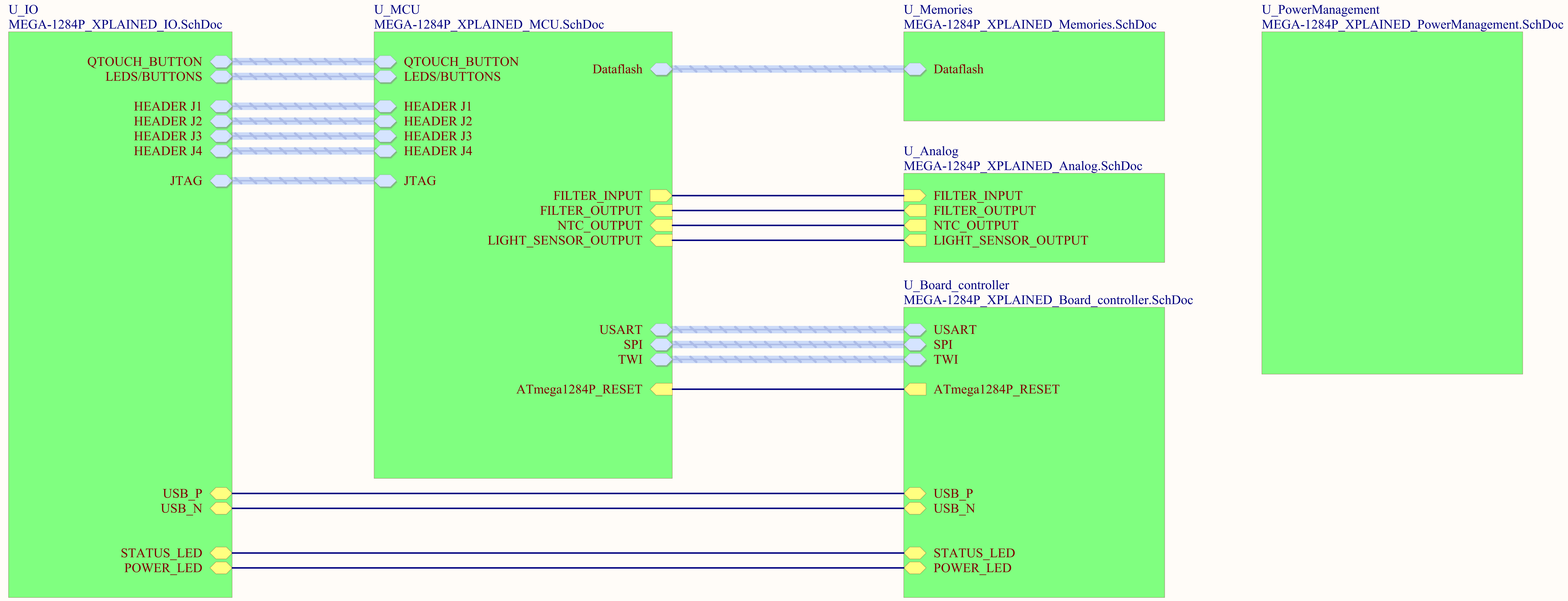


LABEL1

Product number/revision
Serial number

Label PCBA

PCB1

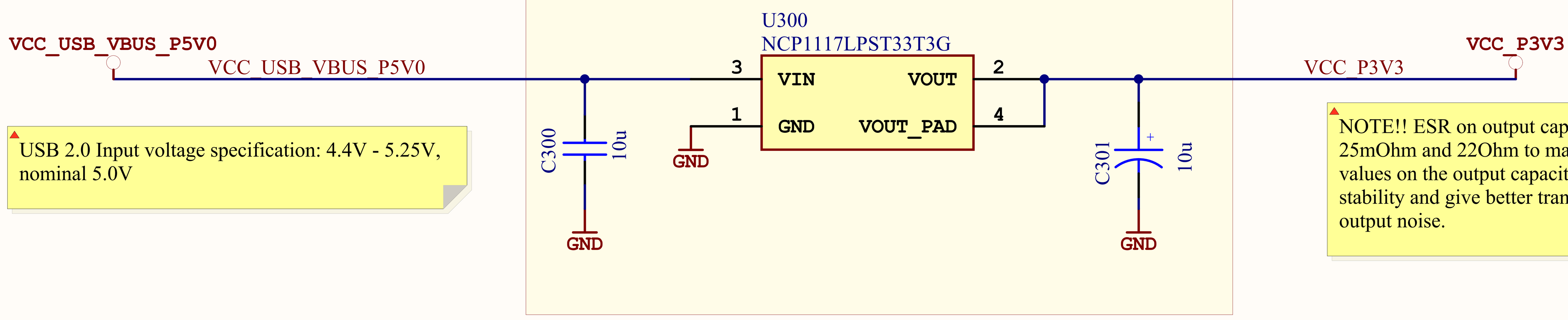
MEGA-1284P Xplained PCB, 4-layer, size 54mm x 85mm

ATMEL Norway	*			
Vestre Rosten 79	*			
N-7075 TILLER	*			
NORWAY				
Date:	29.03.2011	13:24:55	PAGE: 1 of 7	
Document number:	1		Revision:	4
TITLE: MEGA-1284P XPLAINED				
MEGA-1284P_XPLAINED_TopLevel.SchDoc				


LEDS/BUTTONS
HEADER J3
HEADER J2
U100
ATmega1284P-AUR
VCC_MCU_P3V3
This 0Ohm resistor is not mounted, shorting these pads will connect AREF to ADC0 if external reference on the AREF pin is used.
SPI
Dataflash
HEADER J1
HEADER J4
FILTER_OUTPUT
LIGHT_SENSOR_OUTPUT
NTC_OUTPUT
Close to AREF
AVCC_MCU_P3V3
This strap with SMD pads can be used to place a resistor in the XOUT signal in order to measure the drive level and the oscillator allowance.
By default this strap is closed and nothing is mounted on the pads.
32.768kHz crystal circuitry
Micro Crystal CC5V-T1A
XC100
J100
SMD-STRAP_CLOSED
Crystal datasheet:
Load capacitance CL = 7 pF
ESR 70kOhm Max.
Frequency tolerance +/-20ppm
Drive Level 1.0uW
ATmega1284P datasheet:
Internal capacitance on each TOSC pin is Ci = 6pF
Ce = 2CL - Ci - Cs
where:
Ce - is the external capacitance needed
Ci - is the pin capacitance
CL - is the load capacitance specified by the crystal vendor
Cs - is the total stray capacitance
Cs is assumed to be <1pF and can be ignored
The estimated external capacitance needed can then be calculated:
Ce = 2*7pF - 6pF
Ce = 8pF
Ce 8.2pF
Crystal datasheet:
Load capacitance CL = 10 pF
ATmega1284P IBIS files:
Internal capacitance on each XTAL pin is Cixtall = 4.3pF & Cixtal2 = 8.6pF
Cetot = Ci + Ce
Cetot1 = Cixtall + Ce1
Cetot2 = Cixtal2 + Ce2
To balance the external load Cetot1 has to be equal to Cetot2. Specifying Ce1 = 15pF (C5) resulting in:
Cetot1 = 4.3pF + 15pF, Cetot1 = 19.3pF
Ce2 = 19.3pF - 8.6pF
Ce2 = 10.7pF, Ce12pF (C4)
We need a crystal with CL:
CL = (Cetot1*Cetot2)/(Cetot1+Cetot2)
CL = (19.3pF*20.6pF)/(19.3pF+20.6pF)
CL = 9.96pF, CL10pF
Cetot - is the total capacitance seen from the crystal
Ce - is the external capacitance needed
Ci - is the pin capacitance
CL - is the load capacitance specified by the crystal vendor
Cs - is the total stray capacitance(ignored)
11.0592MHz crystal circuitry
SMD-STRAP_CLOSED
XC101
11.0592 MHz
TWI Pull-Ups (Not mounted)
VCC_P3V3
JTAG
ATmega1284P_RESET
USART
FILTER_INPUT
QTOUCH_BUTTON
TWI
Reset button
D100
SCHOTTKY_SMD_31
BAT54
SKRAAKE010
SW100
Place this decoupling capacitor close to the RESET pin of the ATmega1284P device.
Close to VCC/GND Pair
Close to VCC/GND Pair
Close to VCC/GND Pair
Close to AVCC/GND
L100
BLM18HE152SN1
ATMEL Norway
Vestre Rosten 79
N-7075 TILLER
NORWAY
Date: 29.03.2011 13:24:55
PAGE: 2 of 7
Document number: 2
Revision: 4
TITLE: MEGA-1284P XPLAINED
MEGA-1284P_XPLAINED_MCU.SchDoc

ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	29.03.2011	13:24:55	PAGE: 3 of 7
Document number:	3		Revision: 4
TITLE: MEGA-1284P XPLAINED			
MEGA-1284P_XPLAINED_IO.SchDoc			

