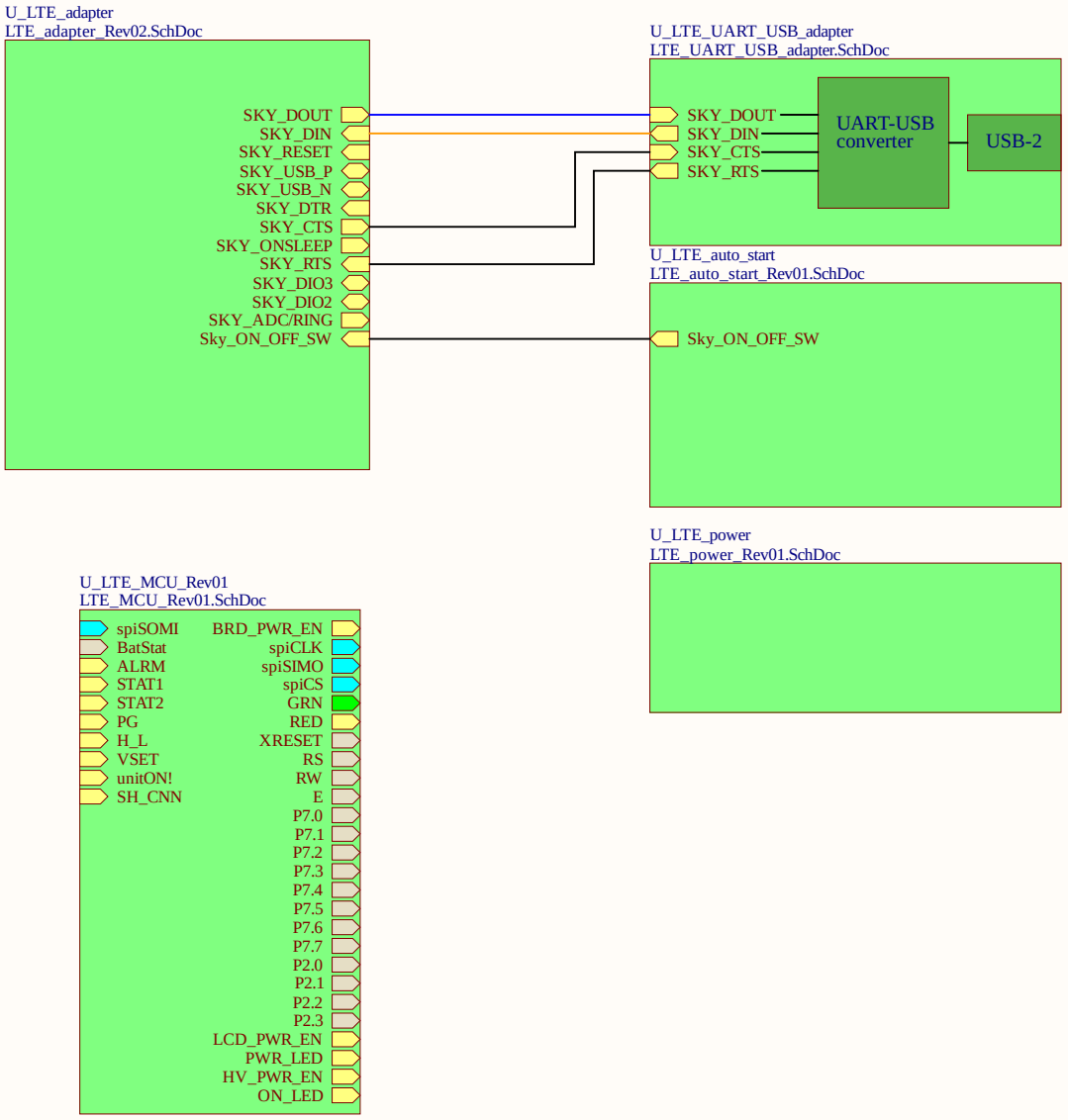
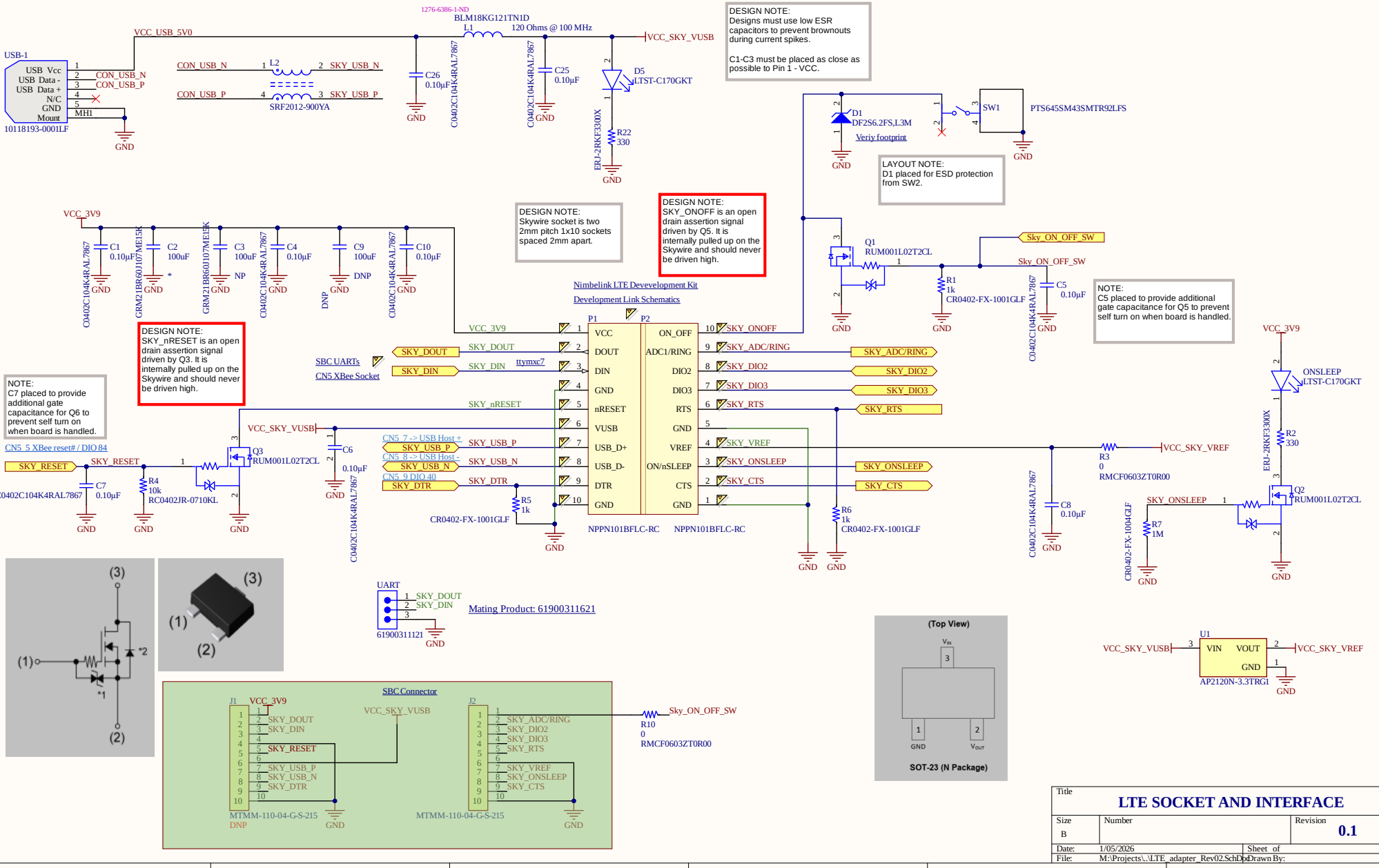
