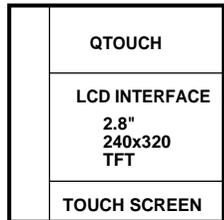
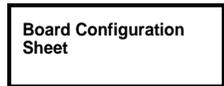


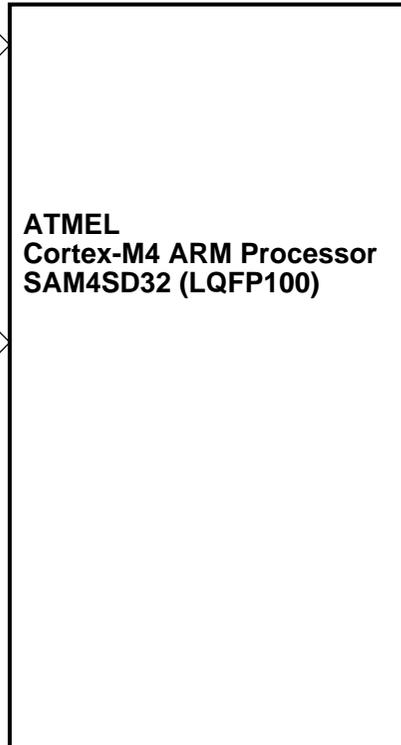
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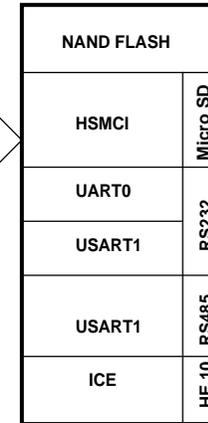
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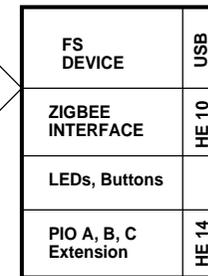
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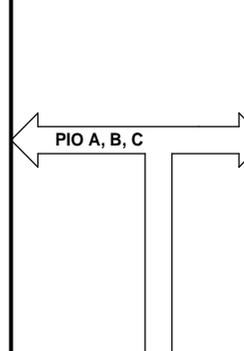
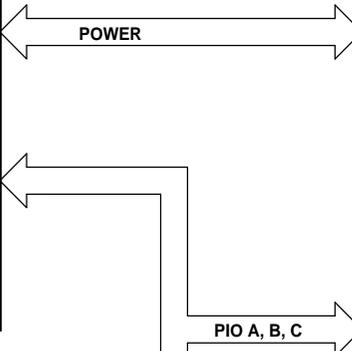
Sheet 3



Sheet 4



Sheet 7



| | | | | | |
|---------------|-----------|------|-----------|--------|-----------|
| | | | | | |
| REV. A | INIT EDIT | PP | 30-APR-12 | XXX | XX-XXX-XX |
| MODIF. | DES. | DATE | | VER. | DATE |
| SCALE 1/1 | | | | REV. A | SHEET 1/1 |
| Block Diagram | | | | | |

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REVISION HISTORY

| REV | DATA | NOTE |
|-----|---------|-------------------|
| A | 2012.04 | ORIGINAL RELEASED |

SCHEMATICS CONVENTIONS

| |
|---|
| (1) Resistance Unit: "K" is "Kohm", "R" is "Ohm," |
| (2) "DNP" means the component is not populated by default |

TABLE OF CONTENTS

| PAGE | DESCRIPTION |
|------|--|
| 1 | Block Diagram |
| 2 | Reference guide |
| 3 | Microcontroller |
| 4 | NAND Flash, RS232, RS485, MCI, JTAG |
| 5 | LCD, Touch items |
| 6 | Audio, AD/DA, Power |
| 7 | IO Expansion, USB, ZigBEE, LED, Button |

TEST POINT

| PAGE | REFERENCE | FUNCTION |
|------|--------------------|---|
| 3 | TP1, TP2, TP3, TP4 | GND |
| 4 | TP5 TP6 | UART TXD UART RXD |
| 5 | TP7 TP8, TP9 | LCD backlight driver anode Aux ADC input for TSC |
| 6 | TP12 | Optional audio PA input |

JUMPER and SOLDERDROP

| PAGE | REFERENCE | DEFAULT | FUNCTION |
|------|--------------------|---------|---|
| 3 | JP1 | OPEN | Close to select JTAG boundary scan |
| | JP2 | 1-2 | Analog reference voltage selection between 3.3V and 3.0V |
| | JP3 | OPEN | Close to reinitialize the Flash contents and some of its NVM bits |
| | JP4 | OPEN | Close for manufacturing test or fast programming mode |
| | JP5, JP6, JP7, JP8 | CLOSE | Access for current measurement on each power rail |
| 4 | JP9 | CLOSE | Nand Flash chip select enable |
| | JP11 | CLOSE | RS485 bus termination enable |
| | JP10, JP12 | OPEN | RS485 pull resistor selectors |
| | JP28 | OPEN | Option for software test |
| | JP31 | 1-2 | RS232 USART and RS485 selection |
| 5 | JP13 | CLOSE | LCD chip select enable |
| | JP32 | CLOSE | TOUCH SCREEN chip select enable |
| 6 | JP14, JP15 | OPEN | Sync close to degrade gain stage on microphone input |
| | JP17, JP19 | OPEN | Close to mux RIN/LIN into MONO-IN path within audio PA |
| | JP16, JP21 | OPEN | Close for impedance matching on AD/DA BNC port |
| | JP18 | 1-2 | ADC input selection between BNC port and potentiometer |
| | JP20 | OPEN | Close to fix in mono speaker mode, no matter stereo plug state |
| | JP29 | 2-3 | AUDIO Amplifier power select between VCC33 and +5V |
| | JP30 | 1-2 | DAC output between AUDIO left channel and BNC connector |
| 7 | JP22, JP23, JP24 | 1-2 | DC voltage selection between 3.3V and 5V on PIO expansion ports |
| | JP25 | CLOSE | Button BP2 disable |
| | JP26 | CLOSE | Button BP3 disable |
| | JP27 | CLOSE | Power consumption measure for ZigBEE module |

