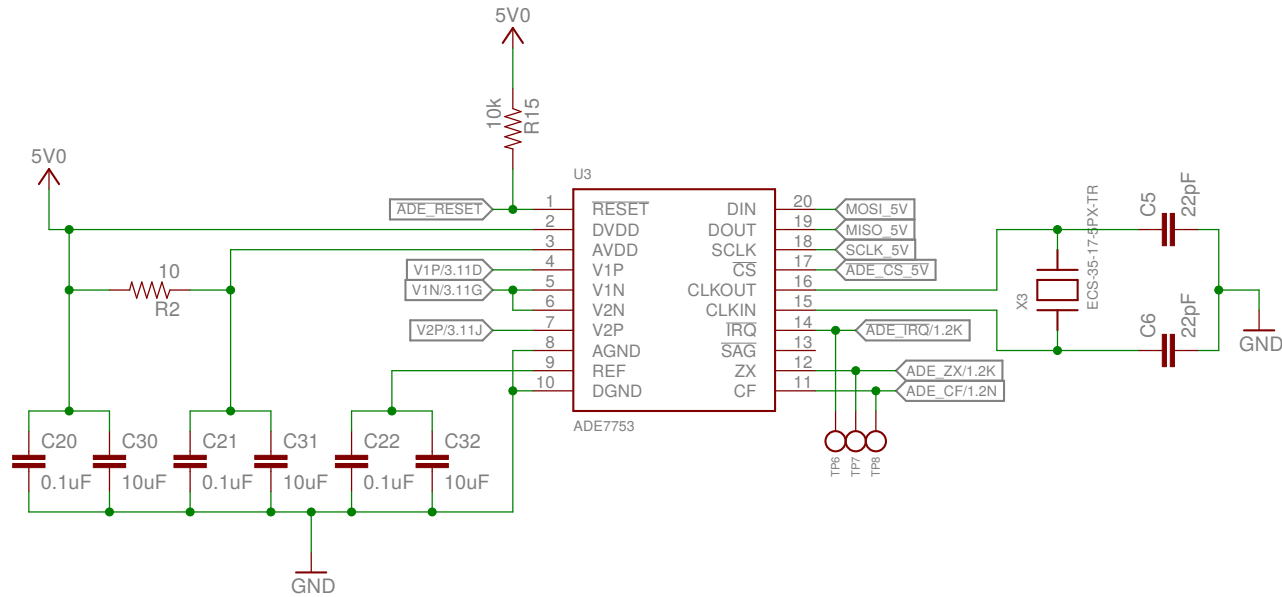




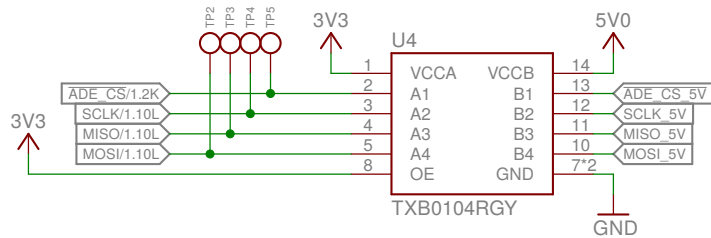
Pinout diagram for the TC2030-CC2538-BL-NL module. The module is a small black component with pins numbered 1 to 6. Pin 1 is connected to 3V3. Pin 2 is connected to GND. Pin 3 is connected to BTLDR TX. Pin 4 is connected to BTLDR RX. Pin 5 is connected to BTLDR CTRL. Pin 6 is connected to RESET. The module is labeled TC2030-CC2538-BL-NL.

Sheet: 1/4

## ADE7753 Power Measurement



## Level Converter 5V SPI



TITLE: ACme++

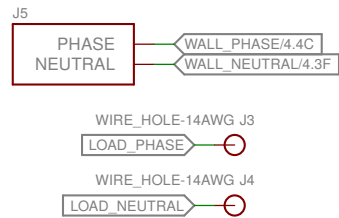
Document Number:

REV:

