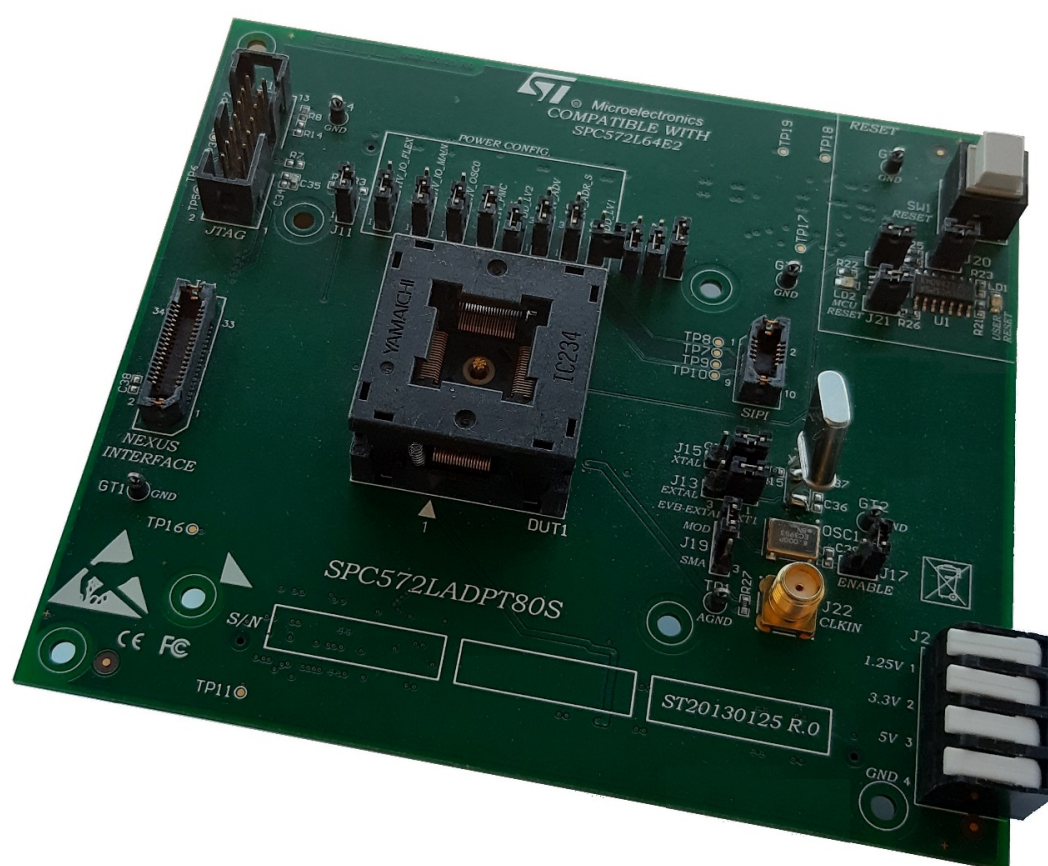


SPC572LADPT80S evaluation board

Introduction

The SPC572LADPT80S evaluation board supports STMicroelectronics SPC572L64E2 microcontroller in TQFP80-EP package.

Figure 1. SPC572LADPT80S



Note: picture not contractual.

1 Overview

The SPC572LADPT80S "mini module" is an evaluation board supporting STMicroelectronics SPC572L64E2 device in TQFP80-EP package.

This "mini module" is designed to be connected onto the SPC58xxMB motherboard, offering a mechanism for easy customer evaluation of the SPC572Lxx family of device 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 how to use the SPC572LADPT80S "mini module" board and its hardware features.

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

Figure 2. Overview of SPC572LADPT80S "mini module" - top

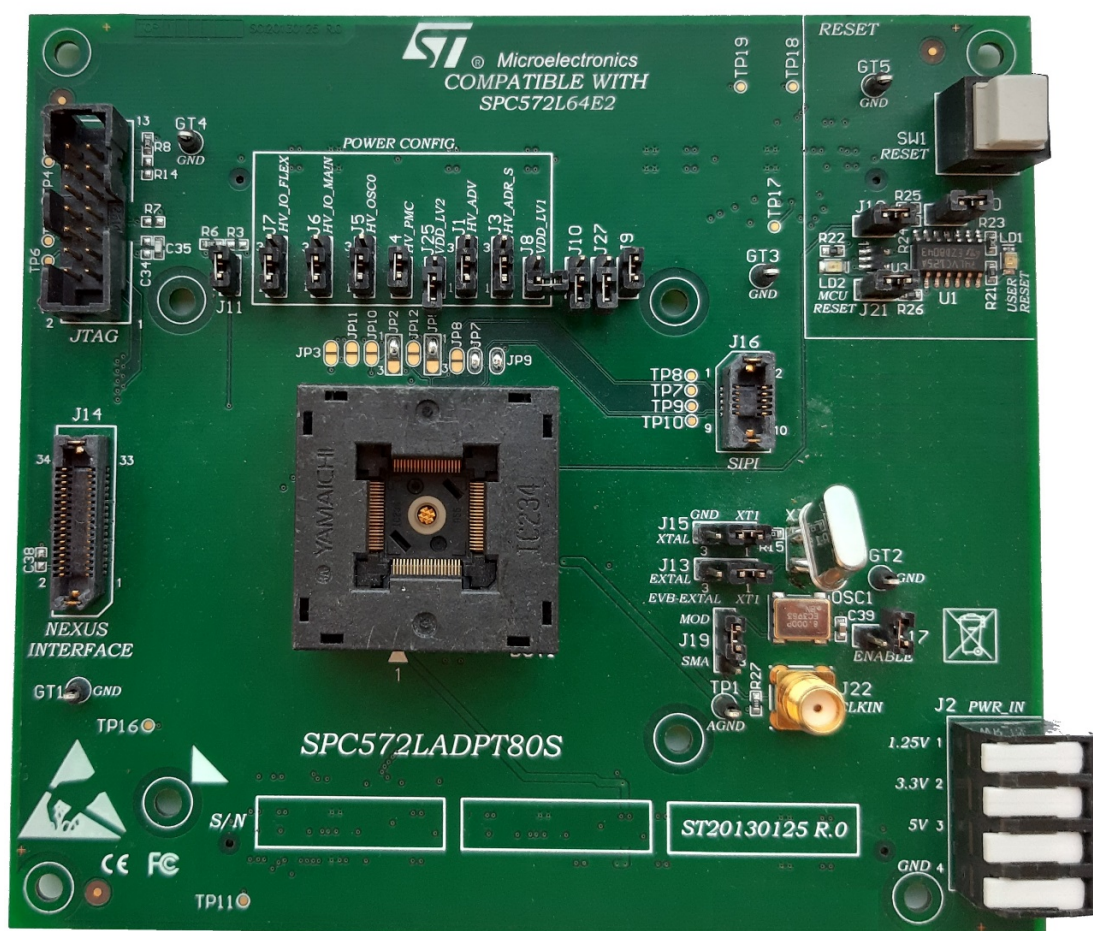
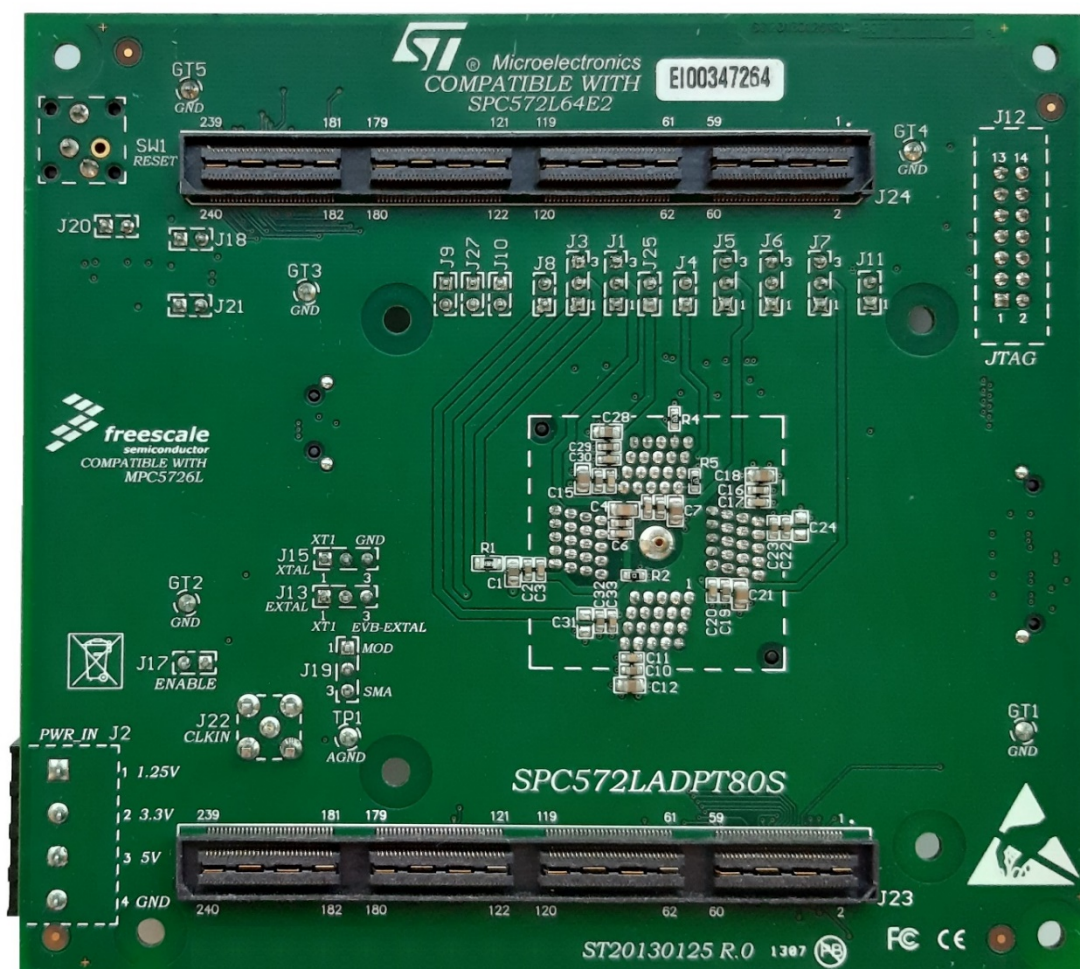


