Schematic: SAMA5D27-SOM1-EK1

SHEET	SHEET NAME
01	Title & Revision History
02	Block Diagram
03	PIO Muxing
04	Power Supply
05	SAMA5D27SOM
06	JTAG & DBUG
07	SD & QSPI
08	Ethernet & USB
09	Expansion & Connectors

Revision History

DATE	REVISION	DESCRIPTION
6 Mar 2017	SAMA5D27-SOM-BB_ REVA	Prototype Release
10 Aug 2017	SAMA5D27-SOM1-EK1_REVB	New Release

REV	MODIF.	DES.	DATE	VER.	DATE
B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
A	INIT EDIT	PPn	06-MAR-17	XXX	XX-XXX-XX

MICROCHIP

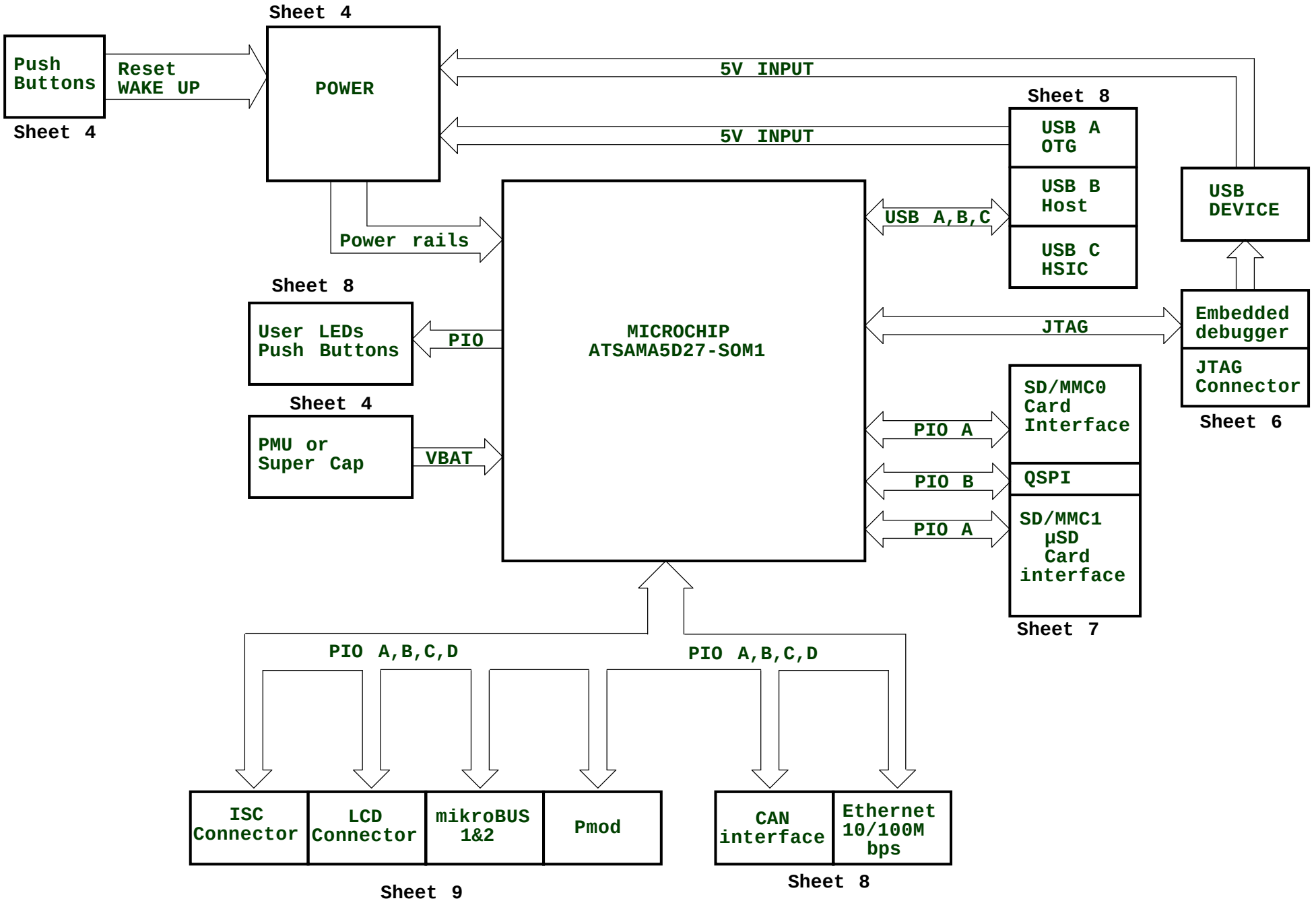
Title & Revision History

SAMA5D27-SOM1-EK1

SCALE 1/1

REV. B

SHEET 1/9



REV	MODIF.	DES.	DATE	VER.	DATE
B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
A	INIT EDIT	PPn	06-MAR-17	XXX	XX-XXX-XX

