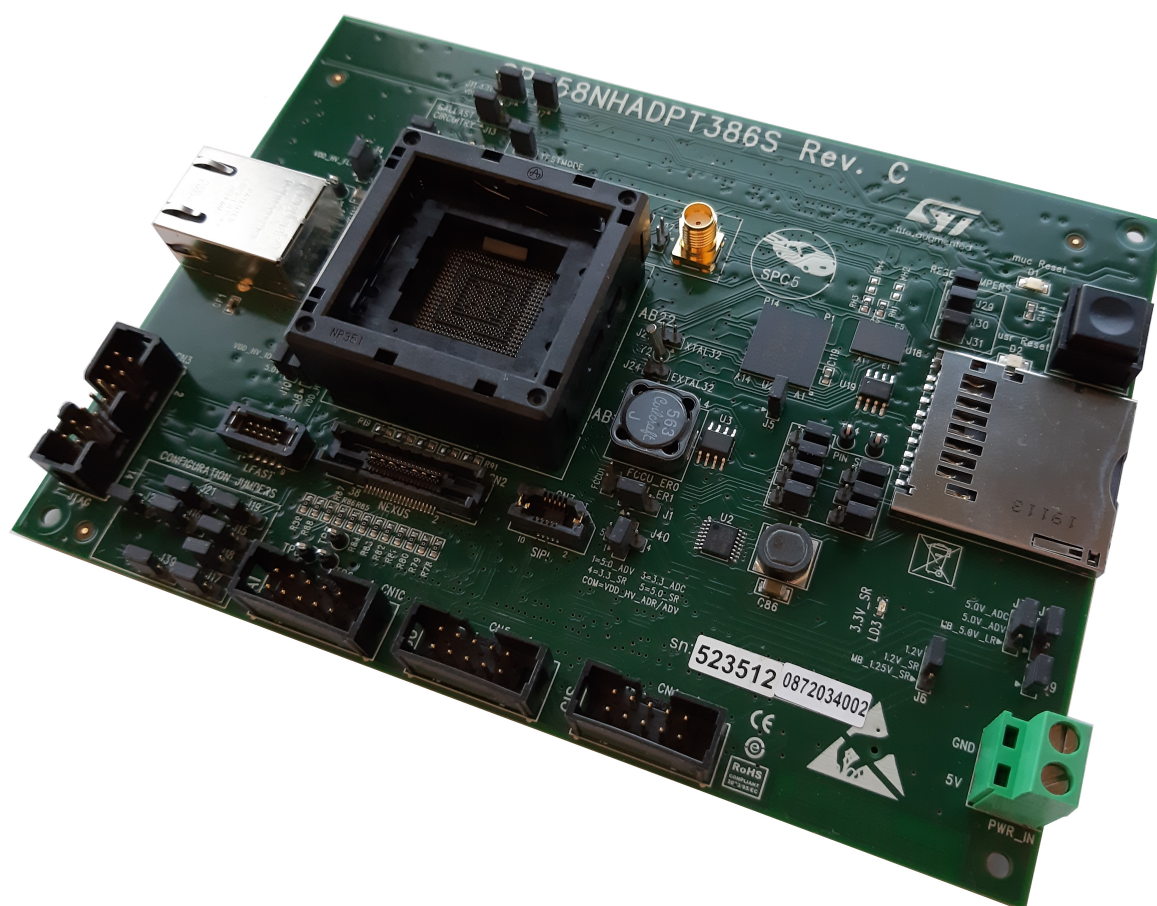


SPC58NHADPT386S Rev.C evaluation board

Introduction

The SPC58NHADPT386S Rev.C evaluation board supports STMicroelectronics SPC58NH92 microcontroller in FPBGA 19x19x1.8 386 package.

Figure 1. SPC58NHADPT386S Rev.C



Note: picture not contractual

1 Overview

The SPC58NHADPT386S Rev.C "mini module" is an evaluation board supporting STMicroelectronics SPC58NH92 microcontroller in FPBGA 19x19x1.8 386 package (FPBGA 19x19x1.8 386 3R22+10+2R14+52 PITCH 0.8 BALL 0.55). This "mini module" is designed to be connected onto the SPC58xxMB motherboard, offering a mechanism for easy customer evaluation of the supported devices and to facilitate hardware and software development. The "mini module" may be used as a stand-alone unit allowing access to the CPU, limited access to the I/O pins as well as any motherboard peripherals.

Figure 2. Overview of SPC58NHADPT386S Rev. C "mini module" - top

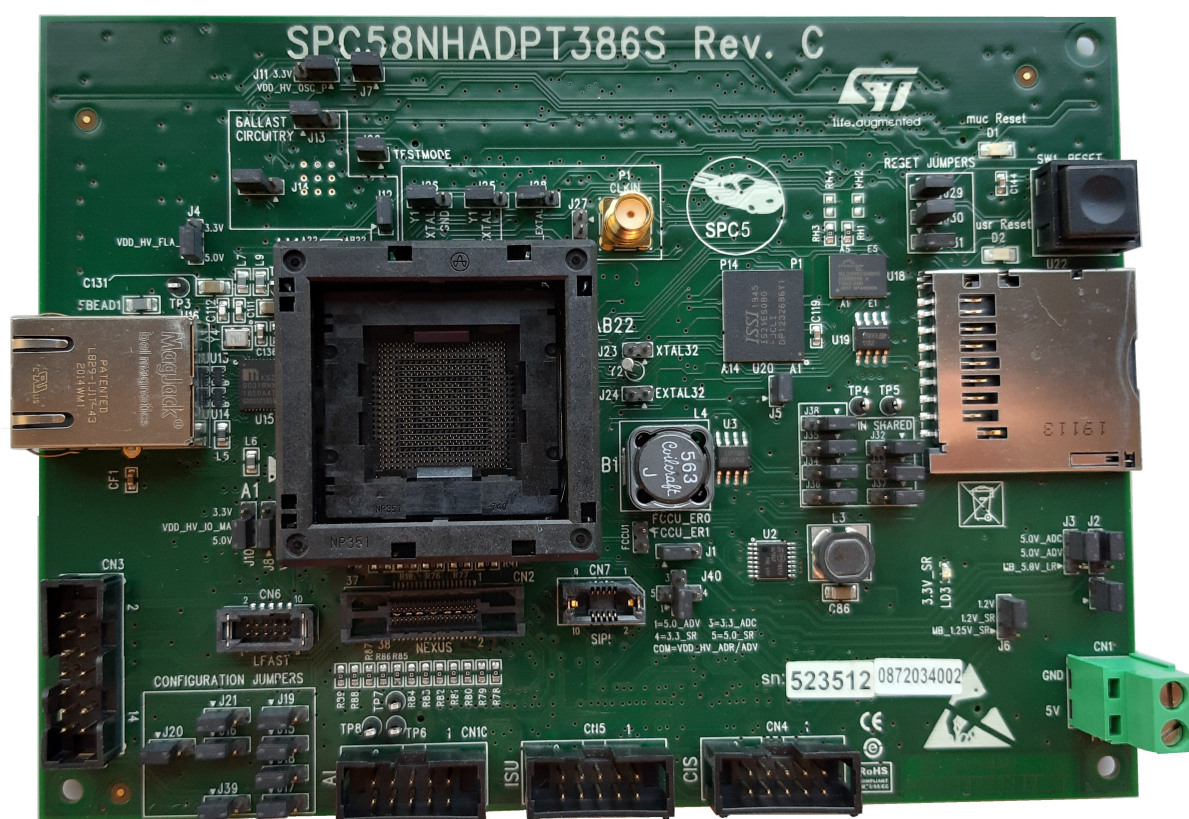
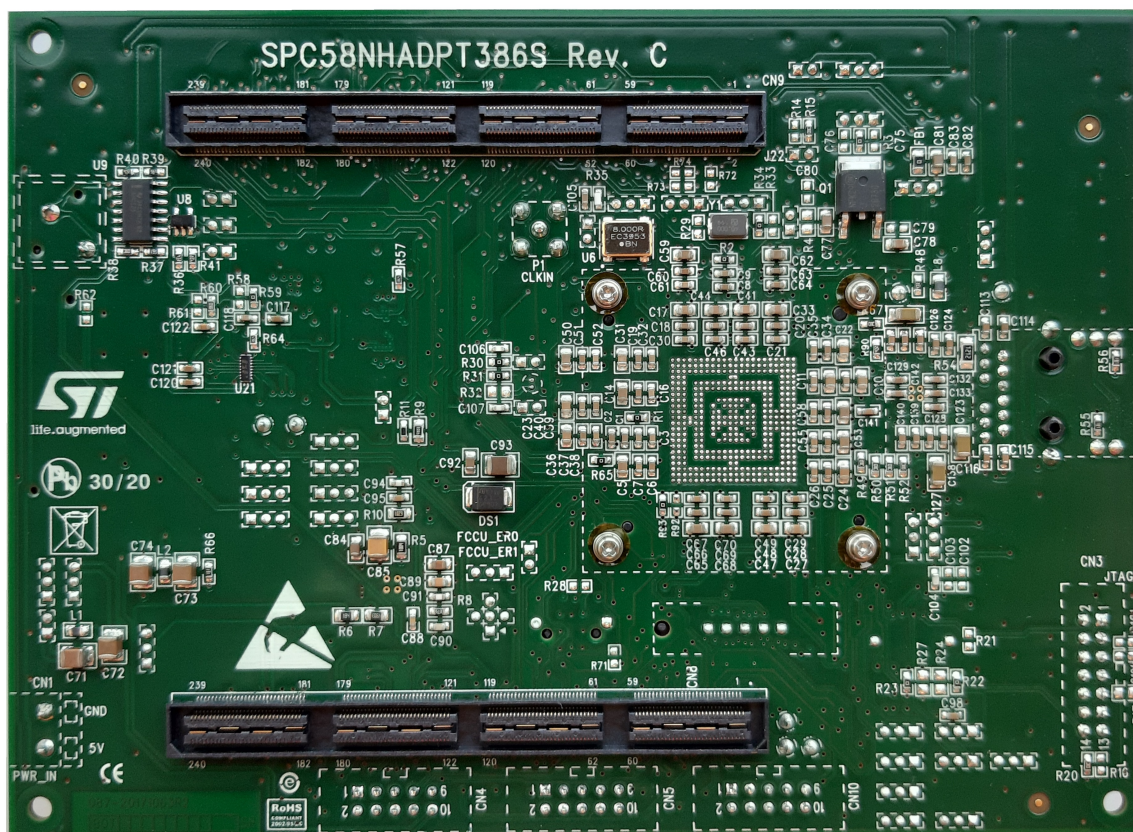