Figure 3. Overview of SPC572LADPT80S "mini module" - bottom



1.1 Supported devices

The SPC572LADPT80S evaluation board supports the following STMicroelectronics family of microcontrollers in TQFP80-EP package:

- SPC572L64E2

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 SPC572LADPT80S "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, 1.25 V)
- Reset button with driver and led indicator
- SPC572LADPT80S has socket for device in TQFP80-EP package
- Debug ports:
 - 34-pin SAMTEC connector for Nexus 2
 - 14-pin header connector for JTAG port
 - 12-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 dimensions

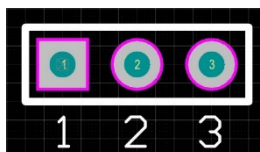
The evaluation board has the following dimensions:

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

4.3 Pin numbering for jumpers

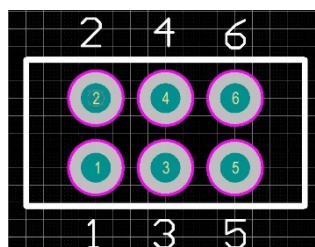
3-pin jumpers for the "mini module" have rectangular pad to indicate the position of pin 1 and there is the PCB silk-screen with the numbers of all the pins. See the example below for the numbering convention used in this manual for jumpers settings:

Figure 4. Overview of 3-pin jumpers numbering convention



6-pin jumpers for the “mini module” have the PCB serigraphy with the numbers of all pins. See the example below for the numbering convention used in this manual for jumpers settings:

Figure 5. Overview of 6-pin jumpers numbering convention



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 SPC572LADPT80S "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 supplies configuration jumpers

Jumper	Description	Default	Position
J1	VDD_HV_ADV voltage configuration: 1-2: 5V_LR (linear) 2-3: 5V_SW (switching)	1-2 (5V_LR)	Figure 10. SPC572LADPT80S "mini module" - top - B2
J3	VDD_HV_ADR_S voltage configuration: 1-2: 5V_LR (linear) 2-3: 5V_SW (switching)	1-2 (5V_LR)	Figure 10. SPC572LADPT80S "mini module" - top - B2
J4	VDD_HV_PMC configuration - Open: VDD_HV_PMC not connected to VDD_HV_IO_MAIN - Closed: VDD_HV_PMC connected to VDD_HV_IO_MAIN	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2
J5	VDD_HV_OSC0 voltage configuration: 1-2: 5V_SR 2-3: 3.3V_SR	1-2 (5V_SR)	Figure 10. SPC572LADPT80S "mini module" - top - B2
J6	VDD_HV_IO_MAIN voltage configuration: 1-2: 5V_SR 2-3: 3.3V_SR	1-2 (5V_SR)	Figure 10. SPC572LADPT80S "mini module" - top -
J7	VDD_HV_IO_FLEX voltage configuration: 1-2: 5V_SR 2-3: 3.3V_SR	1-2 (5V_SR)	Figure 10. SPC572LADPT80S "mini module" - top - B2
J8	VDD_LV1 configuration for external 1.25 V use: - Open: VDD_LV1 not connected to JP1 - Closed: VDD_LV1 connected to JP1	Open	Figure 10. SPC572LADPT80S "mini module" - top - C2
J25	VDD_LV2 configuration for external 1.25 V use: - Open: VDD_LV2 not connected to JP1 - Closed: VDD_LV2 connected to JP1	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2

5.2 Port configuration

The following jumpers need to configure the ports:

Table 2. Ports related jumpers

Jumper	Description	Default	Position
J9	PD[6] connection to QSH connectors configuration: - Open: PD[6] not connected to QSH connectors (motherboard) - Closed: PD[6] connected to QSH connectors (motherboard)	Closed	Figure 10. SPC572LADPT80S "mini module" - top - C2
J10	PD[6] connection to EVTI configuration: - Open: PD[6] not connected to EVTI - Closed: PD[6] connected to EVTI	Open	Figure 10. SPC572LADPT80S "mini module" - top - C2
J11	TESTMODE connection configuration: - Open: TESTMODE not connected - Closed: TESTMODE connected to: - R6 Mounted: pulldown (default) - R3 Mounted: pullup	Closed (default pull-down)	Figure 10. SPC572LADPT80S "mini module" - top - A2
J27	PD[6] connection to EVTO configuration: - Open: PD[6] not connected to EVTO - Closed: PD[6] connected to EVTO	Open	Figure 10. SPC572LADPT80S "mini module" - top - C2
JP2	PA[6] connection configuration: 1-2: PA[6] connected to TCK 2-3: PA[6] connected to DRCLK	1-2 (TCK)	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP3	PA[9] connection to QSH connectors configuration: - Open: PA[9] not connected to QSH connectors (motherboard) - Closed: PA[9] connected to QSH	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP5	PA[8] connection configuration: 1-2: PA[8] connected to TDI 2-3: PA[8] connected to SIPI_TXP	1-2 (TDI)	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP7	PF[13] connection to QSH connectors configuration: - Open: PF[13] not connected to QSH connectors (motherboard) - Closed: PF[13] connected to QSH	Closed	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP8	PD[6] connection to SIPI_TXN configuration: - Open: PD[6] not connected to SIPI_TXN - Closed: PD[6] connected to SIPI_TXN	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP9	PD[7] connection to QSH connectors configuration: - Open: PD[7] not connected to QSH connectors (motherboard) - Closed: PD[7] connected to QSH	Closed	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP10	PA[6] connection to QSH connectors configuration: - Open: PA[6] not connected to QSH connectors (motherboard) - Closed: PA[6] connected to QSH	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2
JP11	PA[7] connection to QSH connectors configuration: - Open: PA[7] not connected to QSH connectors (motherboard) - Closed: PA[7] connected to QSH	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2

