

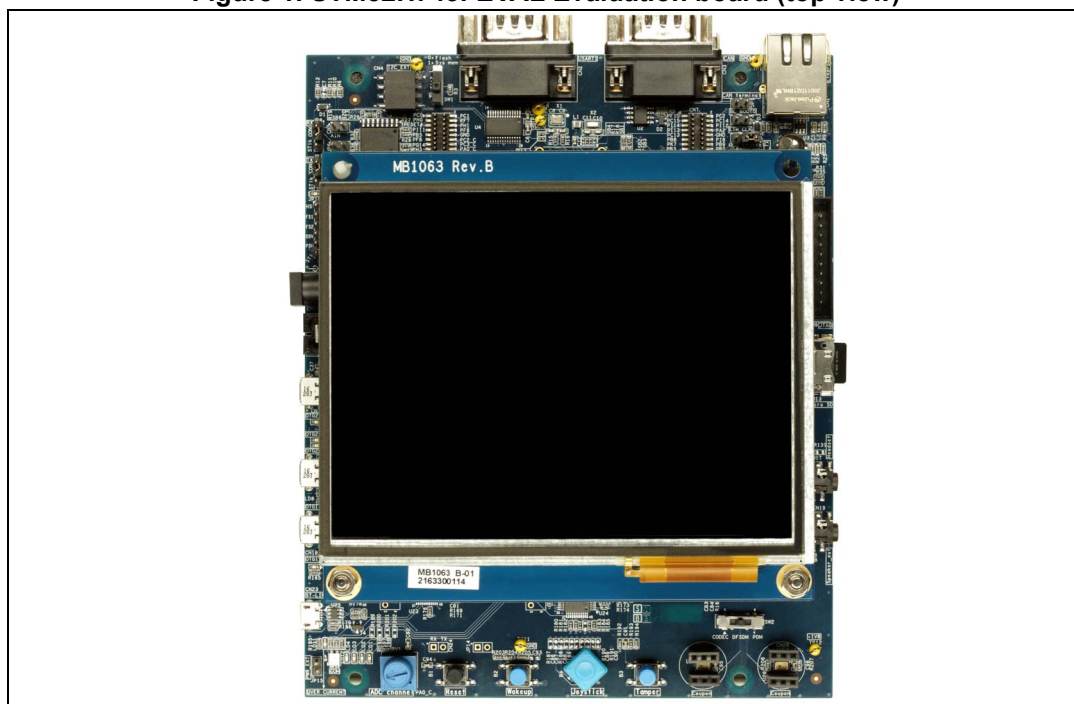
Evaluation board with STM32H743XI MCU

Introduction

The STM32H743I-EVAL Evaluation board is a high-end development platform for the ARM® Cortex®-M7-based STM32H743XI microcontroller. The STM32H743I-EVAL Evaluation board provides access to all the STM32 peripherals for user applications and includes an embedded ST-LINK debugger/programmer. The full range of the hardware features on the STM32H743I-EVAL Evaluation board, helps to evaluate all the peripherals (USB OTG HS and FS, Ethernet, FD-CAN, USART, Audio DAC and ADC, digital microphone, SRAM, SDRAM, NOR Flash, Twin Quad-SPI Flash, microSD™ 3.0 card and 5.7" 640x480 TFT color LCD with touch screen) and to develop applications.

The expansion connectors provide an easy way to add specialized features, while ETM trace is supported through external probes.

Figure 1. STM32H743I-EVAL Evaluation board (top view)



1. Picture is not contractual.

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1 Features

- STM32H743XIH6 microcontroller with 2 Mbytes of Flash memory and 1 Mbyte of RAM in TFBGA240+25 package
- 5.7" 640x480 TFT-color LCD with touch screen
- Ethernet compliant with IEEE-802.3-2002
- USB OTG HS and FS
- I²C compatible serial interface
- RTC with rechargeable backup battery
- SAI Audio DAC
- ST-MEMS digital microphones
- 8-Gbyte (or more) SDIO3.0 interface microSD™ card
- 8Mx32-bit SDRAM, 1Mx16bit SRAM and 8Mx16-bit NOR Flash
- 1 1-Gbit Twin Quad-SPI NOR Flash memory or two 512Mb Quad-SPI NOR Flash memories
- Potentiometer
- 4 colored LEDs
- Reset, wakeup, tamper or key buttons
- Joystick with 4-direction control and selector
- Board connectors
 - Power jack
 - 3 USB with Micro-AB
 - RS-232 communications
 - Ethernet RJ45
 - FD-CAN compliant connection
 - Stereo headset jack including analog microphone input
 - 2 audio jacks for external speakers
 - microSD™ card
 - JTAG/SWD and ETM trace
- Board expansion connectors:
 - Extension connectors and memory connectors for daughterboard or wire-wrap board
- Flexible power-supply options: ST-LINK USB V_{BUS} or external sources
- On-board ST-LINK/V2-1 debugger/programmer with USB re-enumeration capability: mass storage, virtual COM port and debug port
- Comprehensive free software libraries and examples available with the STM32Cube package

2 Product marking

Evaluation tools marked as “ES” or “E” are not yet qualified and therefore not ready to be used as reference design or in production. Any consequences deriving from such usage will not be at ST charge. In no event, ST will be liable for any customer usage of these engineering sample tools as reference design or in production.

“E” or “ES” marking examples of location:

- On the targeted STM32 that is soldered on the board (for illustration of STM32 marking, refer to the STM32 datasheet “Package information” paragraph at the www.st.com website).

Next to the evaluation tool ordering part number that is stuck or silk-screen printed on the board.

3 System requirements

- Windows® OS (XP, 7, 8 and 10), Linux® or MacOS™
- USB Type-A to Micro-B cable

4 Development toolchains

- ARM® Keil®: MDK-ARM^(a)
- IAR™: EWARM^(a)
- GCC-based IDEs: free SW4STM32 from AC6

5 Demonstration software

The demonstration software is preloaded in the STM32H743XI Flash memory for easy demonstration of the device peripherals in standalone mode. The latest versions of the demonstration source code and associated documentation can be downloaded from the www.st.com website.

a. On Windows® only.

6 Ordering information

To order the STM32H743I-EVAL Evaluation board, refer to [Table 1](#):

Table 1. Ordering information

Order code	Target STM32
STM32H743I-EVAL	STM32H743XI

7 Delivery recommendations

Some verifications are needed before using the Evaluation board for the first time, to make sure that no damage occurred during shipment and that no components are unplugged or lost.

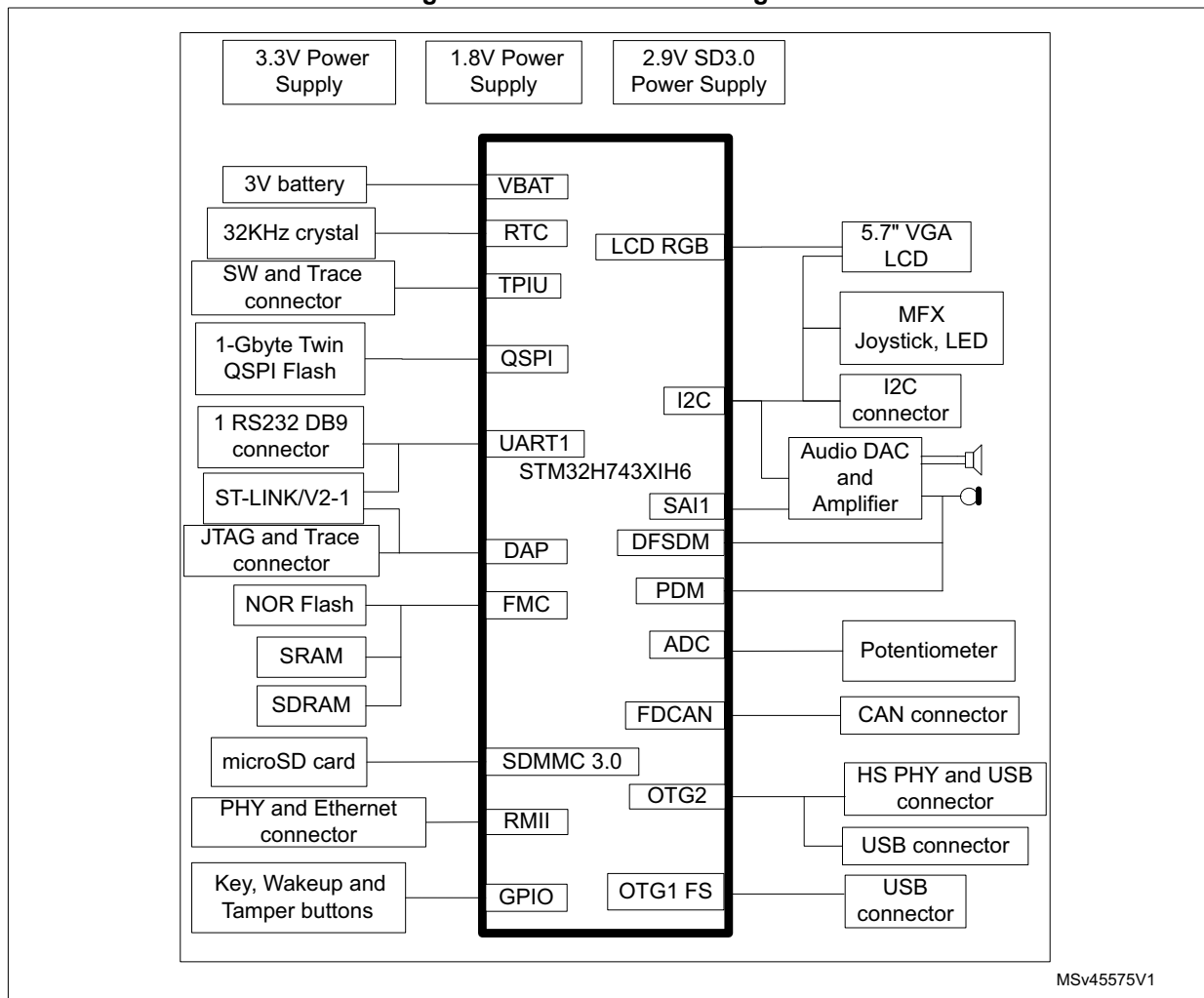
When the board is extracted from its plastic bag, check that no component remains in the bag. The main component to verify is the microSD card that may have been ejected from the connector CN13 (right side of the board).

Caution: There is an explosion risk if the battery is replaced by an incorrect one. Make sure to dispose of used batteries according to the instructions.

8 Hardware layout and configuration

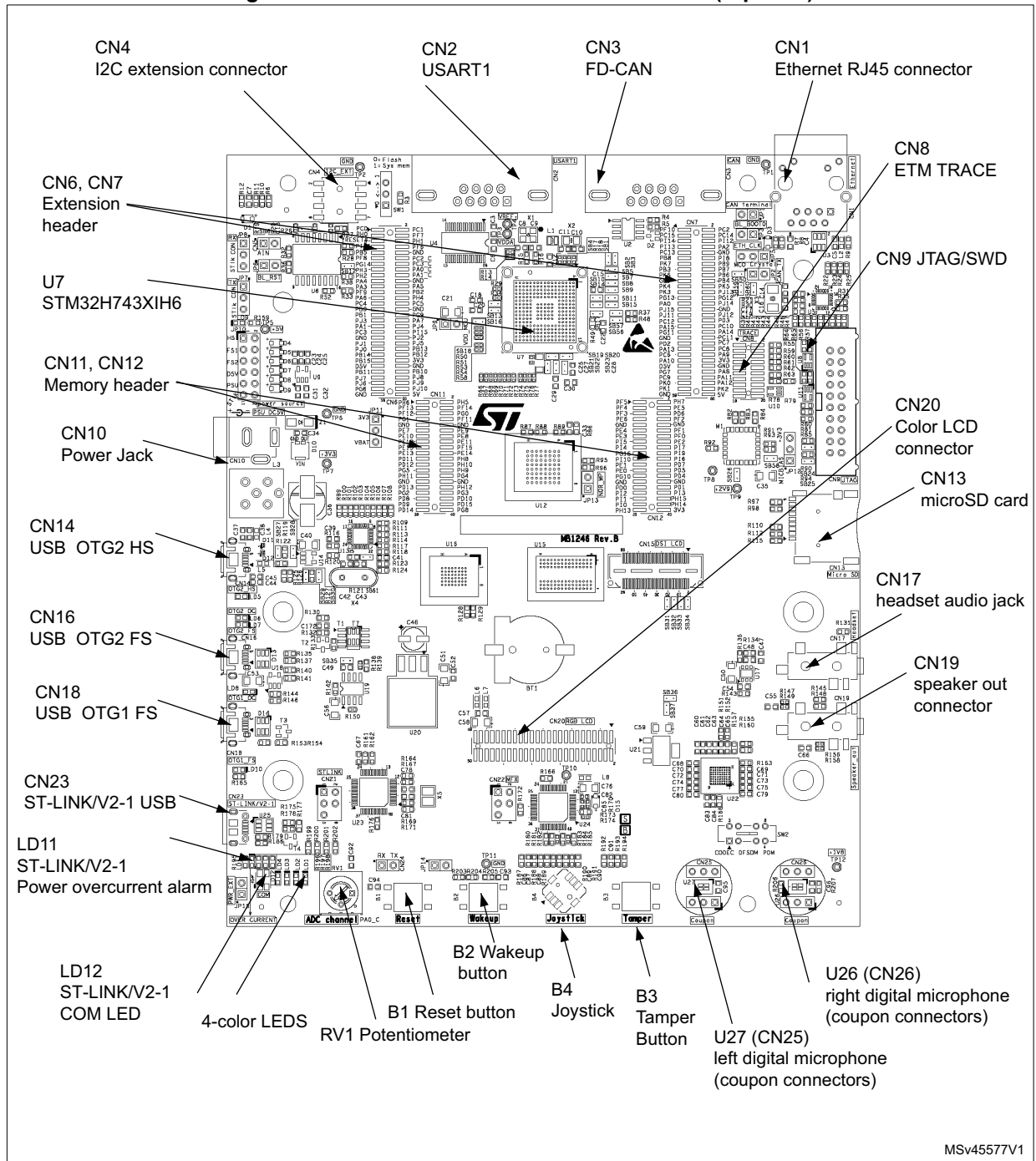
The STM32H743I-EVAL Evaluation board is designed around the STM32H743XIH6 (240+25-pin TFBGA package) microcontroller. The hardware block diagram (see [Figure 2](#)) illustrates the connection between STM32H743XIH6 and the peripherals (SDRAM, SRAM, NOR Flash, Twin Quad-SPI Flash, color LCD, USB OTG connectors, USART, Ethernet, Audio, FD-CAN, microSD 3.0 card and embedded ST-LINK). [Figure 3](#) helps users to locate these features on the Evaluation board. The mechanical dimensions of the board are showed in [Figure 4](#).

Figure 2. Hardware block diagram



8.1 STM32H743I-EVAL Evaluation board layout

Figure 3. STM32H743I-EVAL Evaluation board (top side)



8.2 STM32H743I-EVAL Evaluation board mechanical drawing

Figure 4 and Table 2 show the mechanical dimensions for the MB1246 board with the 5.7" LCD daughterboard.

Figure 4. STM32H743I-EVAL Evaluation board mechanical drawing

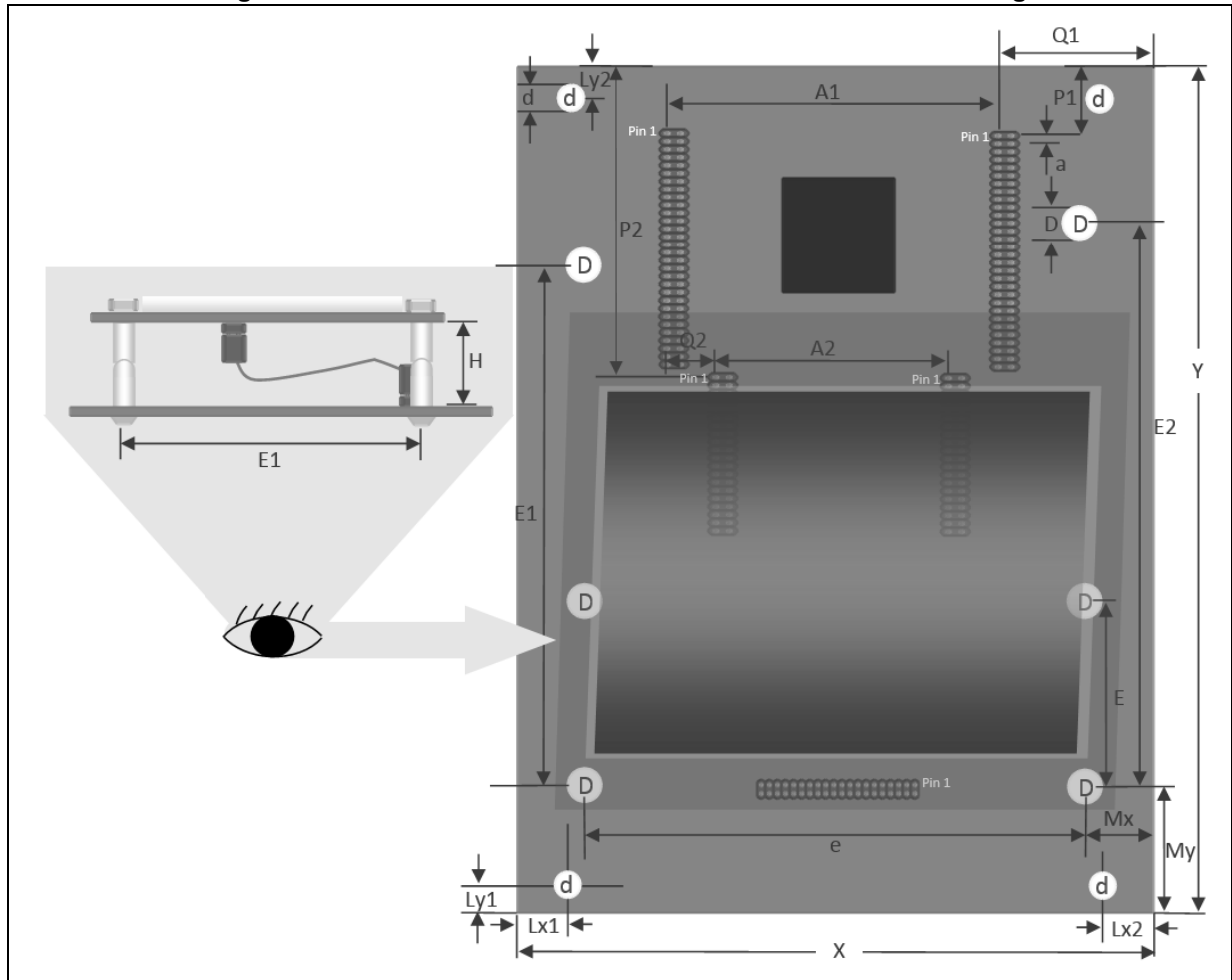


Table 2. Mechanical dimensions

Symbol	Size (mm)	Symbol	Size (mm)	Symbol	Size (mm)
A1	68.58	e	116.5	My	32.7
A2	48.62	H	8	P1	16.76
a	1.27	Lx1	13.7	P2	55.32
D	4.5	Lx2	25	Q1	39.23
d	3.5	Ly1	5	Q2	9.98
E1	107	Ly2	6.4	X	141.60
E2	114.18	Mx	12.5	Y	172.72

8.3 Embedded ST_LINK/V2-1

The ST-LINK/V2-1 programming and debugging tool is integrated on the STM32H743I-EVAL Evaluation board. Compared to ST-LINK/V2 the changes are listed below.

The new features supported on ST-LINK/V2-1 are:

- USB software re-enumeration
- Virtual COM port interface on USB
- Mass storage interface on USB
- USB power management request for more than 100mA power on USB

This feature is no more supported on ST-LINK/V2-1: SWIM interface

For all general information concerning debugging and programming features common between V2 and V2-1 versions, refer to *ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32 User manual* (UM1075) at the www.st.com website.

