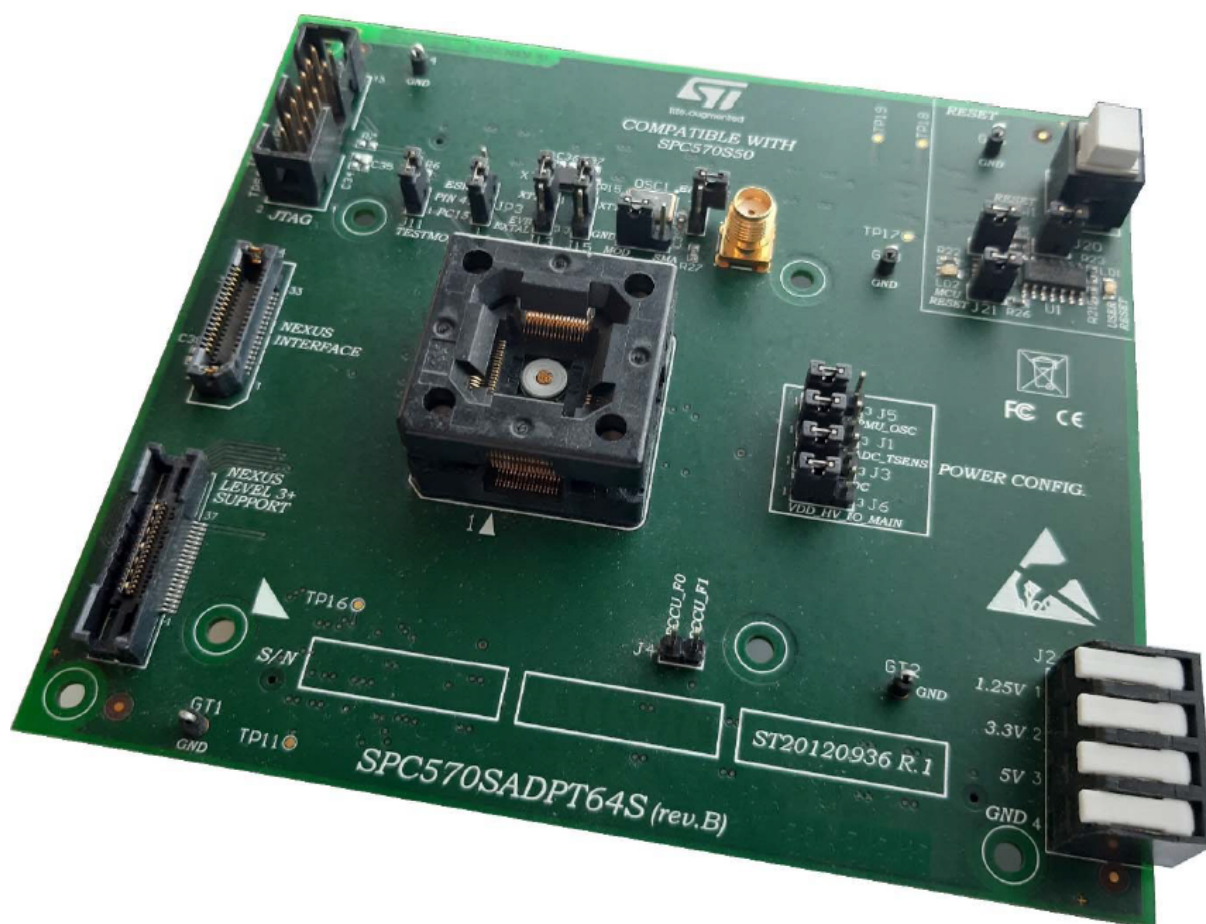


SPC570SADPT64S rev. B evaluation board

Introduction

The SPC570SADPT64S rev. B "mini module" is an evaluation board supporting STMicroelectronics SPC570S50E1 device in eTQFP64 package.

Figure 1. SPC570SADPT64S rev.B



Note: picture is not contractual.

1 Overview

This "mini module" is designed to be connected onto the SPC58xxMB motherboard, offering a mechanism for easy customer evaluation of the SPC570S family of device, and facilitating hardware and software development. High density connectors provide the interface between the EVB and MCU daughter cards and help the developers to evaluate all peripherals of the device.

This user manual provides information on using [SPC570SADPT64S rev. B](#) "mini module" board and its hardware features.

