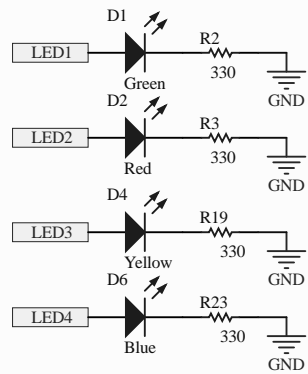
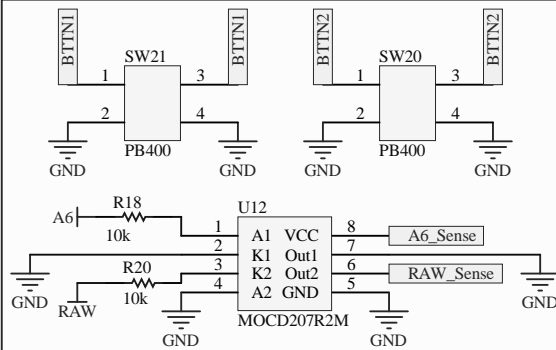


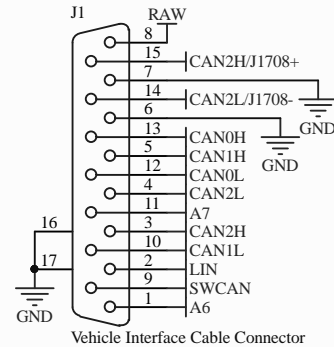
Breakout Headers



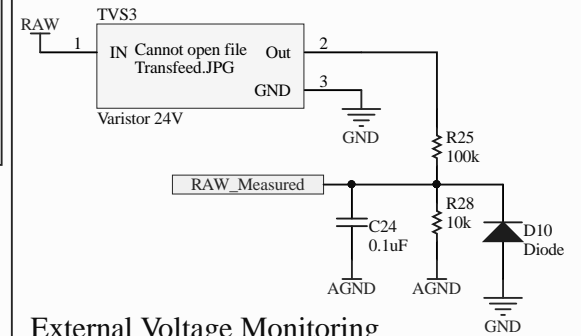
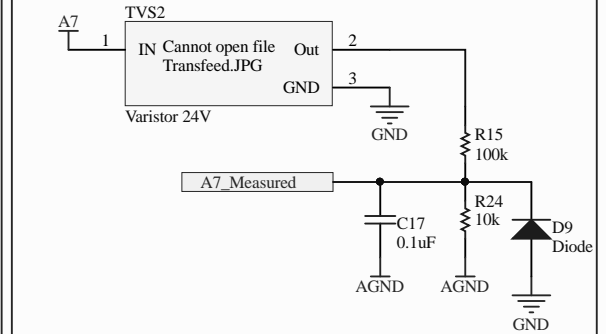
LED Indicators



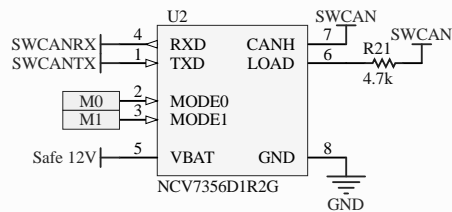
Optically Isolated Inputs



External Connections



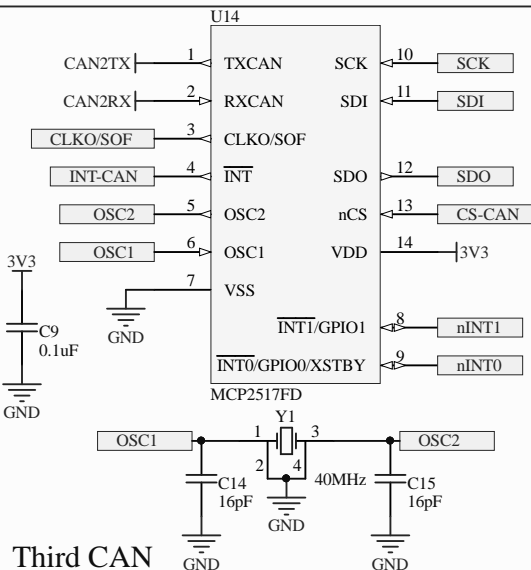
External Voltage Monitoring



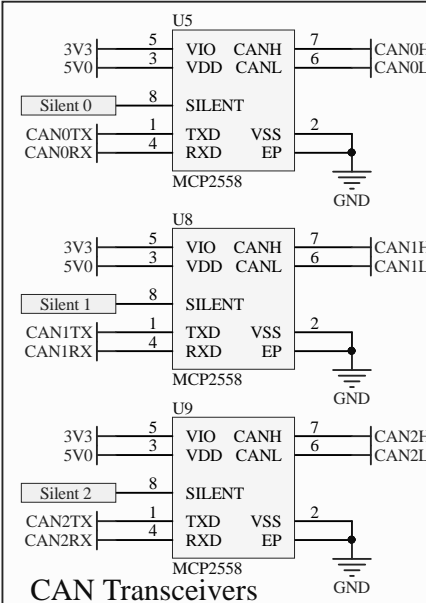
Single Wire CAN (GMLAN)



This device was designed to support the NMFTA's CAN Data Collection Project. The contributions of the NMFTA are gratefully acknowledged.