Note:1 It is possible to power the Evaluation board through CN23 (Embedded ST-LINK/V2-1 USB connector) even if an external tool is connected to CN8 (ETM Trace connector) or CN9 (External JTAG and SWD connector).

Note:2 ETM can only work at 50 MHz clock by default because ETM signals are shared with other peripherals. If better performance of ETM is required (84 MHz/98 MHz), R217, R230, R231, R234, R236, SB2, SB5, SB8, SB11, SB42, SB57 must be removed to reduce the stub on ETM signals. In this configuration SAI and PDM are not functional and NOR Flash and the address of SRAM are limited on A18.

Note:3 ETM trace function would be abnormal as SAI_SDB share the same pins with TRACE_D0, and TRACE_D0 would be forced high by SAI_SDB. When using ETM trace it is necessary to set ADCDAT1 pin (SAI_SDB signal of the STM32) of audio codec WM8994ECS/R (U22) by software to be tri-state.

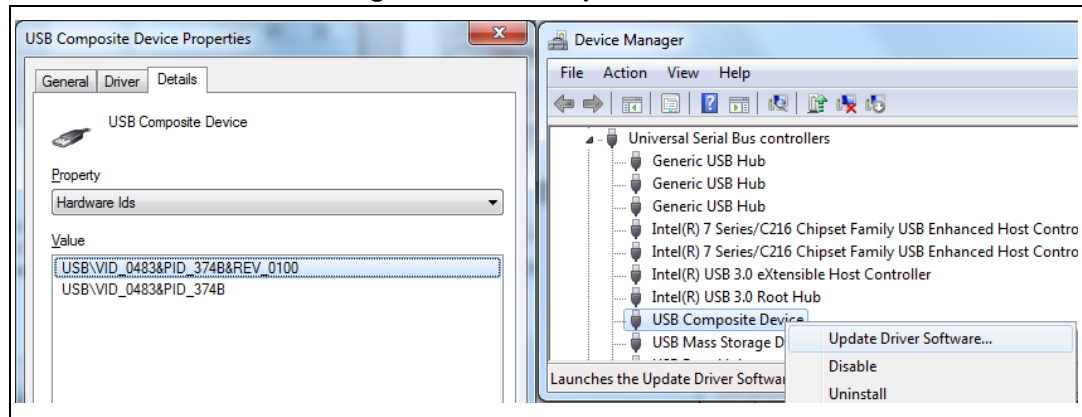
8.3.1 Drivers

Before connecting the STM32H743I-EVAL Evaluation board to a Windows® PC (XP, 7, 8 or 10) through a USB, a driver for the ST-LINK/V2-1 must be installed. It is available at the www.st.com website.

In case the STM32H743I-EVAL Evaluation board is connected to the PC before the driver is installed, some STM32H743I-EVAL interfaces may be declared as "unknown" in the PC device manager. To recover from this situation the user has to install the driver files, and update the driver of the connected device from the device manager (see [Figure 5](#)).

Note: Prefer using the "USB Composite Device" handle for a full recovery.

Figure 5. USB composite device



8.3.2 ST-LINK/V2-1 firmware upgrade

The ST-LINK/V2-1 embeds a firmware upgrade mechanism for in-situ upgrade through the USB port. As the firmware may evolve during the life time of the ST-LINK/V2-1 product (for example new functionalities, bug fixes, support for new microcontroller families), it is recommended to visit www.st.com before starting to use the STM32H743I-EVAL Evaluation board and periodically, to stay up-to-date with the latest firmware version.

8.4 Power Supply

The STM32H743I-EVAL Evaluation board is designed to be powered by 5 V DC power supply and is protected by PolyZen from wrong power plug-in events. It is possible to configure the Evaluation board to use any of the following six sources for the power supply:

- 5 V DC power adapter connected to CN10, the power jack on the board (Power Supply Unit on silk screen of JP10 (PSU)).
- 5 V DC power with 500 mA limitation from CN23, the USB Micro-B connector of ST-LINK/V2-1 (USB 5 V power source on silkscreen of JP10 (STIk)). If the USB enumeration succeeds (as explained below), the ST-LINK U5V power is enabled, by asserting the PWR_EN pin. This pin is connected to a power switch (ST890) that powers the board. This power switch features also a current limitation to protect the PC in case of short-circuit on the board. If overcurrent (more than 600 mA) happens on the board, the LED LD11 lights up.
- 5 V DC power with 500 mA limitation from CN14, the USB OTG2 HS Micro-AB connector (USB 5V power source on silkscreen of JP10 (HS)).
- 5 V DC power with 500 mA limitation from CN18, the USB OTG1 FS Micro-AB connector (USB 5V power source on silkscreen of JP10 (FS1)).
- 5 V DC power with 500 mA limitation from CN16, the USB OTG2 FS Micro-AB connector (USB 5V power source on silkscreen of JP10 (FS2)).
- 5 V DC power from CN6 and CN7, the extension connectors for daughterboard (daughterboard power source on silkscreen of JP10 (D5V)).

The STM32H743I-EVAL Evaluation board can be powered from the ST-LINK/V2-1 USB connector CN23 (U5V), but only the ST-LINK/V2-1 circuit has the power before USB enumeration, because the host PC only provides 100 mA to the board at that time. During the USB enumeration phase the STM32H743I-EVAL board requires 300 mA power from the

host PC. If the host is able to provide the required power, the enumeration succeeds, the power transistor U19 (ST890) is switched ON, the red LED LD9 is turned ON, and thus the STM32H743I-EVAL board is powered and can consume maximum 300 mA current. If the host PC is not able to provide the requested current, the enumeration fails. Therefore the STM32 part including the extension board is not powered. As a consequence the red LED LD9 remains turned OFF. In this case it is mandatory to use an external power supply to supply extra power.

E5V (from PSU) or D5V can be used as an external power supply in case the current consumption of the STM32H743I-EVAL board exceeds the allowed current on USB. In this condition it is still possible to use USB for communication, programming or debugging only, but it is mandatory to power the board first using E5V or D5V, and then connecting the USB cable to the PC. Proceeding this way ensures that the enumeration succeeds thanks to the external power source.

The following power sequence procedure must be respected:

1. Connect jumper JP10 for PSU or D5V side
2. Check that JP15 is removed
3. Connect the external power source to PSU or D5V (daughterboard mounted)
4. Check red LED LD9 is turned ON
5. Connect the PC to USB connector CN23

If this order is not respected, the board may be powered by V_{BUS} first then by E5V or D5V, and the following risks may be encountered:

1. If more than 300 mA current is needed by the board, the PC may be damaged or current can be limited by PC. As a consequence the board is not powered correctly.
2. 300 mA is requested at the enumeration phase (since JP15 must be OFF), so there is risk that the request is rejected and the enumeration does not succeed if PC cannot provide such current. Consequently the board is not powered (LED LD9 remains OFF).

Note: In case the STM32H743I-EVAL board is powered by a USB charger, there is no USB enumeration, so the led LD9 remains set to OFF permanently and the board is not powered. Only in this specific case the jumper JP15 needs to be set to ON, to allow the board to be powered anyway.

The power supply is configured by setting the related jumpers **JP9**, **JP10** and **JP11** as described in [Table 3](#).

Table 3. Power related jumpers

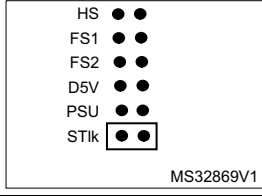
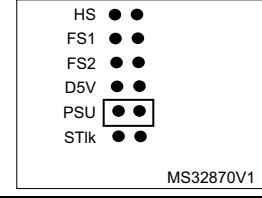
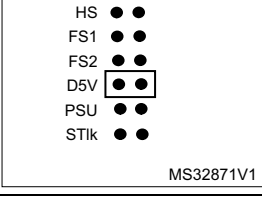
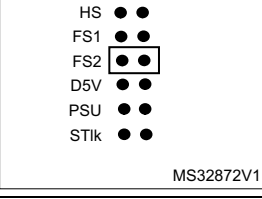
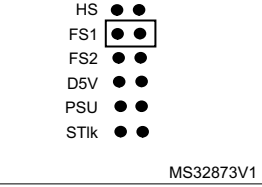
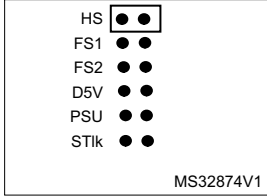
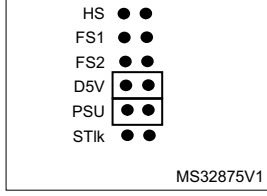
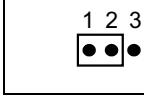
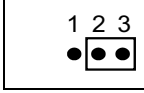
Jumper	Description
JP9	JP9 is used to measure STM32 current consumption manually by a multimeter. Default setting: Fitted
JP10	JP10 is used to select one of the six possible power supply resources. To supply the STM32H743I-EVAL board through the USB connector of the ST-LINK/V2-1 (CN23) set JP10 as shown to the right: (default setting)
	 <p style="text-align: right;">MS32869V1</p>
	To supply the STM32H743I-EVAL board through the jack (CN10), set JP10 as shown to the right:
	 <p style="text-align: right;">MS32870V1</p>
	To supply the STM32H743I-EVAL board through the daughterboard connectors (CN6 and CN7), set JP10 as shown to the right:
	 <p style="text-align: right;">MS32871V1</p>
To supply the STM32H743I-EVAL board through the USB OTG2 FS (CN16), set JP10 as shown to the right:	
 <p style="text-align: right;">MS32872V1</p>	
To supply the STM32H743I-EVAL board through the USB OTG1 FS (CN18), set JP10 as shown to the right:	
 <p style="text-align: right;">MS32873V1</p>	

Table 3. Power related jumpers (continued)

Jumper	Description
JP10	<p>To supply the STM32H743I-EVAL board through the USB OTG2 HS (CN14), set JP10 as shown to the right:</p>  <p style="text-align: right; font-size: small;">MS32874V1</p>
	<p>To supply the STM32H743I-EVAL board and the daughterboard connected on CN6 and CN7 through the power supply jack (CN10), set JP10 as shown to the right (daughterboard must not have its power supply connected)</p>  <p style="text-align: right; font-size: small;">MS32875V1</p>
JP11	<p>V_{BAT} is connected to +3.3 V when JP11 is set as shown to the right: (Default setting)</p> 
	<p>V_{BAT} is connected to the battery when JP11 is set as shown to the right:</p> 

The LED LD9 lights up when the STM32H743I-EVAL Evaluation board is powered by the 5 V correctly.

Note: To avoid the impact of USB PHY, Ethernet PHY and get precise results about current consumption on JP9, take into account the following cautions:

- 1) Remove JP5 to avoid Ethernet PHY influence
- 2) Configure USB HS PHY into low-power mode (Register Address=04, bit 6 in USB PHY)

8.5 Clock source

Two clock sources (X1 and X2) are available on the STM32H743I-EVAL Evaluation board for the STM32H743XI and RTC embedded. Other clock sources (X3 and X4) are used for their peripherals:

- X1, 25-MHz crystal for STM32H743XI, it can be disconnected by removing R15 and R16 when internal RC clock is used
- X2, 32-KHz crystal for embedded RTC
- X3, 25-MHz crystal for Ethernet PHY
- X4, 24-MHz crystal for USB OTG2 HS PHY

Table 4. 25-MHz crystal X1 related solder bridges

Solder bridge	Description
SB39	PH0 is connected to 25-MHz crystal when SB39 is open (Default setting).
	PH0 is connected to extension connector CN6 when SB39 is closed. In such case R15 must be removed to avoid disturbance due to the 25-MHz quartz.
SB40	PH1 is connected to 25-MHz crystal when SB40 is open (Default setting).
	PH1 is connected to extension connector CN6 when SB40 is closed. In such case R16 must be removed to avoid disturbance due to the 25-MHz quartz.

Table 5. 32 KHz crystal X2 related solder bridges

Solder bridge	Description
SB1	PC14 is connected to 32-KHz crystal when SB1 is open (Default setting).
	PC14 is connected to extension connector CN7 when SB1 is closed. In such case R18 must be removed to avoid disturbance due to the 32-KHz quartz.
SB4	PC15 is connected to 32-KHz crystal when SB4 is open (Default setting).
	PC15 is connected to extension connector CN7 when SB4 is closed. In such case R17 must be removed to avoid disturbance due to the 32-KHz quartz.

Note: For Ethernet clock and jumper JP5 configuration refer to [Section 8.15](#).

8.6 Reset sources

The reset signal of STM32H743I-EVAL Evaluation board is low active and the reset sources include:

- Reset button B1
- Debugging tools from JTAG/SWD connector CN9 and ETM trace connector CN8
- Daughterboard from CN6
- Embedded ST-LINK/V2-1
- RS232 connector CN2 for ISP.

Note: The jumper JP6 has to be closed for RESET handled by pin 8 of RS232 connector CN2 (CTS signal).

8.7 Boot option

The STM32H743I-EVAL Evaluation board can boot from:

- Embedded user Flash
- System memory with boot loader for ISP
- Embedded SRAM for debugging

The boot option is configured by setting the switch SW1 (BOOT) and the boot base address programmed in the BOOT_ADD0 and BOOT_ADD1 option bytes. The BOOT can be configured also through the RS232 connector CN2.

Table 6. Boot related switches

Switch configuration	Boot address option bytes	Boot space
<p>0<->1 SW1 (Default setting)</p>	BOOT_ADD0 [15:0]	CPU boot address defined by user option byte BOOT_ADD0[15:0] ST programmed value: Flash at 0x0800 0000.
<p>0<->1 SW1</p>	BOOT_ADD1 [15:0]	CPU boot address defined by user option byte BOOT_ADD1[15:0] ST programmed value: System boot loader at 0x0000 0000.

Table 7. Boot related jumpers

Jumper	Description
JP3	The Bootloader_BOOT0 is managed by pin 6 of connector CN2 (RS232 DSR signal) when JP3 is closed. This configuration is used for boot-loader application only. Default Setting: Not fitted

8.8 Audio




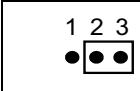
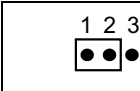
An audio codec WM8994ECS/R with 4 DACs and 2 ADCs inside is connected to the SAI interface of the STM32H743XI microcontroller to support the TDM feature on SAI port. This feature is able to implement audio recording on digital and analog microphones and audio playback of various audio streams on headphone and lineout at the same time.

It communicates with STM32H743XI through I2C1 bus which is shared with LCD and MFX (Multi Function eXpander).

The analog microphone on the headset is connected to the ADC of the WM8994ECS/R through the audio jack CN17. External speakers can be connected to WM8994ECS/R through the audio jack CN19.

Two digital microphones (ST-MEMS microphones) MP34DT01TR are on the STM32H743I-EVAL Evaluation board. They can be connected to either an audio codec DFSDM or to the PDM port of the STM32H743XI, by setting the switch SW2 shown in [Table 8](#). The coupon connectors CN25 and CN26 can be used to support ST-MEMS microphone STEVAL-MKI129V1 after removing SB54 and SB55 solder bridges.

Table 8. Audio related switch and jumper

Switch/ Jumper	Description
SW2	Digital microphone is connected to the audio codec when SW2 is set as shown to the right (Default setting): 
	Digital microphone is connected to the DFSDM port of STM32H743XI when SW2 is set as shown to the right: 
	Digital microphone is connected to the PDM port of STM32H743XI when SW2 is set as shown to the right: 
JP12	Digital microphone power source is connected to +3.3 V power when JP12 is set as shown to the right (Default setting): 
	Digital microphone power source is connected to MICBIAS1 from WM8994ECS/R when JP12 is set as shown to the right: 

Note:1 *I²C address of WM8994ECS/R is 0b0011010.*

Note:2 *PDM clock is on PE2 and it conflicts with SAI_CLK on PE2 by default. When PDM and SAI functions are used at the same time, SB57 must be removed and SB56 must be closed to move SAI_CLK to PG7.*

8.9 USB OTG1 FS

The STM32H743I-EVAL Evaluation board supports USB OTG1 full-speed communication through a USB Micro-AB connector (CN18) and USB power switch (U18) connected to V_{BUS}. The Evaluation board can be powered by this USB connection at 5 V DC with 500 mA current limitation.

A green LED LD10 lights up in one of these cases:

- Power switch (U18) is ON and the STM32H743I-EVAL board works as a USB host
- V_{BUS} is powered by another USB host when the STM32H743I-EVAL board works as a USB device.

The red LED LD8 lights up when an overcurrent occurs ($I_{V_{BUS}} > 500$ mA).

Note:1 The STM32H743I-EVAL board should be powered by an external power supply when using OTG function.

Note:2 JP2 and SB50 must be removed when using USB OTG FS as mentioned in [Table 11](#).

8.10 USB OTG2 HS and FS

The STM32H743I-EVAL Evaluation board supports USB OTG2:

- High-speed communication through a USB Micro-AB connector (CN14), USB high-speed PHY (U13) for high-speed function
- Full-speed communication through another USB Micro-AB connector (CN16)

The Evaluation board can be powered by these USB connectors (CN14 or CN16) at 5 V DC with 500 mA current limitation.

As several OTG2 FS signals are shared with the OTG2 HS ULPI bus and USART1, some PCB reworks are needed when using OTG2 FS (CN16) as shown in [Table 9](#).

Table 9. USB OTG2 and USART1 function configuration

Function	Mount	Remove
OTG2 HS-CN14 (Default)	R104,R105,SB27,SB30	R254,SB48,SB28,SB29
OTG2 FS-CN16	R254,SB48,SB28,SB29 SB47,SB49	R104,R105,SB27,SB30, SB46,SB51
USART1 (Default)	SB46,SB51	SB47,SB49

A USB power switch (U14) is also connected on V_{BUS} and provides power to either CN14 (with SB27 and SB30 closed and SB28 and SB29 open) or CN16 (with SB28 and SB29 closed and SB27 and SB30 open).

Green LED LD5 (for CN14) or LD7 (for CN16) lights up in one of these cases:

- Power switch (U14) is ON and the STM32H743I-EVAL board works as a USB host.
- V_{BUS} is powered by another USB host when the STM32H743I-EVAL board works as a USB device.

The red LED LD6 lights up when an overcurrent occurs ($I_{V_{BUS}} > 500$ mA).

Note: The STM32H743I-EVAL board should be powered by an external power supply when using OTG function.

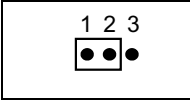
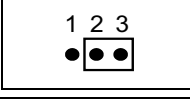
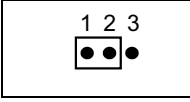
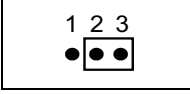
8.11 RS232

Communication through RS232 is supported by the D-type, 9-pins connector CN2, which is connected to the USART1 of the STM32H743XI on the STM32H743I-EVAL Evaluation

board. The signals Bootloader_RESET and Bootloader_BOOT0 are added on the RS232 connector CN2 for ISP support.

The USART1 of the STM32H743XI is shared with the RS232 of the ST-LINK/V2-1 controller. Connection is switched by setting JP7 and JP8.

Table 10. USART1 related jumpers

Jumper	Description
JP7	USART1_TX is connected to RS232 when JP7 is set as shown to the right (Default setting):
	
JP8	USART1_TX is connected to the USART_RX of the ST-LINK/V2-1 controller when JP7 is set as shown to the right:
	
JP8	USART1_RX is connected to RS232 when JP8 is set as shown to the right (Default setting):
	
JP8	USART1_RX is connected to the USART_TX of the ST-LINK/V2-1 controller when JP8 is set as shown to the right:
	

8.12 microSD card

The 8-Gbyte (or more) microSD card connected to the SDIO 3.0 port of the STM32H743XI microcontroller is available on the Evaluation board. Detection of the microSD card is managed by MFX GPIO15.

IP4856CX25/C (M1) is an SD 3.0-compliant, 6-bit-bidirectional, dual-voltage-level translator. It is implemented on the STM32H743I-EVAL board and it supports SD 3.0, SDR104, SDR50, DDR50, SDR25, SDR12 and SD 2.0 in high-speed (50 MHz) and default-speed (25 MHz) modes.

