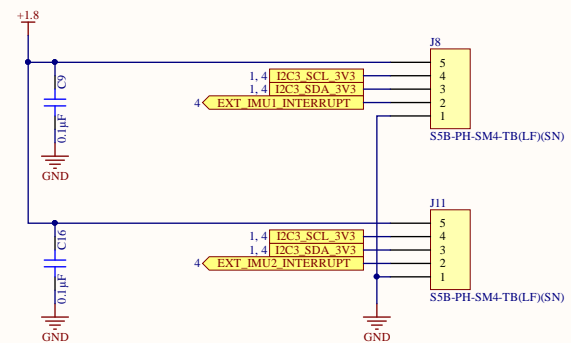
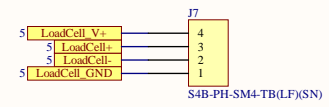
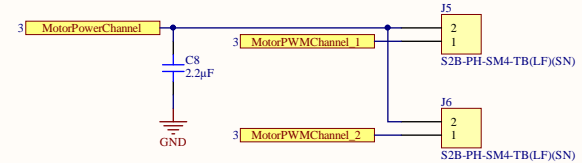
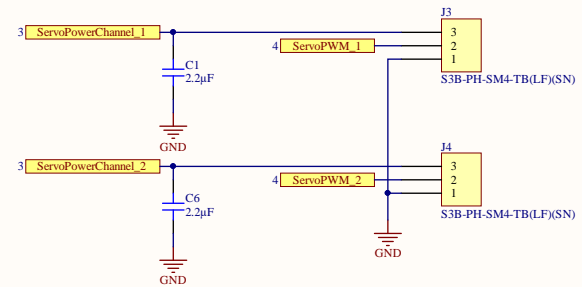
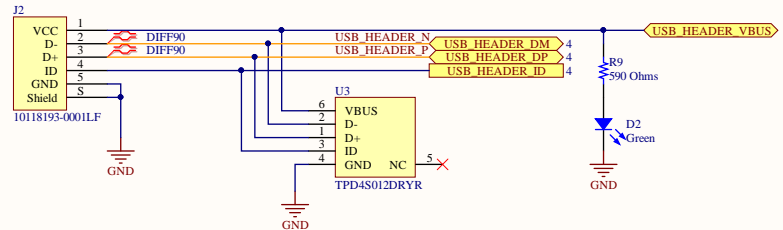
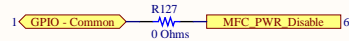
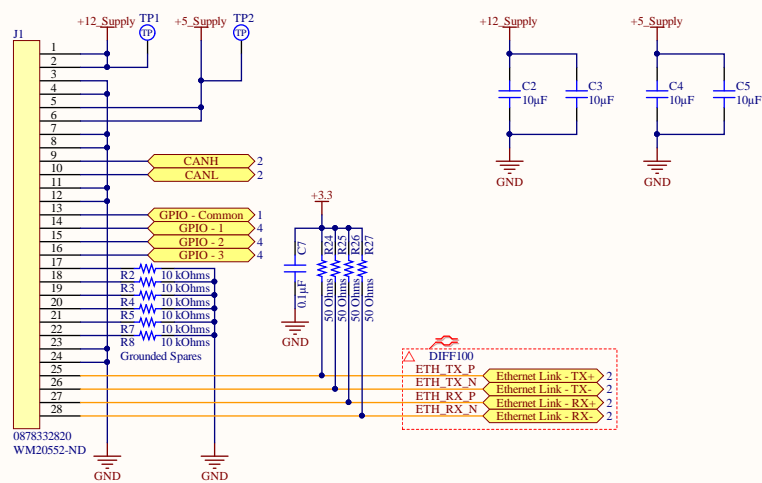
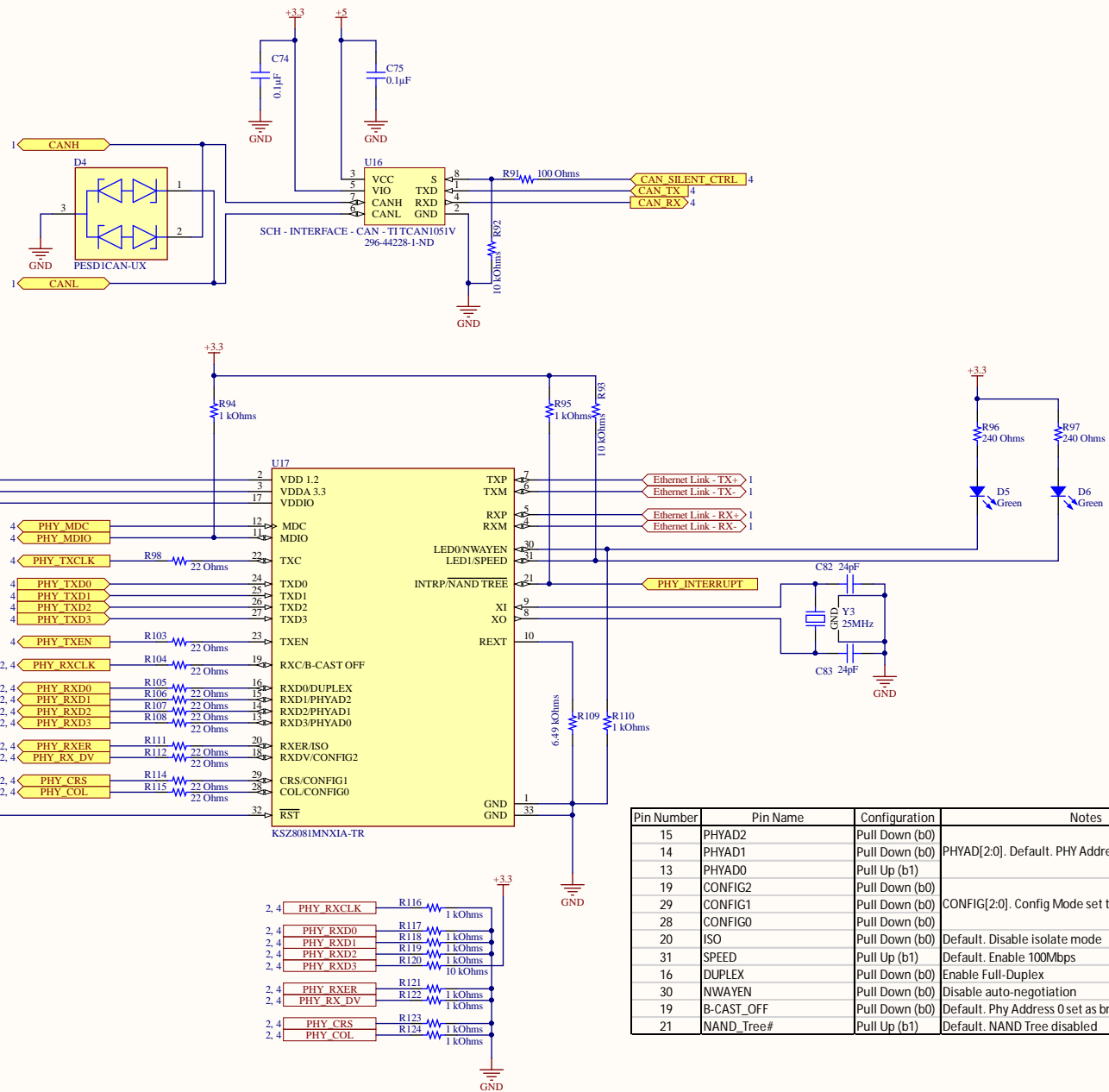


1 2 3 4 5 6 7 8





Pin Number	Pin Name	Configuration	Notes
15	PHYAD2	Pull Down (b0)	PHYAD[2:0]. Default. PHY Address set to 1
14	PHYAD1	Pull Down (b0)	
13	PHYAD0	Pull Up (b1)	
19	CONFIG2	Pull Down (b0)	CONFIG[2:0]. Config Mode set to MII interface
29	CONFIG1	Pull Down (b0)	
28	CONFIG0	Pull Down (b0)	Default. Disable isolate mode
20	ISO	Pull Down (b0)	
31	SPEED	Pull Up (b1)	
16	DUPLEX	Pull Down (b0)	Enable Full-Duplex
30	NWAYEN	Pull Down (b0)	Disable auto-negotiation
19	B-CAST_OFF	Pull Down (b0)	Default. Phy Address 0 set as broadcast PHY address
21	NAND_Tree#	Pull Up (b1)	Default. NAND Tree disabled

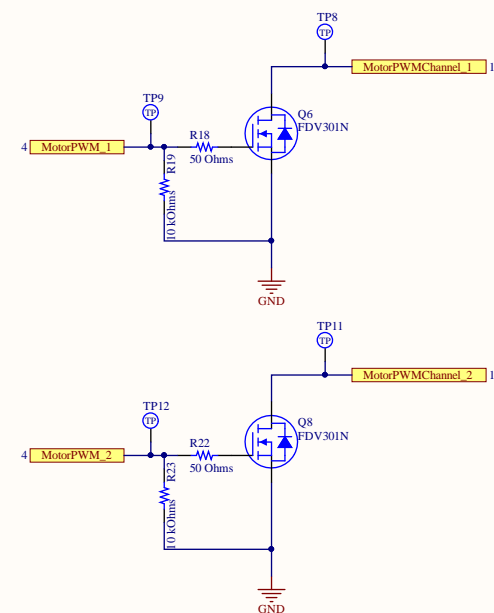
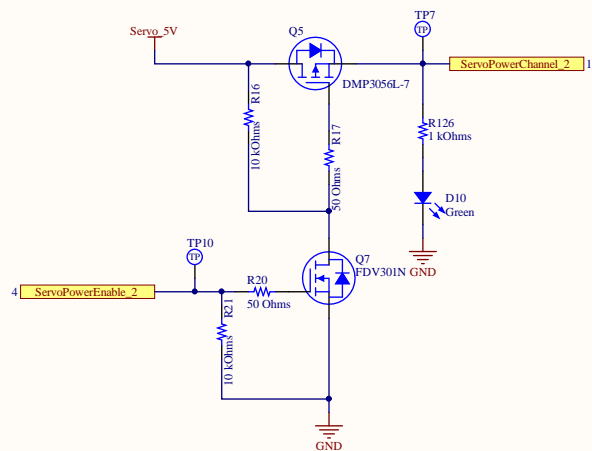
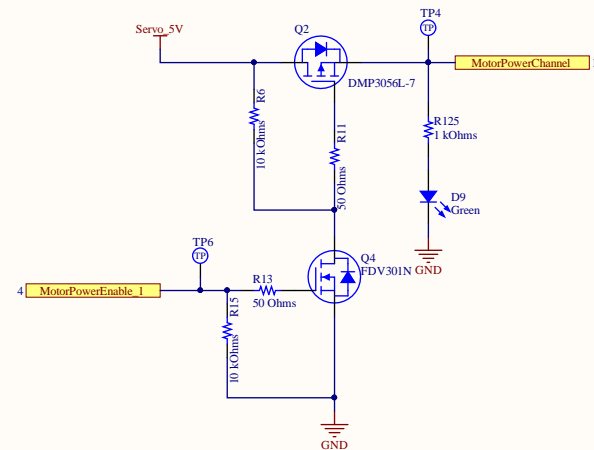
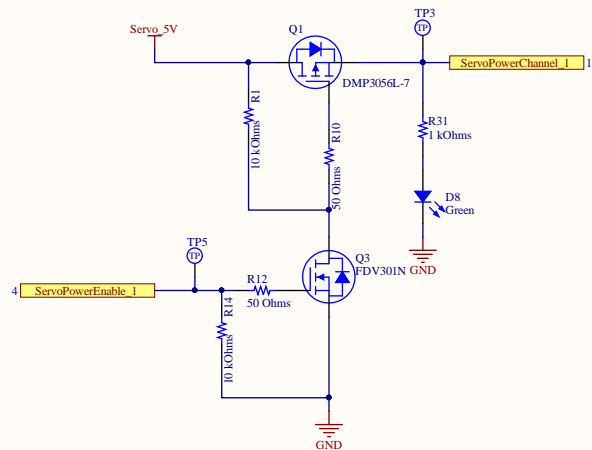


Table 2. Data Rate Settings

SPEED PIN	DATA RATE	
	Internal Oscillator	External Clock
0	10SPS	$f_{CLKIN} / 491,520$
1	80SPS	$f_{CLKIN} / 61,440$

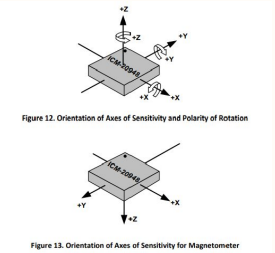
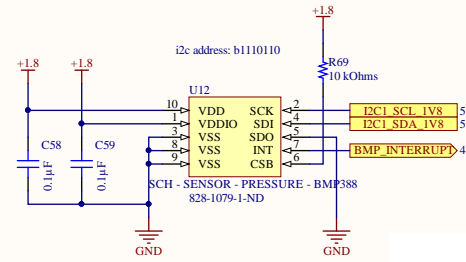
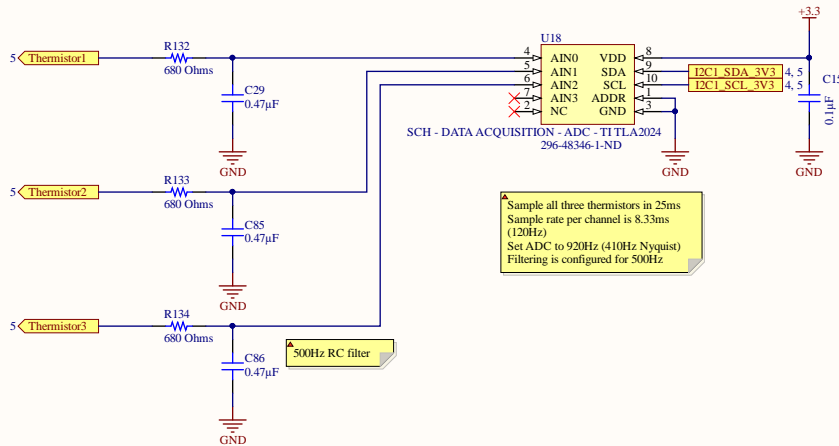
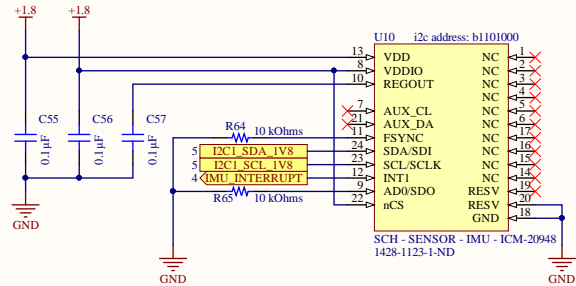
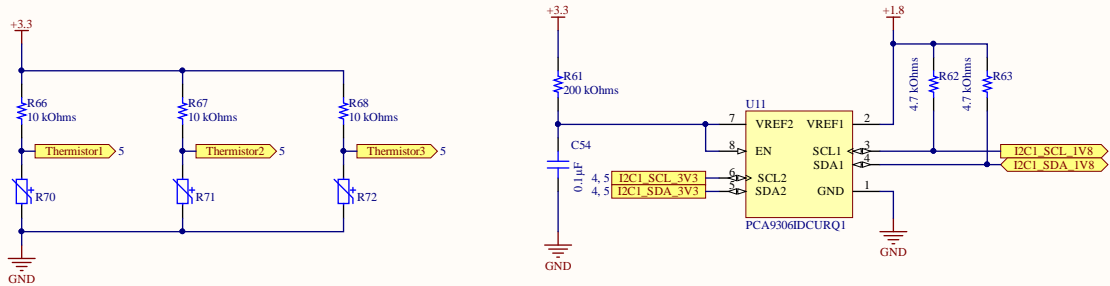
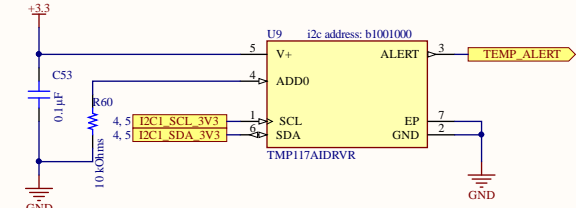
