

EDBG
SAML22_Xplained_Pro_EDBG.SchDoc

Target_MCU
SAML22_Xplained_Pro_Target_MCU.SchDoc

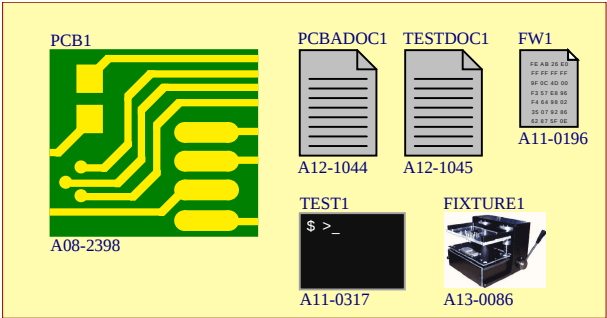
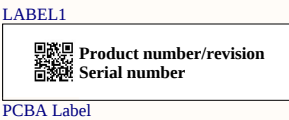
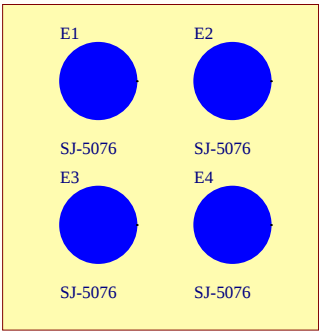
Target_MCU_peripherals
SAML22_Xplained_Pro_peripherals.SchDoc

Arduino_Connectors
SAML22_Xplained_Pro_Arduino_Connectors.SchDoc

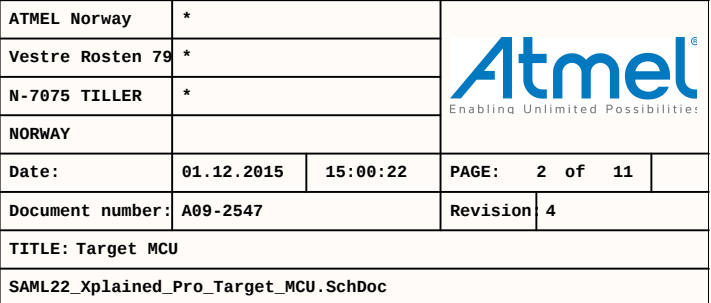
Connectors
SAML22_Xplained_Pro_Connectors.SchDoc

Power_supply
SAML22_Xplained_Pro_triple_input_power_supply.SchDoc

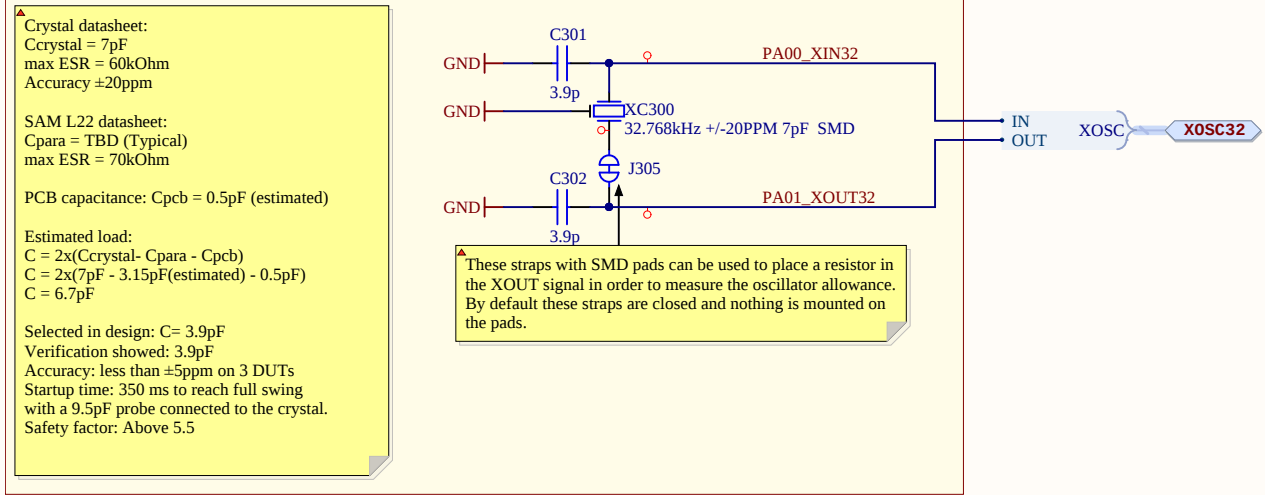
Current_measurement
SAML22_Xplained_Pro_current_measurement.SchDoc



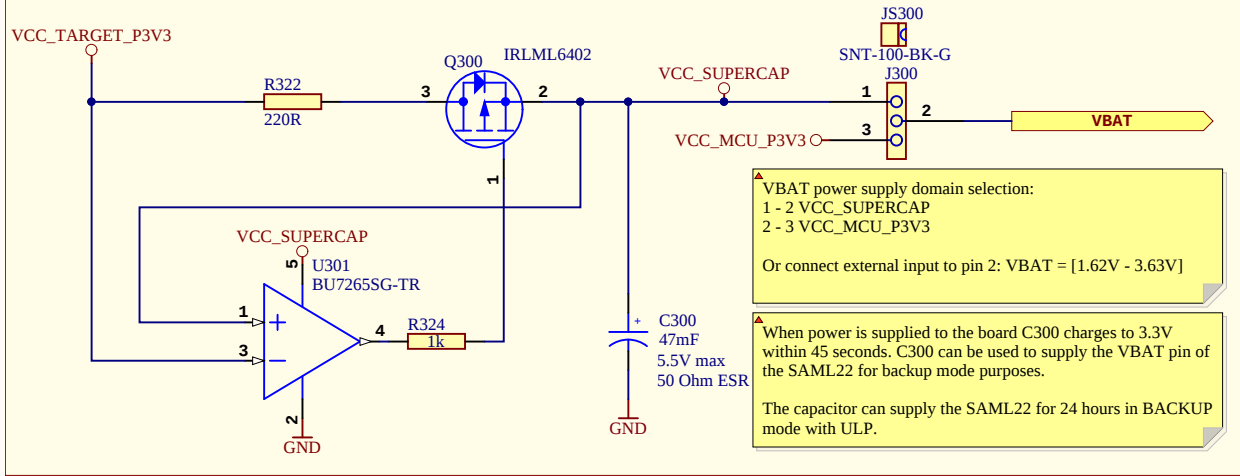
ATMEL Norway		*	 Enabling Unlimited Possibilities!		
Vestre Rosten 79		*			
N-7075 TILLER		*			
NORWAY					
Date:	01.12.2015	15:00:22	PAGE:	1 of 11	
Document number:	A09-2547		Revision	4	
TITLE: Top Level Schematics					
SAML22_Xplained_Pro_TopLevel.SchDoc					



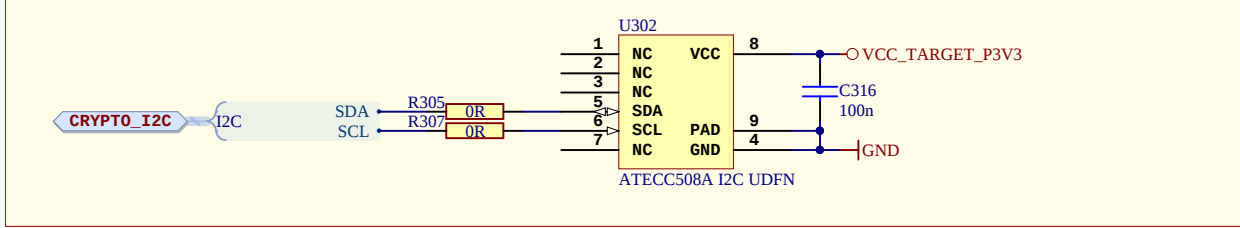
32 kHz CRYSTAL



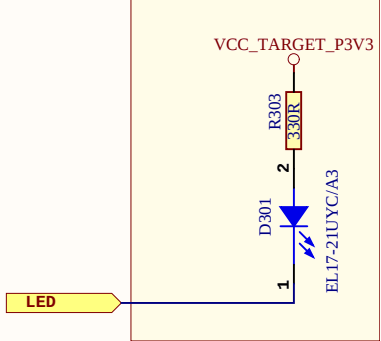
SUPERCAP BACKUP



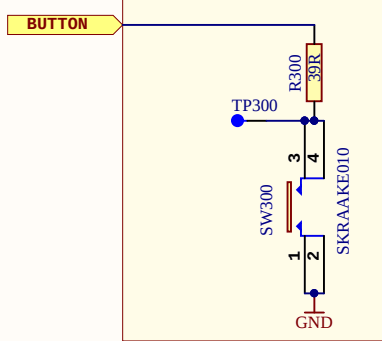
CRYPTO AUTHENTICATION



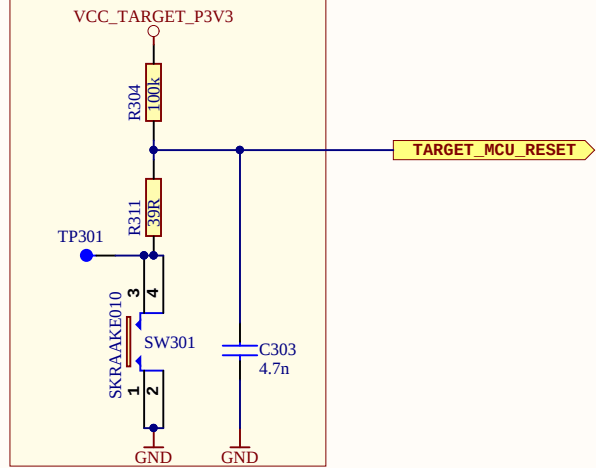
USER LED



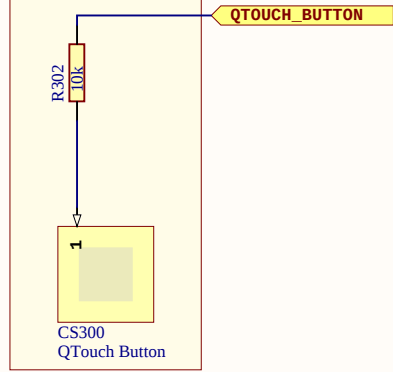
USER BUTTON



RESET button with current limit and noise filter

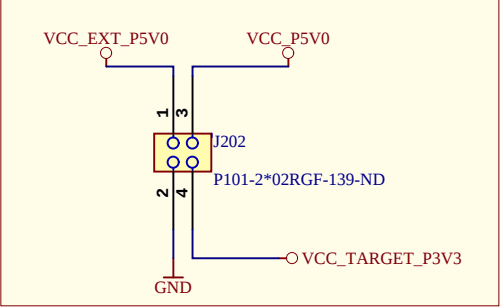


QTOUCH BUTTON



ATMEL Norway		*			
Vestre Rosten 79		*			
N-7075 TILLER		*			
NORWAY					
Date:	01.12.2015	15:00:22	PAGE:	3 of 11	
Document number:	A09-2547		Revision:	4	
TITLE: Target MCU peripherals					
SAML22_Xplained_Pro_peripherals.SchDoc					

