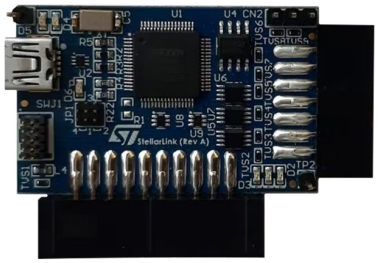


StellarLINK Circuit Debugger Programmer Owner's Manual

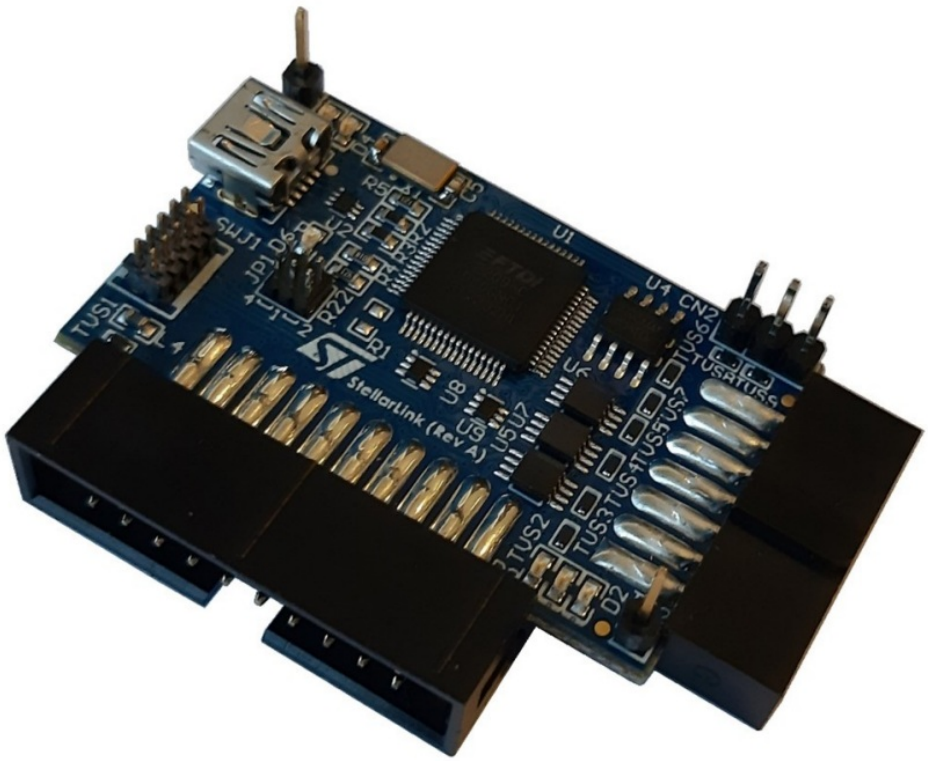
UM3099
User manual
How to use the StellarLINK

Contents

Introduction

The StellarLINK is an in-circuit debugger/programmer for the Stellar microcontrollers families and for the SPC5x microcontroller families.

Figure 1. **StellarLINK**



Note: picture is not contractual.

Overview

The StellarLINK adapter is a USB/JTAG debugger dongle for Stellar devices and for SPC5x devices. It is compliant with the IEEE 1149.1 JTAG protocol.
The StellarLINK adapter enables application run and debugging on Stellar boards and on SPC5x boards and it provides NVM programming (erase/program/verify).