Figure 3. Overview of SPC58NHADPT386S Rev. C "mini module" - bottom



1.1 Package contents

An SPC58NHADPT386S Rev. C adapter package includes the following item:

- SPC58NHADPT386S Rev. C "mini module"

The MCU is not included, it must be purchased separately. Please contact your sales representative for more details.

1.2 Supported devices

The SPC58NHADPT386S Rev. C "mini module" supports the following STMicroelectronics family of microcontrollers in FBGA 19x19x1.8 386 package:

- SPC58NH92C5xx

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 SPC58NHADPT386S Rev. C "mini module" board has the following features:

- Connector for external power supplies input (5 V) used in stand-alone mode
- Reset button with driver and led indicator
- Socket for device in FPBGA386 package
- Debug interfaces:
 - 14-pin header connector for JTAG interface
 - 10-pin header connector for JTAG/LFAST LVDS interface
 - 10-pin header connector for SIPI interface
 - 38-pin Nexus parallel debug connector
- 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 with jumper to optionally disconnect it
- 2 X Samtec QSH series, 240-way connector to connect mini module to motherboard
- 1 Gb/s Ethernet port
- HyperRAM and HyperFlash connected to HyperBUS interface
- Embedded eMMC device
- SD/MMC card reader
- 3 x Header connectors 5x2 with 0.1" (CIS, ISU and AI connectors)

4.2 Hardware dimensions

The "mini module" has the following dimensions:

- PCB area: 157 mm x 114.3 mm
- Top components height: 19 mm max
- Bottom components height: 3.5 mm max

5 Power and system configuration

5.1 Power supplies

The "mini module" can be powered by providing voltages or supplied externally by the 2-Way PCB screw connector (CN1) or supplied by the motherboard.

When the "mini module" is connected to the motherboard (MB), 1.25 V, 3.3 V and 5.0 V are supplied by MB connector selecting the associated jumpers. In this setup, the external power supply input available on the "mini module" should NOT be used.

When the SPC58NHADPT386S Rev. C "mini module" is used as a stand-alone board, 5V0 voltages must be supplied externally, 3V3 and 1V2 voltages will be generated internally by specific circuit on the "mini module".

The following jumpers are used to configure the power supply (common for all supported devices):

Table 1. Power configuration jumpers

Jumper	Description	Default	Position
J1	3.3V_SR switching voltage configuration: 1-2 3.3V (3V3 generated by "mini module") 2-3 MB_3.3V_SR (3V3 by motherboard)	1-2 (3.3V by "mini module")	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3
J40	VDD_HV_ADR_S / VDD_HV_ADV voltage configuration: 1-2: 5.0V_ADV 3-2: 3.3V_ADC 4-2: 3.3_SR 5-2: 5.0_SR	1-2 (5.0V_ADV)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3
J2	5.0V_SR switching voltage configuration: 1-2 5.0V_EXT (5V0 externally voltage) 2-3 MB_5.0V_SR (5V0 by motherboard)	2-3 (5.0V_SR by MB)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
J3	5.0V_ADV configuration: 1-2 MB_5.0V_LR (5.0V linear from MB) 2-3 5.0V_ADC (5.0V filtered)	2-3 (5.0V_ADC)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
J4	VDD_HV_FLTA voltage configuration: 1-2 5.0V_SR 2-3 3.3V_SR	1-2 (5.0V_SR)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2
J5	VDD_HV_IO_EMMC voltage enable: Closed: connect 3.3V_SR to VDD_HV_IO_EMMC pins	Closed (connect 3.3V_SR to VDD_HV_IO_EMMC pins)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C2
J6	1.2V_SR switching configuration: 1-2 MB_1.25V_SR (1.25V from MB) 2-3 1.2V (1.2V from "mini module")	2-3 (1.2V from "mini module")	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D4
J7	VDD_HV_IO_ETH1 voltage enable: Closed: connect 3.3V_SR to VDD_HV_IO_ETH1 pins	Closed (connect 3.3V_SR to VDD_HV_IO_ETH1 pins)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1
J8	VDD_HV_IO_ETH0 voltage configuration: 1-2 5.0V_SR 2-3 3.3V_SR	1-2 (5.0V_SR)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A3

Jumper	Description	Default	Position
J9	5.0V_ADC filtered voltage enable: Closed: connect the 5.0V_EXT to 5.0V_ADC through the filter circuit.	Closed (5.0V_ADC)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
J10	VDD_HV_IO_MAIN voltage configuration: 1-2 5.0V_SR 2-3 3.3V_SR	1-2 (5.0V_SR)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A3
J11	VDD_HV_OSC voltage configuration: 1-2 5.0V_SR 2-3 3.3V_SR	1-2 (5.0V_SR)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A1
J12	BALLAST CIRCUIT ENABLE - Closed: enabled - Open: disable	Closed (enable)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1
J13	Supply for BALLAST circuit configuration 1-2 VDD_HV_IO_MAIN 2-3 5.0V_SR	1-2 (VDD_HV_IO_MAIN)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1
J14	VDD_LV voltage configuration: 2-1 (BALLAST circuit) 2-3 (1.2V_SR) 2-4 (SMPS regulator module)	2-3 (1.2V_SR)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A1

5.2 JTAG/LFAST LVDS interface configuration

The following jumpers need to configure the JTAG/LFAST LVDS/SIPI:

Table 2. JTAG/LFAST/SIPI configuration jumpers

Jumper	Description	Default	Position
J15	JTAG/LFAST LVDS pin 7 configuration 1-2: EVTI 2-3: PK10	1-2 (EVTI)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J16	JTAG pin 1/ LFAST LVDS pin 6 configurations 1-2: TDI 2-3: PA8	1-2 (TDI)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J17	JTAG pin 3/ LFAST LVDS pin 4 configurations 1-2: TDO 2-3: PA9	1-2 (TDO)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J18	JTAG pin 13 configuration 1-2: EVTO 2-3: PJ3	1-2 (EVTO)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J19	PC1 / ESR0 1-2 ESR0 2-3 PC1	1-2 (ESR0)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J20	EVTO/ESR0 1-2 ESR0 2-3 EVTO	1-2 (ESR0)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J39	PE3 / CLKOUT 1-2 CLKOUT 2-3 PE3	1-2 (CLKOUT)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4