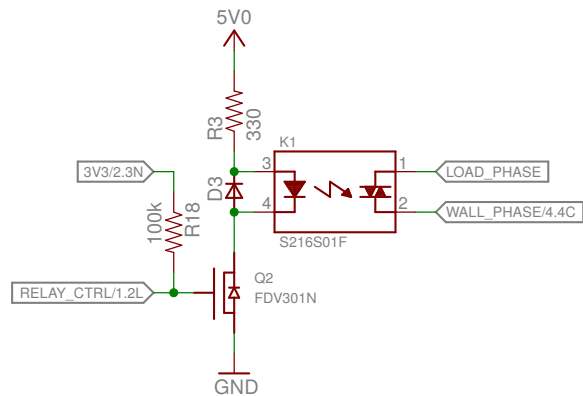
Date: 8/20/14 5:44 PM

Sheet: 2/4

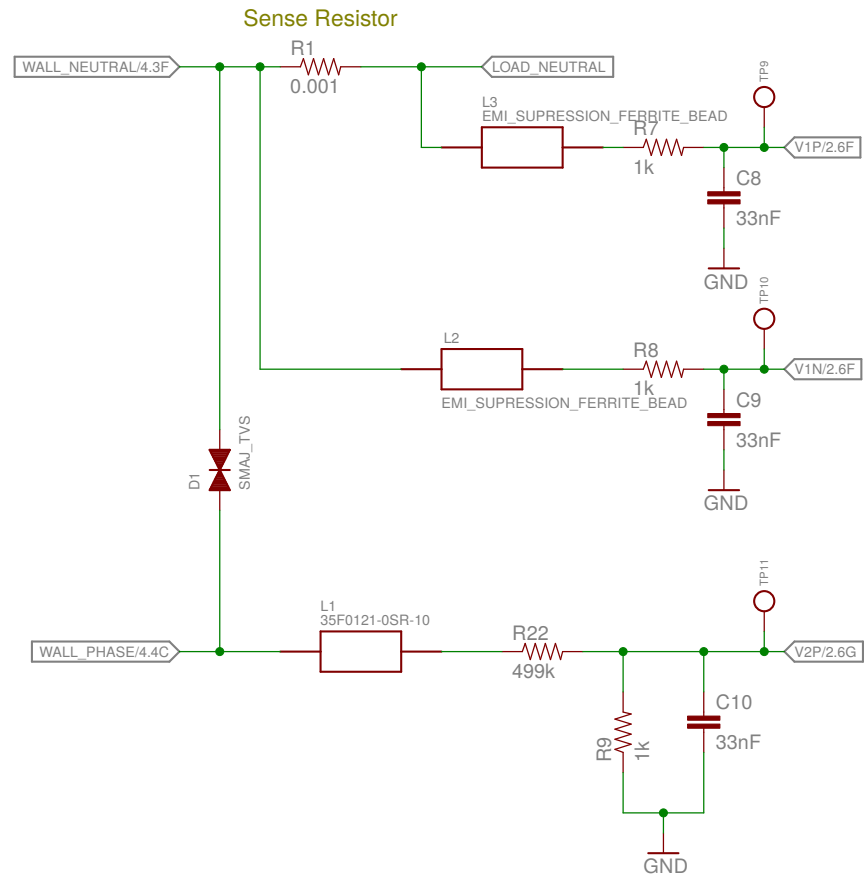
## AC Plugs



## Load Control Relay



## Metering Conditioning



TITLE: ACme++

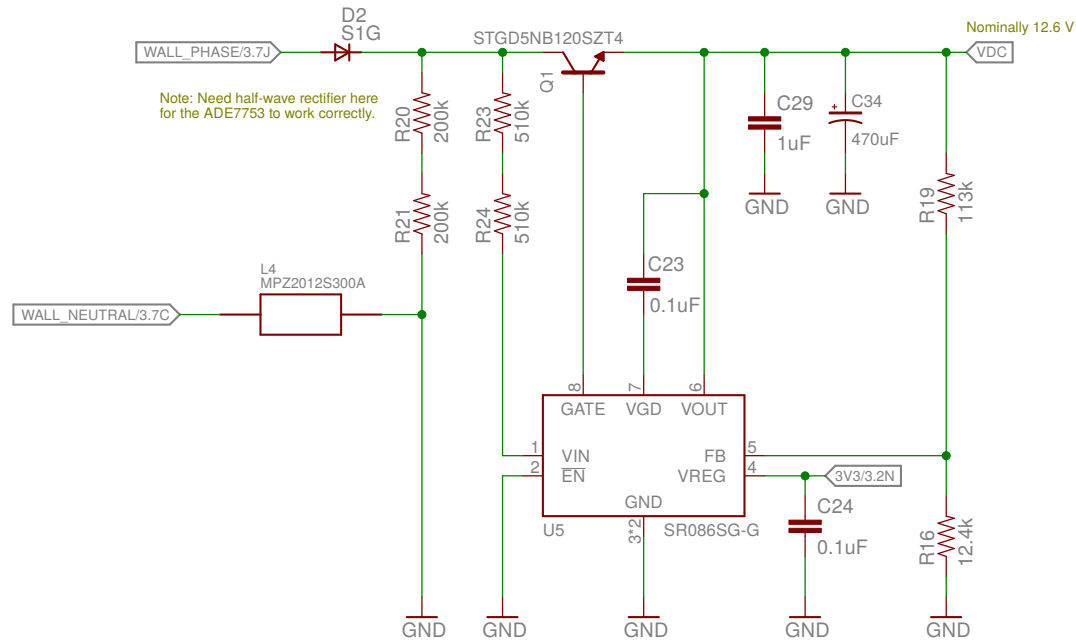
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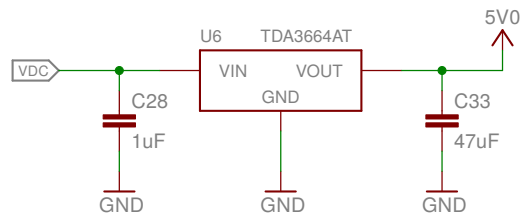
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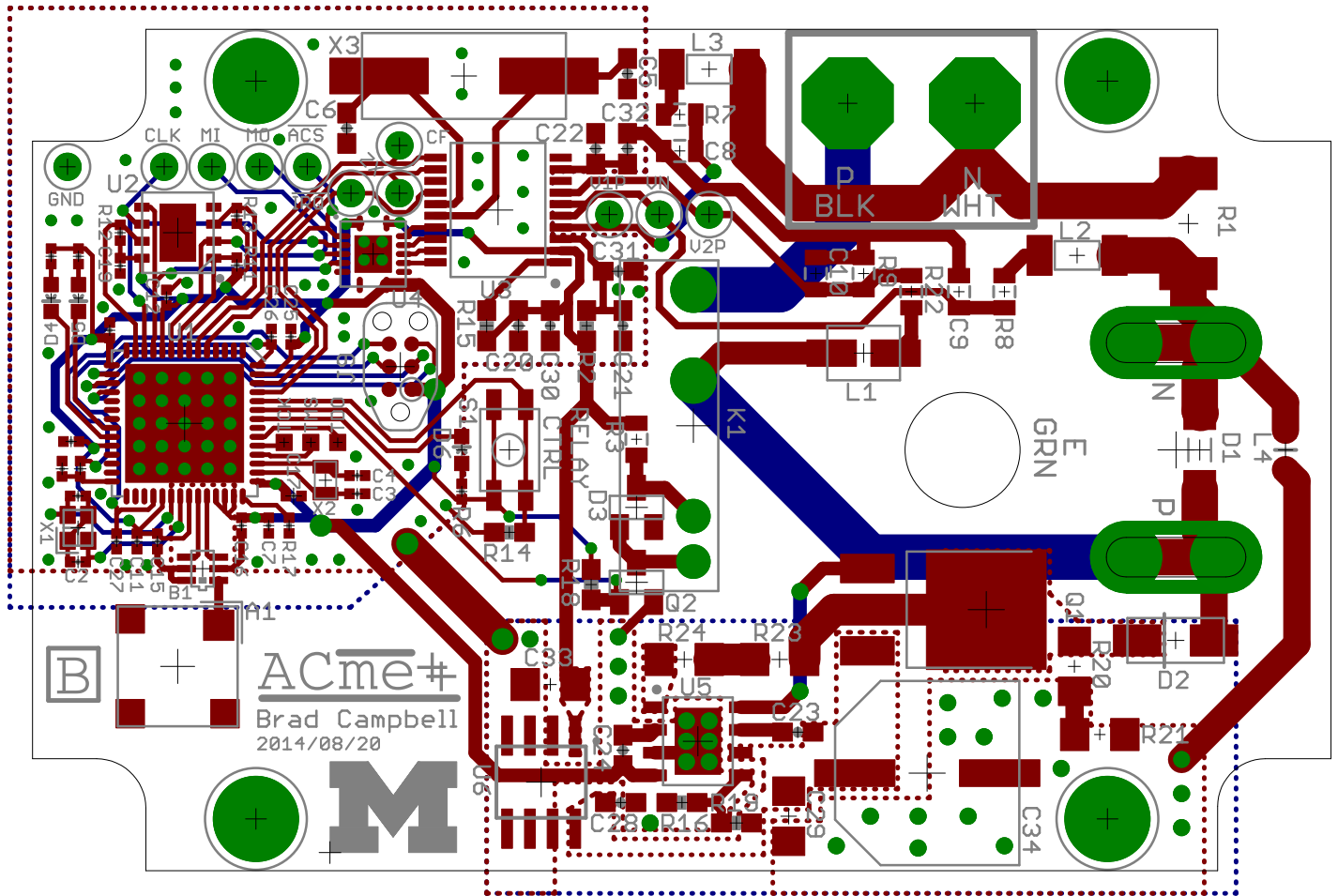
Sheet: 3/4

