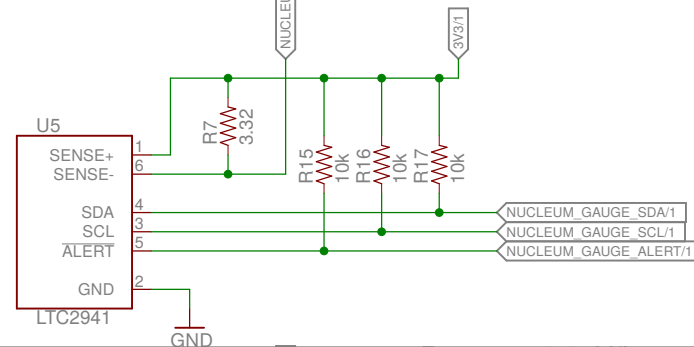


The Regulator Blocks

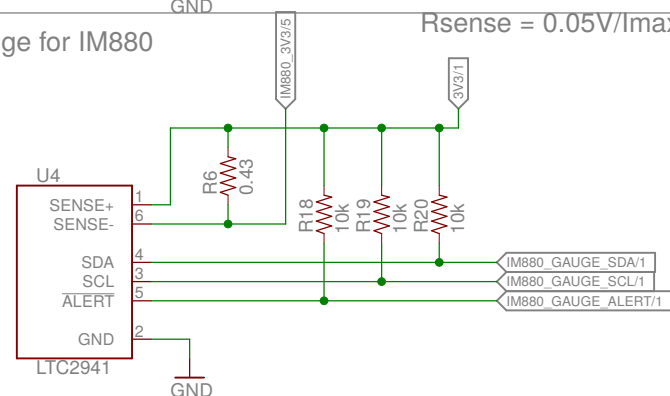
Energy gauge for nucleum

$$R_{sense} = 0.05V/I_{max} = 0.05V/15mA$$



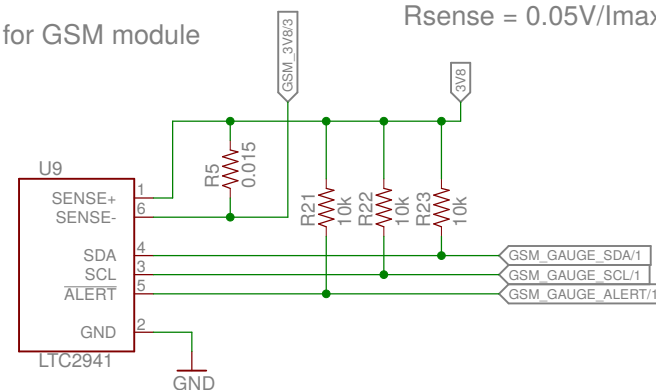
Energy gauge for IM880