8.13 External I²C connector

The I2C1 bus of the STM32H743XI is connected to CN4 on the STM32H743I-EVAL. The I²C functional daughterboard can be mounted on the CN4 connector and accessed by the microcontroller through the I2C1 bus.

8.14 FD-CAN

The STM32H743I-EVAL Evaluation board supports one channel of the Flexible Data Rate CAN (FD-CAN) communication bus, based on the 3.3 V CAN transceiver.

The standby signal on the FD-CAN transceiver is controlled by PD3 of the STM32H743XI. Other FD-CAN signals are shared with USB OTG1 FS signals.

Table 11. CAN related jumpers and solder bridges

Jumper	Description
JP1	CAN terminal resistor is enabled when JP1 is fitted. Default setting: Not fitted
JP2	PA12 is connected with FDCAN TX signal when JP2 is fitted. Default setting: Not fitted
SB50	PA11 is connected with FDCAN RX signal when SB50 is closed. Default setting: Open

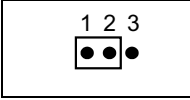
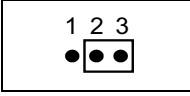
8.15 Ethernet

The STM32H743I-EVAL Evaluation board supports 10M/100M Ethernet communication by a PHY LAN8742A (U5) and integrated RJ45 connector (CN1). Ethernet PHY is connected to STM32H743XI through the RMII interface.

A 50-M reference clock can be generated by PHY with 25-M crystal or with 25-M MCO from STM32H743XI. These two resources can be selected by setting jumper JP5 as shown in [Table 12](#).

Table 12. Ethernet related jumpers

Jumper	Description
JP5	50M RMII reference clock is generated by an external crystal X3 when JP5 is set as shown to the right: (Default setting)
	50M RMII reference clock is generated by MCO at PA8 when JP5 is set as shown to the right:

8.16 Memories

An 8M x 32-bit SDRAM is connected to the SDRAM bank1 of the FMC interface of the STM32H743XI microcontroller.

A 1Mx16-bit SRAM is connected to the NOR/PSRAM2 bank1 of the FMC interface and both 8-bit and 16-bit accesses are allowed by BLN0 and BLN1, connected to BLE and BHE of SRAM respectively.

A 128-Mbit NOR Flash is connected to the NOR/PSRAM1 bank1 of the FMC interface. The 16-bit operation mode is selected by pull-up resistor connected to the BYTE pin of NOR Flash. The write protection can be enabled or disabled, depending on how the jumper JP13 is set, as showed in [Table 13](#).

Table 13. NOR Flash related jumpers

Jumper	Description
JP13	Write protection is enabled when JP13 is fitted while write protection is disabled when JP13 is not fitted. Default Setting: Not fitted

All signals for memory are also connected on memory connectors CN11 and CN12 for memory daughterboards.

Limitations can happen when using other peripherals:

1. FMC addressing limitation depending on number of trace data bus used (A18 max for 4 bit ETM to A21 max for 1 bit ETM)
2. FMC addresses limited to A18 when SAI used
3. FMC addresses limited to A22 when PDM is used

In such cases, serial resistors R236 (A19), R231 (A20), R217 (A21) and R230 (A22) should be removed. Thus memory addresses A19 to A22 are not connected to FMC and they are pulled down on the board. Memories can be addressed within a limited address range.

By default, all these serial resistors are soldered on the board. If A19 is required, it is necessary to configure (SAI_SDB) ADCDAT1 pin of audio codec WM8994ECS/R (U22) by software to be tri-state.

8.17 Twin Quad-SPI NOR Flash

The Quad-SPI Flash is implemented on the STM32H743XI microcontroller of the Evaluation board either as 1 Twin Quad-SPI NOR Flash (1-Gbit (2*512Mb)) memory or as 2 Quad-SPI NOR Flash (512Mb) memories.

The two dies in the Twin Quad-SPI Flash memory share the same clock and chip select signals of the STM32H743XI microcontroller.

8.18 Analog input

The two-pin header CN5 and 10 K ohm potentiometer RV1 is connected to PA0_C of STM32H743XI as analog input. A low-pass filter can be implemented by replacing R11 and C7 with the right value of resistor and capacitor as requested by the end-user application.

8.19 Display and input devices

Four general-purpose-color LEDs (LD 1, 2, 3 and 4) are available as display device. LD1 and LD3 are connected on STM32H743XI, LD2 and LD4 are connected on MFX.

The 4-direction joystick (B4) with selection, Wakeup (B2) and Tamper/key button (B3) are available as input devices.

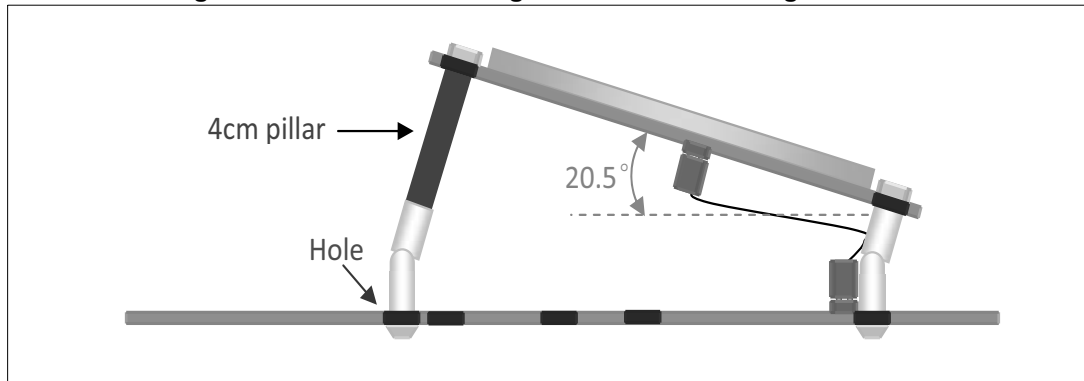
5.7" 640x480 TFT color LCD with capacitive touch panel is connected to the RGB LCD interface of the STM32H743XI microcontroller.

Table 14. LCD module connector (CN20)

Pin No.	Description	Pin connection	Pin No.	Description	Pin connection
1	GND	-	2	GND	-
3	R0	PI15	4	G0	PJ7
5	R1	PJ0	6	G1	PJ8
7	R2	PJ1	8	G2	PJ9
9	R3	PJ2	10	G3	PJ10
11	R4	PJ3	12	G4	PJ11
13	R5	PJ4	14	G5	PK0
15	R6	PJ5	16	G6	PK1
17	R7	PJ6	18	G7	PK2
19	GND	-	20	GND	-
21	B0	PJ12	22	ENB	PK7
23	B1	PJ13	24	-	-
25	B2	PJ14	26	HSYNC	PI12
27	B3	PJ15	28	VSYNC	PI13
29	B4	PK3	30	GND	-
31	B5	PK4	32	CLK	PI14
33	B6	PK5	34	GND	-
35	B7	PK6	36	RESET#	-
37	GND	-	38	I2C1_SDA	PB7
39	INT	MFX GPIO14	40	I2C1_SCL	PB6
41	-	-	42	-	-
43	BL_CTRL	PA6	44	-	-
45	5V	-	46	-	-
47	BLGND	-	48	-	-
49	BLGND	-	50	3.3V	-

The orientation of the 5.7-inch LCD daughterboard can be changed by means of hinged standoffs and pillars. Refer to [Figure 6](#) for details.

Figure 6. Orientation setting of 5.7-inch LCD daughterboard



8.20 MFX (Multi Function eXpander)

MFX circuit on STM32H743I-EVAL Evaluation board acts as IO-expander. The communication interface between MFX and STM32H743XI is I2C1 bus.

The signals connected to MFX are listed in [Table 15](#).

Table 15. MFX signals

Pin number of MFX	Pin name of MFX	MFX functions	Function of STM32H743I-EVAL	Direction (For MFX)	Terminal device
15	PA5	MFX_GPIO5	Audio_INT	Input	Codec
16	PA6	MFX_GPIO6	OTG_FS1_OverCurrent	Input	USB_FS1
17	PA7	MFX_GPIO7	OTG_FS1_PowerSwitchOn	Output	USB_FS1
18	PB0	MFX_GPIO0	JOY_SEL	Input	Joystick
19	PB1	MFX_GPIO1	JOY_DOWN	Input	Joystick
20	PB2	MFX_GPIO2	JOY_LEFT	Input	Joystick
26	PB13	MFX_GPIO13	SD_LDO_SEL	Output	microSD
27	PB14	MFX_GPIO14	TOUCH_INT	Input	LCD
28	PB15	MFX_GPIO15	MicroSDcard Detect	Input	microSD
29	PA8	MFX_GPIO8	OTG_FS2_OverCurrent	Input	USB_FS2
30	PA9	MFX_GPIO9	OTG_FS2_PowerSwitchOn	Output	USB_FS2
31	PA10	MFX_GPIO10	LED2	Output	LED
32	PA11	MFX_GPIO11	LED4	Output	LED
33	PA12	MFX_GPIO12	-	-	-
39	PB3	MFX_GPIO3	JOY_RIGHT	Input	Joystick
40	PB4	MFX_GPIO4	JOY_UP	Input	Joystick

9 Connectors

9.1 Ethernet RJ45 connector CN1

Figure 7. Ethernet RJ45 connector CN1 (front view)

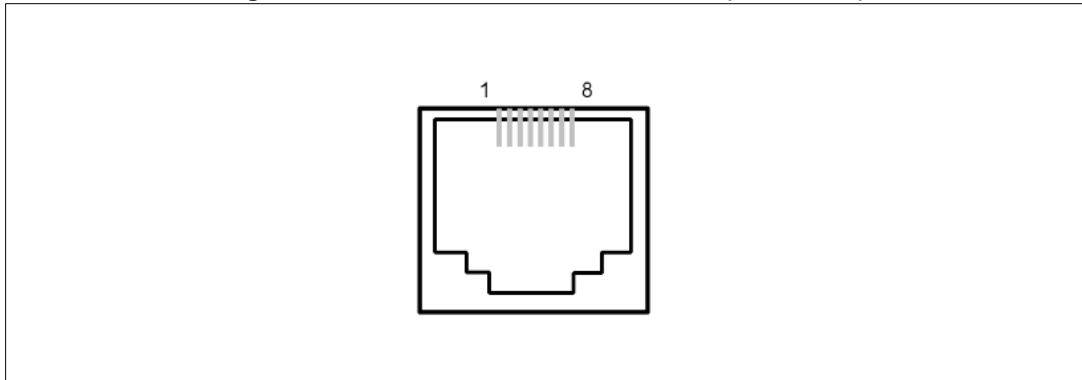
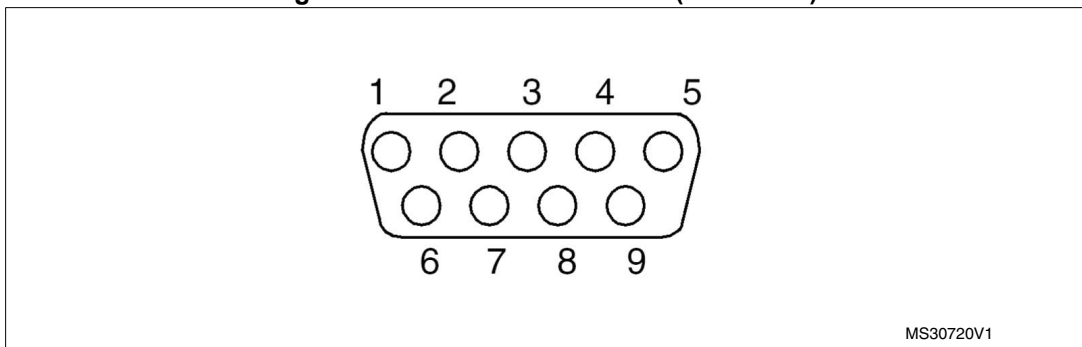


Table 16. RJ45 connector CN1

Pin number	Description	Pin number	Description
1	TxData+	2	TxData-
3	RxData+	4	Shield
5	Shield	6	RxData-
7	Shield	8	Shield

9.2 RS232 connector CN2

Figure 8. RS232 connector CN2 (front view)



MS30720V1

Table 17. RS232 connector CN2 with ISP support

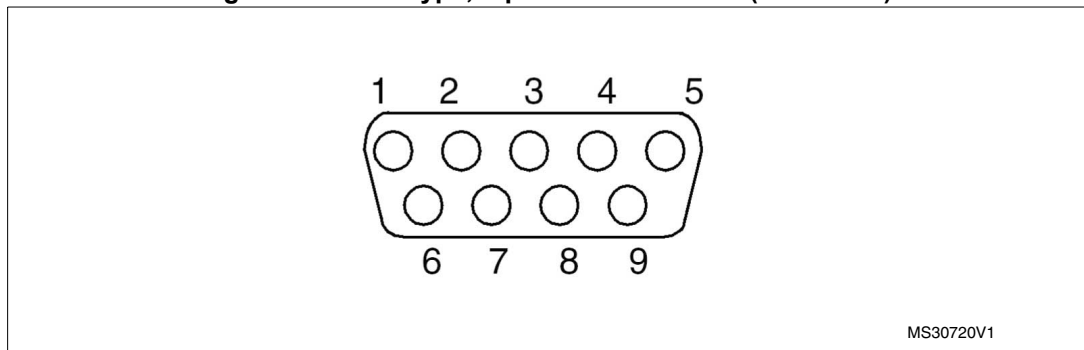
Pin number	Description	Pin number	Description
1	NC	6	Bootloader_BOOT0
2	RS232_RX (PB15)	7	NC

Table 17. RS232 connector CN2 with ISP support (continued)

Pin number	Description	Pin number	Description
3	RS232_TX (PB14)	8	Bootloader_RESET
4	NC	9	NC
5	GND	-	-

9.3 CAN D-type, 9-pin male connector CN3

Figure 9. CAN D-type, 9-pin connector CN3 (front view)



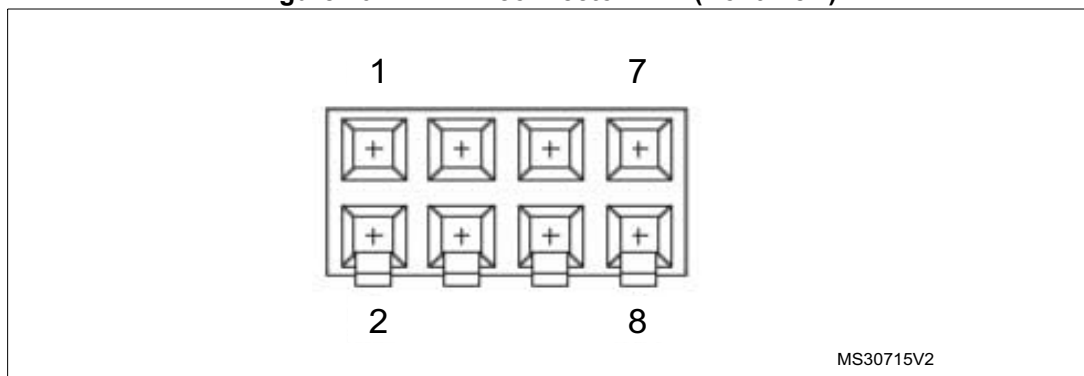
MS30720V1

Table 18. CAN D-type 9-pin male connector CN3

Pin number	Description	Pin number	Description
1,4,8,9	NC	7	CANH
2	CANL	3,5,6	GND

9.4 External I²C connector CN4

Figure 10. I2C EXT connector CN4 (front view)



MS30715V2

Table 19. I²C EXT connector CN4

Pin number	Description	Pin number	Description
1	I2C1_SDA (PB7)	5	+3.3 V
2	NC	6	NC
3	I2C1_SCL (PB6)	7	GND
4	RESET (PA4)	8	NC

9.5 Analog input-output connector CN5

Figure 11. Analog input-output connector CN5 (top view)

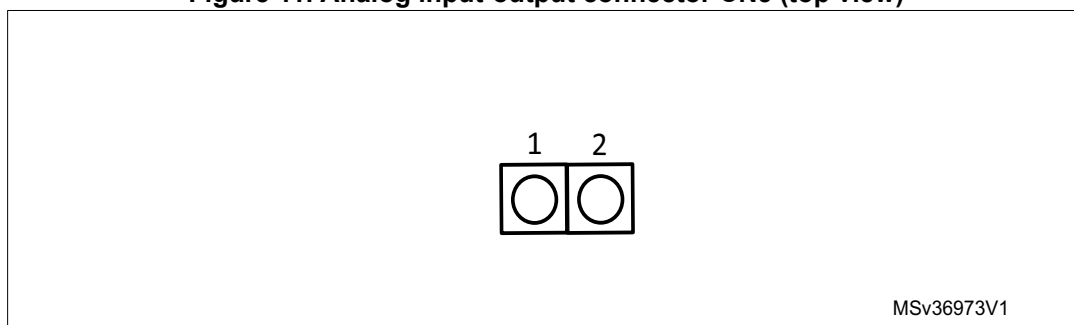


Table 20. Analog input-output connector CN5

Pin number	Description	Pin number	Description
1	analog input-output (PA0_C)	2	GND

9.6 Daughterboard extension connector CN6 and CN7

Two 60-pin male headers CN6 and CN7 can be used to connect a daughterboard or a standard wrapping board to the STM32H743I-EVAL Evaluation board. All GPI/Os are available on CN6 and CN7 and memory connectors on CN11 and CN12.

The space between these two connectors is defined as a standard that allows developing common daughterboards for several ST evaluation boards. The standard width between CN6 pin1 and CN7 pin1 is 2700 mils (68.58 mm).

Each pin on CN6 and CN7 can be used by a daughterboard after disconnecting it from the corresponding function block on STM32H743I-EVAL Evaluation board. For details refer to [Table 21](#) and [Table 22](#).