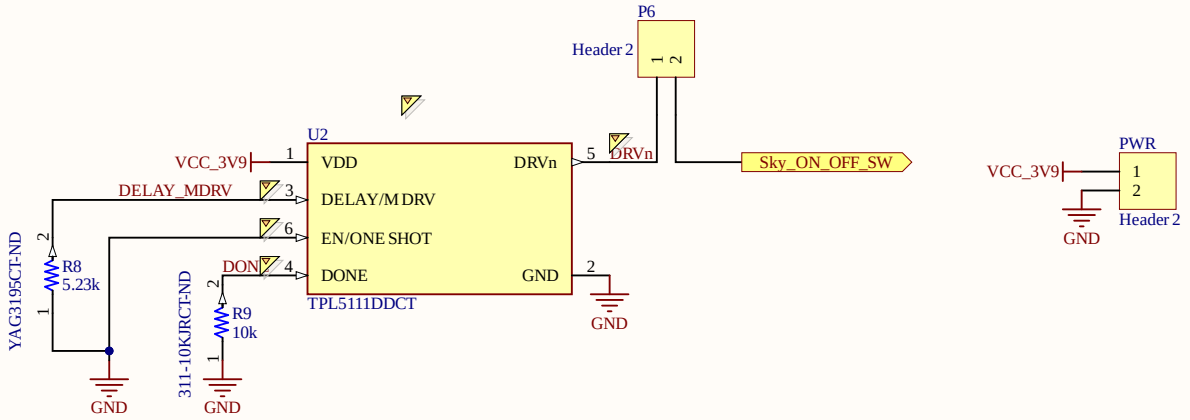


