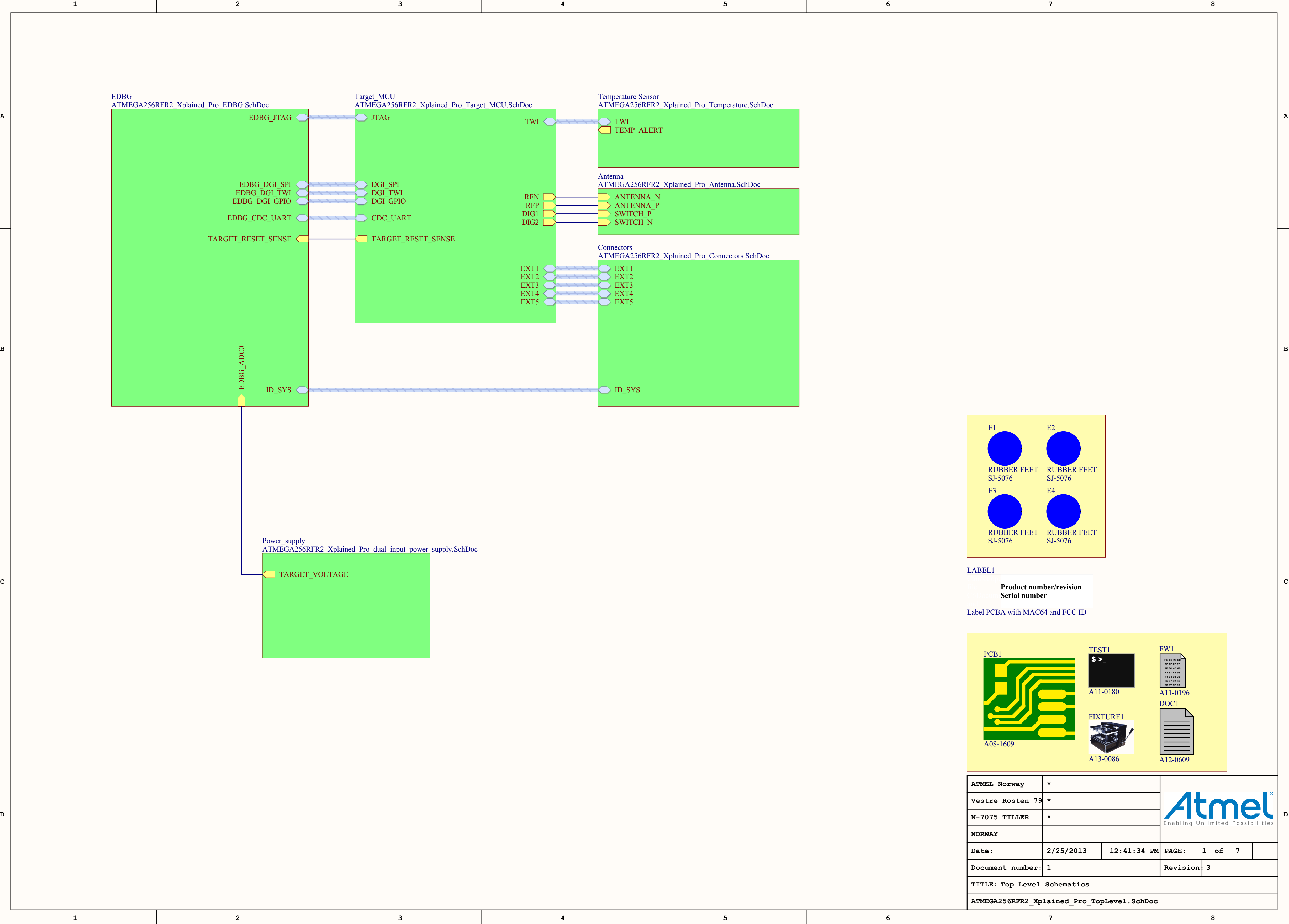
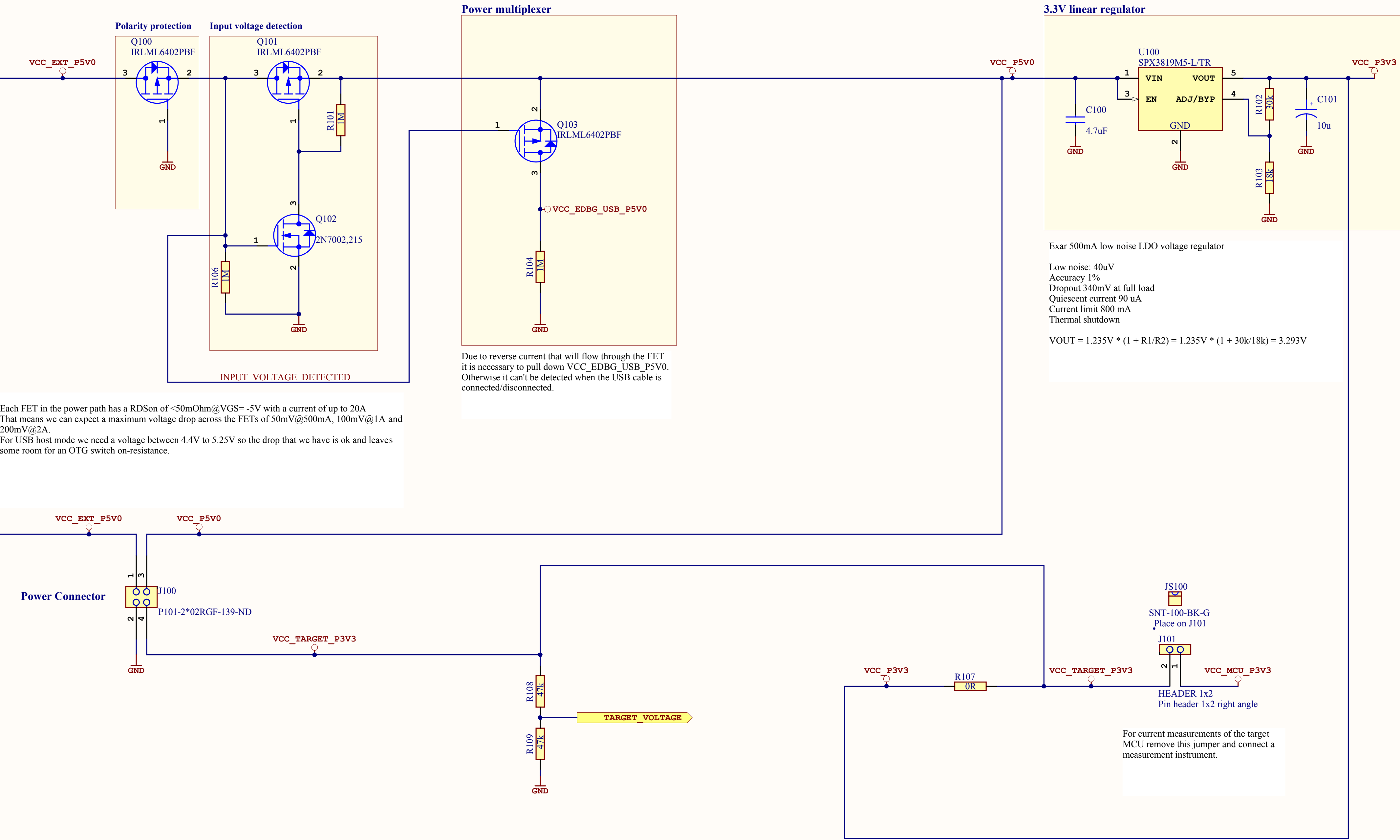






Each FET in the power path has a R_{DSon} of $<50m\Omega$ at $V_{GS} = -5V$ with a current of up to 20A. That means we can expect a maximum voltage drop across the FETs of 50mV@500mA, 100mV@1A and 200mV@2A. For USB host mode we need a voltage between 4.4V to 5.25V so the drop that we have is ok and leaves some room for an OTG switch on-resistance.

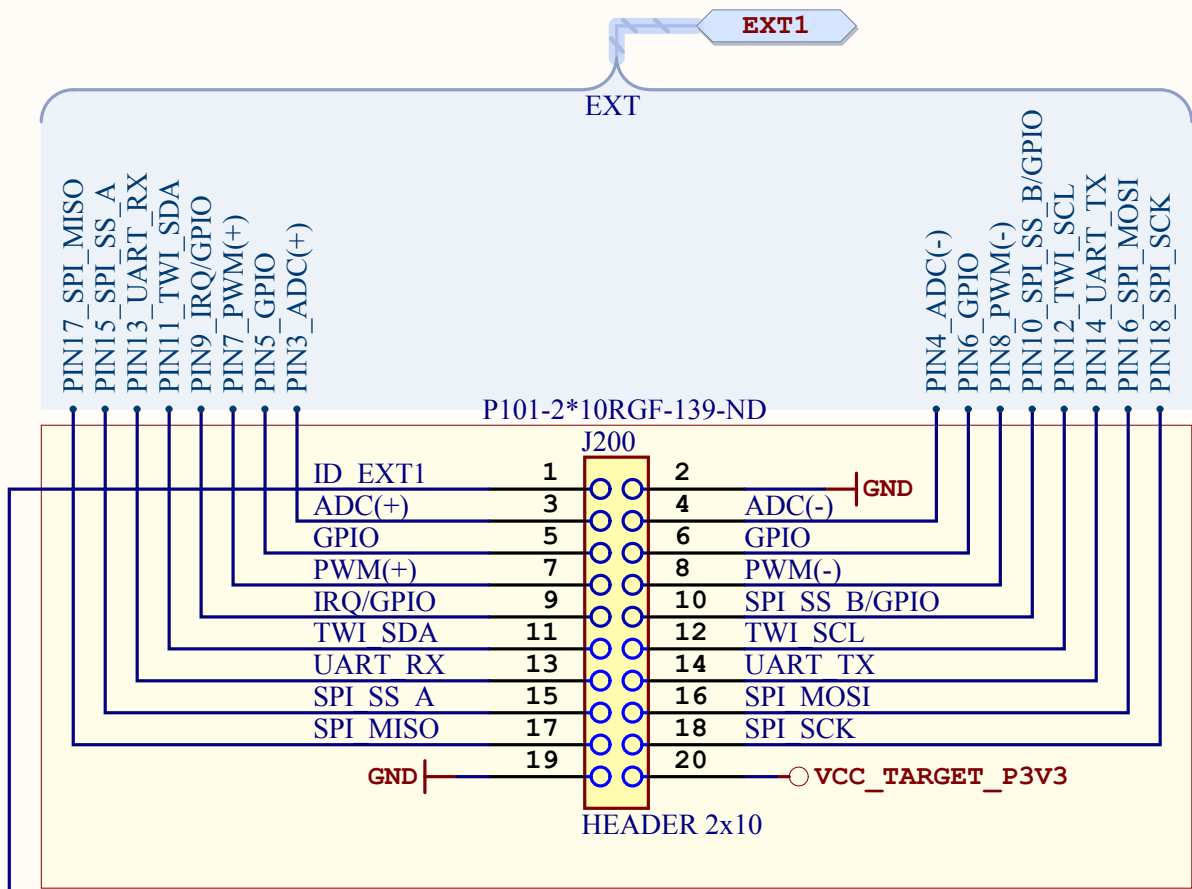
Due to reverse current that will flow through the FET it is necessary to pull down $VCC_EDBG_USB_P5V0$. Otherwise it can't be detected when the USB cable is connected/disconnected.