Table 21. Daughterboard extension connector CN6

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
1	PC0	ULPI_STP	Remove R124
3	PH0	OSC_IN	Remove R15, Close SB39
5	RESET#	-	-
7	PI11	ULPI_DIR	Remove R123
9	PB5	ULPI_D7	Remove R101
11	PF8	QSPI_BK1_IO0	Remove R38
13	PG14	QSPI_BK2_IO3	Remove R27
15	PH3	QSPI_BK2_IO1	Remove R28
17	PH2	QSPI_BK2_IO0	Remove R52
19	PA4	EXT_RESET/LED3	Disconnect CN4, Remove R296
21	PA3	ULPI_D0	Remove R114
23	PF9	QSPI_BK1_IO1	Remove R32
25	PA6	GPIO_LCD_BL_CTRL	Disconnect CN15
27	PC4	RMII_RXD0	Remove R41
29	PB0	ULPI_D1	Remove R113
31	PB1	ULPI_D2	Remove R111
33	PJ3	RGB_LCD_R4	Disconnect CN20
35	PA1	RMII_RX_CLK	Remove R31
37	PC3	DFSDM_DATA1	Not to dial SW2 to the middle
39	GND	-	-
41	PJ1	RGB_LCD_R2	Disconnect CN20
43	PJ0	RGB_LCD_R1	Disconnect CN20
45	PB14	USART1_TX/USB_FS2_DM	Open SB46, SB47
47	PB15	USART1_RX/USB_FS2_DP	Open SB49, SB51
49	D5V	-	-
51	PB11	ULPI_D4	Remove R109
53	PJ7	RGB_LCD_G0	Remove R24, Disconnect CN20
55	PJ6	RGB_LCD_R7	Disconnect CN20
57	PG6	QSPI_BK1_NCS	Open SB6, Remove R19
59	GND	-	-
2	PC1	RMII_MDC/ PDM1_D1	Open SB38, Not to dial SW2 to the right
4	PF7	QSPI_BK1_IO2	Remove R36
6	PH1	OSC_OUT	Remove R16
8	PF6	QSPI_BK1_IO3	Remove R26

Table 21. Daughterboard extension connector CN6 (continued)

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
10	GND	-	-
12	PC2_C	-	-
14	PC3_C	-	-
16	PA0_C	Potentiometer	Open SB43
18	PA1_C	-	-
20	GND	-	-
22	PA5	ULPI_CK	Remove R118
24	PB2	QSPI_CLK	-
26	PH4	ULPI_NXT	Remove R117
28	PC5	RMII_RXD1	Remove R39
30	GND	-	-
32	PG9	QSPI_BK2_IO2	Remove R33
34	PA7	RMII_CRS_DV	Remove R44
36	PJ4	RGB_LCD_R5	Disconnect CN20
38	PI15	RGB_LCD_R0	Disconnect CN20
40	PJ2	RGB_LCD_R3	Disconnect CN15, CN20
42	PJ5	RGB_LCD_R6	Disconnect CN20
44	PB13	ULPI_D6/USB_FS2_VBUS	Remove R104, R254
46	PB12	ULPI_D5/USB_FS2_ID	Remove R105, Open SB48
48	+3V3	-	-
50	GND	-	-
52	PB10	ULPI_D3	Remove R109
54	PJ8	RGB_LCD_G1	Disconnect CN20
56	PJ9	RGB_LCD_G2	Disconnect CN20
58	PJ10	RGB_LCD_G3	Disconnect CN20
60	+5V	-	-

Table 22. Daughterboard extension connector CN7

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
1	PF10	LED1	Remove R286, Disconnect CN15, Remove R294
3	PC15	OSC32_OUT	Remove R17, Close SB4
5	PI14	RGB_LCD_CLK	Disconnect CN20
7	PI13	RGB_LCD_VSYNC	Disconnect CN20

Table 22. Daughterboard extension connector CN7 (continued)

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
9	PC13	KEY_TAMP_1/WKUP2	Remove R193
11	PB8	SDIO_1_CKIN	-
13	PK7	RGB_LCD_DE	Disconnect CN20
15	PB3	JTDO/TRACESWO	Remove R60
17	PK6	RGB_LCD_B7	Remove R199, Disconnect CN20
19	GND	-	-
21	PK4	RGB_LCD_B5	Remove R201, Disconnect CN20
23	PK3	RGB_LCD_B4	Remove R202, Disconnect CN20
25	PG13	RMII_TXD0	-
27	PA0	KEY_WKUP0	Remove R173, R203
29	PJ15	RGB_LCD_B3	Disconnect CN20
31	PJ11	RGB_LCD_G4	Disconnect CN20
33	PC12	SDIO_1_CK	Remove R83
35	PA15	JTDI/CEC	Remove R61, Disconnect CN15
37	PG11	RMII_TX_EN	-
39	GND	-	-
41	PD2	SDIO_1_CMD	-
43	PA13	JTMS-SWDIO	Remove R55
45	PC6	SDIO_1_D0DIR	Remove SB58
47	PA10	USB_FS1_ID	Disconnect CN18
49	D5V	-	-
51	PG7	SAI_1_MCLK_A	Remove SB56
53	PC9	SDIO_1_D1	-
55	PK0	RGB_LCD_G5	Disconnect CN20
57	PK1	RGB_LCD_G6	Disconnect CN20
59	GND	-	-
2	PC2	DFSDM_CKOUT	Not to dial SW2 to the left
4	PC14	OSC32_IN	Remove R18, Close SB1
6	PI12	RGB_LCD_HSYNC	Disconnect CN20
8	PA2	RMII_MDIO	Remove R47
10	GND	-	-
12	PI8	GPIO_EXPANDER_INT	Remove R185
14	PB9	SDIO_1_CDIR	Remove R91

Table 22. Daughterboard extension connector CN7 (continued)

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
16	PB7	I2C_1_SDA	Remove R160, R181, R209, Disconnect CN4, CN15, CN20
18	PB6	I2C_1_SCL	Remove R155, R180, R212, Disconnect CN4, CN15, CN20
20	PB4	NJTRST	Remove R79
22	PK5	RGB_LCD_B6	Remove R200, Disconnect CN20
24	PJ13	RGB_LCD_B1	Disconnect CN20
26	PG12	RMII_TXD1	-
28	PJ14	RGB_LCD_B2	Disconnect CN20
30	GND	-	-
32	PJ12	RGB_LCD_B0	Remove R25, Disconnect CN20
34	PD3	GPIO_CAN_STBY	Remove R4
36	PC10	SDIO_1_D2	-
38	PA14	JTCK-SWCLK	Remove R59
40	PC11	SDIO_1_D3	Open SB45
42	PC7	SDIO_1_D123DIR	Remove R92
44	PC8	SDIO_1_D0	-
46	PA9	USB_FS1_VBUS	Remove R255
48	+3.3V	-	-
50	GND	-	-
52	PA8	MCO1	Disconnect CN15, Keep JP5 on open
54	PA11	USB_FS1_DM/ FDCAN_1_RXFD	Open SB50, SB59
56	PA12	USB_FS1_DP/ FDCAN_1_TXFD	Keep JP2 on open, Open SB60
58	PK2	RGB_LCD_G7	Disconnect CN20
60	+5V	-	-

9.7 ETM trace debugging connector CN8

Figure 12. ETM trace debugging connector CN8 (top view)

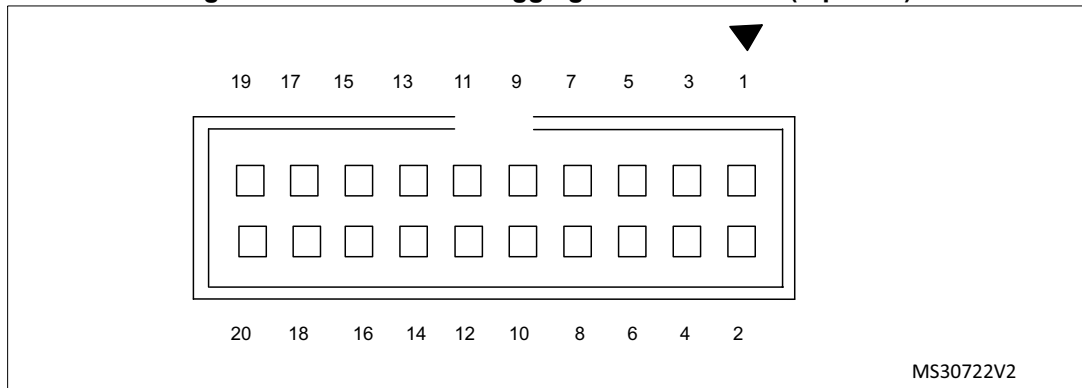


Table 23. ETM Trace debugging connector CN8

Pin number	Description	Pin number	Description
1	+3.3V	2	TMS/PA13
3	GND	4	TCK/PA14
5	GND	6	TDO/PB3
7	KEY	8	TDI/PA15
9	GND	10	RESET#
11	GND	12	TraceCLK/PE2
13	GND	14	TraceD0/PE3 or SWO/PB3
15	GND	16	TraceD1/PE4 or nTRST/PB4
17	GND	18	TraceD2/PE5
19	GND	20	TraceD3/PE6

9.8 JTAG/SWD connector CN9

Figure 13. JTAG/SWD debugging connector CN9 (top view)

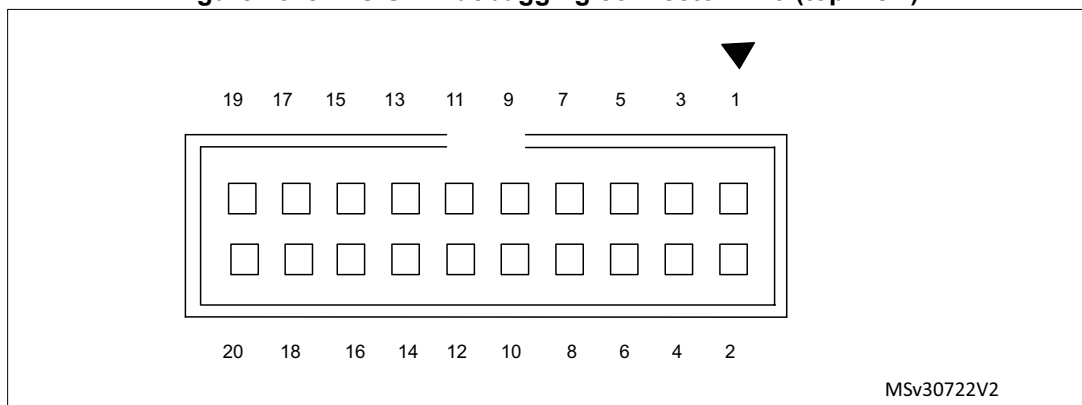


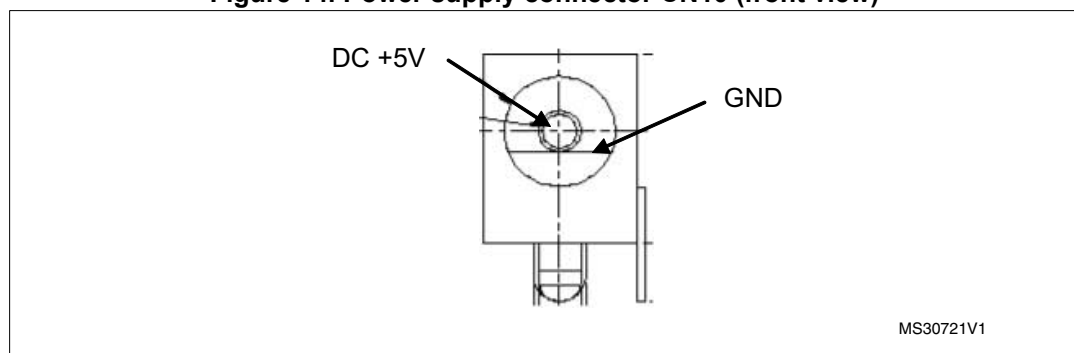
Table 24. JTAG/SWD debugging connector CN9

Pin number	Description	Pin number	Description
1	+3.3V	2	+3.3V
3	TRST(PB4)	4	GND
5	TDI(PA15)	6	GND
7	TMS/SWDIO(PA13)	8	GND
9	TCK/SWCLK(PA14)	10	GND
11	RTCK	12	GND
13	TDO/SWO(PB3)	14	GND
15	RESET#	16	GND
17	DBGRRQ(PJ7)	18	GND
19	DBGACK(PJ12)	20	GND

9.9 Power connector CN10

STM32H743I-EVAL Evaluation board can be powered from a DC 5 V power supply through the external power supply jack (CN10) shown in [Figure 14](#). The central pin of CN10 must be positive.

Figure 14. Power supply connector CN10 (front view)



9.10 Memory connector CN11 and CN12

Two 40-pin male headers CN11 and CN12 are used to connect with memory daughterboard.

All GPIOs are connected on the extension connectors CN6 and CN7, but the GPIOs which are used for FMC memory signals, are connected on CN11 and CN12.

The space between these two connectors is defined as a standard that allows to develop common daughterboard. The standard width between CN11 pin1 and CN12 pin1 is 1914 mils (48.62 mm). For details on signals assignment refer to [Table 25](#) and [Table 26](#).

Table 25. Memory connector CN11

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
1	PH6	SDNE1	-
3	PF13	A7	-
5	PF12	A6	-
7	PG1	A11	-
9	GND	-	-
11	PE7	D4	-
13	PE10	D7	-
15	PE12	D9	-
17	PE15	D12	-
19	PE13	D10	-
21	PD11	A16	-
23	PD12	A17	-
25	PG5	A15/BA1	-
27	PH11	D19	-
29	GND	-	-
31	PD13	A18	-
33	PG2	A12	-
35	PD8	D13	-
37	PD9	D14	-
39	PD14	D0	-
2	PH5	SDNWE	-
4	PF14	A8	-
6	PG0	A10	-
8	PF11	SDNRAS	-
10	GND	-	-
12	PE9	D6	-
14	PE8	D5	-
16	PE11	D8	-
18	PF15	A9	-
20	PE14	D11	-
22	PH8	D16	-
24	PH10	D18	-
26	PH9	D17	-
28	PG4	A14/BA0	-

Table 25. Memory connector CN11 (continued)

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
30	GND	-	-
32	PH12	D20	-
34	PG3	A13	-
36	PD10	D15	-
38	PD15	D1	-
40	PG8	SDCLK	-

Table 26. Memory connector CN12

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
1	PF5	A5	-
3	PF4	A4	-
5	PF3	A3	-
7	PE6	A22/SAI1_SD_A/TRACED3	Open SB2, SB3
9	GND	-	-
11	PE4	A20/SAI1_FS_A/TRACED1	Open SB5, SB7
13	PE3	A19/SAI1_SD_B/TRACED0	Open SB8, SB9
15	PI5	NBL3	-
17	PI4	NBL2	-
19	PG15	SDNCAS	-
21	PI10	D31	-
23	PE1	NBL1	-
25	PE0	NBL0	-
27	PG10	NE3	-
29	GND	-	-
31	PD0	D2	-
33	PI2	D26	-
35	PI1	D25	-
37	PI0	D24	-
39	PH13	D21	-
2	PH7	SDCKE1	-
4	PE5	A21/SAI1_SCK_A/TRACED2	Open SB41, SB42
6	PD6	NWAIT	-
8	PF2	A2	-

Table 26. Memory connector CN12 (continued)

Pin	Description	Alternative function	How to disconnect with function block on STM32H743I-EVAL board
10	GND	-	-
12	PF1	A1	-
14	PF0	A0	-
16	PE2	A23/PDM1_CK1/ SAI1_MCLK_A /TRACECLK	Open SB11, SB15, SB57
18	PI7	D29	-
20	PI9	D30	-
22	PI6	D28	-
24	PD7	NE1	-
26	PD5	NWE	-
28	PD4	NOE	-
30	GND	-	-
32	PD1	D3	-
34	PI3	D27	-
36	PH15	D23	-
38	PH14	D22	-
40	+3.3V	-	-

9.11 microSD connector CN13

Figure 15. microSD connector (top view)

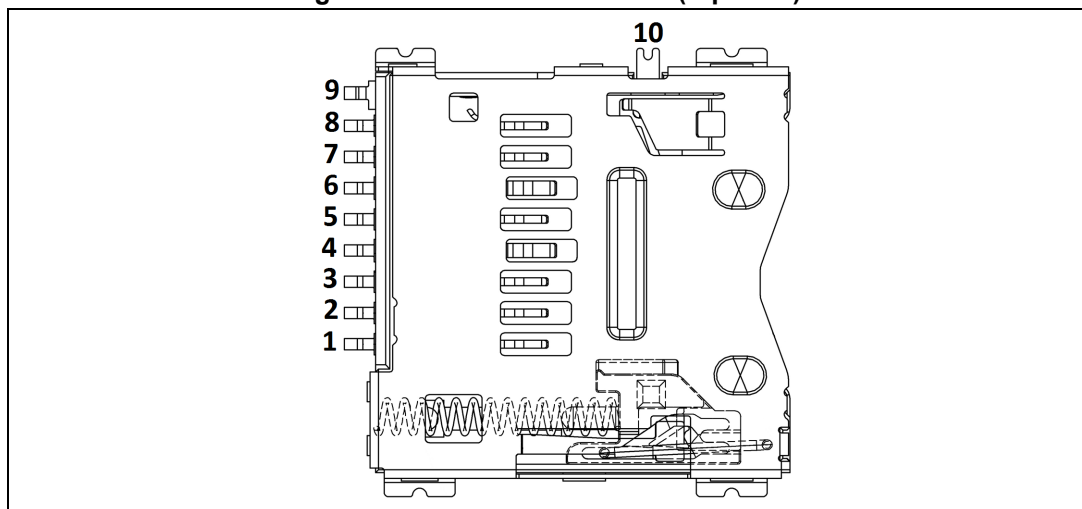


Table 27. microSD connector CN13

Pin number	Description	Pin number	Description
1	SD_DATA2	6	Vss/GND
2	SD_DATA3	7	SD_DATA0
3	SD_CMD	8	SD_DATA1
4	+2.9V_SD	9	GND
5	SD_CLK	10	MicroSDcard_detect (MFX GPIO15)

9.12 USB OTG2 HS Micro-AB connector CN14

Figure 16. USB OTG HS Micro-AB connector CN14 (front view)

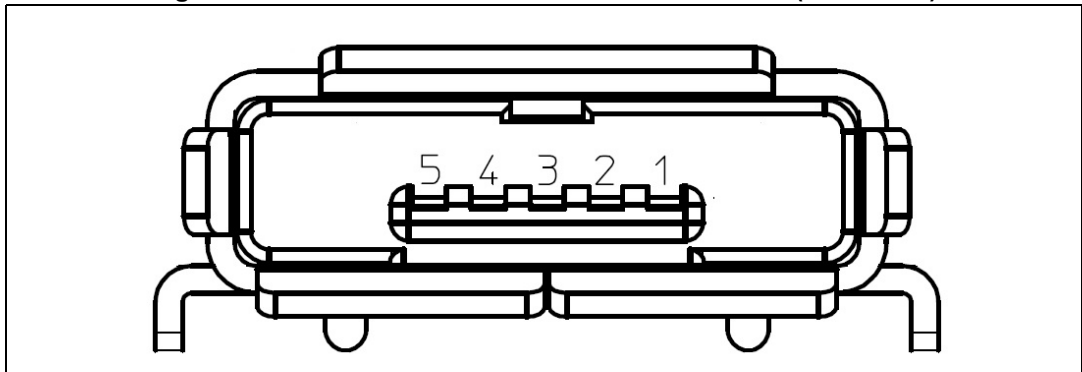


Table 28. USB OTG HS Micro-AB connector CN14

Pin number	Description	Pin number	Description
1	V _{BUS}	4	ID
2	D-	5	GND
3	D+	-	-

9.13 USB OTG2 FS Micro-AB connector CN16

Figure 17. USB OTG FS Micro-AB connector CN16 (front view)

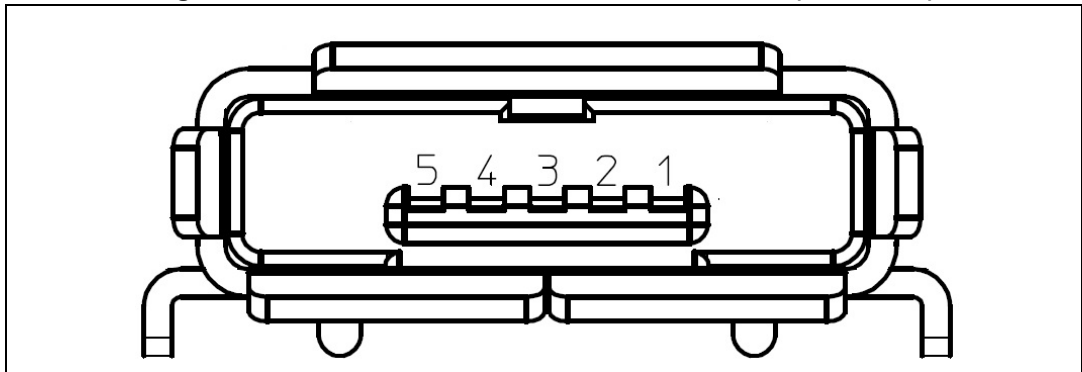


Table 29. USB OTG1 FS Micro-AB connector CN18

Pin number	Description	Pin number	Description
1	VBUS (PB13)	4	ID (PB12)
2	D- (PB14)	5	GND
3	D+ (PB15)	-	-

9.14 USB OTG1 FS Micro-AB connector CN18

Figure 18. USB OTG FS Micro-AB connector CN18 (front view)

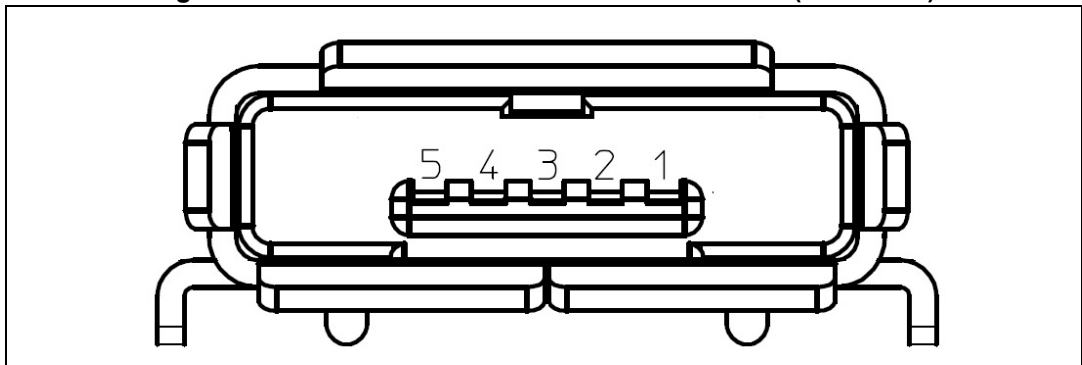


Table 30. USB OTG1 FS Micro-AB connector CN18

Pin number	Description	Pin number	Description
1	V _{BUS} (PA9)	4	ID (PA10)
2	D- (PA11)	5	GND
3	D+ (PA12)	-	-

9.15 Audio jack CN17

A 3.5 mm stereo audio jack CN17 is available on STM32H743I-EVAL Evaluation board to support headset (headphone and microphone integrated).