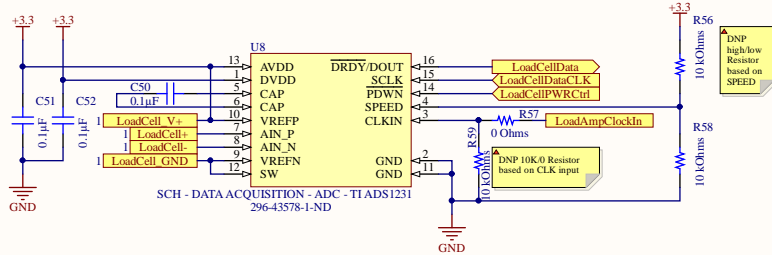
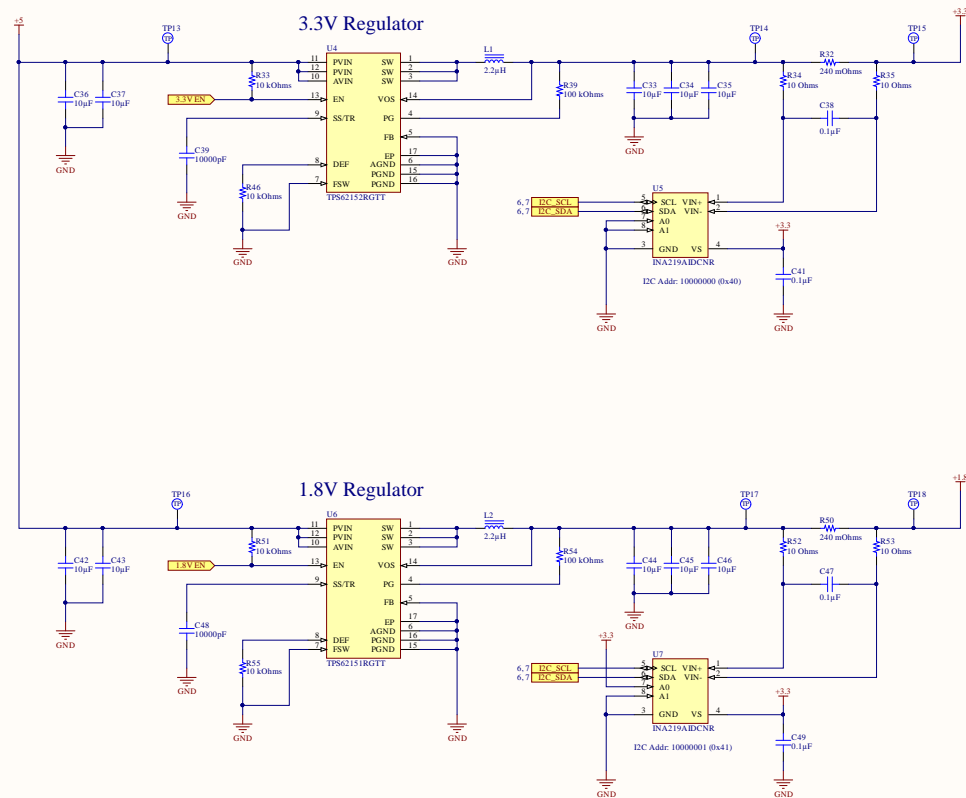


Figure 13. Orientation of Axes of Sensitivity for Magnetometer



Line #	Name	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Manufacturer Lifecycle 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Supplier Subtotal 1
2.2µF	CAP CER 2.2UF 16V XSR 0603	C1, C6, C8, C10, C11	5	Taiyo Yuden	EMK107B122XA-1	Volume Production	Digi-Key	587-1430-1-ND	0.11	0.55	
10µF	CAP CER 10UF 16V XSR 0805	C2, C3, C4, C5, C32, C33, C34, C35, C36, C37, C42, C43, C44, C45	23	Yageo	C0805KX5R7B8106	Volume Production	Digi-Key	311-1865-1-ND	0.288	6.62	
0.1µF	CAP CER 0.1UF 25V XSR 0603	C7, C9, C14, C15, C16, C17, C18, C19, C20, C21, C22, C25, C30, C31	39	Samsung	CL10B104KABWPC	New Product	Digi-Key	1276-6717-1-ND	0.048	2.4	
2.1µF	CAP CER RF 2.1PF 50V +/-0.1 PF C	C12, C13	2	KEMET	CBR06C219B5GAC		Digi-Key	399-16153-1-ND	0.29	0.58	
4.7µF	CAP CER 4.7UF 16V XSR 0603	C23	1	TDK	C1608SR1C475K080AC	Volume Production	Digi-Key	445-7478-1-ND	0.3	0.3	
1µF	CAP CER 1UF 16V XSR 0603	C24, C26	2	Murata	GCM188R71C105KA64J	Volume Production	Digi-Key	490-12657-1-ND	0.22	0.44	
2µF	CAP CER 2µF 50V C0G/NP0 0603	C27, C28, C82, C83	4	Samsung	CL10C240B08WVNC	Volume Production	Digi-Key	1276-1761-1-ND	0.1	0.4	
0.47µF	CAP CER 0.47UF 16V XSR 0603	C29, C85, C86	3	KEMET	C0603C474KAPACTU	Volume Production	Digi-Key	399-1934-1-ND	0.15	0.45	
1000µF	CAP CER 1000µF 16V XTR 0603	C39, C48	2	KEMET	C0603S103K4RAC1U	Volume Production	Digi-Key	399-9135-1-ND	0.36	0.72	