Exar 500mA low noise LDO voltage regulator

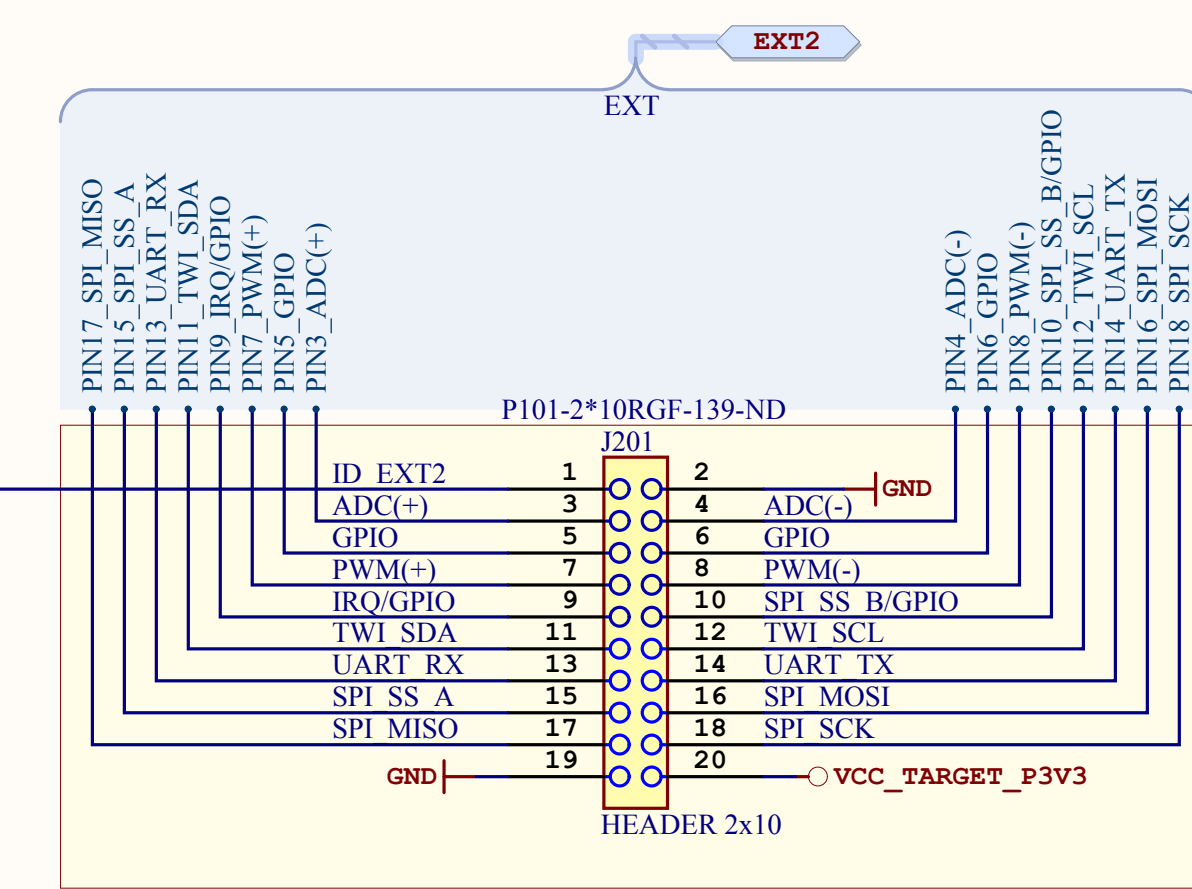
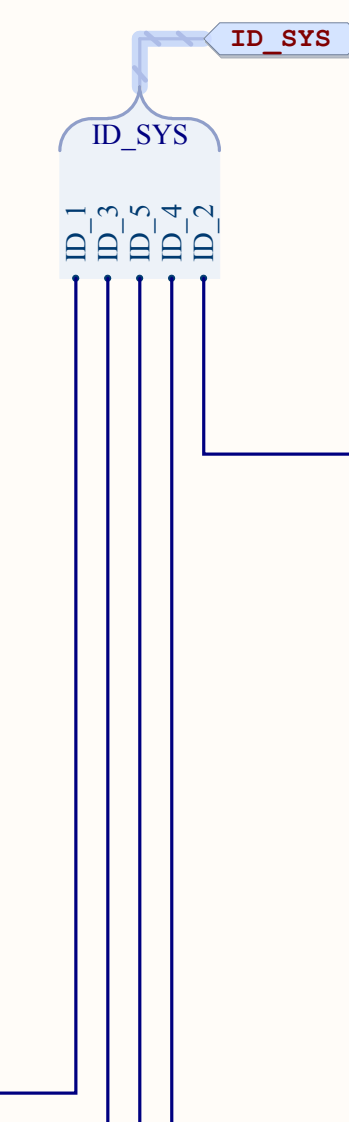
Low noise: 40uV
Accuracy 1%
Dropout 340mV at full load
Quiescent current 90 uA
Current limit 800 mA
Thermal shutdown

$VOUT = 1.235V * (1 + R1/R2) = 1.235V * (1 + 30k/18k) = 3.293V$

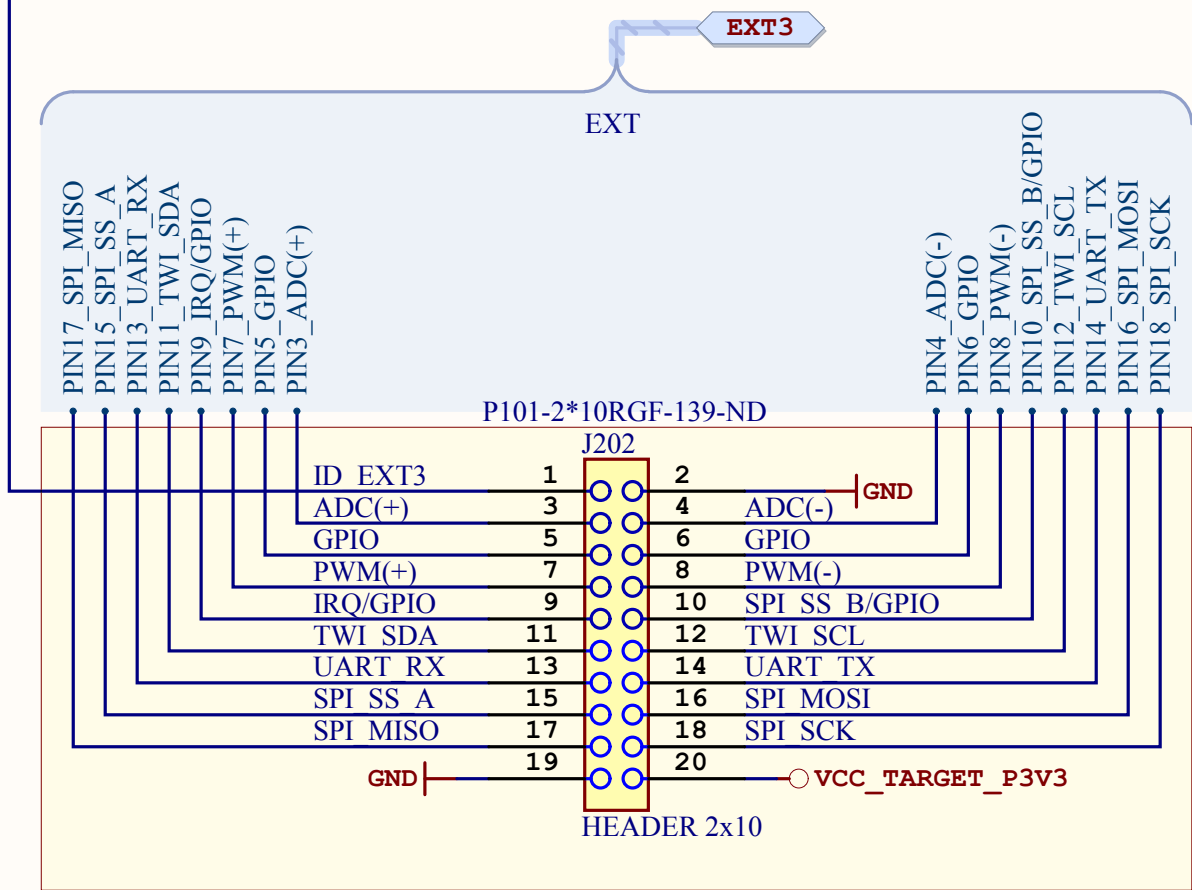
For current measurements of the target MCU remove this jumper and connect a measurement instrument.