Jumper	Description	Default	Position
JP12	PA[8] connection to QSH connectors configuration: - Open: PA[8] not connected to QSH connectors (motherboard) - Closed: PA[8] connected to QSH	Open	Figure 10. SPC572LADPT80S "mini module" - top - B2

5.3 System clock configuration

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

Table 3. System clock related jumpers

Jumper	Description	Default	Position
J13	- EXTAL connection configuration: 1-2: EXTAL connected to 40 MHz crystal clock source 2-3: EXTAL connected to EXTAL EVB clock source	1-2 (XT1 pin2)	Figure 10. SPC572LADPT80S "mini module" - top - C3
J15	- XTAL connection configuration: 1-2: XTAL connected to 40 MHz crystal clock source 2-3: XTAL connected to XTAL EVB clock source	1-2 (XT1 pin1)	Figure 10. SPC572LADPT80S "mini module" - top - C3
J17	8MHz oscillator enable jumper: - Open: 8MHz oscillator not enabled - Closed: 8MHz oscillator enabled	Open	Figure 10. SPC572LADPT80S "mini module" - top - D3
J19	- External clock source jumper selector: 1-2: from 8MHz oscillator 2-3: from SMA connector	1-2	Figure 10. SPC572LADPT80S "mini module" - top - C3

5.4 Reset circuit configuration

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

Table 4. Reset configuration jumpers

Jumper	Description	Default	Position
SW1	Reset push button	Open	Figure 10. SPC572LADPT80S "mini module" - top - D1
J18	External reset connection to ESRO pin configuration: - Open: the external reset is not connected to ESRO pin - Closed: the external reset is connected to ESRO pin	Closed	Figure 10. SPC572LADPT80S "mini module" - top - D1
J20	External reset connection to reset driver configuration: - Open: the external reset is not connected to the reset driver for ESRO and PORST pins - Closed: the external reset is connected to the reset driver for ESRO and PORST pins	Closed	Figure 10. SPC572LADPT80S "mini module" - top - D1
J21	External reset connection to PORST pin configuration: - Open: the external reset is not connected to PORST pin - Closed: the external reset is connected to PORST pin	Closed	Figure 10. SPC572LADPT80S "mini module" - top - D2

5.5 Connectors

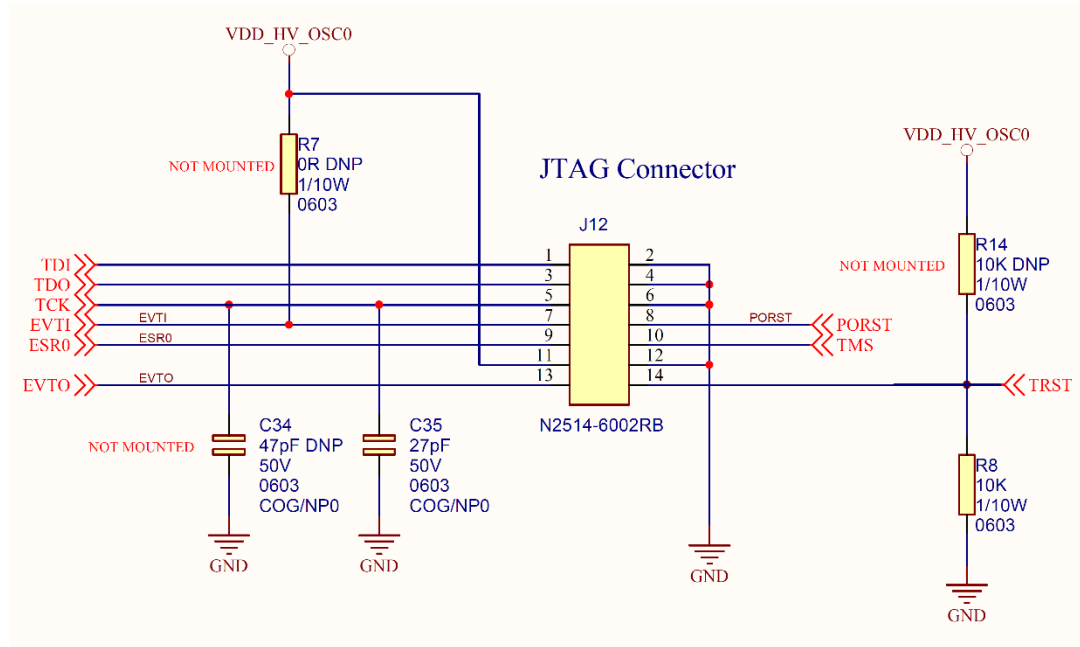
The "mini module" has other connectors described in the table below:

Table 5. Connectors

Connectors	Description	Position
J12	14-pin header connector for JTAG port	Figure 10. SPC572LADPT80S "mini module" - top - A1
J14	34-pin SAMTEC connector for Nexus 2	Figure 10. SPC572LADPT80S "mini module" - top - A2
J16	10-pin SIPI interface connector	Figure 10. SPC572LADPT80S "mini module" - top - C2
J2	External power supplies input	Figure 10. SPC572LADPT80S "mini module" - top - D4
J23, J24	2 X SAMTEC QSH series, 240 way connector to connect "mini module" to motherboard	Figure 11. SPC572LADPT80S "mini module" - bottom

The following figure shows the JTAG connector scheme:

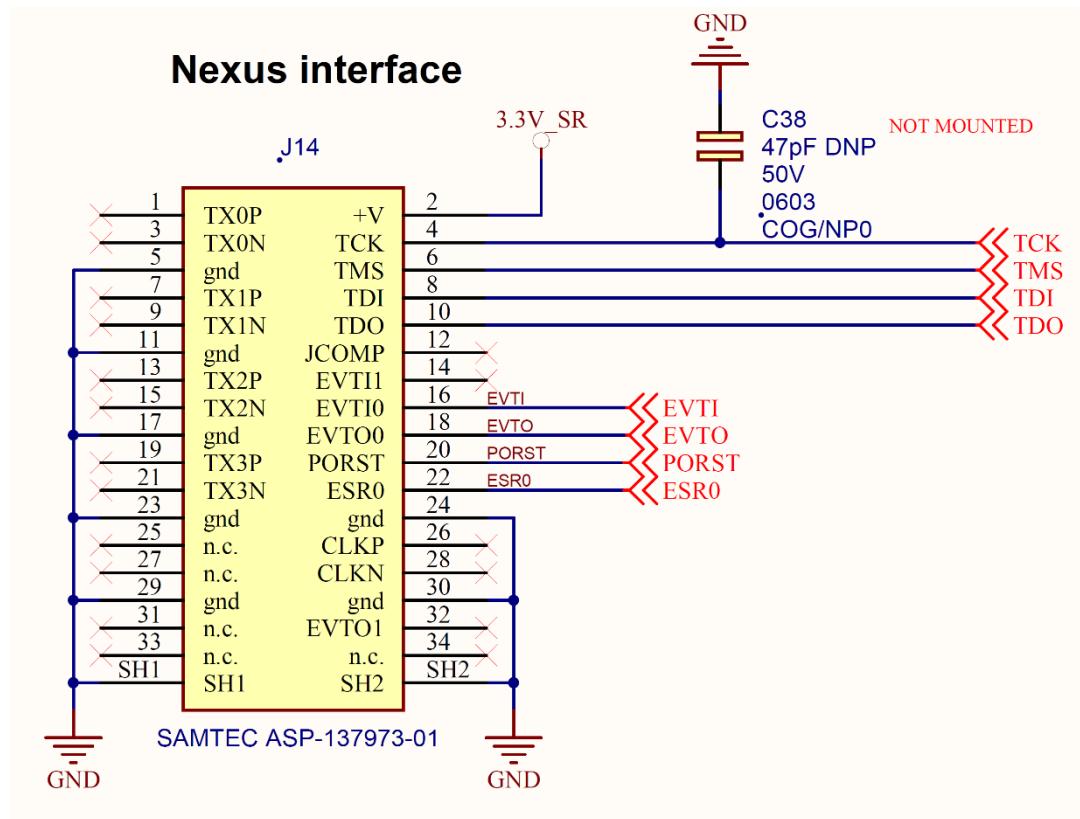
Figure 6. JTAG connector scheme



The following table shows the JTAG connector pinout:

Table 6. JTAG Header 2x7 pins connector pinout

Pin number	Signal
1	TDI
2	GND
3	TDO
4	GND
5	TCK
6	GND
7	EVTI
8	PORST
9	ESR0
10	TMS
11	VDD_HV_IO_MAIN
12	GND
13	EVTO
14	N.C.

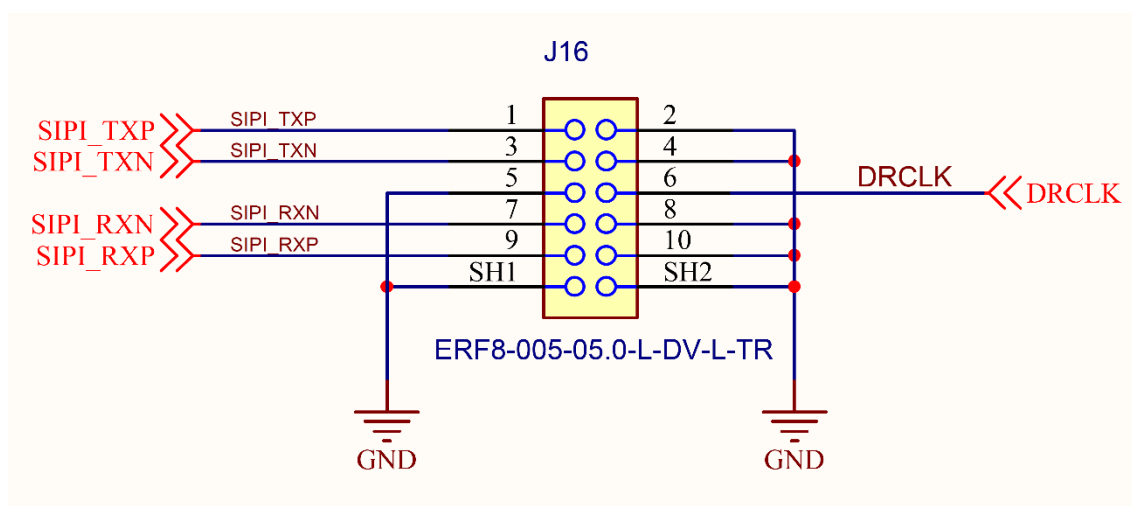
Figure 7. NEXUS SAMTEC ASP-137973-01

Table 7. 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	ESR0
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 shows the SIPI interface scheme:

Figure 8. SIPI interface scheme



The following picture shows the SIPI interface connector pinout:

Table 8. SIPI interface connector pinout

Pin number	Signal
1	SIPI_TXP
2	GND
3	SIPI_TXN
4	GND
5	GND
6	DRCLK
7	SIPI_RXN
8	GND
9	SIPI_RXP
10	GND

The following figure shows the external power supply connector scheme:

Figure 9. External power supply connector scheme

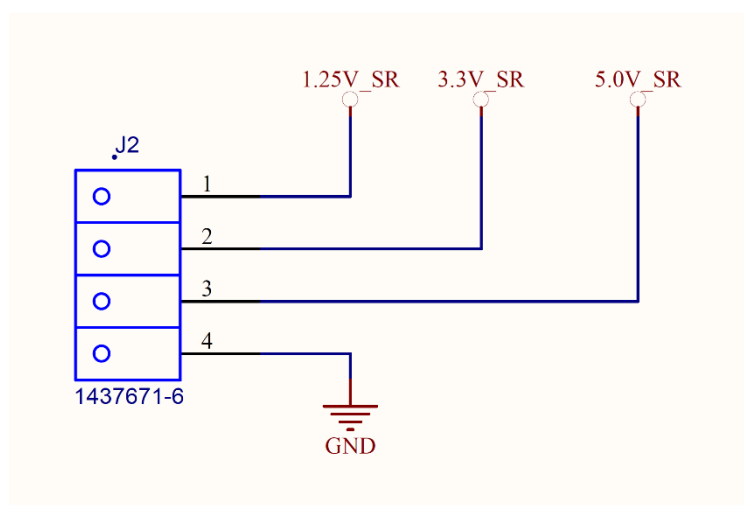


Table 9. External power supply connector pinout

Pin number	Signal
1	1.25 V
2	3.3 V
3	5 V
4	GND

5.6 Test points

Several test points of different shape and functionality are scattered around the SPC572LADPT80S 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.

Table 10. Test points

Test point	Description	Position
GT1	GND test point	Figure 10. SPC572LADPT80S "mini module" - top - A3
GT2	GND test point	Figure 10. SPC572LADPT80S "mini module" - top - D3
GT3	GND test point	Figure 10. SPC572LADPT80S "mini module" - top - C2
GT4	GND test point	Figure 10. SPC572LADPT80S "mini module" - top - A1
GT5	GND test point	Figure 10. SPC572LADPT80S "mini module" - top - D1
TP1	AGND test point	Figure 10. SPC572LADPT80S "mini module" - top - C3
TP2	TRST test point (JTAG)	Figure 10. SPC572LADPT80S "mini module" - top - A1
TP3	TCK test point (JTAG)	Figure 10. SPC572LADPT80S "mini module" - top - A2
TP4	TMS test point (JTAG)	Figure 10. SPC572LADPT80S "mini module" - top - A1
TP5	TDI test point (JTAG)	Figure 10. SPC572LADPT80S "mini module" - top - A2
TP6	TDO test point (JTAG)	Figure 10. SPC572LADPT80S "mini module" - top - A2
TP7	SIPI_TXN test point	Figure 10. SPC572LADPT80S "mini module" - top - C2
TP8	SIPI_TXP test point	Figure 10. SPC572LADPT80S "mini module" - top - C2
TP9	SIPI_RXN test point	Figure 10. SPC572LADPT80S "mini module" - top - C2
TP10	SIPI_RXP test point	Figure 10. SPC572LADPT80S "mini module" - top - C2
TP11	J23A, QSH connector, pin10 (PA[5]) test point	Figure 10. SPC572LADPT80S "mini module" - top - A4
TP16	J23A, QSH connector, pin19 (PA[14]) test point	Figure 10. SPC572LADPT80S "mini module" - top - A4
TP17	J24B, QSH connector, pin210 (PD[6]) test point	Figure 10. SPC572LADPT80S "mini module" - top - C1
TP18	J24B, QSH connector, pin209 (PD[7]) test point	Figure 10. SPC572LADPT80S "mini module" - top - D1
TP19	J24B, QSH connector, pin183 (PF[13]) test point	Figure 10. SPC572LADPT80S "mini module" - top - C1