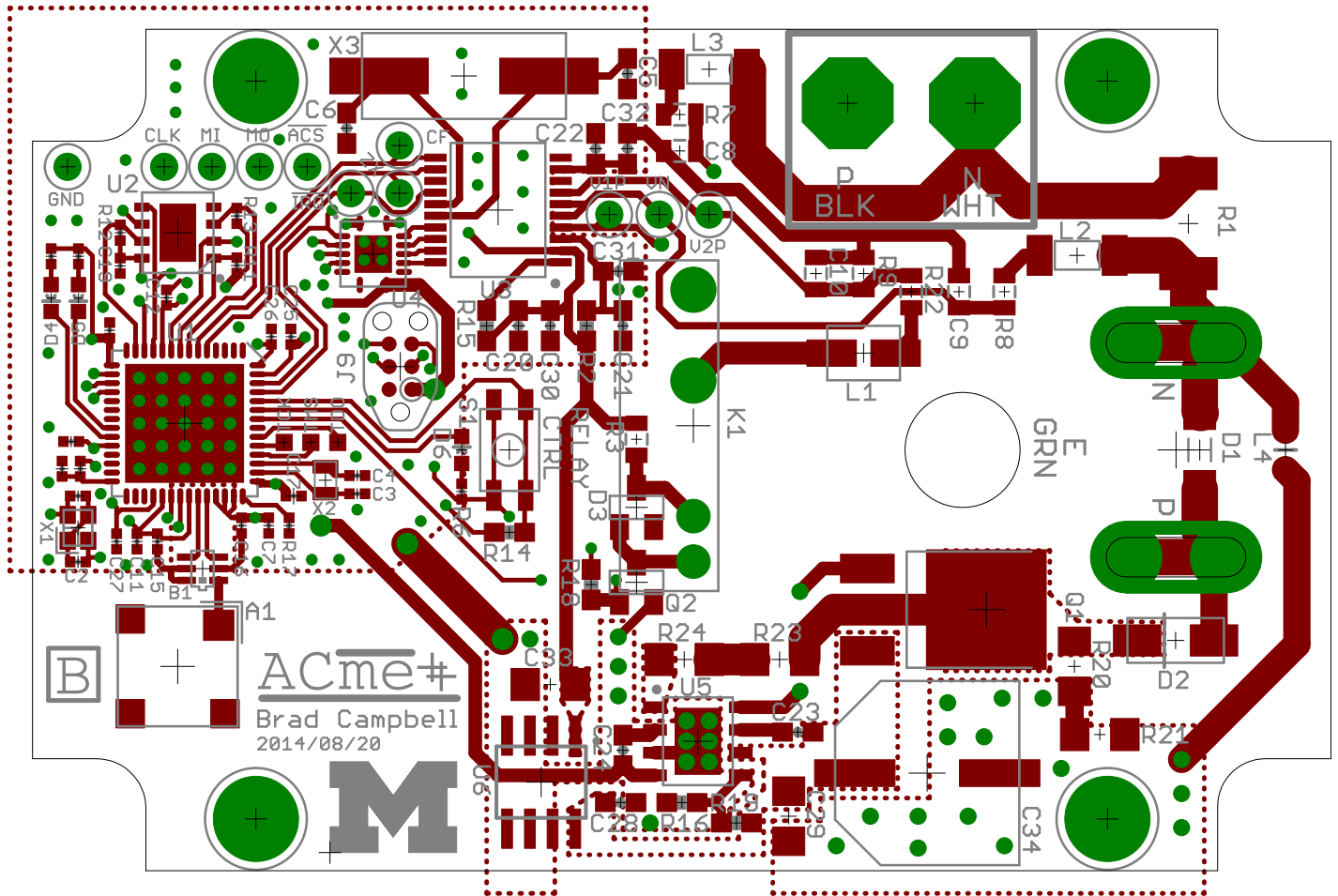
## AC-DC Converter

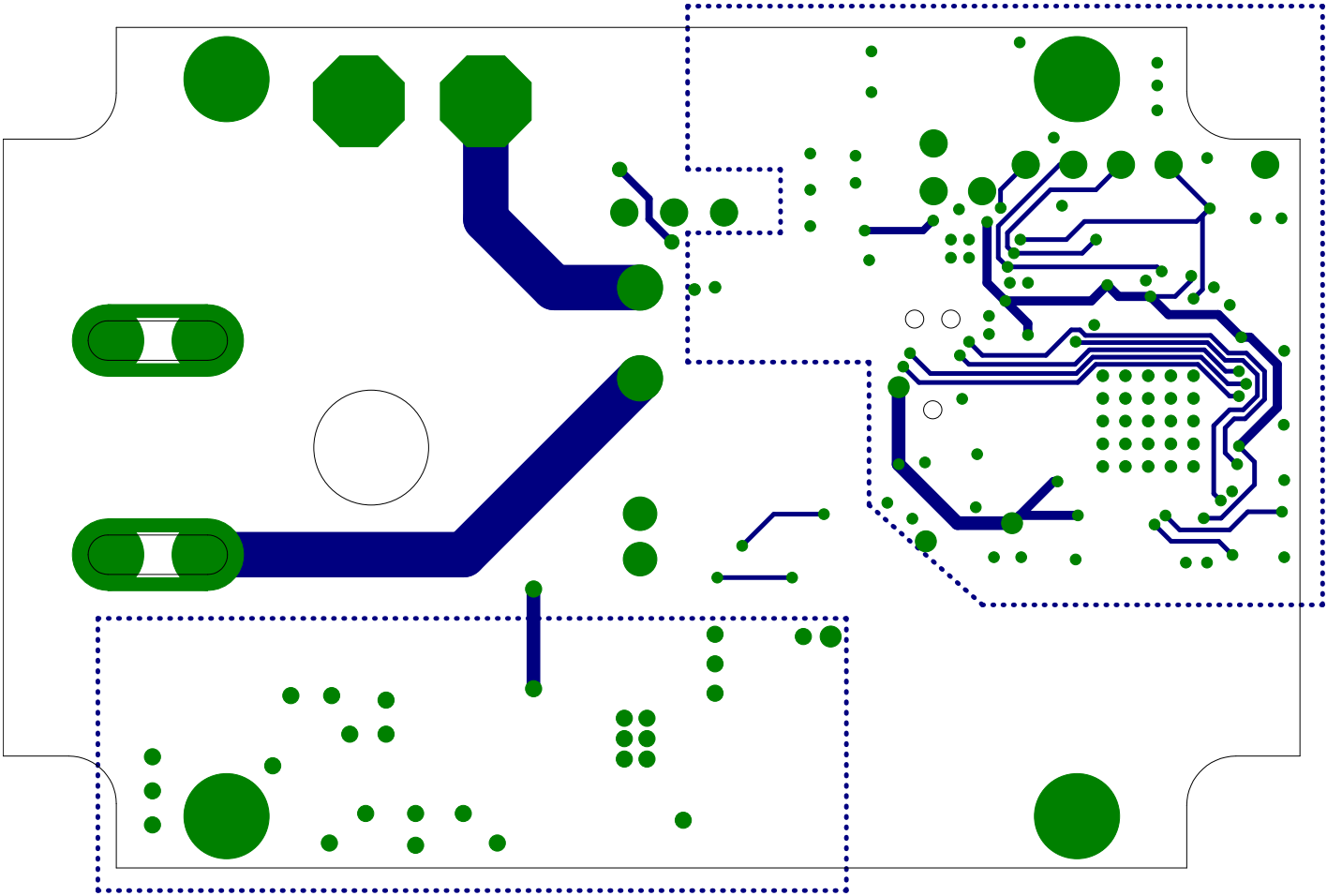


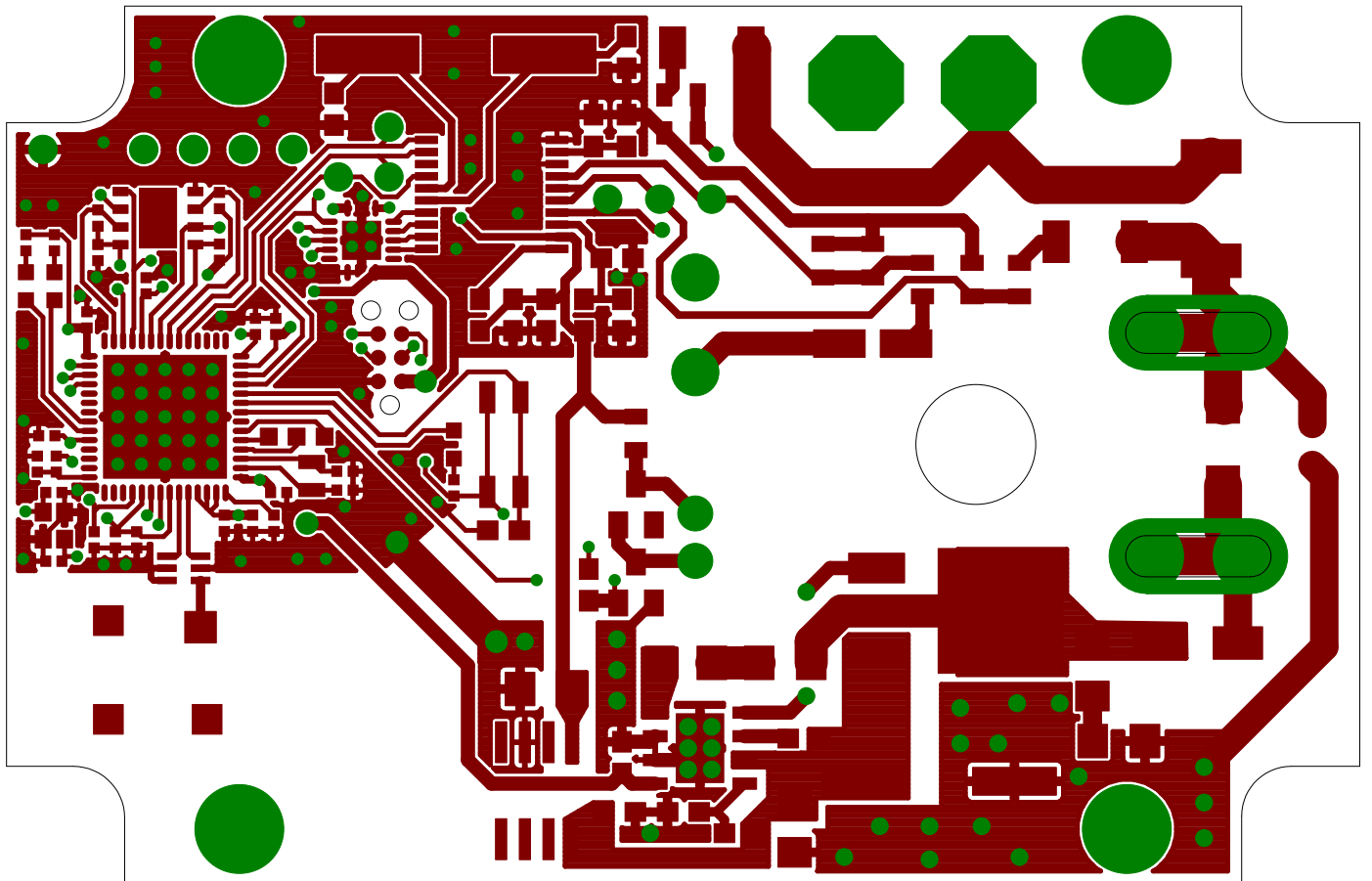
## 5V Regulator





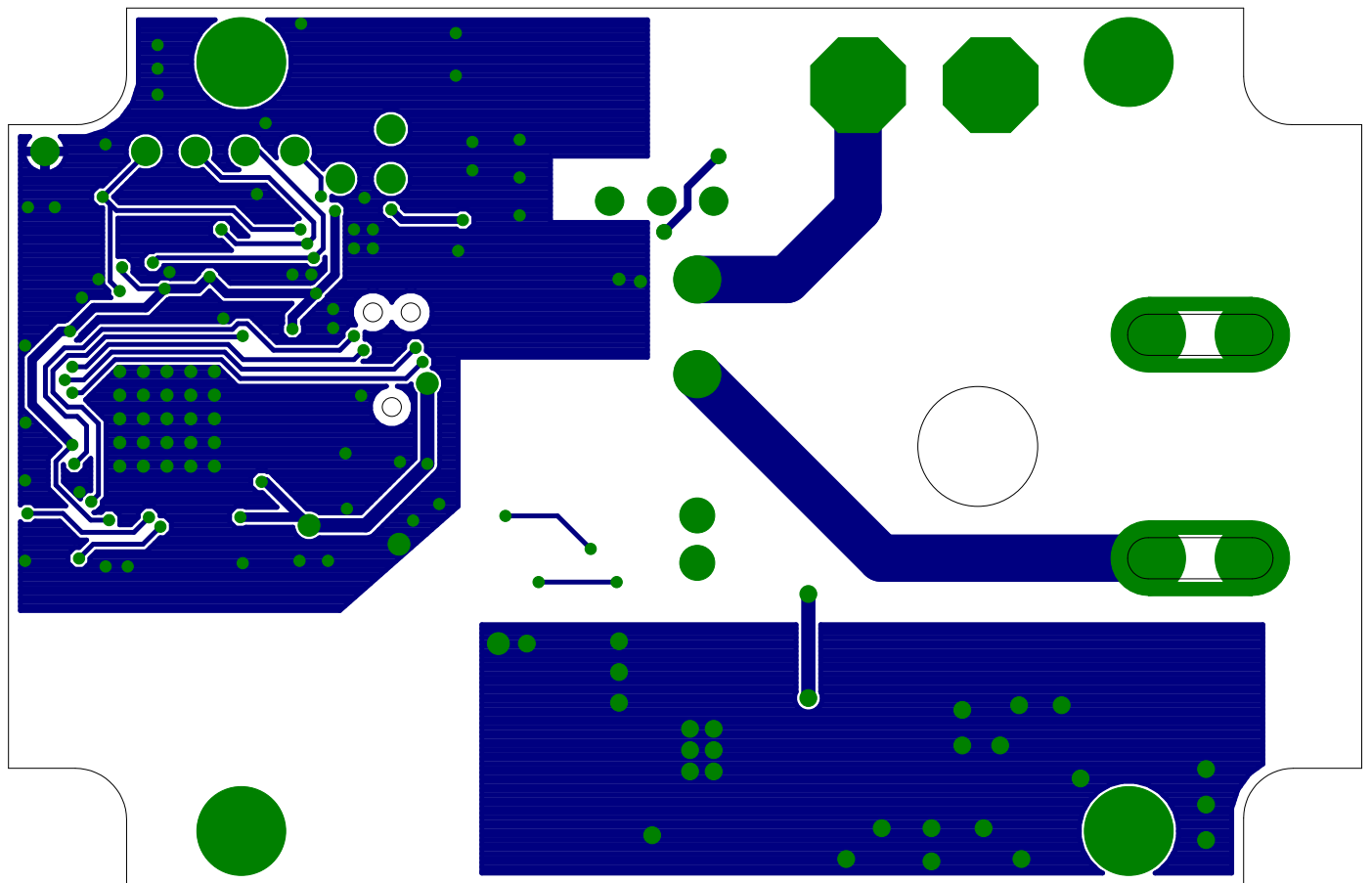


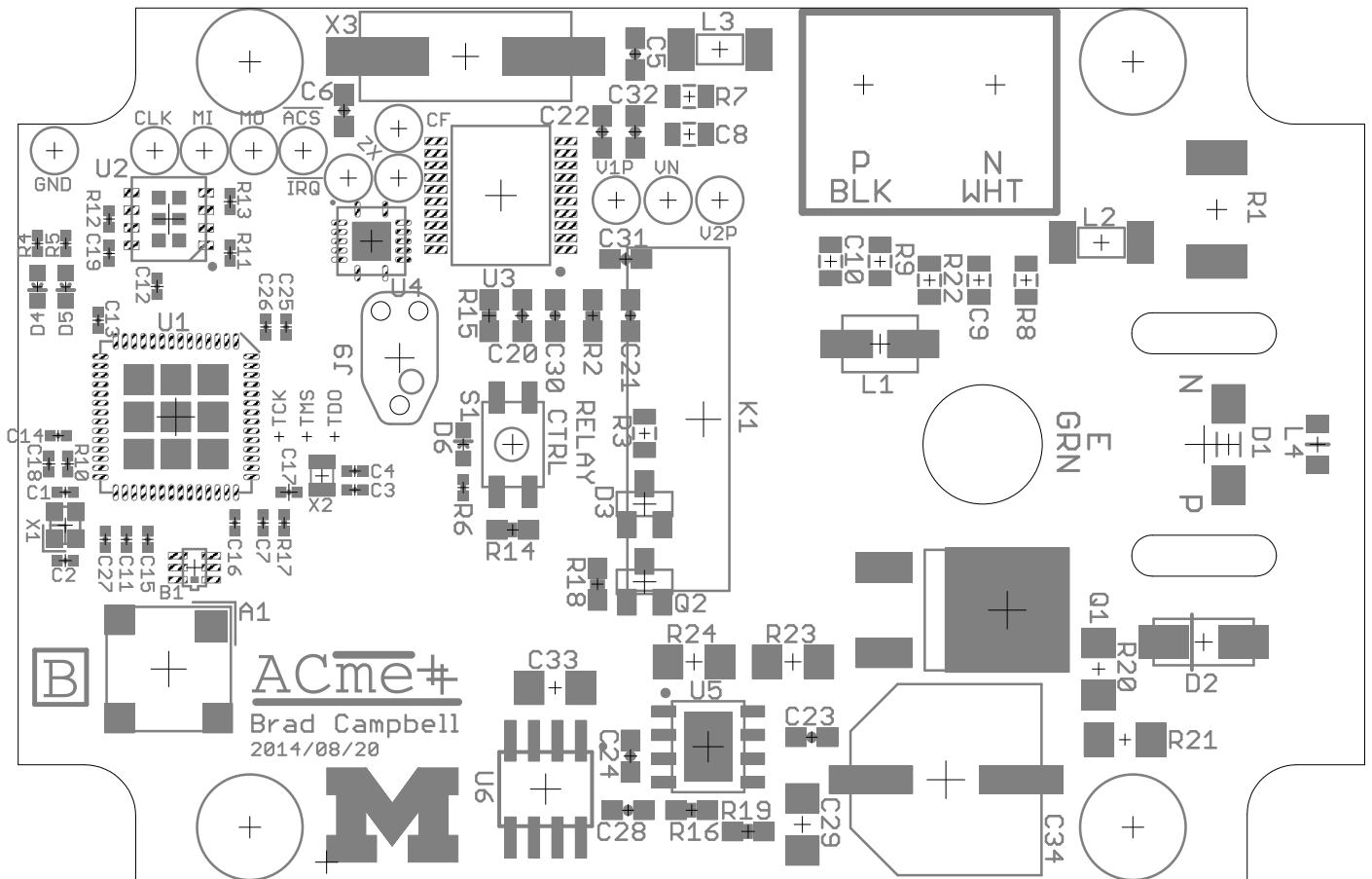




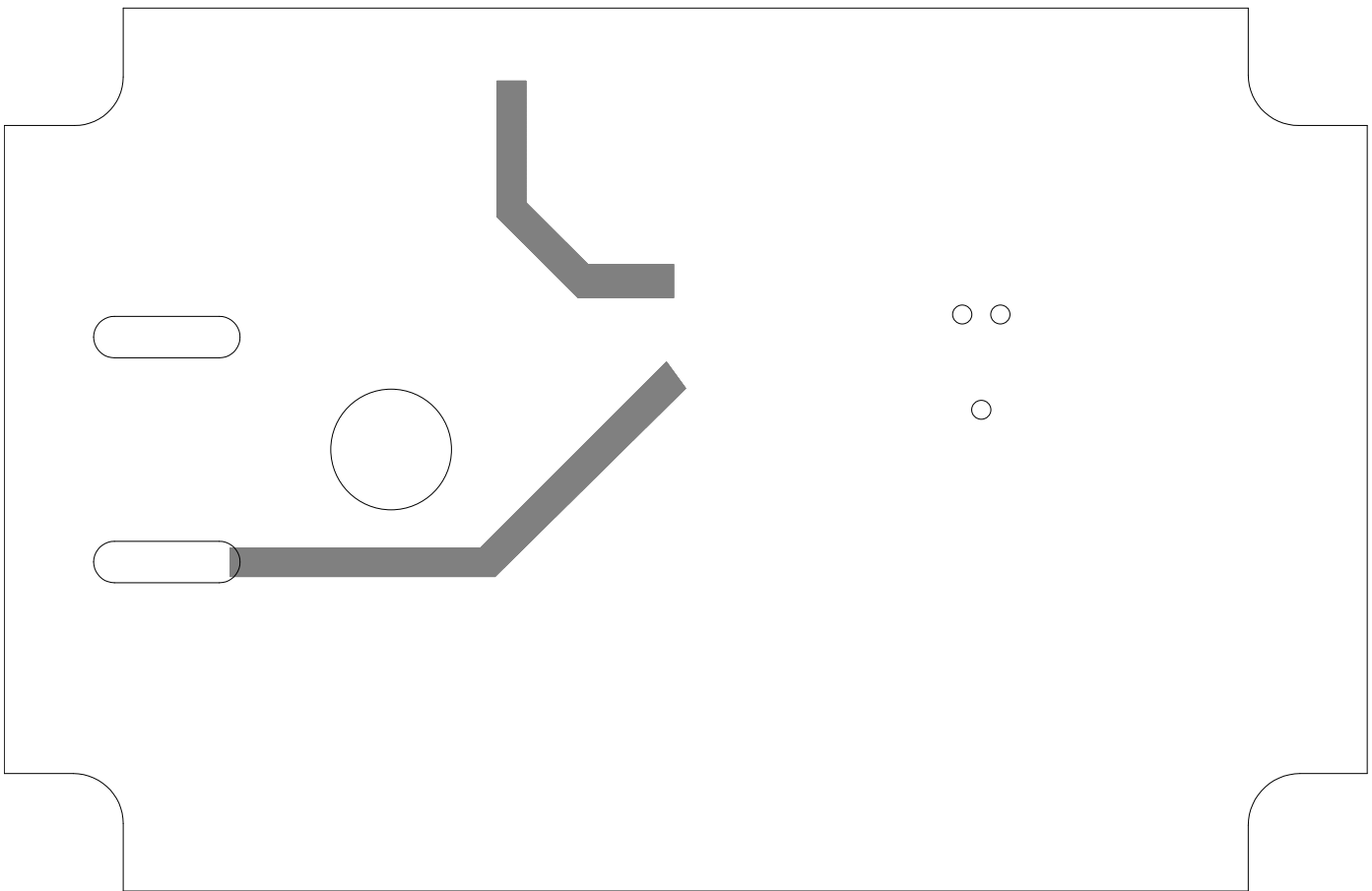


Bottom Copper Layer

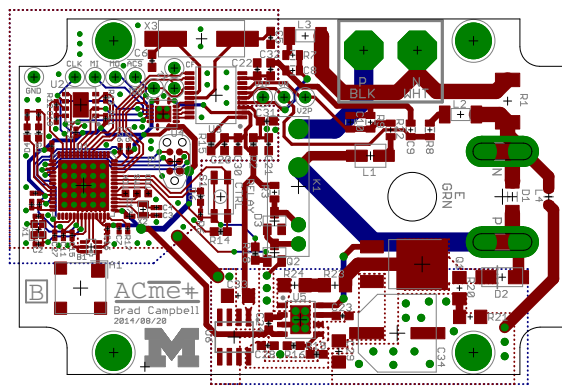


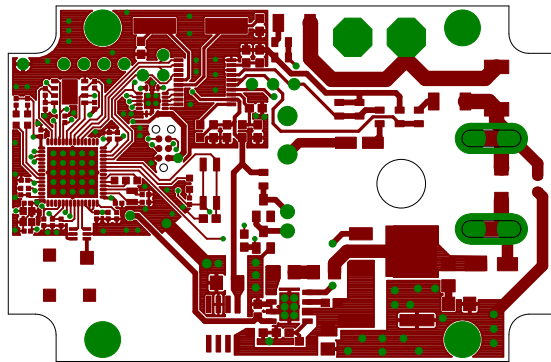


## Bottom Paste Layer with Silkscreen

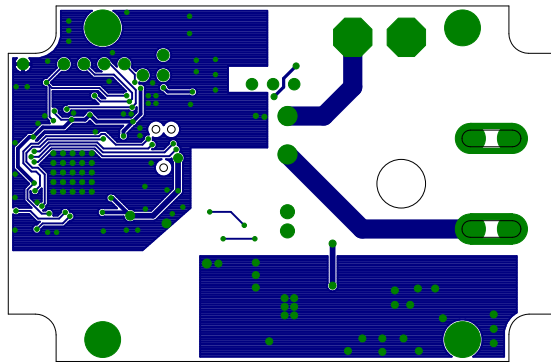


Top and Bottom Layers 1:1 Scale





Bottom Copper Layer 1:1 Scale



Qty	Value	Device	Package	Parts	Description	DIGIKEY	MOUSER	NEWARK	RICHARDSON_RFPD	McMASTER-CARR
1	FRACTUS-2.4GHZ-FR05-S1-N-0-001	FRACTUS-2.4GHZ-FR05-S1-N-0-001	FRACTUS-ANTENNA-FR05-S1-N-0-001	A1	Fractus Reach Xtend				FR05-S1-N-00018	
1	2450BM15A0002	2450BM15A0002	2450BM	B1	BALUN JTI MATCHED ZIGBEE	712-1536-1-ND				
2	12pF	CAPACITOR	0402-CAP	C1, C2	Capacitor	445-1236-1-ND				
2	22pF	CAPACITOR	0402-CAP	C3, C4	Capacitor	490-5868-1-ND				
2	22pF	CAP0603-CAP	0603-CAP	C5, C6	Capacitor	445-1273-1-ND				
1	220pF	CAPACITOR	0402-CAP	C7	Capacitor	445-1251-1-ND				