1500µF	CAP CER 1500µF 25V XTR 0603	C40, C63	2	Yageo	CC0603RX7R8BB152	Volume Production	Digi-Key	311-3996-1-ND	0.12	0.24	
22µF	CAP CER 22UF 10V XSR 0805	C76, C78, C80	3	Samsung	CL21A226KPLCRLNC	New Product	Digi-Key	1276-6786-1-ND	0.39	1.17	
CUS08F30.H3F	DIODE SCHOTTKY 30V 800MA USC	D1, D3	2	Toshiba	CUS08F30.H3F	Volume Production	Digi-Key	CUS08F30H3FCT-ND	0.35	0.7	
Green	LED GREEN CLEAR CHIP SMD	D2, D5, D6, D8, D9, D10, D11, D12	8	Vishay Lite-On	LDST-C193KGKT-5A	Volume Production	Digi-Key	160-1828-1-ND	0.209	2.09	
PSD1CAN-UX	TVS DIODE 24V 50V SOT-23	D4	1	Nexperia	PSD1CAN-UX		Digi-Key	1727-1306-6-ND	0.36	0.36	
1N4148W RHG	DIODE GEN PURP 100V 150MA SOD123	D7	1	Taiwan Semiconductor	1N4148W RHG		Digi-Key	1N4148WRHGCT-ND	0.17	0.17	
0878332820		J1	1	Molex	0878332820	Volume Production	Digi-Key	WM20552-ND	3.23	3.23	
10118193-0001LF	CONN RCPT USB2.0 MICRO B SMD R/A	J2	1	Amphenol ICC	10118193-0001LF		Digi-Key	609-4616-2-ND	0.22564	270.77	
S3B-PH-SM4-TB(LF)	CONN HEADER SMD R/A 3POS 2MM	J3, J4	2	JST	S3B-PH-SM4-TB(LF)(SN)	Volume Production	Digi-Key	455-1750-1-ND			
S2B-PH-SM4-TB(LF)	CONN HEADER SMD R/A 2POS 2MM	J5, J6	2	JST	S2B-PH-SM4-TB(LF)(SN)	Volume Production	Digi-Key	455-1749-1-ND			
S4B-PH-SM4-TB(LF)	CONN HEADER SMD R/A 4POS 2MM	J7	1	JST	S4B-PH-SM4-TB(LF)(SN)	Volume Production	Digi-Key	455-1751-1-ND			
S8B-PH-SM4-TB(LF)	CONN HEADER SMD R/A 8POS 2MM	J8, J11	2	JST	S8B-PH-SM4-TB(LF)(SN)	Volume Production	Digi-Key	455-1752-1-ND			