3.3V linear regulator with input range from - 4.4V - 18V

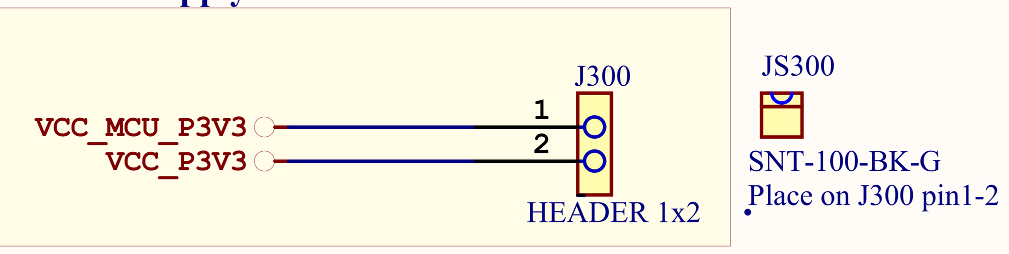


USB 2.0 Input voltage specification: 4.4V - 5.25V, nominal 5.0V

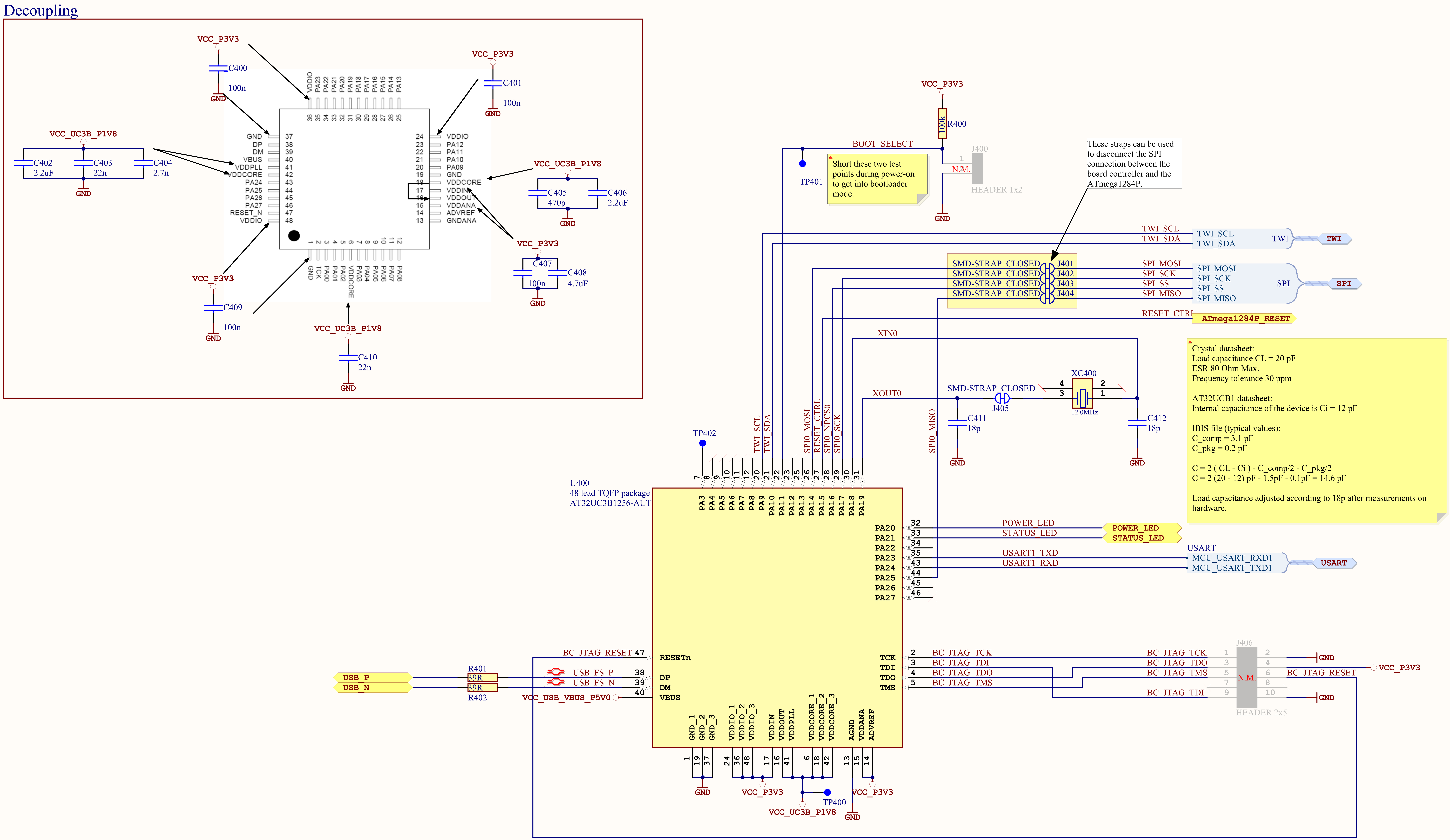
NOTE!! ESR on output capacitor should be between 25mOhm and 22Ohm to maintain stable regulation. Higher values on the output capacitor will also improve loop stability and give better transient response which reduces output noise.

This regulator can handle up to 18V input voltage and maximum 1.0A load current, with a maximum voltage drop of 1.4V. The output voltage is 3.3V ± 2%. The maximum quiescent current is 700µA. NOTE!! that worst-case output voltage may drop down to 3.0V with 4.4V input voltage.

CPU Power Supply Measurement Header

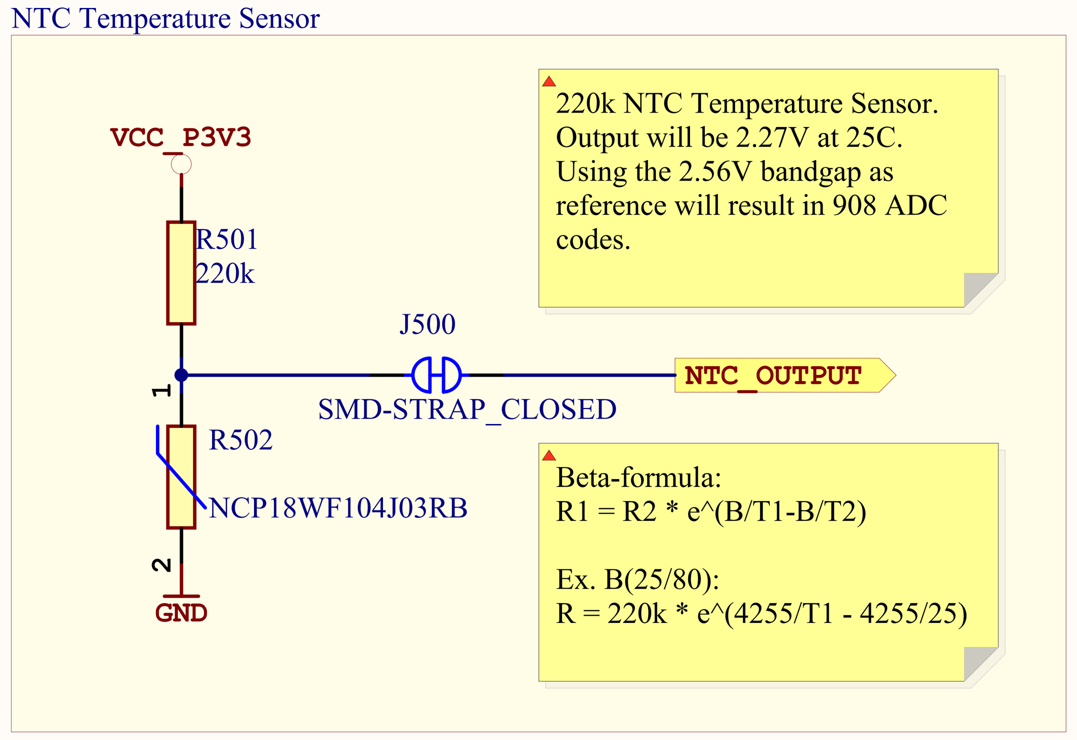


ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	29.03.2011	13:24:55	PAGE: 4 of 7
Document number:	4		Revision: 4
TITLE: MEGA-1284P XPLAINED			
MEGA-1284P_XPLAINED_PowerManagement.SchDoc			

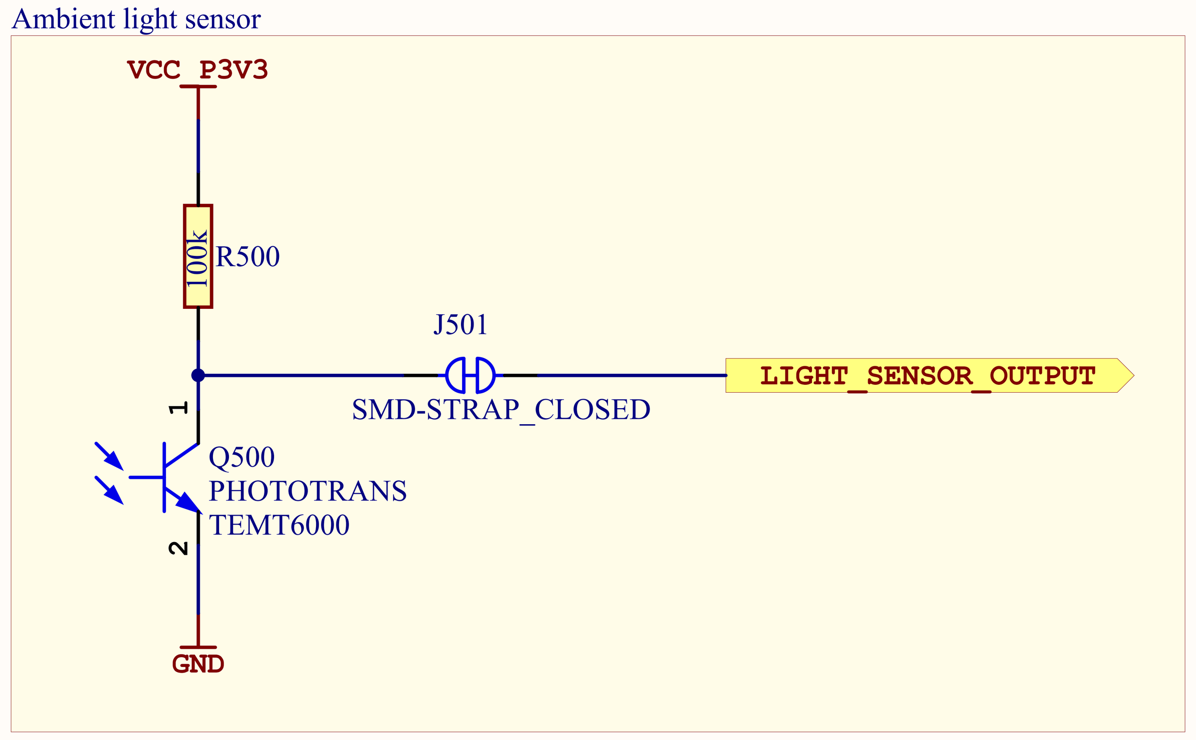


ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	29.03.2011	13:24:56	PAGE: 5 of 7
Document number:	5		Revision: 4
TITLE: MEGA-1284P XPLAINED			
MEGA-1284P_XPLAINED_Board_controller.SchDoc			