9.16 Audio jack (speaker) CN19

A 3.5mm stereo audio jack CN19 for speaker out is available on STM32H743I-EVAL Evaluation board to support an external speaker.

9.17 TFT LCD connector CN20

A TFT-color LCD board is mounted on CN20. Refer to [Section 8.19](#) for details.

9.18 ST-LINK/V2-1 programming connector CN21

The connector CN21 is used only for embedded ST-LINK/V2-1 programming during board manufacturing. It is not populated by default and not for end users.

9.19 MFX programming connector CN22

The connector CN22 is used only for MFX (Multi Function eXpander) programming during board manufacturing. It is not populated by default and not for end users.

9.20 ST-LINK/V2-1 USB Micro-B connector CN23

The USB Micro-B connector CN23 is used to connect the embedded ST-LINK/V2-1 to a PC for programming and debugging purposes.

Figure 19. USB Micro-B connector CN23 (front view)

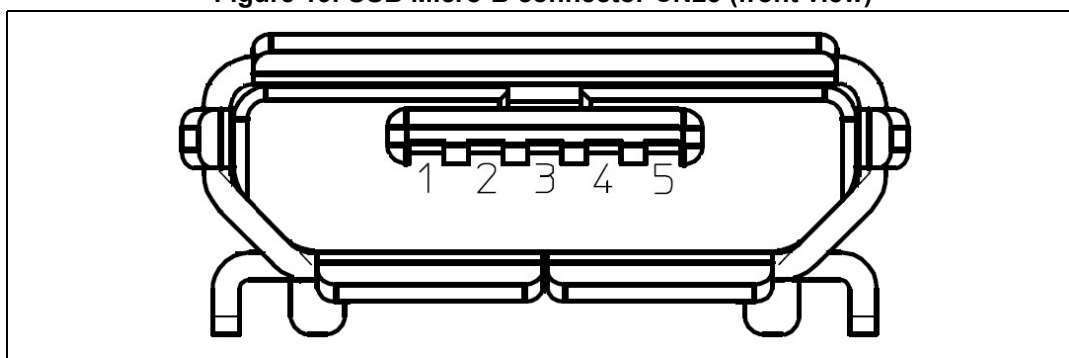


Table 31. USB Micro-B connector CN23 (front view)

Pin number	Description	Pin number	Description
1	V _{BUS} (power)	4	ID

Table 31. USB Micro-B connector CN23 (front view) (continued)

Pin number	Description	Pin number	Description
2	DM	5	GND
3	DP	-	-

9.21 MEMS microphone coupon connectors CN25 and CN26

Figure 20. MEMS microphone coupon connectors CN25 and CN26 (top view)

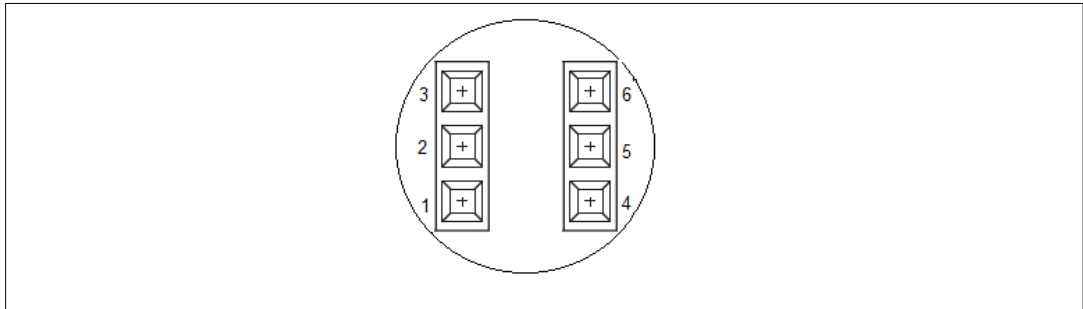


Table 32. 2.21 MEMS microphone coupon connectors CN25 and CN26

Pin number	Description	Pin number	Description
1	DATA	4	V _{DD}
2	GND	5	L/R
3	CLK	6	NC

Appendix A STM32H743I-EVAL I/O assignment

Table 33. STM32H743I-EVAL I/O assignment

Pin No.	Pin Name	Default function	Alternative function
N5	PA0-WKUP	KEY_WKUP0	-
N4	PA1	RMII_REF_CLK	-
N3	PA2	RMII_MDIO	-
U2	PA3	ULPI_D0	-
U3	PA4	EXT_RESET/LED3	-
T3	PA5	ULPI_CK	-
R3	PA6	GPIO_LCD_BACKLIGHT_CTRL	-
R5	PA7	RMII_CRS_DV	-
E15	PA8	MCO1	-
D15	PA9	USB_FS1_VBUS	-
D14	PA10	USB_FS1_ID	-
E17	PA11	USB_FS1_DM	FDCAN_1_RXFD
E16	PA12	USB_FS1_DP	FDCAN_1_TXFD
C15	PA13	JTMS-SWDIO	-
B14	PA14	JTCK-SWCLK	-
A14	PA15	JTDI	CEC
U5	PB0	ULPI_D1	-
T5	PB1	ULPI_D2	-
R6	PB2	QSPI_CLK	-
C6	PB3	JTDO/TRACESWO	-
B7	PB4	NJTRST	-
A5	PB5	ULPI_D7	-
B5	PB6	I2C_1_SCL	-
C5	PB7	I2C_1_SDA	-
D5	PB8	SDIO_1_CKIN	-
D4	PB9	SDIO_1_CDIR	-
P11	PB10	ULPI_D3	-
P12	PB11	ULPI_D4	-
T14	PB12	ULPI_D5	USB_FS2_ID
U14	PB13	ULPI_D6	USB_FS2_VBUS
U15	PB14	USART1_TX	USB_FS2_DM
T15	PB15	USART1_RX	USB_FS2_DP

Table 33. STM32H743I-EVAL I/O assignment (continued)

Pin No.	Pin Name	Default function	Alternative function
L2	PC0	ULPI_STP	-
M2	PC1	RMII_MDC	PDM1_D1
M3	PC2	DFSDM_CKOUT	-
M4	PC3	DFSDM_DATA1	-
T4	PC4	RMII_RXD0	-
U4	PC5	RMII_RXD1	-
F14	PC6	SDIO_1_D0DIR	-
F13	PC7	SDIO_1_D123DIR	-
E13	PC8	SDIO_1_D0	-
E14	PC9	SDIO_1_D1	-
A13	PC10	SDIO_1_D2	-
B13	PC11	SDIO_1_D3	-
C12	PC12	SDIO_1_CK	-
E3	PC13- ANTI_TAMP	KEY_TAMP_1/WKUP2	-
C2	PC14- OSC32_IN	OSC32_IN	-
C1	PC15- OSC32_OUT	OSC32_OUT	-
D13	PD0	FMC_D2	-
E12	PD1	FMC_D3	-
D12	PD2	SDIO_1_CMD	-
B12	PD3	GPIO_CAN_STANDBY	-
A12	PD4	FMC_NOE	-
A11	PD5	FMC_NWE	-
B11	PD6	FMC_NWAIT	-
C11	PD7	FMC_NE1	-
U16	PD8	FMC_D13	-
T17	PD9	FMC_D14	-
T16	PD10	FMC_D15	-
R15	PD11	FMC_A16	-
R16	PD12	FMC_A17	-
R17	PD13	FMC_A18	-
P16	PD14	FMC_D0	-
P15	PD15	FMC_D1	-
C4	PE0	FMC_NBL0	-

Table 33. STM32H743I-EVAL I/O assignment (continued)

Pin No.	Pin Name	Default function	Alternative function
B4	PE1	FMC_NBL1	-
C3	PE2	PDM1_CK1	FMC_A23/TRACECLK/ SAI_1_MCLK_A
D3	PE3	SAI1_SD_B	FMC_A19/TRACED0
D2	PE4	SAI1_FS_A	FMC_A20/TRACED1
D1	PE5	SAI1_SCK_A	FMC_A21/TRACED2
E5	PE6	SAI1_SD_A	FMC_A22/TRACED3
U9	PE7	FMC_D4	-
T9	PE8	FMC_D5	-
P9	PE9	FMC_D6	-
N9	PE10	FMC_D7	-
P10	PE11	FMC_D8	-
R10	PE12	FMC_D9	-
T10	PE13	FMC_D10	-
U10	PE14	FMC_D11	-
R11	PE15	FMC_D12	-
G4	PF0	FMC_A0	-
G3	PF1	FMC_A1	-
G1	PF2	FMC_A2	-
H4	PF3	FMC_A3	-
J5	PF4	FMC_A4	-
J4	PF5	FMC_A5	-
K2	PF6	QSPI_BK1_IO3	-
K3	PF7	QSPI_BK1_IO2	-
K4	PF8	QSPI_BK1_IO0	-
L4	PF9	QSPI_BK1_IO1	-
L3	PF10	LED1	-
T7	PF11	SDR_SDNRAS	-
R7	PF12	FMC_A6	-
P7	PF13	FMC_A7	-
P8	PF14	FMC_A8	-
R9	PF15	FMC_A9	-
T8	PG0	FMC_A10	-
U8	PG1	FMC_A11	-
H16	PG2	FMC_A12	-

Table 33. STM32H743I-EVAL I/O assignment (continued)

Pin No.	Pin Name	Default function	Alternative function
H15	PG3	FMC_A13	-
H14	PG4	FMC_A14 / SDR_BA0	-
G14	PG5	FMC_A15 / SDR_BA1	-
G15	PG6	QSPI_BK1_NCS	-
F16	PG7	SAI_1_MCLK_A	-
F15	PG8	SDR_SDCLK	-
A10	PG9	QSPI_BK2_IO2	-
A9	PG10	FMC_NE3	-
B9	PG11	RMII_TX_EN	-
C9	PG12	RMII_TXD1	-
D9	PG13	RMII_TXD0	-
D8	PG14	QSPI_BK2_IO3	-
D6	PG15	SDR_SDNCAS	-
J2	PH0 - OSC_IN	OSC_IN	-
J1	PH1 - OSC_OUT	OSC_OUT	-
N2	PH2	QSPI_BK2_IO0	-
P2	PH3	QSPI_BK2_IO1	-
P3	PH4	ULPI_NXT	-
P4	PH5	SDR_SDNWE	-
T11	PH6	SDR_SDNE1	-
U13	PH7	SDR_SDCKE1	-
T13	PH8	FMC_D16	-
R13	PH9	FMC_D17	-
P13	PH10	FMC_D18	-
P14	PH11	FMC_D19	-
R14	PH12	FMC_D20	-
D16	PH13	FMC_D21	-
B17	PH14	FMC_D22	-
B16	PH15	FMC_D23	-
A16	PI0	FMC_D24	-
A15	PI1	FMC_D25	-
B15	PI2	FMC_D26	-
C14	PI3	FMC_D27	-
A4	PI4	FMC_NBL2	-

Table 33. STM32H743I-EVAL I/O assignment (continued)

Pin No.	Pin Name	Default function	Alternative function
A3	PI5	FMC_NBL3	-
A2	PI6	FMC_D28	-
B3	PI7	FMC_D29	-
E4	PI8- ANTI TAMP2	GPIO_EXPANDER_INT	-
E2	PI9	FMC_D30	-
F3	PI10	FMC_D31	-
F4	PI11	ULPI_DIR	-
H1	PI12	RGB_LCD_HSYNC	-
H2	PI13	RGB_LCD_VSYNC	-
H3	PI14	RGB_LCD_CLK	-
P5	PI15	RGB_LCD_R0	-
N6	PJ0	RGB_LCD_R1	-
P6	PJ1	RGB_LCD_R2	-
T6	PJ2	RGB_LCD_R3	-
U6	PJ3	RGB_LCD_R4	-
U7	PJ4	RGB_LCD_R5	-
R12	PJ5	RGB_LCD_R6	-
N15	PJ6	RGB_LCD_R7	-
N14	PJ7	RGB_LCD_G0	-
N13	PJ8	RGB_LCD_G1	-
M14	PJ9	RGB_LCD_G2	-
L14	PJ10	RGB_LCD_G3	-
K14	PJ11	RGB_LCD_G4	-
D11	PJ12	RGB_LCD_B0	-
E10	PJ13	RGB_LCD_B1	-
D10	PJ14	RGB_LCD_B2	-
B10	PJ15	RGB_LCD_B3	-
J14	PK0	RGB_LCD_G5	-
J15	PK1	RGB_LCD_G6	-
H17	PK2	RGB_LCD_G7	-
C8	PK3	RGB_LCD_B4	-
B8	PK4	RGB_LCD_B5	-
A8	PK5	RGB_LCD_B6	-
C7	PK6	RGB_LCD_B7	-

Table 33. STM32H743I-EVAL I/O assignment (continued)

Pin No.	Pin Name	Default function	Alternative function
D7	PK7	RGB_LCD_DE	-
T1	PA0_C	Potentiometer	-
T2	PA1_C	-	-
R1	PC2_C	-	-
R2	PC3_C	-	-

Appendix B Electrical schematics

This section provides the design schematics for the STM32H743I-EVAL Evaluation board:

- Overall schematics for the STM32H743I-EVAL, see [Figure 21](#)
- STM32H743I-EVALMCU, see [Figure 22](#)
- Power, see [Figure 23](#)
- SRAM, Flash and SDRAM, see [Figure 24](#)
- Audio, see [Figure 25](#)
- LCD, see [Figure 26](#)
- Ethernet, see [Figure 27](#)
- USB OTG HS, see [Figure 28](#)
- USB OTG FS, see [Figure 29](#)
- RS232, see [Figure 30](#)
- FDCAN and Quad-SPI, see [Figure 31](#)
- microSD, see [Figure 32](#)
- Peripherals, see [Figure 33](#)
- Extension connectors, see [Figure 34](#)
- ST-LINK, see [Figure 35](#)
- MFX, see [Figure 36](#)
- JTAG and trace, see [Figure 37](#)
- 5.7" LCD board, see [Figure 38](#)