M20-9990246	CONN HEADER VERT 2POS 2.54MM	J9	1	Harwin	M20-9990246	Volume Production	Newark	56K0146	0.024	0.024	
B7B-PH-K-SLF(SN)	CONN HEADER VERT 7POS 2MM	J12	1	JST	B7B-PH-K-SLF(SN)	Volume Production	Digi-Key	455-1709-1-ND			
2.2µH	FIXED IND 2.2UH 2.9A 44 MOHM SMD	L1, L2	2	Bourns	SRN4018-2R2MCT-ND	Volume Production	Digi-Key	SRN4018-2R2MCT-ND			
LQH58PNR3N38L	Wire Wound Ferrite Inductor for Power Lines 3	L3	1	Murata	LQH58PNR3N38L		Mouser	81-LQH58PNR3N38L	0.76	0.76	
DMP3056L-7	MOSFET P-CH 30V 4.3A SOT23	O1, O2, O5	3	Diodes	DMP3056L-7	Volume Production	Digi-Key	DMP3056L-7DICT-ND	0.42	1.26	
FDV301N	MOSFET N-CH 25V 220MA SOT-23	O3, O4, O6, O7, O8	5	ON Semiconductor	FDV301N	Volume Production	Digi-Key	FDV301NCT-ND			
NTR4003NT1G	MOSFET N-CH 30V 500MA SOT-23	O9, O10	2	ON Semiconductor	NTR4003NT1G	Volume Production	Digi-Key	NTR4003NT1GOSCT-ND			
10 kOhms	RES 10K OHM 5% 1/10W 0603	R1, R2, R3, R4, R5, R6, R7, R8, R14, R15, R16, R19, R21, R23, R24	40	Stackpole Electronic	RMCF0603JT10K0	Volume Production	Digi-Key	RMCF0603JT10K0CT-ND	0.015	0.6	
590 Ohms	RES 590 OHM 1% 1/10W 0603	R9	1	Stackpole Electronic	RMCF0603FT590R	Volume Production	Digi-Key	RMCF0603FT590RCT-ND	0.1	0.1	
50 Ohms	RES SMD 50 OHM 1% 1/10W 0603	R10, R11, R12, R13, R17, R18, R20, R22, R24, R25, R26, R27, R47	14	Vishay Dale	CRN0603500R0KEA	Volume Production	Digi-Key	541-3316-1-ND			
4.7 kOhms	RES 4.7K OHM 1% 1/10W 0603	R29, R30, R62, R63, R129, R130, R135	7	Stackpole Electronic	RMCF0603FT4K70	Volume Production	Digi-Key	RMCF0603FT4K70CT-ND	0.017	0.17	
