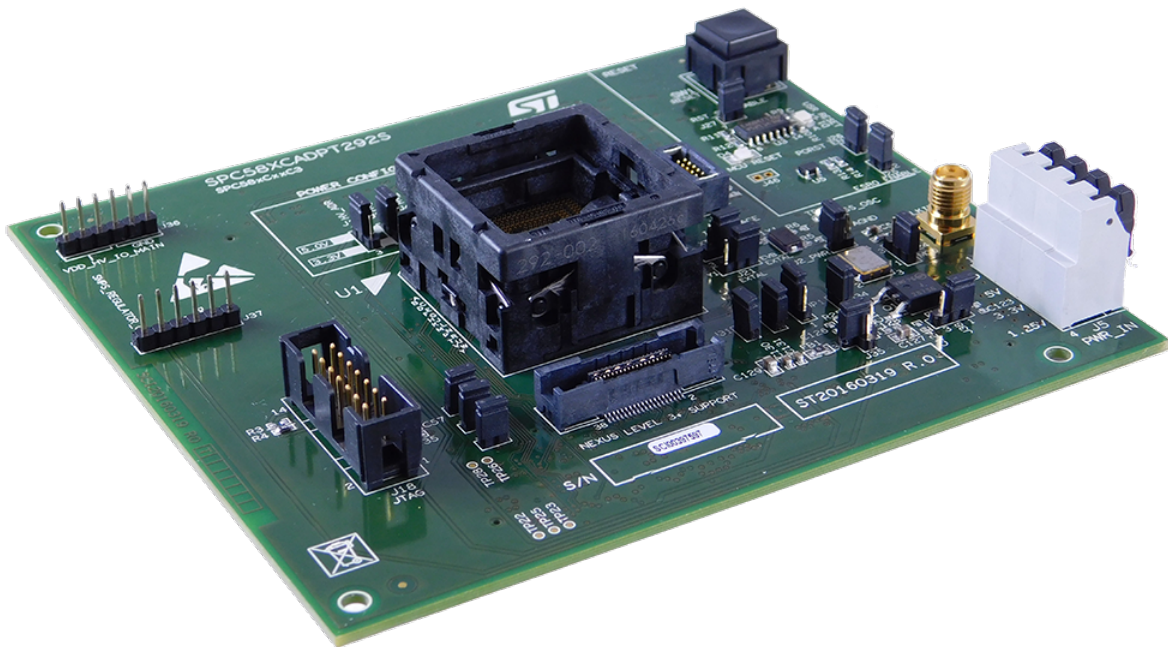


SPC58XCADPT292S Rev. A evaluation board

Introduction

The SPC58XCADPT292S Rev.A evaluation board supports STMicroelectronics SPC58xCxxC3, microcontrollers in LFBGA292 package.

Figure 1. SPC58XCADPT292S Rev.A



Note: picture not contractual

1 Overview

The SPC58XCADPT292S mini module is an evaluation board supporting STMicroelectronics SPC58xCxxC3, microcontrollers in LFBGA292 package.

The mini module is designed to be connected onto the SPC58XXMB motherboard, offering a mechanism for easy customer evaluation of the supported microcontrollers, and to facilitate hardware and software development.