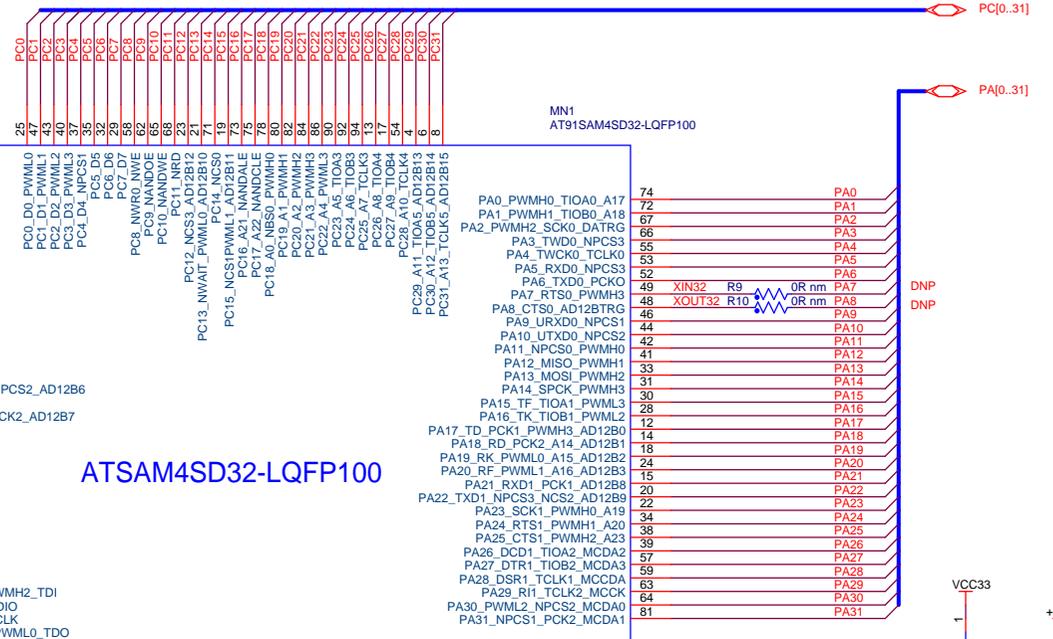
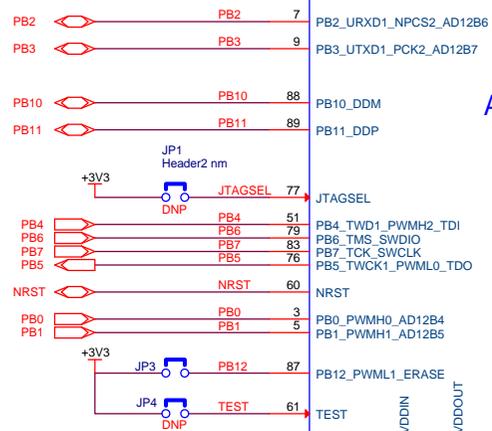
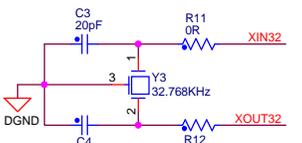
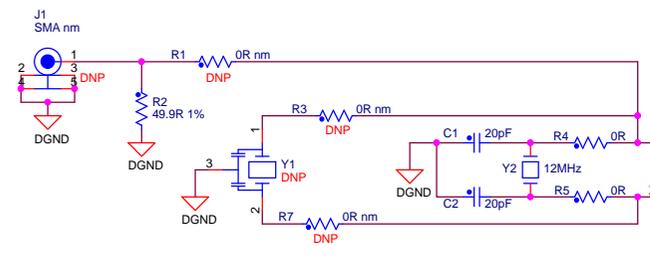
PIO MUXING

| PIOA | USAGE | PIOA | USAGE | PIOB | USAGE | PIOC | USAGE | PIOC | USAGE |
|------|----------------|------|------------------|------|-------------|------|-----------|------|----------------|
| PA0 | TSLIDR_SL_SNS | PA16 | TSC_IRQ/ZB_IRQ0 | PB0 | MIC INPUT | PC0 | D0 | PC16 | NAND_ALE |
| PA1 | TSLIDR_SL_SNSK | PA17 | TSC_BUSY/ZB_IRQ1 | PB1 | ANA INPUT | PC1 | D1 | PC17 | NAND_CLE |
| PA2 | TSLIDR_SM_SNS | PA18 | ZB_RSTN | PB2 | ZB_NPCS2 | PC2 | D2 | PC18 | NAND_RDYBSY |
| PA3 | TSLIDR_SM_SNSK | PA19 | LED_BLUE | PB3 | USER_PB1 | PC3 | D3 | PC19 | REGSEL_LCD |
| PA4 | TSLIDR_SR_SNS | PA20 | LED_GREEN | PB4 | JTAG | PC4 | D4 | PC20 | LED_RED(POWER) |
| PA5 | TSLIDR_SR_SNSK | PA21 | RXD1 | PB5 | JTAG | PC5 | D5 | PC21 | USB_CNX |
| PA6 | MCI_CD | PA22 | TXD1 | PB6 | JTAG | PC6 | D6 | PC22 | TVALID_SNS |
| PA7 | CLK_32K | PA23 | COM1EN | PB7 | JTAG | PC7 | D7 | PC23 | TVALID_SNSK |
| PA8 | CLK_32K | PA24 | RTS1 | PB8 | CLK_12M | PC8 | WR_LCD | PC24 | TUP_SNS |
| PA9 | RX_UART0 | PA25 | CTS1 | PB9 | CLK_12M | PC9 | NAND_OE | PC25 | TUP_SNSK |
| PA10 | TX_UART0 | PA26 | MCI | PB10 | USB_DDM | PC10 | NAND_WE | PC26 | TDWN_SNS |
| PA11 | TSC_CS | PA27 | MCI | PB11 | USB_DDP | PC11 | RD_LCD | PC27 | TDWN_SNSK |
| PA12 | MISO | PA28 | MCI | PB12 | ERASE | PC12 | USER_PB2 | PC28 | TLEFT_SNS |
| PA13 | MOSI | PA29 | MCI | PB13 | AUDIO OUT R | PC13 | EN_LCD | PC29 | TLEFT_SNSK |
| PA14 | SPCK | PA30 | MCI | PB14 | AUDIO OUT L | PC14 | NAND_NCS0 | PC30 | TRIGHT_SNS |
| PA15 | ZB_SLPTR | PA31 | MCI | | | PC15 | NSC1_LCD | PC31 | TRIGHT_SNSK |

