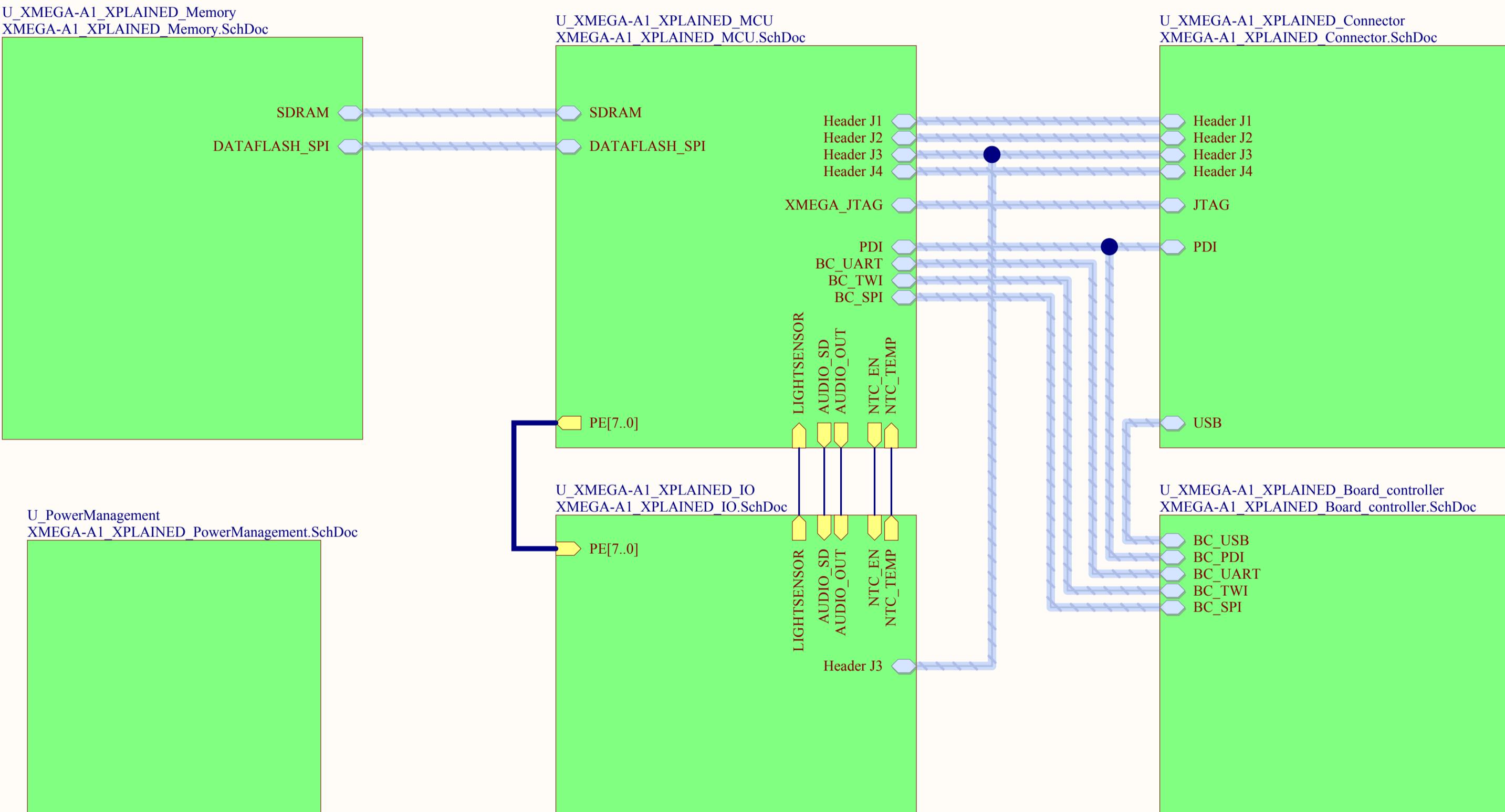
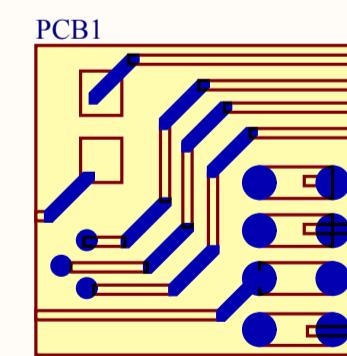


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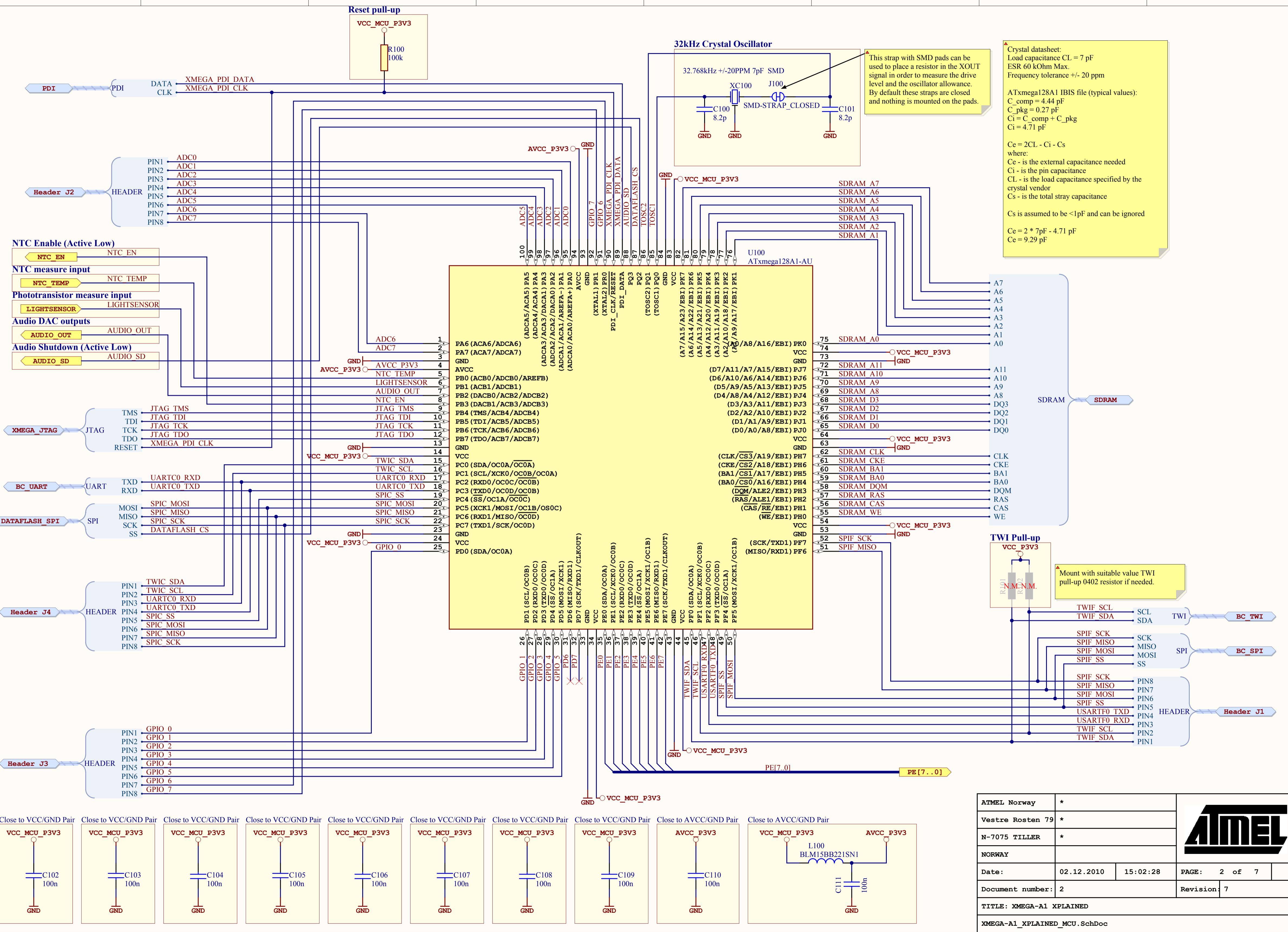
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 Product number/revision  
 Serial number

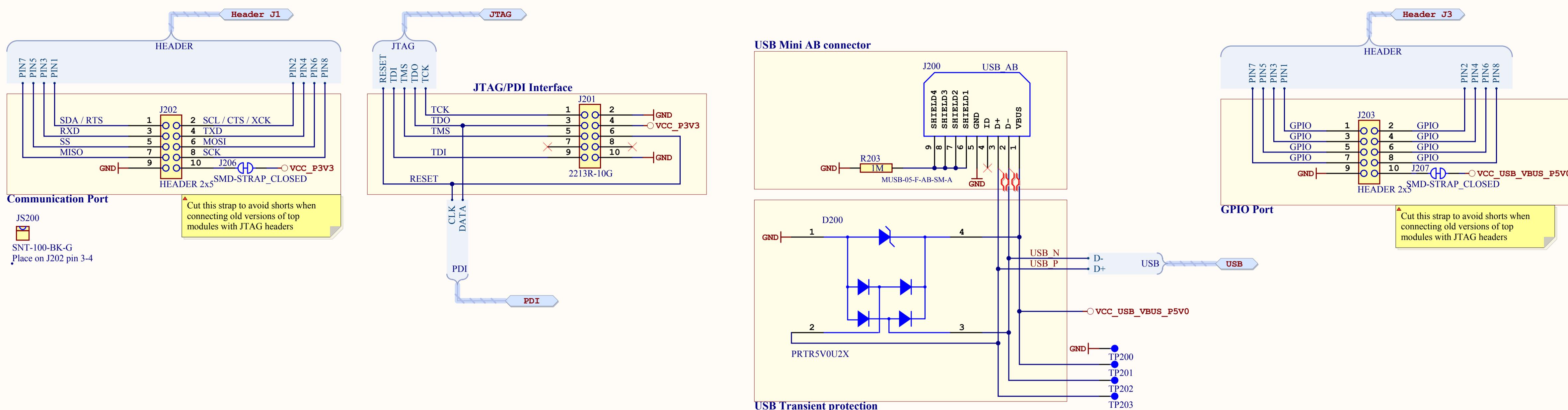
Label PCBA



ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	02.12.2010	15:02:28	PAGE: 1 of 7
Document number:	1		Revision: 7
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XMEGA-A1_XPLAINED_TopLevel.SchDoc			