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

Figure 2. Overview of SPC58XCADPT292S Rev. A mini module - top

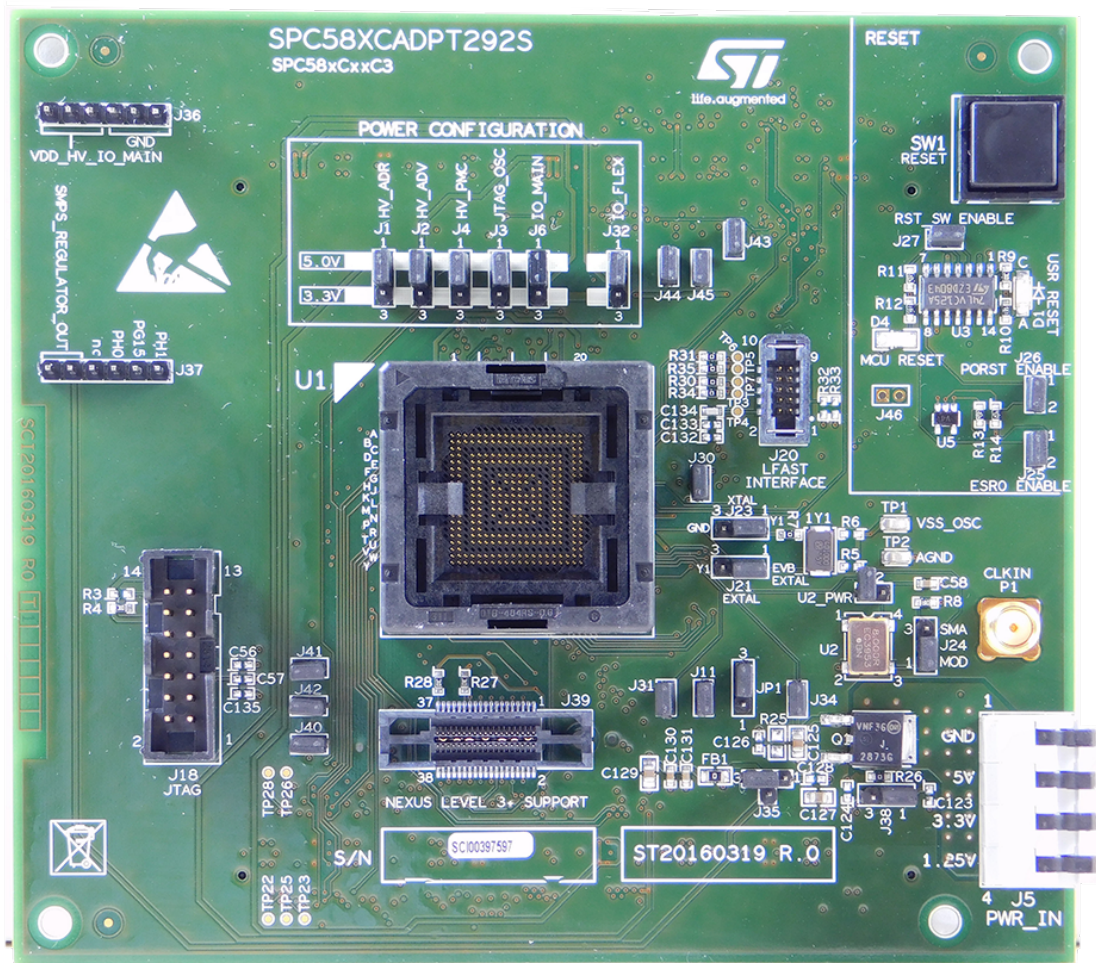
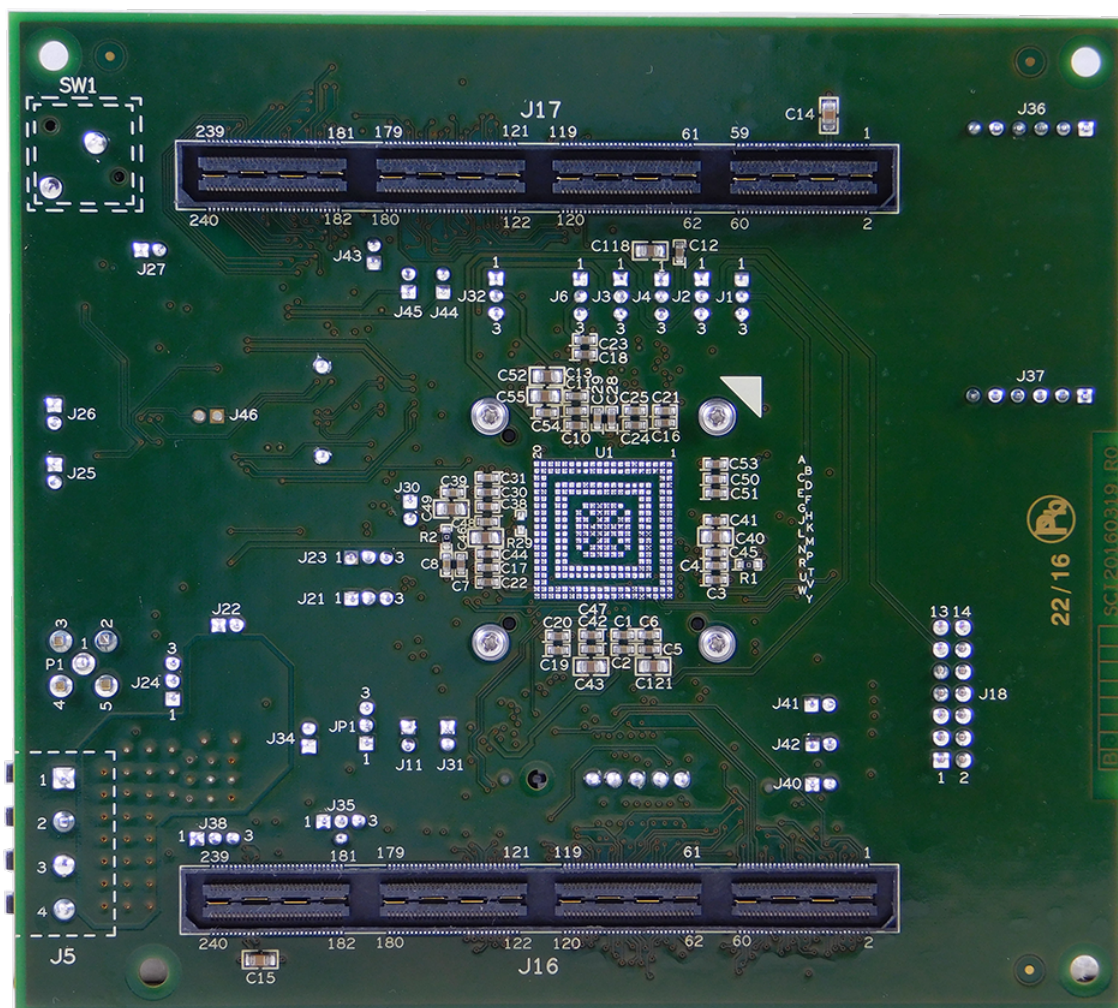


Figure 3. Overview of SPC58XCADPT292S Rev. A mini module - bottom



1.1 Package contents

An SPC58XCADPT292S adapter package includes the following item:

- SPC58XCADPT292S mini module

1.2 Supported devices

The SPC58XCADPT292S mini module supports the following STMicroelectronics family of microcontrollers in LFBGA292 package:

- SPC58xCxxC3

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 www.st.com/ebla ". 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 SPC58XCADPT292S mini module board has the following features:

- Connector for external power supplies input (5.0V, 3.3V, 1.25V) used in stand-alone mode
- Reset button with driver and led indicator
- Socket for device in LFBGA292 package
- Debug ports: 38-pin TYCO connector for Nexus 2, 14-pin header connector for JTAG port and 12-pin header connector for LFAST 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
- Jumper for boot configuration
- 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: 19.4 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 SPC58XCADPT292S mini module is used as a stand-alone board, external power supplies must be used (5.0V, 3.3V, 1.25V).

The following jumpers are used to configure the power supply:

Table 1. Power configuration jumpers

Jumper	Description	Default	Position
J1	VDD_HV_ADR voltage configuration from 5.0V_LR or 3.3V_SR	1-2 (5.0V_LR)	Figure 4. SPC58XCADPT292S Rev A top component view - B2
J2	VDD_HV_ADV voltage configuration from 5.0V_LR or 3.3V_SR	1-2 (5.0V_LR)	Figure 4. SPC58XCADPT292S Rev A top component view - B2
J3	VDD_HV_JTAG_OSC voltage configuration from 5.0V_SR or 3.3V_SR	1-2 (5.0V_SR)	Figure 4. SPC58XCADPT292S Rev A top component view - B2
J4	VDD_HV_PMC voltage configuration from 5.0V_SR or 3.3V_SR	1-2 (5.0V_SR)	Figure 4. SPC58XCADPT292S Rev A top component view - B2
J6	VDD_HV_IO_MAIN voltage configuration from 5.0V_SR or 3.3V_SR	1-2 (5.0V_SR)	Figure 4. SPC58XCADPT292S Rev A top component view - B2
J32	VDD_HV_IO_FLEX voltage configuration from 5.0V_SR or 3.3V_SR	1-2 (5.0V_SR)	Figure 4. SPC58XCADPT292S Rev A top component view - C2
J35	VDD_LV voltage configuration from BALLAST circuit, 1.25V_SR or SMPS_REGULATOR_OUT	2-3 (1.25V_SR)	Figure 4. SPC58XCADPT292S Rev A top component view - C4
J38	Supply for BALLAST circuit configuration from VDD_HV_IO_MAIN or 5.0V_SR	1-2 (VDD_HV_IO_MAIN)	Figure 4. SPC58XCADPT292S Rev A top component view - D4

5.2 Microcontrollers configuration

Table 2. Microcontroller SPC58xCxxC3 configuration related jumpers

Jumper	Description	Default	Position
J34	Device ball N19 BCTRL function configuration	Close (connect BCTRL with BALLAST circuit) NOTE: the other configuration is reserved	Figure 4. SPC58XCADPT292S Rev A top component view - C3
JP1	Source reset configuration	1-2: ESRO 2-3: PORST(Default)	Figure 4. SPC58XCADPT292S Rev A top component view - C3

The jumpers are default closed for STMicroelectronics microcontroller SPC58xCxxC3:

- J34: default close
- JP1: default close 2-3

5.3 Port configuration

The following jumpers need to configure the ports:

Table 3. Ports related jumpers

Jumper	Description	Default	Position
J30	TESTMODE settings	Close	Figure 4. SPC58XCADPT292S Rev A top component view - C2
J11	PK[10]/EVTI connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - C3
J31	PJ[3]/EVTO connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - C3
J40	PE[3]/CLKOUT connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - B4
J41	PC[1]/ESR0 connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - B3
J42	PA[14]/RDY connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - B3
J43	PJ[8]/MCKO connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - C1
J44	PL[9]/MSEO0 connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - C2
J45	PL[11]/MSEO1 connection to QSH motherboard connectors	Close	Figure 4. SPC58XCADPT292S Rev A top component view - C2

5.4 System clock configuration

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

Table 4. Clock configuration jumpers

Jumper	Description	Default	Position
J21	40 MHz crystal clock source Enable for pin XTAL	1-2 (XT1 pin)	Figure 4. SPC58XCADPT292S Rev A top component view - C3
J22	Enable 8 MHz oscillator power supply	Open	Figure 4. SPC58XCADPT292S Rev A top component view - D3
J23	40 MHz crystal clock source Enable for pin XTAL	1-2 (XT1 pin1)	Figure 4. SPC58XCADPT292S Rev A top component view - C3
J24	External clock source from 8 MHz oscillator or SMA connector	1-2 (8 MHz oscillator)	Figure 4. SPC58XCADPT292S Rev A top component view - D3

5.5 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 5. Reset configuration jumpers

Jumper	Description	Default	Position
SW1	Reset push button	Open	Figure 4. SPC58XCADPT292S Rev A top component view - D1
J27	Connect the external reset to the reset driver for ESR0 and PORST pins	Close	Figure 4. SPC58XCADPT292S Rev A top component view - D1
J25	Connect the external reset to ESR0 pin	Close	Figure 4. SPC58XCADPT292S Rev A top component view - D2
J26	Connect the external reset to PORST pin	Close	Figure 4. SPC58XCADPT292S Rev A top component view - D2

