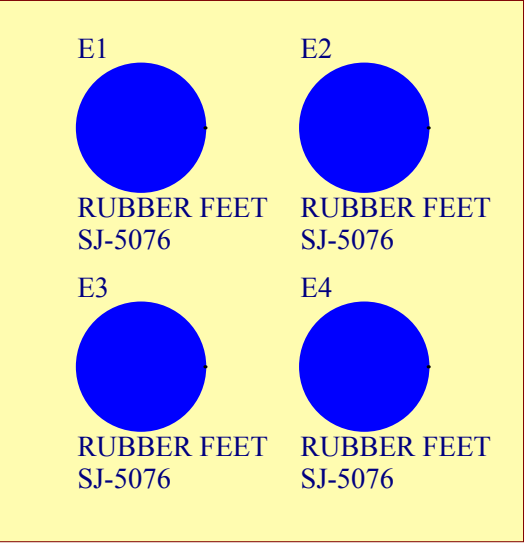
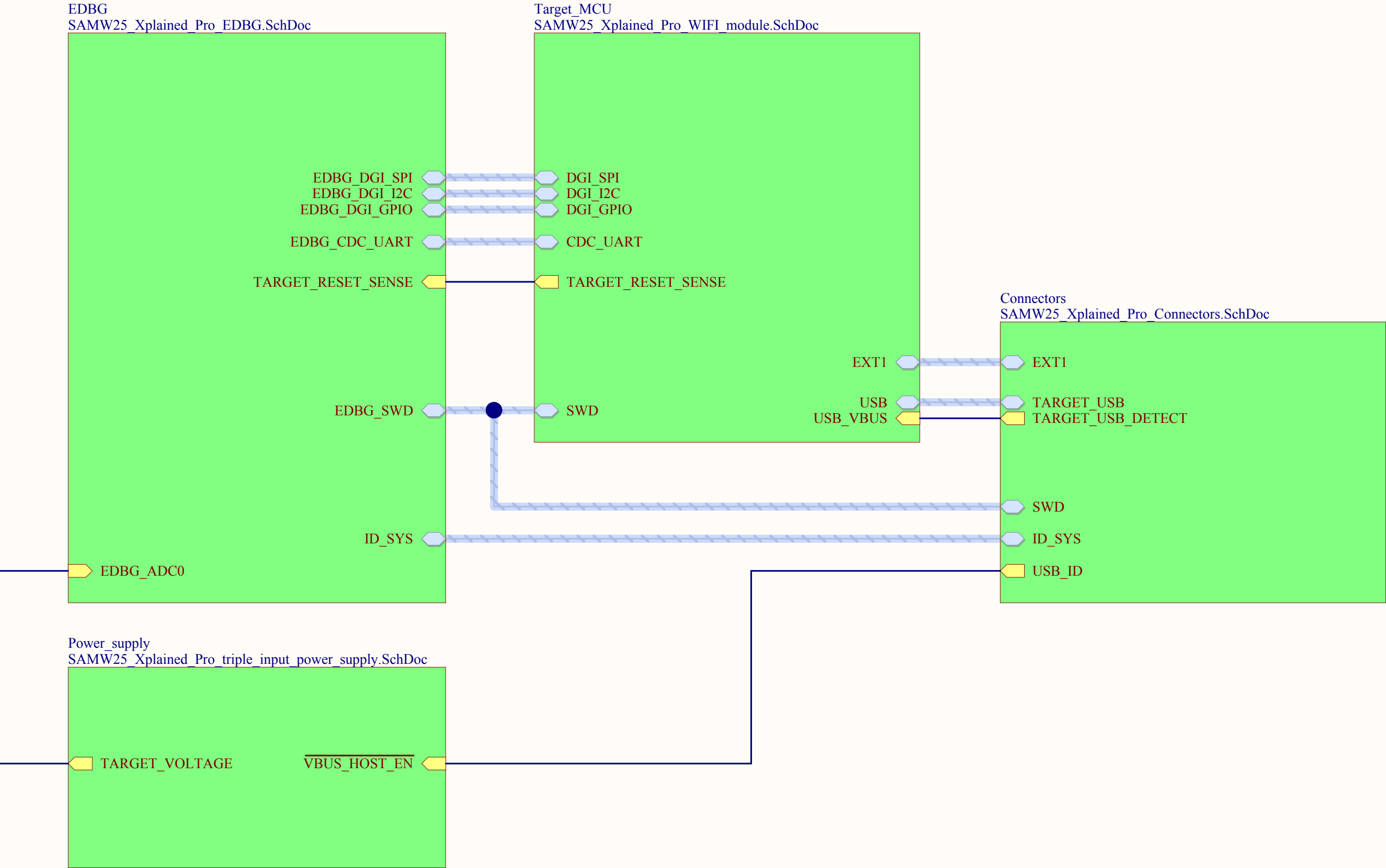
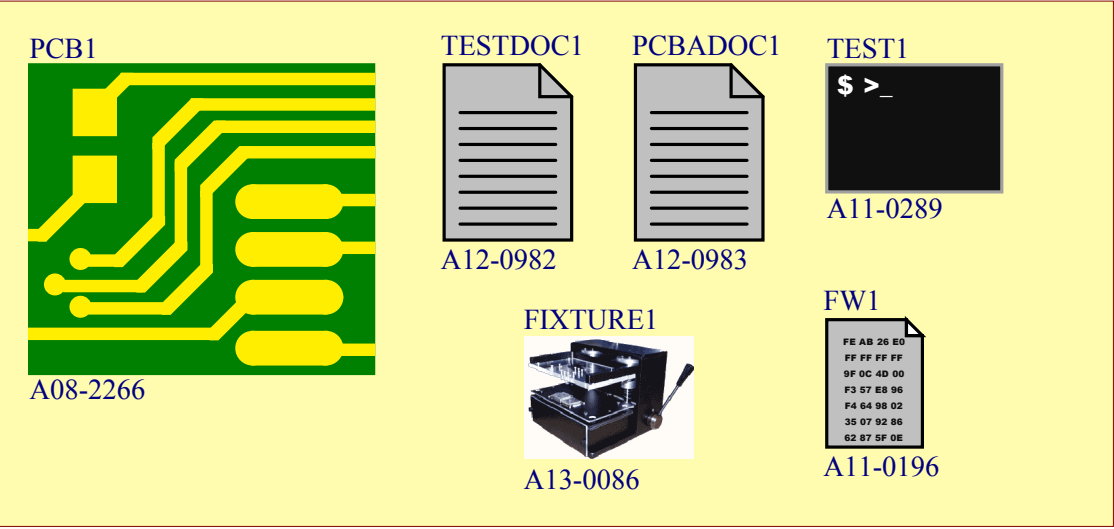
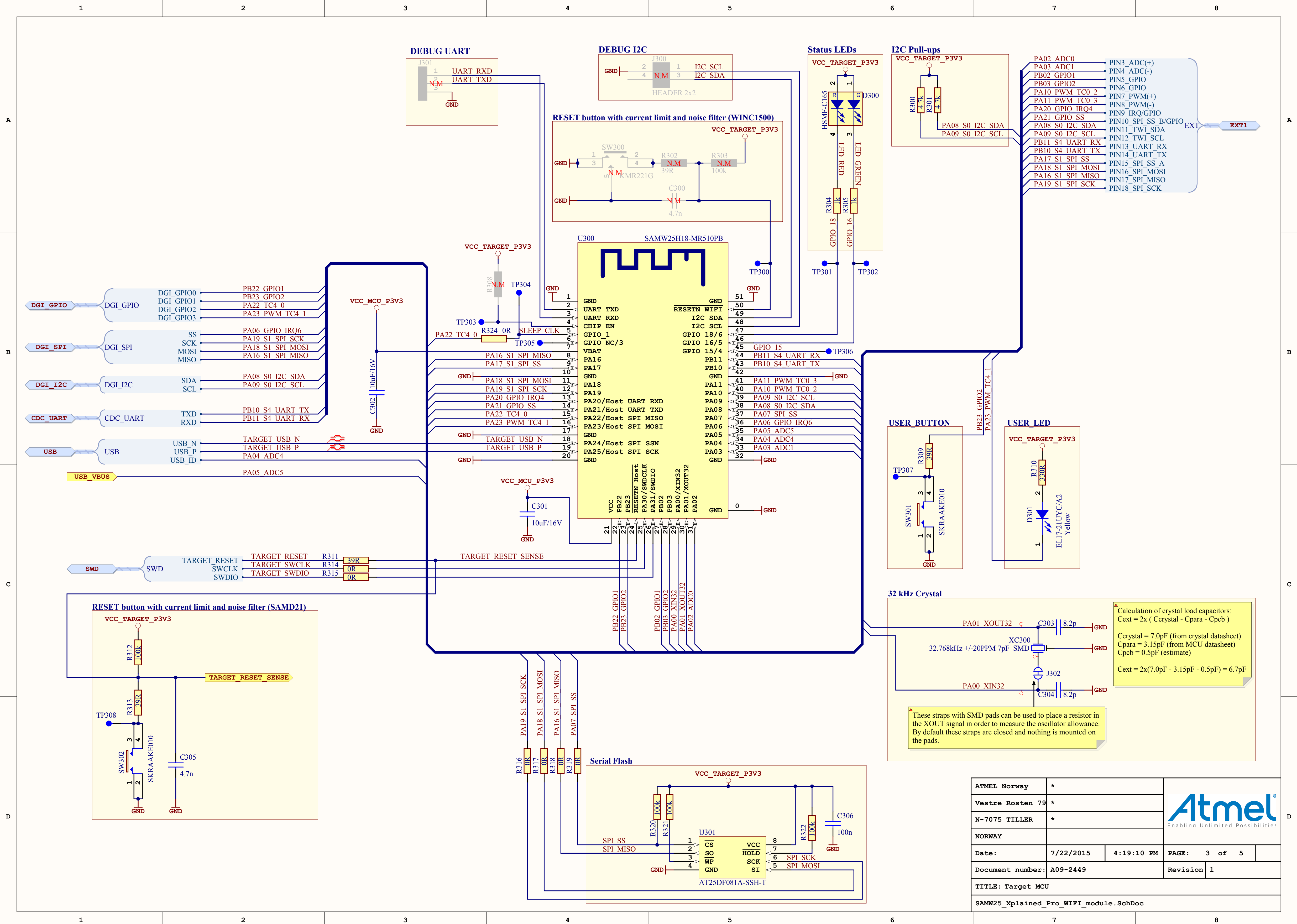