$$R_{sense} = 0.05V/I_{max} = 0.05V/118mA$$



Energy gauge for GSM module

$$R_{sense} = 0.05V/I_{max} = 0.05V/3A$$



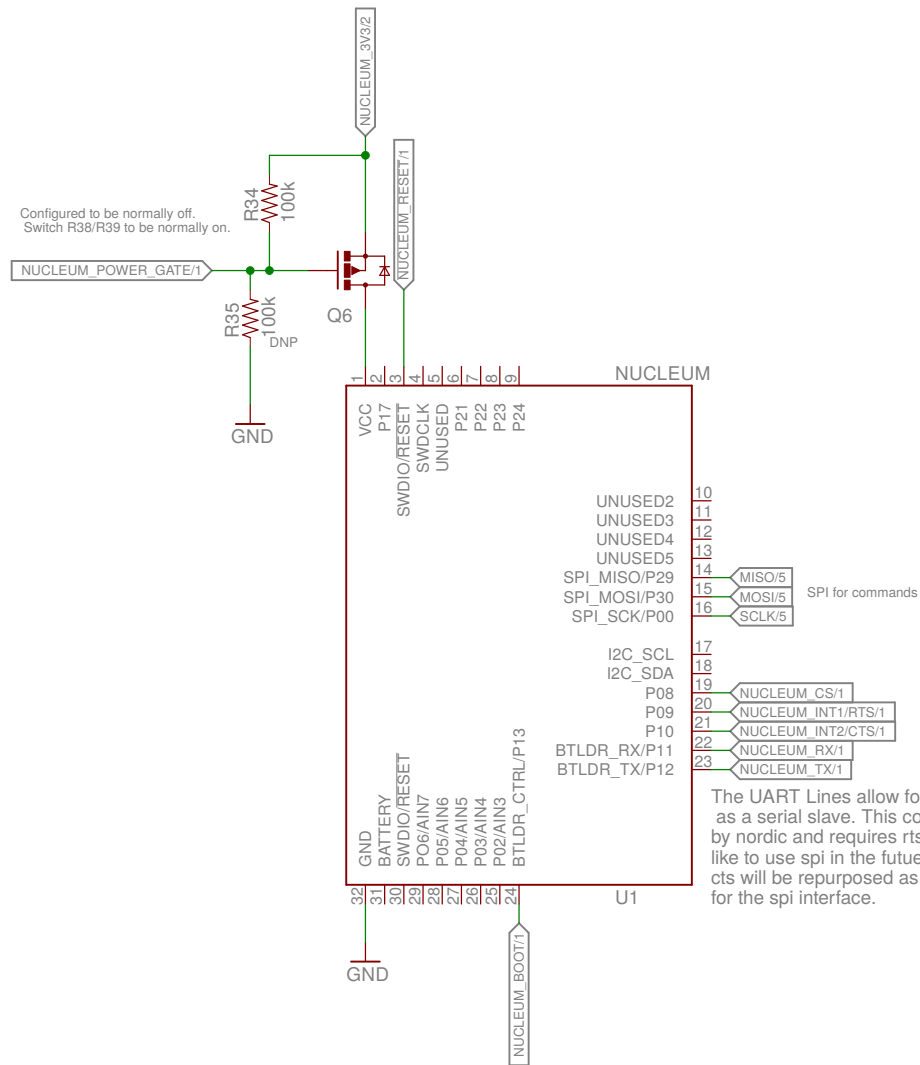
M Radio Module

REV:
A

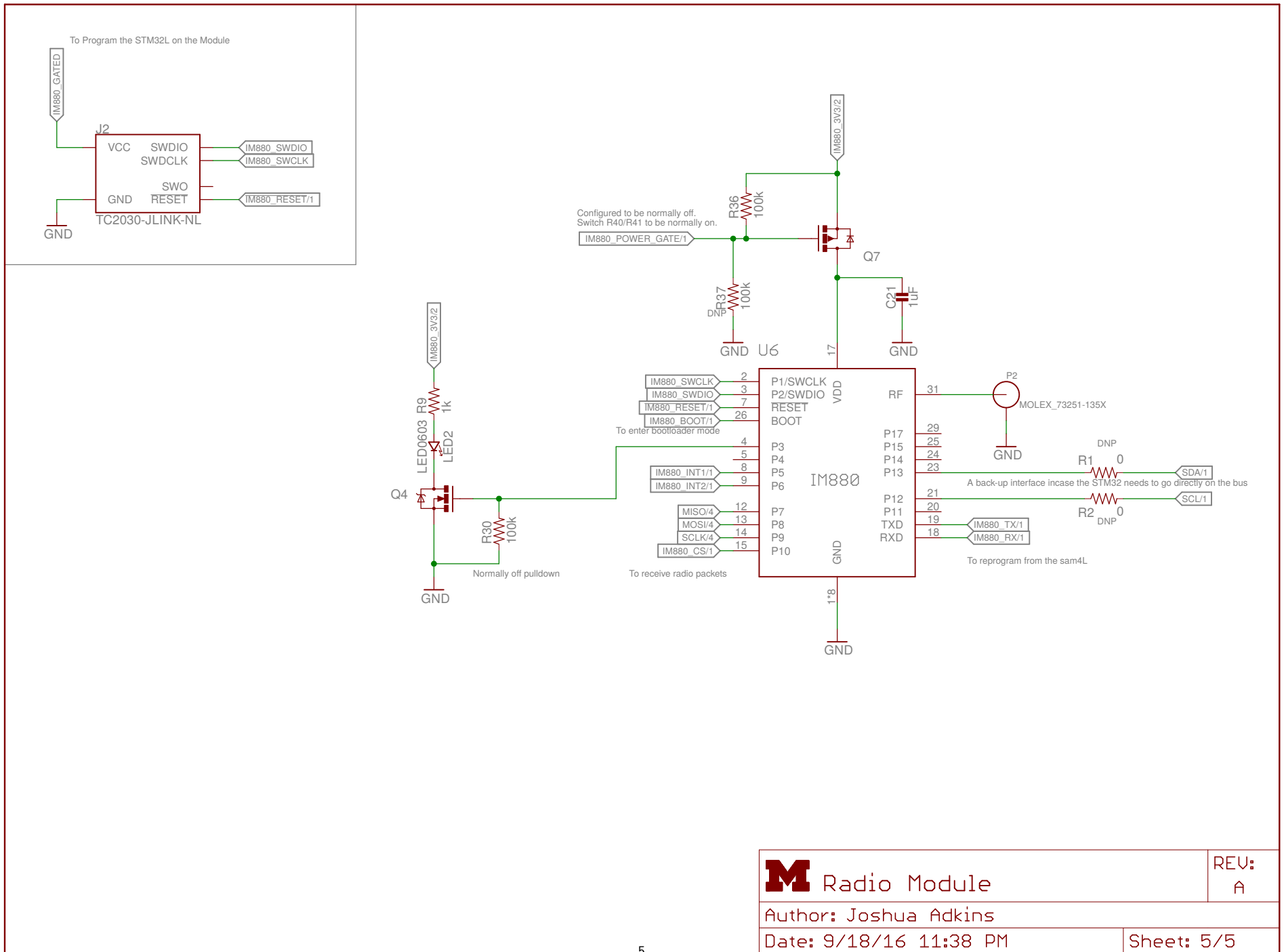
Author: Joshua Adkins