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
J23	XTAL32 configuration: Close: connect pin 2 of 32.768 KHz crystal (Y2) to XTAL32	Open	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C2
J24	EXTAL32 configuration: Close: Connect pin 1 of 32.768 KHz crystal (Y2) to EXTAL32	Open	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C2
J25	EXTAL configuration: 1-2 Connect pin 2 of 40 MHz crystal (Y1) to EXTAL 2-3 EVB-EXTAL	1-2 (XT1 pin2)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1
J26	XTAL configuration: 1-2 Connect pin 1 of 40 MHz crystal (Y1) to XTAL 2-3 GND	1-2 (XT1 pin1)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1
J27	Enable 8 MHz oscillator power supply: - open – Power off - closed – Power on	Open (power off)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B2
J28	External 8 MHz clock source: 1-2 OSC-MOD (from oscillator) 2-3 EXTAL-SMA (from SMA connector)	1-2 (8 MHz from oscillator)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1

5.4 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 4. Reset configuration jumpers

Jumper	Description	Default	Position
SW1	Reset push button	Open	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D1
J29	Connect the external reset to the reset driver for ESR0 and PORST pins	Close	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D1
J30	Connect the external reset to ESR0 pin	Close	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D2
J31	Connect the external reset to PORST pin	Close	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D2

5.5 Other Jumpers

Table 5. Other jumpers

Jumper	Description	Default	Position
J21	EXTREG_SEL 1-2 VDD_HV_IO_MAIN 2-3 GND 1-2	1-2 (VDD_HV_IO_MAIN)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A4
J22	TESTMODE settings	Close (10 K Ω down)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B1

5.6 Configuration for pin shared between eMMC & SD-card reader

The following jumpers need to configure the pin shared between eMMC & SD-CARD READER set the jumpers described in the table below.

Table 6. Pin shared between eMMC & SD card reader Jumper

Jumper	Description	Default	Position
J32	PQ4 configuration • 1-2 PQ4_S (SD-CARD) • 2-3 PQ4_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
J33	PQ5 configuration • 1-2 PQ5_S (SD-CARD) • 2-3 PQ5_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
J34	PQ6 configuration • 1-2 PQ6_S (SD-CARD) • 2-3 PQ6_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3
J35	PQ7 configuration • 1-2 PQ7_S (SD-CARD) • 2-3 PQ7_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3
J36	PS6 configuration • 1-2 PS6_S (SD-CARD) • 2-3 PS6_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3
J37	PP15 configuration • 1-2 PP15_S (SD-CARD) • 2-3 PP15_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
J38	PQ0 configuration • 1-2 PQ0_S (SD-CARD) • 2-3 PQ0_E (eMMC)	1-2 (SD-CARD)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3

6 Hardware description

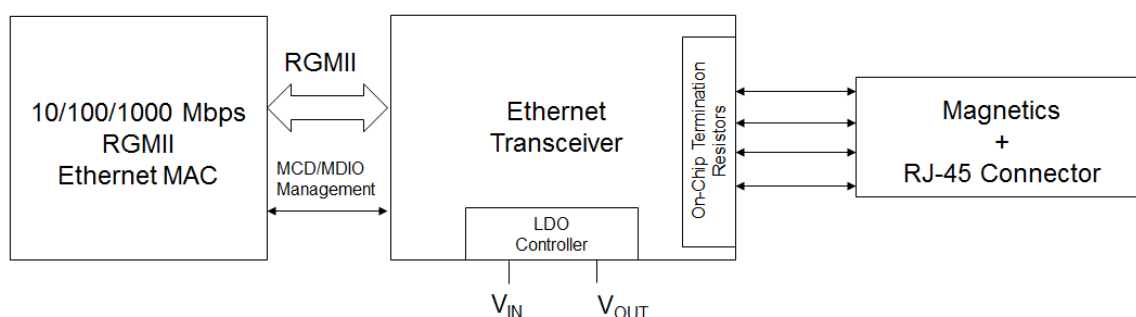
6.1 1 Gb/s ethernet interface

This paragraph describes the 1Gb/s Ethernet interface present on the "mini module".

The Ethernet connector is RJ-45 with integrated magnetics.

It shows the functional diagram of the Ethernet interface.

Figure 4. 1 Gb/s Ethernet functional diagram



Here below the Ethernet ESD protection schema.

Figure 5. 1 Gb/s Ethernet ESD protection schema

ESD Protection



The following table describes all the hardware of the 1Gb/s Ethernet interface of the "mini module" and their position on pcb.

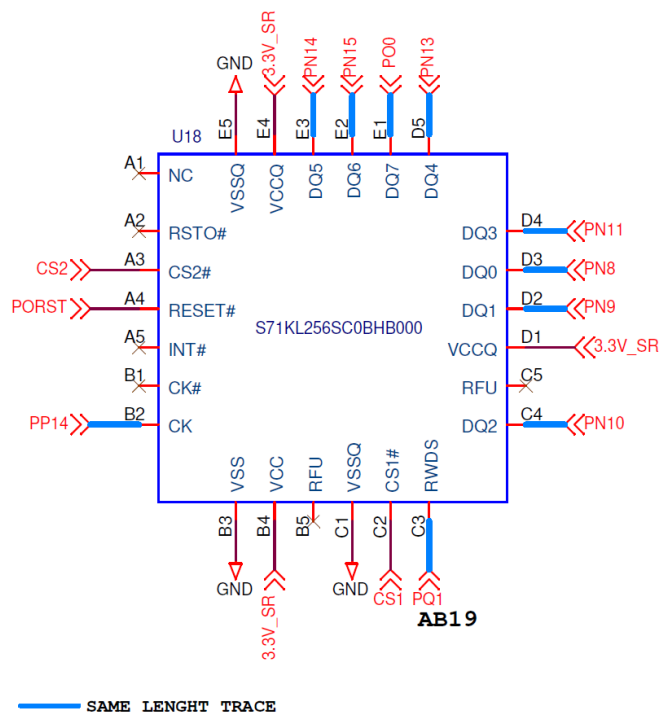
Table 7. 1 Gb/s Ethernet interface

Symbol	Description	Position
U13	ESD protection	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2
U14	ESD protection	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2
U15	Ethernet 1-port GigabitEthernet ethernet PHY	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2
U16	Ethernet connector	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2

6.2 Hyperbus interface

This paragraph describes the hyperbus interface present on the "mini module".
The following figure shows the hyperbus scheme.

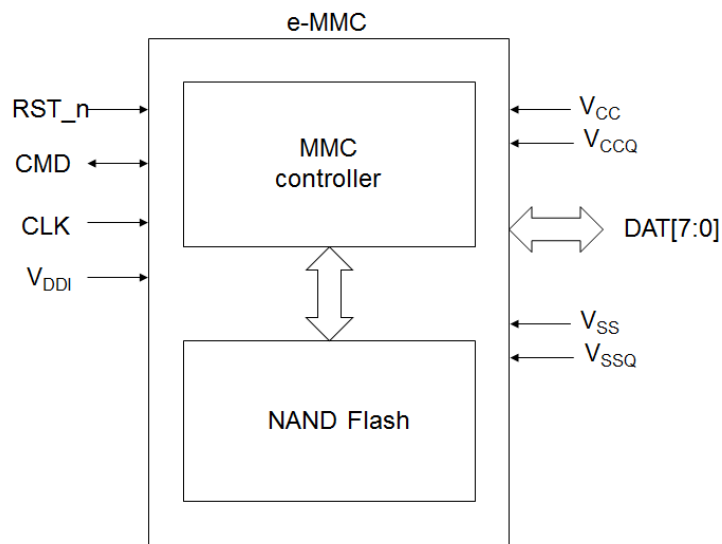
Figure 6. Hyperbus scheme



6.3 eMMC interface

This paragraph describes the embedded eMMC device present on the "mini module".
The figure below shows the functional diagram of the eMMC interface.

Figure 7. eMMC functional diagram



The following table describes all the hardware of the eMMC interface of the "mini module" and their position on PCB.

Table 8. eMMC interface

Symbol	Description	Position
U20	eMMC Memory 8GB	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C2

6.4 SD/MMC interface

This paragraph describes the card reader JEDED/MMC standard version 5.0 compliant.