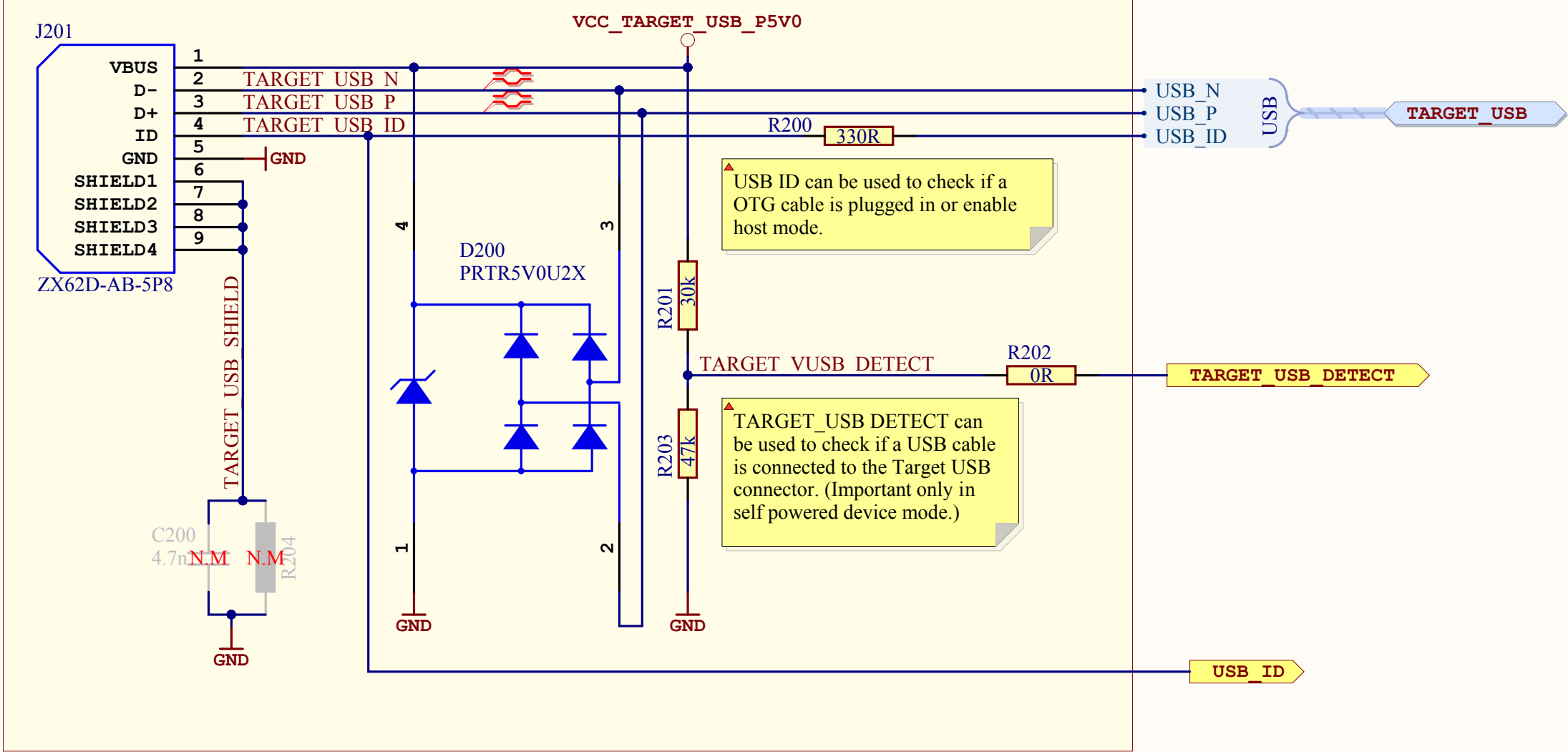
PCBA Label



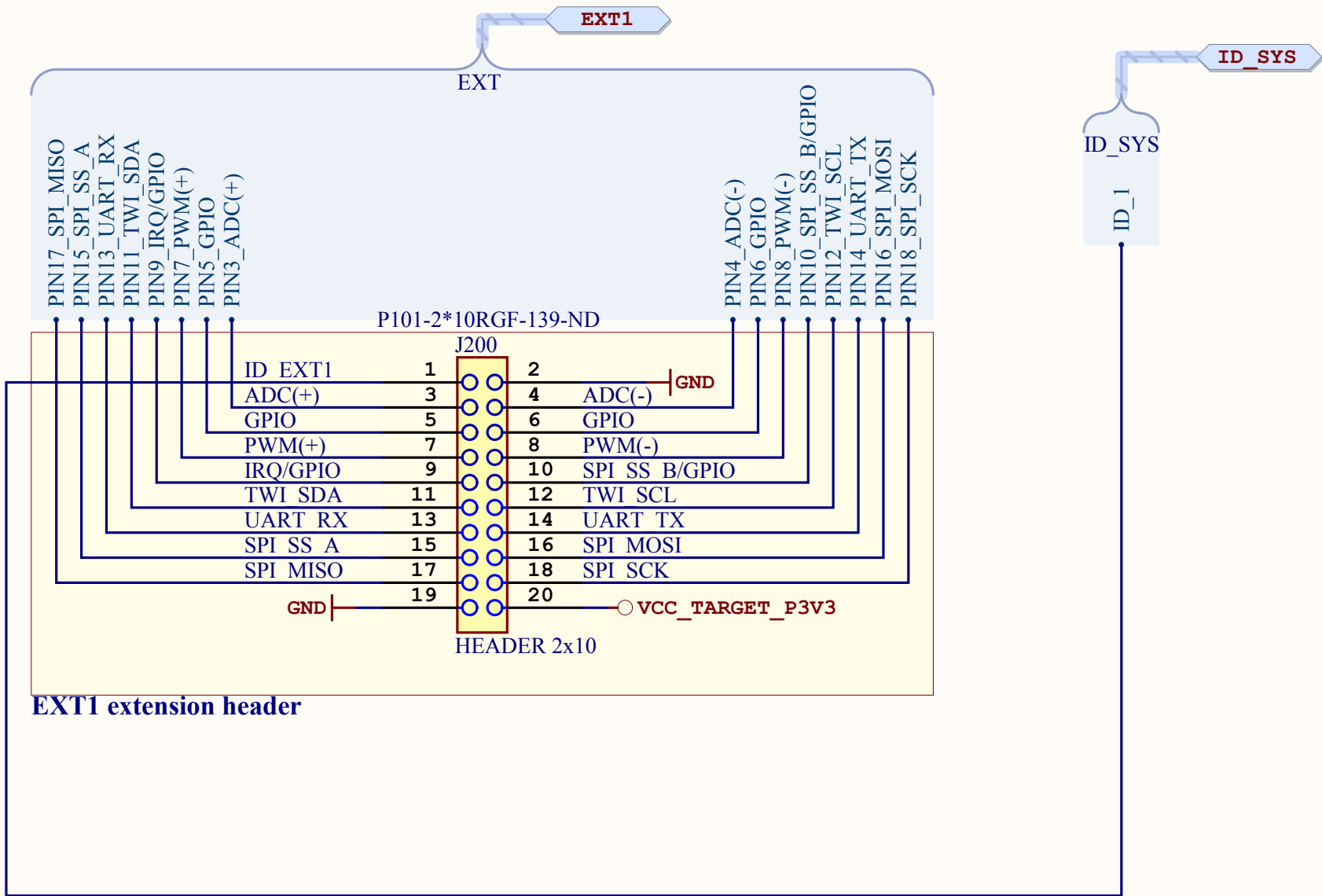
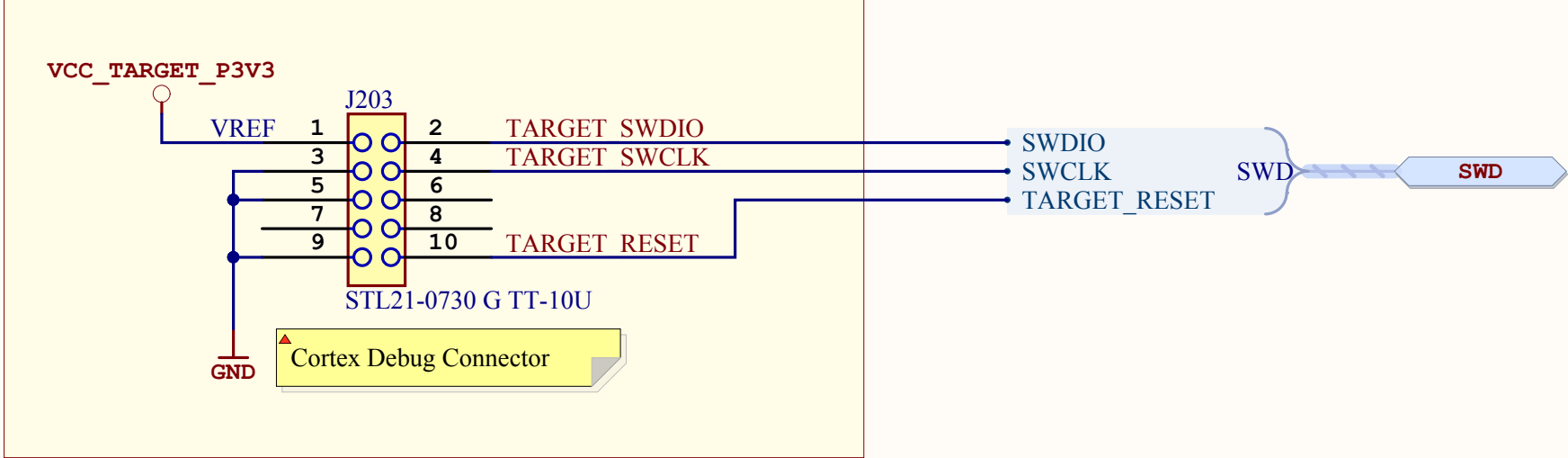
ATMEL Norway	*		 Enabling Unlimited Possibilities		
Vestre Rosten 79	*				
N-7075 TILLER	*				
NORWAY					
Date:	7/22/2015	4:19:09 PM	PAGE:	1 of 5	
Document number:	A09-2449		Revision	1	
TITLE: Top Level Schematics					
SAMW25_Xplained_Pro_TopLevel.SchDoc					

