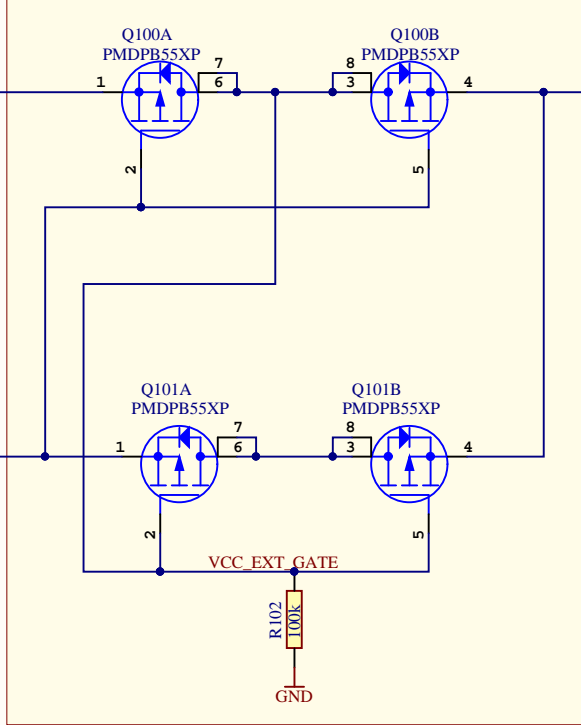


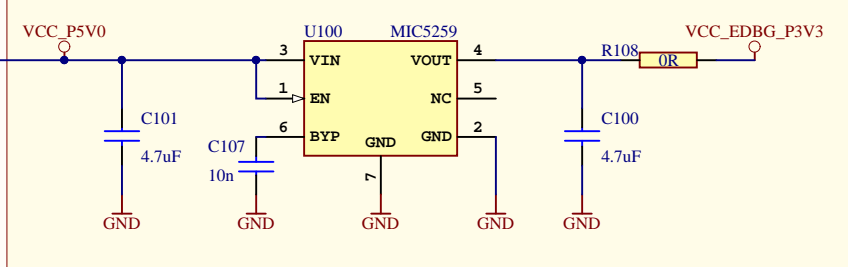
Drawn By: Microchip Norway		Designed with <b>Altium</b> Altium.com
Engineer: TF		
Project Title <b>ATmega4809 Xplained Pro</b>		
Sheet Title <b>Top Level Schematics</b>		
Size A3	PCB Assembly Number: A09-3074	PCBA Revision: 8
	PCB Number: A08-2821	PCB Revision: 3
File: ATmega4809_Xplained_Pro_TopLevel.SchDoc		Date: 11/22/2019
		Page: 1 of 6

**Power multiplexer**



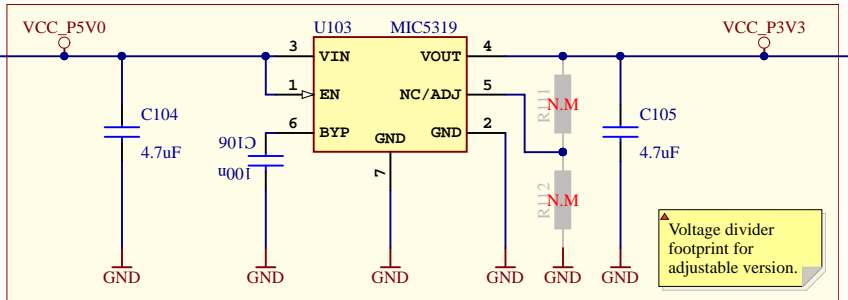
Power input multiplexer priority:  
1. VCC\_EXT\_IN  
2. VCC\_EDBG\_USB

**3.3V linear regulator EDBG**



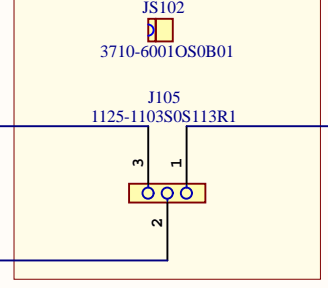
Iout max = 300mA  
Accuracy 3%  
Low noise: 30 uVrms (10 Hz to 100 kHz)  
Dropout 300mV at full load  
Quiescent current 105 uA (no load)  
Current limit max 475 mA  
Thermal shutdown  
Minimum capacitance required on output is 1uF (with less than 300mOhm ESR)

**3.3V linear regulator Target**

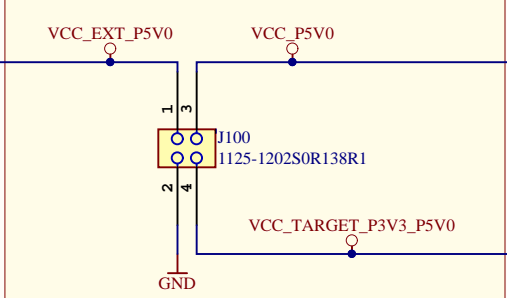


500mA low noise LDO voltage regulator  
Noise: 40uVrms  
Accuracy 2%  
Dropout 200 mV at full load  
Quiescent current 90 uA  
Current limit 700 mA  
Thermal shutdown  
Minimum capacitance required on output is 2.2uF (with low ESR)

**3.3V or 5.0V Selector**

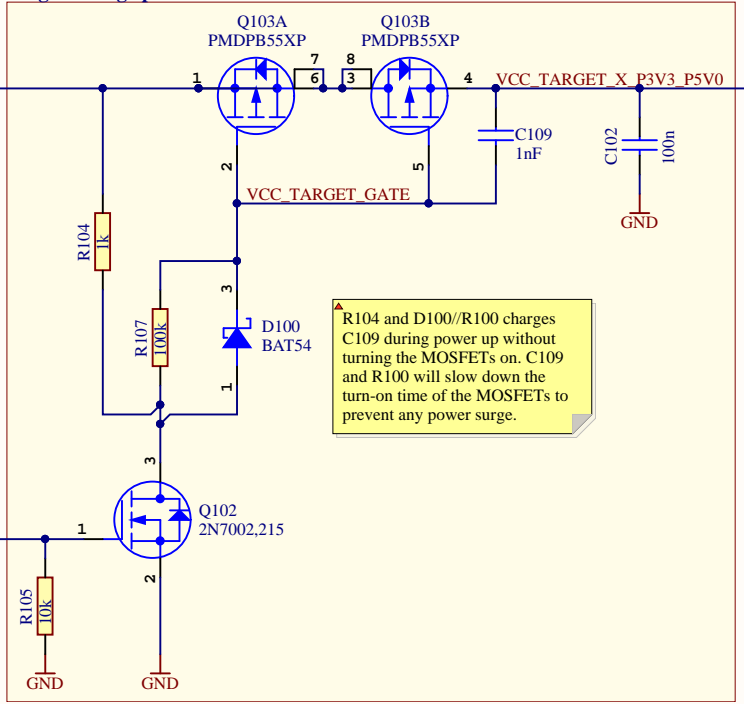


**Power Connector**



Power inputs/outputs to the Xplained PRO:  
VCC\_EXT\_P5V0 (input)  
This power input can be used to power the whole board and it has a higher priority as the USB power input.  
VCC\_P5V0 (output)  
This supply is connected to either VCC\_EXT\_P5V0 or VCC\_EDBG\_USB\_P5V0, based on the availability and priority of these supplies.  
VCC\_TARGET\_P3V3\_P5V0 (output)  
Target supply voltage (target MCU and peripherals)  
Power input multiplexer priority:  
1. VCC\_EXT\_IN  
2. VCC\_EDBG\_USB

**Target Voltage power switch with slew rate control**

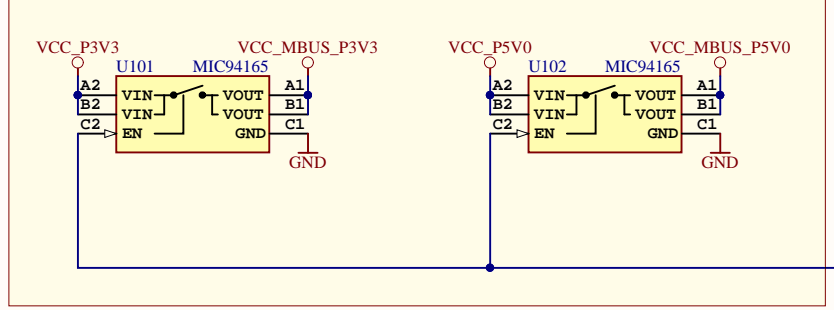


R104 and D100/R100 charges C109 during power up without turning the MOSFETs on. C109 and R100 will slow down the turn-on time of the MOSFETs to prevent any power surge.

Jumper for current measurement.

