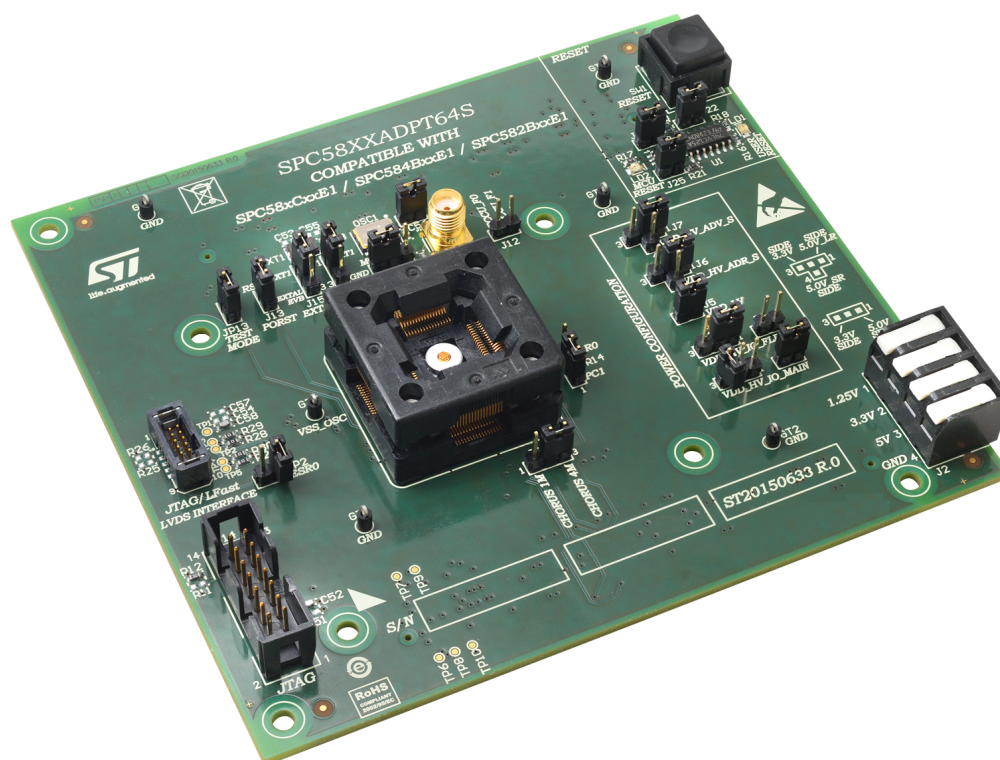


SPC58XXADPT64S rev. B evaluation board

Introduction

The SPC58XXADPT64S rev. B evaluation board supports STMicroelectronics SPC582BxxE1, SPC584BxxE1 and SPC58xCxxE1 microcontrollers in eTQFP64 package.

Figure 1. SPC58XXADPT64S rev. B



1 Overview

The SPC58XXADPT64S rev. B "mini module" is an evaluation board supporting STMicroelectronics SPC582BxxE1, SPC584BxxE1 and SPC58xCxxE1 microcontrollers in eTQFP64 package with exposed pad down.

The SPC58XXADPT64S rev. B "mini module" is designed to be connected onto the SPC58xxMB motherboard, offering a mechanism for easy customer evaluation of the SPC582BxxE1, SPC584BxxE1 and SPC58xCxxE1 microcontrollers and to facilitate hardware and software development.

High density connectors provide the interface between the EVB and MCU daughter cards and help the developers evaluate all device peripherals.

This user manual provides information on using SPC58XXADPT64S rev. B "mini module" board and its hardware features.

The "mini module" may be used as a stand-alone unit granting access to the CPU, but no access to the I/O pins as any motherboard peripherals.

The SPC58XXADPT64S rev. B "mini module" is designed to be easily configurable and to be used for SPC582BxxE1, SPC584BxxE1 and SPC58xCxxE1.

The "mini module" is configured by default for SPC582BxxE1 and easily supports SPC584BxxE1 and SPC58xCxxE1 by simply changing the following through-hole jumper JR19.