Title	**LTE ADAPTER BOARD**	
Size: Letter	Number	Revision: **0**
Date: 1/05/2026	Sheet of	
File: M:\Projects\..\LTE_block_diagram.SchDoc	Drawn By:	


1276-6386-1-ND
BLM18KG121TN1D
L1
120 Ohms @ 100 MHz
VCC_USB_5V0
VCC_SKY_VUSB
USB-1
USB Vcc
USB Data -
USB Data +
N/C
GND
Mount
10118193-0001LF
CON_USB_N
CON_USB_P
L2
SRF2012-900YA
SKY_USB_N
SKY_USB_P
C26
0.10µF
C25
0.10µF
C0402C104K4RAL7867
D5
LTST-C170GKT
R22
330
ERJ-2RKF3300X
DESIGN NOTE:
Designs must use low ESR capacitors to prevent brownouts during current spikes.
C1-C3 must be placed as close as possible to Pin 1 - VCC.
D1
DF2S6.2FS,L3M
Veriy footprint
SW1
PTS645SM43SMTR92LFS
LAYOUT NOTE:
D1 placed for ESD protection from SW2.
VCC_3V9
C1
0.10µF
C2
100uF
C3
100uF
NP
C4
0.10µF
C9
100uF
DNP
C10
0.10µF
GRM21BR60J107ME15K
GRM21BR601107ME15K
DESIGN NOTE:
Skywire socket is two 2mm pitch 1x10 sockets spaced 2mm apart.
DESIGN NOTE:
SKY_ONOFF is an open drain assertion signal driven by Q5. It is internally pulled up on the Skywire and should never be driven high.
Nimbelink LTE Devevelopment Kit
Development Link Schematics
P1
P2
VCC
DOUT
DIN
GND
nRESET
VUSB
USB_D+
USB_D-
DTR
ON_OFF
ADC1/RING
DIO2
DIO3
RTS
VREF
ON/nSLEEP
CTS
SKY_ONOFF
SKY_ADC/RING
SKY_DIO2
SKY_DIO3
SKY_RTS
SKY_VREF
SKY_ONSLEEP
SKY_CTS
NPPN101BFLC-RC
Q1
RUM001L02T2CL
Sky_ON_OFF_SW
R1
1k
CR0402-FX-1001GLF
C5
0.10µF
NOTE:
C5 placed to provide additional gate capacitance for Q5 to prevent self turn on when board is handled.
SBC UARTs
CN5 XBee Socket
SKY_DOUT
SKY_DIN
ttymxc7
DESIGN NOTE:
SKY_nRESET is an open drain assertion signal driven by Q3. It is internally pulled up on the Skywire and should never be driven high.
SKY_nRESET
NOTE:
C7 placed to provide additional gate capacitance for Q6 to prevent self turn on when board is handled.
CN5_5 XBee reset# / DIO 84
SKY_RESET
Q3
RUM001L02T2CL
R4
10k
RC0402JR-0710KL
C7
0.10µF
C6
0.10µF
CN5_7 -> USB Host +
CN5_8 -> USB Host -
CN5_9 DIO 40
R5
1k
R6
1k
CR0402-FX-1001GLF
R3
0
RMCF0603ZT0R00
VCC_SKY_VREF
C8
0.10µF
ONSLEEP
LTST-C170GKT
R2
330
Q2
RUM001L02T2CL
R7
1M
CR0402-FX-1004GLF
UART
61900311121
Mating Product: 61900311621
(Top View)
SOT-23 (N Package)
U1
VIN
VOUT
AP2120N-3.3TRG1
SBC Connector
J1
J2
MTMM-110-04-G-S-215
DNP
R10
0
RMCF0603ZT0R00
Title
LTE SOCKET AND INTERFACE
Size
B
Number
Revision
0.1
Date:
1/05/2026
Sheet of
File:
M:\Projects\..\LTE_adapter_Rev02.SchDoc
Drawn By:



Title	**LTE Board Auto Start**	
Size: Letter	Number:	Revision: **0**
Date: 1/05/2026	Sheet of	
File: M:\Projects\..\LTE_auto_start_Rev01.SchDoc	Drawn By:	