Figure 21. STM32H743I-EVAL Evaluation board

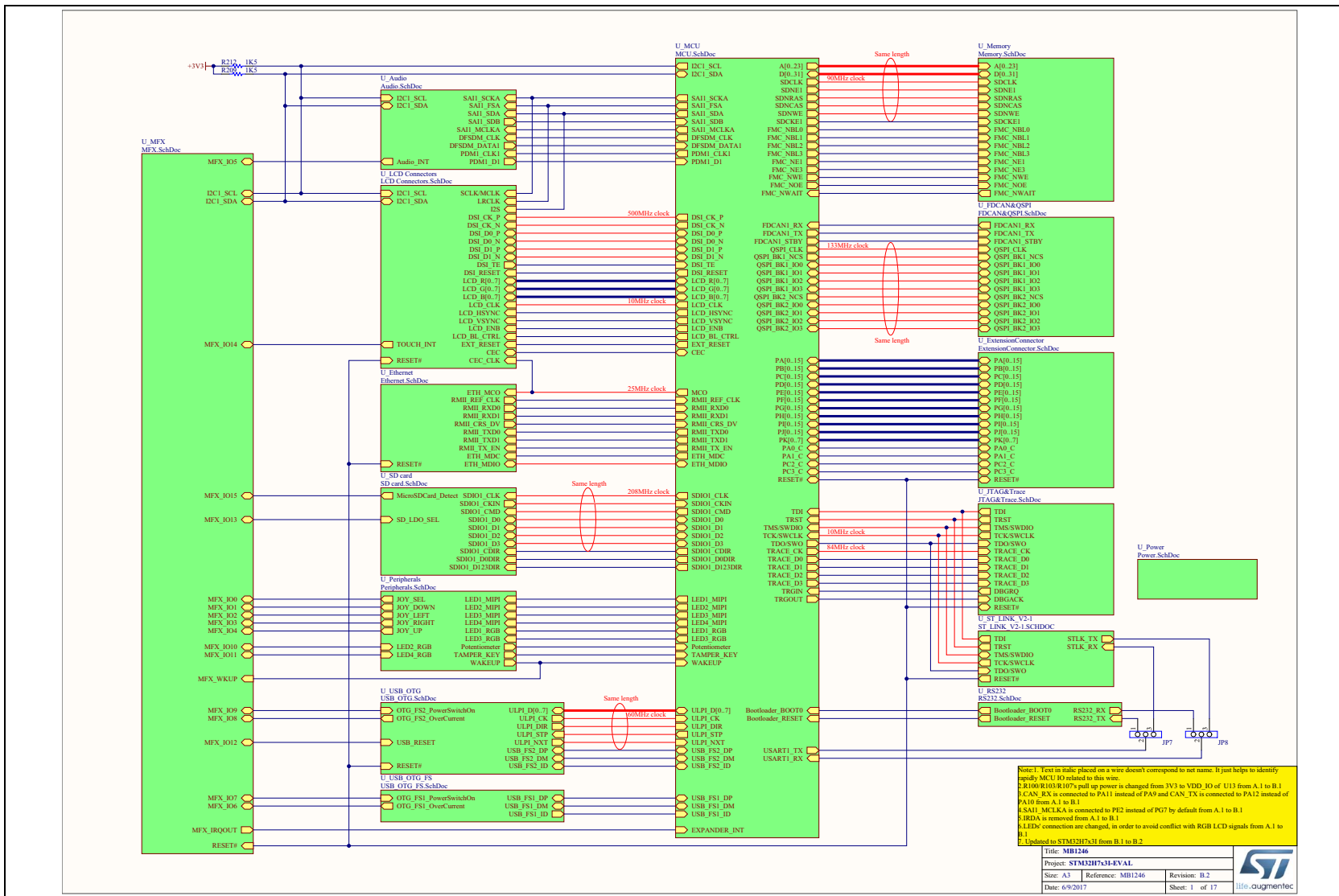


Figure 23. Power

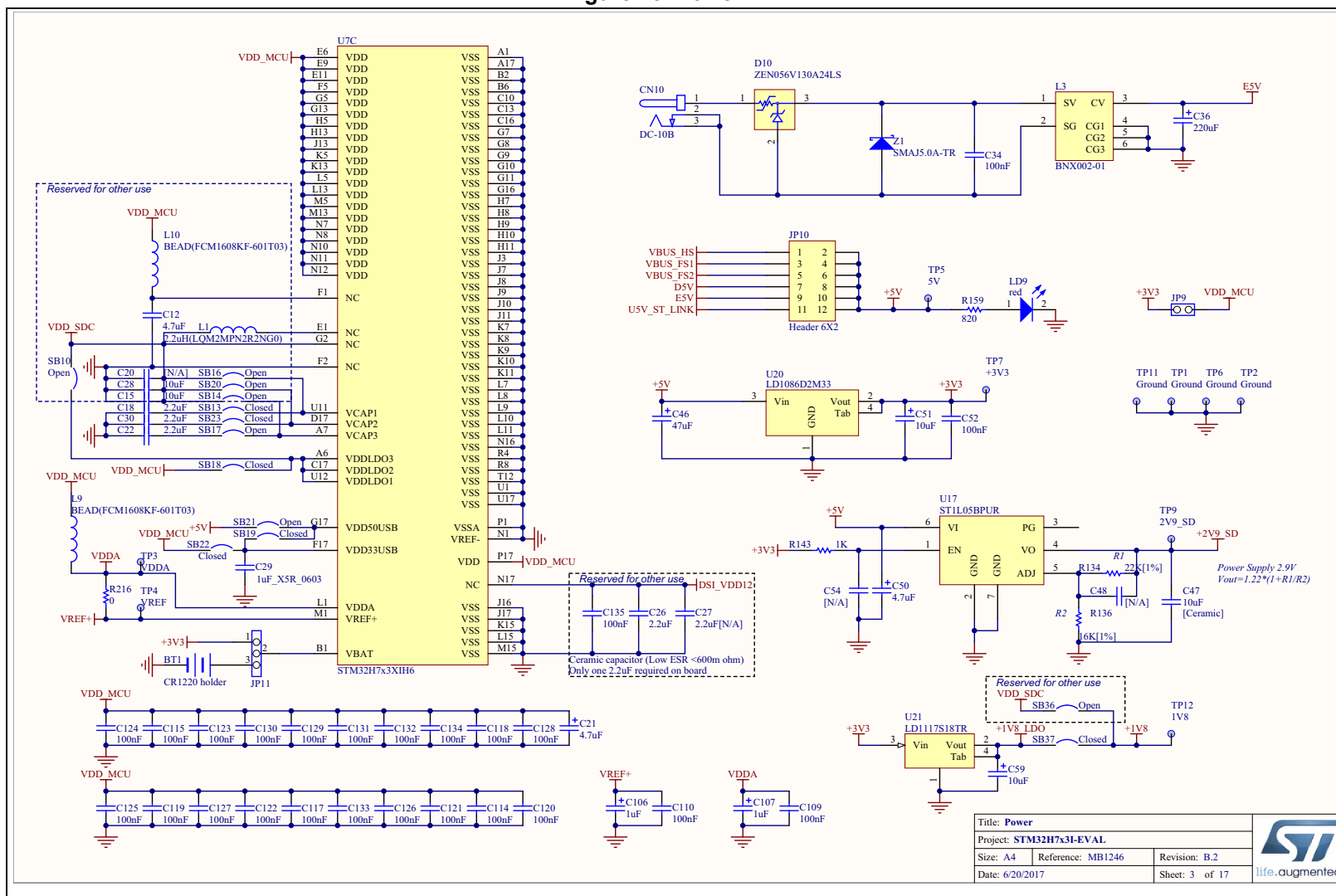
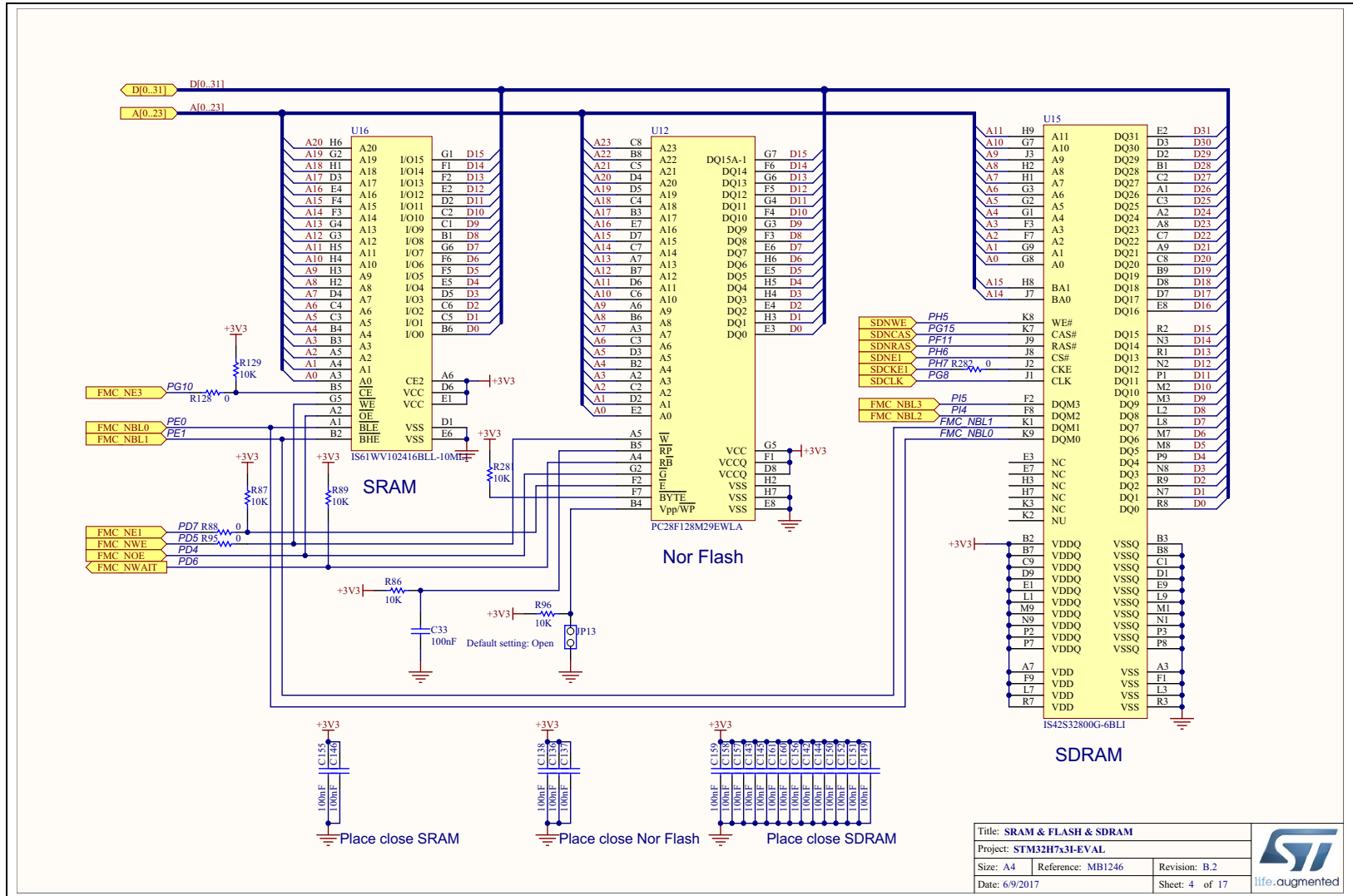




Figure 24. SRAM, FLASH and SDRAM



Title: SRAM & FLASH & SDRAM		
Project: STM32H7x3I-EVAL		
Size: A4	Reference: MB1246	Revision: B.2
Date: 6/9/2017	Sheet: 4 of 17	



Figure 25. Audio

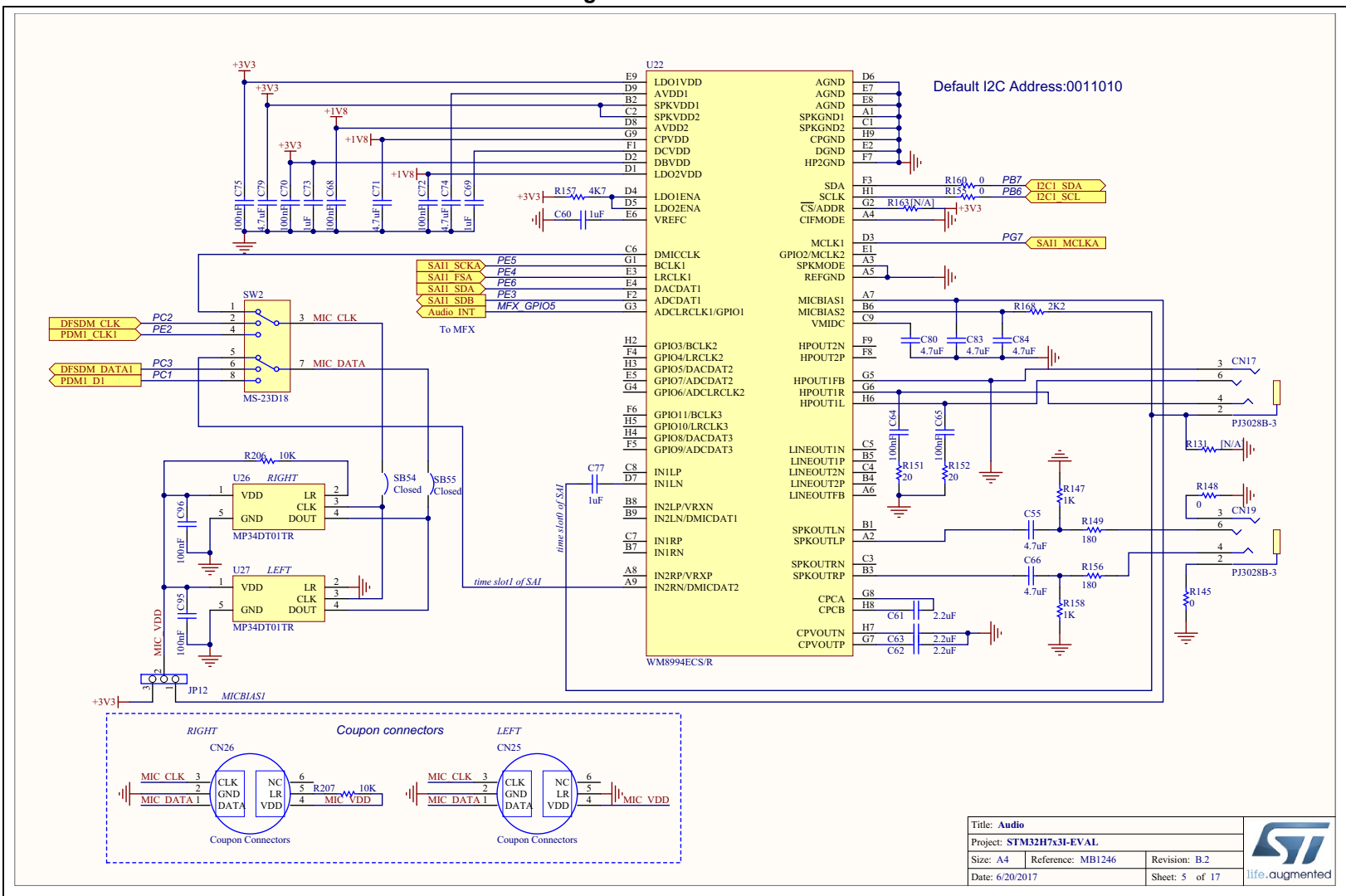
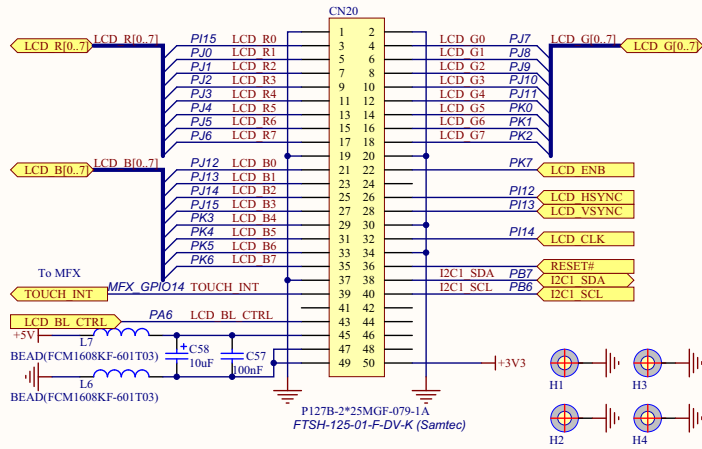


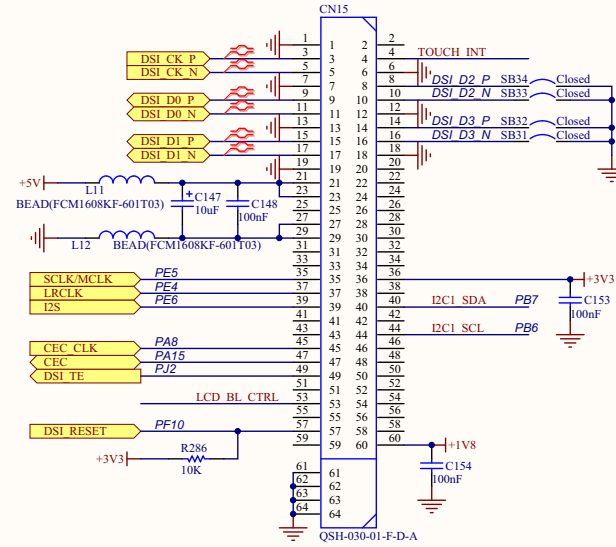


Figure 26. LCD connectors

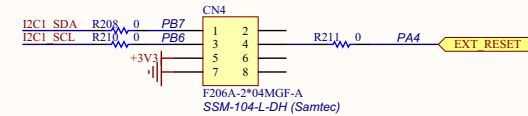
LCD Connector



Extension connector (Reserved for other use)

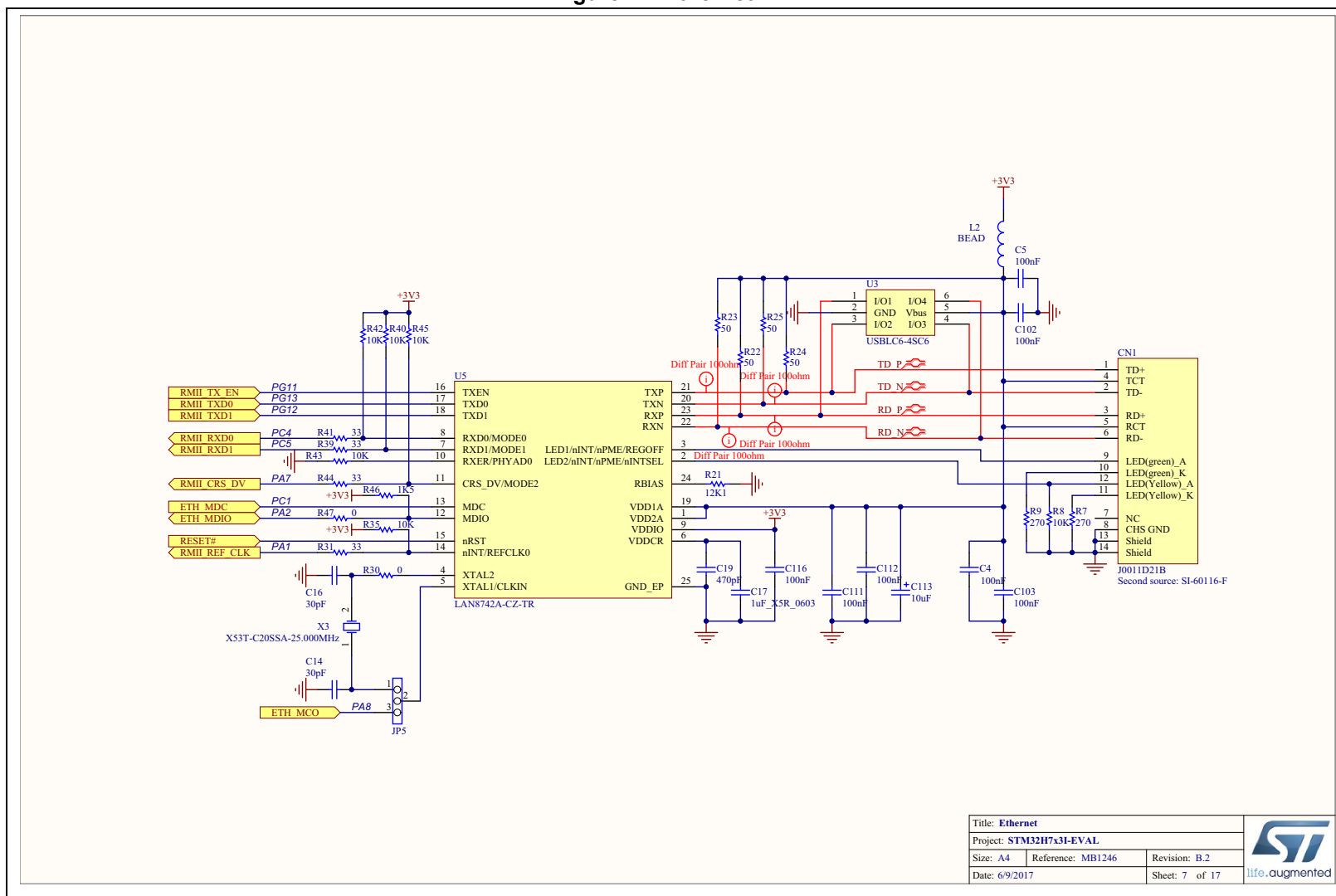


I2C Connector



Title: LCD Connectors			
Project: STM32H7x3I-EVAL			
Size: A4	Reference: MB1246		Revision: B.2
Date: 6/20/2017	Sheet: 6 of 17		

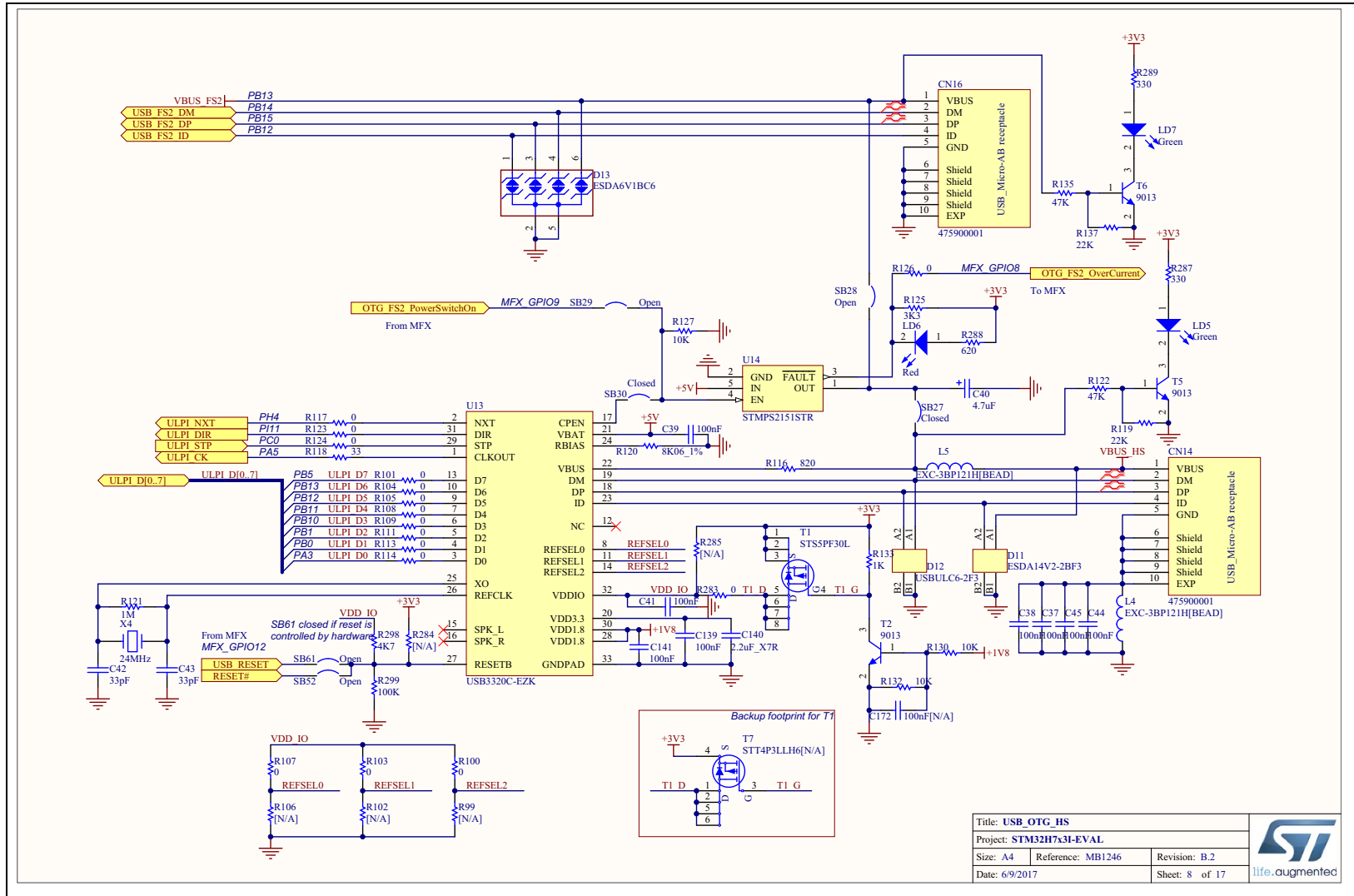
Figure 27. Ethernet



Title: Ethernet			
Project: STM32H7x3I-EVAL			
Size: A4	Reference: MB1246		Revision: B.2
Date: 6/9/2017	Sheet: 7 of 17		life.augmented