MICROCHIP

Block Diagram

SAMA5D27-SOM1-EK1

SCALE 1/1

REV. B

SHEET 2/9

PIO Muxing & Jumper setting

LCD	
NC	1
GND	2
LCDDAT0	3
LCDDAT1	4
LCDDAT2	5
LCDDAT3	6
GND	7
LCDDAT4	8
LCDDAT5	9
LCDDAT6	10
LCDDAT7	11
GND	12
LCDDAT8	13
LCDDAT9	14
LCDDAT10	15
LCDDAT11	16
GND	17
LCDDAT12	18
LCDDAT13	19
LCDDAT14	20
LCDDAT15	21
GND	22
LCDDAT16	23
LCDDAT17	24
LCDDAT18	25
LCDDAT19	26
GND	27
LCDDAT20	28
LCDDAT21	29
LCDDAT22	30
LCDDAT23	31
GND	32
LCDPCK	33
LCDVSYNC	34
LCDHSYNC	35
LCDDEN	36
SPI0_ SPCK	37
SPI0_ MOSI	38
SPI0_ MISO	39
SPI0_NPCS0	40
LCDDISP	41
TWD1	42
TWCK1	43
IRQ1	44
IRQ2	45
LCDPWM	46
NRST	47
VCC	48
VCC	49
GND	50

PIOA	USAGE	PIOA	USAGE	PIOB	USAGE	PIOB	USAGE	PIOC	USAGE
PA0	SDMMC0_CK	PA16	SPI0_ MISO	PB0	INT_mBUS1	PB16	LCDDAT5	PC0	LCDDAT21
PA1	SDMMC0_CDA	PA17	SPI0_NPCS0	PB1	LED_Green/PWM_mBUS1	PB17	LCDDAT6	PC1	LCDDAT22
PA2	SDMMC0_DA0	PA18	SDMMC1_DAT0	PB2	RST_mBUS1	PB18	LCDDAT7	PC2	LCDDAT23
PA3	SDMMC0_DA1	PA19	SDMMC1_DAT1	PB3	RX_mBUS1	PB19	LCDDAT8	PC3	LCDPWM
PA4	SDMMC0_DA2	PA20	SDMMC1_DAT2	PB4	TX_mBUS1	PB20	LCDDAT9	PC4	LCDDISP
PA5	SDMMC0_DA3	PA21	SDMMC1_DAT3	PB5	QSPI1_SCK	PB21	LCDDAT10	PC5	LCDVSYNC
PA6	SDMMC0_DA4	PA22	SDMMC1_CK	PB6	QSPI1_CS	PB22	LCDDAT11	PC6	LCDHSYNC
PA7	SDMMC0_DA5	PA23	TWCK_mBUS1&2	PB7	QSPI1_IO0	PB23	LCDDAT12	PC7	LCDPCK
PA8	SDMMC0_DA6	PA24	TWD_mBUS1&2	PB8	QSPI1_IO1	PB24	LCDDAT13	PC8	LCDDEN
PA9	SDMMC0_DA7	PA25	INT_mBUS2	PB9	QSPI1_IO2	PB25	LCDDAT14	PC9	ISC_D0
PA10	LED_Red	PA26	RST_mBUS2	PB10	QSPI1_IO3	PB26	LCDDAT15	PC10	ISC_D1
PA11	SDMMC0_VDDSEL	PA27	USBB_POWR_EN	PB11	LCDDAT0	PB27	LCDDAT16	PC11	ISC_D2
PA12	SDMMC0_WP	PA28	SDMMC1_CDA	PB12	LCDDAT1	PB28	LCDDAT17	PC12	ISC_D3
PA13	SDMMC0_CD	PA29	User Button	PB13	LCDDAT2	PB29	LCDDAT18	PC13	ISC_D4
PA14	SPI0_ SPCK	PA30	SDMMC1_CD	PB14	LCDDAT3	PB30	LCDDAT19	PC14	ISC_D5
PA15	SPI0_ MOSI	PA31	LED_blue/PWM_mBUS2	PB15	LCDDAT4	PB31	LCDDAT20	PC15	ISC_D6

PIOC	USAGE	PIOD	USAGE	PIOD	USAGE
PC16	ISC_D7	PD0	NPCS1_mBUS2	PD16	NA
PC17	ISC_D8	PD1	IRQ1	PD17	NA
PC18	ISC_D9	PD2	DBGU_RXD	PD18	NA
PC19	ISC_D10	PD3	DBGU_TXD	PD19	USBB_OVCUR
PC20	ISC_D11	PD4	TWD_LCD_ISC	PD20	USBA_VBUS_5V
PC21	ISC_PCK	PD5	TWCK_LCD_ISC	PD21	TWD0
PC22	ISC_VSYNC	PD6	ISC_RST	PD22	TWCK0
PC23	ISC_HSYNC	PD7	ISC_PWD	PD23	RX_mBUS2
PC24	ISC_MCK	PD8	BB_PWR_GOOD	PD24	TX_mBUS2
PC25	IRQ2	PD9	NA	PD25	AN_mBUS1
PC26	CANTX1	PD10	NA	PD26	AN_mBUS2
PC27	CANRX1	PD11	NA	PD27	SOM_TCK
PC28	MOSI_mBUS1&2	PD12	NA	PD28	SOM_TDI
PC29	MISO_mBUS1&2	PD13	NA	PD29	SOM_TD0
PC30	SPCK_mBUS1&2	PD14	NA	PD30	SOM_TMS
PC31	NPCS0_mBUS1	PD15	NA	PD31	NA

JUMPER DESCRIPTION

PART	DEFAULT	FUNCTION
J1	CLOSE	I VDD_MAIN_5V Measurement
J2	CLOSE	I VDD_3V3 Measurement
J4	CLOSE	I VDDBU Measurement
J7	OPEN	Disable JLINK JTAG
J8	OPEN	ERASE SAM3U
J9	OPEN	Disable JLINK CDC
J13	OPEN	Disable boot
J22	CLOSE	POWER SELECT
J28	CLOSE	POWER SELECT