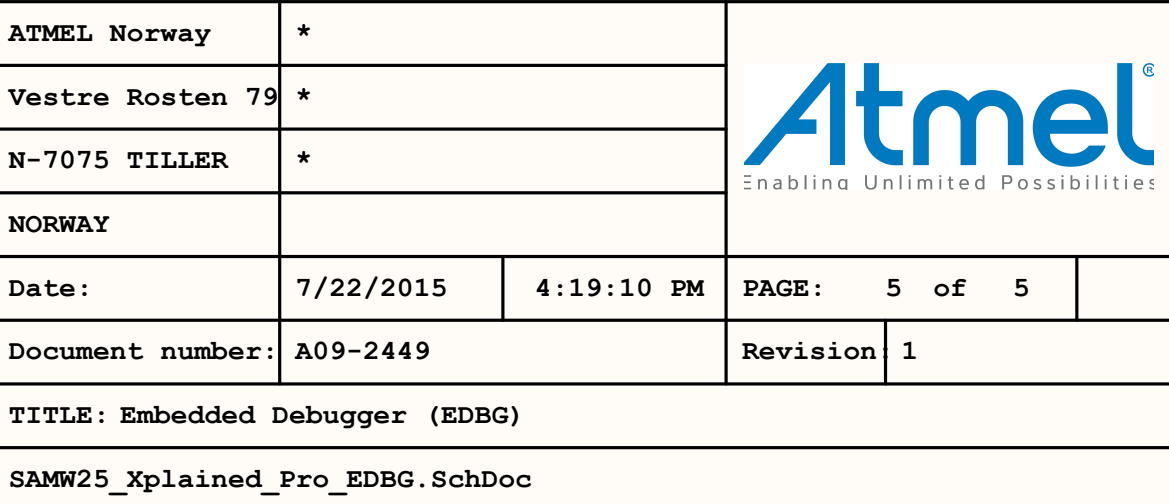


Target USB

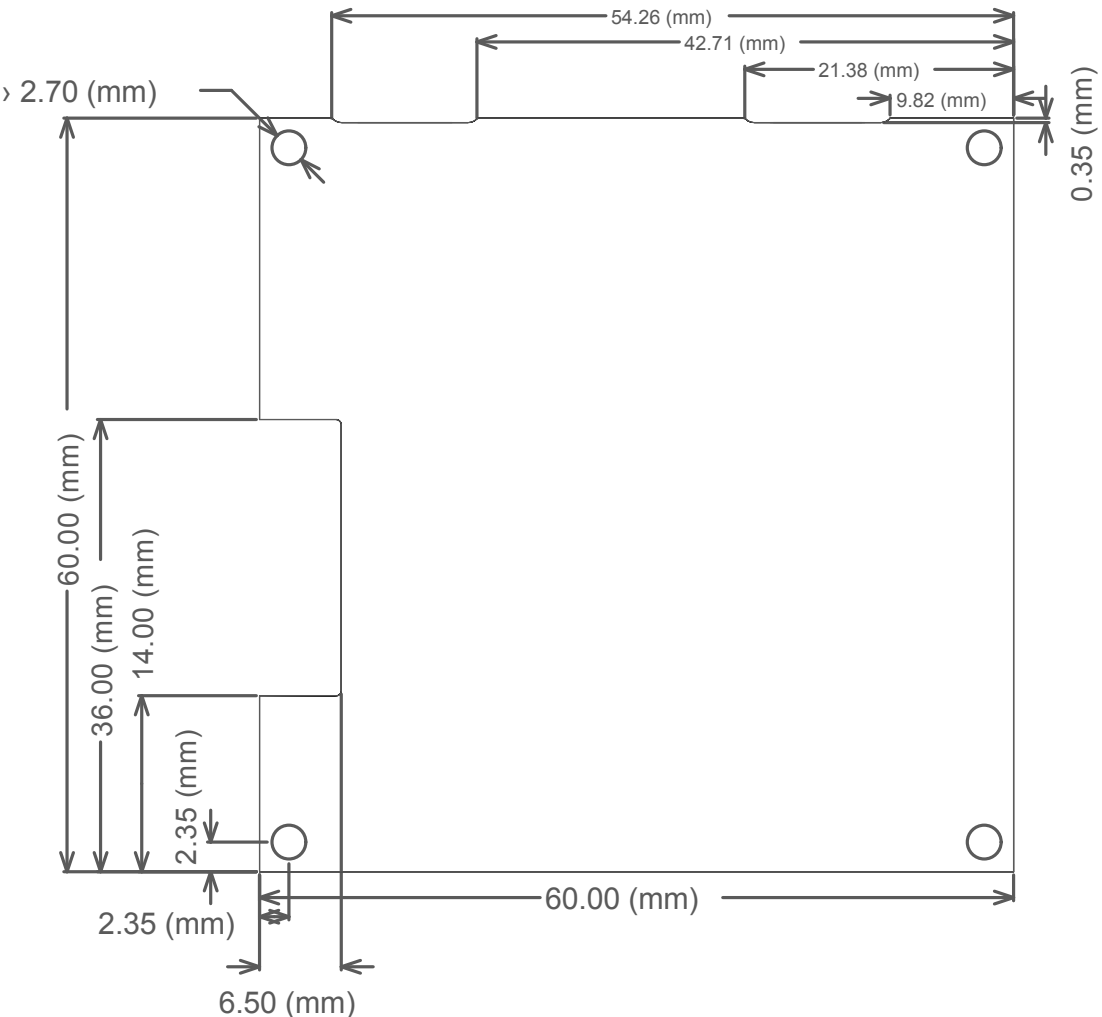


Target Debug Connector

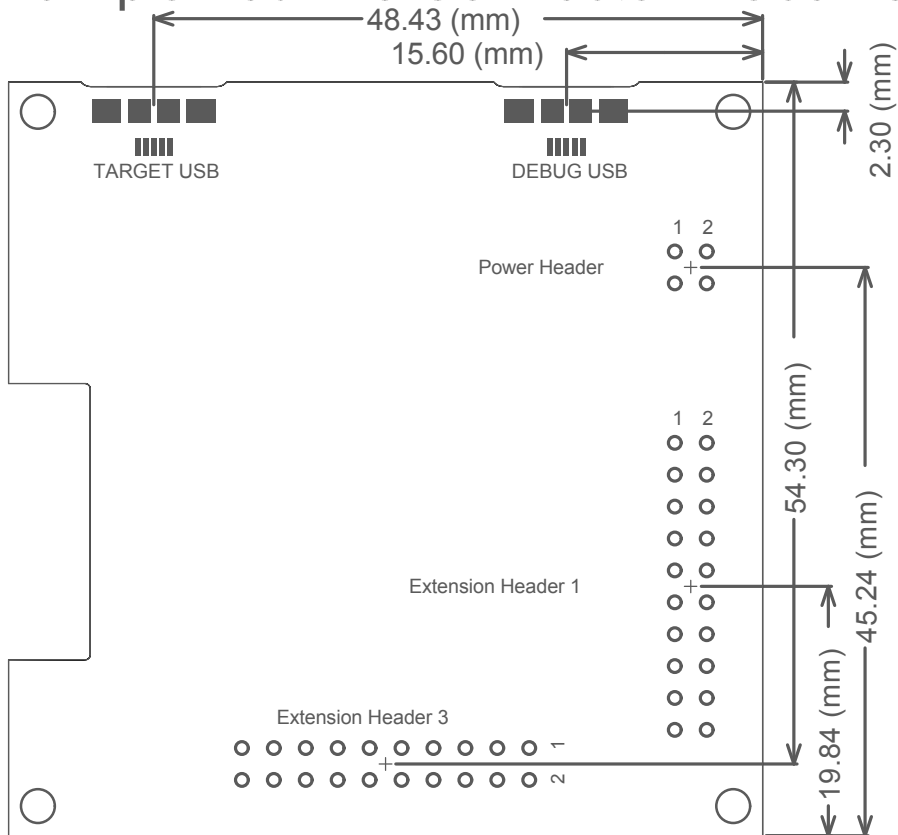


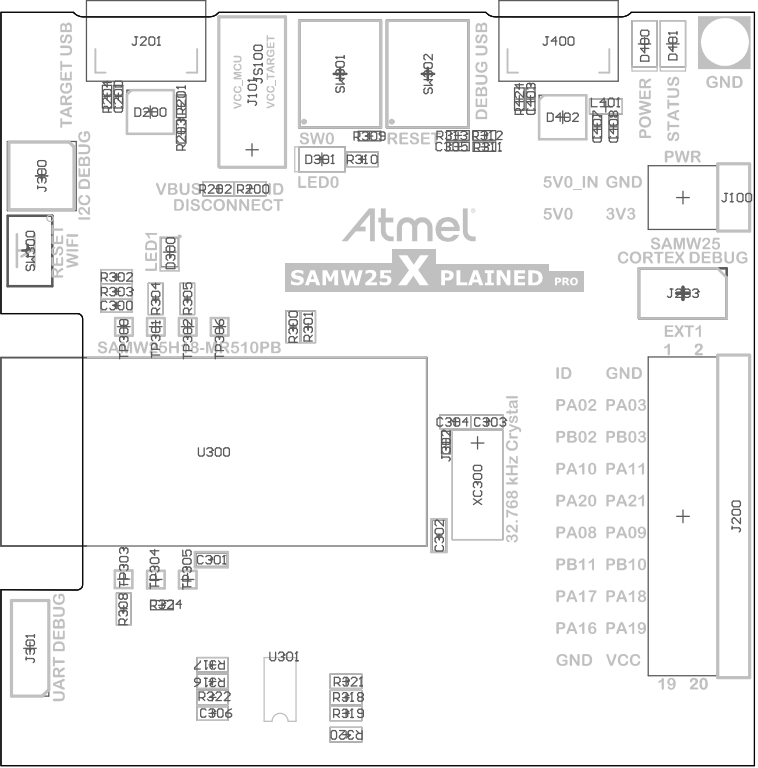


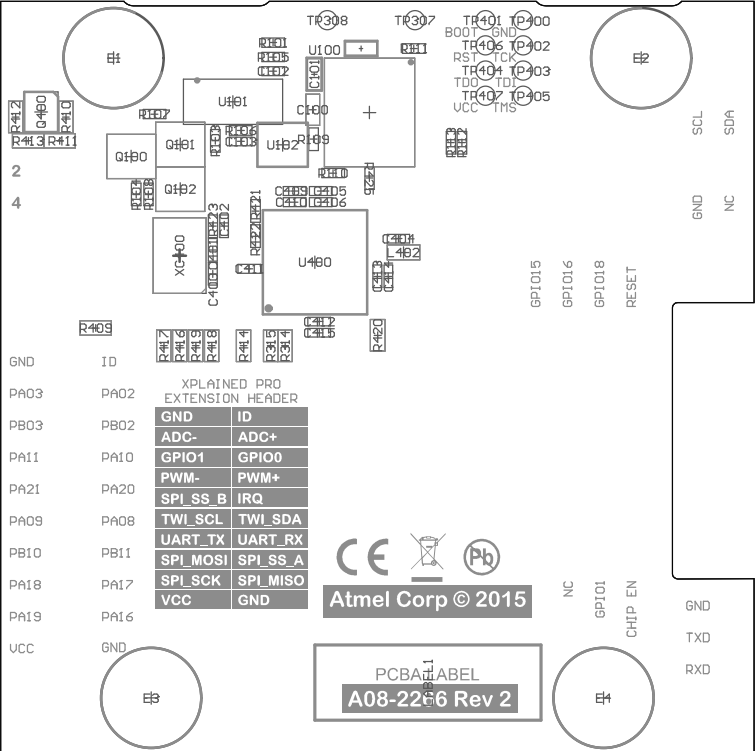
SAMW25 Xplained Pro Mechanical Dimensions