Figure 2. **StellarLINK top view**

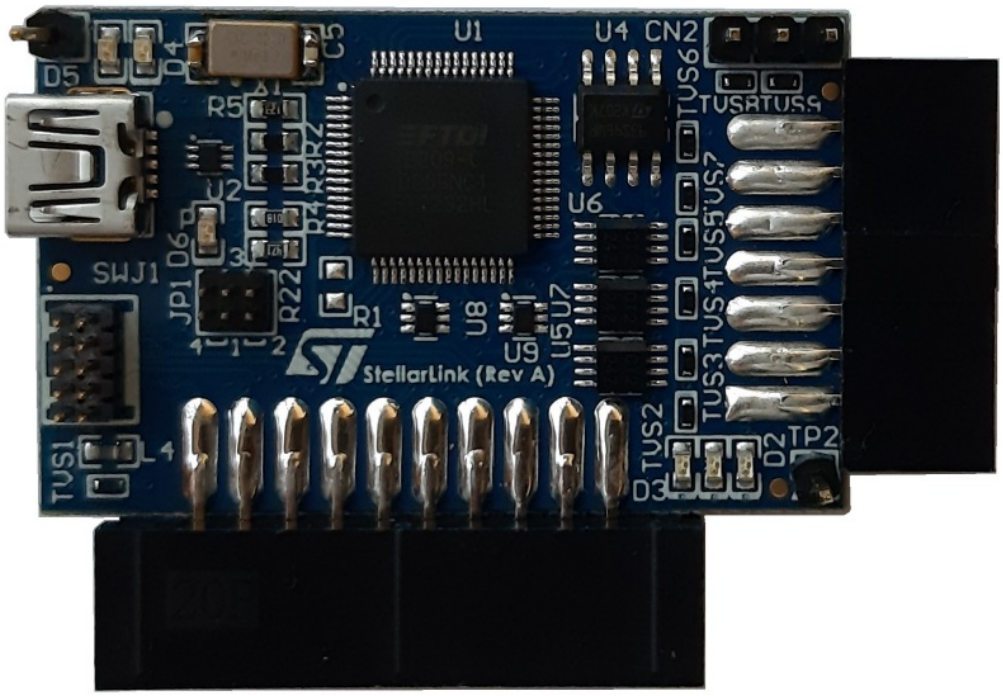
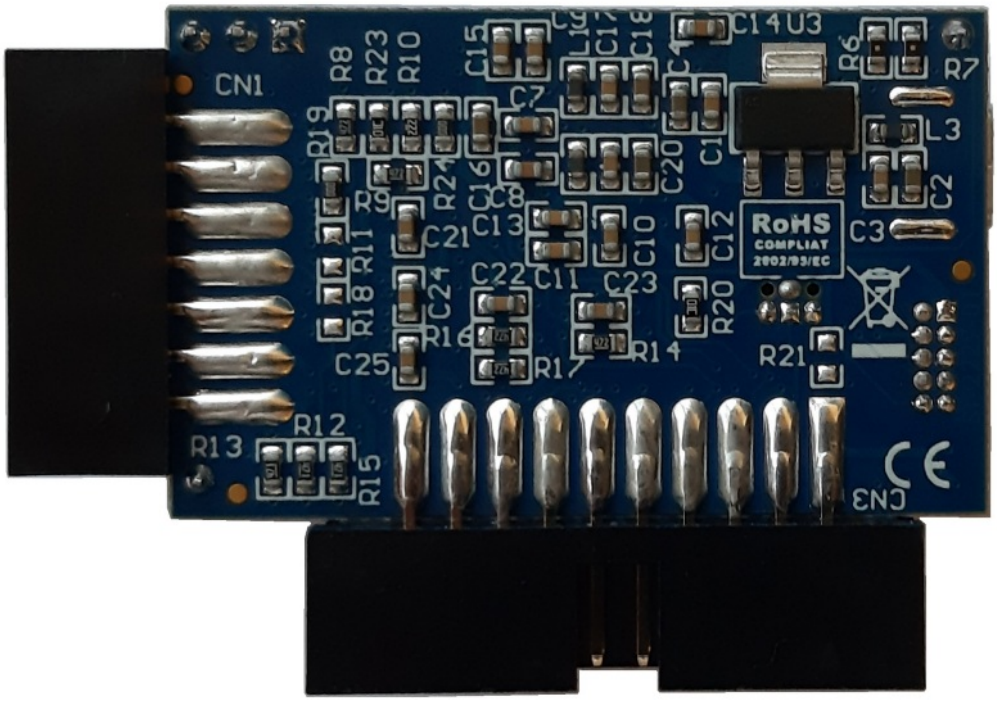


Figure 3. **StellarLINK bottom view**



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.

Handling precautions

Please take care to handle the package content in order to prevent electrostatic discharge.
Before the EVB is used or the 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.