Figure 2. Overview of SPC58XXADPT64S rev. B "mini module" - top

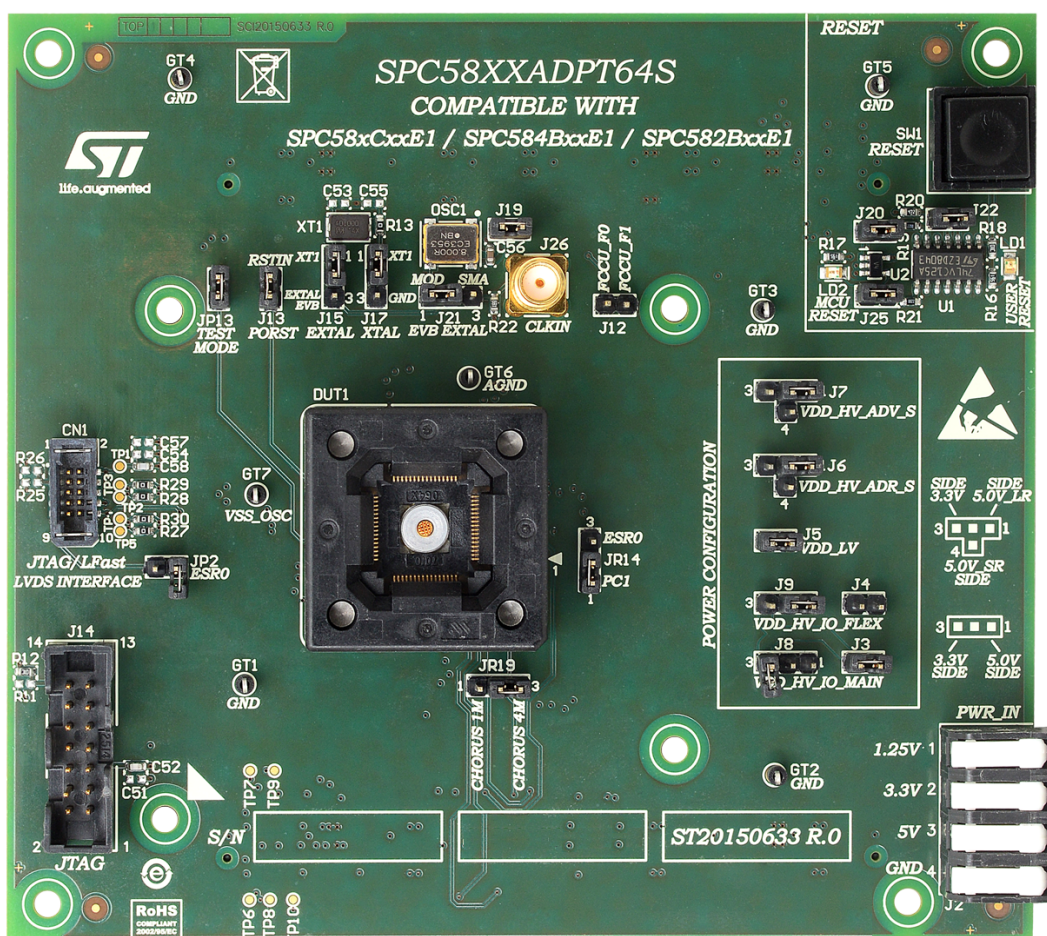
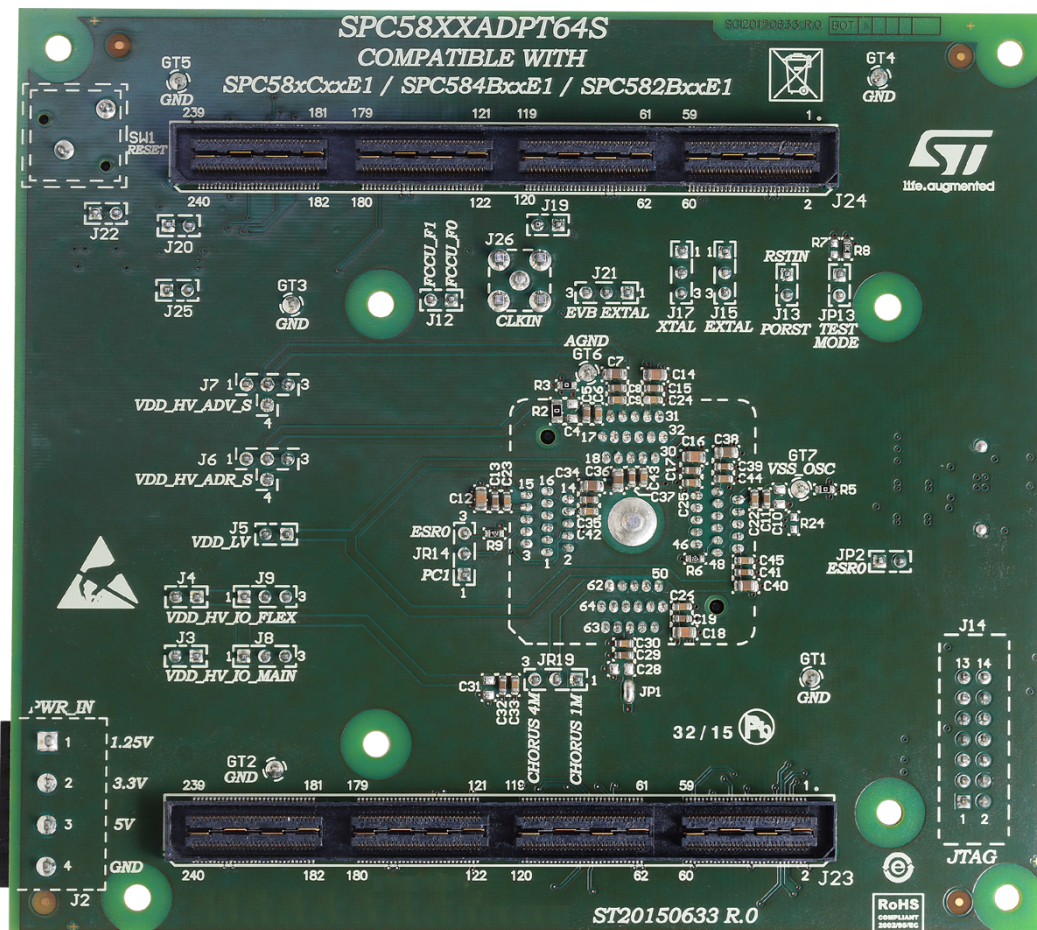


Figure 3. Overview of SPC58XXADPT64S rev. B "mini module" - bottom



1.1 Package contents

An SPC58XXADPT64S rev. B adapter package includes the following item:

- SPC58XXADPT64S rev. B "mini module"

1.2 Supported devices

The SPC58XXADPT64S rev. B "mini module" supports the following STMicroelectronics family of microcontrollers in eTQFP64 package:

- SPC582BxxE1
- SPC584BxxE1
- SPC58xCxxE1

2 License agreement

The packaging of this evaluation board was sealed with a seal stating, " by breaking this seal, you agree to the terms and conditions of the evaluation board license agreement, the terms and conditions of which are available at https://www.st.com/resource/en/evaluation_board_terms_of_use/evaluationproductlicenseagreement.pdf". Upon breaking the seal, you and STMicroelectronics entered into the evaluation board license agreement, a copy of which is also enclosed with the evaluation board for convenience.