5.6 Test points

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

Table 6. Test points

Test point	Description	Position
TP3	JCOMP/RXN test point	Figure 4. SPC58XCADPT292S Rev A top component view - C2
TP4	TCK test point	Figure 4. SPC58XCADPT292S Rev A top component view - C2
TP5	TMS/TXP test point	Figure 4. SPC58XCADPT292S Rev A top component view - C2
TP6	TDI/TXN test point	Figure 4. SPC58XCADPT292S Rev A top component view - C2
TP7	TDO/RXP test point	Figure 4. SPC58XCADPT292S Rev A top component view - C2
TP22	J16A, QSH connector, pin10 (PA5) test point	Figure 4. SPC58XCADPT292S Rev A top component view - A4
TP28	J16A, QSH connector, pin11 (PA6) test point	Figure 4. SPC58XCADPT292S Rev A top component view - A4
TP25	J16A, QSH connector, pin12 (PA7) test point	Figure 4. SPC58XCADPT292S Rev A top component view - B4
TP26	J16A, QSH connector, pin13 (PA8) test point	Figure 4. SPC58XCADPT292S Rev A top component view - B4
TP23	J16A, QSH connector, pin14 (PA9) test point	Figure 4. SPC58XCADPT292S Rev A top component view - B4

5.7 Connectors

The mini module has the following connectors:

Table 7. Connectors

Connectors	Description	Position
J20	12-pin header connector for LFAST interface	Figure 4. SPC58XCADPT292S Rev A top component view - C2
J18	14-pin header connector for JTAG port	Figure 4. SPC58XCADPT292S Rev A top component view - A3
J39	38-pin TYCO connector for Nexus interface	Figure 4. SPC58XCADPT292S Rev A top component view - B4
J36, J37	DC-DC Regulator Module	Figure 4. SPC58XCADPT292S Rev A top component view - A1/A2
J16, J17	2 X SAMTEC QSH series, 240 way connector to connect mini module to Motherboard	Figure 5. SPC58XCADPT292S Rev A bottom component view
J5	External power supplies input (5V, 3.3V, 1.25V)	Figure 4. SPC58XCADPT292S Rev A top component view - D4
P1	SMA Connector for External Clock Input	Figure 4. SPC58XCADPT292S Rev A top component view - D3

7 BOM

Table 8. BOM

Qty	Designator	Part number EI	Comment	Part description
2	J16, J17	SAM-QSH12001LDA	Samtec QSH-120-01-L-D-A	Samtec 0.5 mm pitch high speed socket
1	J18	M.14.180 LP-3M	N2514-6002RB	3MConn Flat Male 14 pins, straight - Pitch 2.54 mm
1	J20	CONNERF805X2-SMD	ERF8-005-05.0-L- DV-L-TR	Samtec 0.8 mm pitch Rugged High Speed Female Connector
2	J36, J37	STRIP36PMD	STRIP	Male Strip 36 pins pitch 2.54 180°
1	J39	TYCO-5767054-1	5767054-1	Conn Female 38 Pin, 180°, MICTOR - GND
1	J46		STRIP 2 mm	Male Strip 20 poles, single row, vertical, golden, pitch 2 mm - Do not mount
1	P1	BNC-SMA-FEM-180	CON 1 SMA	Female RFSMA 180°
1	Q1	TRNJD2873-SMD	NJD2873	NPN PlasticPower Transistor DPAK
4	R1, R2, R7 R26	RESMD000-0603	0R	Resistor 1/10W 1% 0603
1	R3		10K	Resistor 1/10W 1% 0603 - Do not mount
2	R4, R9	RESMD103-0603	10K	Resistor 1/10W 1% 0603
2	R5, R6		0R	Resistor 1/10W 1% 0603 - Do not mount
1	R8	RESMD101-0603	100R	Resistor 1/10W 1% 0603
2	R10, R12	RESMD561-0603	560R	Resistor 1/10W 1% 0603
3	R11, R13, R14	RESMD472-0603	4K7	Resistor 1/10W 1% 0603
1	R25		DNM	Resistor 1/10W 1% 0805 - Do not mount
2	R27, R28	RESMD103-0603	10K	Resistor
3	R29, R32, R33		DNM	Resistor not mounted
4	R30, R31, R34, R35	RESMD000-0603	0R	Resistor
1	SW1	PULSANTECS	Pushbutt on	Pushbutton NO
2	TP1,TP2	TEST1-SMD	Testpoint SMD	PCBtest point
10	TP3, TP4, TP5, TP6, TP7, TP22, TP23, TP25, TP26, TP28		TEST POINT	Testpoint SMD - Ignore
1	U1	ZOCC292OTB	Socket	Socketfor BGA292 - OTB-292(484RS)-0.8-002 ENPLAS
1	U2	Q8MHZ-SMD-3953M	8 MHz	Hybrid QuartzOsc ECS 3953M
1	U3	74LVC125AMTR- SMD	74LVC12 5AMTR	I.C.Low Voltage CMOS quad bus buffers - SO14
1	U5	74V1G08-SMD	74V1G08STR	I.C.Single 2 - Input and gate - SMD SOT23-5L
1	Y1	Q40MHZ-SMD-5032	40MHZ	Quartz 40 MHz NX5032GA XTAL NDK