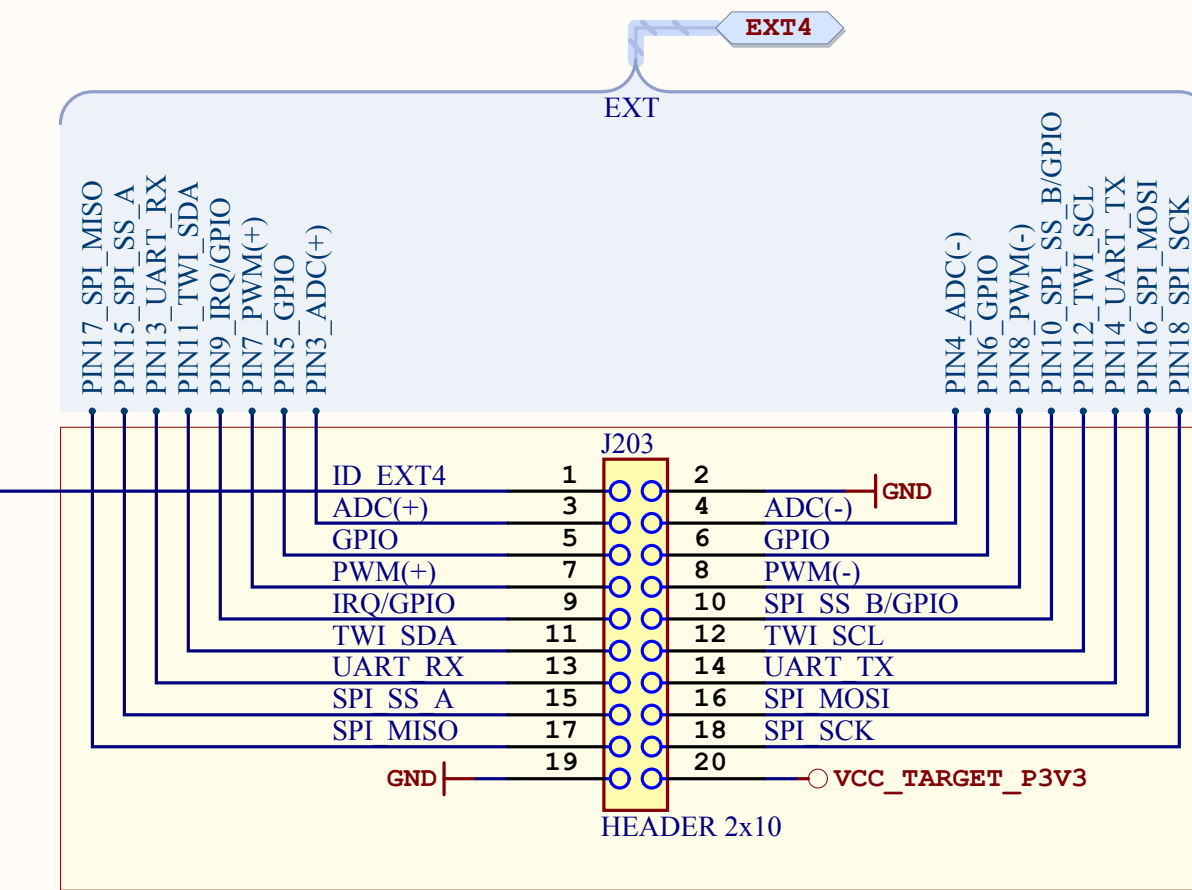
EXT1 extension header



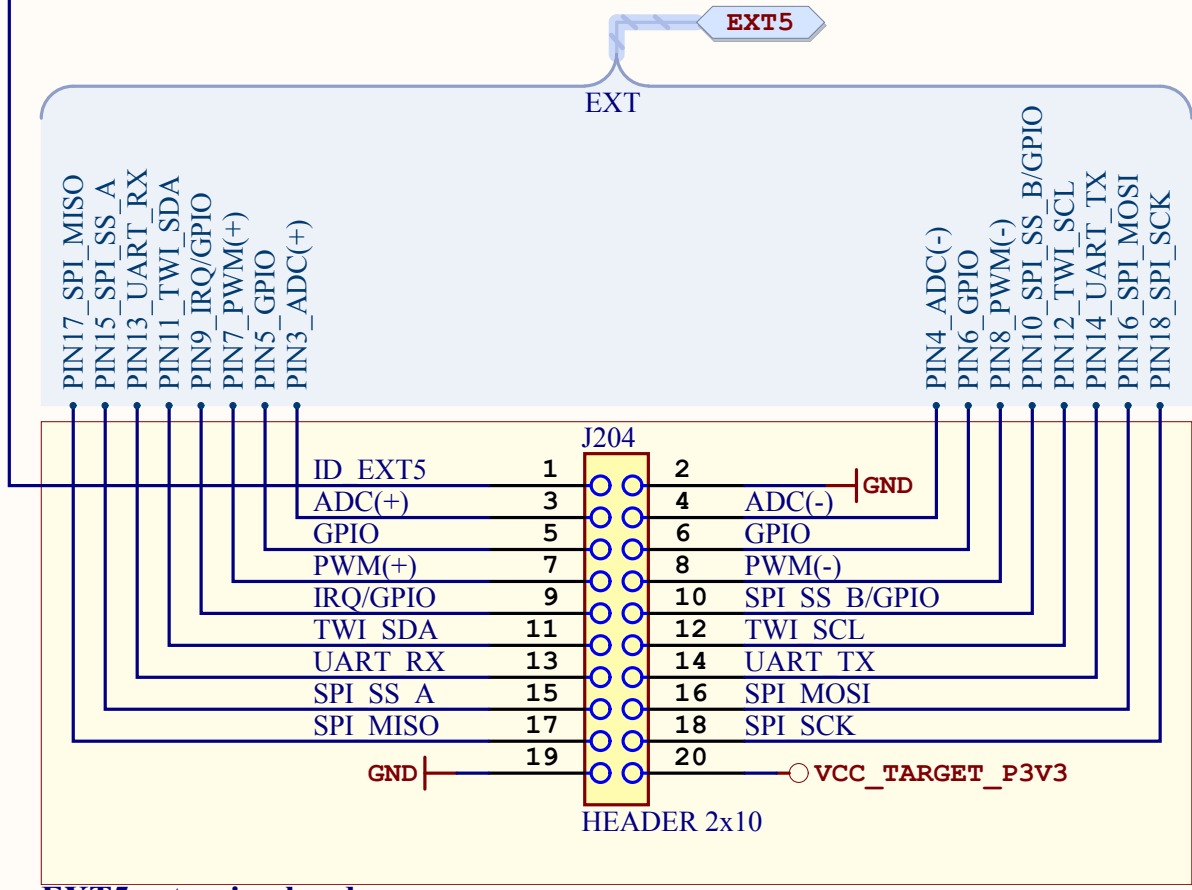
EXT2 extension header



EXT3 extension header

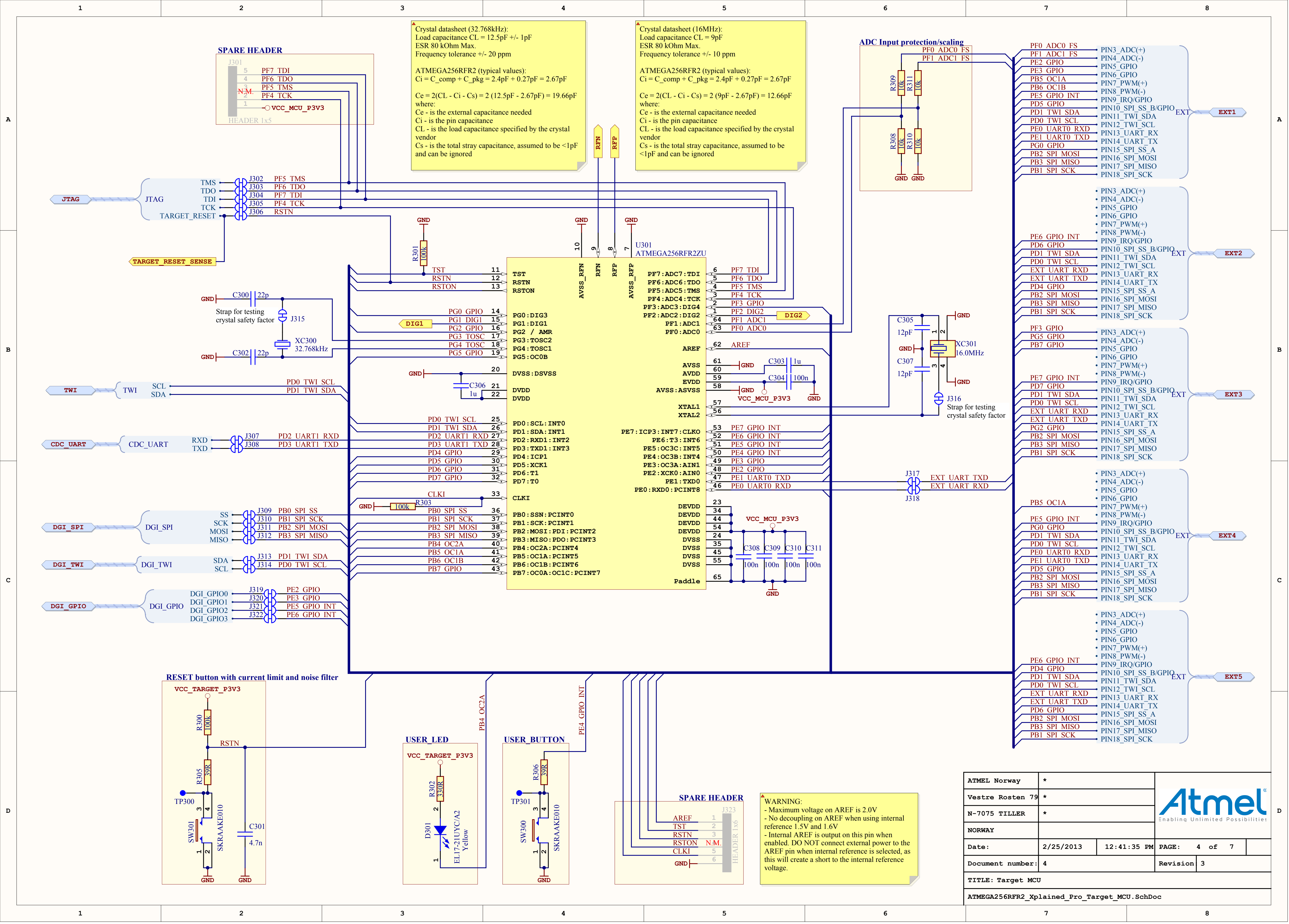


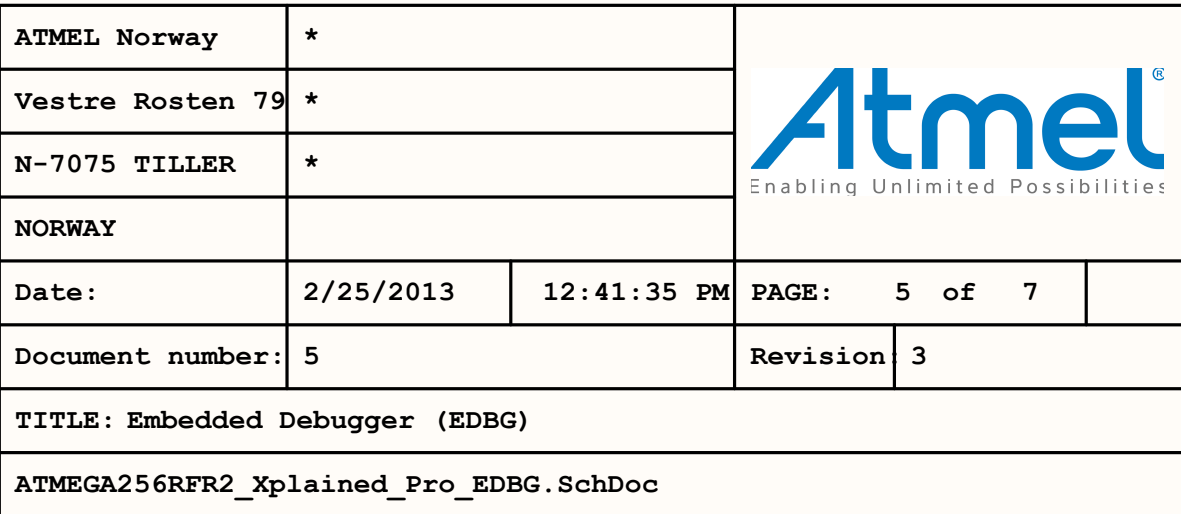
EXT4 extension header

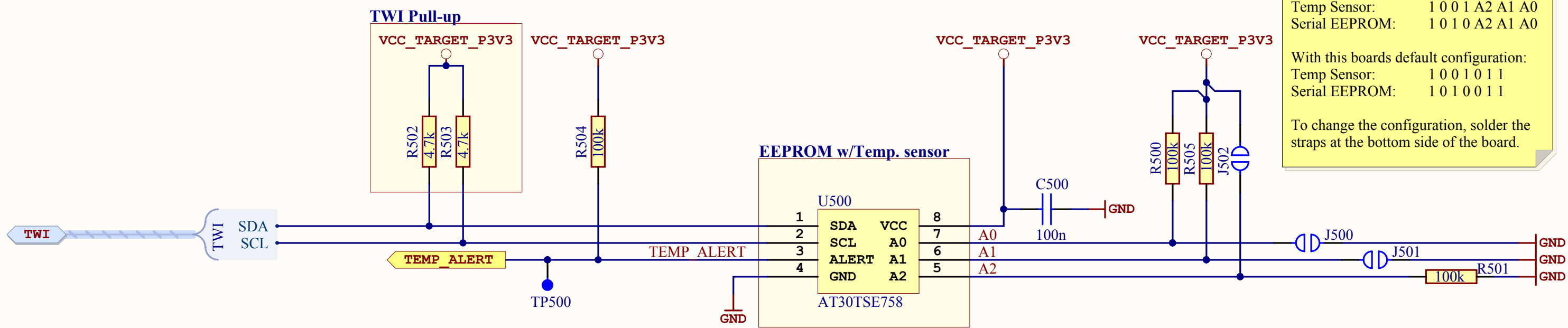