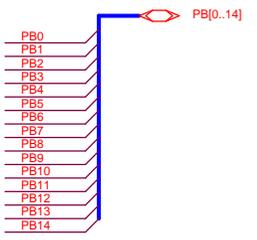
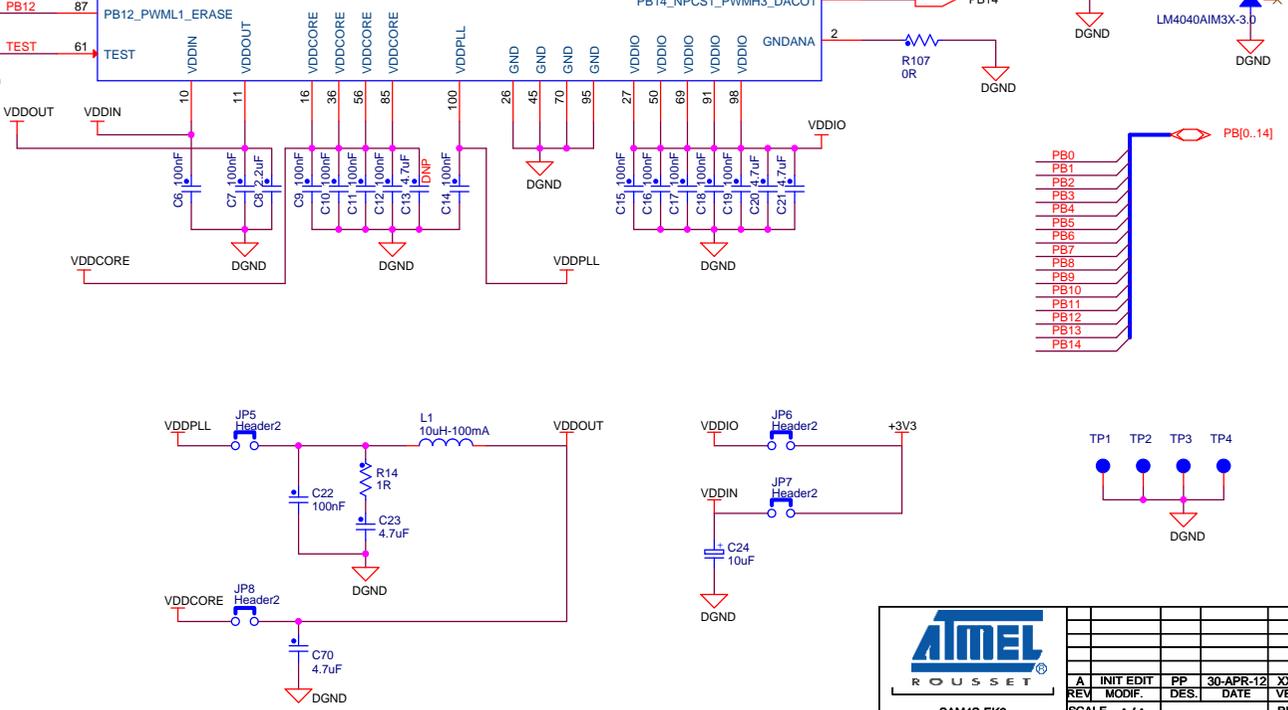
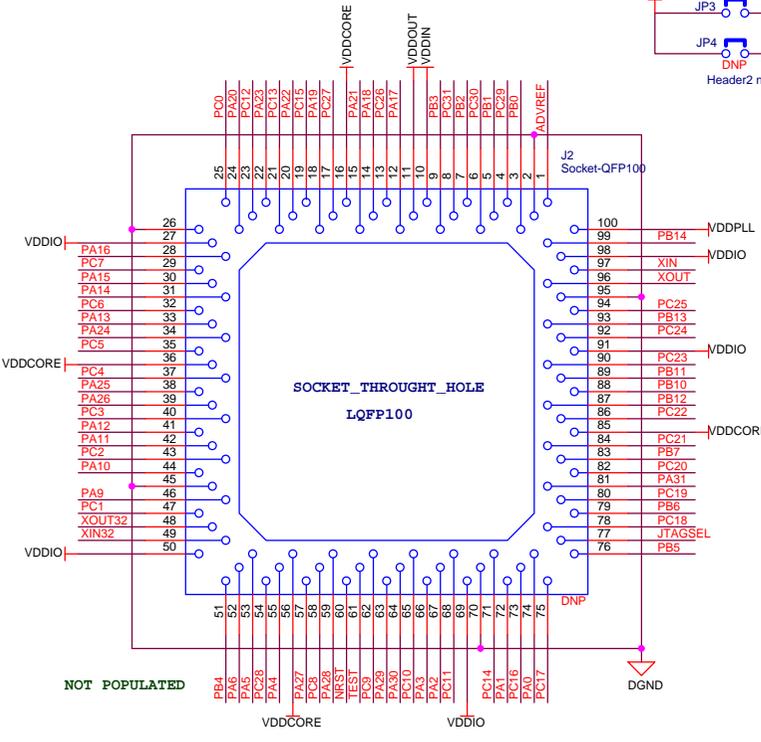
DEFAULT NO POPULATE PARTS