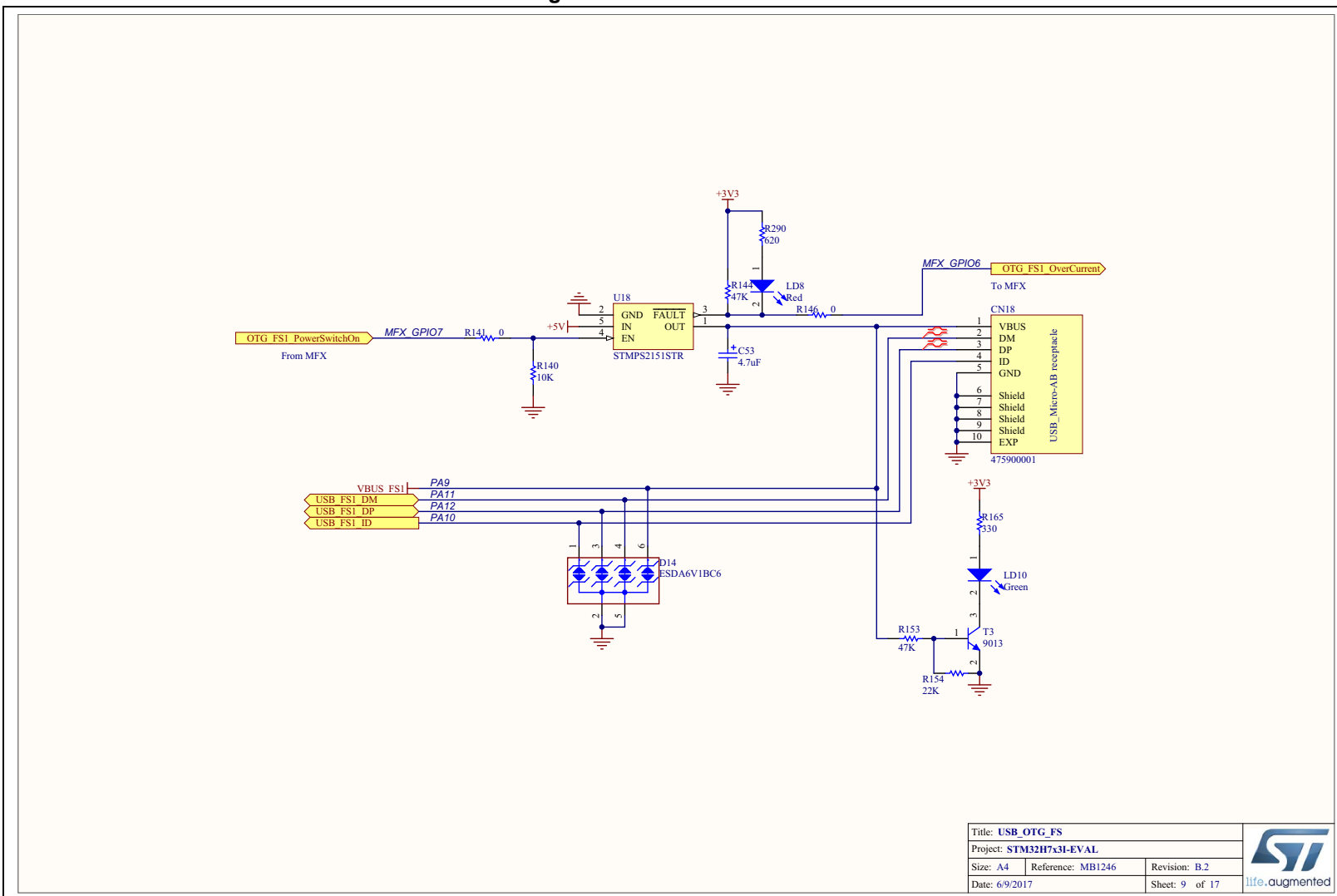
Figure 28. USB OTG HS



Title: USB_OTG_HS	
Project: STM32H7x31-EVAL	
Size: A4	Reference: MB1246
Date: 6/9/2017	Revision: B.2
Sheet: 8 of 17	