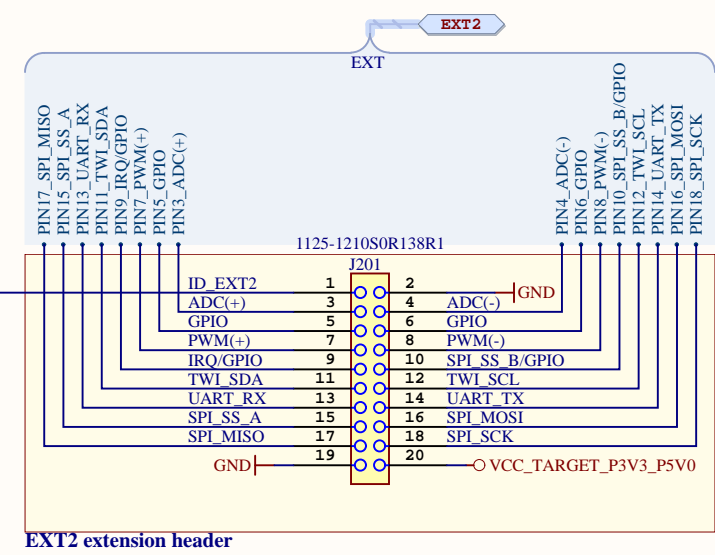
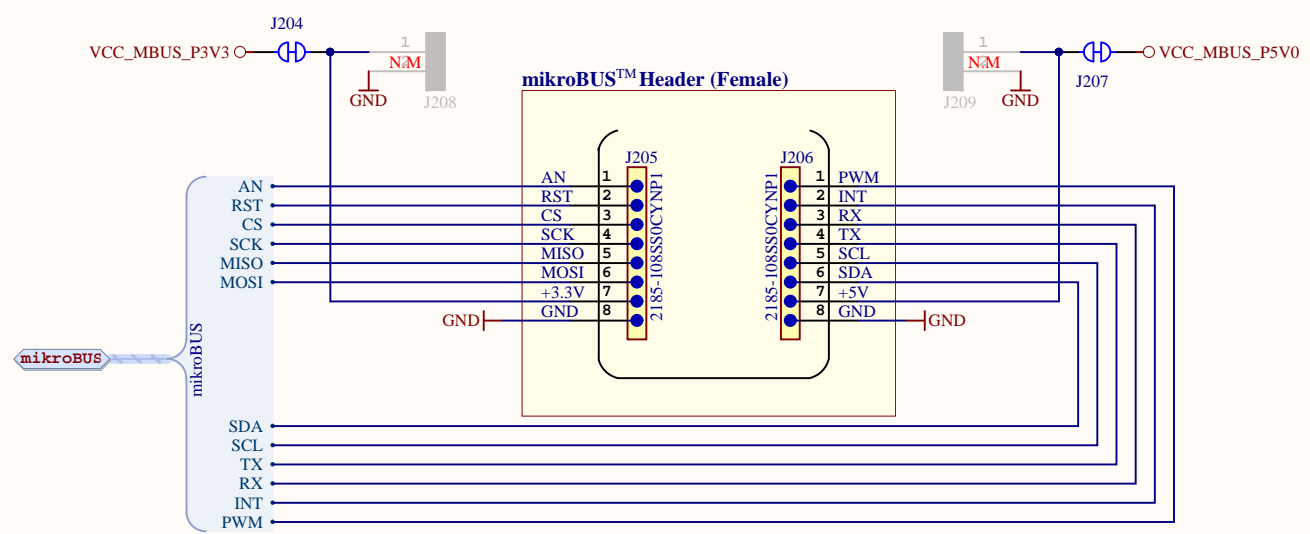
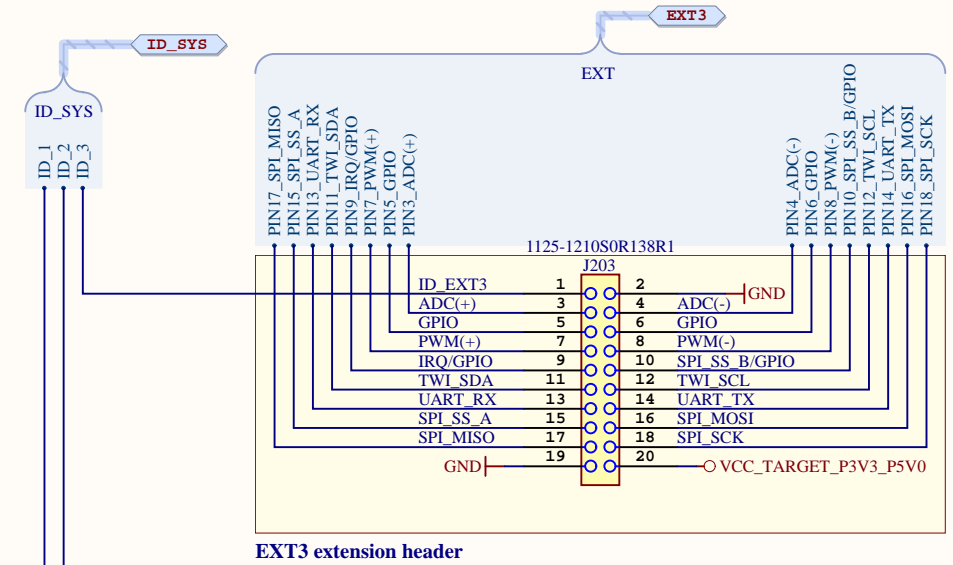
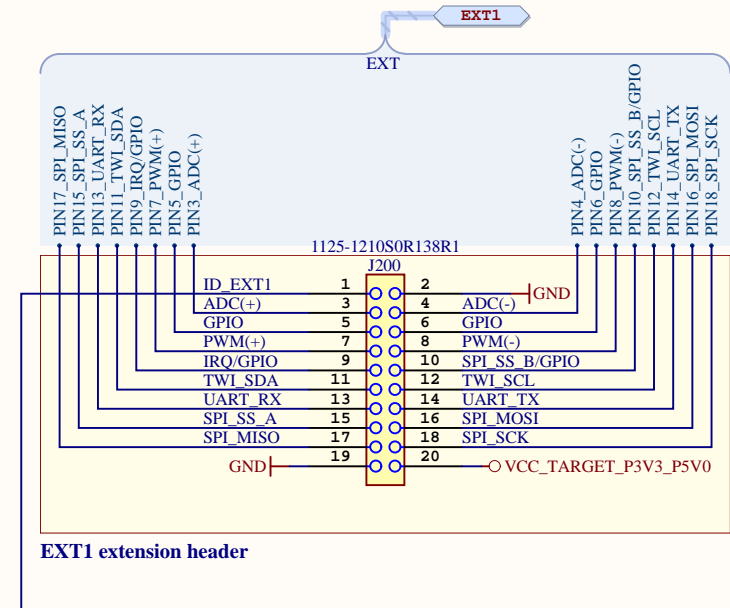
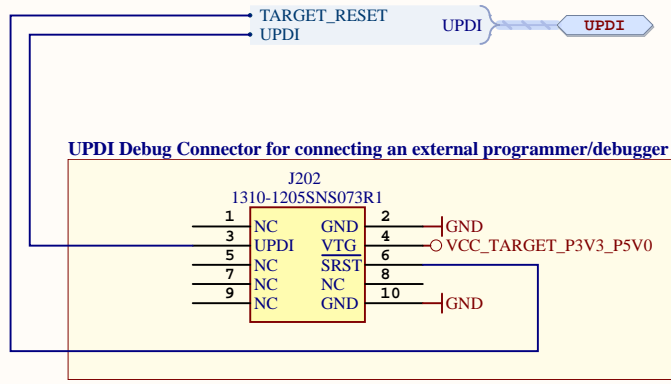
Current measurements via external tools can be done either via this header or from the supply muxing header (this header is kept for compatibility reasons to the other Xplained Pro boards)