Hardware description

4.1 Hardware features

The StellarLINK has the following features:

- USB/JTAG debugger dongle
- 5 V power supplied by a mini-USB connector
- Enables application run and debugging on Stellar devices and on SPC5x devices
- Compliant with IEEE 1149.1 JTAG protocol
- Integrates serial port connection via USB interface (virtual COM)
- Provides NVM programming (erase/program/verify)
- Connectors:
  – 20-pin Arm® connector for JTAG/Main DAP interface
  – 10-pin header connector for JTAG/Main DAP interface
  – 14-pin header connector for JTAG interface
  – 3-pin header connector for UART interface
- Status LEDs to indicate target's IO voltage, connection state, and running state
- Operating temperature range: from 0 to 50 °C

RELATED LINKS
5 Hardware configuration on page 7

4.2 Hardware dimensions

The StellarLINK has the following dimensions:

- Board dimension: 54 mm x 38 mm x 15 mm

Hardware configuration

The StellarLINK is a USB adapter based on an FTDI FT2232HL interface chip.
The user EEPROM is programmed with a unique serial number.

5.1 Connectors

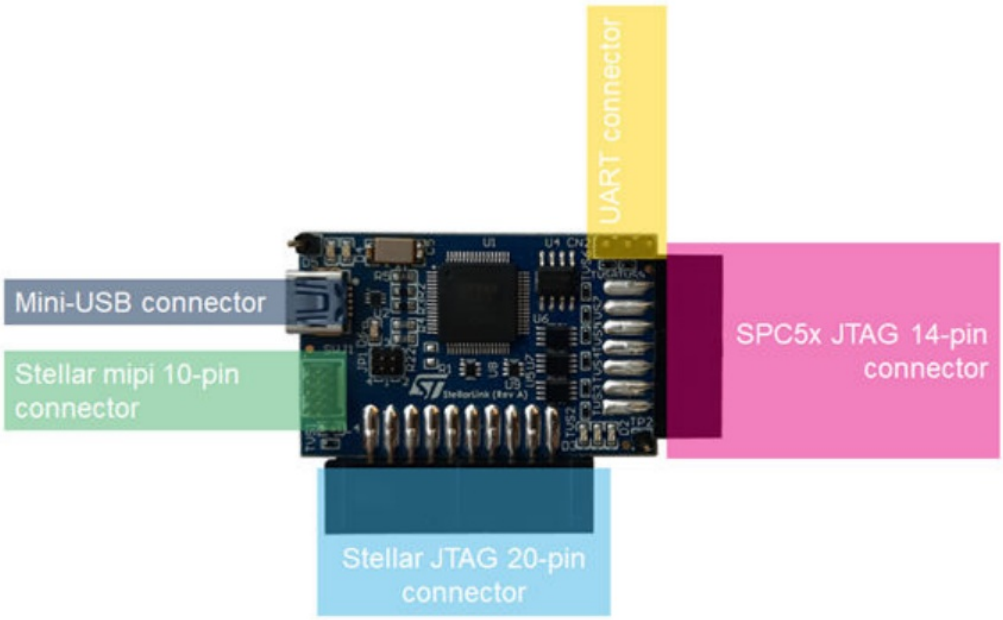
The following table describes the connectors present in the StellarLINK board.

Table 1. Connectors

Connector	Description	Position
P1	Mini-USB female connector	Top side A2
SWJ1	10-pin header connector for JTAG/Main DAP interface	Top side A3
CN1	14-pin header connector for JTAG interface	Top side D2-D3
CN2	3-pin header connector for UART interface	Top side D1
CN3	20-pin Arm connector for JTAG/Main DAP interface	Top side B4-C4

The following picture shows the position of the connectors available in the StellarLINK adapter.

Figure 4. StellarLINK connectors



RELATED LINKS
6 Layout overview on page 11
7 BOM on page 13

5.1.1 SWJ1

The following table describes the SWJ1 pinout.
Table 2. SWJ1 pinout

Pin	Description
1	VIN
2	TMS
3	GND
4	TCK
7	GND
5	GND
6	TDO
8	TDI
9	GND
10	SRST

RELATED LINKS
7 BOM on page 13

5.1.2 CN1

The following table describes the CN1 pinout.

