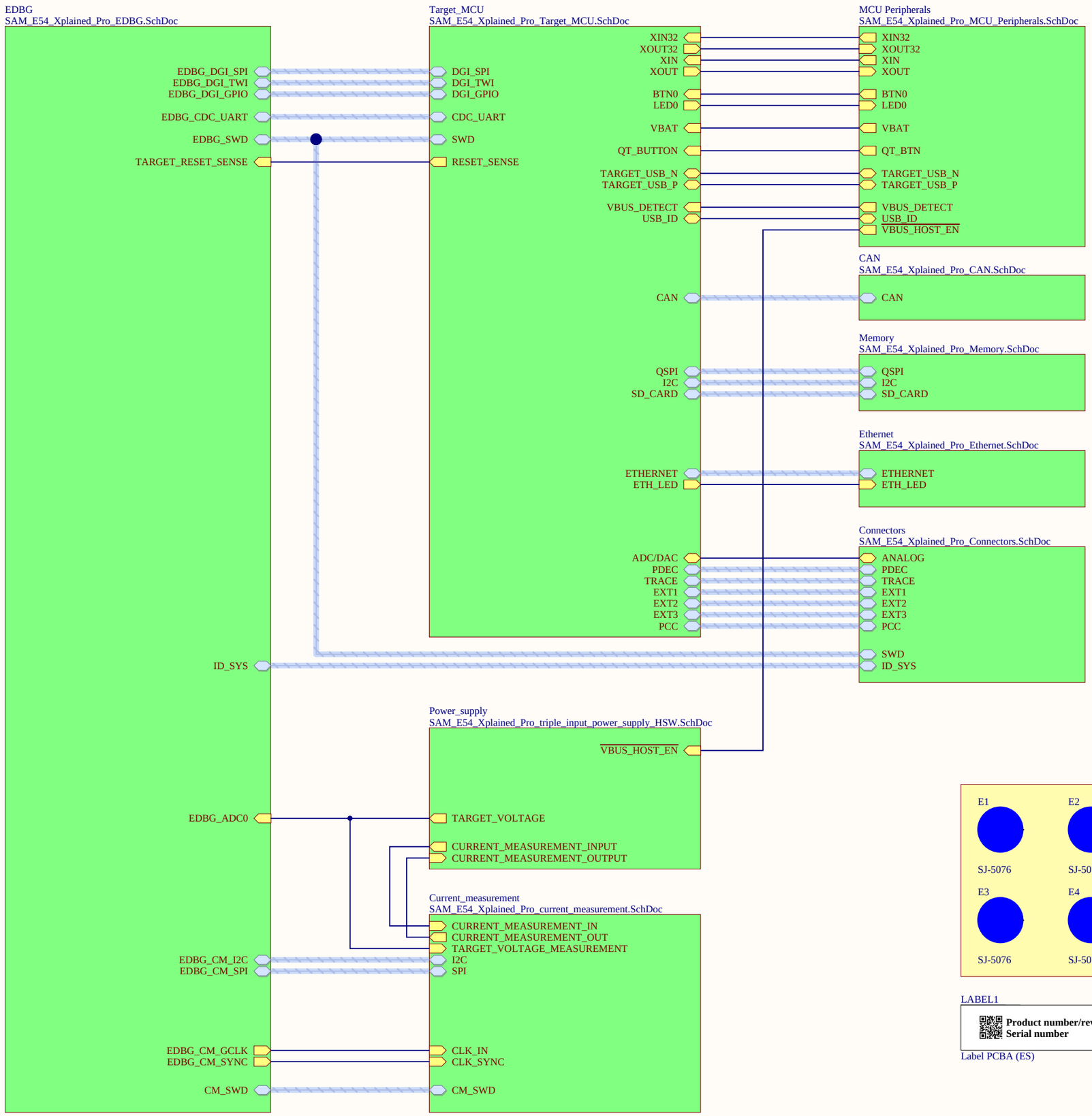


E1 SJ-5076 E2 SJ-5076
E3 SJ-5076 E4 SJ-5076

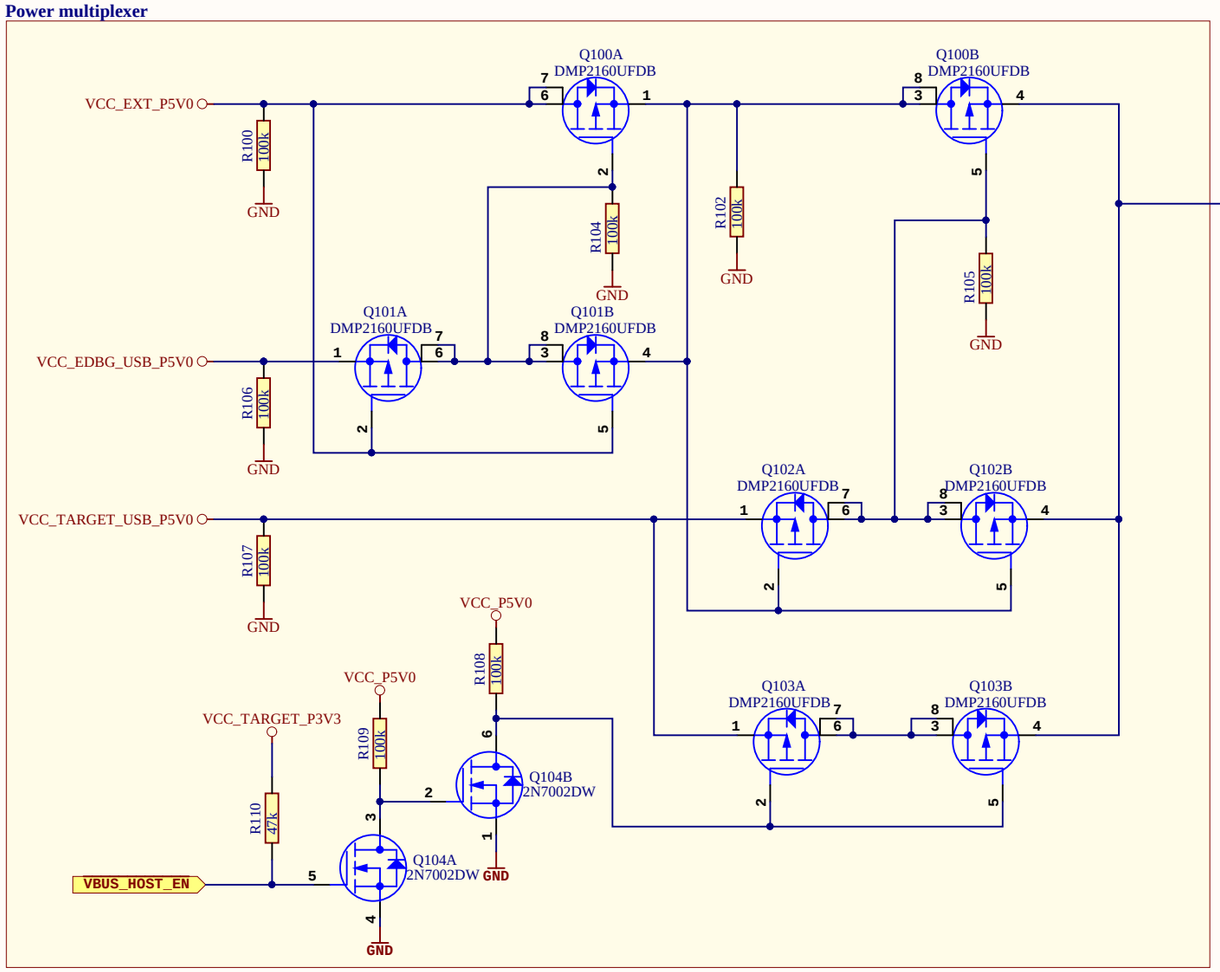
LABEL1
Product number/revision
Serial number
Label PCBA (ES)

PCB1
A08-2643
SAM E54 Xplained Pro PCB documentation

PCBADOC1 A12-1180
TESTDOC1 A12-1179
FW1 A11-0196
TEST1 A11-0353
FIXTURE1 A13-0086

ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:55	PAGE: 1 of 13
Document number:	A09-2748		Revision 4
TITLE: Top Level Schematics			
SAM_E54_Xplained_Pro_TopLevel.SchDoc			

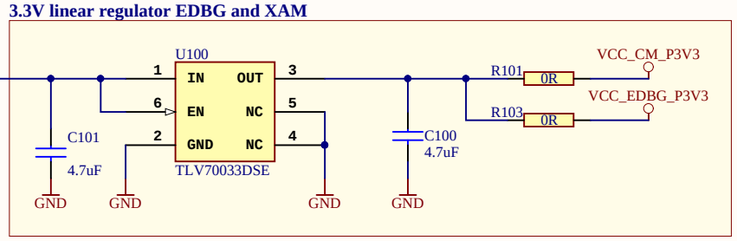
Power multiplexer



Power input multiplexer priority:
1. VCC_IN
2. VCC_EDBG_USB
3. VCC_TARGET_USB

Pulling #VBUS_HOST_EN low will enable power from the board to the USB connector through Q103. #VBUS_HOST_EN is automatically controlled by the ID pin in the USB cable, the control signal can also be overrided by setting PC19 low.

3.3V linear regulator EDBG and XAM



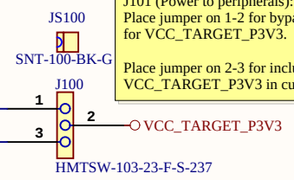
Iout max = 200mA
Accuracy 2%
Low noise: 48 uVrms (10 Hz to 100 kHz)
Dropout 150mV at full load
Quiescent current 55 uA (no load)
Current limit max 860 mA
Thermal shutdown
Minimum capacitance required on output is 0.1uF (with less than 200mOhm ESR)

VCC_P5V0

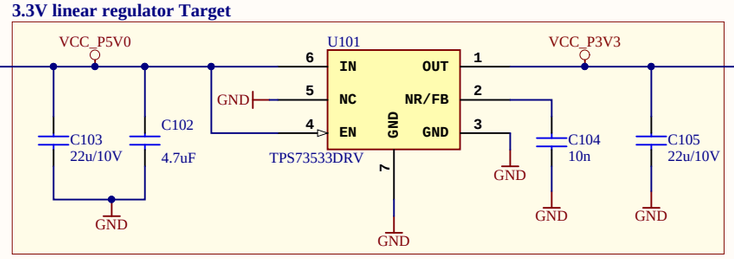
The target peripheral and the MCU can be powered either directly from the regulator or from the current measurement circuitry (XAM). When powered from the current measurement the supply voltage will vary from 3.3 V to 3.2 V due to voltage drop over the current measurement shunt resistor.

J101 (Power to peripherals):
Place jumper on 1-2 for bypassing current measurement for VCC_TARGET_P3V3.

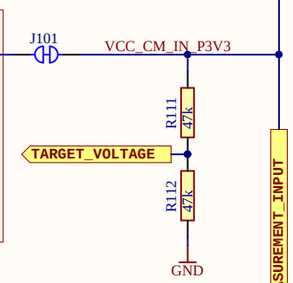
Place jumper on 2-3 for including VCC_TARGET_P3V3 in current measurement.



3.3V linear regulator Target

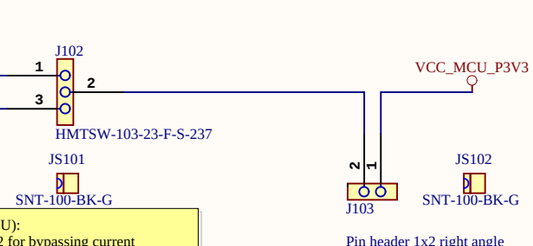


500mA low noise LDO voltage regulator
Noise: 28uVrms
Accuracy 2%
Dropout 280 mV at full load
Quiescent current 46 uA
Current limit 1170 mA
Thermal shutdown



CURRENT_MEASUREMENT_INPUT

CURRENT_MEASUREMENT_OUTPUT



J102 (Power to MCU):
Place jumper on 1-2 for bypassing current measurement for VCC_MCU_P3V3.

Place jumper on 2-3 for including VCC_MCU_P3V3 in current measurement.

Current measurements via external tools can be done either via this header or from the supply muxing header (this header is kept for compatibility reasons to other Xplained Pro boards)

ATMEL Norway	*		
Vestre Rosten 79	*		
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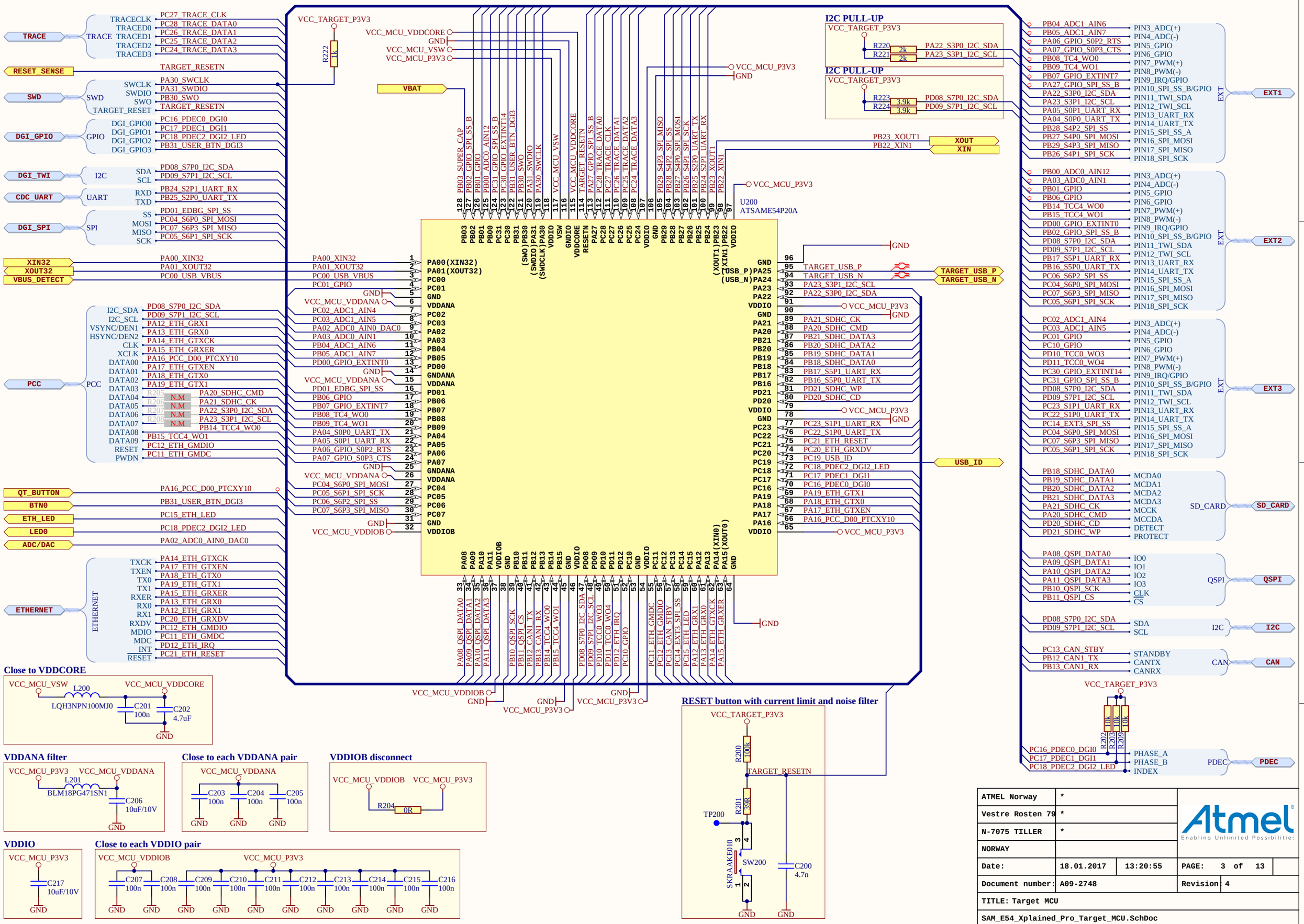
NORWAY			
Date:	18.01.2017	13:20:55	PAGE: 2 of 13
Document number:	A09-2748		Revision: 4
TITLE: Power supply			
SAM_E54_Xplained_Pro_triple_input_power_supply_HSW.SchDoc			