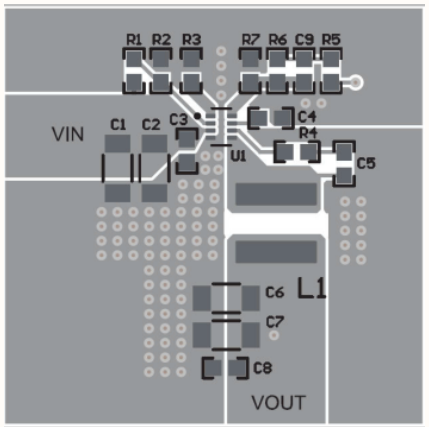


Figure 12-2. TPS62933 Top Layout Example

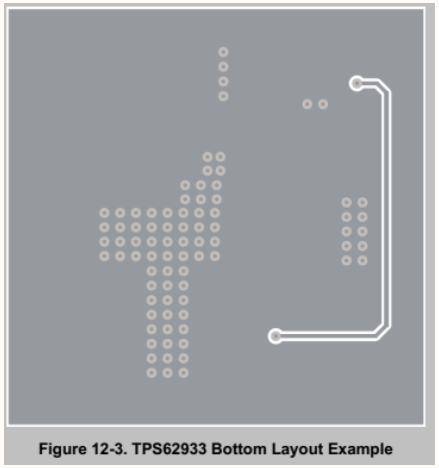
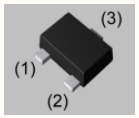
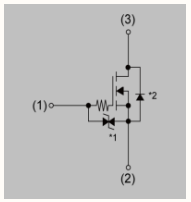
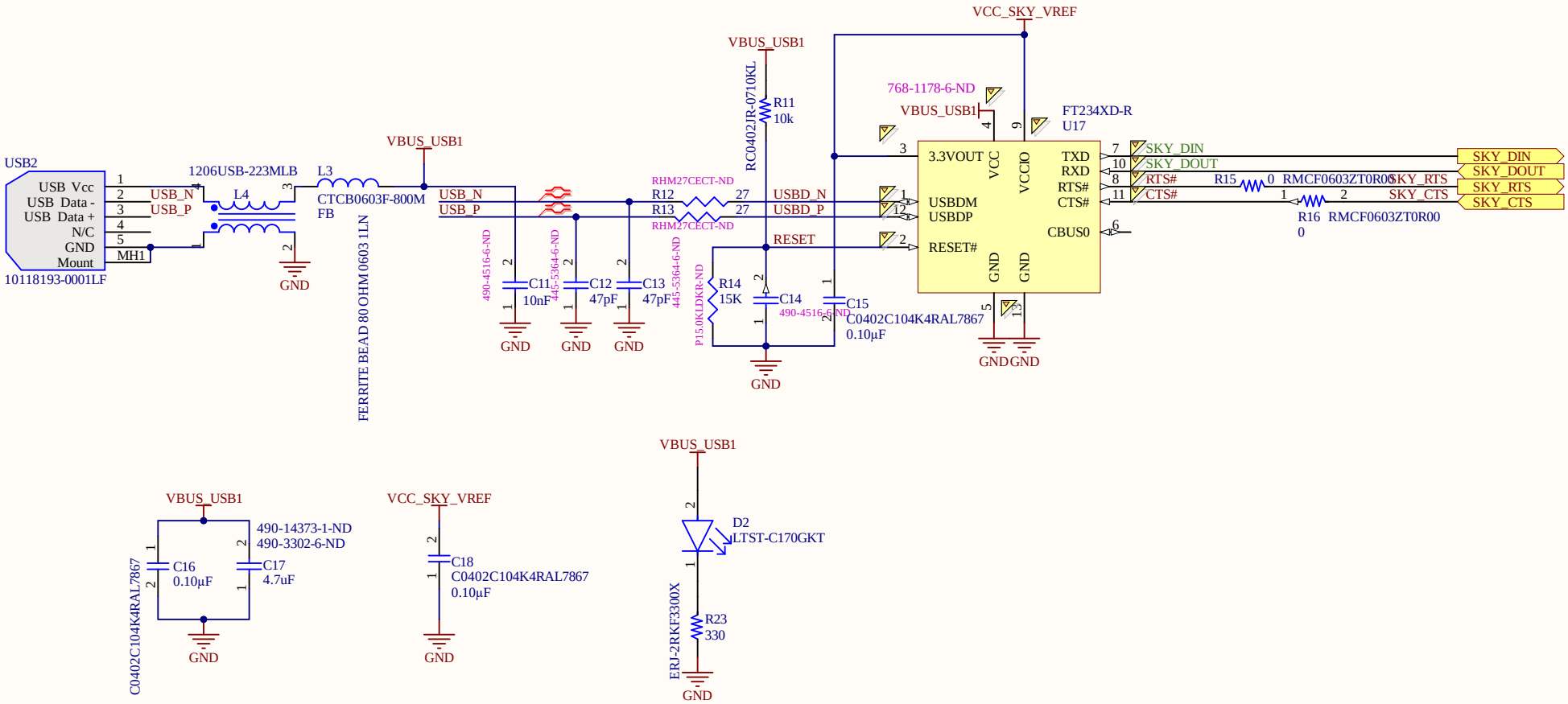