6 Layout overview

Figure 10. SPC572LADPT80S "mini module" - top

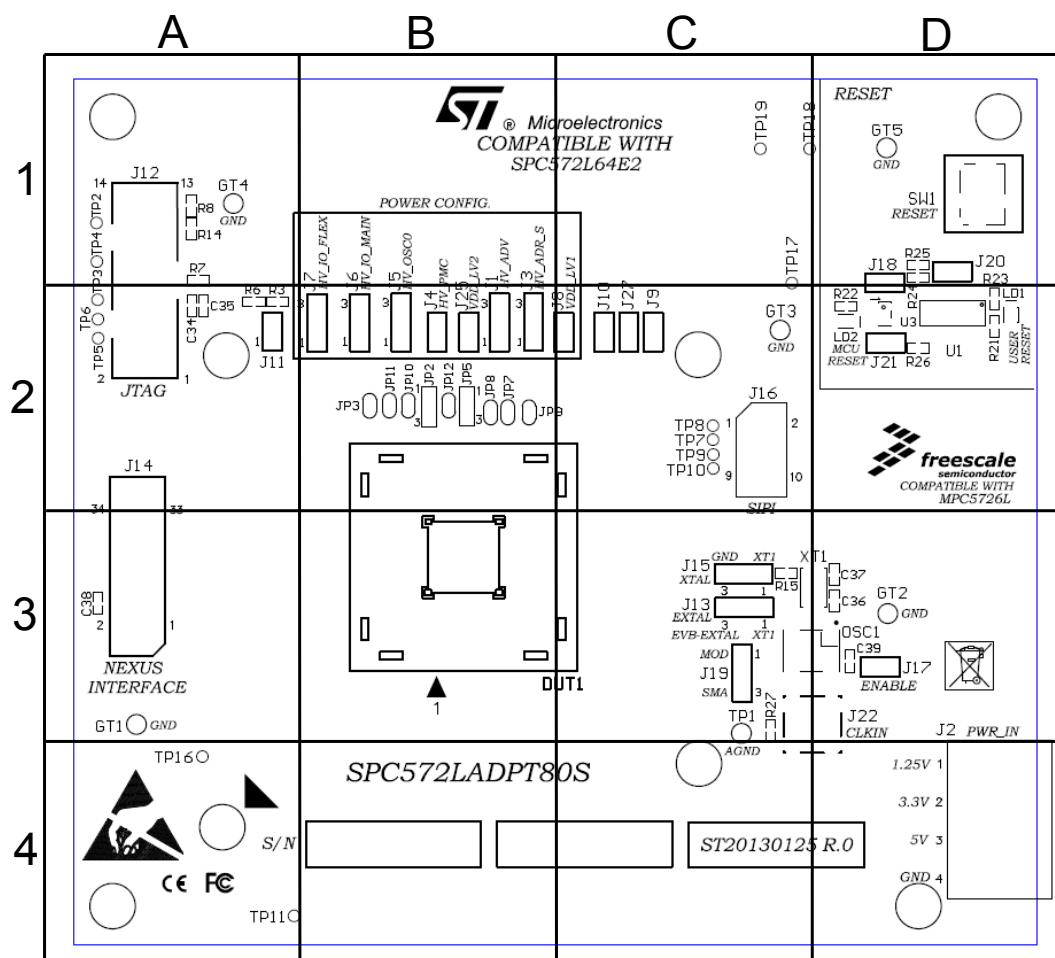
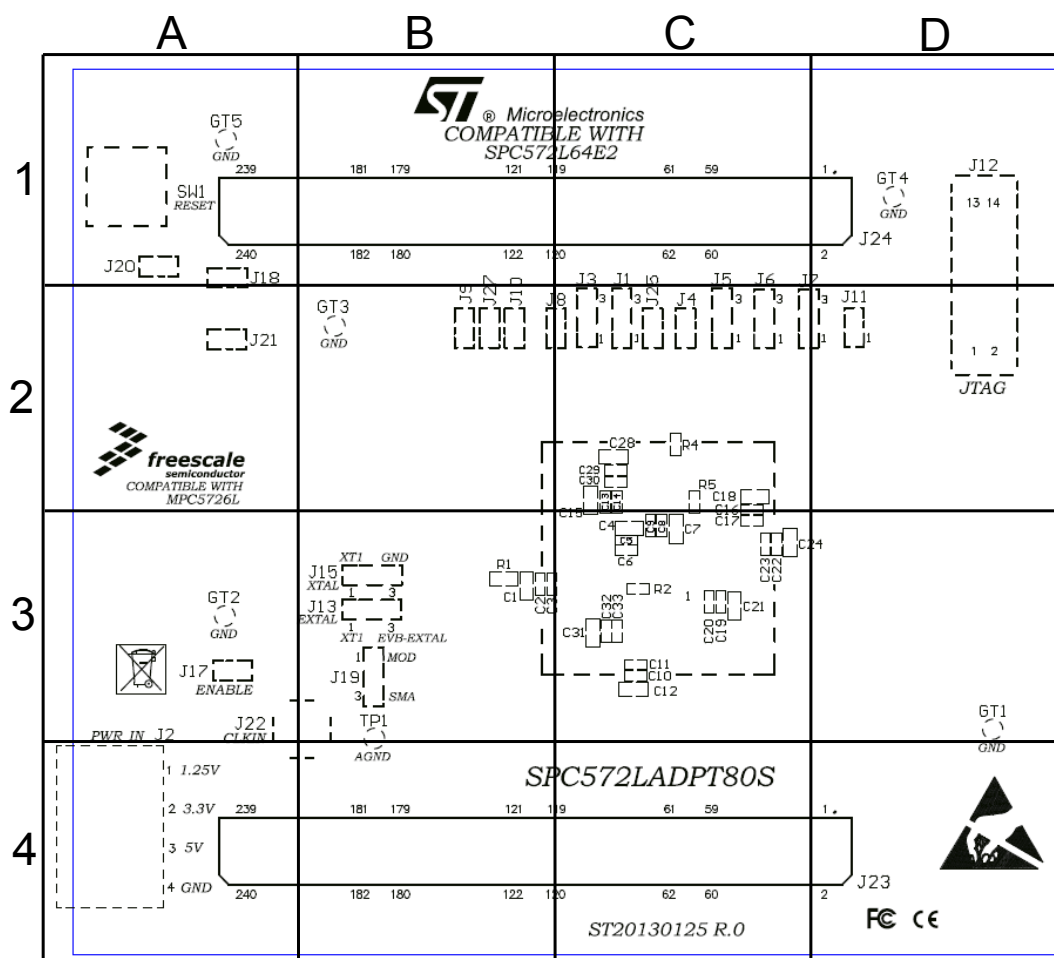