1 kOhms	RES 1K OHM 1% 1/8W 0603	R31, R94, R95, R110, R116, R117, R118, R119, R121, R122, R123	15	Stackpole Electronic	RMCF0603FTD1K00	Volume Production	Digi-Key	RNCP0603FTD1K00CT-ND	0.058	0.87	
240 mOhms	RES 0.24 OHM 1% 1/2W 0805	R32, R50	2	Panasonic	ERJ-6DF02R4V	Volume Production	Digi-Key	P19293CT-ND	0.33	0.66	
10 Ohms	CRGCO 0603 TOR 1%	R34, R35, R52, R53, R88, R89	6	TE Connectivity	CRGCO0603TOR		Digi-Key	A129664CT-ND	0.031	0.31	
140 kOhms	RES SMD 140K OHM 0.1% 1/10W 0603	R36	1	Yageo	RT0603BRE07140KL	Volume Production	Digi-Key	YAG4626CT-ND	0.38	0.38	
100 kOhms	RES SMD 100K OHM 5% 1/10W 0603	R39, R54	2	Yageo	RC0603JR-10100KL	Volume Production	Digi-Key	YAG2294CT-ND	0.1	0.2	
180 kOhms	RES 180K OHM 1% 1/10W 0603	R40	1	Stackpole Electronic	RMCF0603FT180K	Volume Production	Digi-Key	RMCF0603FT180KCT-ND	0.1	0.1	
7.15 kOhms	RES SMD 7.15K OHM 0.1% 1/5W 0603	R41, R77	2	Panasonic	ERJ-PB3B715TV	New Product	Digi-Key	P20070CT-ND	0.23	0.46	
47.5 kOhms	RES 47.5K OHM 1% 1/10W 0603	R42	1	Stackpole Electronic	RMCF0603FG47K5	Volume Production	Digi-Key	RMCF0603FG47K5CT-ND	0.1	0.1	
150 kOhms	RES 150K OHM 1% 1/10W 0603	R43	1	Stackpole Electronic	RMCF0603FG150K	Volume Production	Digi-Key	RMCF0603FG150KCT-ND	0.1	0.1	
63.4 kOhms	RES 63.4K OHM 1% 1/10W 0603	R44	1	Stackpole Electronic	RMCF0603FT63K4	Volume Production	Digi-Key	RMCF0603FT63K4CT-ND	0.1	0.1	
32.4 kOhms	RES SMD 32.4K OHM 0.1% 1/5W 0603	R48, R82	2	Panasonic	ERJ-PB3B3242V	New Product	Digi-Key	P20142CT-ND	0.23	0.46	