Pin	Description
1	TDI
2	GND
3	TDO
4	GND
7	TCK
5	GND
6	USERID 0
8	USERID 1
9	SRST#
10	TMS
11	VIN
12	N.C.
13	N.C.
14	TRST#

RELATED LINKS
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5.1.3 CN2

The following table describes the CN2 pinout.

Table 4. CN2 pinout

Pin	Description
1	UART_RX
2	UART_TX
3	GND

RELATED LINKS

7 BOM on page 13

5.1.4 CN3

The following table describes the CN3 pinout.

Table 5. CN3 pinout

Pin	Description
1	VIN
2	N.C. (mounting R21 connected to VIN)
3	TRSTN
4	GND
5	TDI
6	GND
7	TMS
8	GND
9	TCK
10	GND
11	N.C.
12	GND
13	TDO
14	GND#
15	SRST#
16	GND
17	N.C.
18	GND
19	N.C.
20	GND

RELATED LINKS
7 BOM on page 13

5.2 LEDs

The following table describes the connectors present in the StellarLINK board.

Table 6. LEDs

Connector	Description	Position
D1	Target system reset LED	Top side D4
D2	User LED	Top side D4
D3	Target's IO voltage LED	Top side D4
D4	UART Rx LED	Top side A1
D5	UART Tx LED	Top side A1
D6	Power on LED	Top side A2

RELATED LINKS
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7 BOM on page 13

5.3 Jumpers

The following table describes the jumpers present in the StellarLINK board.

Table 7. Jumpers

Connector	Description	Default value	Position
JP1	TRSTN target signal configuration • 1-2: Connected to a 10K ohm pullup r esistor • 1-3: Connected to the TRST from FT DI • 2-3: Connected to GND	1-3	Top side A3

RELATED LINKS
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Layout overview

