDFN-6-MAXIM	U7	Very high efficiency, very low power boost converter suitable for EH applications	
1	MAX44009	MAX44009	UDFN-6-EXPOSED	U8	low power ambient light sensor	
1	MS5637-02BA03	MS5637-02BA03	4-SMD	U9	low power pressure sensor	
1	NANO_SIM	NANO_SIM	WURTH_NANO_SIM3		WURTH Nano SIM Connector	
1	NRF9160	NRF9160	NRF9160	U5	IC RF TXRX+MCU CELL LTE-M/NB-IOT	
9	PMDXB950UPEL	PMDXB950UPEL	XDFN-6	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q10	20 V 500mA, dual P-channel Trench MOSFET	
1	SI7021-A20-GM1	SI7021-A20-GM1	DFN-6/3MM	U11	IC TEMP SENSOR RH 2% DFN	
1	SIP32510	SIP32510	TSOT23-6	U10	Load switch, slew rate controlled. By Vishay	IC LOAD SWITCH SOT23-6
1	SML-LX0404SIUPGUSB	SML-LX0404SIUPGUSB	1MM_SQ_4PAD	D2	1mm*2 RGB LED	
1	SOLARCELLHOLES	SOLARCELLHOLES	SOLAR_HOLES	D1	Generic solar cell	
1	TC2030-JLINK-NL	TC2030-JLINK-NL	TC2030-IDC-NL	J1		
1	TCS34725	TCS34725	FN-6	U12	Color Light-to-Digital Converter with IR Filter	
29	TEST-POINT	TEST-POINT	PAD.03X.03	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP25, TP26, TP27, TP30, TP31, TP32		
1	TPD3F303DPVR	TPD3F303DPVR	DPV8_1P7X0P4	U13	FILTER RC(P) ESD SMD	
2	U.FL-R-SMT	U.FL-R-SMT	U.FL_SMT	J2, J4	U.FL-R-SMT Antenna Connector	