TRACE
TRACECLK
TRACED0
TRACED1
TRACED2
TRACED3
PC27_TRACE_CLK
PC28_TRACE_DATA0
PC26_TRACE_DATA1
PC25_TRACE_DATA2
PC24_TRACE_DATA3
RESET_SENSE
TARGET_RESETN
SWD
SWCLK
SWDIO
SWO
TARGET_RESET
PA30_SWCLK
PA31_SWDIO
PB30_SWO
TARGET_RESETN
DGI_GPIO
GPIO
DGI_GPIO0
DGI_GPIO1
DGI_GPIO2
DGI_GPIO3
PC16_PDEC0_DGI0
PC17_PDEC1_DGI1
PC18_PDEC2_DGI2_LED
PB31_USER_BTN_DGI3
DGI_TWI
I2C
SDA
SCL
PD08_S7P0_I2C_SDA
PD09_S7P1_I2C_SCL
CDC_UART
UART
RXD
TXD
PB24_S2P1_UART_RX
PB25_S2P0_UART_TX
DGI_SPI
SPI
SS
MOSI
MISO
SCK
PD01_EDBG_SPI_SS
PC04_S6P0_SPI_MOSI
PC07_S6P3_SPI_MISO
PC05_S6P1_SPI_SCK
XIN32
XOUT32
VBUS_DETECT
PA00_XIN32
PA01_XOUT32
PC00_USB_VBUS
PCC
I2C_SDA
I2C_SCL
VSYNC/DEN1
HSYNC/DEN2
CLK
XCLK
DATA00
DATA01
DATA02
DATA03
DATA04
DATA05
DATA06
DATA07
DATA08
DATA09
RESET
PWDN
PD08_S7P0_I2C_SDA
PD09_S7P1_I2C_SCL
PA12_ETH_GRX1
PA13_ETH_GRX0
PA14_ETH_GTXCK
PA15_ETH_GRXER
PA16_PCC_D00_PTCXY10
PA17_ETH_GTXEN
PA18_ETH_GTX0
PA19_ETH_GTX1
R205 N.M PA20_SDHC_CMD
R206 N.M PA21_SDHC_CK
R207 N.M PA22_S3P0_I2C_SDA
R208 N.M PA23_S3P1_I2C_SCL
PB14_TCC4_WO0
PB15_TCC4_WO1
PC12_ETH_GMDIO
PC11_ETH_GMDIO
QT_BUTTON
BTN0
ETH_LED
LED0
ADC/DAC
PA16_PCC_D00_PTCXY10
PB31_USER_BTN_DGI3
PC15_ETH_LED
PC18_PDEC2_DGI2_LED
PA02_ADC0_AIN0_DAC0
ETHERNET
TXCK
TXEN
TX0
TX1
RXER
RX0
RX1
RXDV
MDIO
MDC
INT
RESET
PA14_ETH_GTXCK
PA17_ETH_GTXEN
PA18_ETH_GTX0
PA19_ETH_GTX1
PA15_ETH_GRXER
PA13_ETH_GRX0
PA12_ETH_GRX1
PC20_ETH_GRXDV
PC12_ETH_GMDIO
PC11_ETH_GMDIO
PD12_ETH_IRQ
PC21_ETH_RESET
VCC_TARGET_P3V3
R222 1k
VCC_MCU_VDDCORE
GND
VCC_MCU_VSW
VCC_MCU_P3V3
VBAT
VCC_MCU_P3V3
GND
U200
ATSAME54P20A
PB03_SUPER_CAP
PB02_GPIO_SPI_SS_B
PB01_GPIO
PB00_ADC0_AIN12
PC31_GPIO_SPI_SS_B
PC30_GPIO_EXTINT14
PB31_USER_BTN_DGI3
PB30_SWO
PA31_SWDIO
PA30_SWCLK
VCC_MCU_VSW
VCC_MCU_VDDCORE
TARGET_RESETN
PA27_GPIO_SPI_SS_B
PC28_TRACE_DATA0
PC27_TRACE_CLK
PC26_TRACE_DATA1
PC25_TRACE_DATA2
PC24_TRACE_DATA3
PB29_S4P3_SPI_MISO
PB28_S4P2_SPI_SS
PB27_S4P0_SPI_MOSI
PB26_S4P1_SPI_SCK
PB25_S2P0_UART_TX
PB24_S2P1_UART_RX
PB23_XOUT1
PB22_XIN1
PB03 PB02 PB01 PB00 PC31 PC30 PB31 PB30 PA31 PA30 VDDIO VSW GNDIO VDDCORE RESETN PA27 PC28 PC27 PC26 PC25 PC24 VDDIO GND PB29 PB28 PB27 PB26 PB25 PB24 PB23 PB22 VDDIO
128 127 126 125 124 123 122 121 120 119 118 117 116 115 114 113 112 111 110 109 108 107 106 105 104 103 102 101 100 99 98 97
PA00(XIN32) 1
PA01(XOUT32) 2
PC00 3
PC01 4
GND 5
VDDANA 6
PC02 7
PC03 8
PA02 9
PA03 10
PB04 11
PB05 12
PD00 13
GNDANA 14
VDDANA 15
PD01 16
PB06 17
PB07 18
PB08 19
PB09 20
PA04 21
PA05 22
PA06 23
PA07 24
GND 25
VDDANA 26
PC04 27
PC05 28
PC06 29
PC07 30
GND 31
VDDIOB 32
PA08 PA09 PA10 PA11 VDDIOB GND PB10 PB11 PB12 PB13 PB14 PB15 GND VDDIOB PD08 PD09 PD10 PD11 PD12 PC10 GND VDDIO PC11 PC12 PC13 PC14 PC15 PA12 PA13 PA14(XIN0) PA15(XOUT0) GND
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
(XOUT1)PB23 (XIN1)PB22 VDDIO
(USB_P)PA25 (USB_N)PA24
GND 96
TARGET_USB_P 95
TARGET_USB_N 94
PA23_S3P1_I2C_SCL 93
PA22_S3P0_I2C_SDA 92
VDDIO 91
GND 90
PA21_SDHC_CK 89
PA20_SDHC_CMD 88
PB21_SDHC_DATA3 87
PB20_SDHC_DATA2 86
PB19_SDHC_DATA1 85
PB18_SDHC_DATA0 84
PB17_S5P1_UART_RX 83
PB16_S5P0_UART_TX 82
PD21_SDHC_WP 81
PD20_SDHC_CD 80
VDDIO 79
GND 78
PC23_S1P1_UART_RX 77
PC22_S1P0_UART_TX 76
PC21_ETH_RESET 75
PC20_ETH_GRXDV 74
PC19_USB_ID 73
PC18_PDEC2_DGI2_LED 72
PC17_PDEC1_DGI1 71
PC16_PDEC0_DGI0 70
PA19_ETH_GTX1 69
PA18_ETH_GTX0 68
PA17_ETH_GTXEN 67
PA16_PCC_D00_PTCXY10 66
VDDIO 65
USB_ID
XOUT
XIN
TARGET_USB_P
TARGET_USB_N
I2C PULL-UP
VCC_TARGET_P3V3
R220 2k PA22_S3P0_I2C_SDA
R221 2k PA23_S3P1_I2C_SCL
I2C PULL-UP
VCC_TARGET_P3V3
R223 3.9k PD08_S7P0_I2C_SDA
R224 3.9k PD09_S7P1_I2C_SCL
PB04_ADC1_AIN6
PB05_ADC1_AIN7
PA06_GPIO_S0P2_RTS
PA07_GPIO_S0P3_CTS
PB08_TC4_WO0
PB09_TC4_WO1
PB07_GPIO_EXTINT7
PA27_GPIO_SPI_SS_B
PA22_S3P0_I2C_SDA
PA23_S3P1_I2C_SCL
PA05_S0P1_UART_RX
PA04_S0P0_UART_TX
PB28_S4P2_SPI_SS
PB27_S4P0_SPI_MOSI
PB29_S4P3_SPI_MISO
PB26_S4P1_SPI_SCK
PIN3_ADC(+)
PIN4_ADC(-)
PIN5_GPIO
PIN6_GPIO
PIN7_PWM(+)
PIN8_PWM(-)
PIN9_IRQ/GPIO
PIN10_SPI_SS_B/GPIO
PIN11_TWI_SDA
PIN12_TWI_SCL
PIN13_UART_RX
PIN14_UART_TX
PIN15_SPI_SS_A
PIN16_SPI_MOSI
PIN17_SPI_MISO
PIN18_SPI_SCK
EXT
EXT1
PB00_ADC0_AIN12
PA03_ADC0_AIN1
PB01_GPIO
PB06_GPIO
PB14_TCC4_WO0
PB15_TCC4_WO1
PD00_GPIO_EXTINT0
PB02_GPIO_SPI_SS_B
PD08_S7P0_I2C_SDA
PD09_S7P1_I2C_SCL
PB17_S5P1_UART_RX
PB16_S5P0_UART_TX
PC06_S6P2_SPI_SS
PC04_S6P0_SPI_MOSI
PC07_S6P3_SPI_MISO
PC05_S6P1_SPI_SCK
EXT2
PC02_ADC1_AIN4
PC03_ADC1_AIN5
PC01_GPIO
PC10_GPIO
PD10_TCC0_WO3
PD11_TCC0_WO4
PC30_GPIO_EXTINT14
PC31_GPIO_SPI_SS_B
PD08_S7P0_I2C_SDA
PD09_S7P1_I2C_SCL
PC23_S1P1_UART_RX
PC22_S1P0_UART_TX
PC14_EXT3_SPI_SS
PC04_S6P0_SPI_MOSI
PC07_S6P3_SPI_MISO
PC05_S6P1_SPI_SCK
EXT3
PB18_SDHC_DATA0
PB19_SDHC_DATA1
PB20_SDHC_DATA2
PB21_SDHC_DATA3
PA21_SDHC_CK
PA20_SDHC_CMD
PD20_SDHC_CD
PD21_SDHC_WP
MCDA0
MCDA1
MCDA2
MCDA3
MCCK
MCCDA
DETECT
PROTECT
SD_CARD
SD_CARD
PA08_QSPI_DATA0
PA09_QSPI_DATA1
PA10_QSPI_DATA2
PA11_QSPI_DATA3
PB10_QSPI_SCK
PB11_QSPI_CS
IO0
IO1
IO2
IO3
CLK
CS
QSPI
QSPI
PD08_S7P0_I2C_SDA
PD09_S7P1_I2C_SCL
SDA
SCL
I2C
I2C
PC13_CAN_STBY
PB12_CAN1_TX
PB13_CAN1_RX
STANDBY
CANTX
CANRX
CAN
CAN
VCC_TARGET_P3V3
R202 10k
R203 10k
R209 10k
PC16_PDEC0_DGI0
PC17_PDEC1_DGI1
PC18_PDEC2_DGI2_LED
PHASE_A
PHASE_B
INDEX
PDEC
PDEC
Close to VDDCORE
VCC_MCU_VSW
L200
LQH3NPN100MJ0
VCC_MCU_VDDCORE
C201 100n
C202 4.7uF
GND
VDDANA filter
VCC_MCU_P3V3
VCC_MCU_VDDANA
L201
BLM18PG471SN1
C206 10uF/10V
GND
Close to each VDDANA pair
VCC_MCU_VDDANA
C203 100n
C204 100n
C205 100n
GND GND GND
VDDIOB disconnect
VCC_MCU_VDDIOB
VCC_MCU_P3V3
R204 0R
VDDIO
VCC_MCU_P3V3
C217 10uF/10V
GND
Close to each VDDIO pair
VCC_MCU_VDDIOB
VCC_MCU_P3V3
C207 100n
C208 100n
C209 100n
C210 100n
C211 100n
C212 100n
C213 100n
C214 100n
C215 100n
C216 100n
GND GND GND GND GND GND GND GND GND GND
RESET button with current limit and noise filter
VCC_TARGET_P3V3
R200 100k
TARGET_RESETN
R201 39R
TP200
SW200
SKRAAKE010
C200 4.7n
GND GND
ATMEL Norway
Vestre Rosten 79
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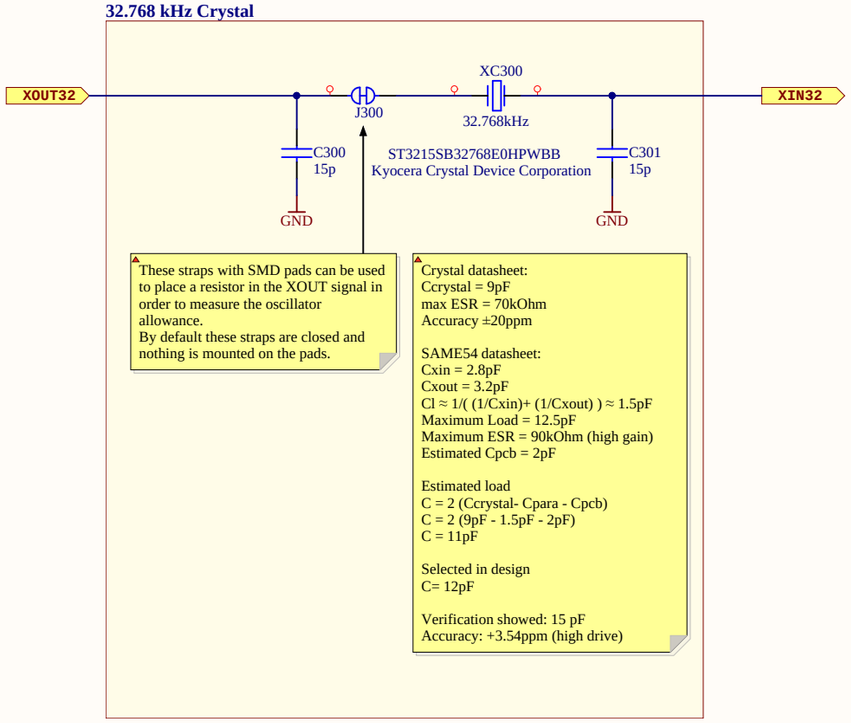
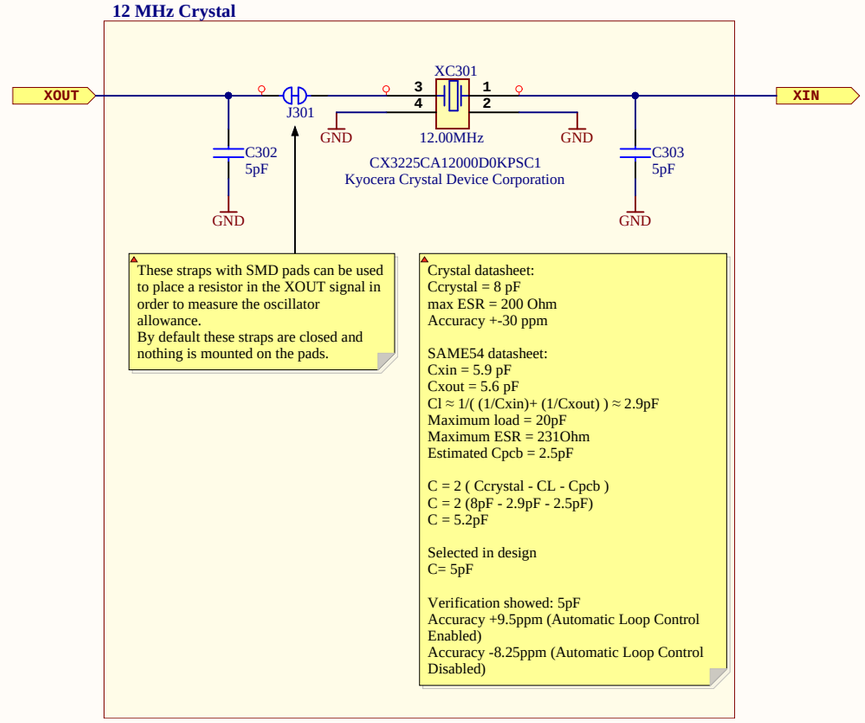
NORWAY
Date: 18.01.2017 13:20:55
PAGE: 3 of 13
Document number: A09-2748
Revision 4
TITLE: Target MCU
SAM_E54_Xplained_Pro_Target_MCU.SchDoc
Atmel
Enabling Unlimited Possibilities