Figure 5. StellarLINK top layer

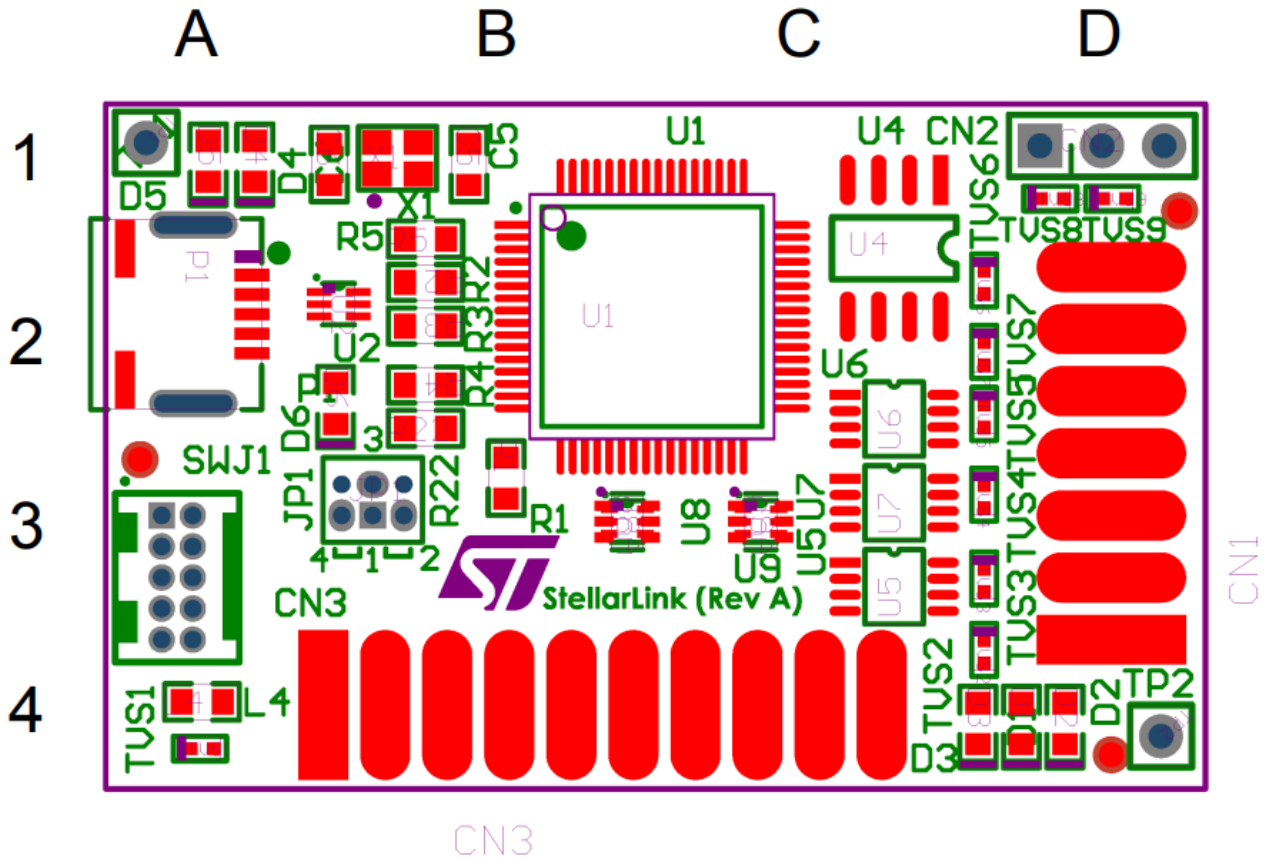
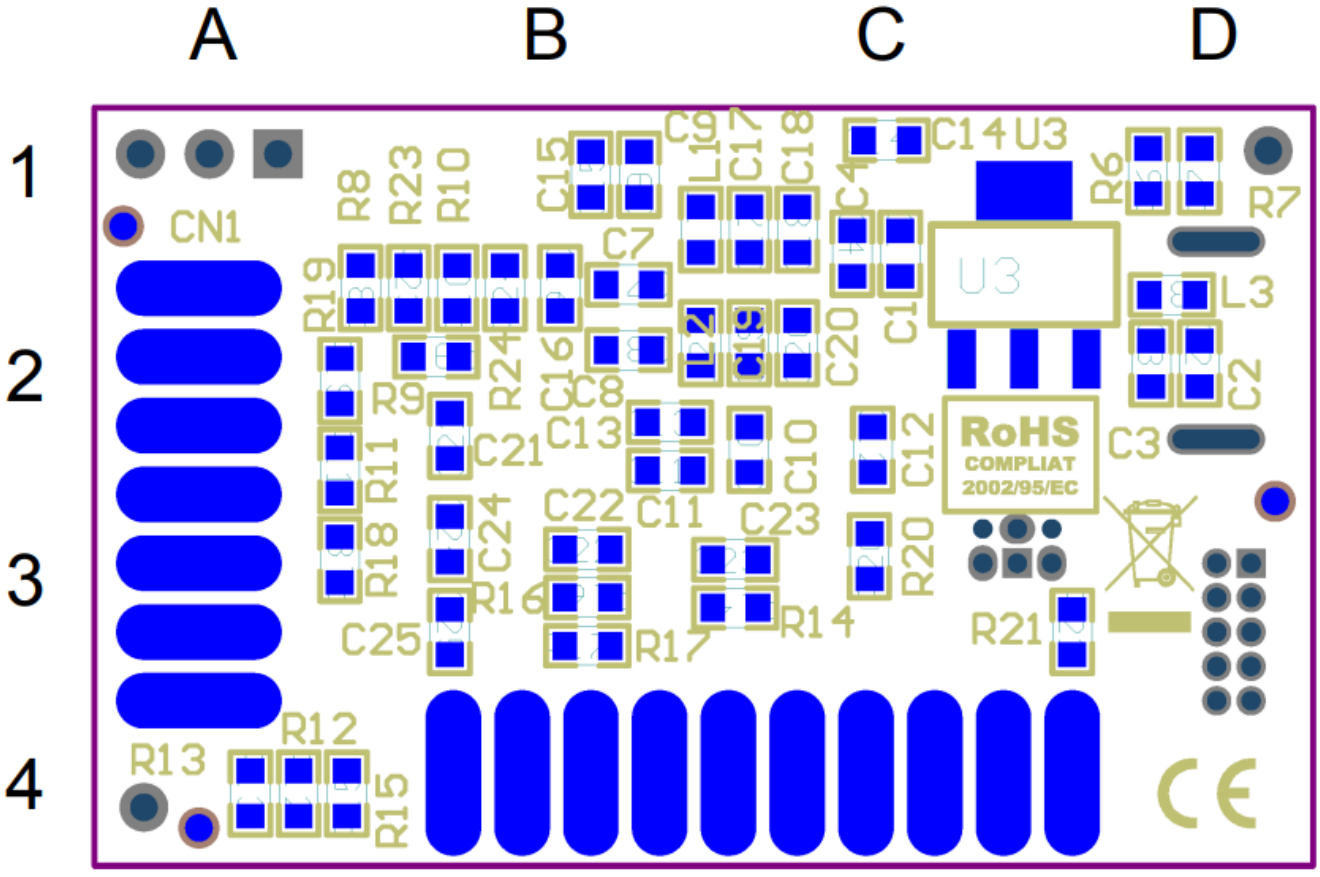