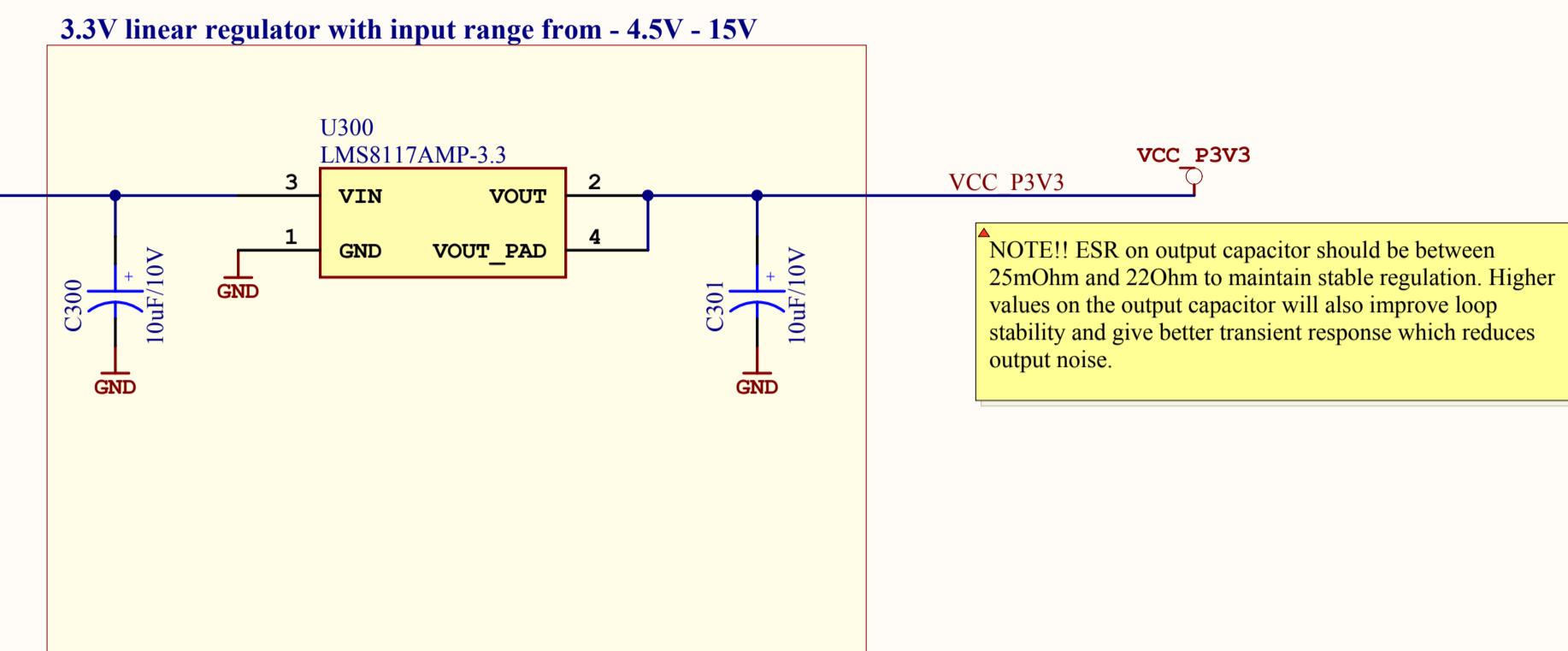
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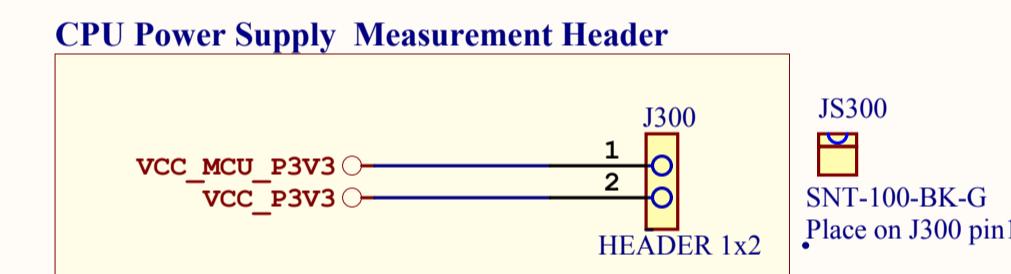


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N-7075 TILLER	*	
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XMEGA-A1_XPLAINED_Connector.SchDoc		