**mikroBUS Power Control**

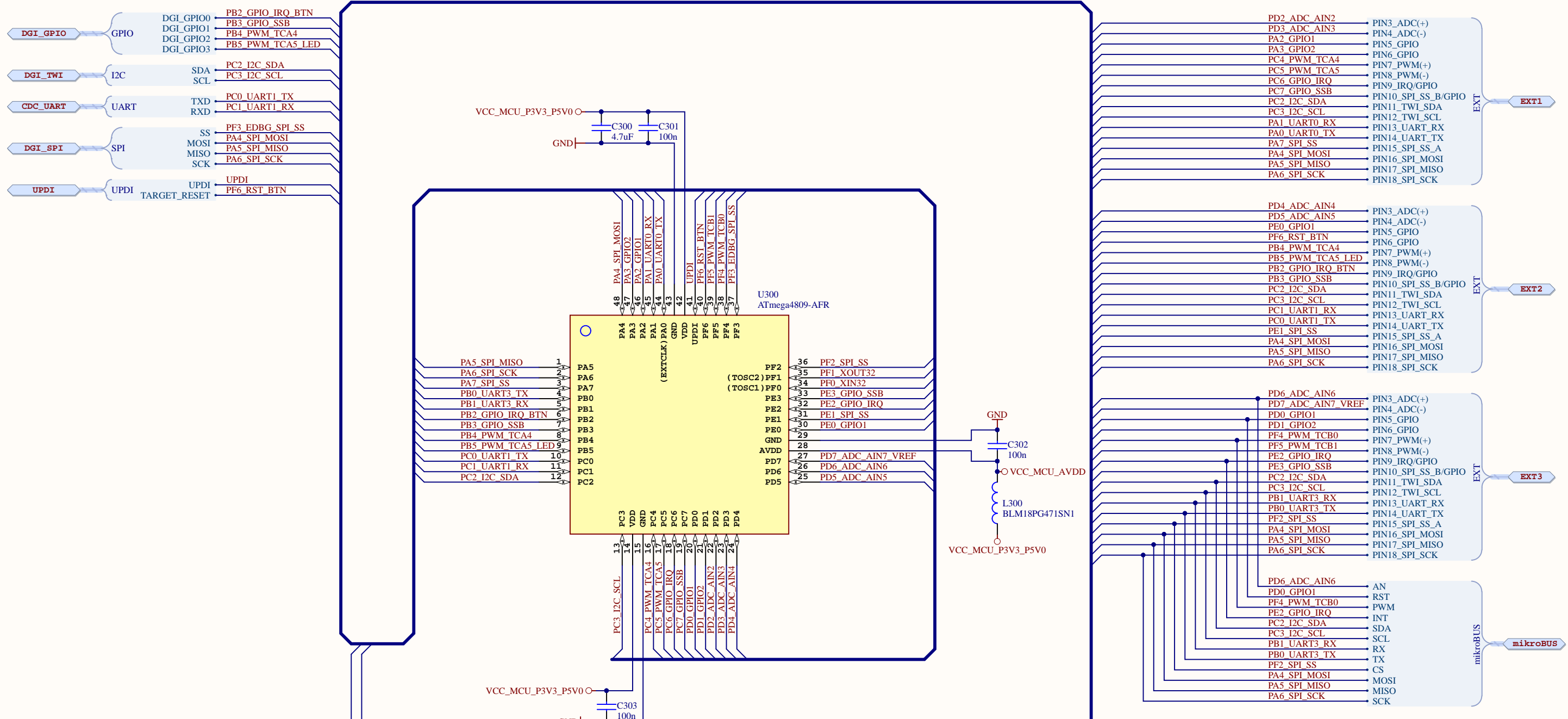


Drawn By: Microchip Norway		
Engineer: TF		
Project Title <b>ATmega4809 Xplained Pro</b>		
Sheet Title <b>Power supply</b>		
Size A3	PCB Assembly Number: A09-3074	PCBA Revision: 8
	PCB Number: A08-2821	PCB Revision: 3
File: ATmega4809_Xplained_Pro_dual_input_power_supply.SchDoc		Date: 11/22/2019
		Page: 2 of 6





Drawn By: Microchip Norway		
Engineer: TF		
Project Title <b>ATmega4809 Xplained Pro</b>	<b>Designed with</b> 	
Sheet Title <b>Extension connectors</b>		
Size A3	PCB Assembly Number: A09-3074	PCBA Revision: 8
	PCB Number: A08-2921	PCB Revision: 3
File: ATmega4809_Xplained_Pro_Connectors.SchDoc		Date: 11/22/2019
		Page: 3 of 6



**32 kHz CRYSTAL**

Crystal datasheet:  
 Crystal = 7pF  
 max ESR = 70kOhm  
 Accuracy ±20ppm

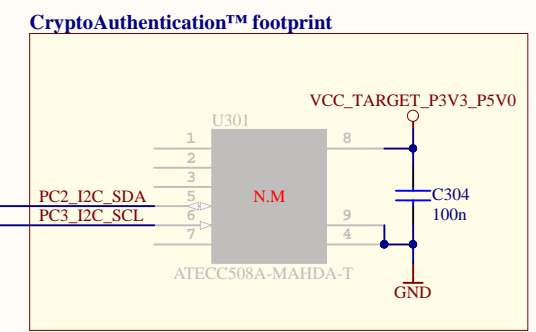
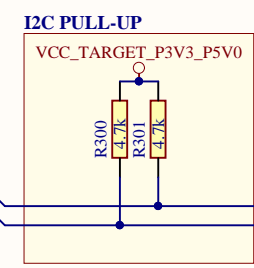
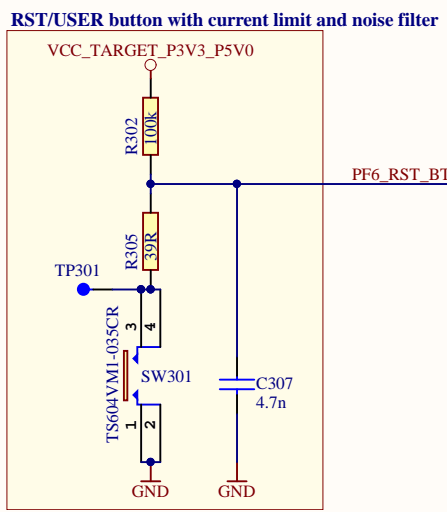
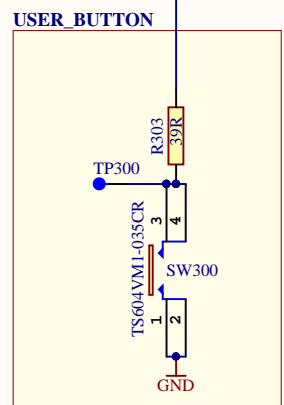
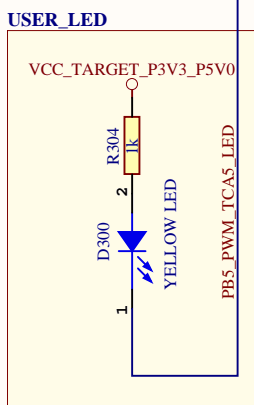
ATmega4809 datasheet:  
 Cpara = 5.5pF / 5.5pf (XIN and XOUT)  
 max ESR = 80kOhm

PCB capacitance: Cpcb = 0.5pF (estimated)

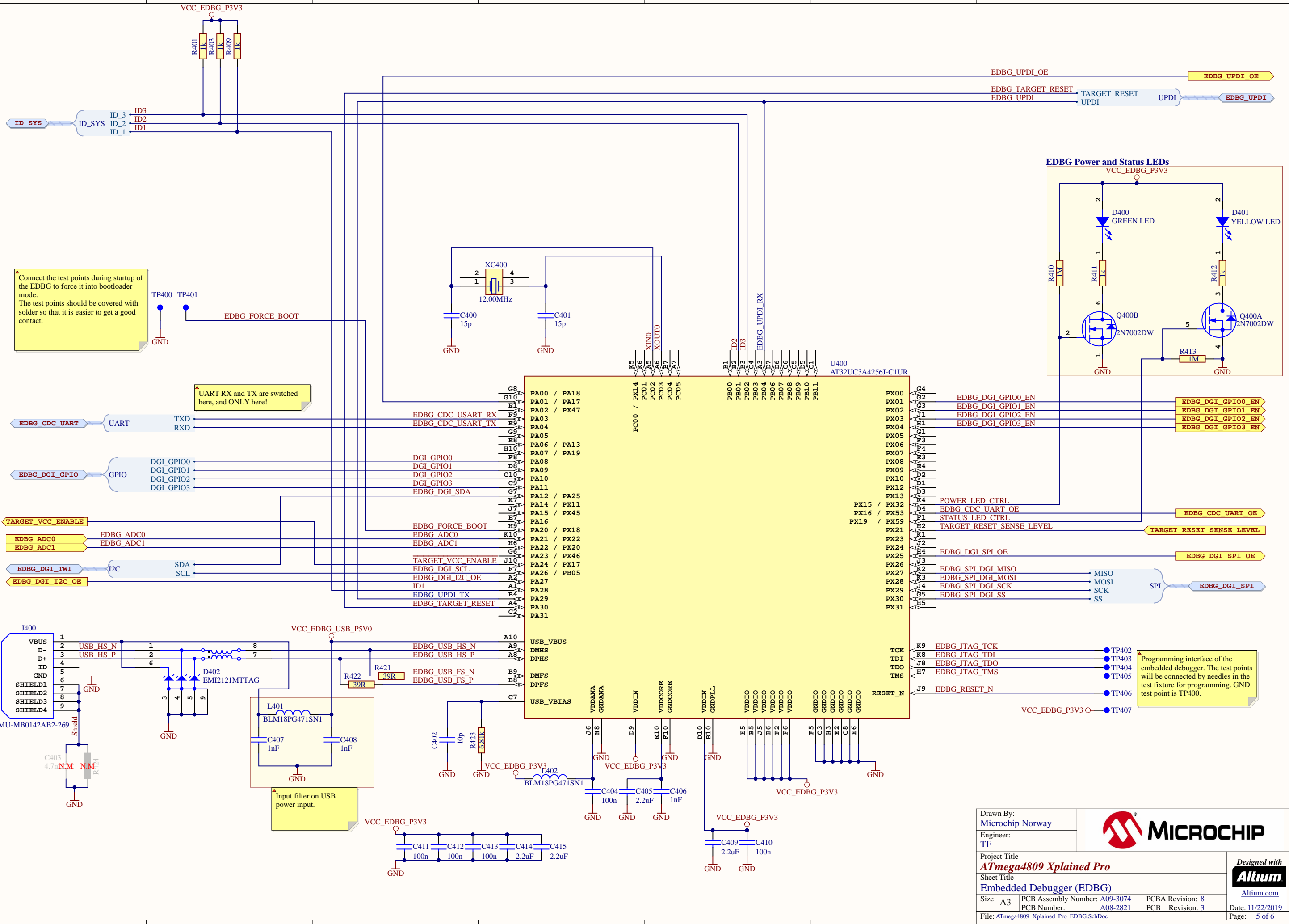
Estimated load:  
 $C = 2x(\text{Crystal} - C_{para} - C_{pcb})$   
 $C = 2x(7\text{pF} - 2.75\text{pF} - 0.5\text{pF})$   
 $C = 7.5\text{pF}$

C305 = 10pF and C306 = 13pF.