3	33nF	CAP0805	0805-CAP	C8, C9, C10	Capacitor	478-1389-1-ND				
9	0.1uF	CAPACITOR	0402-CAP	C11, C12, C13, C14, C15, C16, C17, C18, C19	Capacitor	445-1265-1-ND				
5	0.1uF	CAP0603-CAP	0603-CAP	C20, C21, C22, C23, C24	Capacitor	445-1316-1-ND				
3	1uF	CAPACITOR	0402-CAP	C25, C26, C27	Capacitor	445-4998-1-ND				
1	1uF	CAP0603-CAP	0603-CAP	C28	Capacitor	445-5956-1-ND				
1	1uF	CAP1206	1206-CAP	C29	Capacitor	445-1381-1-ND				
3	10uF	CAP0603-CAP	0603-CAP	C30, C31, C32	Capacitor	1276-1119-1-ND				
1	147uF	CAP1206	1206-CAP	C33	Capacitor	399-5508-1-ND				
1	1470uF	CAP_EEE-FP1E471AP	CAP_SM_10MM	C34	Surface mount low ESR cap.	PCE4440CT-ND				
1	SMAJ_TVS	SMAJ_TVS	DO214_TVS	D1		SMAJ250CALFCT-ND				
1	S1G	S1G	DO-214AC	D2	Diode 400V 1A SMA	S1GFSCT-ND				
1	DIODE_MMBD914	DIODE_MMBD914	SOT-23	D3	DIODE SML SIG 100V 0.2A SOT23-3	MMBD914FSCCT-ND				
1	RED	LED0603	LED-0603	D4	LEDs	160-1835-1-ND				
1	GREEN	LED0603	LED-0603	D5	LEDs	160-1834-1-ND				
1	BLUE	LED0603	LED-0603	D6	LEDs	160-1837-1-ND				
1	S216S01F	S216S01F	RELAY_SX16S0X	K1	RELAY SSR 240VAC 16A TRIAC 4-SIP	425-2413-5-ND	852-S216S01F	14N9591		
1	35F0121-05R-10	35F0121-05R-10	35F0102	L1	FERRITE 10A 42 OHMS @ 10 MHZ SMD	240-2520-1-ND				