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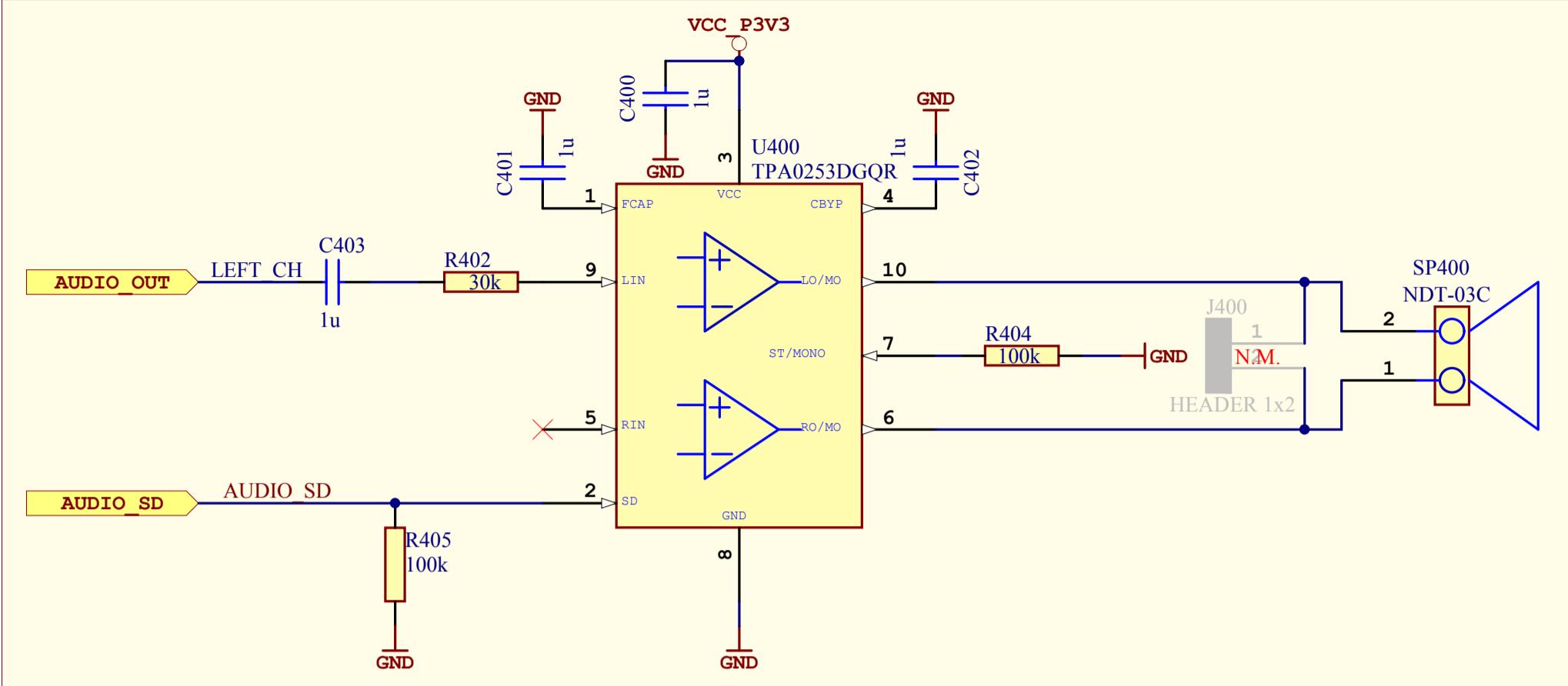
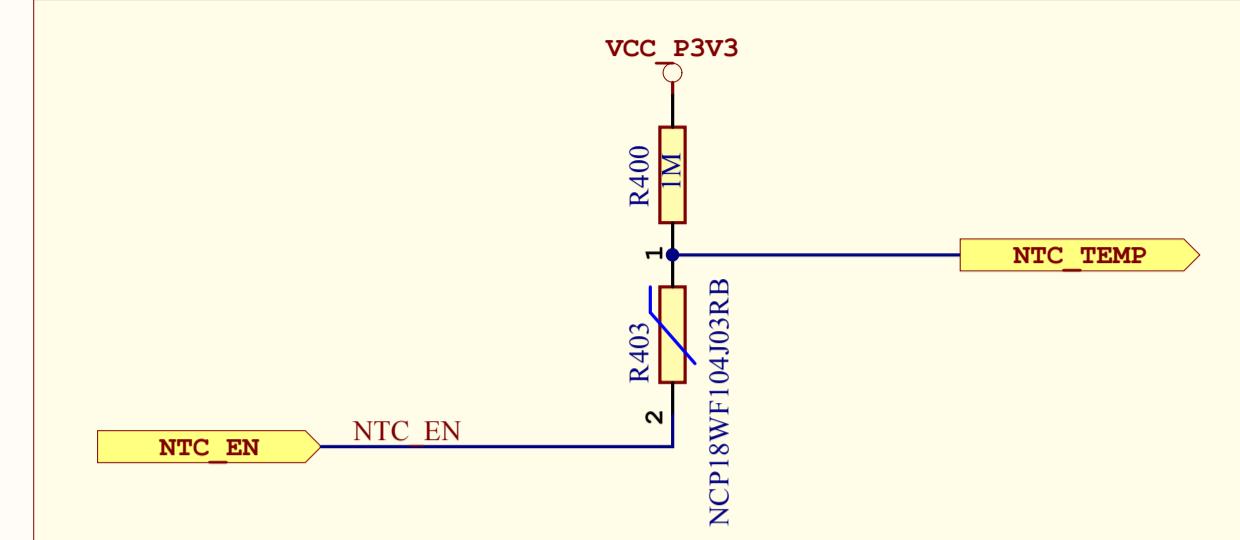
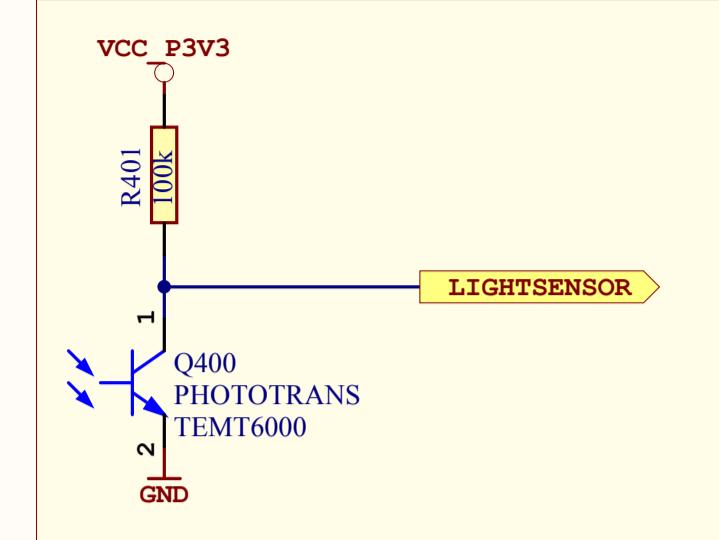
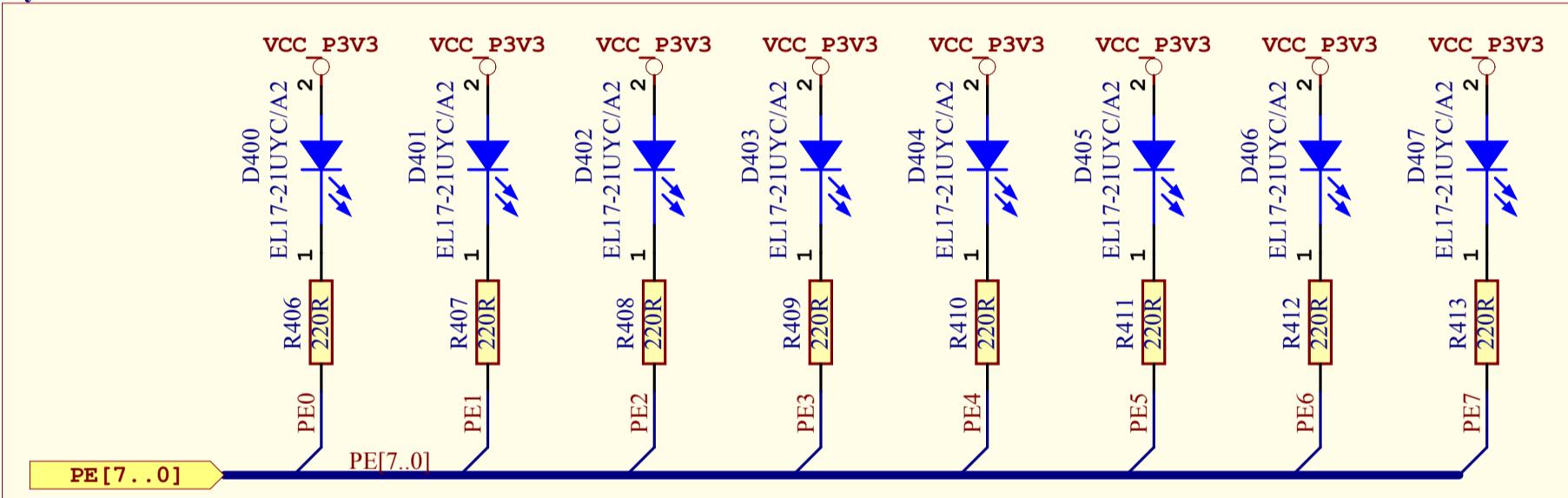
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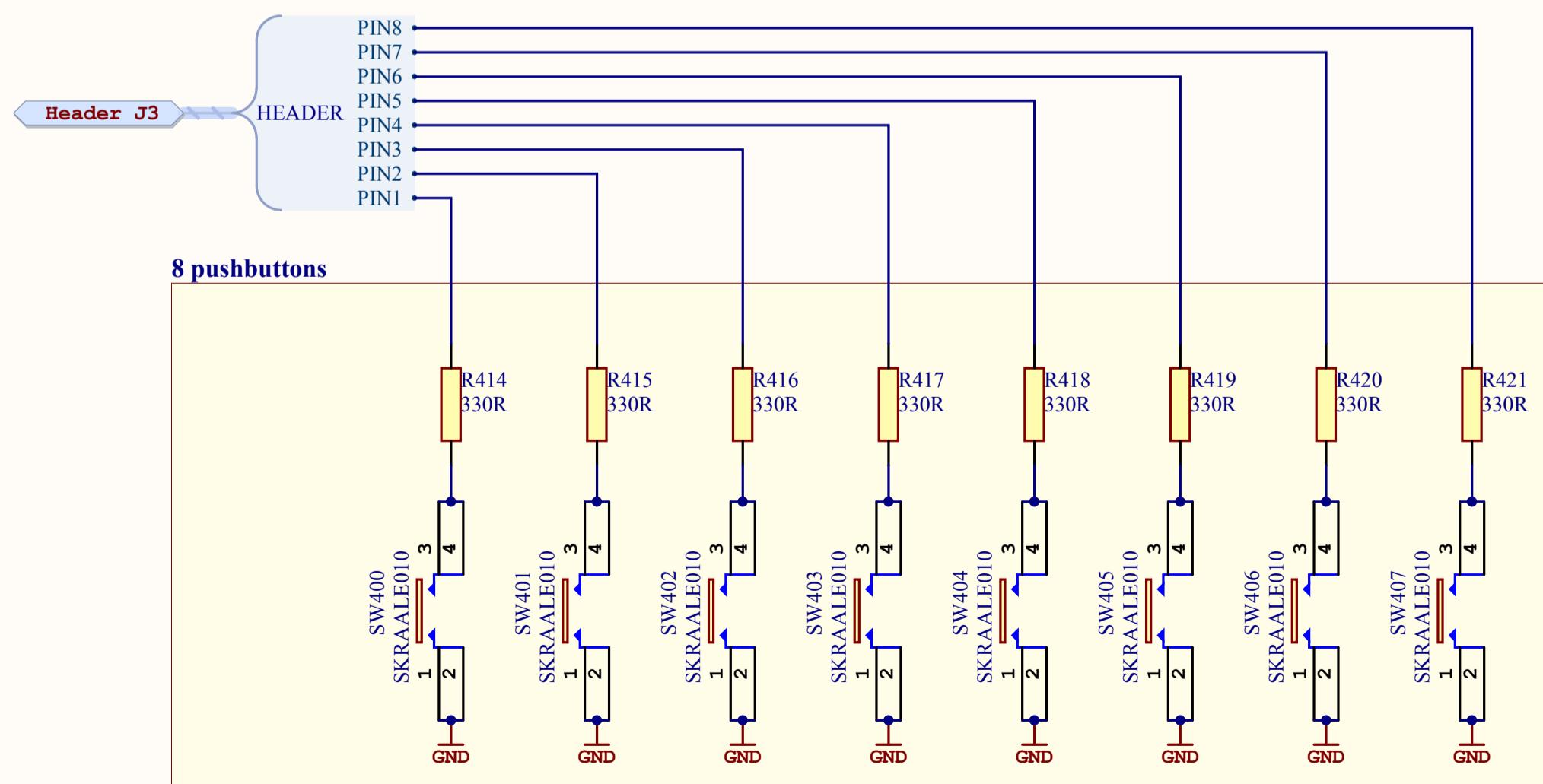
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Vestre Rosten 79	*		
N-7075 TILLER	*		
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Date:	02.12.2010	15:02:28	PAGE: 4 of 7
Document number:	4	Revision:	7
TITLE: XMEGA-A1 XPLAINED			
XMEGA-A1_XPLAINED_PowerManagement.SchDoc			