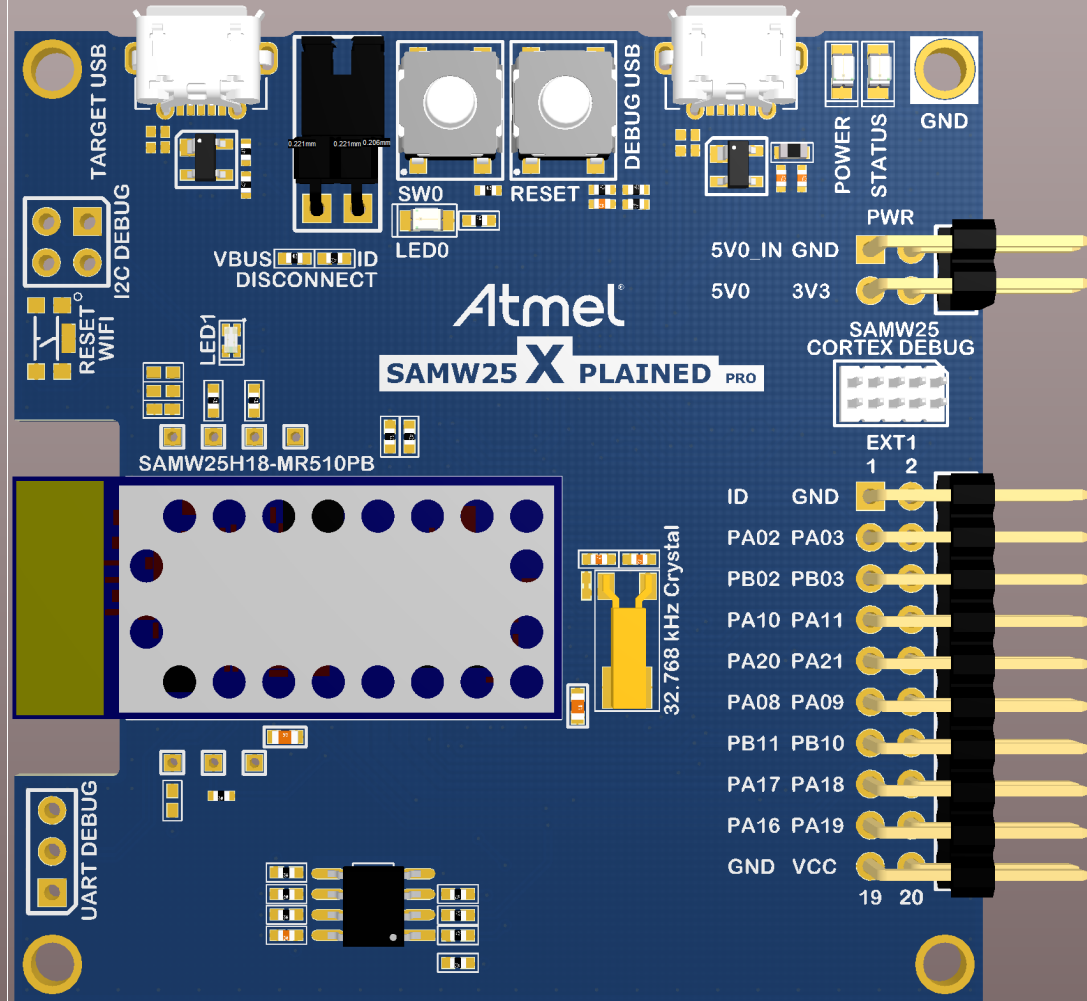


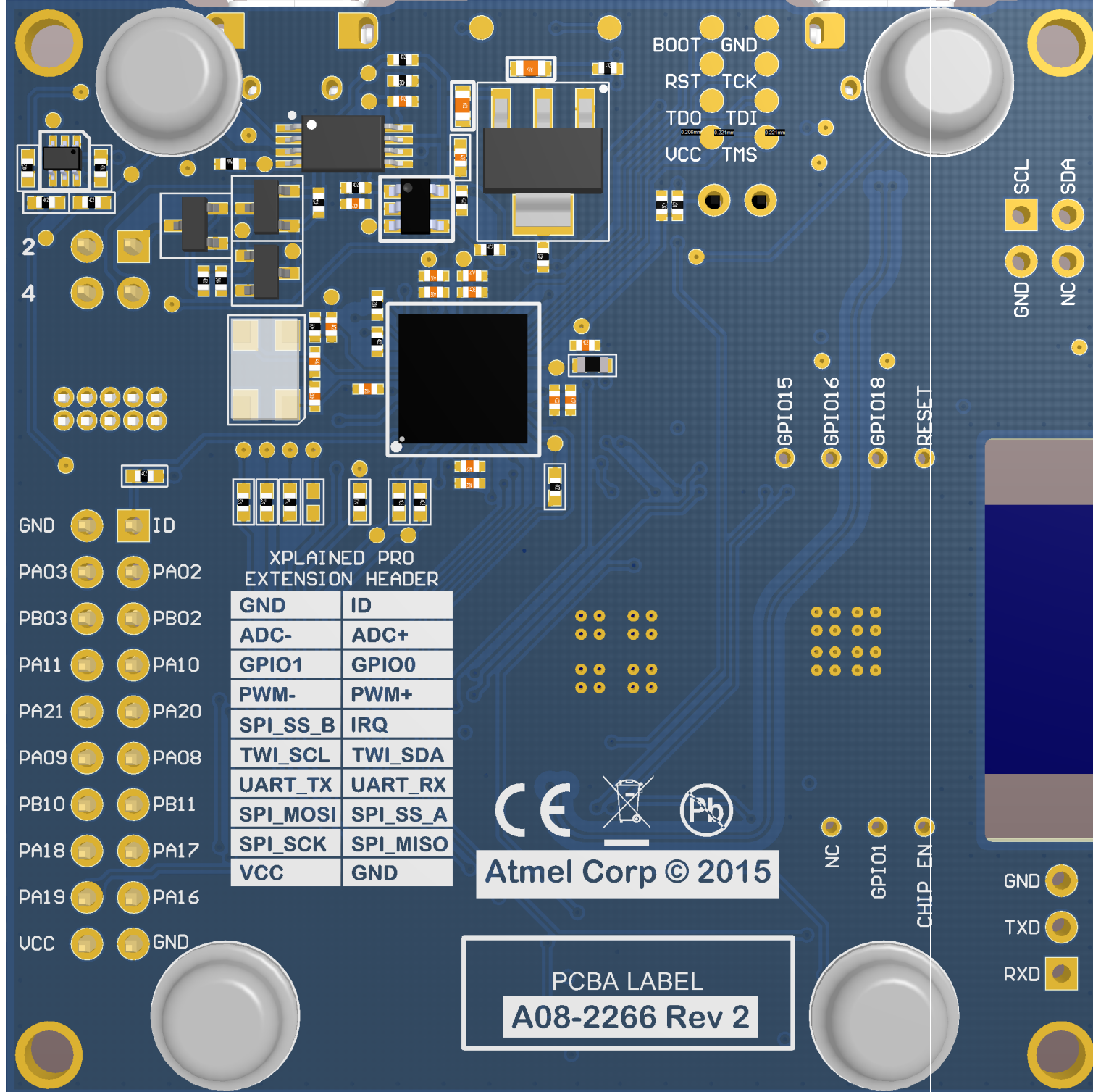
SAMW25 Xplained Pro Connector Placement









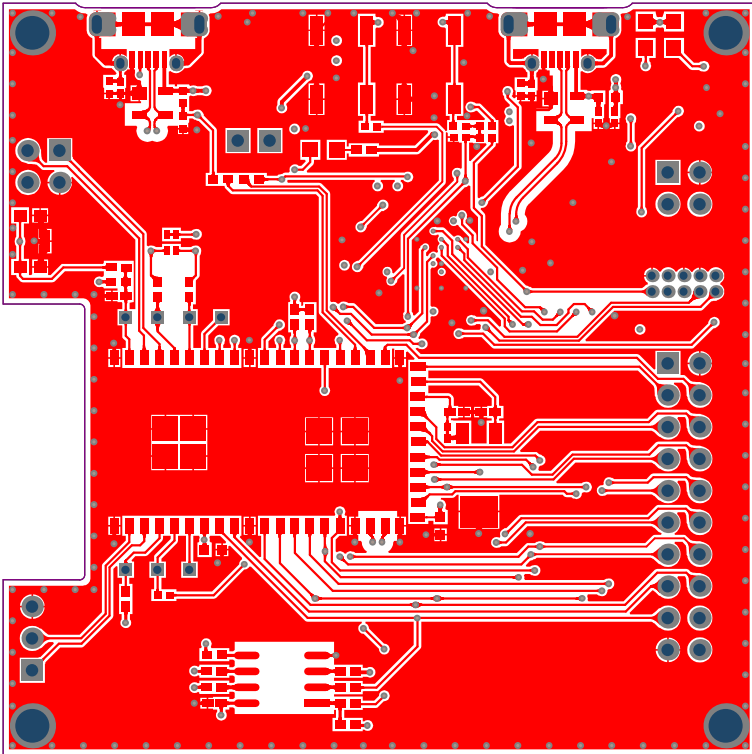


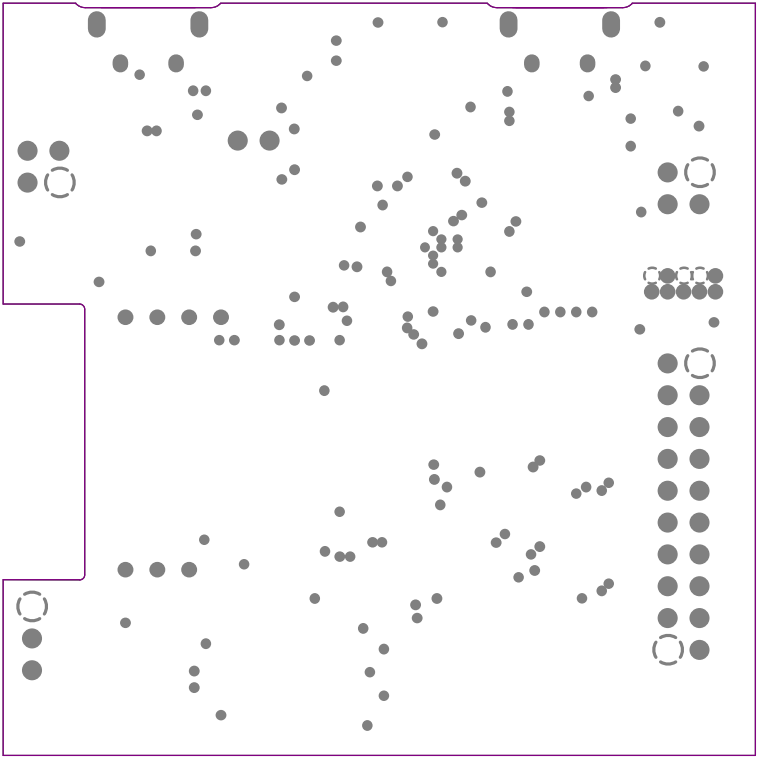
XPLAINED PRO
EXTENSION HEADER

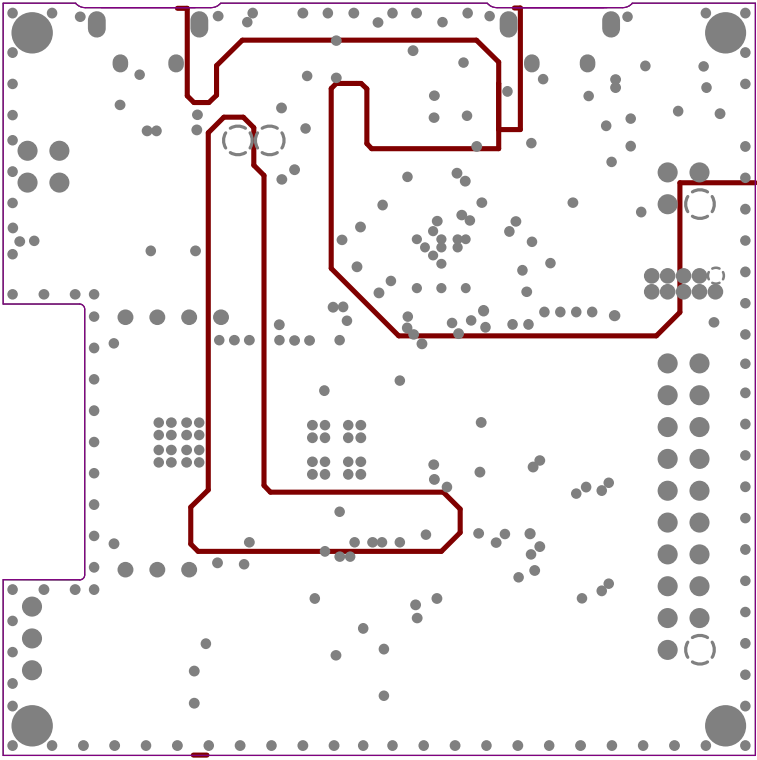
GND	ID
ADC-	ADC+
GPIO1	GPIO0
PWM-	PWM+
SPI_SS_B	IRQ