MICROCHIP

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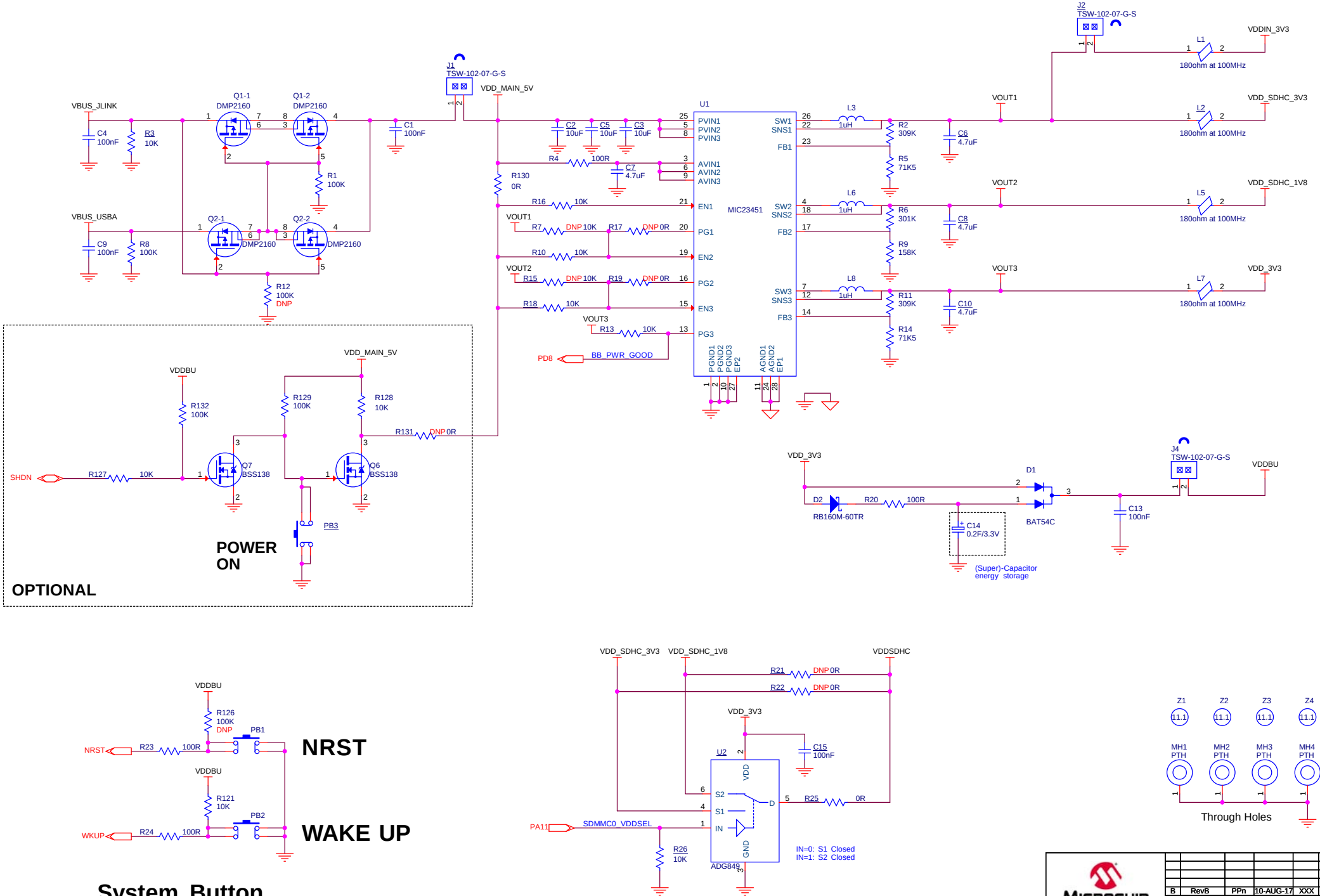
PIO Muxing