**Mono audio output with onboard speaker****NTC Temperature sensor****Light sensor****8 yellow LEDs**

c

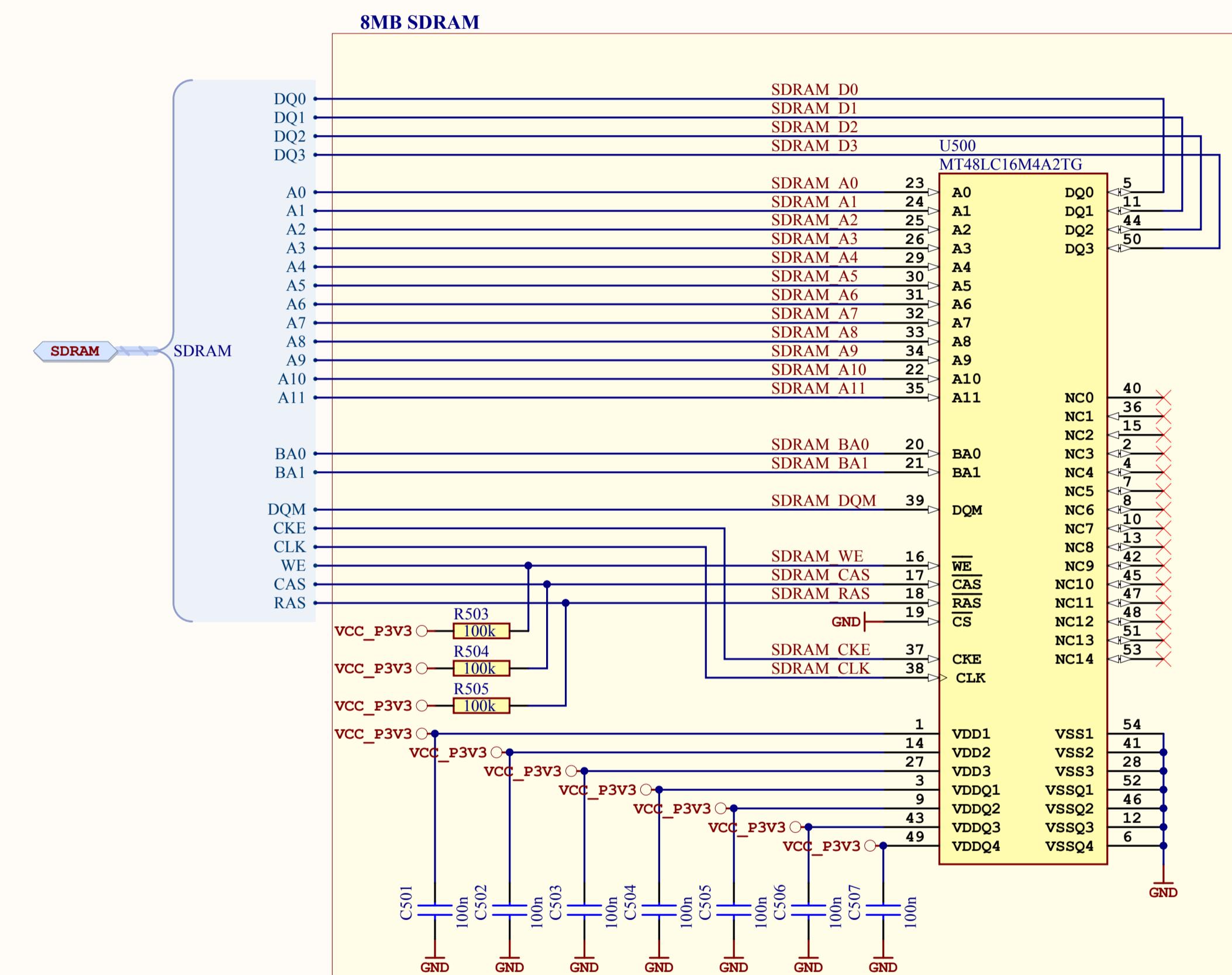
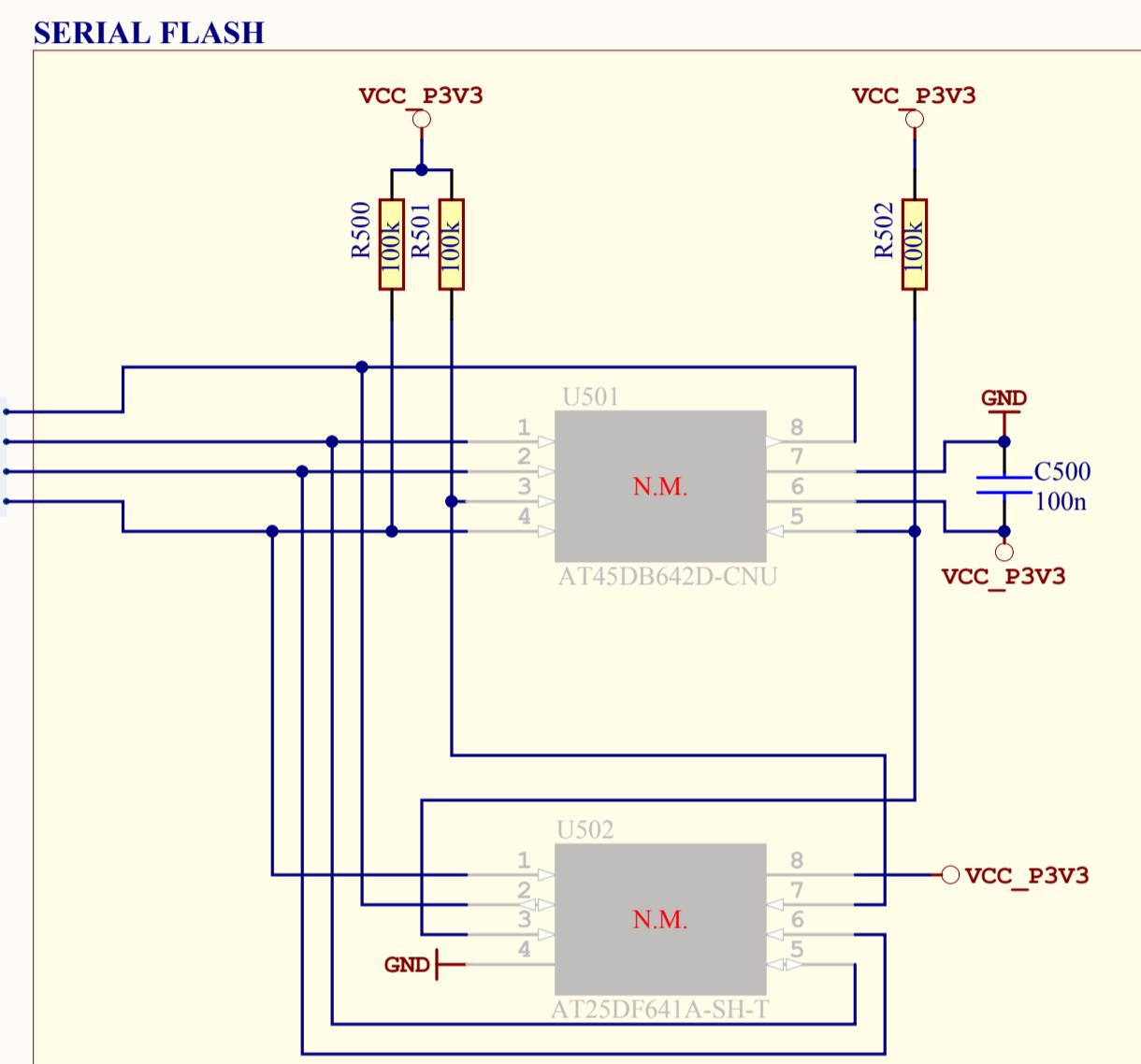


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N-7075 TILLER	*
NORWAY	
Date:	02.12.2010 15:02:28
Document number:	5
Revision:	7
TITLE: XMEGA-A1 XPLAINED	
XMEGA-A1_XPLAINED_IO.SchDoc	



A

A



B

B

C

C

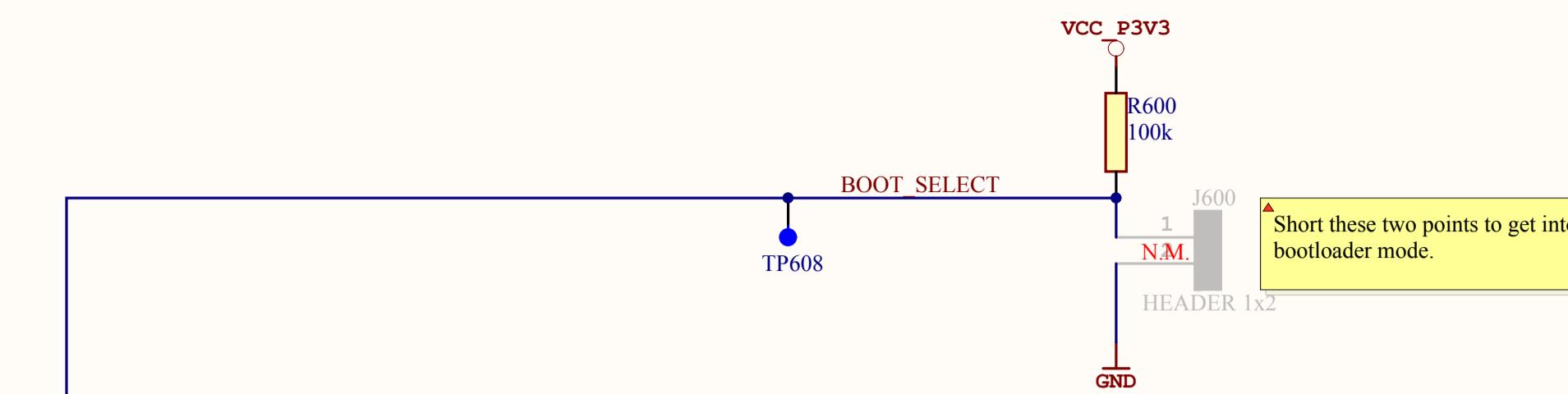
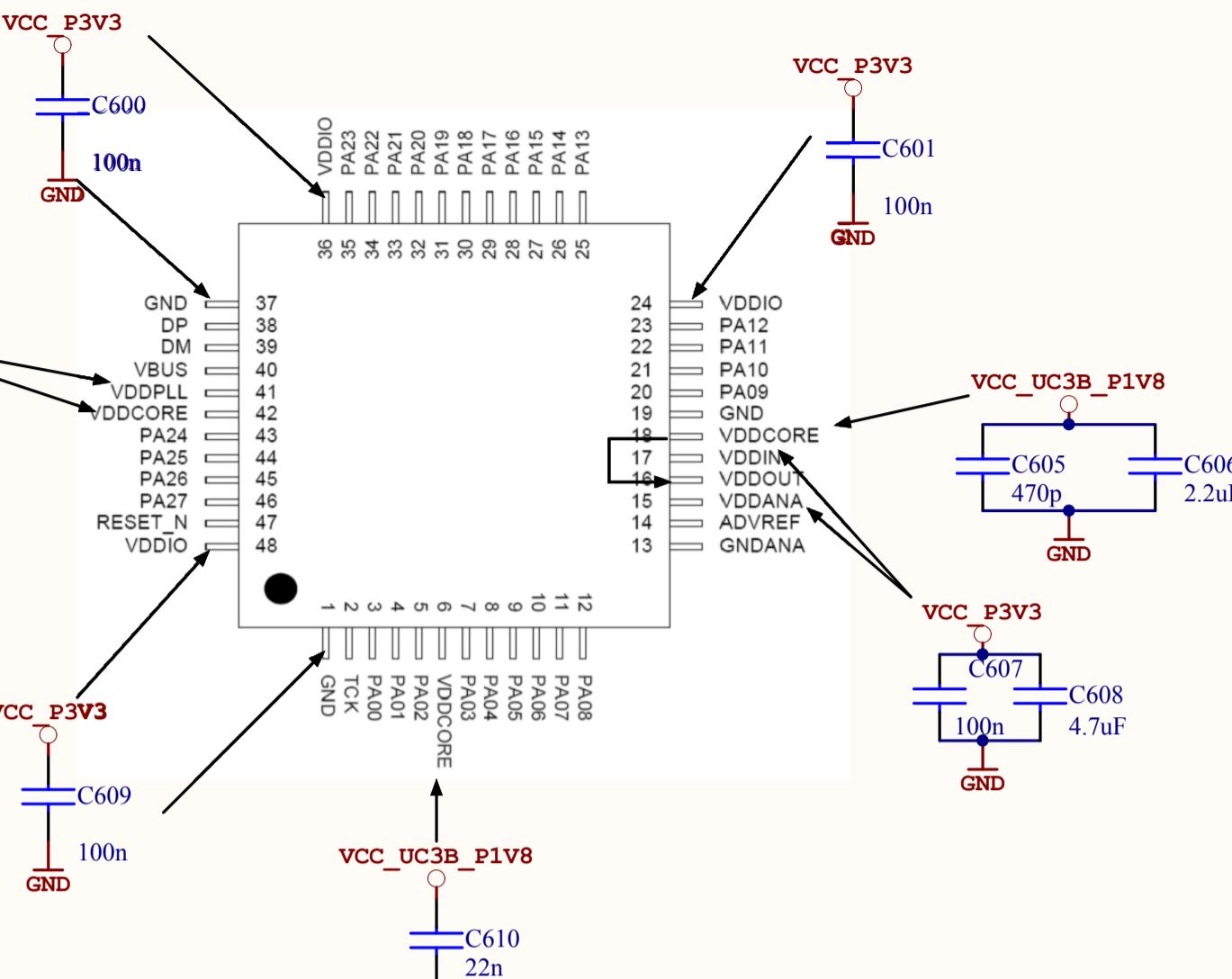
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D