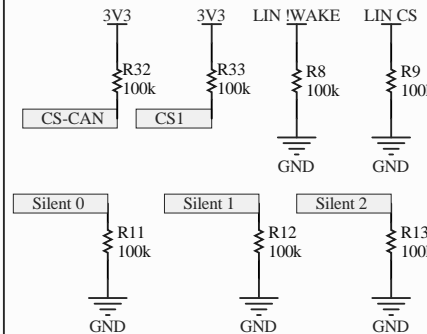


Third CAN

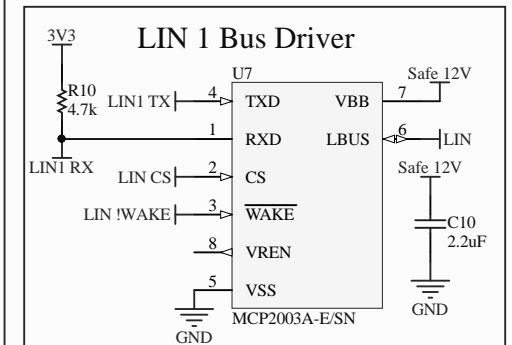


CAN Transceivers

Biasing Resistors



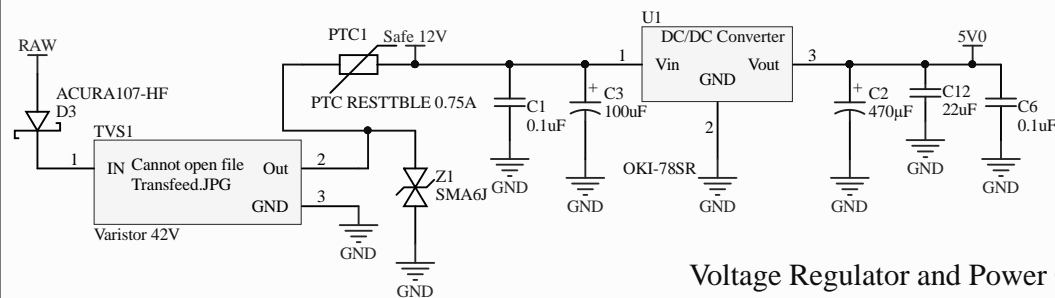
Fits Bud HP-3561-B Enclosure

Title: **Secure CAN Logger**

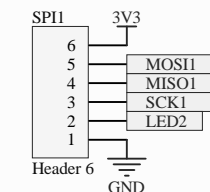
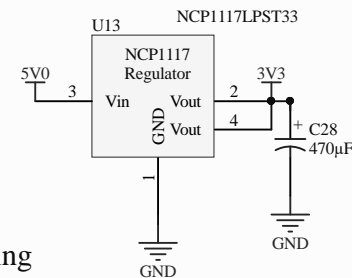
Subtitle: External Connections

Revision: 3b

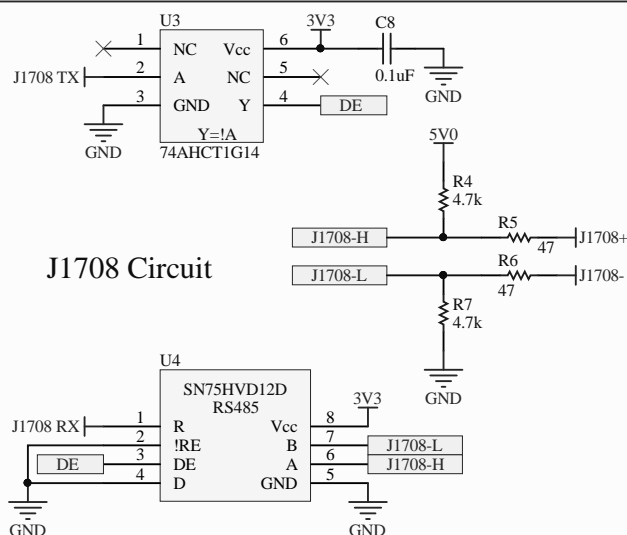
Date: 12/3/2019 Time: 8:31:29 AM Sheet 1 of 3  
File: Teensy 3.6 with J1939 - Handheld Rev3b.SchDocDr. Jeremy Daily  
Systems Engineering  
Engineering A202  
Fort Collins, CO 80523  
www.engr.colostate.edu/se/  
Drawn with Altium