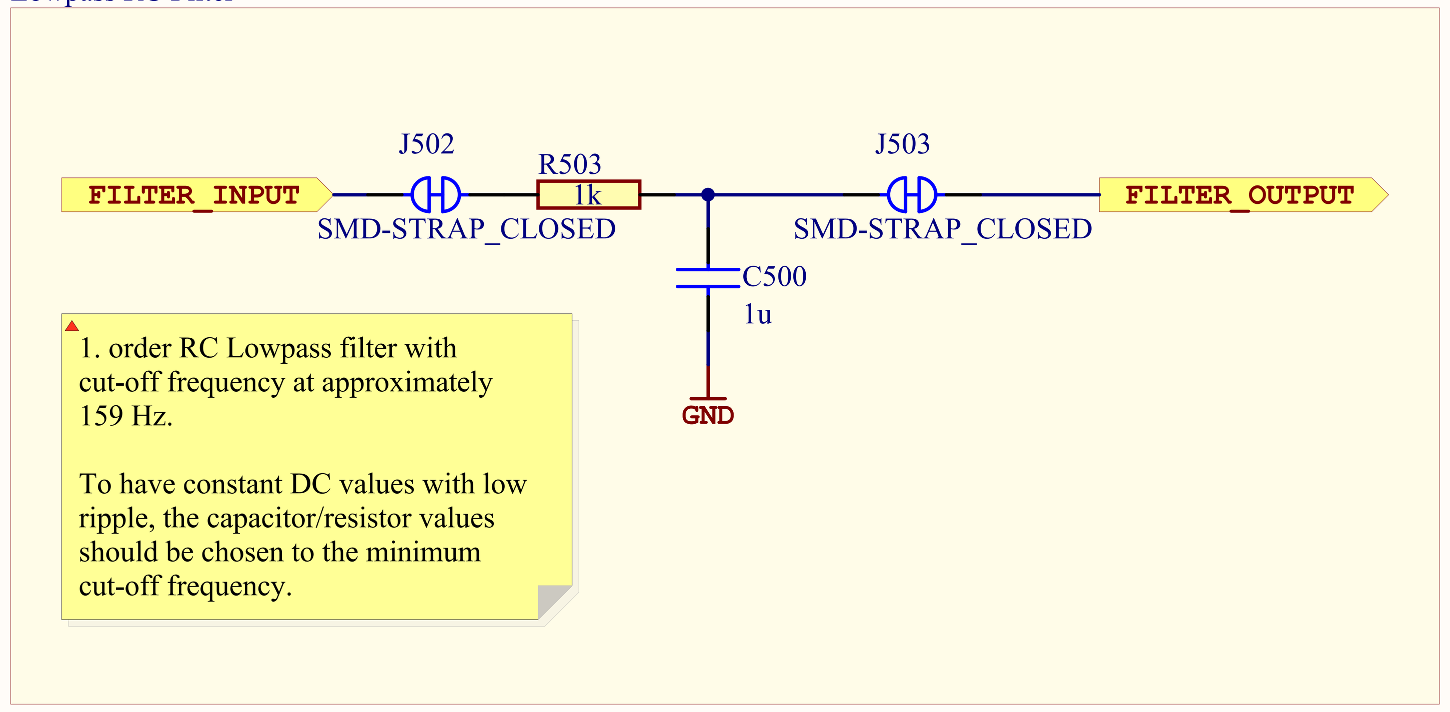
NTC Temperature Sensor



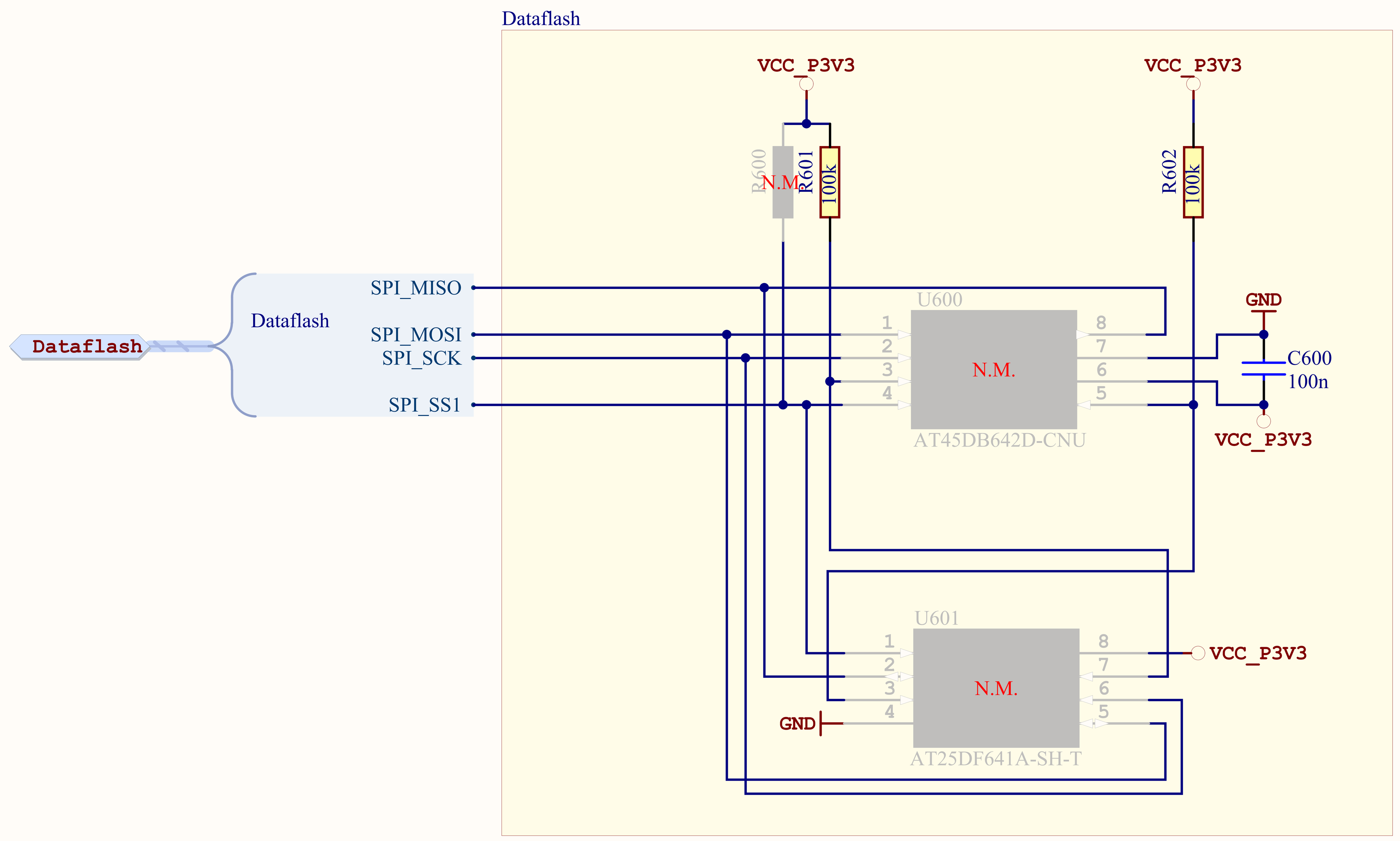
Ambient light sensor



Lowpass RC Filter

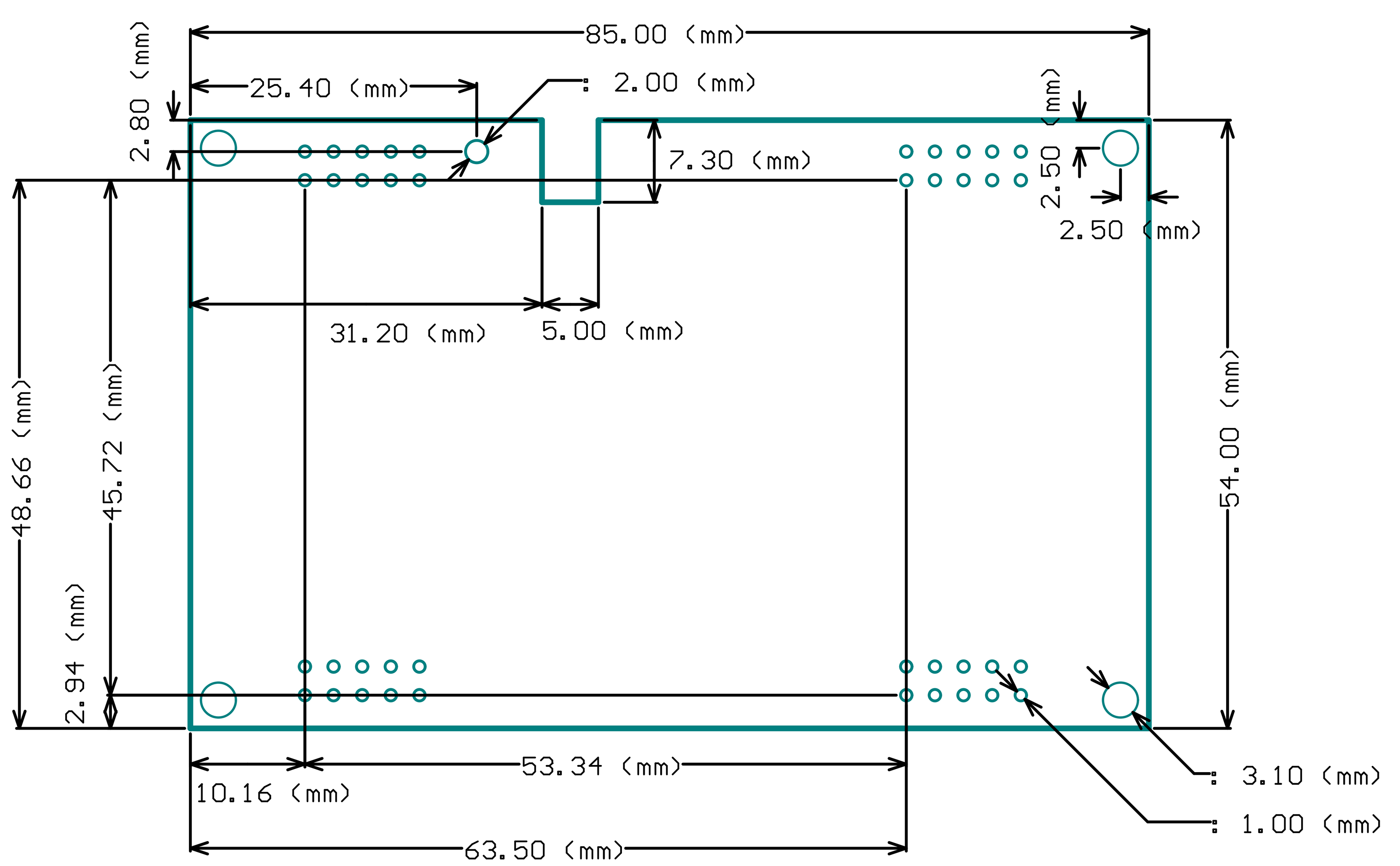


ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	29.03.2011	13:24:56	PAGE: 6 of 7
Document number:	6		Revision: 4
TITLE: MEGA-1284P XPLAINED			
MEGA-1284P_XPLAINED_Analog.SchDoc			

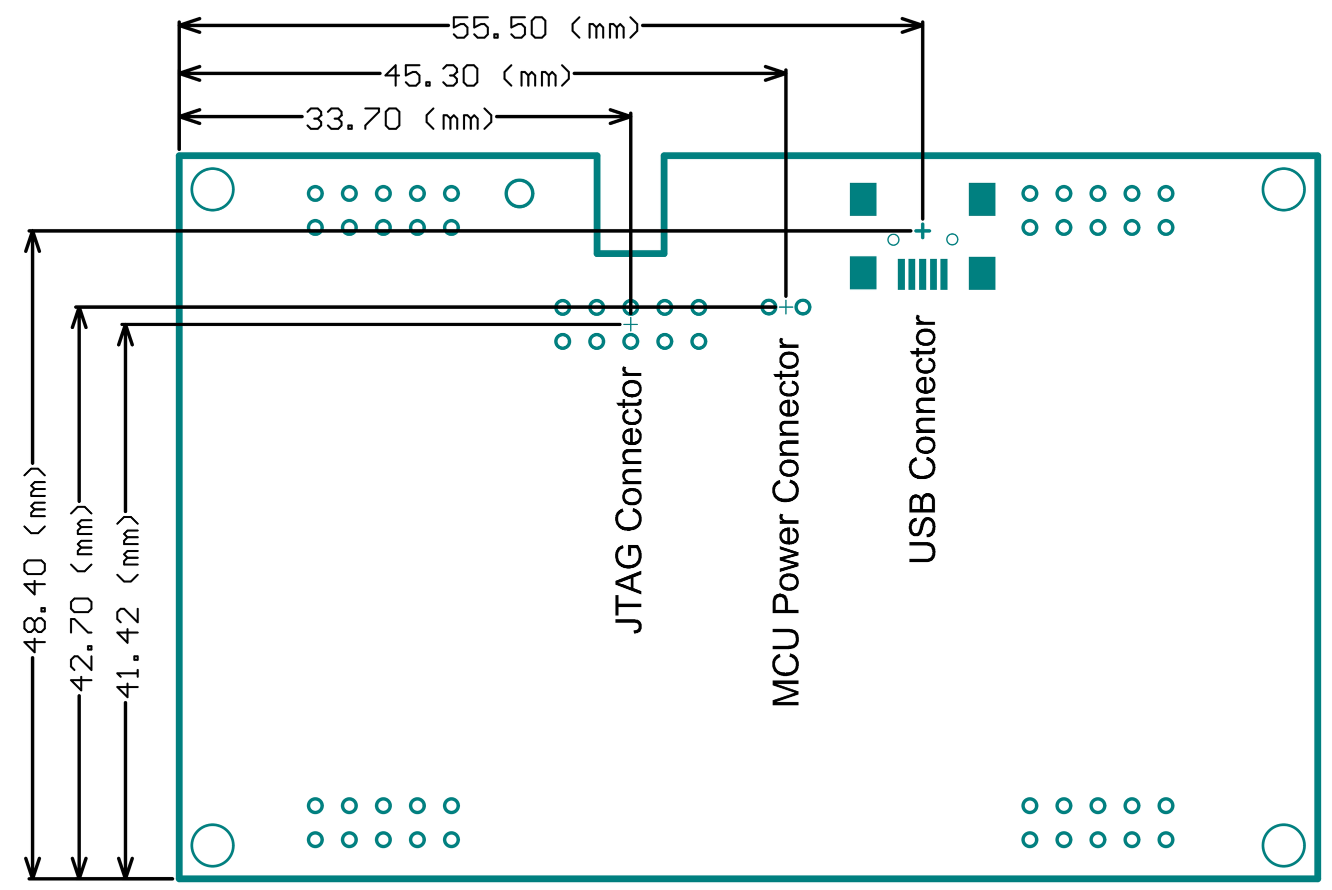


ATMEL Norway	*			
Vestre Rosten 79	*			
N-7075 TILLER	*			
NORWAY				
Date:	29.03.2011	13:24:56	PAGE:	7 of 7
Document number:	7		Revision:	4
TITLE: MEGA-1284P XPLAINED				
MEGA-1284P_XPLAINED_Memories.SchDoc				