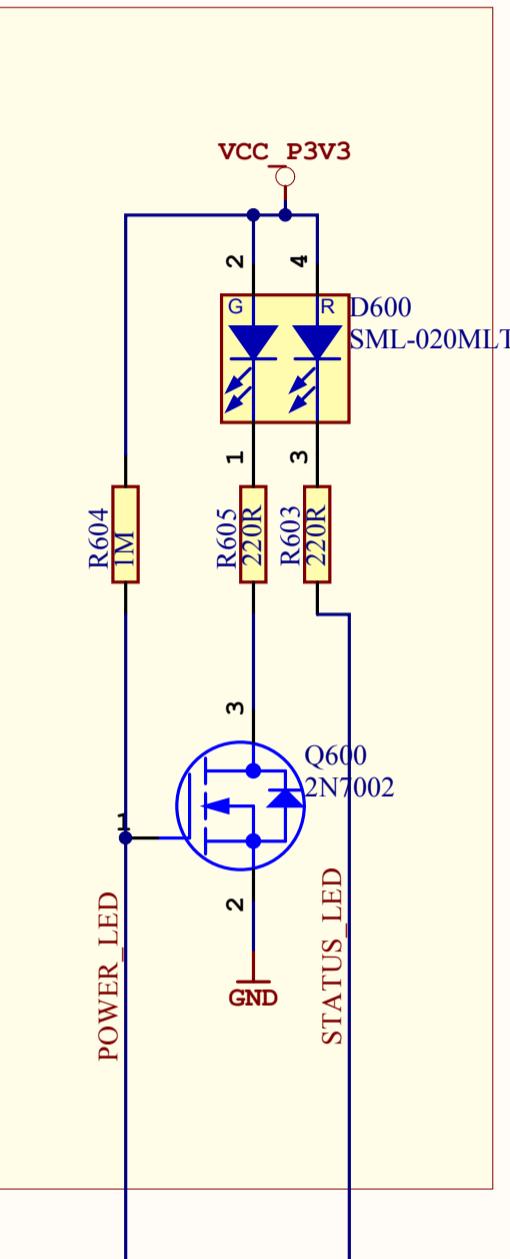
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N-7075 TILLER	*		
NORWAY			
Date:	02.12.2010	15:02:28	PAGE: 6 of 7
Document number:	6		Revision: 7
TITLE: XMEGA-A1 XPLAINED			
XMEGA-A1_XPLAINED_Memory.SchDoc			



## Decoupling



Power LED and USB Status LED



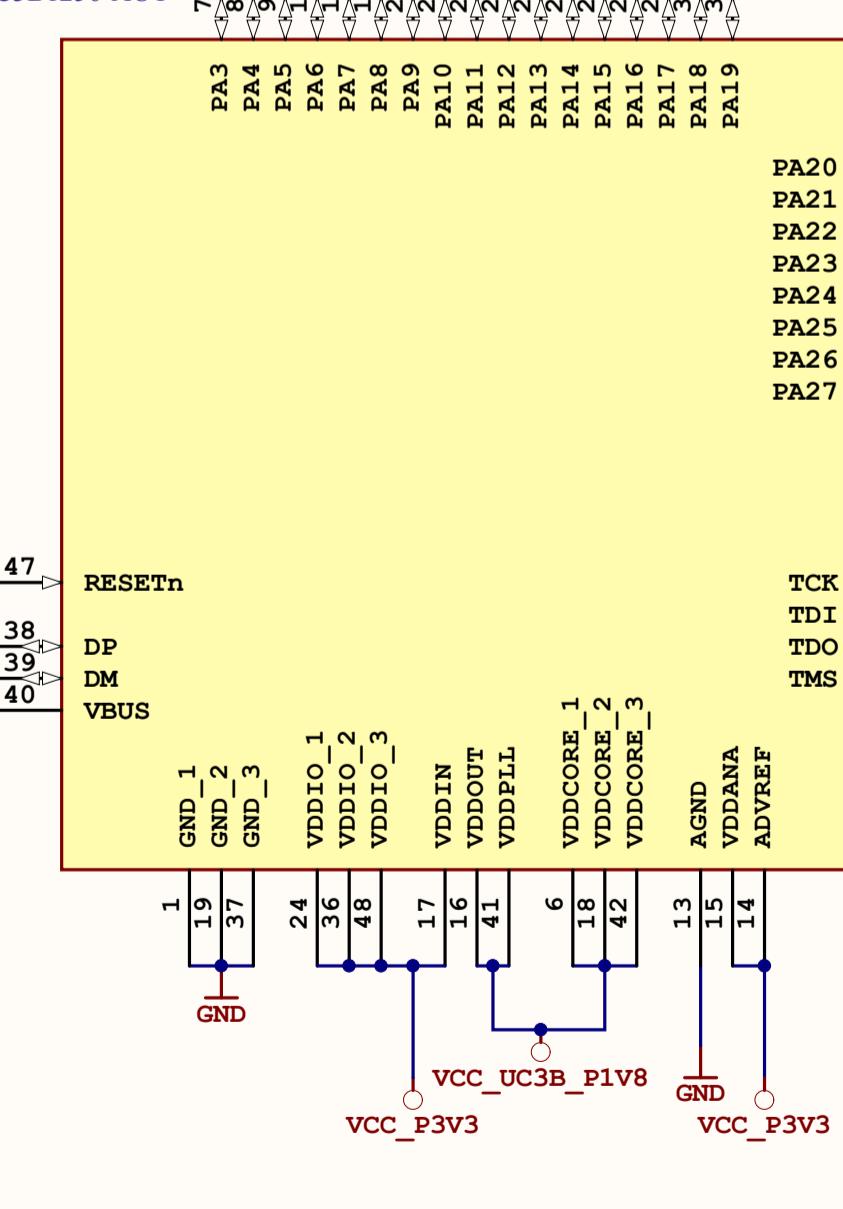
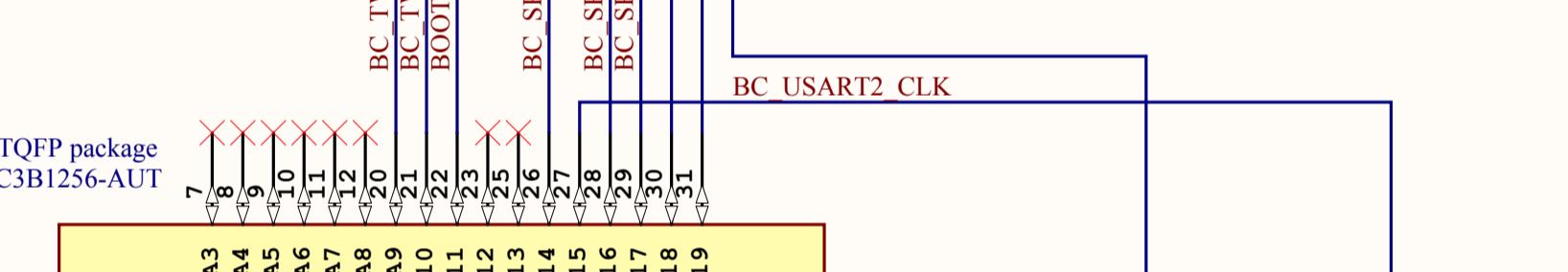
Crystal datasheet:  
Load capacitance  $C_L = 20 \text{ pF}$   
ESR 80 Ohm Max.  
Frequency tolerance 30 ppm

AT32UCB1 datasheet:  
Internal capacitance of the device is  $C_i = 12 \text{ pF}$

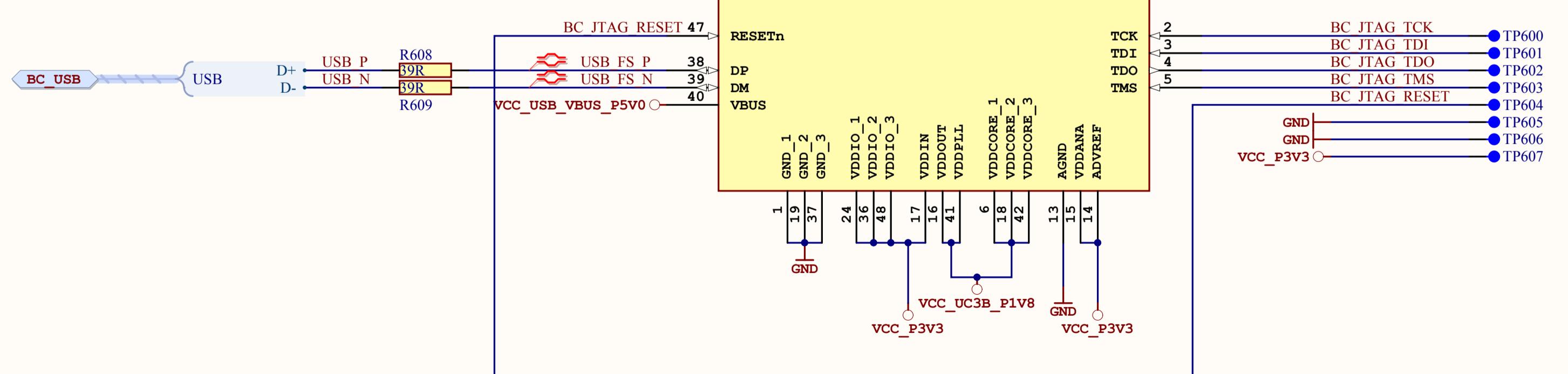
IBIS file (typical values):  
 $C_{comp} = 3.1 \text{ pF}$   
 $C_{pkg} = 0.2 \text{ pF}$

$C = 2 (C_L - C_i) - C_{comp}/2 - C_{pkg}/2$   
 $C = 2 (20 - 12) \text{ pF} - 1.5 \text{ pF} - 0.1 \text{ pF} = 14.6 \text{ pF}$

Load capacitance adjusted according to 18p after measurements on hardware.