Figure 6. StellarLINK bottom layer



BOM

Table 8. BOM

#	Item	Qty	Value	Mounting option	Description	Footprint
1	C1, C3, C7, C8, C9, C10, C11, C12, C13, C14, C15, C17, C19, C21, C22, C23, C24, C25	18	100nF		Capacitor X7R – 0603	0603C
2	C2, C4	2	10µF		Capacitor X7R – 0603	0603C
3	C5, C6	2	12pF		C0G ceramic multilayer capacitor	0603C
4	C16, C18, C20	3	4µ7		Capacitor X7R – 0603	0603C
5	CN1	1	Header 7X2 female		Header, 7-Pin, dual row (6+2.5+10 mm)	C_EDGE7X2_254
6	CN2	1		Do not populate	Header connector, PCB Mount, recent, 3 contacts, pin, 0.1 pitch, pc tail terminal	STP3X1
7	CN3	1	ARM20		Conn Flat Male 20 pins, straight low profile	C_EDGE10X2_254
8	D1, D2, D3, D6	4	KP-1608SGC		LED green	LED_0603
9	D4	1	KP-1608SGC		LED green	LED_0603
10	D5	1	KP-1608SGC		LED green	LED_0603
11	JP1	1	Header 3×2 + jumper		Jumper 4×2.54_Closed_V	STP3X2_P50_JMP3W
12	L1, L2, L3, L4	4	74279267		Ferrite bead 0603 60Ohm 500mA	0603
13	P1	1	USB Port_B		USB-MINI_B	HRS_UX60SC-MB-5S8
14	R1, R11, R18, R21	4	0R	Do not populate	Resistor 0603	0603R
15	R2, R3	2	10R		Resistor 0603	0603R

16	R4	1	1k		Resistor 0603	0603R
17	R5	1	12k		Resistor 0603	0603R
18	R6, R7	2			Res thick film 060 3 470 ohm 1% 1/4 W	0603R
19	R8, R9, R14, R1 6, R17	5	4k7		Resistor 0603	0603R
20	R10	1	2k2		Resistor 0603	0603R
21	R12, R1 3, R15, R22	4	470		Resistor 0603	0603R
22	R19, R2 4	2	0R		Resistor 0603	0603R

#	Item	Qty	Value	Mounting option	Description	Footprint
23	R20, R2 3	2	10k		Resistor 0603	0603R
24	SWJ1	1	SAM8798-ND		Debug connector 5×2 1.27mm	SAMTEC_FTSH-105-01-L-D
25	TP1	1	90120-0921	Do not po pulate	Headers	TP
26	TP2	1	90120-0921	Do not po pulate	Headers	TP
27	TVS1, T VS2, TV S3, TVS 4, TVS5, TVS6, T VS7, TV S8, TVS 9	9	5.0V		ESD suppressor WE- VE, Vdc=5.0 V	SOD882T
28	U1	1	FT2232HL		FT2232HL	TQFP50P1000X1000X100-64N
29	U2	1	USBLC6-2P6		ESD protection	SOT666
30	U3	1	LD1117S33TR		Low drop positive voltage regulator	SOT223

31	U4	1	M93S46XS		1K (x16) serial microwire bus EEPROM with Block protection	SO-8
32	U5, U6, U7	3	SN74LVC2T45DCTR		Dual-Bit dual-supply bus transceiver	SM8
33	U8, U9	2	SN74LVC1T45DCK		Single-Bit dual-supply bus transceiver	SOT563
34	U8A, U9A	2				SC70-6
35	X1	1	12 MHz		ECS crystals 12MHz,CL 12,TOL +/-25 ppm, STAB +/-30 ppm,-40 +85 C,ESR 150O	ECS-120-12-36-AGN-TR3