Figure 11. SPC572LADPT80S "mini module" - bottom



7 BOM

Table 11. BOM

#	Item	Qty	Reference	Value	Option	Description
1	C1	1	CCERSMD225-0805M	2.2 uF		Mult. cer. cap. 16V SMD 0805 - automotive series
2	C2, C5, C8, C10, C13, C16, C19, C22, C29, C32, C39	11	CCERSMD104-0603M	100 nF		Mult. cer. cap. 50V SMD 0603
3	C3, C6, C9, C11, C14, C17, C20, C30, C33	9	CCERSMD102-0603V	1 nF		Mult. cer. cap. 100V SMD 0603
4	C4, C7, C12, C15, C18, C21	6	CCERSMD475-0805M	4.7 uF		Mult. cer. cap. 16V SMD 0805
5	C23	1	CCERSMD473-0603M	47 nF		Mult. cer. cap. 50V SMD 0603
6	C24, C28, C31	3		2.2 uF DNP	DNP	Mult. Cer. cap. 16V SMD 0805 - Automotive Series
7	C34, C38	2		47 pF DNP	DNP	Mult. cer. cap. 50V SMD 0603
8	C35	1	CCERSMD270-0603	27 pF		Mult. cer. cap. 50V SMD 0603
9	C36, C37	2		10 pF DNP	DNP	Mult. cer. cap. 50V SMD 0603
10	DUT1	1	ZOCC80ETQFP	LAVAREDO - TQFP80-EP		LAVAREDO - device under test - TQFP80- EP - YAMAICHI - IC234-0804-055P-2
11	GT1, GT2, GT3, GT4, GT5, TP1	6	TEST2	TESTPOINT		PCB test point - raised loops
12	J1, J3, J5, J6, J7, J13, J15, J19	8	STRIP3PM	STRIP3PM		Male strip 3 poles
13	J2	1	TYCO-1437671-6	1437671-6		TYCO board Mount screwless connector - pitch 5.08 mm 90°
14	J4, J9, J11, J18, J20, J21	6	STRIP2PM	STRIP2PM	Closed	Male strip 2 poles
15	J8, J10, J17, J25, J27	5	STRIP2PM	STRIP2PM	Open	Male strip 2 poles
16	J12	1	M.14.180 LP-3M	N2514-6002RB		3M conn flat male 14 pins, straight - pitch 2.54 mm
17	J14	1	SAM-ASP13797301	SAMTEC ASP-137973-01		SAMTEC 0.8 mm pitch - connector SMD 17x2 - NEXUS connector
18	J16	1	CONNERF805X2-SMD	ERF8-005-05.0-L-DV-L- TR		SAMTEC 0.8 mm pitch rugged high speed SMD connector
19	J22	1	BNC-SMA-FEM-180	BNC-SMA-FEM-180		Conn. RF SMA 180°

#	Item	Qty	Reference	Value	Option	Description
20	J23, J24	2	SAM-QSH12001LDA	SAMTEC QSH-120-01-L-D-A		SAMTEC 0.5 mm pitch high speed SMD socket
21	JP2, JP5	2			Close 1-2	Jumper SMD
22	JP3, JP8, JP10, JP11, JP12	5				Jumper SMD
23	JP7, JP9	2			Closed	Jumper SMD
24	LD1	1	LEDSMDGIAL-0805	Yellow		Led diode yellow SMD 0805
25	LD2	1	LEDSMDRED-0805	Red		Led diode red SMD 0805
26	OSC1	1	Q8MHZ-SMD-3953M	8 MHz		Hybrid quartz osc SMD ECS 3953M
27	R1	1	RESMD49R9-805	49R9		Resistor 1/10W 1% SMD 0805
28	R2, R15	2	RESMD000-0603	0R		Resistor 1/10W 1% SMD 0603
29	R3, R14	2		10K DNP	DNP	Resistor 1/10W 1% SMD 0603
30	R4, R5, R25	3	RESMD472-0603	4K7		Resistor 1/10W 1% SMD 0603
31	R6, R8, R23	3	RESMD103-0603	10K		Resistor 1/10W 1% SMD 0603
32	R7	1		0R DNP	DNP	Resistor 1/10W 1% SMD 0603
33	R21, R22	2	RESMD561-0603	560R		Resistor 1/10W 1% SMD 0603
34	R24, R26	2	RESMD221-0603	220R		Resistor 1/10W 1% SMD 0603
35	R27	1	RESMD101-0603	100R		Resistor 1/10W 1% SMD 0603
36	SW1	1	PULSANTEG	Pushbutton		Pushbutton for pcb 4 pins
37	TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP16, TP17, TP18, TP19	14			DNP	Testpoint SMD
38	U1	1	74LVC125AMTR-SMD	74LVC125AMTR		I.C. quad bus buffers SO14
39	U3	1	74V1G08-SMD	74V1G08STR		I.C. single 2-input and gate - SMD SOT23-5L
40	XT1	1	Q40MHZ-SMD-5032	40 MHz		Quartz 40 MHz SMD NX5032GA XTAL NDK
41	C1	1	CCERSMD225-0805M	2.2 uF		Mult. cer. cap. 16V SMD 0805 - automotive series