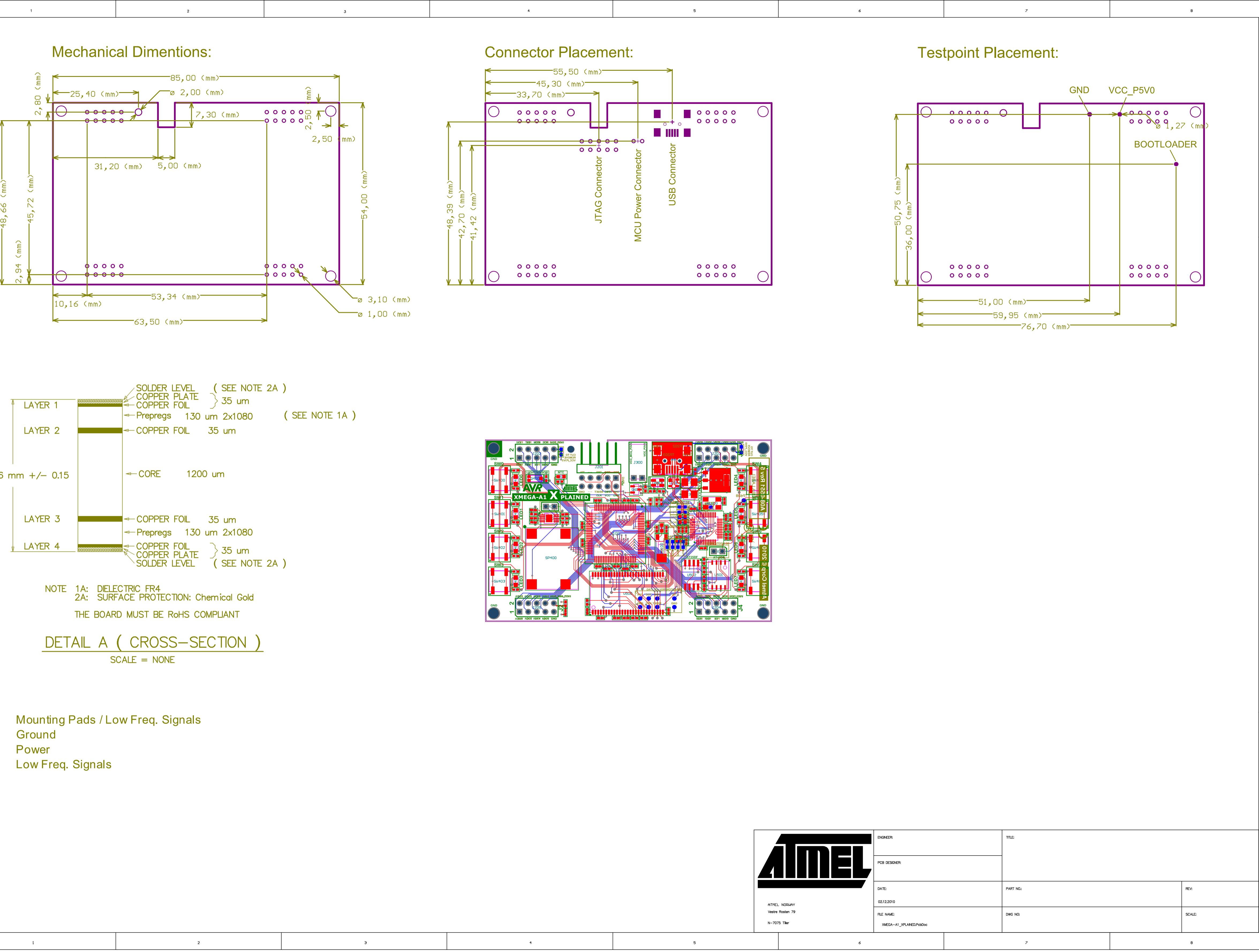


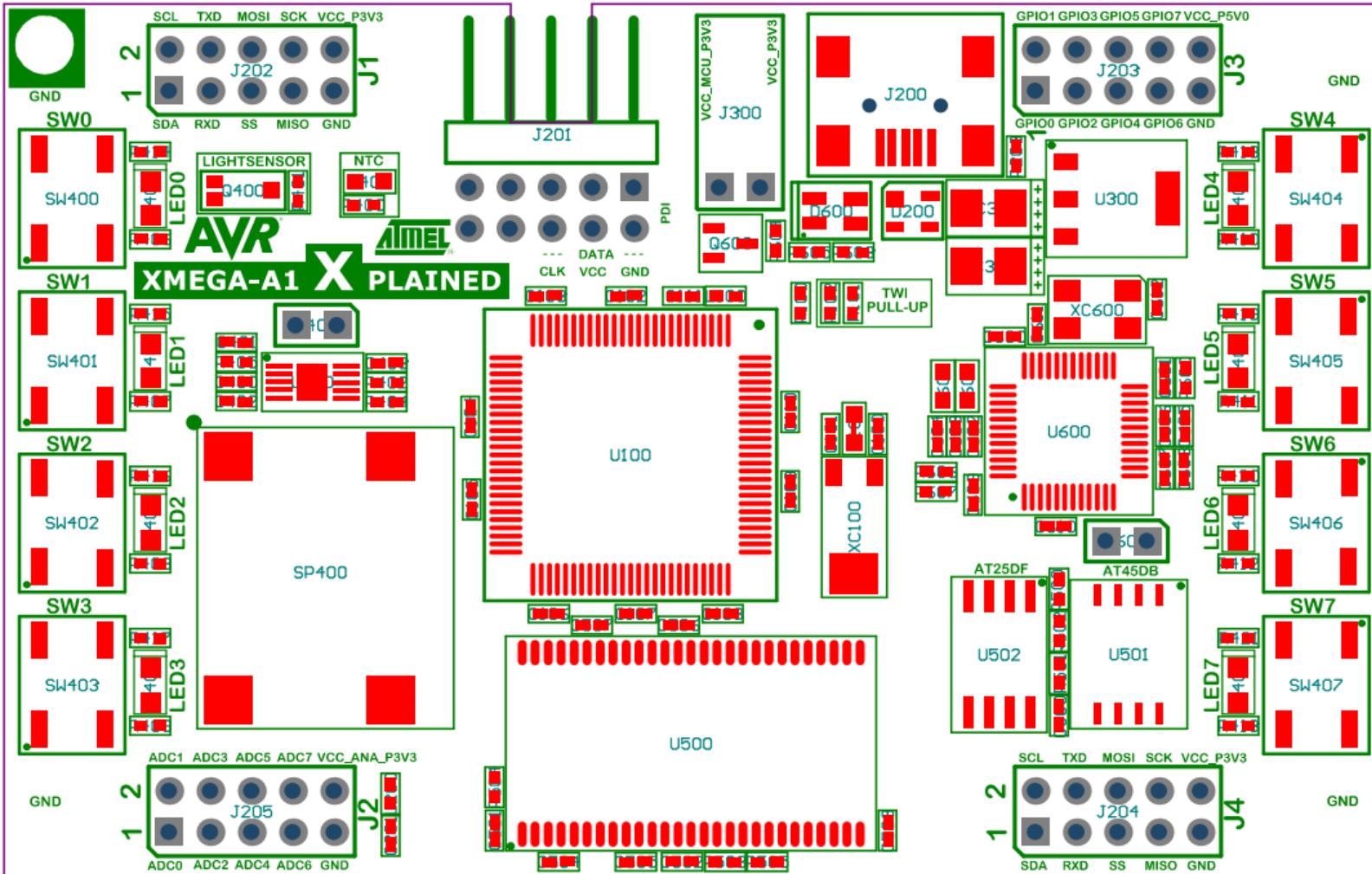
U600  
48 lead TQFP package  
AT32UC3B1256-AUT