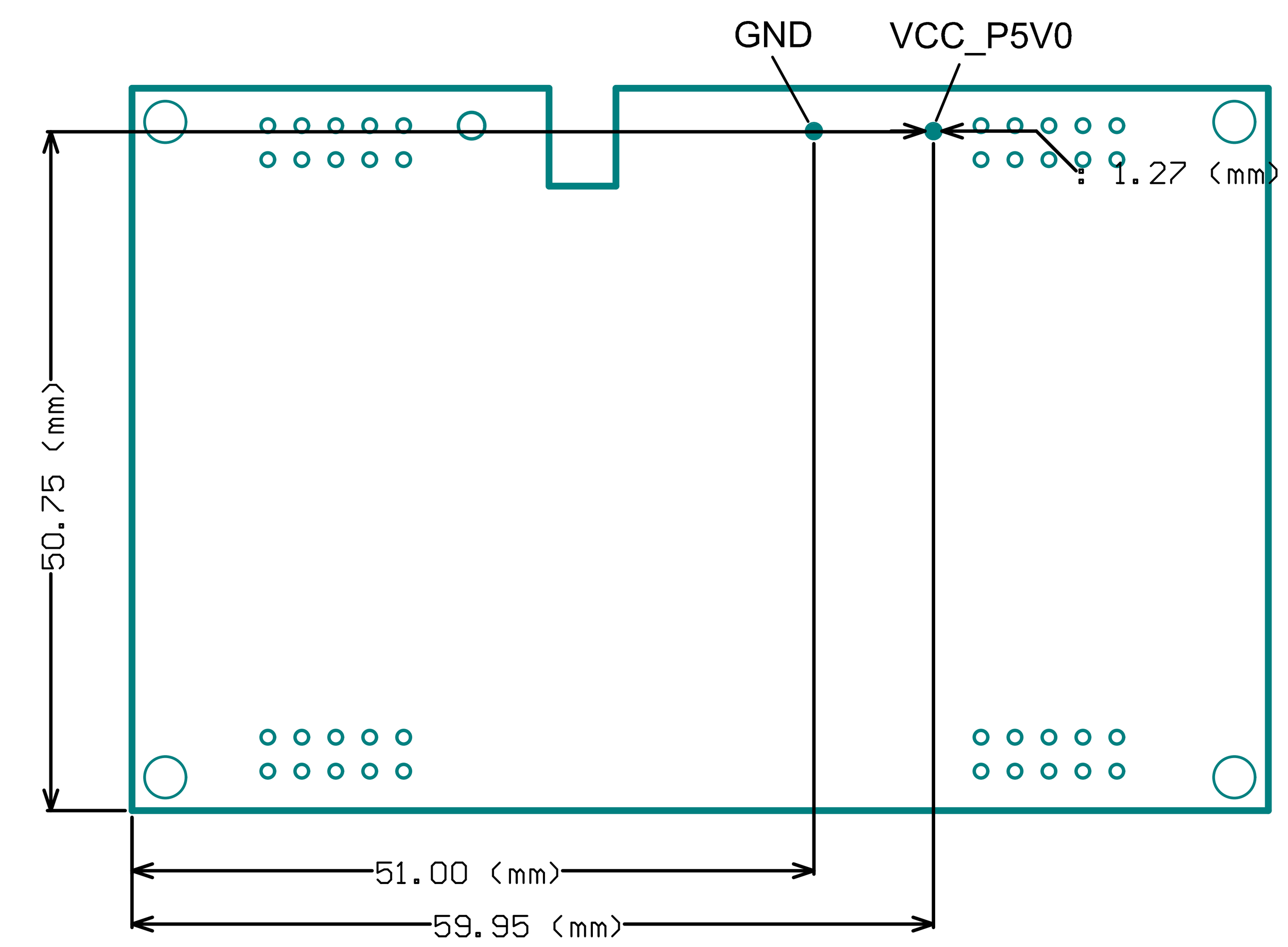
Mechanical Dimentions:

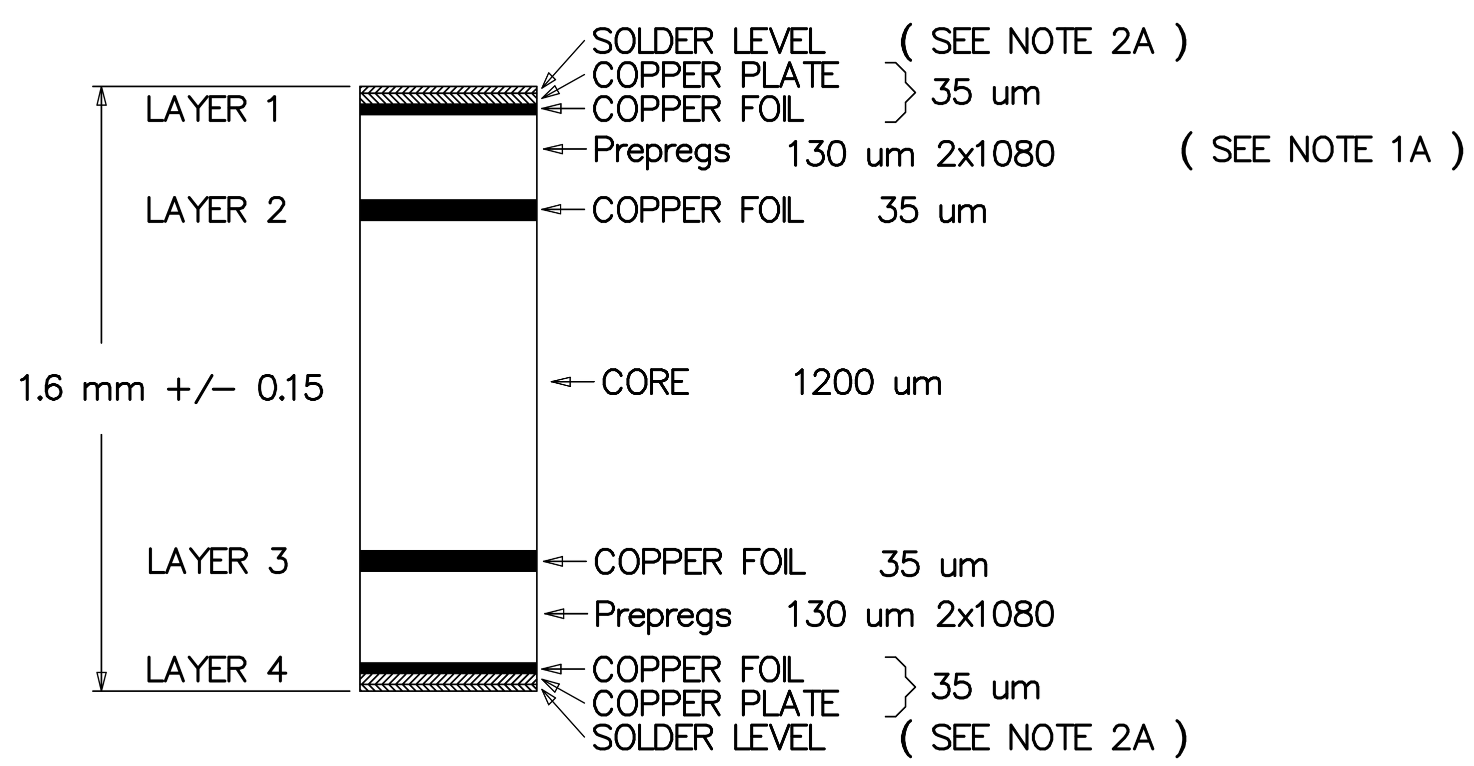


Connector Placement:



Testpoint Placement:



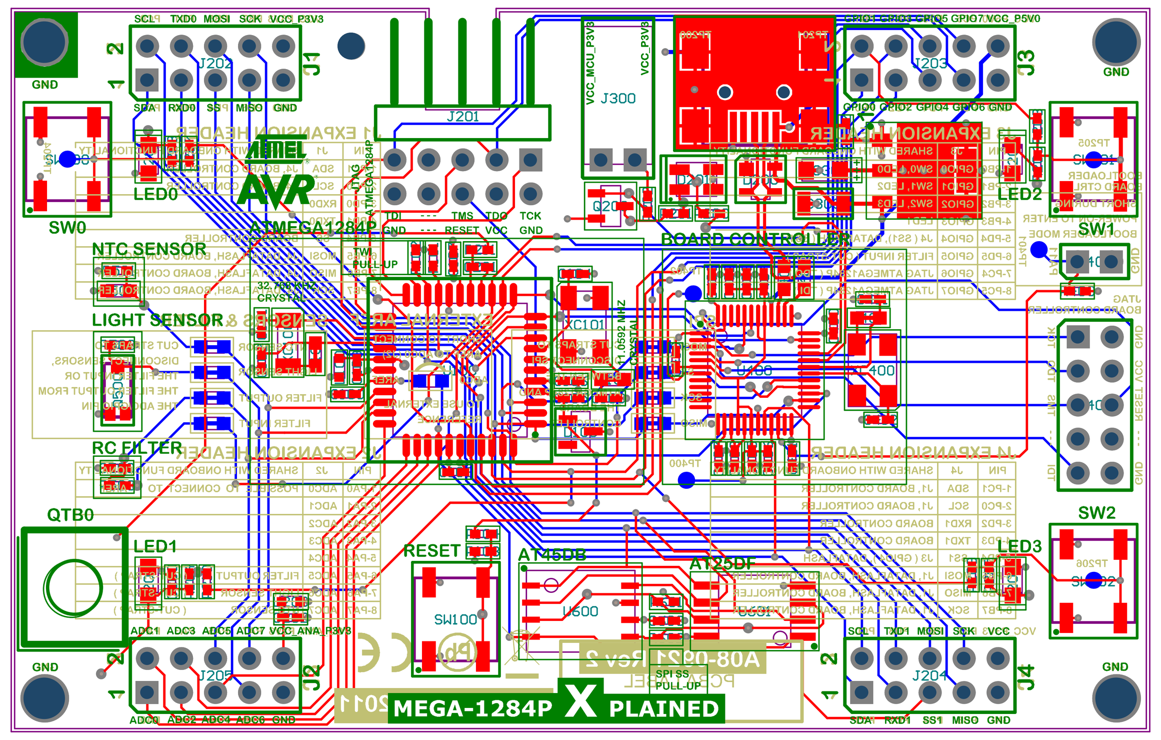


NOTE 1A: DIELECTRIC FR4
2A: SURFACE PROTECTION: Chemical Gold

THE BOARD MUST BE RoHS COMPLIANT

DETAIL A (CROSS-SECTION)