8 Schematics

Figure 6. Schematic of microcontroller power pins

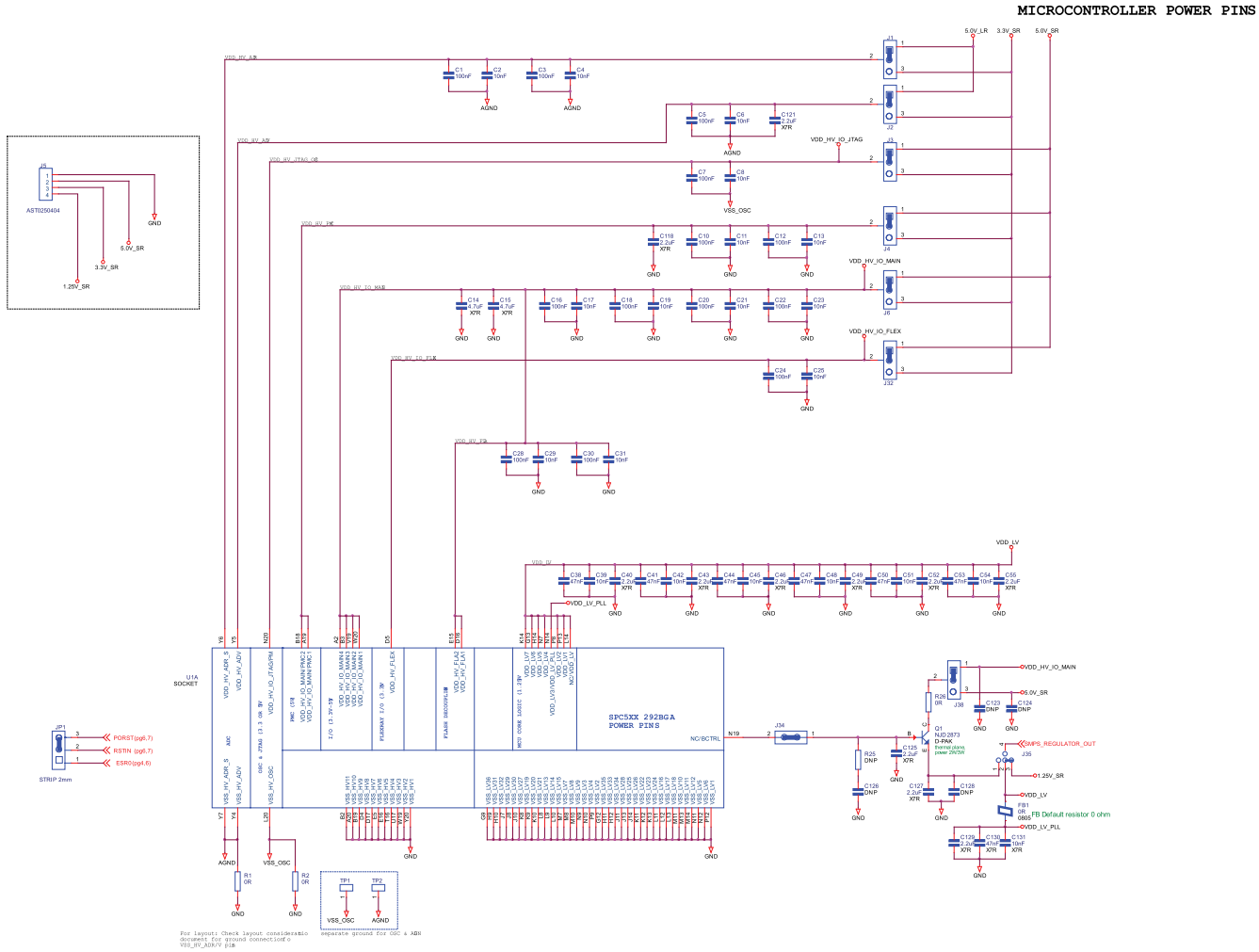
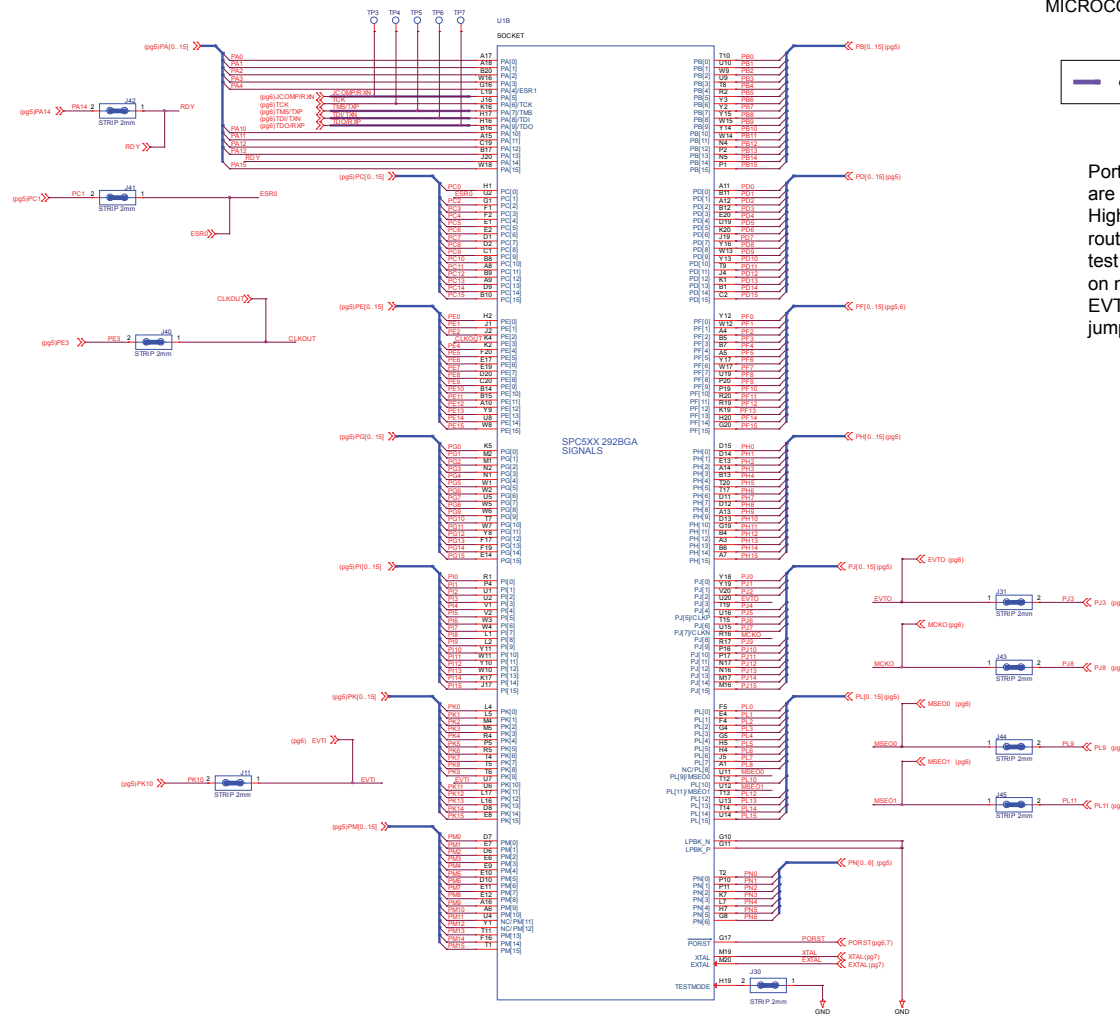