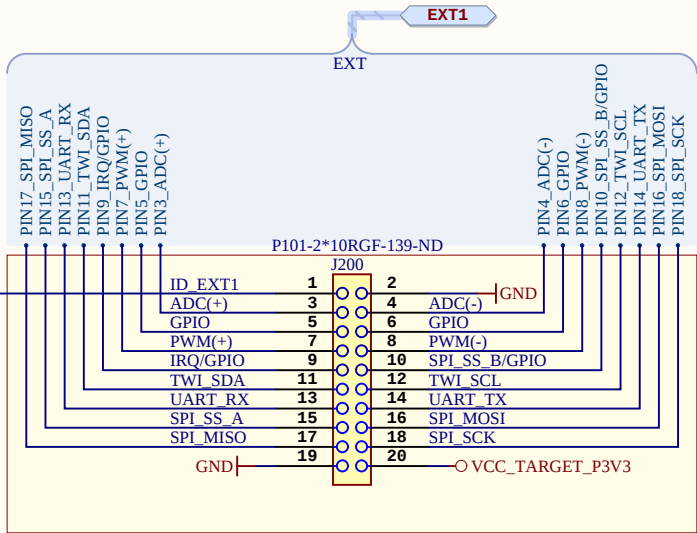
Power Connector



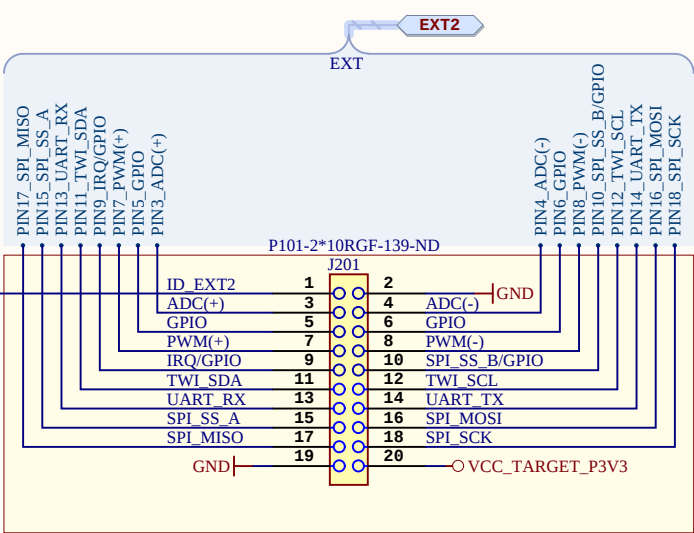
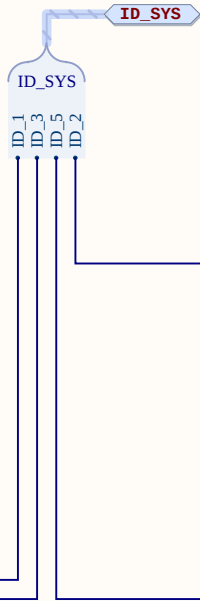
Power inputs/outputs to the Xplained PRO:
VCC_EXT_P5V0 (input)
This power input can be used to power the whole board and it has a higher priority as the USB power inputs. Connect a power supply if a target MCU with USB host is present and 4.3V to 5.5V is possible but for USB host operation it should be 5V +-2%

VCC_P5V0 (output)
This supply is connected to either VCC_EXT_P5V0, VCC_EDBG_USB_P5V0 or VCC_TARGET_USB_P5V0, based on the availability and priority of these supplies.

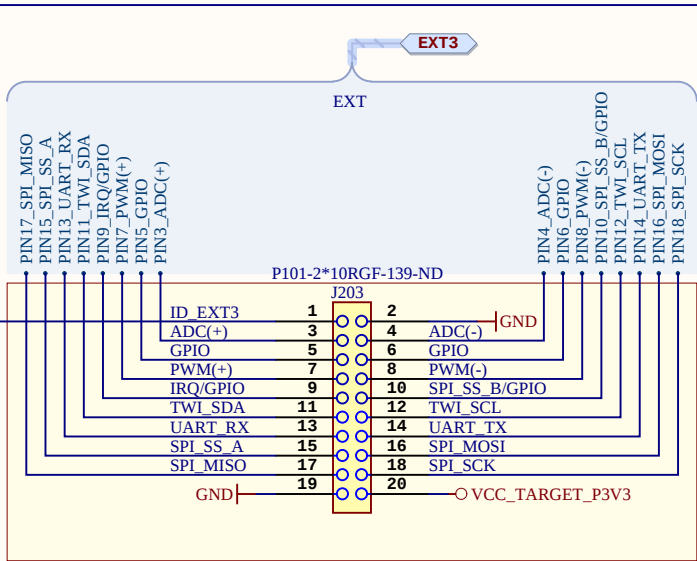
VCC_TARGET_P3V3 (output)
Target supply voltage (target MCU and peripherals)



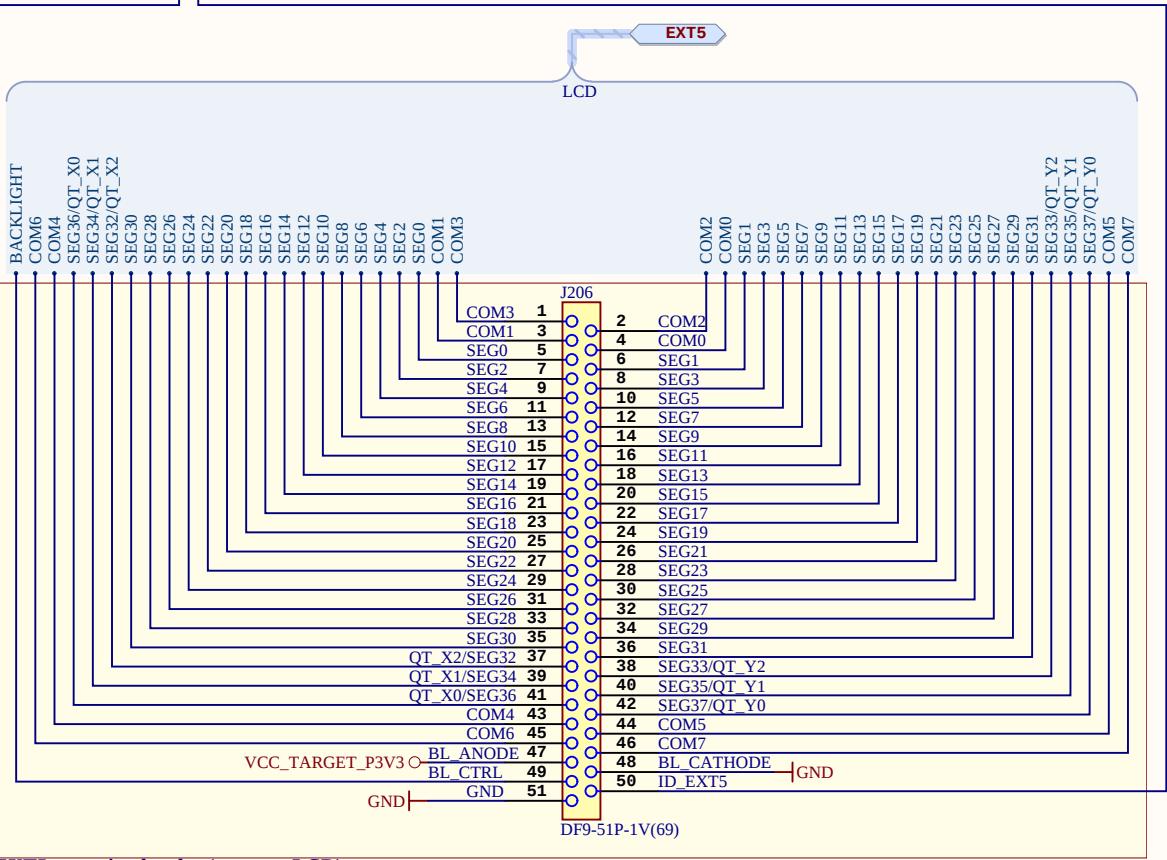
EXT1 extension header



EXT2 extension header

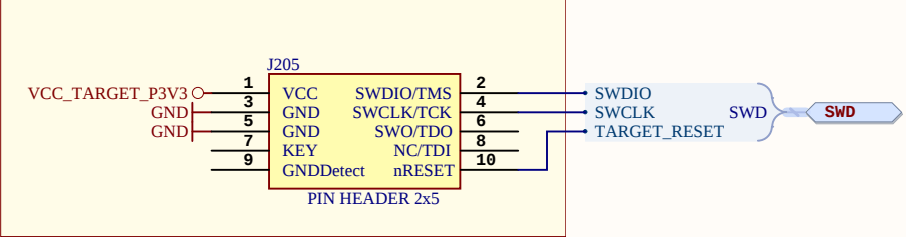


EXT3 extension header

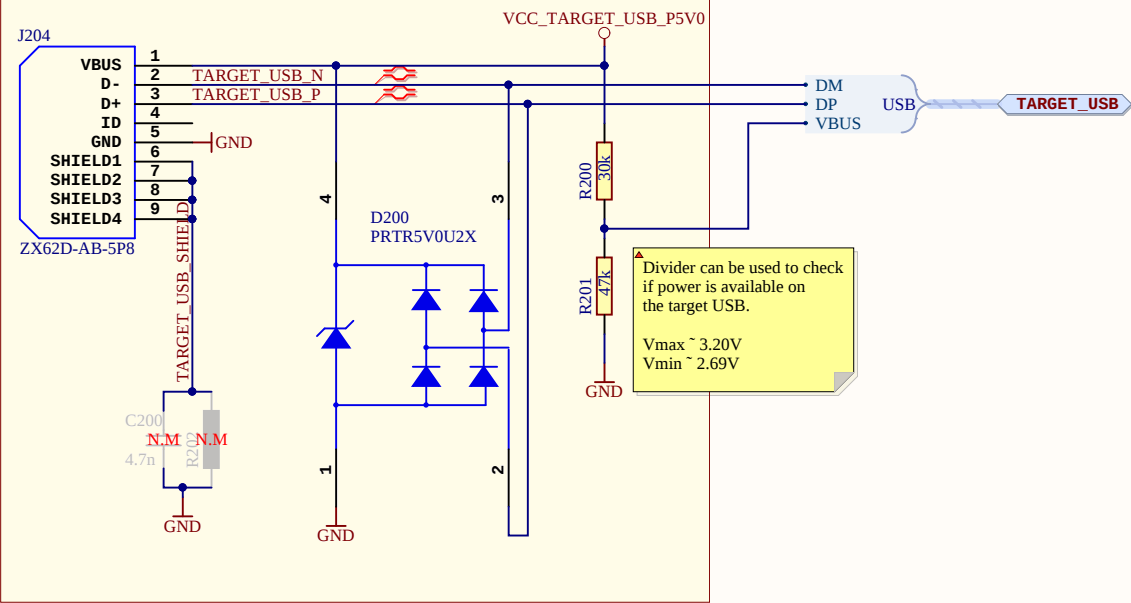


EXT5 extension header (segment LCD)