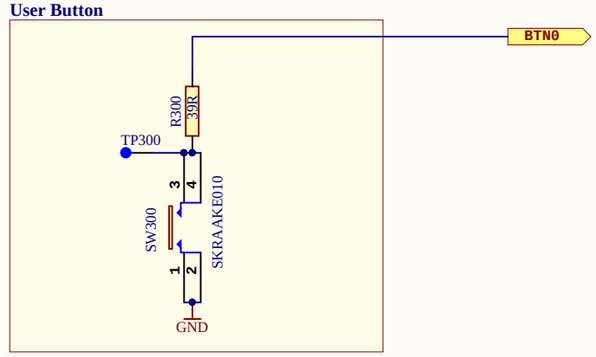
32.768 kHz Crystal



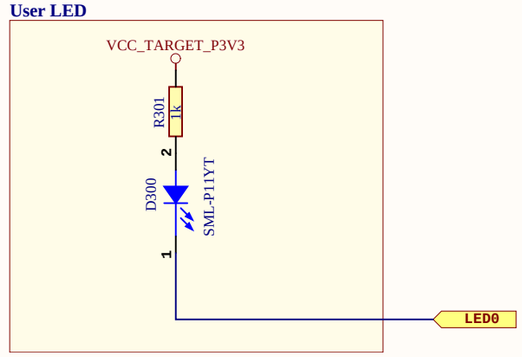
12 MHz Crystal



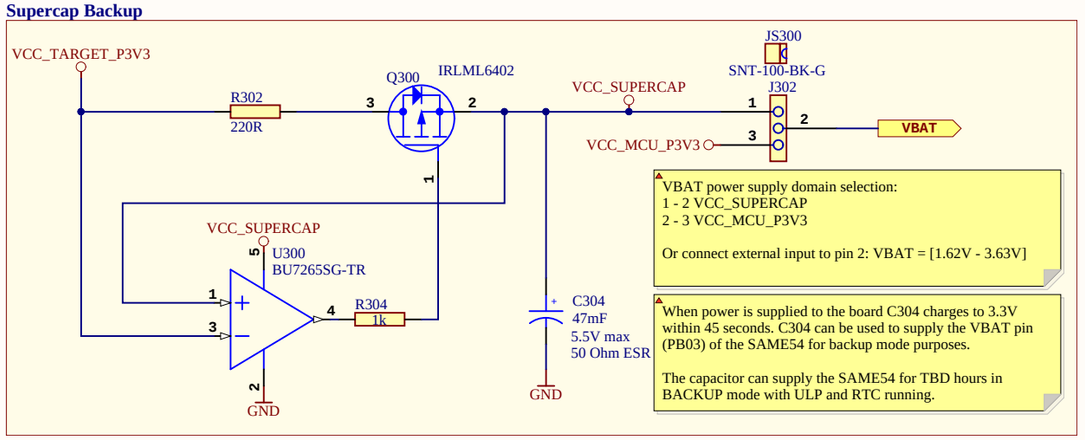
User Button



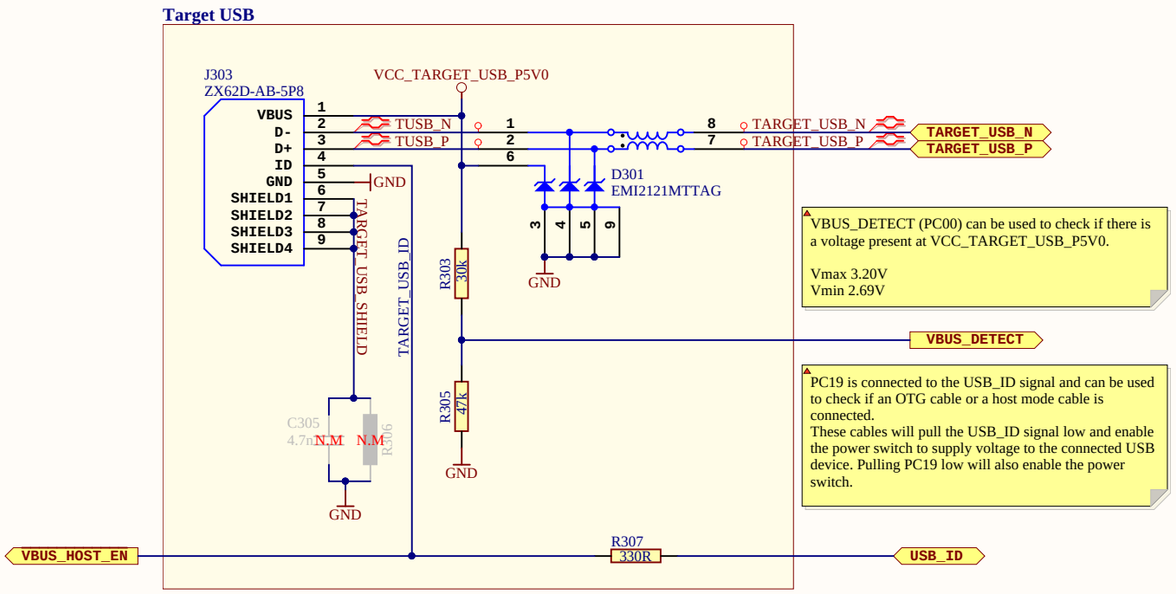
User LED



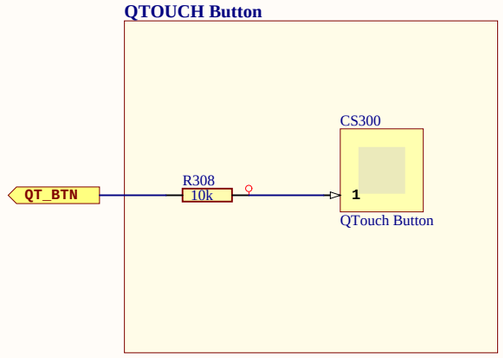
Supercap Backup



Target USB



QTOUCH Button



ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
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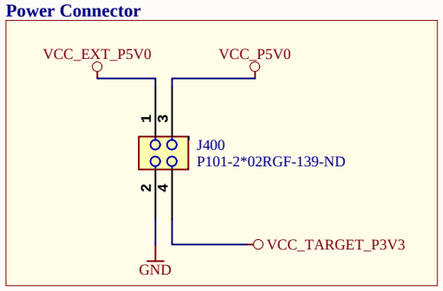
TITLE: Target MCU Peripherals			
SAM_E54_Xplained_Pro_MCU_Peripherals.SchDoc			

Power Connector

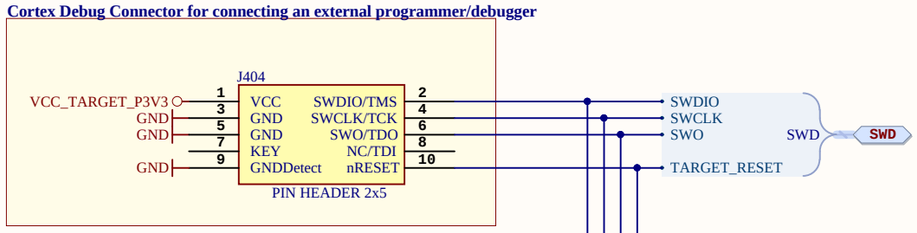


Power inputs/ouputs to the Xplained PRO:
VCC_EXT_P5V0 (input)
This power input can be used to power the whole board and it has a higher priority than the USB power inputs.

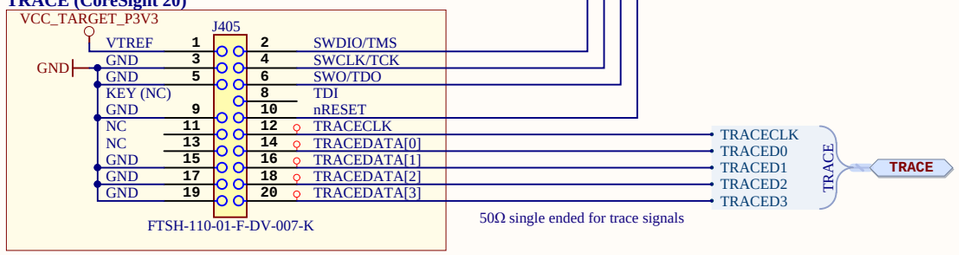
VCC_P5V0 (output)
This pin is supplied from either VCC_EXT_P5V0, VCC_EDBG_USB_P5V0, or VCC_TARGET_USB_P5V0 based on the availability and priority ot these supplies.

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

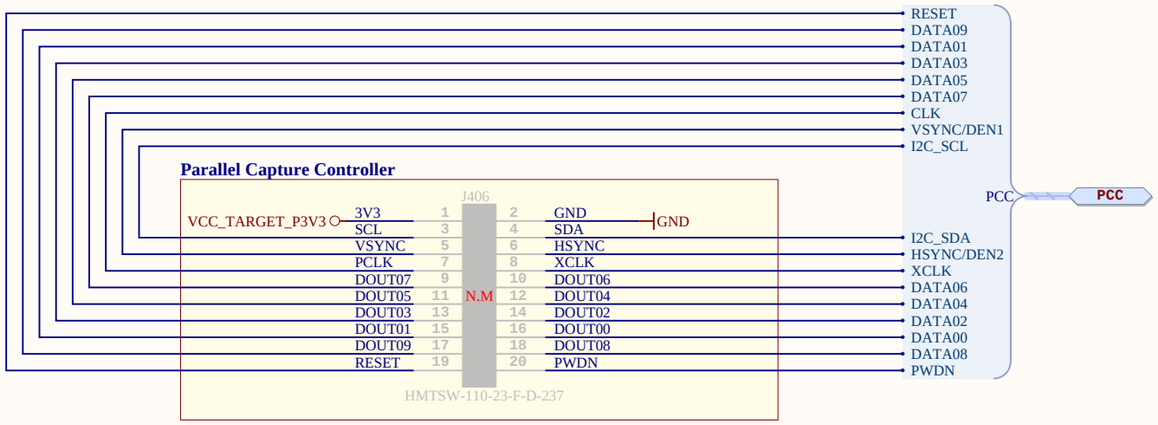
Cortex Debug Connector for connecting an external programmer/debugger

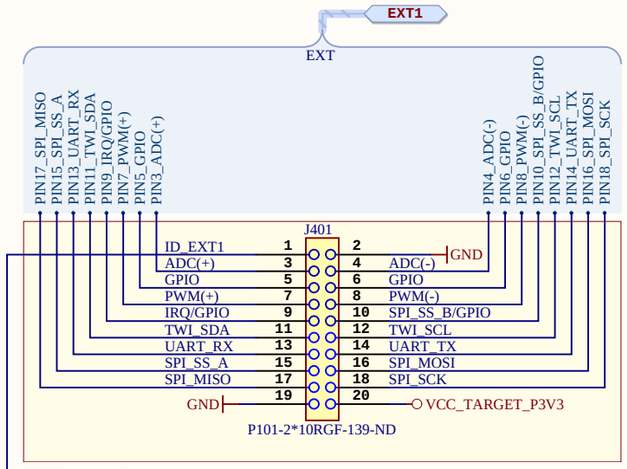


TRACE (CoreSight 20)

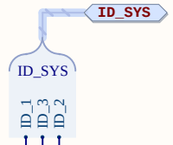


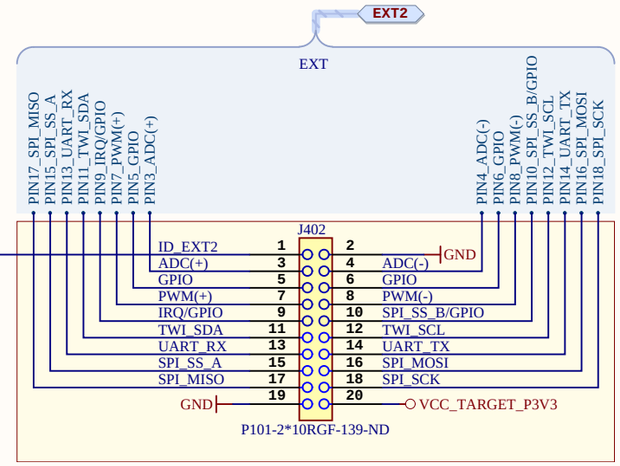
50Ω single ended for trace signals



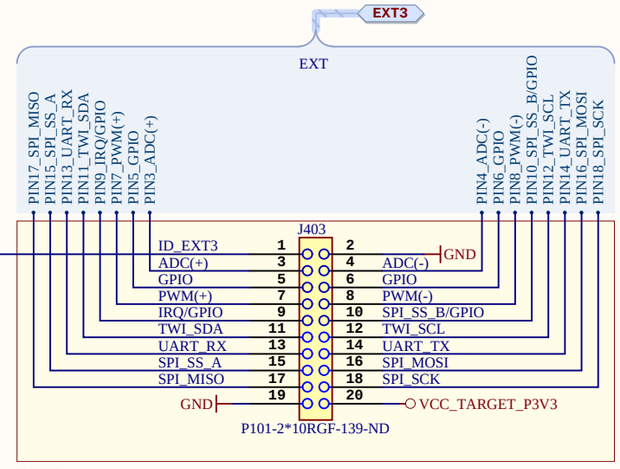


EXT1 extension header



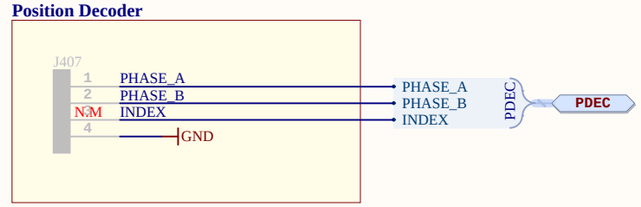


EXT2 extension header

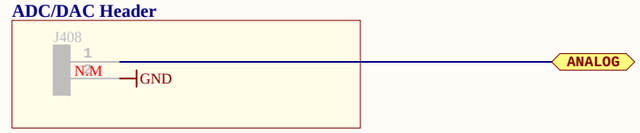


EXT3 extension header

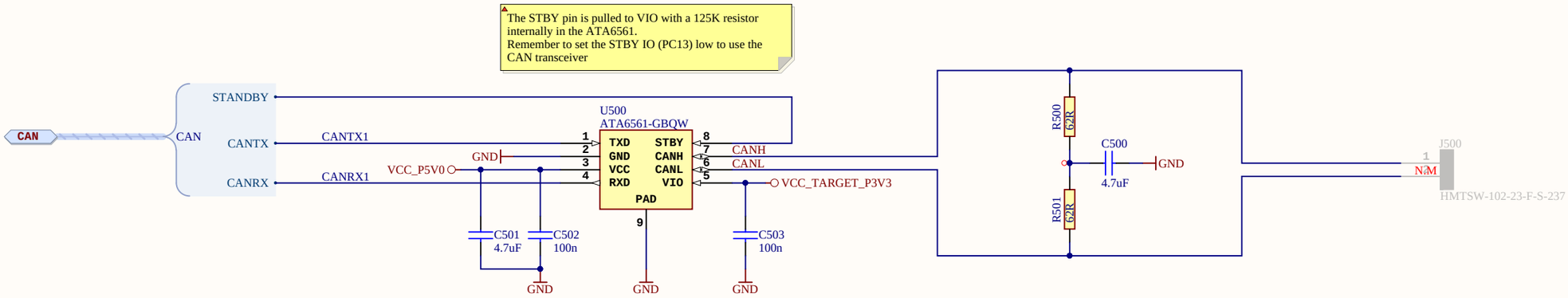
Position Decoder



ADC/DAC Header



ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:56	PAGE: 5 of 13
Document number:	A09-2748		Revision: 4
TITLE: Extension connectors			
SAM_E54_Xplained_Pro_Connectors.SchDoc			



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Vestre Rosten 79	*			
N-7075 TILLER	*			
NORWAY				
Date:	18.01.2017	13:20:56	PAGE: 6 of 13	
Document number:	A09-2748		Revision	4
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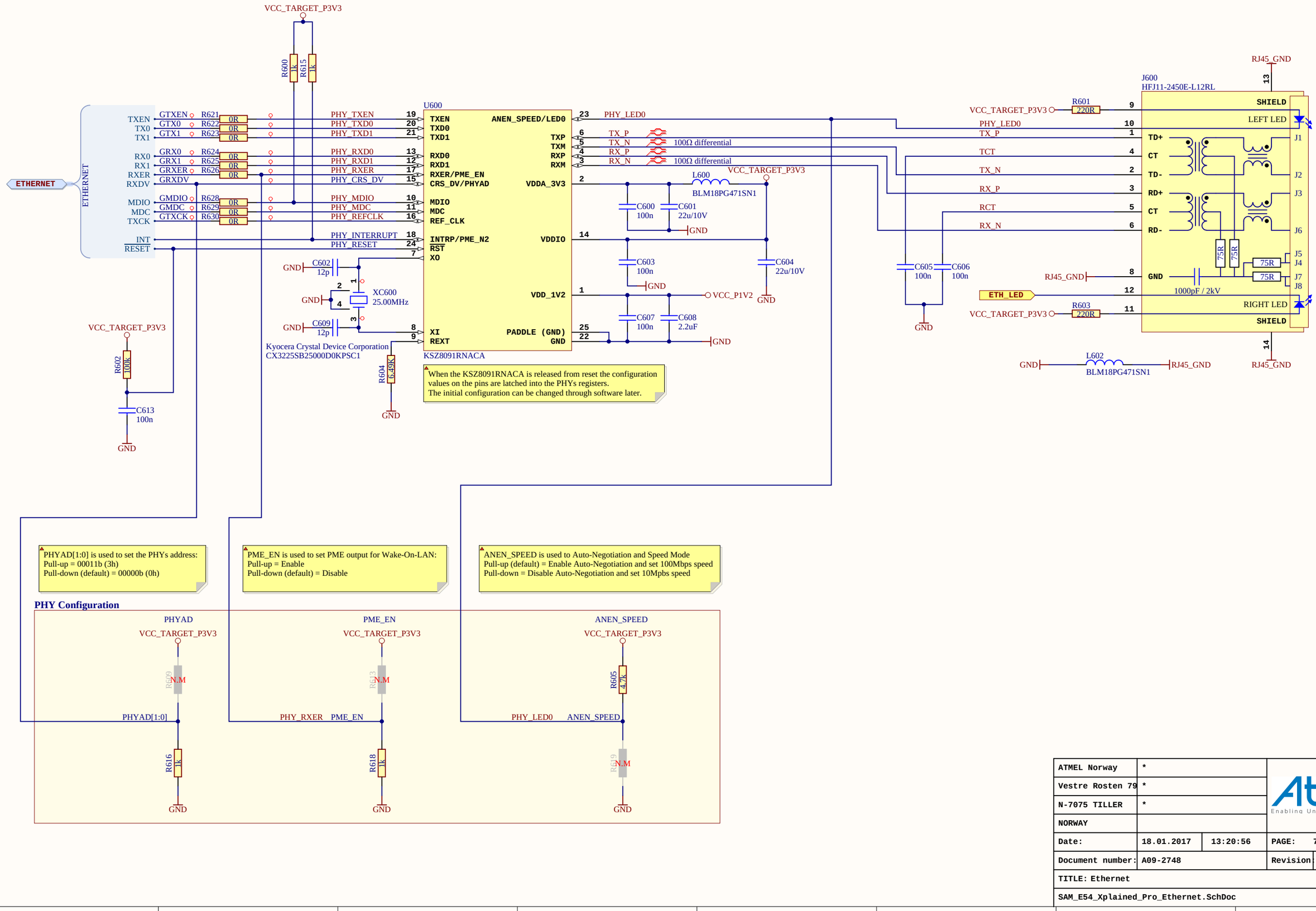
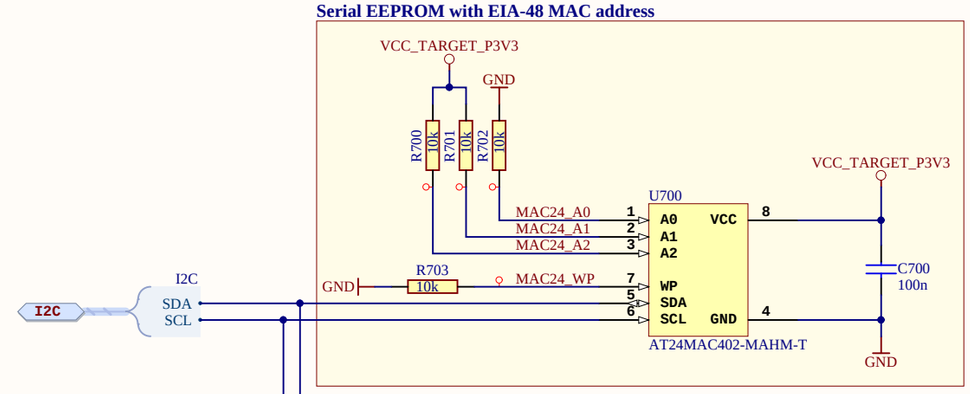
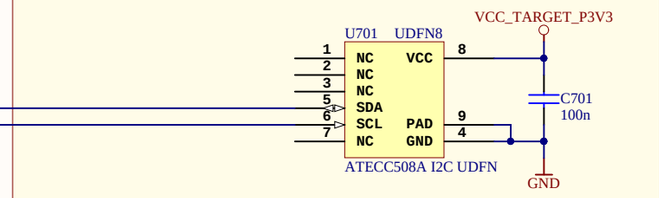


ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:56	PAGE: 7 of 13
Document number:	A09-2748		Revision: 4
TITLE: Ethernet			
SAM_E54_Xplained_Pro_Ethernet.SchDoc			

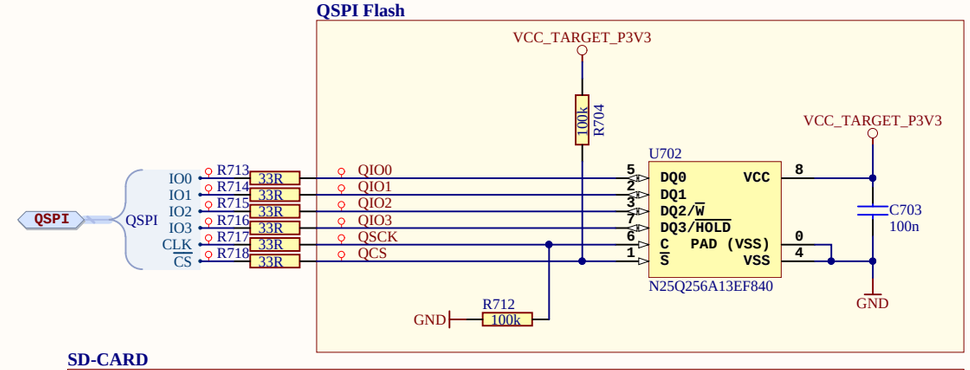
Serial EEPROM with EIA-48 MAC address



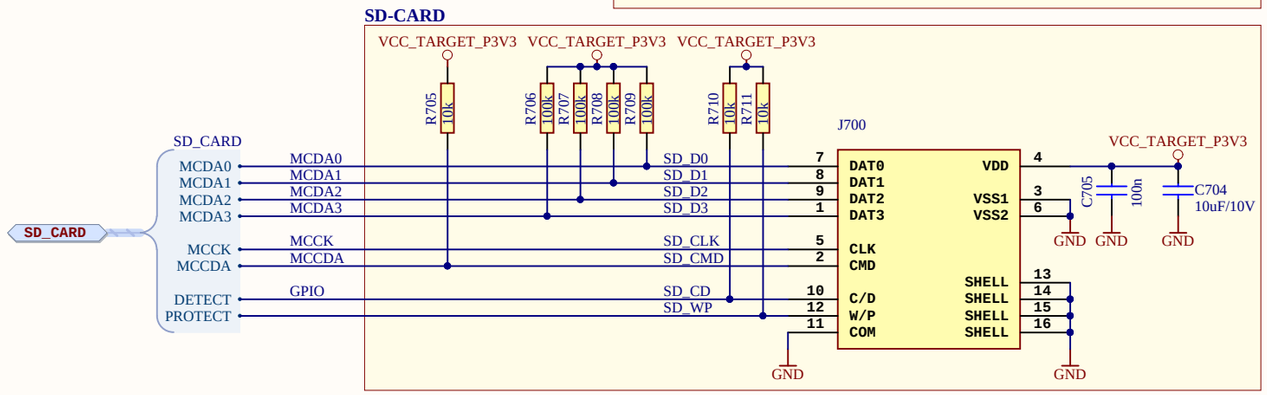
ATECC508 Crypto



QSPI Flash



SD-CARD



C/D is connected to COM when a card is placed into the socket.
W/P is connected to COM when the write protect slider is in protect position.

ATMEL Norway	*		
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:57	PAGE: 8 of 13
Document number:	A09-2748		Revision: 4
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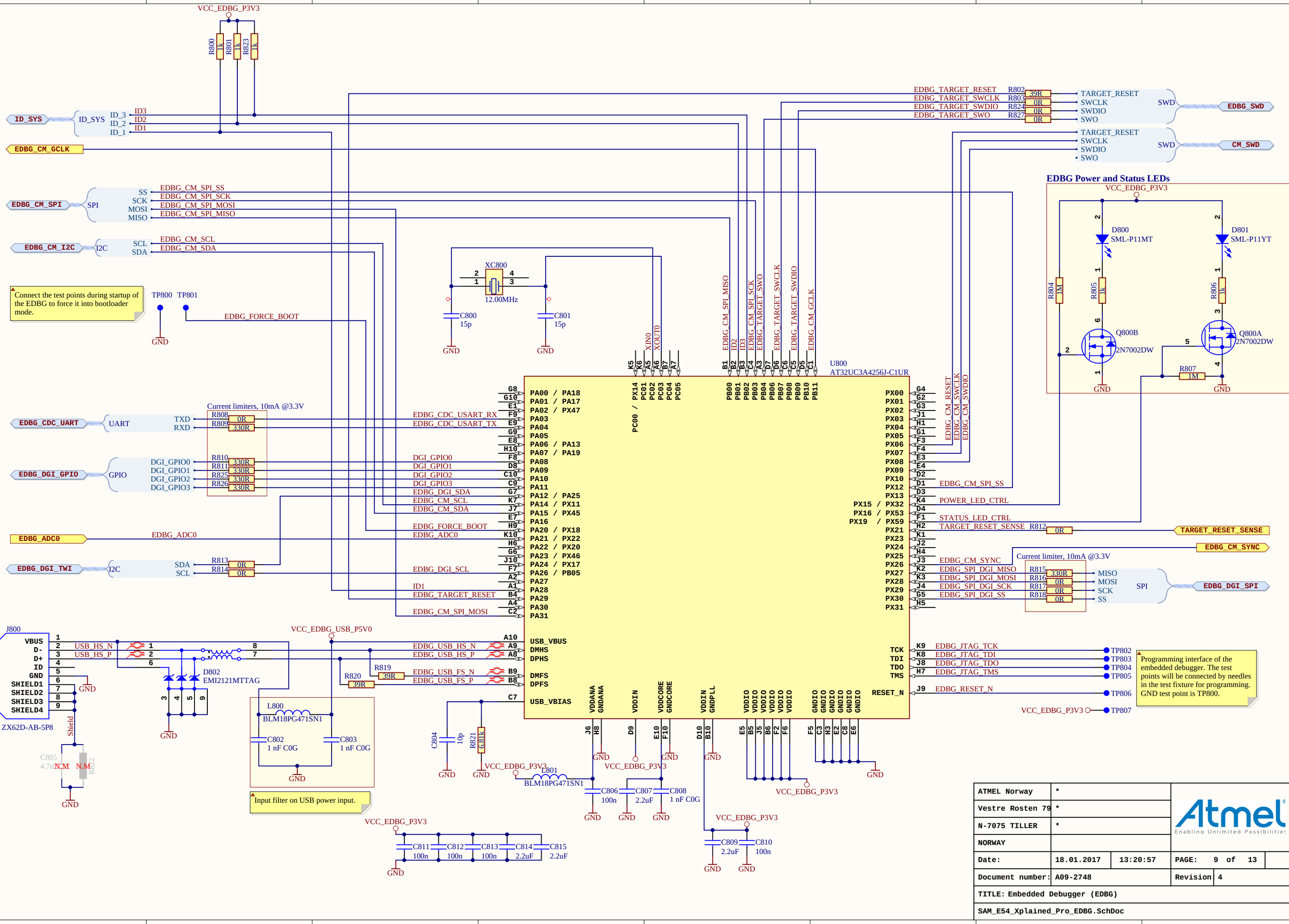
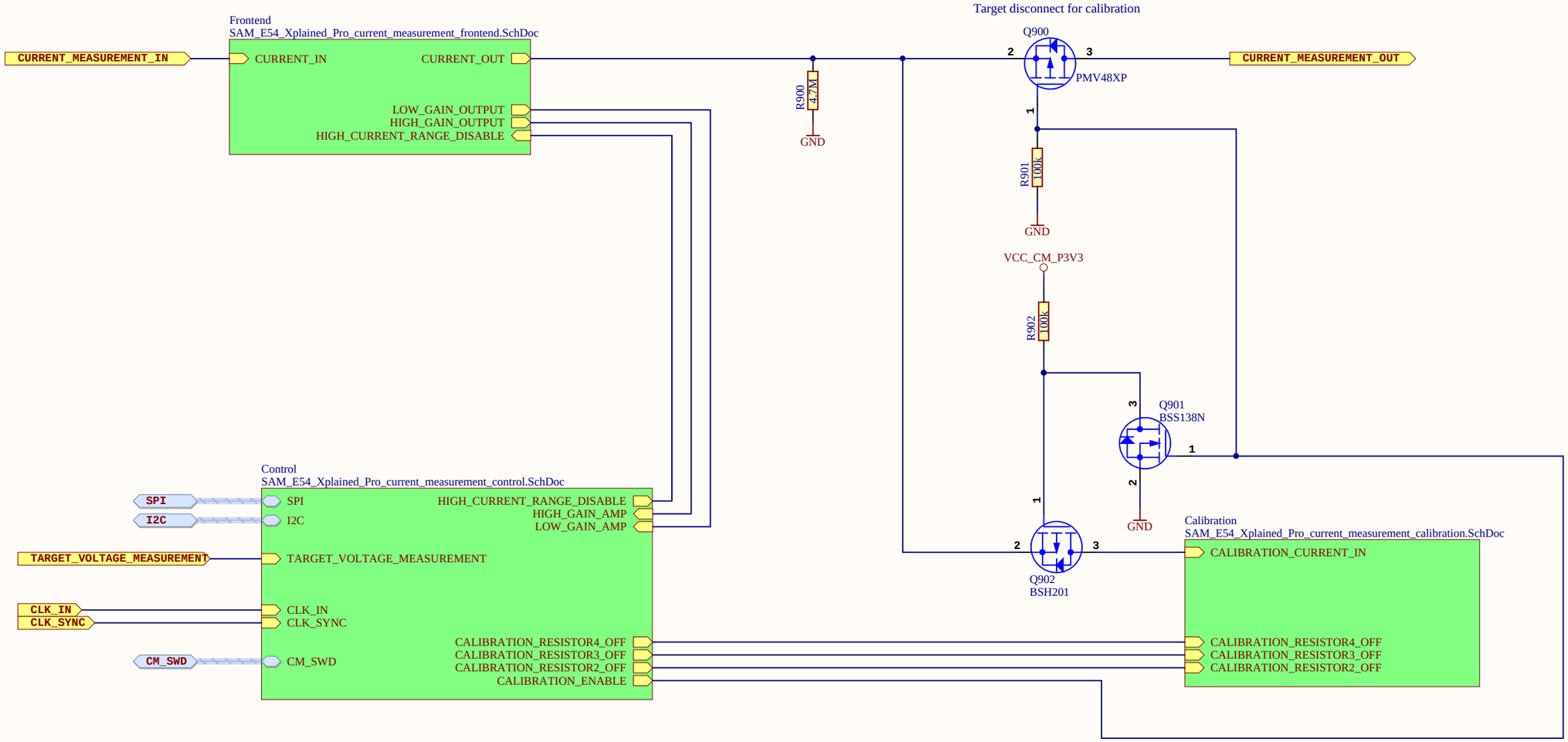
SAM_E54_Xplained_Pro_Memory.SchDoc			



ATMEL Norway	*		Atmel Enabling Unlimited Possibilities
Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:57	PAGE: 9 of 13
Document number:	A09-2748		Revision 4
TITLE: Embedded Debugger (EDBG)			
SAM_E54_Xplained_Pro_EDBG.SchDoc			



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Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:57	PAGE: 10 of 13
Document number:	A09-2748		Revision: 4
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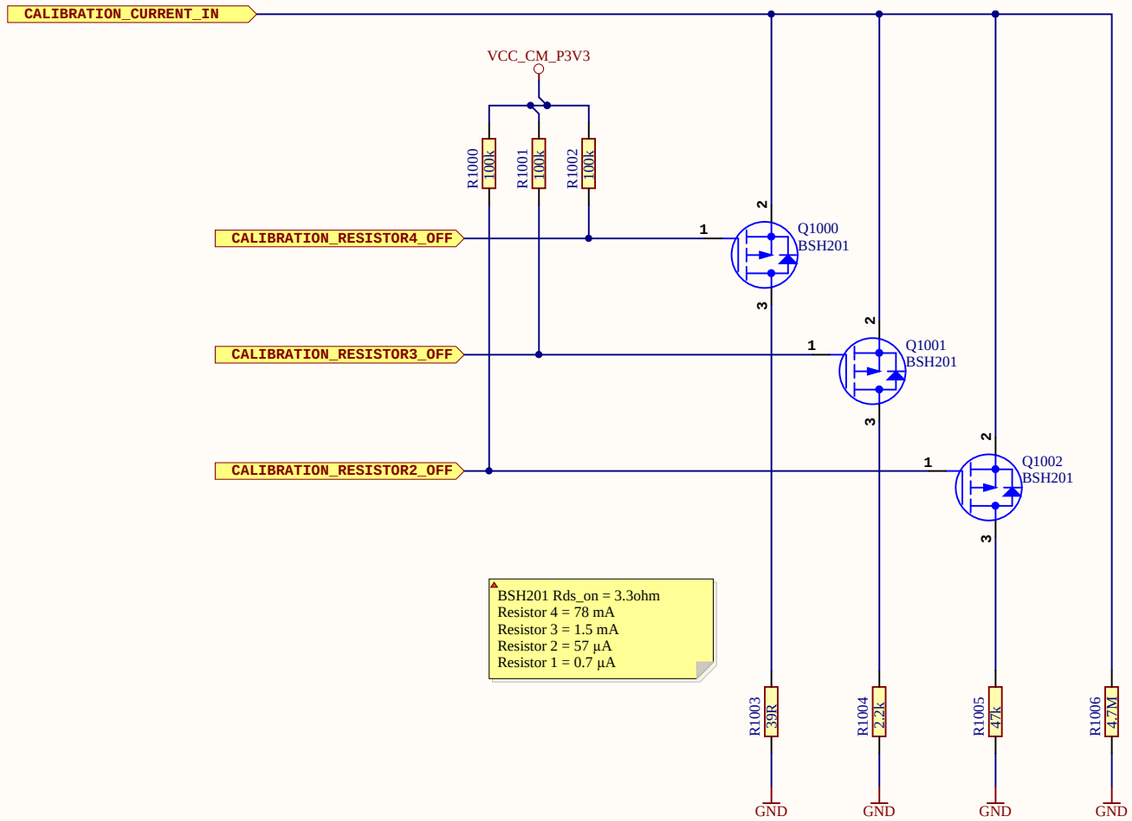
SAM_E54_Xplained_Pro_current_measurement.SchDoc			