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

Figure 2. Overview of SPC570SADPT64S rev. B mini module - top

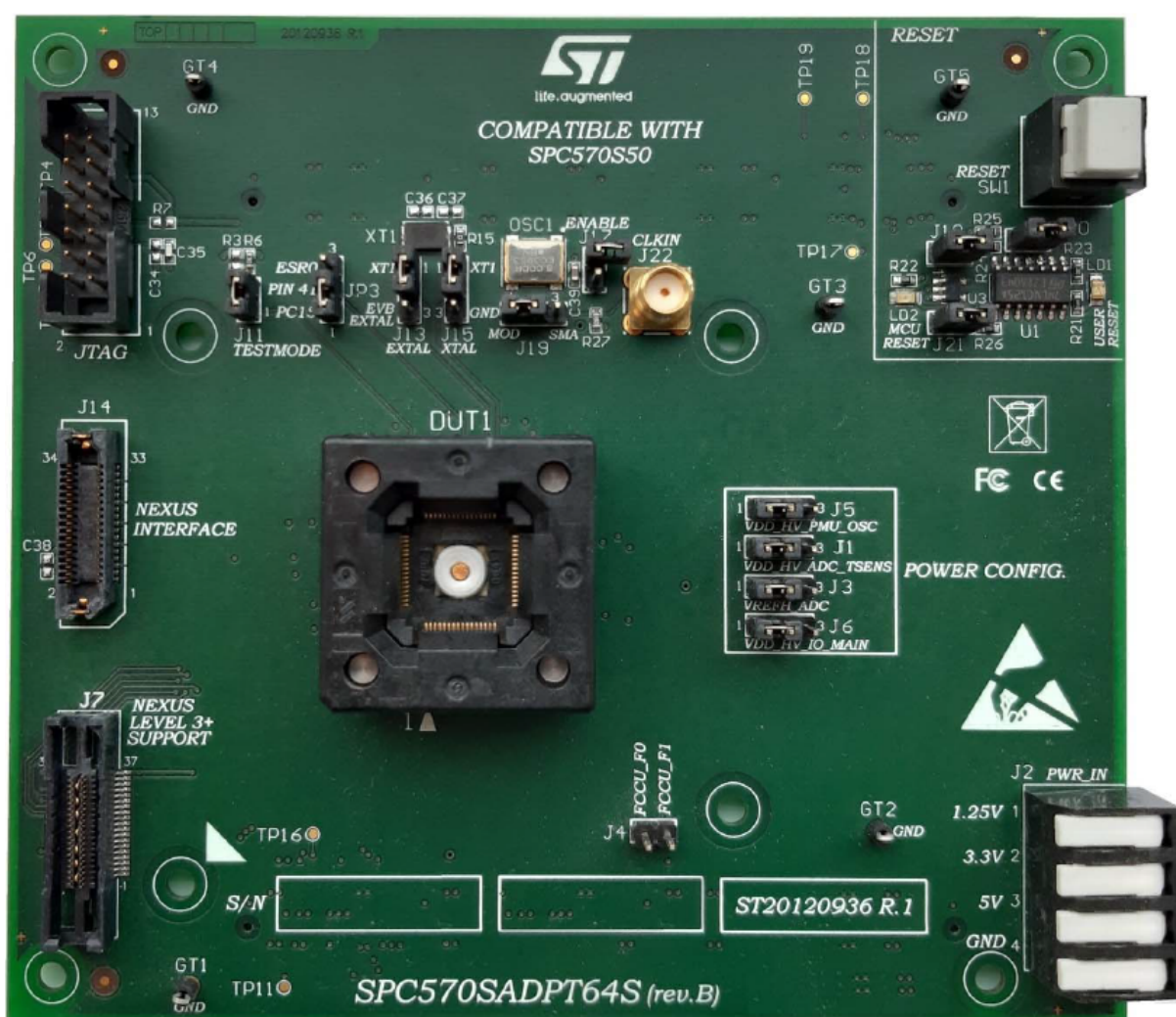
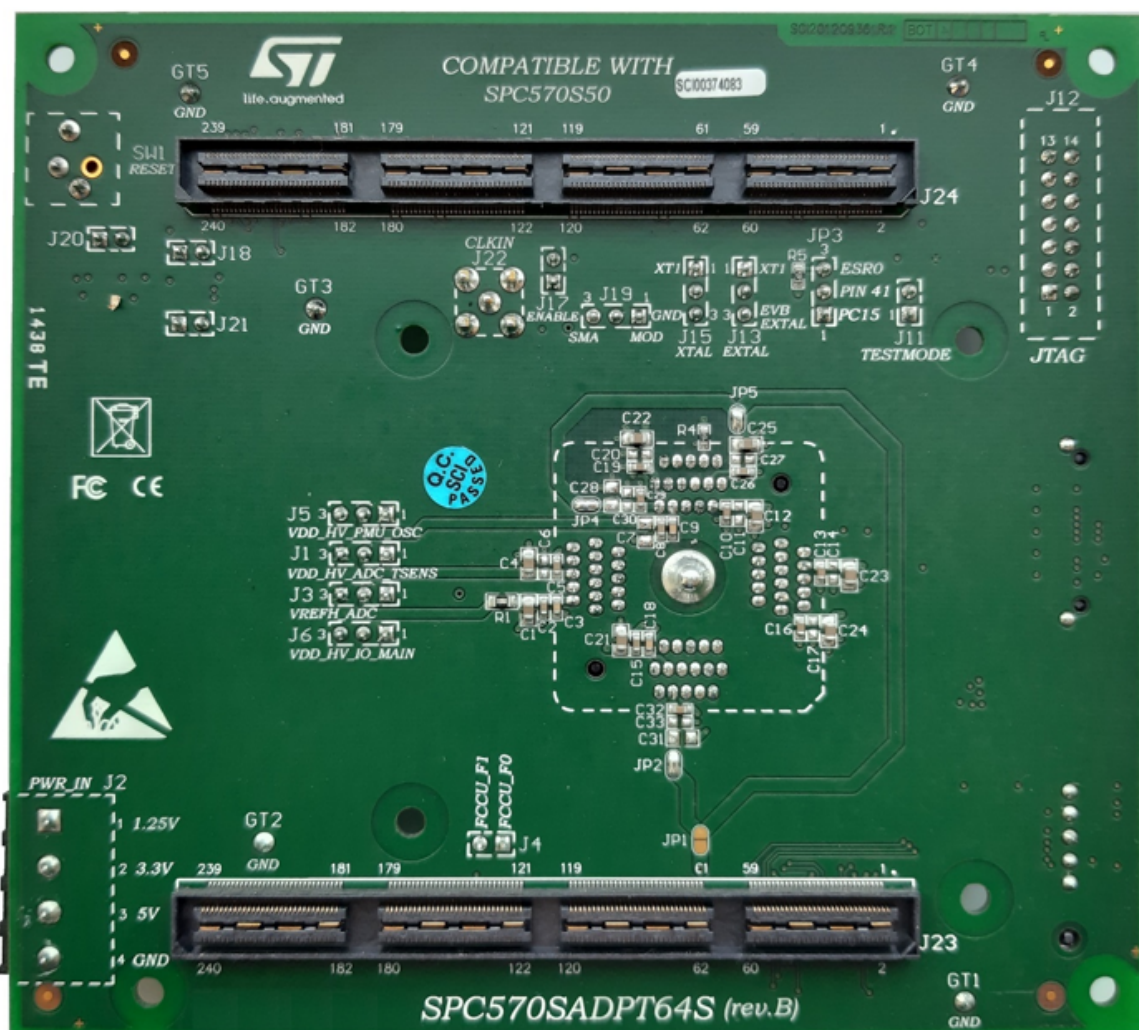


Figure 3. Overview of SPC570SADPT64S rev. B mini module - bottom



1.1 Package contents

An SPC570SADPT64S rev. B adapter package includes the following items:

- SPC570SADPT64S rev. B evaluation board

1.2 Supported devices

The SPC570SADPT64S rev. B evaluation board supports STMicroelectronics family of microcontrollers in eTQFP64:

- SPC570S50E1

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 content in order 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 SPC570SADPT64S rev. B "mini module" board has the following features:

- Can be used as a stand- alone board by providing external power supplies input (5 V, 3.3 V)
- Reset button with driver and led indicator
- Socket for device in eTQFP64 package
- Debug ports:
 - 34-pin SAMTEC connector for Nexus 2
 - 38-pin Mictor connector for Nexus level 3+
 - 14-pin header connector for JTAG port
- 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 connectors to connect "mini module" to motherboard

4.2 Hardware dimensions

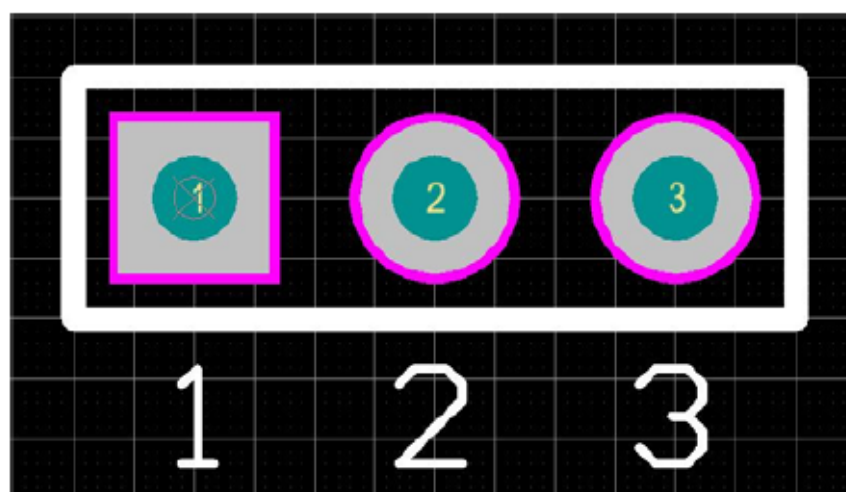
The evaluation board has the following dimensions:

- PCB area: 127 mm X 114.3 mm
- Top components height: 18.8 mm max
- Bottom components height: 3.5 mm max
- PCB thickness: 1.6 mm

4.3 Pin numbering for jumpers

3 pin jumpers for the "mini module" have rectangular pad to indicate the position of pin 1 and there is the PCB silk-screen with the number of all pins. See example below for the numbering convention used in this manual for jumper settings:

Figure 4. Overview of pin numbering convention



5 Hardware and jumper setting

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 SPC570SADPT64S rev. B "mini module" is used as a stand-alone board, external power supplies must be used (5 V, 3.3 V, 1.25 V).