0 Ohms	RES 0 OHM JUMPER 1/10W 0603	R57, R127	2	Stackpole Electronic	RMCF0603ZT0R00	Volume Production	Digi-Key	RMCF0603ZT0R00CT-ND	0.013	0.13	
200 kOhms	RES 200K OHM 1% 1/10W 0603	R61	1	Stackpole Electronic	RMCF0603FT200K	Volume Production	Digi-Key	RMCF0603FT200KCT-ND	0.1	0.1	
10 kOhms	RES 10K OHM 1% 1/10W 0603	R66, R67, R68, R90	4	SEI	RMCF0603FT10K0		Digi-Key	RMCF0603FT10K0CT-ND	0.23	0.69	
10 kOhms	SENSOR PTC 10K OHM 1% X1SON	R70, R71, R72	3	Texas Instruments	TM6P131DEC-R		Digi-Key	TM6P131DEC-RCT-ND	0.23	0.69	
392 kOhms	RES 392K OHM 1% 1/10W 0603	R73	1	Stackpole Electronic	RMCF0603FT392K	Volume Production	Digi-Key	RMCF0603FT392KCT-ND	0.1	0.1	
475 kOhms	RES 475K OHM 1% 1/10W 0603	R76	1	Stackpole Electronic	RMCF0603FT475K	Volume Production	Digi-Key	RMCF0603FT475KCT-ND	0.1	0.1	
45.3 kOhms	RES 45.3K OHM 1% 1/10W 0603	R78	1	Stackpole Electronic	RMCF0603FT45K3	Volume Production	Digi-Key	RMCF0603FT45K3CT-ND			
82.5 kOhms	RES 82.5K OHM 1% 1/10W 0603	R79	1	Stackpole Electronic	RMCF0603FT82K5	Volume Production	Digi-Key	RMCF0603FT82K5CT-ND	0.1	0.1	
57.6 kOhms	RES 57.6K OHM 1% 1/10W 0603	R80	1	Stackpole Electronic	RMCF0603FT57K6	Volume Production	Digi-Key	RMCF0603FT57K6CT-ND			
20 mOhms	0805 CURRENT SENSING RES. 0.5%	R85	1	Panasonic	ERJ-6CWR020V		Digi-Key	P124408CT-ND	0.59	0.59	
54.9 kOhms	RES 54.9K OHM 1% 1/10W 0603	R87	1	Stackpole Electronic	RMCF0603FT54K9	Volume Production	Digi-Key	RMCF0603FT54K9CT-ND	0.1	0.1	