Date: 9/18/16 11:38 PM

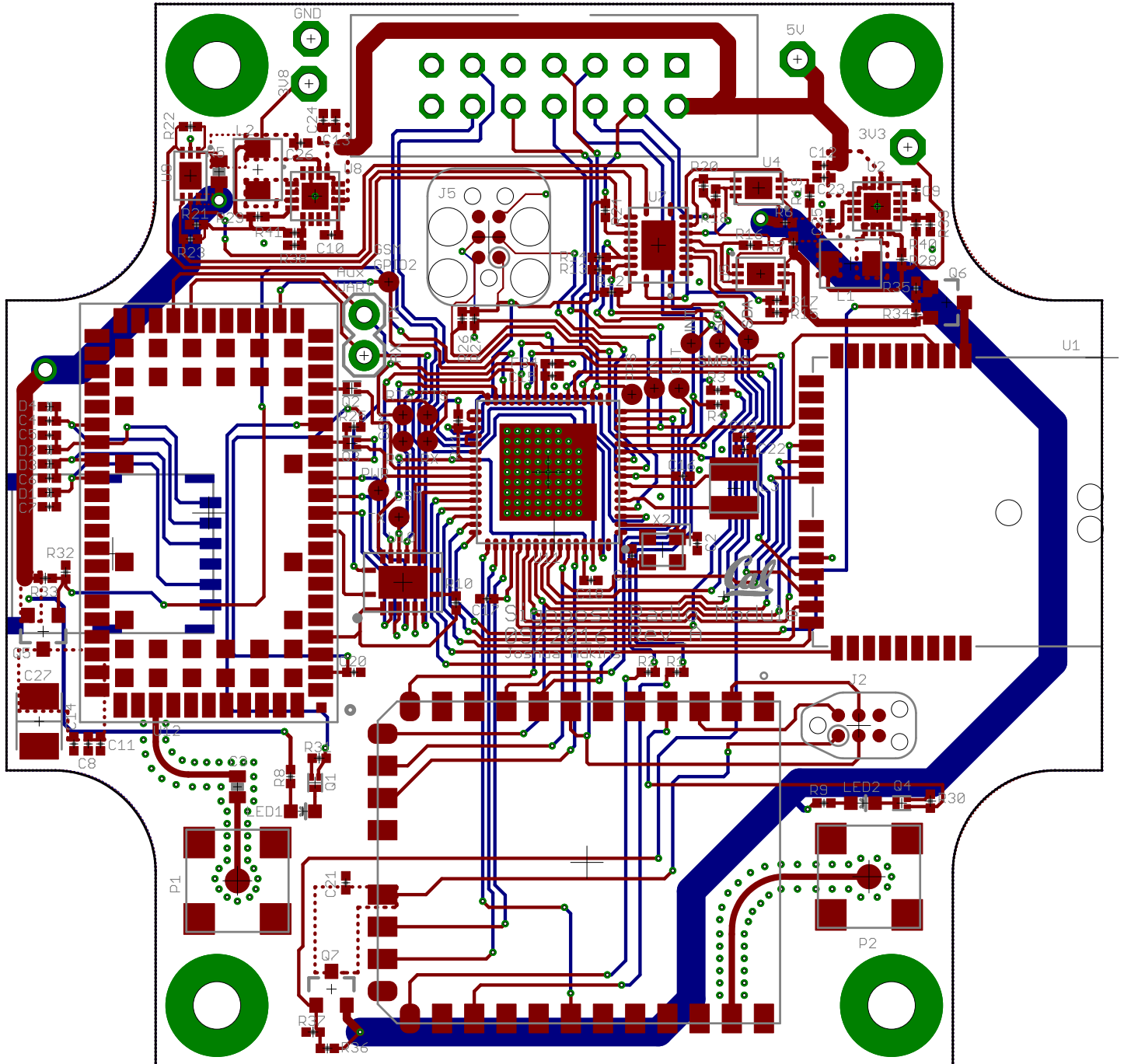
Sheet: 2/5

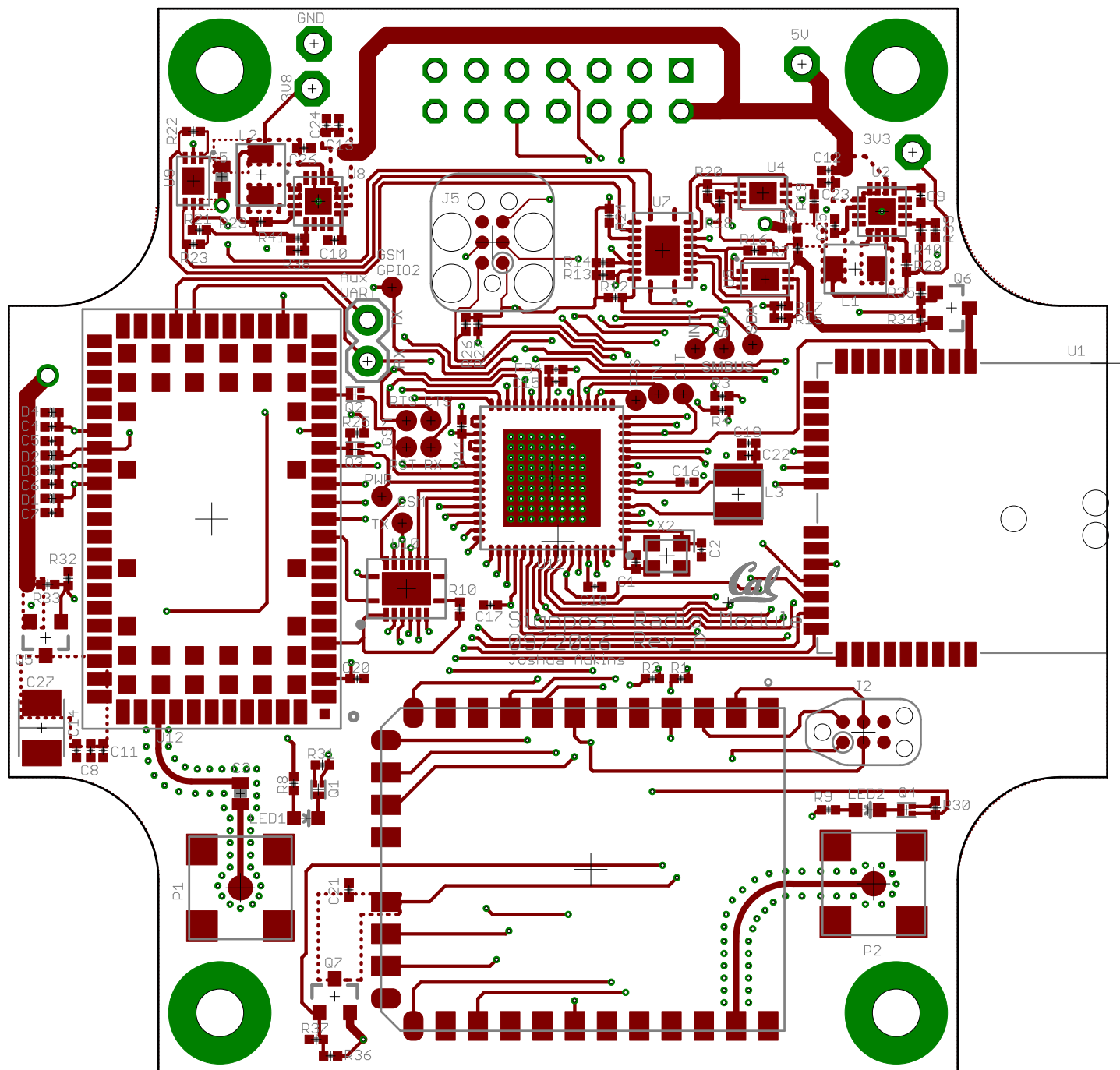


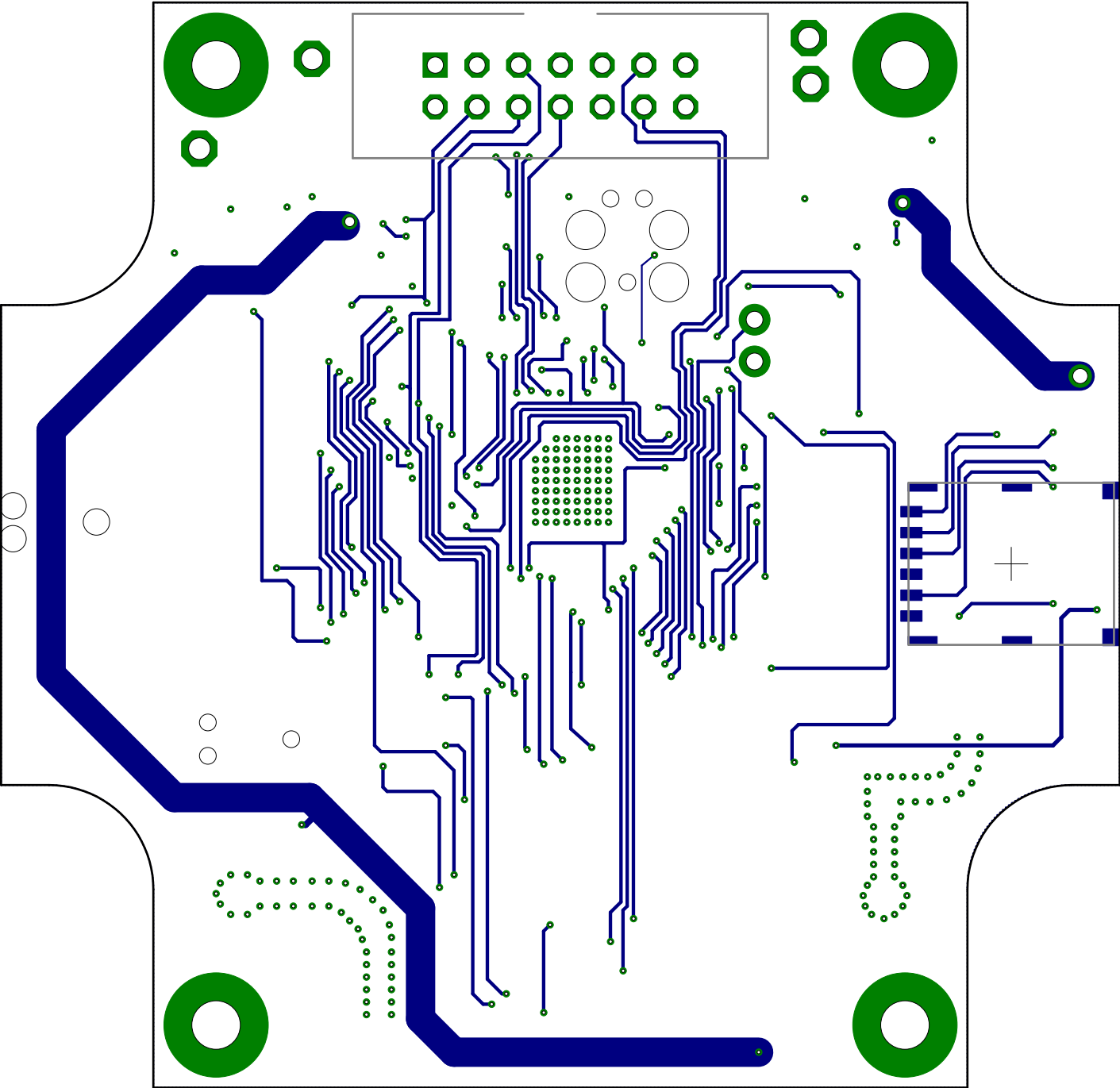
M Radio Module		REV: A
Author: Joshua Adkins		
Date: 9/18/16 11:38 PM		Sheet: 4/5