Figure 7. Schematic of microcontroller IO & service pins



MICROCONTROLLER PIN

— differential signals

Port pins and reset signals are routed to motherboard. High speed signals are not routed to mother board, but have test points to connect to test on mother board connector. EVT signals are connected to optional jumpers to be routed to mother board.



Figure 8. Schematic of daughter card to motherboard connector



DAUGHTER CARD TO MOTHERBOARD CONNECTOR

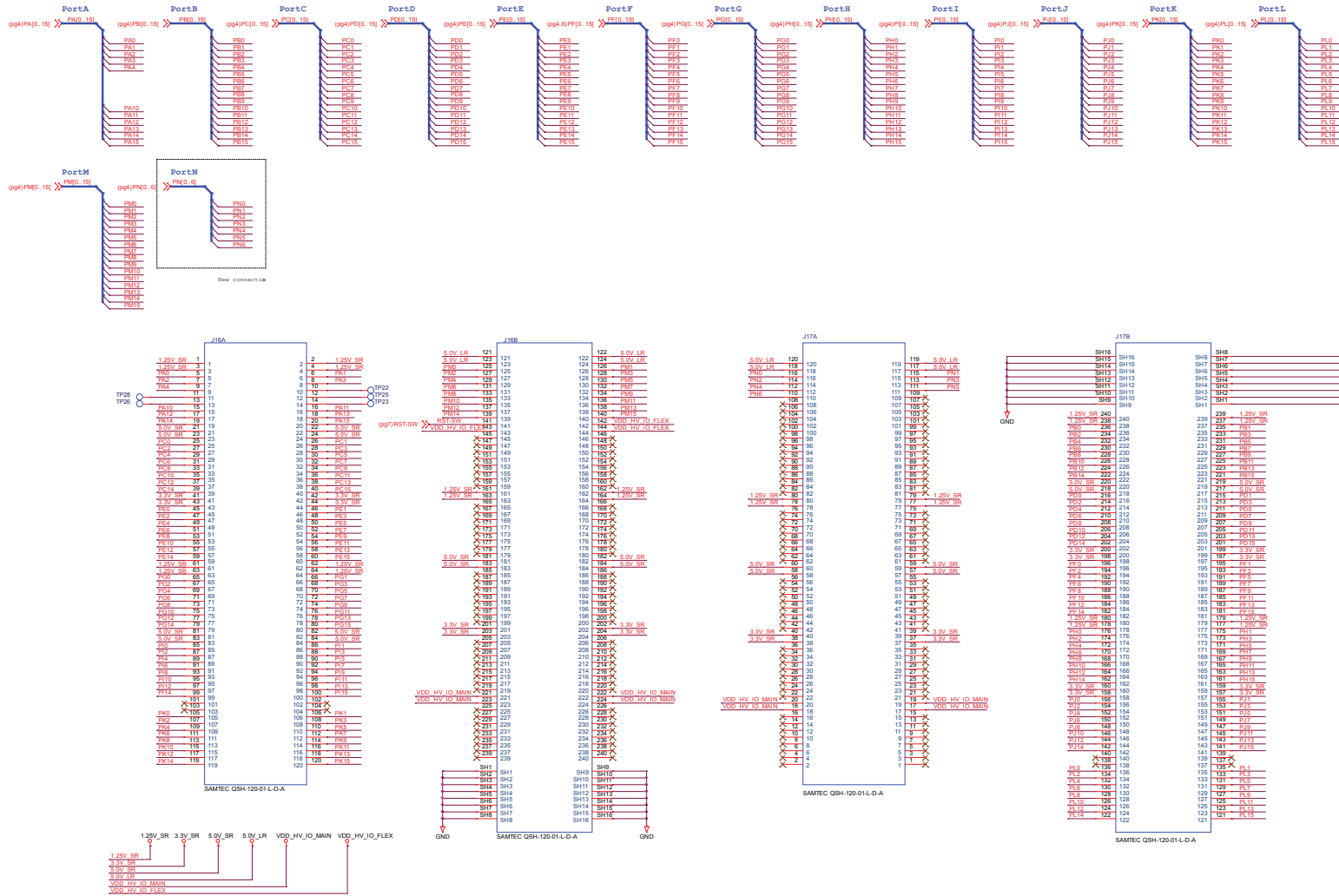


Figure 9. Schematic of Jtag, nexus and lfast connectors

- (pg4)PH(0..19) >>
- (pg4)PG(0..19) >>
- (pg5.6)PF(0..19) >>
- (pg5)PM(0..19) >>
- (pg5)PJ(0..19) >>
- (pg5)PI(0..19) >>
- (pg5)PL(0..19) >>
- (pg5)PD(0..19) >>

JTAG, NEXUS & LFAST

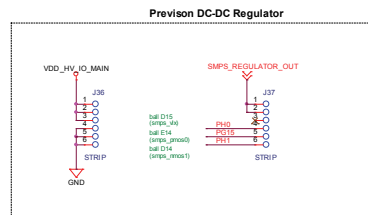
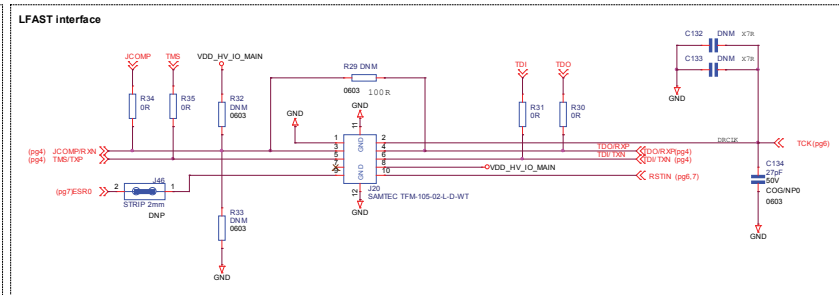
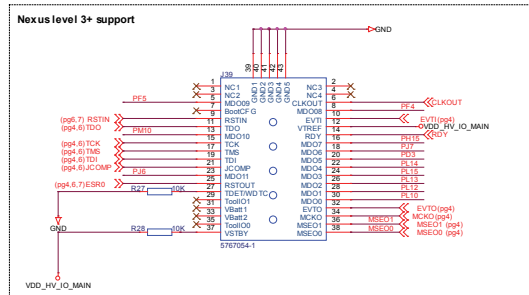
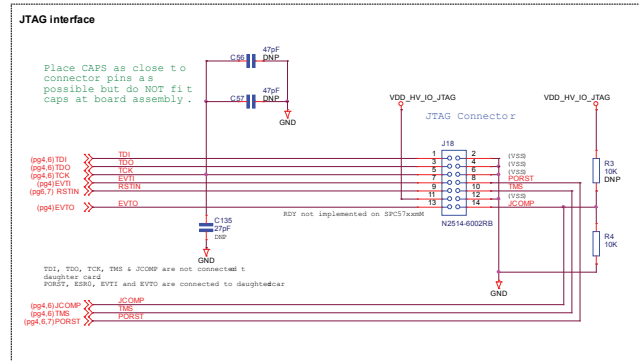
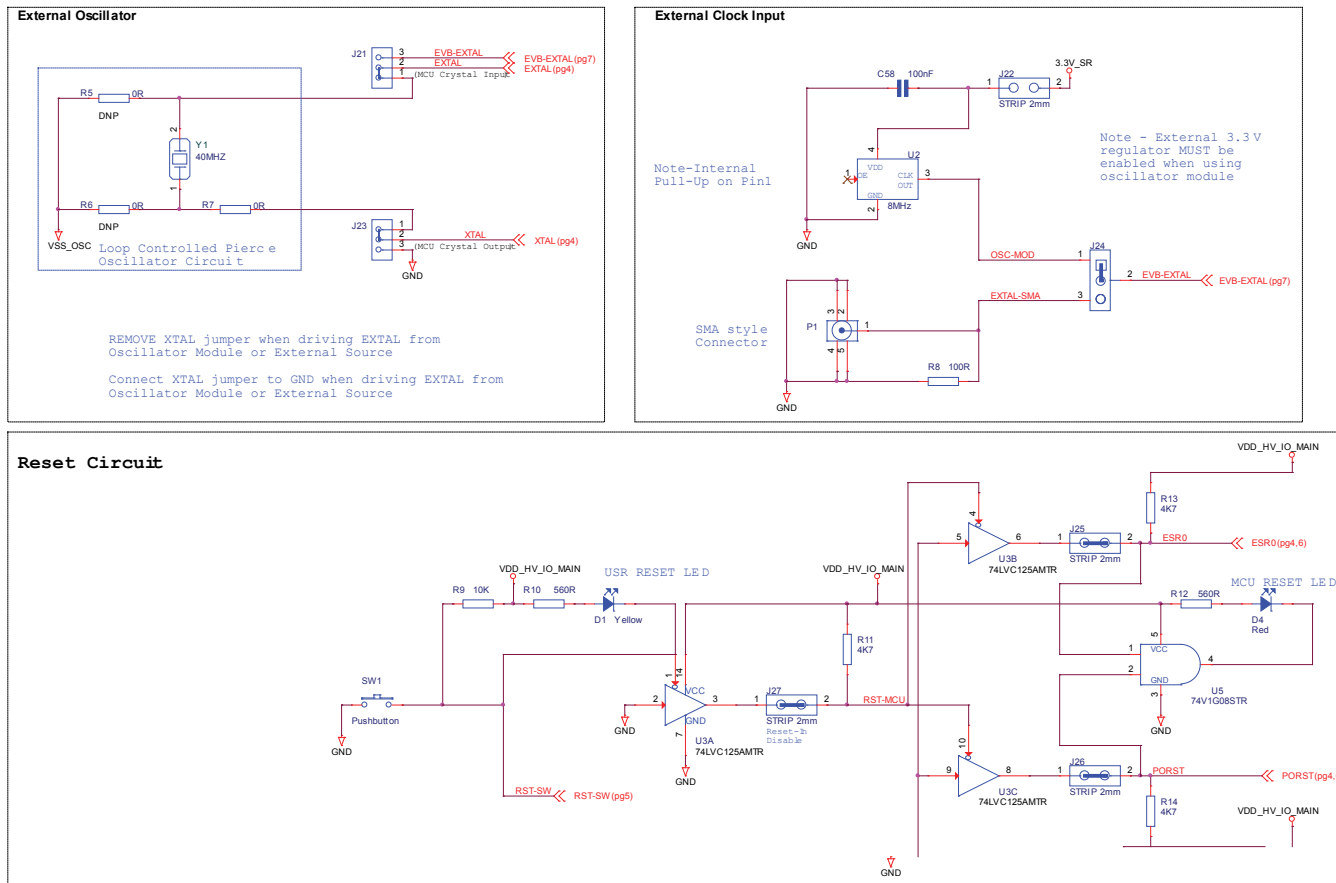