The following jumpers are used to configure the power supply:

Table 1. Power configuration jumpers

Jumper	Description	Default	Position
J1	VDD_HV_ADC_TSENS voltage configuration: 1-2: 5 V_LR (linear) 2-3: 5 V_SW (switching)	1-2 (5V_LR)	Figure 10 - C3
J3	VREFH_ADC voltage configuration: 1-2: 5 V_LR (linear) 2-3: 5 V_SW (switching)	1-2 (5V_LR)	Figure 10 - C3
J5	VDD_HV_PMU_OSC voltage configuration: 1-2: 5 V_SR 2-3: 3.3 V_SR (switching)	1-2 (5V_SR)	Figure 10 - C2
J6	VDD_HV_IO_MAIN voltage configuration: 1-2: 5 V_SR 2-3: 3.3 V_SR (switching)	1-2 (5V_SR)	Figure 10 - C3
JP1	External core voltage supply configuration jumper: - Open: core voltage supply not connected to external 1.25 V - Closed: core voltage supply connected to external 1.25 V	Open	Figure 11 - C4
JP2	VDD_LV1 configuration for external 1.25 V use: - Open: VDD_LV1 not connected to JP1 - Closed: VDD_LV1 connected to JP1	Close	Figure 11 - C3
JP4	VDD_LV2 configuration for external 1.25 V use: - Open: VDD_LV2 not connected to JP1 - Closed: VDD_LV2 connected to JP1	Close	Figure 11 - C2
JP5	VDD_LV3 configuration for external 1.25 V use: - Open: VDD_LV3 not connected to JP1 - Closed: VDD_LV3 connected to JP1	Close	Figure 11- C2

5.2 Port configuration

The following jumpers need to configure the ports:

Table 2. Ports related jumpers

Jumper	Description	Default	Position
J11	VDD_LV2 configuration for external 1.25 V use: - Open: TESTMODE not connected - Closed: TESTMODE connected to: - R6 Mounted: pulldown (default) - R3 Not Mounted: pullup	Close (default pull-down)	Figure 10 - A2
JP3	PC[15] connection configuration jumper: 1-2: QSH connectors (motherboard) 2-3: ESR0	1-2 (QSH connectors motherboard)	Figure 10 - B2

5.3 System clock configuration

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

Table 3. Clock configuration jumpers

Jumper	Description	Default	Position
J13	EXTAL connection configuration: 1-2: EXTAL connected to 40 MHz cristal clock source 2-3: EXTAL connected to EXTAL EVB clock source	1-2 (XT1 pin2)	Figure 10 - B2
J15	XTAL connection configuration: 1-2: XTAL connected to 40 MHz cristal clock source 2-3: XTAL connected to GND	1-2 (XT1 pin1)	Figure 10 - B2
J17	8MHz oscillator enable jumper: - Open: 8 MHz oscillator not enabled - Closed: 8 MHz oscillator enabled	Open	Figure 10 - C1
J19	External clock source jumper selector: 1-2: from 8 MHz oscillator 2-3: from SMA connector	1-2	Figure 10 - B2

5.4 Connectors

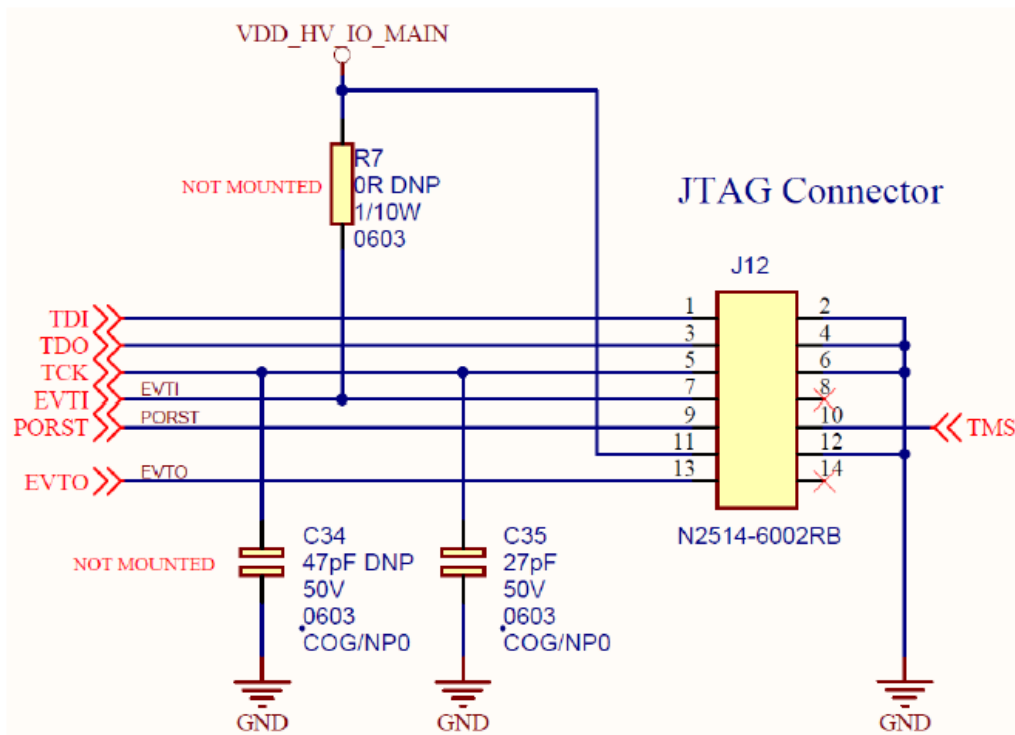
The "mini module" evaluation board has the following debug connectors:

Table 4. Connectors

Connectors	Description	Position
J12	14-pin header connector for JTAG port	Figure 10 - A1
J14	34-pin SAMTEC connector for Nexus 2	Figure 10 - A2
J7	38-pin Mictor connector for Nexus level 3+	Figure 10 - A3
J4	Fault collection and control Unit (FCCU) pin, for failure notification	Figure 10 - C4
J2	External power supplies input	Figure 10 - D4
J23,J24	2 X SAMTEC QSH series, 240 way connector to connect minimodule to motherboard	Figure 11

The following Figure 5 shows the JTAG connector schema:

Figure 5. JTAG connector schema

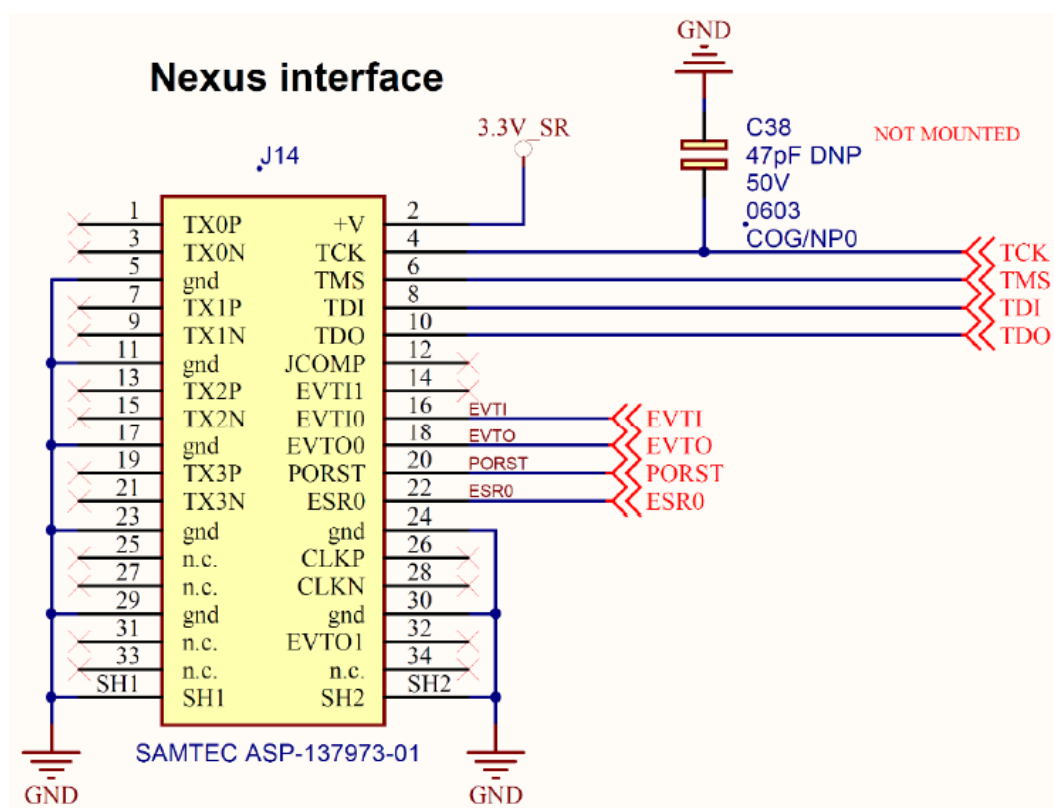


The following Table 5 shows the JTAG connector pinout:

Table 5. JTAG Header 2x7 pins connector pinout

Pin number	Signal
1	TDI
2	GND
3	TDO
4	GND
5	TCK
6	GND
7	EVTI
8	N.C.
9	PORST
10	TMS
11	VDD HV IO MAIN
12	GND
13	EVTO
14	N.C.

The following Figure 6 shows the NEXUS SAMTEC ASP-137973-01 connector schema:

Figure 6. NEXUS SAMTEC ASP-137973-01


The following Table 6 shows the NEXUS SAMTEC ASP-137973-01 connector pinout:

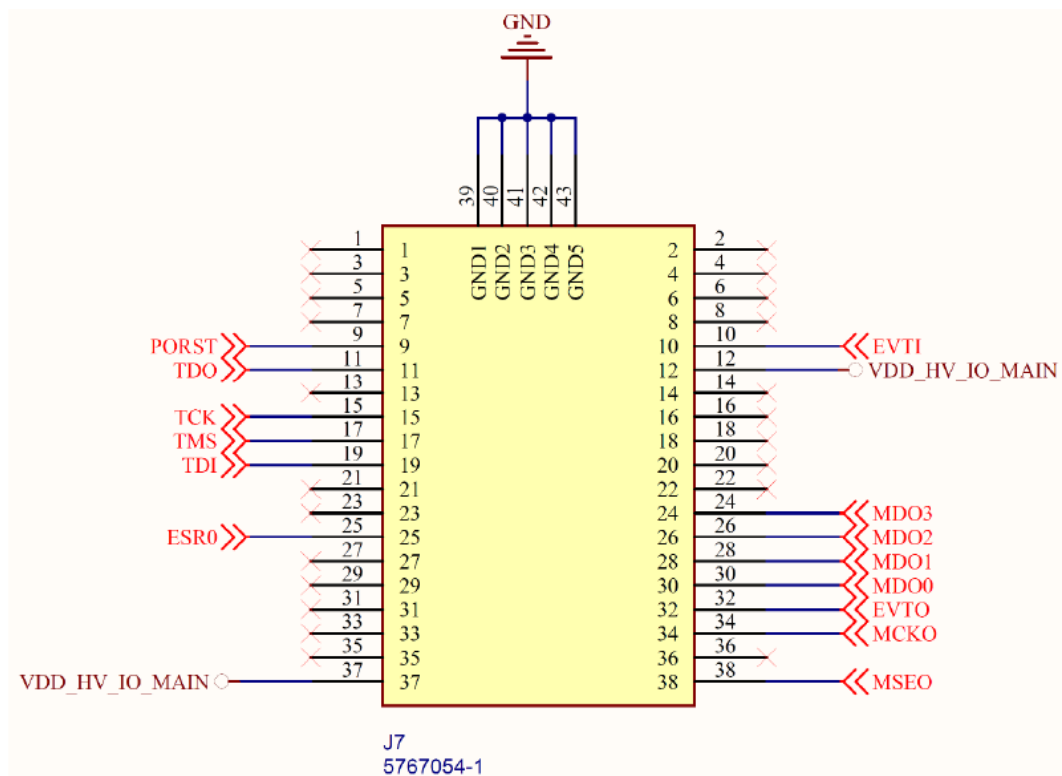
Table 6. NEXUS SAMTEC ASP-137973-01 connector pinout

Pin number	Signal
1	N.C.
2	3.3 V
3	N.C.
4	TCK
5	GND
6	TMS
7	TX1P
8	TDI
9	TX1N
10	TDO
11	GND
12	JCOMP
13	N.C.
14	N.C.
15	N.C.
16	EVTI
17	GND

Pin number	Signal
18	EVTO
19	N.C.
20	PORST
21	N.C.
22	ESRO
23	GND
24	GND
25	N.C.
26	N.C.
27	N.C.
28	N.C.
29	GND
30	GND
31	N.C.
32	N.C.
33	N.C.
34	N.C.
SH1	GND
SH2	GND

The following Figure 7 shows the NEXUS Level 3+ schema:

Figure 7. AURORA schema



The following [Table 7. Nexus level 3+ connector pinout](#) shows the Nexus level 3+ connector pinout:

Table 7. Nexus level 3+ connector pinout

Pin number	Signal
1	Not connected
2	Not connected
3	Not connected
4	Not connected
5	Not connected
6	GND
7	TRACE_D2_P
8	Not connected
9	TRACE_D2_N
10	Not connected
11	GND
12	GND
13	TRACE_D0_P
14	Not connected
15	TRACE_D0_N
16	Not connected
17	GND
18	GND
19	TRACE_CLK_P
20	Not connected
21	TRACE_CLK_N
22	Not connected
23	GND
24	GND
25	TRACE_D1_P
26	Not connected
27	TRACE_D1_N
28	Not connected
29	GND
30	GND
31	TRACE_D3_P
32	Not connected
33	TRACE_D3_N
34	Not connected
35	GND
36	GND
37	Not connected
38	GND