Figure 29. USB OTG FS



life.augmented



Figure 30. RS232

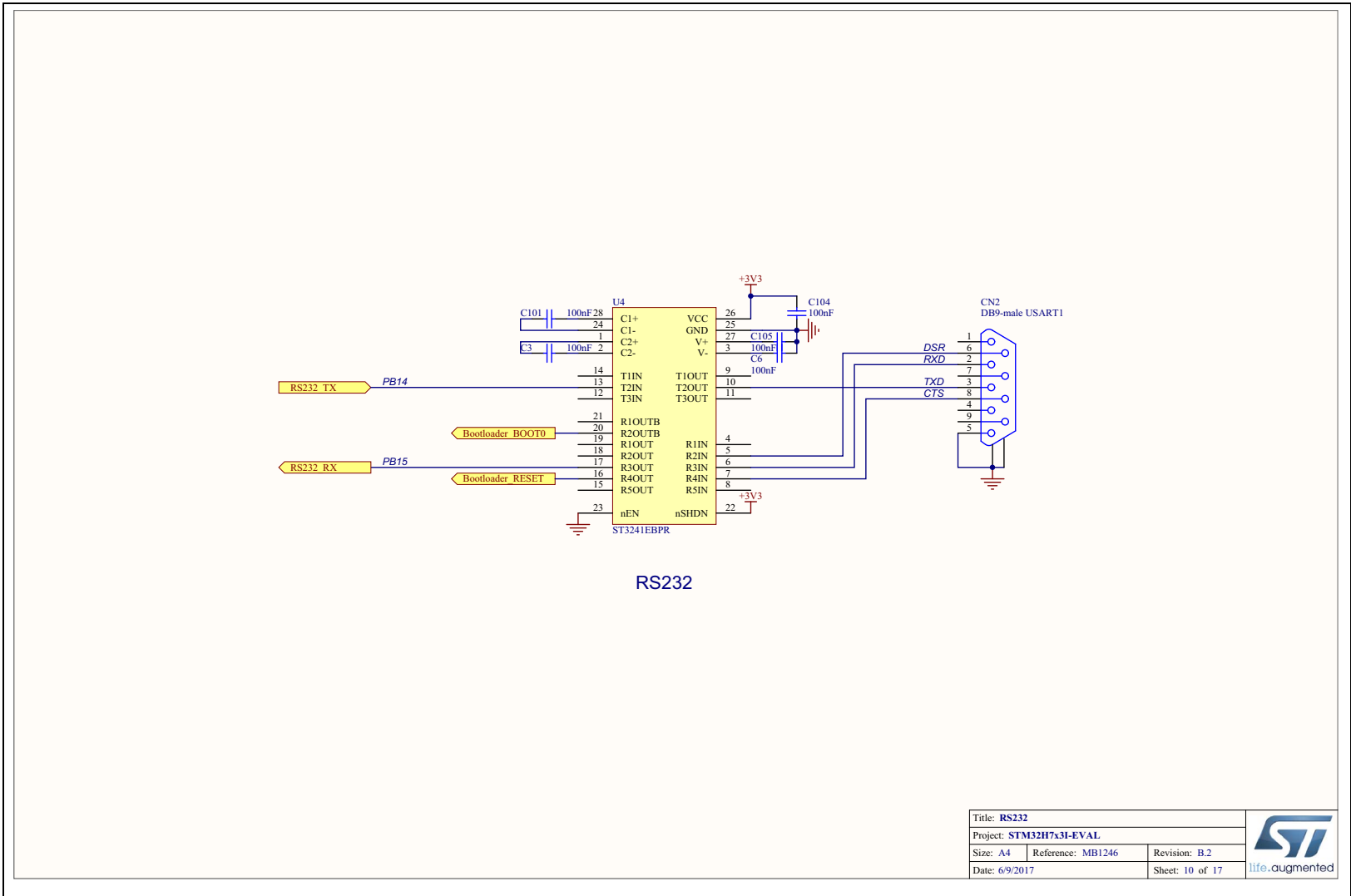


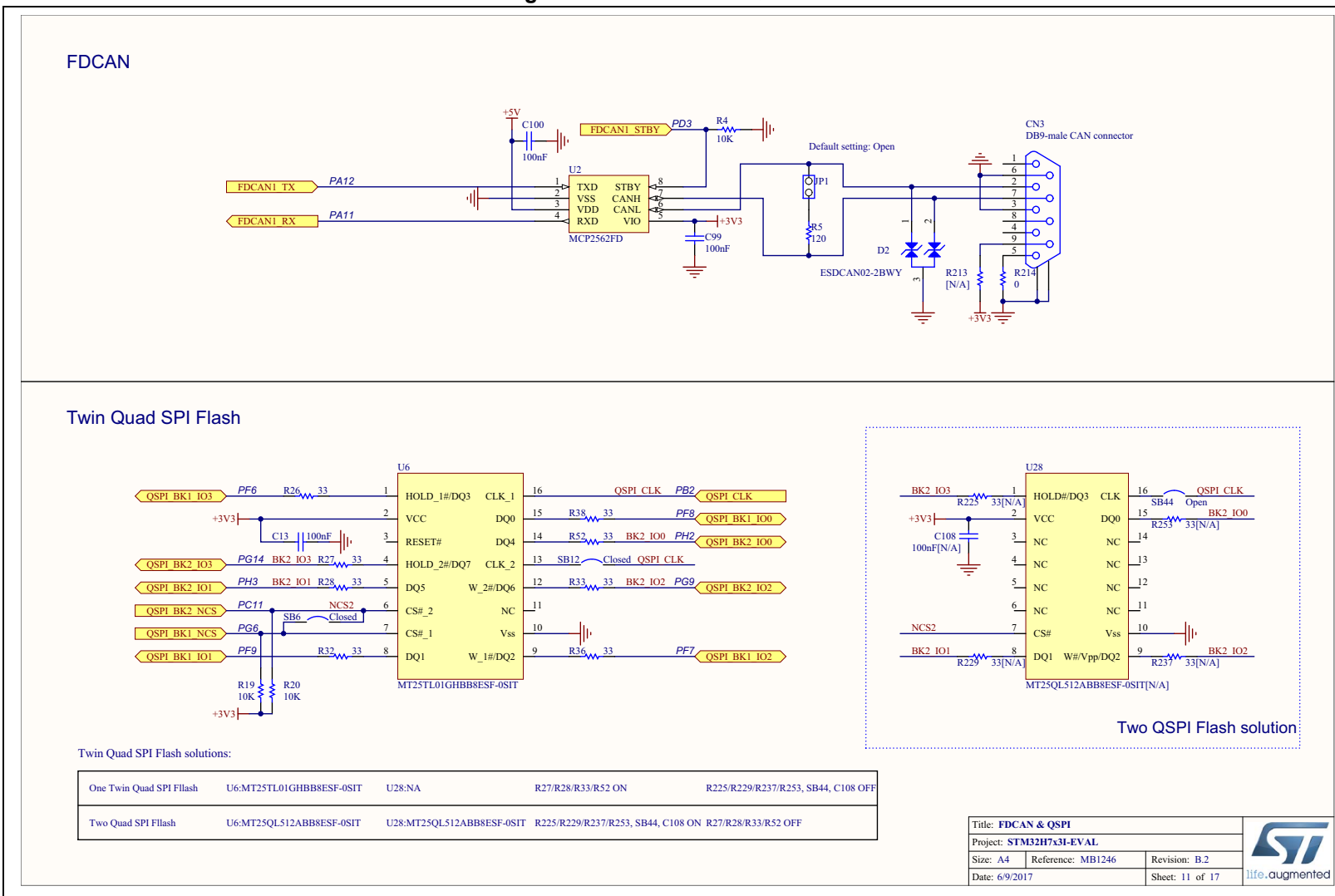
Figure 31. FDCAN and QSPI




Figure 32. microSD 3.0 card

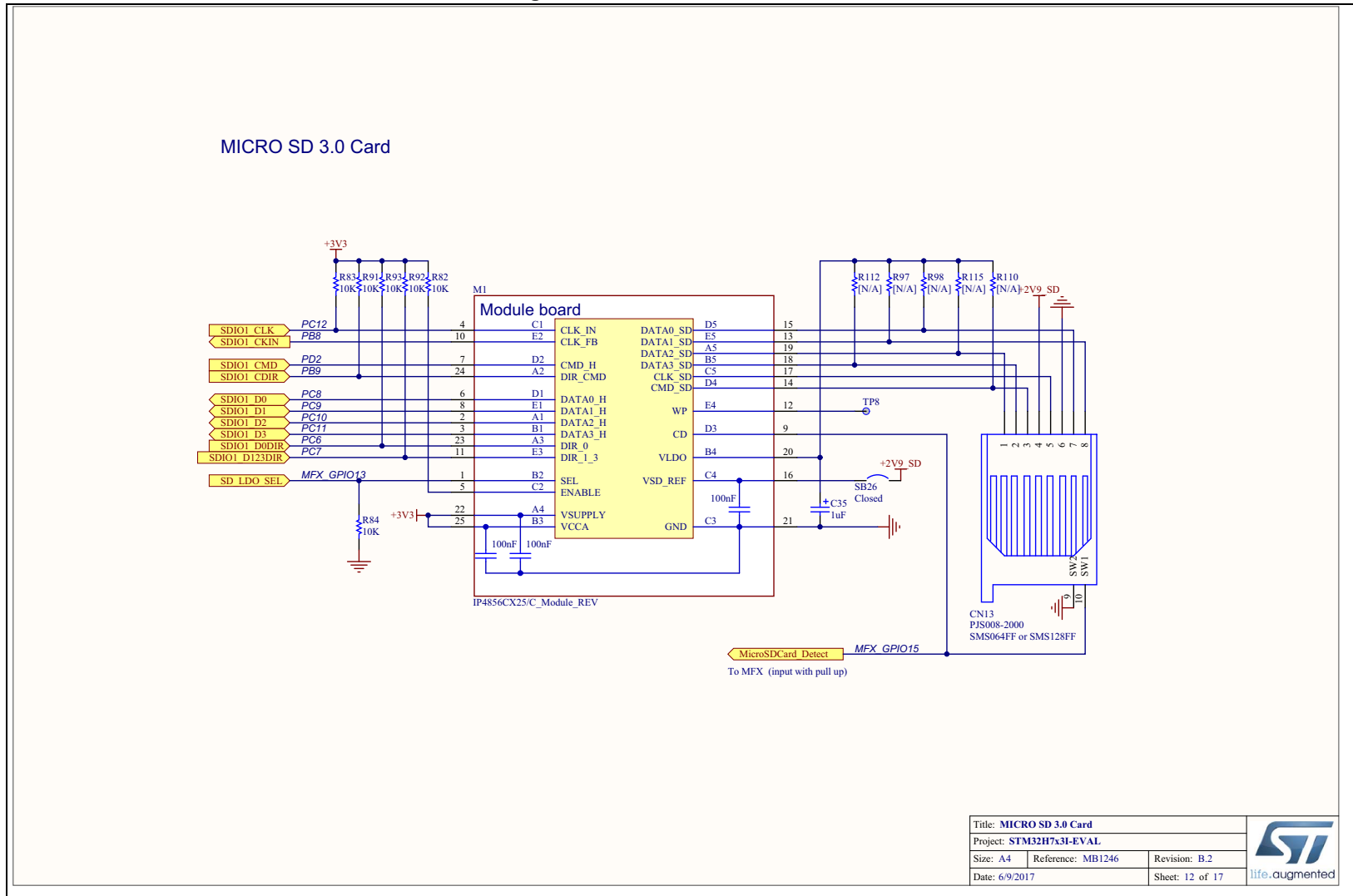


Figure 33. Peripherals

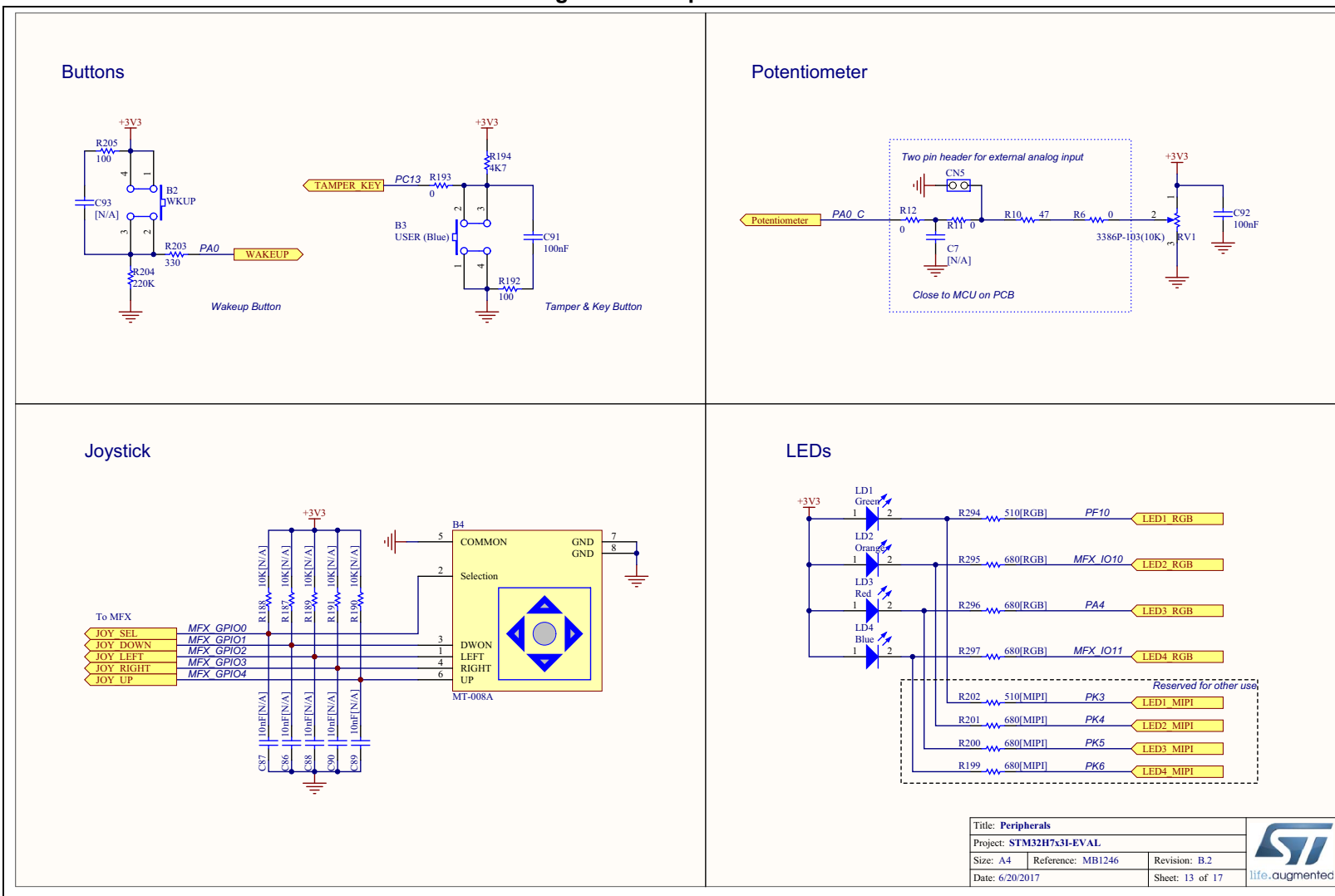
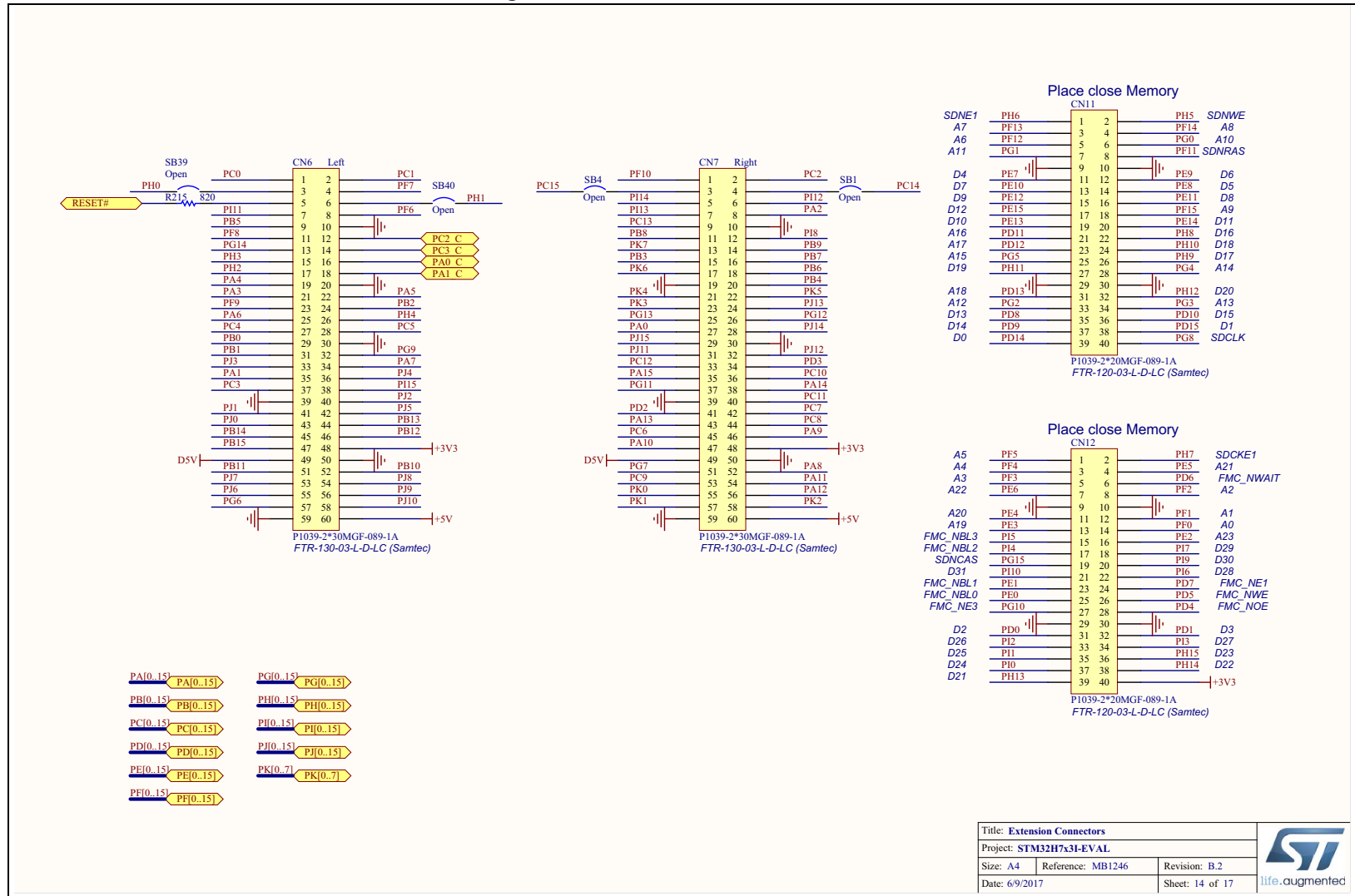




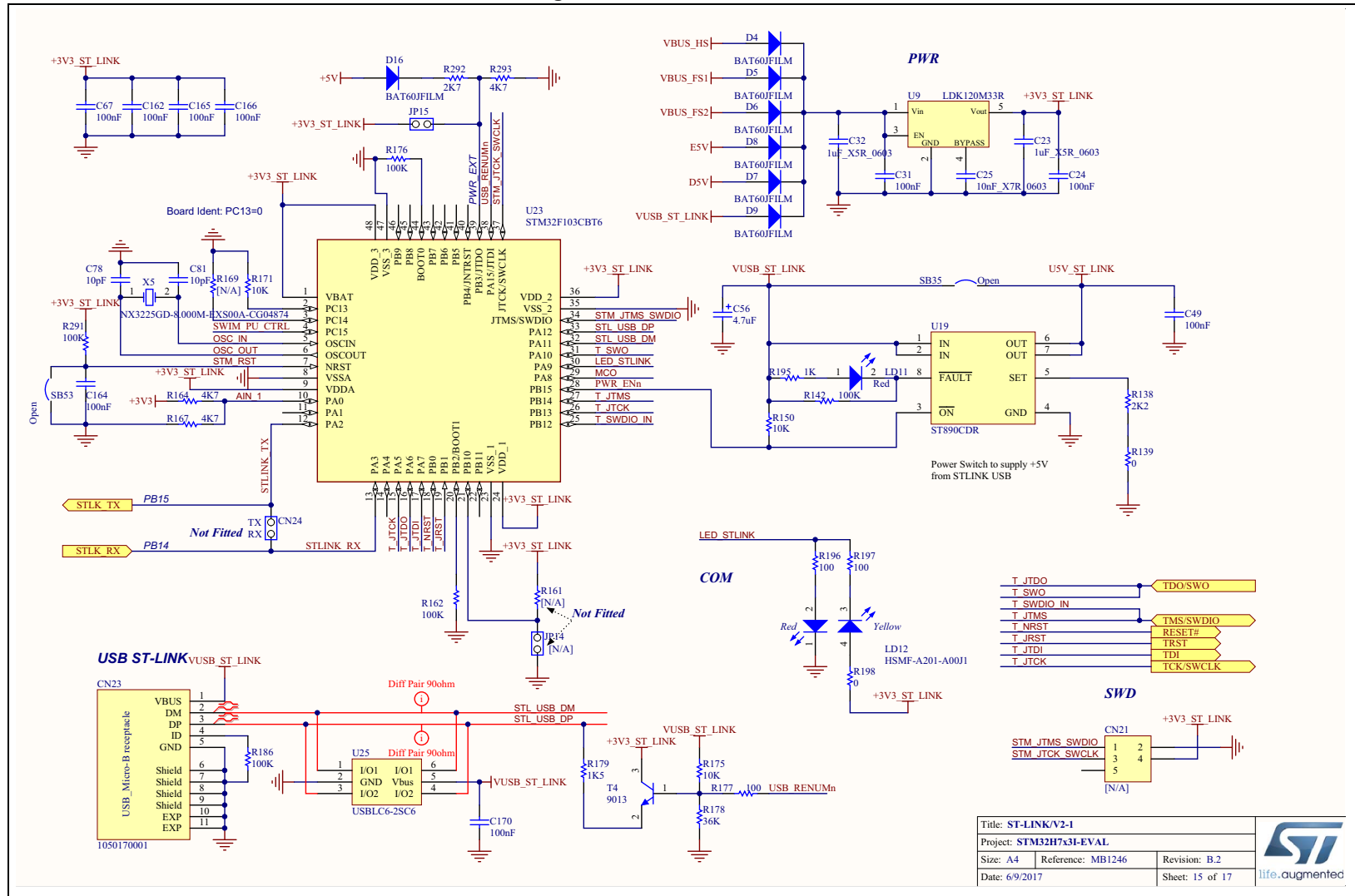
Figure 34. Extension connectors



Title: Extension Connectors		
Project: STM32H7x3I-EVAL		
Size: A4	Reference: MB1246	Revision: B.2
Date: 6/9/2017		Sheet: 14 of 17



Figure 35. ST-LINK/V2-1



Title: ST-LINK/V2-1			
Project: STM32H7x3I-EVAL			
Size: A4	Reference: MB1246	Revision: B.2	
Date: 6/9/2017		Sheet: 15 of 17	life.augmented



Figure 36. MFX

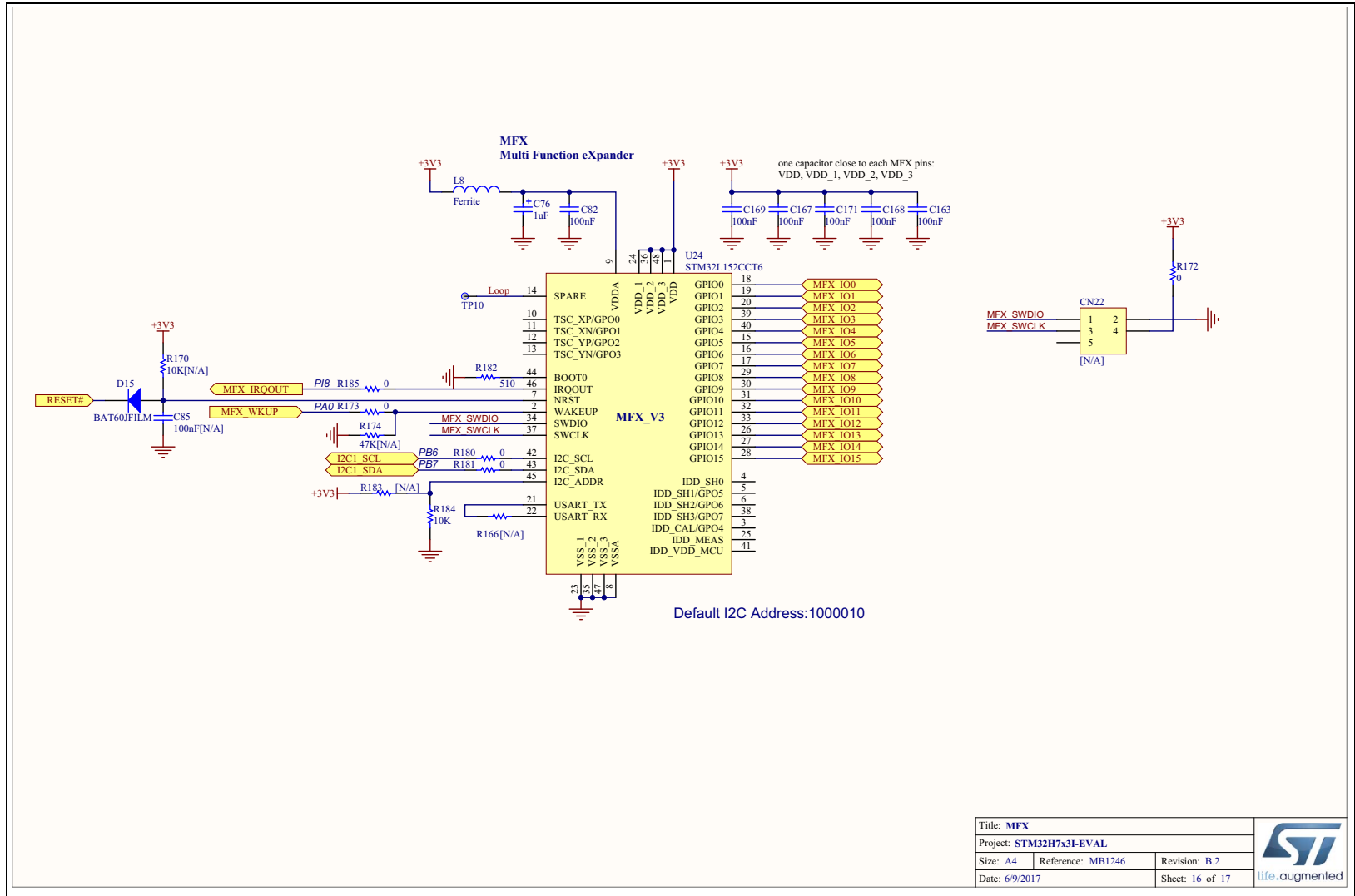


Figure 37. JTAG and trace

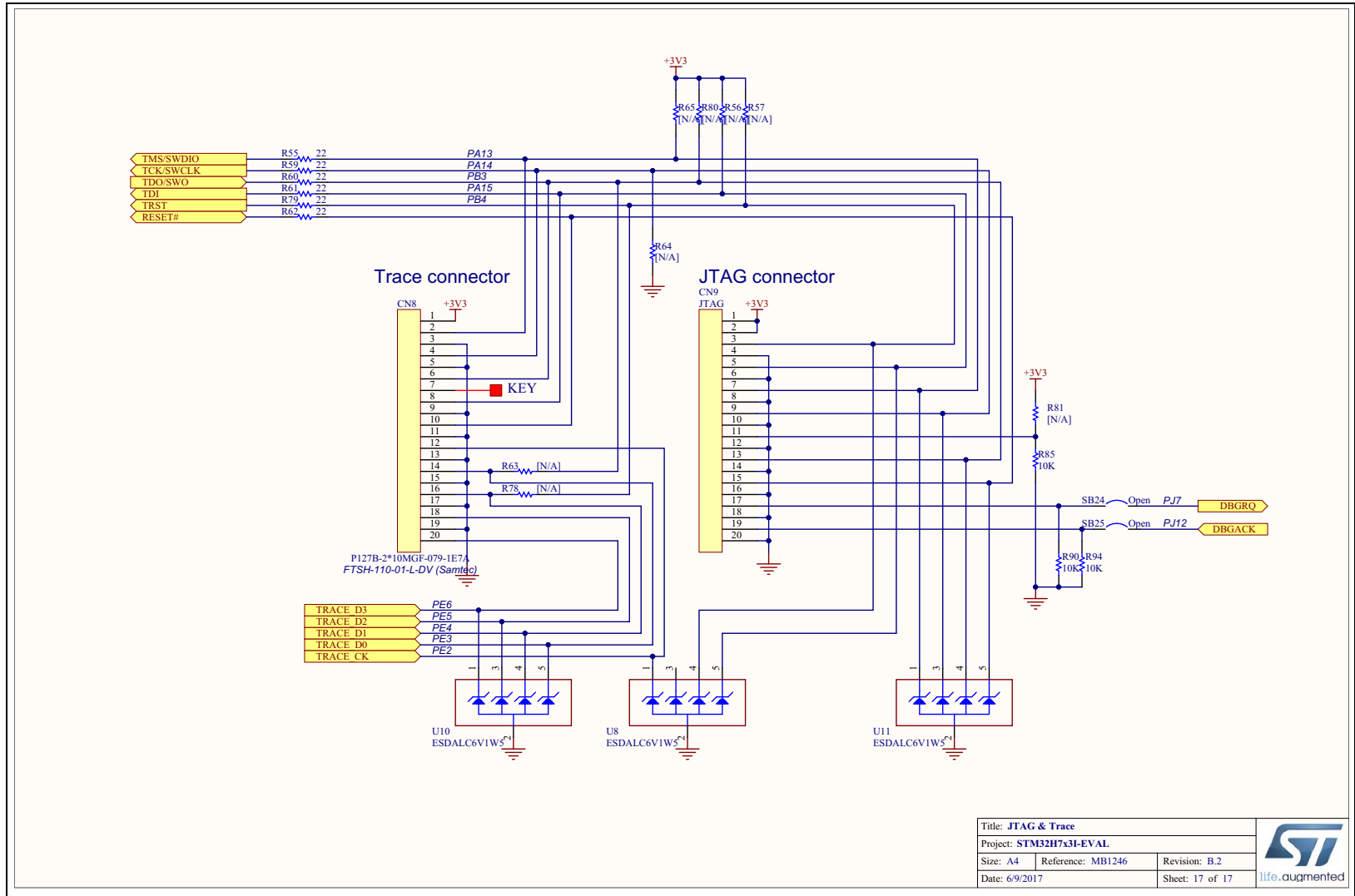
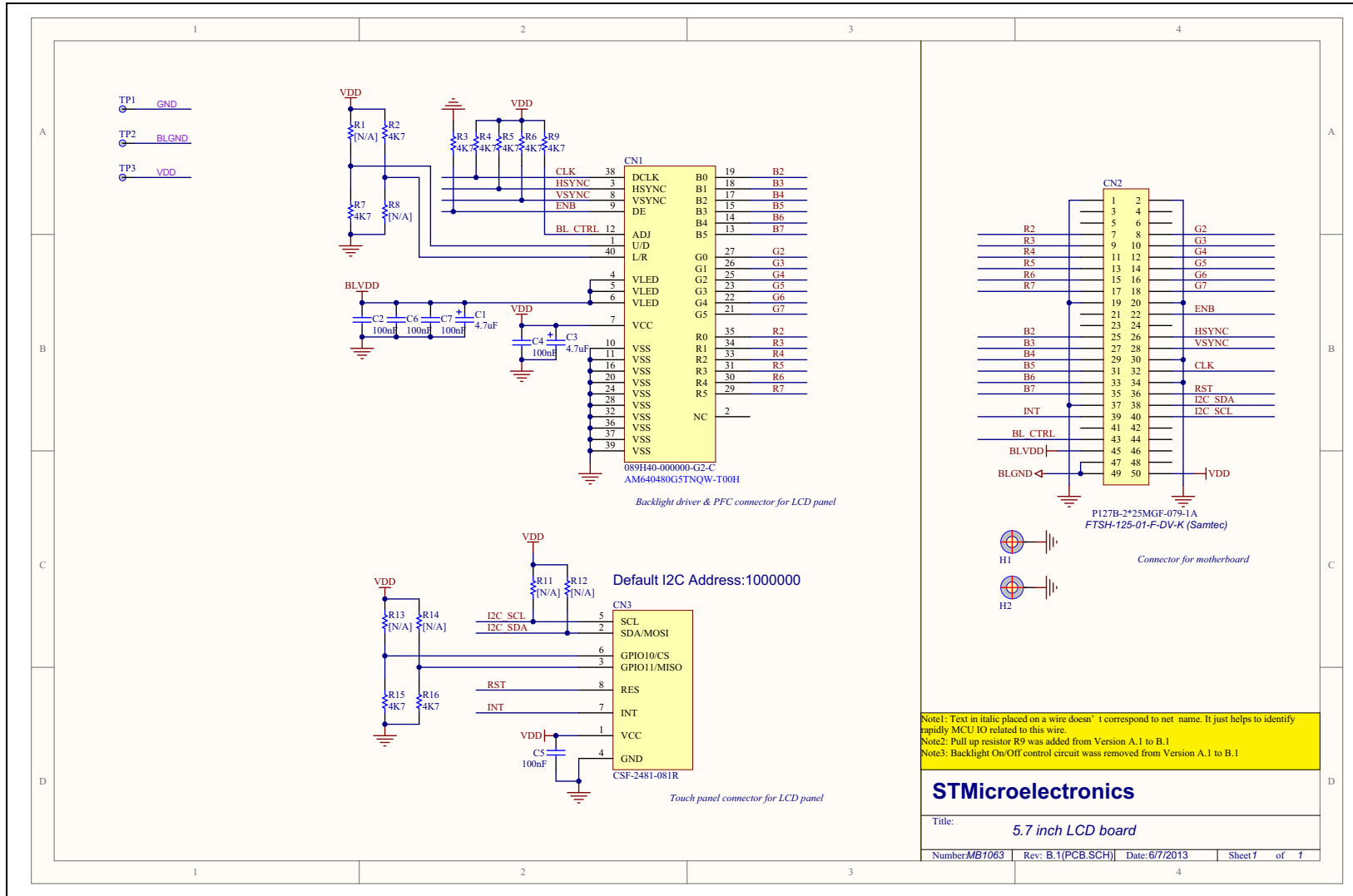




Figure 38. 5.7" LCD board



Appendix C Board revision history and limitations

Table 34. Board revision history and limitations

Board	Version	Revision details	Known limitations
MB1246 (Main board)	B-01	Initial version for STM32H743I-EVAL	-
MB1065 (LCD board)	B-01	Initial version	-

Revision history

Table 35. Document revision history

Date	Revision	Changes
26-Jun-2017	1	Initial release.

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