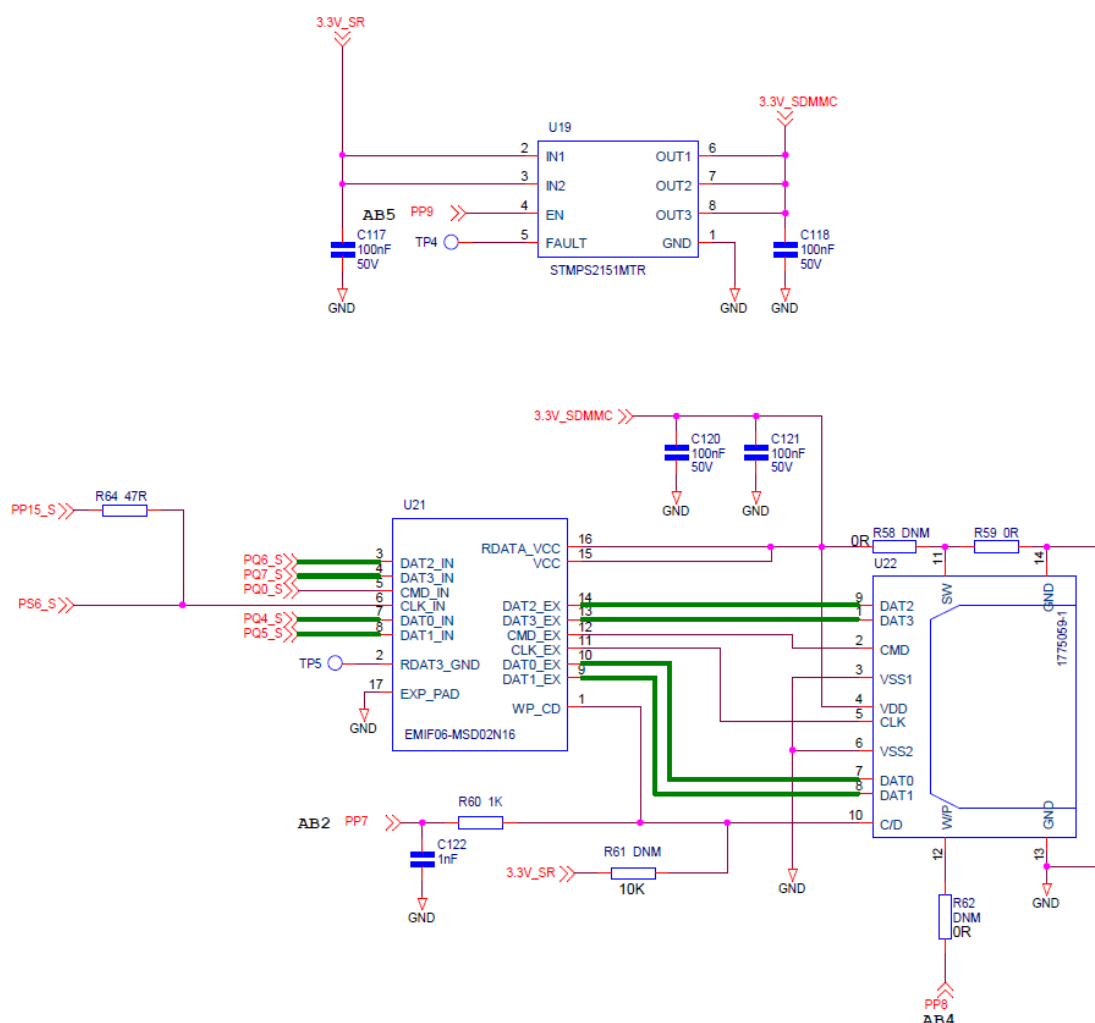
The filter used is EMIF06-MSD02N16 by ST.

The SD/MMC card reader needs to use a power switch to limits the output current to a safe level in case the output load exceeds the current limits threshold or a short is present.

Use an STMPS2151MTR by ST.

The figure below shows SD/MMC card reader diagram.

Figure 8. SD/MMC card reader diagram



The following table describes all the hardware of the SD/MMC interface of the "mini module", their position on PCB.

Table 9. SD/MMC interface

Symbol	Description	Position
U19	CMOS switch	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D2
U21	Filter EMI 6-line micro	Figure 10. Overview of SPC58NHADPT386S Rev. C "mini module" - bottom - A2
U22	Connector SD reverse push-push	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D2

6.5 Test points

The "mini module" has several test points, described in the table below.

Table 10. Test points

Test Point	Description	Position
TP2	INT_N (on U15)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2
TP3	LDO_O (on U15)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - A2
TP4	FAULT (on U19)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - C3
TP5	RDAT3_GND (on U21)	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - D3
TP6	JCOMP_RxDATA_N/PA[5]	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B4
TP7	TCK/PA[6]	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B4
TP8	TMS_TxDATA_P/PA[7]	Figure 9. Overview of SPC58NHADPT386S Rev. C "mini module" - top - B4

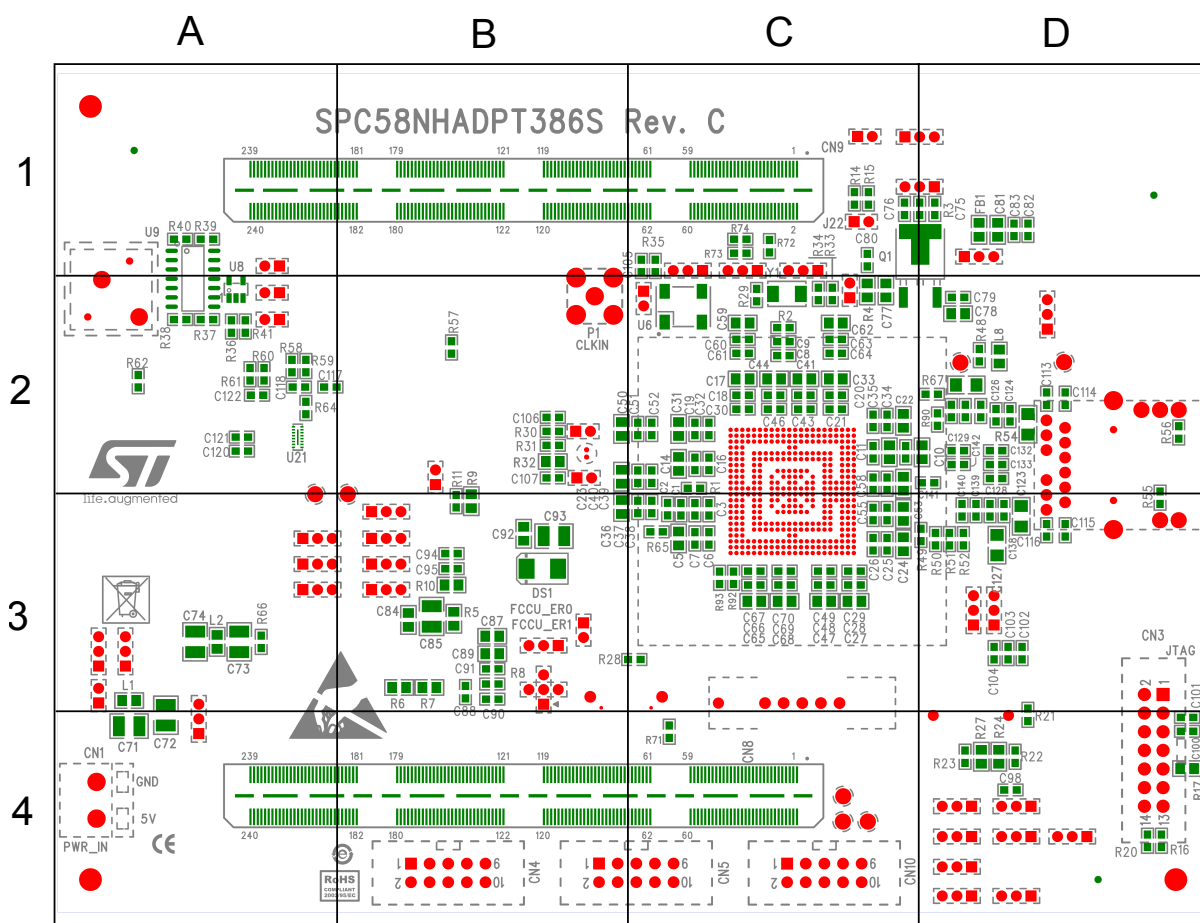
6.6 Connectors

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

Table 11. Other connectors

Connectors	Description
CN1	External power supplies input (5V) - D4
CN2	38-pin Mictor Nexus parallel connector - D3
CN3	14-pin header connector for JTAG interface - A4
CN4	2x5 CIS header connector - C4
CN5	2x5 ISU header connector - B4
CN6	10-pin header connector for JTAG/LFAST LVDS interface - A4
CN7	10-pin header connector for SIPI interface - C3
CN8, CN9	2 X SAMTEC QSH series, 240-way connector to connect "mini module" to motherboard - A1/A4
CN10	2x5 AI header connector - A2
P1	SMA Connector for External Clock Input - C1
U22	SD Revers Connector - D2
FCCU	FCCU TEST CONNECTOR - C3