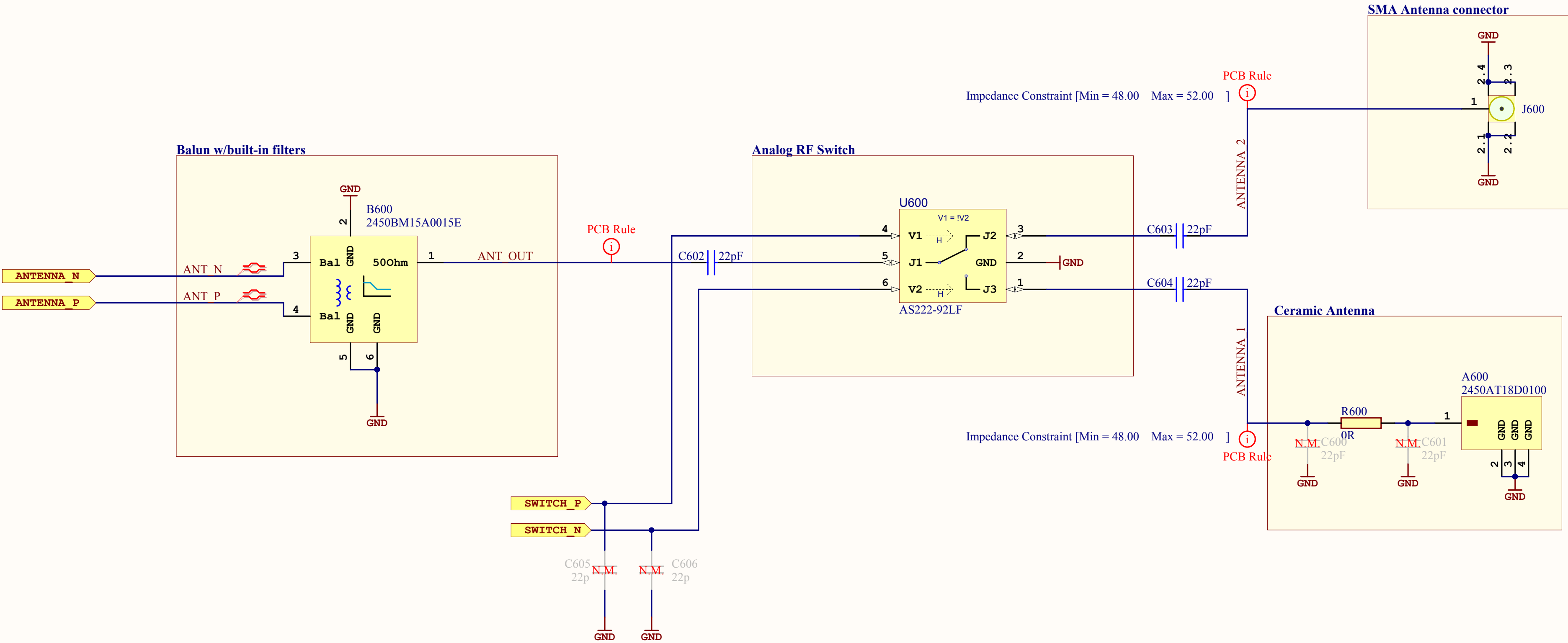
EXT5 extension header

ATMEL Norway	*		 Enabling Unlimited Possibilities		
Vestre Rosten 79	*				
N-7075 TILLER	*				
NORWAY					
Date:	2/25/2013	12:41:34 PM	PAGE:	3 of 7	
Document number:	3		Revision:	3	
TITLE: Extension connectors					
ATMEGA256RFR2_Xplained_Pro_Connectors.SchDoc					