TWI_SCL	TWI_SDA
UART_TX	UART_RX
SPI_MOSI	SPI_SS_A
SPI_SCK	SPI_MISO
VCC	GND

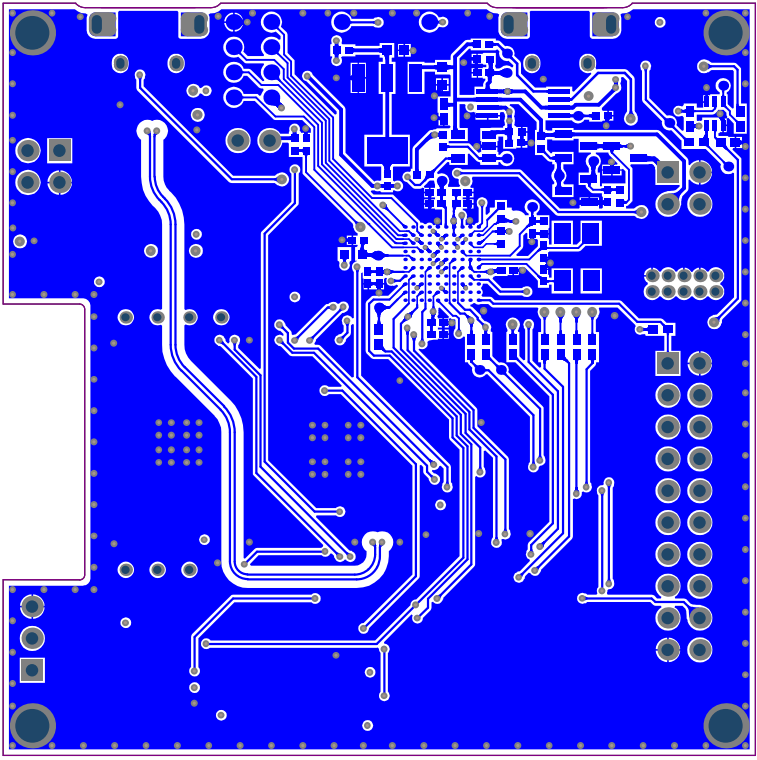
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PCBA LABEL
A08-2266 Rev 2









Component list

Top Level Schematics

Source Data From:	SAMW25_Xplained_Pro.PrjPCB
Project:	SAMW25_Xplained_Pro.PrjPCB
Variant:	Default_assembly