Figure 10. Overview of SPC58NHADPT386S Rev. C "mini module" - bottom



8 BOM

Table 12. BOM

Item	QTY	Reference	Manufacturer code	Value	Part description
1	42	CF1, C1, C2, C6, C8, C18, C19, C20, C25, C28, C34, C37, C39, C42, C45, C48, C98, C105, C113, C114, C115, C116, C117, C118, C119, C120, C121, C124, C125, C126, C128, C129, C130, C132, C133, C135, C138, C139, C140, C141, C142, C143	GCM188R71H104KA57D	100 nF	Mult. cer. cap.
2	1	CN1		2V1P	Screw terminal block, 1 Row
3	1	CN2	5767054-1	5767054-1	Conn female 38 pin, 180°, ICTOR - GND
4	1	CN3	N2514-6002RB	N2514-6002RB	Conn flat male 14 pin, 180°
5	3	CN4, CN5, CN10	N2510-6002-RB	N2510-6002-RB	Conn flat male 10 pin, 180°
6	1	CN6	TFM-105-02-L-D-WT	SAMTEC TFM-105-02-L-D-WT	Conn TFM 10 pin, with weld tabs
7	1	CN7	ERF8-005-05.0-L-DV-L-TR	ERF8-005-05.0-L-DV-L-TR	Conn rugged female 10 pin, HS (N*)
8	2	CN8, CN9	QSH-120-01-L-D-A	SAMTEC QSH-120-01-L-D-A	Female conn 240 pin, 2 row
9	27	C3, C4, C7, C9, C11, C13, C16, C21, C26, C29, C30, C32, C35, C38, C40, C43, C46, C49, C52, C55, C58, C61, C64, C67, C70, C83, C136	GCM188R71H103KA37D	10 nF	Mult. cer. cap.
10	12	C5, C14, C50, C53, C56, C59, C62, C65, C68, C77, C78, C81	GCM21BR71C225KA64L	2.2 uF	Mult. cer. cap.
11	2	C10, C12	CL21B105KBFNNNE	1 uF	Mult. cer. cap.
12	9	C15, C51, C54, C57, C60, C63, C66, C69, C82	GCM188R71H473KA55D	47 nF	Mult. cer. cap.
13	11	C17, C22, C23, C24, C27, C31, C33, C36, C41, C44, C47	GCM21BR71C475KA73	4.7 uF	Mult. cer. cap.

Item	QTY	Reference	Manufacturer code	Value	Part description
14	4	C71, C72, C73, C74	GRM32ER71H475KA88L	4.7 uF	Mult. cer. cap.
15	8	C75, C76, C79, C80, C100, C101, C102, C103		DNM	Mult. cer. cap. - not mounted
16	2	C84, C87	GRM21BR71H474KA88L	470 nF	Mult. cer. cap.
17	1	C85	C1210C226K3RACTU	22 uF	Mult. cer. cap.
18	6	C86, C123, C127, C131, C134, C137	C1206C476M8PACTU	47 uF	Mult. cer. cap.
19	1	C88	CC0603KRX7R9BB822	8.2 nF	Mult. cer. cap.
20	1	C89	MCCA000383	68 nF	Mult. cer. cap.
21	1	C90	GRM1885C1H391JA01D	390 pF	Mult. cer. cap.
22	3	C91, C111, C112	06035A220JAT2A	22 pF	Mult. cer. cap.
23	1	C92	GRM21BR71E155KA88L	1.5 uF	Mult. cer. cap.
24	1	C93	GRM32ER61C476KE15L	47 uF	Mult. cer. cap.
25	1	C94	06035A101JAT2A	100 pF	Mult. cer. cap.
26	1	C95	GRM188R71H183KA01D	18 nF	Mult. cer. cap.
27	1	C104	GCM1885C1H270JA16D	27 pF	Mult. cer. cap.
28	2	C106, C107	06035A100JAT2A	10 pF	Mult. cer. cap.
29	1	C122	GCM188R72A102KA37D	1 nF	Mult. cer. cap.
30	1	C144	GRM188R71E104KA01D	100 nF	Mult. cer. cap.
31	1	DS1	STPS2L25U	STPS2L25U	Power Schottky rectifier
32	1	D1	HSMS-C150	Red	Led diode red
33	1	D2	HSMY-C150	Yellow	Led diode yellow
34	1	FBEAD1	HI1206N101R-10	100R	Multilayer ferrite
35	1	FB1	RC0805JR-070RL	0R	Resistor
36	12	FCCU1, J5, J7, J9, J12, J22, J23, J24, J27, J29, J30, J31	M22-2512005	STRIP2PMD-2MM	Strip male 2 pin, 2 mm pitch, 1 row, 180° - see mech part
37	24	J1, J4, J8, J10, J11, J13, J15, J16, J17, J18, J19, J20, J21, J25, J26, J28, J32, J33, J34, J35, J36, J37, J38, J39	M22-2512005	STRIP3PMD-2MM	Strip male 3 pin, 2 mm pitch, 1 row, 180° - see mech part
38	4	J2, J3, J6, J14	M22-2512005	STRIP20PMD-2MM	Strip male 3 pin, 1 row, 180° - see mech part
39	1	J40		STRIP3PMD+2PM-2MM	Strip male 5 pin, 1 row, 180° - see mech part
40	1	LD3	KP-1608MGC	Green	Led diode green
41	8	LN1, LN2, LN3, LN4, LN5, LN6, LN7, LN8		LINK	Wire connection - ignore

Item	QTY	Reference	Manufacturer code	Value	Part description
42	2	L1, L2	MPZ2012S221A	220R	Multilayer ferrite bead
43	1	L3	744787039	3.9 uH	Inductor
44	1	L4	MSS1260-563MLD	56uH	Inductor
45	5	L5, L6, L7, L8, L9	BLM21PG221SN1D	220R	Multilayerferrite
46	1	P1	SMA-J-P-H-ST-TH1	SMA-FEM-180	Coax conn female 5 pin, 180°
47	1	Q1	NJD2873T4G	NJD2873T4G	Trans. NPN plastic power
48	29	RH1, R1, R2, RH3, R3, R22, R23, R30, R31, R34, R59, R65, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R91, R93	CRG0603ZR	0R	Resistor
49	16	RH2, RH4, R14, R16, R21, R28, R29, R33, R58, R61, R62, R71, R72, R73, R74, R92		DNM	Resistor - not mounted
50	5	R4, R17, R24, R27, R32		DNM	Resistor - not mounted
51	1	R5	RC0805FR-071ML	1M	Resistor
52	1	R6		180K	Resistor
53	1	R7		430K	Resistor
54	1	R8		51K	Resistor
55	1	R9		9K1	Resistor
56	1	R10		6K2	Resistor
57	1	R11	RC0603FR-075K49L	5K49	Resistor
58	10	R15, R18, R19, R20, R38, R49, R50, R51, R52, R67	RC0603FR-0710KL	10K	Resistor
59	1	R35	FC0603E50R0BTBST1	50R	Resistor
60	5	R36, R40, R41, R48, R90	CRG0603F4K7	4K7	Resistor
61	2	R37, R39	CRCW0603560RFKEA	560R	Resistor
62	1	R54	FCR0FT-1212	12K1	Resistor
63	3	R55, R56, R66	RC0603FR-07180RL	180R	Resistor
64	2	R57, R64	CRG0603F47R	47R	Resistor
65	1 1	R60 SW1	MC0063W060311K B6110-0	1K Pushbutton	Resistor pushbutton NO B6110-0 (N2)
66	7	TP2, TP3, TP4, TP5, TP6, TP7, TP8	20-2137	TESTPOINT	PCB test point 1 pin - Black