Attention: *This evaluation board only offers limited features for evaluating ST products. It has not been tested for use with other products and is not suitable for any safety or other commercial or consumer application. This evaluation board is otherwise provided "AS IS" and STMicroelectronics disclaims all warranties, express or implied, including the implied warranties of merchantability and fitness for a particular purpose.*

3 Handling precautions

Please take care to handle the package contents in a manner such as to prevent electrostatic discharge.
Before the EVB is used or power is applied, please fully read the following sections on how to correctly configure the board. Failure to correctly configure the board may cause irreparable component, MCU or EVB damage.

4 Hardware description

4.1 Hardware features

The SPC58XXADPT64S rev. B "mini module" board has the following features:

- Connector for external power supplies input (5.0 V, 3.3 V, 1.25 V) used in stand-alone mode
- Reset button with driver and led indicator
- Socket for device in eTQFP64 package
- Debug ports:
 - 14-pin header connector for JTAG port
 - 10-pin header connector for SIPI interface
- 40 Mhz crystal main oscillator with jumpers to optionally disconnect it
- 8 Mhz oscillator with jumpers to optionally disconnect it
- Clock input through SMA connector to optionally disconnect it
- 2 X SAMTEC QSH series, 240 way connector to connect "mini module" to motherboard

4.2 Hardware dimension and PCB component view

The "mini module" has the following dimensions:

- PCB area: 127 mm x 114.3 mm
- Top components height: 16 mm max
- Bottom components height: 3.5 mm max
- PCB thickness: 1.6 mm

5 Power and system configuration

5.1 Power supplies

When the "mini module" is plugged onto the motherboard, power is supplied directly by the motherboard. In this setup, the external power supply input available on the "mini module" should NOT be used.

When the SPC58XXADPT64S rev.B "mini module" is used as a stand-alone board, external power supplies must be used (5.0 V, 3.3 V, 1.25 V).

The following jumpers are used to configure the power supply:

Table 1. Supply related jumpers

Jumper	Description	Default	Position
J3	Jumper to enable the use of supply 3.3V_SR	Closed	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D3
J4	Jumper to enable the use of supply 5.0V_SR	Closed	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D3
J5	Jumper to enable the use of supply 1.25V_SR	Closed	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3
J6	VDD_HV_ADR_S voltage configuration, select from 5.0V_LR (linear), 3.3V_SR (switching) or 5.0V_SR (switching)	1-2 (5.0V_LR)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D2
J7	VDD_HV_ADV_S voltage configuration, select from 5.0V_LR (linear), 3.3V_SR (switching) or 5.0V_SR (switching)	1-2 (5.0V_LR)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D2
J8	VDD_HV_IO_MAIN voltage configuration, select from 5.0V_SR or 3.3V_SR	1-2 (5.0V_SR)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D3
J9	VDD_HV_IO_FLEX voltage configuration, select from 5.0V_SR or 3.3V_SR (for Chorus 4M with JR19 closed 2-3)	1-2 (5.0V_SR)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D3
J16	VDD_LV voltage configuration, select from 1.25V_SR or from Ballast Circuit	1-2 (1.25V_SR)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B3
J18	Ballast supply voltage configuration, select from VDD_HV_IO_MAIN or from 5.0V_SR	1-2 (5.0V_SR)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3
JP1	VDD_HV_FLA voltage configuration, connect or disconnect VDD_HV_FLA from VDD_HV_IO_MAIN	Closed	Figure 5. SPC58XXADPT64S rev. B "mini module" - bottom - C3

5.2 Microcontrollers configuration

The SPC58XXADPT64S rev. B "mini module" is designed to be easily configurable and be used for SPC582BxxE1, SPC584BxxE1 and SPC58xCxxE1.

The "mini module" is configured by default for SPC582BxxE1 and easily supports SPC584BxxE1 and SPC58xCxxE1 by simply changing the following through-hole jumper JR19.

Table 2. Microcontroller configuration related jumpers

Jumper	Description	Default	Position
JR19	Device pin 62 port configuration / function configuration: 1-2 - PC12 for SPC582BxxE1 2-3 - VDD_HV_IO_FLEX for SPC584BxxE1 and SPC58xCxxE1	Closed 1-2 PC12 for SPC582BxxE1	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B3

5.3 Port configuration

The following jumpers need to configure the ports:

Table 3. Ports related jumpers

Jumper	Description	Default	Position
JP13	TESTMODE settings	Close (10 K Ω pull-down)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A2
JR14	Device pin 6 port configuration / function configuration: 1-2 (PC1) 2-3 (ESR0)	Open	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - C3
J29	Device pin 56 port configuration / function configuration: 1-2 (PH4) SPC582BxxE1 2-3 (BCTRL) SPC584BxxE1, SPC58xCxxE	1-2 (PH4) SPC582BxxE1	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3

5.4 Debug interface configuration

The following jumpers need to configure the ports:

Table 4. Debug interface configuration related jumpers

Jumper	Description	Default	Position
J13	RSTIN connection - open (disconnect PORST) - closed (connect PORST)	Closed (connect PORST)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B2
JP2	JTAG/LFAST LVDS pin 9 configuration - open (disconnect ESR0) - closed (connect ESR0)	Open (disconnect ESR0)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3

5.5 System clock configuration

The "mini module" supports the usage of the crystal clock sources as well as the external clock source:

Table 5. Clock configuration jumpers

Jumper	Description	Default	Position
J15	40 MHz crystal clock source enable for pin EXTAL	1-2 (XT1 pin2)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B2
J17	40 MHz crystal clock source enable for pin XTAL	1-2 (XT1 pin1)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B2
J19	Enable 8 MHz oscillator power supply	Open	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B1
J21	External clock source from 8 MHz oscillator or SMA connector	1-2 (8 MHz oscillator)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D1

5.6 Reset circuit

The "mini module" supports different ways to reset the microcontroller.
To use and perform the reset driving there are different jumpers and switches:

Table 6. Reset configuration jumpers

Jumper	Description	Default	Position
SW1	Reset push button	Open	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D1
J22	Connect the external reset to the reset driver for ESR0 and PORST pins	Close	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D1
J20	Connect the external reset to ESR0 pin	Close	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D1
J25	Connect the external reset to PORST pin	Close	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D2

5.7 Test points

The "mini module" has several test points. Below all test points description:

Table 7. Test points

Test point	Description	Position
GT1	GND test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A2
GT2	GND test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - C4
GT3	GND test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - C2
GT4	GND test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A1
GT5	GND test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D1
GT6	AGND test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B2
GT7	VSS_OSC test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B3
TP1	TCK test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A2
TP2	TMS/Txp test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3
TP3	TDI/Txn test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3
TP4	TDO/Rxp test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3
TP5	JCOMP/Rxn test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3
TP6	J23A, QSH connector, pin10 (PA5) test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A4
TP7	J23A, QSH connector, pin11 (PA6) test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A4
TP8	J23A, QSH connector, pin12 (PA7) test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B4
TP9	J23A, QSH connector, pin13 (PA8) test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B4
TP10	J23A, QSH connector, pin14 (PA9) test point	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - B4

5.8 Connectors

The "mini module" has the following connectors:

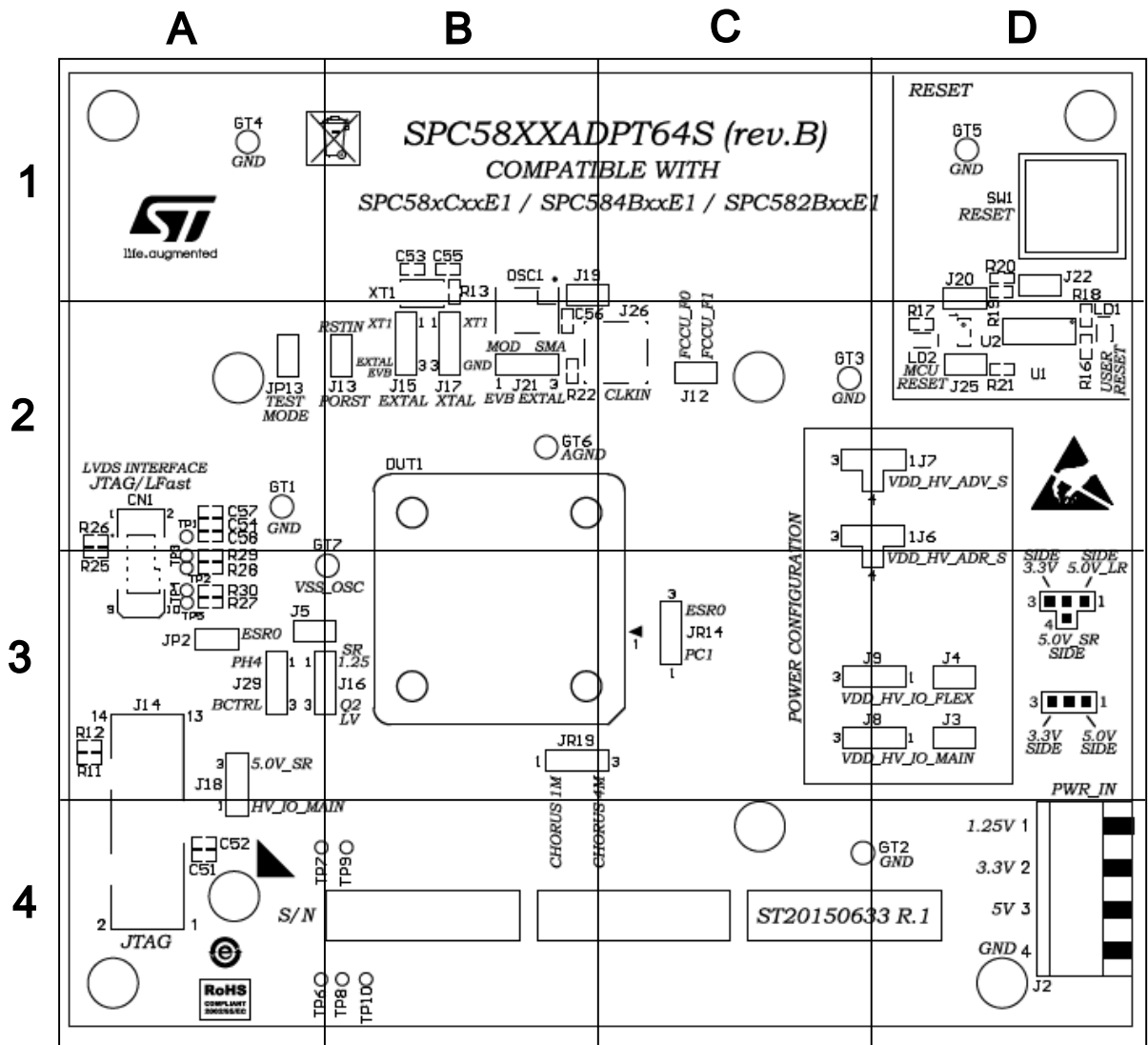
Table 8. Connectors

Connectors	Description	Position
J14	14-pin header connector for JTAG interface	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A3