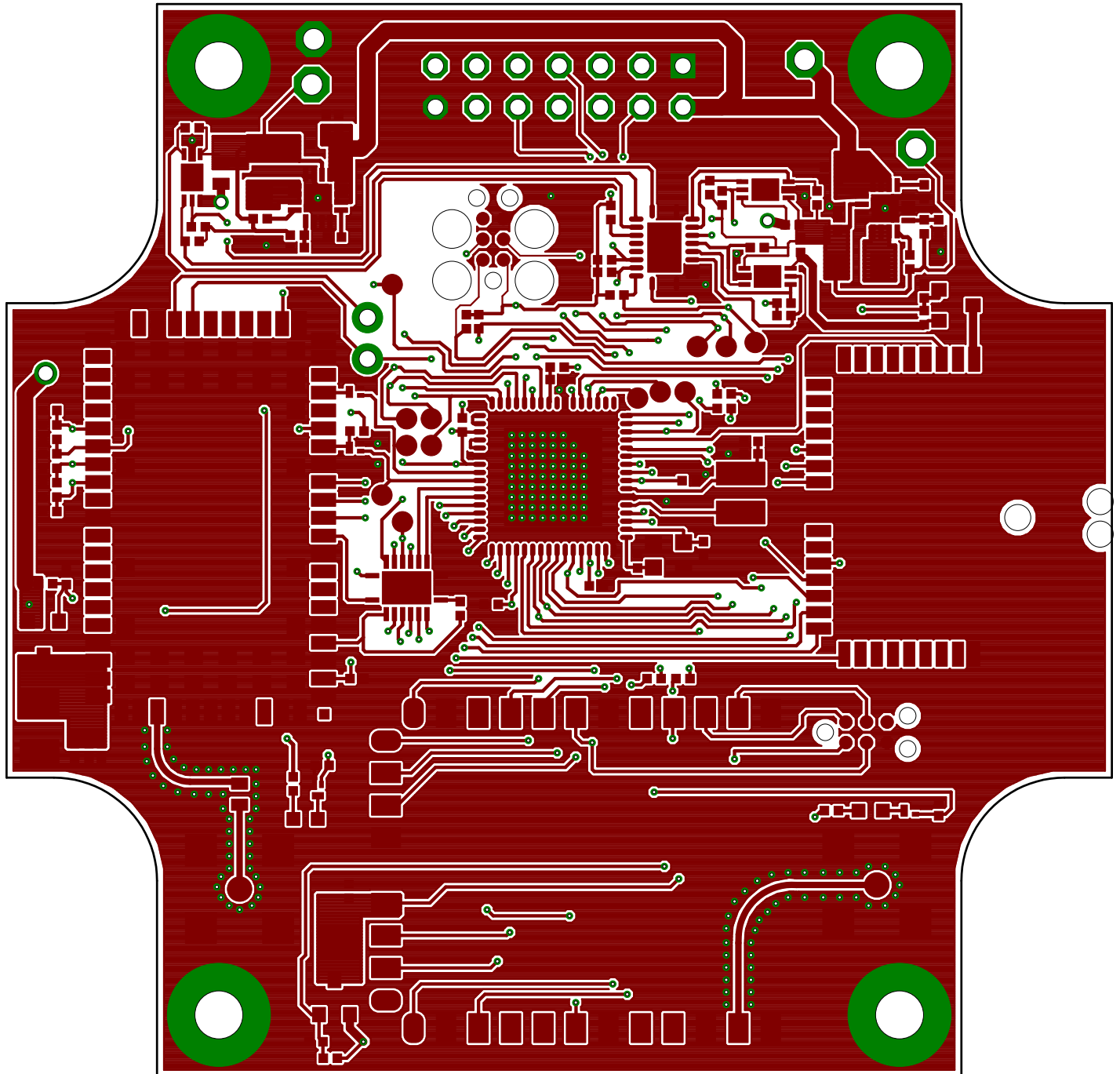


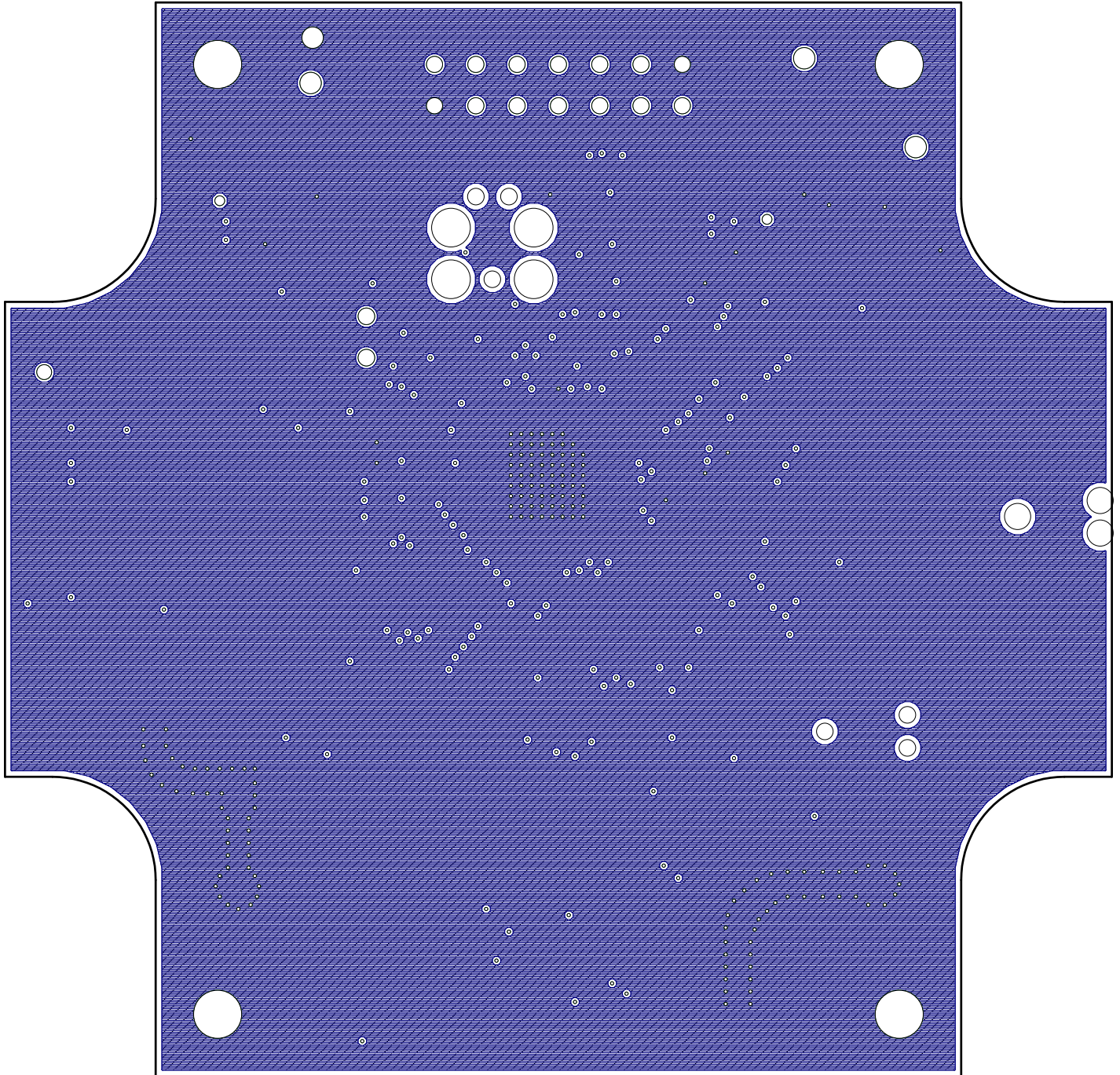
Top and Bottom Layers

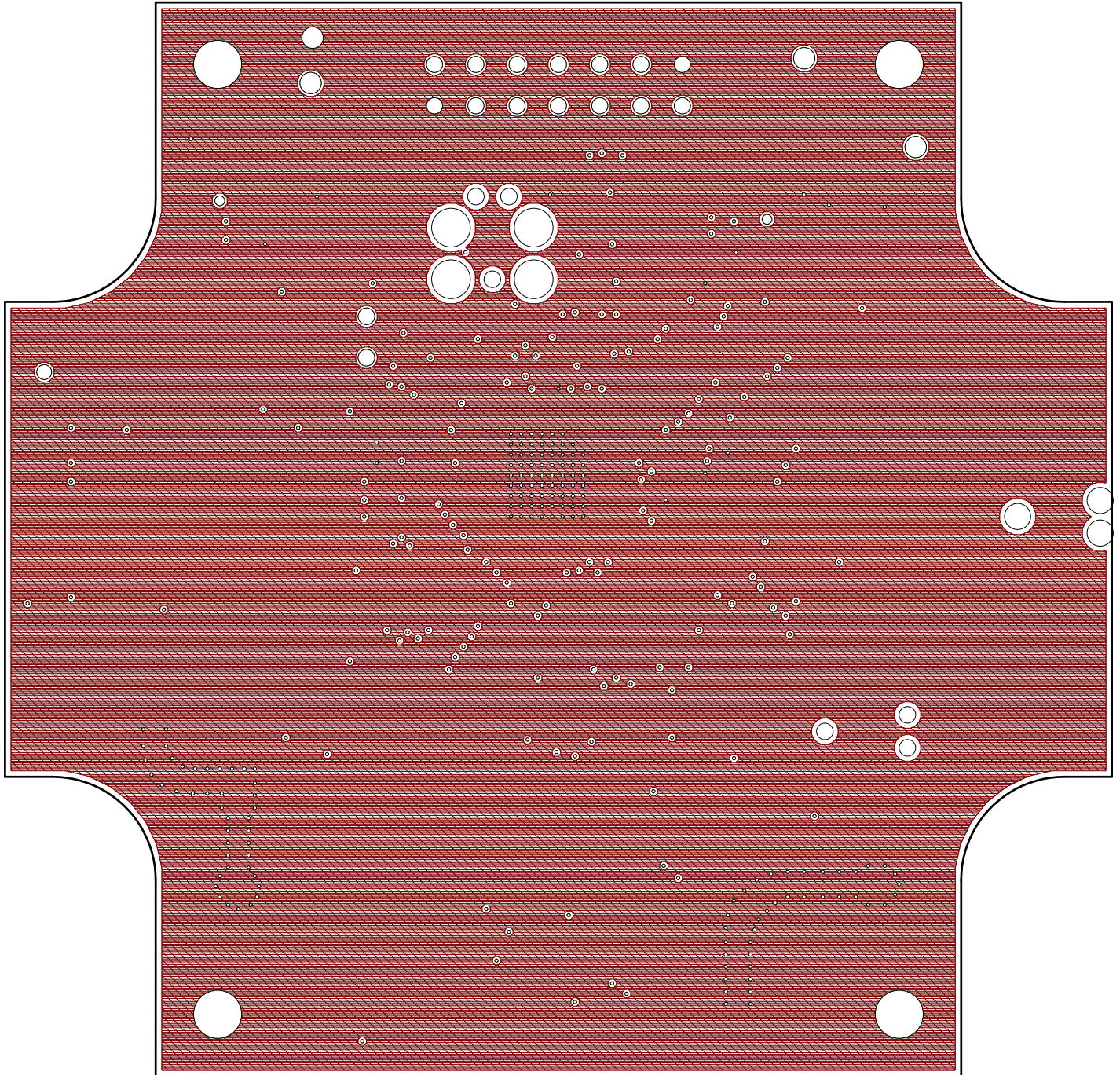




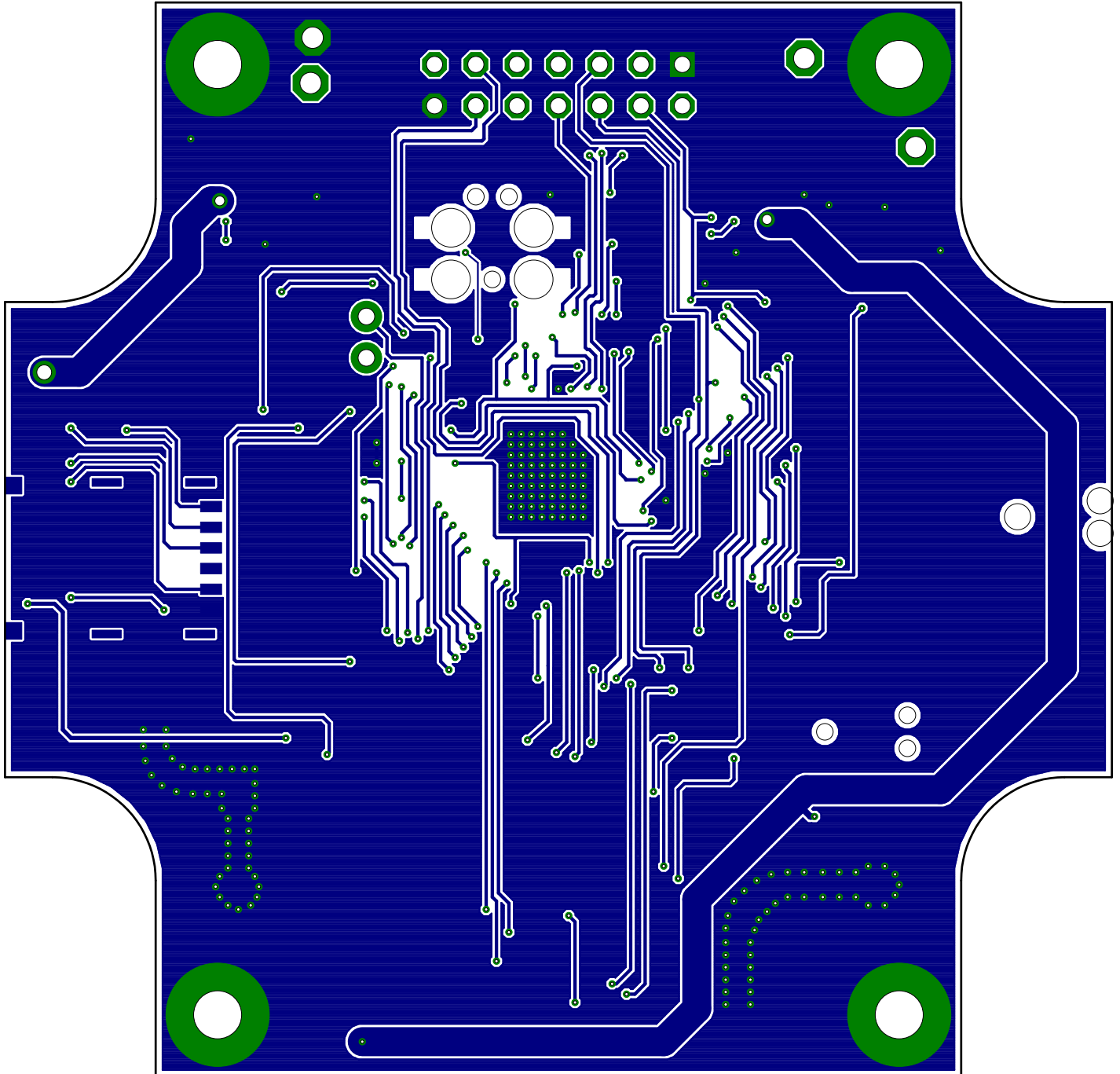






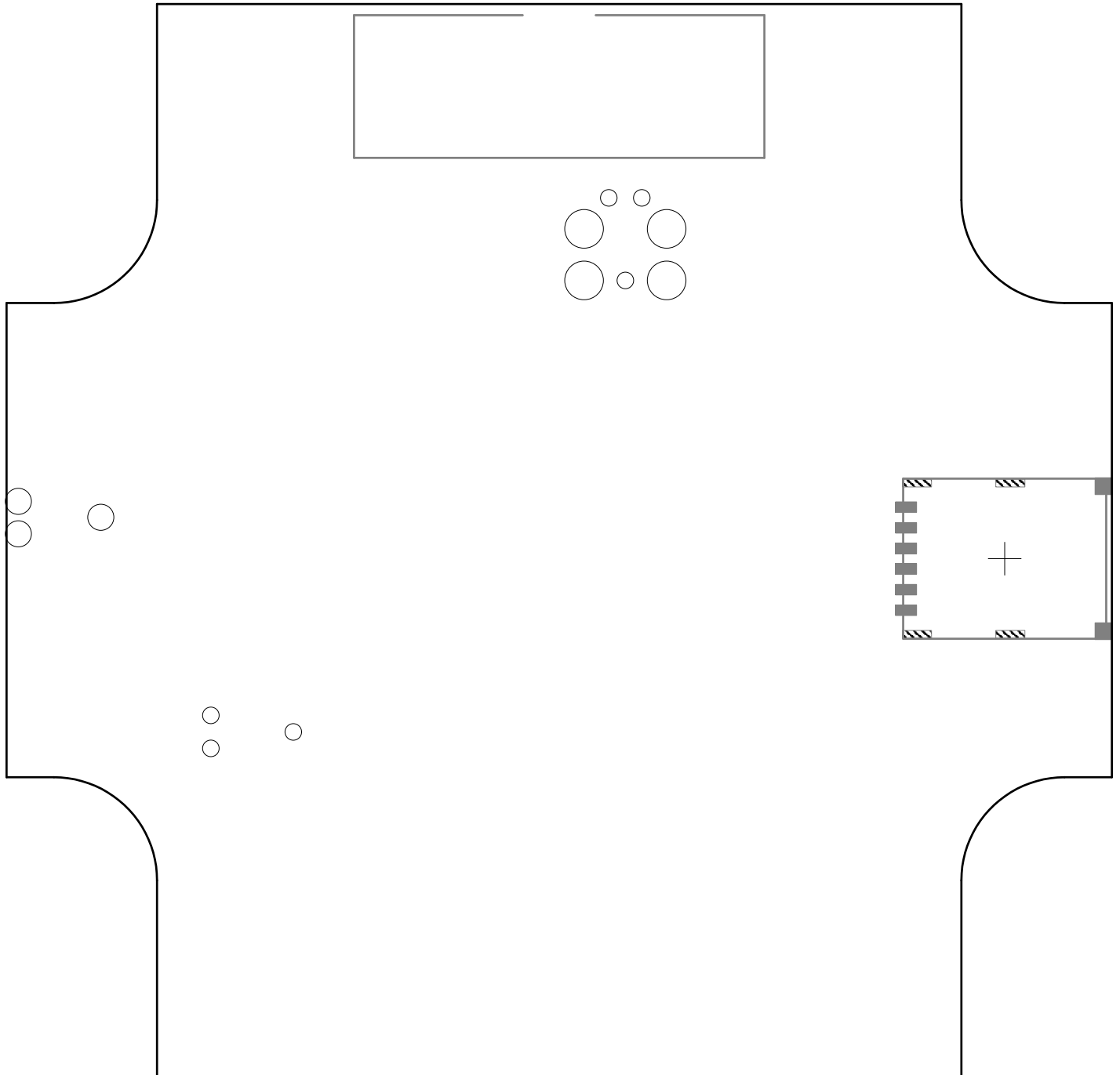


Bottom Copper Layer

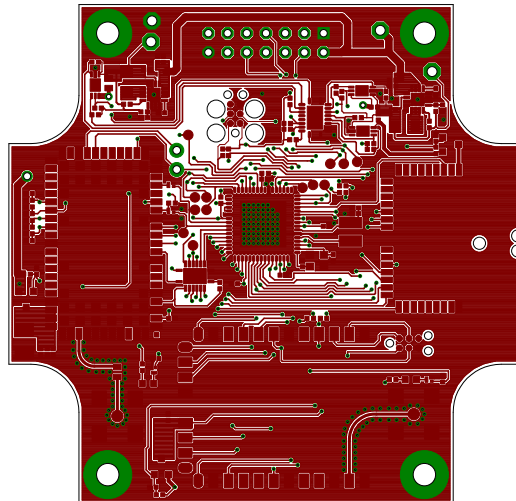


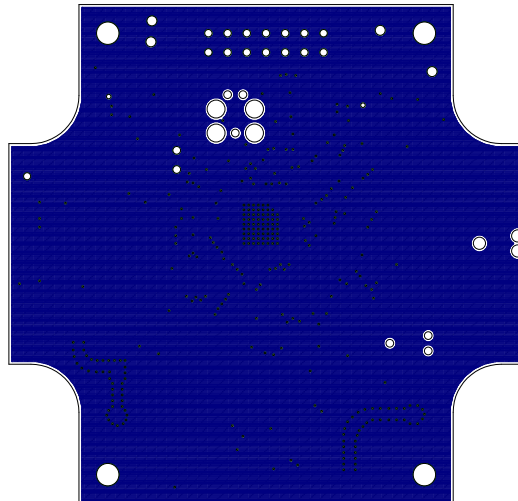
The image shows a detailed PCB layout for the Signpost Radio Module, Rev_A. The board is populated with numerous components, including resistors (R1-R40), capacitors (C1-C26), integrated circuits (U1-U10), and connectors (J1-J5). The layout includes a central microcontroller (U1) with various pins labeled for functions like PPS, IN, OUT, INT, SCL, SDA, and SMBUS. There are also sections for power regulation (L1, L2, L3) and signal processing (U2, U3, U4, U5, U6, U7, U8, U9, U10). The board features a large connector (U1) on the right side and a smaller connector (U12) on the left. The layout is labeled with component values and pin numbers, and includes a title block with the text "Signpost Radio Module", "09/2016", "Rev_A", and "Joshua Adkins".