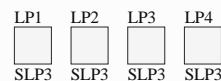
Voltage Regulator and Power Conditioning



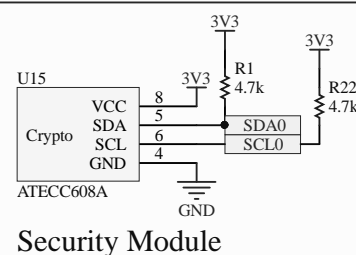
Breakout Header



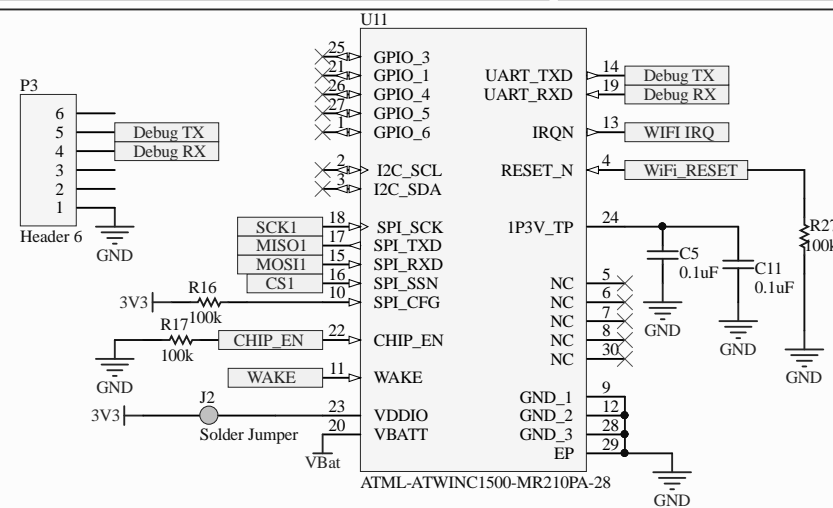
J1708 Circuit



Light Pipes



Security Module



Wireless Communications

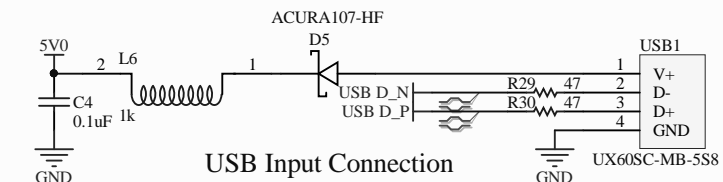
This project is released under an MIT Open Source License

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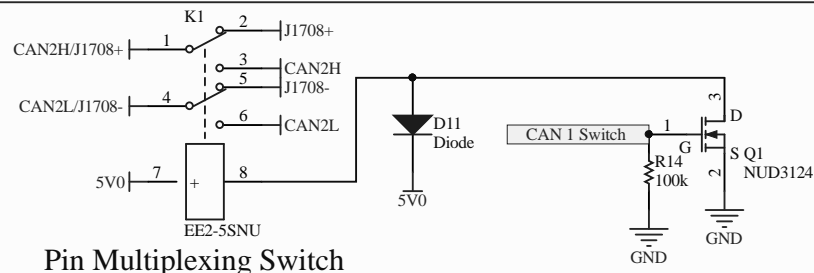
USB Input Connection



This material is based upon work supported by the National Science Foundation under Grant No. 1715409 with the following title:

SaTC: CORE: Small: Collaborative: GOALI: Detecting and Reconstructing Network Anomalies and Intrusions in Heavy Duty Vehicles.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