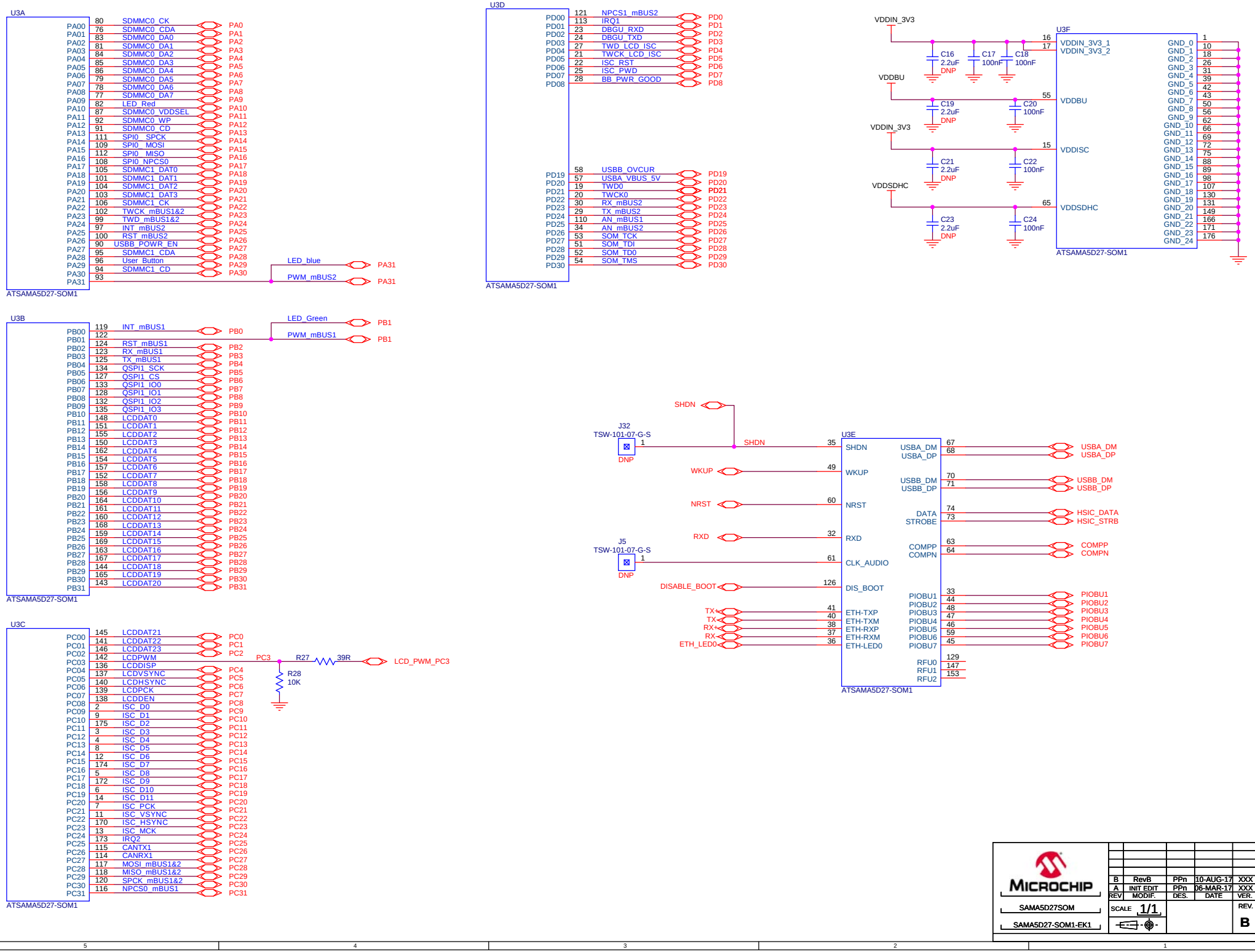
SAMA5D27-SOM1-EK1

SCALE 1/1

REV. B

SHEET 3/9


J2
TSW-102-07-G-S
VDDIN_3V3
L1
180ohm at 100MHz
J1
TSW-102-07-G-S
VDD_MAIN_5V
VBUS_JLINK
Q1-1
DMP2160
Q1-2
DMP2160
C4
100nF
R3
10K
C1
100nF
R1
100K
VBUS_USBA
Q2-1
DMP2160
Q2-2
DMP2160
C9
100nF
R8
100K
R12
100K
DNP
U1
MIC23451
PVIN1
PVIN2
PVIN3
AVIN1
AVIN2
AVIN3
EN1
EN2
EN3
PG1
PG2
PG3
SW1
SNS1
FB1
SW2
SNS2
FB2
SW3
SNS3
FB3
PGND1
PGND2
PGND3
EP2
AGND1
AGND2
EP1
C2
10uF
C5
10uF
C3
10uF
R4
100R
C7
4.7uF
R130
0R
R16
10K
R7
DNP 10K
R17
DNP 0R
R10
10K
R15
DNP 10K
R19
DNP 0R
R18
10K
R13
10K
PD8
BB_PWR_GOOD
L3
1uH
L6
1uH
L8
1uH
R2
309K
R5
71K5
R6
301K
R9
158K
R11
309K
R14
71K5
C6
4.7uF
C8
4.7uF
C10
4.7uF
VOUT1
VOUT2
VOUT3
L2
180ohm at 100MHz
VDD_SDHC_3V3
L5
180ohm at 100MHz
VDD_SDHC_1V8
L7
180ohm at 100MHz
VDD_3V3
OPTIONAL
VDDBU
VDD_MAIN_5V
R132
100K
R129
100K
R128
10K
R131
DNP 0R
SHDN
R127
10K
Q7
BSS138
Q6
BSS138
PB3
POWER
ON
VDD_3V3
D2
RB160M-60TR
R20
100R
D1
BAT54C
C14
0.2F/3.3V
(Super)-Capacitor
energy storage
C13
100nF
J4
TSW-102-07-G-S
VDDBU
VDDBU
R126
100K
DNP
PB1
NRST
R23
100R
NRST
VDDBU
R121
10K
PB2
WKUP
R24
100R
WAKE UP
System Button
VDD_SDHC_3V3
VDD_SDHC_1V8
VDDSDHC
R21
DNP 0R
R22
DNP 0R
VDD_3V3
C15
100nF
U2
ADG849
VDD
S2
S1
IN
D
GND
R25
0R
PA11
SDMMC0_VDDSEL
R26
10K
IN=0: S1 Closed
IN=1: S2 Closed
Z1
11.1
Z2
11.1
Z3
11.1
Z4
11.1
MH1
PTH
MH2
PTH
MH3
PTH
MH4
PTH
Through Holes
MICROCHIP
Power Supply
SAMA5D27-SOM1-EK1
B RevB PPn 10-AUG-17 XXX XX-XXX-XX
A INIT EDIT PPn 06-MAR-17 XXX XX-XXX-XX
REV MODIF. DES. DATE VER. DATE
SCALE 1/1
REV. B
SHEET 4/9