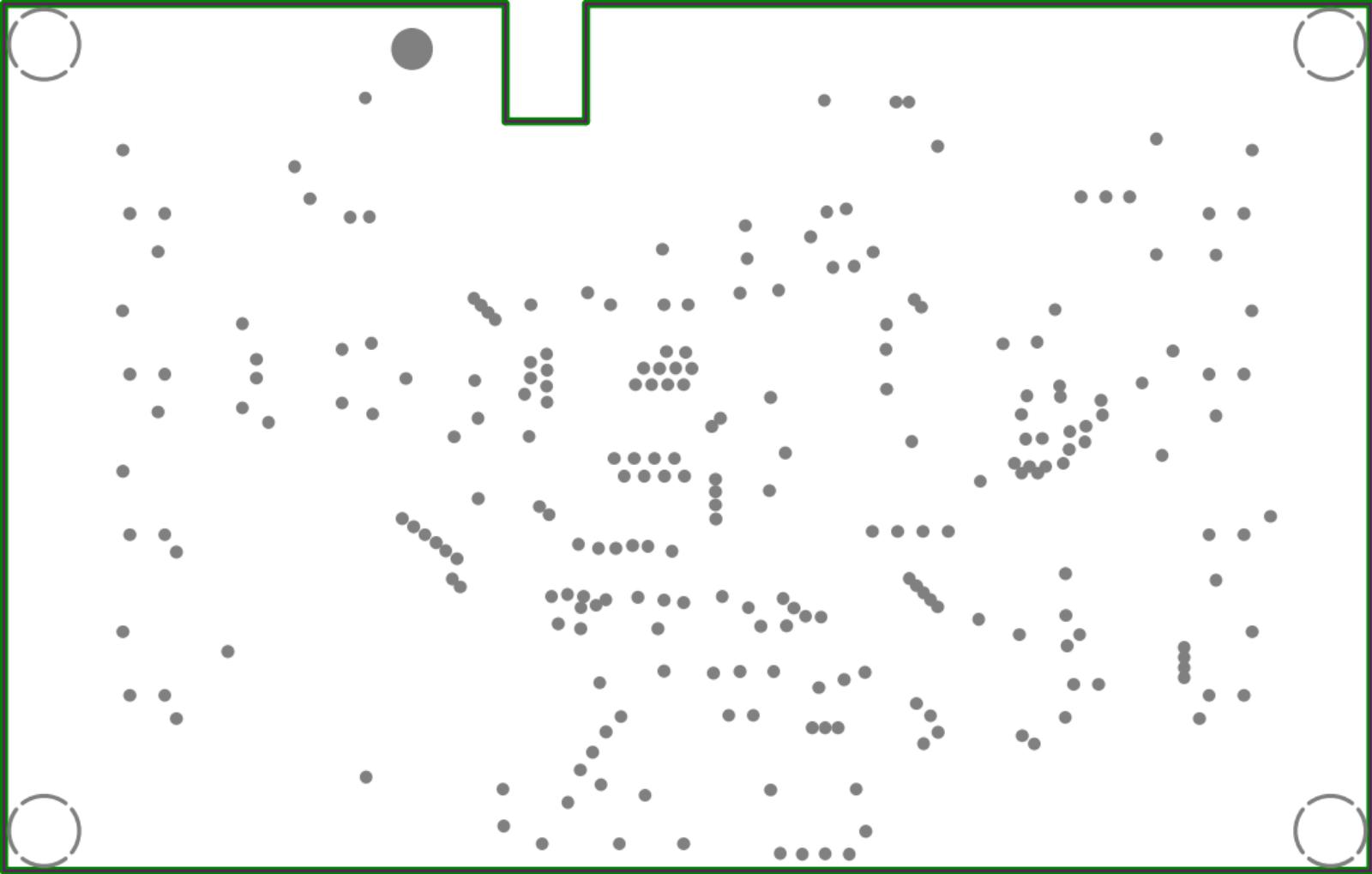


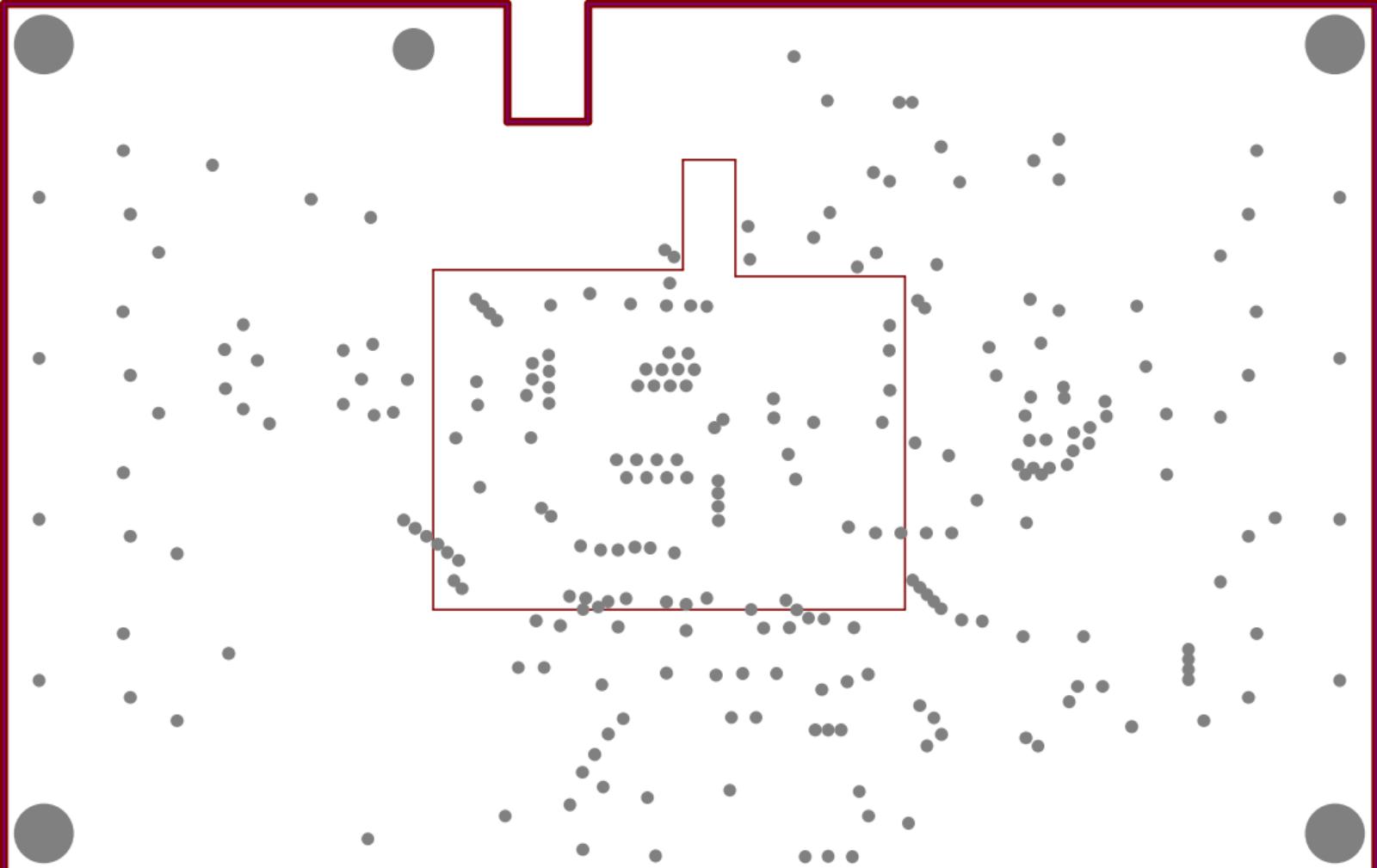
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Vestre Rosten 79	*	
N-7075 TILLER	*	
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Date:	02.12.2010	15:02:29
Document number:	7	Revision: 7
TITLE:	XMEGA-A1 XPLAINED	
XMEGA-A1_XPLAINED_Board_controller.SchDoc		