Pin Multiplexing Switch

Title: **Secure Handheld J1939 Logger**

Subtitle: Wifi, J1708, USB, and Security

Date: 12/3/2019 Time: 8:31:30 AM

File: Additional Circuits - Handheld - Rev 3b.SchDoc

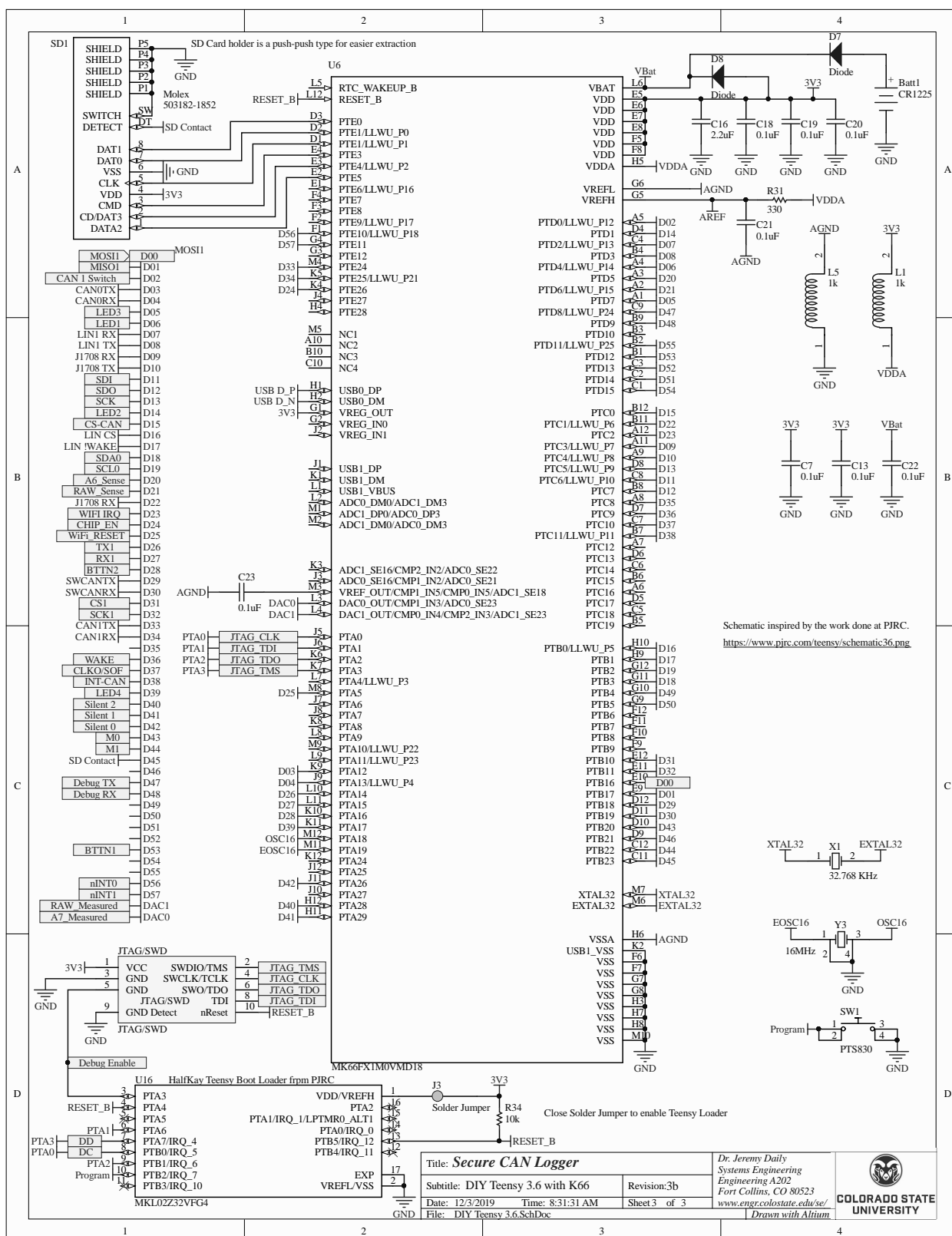