Item	QTY	Reference	Manufacturer code	Value	Part description
67	1	U1	NP351-386-761	Socket FBGA	Socket FPBGA 386P NP351-386-761 YAMAICHI
68	1	U2	A6986	A6986	Volt. Reg
69	1	U3	L5970AD	L5970AD	Volt. Reg
70	1	U6	ECS-3953M-080-BN-TR	8MHz	Clock Oscillator
71	1	U8	74V1G08STR	74V1G08STR	CMOS AND Gate
72	1	U9	SN74AHC125DR	SN74AHC125DR	Buffer
73	2	U13, U14	HSP061-4M10Y	HSP061-4M10Y	ESD Protection
74	1	U15	KSZ9031RNXIA	KSZ9031RNXIA	Ethernet 1-Port Gigabit Ethernet PHY
75	1	U16	L829-1J1T-43	L829-1J1T-43	Ethernet connector
76	1	U18	S71KL256SC0BHB000	S71KL256SC0BHB000	RAM 256 Mbit
77	1	U19	STMP2151MTR	STMP2151MTR	CMOS switch
78	1	U20	IS21ES08G-JCLI	IS21ES08G-JCLI	eMMC memory 8 GB 3.3 V 200 Mhz eMMC NAND flash
79	1	U21	EMIF06-MSD02N16	EMIF06-MSD02N16	Filter EMI 6-line micro
80	1	U22	1775059-1	1775059-1	Connector SD reverse push-push
81	1	Y1	NX5032GA	40MHz	Quartz
82	1	Y2	CFS206-32.768-KDZF-UB	32.768 KHz	Quartz
83	1	Y4	X1E0000210132 TSX-3225 25 MHZ 9.0PF	25MHZ	Quartz
84	1	PCB			PCB FR4 1.6 mm; 157 mmX114, 3 mm 10Layers
85	41	FCCU1,	MJ2P-CGB-L		Bridge shunt 2 pins female 2 mm black
86	8	FCCU1,	M22-2512005	STRIP20PMD-2MM	Strip male 20 pin, 1 row, 180°(N1)