8 Schematics



Figure 12. Power and decoupling

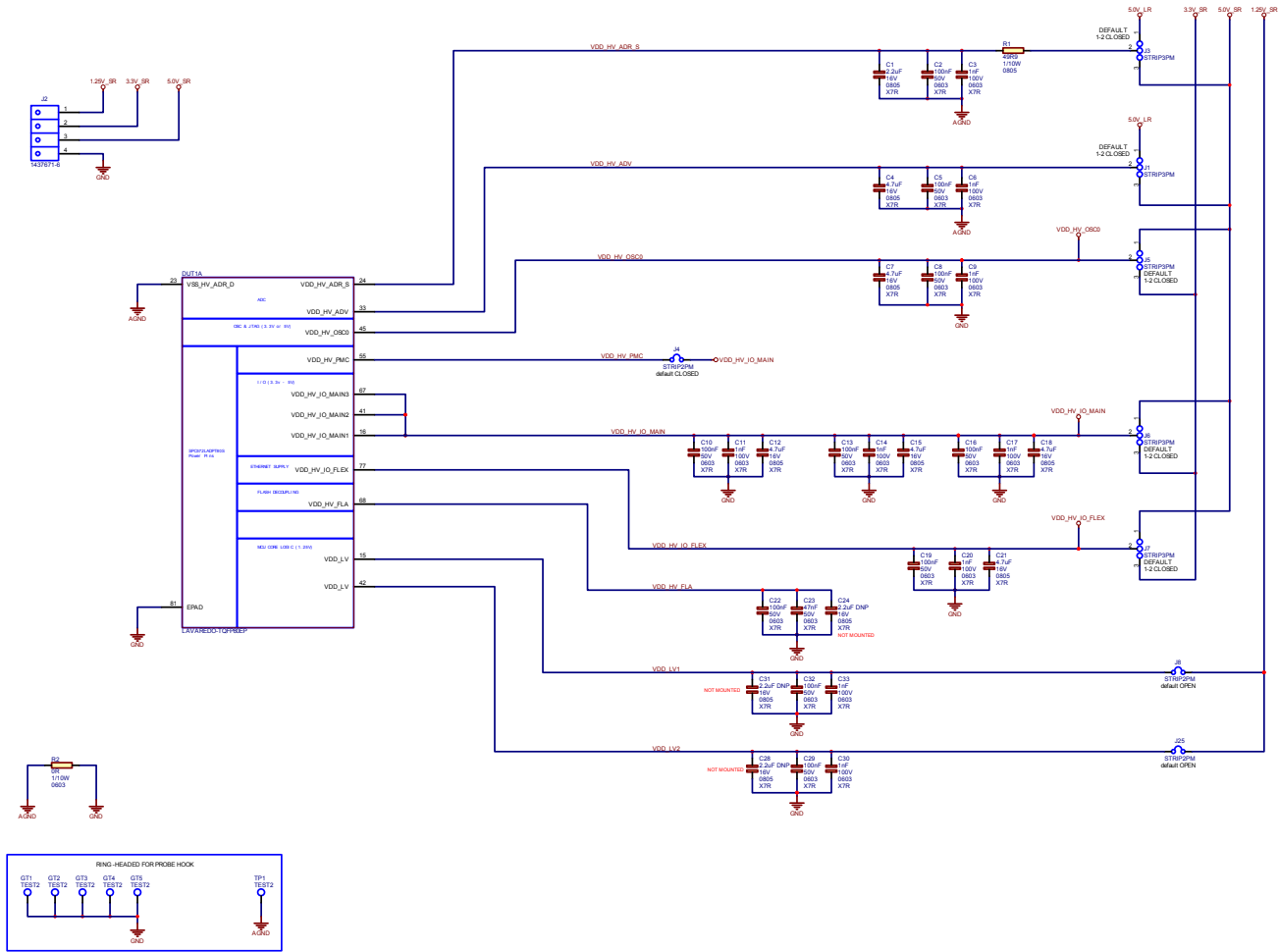


Figure 13. Signals

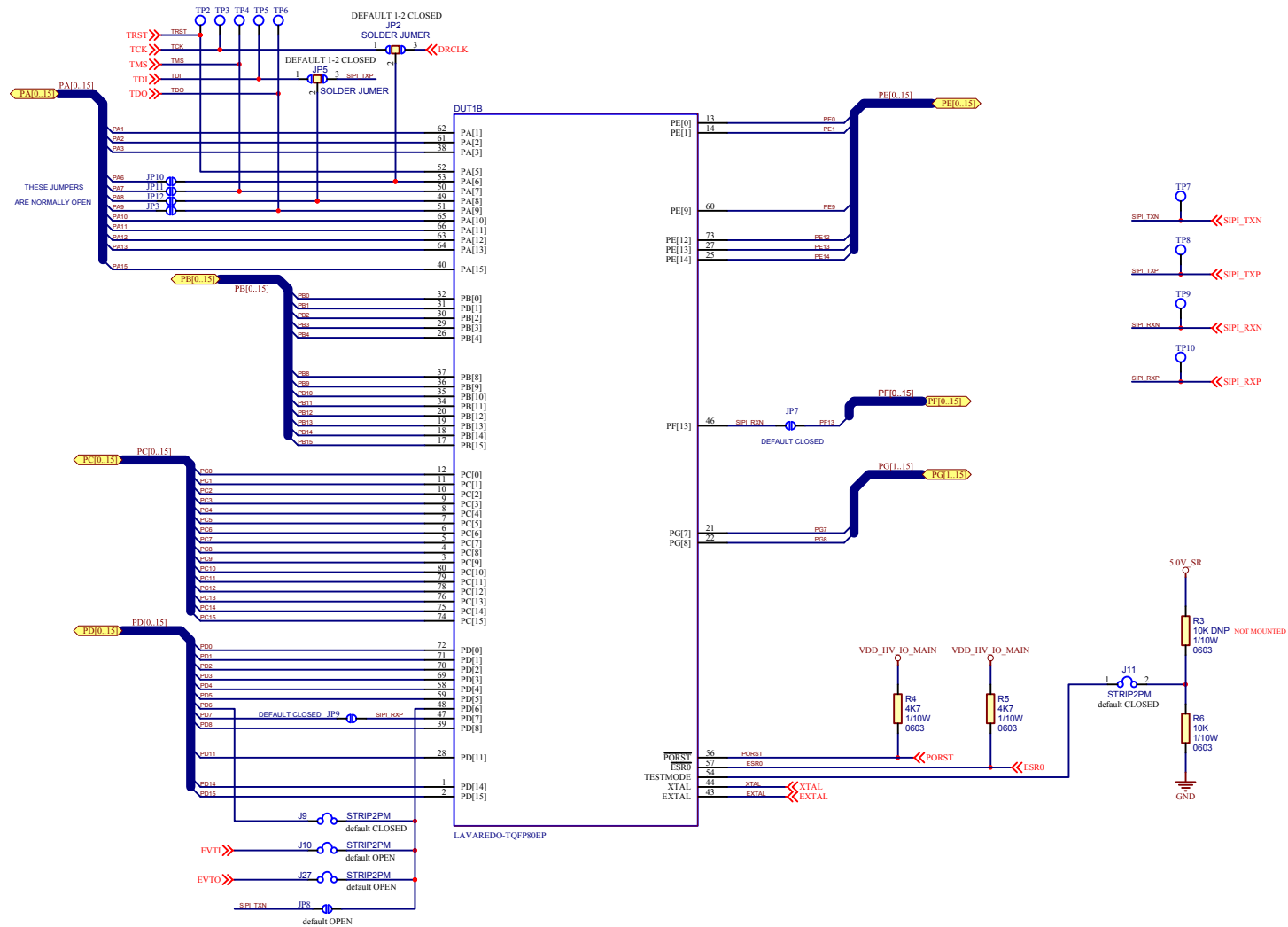


Figure 14. Reset JTAG, SIPI, Nexus interface and crystal oscillator

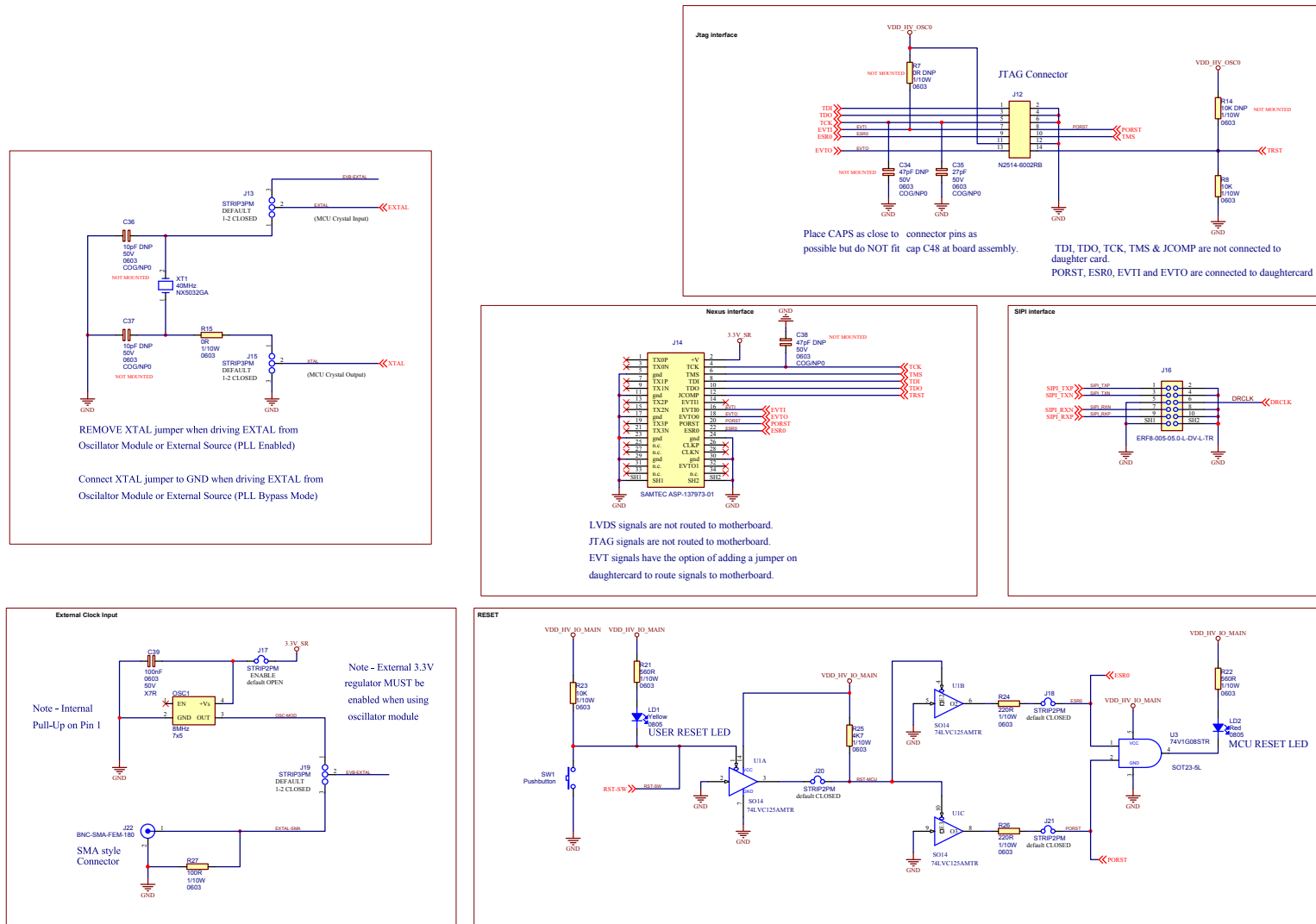
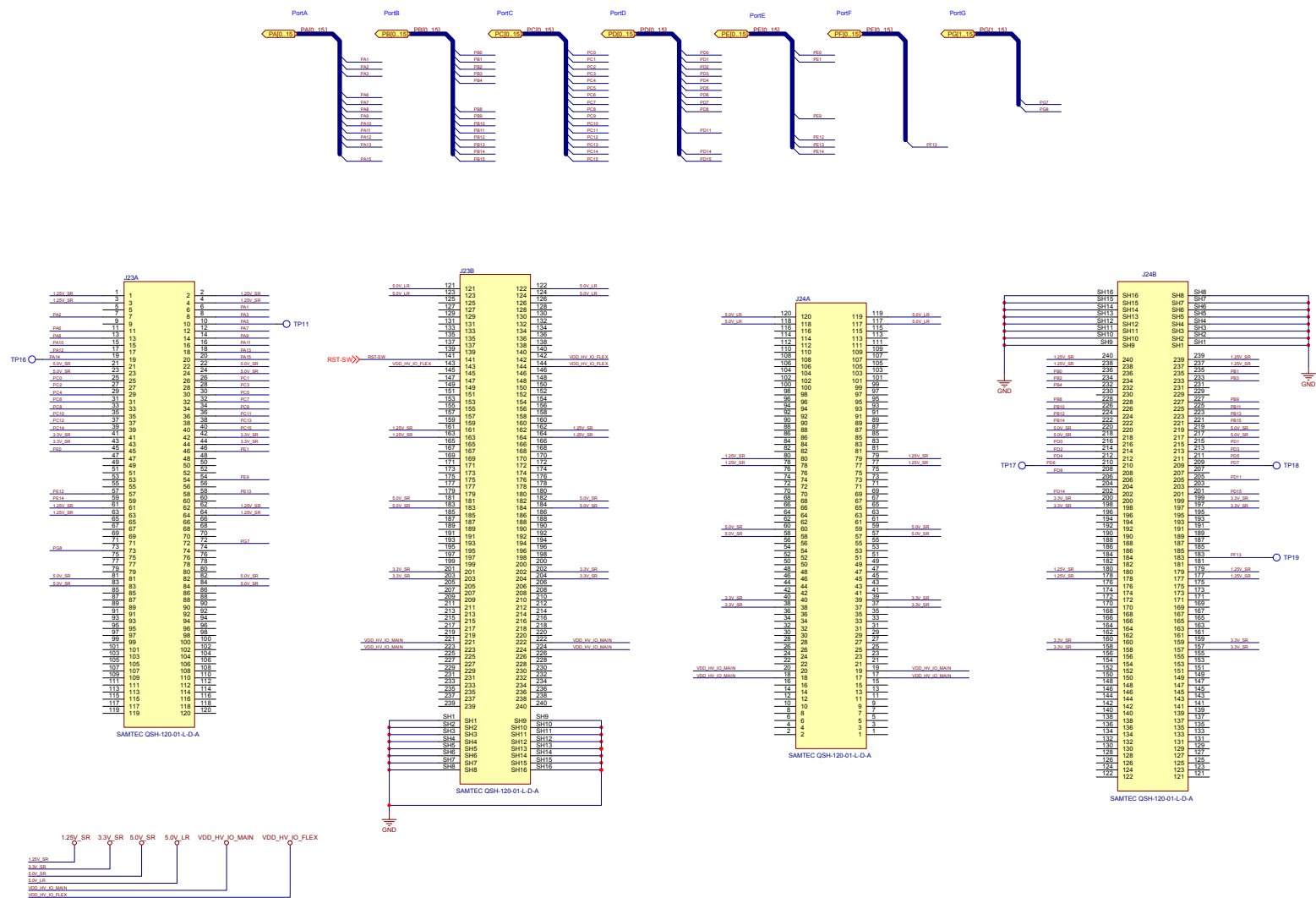


Figure 15. Daughter card and motherboard connectors



Revision history

Table 12. Document revision history

Date	Version	Changes
03-Jun-2021	1	Initial release.

Contents

1	Overview	2
1.1	Supported Devices	3
2	License agreement	4
3	Handling precautions	5
4	Features	6
4.1	Hardware features	6
4.2	Hardware dimension	6
4.3	Pin numbering for jumpers	6
5	Power and system configuration	8
5.1	Power supplies	8
5.2	Port configuration	9
5.3	System clock configuration	10
5.4	Reset circuit	11
5.5	Connectors	11
5.6	Configuration for Pin Shared	16
6	Layout overview	17
7	BOM	19
8	Schematics	21
	Revision history	25

List of tables

Table 1.	Power supplies configuration jumpers	8
Table 2.	Ports related jumpers	9
Table 3.	System clock related jumpers	10
Table 4.	Reset configuration jumpers	11