| PAGE | REFERENCE | FUNCTION |
|------|--|--|
| 3 | J1, R1 | External clock resource input |
| | Y1, R3, R7 R6, R8 R9, R10 JP1, JP4 C13 J2 | Backup 12MHz crystal Isolation between 12MHz clock source and GPIO line Isolation between 32KHz clock source and GPIO line JTAGESEL and TEST selector Coupling capacitor LQFP100 Socket |
| 4 | R22 | Optional write protection on NAND flash |
| | R24, R30 JP28 | Differential impedance matching for RS485 cable Option for software test |
| 5 | D1 | Optional ESD protection for LCD touch panel |
| | R61, R63, RA2, RA3 | Optional databus termination for LCD controller |
| 7 | R122, R123 | Optional TWI |

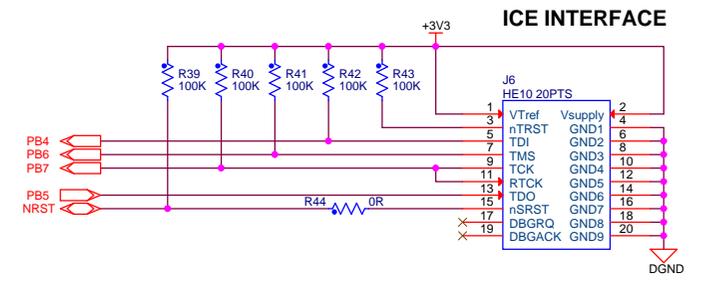
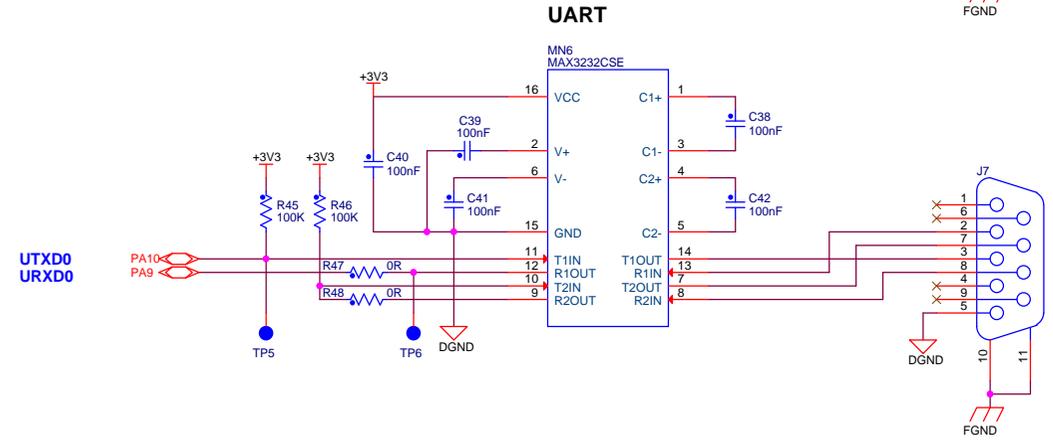
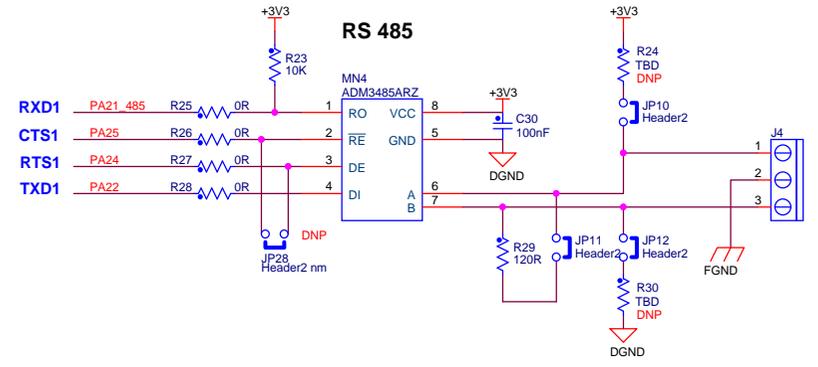