9 Schematic



Figure 11. uC supply

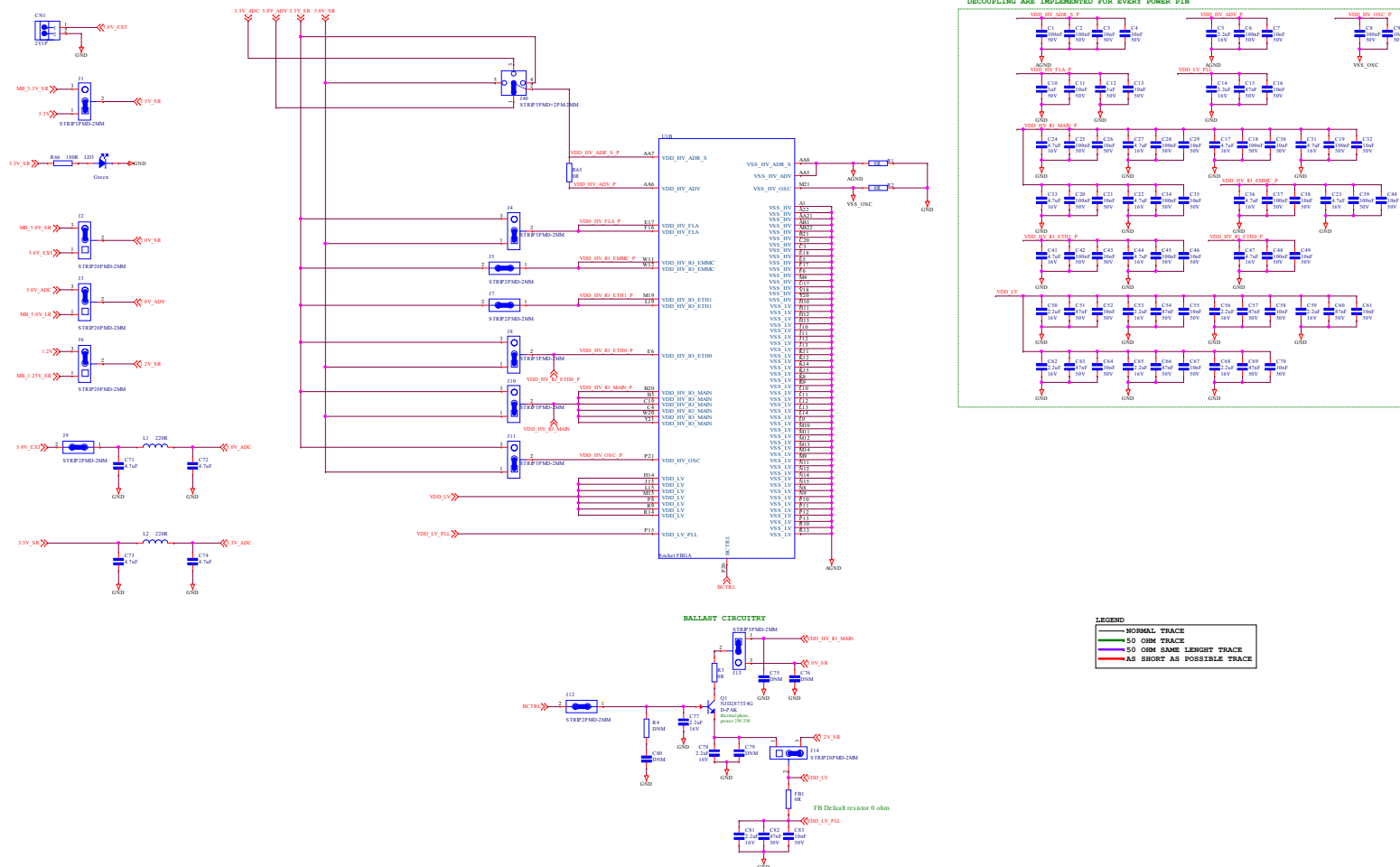


Figure 12. Voltage regulators

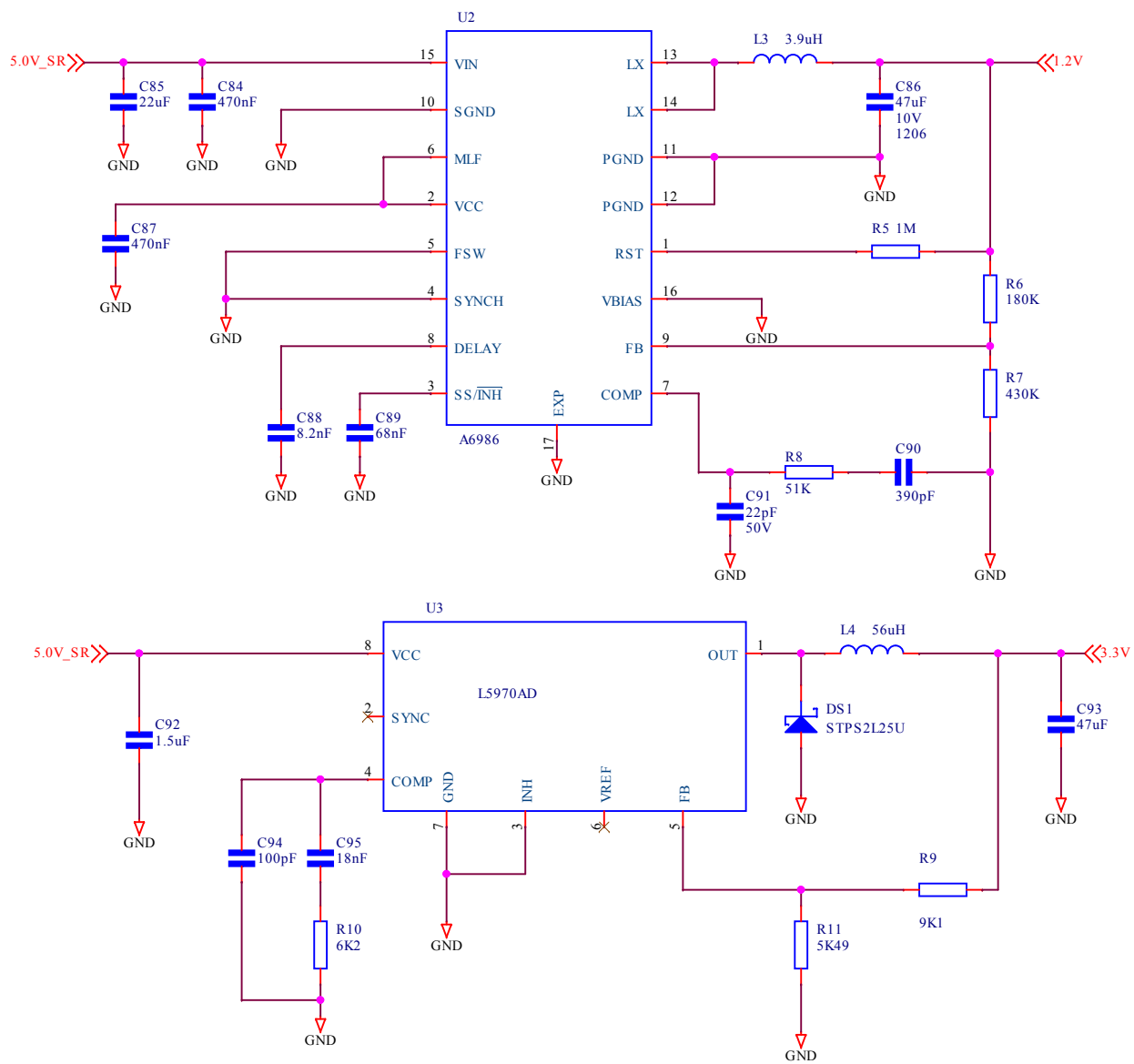


Figure 13. uC I/O

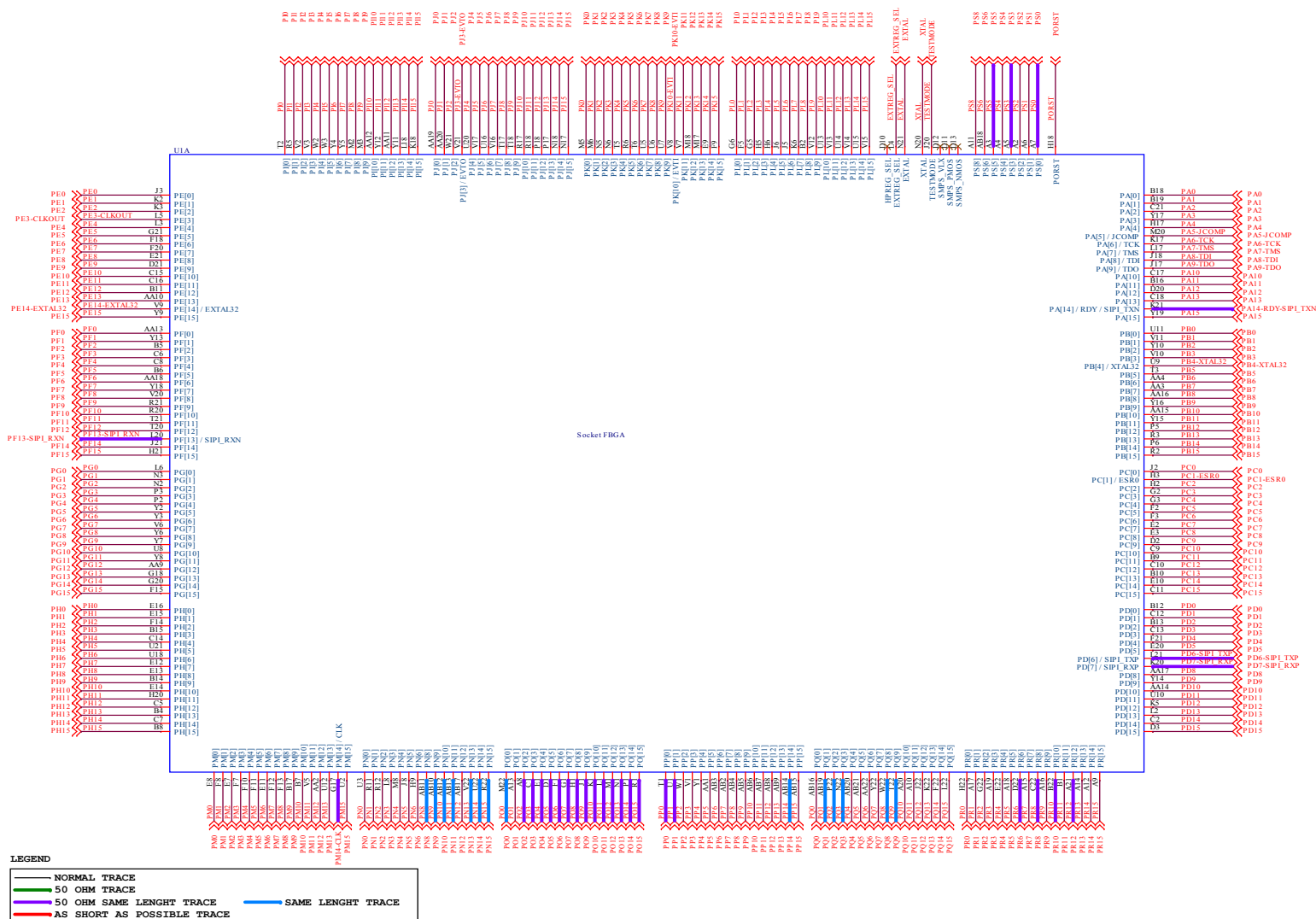


Figure 14. Debug connectors



JTAG, NEXUS & LFAST

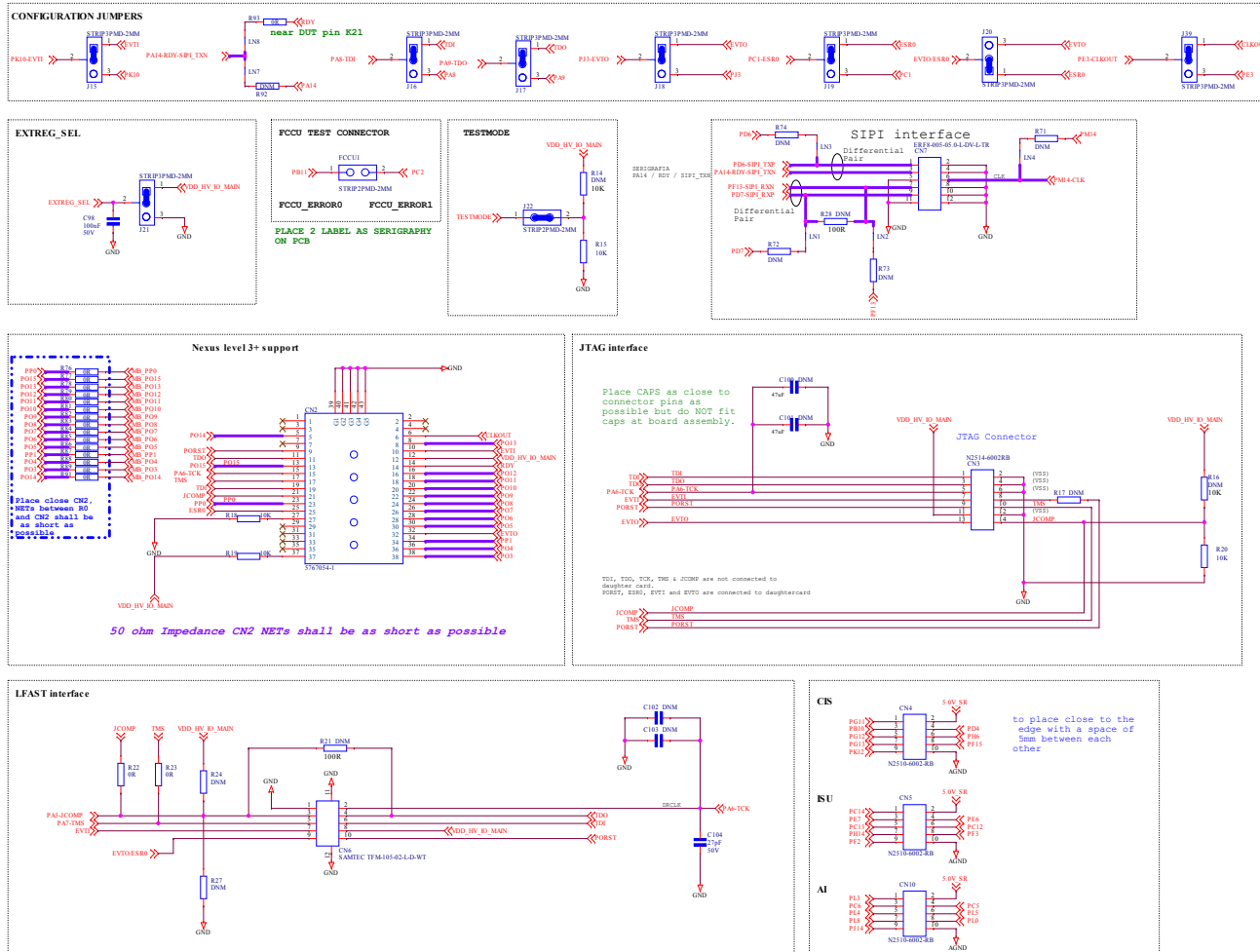
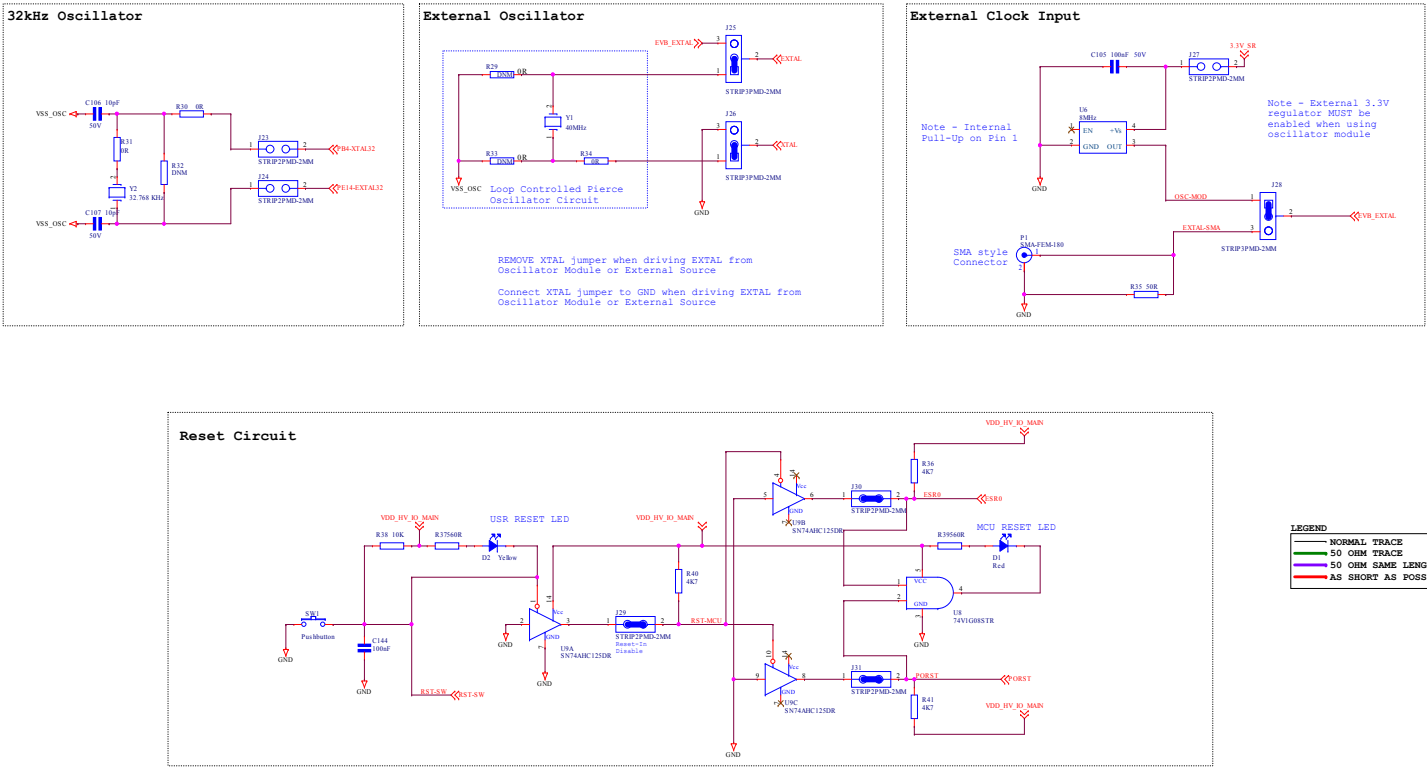
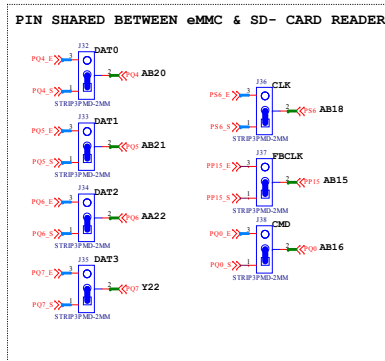