Table 5.	Connectors	11
Table 6.	JTAG Header 2x7 pins connector pinout	12
Table 7.	NEXUS SAMTEC ASP-137973-01 connector pinout.	13
Table 8.	SIPI interface connector pinout	15
Table 9.	External power supply connector pinout	15
Table 10.	Test points	16
Table 11.	BOM	19
Table 12.	Document revision history	25

List of figures

Figure 1.	SPC572LADPT80S	1
Figure 2.	Overview of SPC572LADPT80S "mini module" - top	2
Figure 3.	Overview of SPC572LADPT80S "mini module" - bottom	3
Figure 4.	Overview of 3-pin jumpers numbering convention	6
Figure 5.	Overview of 6-pin jumpers numbering convention	7
Figure 6.	JTAG connector scheme	12
Figure 7.	NEXUS SAMTEC ASP-137973-01	13
Figure 8.	SIPI interface scheme	14
Figure 9.	External power supply connector scheme	15
Figure 10.	SPC572LADPT80S "mini module" - top	17
Figure 11.	SPC572LADPT80S "mini module" - bottom	18
Figure 12.	Power and decoupling	21
Figure 13.	Signals	22
Figure 14.	Reset JTAG, SIPI, Nexus interface and crystal oscillator	23
Figure 15.	Daughter card and motherboard connectors	24

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