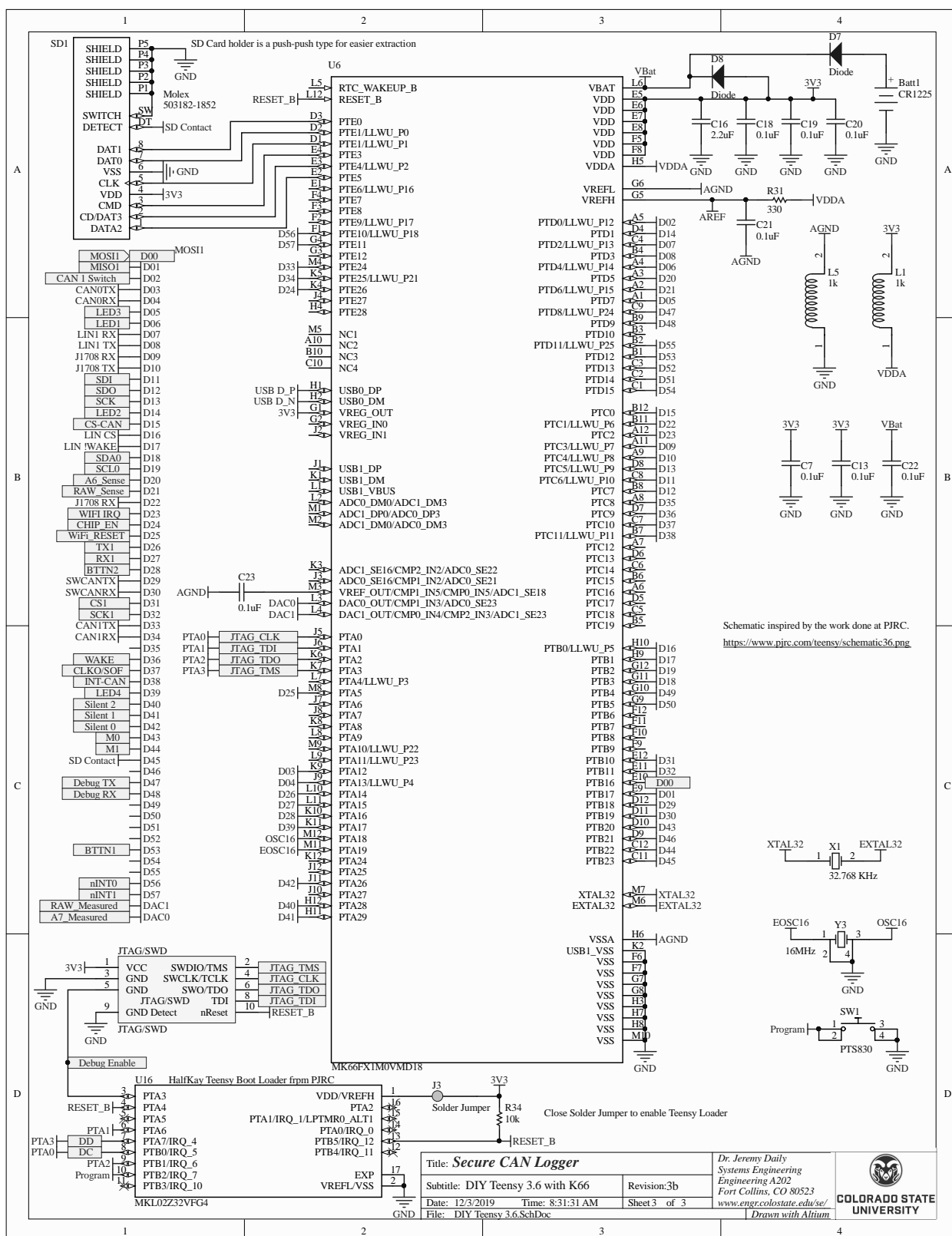
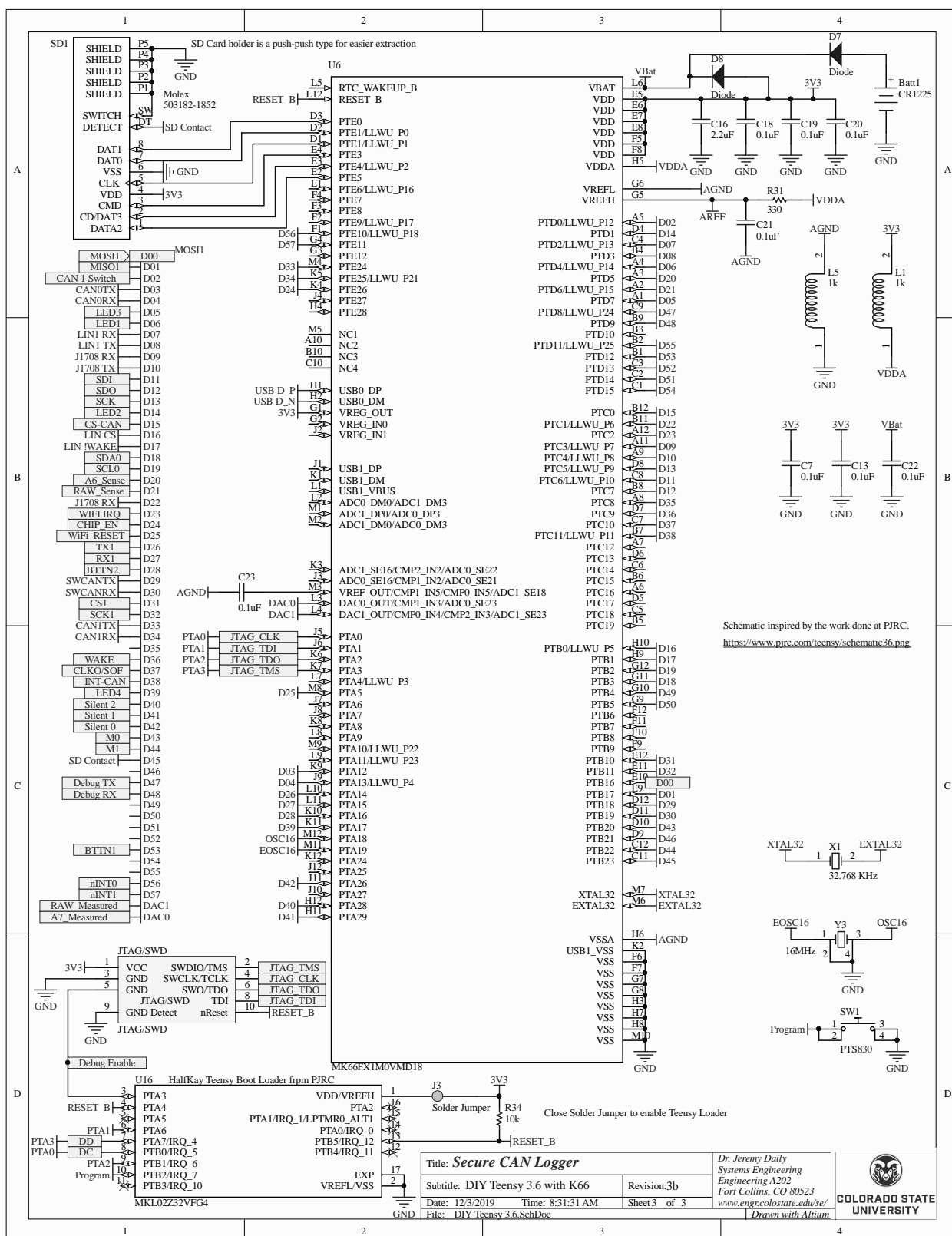
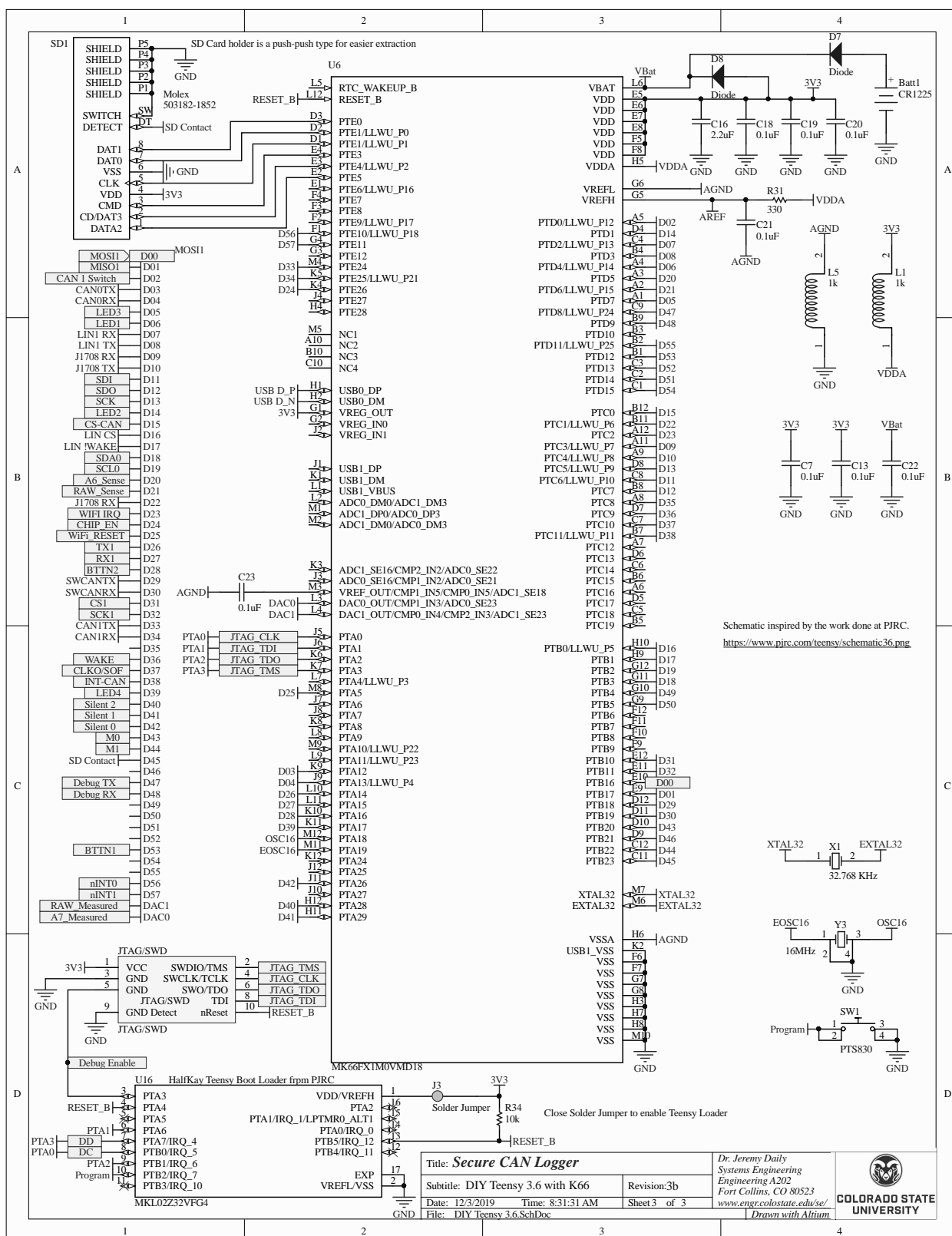
Revision:3b