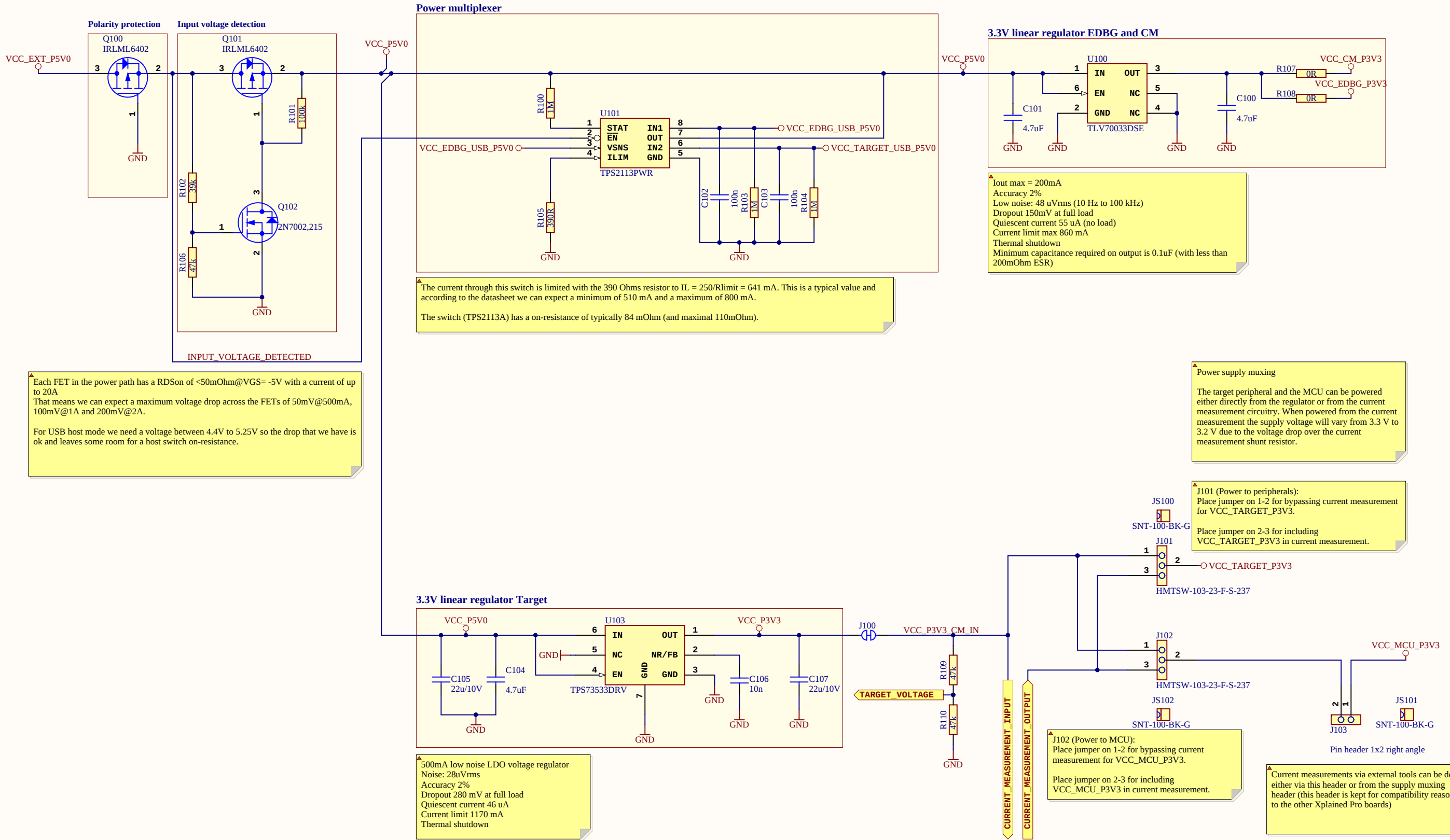
Cortex Debug Connector for connecting an external programmer/debugger