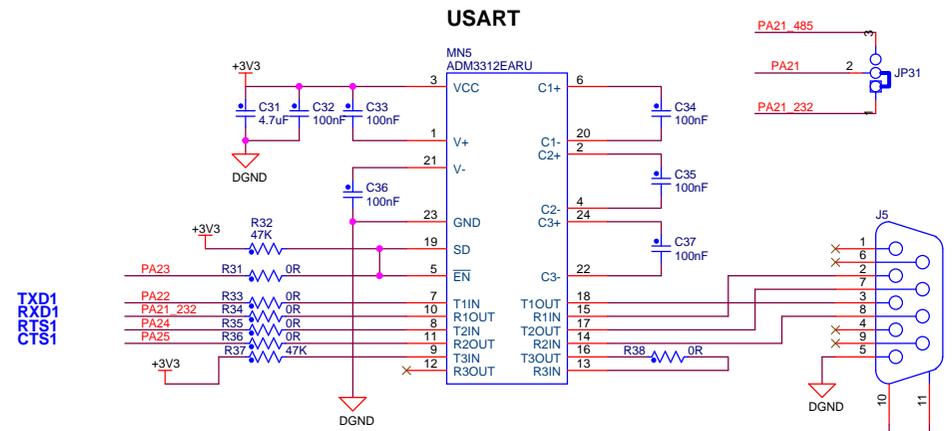
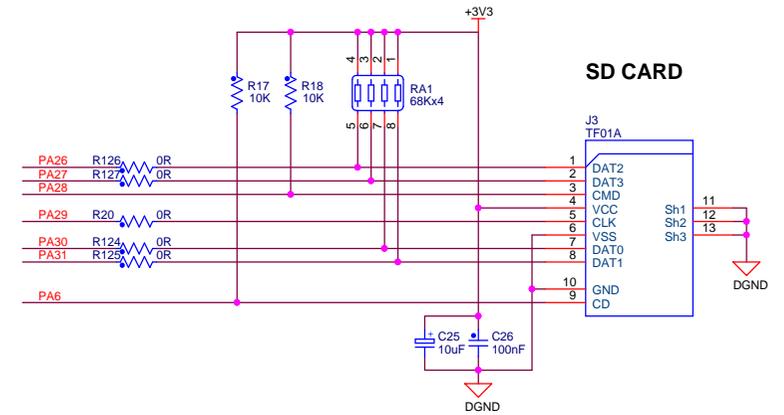
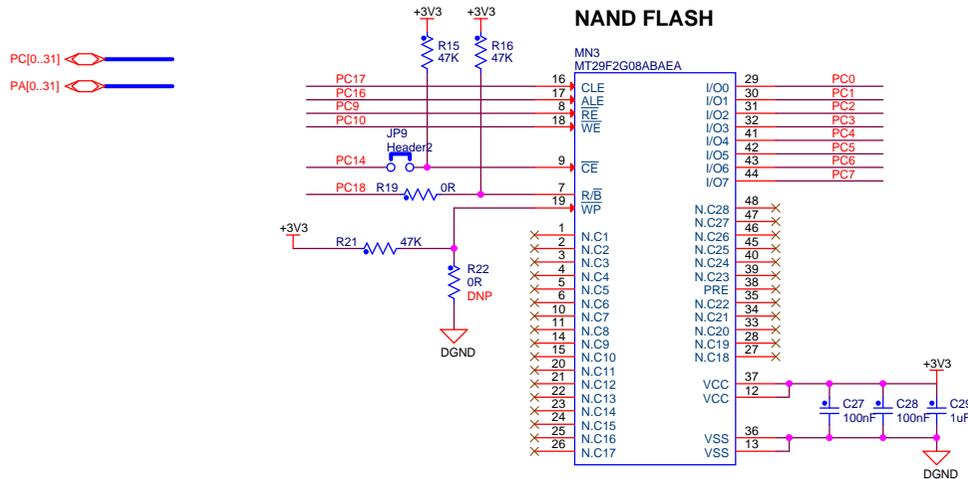
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| A | MODIF. | DES. | DATE | VER. | DATE | Board Configuration | | A | 2/7 |
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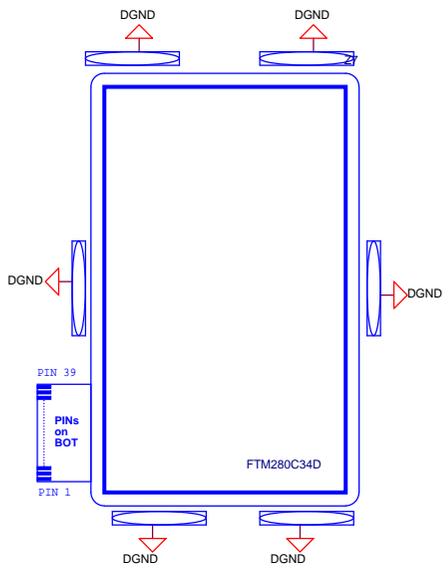
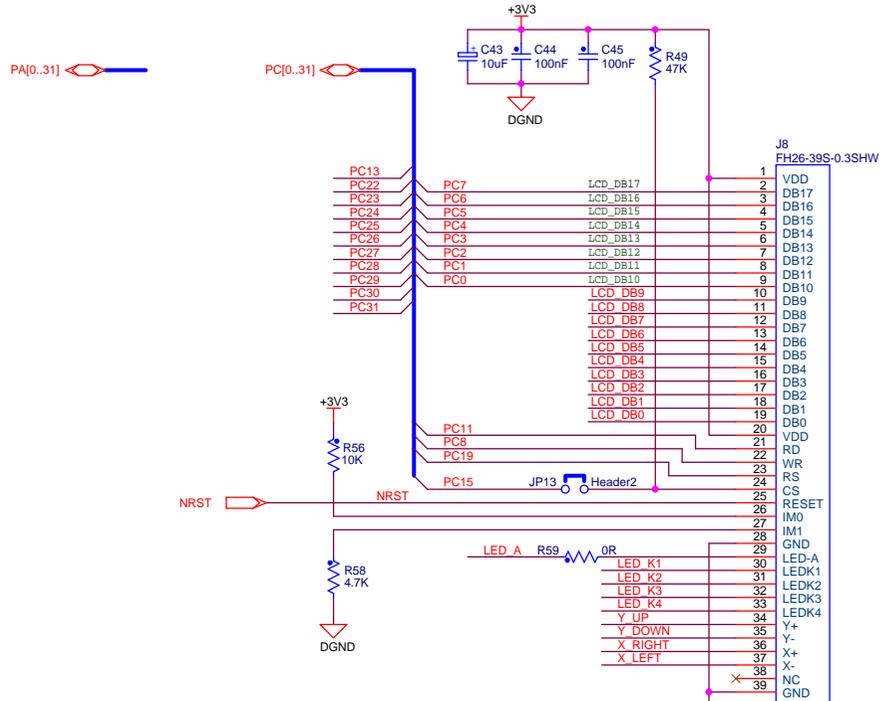
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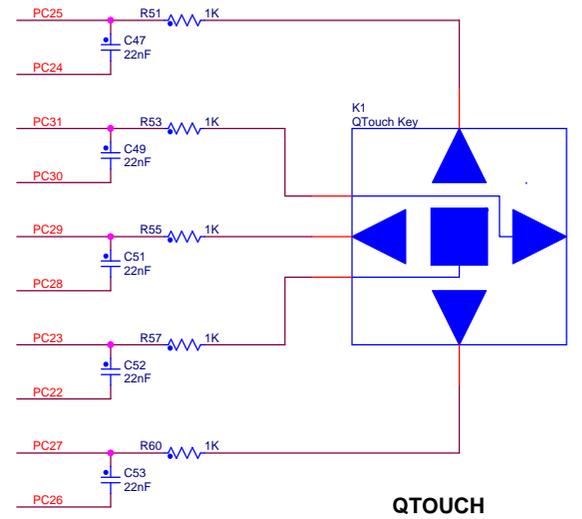
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| ATMEL ROUSSET | | SAMS-EK2 | | Microcontroller | |
| A | INIT EDIT | PP | 30-APR-12 | XXX | XX-XXX-XX |
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| SCALE 1/1 | | | REV. A | | SHEET 3/7 |