SCALE = NONE

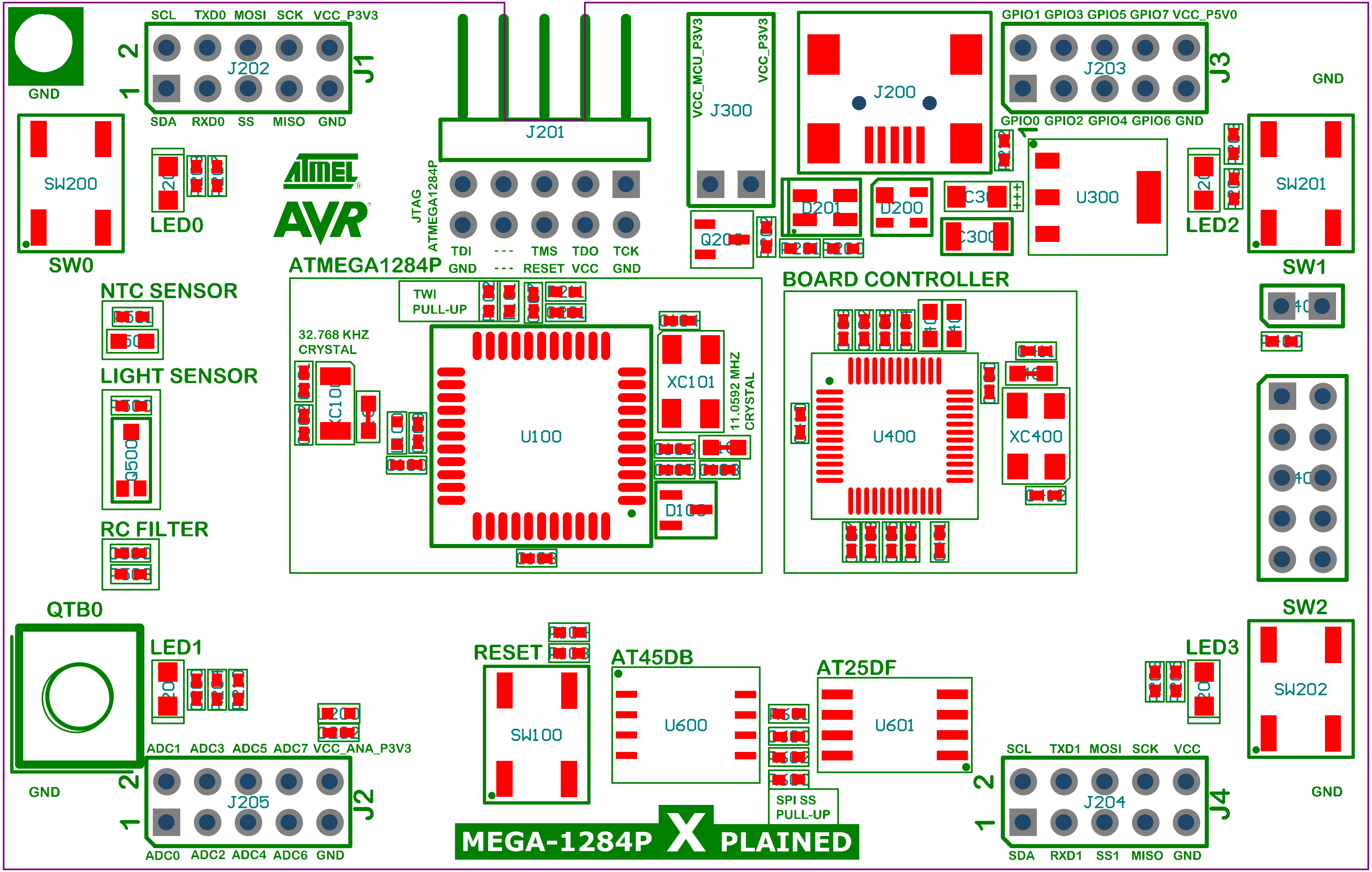


L1 Mounting Pads / Low Freq. Signals
L2 Ground
L3 Power
L4 Low Freq. Signals

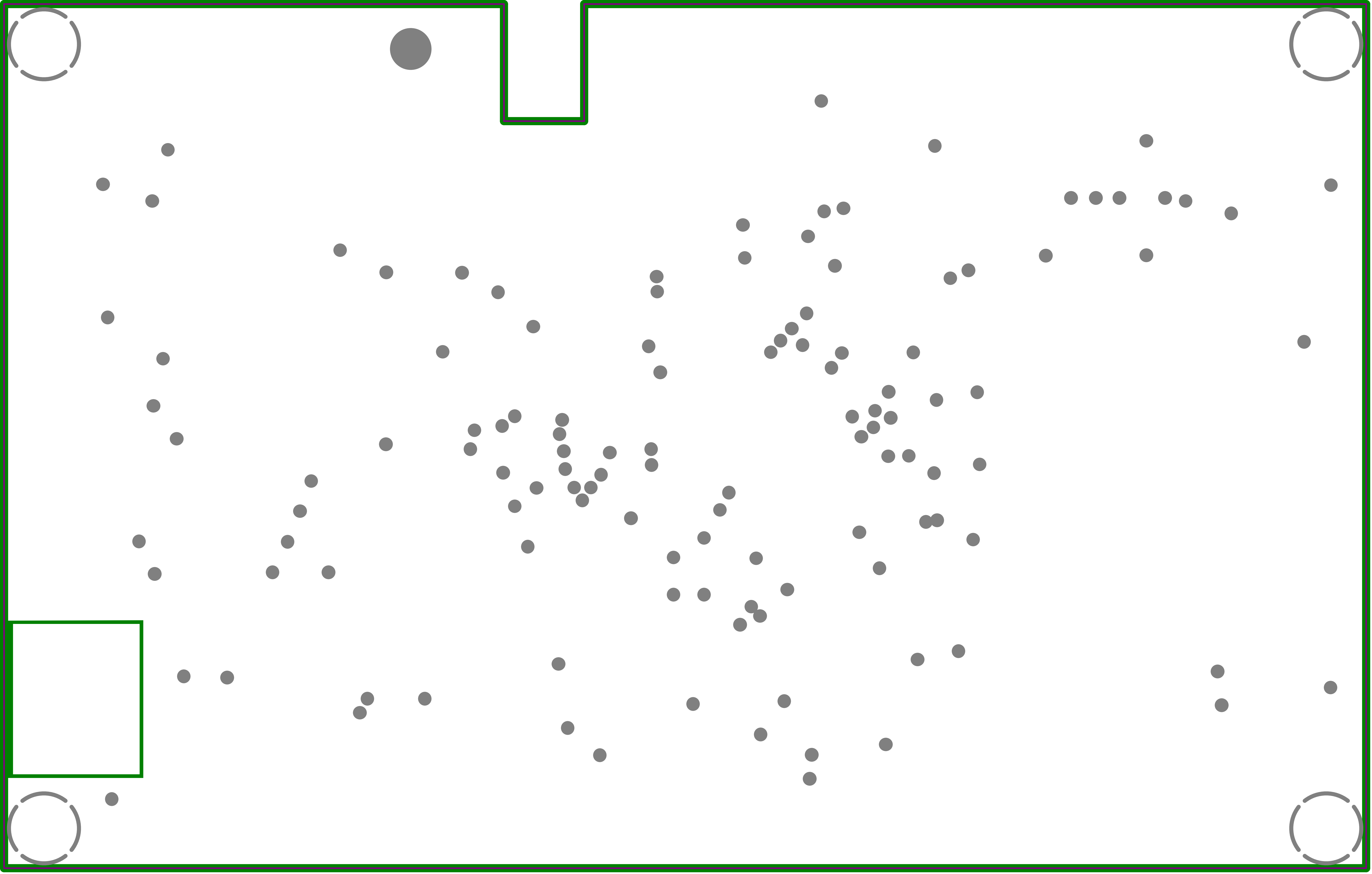
ATMEL

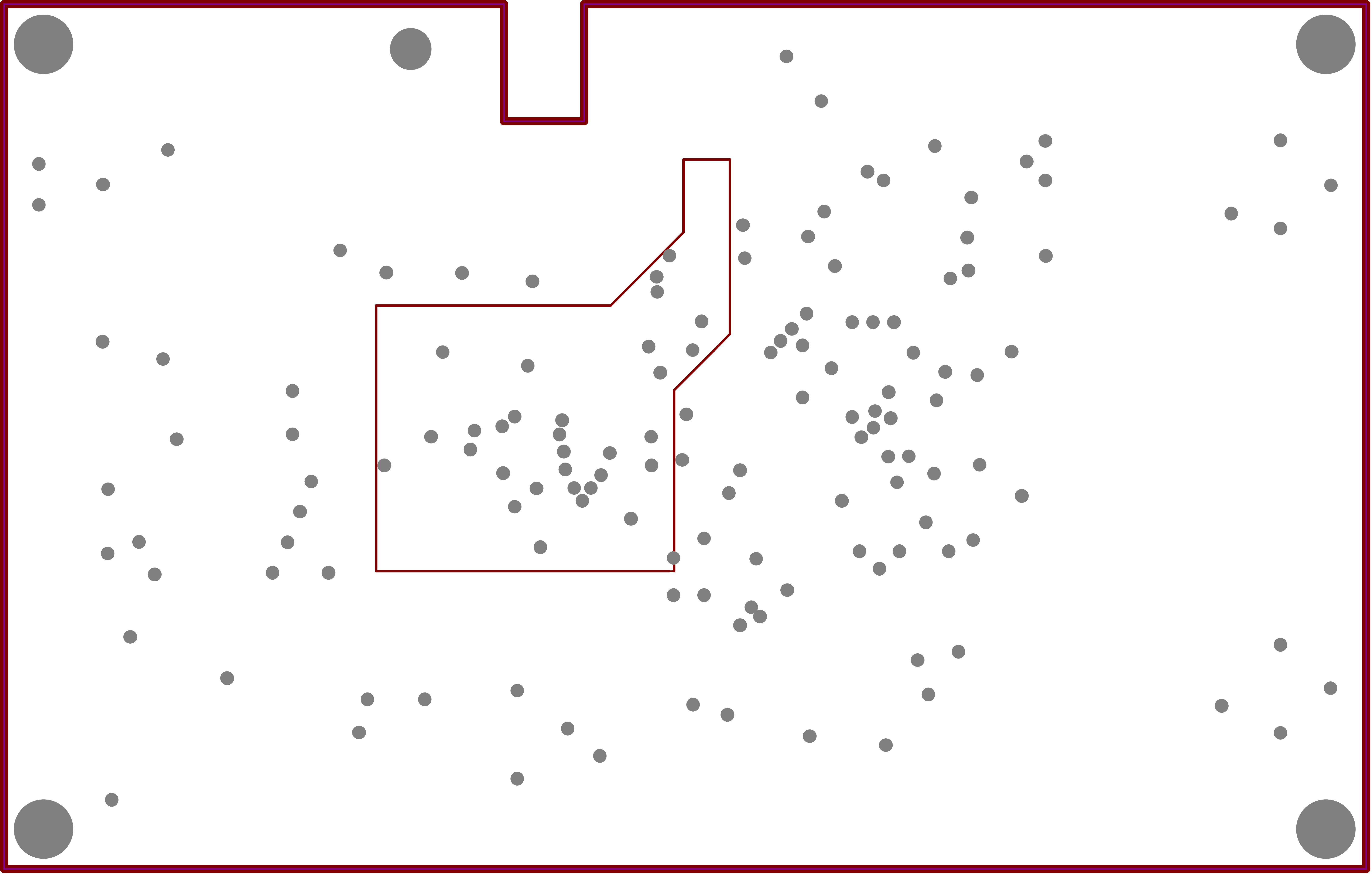
ATMEL NORWAY
Vestre Rosten 79
N-7075 Tiler