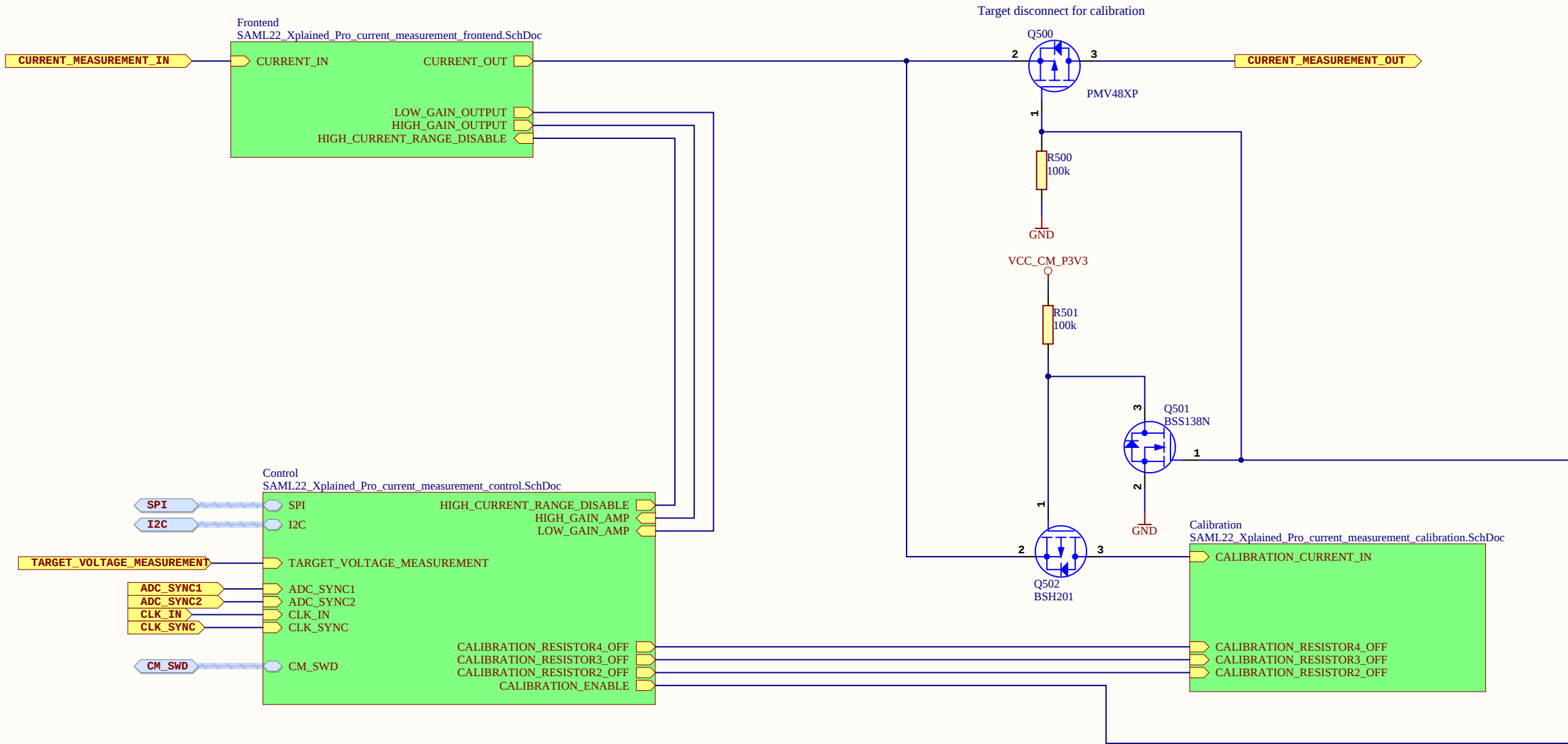


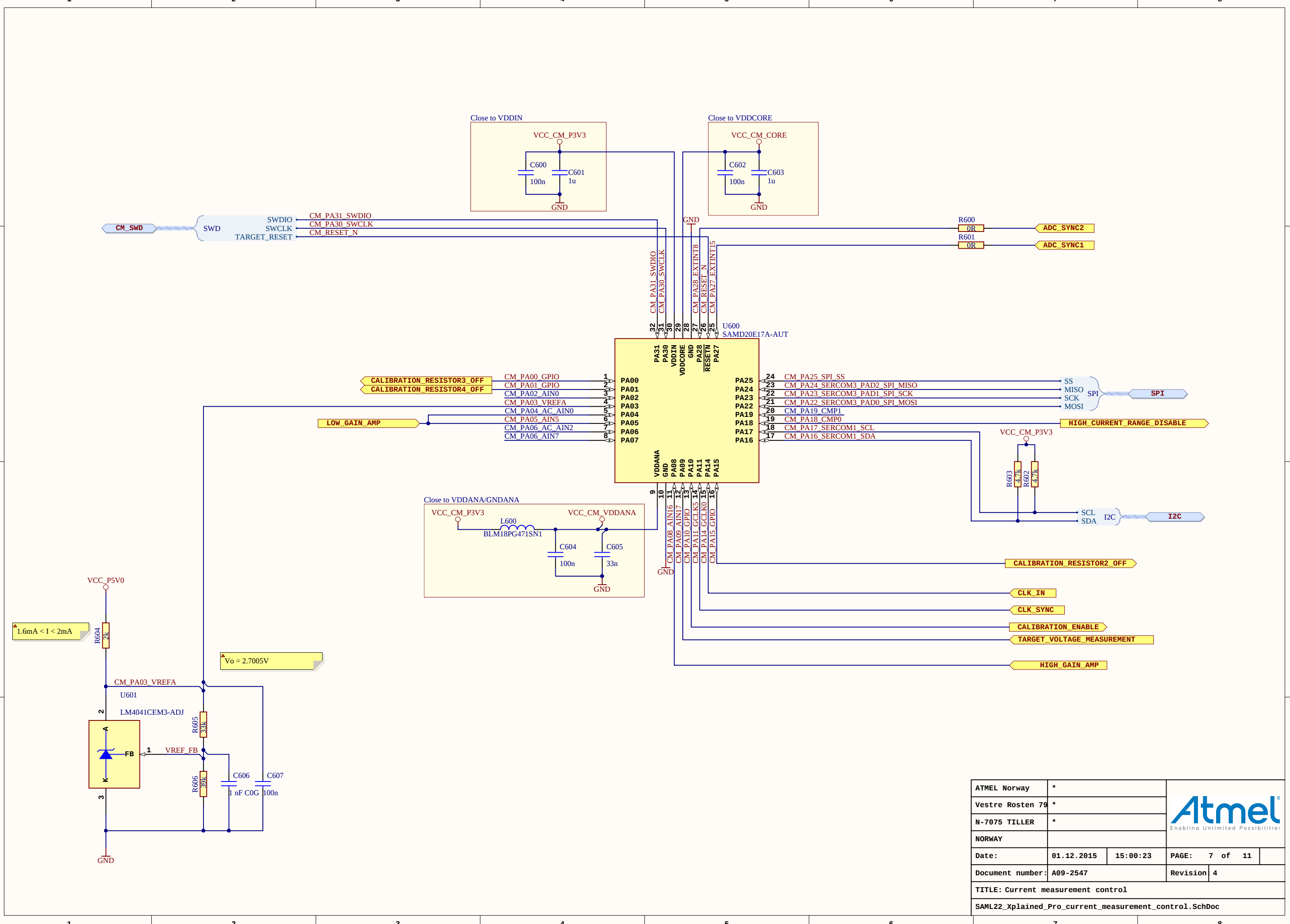
Target USB



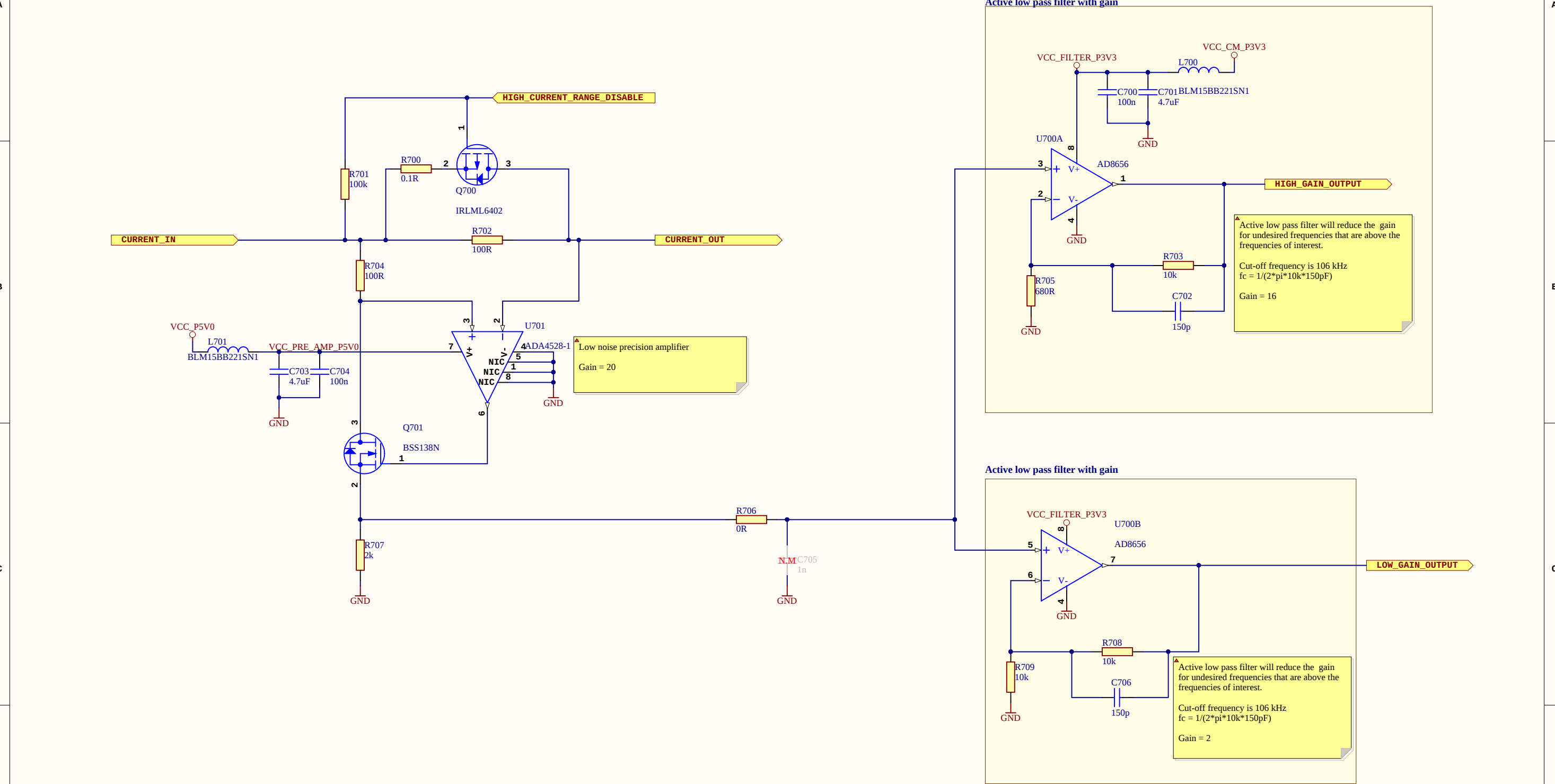
ATMEL Norway	*				
Vestre Rosten 79	*				
N-7075 TILLER	*				
NORWAY					
Date:	01.12.2015	15:00:22	PAGE:	4 of 11	
Document number:	A09-2547		Revision	4	
TITLE: Extension connectors					
SAML22_Xplained_Pro_Connectors.SchDoc					

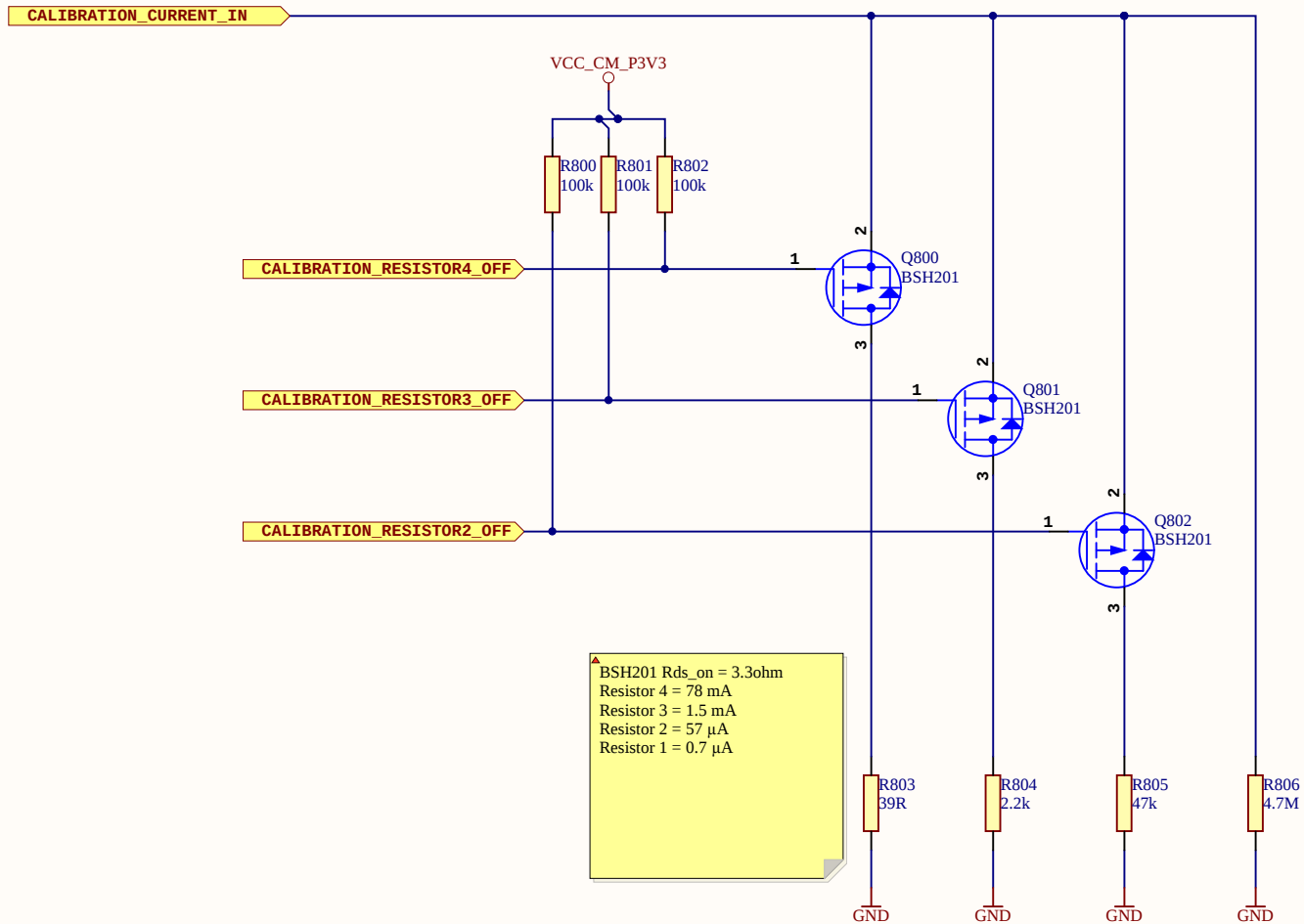






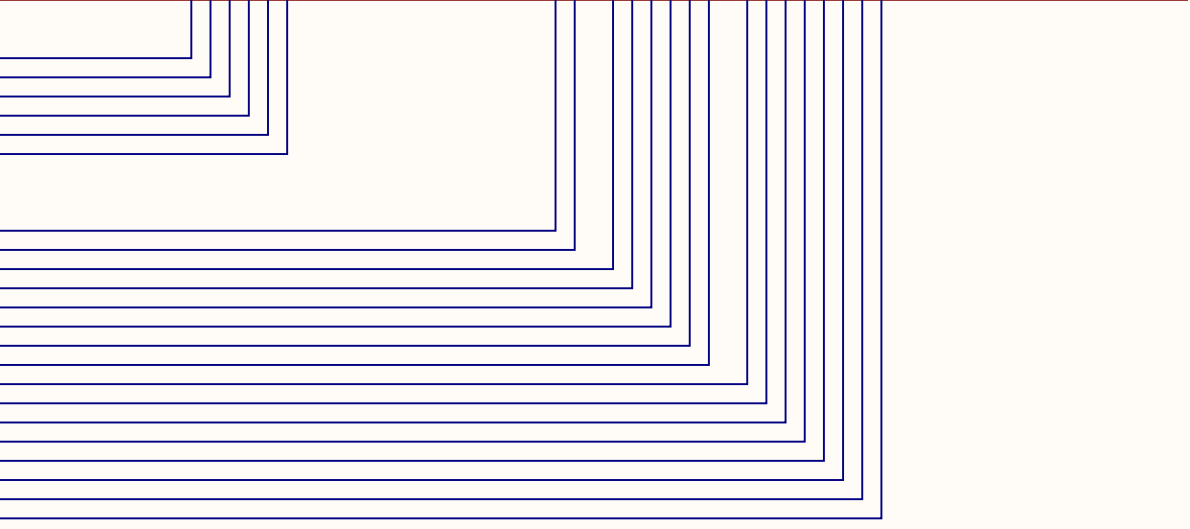
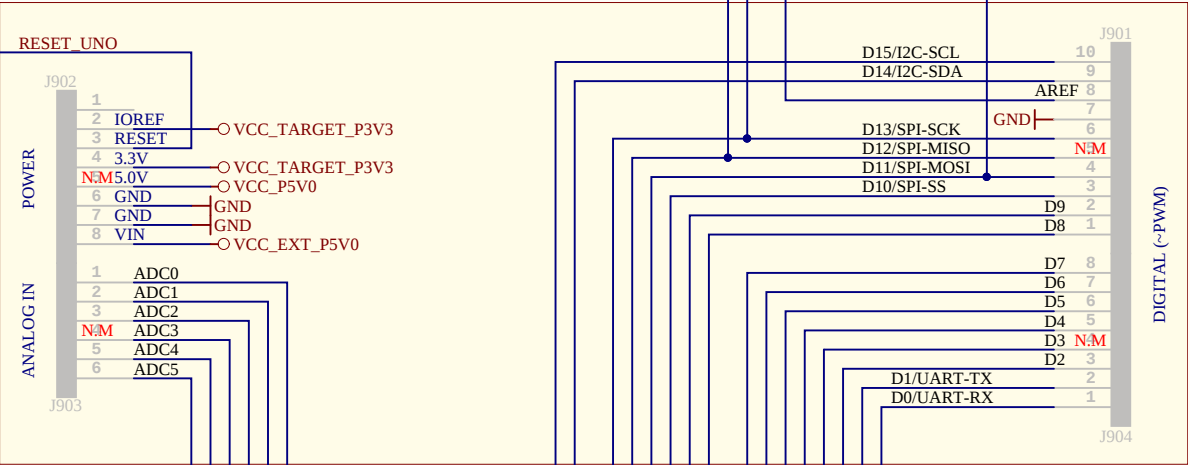
ATMEL Norway		*		 Enabling Unlimited Possibilities	
Vestre Rosten 79		*			
N-7075 TILLER		*			
NORWAY					
Date:	01.12.2015	15:00:23	PAGE:	7 of 11	
Document number:	A09-2547		Revision:	4	
TITLE: Current measurement control					
SAML22_Xplained_Pro_current_measurement_control.SchDoc					



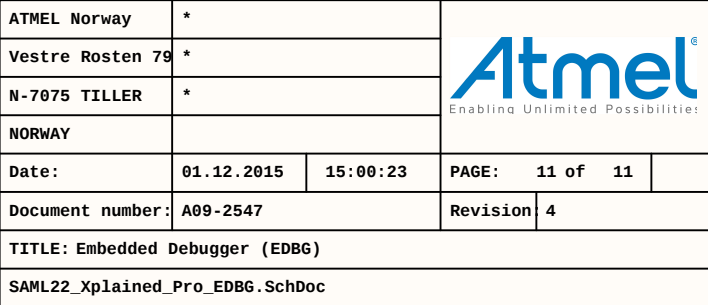


ATMEL Norway	*				
Vestre Rosten 79	*				
N-7075 TILLER	*				
NORWAY					
Date:	01.12.2015	15:00:23	PAGE:	9 of 11	
Document number:	A09-2547		Revision:	4	
TITLE: Current measurement calibration					
SAML22_Xplained_Pro_current_measurement_calibration.SchDoc					