Connectors	Description	Position
CN1	10-pin header connector for JTAG/LFAST LVDS interface	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - A2
J12	Fault collection and control unit (FCCU) pin, for failure notification	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - C2
J23, J24	2 X Samtec QSH series, 240 way connector to connect "mini module" to motherboard	Figure 5. SPC58XXADPT64S rev. B "mini module" - bottom - A1/A4
J2	External power supplies input (5 V, 3.3 V, 1.25 V)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - D4
J26	SMA connector for external clock input)	Figure 4. SPC58XXADPT64S rev. B "mini module" - top - C2

6 Layout overview

Figure 4. SPC58XXADPT64S rev. B "mini module" - top



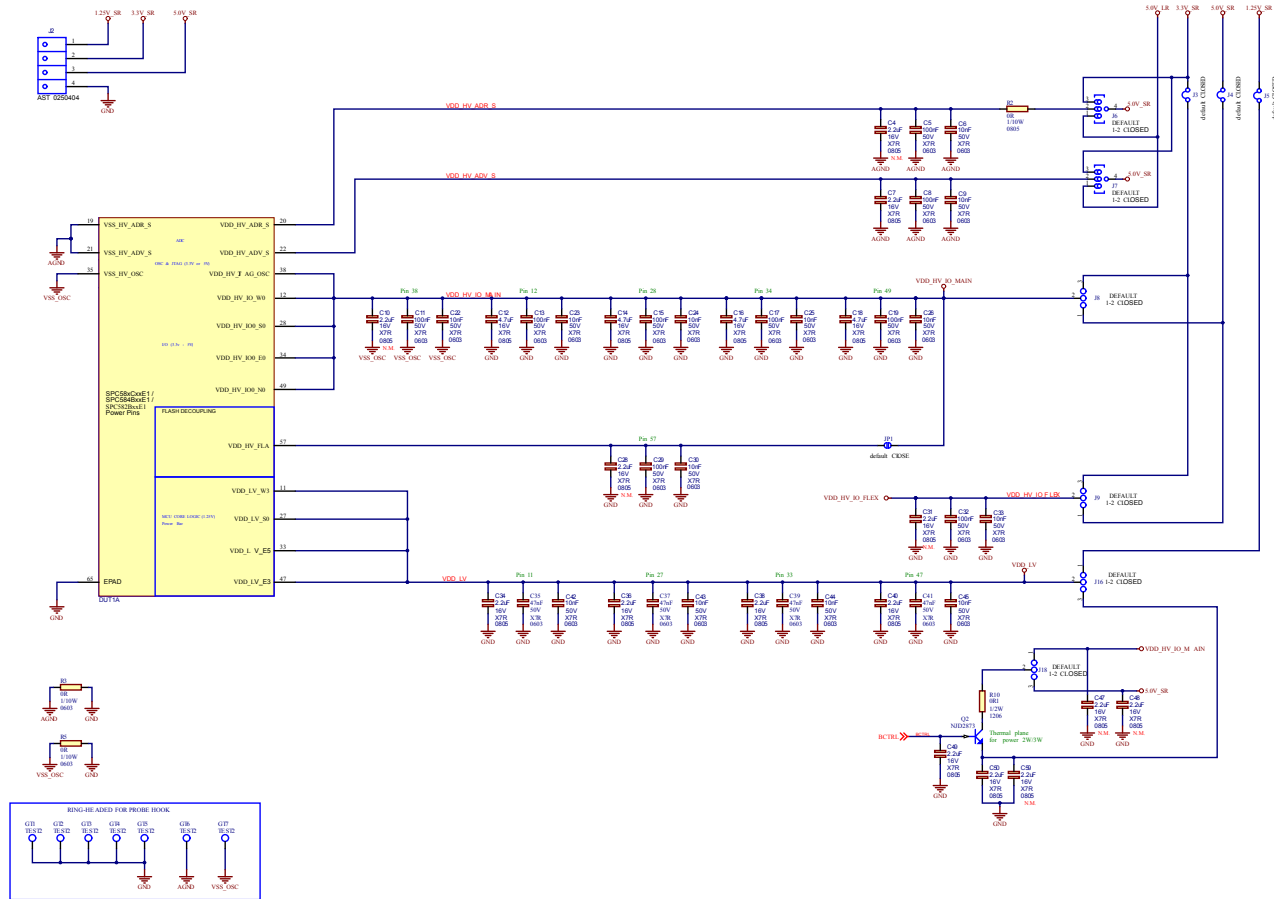
7 BOM

Table 9. BOM

Item	QTY	Reference	Manufacturer Code	Value	Part description
1	7	C4, C10, C28, C31, C47, C48, C59		2.2 uF	Mult. cer. cap. 16V 0805 - automotive series - not mounted!
2	9	C5, C8, C11, C13, C15, C17, C19, C29, C32	CCERSMD104-0603M	100 nF	Mult. cer. cap. 50V 0603
3	13	C6, C9, C22, C23, C24, C25, C26, C30, C33, C42, C43, C44, C45	CCERSMD103-0603M	10 nF	Mult. cer. cap. 50V 0603
4	7	C7, C34, C36, C38, C40, C49, C50	CCERSMD225-0805M	2.2 uF	Mult. cer. cap. 16V 0805 - automotive series
5	4	C12, C14, C16, C18	CCERSMD475-0805M	4.7 uF	Mult. cer. cap. 16V 0805
6	4	C35, C37, C39, C41	CCERSMD473-0603M	47 nF	Mult. cer. cap. 50V 0603
7	1	C51		47 pF DNP	Mult. cer. cap. 50V SMD 0603 - not mounted!
8	1	C52	CCERSMD270-0603	27 pF	Mult. cer. cap. 50V SMD 0603
9	2	C53, C55		10 pF DNP	Mult. cer. cap. 50V SMD 0603 - not mounted!
10	2	C54, C57		DNM	Mult. cer. cap. 50V SMD 0603 - not mounted!
11	1	C56	CCERSMD104-0603M	100 nF	Mult. cer. cap. 50V SMD 0603
12	1	C58	CCERSMD270-0603M	27 pF	Mult. cer. cap. 50V SMD 0603
13	1	CN1	SAM-TFM10502LDWT	Samtec TFM-105-02-L-D-WT	Samtec 5x2 TFM connector - 1.27 mm pitch - with weld Tabs
14	1	DUT1	ZOCC64ETQFP		CHORUS - device under test - TQFP64-EP - SENSATA(WELLS) - 3010-064-X-0G-ST
15	7	GT1, GT2, GT3, GT4, GT5, GT6, GT7	TEST2	TEST2	PCB test point - raised loops
16	1	J2	AST-0250404	AST0250404	Conn 4 pin, 90°, AST board mount screwless
17	5	J3, J4, J5, J13, JP13	STRIP2PM	STRIP2PM	Male strip 2 poles see mech part - normally closed !!