Schematics

Figure 7. **Block diagram**

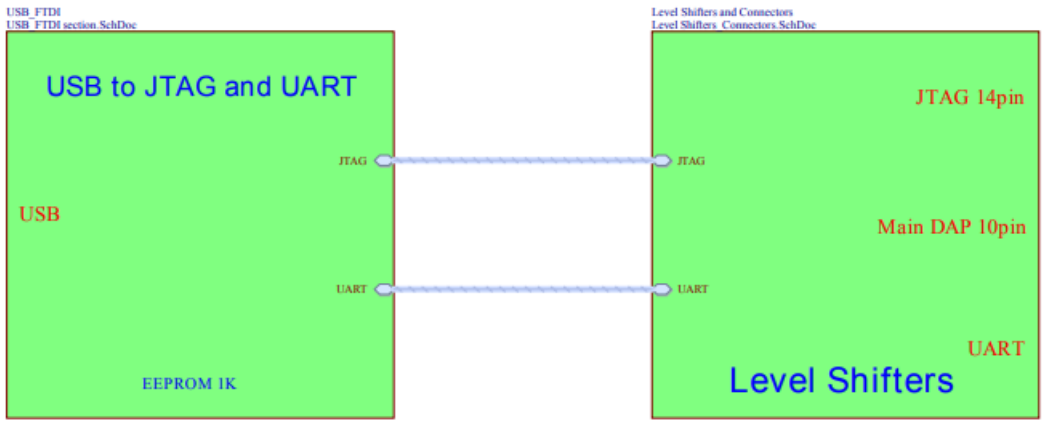


Figure 8. **USB and FTDI section**

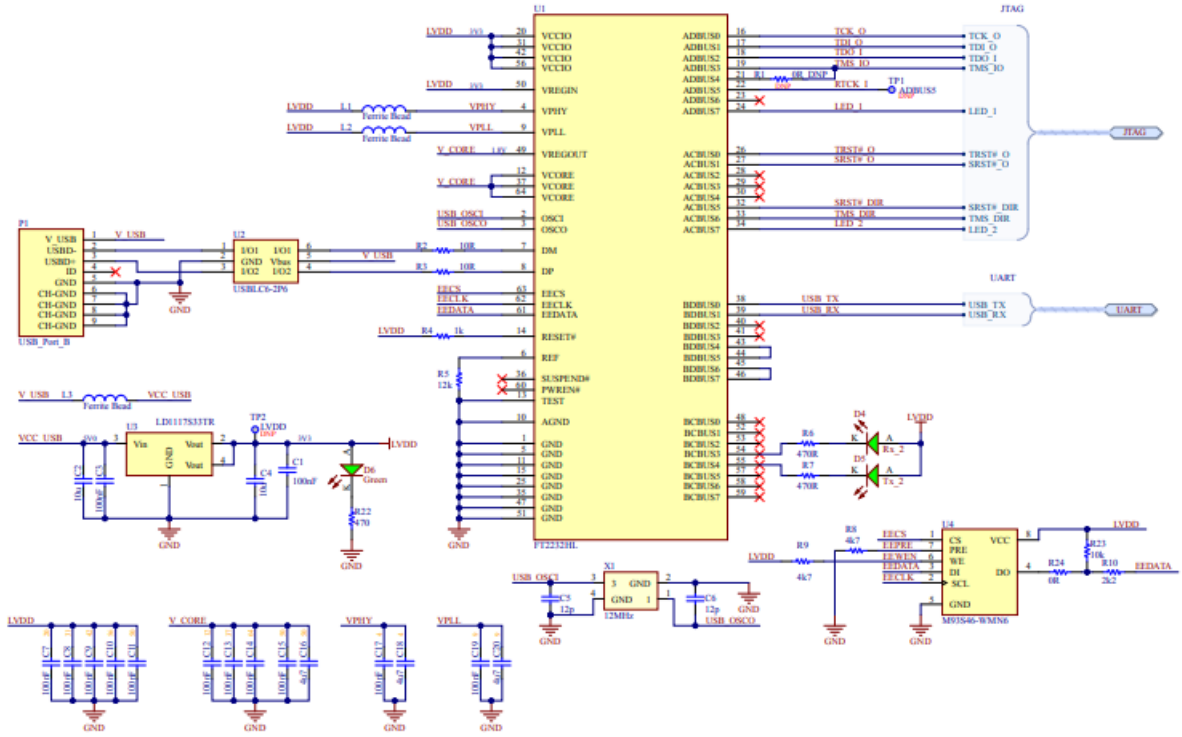
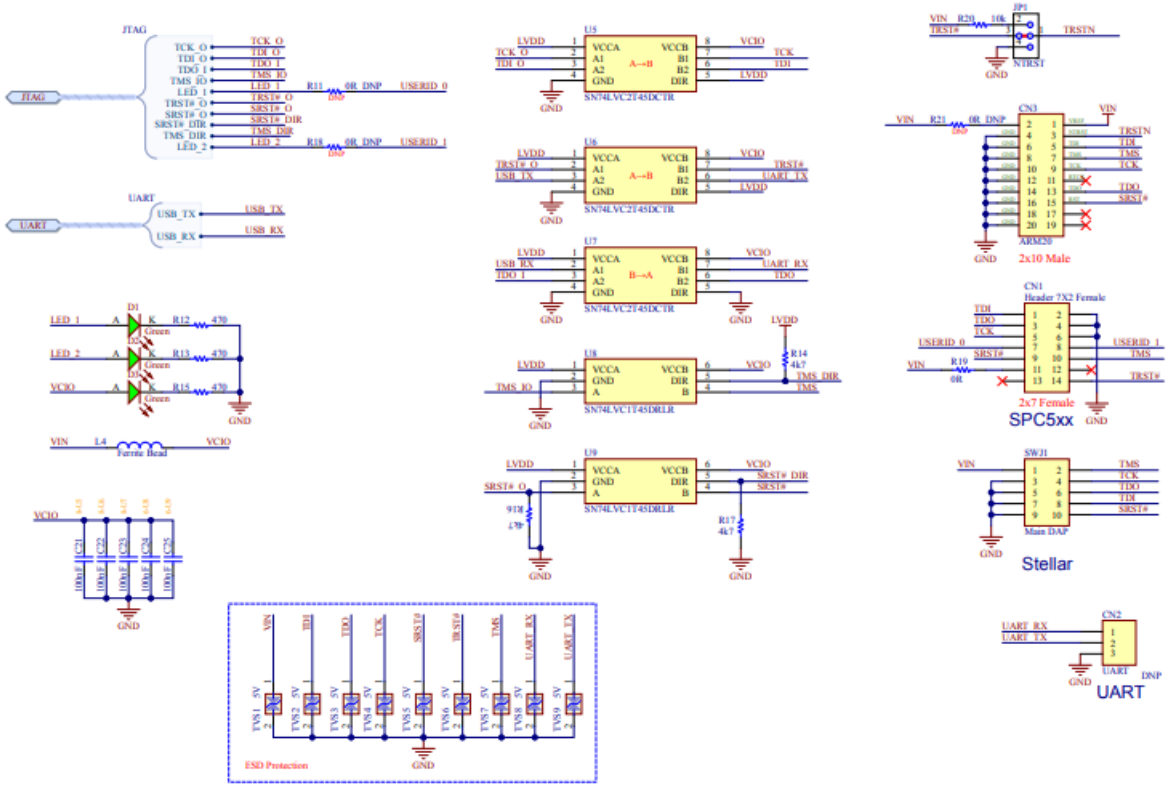


Figure 9. **Level shifters and connectors**



Revision history

Table 9. Document revision history

Date	Revision	Changes
07-Nov-2022	1	Initial release.
20-Feb-2023	2	Confidentiality level changed from restricted to public.

Documents / Resources

	**ST StellarLINK Circuit Debugger Programmer** [pdf] Owner's Manual StellarLINK Circuit Debugger Programmer, StellarLINK, Circuit Debugger Programmer, Debugger Programmer, Programmer

References

- **STMicroelectronics: Our technology starts with you**
- **STMicroelectronics Trademark List - STMicroelectronics**