Figure 12-3. TPS62933 Bottom Layout Example

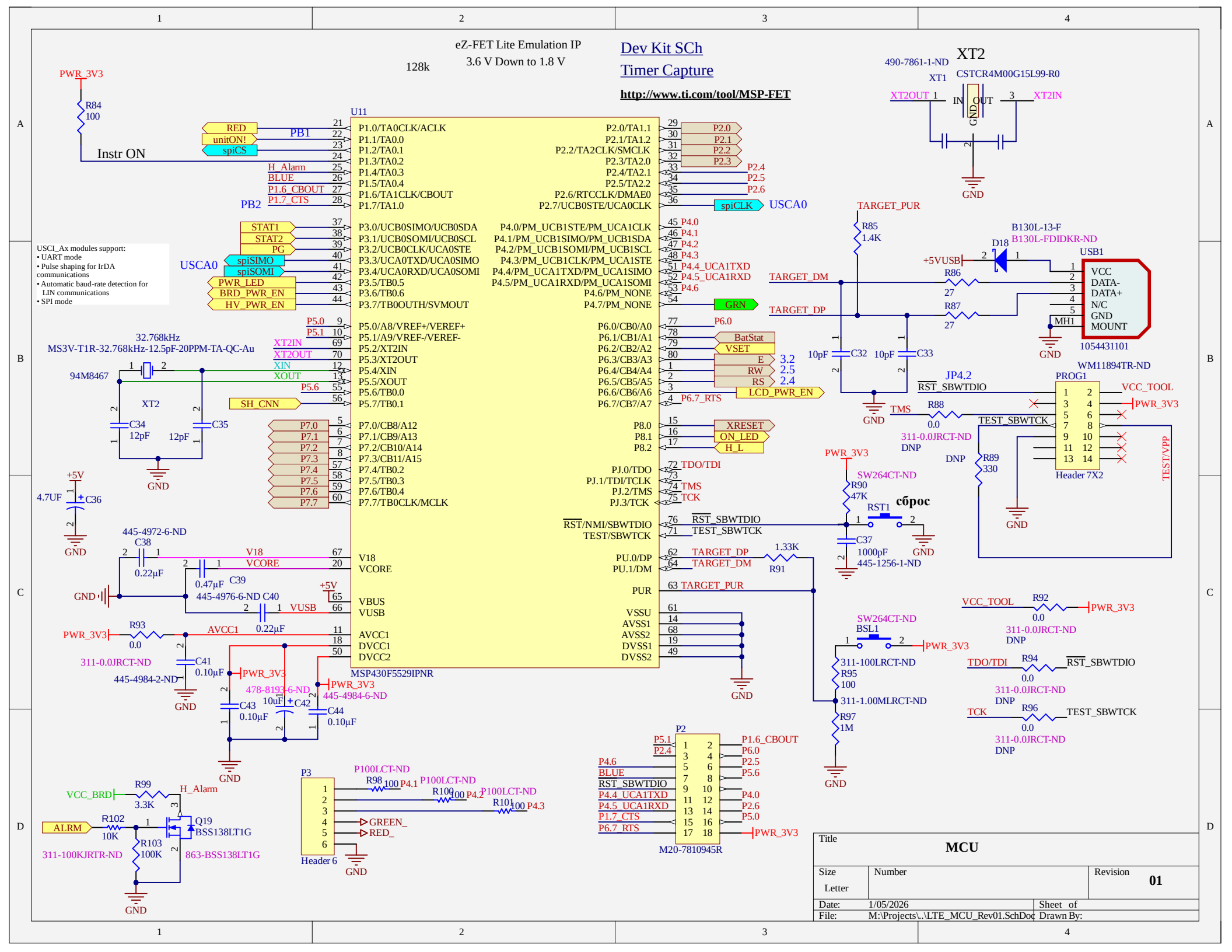




Title	**LTE BOARD POWER 9-24VDC to 3.9VDC**	
Size: Letter	Number	Revision: **0.1**
Date: 1/05/2026		Sheet of
File: M:\Projects\..\LTE_power_Rev01.SchDoc		Drawn By:



Title	**LTE USB-UART**	
Size: Letter	Number	Revision: **01**
Date: 1/05/2026	Sheet of	
File: M:\Projects\..\LTE_UART_USB_adapter.SchDoc	Drawn By:	


eZ-FET Lite Emulation IP
3.6 V Down to 1.8 V
128k
Dev Kit SCh
Timer Capture
http://www.ti.com/tool/MSP-FET
XT2
490-7861-1-ND
XT1
CSTCR4M00G15L99-R0
XT2OUT
XT2IN
GND
PWR_3V3
R84
100
Instr ON
U11
MSP430F5529IPNR
RED
unitON!
spiCS
PB1
PB2
H_Alarm
BLUE
P1.6_CBOUT
P1.7_CTS
spiCLK
USCA0
STAT1
STAT2
PG
spiSIMO
spiSOMI
PWR_LED
BRD_PWR_EN
HV_PWR_EN
USCI_Ax modules support:
• UART mode
• Pulse shaping for IrDA communications
• Automatic baud-rate detection for LIN communications
• SPI mode
32.768kHz
MS3V-T1R-32.768kHz-12.5pF-20PPM-TA-QC-Au
94M8467
XT2IN
XT2OUT
XIN
XOUT
SH_CNN
C34
12pF
C35
12pF
+5V
4.7UF
C36
445-4972-6-ND
C38
0.22µF
V18
VCORE
0.47µF
C39
445-4976-6-ND
C40
VUSB
0.22µF
AVCC1
R93
0.0
311-0.0JRCT-ND
C41
0.10µF
445-4984-2-ND
478-8193-6-ND
10uF
C42
445-4984-6-ND
C43
0.10µF
C44
0.10µF
P3
Header 6
P100LCT-ND
R98
100
P4.1
R100
P4.2
R101
P4.3
GREEN_
RED_
VCC_BRD
R99
3.3K
ALRM
R102
10K
R103
100K
Q19
BSS138LT1G
311-100KJRTR-ND
863-BSS138LT1G
P2
M20-7810945R
P5.1
P2.4
P4.6
BLUE
RST_SBWTDIO
P4.4_UCA1TXD
P4.5_UCA1RXD
P1.7_CTS
P6.7_RTS
P6.0
P2.5
P5.6
P4.0
P2.6
P5.0
TARGET_PUR
R85
1.4K
TARGET_DM
TARGET_DP
R86
27
R87
27
D18
B130L-13-F
B130L-FDIDKR-ND
+5VUSB
USB1
VCC
DATA-
DATA+
N/C
GND
MOUNT
MH1
1054431101
C32
10pF
C33
10pF
JP4.2
WM11894TR-ND
PROG1
Header 7X2
VCC_TOOL
PWR_3V3
TEST/VPP
TMS
R88
0.0
311-0.0JRCT-ND
DNP
TEST_SBWTCK
R89
330
SW264CT-ND
R90
47K
RST1
сброс
C37
1000pF
445-1256-1-ND
BSL1
311-100LRCT-ND
R95
100
311-1.00MLRCT-ND
R97
1M
R91
1.33K
TDO/TDI
TCK
R92
R94
R96
311-0.0JRCT-ND
DNP
Title
MCU
Size
Letter
Number
Revision
01
Date:
1/05/2026
File:
M:\Projects\..\LTE_MCU_Rev01.SchDoc
Sheet of
Drawn By:

NOTES:

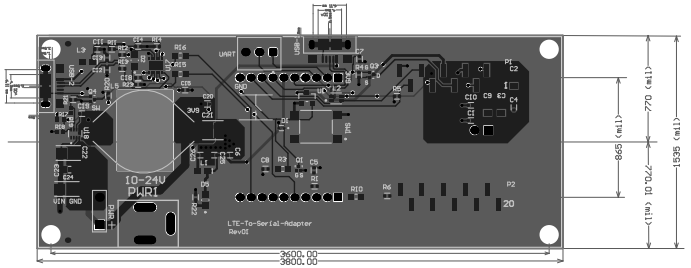
/1/ The vendor shall be UL approved to a minimum catagory of 94v2.
The vendor I.D. shall be silkscreened on the top side of the board.