B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
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REV	MODIF.	DES.	DATE	VER.	DATE

SAMA5D27SOM

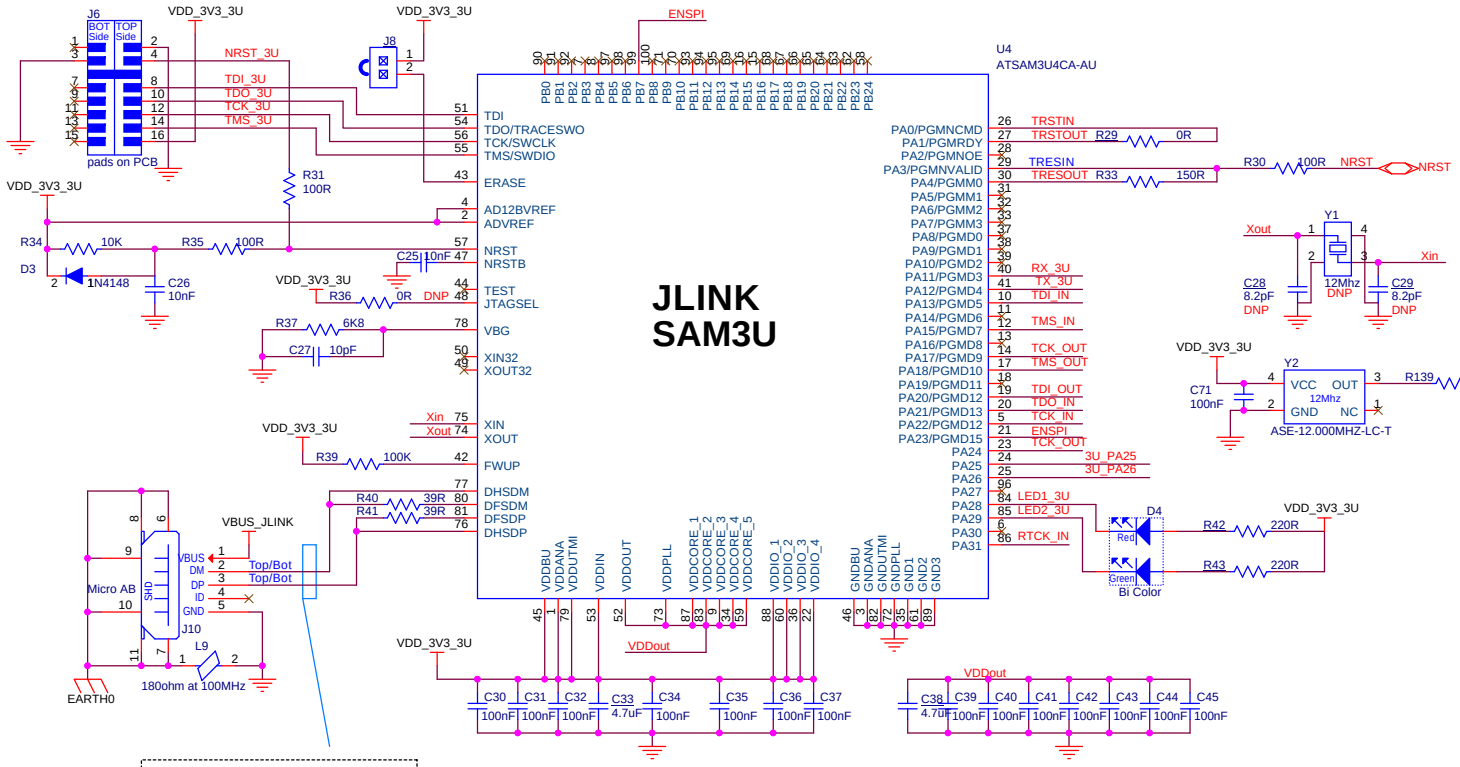
SAMA5D27-SOM1-EK1

SCALE 1/1

REV. B

SHEET 5/9

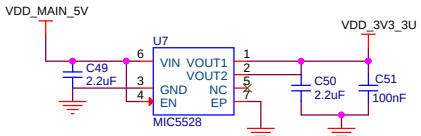
JLINK-OB interface

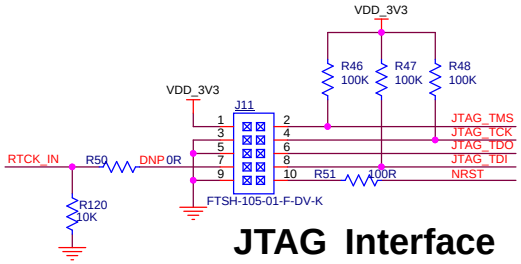


Routing USB

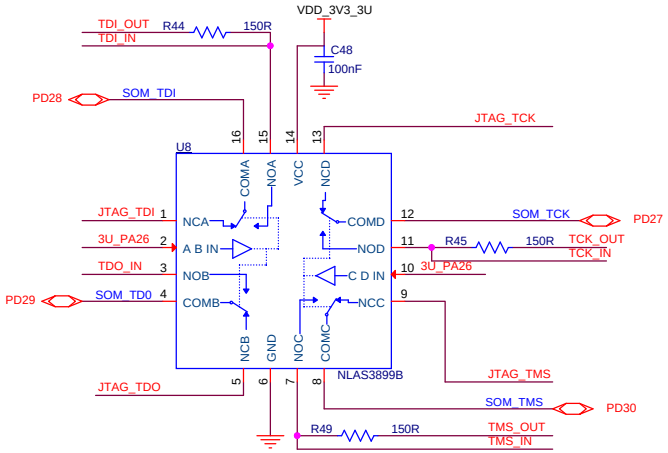
Max trace-length mismatch between USB signals pairs should be no greater than 3.8mm