ENGINEER:	TITLE:		
PCB DESIGNER:			
DATE: 29.03.2011	PART NO:		REV:
FILE NAME: MEGA-1284P_XPLAINED.PcbDoc	DWG NO:		SCALE:



GND
SCL TXD0 MOSI SCK VCC_P3V3
J202
J1
SDA RXD0 SS MISO GND
J201
VCC_MCU_P3V3
VCC_P3V3
J300
J200
GPIO1 GPIO3 GPIO5 GPIO7 VCC_P5V0
J203
J3
GPIO0 GPIO2 GPIO4 GPIO6 GND
GND
SW200
LED0
SW0
ATMEL
AVR
JTAG
ATMEGA1284P
TDI --- TMS TDO TCK
GND --- RESET VCC GND
Q200
D201
D200
U300
LED2
SW201
SW1
ATMEGA1284P
NTC SENSOR
TWI PULL-UP
32.768 KHZ CRYSTAL
XC100
U100
XC101
11.0592 MHZ CRYSTAL
D100
BOARD CONTROLLER
U400
XC400
LIGHT SENSOR
Q500
RC FILTER
QTB0
LED1
RESET
AT45DB
AT25DF
SW100
U600
U601
SW2
LED3
SW202
ADC1 ADC3 ADC5 ADC7 VCC_ANA_P3V3
GND
J205
J2
ADC0 ADC2 ADC4 ADC6 GND
SPI SS PULL-UP
MEGA-1284P X PLAINED
SCL TXD1 MOSI SCK VCC
J204
J4
SDA RXD1 SS1 MISO GND
GND





VCC_P5V0 PC5 PD5 PB3 PB1

J3

GND PC4 PD4 PB2 PB0

GND

TP201 TP200

VCC_P3V3 PB7 PB5 PD1 PC0

J1

GND PB6 PB4 PD0 PC1

GND

J3 EXPANSION HEADER

PIN	J3	SHARED WITH ONBOARD FUNCTIONALITY
1-PB0	GPIO0	SW0, LED0
2-PB1	GPIO1	SW1, LED2
3-PB2	GPIO2	SW2, LED3
4-PB3	GPIO3	LED1
5-PD4	GPIO4	J4 (SS1), DATAFLASH (SS1)
6-PD5	GPIO5	FILTER INPUT (CUT-STRAP)
7-PC4	GPIO6	JTAG ATMEGA1284P (TDO)
8-PC5	GPIO7	JTAG ATMEGA1284P (TDI)

J1 EXPANSION HEADER

PIN	J1	SHARED WITH ONBOARD FUNCTIONALITY
1-PC1	SDA	J4, BOARD CONTROLLER
2-PC0	SCL	J4, BOARD CONTROLLER
3-PD0	RXD0	
4-PD1	TXD0	
5-PB4	SS	BOARD CONTROLLER
6-PB5	MOSI	J4, DATAFLASH, BOARD CONTROLLER
7-PB6	MISO	J4, DATAFLASH, BOARD CONTROLLER
8-PB7	SCK	J4, DATAFLASH, BOARD CONTROLLER

TP205 TP204

BOOTLOADER
BOARD CTRL

SHORT DURING
POWER-ON TO ENTER
BOOTLOADER MODE

GND PA1 TP401

TP402

JTAG
BOARD CONTROLLER

GND VCC RESET ... GND

TCK TDO TMS ... TDI

SPI

MOSI
SS
SCK
MISO

CUT STRAPS TO DISCONNECT SPI BETWEEN THE ATMEGA1284P AND THE BOARD CONTROLLER

EXTERNAL AREF

SHORT TO CONNECT AREF TO ADC0 (J2)

ADC0 AREF

TO USE EXTERNAL REFERENCE

SENSORS & FILTER

NTC SENSOR
LIGHT SENSOR
FILTER OUTPUT
FILTER INPUT

CUT STRAPS TO DISCONNECT SENSORS, THE FILTER INPUT OR THE FILTER OUTPUT FROM THE ADC/GPIO PIN

J4 EXPANSION HEADER

PIN	J4	SHARED WITH ONBOARD FUNCTIONALITY
1-PC1	SDA	J1, BOARD CONTROLLER
2-PC0	SCL	J1, BOARD CONTROLLER
3-PD2	RXD1	BOARD CONTROLLER
4-PD3	TXD1	BOARD CONTROLLER
5-PD4	SS1	J3 (GPIO4), DATAFLASH
6-PB5	MOSI	J1, DATAFLASH, BOARD CONTROLLER
7-PB6	MISO	J1, DATAFLASH, BOARD CONTROLLER
8-PB7	SCK	J1, DATAFLASH, BOARD CONTROLLER

TP400

J2 EXPANSION HEADER

PIN	J2	SHARED WITH ONBOARD FUNCTIONALITY
1-PA0	ADC0	POSSIBLE TO CONNECT TO AREF
2-PA1	ADC1	
3-PA2	ADC2	
4-PA3	ADC3	
5-PA4	ADC4	
6-PA5	ADC5	FILTER OUTPUT (CUT-STRAP)
7-PA6	ADC6	LIGHT SENSOR (CUT-STRAP)
8-PA7	ADC7	NTC SENSOR (CUT-STRAP)

TP206

VCC_P3V3 PB7 PB5 PD3 PC0

GND

J4

GND PB6 PD4 PD2 PC1

A08-0921 Rev 2

PCB LABEL

LABEL1

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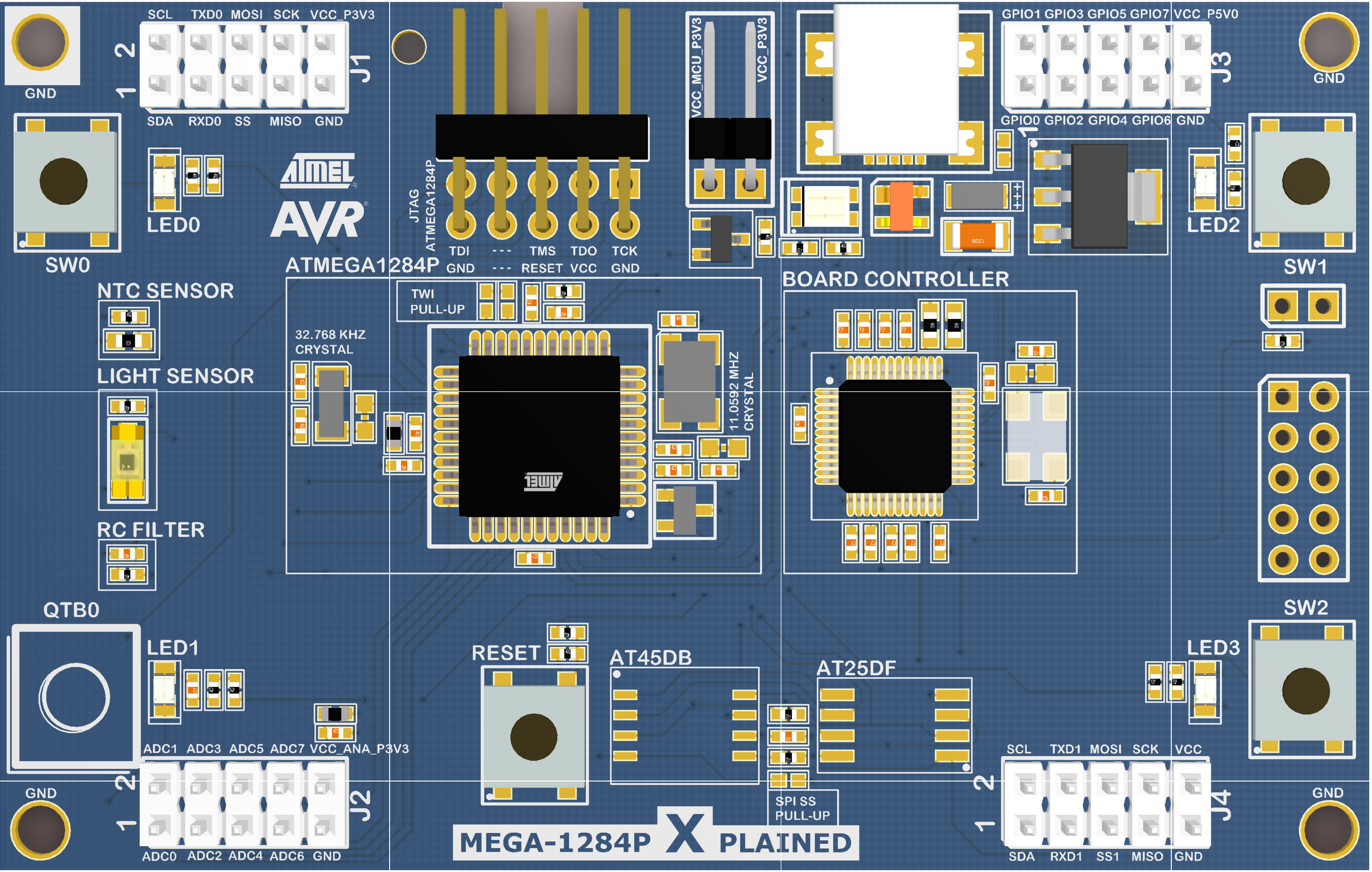
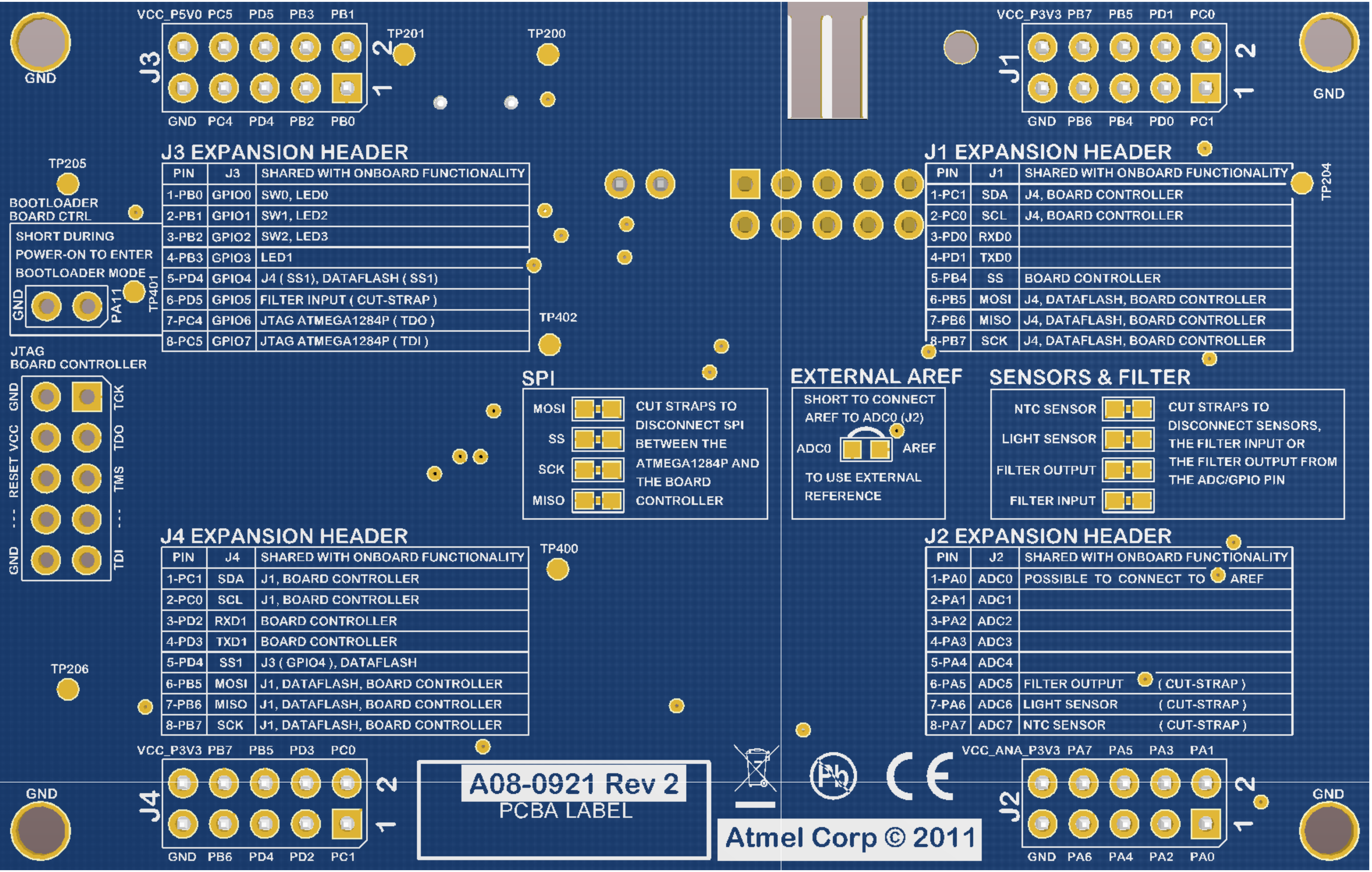
VCC_ANA_P3V3 PA7 PA5 PA3 PA1