2. The UL marking shall appear in copper or silkscreen
3. BOARD MUST BE IDENTIFIED WITH APPROPRIATE VENDOR UL IDENTIFACTION MARK,DATE CODE
4. PCB MATERIAL UL FLAMMIBILITY RATING(94V-0 MINIMUM)
5. ALL DIMESION TOLERANCE AS BELOW UNLESS OTHERWISE SPECIFIED.
6. PCB LAYERS : 4 LAYERs
7. PCB THICKNESS : 62 mil +/-10%
8. TRACE WIDTHS TO BE FINISHED SIZES+/-1MIL
9. TOP SIDE SILKSCREEN : WHITE
   BOTTOM SIDE SILKSCREEN: WHITE
10. SOLDER MASK : GREEN BOTH SIDES
11. MATERIAL : HF_FR4 TG: 150 CELSIUS
12. PLATING : IMMERSION GOLD (ENIG)
13. PCB Outline Dimension Tol: ROUTING : +/- 0.13mm
14. Fabricate per IPC-6012A CLASS 2

Template

ENGINEER: Roman Chak	TITLE: PCBA, UUDI-360 LTE ADAPTER BOARD		
ENGINEER: XXXXXXXX PHONE:XXX-XXXX-XXXX	PART NO.: 29-9020	C	DATE: 1/5/2026
FILE NAME: LTE-To-Serial-Adapter.PcbDoc	LAYER: [illegible]		SHEET: [illegible]

Layer	Name	Material	Thickness	Constant	Board Layer Stack
	Top Overlay				
	Top Solder	Solder Resist	0.40mil	3.5	
1	Top Layer	CF-004	1.38mil		
	Dielectric 1	PP-017	5.10mil	4.3	
	Dielectric 1A	PP-016	4.60mil	4.4	
2	Mid Layer 1 Sig	CF-004	1.38mil		
	Core	FR-4	39.00mil	4.8	
3	Mid Layer 2 GND	CF-004	1.38mil		
	Dielectric 4	PP-016	4.60mil	4.4	
	Dielectric 2	PP-017	5.10mil	4.3	
4	Bottom Layer	CF-004	1.38mil		
	Bottom Solder	Solder Resist	0.40mil	3.5	
	Bottom Overlay				



1/5/2026
11:35:03 AM

1/5/2026
11:35:03 AM

M:\Projects\Github\IoT-dev\IoT_Dev_v0.00\LTE-To-Serial-Adapter.PcbDoc

PROJECT TITLE: .PRJ_Title	
DESIGNED FOR: .PRJ_Customer	
FILE NAME: LTE-To-Serial-Adapter.PcbDoc	
ENGINEER: .PRJ_Engineer	LAYOUT BY: .PCB_Layout
SCALE: 1.00	ALTIUM DESIGNER VERSION: 25.6.2.33