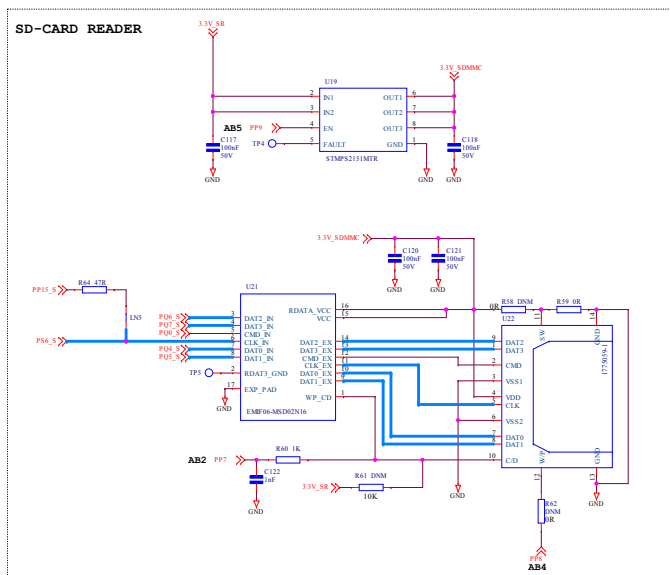


Figure 15. Clock and reset

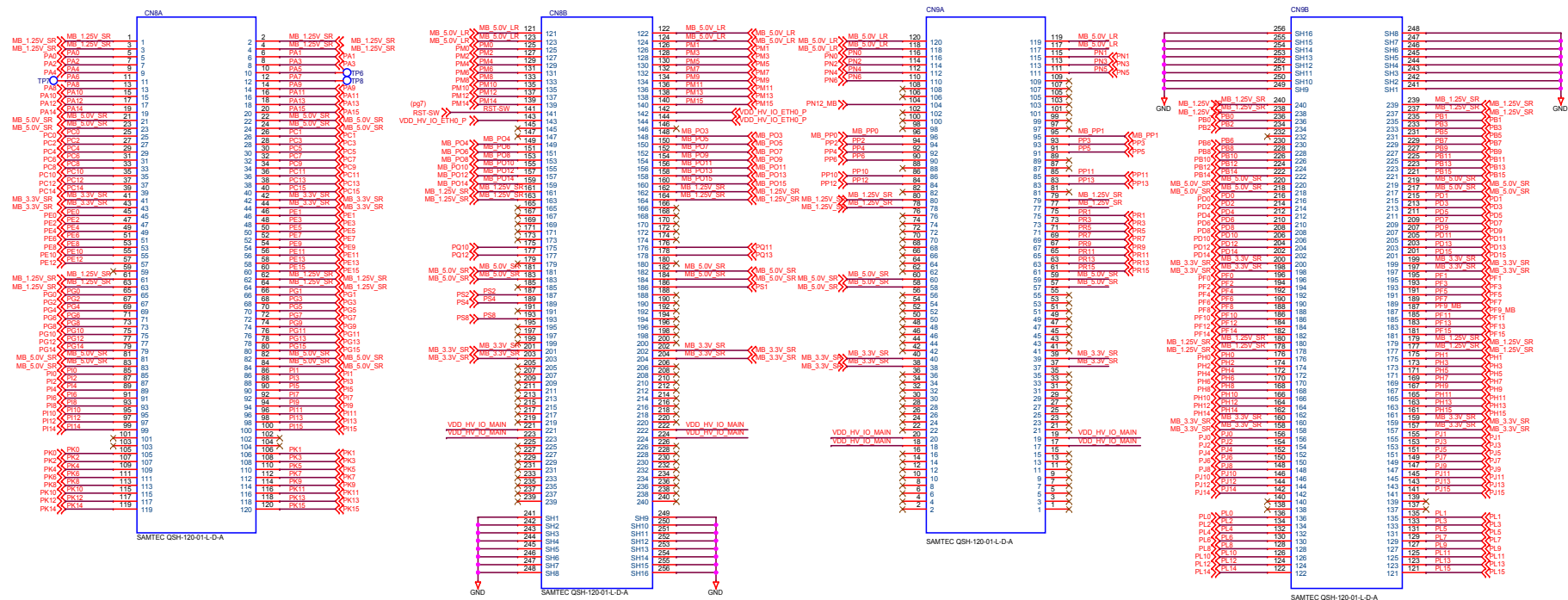






LEGEND

	NORMAL TRACE		SAME LENGHT TRACE
	50 OHM TRACE		
	50 OHM SAME LENGHT TRACE		
	AS SHORT AS POSSIBLE TRACE		



Revision history

Table 13. Document revision history

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

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