Pin number	Signal
39	Not connected
40	GND

The following [Figure 8](#) shows the FCCU (Fault Collection and Control Unit) connector schema:

Figure 8. FCCU connector schema

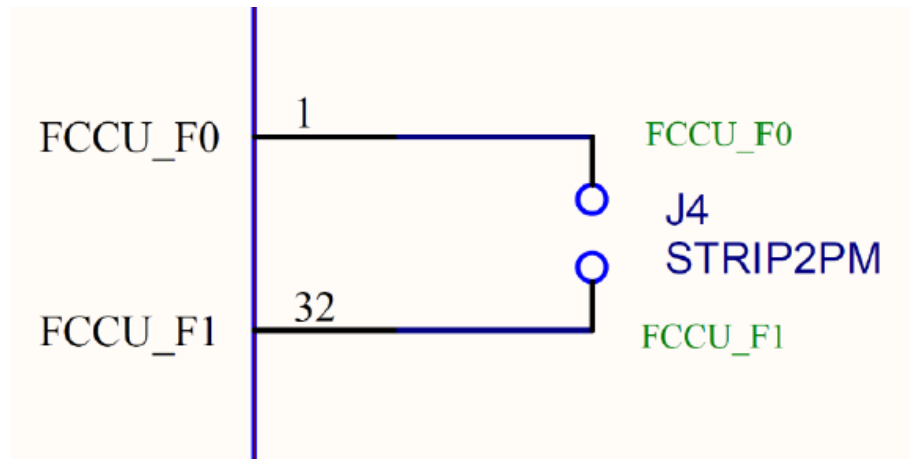


Table 8. FCCU connector pinout

Pin number	Signal
1	FCCU_F0
2	FCCU_F1

The following [Figure 9](#) shows the external power supply connector schema:

Figure 9. External power supply connector schema

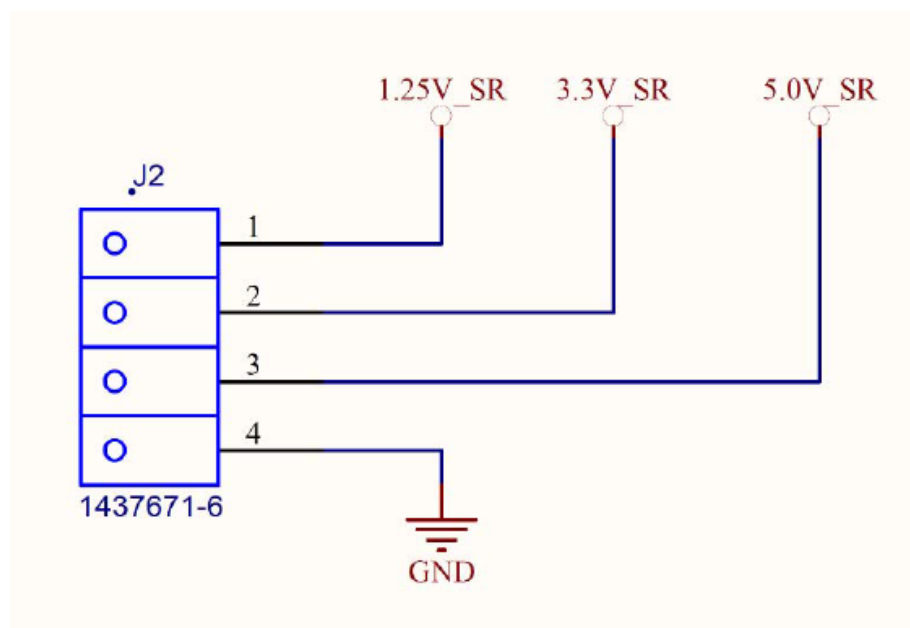


Table 9. External power supply connector pinout

Pin number	Signal
1	1.25 V
2	3.30 V
3	5V
4	GND

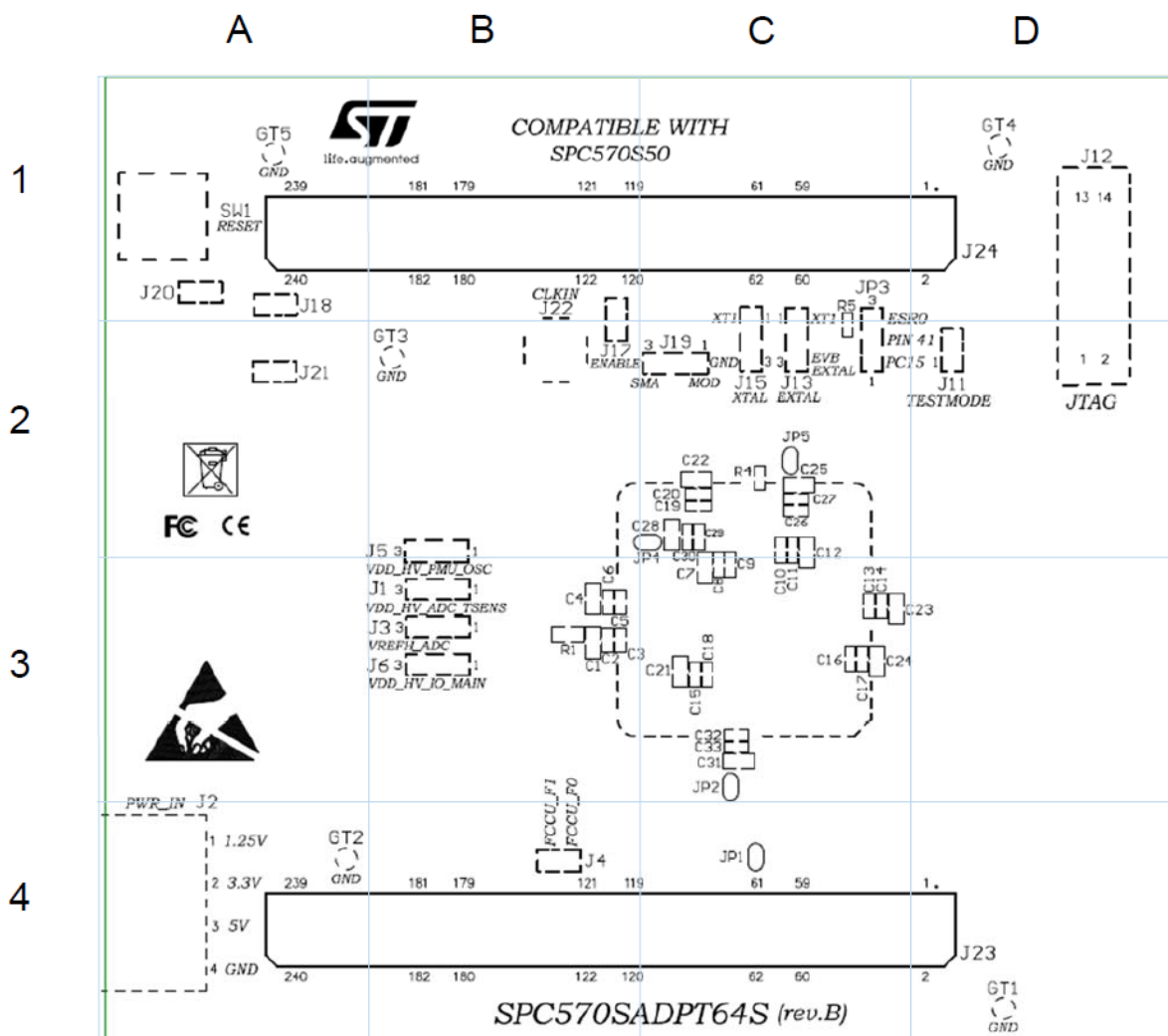
5.5 Test points

Several test points of different shape and functionality are scattered around the SPC570SADPT64S Rev. B evaluation board to allow easy access to MCU and reference signals. This chapter summarizes and describes the available test points. Test points are listed and detailed in the following [Table 10](#):

Table 10. Test points

Test point	Description	Position
GT1	GND test point	Figure 10 – A4
GT2	GND test point	Figure 10 – D4
GT3	GND test point	Figure 10 – C2
GT4	GND test point	Figure 10 – A1
GT5	GND test point	Figure 10 – D1
TP3	TCK test point (JTAG)	Figure 10 – A1
TP4	TMS test point (JTAG)	Figure 10 – A1
TP5	TDI test point (JTAG)	Figure 10 – A2
TP6	TDO test point (JTAG)	Figure 10 – A1
TP11	J23A, QSH connector, pin10 (PA[5]) test point	Figure 10 – A4
TP16	J23A, QSH connector, pin19 (PA[14]) test point	Figure 10 – B4
TP17	J24B, QSH connector, pin210 (PD[6]) test point	Figure 10 – D1
TP18	J24B, QSH connector, pin209 (PD[7]) test point	Figure 10 – D1
TP19	J24B, QSH connector, pin183 (PF[13]) test point	Figure 10 – C1