WO # : 307464-7462-D

Comment	Description	Designator	Footprint	LibRef	Quantity
B3F-6022	SWITCH TACTILE SPST-NO 0.05A 24V	BSL1, RST1	DTST-61K-Q_Rev01	SW-PB	2
C0402C104K4RAL7867	0.1 µF ±10% 16V Ceramic Capacitor X7R 0402 (1005 Metric)	C1, C4, C5, C6, C7, C8, C10, C15, C16, C18, C19, C25, C26	SMD CAP 1005	1000742	13
GRM21BR60J107ME15K	100 µF ±20% 6.3V Ceramic Capacitor X5R 0805 (2012 Metric)	C2, C3	CAPC1210M	1001241	2
DNP	100 µF ±20% 6.3V Ceramic Capacitor X5R 0805 (2012 Metric)	C9	CAPC1210M	1001241	1
GRM155R71H103KA88D	10000 pF ±10% 50V Ceramic Capacitor X7R 0402 (1005 Metric), 0.1 µF ±10% 16V Ceramic Capacitor X7R 0402 (1005 Metric)	C11, C14, C?	SMD CAP 1005	Cap Semi	3
C1005C0G1H470G050BA	47 pF ±2% 50V Ceramic Capacitor C0G, NP0 0402 (1005 Metric)	C12, C13	SMD CAP 1005	Cap Semi	2
GRM188R61A475KAAJD	4.7 µF ±10% 10V Ceramic Capacitor X5R 0603 (1608 Metric)	C17	CAPC1608M	Cap Semi	1
GRM0335C1E470JA01D	47 pF ±5% 25V Ceramic Capacitor C0G, NP0 0201 (0603 Metric)	C20	FP-GRM033-0_03-IPC_B	CMP-2010-00985-2	1
GRM32ER61C476KE15L	47 µF ±10% 16V Ceramic Capacitor X5R 1210 (3225 Metric)	C21	FP-GRM32E-0_3-0_2-IPC_C	CMP-2000-06362-2	1
C3216X5R1H106K160AB	10 µF ±10% 50V Ceramic Capacitor X5R 1206 (3216 Metric)	C22, C24	FP-C3216-160-0_2-IPC_A	CMP-2000-06045-2	2
CGA3E2X7R1H104K080AA	0.1 µF ±10% 50V Ceramic Capacitor X7R 0603 (1608 Metric)	C23	FP-CGA3E-0_3-0_1-IPC_A	CMP-2000-07546-2	1
C1005C0G1H100D050BA	10pF ±0.5pF 50V C0G, NP0 Ceramic Capacitor -55°C~125°C Surface Mount, MLCC 0402 (1005 Metric) 0.039" L x 0.020" W (1.00mm x 0.50mm)	C32, C33	SMD CAP 1005	Cap Semi	2
C1005C0G1H120J050BA	CAP CER 12PF 50V C0G 0402	C34, C35	SMD CAP 1005	Cap Semi	2
T491A475K010AT	CAP TANT 4.7UF 10V 10% 1206	C36	TC3216-1206	Cap Pol 1	1
C1005X7R1H102K050BA	1000pF ±10% 50V X7R Ceramic Capacitor -55°C ~ 125°C Surface Mount, MLCC 0402 (1005 Metric) 0.039" L x 0.020" W (1.00mm x 0.50mm)	C37	SMD CAP 1005	Cap Semi	1
C1005X5R1C224K050BB	0.22µF ±10% 16V X5R Ceramic Capacitor -55°C ~ 85°C Surface Mount, MLCC 0402 (1005 Metric) 0.039" L x 0.020" W (1.00mm x 0.50mm)	C38, C40	SMD CAP 1005	Cap Semi	2
C1005X5R1C474K050BC	0.10µF ±20% 10V X5R Ceramic Capacitor -55°C ~ 85°C Surface Mount, MLCC 0402 (1005 Metric) 0.039" L x 0.020" W (1.00mm x 0.50mm)	C39	SMD CAP 1005	Cap Semi	1
C1005X5R1A104M050BA	0.10µF ±20% 10V X5R Ceramic Capacitor -55°C ~ 85°C Surface Mount, MLCC 0402 (1005 Metric) 0.039" L x 0.020" W (1.00mm x 0.50mm)	C41, C43, C44	SMD CAP 1005	Cap Semi	3
F931A106MAA	CAP TANT 10UF 10V 20% 1206	C42, C?	TC3216-1206	Cap Pol 1	2
GRM155R61A105KE15D	CAP CER 1UF 10V 10% X5R 0402	C?	SMD CAP 1005	C0603-1µ0	1
DF2S6.2FS,L3M	Clamp Ipp Tvs Diode Surface Mount SOD-923	D1	SODFL1006X40N	D Zener	1
LTST-C170GKT	Green 569nm LED Indication - Discrete 2.1V 0805 (2012 Metric)	D2, D4, D5, ONSLEEP	FP-LTST-C170GKT-MFG	CMP-1674-00002-6	4
B130L-13-F	DIODE SCHOTTKY 30V 1A SMA	D18	SMA	D Schottky	1
SMBJ28A	45.4V Clamp 13.3A Ipp Tvs Diode Surface Mount DO-214AA (SMBJ)	D20	FP-SMBJ-MFG	CMP-08607-000081-1	1
B340A-13-F	Diode 40 V 3A Surface Mount SMA	D21	FP-SMA-MFG	CMP-1667-00003-3	1
1N5819HW-7-F	DIODE SCHOTTKY 40V 1A SOD123	D?	DIOD-SOD-123-2_V	CMP-0303-00003-1	2
MTMM-110-04-G-S-215	Connector Header Through Hole 10 position 0.079" (2.00mm)	J1, J2	HDRV10W50P200_10X1_2000X200H696	MTMM-110-04-G-S-215	2
BLM18KG121TN1D	120 Ohms @100 MHz 1 Power Line Ferrite Bead 0603 (1608 Metric) 3A 30mOhm	L1	INDC1608M	Inductor	1
SRF2012-900YA	2 Line Common Mode Choke Surface Mount 90 Ohms @100 MHz 400mA DCR 300mOhm	L2	FP-SRF2012A-MFG	CMP-07251-000007-1	1
CTCB0603F-800M	80 Ohms @100 MHz 1 Ferrite Bead 0603 (1608 Metric) 600mA 100mOhm	L3	INDC1608M	Inductor	1
1206USB-223MLB	Common Mode Chokes / Filters	L4	1206USB-223MLB	Trans Ideal	1
5.6µH, 5.3A	5.6 µH Unshielded Drum Core, Wirewound Inductor 5.3 A 20mOhm Max Nonstandard WE-PD4 SMT Power Inductor, Type X, 5.6µH, 5.3A, 0.02Ω	L5	WE-PD4_Type X	74458005	1
NPPN101BFLC-RC	CONN HDR 10POS 0.079 GOLD SMD	P1, P2	NPPN101BFLC-RC	Skywire_Header_1_10, skywire_header_11_20	2