Negative resistance: -465 kOhm  
 Accuracy @ vcc=3.3V: 3.4 ppm  
 Accuracy @ vcc=5.0V: -0.3 ppm



Drawn By: Microchip Norway			
Engineer: TF			
Project Title <b>ATmega4809 Xplained Pro</b>		Designed with 	
Sheet Title <b>Target MCU</b>		Altium.com	
Size A3	PCB Assembly Number: A09-3074	PCBA Revision: 8	Date: 11/22/2019
	PCB Number: A08-2821	PCB Revision: 3	Page: 4 of 6
File: ATmega4809_Xplained_Pro_Target_MCU.SchDoc			

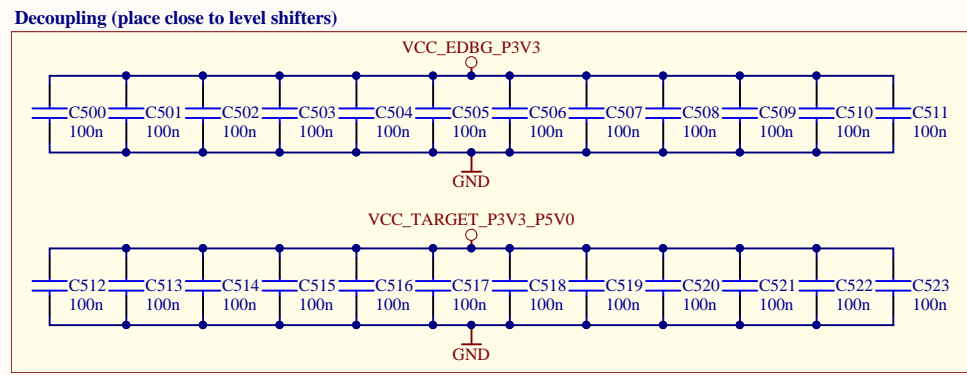
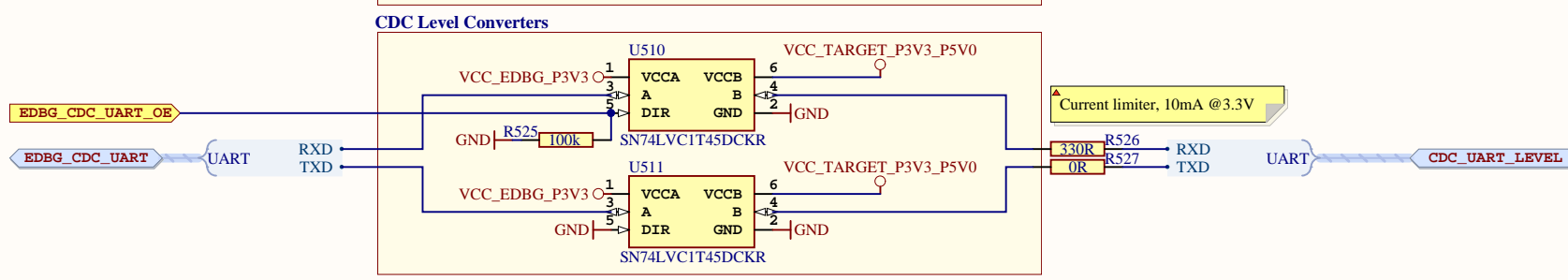
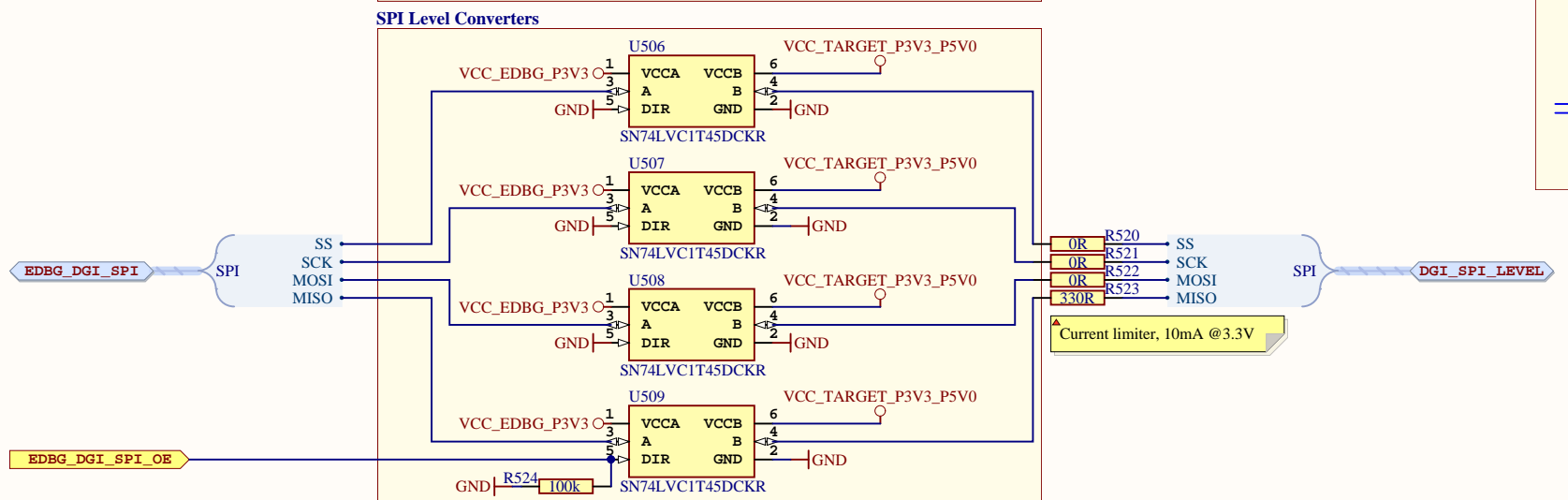
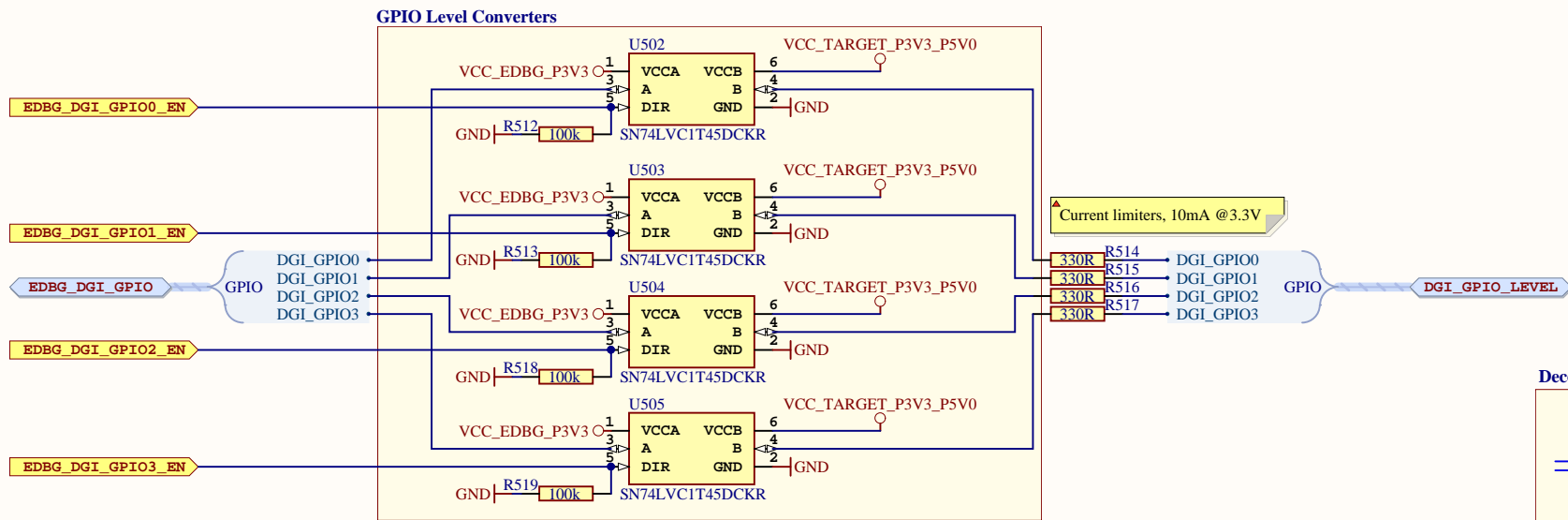
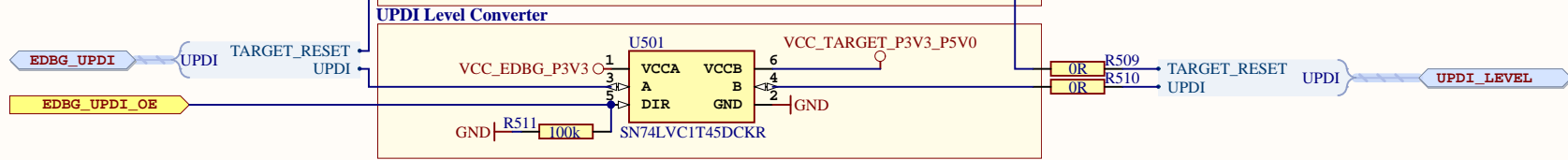
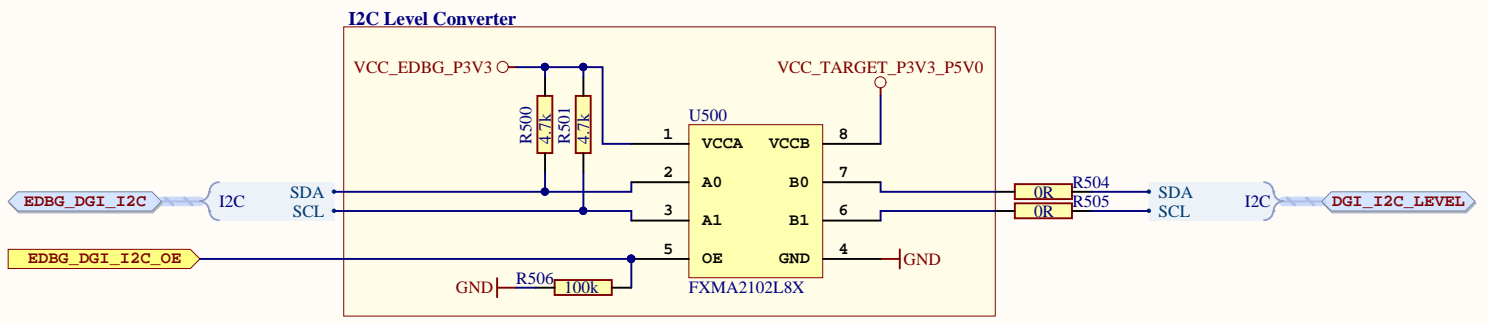
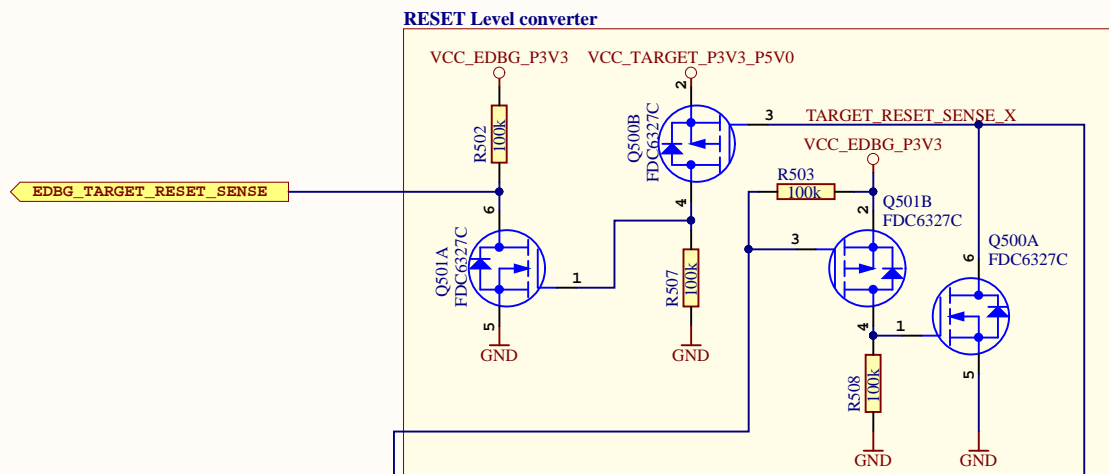