Report Date:	7/22/2015	4:19:32 PM
Print Date:	7/22/2015	4:19:28 PM

Fitted	Designator	Quantity	Value	Manufacturer	MPN	Description
Fitted	C100	1	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C101, C104	2	10uF	Taiyo Yuden	EMK107BBJ106MA-T	Ceramic capacitor, SMD 0603, X5R, 16V, 10UF ± 20% (High Density)
Fitted	C102, C103	2	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C301, C302	2	10uF/16V	Taiyo Yuden	EMK107BBJ106MA-T	Ceramic capacitor, SMD 0603, X5R, 16V, 10UF ± 20% (High Density)
Fitted	C303, C304	2	8.2p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C305	1	4.7n	NIC Components Corp.	NMC0402X7R472K25TRPF	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10 %
Fitted	C306	1	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C400, C401	2	22p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C402	1	10p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C404, C410, C411, C412, C413	5	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
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 C0G	Murata	GRM1555C1H102JA01D	Ceramic capacitor, SMD 0402, C0G, 50V, +/-5%
Fitted	D200, D402	2	PRTR5V0U2X	Philips	PRTR5V0U2X	Double rail-to-rail USB ESD protection diode
Fitted	D300	1	HSMF-C165	Avago Technologies	HSMF-C165	LED, Bicolor, Red/Green, Diffused, 1.6 x 0.8 mm (0603)
Fitted	D301, D401	2	EL17-21UYC/A2	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	ATMEL		EDBG secured firmw are
Fitted	J100	1	P101-2*02RGF-139-ND	Pro-data International Corp	P101-2*02RGF-139-ND	Pin header, 2x2, Right Angle, 2.54mm, TH1, Pin In Paste
Fitted	J101	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	1	P101-2*10RGF-139-ND		P101-2*10RGF-139-ND	Pin header, 2x10, Right Angle, 2.54mm, TH1, Pin In Paste
Fitted	J201, J400	2	ZX62D-AB-5P8			Micro USB AB Connector, Standard SMT + DIP
Fitted	J203	1	PIN HEADER 2x5	Garry	STL21-0730 G TT-10U	2x5 pin header, 1.27mm pitch, TH1
Fitted	JS100	1	SNT-100-BK-G	SAMTEC	SNT-100-BK-G	Jumper cap for 2.54mm pinheader
Fitted	L401, L402	2	BLM18PG471SN1	Murata	BLM18PG471SN1	SMD RF inductor 0603, Z=470Ohm (@100MHz), Max R(dc)=0.65Ohm, Max current=1A
Fitted	LABEL 1	1	PCBA Label	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	PCB1	1	SAM W25 Xplained Pro PCB documentation			SAM W25 Xplained Pro PCB documentation
Fitted	PCBADO C1	1	A09-2449 PCBA Files			SAM W25 Xplained Pro PCBA documentation
Fitted	Q100, Q101	2	IRLML6402PBF	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) = 3.8Ohm@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	R101, R105, R106	3	1M			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R103, R109, R110, R312	4	100k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R104	1	39k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R107	1	390R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R108, R112, R113, R203	4	47k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R111, R324, R425	3	0R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R200, R310, R411, R412, R414, R416, R417, R419, R420	9	330R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R201	1	30k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R202, R314, R315, R316, R317, R318, R319	7	0R		RMCF0402ZT0R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R300, R301	2	4.7k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R304, R305, R409	3	1k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R309, R311, R313, R421, R422	5	39R			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R320, R321, R322	3	100k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R410, R413	2	1M	KOA	RK73H1ETTP1004F	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R423	1	6.81k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	SW301, SW302	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 W25 Xplained Pro test			Fixture test for SAM W25 Xplained Pro
Fitted	TESTDOC1	1	SAM W25 Xplained Pro test Instructions			SAM W25 Xplained Pro test Instructions
Fitted	U100	1	TLV1117LV33DCY	Texas Instruments	TLV1117LV33DCYR	1-A, LDO (0.455V @ 1A), 3.3V out, 1.5% accuracy, 6.0V Vin max.
Fitted	U101	1	TPS2113PWR	Texas Instruments	TPS2113PWR	Autosw itching 2:1 Power Mux
Fitted	U102	1	STMP52161STR			Single channel pow er sw itch, 1A, reverse block, active low enabled.
Fitted	U300	1	SAMW25H18-MR510PB	ATMEL	ATSAMW25H18-MR510PB	IEEE 802.11 b/g/n module with onboard SAMD21G18A-MU and Crypto IC
Fitted	U301	1	AT25DF081A-SSH-T	Adesto Technologies	AT25DF081A-SSH-T	8Mbit SPI serial flash memory
Fitted	U400	1	AT32UC3A4256J-C1UR	ATMEL	AT32UC3A4256J-C1UR	AVR 32-bit RISC MCU
Fitted	XC300	1	32.768kHz +/-20PPM 7pF SMD	Micro Crystal	MS1V-T1K 32.768kHz 7pF +/-20PPM TA	32k768 crystal, +/-20ppm, CL=7pF, max ESR 60kOhm, SMD
Fitted	XC400	1	12.0MHz	Fox Electronics	FQ5032B-12-C-C-C-200-1	Fox FQ5032B 12.0MHz SMD crystal 738B-12
Not Fitted	C200, C403	0	4.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Not Fitted	C300	0	4.7n	NIC Components Corp.	NMC0402X7R472K25TRPF	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10 %
Not Fitted	J300	0	CD0750142X2	Freber	CD0750142X2	2x2 pin header, 2.54 mm pitch, Pin-in-Paste TH1
Not Fitted	J301	0	HMTSW-103-23-F-S-237	SAMTEC	HMTSW-103-23-F-S-237	1x3 pin header, 2.54mm pitch, Pin-in-Paste TH1, 1mm hole
Not Fitted	R204, R424	0	1M	KOA	RK73H1ETTP1004F	Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R302	0	39R			Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R303, R308	0	100k			Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R418	0	330R			Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	SW300	0	KMR221G	ITT cannon	KMR221G	Microminiature Tact Sw itch for SMT

115		
Approved	Notes	



SAM W25 Xplained Pro PCB Specification



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4	QUALITY OF SILKSCREEN LAYERS	5



1 General information

1.1 Board identification

Name: SAM W25 Xplained Pro
Board identification number: A08-2266

2 PCB specification

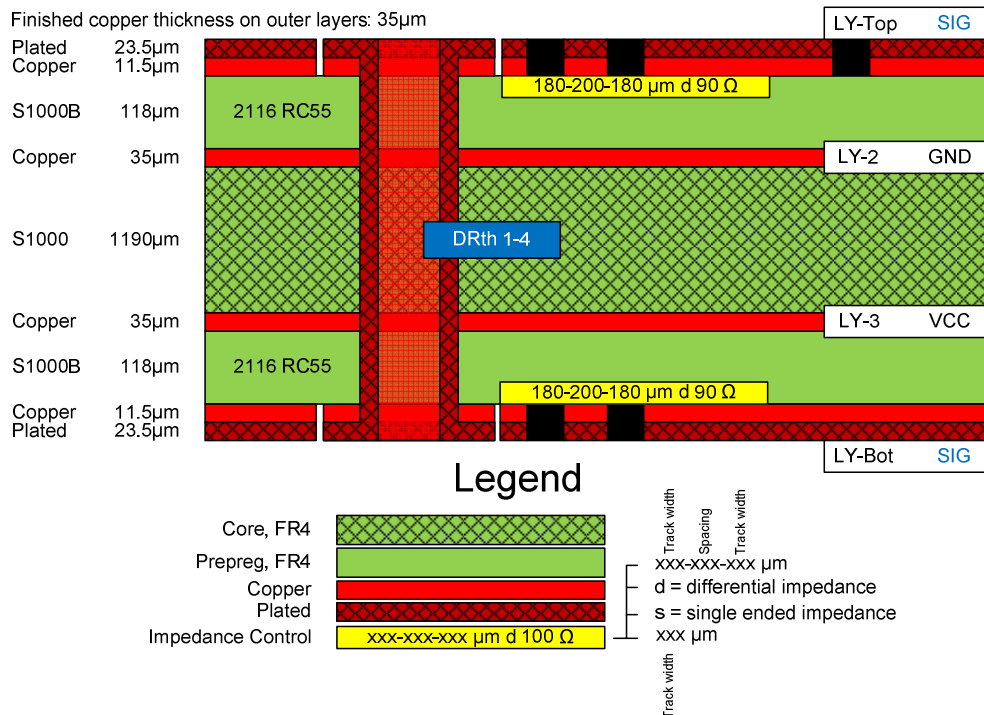
2.1 Manufacturing data

- Size: 60mm x 60mm
- PCB material: S1000, 1.6mm thickness
- Layers: 4
- Finish: ENIG
- Minimum via hole size: 0.2 mm
- Minimum via pad size: 0.4 mm
- Minimum track width: 0.125 mm (4.9mil)
- Minimum spacing: 0.12 mm (4.6mil)
- Solder mask color: Dark BLUE
- Silk-screen color: White

2.2 Layer stack-up

Figure 2-1 shows the detailed layer stack-up for this PCB.