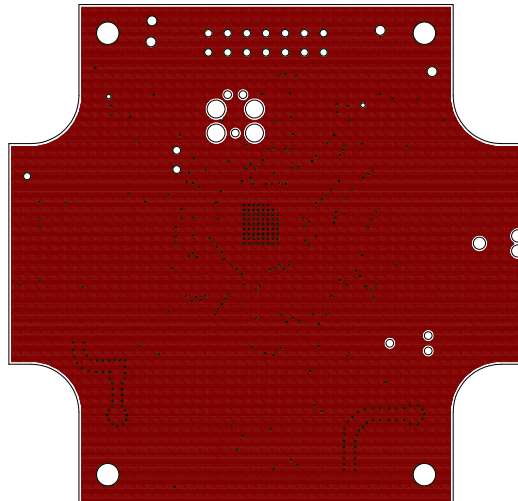
Bottom Paste Layer with Silkscreen



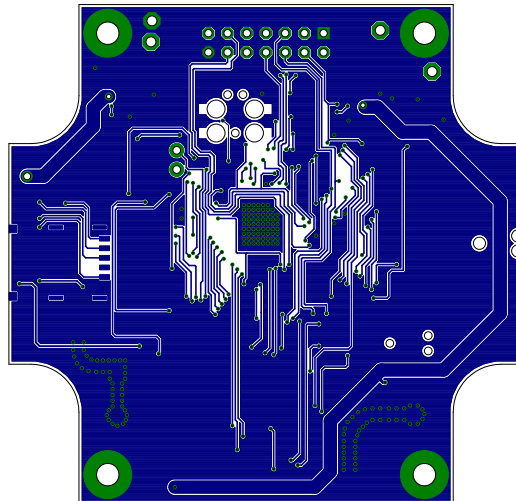
Top Layer 1:1 Scale







Bottom Copper Layer 1:1 Scale



radio_module

Part	Value	Device	Package
C1	8pF	CAPACITOR0402_CAP	0402_CAP
C2	8pF	CAPACITOR0402_CAP	0402_CAP
C3	33pF	CAPACITOR0603_CAP	0603_CAP
C4	47pF	CAPACITOR0402_CAP	0402_CAP
C5	47pF	CAPACITOR0402_CAP	0402_CAP
C6	47pF	CAPACITOR0402_CAP	0402_CAP
C7	47pF	CAPACITOR0402_CAP	0402_CAP
C8	56pF	CAPACITOR0402_CAP	0402_CAP
C9	3.3nF	CAPACITOR0402_CAP	0402_CAP
C10	3.3nF	CAPACITOR0402_CAP	0402_CAP
C11	10nF	CAPACITOR0402_CAP	0402_CAP
C12	0.1uF	CAPACITOR0402_CAP	0402_CAP
C13	0.1uF	CAPACITOR0402_CAP	0402_CAP
C14	100nF	CAPACITOR0402_CAP	0402_CAP
C15	100nF	CAPACITOR0402_CAP	0402_CAP
C16	100nF	CAPACITOR0402_CAP	0402_CAP
C17	100nF	CAPACITOR0402_CAP	0402_CAP
C18	100nF	CAPACITOR0402_CAP	0402_CAP
C19	100nF	CAPACITOR0402_CAP	0402_CAP
C20	100nF	CAPACITOR0402_CAP	0402_CAP
C21	1uF	CAPACITOR0402_CAP	0402_CAP
C22	4.7uF	CAPACITOR0402_CAP	0402_CAP
C23	10uF	CAPACITOR0402_CAP	0402_CAP
C24	10uF	CAPACITOR0402_CAP	0402_CAP
C25	22uF	CAPACITOR0402_CAP	0402_CAP
C26	22uF	CAPACITOR0402_CAP	0402_CAP
C27	220uF	CAPACITOR1210_CAP	1210_CAP
D1		DIODE_ZENER	0402_DIODE
D2		DIODE_ZENER	0402_DIODE
D3		DIODE_ZENER	0402_DIODE
D4		DIODE_ZENER	0402_DIODE
FB4	1.5k	FERRITE_BEAD0402	0402_CAP
J1	MODULE_GENERIC	MODULE_GENERIC	MODULE_GENERIC
J4	NANO_SIM	NANO_SIM	WURTH_NANO_SIM
JP1		M02PTH	1X02
L1	2.2uH	INDUCTOR1HL	IHL-1212BZ-11
L2	2.2uH	INDUCTOR1HL	IHL-1212BZ-11
L3	22uH	LHQ3NP	1212
LED1	LED0603	LED0603	LED-0603
LED2	LED0603	LED0603	LED-0603
P1	MOLEX_73251-135X	MOLEX_73251-135X	SMA-J/PCB
P2	MOLEX_73251-135X	MOLEX_73251-135X	SMA-J/PCB
Q1	MOSFET-NCHANNELXFDN-3	MOSFET-NCHANNELXFDN-3	XFDN-3
Q2	MOSFET-NCHANNELXFDN-3	MOSFET-NCHANNELXFDN-3	XFDN-3
Q3	MOSFET-NCHANNELXFDN-3	MOSFET-NCHANNELXFDN-3	XFDN-3
Q4	MOSFET-NCHANNELXFDN-3	MOSFET-NCHANNELXFDN-3	XFDN-3
Q5	SI223DDS	SI223DDS	SOT23-3
Q6	SI223DDS	SI223DDS	SOT23-3