Sheet2 of 3

Drawn with Altium

Dr. Jeremy Daily  
Systems Engineering  
Engineering A202  
Fort Collins, CO 80523  
www.engr.colostate.edu/se/





Item #	Designator	Description	Comment	Quantity	Manufacturer	PartNumber	Footprint
1	D4	LED YELLOW DIFFUSED 0805 SMD	Yellow	1	OSRAM Opto Semiconductors Inc	LY R976-PS-36	0805 Polarize
2	J1	Receptacle Assembly, 15 Position	Vehicle Interface	1	Amphenol FCI	D15S33E4GV00LF	DSUB1.3852
3	TVS1	VARISTOR CAP FEEDTHRU 18V 0.5W	Varistor 42V	1	AVX	V2F118A400Y2EDP	Transfeed
4	TVS2, TVS3	VARISTOR CAP FEEDTHRU 14V 0.5W	Varistor 24V	2	AVX	V2F114C300Y1FDP	Transfeed
5	USB1	USB - mini B USB 2.0 Receptacle	UX60SC-MB-5S8	1	Hirose	UX60SC-MB-5S8	USB Mini UX6
6	U4	IC RS485 TXRX 3/5V 8-SOIC	SN75HVD08DR	1	Texas Instruments	SN75HVD08DR	SOIC-SN8 N
7	Z1	TVS DIODE 20VWM 36.8VC SMA	SMA6J	1	Micro Commercial Co	SMA6J24CA-TP	SMA
8	LP1, LP2, LP3, LP4	Light Pipe Single Clear Rigid Round	SLP3	4	Bivar Inc.	SLP3-150-250-R	PCB Component
9	D2	Red 633nm LED Indication - Discrete	Red	1	OSRAM Opto Semiconductors Inc	LS R976-NR-1	0805 Polarize
10	SW1	Tactile Switch SPST-NO Top Actuator	PTS830	1	C & K Components	PTS830GM140 SMTR LFS	Switch PTS83
11	PTC1	PTC RES TTBLE 0.75A 33V CHIP	PTC RESTTBLE	1	Bel Fuse Inc.	OZCG0075BF2B	1812
12	SW20, SW21	Pushbutton Switch DPST-NO Standard	PB400	2	E-Switch	PB400OAGR1BLK	PB400
13	U1	5V DC/DC Converter (7805 replacement)	OKI-78SR	1	Murata Power Solutions Inc.	OKI-78SR-5/1.5-W36HC	OKI-78SR
14	Q1	IC INDCT LOAD DRVR AUTO SOT23	NUD3124	1	ON Semiconductor	NUD3124LT1G	SOT23 N
15	U2	Single Wire CAN Transceiver, 5 to 12V	NCV7356D1R2G	1	On Semiconductor	NCV7356D1R2G	ONSC-SOIC-8
16	U13	Linear Voltage Regulator IC Positive	NCP1117LPST33	1	On Semiconductor	NCP1117LPST33T3G	SOT-223
17	U12	Optoisolator Transistor Output 250V	MOCD207R2M	1	Fairchild/ON Semiconductor	MOCD207R2M	SOIC-8
18	U16	32 Bit Microcontroller, Kinetis L Series	MKL02Z32VFG4	1	NXP USA Inc.	MKL02Z32VFG4	*QFN50P300
19	U6	Kinetis K66: 180MHz Cortex-M4F	MK66FX1M0VMD18	1	NXP USA Inc.	MK66FX1M0VMD18	*BGA144C10
20	U5, U8, U9	Microchip CAN FD Transceiver with	MCP2558	3	Microchip Technology, Microchip	MCP2558FDT-HMNY	TDFN
21	U14	CANbus Controller CAN 2.0 SPI Interface	MCP2517FD	1	Microchip Technology	MCP2517FDT-HUHA	SOP14
22	U7	LIN J2602 Transceiver, 8-Pin SOIC	MCP2003A-E/SN	1	Microchip Technology	MCP2003A-E/SN	SOIC-SN8 N
23	JTAG/SWD	Connector Header Surface Mount	JTAG/SWD	1	CNC Tech	3221-10-0300-00	JTAG 10-pin