Figure 10. Schematic of clock and reset circuit

Clock and Reset Circuitry



Revision history

Table 9. Document revision history

Date	Version	Changes
15-Nov-2018	1	Initial release.
10-Sep-2020	2	Updated the title in cover page. Updated Section 1 Overview , Section 4 Hardware description and Section 5 Power and system configuration . Added Section 2 License agreement and Section 6 Layout overview . Minor text changes.

Contents

1	Overview	2
1.1	Package Contents	3
1.2	Supported Devices	3
2	License agreement	4
3	Handling precautions	5
4	Hardware description	6
4.1	Hardware features	6
4.2	Hardware dimension and PCB component view	6
5	Power and system configuration	7
5.1	Power supplies	7
5.2	Microcontrollers configuration	7
5.3	Port configuration	8
5.4	System clock configuration	8
5.5	Reset circuit	9
5.6	Test points	9
5.7	Connectors	10
6	Layout overview	11
7	BOM	13
8	Schematics	14
	Revision history	19

List of tables

Table 1.	Power configuration jumpers	7
Table 2.	Microcontroller SPC58xCxxC3 configuration related jumpers	7
Table 3.	Ports related jumpers	8
Table 4.	Clock configuration jumpers	8
Table 5.	Reset configuration jumpers	9
Table 6.	Test points	9
Table 7.	Connectors	10
Table 8.	BOM	13
Table 9.	Document revision history	19

List of figures

Figure 1.	SPC58XCADPT292S Rev.A	1
Figure 2.	Overview of SPC58XCADPT292S Rev. A mini module - top	2
Figure 3.	Overview of SPC58XCADPT292S Rev. A mini module - bottom	3
Figure 4.	SPC58XCADPT292S Rev A top component view	11
Figure 5.	SPC58XCADPT292S Rev A bottom component view	12
Figure 6.	Schematic of microcontroller power pins	14
Figure 7.	Schematic of microcontroller IO & service pins	15
Figure 8.	Schematic of daughter card to motherboard connector	16
Figure 9.	Schematic of Jtag, nexus and lfast connectors	17
Figure 10.	Schematic of clock and reset circuit.	18

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2020 STMicroelectronics – All rights reserved