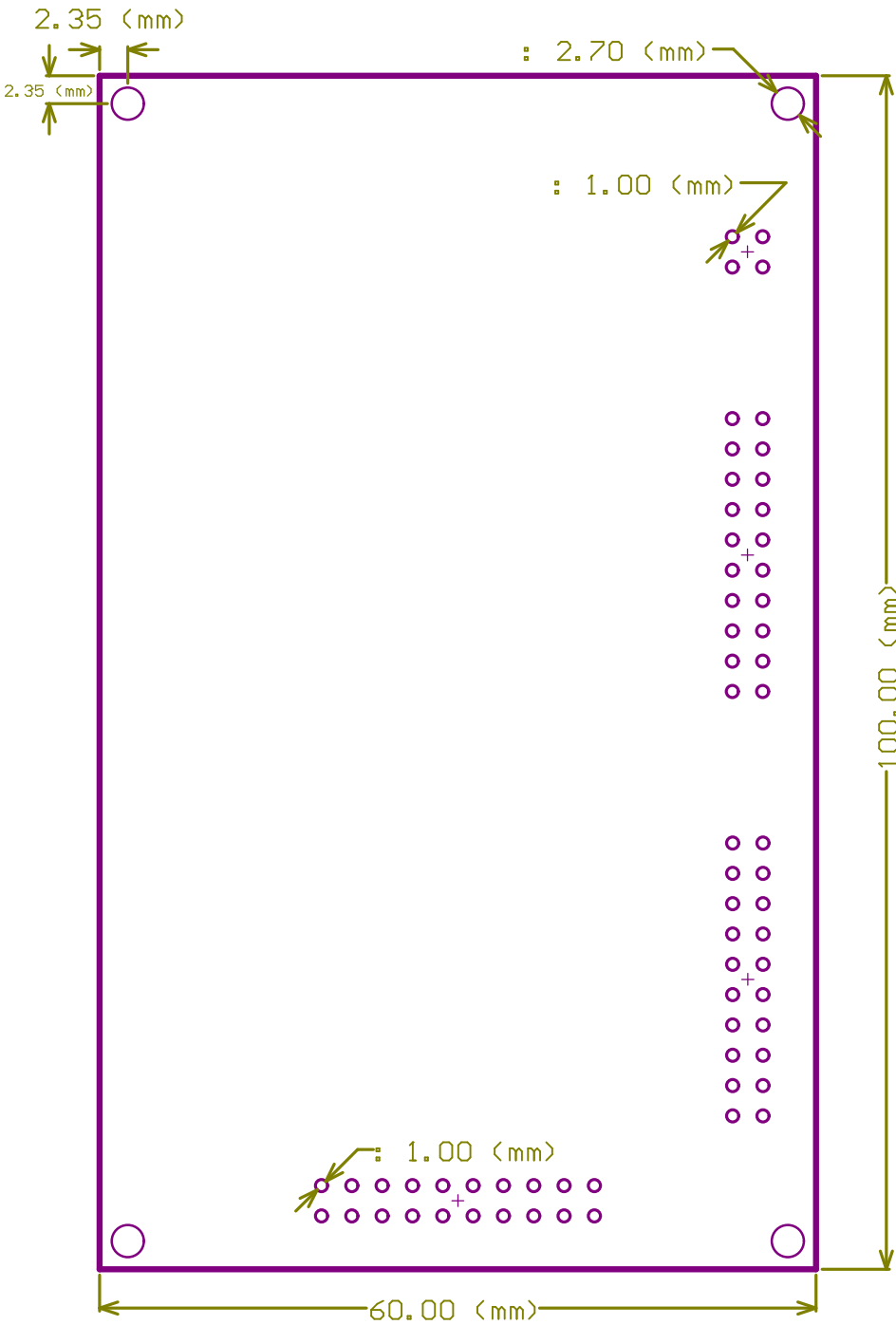




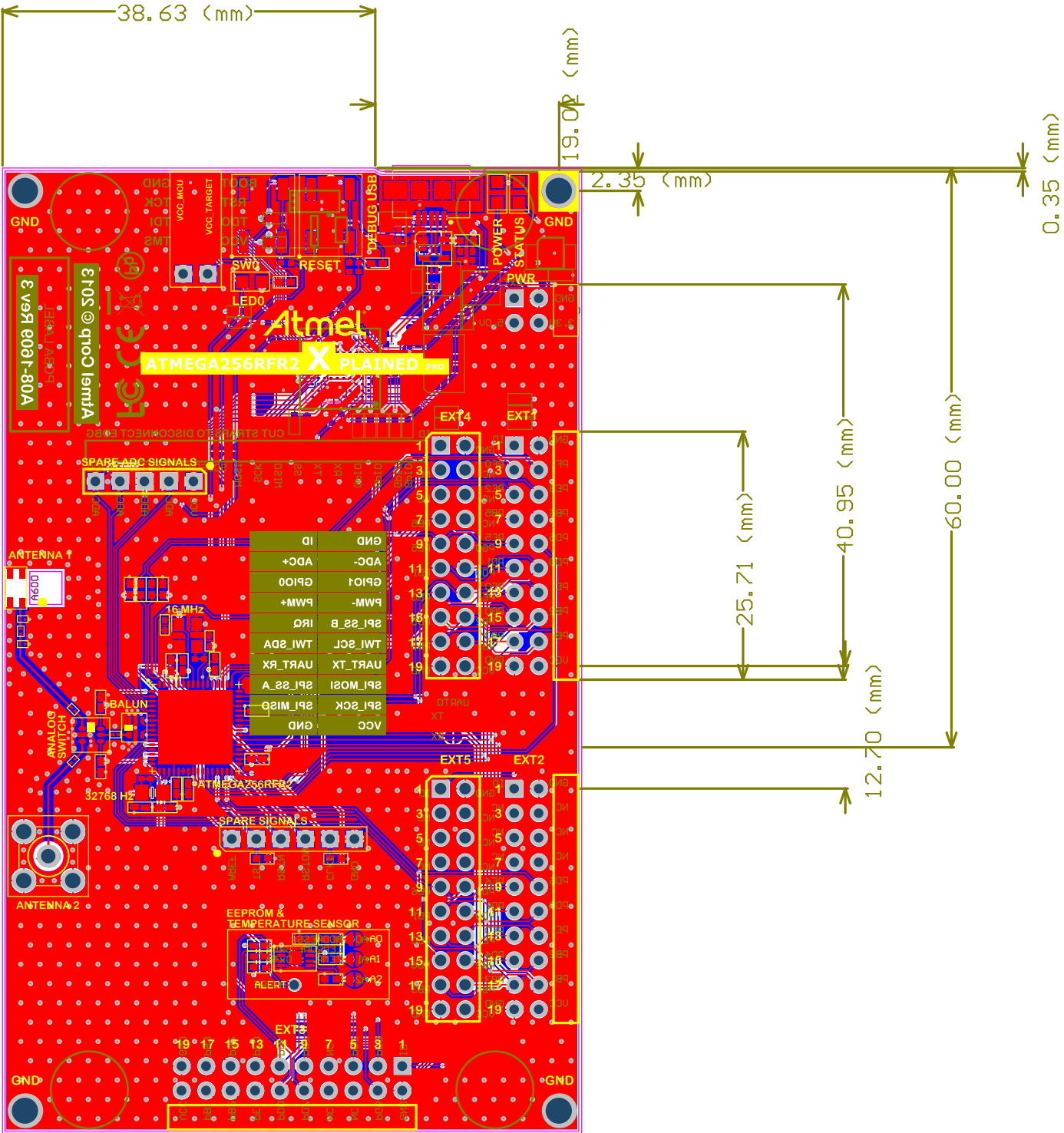
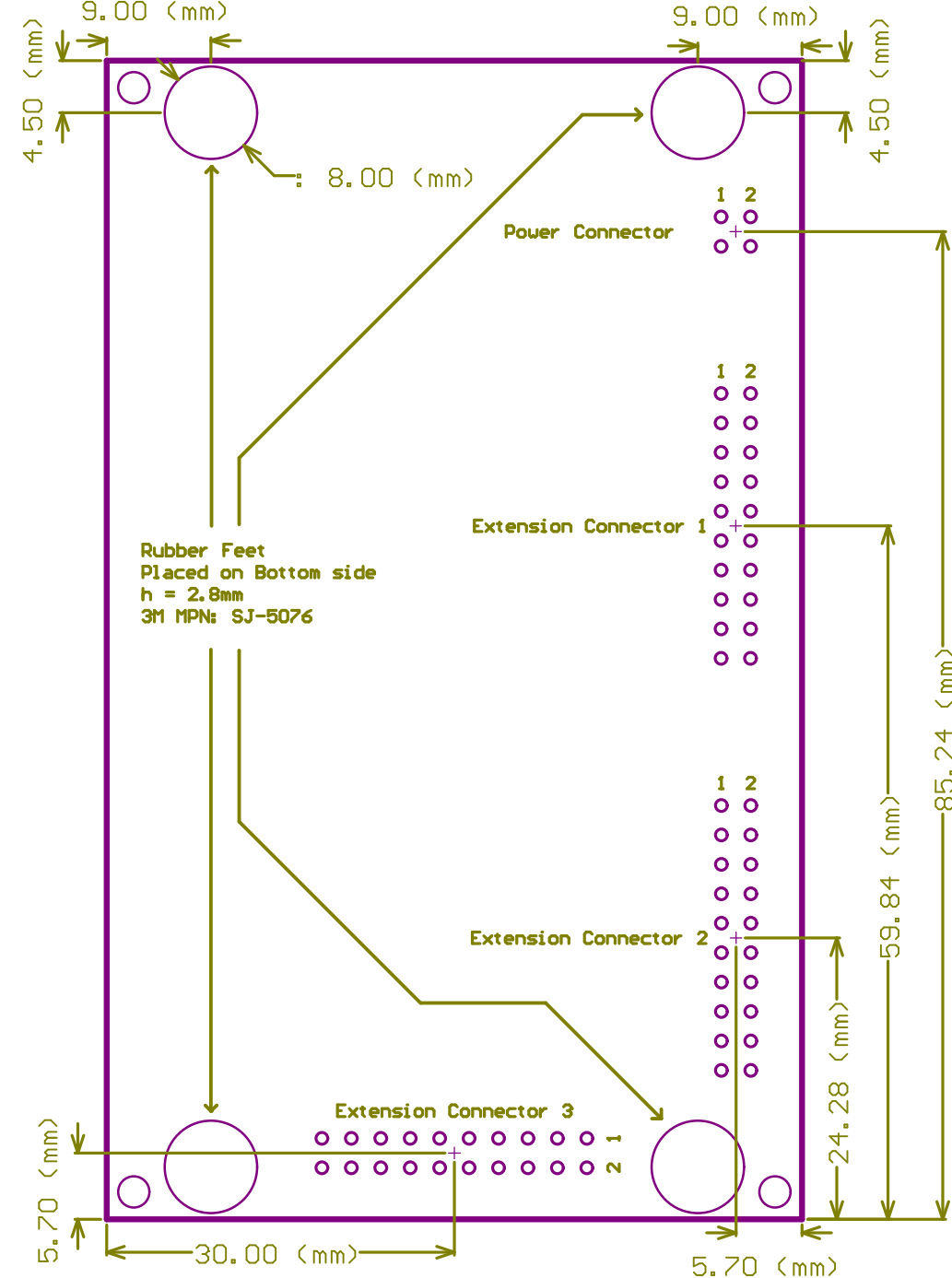