ATMEL Norway	*			
Vestre Rosten 79	*			
N-7075 TILLER	*			
NORWAY				
Date:	18.01.2017	13:20:57	PAGE: 11 of 13	
Document number:	A09-2748		Revision	4
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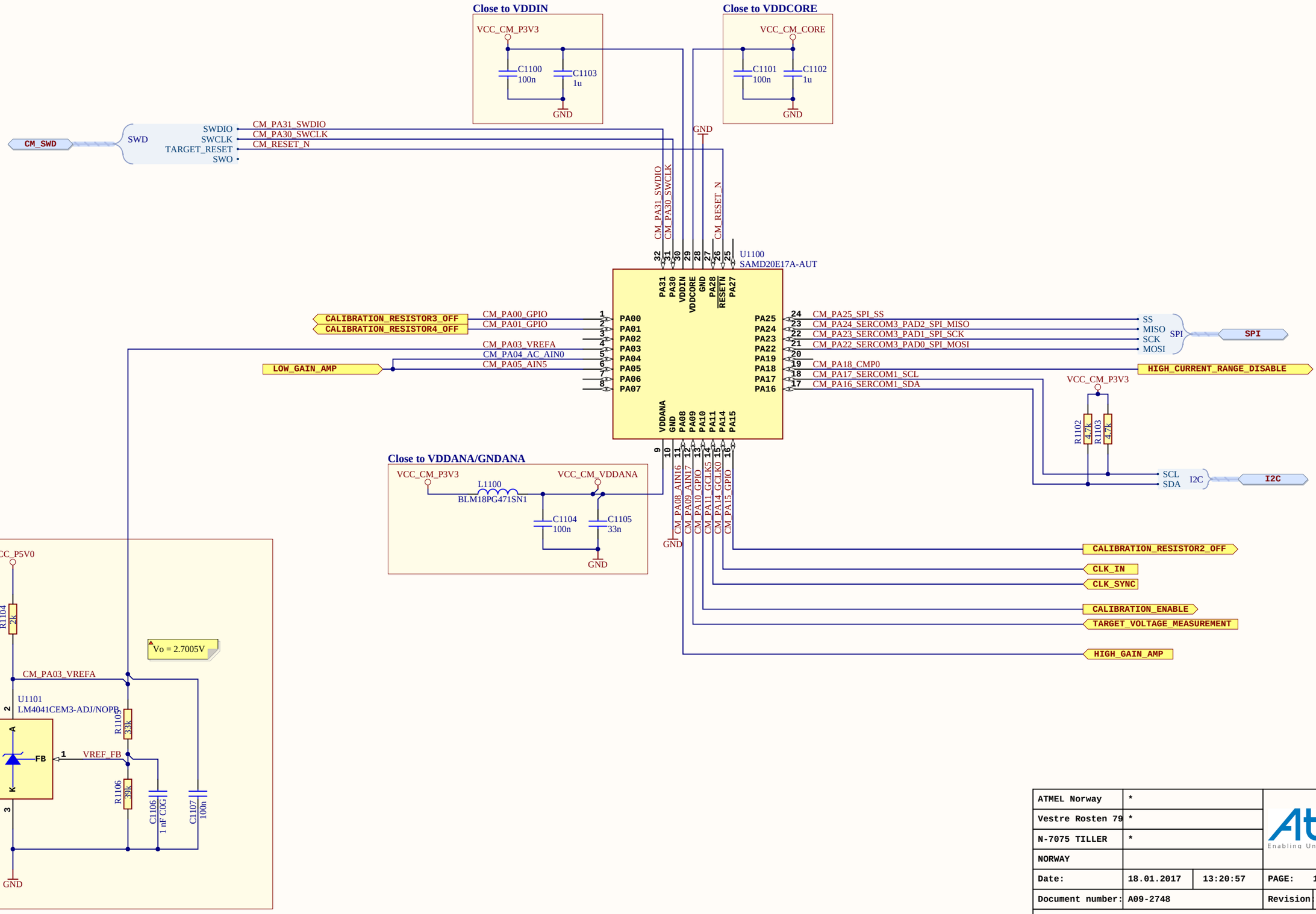

ATMEL Norway	*			
Vestre Rosten 79	*			
N-7075 TILLER	*			
NORWAY				
Date:	18.01.2017	13:20:57	PAGE: 12 of 13	
Document number:	A09-2748		Revision	4
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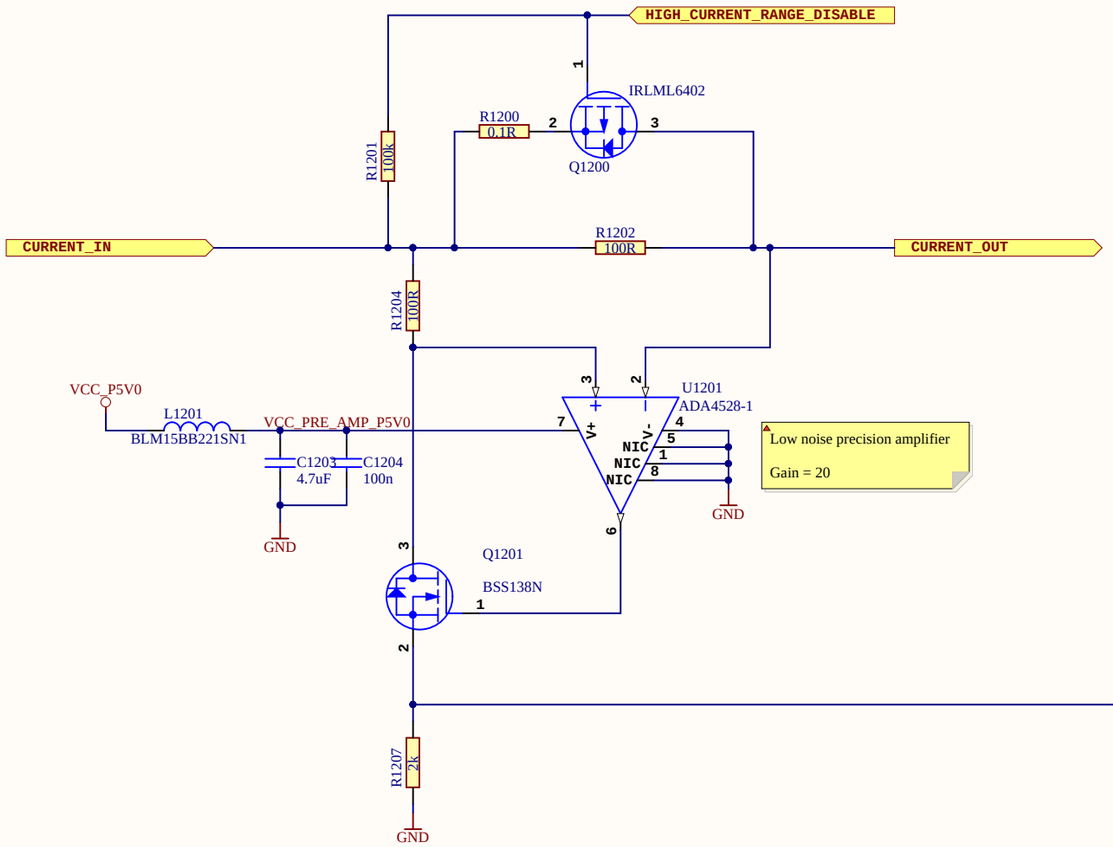
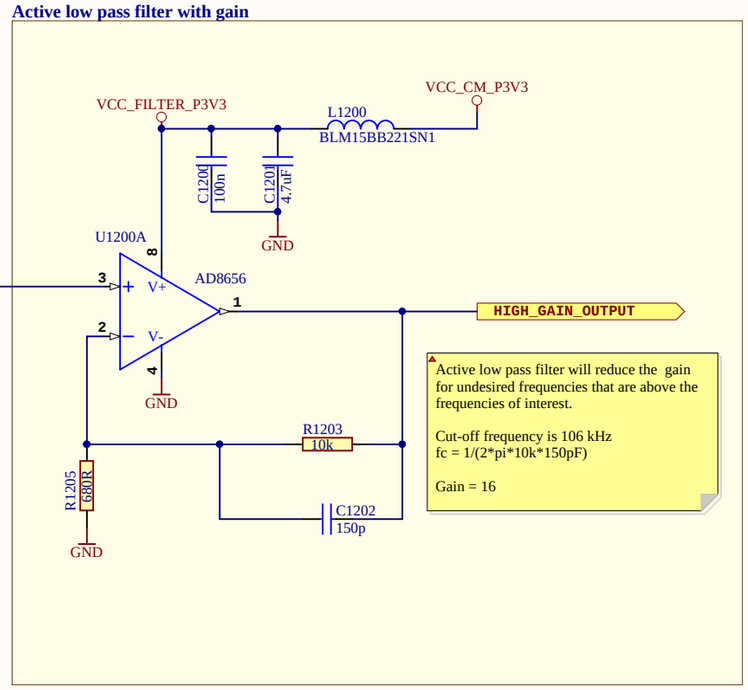
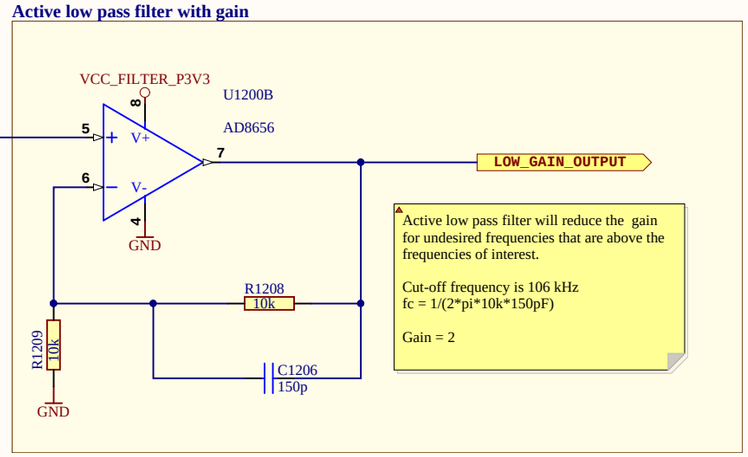


Active low pass filter with gain



Active low pass filter with gain



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Vestre Rosten 79	*		
N-7075 TILLER	*		
NORWAY			
Date:	18.01.2017	13:20:57	PAGE: 13 of 13
Document number:	A09-2748		Revision: 4
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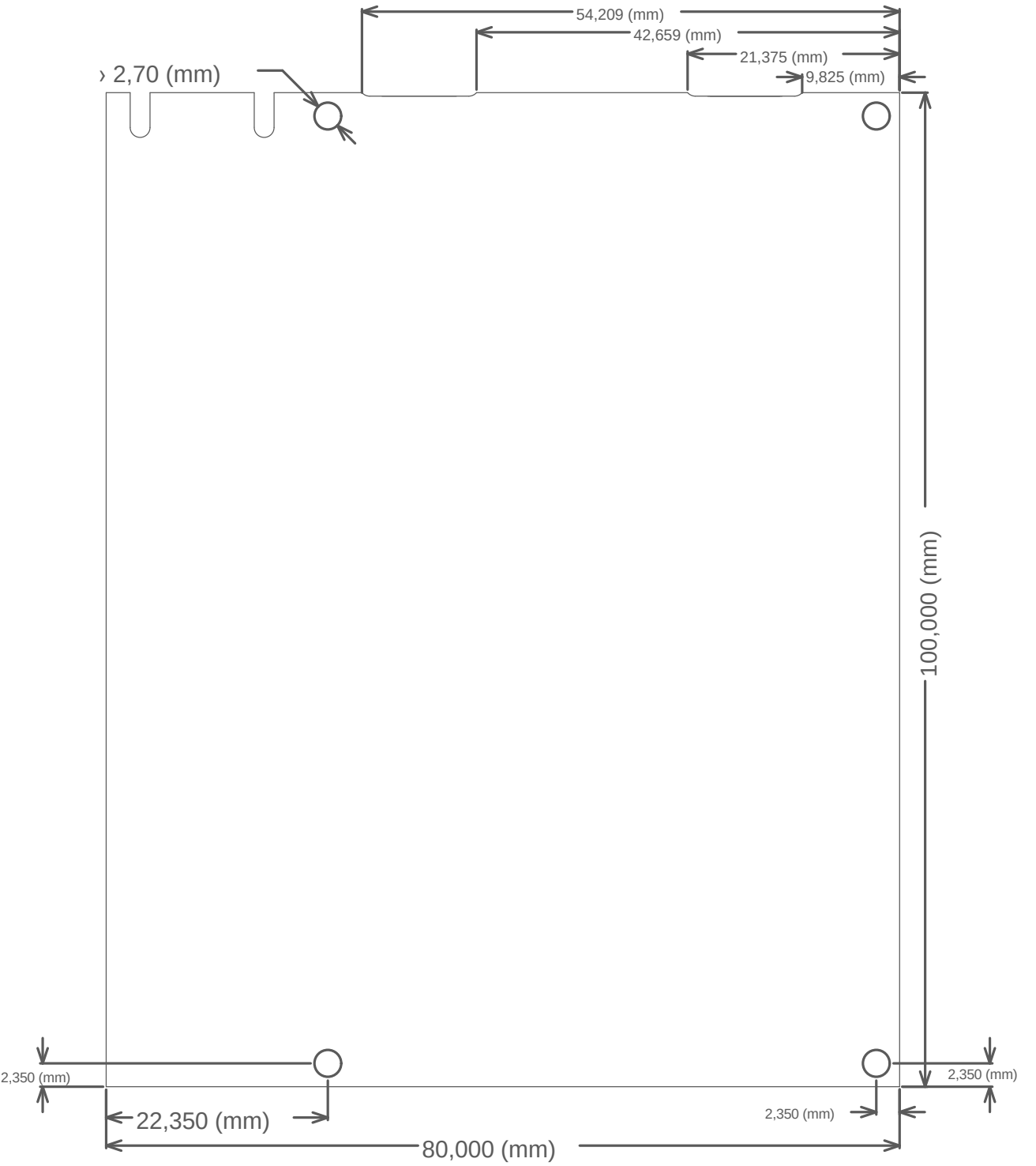
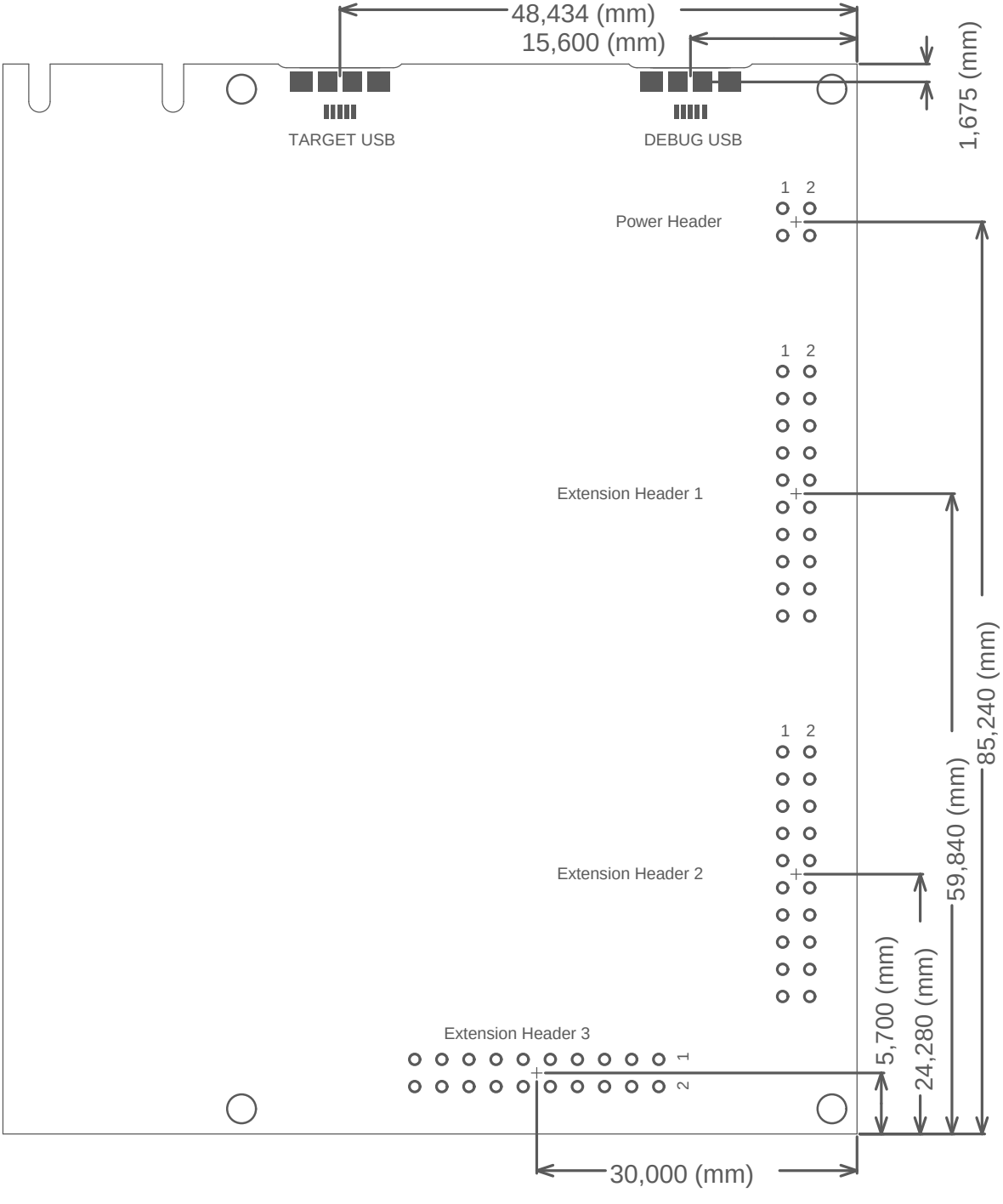
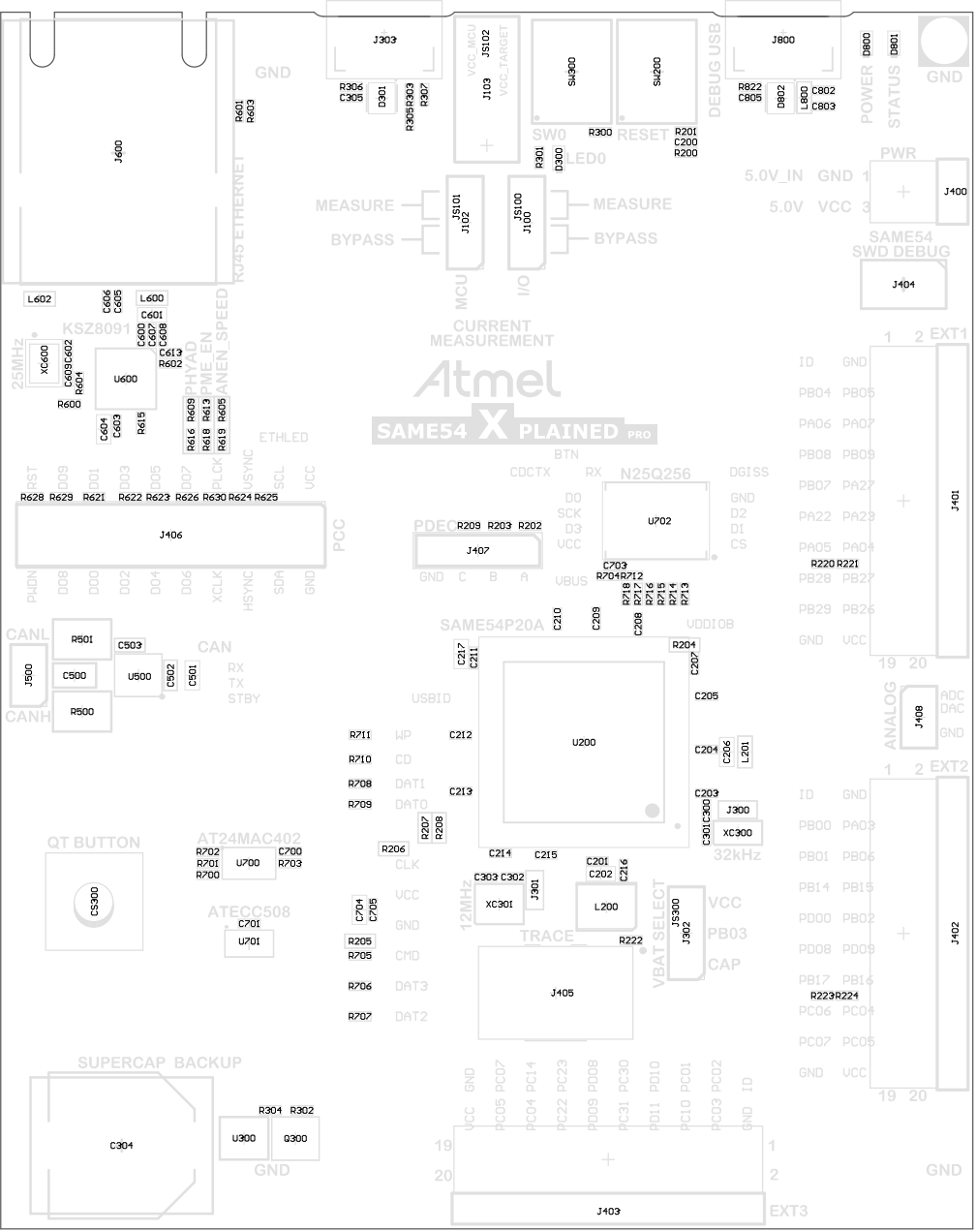
SAM_E54_Xplained_Pro_current_measurement_frontend.SchDoc			