24	J2, J3, P3, SPI1, UART	Header, 4-Pin, [No Value], Header	Header 4, Solder	6			HDR1X4, Solder
25	D1	Green 570nm LED Indication - Discrete	Green	1	OSRAM Opto Semiconductors Inc	LG R971-KN-1	0805 Polarize
26	K1	General Purpose Relay DPDT (2 Feed)	EE2-5SNU	1	KEMET	EE2-5SNU	RELAY - EE2
27	P2	CONN HEADER PH SIDE 3POS 2MM	DNP GP-20U7 JST	1	JST	S3B-PH-SM4-TB(LF)/SN	MHDR1X3
28	D7, D8, D9, D10, D11	Default Diode	Diode	5	Shimoda Semiconductor and Storage	CCS15S30L3FCT-ND	CST2C
29	Batt1	Lithium Battery Non-Rechargeable	CR1225	1	Linx	BAT-HLD-012-SMT	Battery Clip -
30	D6	Blue 470nm LED Indication - Discrete	Blue	1	Broadcom Limited	HSMN-C170	0805 Polarize
31	U11	SMART CONNECT ATWINC1500B	ATML-ATWINC1500	1	Microchip Technologies	ATWINC1510-MR210PB1140	ATML-ATWIN
32	U15	Authentication Chip IC Networking	ATECC608A	1	Microchip Technology	ATECC608A-SSHDA-T	SOIC-8
33	D3, D5	Diode Schottky 1000V 1A Surface	ACURA107-HF	2	Comchip Technology	ACURA107-HF	SMA with Aar
34	SD1	MICRO SD NORMAL ULTRA LOW	503182-1852	1	Molex	5031821852	*MOLEX 503
35	C2, C28	470µF 16V Aluminum Electrolytic	470µF	2	Panasonic Electronic Components	EEE-HC1C471P	Elec. Cap - G
36	R2, R3, R19, R23, R33	330 Ohms ±1% 0.1W, 1/10W Chip	330	5	Rohm Semiconductor	KTR03EZPF3300	0603
37	C3	Aluminum Electrolytic Capacitors	100µF	1	Panasonic Electronic Components	EEE-HC1H101P	Elec. Cap - G
38	R3, R14, R15, R16, R17	100 kOhms ±1% 0.1W, 1/10W Chip	100k	13	Rohm Semiconductor	KTR03EZPF1003	0603
39	U3	IC SCHMIT-TRIGG INV GATE SOT23	74AHCT1G14	1	Diodes Incorporated	74AHCT1G14SE-7	SOT-353
40	R5, R6, R29, R30	±1% 0.1W, 1/10W Chip Resistor	06047	4	Rohm Semiconductor	KTR03EZPF47R0	0603
41	Y1	40MHz ±10ppm Crystal 10pF 40 Ohm	40MHz	1	ECS Inc.	ECS-400-10-37B-CKY-TR	XTAL 4 pad
42	X1	Canned Oscillator	32.768 KHz	1	ECS Inc.	ECX-.327-CDX-1293	XTAL 2-pad S
43	C12	22µF ±20% 25V Ceramic Capacitor	22µF	1	Murata Electronics North America	GRT31CR61E226ME01L	1206
44	C14, C15	16pF ±5% 50V Ceramic Capacitor	16pF	2	Yageo	CC0603JRNPO9BN160	0603
45	Y3	16MHz ±30ppm Crystal 18pF 80 Ohm	16MHz	1	ECS Inc.	XC2866CT-ND	XTAL 4 pad
46	R8, R20, R24, R28, R31	10 kOhms ±1% 0.1W, 1/10W Chip	10k	5	Rohm Semiconductor	KTR03EZPF1002	0603

47	, R4, R7, R10, R21, R	4.7 kOhms±1% 0.1W, 1/10W Chip	4.7k	6	Rohm Semiconductor	KTR03EZPF4701	0603
48	C10, C16	2.2µF ±10% 6.3V Ceramic Capacit	2.2uF	2	Taiyo Yuden	JMK107BJ225KAHT	0603
49	L1, L5, L6	Ferrite BeadsMulti-Layer Power 1k	1k	3	Murata	BLM18KG102SZ1D	0603
50	C11, C13, C17, C18, C	CAP CER 0.1UF 50V X7R 0603	0.1uF	17	KEMET	C0603C104K5RACAUTO	0603