CUT TO  
REMOVE  
VCC\_P5V0

VCC\_P5V0 PR1 PD5 PD3 PD1

TP202  
TP200  
TP201  
TP203

GND PR0 PD4 PD2 PD0

PCBA LABEL

TP608

TP OSC

BC TWI STRAP  
PC0  
PC1  
PC2  
PC3

BC SPI STRAP  
PC4  
PC6  
PC5  
PC7

BC BOOTLOADER

VCC\_P3V3 PC7 PC5 PC3 PC1

GND PC6 PC4 PC2 PC0

VCC\_P3V3 PF7 PF5 PF3 PF1

CUT TO  
REMOVE  
VCC\_P3V3

GND PF6 PF4 PF2 PF0

TCK TDO TMS --- TDI

GND VCC RESET --- GND

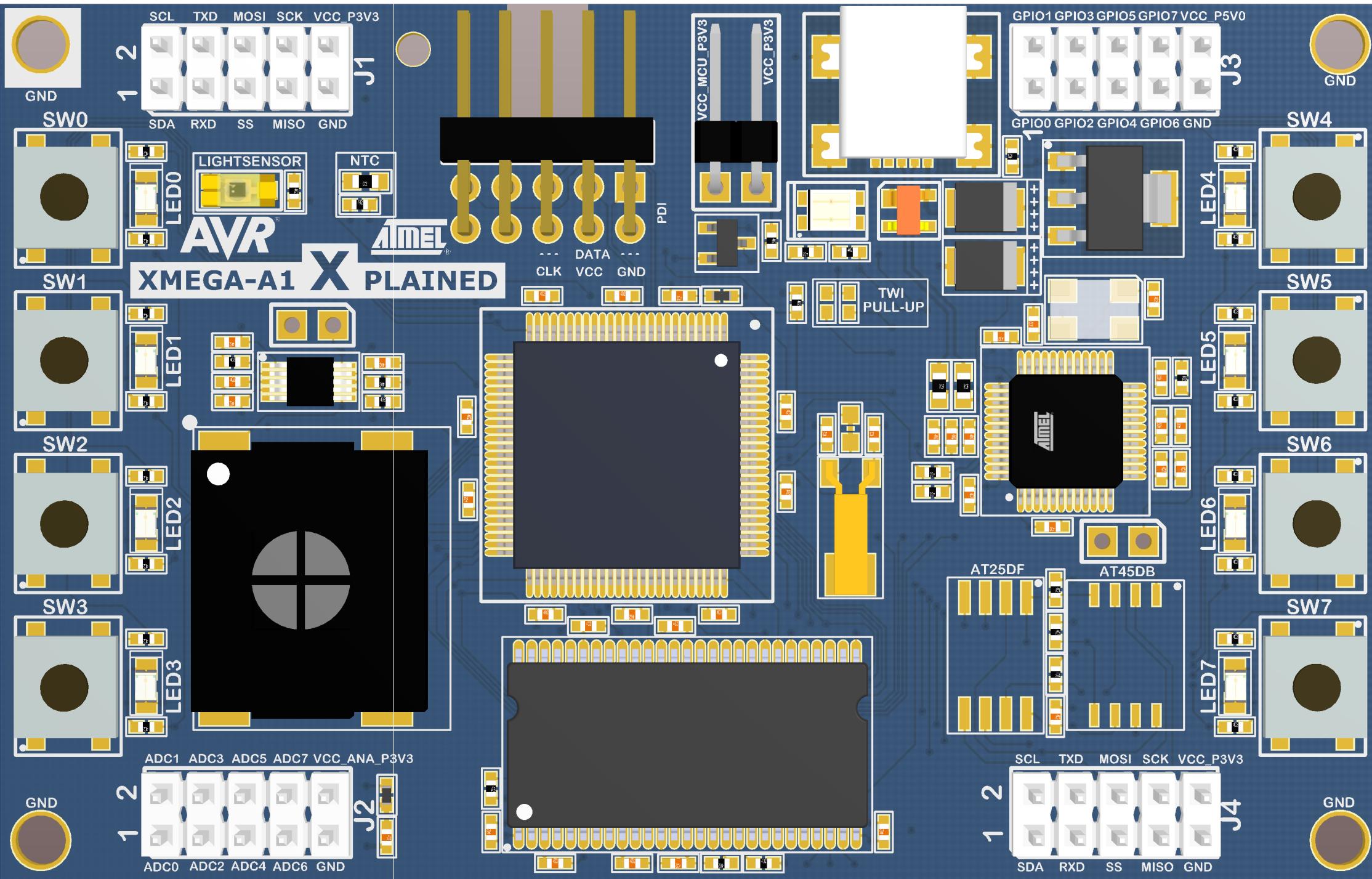
JTAG

SPEAKER OUTPUT  
+ -

BOARDCONTROLLER JTAG  
 TDI --- TMS TDO TCK  
 TP01 TP6 STR02 S00  
 GND --- RESET VCC GND  
 TP06 TP6 STR07 S05

VCC\_ANA\_P3V3 PA7 PA5 PA3 PA1

GND PA6 PA4 PA2 PA0





PCBA LABEL



TP202 TP200  
TP201 TP203

GND PR0 PD4 PD2 PD0

TP OSC

BC TWI STRAP  
PC0  
PC1  
PC2  
PC3

BC SPI STRAP  
PC4  
PC6  
PC5  
PC7

BC BOOTLOADER

VCC\_P3V3 PC7 PC5 PC3 PC1  
GND PC6 PC4 PC2 PC0



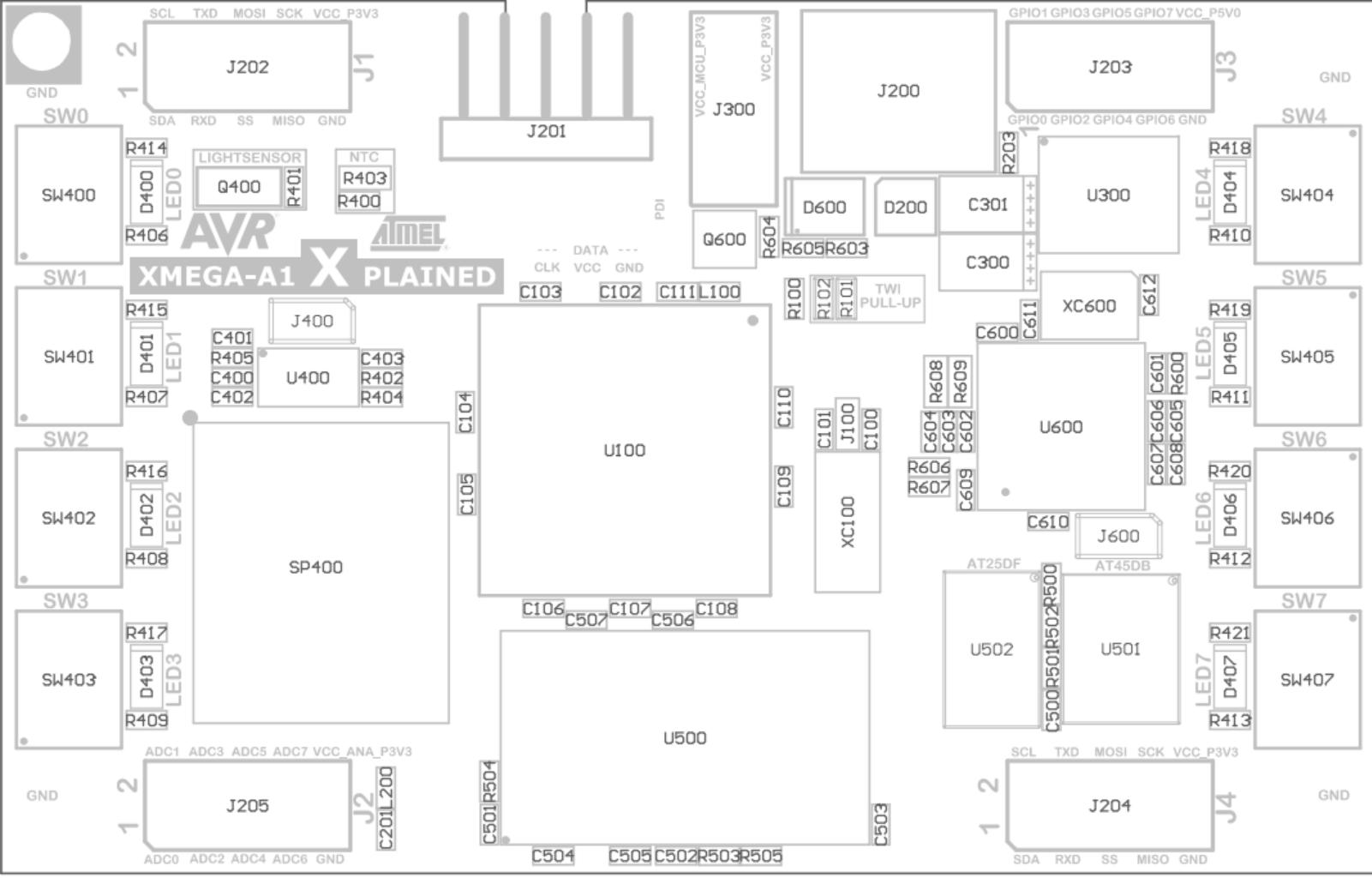
JTAG  
TCK TDO TMS --- TDI  
GND VCC RESET --- GND

VCC\_P3V3 PF7 PF5 PF3 PF1  
CUT TO REMOVE VCC\_P3V3

GND PF6 PF4 PF2 PF0

SPEAKER OUTPUT

VCC\_ANA\_P3V3 PA7 PA5 PA3 PA1  
GND PA6 PA4 PA2 PA0





A08-0551 Rev 5

PCBA LABEL

VCC\_P5V0 PR1 PD5 PD3 PD1  
J207

TP202 TP200

TP201 TP203

GND PR0 PD4 PD2 PD0

TP608

TP OSC  
J607

BC TWI STRAP  

J602	PC0
J601	PC1
J608	PC2
J609	PC3

  
 BC UART STRAP

BC BOOTLOADER

BC SPI STRAP  

J604	PC4
J603	PC6
J606	PC5
J605	PC7

VCC\_P3V3 PC7 PC5 PC3 PC1

BOARDCONTROLLER JTAG  
 TDI --- TMS TDO TCK  
**TP601 TP603TP602TP600**  
 GND --- RESET VCC GND  
**TP606 TP604TP607TP605**

GND PC6 PC4 PC2 PC0

VCC\_P3V3 PF7 PF5 PF3 PF1

CUT TO REMOVE  
VCC\_P3V3

J206

GND PF6 PF4 PF2 PF0

TCK TDO TMS --- TDI

GND VCC RESET --- GND

JTAG

SPEAKER OUTPUT

VCC\_ANA\_P3V3 PA7 PA5 PA3 PA1

GND PA6 PA4 PA2 PA0

# Component list

## XMEGA-A1 XPLAINED

Source Data From:

XMEGA-A1\_XPLAINED.PrbPcb

Project:

XMEGA-A1\_XPLAINED.PrbPcb

Variant:

No Dataflash



Report Date: 02.12.2010 15:03:01  
Print Date: 02.12.2010 15:02:51

#	Designator	Quantity	Value	Manufacturer	MPN	Description
1	C100, C101	2	8.2p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
2	C102, C103, C104, C105, C106 C107, C108, C109, C110, C111 C201, C500, C501, C502, C503 C504, C505, C506, C507, C600 C601, C607, C609	23	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
3	C300, C301	2	10uF/10V	Kemet	T491B106M010AT	SMD tantalum capacitor, precision molded chip, ESR = 3,5
4	C400, C401, C402, C403	4	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10%
5	C602, C606	2	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
6	C603, C610	2	22n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
7	C604	1	2.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
8	C605	1	470p			Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
9	C608	1	4.7uF	Murata	GRM155R60J475ME87D	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
10	C611, C612	2	18p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
11	D200	1	PRTR5V0U2X	Philips	PRTR5V0U2X	Double rail-to-rail USB ESD protection diode
12	D400, D401, D402, D403, D404 D405, D406, D407	8	EL17-21UYC/A2	Everlight	17-21UYC/S530-A3/TR8	LED, Yellow, Wave length=591nm, SMD 0805, +/-70°
13	D600	1	SML-020MLT	ROHM	SML-020MLT	LED, 2 colour (RED/GREEN), transparent clear lens, SMD
14	J200	1	MUSB-05-F-AB-SM-A	SAMTEC	MUSB-05-F-AB-SM-A	USB Mini-AB Connector, SMD
15	J201	1	2213R-10G	Multicomp	2213R-10G	Header, 2 Row, R/Angle, 10 Way
16	J202, J203, J204, J205	4	CD075014 2X5	Fréber	CD075014 2X5	2x5 pin header, 2.54 mm pitch, Pin-in-Paste THM
17	J300	1	Pin header 1x2 right angle	Pro-data International Corp	2213R-2G	1x2 pin header, right angle, 2.54 mm pitch, through-hole
18	JS200, JS300	2	SNT-100-BK-G	SAMTEC	SNT-100-BK-G	Jumper cap for 2.54mm pinheader
19	L100, L200	2	BLM15BB221SN1	Murata	BLM15BB221SN1	SMD RF inductor 0402, Z=220Ohm (@100MHz), Max R(dc)=0.80Ohm, Max current=200mA
20	LBL1	1	Label PCBA	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
21	PCB1	1	A08-0551		A08-0551	Xplain PCB, 4-layer, size 54mm x 85mm
22	Q400	1	TEM76000	vishay	TEM76000	light sensor
23	Q600	1	2N7002	Fairchild	2N7002	N-Channel MOSFET. 60V, 0.115A continuous, 0.8A Peak. RDS(ON) = 7.5Ohm@VGS=5.0V, VGS(th)<2V
24	R100, R401, R404, R405, R500 R501, R502, R503, R504, R505 R600	11	100k			Thick film resistor, SMD 0402, 1/16W, 1%
25	R203, R400, R604	3	1M	KOA	RK73H1ETTP1004F	Thick film resistor, SMD 0402, 1/16W, 1%
26	R402	1	30k			Thick film resistor, SMD 0402, 1/16W, 1%
27	R403	1	NCP18WF104J03RB	Murata	NCP18WF104J03RB	NTC Thermistor 100kOhm @ 25deg.1/10W, 5%, SMD 0603
28	R406, R407, R408, R409, R410 R411, R412, R413, R603, R605	10	220R			Thick film resistor, SMD 0402, 1/16W, 1%
29	R414, R415, R416, R417, R418 R419, R420, R421, R606, R607	10	330R			Thick film resistor, SMD 0402, 1/16W, 1%
30	R608, R609	2	39R	KOA	RK73H1JTTD39R0F	Thick film resistor, SMD 0603, 1/10W, 1%
31	SP400	1	NDT-03C	Star Micronics	NDT-03C	SMD Speaker, 0.5W, 15x15mm
32	SW400, SW401, SW402, SW40 SW404, SW405, SW406, SW40	8	SKRAALE010	ALPS	SKRAALE010	6.2x6.2 mm SMD tact switch
33	U100	1	ATxmega128A1-AU	ATMEL	ATxmega128A1-AU	AVR 8-bit RISC MCU
34	U300	1	LMS8117AMP-3.3	National Semiconductor	LMS8117AMP-3.3	3.3V 1A Low Dropout Linear Regulator SOT223_4
35	U400	1	TPA0253DGQR	Texas Instruments	TPA0253DGQR	1W mono audio power amplifier with headphone drive
36	U500	1	MT48LC16M4A2P-75:G	Micron	MT48LC16M4A2P-75:G	64Mbit SDRAM 16Mx4, 3.3V.
37	U600	1	AT32UC3B1256-AUT	ATMEL	AT32UC3B1256-AUT	AVR 32-bit RISC MCU
38	XC100	1	32.768kHz +/-20PPM 7pF SMD	Micro Crystal	MS1V-T1K 32.768kHz 7pF +/-20PPM TA	32k768 crystal, +/-20ppm, CL=7pF, max ESR 60kOhm, SMD
39	XC600	1	12.0MHz	Fox Electronics	FQ5032B-12-C-C-200-1 / 738B-12	Fox FQ5032B 12.0MHz SMD crystal 738B-12
		119				

Approved

Notes