Connect the test points during startup of the EDBG to force it into bootloader mode. The test points should be covered with solder so that it is easier to get a good contact.

UART RX and TX are switched here, and ONLY here!

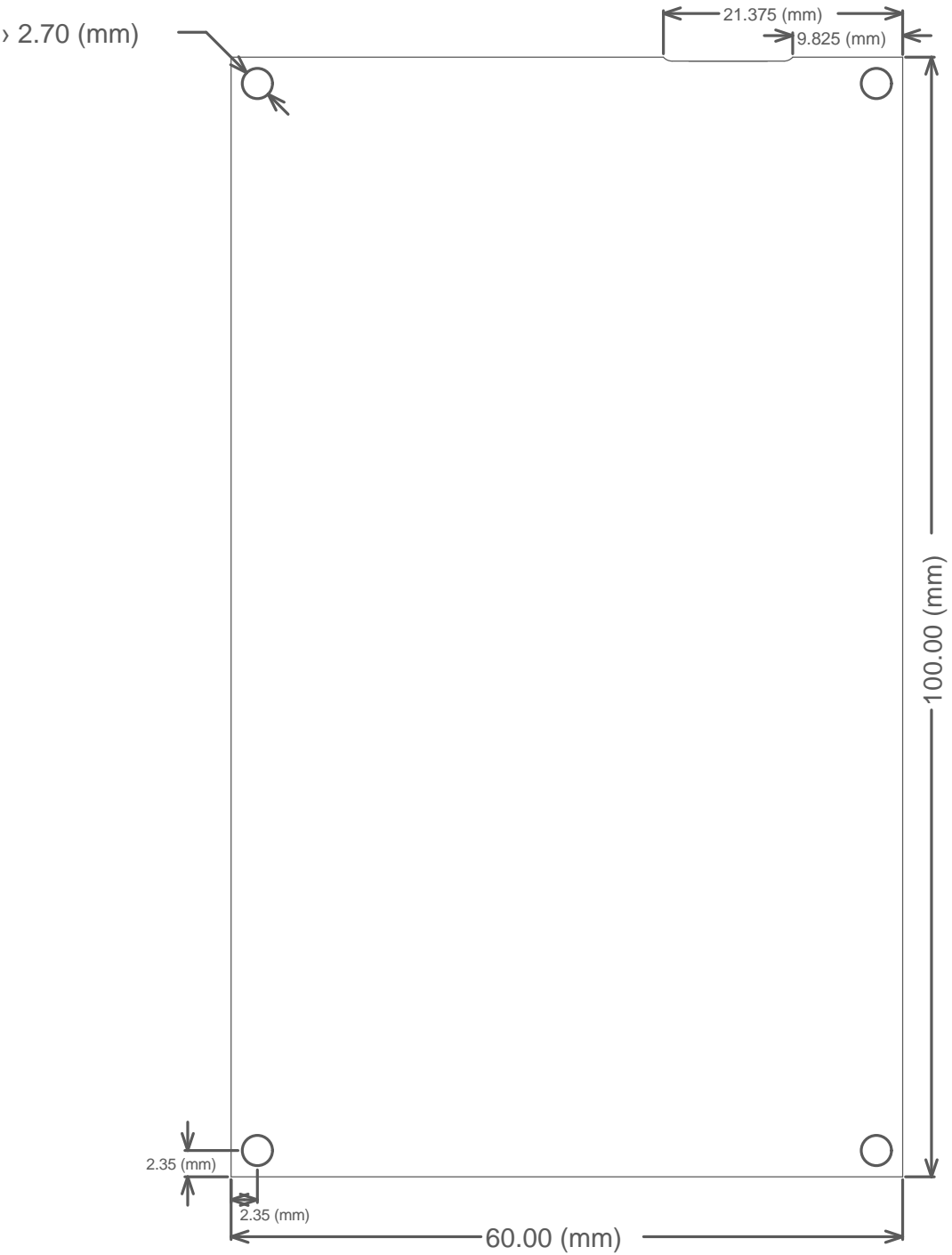
Programming interface of the embedded debugger. The test points will be connected by needles in the test fixture for programming. GND test point is TP400.