Mechanical Dimensions



Connector Placement

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GND
R601
R603
J303
R306
C305
D301
R305
R303
R307
VCC_MCU
VCC_TARGET
JS102
J103
SW300
SW200
SW0
RESET
R300
R201
C200
R200
DEBUG USB
J800
R822
C805
D802
L800
C802
C803
POWER
STATUS
D800
D801
GND
LED0
R301
D300
PWR
5.0V_IN
GND
5.0V
VCC
J400
MEASURE
BYPASS
JS101
J102
JS100
J100
MEASURE
BYPASS
MCU
I/O
SAME54
SWD DEBUG
J404
L602
C606
C605
L600
C601
C600
C607
C608
C613
R602
KSZ8091
25MHz
XC600
C609
C602
R604
U600
R600
C604
C603
R615
R616
R609
R617
R618
R613
R619
R605
PHYPAD
PME_EN
LANEN_SPEED
CURRENT
MEASUREMENT
Atmel
SAME54 X PLAINED PRO
ETHLED
BTN
CDCTX
RX
N25Q256
DGISS
DO
SCK
D3
VCC
GND
D2
DI
CS
U702
C703
R704
R712
R218
R217
R216
R215
R214
R213
VBUS
RST
DD09
DD01
DD03
DD05
DD07
PLCK
VSYNC
SCL
VCC
R628
R629
R621
R622
R623
R626
R630
R624
R625
J406
PCC
PDEC
R209
R203
R202
J407
GND
C
B
A
PWDN
DD08
DD00
DD02
DD04
DD06
XCLK
HSYNC
SDA
GND
SAME54P20A
C210
C209
C208
VDDIOB
R204
C207
C205
C217
C211
U200
C212
C213
C204
C206
L201
C203
C300
C301
J300
XC300
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R711
R710
R708
R709
WP
CD
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DATO
R207
R208
R206
CLK
C214
C215
C201
C202
C216
C303
C302
XC301
J301
L200
12MHz
VCC
GND
CMD
DAT3
DAT2
C704
C705
R205
R705
R706
R707
TRACE
R222
J405
VBAT SELECT
JS300
J302
VCC
PB03
CAP
CANL
CANH
J500
R501
C503
C500
R500
U500
C502
C501
CAN
RX
TX
STBY
USBID
ANALOG
J408
ADC
DAC
GND
EXT1
ID
GND
PB04
PB05
PA06
PA07
PB08
PB09
PB07
PA27
PA22
PA23
PA05
PA04
R220
R221
PB28
PB27
PB29
PB26
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VCC
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20
J401
EXT2
ID
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PB02
PD08
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PB17
PB16
R223
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PC07
PC05