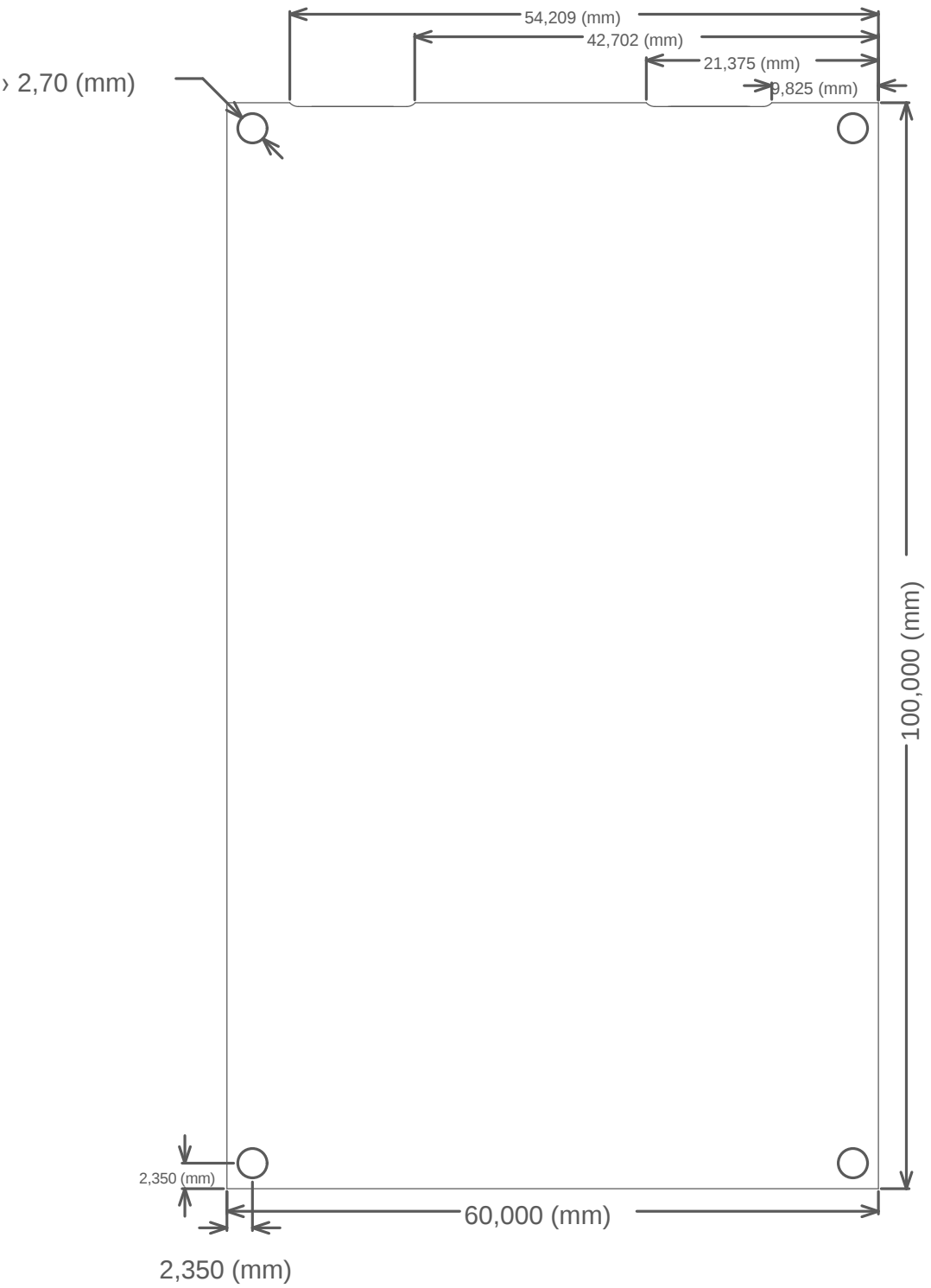
ARDUINO UNO COMPATIBLE HEADERS



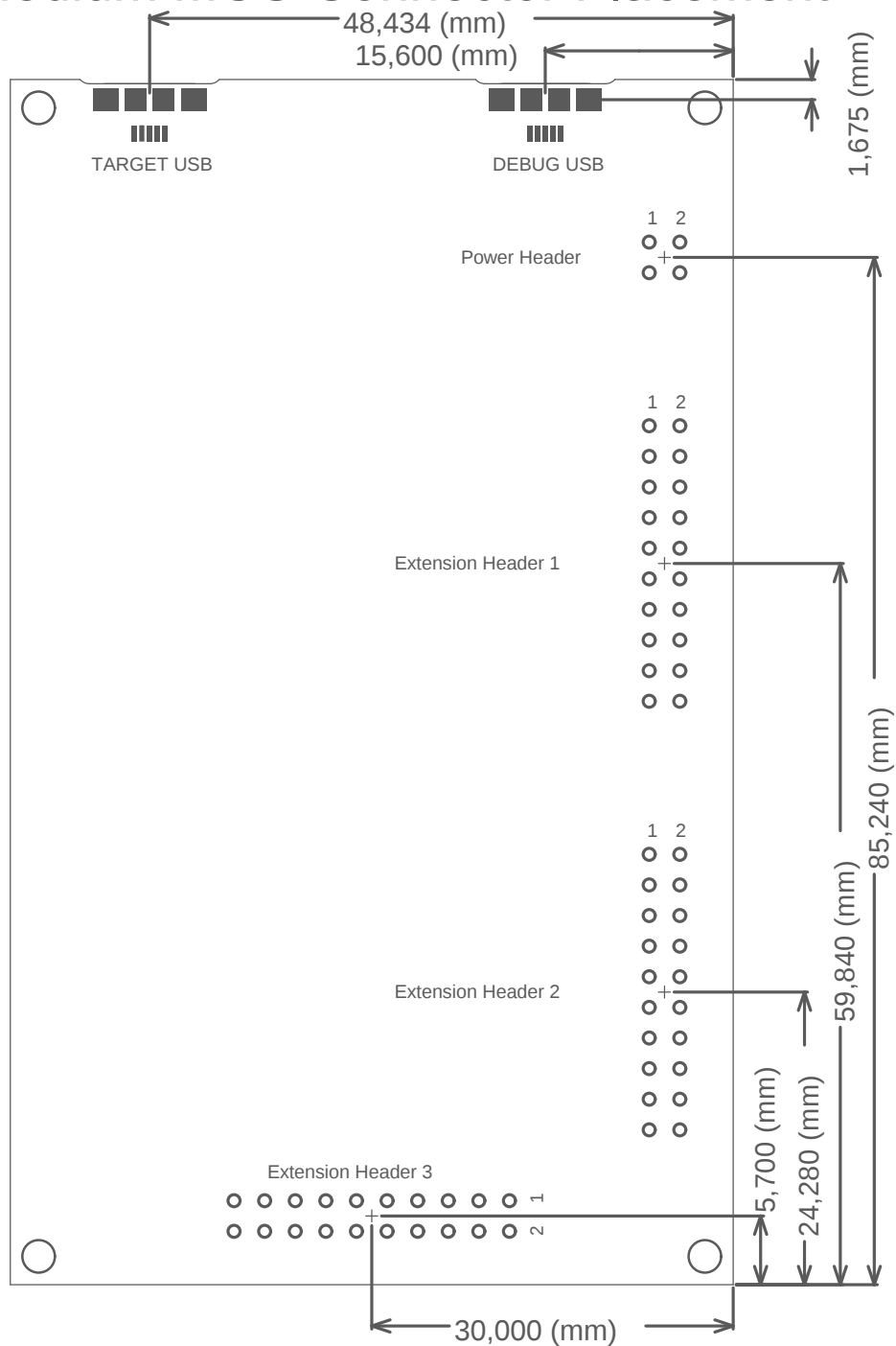
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Vestre Rosten 79	*			
N-7075 TILLER	*			
NORWAY				
Date:	01.12.2015	15:00:23	PAGE:	10 of 11
Document number:	A09-2547		Revision	4
TITLE: Arduino interface connectors				
SAML22_Xplained_Pro_Arduino_Connectors.SchDoc				