Drawn By: <b>Microchip Norway</b>		
Engineer: <b>TF</b>		
Project Title <b>ATmega4809 Xplained Pro</b>		
Sheet Title <b>Embedded Debugger (EDBG)</b>		
Size <b>A3</b>	PCB Assembly Number: <b>A09-3074</b>	PCBA Revision: <b>8</b>
PCB Number: <b>A08-2821</b>		PCB Revision: <b>3</b>
File: ATmega4809_Xplained_Pro_EDBG.SchDoc		Date: 11/22/2019 Page: 5 of 6



Drawn By: Microchip Norway		
Engineer: TF		
Project Title <b>ATmega4809 Xplained Pro</b>	Designed with 	
Sheet Title Level shifters	Altium.com	
Size A3	PCB Assembly Number: A09-3074	PCBA Revision: 8
	PCB Number: A08-2821	PCB Revision: 3
File: ATmega4809_Xplained_Pro_Levelshift.SchDoc	Date: 11/22/2019	Page: 6 of 6

# Mechanical Dimensions

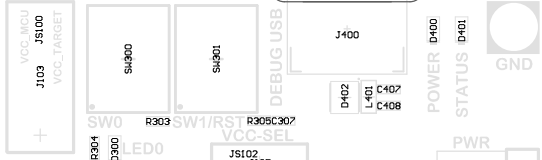








GND



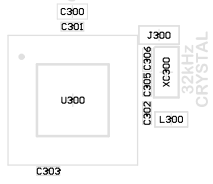
**ATMEGA4809 X PLAINED PRO**



CRYPTO  