100 Ohms	RES 100 OHM 1% 1/10W 0603	R91	1	Stackpole Electronic	RMCF0603FG100R	Volume Production	Digi-Key	RMCF0603FG100RCT-ND	0.1	0.1	
240 Ohms	RES 240 OHM 5% 1/10W 0603	R96, R97	2	Stackpole Electronic	RMCF0603JT240R	Volume Production	Digi-Key	RMCF0603JT240RCT-ND	0.015	0.15	
22 Ohms	RES 22 OHM 1% 1/10W 0603	R98, R99, R100, R101, R102, R103, R104, R105, R106, R107, R108	15	Stackpole Electronic	RMCF0603JT22R0	Volume Production	Digi-Key	RMCF0603JT22R0CT-ND	0.017	0.255	
6.49 kOhms	RES 6.49K OHM 1% 1/8W 0603	R109	1	Stackpole Electronic	RNCP0603FTD6K49	Volume Production	Digi-Key	RNCP0603FTD6K49CT-ND			
680 Ohms	RES 680 OHM 1% 1/10W 0603	R132, R133, R134	3	Stackpole Electronic	RMCF0603FT680R	Volume Production	Digi-Key	RMCF0603FT680RCT-ND	0.017	0.17	
FSM63SMAASTR	SWITCH TACTILE SPST-NO 0.05A 24V	S1	1	TE Connectivity AM	FSM63SMAASTR	Volume Production	Digi-Key	450-2138-1-ND	0.55	0.55	
2 5mm SMD TestPoint		TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12,	20								
SCH - MICROCONTROLLER - STM32F407VET61R		U1	1	STMicroelectronics	STM32F407VET61R	Not Recommended for New Design	Digi-Key	497-19657-1-ND			
SCH - POWER - EFUSE - TPS2942A		U2, U13	2	Texas Instruments	TPS2942ARVCR	Volume Production	Digi-Key	296-40735-1-ND			
TPD4S0120RVR	USB ESD Solution with Power Clamp, 4 Channel	U4	1	Texas Instruments	TPD4S0120RVR	Volume Production	RSCcomponents	7099076P	0.589	29.45	
TPS62152RGTT	Buck Step Down Regulator with 3 to 17 V Input	U5	1	Texas Instruments	TPS62152RGTT	Volume Production	Arrow Electron	TPS62152RGTT	1.99	1.99	