radio_module

Q7	SI223DDS	SI223DDS	SOT23-3
R1		0 RESISTOR0402_RES	0402_RES
R2		0 RESISTOR0402_RES	0402_RES
R3		0 RESISTOR0402_RES	0402_RES
R4		0 RESISTOR0402_RES	0402_RES
R5		0.015 RESISTOR0603_RES	0603-RES
R6		0.43 RESISTOR0402_RES	0402_RES
R7		3.32 RESISTOR0402_RES	0402_RES
R8	1k	RESISTOR0402_RES	0402_RES
R9	1k	RESISTOR0402_RES	0402_RES
R10	10k	RESISTOR0402_RES	0402_RES
R11	10k	RESISTOR0402_RES	0402_RES
R12	10k	RESISTOR0402_RES	0402_RES
R13	10k	RESISTOR0402_RES	0402_RES
R14	10k	RESISTOR0402_RES	0402_RES
R15	10k	RESISTOR0402_RES	0402_RES
R16	10k	RESISTOR0402_RES	0402_RES
R17	10k	RESISTOR0402_RES	0402_RES
R18	10k	RESISTOR0402_RES	0402_RES
R19	10k	RESISTOR0402_RES	0402_RES
R20	10k	RESISTOR0402_RES	0402_RES
R21	10k	RESISTOR0402_RES	0402_RES
R22	10k	RESISTOR0402_RES	0402_RES
R23	10k	RESISTOR0402_RES	0402_RES
R24	10k	RESISTOR0402_RES	0402_RES
R25	100k	RESISTOR0402_RES	0402_RES
R26	100k	RESISTOR0402_RES	0402_RES
R27	100k	RESISTOR0402_RES	0402_RES
R28	100k	RESISTOR0402_RES	0402_RES
R29	100k	RESISTOR0402_RES	0402_RES
R30	100k	RESISTOR0402_RES	0402_RES
R31	100k	RESISTOR0402_RES	0402_RES
R32	100k	RESISTOR0402_RES	0402_RES
R33	100k	RESISTOR0402_RES	0402_RES
R34	100k	RESISTOR0402_RES	0402_RES
R35	100k	RESISTOR0402_RES	0402_RES
R36	100k	RESISTOR0402_RES	0402_RES
R37	100k	RESISTOR0402_RES	0402_RES
R38	200k	RESISTOR0402_RES	0402_RES
R39	240k	RESISTOR0402_RES	0402_RES
R40	750k	RESISTOR0402_RES	0402_RES
R41	750k	RESISTOR0402_RES	0402_RES
U1	NUCLEUM	NUCLEUM	NUCLEUM
U2	TLV62130	TLV62130	TQFN-16/3MM
U4	LTC2941	LTC2941	DFN-6-2MMX3MM
U5	LTC2941	LTC2941	DFN-6-2MMX3MM
U6	IM880_MODULE	IM880_MODULE	IM880_MODULE
U7	PCA9544AQFN-N20	PCA9544AQFN-N20	QFN-N20
U8	TLV62130	TLV62130	TQFN-16/3MM

radio_module

U9	LTC2941	LTC2941	DFN-6-2MMX3MM
U10	TXB0106	TXB0106	R-PVQFN-N16
U11	SAM4LC8BA	SAM4LC8BA	QFN-64-9MM
U12	UBLOX_SARA_G350	UBLOX_SARA_G350	UBLOX_SARA_G3
X2	16 MHz	FH1600015	FHXXX

radio_module

Description	DIGIKEY
0402 Capacitor	490-5867-1-ND
0402 Capacitor	490-5867-1-ND
0402 Capacitor	490-6241-1-ND
0402 Capacitor	491-6241-1-ND
0402 Capacitor	492-6241-1-ND
0402 Capacitor	493-6241-1-ND
0402 Capacitor	494-6241-1-ND
0402 Capacitor	490-1288-1-ND
0402 Capacitor	490-3248-1-ND
0402 Capacitor	491-3248-1-ND
0402 Capacitor	490-4516-1-ND
0402 Capacitor	490-6328-1-ND
0402 Capacitor	491-6328-1-ND
0402 Capacitor	492-6328-1-ND
0402 Capacitor	493-6328-1-ND
0402 Capacitor	494-6328-1-ND
0402 Capacitor	495-6328-1-ND
0402 Capacitor	496-6328-1-ND
0402 Capacitor	497-6328-1-ND
0402 Capacitor	498-6328-1-ND
0402 Capacitor	490-1320-1-ND
0402 Capacitor	490-5915-1-ND
0402 Capacitor	311-1729-1-ND
0402 Capacitor	312-1729-1-ND
0402 Capacitor	1276-6834-1-ND
0402 Capacitor	1277-6834-1-ND
0402 Capacitor	1276-3375-1-ND
	PESD0402-140CT-ND
	PESD0402-140CT-ND
	PESD0402-140CT-ND
	PESD0402-140CT-ND
	490-5216-1-ND
Module header and PCB	guilS9170-ND
WURTH Nano SIM Connecto	732-5954-1-ND
Header 2	3M9447-ND
A very specific inductor	541-1322-1-ND
A very specific inductor	541-1322-1-ND
LHQ3NP Inductor	490-5350-1-ND
LED	511-1578-1-ND
LED	512-1578-1-ND
SMA JACK SMT 50 OHM	WM9357-ND
SMA JACK SMT 50 OHM	WM9357-ND
Generic NMOS footprint	DMN2400UFB4-7DICT-ND
Generic NMOS footprint	DMN2400UFB4-7DICT-ND
Generic NMOS footprint	DMN2400UFB4-7DICT-ND
Generic NMOS footprint	DMN2400UFB4-7DICT-ND
6A SOT-23 P Fet	SI2333DDS-T1-GE3CT-ND
6A SOT-23 P Fet	SI2333DDS-T1-GE3CT-ND

radio_module

6A SOT-23 P Fet	SI2333DDS-T1-GE3CT-ND
Resistor	311-0.0JRCT-ND
Resistor	312-0.0JRCT-ND
Resistor	313-0.0JRCT-ND
Resistor	314-0.0JRCT-ND
Resistor	408-1406-1-ND
Resistor	P.43AKCT-ND
Resistor	541-3.32LLCT-ND
Resistor	311-1.0KJRCT-ND
Resistor	312-1.0KJRCT-ND
Resistor	311-10KJRCT-ND
Resistor	312-10KJRCT-ND
Resistor	313-10KJRCT-ND
Resistor	314-10KJRCT-ND
Resistor	315-10KJRCT-ND
Resistor	316-10KJRCT-ND
Resistor	317-10KJRCT-ND
Resistor	318-10KJRCT-ND
Resistor	319-10KJRCT-ND
Resistor	320-10KJRCT-ND
Resistor	321-10KJRCT-ND
Resistor	322-10KJRCT-ND
Resistor	323-10KJRCT-ND
Resistor	324-10KJRCT-ND
Resistor	325-10KJRCT-ND
Resistor	311-100KLRCT-ND
Resistor	312-100KLRCT-ND
Resistor	313-100KLRCT-ND
Resistor	314-100KLRCT-ND
Resistor	315-100KLRCT-ND
Resistor	316-100KLRCT-ND
Resistor	317-100KLRCT-ND
Resistor	318-100KLRCT-ND
Resistor	319-100KLRCT-ND
Resistor	320-100KLRCT-ND
Resistor	321-100KLRCT-ND
Resistor	322-100KLRCT-ND
Resistor	323-100KLRCT-ND
Resistor	P200KLCT-ND
Resistor	YAG3291CT-ND
Resistor	YAG3228CT-ND
Resistor	YAG3228CT-ND
Nucleum sensorboard prototyping module.	
High Efficient 3A switching st	296-35978-1-ND
I2C Battery Gas Gauge	LTC2941IDCB#TRMPBFCT-ND
I2C Battery Gas Gauge	LTC2941IDCB#TRMPBFCT-ND
Lora Radio module by IMST	
1-4 I2C/SMBUS Multiplexer v	296-20960-1-ND
High Efficient 3A switching st	296-35978-1-ND

radio_module

I2C Battery Gas Gauge LTC2941IDCB#TRMPBFCT-ND
6 channel level translator 296-23868-2-ND
SAM4L Microcontroller. 64QFATSAM4LC8BA-MURDKR-ND
Sara G350 2.5G Radio Module
Pericom Type FH 16 MHz 2.5FH1600015CT-ND