2	EMI_SUPPRESSION_FERRITE_BEAD	EMI_SUPPRESSION_FERRITE_BEAD	L1806	L2, L3	FERRITE 300MA 150 OHM 1806 SMD	240-2418-1-ND				
1	MPZ20125300A	MPZ20125300A	0805	L4	FERRITE CHIP 30 OHM 6A 0805	445-1566-1-ND				
1	STGDSNB120S2T4	STGDSNB120S2T4	DPAK	Q1	5 A - 1200 V - low drop internally clamped IGBT	497-4352-1-ND				
1	FDV301N	FDV301N	SOT-23	Q2		FDV301NCT-ND				
1	0.001	RESISTOR2512	R2512	R1	Resistor	P1.0TCT-ND				
1	10	RESISTOR0603-RES	0603-RES	R2	Resistor	RHM10.0CFCT-ND				
1	330	RESISTOR0805-RES	0805-RES	R3	Resistor	RHM330KCT-ND				
3	470	RESISTOR	0402-RES	R4, R5, R6	Resistor	RHM470BHCT-ND				
3	1k	RESISTOR0805-RES	0805-RES	R7, R8, R9	Resistor	P16058CT-ND				
1	2.2k	RESISTOR	0402-RES	R10	Resistor	RHM2.2KCECT-ND				
3	4.7k	RESISTOR	0402-RES	R11, R12, R13	Resistor	RHM4.7KCECT-ND				
2	10k	RESISTOR0603-RES	0603-RES	R14, R15	Resistor	RHM10.0KCCT-ND				
1	12.4k	RESISTOR0603-RES	0603-RES	R16	Resistor	RHM12.4KCCT-ND				
1	56k	RESISTOR	0402-RES	R17	Resistor	RHM56KBHCT-ND				
1	100k	RESISTOR0603-RES	0603-RES	R18	Resistor	RHM100KCGCT-ND				
1	113k	RESISTOR0603-RES	0603-RES	R19	Resistor	RHM113KCCT-ND				