Figure 11. SPC57SADPT64S Rev.B bottom "mini module" overview



7 BOM

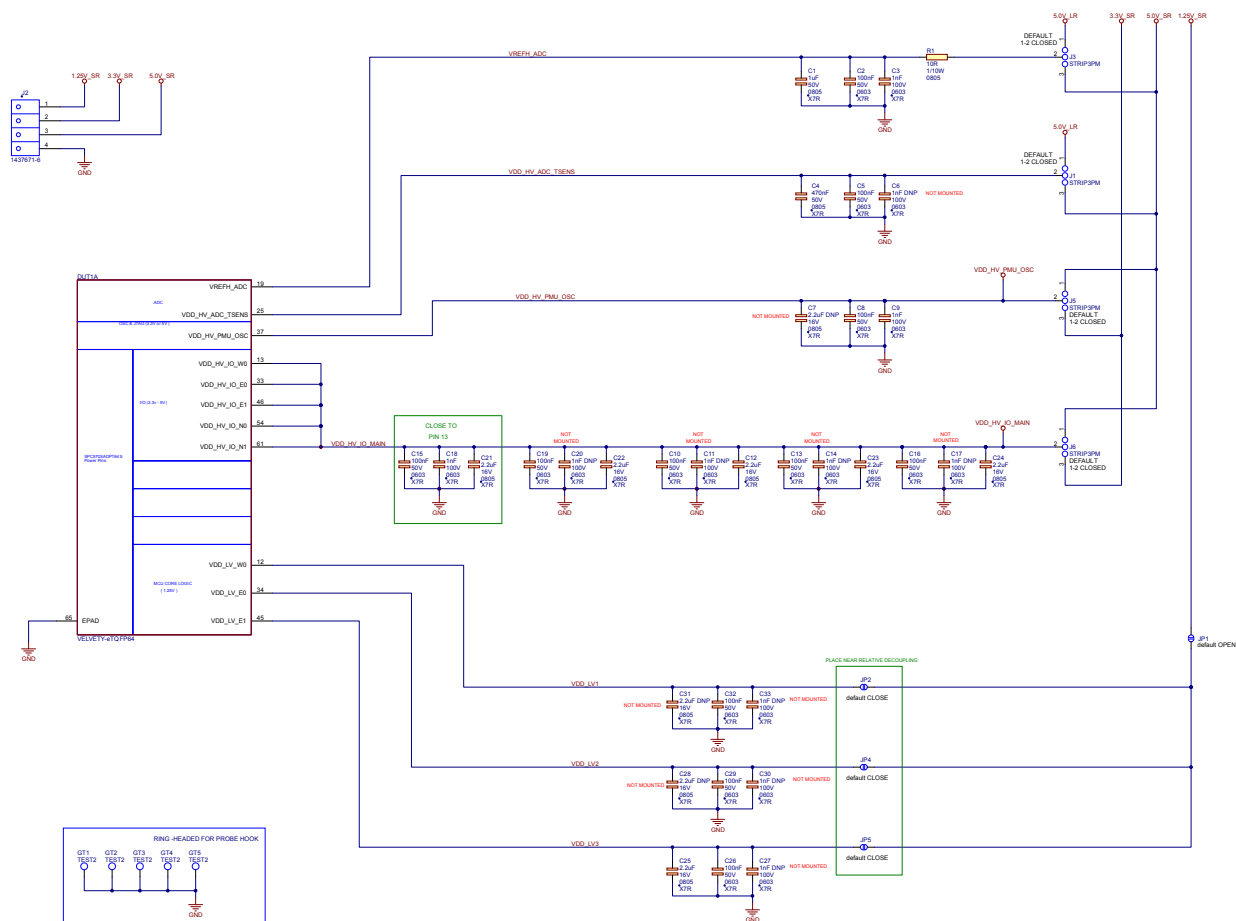
Table 11. BOM

#	Item	Qty.	Reference	Value	Option	Description
1	C1	1	CCERSMD105-0805M	1 μ F		Mult. cer. cap. 50 V SMD0805
2	C2, C5, C8, C10, C13, C15, C16, C19, C26, C29, C32, C39	12	CCERSMD104-0603M	100 nF		Mult. cer. cap. 50 V SMD0603
3	C3, C9, C18	3	CCERSMD102-0603V	1 nF		Mult. cer. cap. 100 V SMD0603
4	C4	1	CCERSMD474-0805X	470 nF		Mult. cer. cap. 50 V SMD0805
5	C6, C11, C14, C17, C20, C27, C30, C33	8		1 nF	DNP	Mult. cer. cap. 100 V SMD0603
6	C7, C28, C31	3		2.2 μ F	DNP	Mult. cer. cap. 16 V SMD0805 - Automotive series
7	C12, C21, C22, C23, C24, C25	6	CCERSMD225-0805M	2.2 μ F		Mult. cer. cap. 16 V SMD0805 - Automotive series
8	C34, C38	2		47 pF	DNP	Mult. cer. cap. 50 V SMD0603
9	C35	1	CCERSMD270-0603	27 pF		Mult. cer. cap. 50 V SMD0603
10	C36, C37	2		10 pF	DNP	Mult. cer. cap. 50 V SMD0603
11	DUT1	1				
12	GT1, GT2, GT3, GT4, GT5	5	TEST2	Test point		PCB test point - Raised loops
13	J1, J3, J5, J6, J13, J15, J19, JP3	8	STRIP3PM	STRIP3PM		Male strip 3 poles
14	J2	1	TYCO-1437671-6	1437671-6		TYCO board mount screwless connector - Pitch 5.08 mm 90°
15	J4	1	STRIP2PM	STRIP2PM		Male strip 2 poles
16	J7	1	TYCO-5767054-1	5767054-1		Conn. SMD TYCO , vertical, female, 38PMICTOR - GND pin lenght 2.74 mm
17	J11, J18, J20, J21	4	STRIP2PM	STRIP2PM		Male strip 2 poles
18	J12	1	M.14.180 LP-3M	N2514-6002RB		3M conn flat male 14 pins, straight - Pitch 2.54 mm
19	J14	1	SAMASP13797301	SAMTECASP-137973-01		SAMTEC 0.8 mm pitch - Connector SMD 17x2 - NEXUS Connector
20	J17	1	STRIP2PM	STRIP2PM		Male strip 2 poles
21	J22	1	BNC-SMAFEM-180	BNCSMAFEM-180		Conn. RF SMA 180°
22	J23, J24	2	SAMQSH12001LDA	SAMTECQSH-120-01-L-D-A		SAMTEC 0.5 mm pitch high speed SMD socket
23	JP1	1				Jumper SMD
24	JP2, JP4, JP5	3				Jumper SMD

#	Item	Qty.	Reference	Value	Option	Description
25	LD1	1	LEDSMDGIAL-0805	Yellow		Led diode yellow SMD0805
26	LD2	1	LEDSMDRED-0805	Red		Led diode red SMD 0805
27	OSC1	1	Q8MHZ-SMD-3953M	8 MHz		Hybrid quartz Osc SMD ECS 3953M
28	R1	1	RESMD100-805	10R		Resistor 1/10 W 1% SMD 0805
29	R3	1		10K	DNP	Resistor 1/10 W 1% SMD 0603
30	R4, R5, R25	3	RESMD472-0603	4K7		Resistor 1/10 W 1% SMD 0603
31	R6, R23	2	RESMD103-0603	10K		Resistor 1/10 W 1% SMD 0603
32	R7	1		0R	DNP	Resistor 1/10 W 1% SMD 0603
33	R15	1	RESMD000-0603	0R		Resistor 1/10 W 1% SMD 0603
34	R21, R22	2	RESMD561-0603	560R		Resistor 1/10 W 1% SMD 0603
35	R24, R26	2	RESMD221-0603	220R		Resistor 1/10 W 1% SMD 0603
36	R27	1	RESMD101-0603	100R		Resistor 1/10 W 1% SMD 0603
37	SW1	1	PULSANTEG	Push button		Push button for pcb 4 pins
38	TP3, TP4, TP5, TP6, TP11, TP16, TP17, TP18, TP19	9			DNP	Test point SMD
39	U1	1	74LVC125AMTR-SMD	74LVC125 AMTR		I.C. low voltage CMOS quad bus buffers - SO14
40	U3	1	74V1G08-SMD	74V1G08STR		I.C. Single 2-input and gate - SMD SOT23-5L
41	XT1	1	Q40MHZSMD-5032	40 MHz		Quartz 40 MHz SMD NX5032GA XTAL NDK

8

Figure 12. Power and decoupling



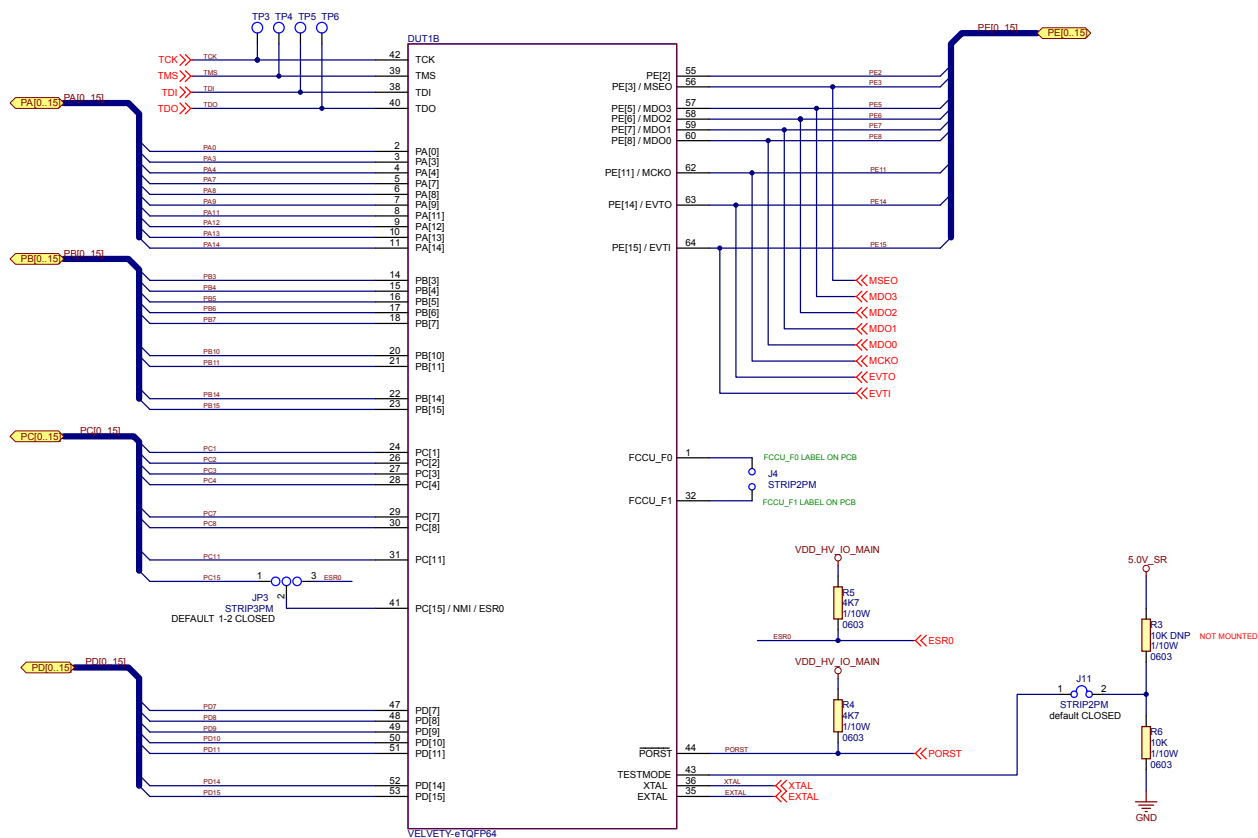


Figure 14. Reset, JTAG, Nexus level 3+ support, Nexus interface and crystal oscillator