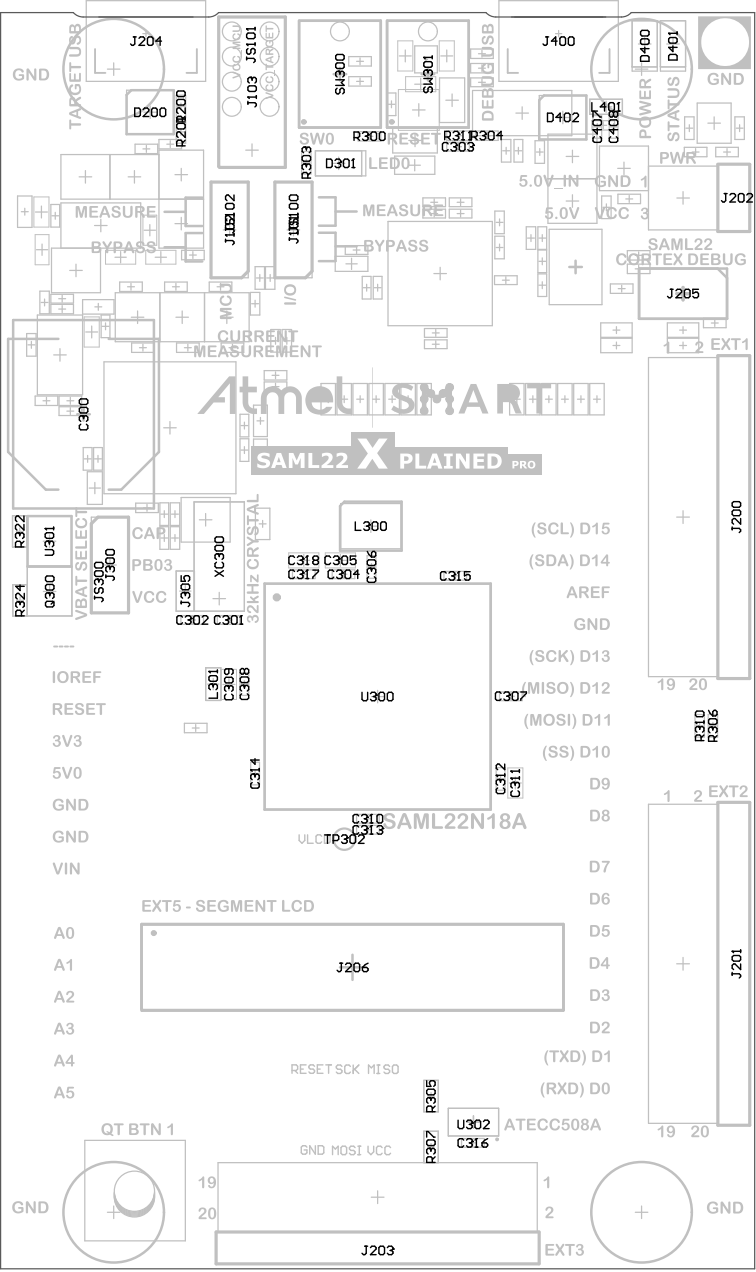


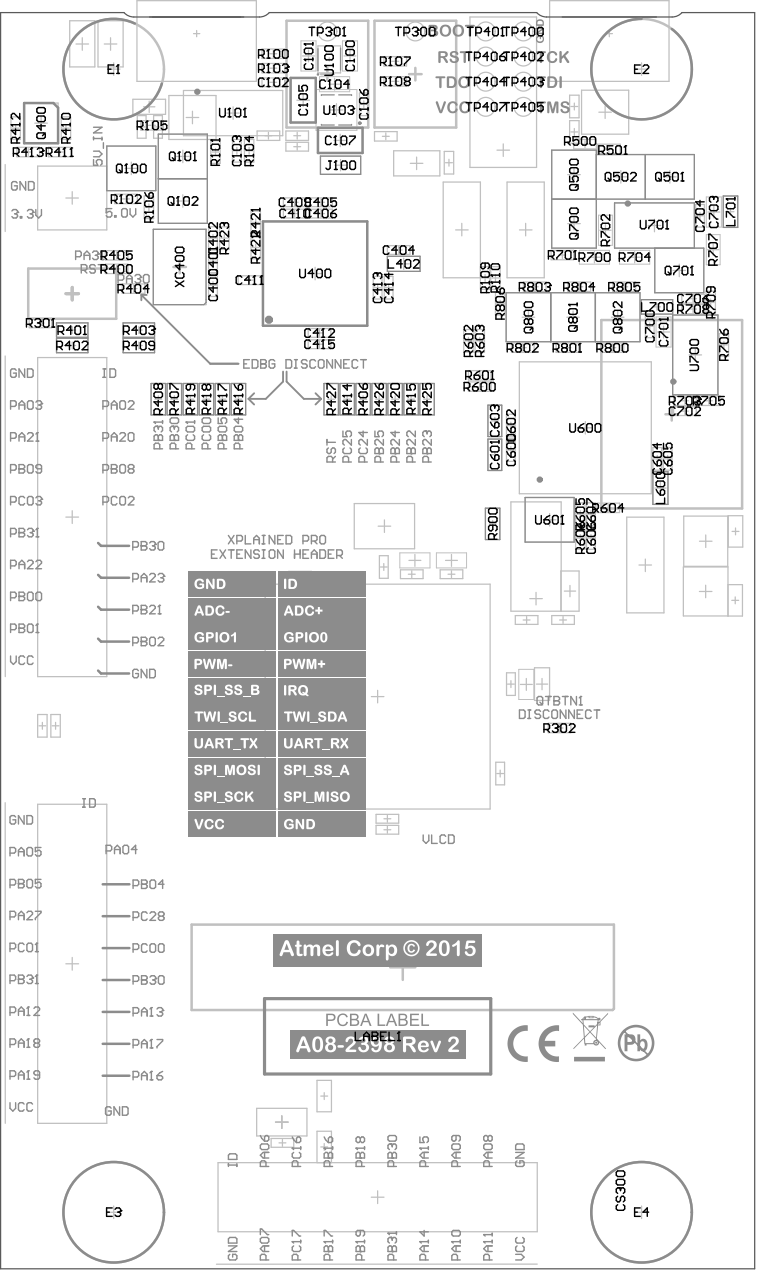
Medium MCU Mechanical Dimensions



Medium MCU Connector Placement





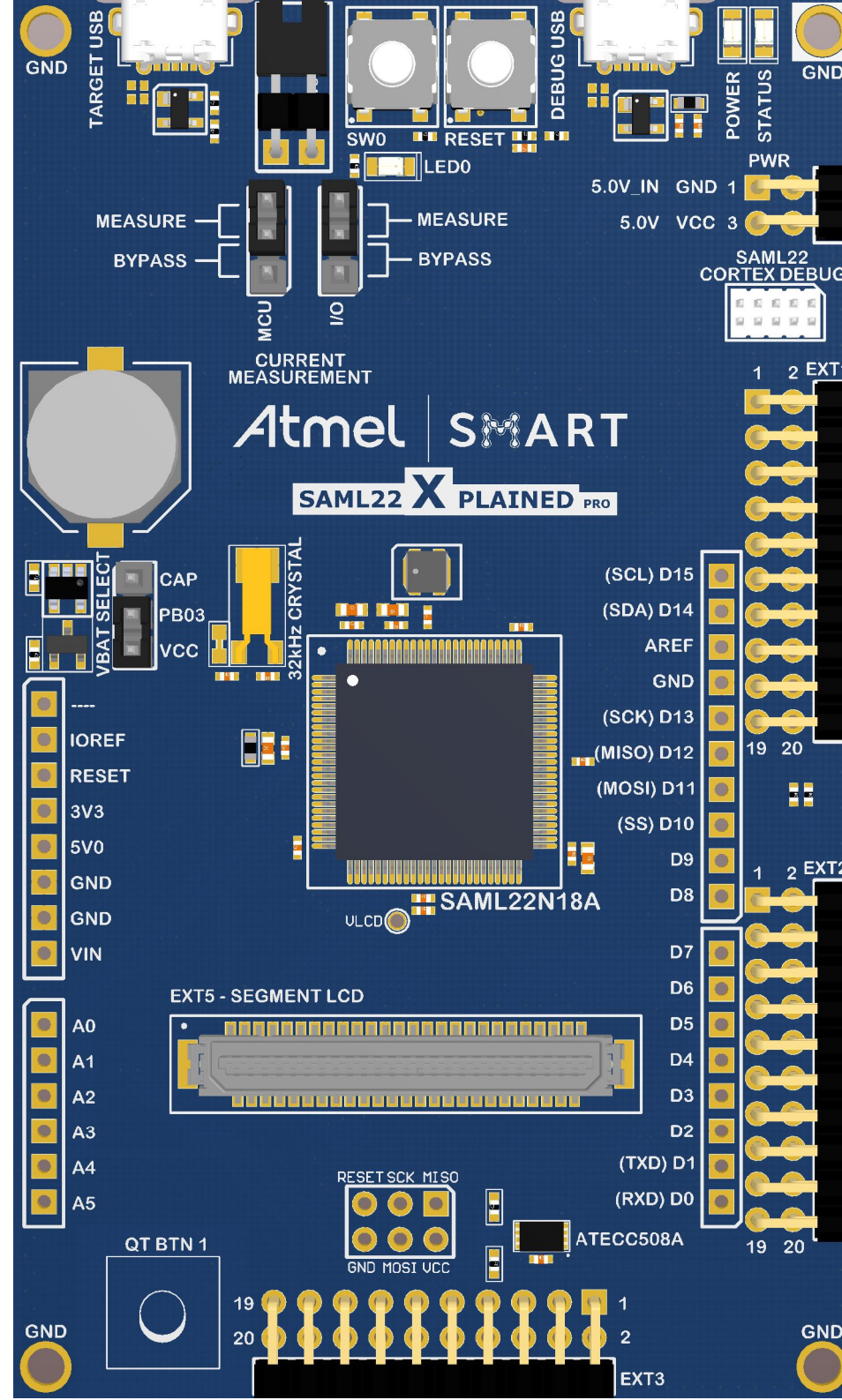


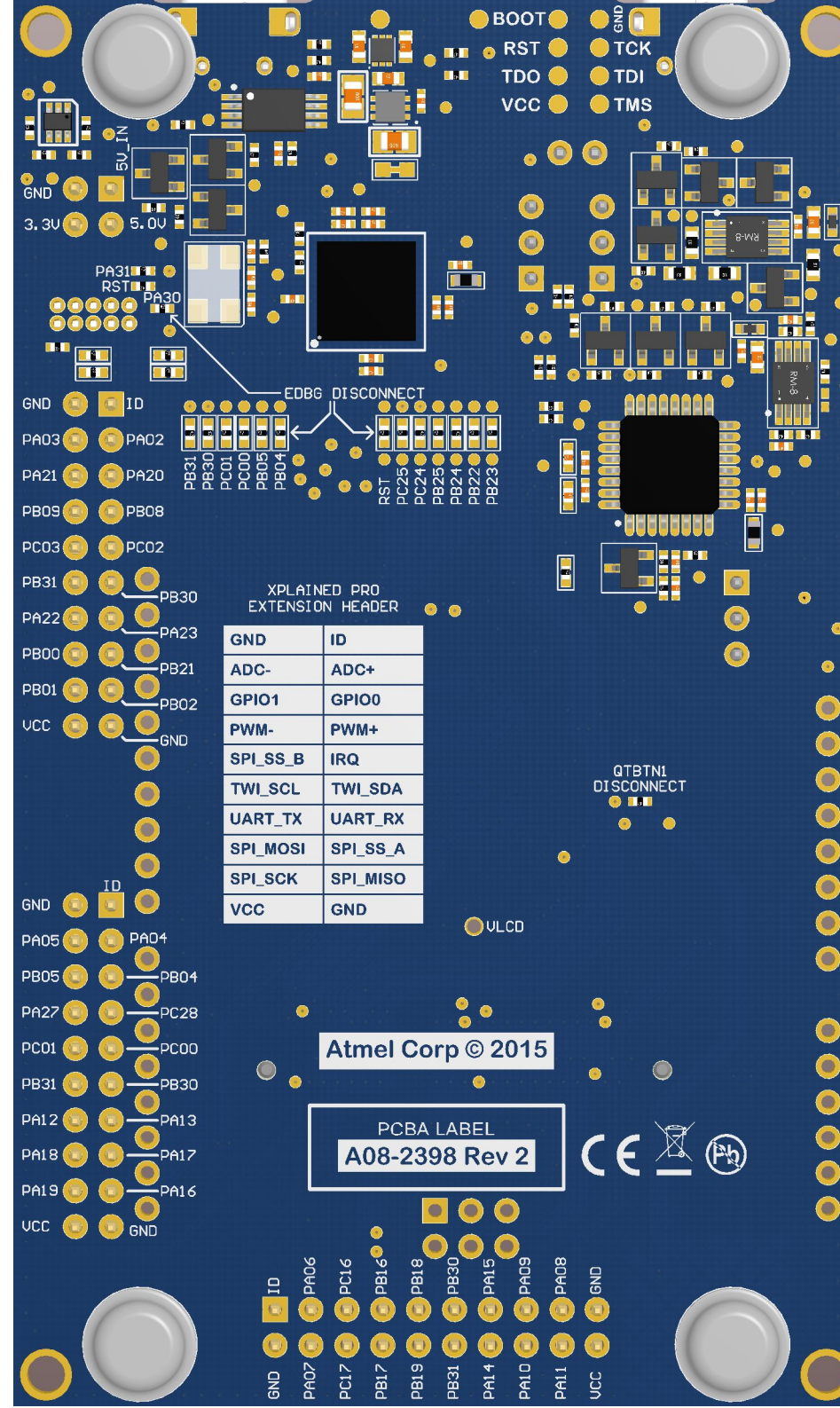
GND	ID
ADC-	ADC+
GPIO1	GPIO0
PWM-	PWM+
SPI_SS_B	IRQ
TWI_SCL	TWI_SDA
UART_TX	UART_RX
SPI_MOSI	SPI_SS_A
SPI_SCK	SPI_MISO
VCC	GND