2	200k	RESISTOR1206	1206-RES	R20, R21	Resistor	P200KALCT-ND				
1	499k	RESISTOR0805-RES	0805-RES	R22	Resistor	P499KCT-ND				
2	510k	RESISTOR1206	1206-RES	R23, R24	Resistor	P510KALCT-ND				
1	EVQP2	EVQP2	EVQP2	S1		P11084SCT-ND				
1	TEST_POINT_0.040IN	TEST_POINT_0.040IN	TESTPOINT_0.040IN	TP1	0.040in Test Point Black	5001K-ND				
3	TEST_POINT_0.040IN	TEST_POINT_0.040IN	TESTPOINT_0.040IN	TP2, TP3, TP4	0.040in Test Point Blue	5117K-ND				
1	TEST_POINT_0.040IN	TEST_POINT_0.040IN	TESTPOINT_0.040IN	TP5	0.040in Test Point Yellow	5004K-ND				
3	TEST_POINT_0.040IN	TEST_POINT_0.040IN	TESTPOINT_0.040IN	TP6, TP7, TP8	0.040in Test Point Green	5116K-ND				
3	TEST_POINT_0.040IN	TEST_POINT_0.040IN	TESTPOINT_0.040IN	TP9, TP10, TP11	0.040in Test Point Orange	5003K-ND				
1	CC2538	CC2538	S-PVQFN-N56	U1	A Powerful System-On-Chip for 2.4-GHz IEEE 802.15.4, 6LoWPAN	296-35797-1-ND	595-CC2538SF53RTQT	87W7713		
1	FM25L8TDFN-8	FM25L8TDFN-8	TDFN-8	U2	IC FRAM 4KBIT 10MHZ 8SOIC	FM25L04B-DGRA-ND	877-FM25L04B-DG			
1	ADE7753	ADE7753	SSOP-20	U3	Single-Phase Multifunction Metering IC	ADE7753ARSZRLCT-ND	584-ADE7753ARSZR	59K0984		