18	2	J6, J7	STRIP3PM + STRIP1PM	STRIP3PM + STRIP1PM	Male strip 4 poles see mech part (close pin 1 and 2)
19	10	J8, J9, J15, J16, J17, J18, J21, J29, JR14, JR19	STRIP3PM	STRIP3PM	Male strip 3 poles see mech part (close pin 1 and 2)
20	1	J12	STRIP2PM	STRIP2PM	Male strip 2 poles
21	1	J14	M.14.180 LP-3M	N2514-6002RB	3M conn flat male 14 pins, straight - pitch 2.54 mm
22	1	J19	STRIP2PM	STRIP2PM	Male strip 2 poles see mech part - open !

Item	QTY	Reference	Manufacturer Code	Value	Part description
23	3	J20, J22, J25	STRIP2PM	STRIP2PM	Male strip 2 poles see mech part - close !
24	2	J23, J24	SAM-QSH12001LDA	Samtec QSH-120-01-L-D-A	Samtec 0.5 mm pitch high speed SMD socket
25	1	J26	BNC-SMA-FEM-180	BNC-SMA-FEM-180	Conn. RF SMA 180°
26	1	JP1			Jumper SMD - close! - with a solder drop !
27	1	JP2	STRIP2PM	STRIP2PM	Male strip 2 poles see mech part - normally open !
28	1	LD1	LEDSMDGIAL-0805	Yellow	Led Diode Yellow SMD 0805
29	1	LD2	LEDSMDRED-0805	Red	Led diode red SMD 0805
30	1	OSC1	Q8MHZ-SMD-3953M	8 MHz	Hybrid quartz osc SMD ECS 3953M
31	1	Q2	TRNJD2873-SMD	NJD2873	NPN plastic Power transistor DPAK
32	1	R2	RESMD000-805-5	0R	Resistor 1/10W 5% 0805
33	6	R3, R5, R27, R28, R29, R30	RESMD000-0603	0R	Resistor 1/10W 1% 0603
34	2	R6, R9	RESMD472-0603	4K7	Resistor 1/10W 1% 0603
35	2	R7, R11		10K DNP	Resistor 1/10W 1% SMD 0603 - not mounted!
36	1	R8	RESMD103-0603	10K	Resistor 1/10W 1% 0603
37	1	R10	RESMD0R1-1206	0R1	Resistor 1/2W 1% 1206
38	2	R12, R18	RESMD103-0603	10K	Resistor 1/10W 1% SMD 0603
39	1	R13	RESMD000-0603	0R	Resistor 1/10W 1% SMD 0603
40	2	R16, R17	RESMD561-0603	560R	Resistor 1/10W 1% SMD 0603
41	2	R19, R21	RESMD221-0603	220R	Resistor 1/10W 1% SMD 0603
42	1	R20	RESMD472-0603	4K7	Resistor 1/10W 1% SMD 0603
43	1	R22	RESMD49R9-0603	49R9	Resistor 1/16W 1% 0603
44	1	R24		100R	Resistor 1/10W 1% 0603 - not mounted!
45	2	R25, R26		DNM	Resistor 1/16W 1% SMD 0603 - not mounted!
46	1	SW1	PULSANTECS	Pushbutton	Pushbutton NO low profile for pcb
47	10	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10		TESTPOINT	Test point SMD - not mounted!
48	1	U1	74LVC125AMTR-SMD	74LVC125AMTR	I.C. quad bus buffers SO14
49	1	U2	74V1G08-SMD	74V1G08STR	I.C. single 2-input and gate - SMD SOT23-5L
50	1	XT1	Q40MHZ-SMD-5032	40 MHz	Quartz 40 MHz SMD NX5032GA XTAL NDK