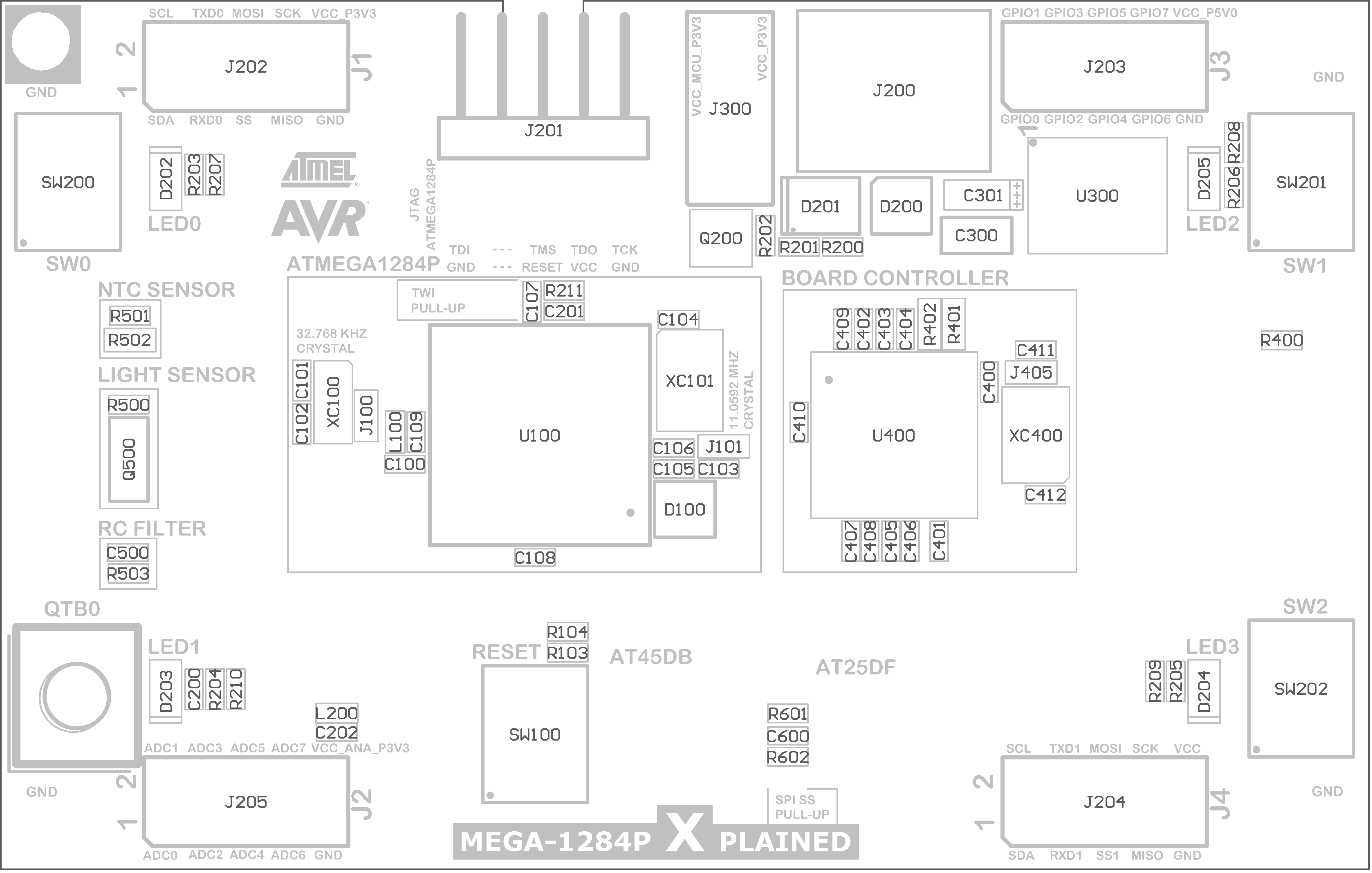
J2

GND PA6 PA4 PA2 PA0

GND


GND
SCL TXD0 MOSI SCK VCC_P3V3
SDA RXD0 SS MISO GND
J1
LED0
SW0
ATMEL
AVR
JTAG ATMEGA1284P
TDI --- TMS TDO TCK
GND --- RESET VCC GND
VCC_MCU_P3V3
VCC_P3V3
GPIO1 GPIO3 GPIO5 GPIO7 VCC_P5V0
GPIO0 GPIO2 GPIO4 GPIO6 GND
J3
LED2
SW1
ATMEGA1284P
NTC SENSOR
LIGHT SENSOR
RC FILTER
TWI PULL-UP
32.768 KHZ CRYSTAL
11.0592 MHZ CRYSTAL
BOARD CONTROLLER
QTB0
LED1
RESET
AT45DB
AT25DF
SW2
LED3
ADC1 ADC3 ADC5 ADC7 VCC_ANA_P3V3
ADC0 ADC2 ADC4 ADC6 GND
J2
SPI SS PULL-UP
SCL TXD1 MOSI SCK VCC
SDA RXD1 SS1 MISO GND
J4
MEGA-1284P X PLAINED


VCC_P5V0 PC5 PD5 PB3 PB1
J3
2
1
GND PC4 PD4 PB2 PB0
TP201
TP200
GND
VCC_P3V3 PB7 PB5 PD1 PC0
J1
2
1
GND PB6 PB4 PD0 PC1
GND
J3 EXPANSION HEADER
PIN | J3 | SHARED WITH ONBOARD FUNCTIONALITY
1-PB0 | GPIO0 | SW0, LED0
2-PB1 | GPIO1 | SW1, LED2
3-PB2 | GPIO2 | SW2, LED3
4-PB3 | GPIO3 | LED1
5-PD4 | GPIO4 | J4 (SS1), DATAFLASH (SS1)
6-PD5 | GPIO5 | FILTER INPUT (CUT-STRAP)
7-PC4 | GPIO6 | JTAG ATMEGA1284P (TDO)
8-PC5 | GPIO7 | JTAG ATMEGA1284P (TDI)
J1 EXPANSION HEADER
PIN | J1 | SHARED WITH ONBOARD FUNCTIONALITY
1-PC1 | SDA | J4, BOARD CONTROLLER
2-PC0 | SCL | J4, BOARD CONTROLLER
3-PD0 | RXD0 |
4-PD1 | TXD0 |
5-PB4 | SS | BOARD CONTROLLER
6-PB5 | MOSI | J4, DATAFLASH, BOARD CONTROLLER
7-PB6 | MISO | J4, DATAFLASH, BOARD CONTROLLER
8-PB7 | SCK | J4, DATAFLASH, BOARD CONTROLLER
TP204
TP205
BOOTLOADER
BOARD CTRL
SHORT DURING
POWER-ON TO ENTER
BOOTLOADER MODE
GND PA11
TP401
TP402
JTAG
BOARD CONTROLLER
GND TCK
VCC TDO
RESET TMS
... ...
GND TDI
SPI
MOSI
SS
SCK
MISO
CUT STRAPS TO
DISCONNECT SPI
BETWEEN THE
ATMEGA1284P AND
THE BOARD
CONTROLLER
EXTERNAL AREF
SHORT TO CONNECT
AREF TO ADC0 (J2)
ADC0 AREF
TO USE EXTERNAL
REFERENCE
SENSORS & FILTER
NTC SENSOR
LIGHT SENSOR
FILTER OUTPUT
FILTER INPUT
CUT STRAPS TO
DISCONNECT SENSORS,
THE FILTER INPUT OR
THE FILTER OUTPUT FROM
THE ADC/GPIO PIN
J4 EXPANSION HEADER
PIN | J4 | SHARED WITH ONBOARD FUNCTIONALITY
1-PC1 | SDA | J1, BOARD CONTROLLER
2-PC0 | SCL | J1, BOARD CONTROLLER
3-PD2 | RXD1 | BOARD CONTROLLER
4-PD3 | TXD1 | BOARD CONTROLLER
5-PD4 | SS1 | J3 (GPIO4), DATAFLASH
6-PB5 | MOSI | J1, DATAFLASH, BOARD CONTROLLER
7-PB6 | MISO | J1, DATAFLASH, BOARD CONTROLLER
8-PB7 | SCK | J1, DATAFLASH, BOARD CONTROLLER
TP400
TP206
J2 EXPANSION HEADER
PIN | J2 | SHARED WITH ONBOARD FUNCTIONALITY
1-PA0 | ADC0 | POSSIBLE TO CONNECT TO AREF
2-PA1 | ADC1 |
3-PA2 | ADC2 |
4-PA3 | ADC3 |
5-PA4 | ADC4 |
6-PA5 | ADC5 | FILTER OUTPUT (CUT-STRAP)
7-PA6 | ADC6 | LIGHT SENSOR (CUT-STRAP)
8-PA7 | ADC7 | NTC SENSOR (CUT-STRAP)
VCC_P3V3 PB7 PB5 PD3 PC0
J4
2
1
GND PB6 PD4 PD2 PC1
GND
A08-0921 Rev 2
PCBA LABEL
Atmel Corp © 2011
VCC_ANA_P3V3 PA7 PA5 PA3 PA1
J2
2
1
GND PA6 PA4 PA2 PA0
GND