1	TXB0104RGY	TXB0104RGY	S-PVQFN-N14	U4	4-BIT BIDIRECTIONAL VOLTAGE-LEVEL TRANSLATOR	296-21930-1-ND				
1	SR0865G-G	SR0865G-G	SR086	U5	Adjustable Off-Line Inductorless Switching Regulator		689-SR0865G-G			
1	TDA3664AT	TDA3664AT	SOIC_8	U6	Very low dropout voltage/quiescent current 5 V voltage regulator	568-3310-1-ND	771-TDA3664ATN1118			
1	EPSON-FA-128	EPSON-FA-128	FA-128	X1	Mhz RANGE CRYSTAL UNIT	SER3800CT-ND	732-FA128-32F20X-K3			
1	FC-12M32.7680KA-A3	FC-12M32.7680KA-A3	FC-12M	X2	kHz RANGE CRYSTAL UNIT	SER3672CT-ND	732-FC-12M-32.76KAA3			
1	ECS-35-17-5PX-TR	ECS-35-17-5PX-TR	PPB-11860-BK	X3	CRYSTAL 3.579545MHZ 17PF SMD	XCL234CT-ND	520-CSM357-17-X			
1	ENCLOSURE	PPB-11860-BK			BOX ABS 3.09X2.09X1.65" BLK	377-1709-ND				
0	ENCLOSURE	PPB-11860-WT			BOX ABS 3.09X2.09X1.65" WHI	377-1710-ND				
1	SOCKET	739W-X2/03			OUTLET PWR NEMA 5-15R SNAPIN/IDC	Q228-ND				
0	14AWG Black	6717 BK005			HOOK-UP STRND 14AWG BLACK 100'	6717 BK005-ND				
0	14AWG Green	6717 GR005			HOOK-UP STRND 14AWG GREEN 100'	6717 GR005-ND				
0	14AWG White	6717 WH005			HOOK-UP STRND 14AWG WHITE 100'	6717 WH005-ND				
4	#4 Screw				#4 3/16" Panhead Self-Tapping Screws					