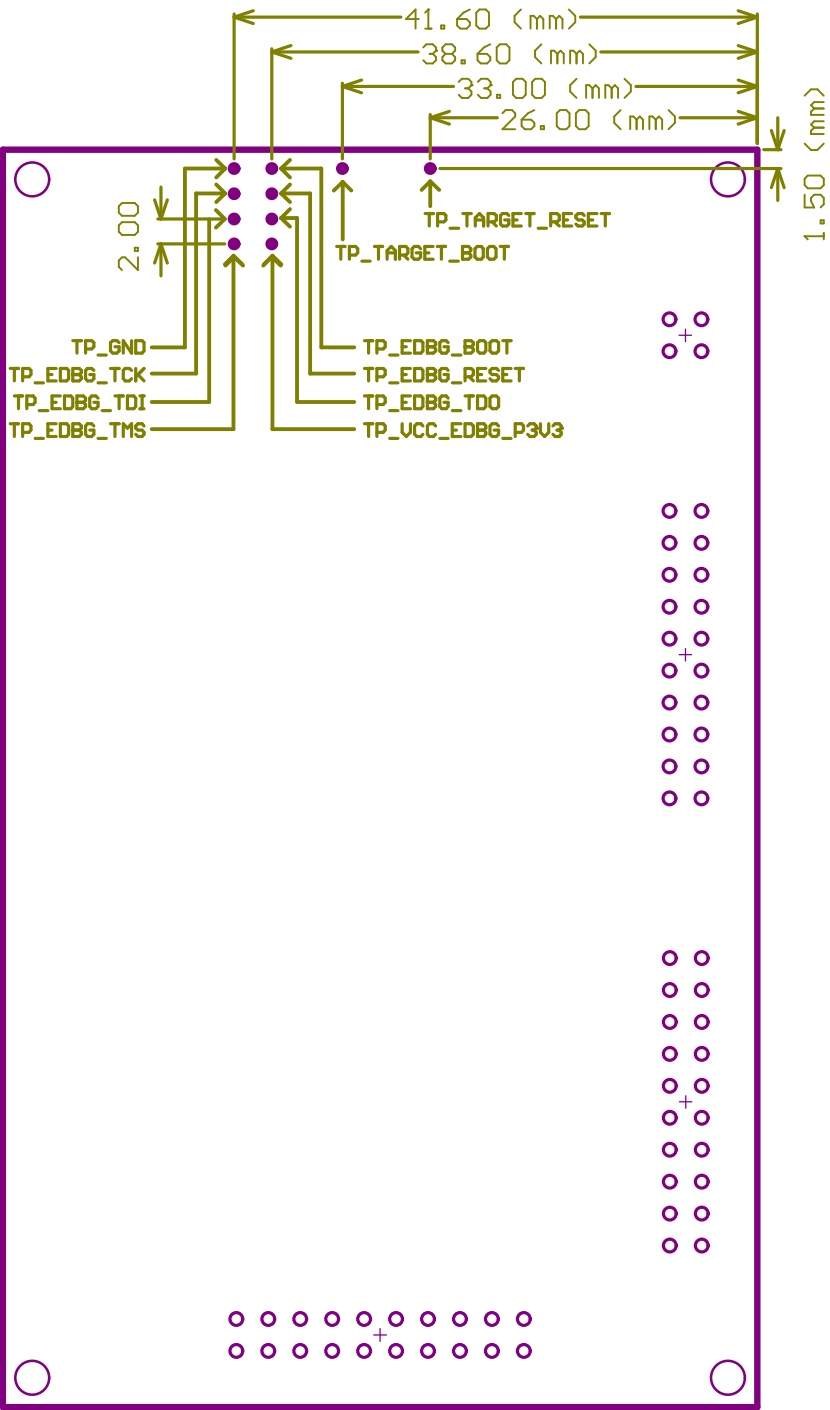
MCU Board Mechanical Dimensions



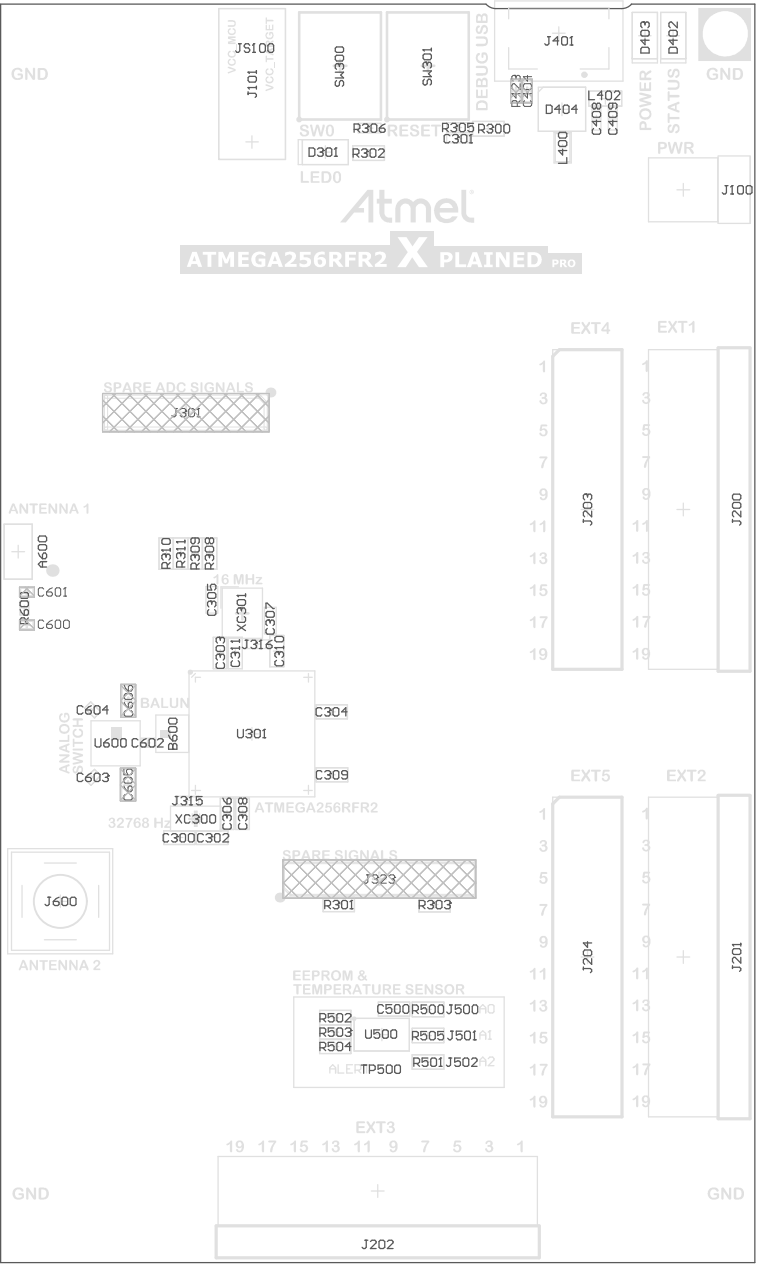
MCU Board Component Placement

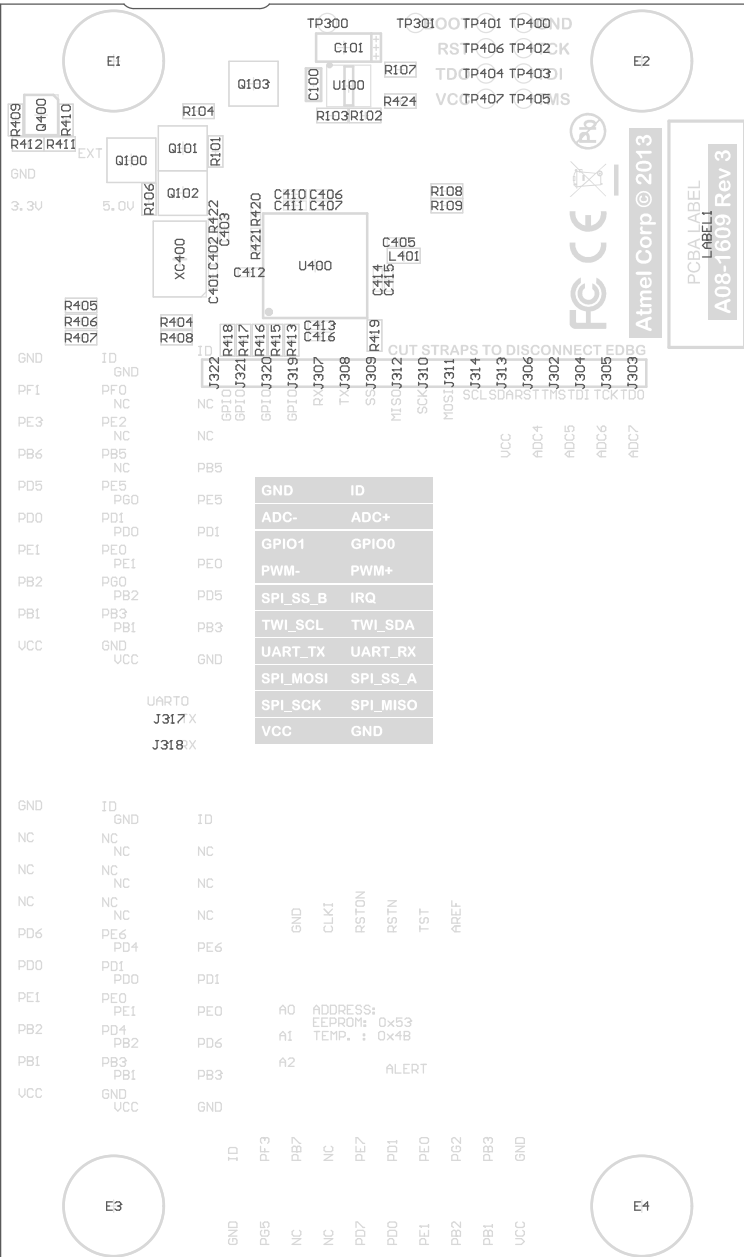


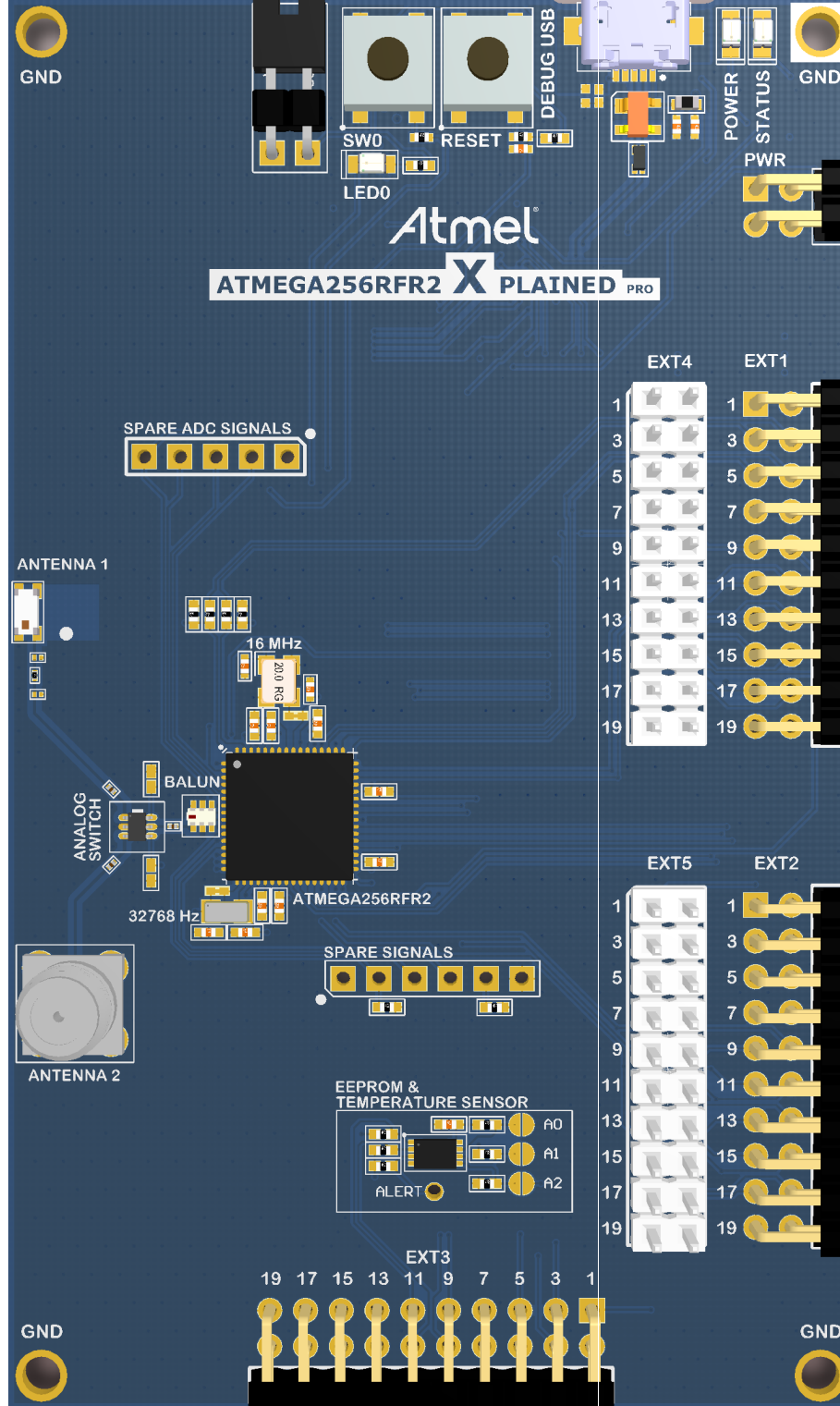
MCU Board Test Points

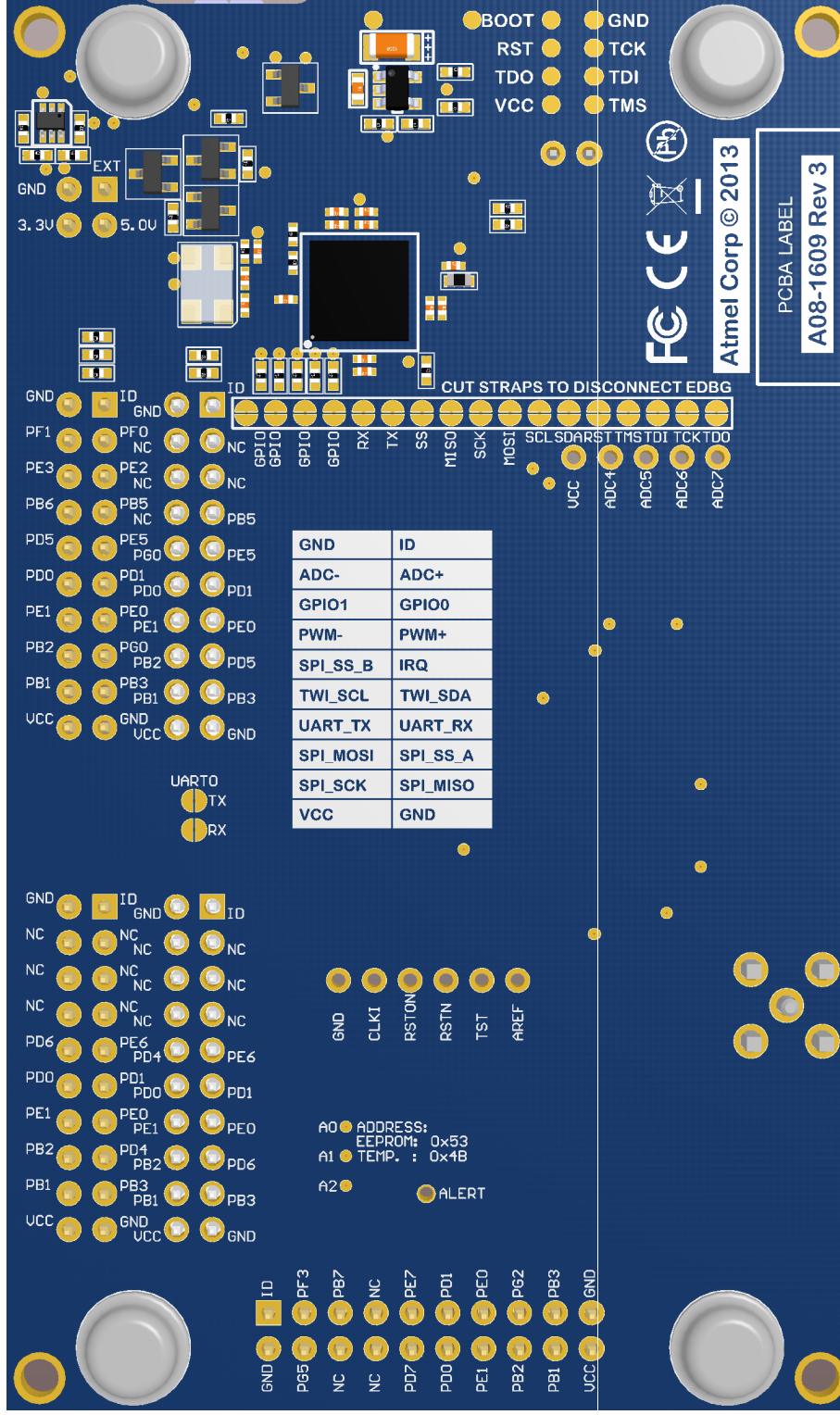


 ATMEL NORWAY Vestre Rosten 79 N-7075 Tiller	ENGINEER:	TITLE:	
	PCB DESIGNER:		
	DATE:	PART NO.:	REV:
	FILE NAME:	DWG NO.:	SCALE:



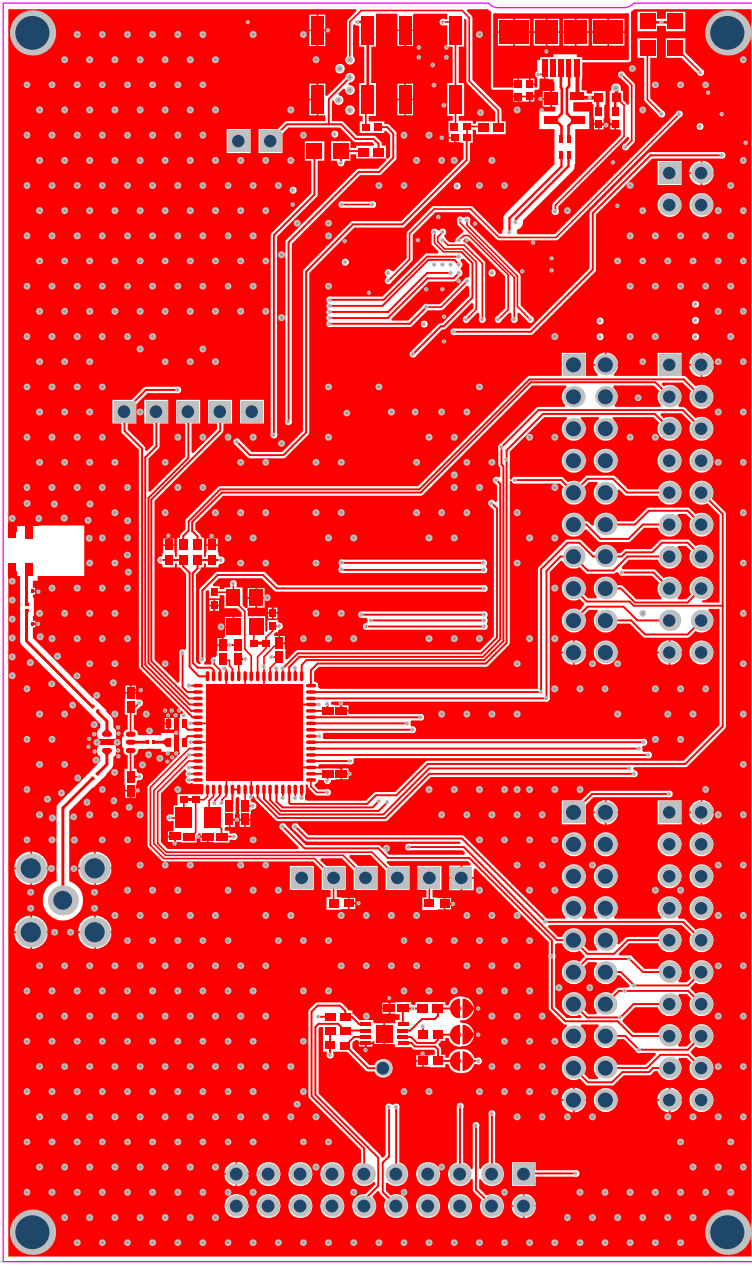


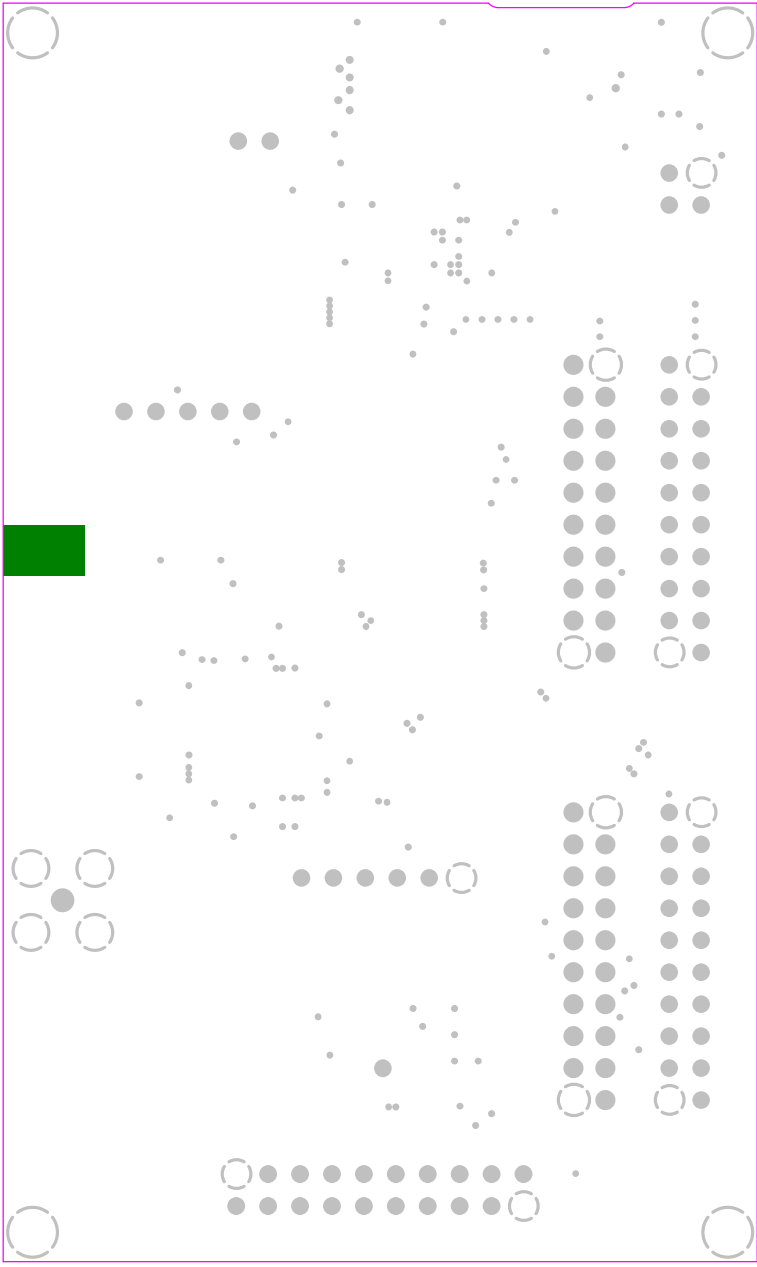


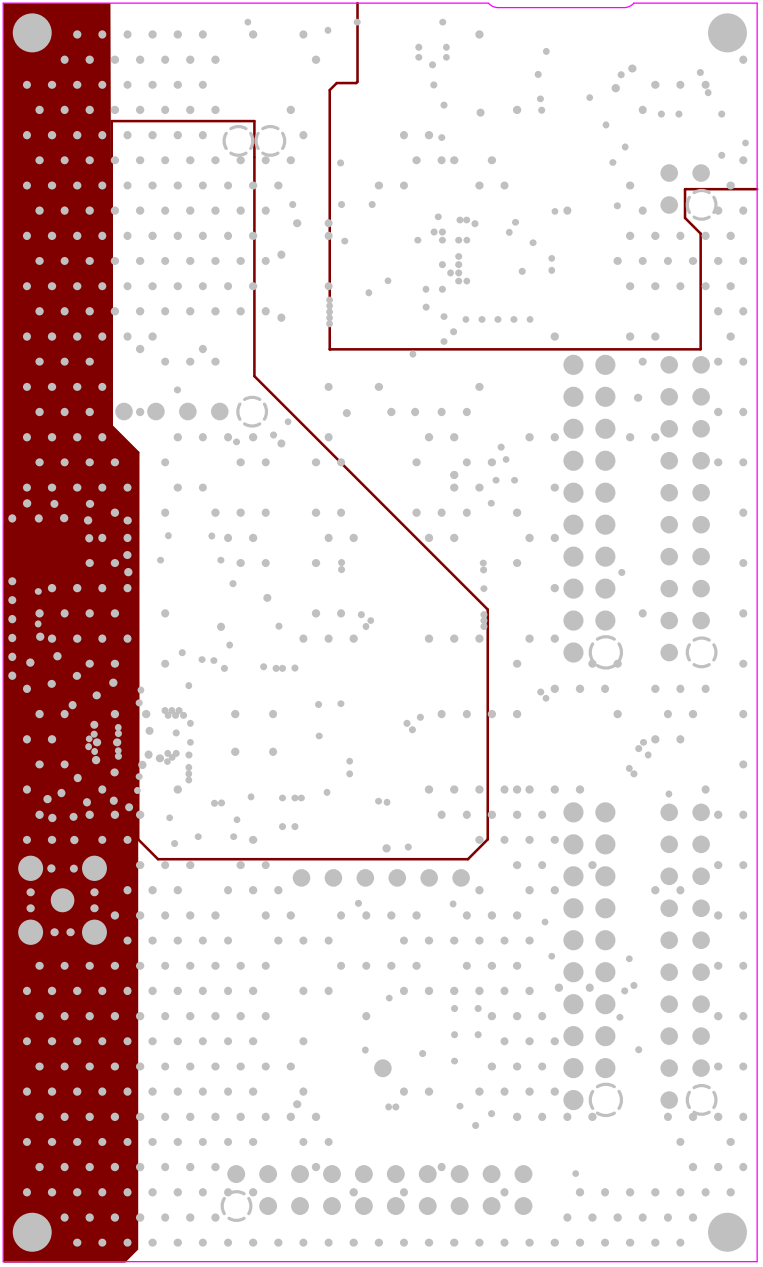


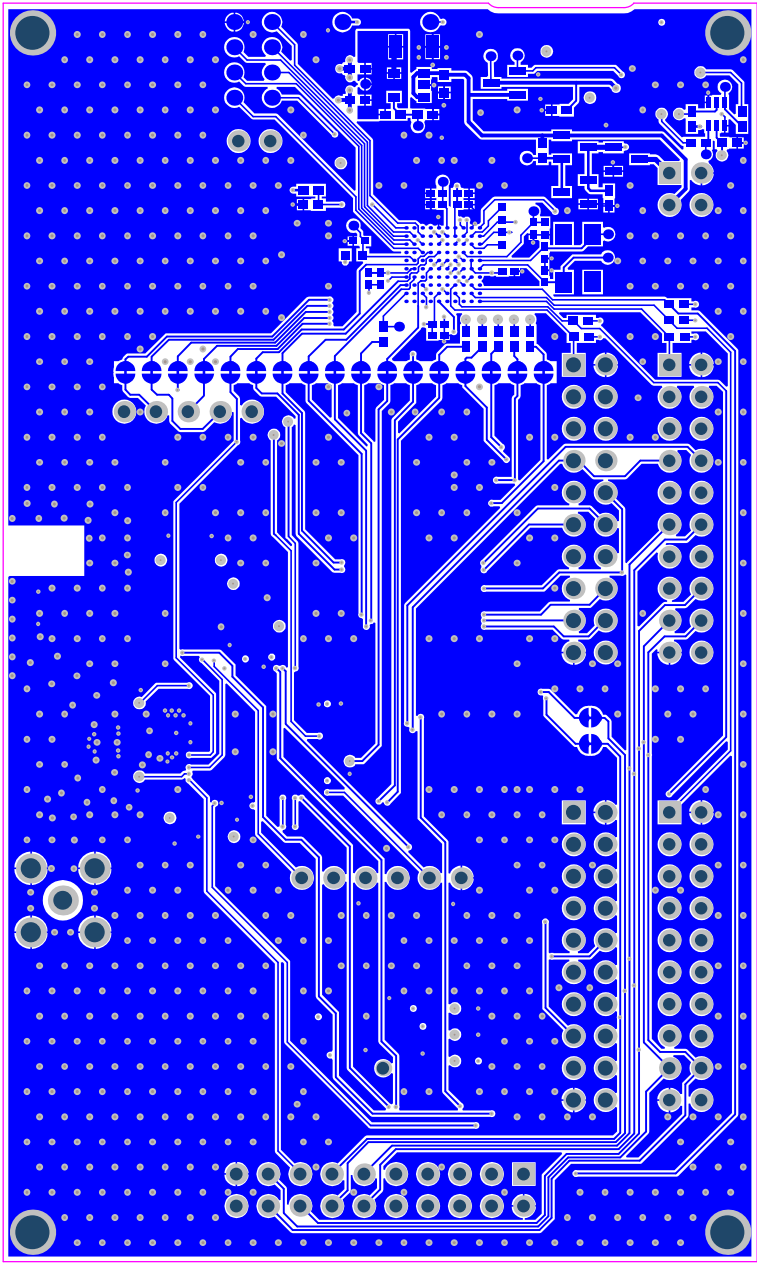
GND	ID
ADC-	ADC+
GPIO1	GPIO0
PWM-	PWM+
SPI_SS_B	IRQ
TWI_SCL	TWI_SDA
UART_TX	UART_RX
SPI_MOSI	SPI_SS_A
SPI_SCK	SPI_MISO
VCC	GND

A0 ● ADDRESS:
EEPROM: 0x53
A1 ● TEMP. : 0x4B
A2 ●
● ALERT









Component list

Bill of Materials Print For Variant [Default_assembly] of Project [ATMEGA256RFR2_Xplained_Pro.PrjPCB] (No PCB Document Selected)



Source Data From:

ATMEGA256RFR2_Xplained_Pro.PrjPCB

Project:

ATMEGA256RFR2_Xplained_Pro.PrjPCB

Variant:

Default_assembly

Report Date: 2/25/2013

12:42:00 PM

Print Date: 2/25/2013

12:41:58 PM

#	Designator	Quantity	Value	Manufacturer	MPN	Description
1	A600	1	2450AT18D0100	Johanson Technology	2450AT18D0100	2.45 GHz Ceramic Antenna
2	B600	1	2450BM15A0015E	Johanson Technology	2450BM15A0015E	Filtered Balun to match AT86RF232/233 (35288)
3	C100	1	4.7uF	tdk	C1608X5R1A475K	Ceramic capacitor, SMD 0603, X5R, 10V, 10% (de31036)
4	C101	1	10u	vishay	TR3A106K016C1700	SMD tantalum capacitor, ESR= 1.7, 3216-18 (EA) 1206,
5	C300, C302, C401, C402	4	22p			Ceramic capacitor, SMD 0402, NPO, 50V, +/-5%
6	C301	1	4.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10% (de35287)
7	C303, C306	2	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
8	C304, C308, C309, C310, C311, C405, C411, C412, C413, C414, C500	11	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
9	C305, C307	2	12pF	Kyocera-elco	CM05CG120J50AH	Ceramic capacitor, SMD 0402, NPO, 50V, +/-5% (de19819)
10	C403	1	10p			Ceramic capacitor, SMD 0402, NPO, 50V, +/-5%
11	C406, C410, C415, C416	4	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
12	C407, C408, C409	3	1 nF COG	Murata	GRM1555C1H102JA01D	Ceramic capacitor, SMD 0402, COG, 50V, +/-5%
13	C602, C603, C604	3	22pF	Johanson Technology	250R05L220JV4T	Ceramic Capacitor, SMD 0201, 25V, NPO, 22PF
14	D301, D402	2	EL17-21UYC/A2	Everlight	17-21UYC/S530-A3/TR8	LED, Yellow, Wave length=591nm, SMD 0805, ±70°
15	D403	1	EL17-21SYGC	Everlight	EL17-21SYGC	LED, Green, Wave length=575nm, SMD 0805, ±70°
16	D404	1	PRTR5V0L2X	Philips	PRTR5V0L2X	Double rail-to-rail USB ESD protection diode
17	DOC1	1	A09-1784 PCB4 Files	ATMEL		ATmega256RFR2 Xplained PRO PCB4 documentation
18	E1, E2, E3, E4	4	SJ-5078	3M	SJ-5078	2.8mm adhesive feet,diam 8.0mm
19	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
20	FW1	1	EDBG secured firmw are			EDBG secured firmw are
21	J100	1	P101-2*10RGF-139-ND		P101-2*10RGF-139-ND	Pin header, 2x2, Right Angle, 2.54mm, THH, Pin In Paste
22	J101	1	Pin header 1x2 right angle	Pro-data International Corp	2213R-2G	1x2 pin header, right angle, 2.54 mm pitch, through-hole
23	J200,, J201, J202	3	P101-2*10RGF-139-ND		P101-2*10RGF-139-ND	Pin header, 2x10, Right Angle, 2.54mm, THH, Pin In Paste
24	J203, J204	2	HMTSW-110-23-F-D-237	SAMTEC	HMTSW-110-23-F-D-237	2x10 pin header, 2.54mm pitch, Pin-in-Paste THH
25	J401	1	10104111-0001LF	FCI	10104111-0001LF	Micro USB AB Connector
26	J600	1	19-46-1-TGG	Multicomp	19-46-1-TGG	SMA PCB mounted connector 50Ohm (de19205)
27	JS100	1	SNT-100-BK-G	SAMTEC	SNT-100-BK-G	Jumper cap for 2.54mm pinheader