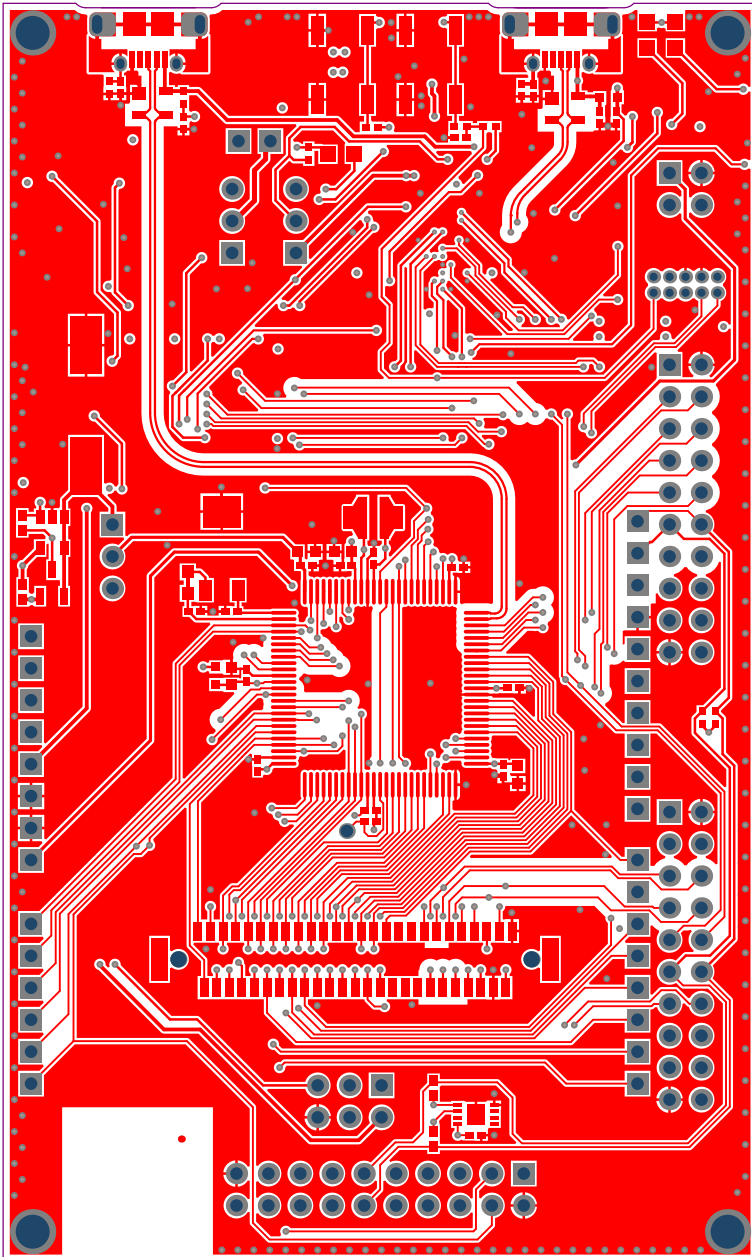
Atmel Corp © 2015

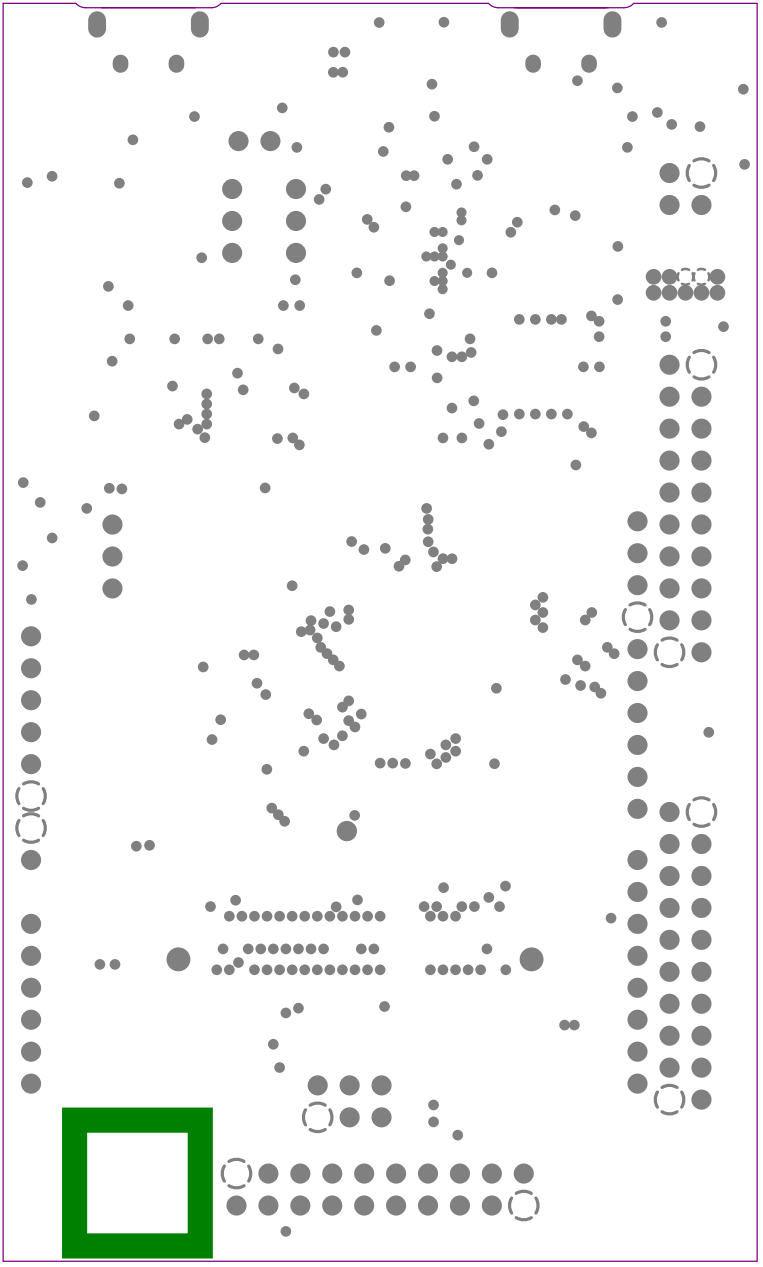
PCBA LABEL
A08-2396 Rev 2

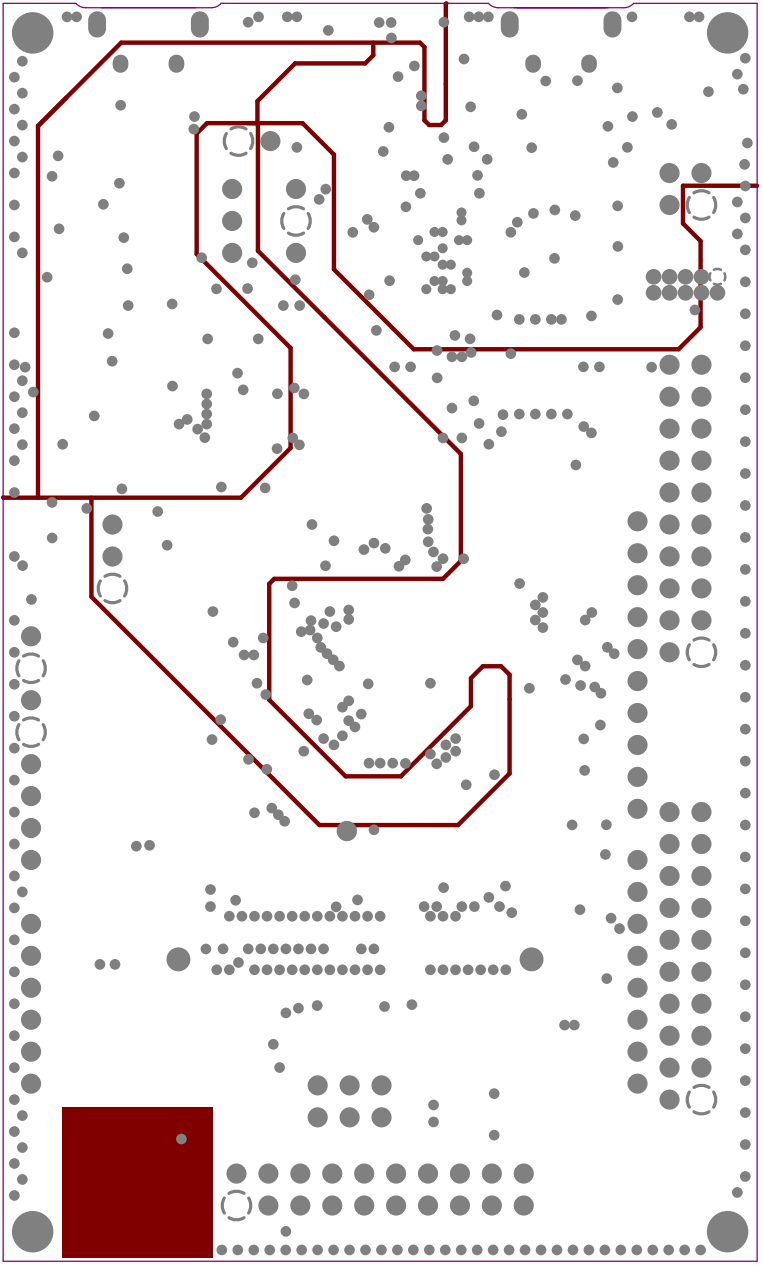


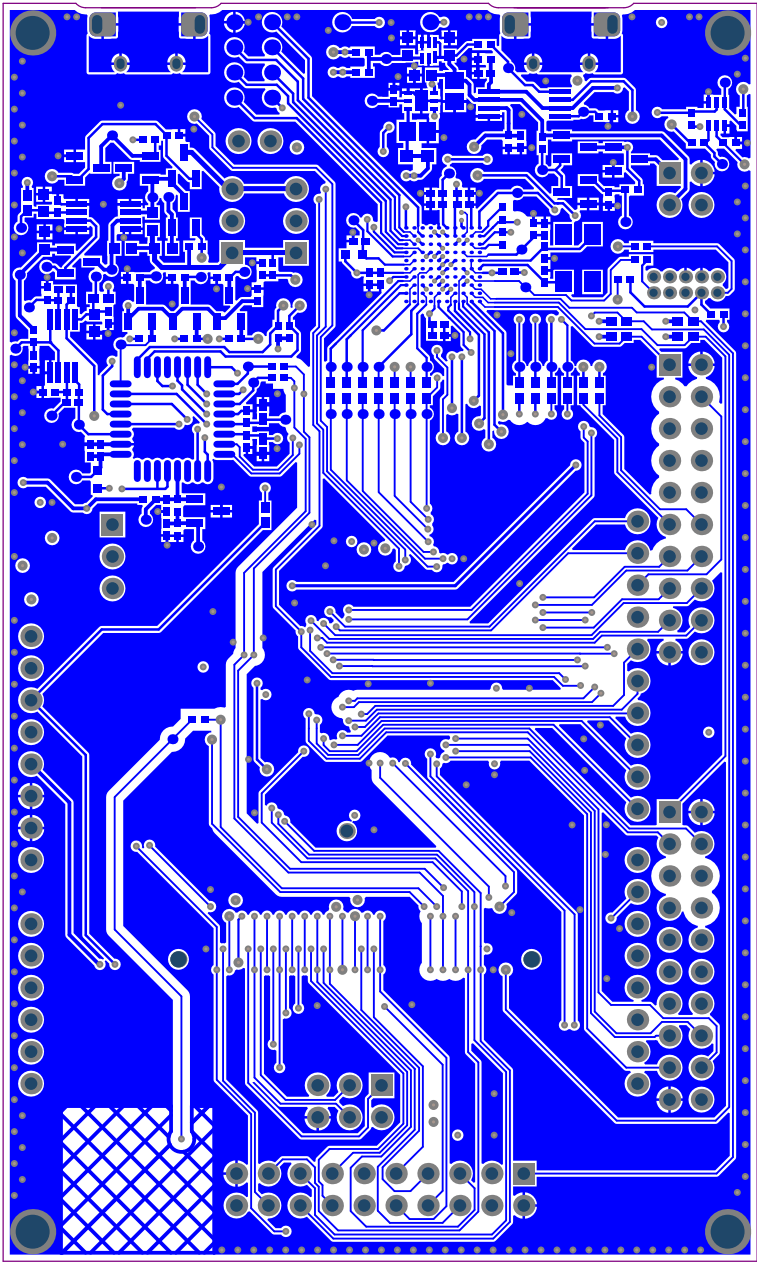












Component list

Top Level Schematics



Source Data From:	SAML22_Xplained_Pro.PrjPCB
Project:	SAML22_Xplained_Pro.PrjPCB
Variant:	Default_assembly