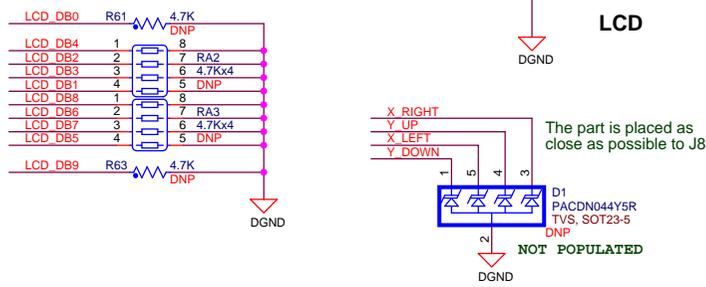
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| ATMEL ROUSSET | | | | | | | |
| SAMS-EK2 | | SCALE | 1/1 | REV. | A | SHEET | 4/7 |
| NAND Flash & Serial IF | | | | | | | |



Six slots on PCB for LCD shield

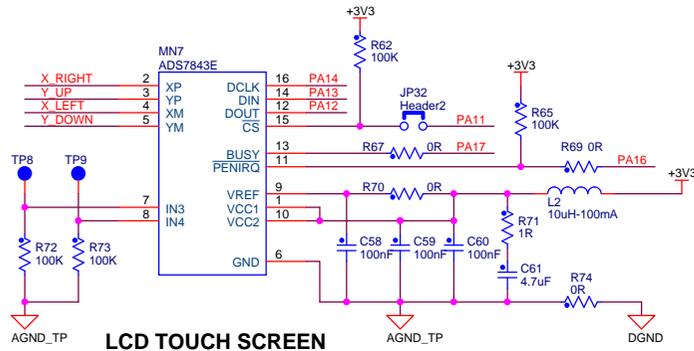


QTOUCH

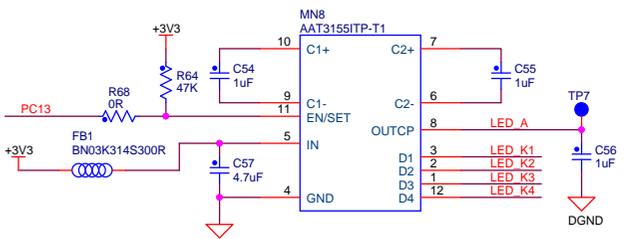


LCD

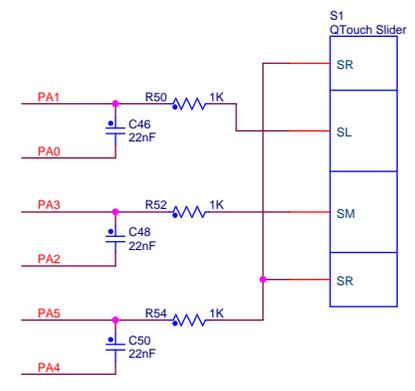
The part is placed as close as possible to J8