INA219AIDCNR	Zero-Drift, Bi-directional Current / Power Monitor	U5, U7, U15	3	Texas Instruments	INA219AIDCNR	Volume Production					
TPS62151RGTT	Buck Step Down Regulator with 3 to 17 V Input	U6	1	Texas Instruments	TPS62151RGTT	Volume Production	Mouser	595-TPS62151RGTT	1.97	1.97	
SCH - DATA ACQUISITION - ADC - TI ADS1231		U8	1	Texas Instruments	ADS1231DR	Volume Production	Digi-Key	296-43578-1-ND	6.18	6.18	
TM1P17A1DRVR	TEMPERATURE SENSOR	U9	1	Texas Instruments	TM1P17A1DRVR	Volume Production	Arrow Electron	TM1P17A1DRVR	6.79	6.79	
SCH - SENSOR - IMU - ICM-20948		U10	1	TDK InvenSense	ICM-20948		Digi-Key	1428-1123-1-ND			
PCA9304IDCURO1	Automotive Catalog Dual Bidirectional 12c Bus	U11	1	Texas Instruments	PCA9304IDCURO1	Volume Production	Arrow Electron	PCA9304IDCURO1	0.8861	0.8861	
SCH - SENSOR - PRESSURE - BMP388		U12	1	Bosch Sensortec	BMP388		Digi-Key	828-1079-1-ND			
SCH - REGULATOR - BUCK - TI TPS565201DDCR		U14	1	Texas Instruments	TPS565201DDCR		Digi-Key	296-49006-1-ND			
SCH - INTERFACE - CAN - TI TCAN1051V		U16	1	Texas Instruments	TCAN1051VDRQ1		Digi-Key	296-44228-1-ND			
KS28081MNXA-TR	IC TRANSCEIVER FULL 1/1 32QFN	U17	1	Microchip	KS28081MNXA-TR	Volume Production					
SCH - DATA ACQUISITION - ADC - TI TLA2024		U18	1	Texas Instruments	TLA2024DR		Digi-Key	296-48364-1-ND	2.16	2.16	
32.768kHz	IOT 32.768KHZ XTAL	Y1	1	Abracon	AB507-166-32.768KHZ-T		Digi-Key	535-14514-1-ND			
25MHz	CRYSTAL 25.000MHZ 18PF SMD	Y2, Y3	2	Epson	TSX-3225 25.000MF20P-C0		Digi-Key	SER4212CT-ND			