Report Date:	01.12.2015	15:00:48
Print Date:	01.12.2015	14:59:04

Fitted	Designator	Quantity	Value	Manufacturer	MPN	Description
Fitted	C100, C101, C104, C305, C309, C311, C318, C701, C703	9	4.7uF	tdk	C1608X5R1A475K	Ceramic capacitor, SMD 0603, X5R, 10V, 10% (de31036)
Fitted	C102, C103, C304, C307, C308, C310, C312, C314, C315, C316, C317, C404, C410, C411, C412, C413, C600, C602, C604, C607	20	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C105, C107	2	22u/10V	tdk	C2012X5R1A226M0.85	Ceramic capacitor, SMD 0805, X5R, 10V, A±20%
Fitted	C106	1	10n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Fitted	C300	1	47mF			Electric Double-Layer (Supercapacitor), 5.5V, 47mF, SMD, 10.5mm diameter, 50lB ESR
Fitted	C301, C302	2	3.9p			Ceramic capacitor, SMD 0402, NPO, 50V, +/-0.25pF
Fitted	C303	1	4.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10% (de35287)
Fitted	C306	1	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
Fitted	C313	1	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
Fitted	C400, C401	2	22p			Ceramic capacitor, SMD 0402, NPO, 50V, +/-5%
Fitted	C402	1	10p			Ceramic capacitor, SMD 0402, NPO, 50V, +/-5%
Fitted	C405, C409, C414, C415	4	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
Fitted	C406, C407, C408	3	1 nF COG	Murata	GRM1555C1H102JA01D	Ceramic capacitor, SMD 0402, COG, 50V, +/-5%
Fitted	C601, C603	2	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
Fitted	C605	1	33n	Murata	GRM155R71E333KA88D	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Fitted	C606	1	1 nF COG	Murata	GRM1555C1H102JA01D	Ceramic capacitor, SMD 0402, COG, 50V, +/-5%
Fitted	C700, C704	2	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C702, C706	2	150p			Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
Fitted	D200, D402	2	PRT8SV0U2X	NXP	PRT8SV0U2X	Double rail-to-rail USB ESD protection diode
Fitted	D301, D401	2	EL17-21UYC/A3	Everlight	17-21UYC/SS30-A3/TR8	LED, Yellow, Wave length=591nm, SMD 0805, ±70°
Fitted	D400	1	EL17-21SYGC	Everlight	EL17-21SYGC	LED, Green, Wave length=575nm, SMD 0805, ±70°
Fitted	E1, E2, E3, E4	4	SJ-5076	3M	SJ-5076	2.8mm adhesive feet, diam 8.0mm
Fitted	FXTURE1	1	Xplained PRO MCU board Jupiter Test Fixture	ESCA TEC	Xplained PRO MCU board Jupiter Test Fixture	Xplained PRO MCU board Jupiter Test Fixture
Fitted	FW1	1	EDBG secured firmw are			EDBG secured firmw are
Fitted	J101, J102, J300	3	HMTSW-103-23-F-S-237	SAMTEC	HMTSW-103-23-F-S-237	1x3 pin header, 2.54mm pitch, Pin-in-Paste THM, 1mm hole
Fitted	J103	1	Pin header 1x2 right angle	Pro-data International Corp	2213R-2G	1x2 pin header, right angle, 2.54 mm pitch, through-hole
Fitted	J200, J201, J203	3	P101-2*10RGF-139-ND	Pro-data International Corp	P101-2*10RGF-139-ND	Pin header, 2x10, Right Angle, 2.54mm, THM Pin In Paste
Fitted	J202	1	P101-2*02RGF-139-ND	Pro-data International Corp	P101-2*02RGF-139-ND	Pin header, 2x2, Right Angle, 2.54mm, THT, Pin In Paste
Fitted	J204, J400	2	ZX62D-AB-5P8	HROSE	ZX62D-AB-5P8	Micro USB AB Connector, Standard SMT + DIP
Fitted	J205	1	PN-HEADER 2x5	Garry	176-2-010-0-T-X-0730	2x5 pin header, 1.27mm pitch, THM
Fitted	J206	1	DF9-51P-1V(69)	HROSE	DF9-51P-1V(69)	header with 51 contacts, 1mm pitch, with boss and metal fitting, gold plating
Fitted	JS100, JS101, JS102, JS300	4	SNF-100-BK-G	SAMTEC	SNF-100-BK-G	Jumper cap for 2.54mm pinheader
Fitted	L300	1	LQH6NPN100MU0	Murata	LQH6NPN100MU0	10uH pow er inductor, Isat = 560mA , Itemp = 710mA, Rdc = 0.360ohm
Fitted	L301, L401, L402, L600	4	BLM18PG471SN1	Murata	BLM18PG471SN1	SMD RF inductor 0603, Z=470Ohm (@100MHz), Max R(dC)=0.650hm, Max current=1A
Fitted	L700, L701	2	BLM15BB221SN1	Murata	BLM15BB221SN1	SMD RF inductor 0402, Z=220Ohm (@100MHz), Max R(dC)=0.80Ohm, Max current=200mA
Fitted	LABE1.1	1	PCBA Label	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	PCB1	1	SAM L22 Xplained Pro PCB			SAM L22 Xplained Pro PCB, 4 layer, 60mm x 100mm
Fitted	PCBADOC1	1	A09-2547 PCBA Files			SAM L22 Xplained Pro PCBA documentation
Fitted	Q100, Q101, Q300, Q700	4	IRLML6402	International Rectifier	IRLML6402PBF	P-ch. MOSFET, -30V, -3.7A continuous, RDS(ON)=0.050hm@VGS=-4.5V, RDS(ON)=0.080hm@VGS=-2.5V
Fitted	Q102	1	2N7002.215	NXP	2N7002.215	N-Channel MOSFET, 60V, 0.300A continuous, 1.2A Peak, RDS(ON) = 3.80hm@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	1	PMV48XP	NXP	PMV48XP,215	P Channel Digital FET, -30V, -3.5A continuous, -14A Peak, RDS(ON)=48mOhm@VGS=-4.5V, RDS(ON)=71mOhm@VGS=-2.5V, VGS(th)<1.25V
Fitted	Q501, Q701	2	BSS138N	Infineon	BSS138N	Low leakage N-Channel MOSFET, 60V, 0.23A continuous, 0.92A Peak, RDS(ON) = 3.50hm@VGS=4.5V, VGS(th)<1.4V
Fitted	Q502, Q800, Q801, Q802	4	BSH201	NXP	BSH201,215	P-Channel Digital FET, -60V, -0.3A continuous, -1.2A Peak, RDS(ON)=2.5@VGS=-10V, RDS(ON)=5 ohm @VGS=-2.5V, VGS(th)<1.9V
Fitted	R100, R103, R104, R410, R413	5	1M			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R101, R304, R500, R501, R701, R800, R801, R802	8	100k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R102, R606	2	39k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R105	1	390R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R106, R109, R110, R201, R805	5	47k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R107, R108, R404, R405, R600, R601, R706	7	0R	(n/a)	RMCF0402210R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R200	1	30k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R300, R311, R400, R421, R422, R803	6	39R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R301	1	1k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R302, R703, R708, R709	4	10k	vishay	CRCW040210K0FKED	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R303, R411, R412	3	330R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R305, R307, R406, R407, R408, R415, R425, R426, R427, R900	10	0R	(n/a)	RMCF0402210R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R306, R310, R602, R603	4	4.7k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R322	1	220R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R324, R401, R402, R403, R409	5	1k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R414, R416, R417, R418, R419, R420	6	330R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R423	1	6.81k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R604	1	2k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R605	1	33k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R700	1	0.1R	vishay	WSL0603R1000FEA	WSL0603R1000FEA, metal strip resistor, 0.1 Ohm, +/-1%, 0603 SMD, 1/10 W, TBMPCO +75 ppm/°C
Fitted	R702, R704	2	100R	Panasonic	ERA3YEB101V	ERA-3YEB101V, metal film, 100R A0.1%, resistor in 0603 at 100mW, TBMPCO A±25ppm/°C, Max V=75V
Fitted	R705	1	680R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R707	1	2k			Thick film resistor, SMD 0603, 1/10W, 1%
Fitted	R804	1	2.2k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R806	1	4.7M			Thick film SMD 0402 1/16W 1%
Fitted	SW300, SW301	2	SKRAAKE010	ALPS	SKRAAKE010	6.2x6.2 mm SMD tact sw itch, same as A08-0091 but less force is needed
Fitted	TEST1	1	SAM L22 Xplained Pro Test Instructions			Fixture eggTest for SAM L22 Xplained Pro
Fitted	TESTDOC1	1	SAM L22 Xplained Pro Test Instructions			SAM L22 Xplained Pro Test Instructions
Fitted	U100	1	TLV70033DSE	Texas Instruments	TLV70033DSE	LDO, 200 mA, Iq=31 uA, Vdo=250mV, Vout=3.3V, VIN= 2 V to 5.5V, SON-6 package
Fitted	U101	1	TPS2113PWR	Texas Instruments	TPS2113PWR	Autoswitching 2:1 Pow er Mux
Fitted	U103	1	TPS73533DRV	Texas Instruments	TPS73533DRV	Low noise LDO, 500 mA, Vout=3.3V, 2% accuracy, IQ=46uA, noise=28uVrms, VIN= 2.7V to 6.5V, Vdo=280mV, stable with low ESR capacitor
Fitted	U300	1	ATSAML22N18A-AUT	ATMEL	ATSAML22N18A-AUT	Atmel 32-bit RISC MCU 100pin
Fitted	U301	1	BU7265SG-TR			Single, Low Voltage (1.8-5.5V), Low Pow er (0.35uA), low cost
Fitted	U302	1	ATECC508A I2C UDFN	ATMEL	ATECC508A-MAHDA-T	ATECC508A with an I2C Interface and a 8 Pin UDFN Package with Paddle
Fitted	U400	1	AT32UC3A4256J-CLUR	ATMEL	AT32UC3A4256J-CLUR	AVR 32-bit RISC MCU
Fitted	U600	1	SAMD20E17A-AUT	ATMEL	ATSAMD20E17A-AUT	Atmel 32bit RISC MCU 32 pin
Fitted	U601	1	LM041CEM3-ADJ	National Semiconductor	LM041CEM3-ADJ	Adjustable shunt voltage regulator, 1.24 to 10V out
Fitted	U700	1	AD8656	Analog Devices	AD8656ARMZ	AD8656, dual low noise precision OpAmp, rail-to-rail, low offset 250uV, GBP 28 MHz, 8MSOP
Fitted	U701	1	ADA4528-1	Analog Devices	ADA4528-1ARMZ	Precision OpAmp, Zero-Drift 0.015uV/K, ultra low noise 5.6nV/sqrt(Hz), Vos=2uV, GBW=4MHz, single supply 2.2V to 5.5V or dual supply +1V to +2.75V, rail to rail, unity gain stable
Fitted	XC300	1	32.768kHz +/-20PPM 7pF SMD	Micro Crystal	MS1V-11K 32.768kHz 7pF +/-20PPM TA	32k768 crystal, +20ppm, CL=7pF, max ESR 60kOhm, SMD
Fitted	XC400	1	12.00MHz	Fox Electronics	FQ5032B-12.000	Fox FQ5032B 12.0MHz SMD crystal 738B-12
Not Fitted	C200, C403	0	4.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Not Fitted	C705	0	1n			Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
Not Fitted	J900	0	HMTSW-103-23-F-D-237	SAMTEC	HMTSW-103-23-F-D-237	2x3 pin header, 2.54mm pitch, Pin-in-Paste THM
Not Fitted	J901	0	SSQ-110-21-F-S	SAMTEC	SSQ-110-21-F-S	1x10 receptacle pin header, low insertion force, 2.54mm pitch THM, Pin in Paste
Not Fitted	J902, J904	0	SSQ-108-21-F-S	SAMTEC	SSQ-108-21-F-S	1x8 receptacle pin header, low insertion force, 2.54mm pitch THM, Pin in Paste
Not Fitted	J903	0	SSQ-106-21-F-S	SAMTEC	SSQ-106-21-F-S	1x6 receptacle pin header, low insertion force, 2.54mm pitch THM
Not Fitted	R202, R424	0	1M			Thick film resistor, SMD 0402, 1/16W, 1%

Approved	202	Notes