90 ohms differential trace impedance

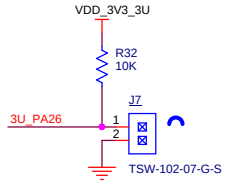




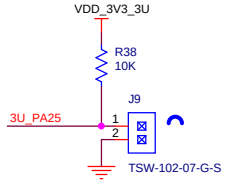
JTAG Interface



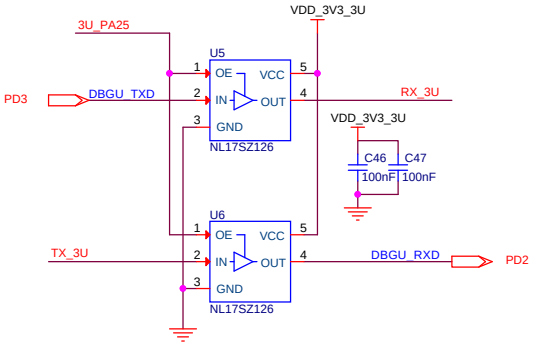
JTAG switches



Disable JLINK JTAG



Disable JLINK CDC



Debug Com Port isolation

B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
A	INIT EDIT	PPn	06-MAR-17	XXX	XX-XXX-XX
REV	MODIF.	DES.	DATE	VER.	DATE

MICROCHIP

JTAG & DBUG

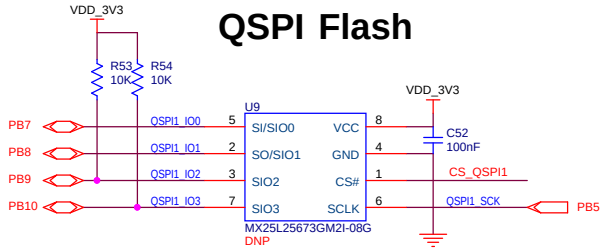
SAMA5D27-SOM1-EK1

SCALE 1/1

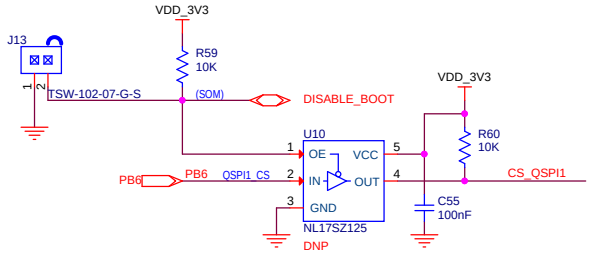
REV. B

SHEET 6/9

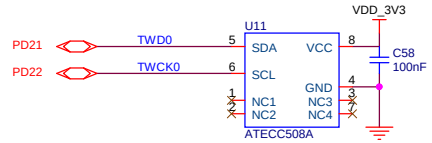
QSPI Flash

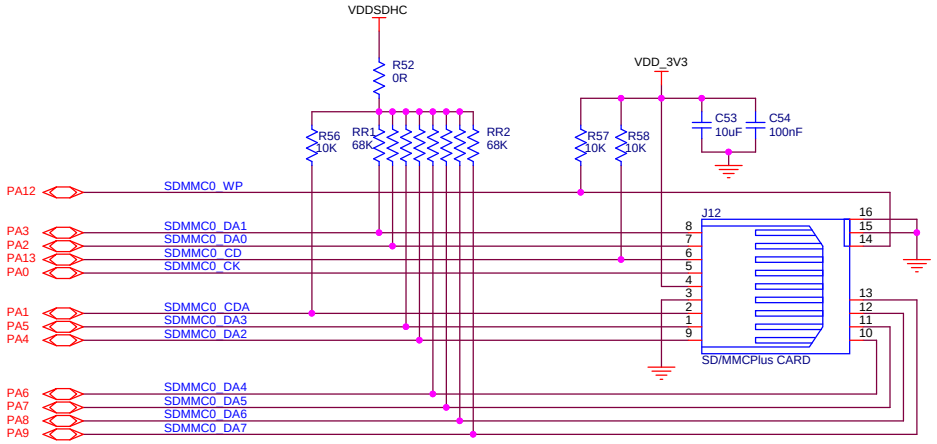


Disable boot

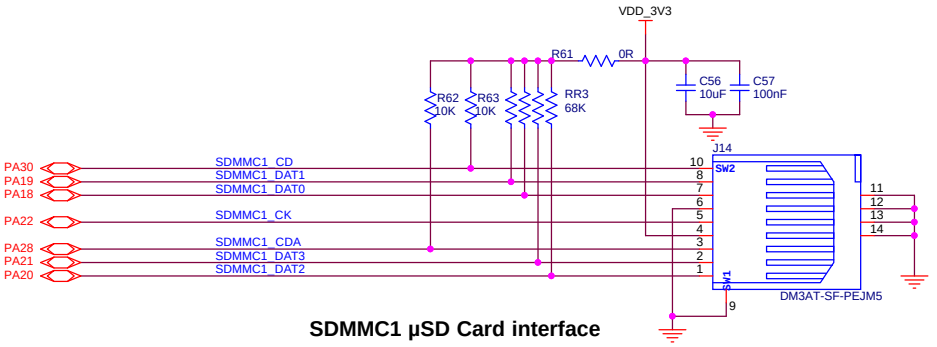


Crypto Authentication





SD/MMC0 Card Interface



SDMMC1 µSD Card interface

B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
A	INIT EDIT	PPn	06-MAR-17	XXX	XX-XXX-XX
REV.	MODIF.	DES.	DATE	VER.	DATE