M20-7810945R	CONN RCPT 2.54" SMD DUAL 18POS	P2	M20-7810945R	Header 9X2	1
Header 6	Header, 6-Pin	P3	HDR1X6	Header 6	1
Header 2	Header, 2-Pin	P6	HDR1X2	Header 2	1
Header 7X2	BERGSTIK II .100" DR STRAIGHT	PROG1	HDR2X7	Header 7X2	1
Header 2	Header, 2-Pin	PWR	Wire_entry_200mil	Header 2	1
PJ-202A	Power Barrel Connector Jack 2.10mm ID (0.083"), 5.50mm OD (0.217") Through Hole, Right Angle	PWR1	PJ-202AH	1000221	1
RUM001L02T2CL	N-Channel 20 V 100mA (Ta) 150mW (Ta) Surface Mount VMT3	Q1, Q2, Q3, Q4	FP-VMT3-MFG	RUM001L02T2CL	4
BSS138LT1G	MOSFET N-CH 50V 200MA SOT-23	Q19	ONSC-SOT-23-3-318-08_V	CMP-1058-00767-1	1
CR0402-FX-1001GLF	1 kOhms ±1% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Thick Film	R1, R5, R6	SMD RES 1005	1000794	3
ERJ-2RKF3300X	330 Ohms ±1% 0.1W, 1/10W Chip Resistor 0402 (1005 Metric) Automotive AEC-Q200 Thick Film	R2, R20, R22, R23	SMD RES 1005	1001162	4
RMCF0603ZT0R00	0 Ohms Jumper Chip Resistor 0603 (1608 Metric) Automotive AEC-Q200 Thick Film	R3, R10, R15, R16	RESC1608M	1001176	4
RC0402JR-0710KL	10 kOhms ±5% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film, RES SMD 10K OHM 5% 1/16W 0402	R4, R9, R11, R102	SMD RES 1005	1000795, 1000794, Res1	4
CR0402-FX-1004GLF	1 MOhms ±1% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Thick Film	R7, R21	SMD RES 1005	1000797	2
YAG3195CT-ND	5.23 kOhms ±1% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film	R8	SMD RES 1005	1000794	1
MCR01MRTJ270	RES SMD 27 OHM 5% 1/16W 0402	R12, R13	SMD RES 1005	Res3	2
ERJ-2RKF1502X	RES SMD 15K OHM 1% 1/10W 0402	R14	SMD RES 1005	Res3	1
RC0603FR-0739KL	39 kOhms ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Moisture Resistant Thick Film	R17	RESC1608X55X25LL10T15	CMP-2000-06940-1	1
CRCW040210K0FKEDHP	10 kOhms ±1% 0.2W, 1/5W Chip Resistor 0402 (1005 Metric) Automotive AEC-Q200, Pulse Withstanding Thick Film	R18, R19	RESC1005X40X25ML05T10	CMP-2002-03043-1	2
RC0402FR-07100RL	RES SMD 100 OHM 1% 1/16W 0402	R84, R95	SMD RES 1005	Res3	2
RC0402FR-071K47L	RES SMD 1.47K OHM 1% 1/16W 0402	R85	SMD RES 1005	Res3	1
RC0402JR-0727RL	RES SMD 27 OHM 5% 1/16W 0402	R86, R87	SMD RES 1005	Res3	2
RC0402JR-070RL	RES SMD 0.0 OHM JUMPER 1/16W	R88, R92, R93, R94, R96	SMD RES 1005	Res3	5
		R89, R99	SMD RES 1005	Res3	2
RC0402FR-0747KL	RES SMD 47K OHM 1% 1/16W 0402	R90	SMD RES 1005	Res3	1
RC0402FR-071K33L	RES SMD 1.33K OHM 1% 1/16W 0402	R91	SMD RES 1005	Res3	1
RC0402FR-071ML	RES SMD 1M OHM 1% 1/16W 0402	R97	SMD RES 1005	Res3	1
ERJ-2RKF1000X	RES SMD 100 OHM 1% 1/10W 0402	R98, R100, R101	SMD RES 1005	Res1	3
RC0402JR-07100KL	RES SMD 100K OHM 5% 1/16W 0402	R103	SMD RES 1005	Res3	1
PTS645SM43SMTR92LFS	SWITCH TACTILE SPST-NO 0.05A 12V	SW1	FP-PTS645SM43SMTR92LFS-MFG	CMP-2000-05160-2	1
AP2120N-3.3TRG1	Linear Voltage Regulator IC Positive Fixed 1 Output 150mA SOT-23-3	U1	FP-SOT23-MFG	CMP-12756-000008-1	1
TPL5111DDCT	IC OSC PROG TIMER TSOT23-6	U2	FP-DDC0006A-IPC_B	CMP-04857-000005-1	1
MSP430F5529IPNR	IC MCU 16BIT 128KB FLASH 80LQFP	U11	PN0080A_L	CMP-0365-00413-2	1
FT234XD-R	IC USB SERIAL BASIC UART 12DFN	U17	DFN-12_V	CMP-0248-00027-1	1
TPS62933PDRLR	Buck Switching Regulator IC Positive Adjustable 0.8V 1 Output 3A SOT-583	U18	SOFL50P160X60-8N	TPS62933PDRLR	1
LMR51625XDDCR	SIMPLE SWITCHERÂ® synchronous buck converter with 4.3V-to-60V, 2.5A and low quiescent current 6-SOT-23-THIN -40 to 150	U?	DDC0006A-MFG	LMR51625XDDCR	1
TPS76933DBVR	LDO Voltage Regulators Ultra Low-Power 100-mA LDO	U?	DBV0005A_L	CMP-0394-00574-2	1
61900311121	Connector Header Through Hole 3 position 0.100" (2.54mm)	UART	61900311121	CMP-1502-00585-2	1
1054431101	USB - micro B Receptacle Connector 5 Position Surface Mount, Right Angle, Horizontal	USB1	1054431101	1054431101	1
10118193-0001LF	USB - micro B USB 2.0 Receptacle Connector 5 Position Surface Mount, Right Angle, Horizontal	USB2, USB-1	10118193-0001LF Rev01	USB mini	2
CSTCR4M00G15L99-R0	CER RES 4.0000MHZ 39PF SMD	XT1	CSTCR4M00G15L99-R0	CSTCR4M00G15L99-R0	1
MS3V-T1R-32.768kHz-12.5pF-20PPM-TA-QC-Au	Crystals 32.768 kHz 12.5 pF +/-20 PPM -40/+85C	XT2	MS3V-T1R	XTAL	1