28	L400	1	0603USB-142ML	Colcraft	0603USB-142ML	USB common-mode filter in 0603
29	L401, L402	2	BLM18PG471SN1	Murata	BLM18PG471SN1	SMD RF inductor 0603, Z=470Ohm (@100MHz), Max R(dc)=0.65Ohm, Max current=1A
30	LABEL1	1	Label PCB4 with MAC64 and FCC ID	ACT Logimark AS	505462	Label for use on wireless PCB4 that needs 64 bit MAC and FCC ID
31	PCB1	1	ATMEGA256RFR2 Xplained PRO PCB	ATMEL		ATMEGA256RFR2 XPRO PCB, 4 layer, 60mm x 100 mm
32	Q100, Q101, Q103	3	IRLM6402BPF	International Rectifier	IRLM6402BPF	P-ch. MOSFET, -30V, -3.7A continuous,RDS(ON)=0.050hm@VGS=4.5V, RDS(ON)=0.080hm@VGS=2.5V
33	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
34	Q400	1	2N7002DW	Fairchild	2N7002DW	Dual N-Channel MOSFET, 60V, 115mA cont,RDS(ON) < 7.5 Ohm @50mA@5V, SOT1-363
35	R101, R104, R106, R410, R412	5	1M			Thick film resistor, SMD 0402, 1/16W, 1%
36	R102	1	30k			Thick film resistor, SMD 0402, 1/16W, 1%
37	R103	1	18k			Thick film resistor, SMD 0402, 1/16W, 1%
38	R107, R424	2	0R			Thick film resistor, SMD 0402, 1/16W, 1%
39	R108, R109	2	47k			Thick film resistor, SMD 0402, 1/16W, 1%
40	R300, R301, R303, R500, R501, R504, R505	7	100k			Thick film resistor, SMD 0402, 1/16W, 1%
41	R302, R409, R411, R413, R415, R416, R417, R418, R419	9	330R			Thick film resistor, SMD 0402, 1/16W, 1%
42	R305, R306, R420, R421	4	39R			Thick film resistor, SMD 0402, 1/16W, 1%
43	R308, R309, R310, R311	4	10k			Thick film resistor, SMD 0402, 1/16W, 1%
44	R404, R405, R406, R407, R408	5	1k			Thick film resistor, SMD 0402, 1/16W, 1%
45	R422	1	6.81k			Thick film resistor, SMD 0402, 1/16W, 1%
46	R502, R503	2	4.7k			Thick film resistor, SMD 0402, 1/16W, 1%
47	R600	1	0R	ROHM	MCR006Y ZPJ000	Thick film resistor, SMD 0201, 1/20W, 5%
48	SW300, SW301	2	SKRAAKED10	ALPS	SKRAAKED10	6.2x6.2 mm SMD tact sw itch, same as A08-0091 but less force is needed
49	TEST1	1	ATmega256RFR2 Xplained PRO test	ATMEL		Fixture test for ATmega256RFR2 Xplained PRO
50	U100	1	SPX3819M5-L/TR	Exar	SPX3819M5-L/TR	500mA LDO, low noise, SOT23-5 package
51	U301	1	ATMEGA256RFR2ZU	ATMEL	ATMEGA256RFR2ZU	AVR Microcontroller with Low Power 2.4GHz Transceiver for IEEE 802.15.4 (de35289)
52	U400	1	AT32UC3A4256J-C1UR	ATMEL	AT32UC3A4256J-C1UR	AVR 32-bit RISC MCU
53	U600	1	AT30TSE758	ATMEL	AT30TSE758-MA8-T	SINGLE DIGITAL TEMPERATURE SENSOR W/ SERIAL EEPROM, UDFN8
54	U600	1	AS222-92LF	SKYWORKS SOLUTIONS	AS222-92LF	PHMPT SPDT Analog SWITCH, 0.1-3 GHz
55	XC300	1	32.768kHz	GEYER ELECTRONIC	12.87150	32.768kHz KX-327NHT, 3.2 x 1.5 mm SMD 20ppm (de19774)
56	XC301	1	16.0MHz	GEYER ELECTRONIC	12.88785	3.2X2.5mm, 10/15/5ppm; 9pF; 80Ohm (de33221)
57	XC400	1	12.0MHz	Fox Electronics	FQ5032B-12-C-C-C-200-1	Fox FQ5032B 12.0MHz SMD crystal 738B-12
58	C404	0	4.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
59	C600, C601	0	22pF	Johanson Technology	250R05L220JV4T	Ceramic Capacitor, SMD 0201, 25V, NPO, 22PF
60	C605, C606	0	22p			Ceramic capacitor, SMD 0402, NPO, 50V, +/-5%
61	J301	0	PIN HEADER 1x5 THH	SAMTEC	TSW-105-26-L-S	1x5 pin header, 2.54 mm pitch, THH
62	J323	0	PIN HEADER 1x6 PIP	Freder	CD0750141X6T8R	1x6 pin header, 2.54mm pitch, THH Pin-In-Paste
63	R423	0	1M	KOA	RK73H1ET1P1004F	Thick film resistor, SMD 0402, 1/16W, 1%

Approved

Notes