MICROCHIP

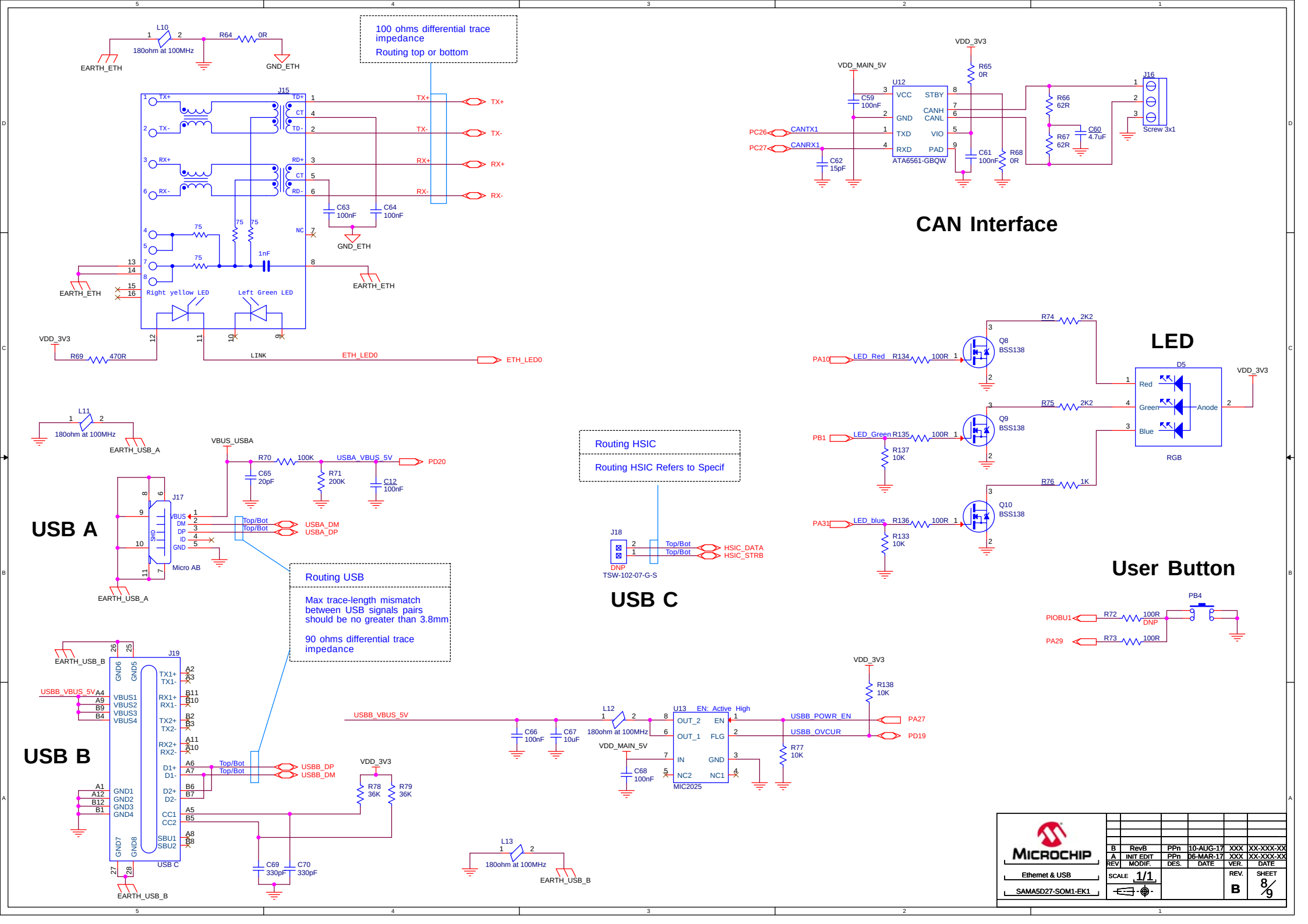
SD & QSPI

SAMA5D27-SOM1-EK1

SCALE 1/1

REV. B

SHEET 7/9



B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
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REV.	MODIF.	DES.	DATE	VER.	DATE