FOOTPRINT

R301  
R300

ATmega4809

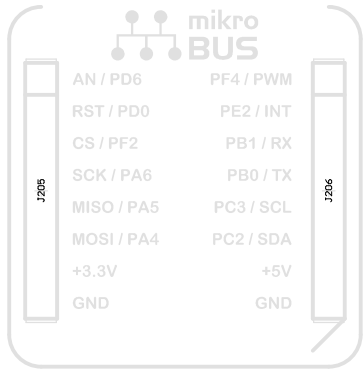


- ID GND
- PD2 PD3
- PA2 PA3
- PC4 PC5
- PC6 PC7
- PC2 PC3
- PA1 PA0
- PA7 PA4
- PA5 PA6
- GND VCC



**mikroBUS  
POWER**  
+3.3V +5V

GND GND



- ID GND
- PD4 PD5
- PE0 PF6
- PB4 PB5
- PB2 PB3
- PC2 PC3
- PC1 PC0
- PE1 PA4
- PA5 PA6
- GND VCC

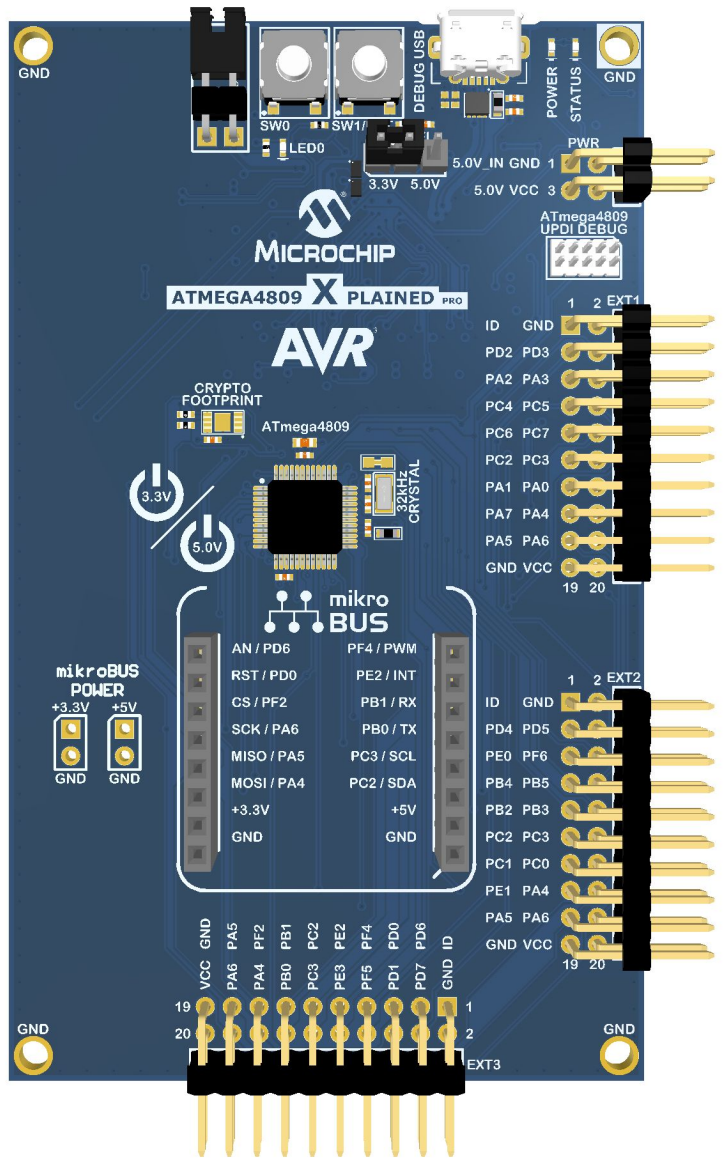


GND

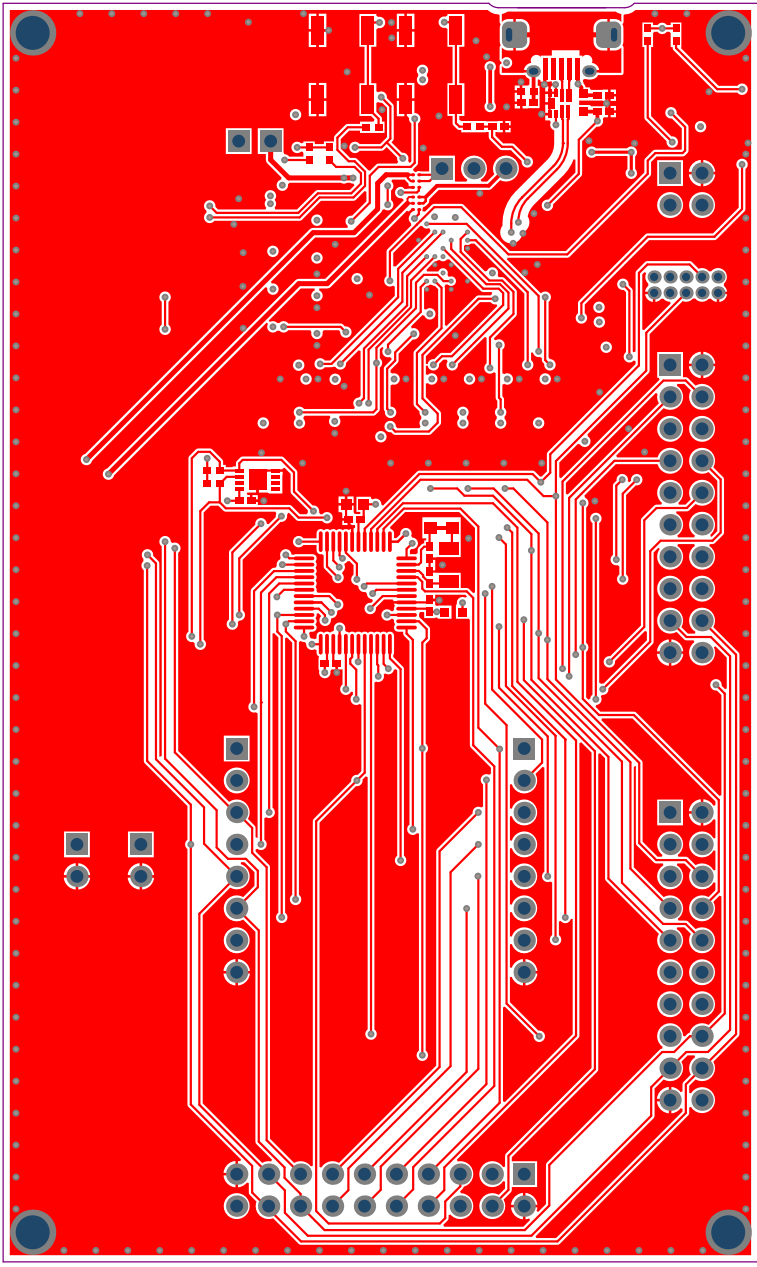


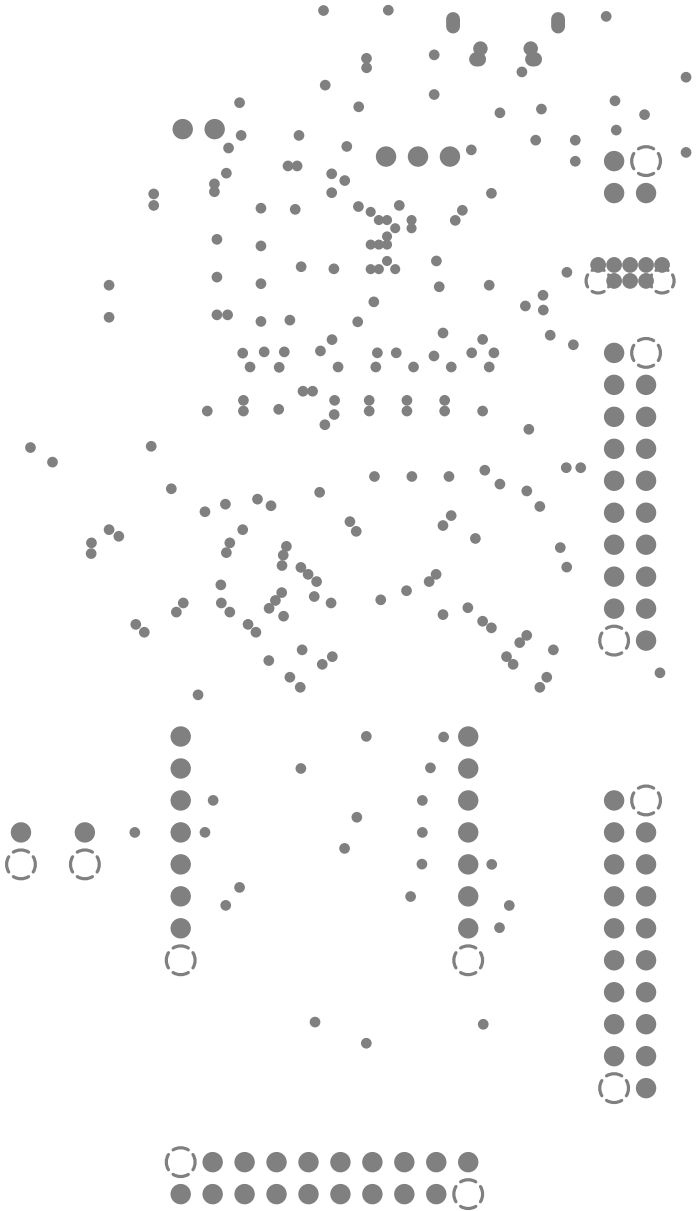
GND

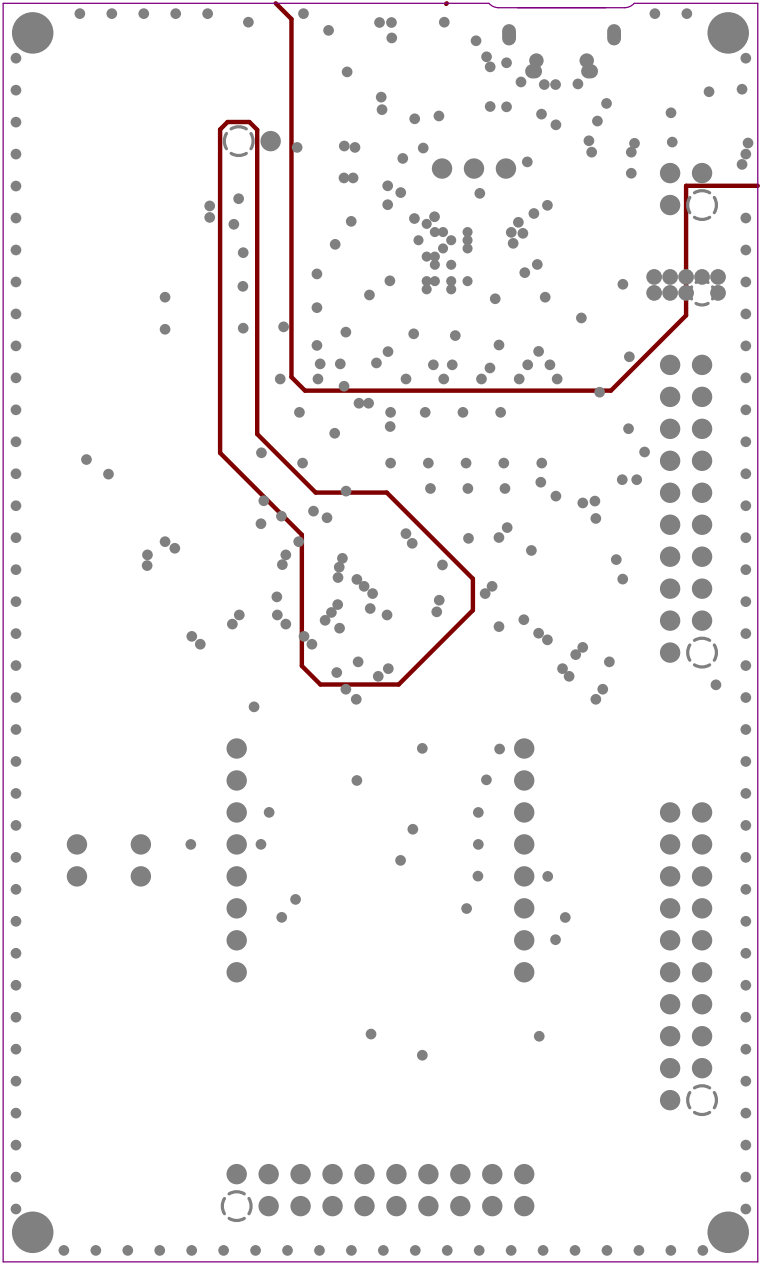




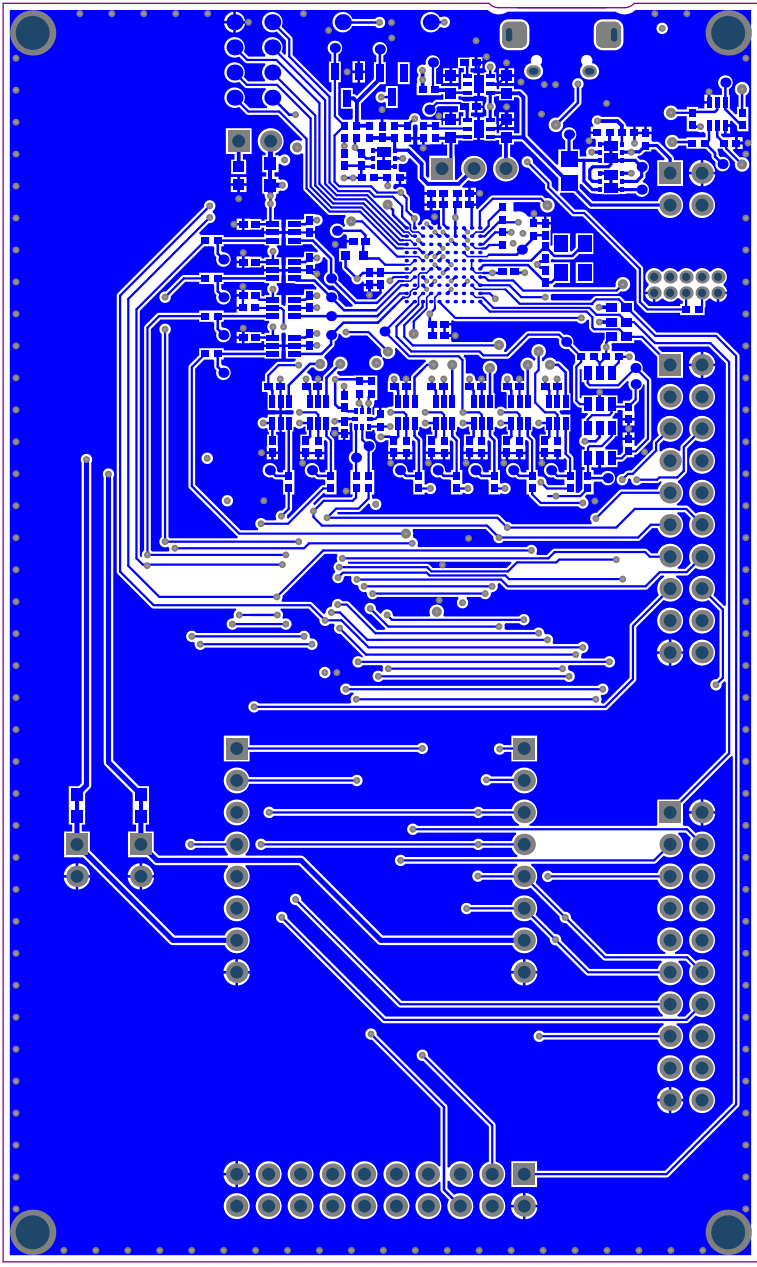












# Component list

Bill of Materials Fitted for Variant [Default\_assembly] of Project [ATmega4809\_Xplained\_Pro.PrjPCB] (No PCB Document Selected)

Source Data From: ATmega4809\_Xplained\_Pro.PrjPCB  
 Project: ATmega4809\_Xplained\_Pro.PrjPCB  
 Variant: Default\_assembly