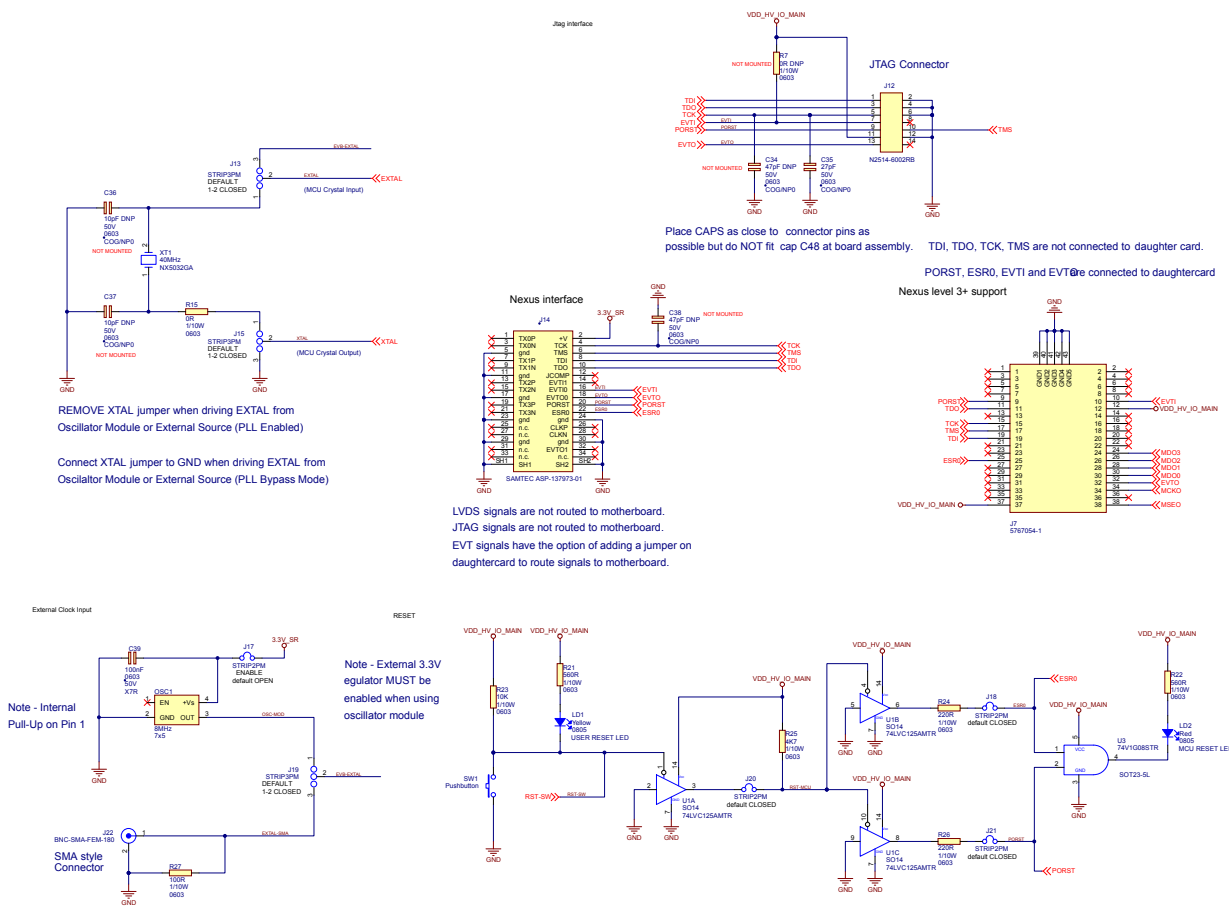
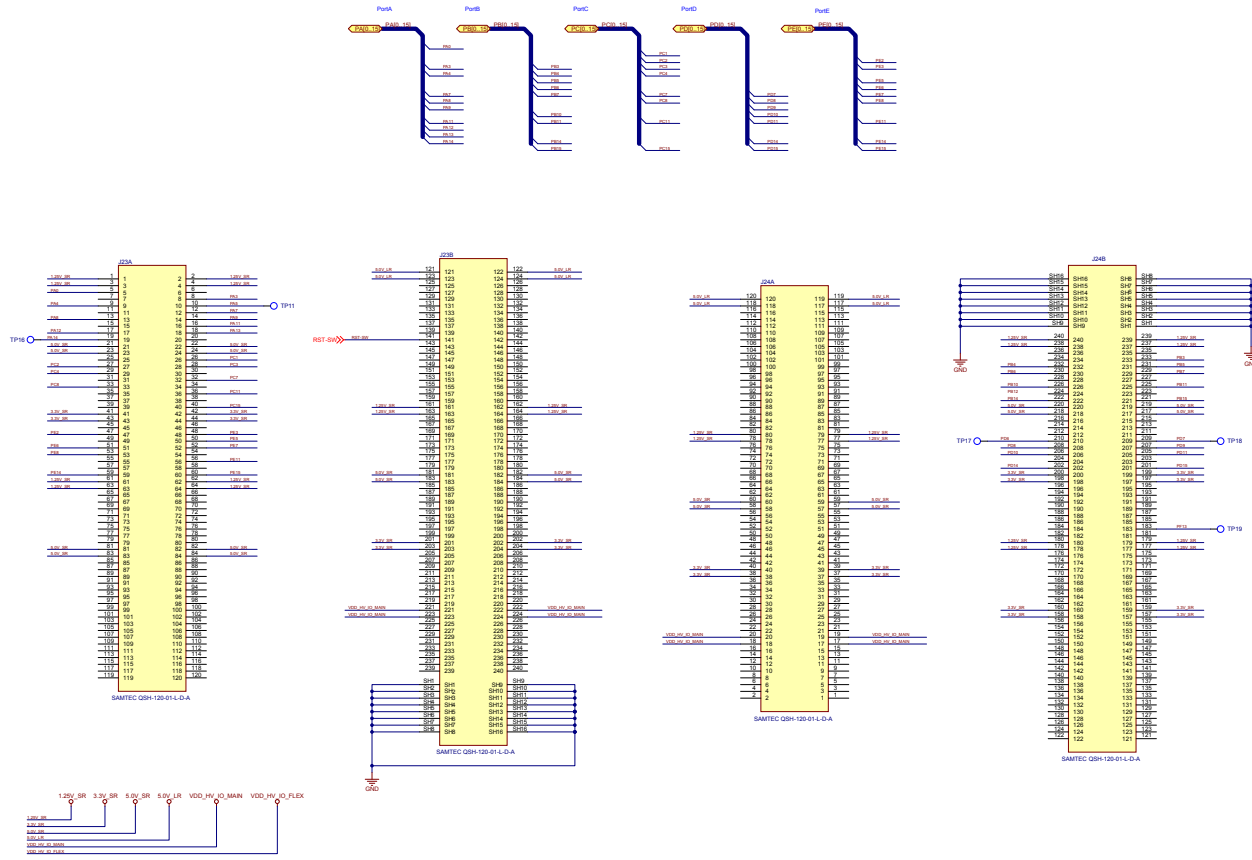


Figure 15. Daughter card to motherboard connectors



Revision history

Table 12. Document revision history

Date	Version	Changes
06-Apr-2021	1	Initial release.

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