MICROCHIP

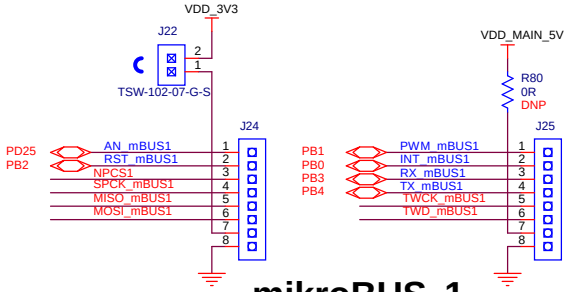
Ethernet & USB

SAMA5D27-SOM1-EK1

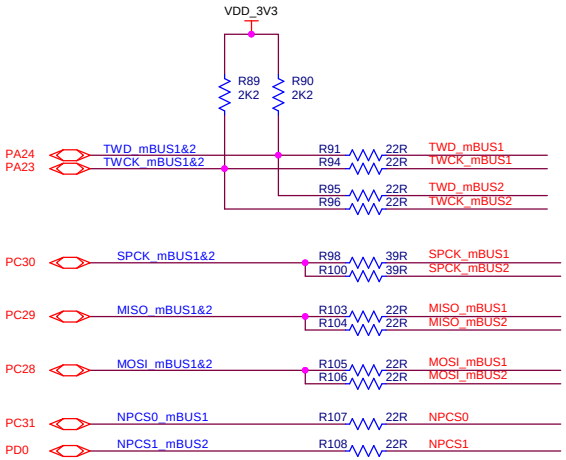
SCALE 1/1

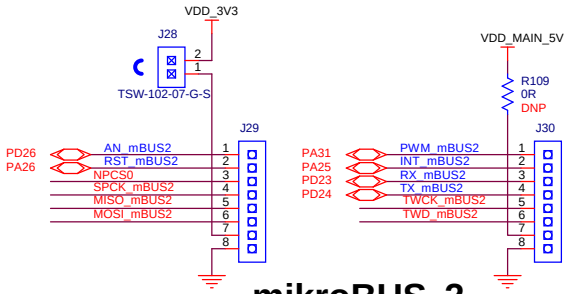
REV. B

SHEET 8/9

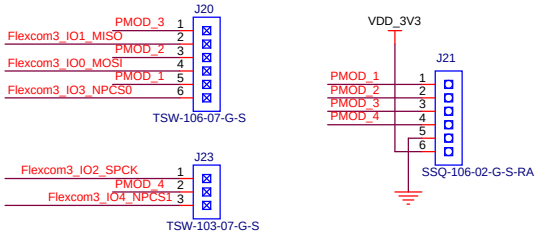


mikroBUS 1

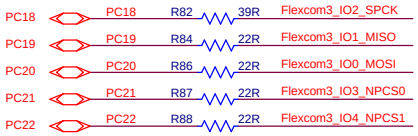


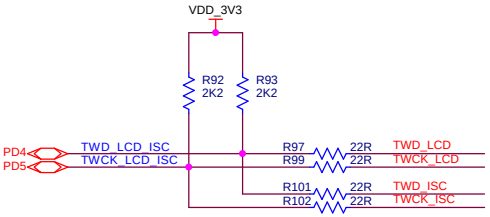


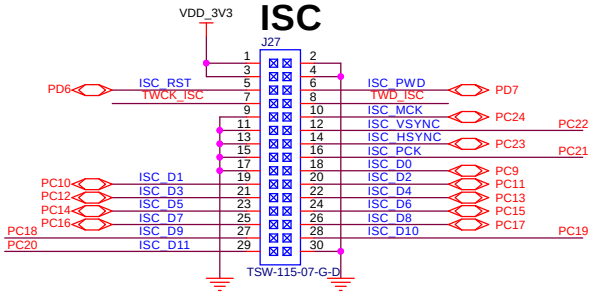
mikroBUS 2



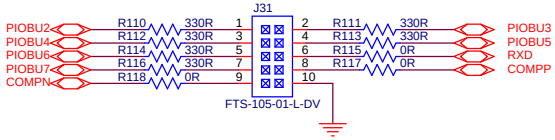
PMOD



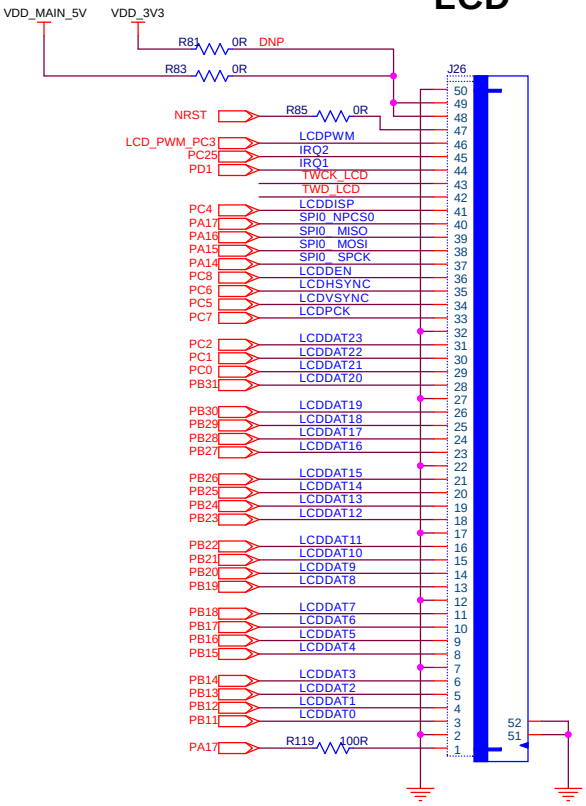




TAMPER



LCD



MICROCHIP					
Expansion & Connectors	B	RevB	PPn	10-AUG-17	XXX	XX-XXX-XX
SAMA5D27-SOM1-EK1	A	INIT EDIT	PPn	06-MAR-17	XXX	XX-XXX-XX
	REV	MODIF.	DES.	DATE	VER.	DATE
SCALE 1/1					REV. B	SHEET 9/9