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VCC
19
20
J402
QT BUTTON
CS300
AT24MAC402
R702
R701
R700
U700
C700
R703
ATECC508
C701
U701
SUPERCAP BACKUP
C304
R304
R302
U300
Q300
GND
VCC
GND
PC05
PC07
PC04
PC14
PC22
PC23
PD09
PD08
PC31
PC30
PD11
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PC03
PC02
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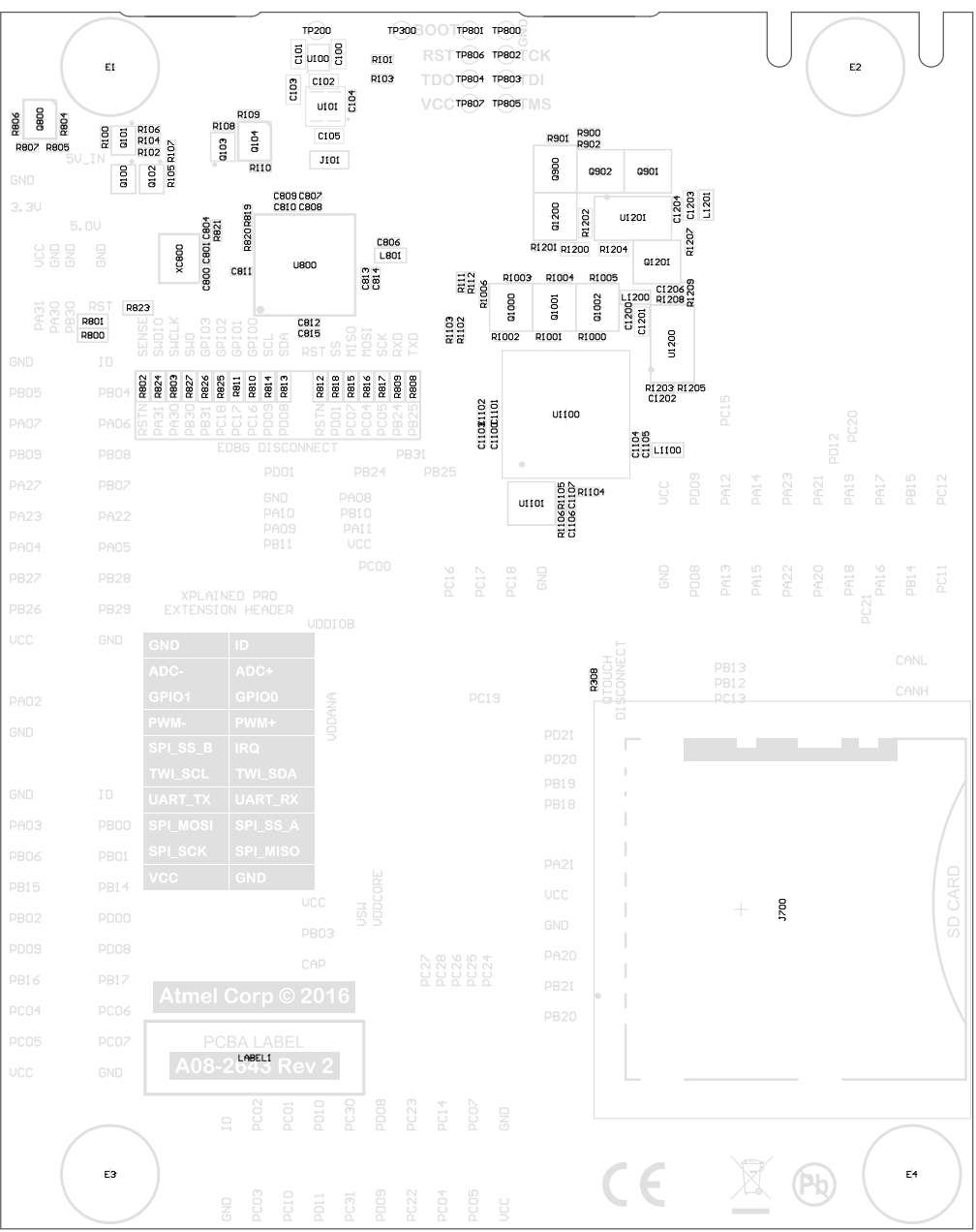
19
20
1
2
J403
EXT3
GND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EXTENSION HEADER
GND
ID
ADC-
ADC+
GPIO1
GPIO0
PWM-
PWM+
SPI_SS_B
IRQ
TWI_SCL
TWI_SDA
UART_TX
UART_RX
SPI_MOSI
SPI_SS_A
SPI_SCK
SPI_MISO
VCC
GND
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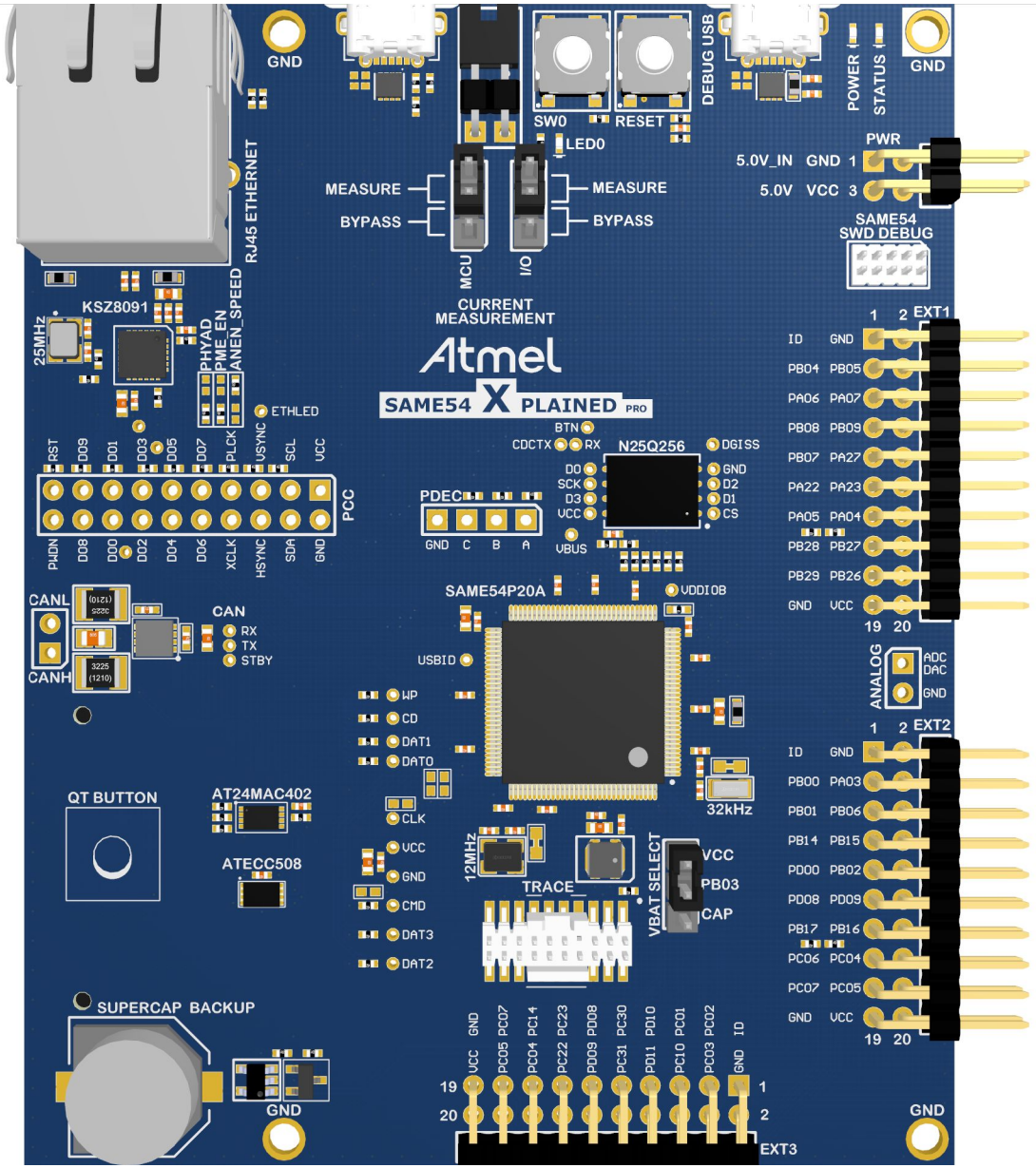
PCBA LABEL
A08-2645 Rev 2
SD CARD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RJ45 ETHERNET
SW0
RESET
LED0
DEBUG USB
POWER
STATUS
GND
PWR
5.0V_IN GND 1
5.0V VCC 3
SAME54 SWD DEBUG
MEASURE
BYPASS
MEASURE
BYPASS
MCU
I/O
CURRENT MEASUREMENT
KSZ8091
25MHz
PHYAD
PME_EN
ANEN_SPEED
ETHLED
Atmel
SAME54 X PLAINED PRO
BTN
CDCTX RX
N25Q256
DGISS
DO
SCK
D3
VCC
GND
D2
D1
CS
VBUS
PDEC
GND C B A
PCC
RST D09 D01 D03 D05 D07 PLCK VSYNC SCL VCC
PWDN D08 D00 D02 D04 D06 XCLK HSYNC SDA GND
CANL
CANH
CAN
RX
TX
STBY
SAME54P20A
VDDIOB
USBID
WP
CD
DAT1
DAT0
CLK
VCC
GND
CMD
DAT3
DAT2
12MHz
32kHz
TRACE
VBAT SELECT
VCC
PB03
CAP
QT BUTTON
AT24MAC402
ATECC508
SUPERCAP BACKUP
GND
EXT1
ID GND
PB04 PB05
PA06 PA07
PB08 PB09
PB07 PA27
PA22 PA23
PA05 PA04
PB28 PB27
PB29 PB26
GND VCC
19 20
ANALOG
ADC
DAC
GND
EXT2
ID GND
PB00 PA03
PB01 PB06
PB14 PB15
PD00 PB02
PD08 PD09
PB17 PB16
PC06 PC04
PC07 PC05
GND VCC
19 20
EXT3
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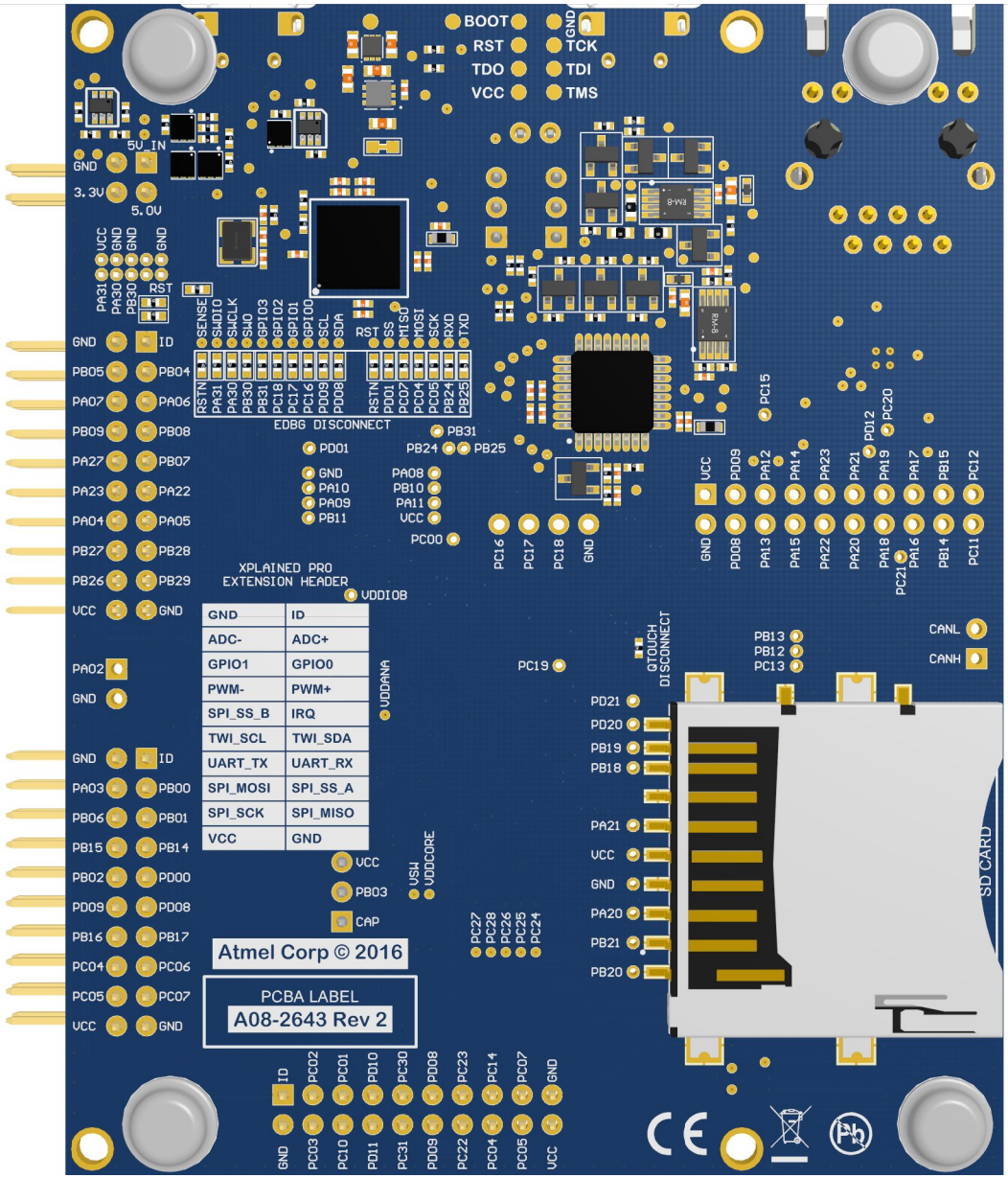
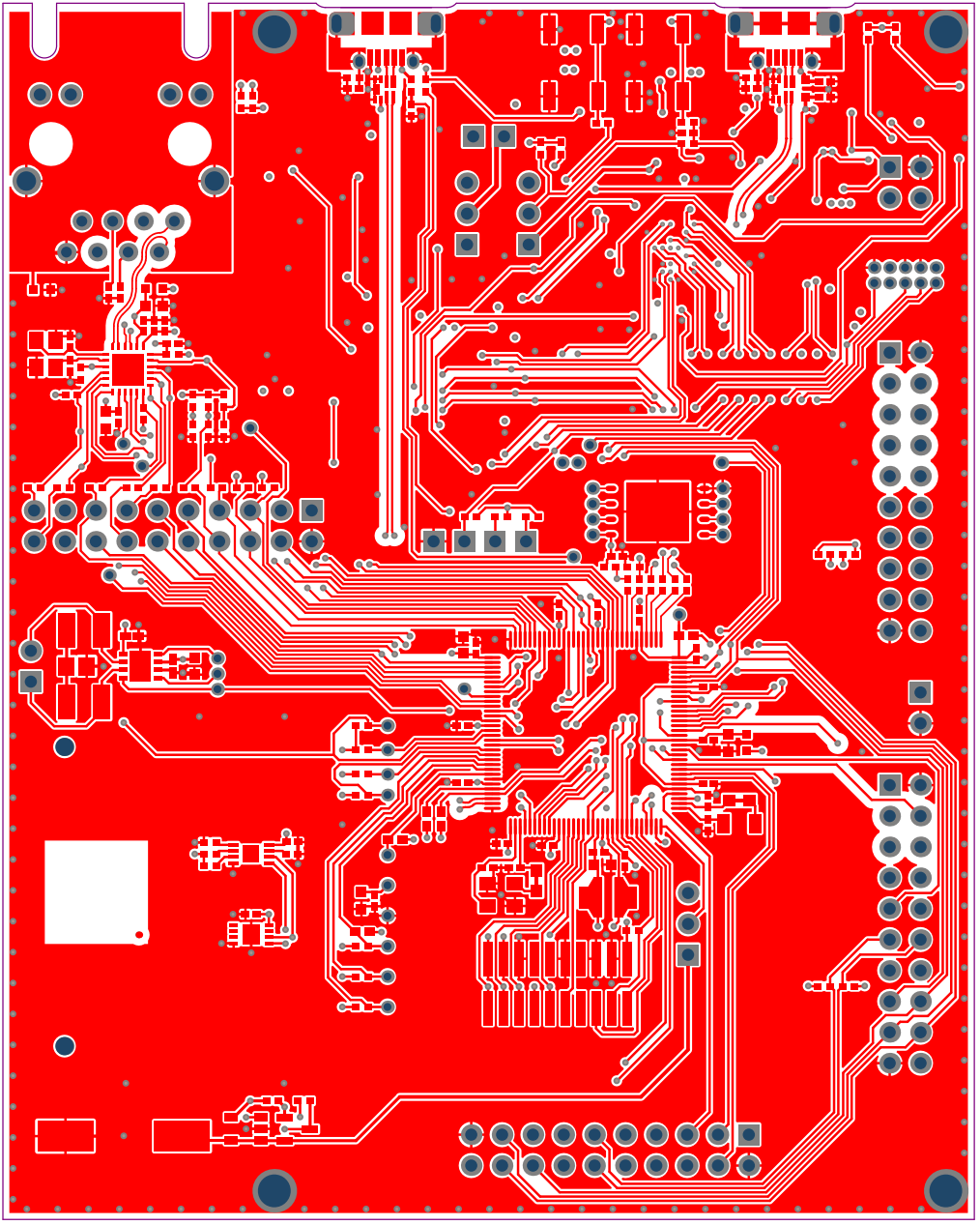
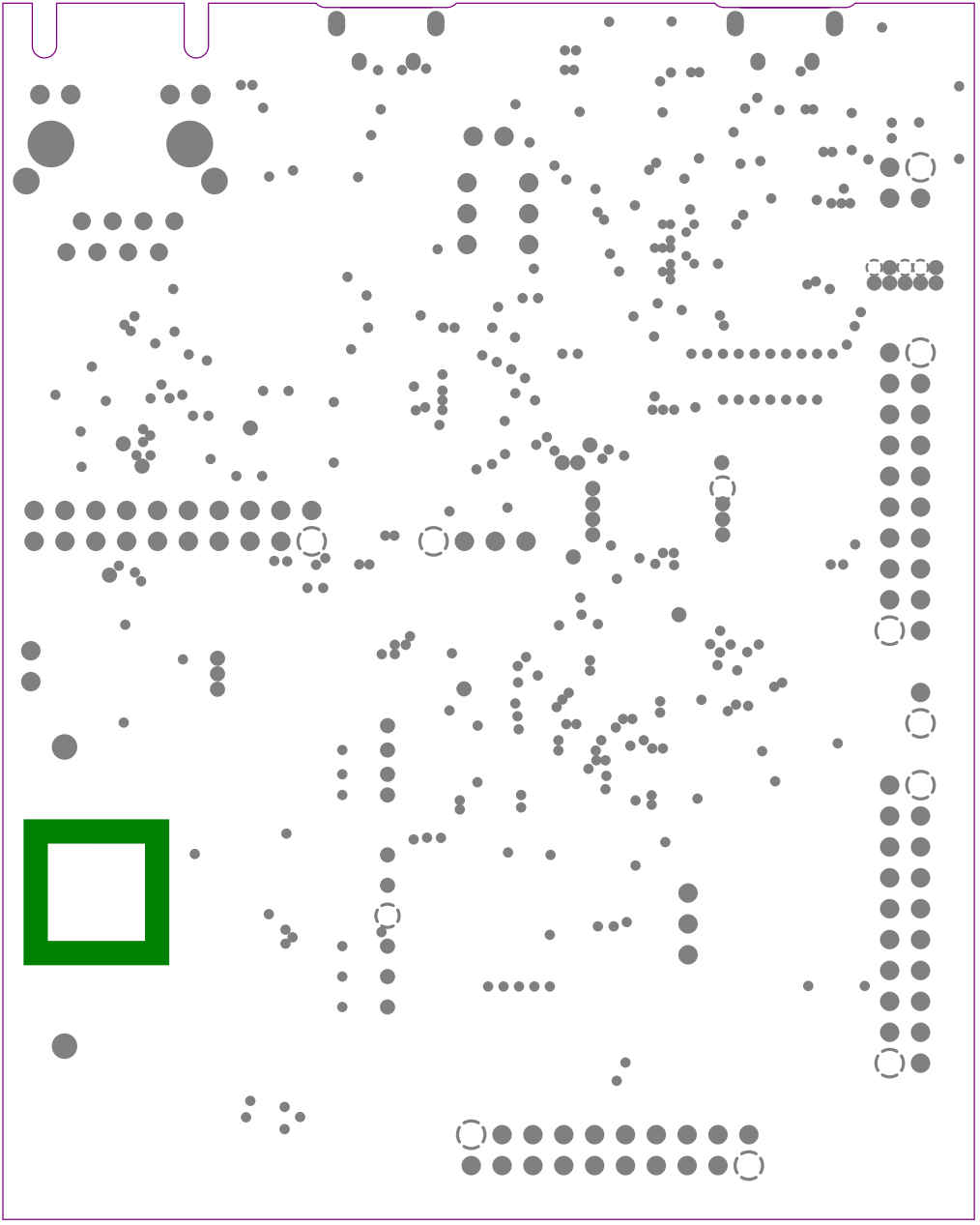
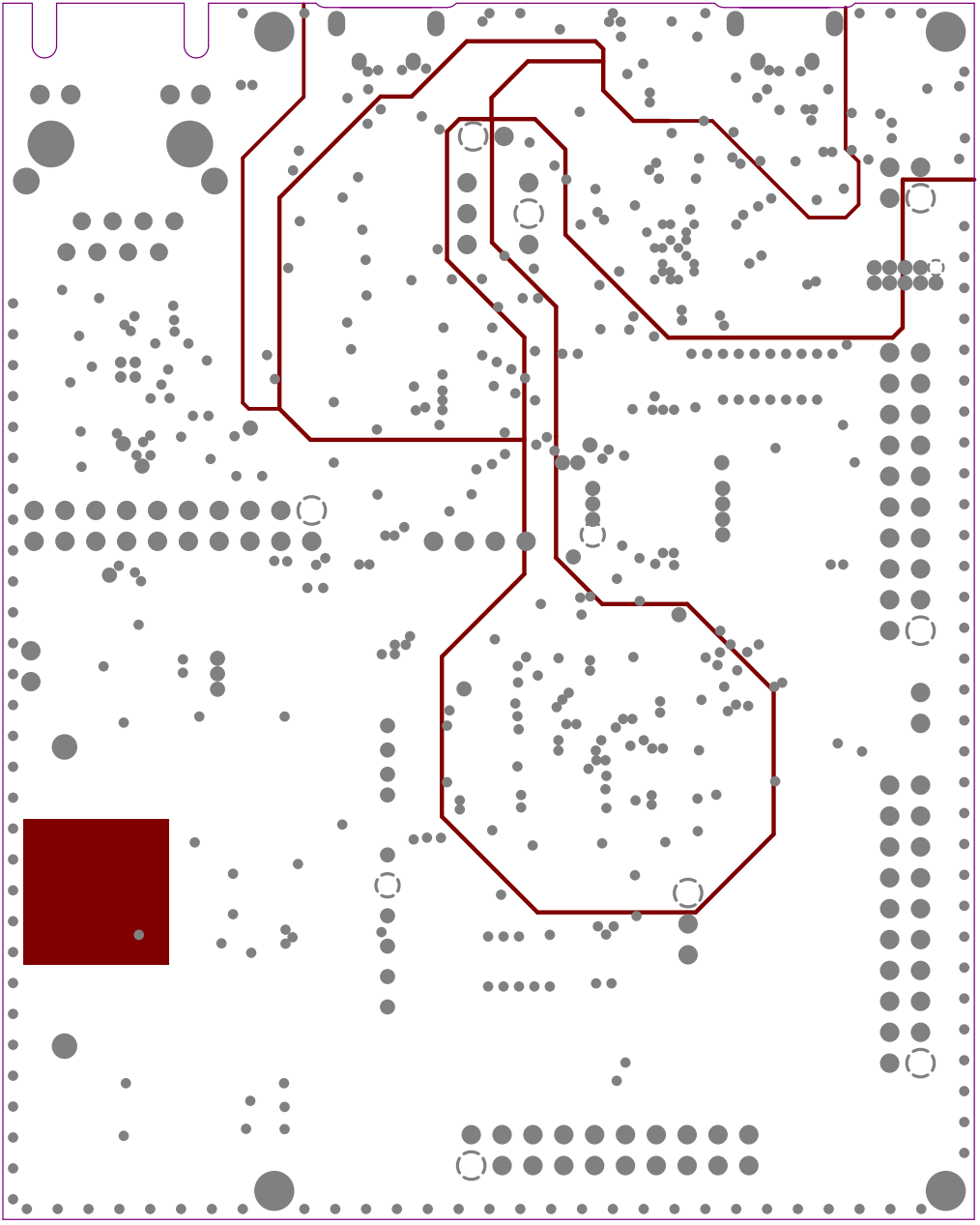
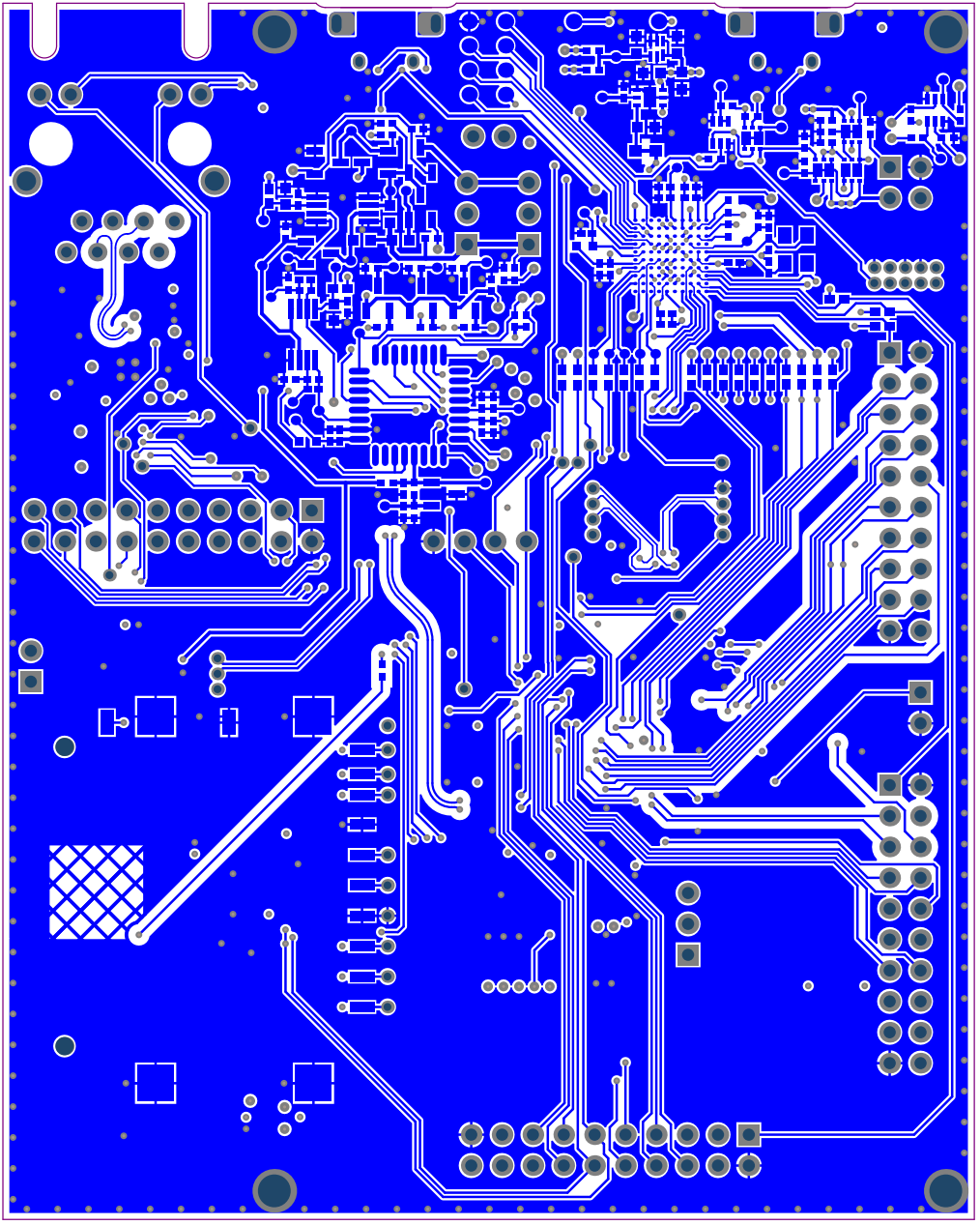
19 20
1 2
GND