SCL TXD0 MOSI SCK VCC_P3V3
SDA RXD0 SS MISO GND
J202
J1
GND
SW200
SW0
D202
R203
R207
LED0
AVR
JTAG
ATMEGA1284P
J201
TDI GND
TMS RESET
TDO VCC
TCK GND
ATMEGA1284P
TWI PULL-UP
C107
R211
C201
32.768 KHZ CRYSTAL
C101
C102
XC100
J100
L100
C109
C100
U100
C104
XC101
11.0592 MHZ CRYSTAL
C106
J101
C105
C103
D100
C108
VCC_MCU_P3V3
VCC_P3V3
J300
Q200
R202
J200
D201
D200
R201
R200
C301
C300
GPIO1 GPIO3 GPIO5 GPIO7 VCC_P5V0
GPIO0 GPIO2 GPIO4 GPIO6 GND
J203
J3
U300
D205
R208
R206
LED2
SW201
SW1
BOARD CONTROLLER
C409
C402
C403
C404
R402
R401
C411
J405
C400
C410
U400
XC400
C412
C407
C408
C405
C406
C401
R400
NTC SENSOR
R501
R502
LIGHT SENSOR
R500
Q500
RC FILTER
C500
R503
QTB0
LED1
D203
C200
R204
R210
L200
C202
ADC1 ADC3 ADC5 ADC7 VCC_ANA_P3V3
ADC0 ADC2 ADC4 ADC6 GND
J205
J2
RESET
R104
R103
SW100
AT45DB
AT25DF
R601
C600
R602
SPI SS PULL-UP
MEGA-1284P XPLAINED
SW2
LED3
R209
R205
D204
SW202
SCL TXD1 MOSI SCK VCC
SDA RXD1 SS1 MISO GND
J204
J4

VCC_P5V0 PC5 PD5 PB3 PB1

TP201 TP200

GND J3 2 1

GND PC4 PD4 PB2 PB0

VCC_P3V3 PB7 PB5 PD1 PC0

J1 2 1 GND

GND PB6 PB4 PD0 PC1

J3 EXPANSION HEADER

PIN	J3	SHARED WITH ONBOARD FUNCTIONALITY
1-PB0	GPIO0	SW0, LED0
2-PB1	GPIO1	SW1, LED2
3-PB2	GPIO2	SW2, LED3
4-PB3	GPIO3	LED1
5-PD4	GPIO4	J4 (SS1), DATAFLASH (SS1)
6-PD5	GPIO5	FILTER INPUT (CUT-STRAP)
7-PC4	GPIO6	JTAG ATMEGA1284P (TDO)
8-PC5	GPIO7	JTAG ATMEGA1284P (TDI)

J1 EXPANSION HEADER

PIN	J1	SHARED WITH ONBOARD FUNCTIONALITY
1-PC1	SDA	J4, BOARD CONTROLLER
2-PC0	SCL	J4, BOARD CONTROLLER
3-PD0	RXD0	
4-PD1	TXD0	
5-PB4	SS	BOARD CONTROLLER
6-PB5	MOSI	J4, DATAFLASH, BOARD CONTROLLER
7-PB6	MISO	J4, DATAFLASH, BOARD CONTROLLER
8-PB7	SCK	J4, DATAFLASH, BOARD CONTROLLER

TP204

TP205

TP205

BOOTLOADER
BOARD CTRL

SHORT DURING
POWER-ON TO ENTER
BOOTLOADER MODE

GND PA1 TP401

TP402

JTAG
BOARD CONTROLLER

GND VCC RESET ... GND

TCK TDO TMS ... TDI

SPI

MOSI J404
SS J403
SCK J402
MISO J401

CUT STRAPS TO DISCONNECT SPI BETWEEN THE ATMEGA1284P AND THE BOARD CONTROLLER

EXTERNAL AREF

SHORT TO CONNECT AREF TO ADC0 (J2)

ADC0 AREF

TO USE EXTERNAL REFERENCE

SENSORS & FILTER

NTC SENSOR J500
LIGHT SENSOR J501
FILTER OUTPUT J503
FILTER INPUT J502

CUT STRAPS TO DISCONNECT SENSORS, THE FILTER INPUT OR THE FILTER OUTPUT FROM THE ADC/GPIO PIN

J4 EXPANSION HEADER

PIN	J4	SHARED WITH ONBOARD FUNCTIONALITY
1-PC1	SDA	J1, BOARD CONTROLLER
2-PC0	SCL	J1, BOARD CONTROLLER
3-PD2	RXD1	BOARD CONTROLLER
4-PD3	TXD1	BOARD CONTROLLER
5-PD4	SS1	J3 (GPIO4), DATAFLASH
6-PB5	MOSI	J1, DATAFLASH, BOARD CONTROLLER
7-PB6	MISO	J1, DATAFLASH, BOARD CONTROLLER
8-PB7	SCK	J1, DATAFLASH, BOARD CONTROLLER

TP400

TP400

J2 EXPANSION HEADER

PIN	J2	SHARED WITH ONBOARD FUNCTIONALITY
1-PA0	ADC0	POSSIBLE TO CONNECT TO AREF
2-PA1	ADC1	
3-PA2	ADC2	
4-PA3	ADC3	
5-PA4	ADC4	
6-PA5	ADC5	FILTER OUTPUT (CUT-STRAP)
7-PA6	ADC6	LIGHT SENSOR (CUT-STRAP)
8-PA7	ADC7	NTC SENSOR (CUT-STRAP)

TP206

TP206

VCC_P3V3 PB7 PB5 PD3 PC0

GND J4 2 1

GND PB6 PD4 PD2 PC1

A08-0921 Rev 2

PCBA LABEL

LABEL1

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VCC_ANA_P3V3 PA7 PA5 PA3 PA1

J2 2 1 GND

GND PA6 PA4 PA2 PA0

Component list

MEGA-1284P XPLAINED

Source Data From:	MEGA-1284P_XPLAINED.PrjPcb
Project:	MEGA-1284P_XPLAINED.PrjPcb
Variant:	Default_assembly

Report Date: 29.03.2011 13:25:29

Print Date: 29.03.2011 13:25:24

#	Designator	Quantity	Value	Manufacturer	MPN	Description
1	C100, C106, C107, C108, C109, C202, C400, C401, C407, C409, C(	11	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
2	C101, C102	2	3.9p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-0.25pF
3	C103	1	12p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
4	C104	1	15p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
5	C105, C201	2	10n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
6	C200	1	1n			Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
7	C300	1	10u	Murata	GRM31CR71C106KA12L	Ceramic capacitor, SMD 1206, X7R, 16V, ±10 %
8	C301	1	10u	Kemet	T494A106K016AT	SMD tantalum capacitor, ESR = 3 Ohm, 3216-18 (EIA) 1206
9	C402, C406	2	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
10	C403, C410	2	22n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
11	C404	1	2.7n			Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
12	C405	1	470p			Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
13	C408	1	4.7uF	Murata	GRM155R60J475ME87D	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
14	C411, C412	2	18p			Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
15	C500	1	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10%
16	D100	1	BAT54	Philips	BAT54	Schottky diode, V(rrm)=30V, I(f)=0.1A, V(f)=0.4V (at If = 0.01A), I(r)=0.5uA (at Vrrm), t(rr)=5ns, SMD SOT23
17	D200	1	PRTR5V0U2X	Philips	PRTR5V0U2X	Double rail-to-rail USB ESD protection diode
18	D201	1	SML-020MLT	ROHM	SML-020MLT	LED, 2 colour (RED/GREEN), transparent clear lens, SMD
19	D202, D203, D204, D205	4	EL17-21UYC/A2	Everlight	EL17-21UYC/A2	LED, Yellow, Wave length=591nm, SMD 0805, ±70°
20	J200	1	MUSB-05-F-AB-SM-A	SAMTEC	MUSB-05-F-AB-SM-A	USB Mini-AB Connector, SMD
21	J201	1	2213R-10G	Multicomp	2213R-10G	Header, 2 Row, R/Angle, 10 Way
22	J202, J203, J204, J205	4	CD075014 2X5	Freber	CD075014 2X5	2x5 pin header, 2.54 mm pitch, Pin-in-Paste THM
23	J300	1	Pin header 1x2 right angle	Pro-data International Corp	2213R-2G	1x2 pin header, right angle, 2.54 mm pitch, through-hole
24	JS200, JS300	2	SNT-100-BK-G	SAMTEC	SNT-100-BK-G	Jumper cap for 2.54mm pinheader
25	L100, L200	2	BLM18HE152SN1	Murata	BLM18HE152SN1	SMD RF inductor 0603. Z=1500Ohm (@100MHz), Max R(dc)=0.50Ohm, Max current=500mA
26	LABEL1	1	Label PCBA	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
27	PCB1	1	MEGA-1284P Xplained PCB, layer, size 54mm x 85mm			MEGA-1284P Xplained PCB, 4-layer, size 54mm x 85mm
28	Q200	1	2N7002	Fairchild	2N7002	N-Channel MOSFET. 60V, 0.115A continuous, 0.8A Peak. RDS(ON) = 7.5Ohm@VGS=5.0V, VGS(th)<3V
29	Q500	1	TEMT6000	vishay	TEMT6000	light sensor
30	R103	1	10k			Thick film resistor, SMD 0402, 1/16W, 1%
31	R104, R203, R204, R205, R206, R207, R208, R209, R210	9	330R			Thick film resistor, SMD 0402, 1/16W, 1%
32	R200, R201	2	220R			Thick film resistor, SMD 0402, 1/16W, 1%
33	R202	1	1M	KOA	RK73H1ETTP1004F	Thick film resistor, SMD 0402, 1/16W, 1%
34	R211, R503	2	1k			Thick film resistor, SMD 0402, 1/16W, 1%
35	R400, R500, R601, R602	4	100k			Thick film resistor, SMD 0402, 1/16W, 1%
36	R401, R402	2	39R	KOA	RK73H1JTTD39R0F	Thick film resistor, SMD 0603, 1/10W, 1%
37	R501	1	220k	KOA	RK73H1ETTP2203F	Thick film resistor, SMD 0402, 1/16W, 1%
38	R502	1	NCP18WF104J03RB	Murata	NCP18WF104J03RB	NTC Thermistor 100kOhm @ 25deg,1/10W, 5%, SMD 0603
39	SW100, SW200, SW201, SW202	4	SKRAAKE010	ALPS	SKRAAKE010	6.2x6.2 mm SMD tact switch, same as A08-0091 but less force is needed
40	U100	1	ATmega1284P-AUR	ATMEL	ATmega1284P-AUR	AVR 8-bit RISC MCU, tape and reel
41	U300	1	NCP1117LPST33T3G	ON Semiconductor	NCP1117LPST33T3G	The low power version of the popular NCP1117
42	U400	1	AT32UC3B1256-AUT	ATMEL	AT32UC3B1256-AUT	AVR 32-bit RISC MCU
43	XC100	1	CC5V-T1A 32.768KHZ 7pF 20PPM TA QC	Micro Crystal	CC5V-T1A 32.768KHZ 7pF +-20PPM TA QC	32.768kHz crystal, CL=7pF, ESRmax=70k, SMD, 4.1 x 1.5 mm,
44	XC101	1	11.0592 MHz	ABRACON	ABM3B-11.0592MHZ-10-1-U-T	Abracon 11.0592MHz SMD crystal, CL=10pF, ESRmax=100Ohm
45	XC400	1	12.0MHz	Fox Electronics	FQ5032B-12-C-C-C-200-1 / 738B-12	Fox FQ5032B 12.0MHz SMD crystal 738B-12
		85				

Approved	Notes