LCD TOUCH SCREEN



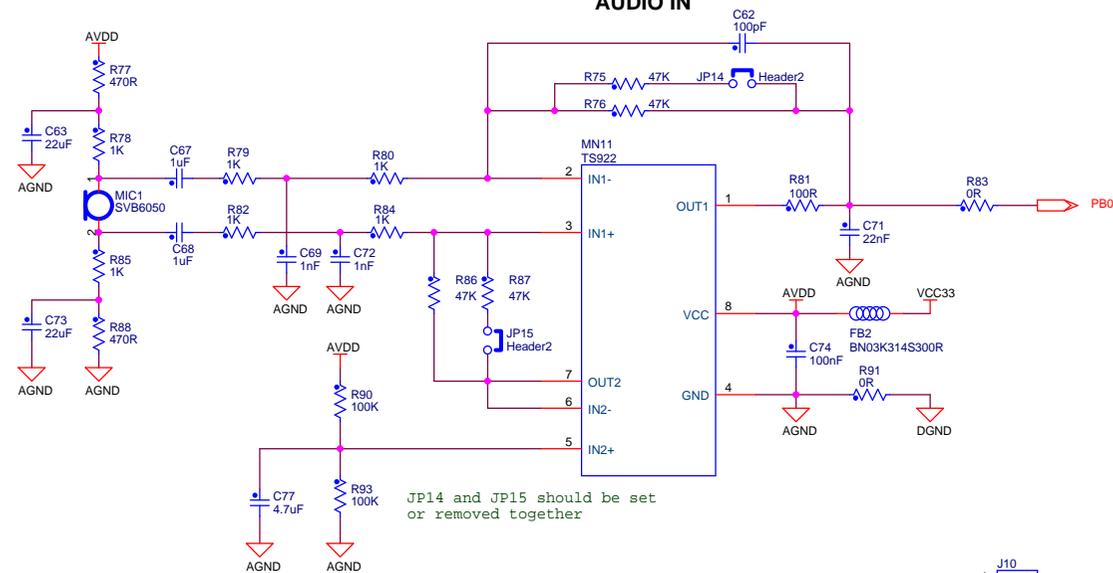
LCD BACKLIGHT



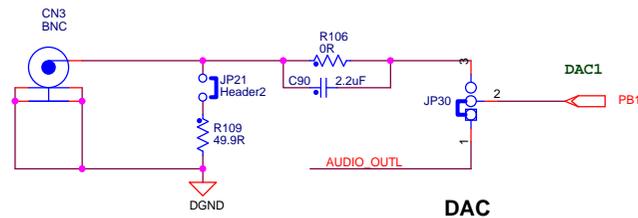
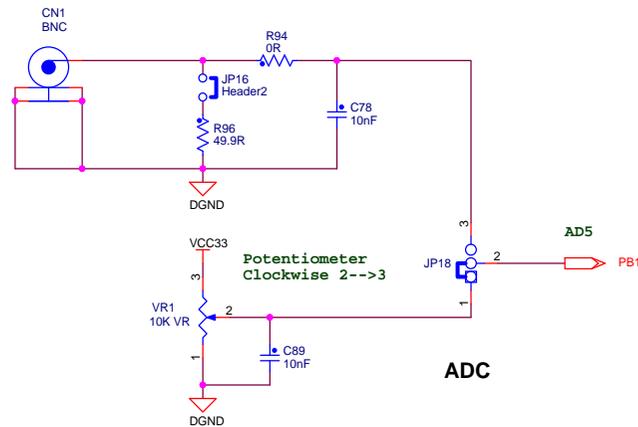
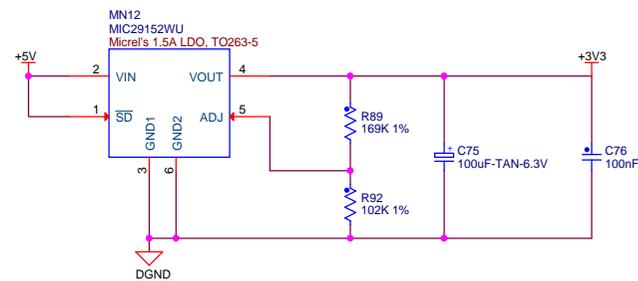
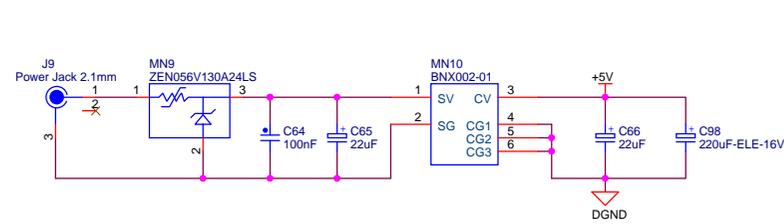
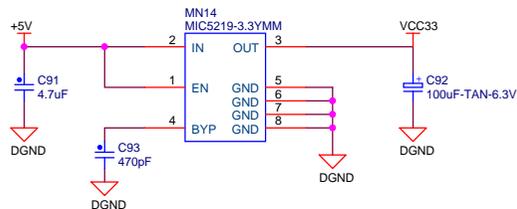
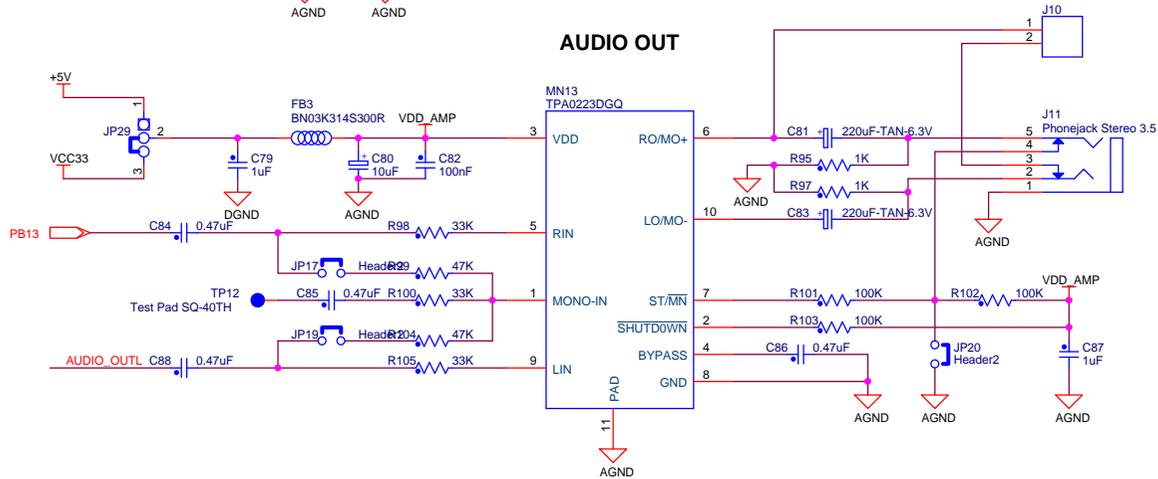
22nF use X7R

| | | | | | |
|------------------|-----------|-------|-----------|------|-----------|
| ATMEL | | | | | |
| ROUSSET | | | | | |
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| SCALE | MODIF. | DES. | DATE | VER. | DATE |
| SAM4S-EK2 | | SCALE | 1/1 | REV. | SHEET |
| TFT-LCD & QTouch | | | | A | 5/7 |