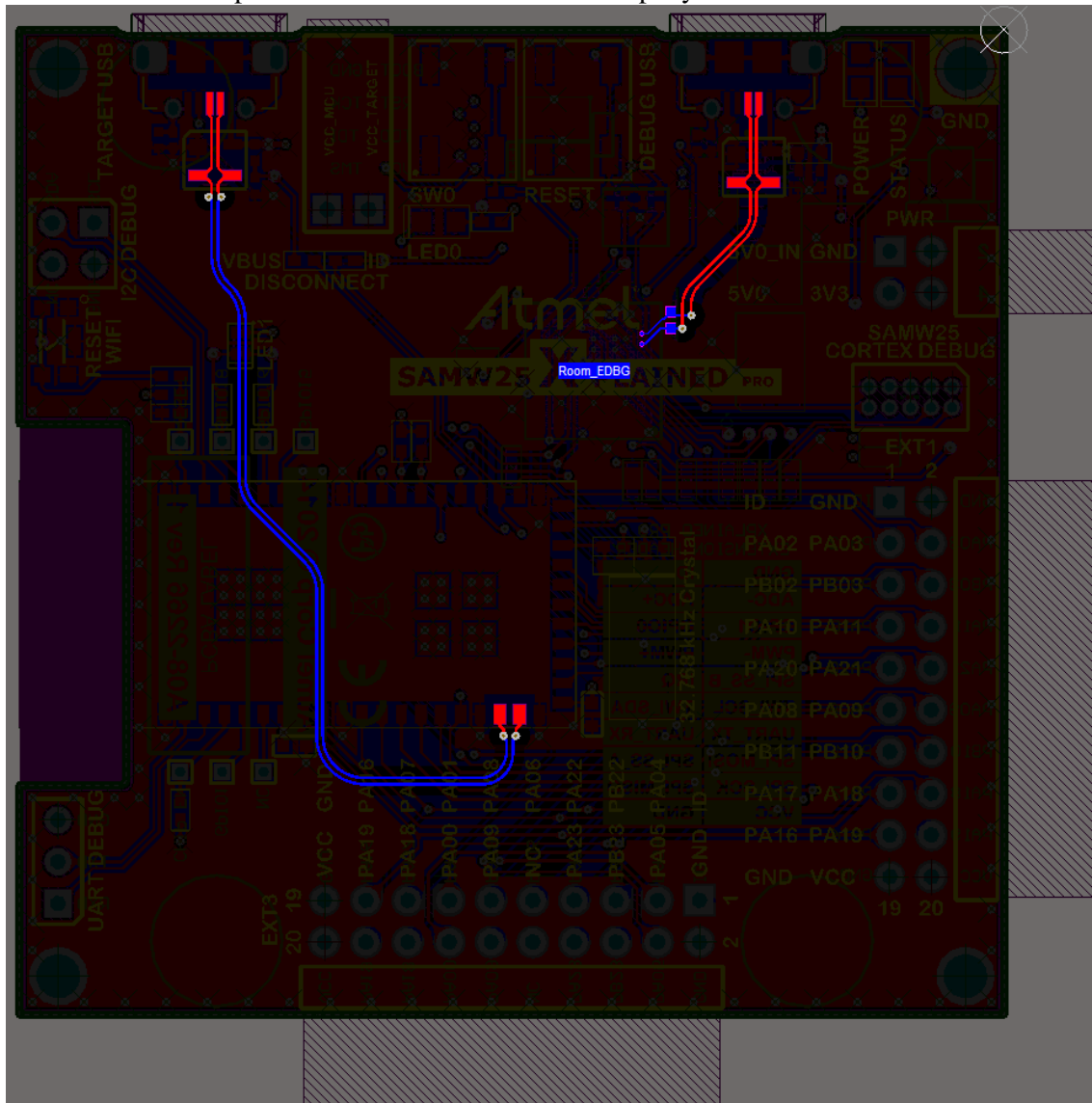
Figure 2-1 Detailed layer stack-up





2.3 Controlled Impedance

This board required three different controlled impedances.
90 Ω differential impedance for USB on bottom and top layer.





2.4 Gerber files

Table 2-1 Layer stack up corresponding Gerber files (listed from top to bottom)

File name	Description
SAMW25_Xplained_Pro.GTP	Gerber file for top paste-mask
SAMW25_Xplained_Pro.GTO	Gerber file for top overlay (silkscreen)
SAMW25_Xplained_Pro.GTS	Gerber file for top solder-mask
SAMW25_Xplained_Pro.GTL	Gerber file for top layer
SAMW25_Xplained_Pro.GP1	Gerber file for internal plane layer 1 (GND layer)
SAMW25_Xplained_Pro.GP2	Gerber file for internal plane layer 2 (power layer)
SAMW25_Xplained_Pro.GBL	Gerber file for bottom signal layer
SAMW25_Xplained_Pro.GBS	Gerber file for bottom solder-mask
SAMW25_Xplained_Pro.GBO	Gerber file for bottom overlay (silkscreen)
SAMW25_Xplained_Pro.GBP	Gerber file for bottom paste-mask
SAMW25_Xplained_Pro.GM1	Gerber file for mechanical 1 layer (board outline)
SAMW25_Xplained_Pro.DRR	Drill file report
SAMW25_Xplained_Pro.TXT	Drill file

2.5 Special via considerations

All vias are covered with solder mask on the top side of the board. On the bottom side vias that are used as test points have openings in the solder mask.

3 Panelizing

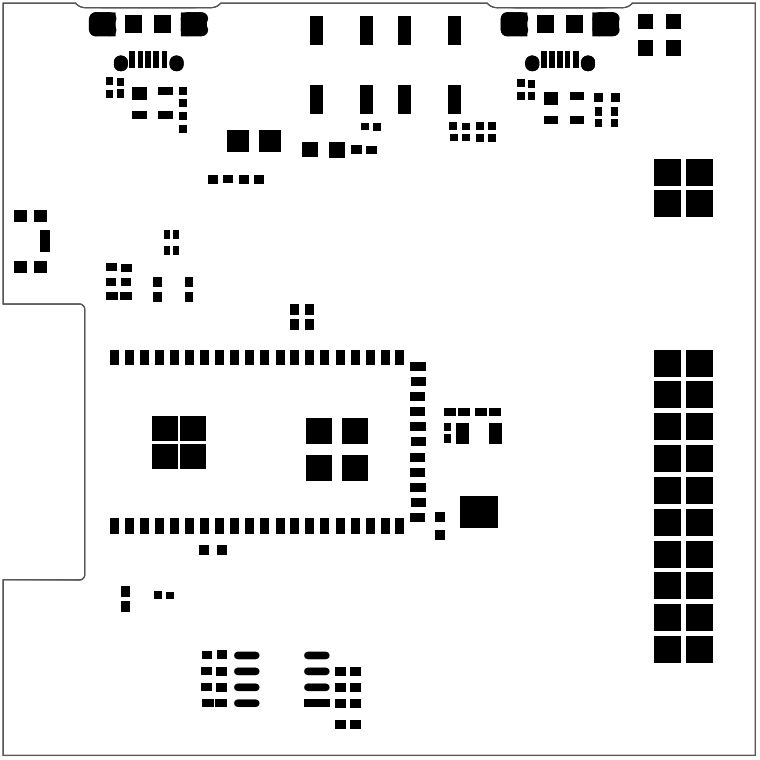
When making panels for this board the following issues should be considered.

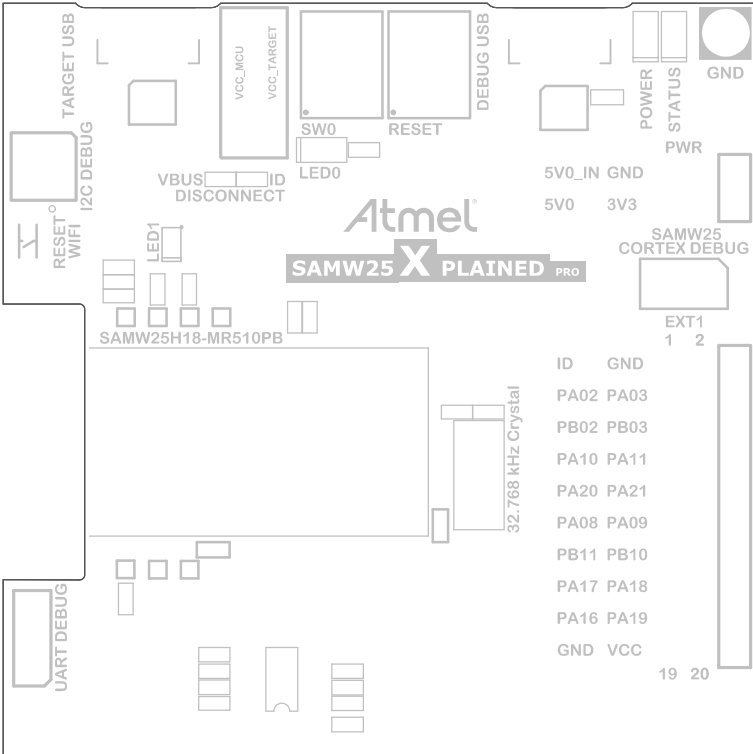
- Fiducial marks should be placed on the panel.

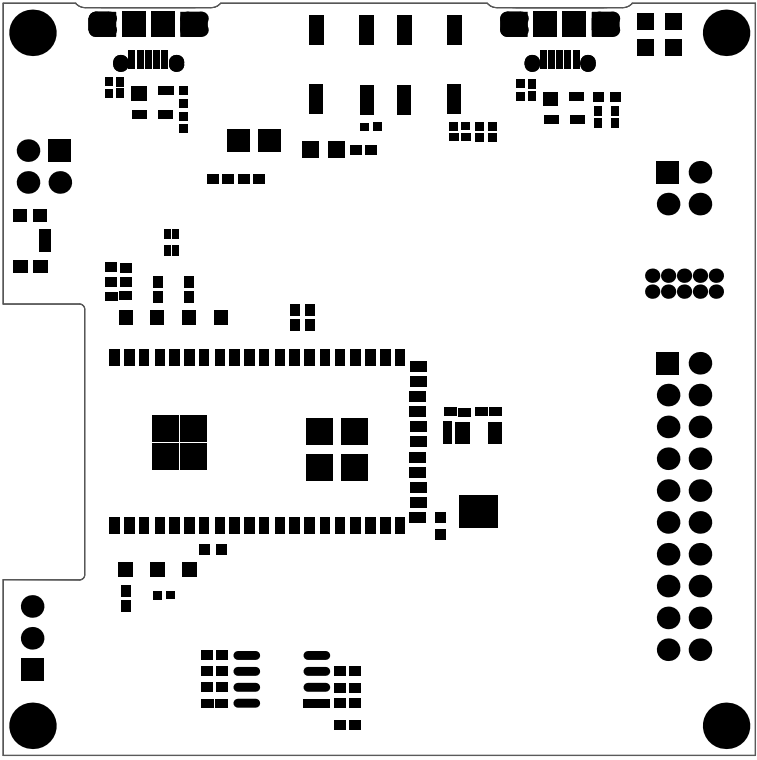
4 Quality of silkscreen layers

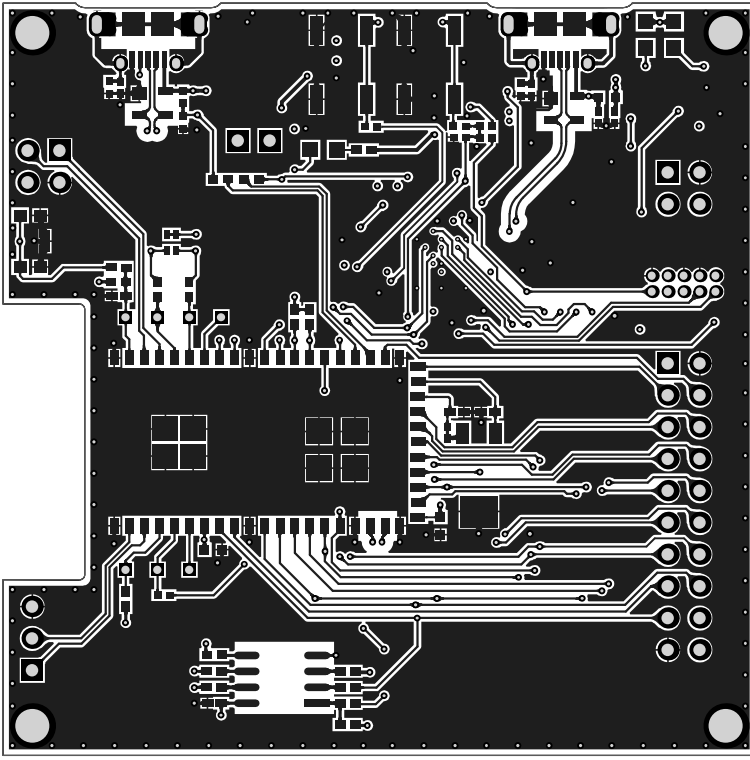
The silkscreen layers for the PCB must be of high quality for several reasons:

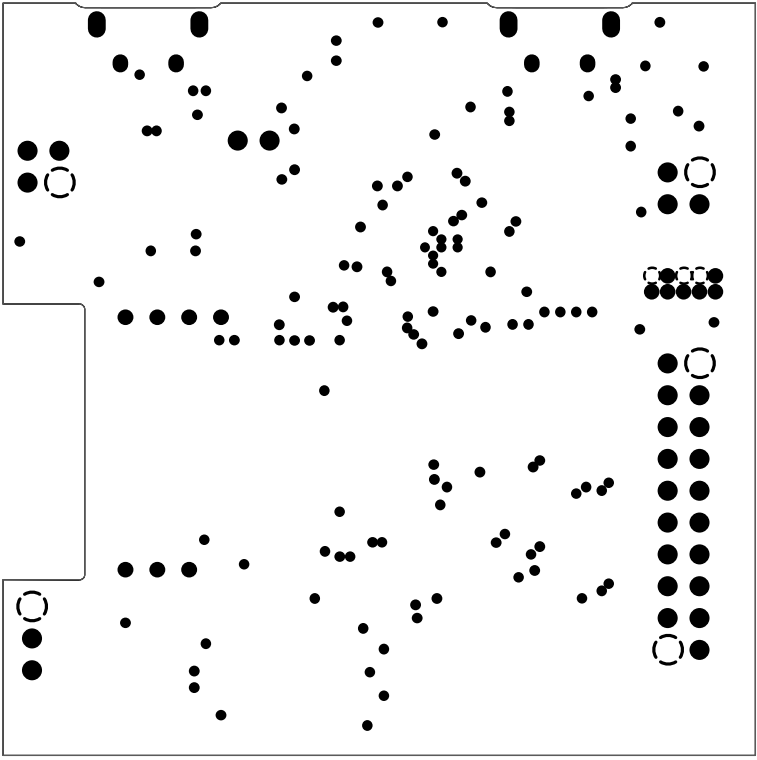
- Very small text is used
- Text is close to pads and therefore the mask must be centered properly on the board
- The PCB is used for development boards and therefore the silkscreen is an essential part of the overall product quality.

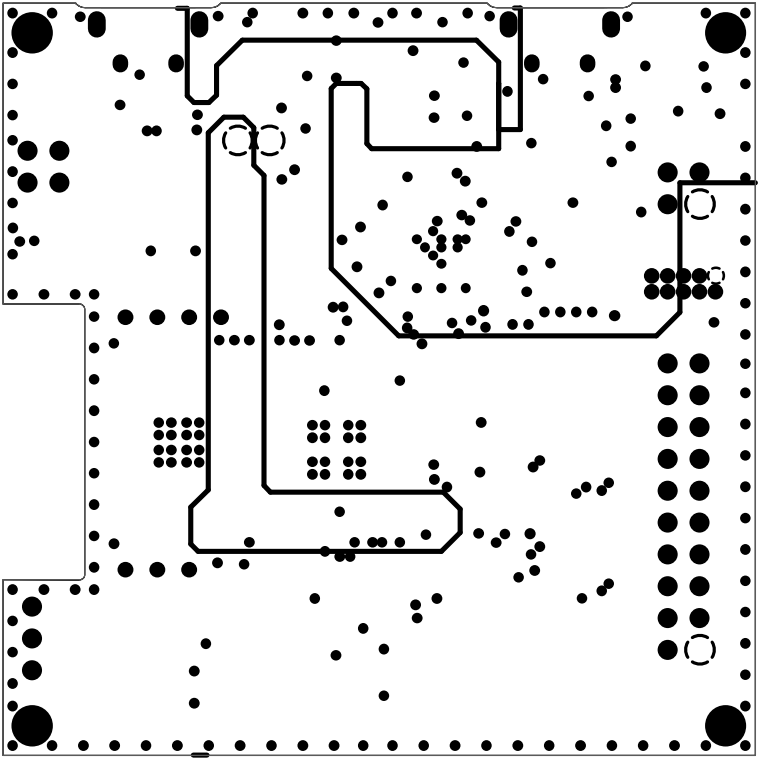


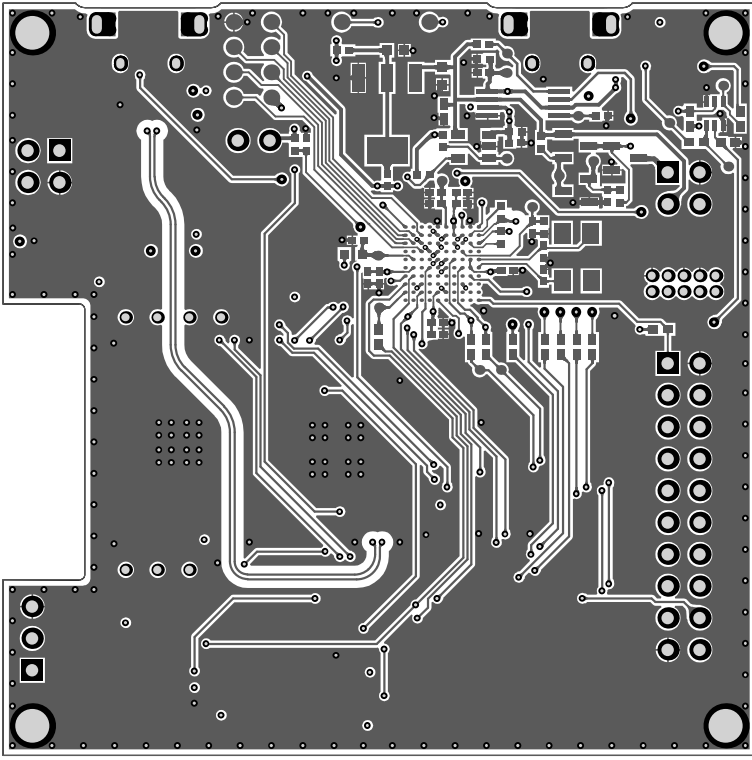


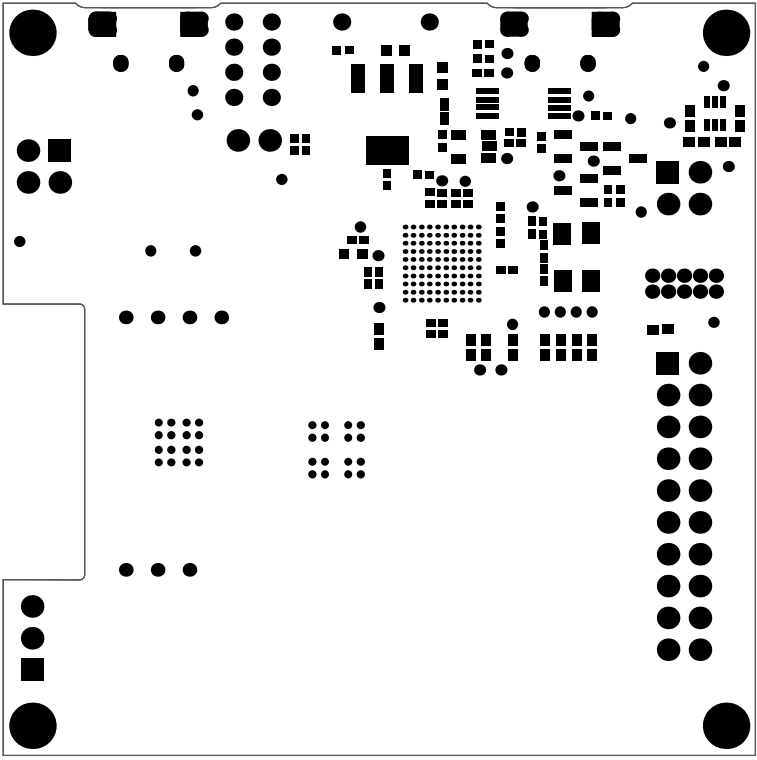












A08-2266 Rev 2
PCBA LABEL

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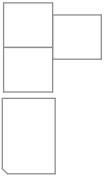


VCC	GND
PA17	SPI_SCK
PB11	SPI_MISO
PA18	SPI_MOSI
PB10	SPI_SS_A
PA08	UART_RX
PA09	UART_TX
PA20	TWI_SCL
PA21	TWI_SDA
PA25	SPI_SS_B
PA20	IRQ
PA20	PWM-
PA10	PWM+
PA10	GP101
PB03	ADC-
PA03	ADC+
PA02	ID
PA02	GND

EXTENSION HEADER
XPLAINED PRO

VCC
GND
PA16
PA18
PA17
PB11
PA08
PA09
PA20
PA21
PA10
PB03
PA03
GND

4
2



VCC TMS
TDO TDI
RST TCK
BOOT GND

PA1019A
PA1019A
PA1019A
RESET

GND
IC
2C2
2D2

RXD
TXD
GND

IC
PA1019A
CHIP EN