92470a106

1 712-1536-1B1  
2 445-1236-1C1, C2  
2 490-5868-1C3, C4  
2 445-1273-1C5, C6  
1 445-1251-1C7  
3 478-1389-1C8, C9, C10  
9 445-1265-1C11, C12, C13, C14, C15, C16, C17, C18, C19  
5 445-1316-1C20, C21, C22, C23, C24  
3 445-4998-1C25, C26, C27  
1 445-5956-1C28  
1 445-1381-1C29  
3 1276-1119-C30, C31, C32  
1 399-5508-1C33  
1 PCE4440C1C34  
1 SMAJ250CAD1  
1 CD2320-B1D2  
1 MMBD914FD3  
1 160-1835-1D4  
1 160-1834-1D5  
1 160-1837-1D6  
1 425-2413-5K1  
1 240-2520-1L1  
2 240-2418-1L2, L3  
1 497-4352-1Q1  
1 FDV301NC-Q2  
1 P1.0TCT-NER1  
1 RHM10.0CfR2  
1 RHM330KCR3  
3 RHM470BHR4, R5, R6  
3 P16058CT-IR7, R8, R9  
2 RHM2.2KCR10, R11  
3 RHM4.7KCR12, R13, R14  
2 RHM10.0KCR15, R16  
1 RHM12.4KCR17  
1 RHM56KBHR18  
1 RHM100KCR19  
1 RHM113KCR20  
2 P200KALCTR21, R22  
1 P499KCCT-IR23  
2 P510KALCTR24, R25  
1 P11084SCTS1  
1 296-35797-U1  
1 DS2411R+ U2



1 FM25L04B-U3  
1 ADE7753AIU4  
1 296-21930-U5  
1 568-3310-1U7  
1 SER3800C1X1  
1 SER3672C1X2  
1 XC1234CT-1X3