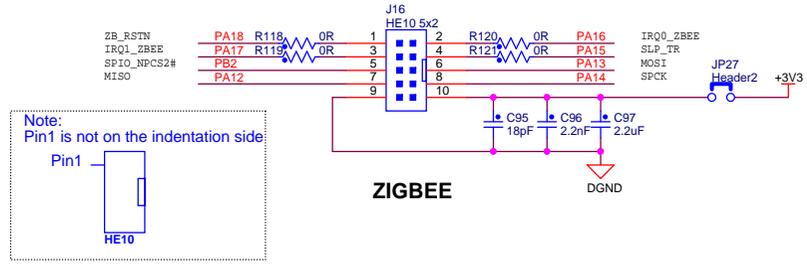
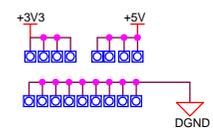
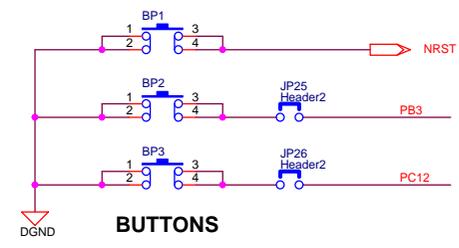
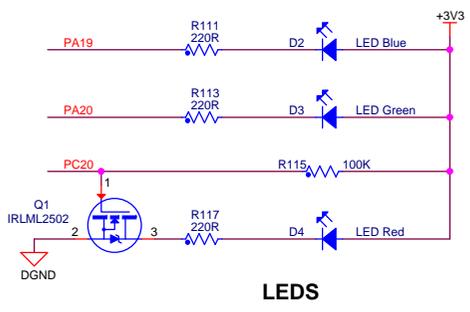
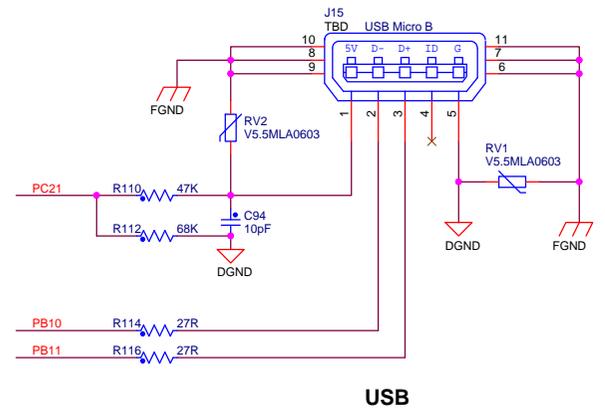
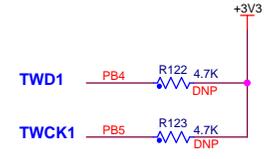
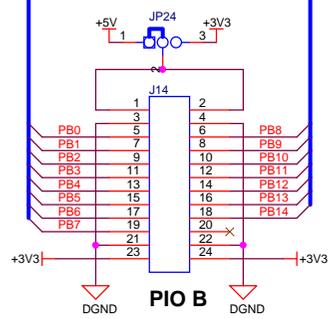
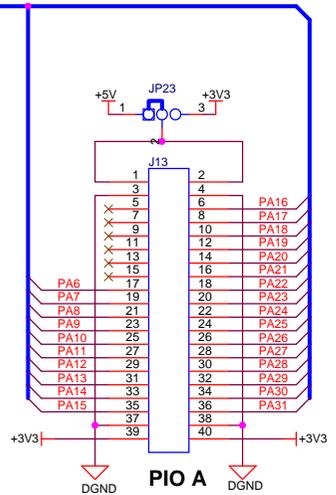
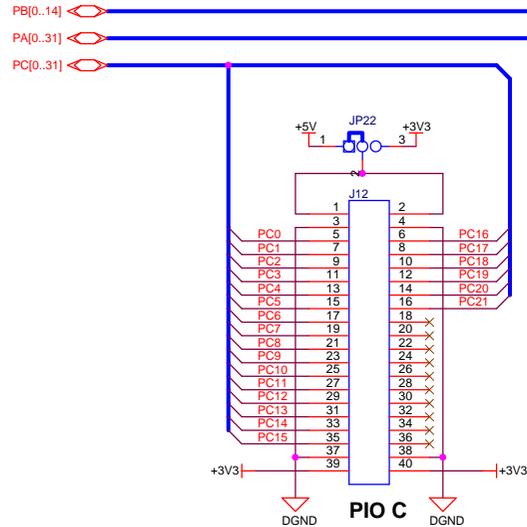
AUDIO IN



AUDIO OUT



| | | | | | | |
|-------------------------|-----------|-------|-----------|------|-----------|--|
| ATMEL ROUSSET | | | | | | |
| REV | INIT EDIT | PP | 30-APR-12 | XXX | XX-XXX-XX | |
| | MODIF. | DES. | DATE | VER. | DATE | |
| SAMS-EK2 | | SCALE | 1/1 | REV. | SHEET | |
| Audio & Power supply | | | | A | 6/7 | |



Note:
Pin1 is not on the indentation side

PROTOTYPE AREA
Pitch = 2.54MM

| | | | | | | | |
|-------------------------|-----------|-------|-----------|------|-----------|------|------|
| ATMEL ROUSSET | | | | | | | |
| REV | INIT EDIT | PP | 30-APR-12 | XXX | XX-XXX-XX | DATE | DATE |
| SAMS-EK2 | | SCALE | 1/1 | REV. | SHEET | | 7/7 |
| User IF & ZigBee | | | | A | | | |