Figure 6. Power and decoupling



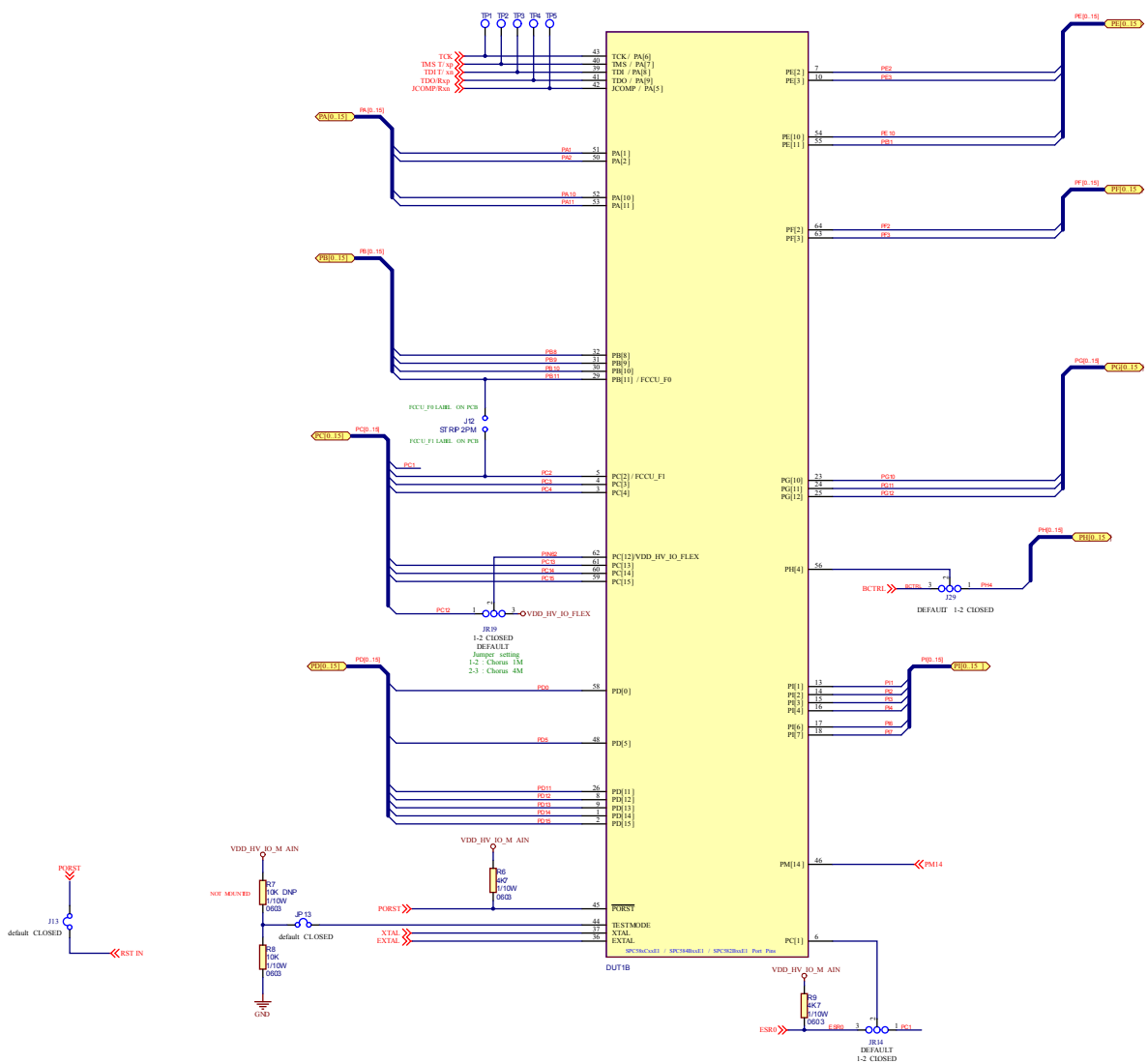
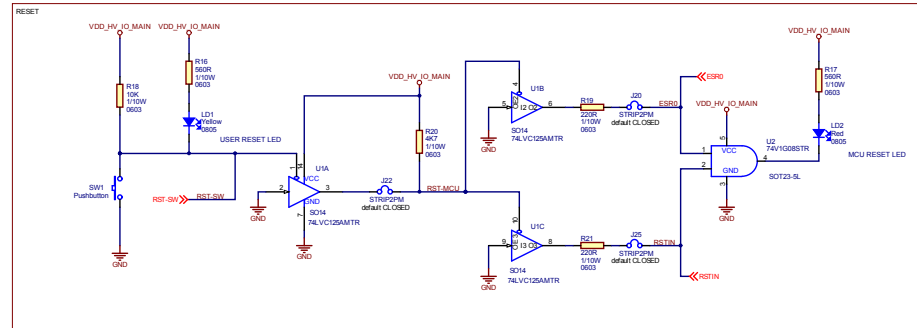
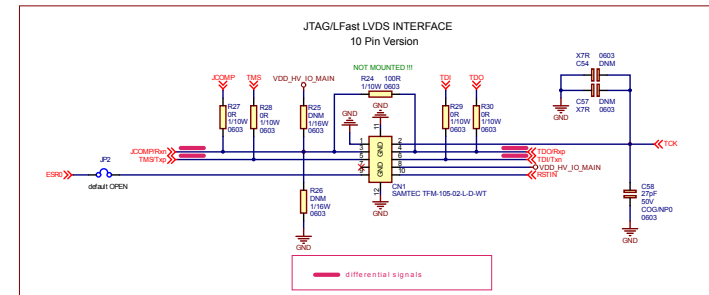
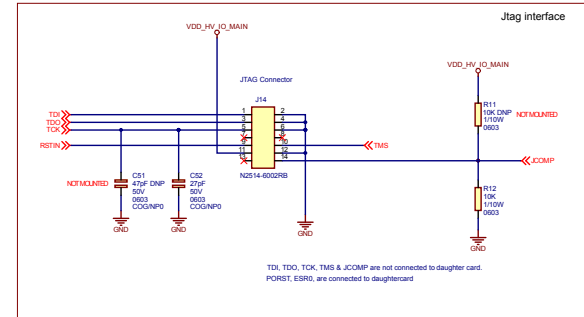
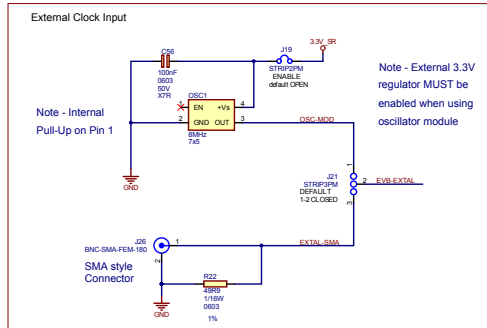
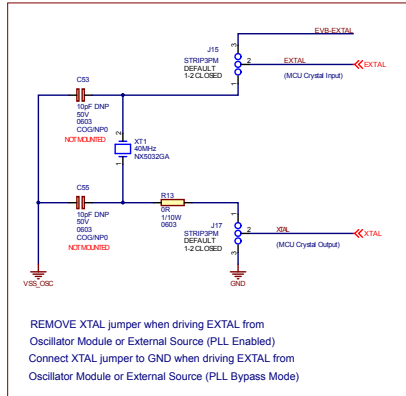