BOOT
RST
TDO
VCC
GND
TCK
TDI
TMS
5V_IN
3.3V
5.0V
EDBG DISCONNECT
XPLAINED PRO
EXTENSION HEADER
VDDIOB
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
VDDANA
VDDCORE
QTOUCH
DISCONNECT
CANL
CANH
SD CARD
Atmel Corp © 2016
PCBA LABEL
A08-2643 Rev 2









Component list

Top Level Schematics

Source Data From: SAM_E54_Xplained_Pro.PrjPCB
Project: SAM_E54_Xplained_Pro.PrjPCB
Variant: Default_assembly

Report Date: 18.01.2017 13:22:21
Print Date: 18.01.2017 13:21:14

Fitted	Designator	Quantity	Value	Manufacturer	MPN	Description
Fitted	C100, C101, C102, C202, C501, C1201, C1203	7	4.7uF	WALSIN Technology Corporation	0603X475K100CT	Ceramic capacitor, SMD 0603, X5R, 10V, 10% (de31036)
Fitted	C103, C105, C601, C604	4	22u/10V	Murata	GRM188R61A226ME15D	Ceramic capacitor, SMD 0603, X5R,10V, Â±20%
Fitted	C104	1	10n	YAGEO CORP	CC0402KRX7R8BB103	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Fitted	C1102, C1103	2	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
Fitted	C1105	1	33n	Murata	GRM155R71E333KA88D	Ceramic capacitor, SMD 0402, X7R, 25V, ±10%
Fitted	C1202, C1206	2	150p	YAGEO CORP	CC0402KRX7R9BB151	Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
Fitted	C200	1	4.7n	PHYCOMP	2238 587 15632	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10% (de35287)
Fitted	C201, C203, C204, C205, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C600, C603, C605, C606, C607, C613, C700, C701, C703, C705, C806, C810, C811, C812, C813, C1100, C1101, C1104, C1107, C1200, C1204	35	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C206, C217, C704	3	10uF/10V	AVX	0603ZD106MAT2A	Ceramic capacitor, SMD 0603, X5R, 10V, 10UF Â± 20%
Fitted	C300, C301, C800, C801	4	15p	AVX	04025A150JAT2A	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C302, C303	2	5pF	Murata	GRM1555C1H5R0CA01D	Ceramic capacitor, SMD 0402, NP0, 50V, +/-0.25pF
Fitted	C304	1	47mF	Kemet	FC0H473ZFTBR24	Electric Double-Layer (Supercapacitor), 5.5V, 47mF, SMD, 10.5mm diameter, 50Ω ESR
Fitted	C500	1	4.7uF	Murata	GRM21BR61E475KA12L	Ceramic capacitor, SMD 0805, X5R, 25V, Â±10 %
Fitted	C502, C503	2	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C602, C609	2	12p	Kemet	C0402C120J5GAC7867	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	C608, C807, C809, C814, C815	5	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
Fitted	C802, C803, C808, C1106	4	1 nF C0G	Murata	GRM1555C1H102JA01D	Ceramic capacitor, SMD 0402, C0G, 50V, +/-5%
Fitted	C804	1	10p	AVX	04025A100JAT2A	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Fitted	D300, D801	2	SML-P11YT	ROHM	SML-P11YT-T86	LED, SMD 0402, Yellow , Wave length=586nm, 7.6mcd @ (1mA, 1.9Vf)
Fitted	D301, D802	2	EMI2121MTTAG	ON Semiconductor	EMI2121MTTAG	EMI2121, SZEMI2121 Single Pair Common Mode Filter with ESD Protection
Fitted	D800	1	SML-P11MT	ROHM	SML-P11MT-T86	LED, SMD 0402, Green, Wave length=569nm, 2.1mcd @ (1mA, 1.9Vf)
Fitted	E1, E2, E3, E4	4	SJ-5076	3M	SJ-5076	2.8mm adhesive feet,diam 8.0mm
Fitted	FIXTURE1	1	Xplained PRO MCU board Jupiter Test Fixture	ESCATEC	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, J102, J302	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	J303, J800	2	ZX62D-AB-5P8	HIROSE	ZX62D-AB-5P8(30)	Micro USB AB Connector, Standard SMT + DIP
Fitted	J400	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	J401, J402, J403	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	J404	1	PIN HEADER 2x5	Garry	176-2-010-0-T-XS0-0730	2x5 pin header, 1.27mm pitch, THM
Fitted	J405	1	FTSH-110-01-F-DV-007-K	SAMTEC	FTSH-110-01-F-DV-007-K	SAMTEC FTSH series 50-mil header, shrouded, pin 7 removed, SMD
Fitted	J600	1	HFJ11-2450E-L12RL	Halo Electronis	HFJ11-2450E-L12RL	10/100Base-TX, THT, RJ45, green and yellow LEDs, integrated magnetics
Fitted	J700	1	KYOCERA - 14 5738 009 220 859+	Kyocera-elco	KYOCERA - 14 5738 009 220 859+	SD/MMC socket, 2.7mm, push-push, SMD
Fitted	JS100, JS101, JS102, JS300	4	SNT-100-BK-G	SAMTEC	SNT-100-BK-G	Jumper cap for 2.54mm pinheader
Fitted	L1200, L1201	2	BLM15BB221SN1	Murata	BLM15BB221SN1	SMD RF inductor 0402. Z=220Ohm (@100MHz), Max R(dc)=0.80Ohm, Max current=200mA
Fitted	L200	1	LQH3NPN100MJ0	Murata	LQH3NPN100MJ0	10uH pow er inductor, Isat = 560mA , Itemp = 710mA, Rdc = 0.360ohm
Fitted	L201, L600, L602, L800, L801, L1100	6	BLM18PG471SN1	Murata	BLM18PG471SN1	SMD RF inductor 0603. Z=470Ohm (@100MHz), Max R(dc)=0.650hm, Max current=1A
Fitted	LABEL1	1	Label PCBA (ES)	ACT Logimark AS	505462	PCBA Label for board with ES device
Fitted	PCB1	1	SAM E54 Xplained Pro PCB documentation			SAM E54 Xplained Pro PCB documentation
Fitted	PCBADOC1	1	SAM E54 Xplained Pro PCBA documentation			SAM E54 Xplained Pro PCBA documentation
Fitted	Q100, Q101, Q102, Q103	4	DMP2160UFDB	Diodes Incorporated	DMP2160UFDB-7	MOSFET 20V 3.8A DUAL P-CHAN, Rds 70 mOhms, Vgs 12V, Vds -20
Fitted	Q104, Q800	2	2N7002DW	Fairchild	2N7002DW	Dual N-Channel MOSFET, 60V, 115mA cont,RDS(ON) < 7.5 Ohm @50mA@5V, SOT-363
Fitted	Q300, Q1200	2	IRLML6402	International Rectifier	IRLML6402PBF	P-ch. MOSFET. -30V, -3.7A continuous,RDS(ON)=0.05Ohm@VGS=-4.5V, RDS(ON)=0.08Ohm@VGS=-2.5V
Fitted	Q900	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	Q901, Q1201	2	BSS138N	Infineon	BSS138N	Low leakage N-Channel MOSFET. 60V, 0.23A continuous, 0.92A Peak. RDS(ON) = 3.5Ohm@VGS=4.5V, VGS(th)<1.4V
Fitted	Q902, Q1000, Q1001, Q1002	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, R102, R104, R105, R106, R107, R108, R109, R200, R602, R704, R706, R707, R708, R709, R712, R901, R902, R1000, R1001, R1002, R1201	22	100k	ASJ	CR10-1003-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R1004	1	2.2k	ASJ	CR10-2201-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R101, R103, R621, R622, R623, R624, R625, R626, R628, R629, R630	11	0R	(n/a)	RMCF0402ZT0R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R110, R111, R112, R305, R1005	5	47k	KOA	RK73H1ETTP4702F	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R1105	1	33k	ASJ	CR10-3302-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R1106	1	39k	ASJ	CR10-3902-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R1200	1	0.1R	vishay	WSL0603R1000FEA	WSL0603R1000FEA, metal strip resistor, 0.1 Ohm, +-1%, 0603 SMD, 1/10 W, TEMPCO +-75 ppmÂ°C
Fitted	R1202, R1204	2	100R	Panasonic	ERA3YEB101V	ERA-3YEB101V, metal film, 100R Â±0.1%, resistor in 0603 at 100mW, TEMPCO Â±25ppmÂ°C, Max V=75V
Fitted	R1205	1	680R	ASJ	CR10-6800-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R201, R300, R819, R820, R1003	5	39R	ASJ	CR10-39R0-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R202, R203, R209, R308, R700, R701, R702, R703, R705, R710, R711, R1203, R1208, R1209	14	10k	vishay	CRCW040210K0FKED	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R204, R803, R808, R812, R813, R814, R816, R817, R818, R824, R827	11	0R	(n/a)	RMCF0402ZT0R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R220, R221, R1104, R1207	4	2k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R222, R301, R304, R600, R615, R616, R618, R805, R806	9	1k	ASJ	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R223, R224	2	3.9k			Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R302, R601, R603	3	220R	ASJ	CR10-2200-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R303	1	30k	ASJ	CR10-3002-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R307	1	330R	ASJ	CR10-3300-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R500, R501	2	62R	vishay	CRCW121062R0FKEAHP	Thick film resistor, SMD 1210, 0.5W, 1%
Fitted	R604	1	6.49K	PHYCOMP	232270676492L	Thick film resistor, SMD 0402, 1/16W, 1%, E48
Fitted	R605, R1102, R1103	3	4.7k	PHYCOMP	2322 706 74702L	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R713, R714, R715, R716, R717, R718	6	33R	ASJ	CR10-33R0-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R800, R801, R823	3	1k	ASJ	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R802	1	39R	ASJ	CR10-39R0-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R804, R807	2	1M	ASJ	CR10-1004-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R809, R810, R811, R815, R825, R826	6	330R	ASJ	CR10-3300-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R821	1	6.81k	vishay	CRCW04026K81FKED	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R900, R1006	2	4.7M	YAGEO CORP	RC0402FR-074M7L	Thick film SMD 0402 1/16W 1%
Fitted	SW200, SW300	2	SKRAAKED10	ALPS	SKRAAKED10	6.2x6.2 mm SMD tact sw itch, same as A08-0091 but less force is needed
Fitted	TEST1	1	SAM E54 Xplained Pro eggTest			SAM E54 Xplained Pro eggTest
Fitted	TESTDOC1	1	SAM E54 Xplained Pro Test Instructions			SAM E54 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	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	U1100	1	SAMD20E17A-AUT	ATMEL	ATSAMD20E17A-AUT	Atmel 32bit RISC MCU 32 pin
Fitted	U1101	1	LM4041CEM3-ADJ/NOPB	Texas Instruments	LM4041CEM3-ADJ/NOPB	Adjustable shunt voltage regulator, 1.24 to 10V out
Fitted	U1200	1	AD8656	Analog Devices	AD8656ARMZ	AD8656, dual low noise precision OpAmp, rail-to-rail, low offset 250uV, GBP 28 MHz, 8MSOP
Fitted	U1201	1	ADA4528-1	Analog Devices	ADA4528-1ARMZ	Precision OpAmp, Zero-Drift 0.015uV/K, ultra low noise 5.6nV/sqrt(Hz), Vo=2uV, GBW=4MHz, single supply 2.2V to 5.5V or dual supply +-1V to +-2.75V, rail to rail, unity gain stable
Fitted	U200	1	ATSAME54P20A	ATMEL	ATSAME54P20A-ANTES	Atmel 32-bit RISC MCU
Fitted	U300	1	BU7265SG-TR	ROHM	BU7265SG-TR	Single, Low Voltage (1.8-5.5V), Low Pow er (0.35ÂµA), low cost
Fitted	U500	1	ATA6561-GBQW	ATMEL	ATA6561-GBQW	5Mbit/s CAN Transceiver,VCC = 5V, VIO = 2.8-5V, 3x3 mm VDFN8
Fitted	U600	1	KSZ8091RNACA	Microchip	KSZ8091RNACA	10Base-T/100Base-TX PHY, RMII, EEE, WOL, 50MHz clock output
Fitted	U700	1	AT24MAC402-MAHM-T	ATMEL	AT24MAC402-MAHM-T	2kbit I2C EEPROM, single EUI-48 MAC, 1.7-5.5V, 2x3mm UDFN (8MA2)
Fitted	U701	1	ATECC508A I2C UDFN	ATMEL	ATECC508A-MAHDA-T	ATECC508A with an I2C Interface and a 8 Pin UDFN Package with Paddle
Fitted	U702	1	N25Q256A13EF840	Micron	N25Q256A13EF840F	256 Mbit (32MB) QSPI flash, 3.3V, 108MHz, V-PDFN-8 (8x6mm)
Fitted	U800	1	AT32UC3A4256J-C1UR	ATMEL	AT32UC3A4256J-C1UR	AVR 32-bit RISC MCU
Fitted	XC300	1	32.768kHz	Kyocera Crystal Device Corporation	ST3215SB32768E0HPWBB	Kyocera ST3215SB32768E0HPWBB, 32.768kHz, 9pF, SMD tuning fork crystal
Fitted	XC301, XC800	2	12.00MHz	Kyocera Crystal Device Corporation	CX3225CA12000D0KPSC1, CX3225GB12000H0KPSC1	Kyocera CX3225CA, 12MHz, 8pF, AEC-Q200, SMD crystal, Kyocera CX3225GB12000H0KPSC1, 12MHz, 12pF, SMD crystal
Fitted	XC600	1	25.00MHz	Kyocera Crystal Device Corporation	CX3225SB25000D0KPSC1	Kyocera CX3225SB, 25MHz, 8pF, AEC-Q200, SMD crystal
Not Fitted	C305, C805	0	4.7n	PHYCOMP	2238 587 15632	Ceramic capacitor, SMD 0402, X7R, 25V, +/-10%
Not Fitted	J406	0	HMTSW-110-23-F-D-237	SAMTEC	HMTSW-110-23-F-D-237	2x10 pin header, 2.54mm pitch, Pin-in-Paste THM, 1mm hole
Not Fitted	J407	0	HMTSW-104-23-F-S-237	SAMTEC	HMTSW-104-23-F-S-237	1x4 pin header, 2.54mm pitch, Pin-in-Paste THM
Not Fitted	J408, J500	0	HMTSW-102-23-F-S-237	SAMTEC	HMTSW-102-23-F-S-237	1x2 pin header, 2.54mm pitch, Pin-in-Paste THM
Not Fitted	R205, R206, R207, R208	0	0R	(n/a)	RMCF0402ZT0R00	RES 0.0 OHM 1/16W 0402 SMD
Not Fitted	R306, R822	0	1M	ASJ	CR10-1004-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R609, R613	0	4.7k	PHYCOMP	2322 706 74702L	Thick film resistor, SMD 0402, 1/16W, 1%
Not Fitted	R619	0	1k	ASJ	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
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Approved

Notes