Report Date: 11/22/2019 12:02 PM  
 Print Date: 11/22/2019 11:59:48 AM

Fitted	Designator	Quantity	Value	Manufacturer	MPN	Description
Fitted	C100, C101, C104, C105, C300	5	4.7uF	WALSIN Technology Corporation	0603X475K100CT	Ceramic capacitor, SMD 0603, X5R, 10V, 10% (de31036)
Fitted	C102, C103, C106, C301, C302, C303, C304, C404, C410, C411, C412, C413, C500, C501, C502, C503, C504, C505, C506, C507, C508, C509, C510, C511, C512, C513, C514, C515, C516, C517, C518, C519, C520, C521, C522, C523	36	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C107	1	10n	Yageo	CC0402KRX7R8BB103	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Fitted	C108	1	10uF/16V	Taiyo Yuden	EMK107BBJ106MA-T	Ceramic capacitor, SMD 0803, X5R, 16V, 10UF +/-20% (High Density)
Fitted	C109, C406, C407, C408	4	1nF	Murata	GRM1555C1H102J0A01D	Ceramic capacitor, SMD 0402, C0G, 50V, +/-5%
Fitted	C305, C402	2	10p	AVX	04025A100JAT2A	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C306	1	13pF	Murata	GRM1555C1H130J0A01D	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C307	1	4.7n	PHYCOMP	2238 587 15632	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10% (de35287)
Fitted	C400, C401	2	15p	AVX	04025A150JAT2A	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C405, C409, C414, C415	4	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
Fitted	D100	1	BATS4	Philips	BATS4	Schottky diode, V(rms)=30V, I(f)=0.1A, V(f)=0.4V (at If=0.01A), I(r)=0.5uA (at Vrrm), I(r)=5ms, SMD SOT23
Fitted	D300, D401	2	YELLOW LED	ROHM	SML-P12YT86R	LED, SMD 0402, Yellow, Wave length=586nm, 7.6mcd @ (1mA, 1.9V)
Fitted	D400	1	GREEN LED	ROHM	SML-P12MT86R	LED, SMD 0402, Green, Wave length=569nm, 2.1mcd @ (1mA, 1.9V)
Fitted	D402	1	EM2121M1TAG	ON Semiconductor	EM2121M1TAG	EM2121, SZEM2121 Single Pair Common Mode Filter with ESD Protection
Fitted	E1, E2, E3, E4	4	SJ-5076	3M	SJ-5076	2.8mm adhesive feet,diam 0.8mm
Fitted	F100	1	MC36213	Multicomp	MC36213	Resettable PTC fuse, Ih = 0.5A, It = 1.0A, 0805 package
Fitted	FIXTURE1	1	Xplained PRO MCU board -Jupiter Test Fixture		Xplained PRO MCU board Jupiter Test Fixture	Xplained PRO MCU board Jupiter Test Fixture
Fitted	FW1	1	EDBG secured firmware	Microchip		EDBG secured firmware
Fitted	J100	1	1125-1102S0R138R1	WC0N	1125-1102S0R138R1	Pin header, 2x2, Right Angle, 2.54mm, THT, Pin In Paste
Fitted	J103	1	Pin header 1x2 right angle	WC0N	1125-1102S0R138R1	1x2 pin header, right angle, 2.54 mm pitch, through-hole
Fitted	J105	1	1125-1103S0S113R1	WC0N	1125-1103S0S113R1	1x3 pin header, 2.54mm pitch, Pin-in-Paste THM
Fitted	J200, J201, J203	3	1125-1210S0R138R1	WC0N	1125-1210S0R138R1	Pin header, 2x10, Right Angle, 2.54mm, THM, Pin In Paste
Fitted	J202	1	1310-1208SNS073R1	WC0N	1310-1208SNS073R1	2x5 pin header, 1.27mm pitch, THM
Fitted	J205, J206	2	2185-108SS0C1YNP1	WC0N	2185-108SS0C1YNP1	1x8 receptacle pin header, 2.54mm pitch THM, PIP
Fitted	J400	1	MLJ480142480-269	Allen Creations Corp.	MLJ480142480-269	USB micro AB, Surface mount signals and DIP shield
Fitted	JS100, JS102	2	3710-6001OS7801	WC0N	3710-6001OS7801	Jumper cap for 2.54mm pinheader
Fitted	L300, L401, L402	3	BLM18PG471SN1	Murata	BLM18PG471SN1	SMD RF inductor 0603, Z=470Ohm (@100MHz), Max R(dc)=0.200Ohm, Max current=1A
Fitted	LABEL1	1	Label PCB/A	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	PCB1	1	ATmega4809 Xplained Pro PCB documentation			ATmega4809 Xplained Pro PCB documentation
Fitted	PCBADOC1	1	A09-3074 PCB/A Files			ATmega4809 Xplained Pro PCB/A documentation
Fitted	Q100, Q101, Q103	3	PMDP865XP	NXP	PMDP865XP	Dual P-Channel MOSFET, -20V, RDS(ON) < 55 mOhm @ -3.4A @ -4.5V
Fitted	Q102	1	2N7002-215	NXP	2N7002-215	N-Channel MOSFET, 60V, 0.300A continuous, 1.2A Peak, RDS(ON) = 3.80Ohm @ VGS=4.5V, VGS(th) < 2.5V
Fitted	Q400	1	2N7002DW	Fairchild	2N7002DW	Dual N-Channel MOSFET, 60V, 115mA cont.RDS(ON) < 7.5 Ohm @50mA@5V, SOT-363
Fitted	Q500, Q501	2	FDC6327C	Fairchild	FDC6327C	Dual NP-ch MOSFET, 20V, 2.7A/1.9A cont. 8A/6A pulse, RDS(ON)<0.080/0.170Ohm @ VGS=4.5V, VGS(th)<1.5/-1.5V, SSOT6
Fitted	R100, R410, R413	3	1M	ASJ Holdings	CR10-1004-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R101, R102, R107, R302, R502, R503, R506, R507, R508, R511, R512, R513, R518, R519, R524, R525	16	100k	ASJ Holdings	CR10-1003-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R103, R106, R109, R110	4	47k	KOA	RK73H1ETTP4702F	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R104, R304, R411, R412	4	1k	ASJ Holdings	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R105	1	10k	Vishay	CRW040210K0FKED	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R108, R504, R505, R509, R510, R520, R521, R522, R527	9	0R	(n/a)	RMCF0402Z10R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R300, R301, R500, R501	4	4.7k	Panasonic	ERJ2RF4701X	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R303, R305, R421, R422	4	39R	ASJ Holdings	CR10-390-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R401, R403, R409	3	1k	ASJ Holdings	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R423	1	6.81k	Vishay	CRW04026K81FKED	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R514, R515, R516, R517, R523, R528	6	330R	ASJ Holdings	CR10-3300-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	SW300, SW301	2	TS604VM1-035CR	Dallywell Electronics Co.LTD	TS604VM1-035CR-R	SWITCH, SMD, 280uf, 6.4mm X 6.2mm
Fitted	TEST1	1	ATmega4809 Xplained Pro test			Fixture test for ATmega4809 Xplained Pro
Fitted	TESTDOC1	1	ATmega4809 Xplained Pro Test Instructions			ATmega4809 Xplained Pro Test Instructions
Fitted	U100	1	MIC5259	Microchip	MIC5259-3.3YML	300mA High PSRR, Low Noise uCap CMOS LDO with 8-pad MLF 20mm
Fitted	U101, U102	2	MIC94165	Microchip	MIC94165CS-TR	Loadswitch, Rds(on) = 14.5mOhm, 1.0mm x 1.5mm WLCSP, reverse blocking, 2.7ms Soft Start
Fitted	U103	1	MIC5319	Microchip	MIC5319-3.3YML	500mA Ultra Low Dropout LDO regulator, 2% accuracy, 2mm x 2mm MLF
Fitted	U300	1	ATmega4809-AFR	Microchip	ATmega4809-AFR	Atmel 8-bit RISC MCU, 48K Flash, 48pin TQFP, 7x7mm, 0.5m pitch package
Fitted	U400	1	AT32UC3A4256J-C1UR	Microchip	AT32UC3A4256J-C1UR	EDBG controller
Fitted	U500	1	FXMA2102L8X	Fairchild	FXMA2102L8X	Dual supply, 2-bit, voltage translator, buffer, repeater, isolator for I2C applications
Fitted	U501, U502, U503, U504, U505, U506, U507, U508, U509, U510, U511	11	SN74LVC1T45DCKR	Texas Instruments	SN74LVC1T45DCKR	Single-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs
Fitted	XC300	1	32.768kHz	Abracon	ABS07-32.768kHz-7-T	Crystal, 32.768kHz, CL=7.0pF, ESR=70kOhm, SMD LxW=3.2 x 1.5mm, 20ppm
Fitted	XC400	1	12.00MHz	Kyocera Crystal Device Corporation	CX3225GB12000H0KPS01	Kyocera CX3225GB12000H0KPS01, 12MHz, 12pF, SMD crystal
Not Fitted	C403	0	4.7n	PHYCOMP	2238 587 15632	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10% (de35287)
Not Fitted	J208, J209	0	1125-1102S0S113R1	WC0N	1125-1102S0S113R1	1x2 pin header, 2.54mm pitch, Pin-in-Paste THM
Not Fitted	R111	0	100k	ASJ Holdings	CR10-1003-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R112	0	47k	KOA	RK73H1ETTP4702F	Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R424	0	1M	ASJ Holdings	CR10-1004-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	U301	0	ATECC508A I2C UDFN	Microchip	ATECC508A-MAHDA-T	ATECC508A with an I2C Interface and a 8 Pin UDFN Package with Paddle

Approved

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