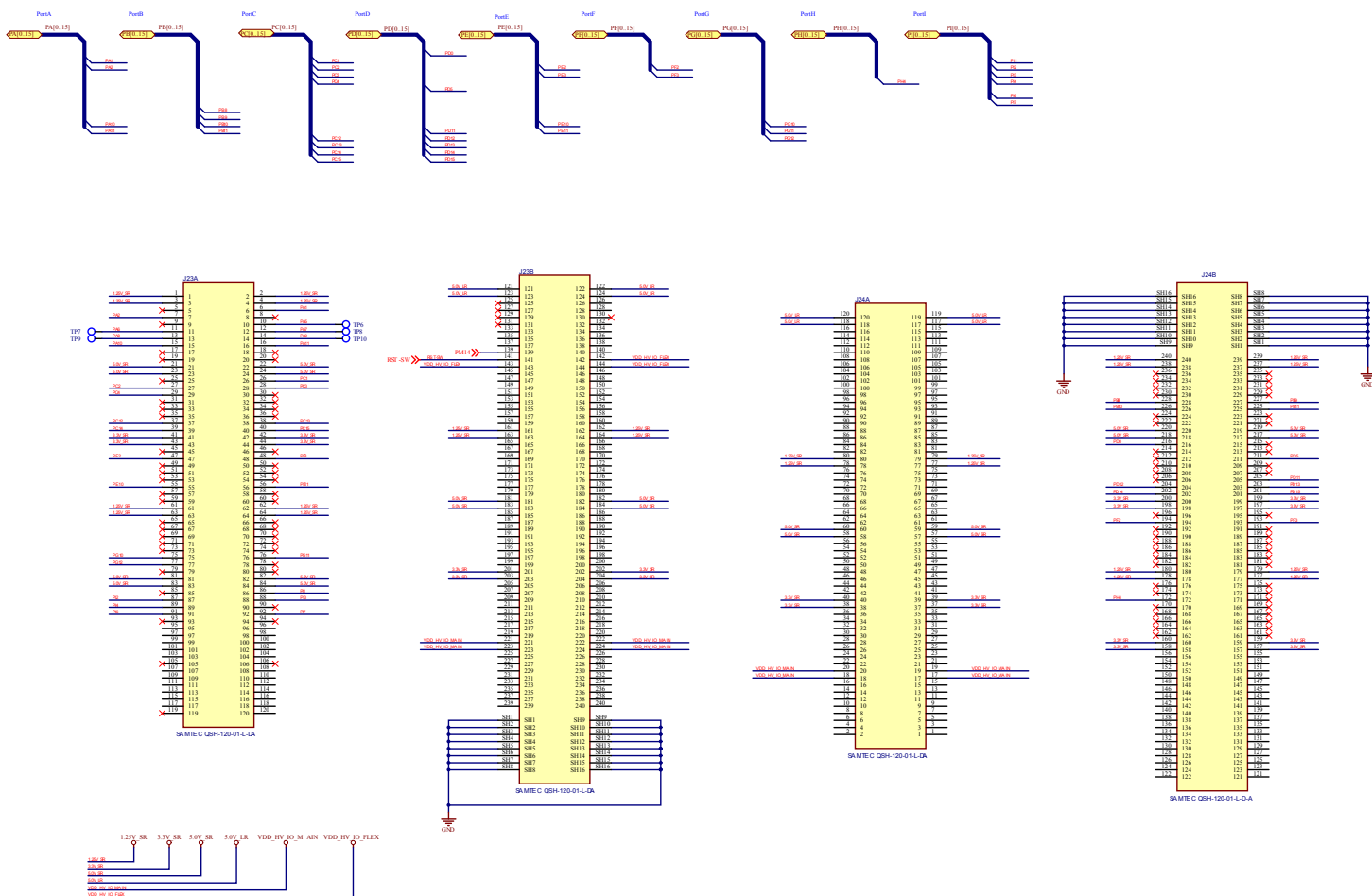


Figure 8. JTAG, JTAG/LFast LVDS INTERFACE, reset and crystal



UM2790
Schematics



Revision history

Table 10. Document revision history

Date	Version	Changes
17-Feb-2021	1	Initial release.

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