Evaluation boards with STM32H743XI and STM32H753XI MCUs

Introduction

The STM32H743I-EVAL and STM32H753I-EVAL Evaluation boards are high-end development platforms for the Arm® Cortex®-M7-based STM32H743XI and STM32H753XI microcontrollers, respectively. The STM32H7x3I-EVAL Evaluation boards provide access to all the STM32 peripherals for user applications, and include an embedded ST-LINK debugger/programmer.

The full range of the STM32H7x3I-EVAL hardware features helps develop applications and evaluate all peripherals: USB OTG HS and OTG FS, Ethernet, CAN FD, USART, audio DAC and ADC, digital microphone, SRAM, SDRAM, NOR flash memory, twin Quad-SPI flash memory, microSD™ 3.0 card, 5.7” 640×480 TFT color LCD with touch panel, and cryptographic hardware accelerator (available only on STM32H753XI devices).

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

Figure 1 shows the initial commercial version of the Evaluation board (order codes STM32H743I-EVAL and STM32H753I-EVAL). While it is obsolete, its description is maintained in this revision of the user manual for legacy reason. Figure 2 shows the current commercial version of the Evaluation board (order codes STM32H743I-EVAL2 and STM32H753I-EVAL2).

Figure 1. STM32H7x3I-EVAL board (top view)

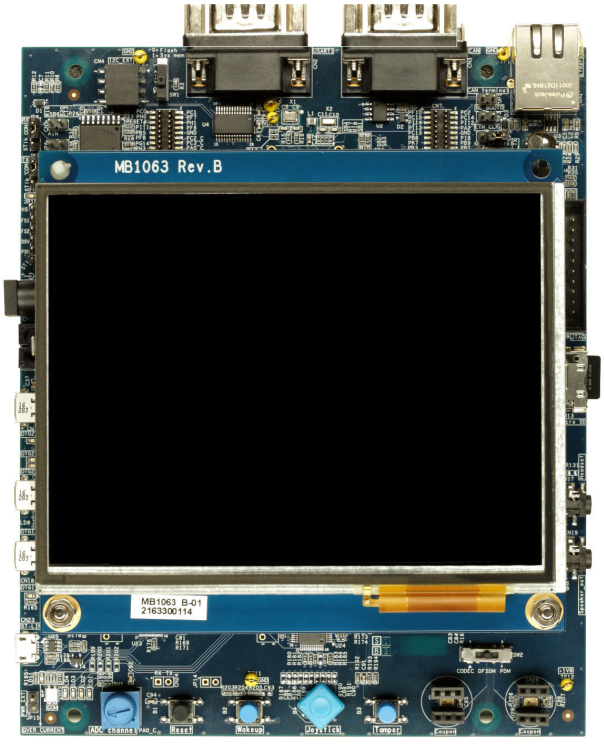
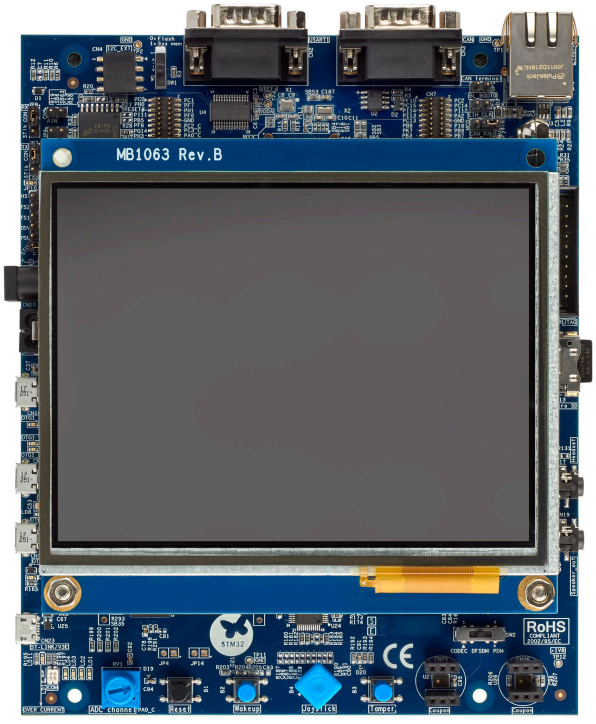


Figure 2. STM32H7x3I-EVAL2 board (top view)



Pictures are not contractual.

1 Features

- STM32H743XIH6 and STM32H753XIH6 Arm® Cortex®-M7 microcontrollers with 2 Mbytes of flash memory and 1 Mbyte of RAM in a TFBGA240+25 package
- 5.7” 640×480 TFT color LCD with touch panel
- Ethernet compliant with IEEE-802.3-2002
- USB OTG HS and OTG FS
- I^2C compatible serial interface
- RTC with rechargeable backup battery
- SAI audio DAC
- MEMS digital microphones
- 8-Gbyte (or more) SDIO 3.0 interface microSD™ card
- 8 M×32-bit SDRAM, 1 M×16-bit SRAM and 8 M×16-bit NOR flash memory
- 1-Gbit twin Quad-SPI NOR flash memory or two 512-Mbit Quad-SPI NOR flash memories
- Potentiometer
- 4 color user LEDs
- Reset, wake up, tamper, or key buttons
- Joystick with 4-direction control and selector
- Board connectors:
  - Power jack
  - 3 USB interfaces with Micro-AB connector
  - RS-232 communications
  - Ethernet RJ45
  - CAN FD-compliant connection
  - Stereo headset jack including analog microphone input
  - 2 audio jacks for external speakers
  - microSD™ card
  - JTAG/SWD and ETM trace
  - Extension connectors and memory connectors for daughterboard or wire-wrap board
- Flexible power-supply options: ST-LINK USB V_{BUS}, USB connector, or external sources
- On-board ST-LINK 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 MCU Package
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

2 Ordering information

To order the STM32H743I-EVAL and STM32H753I-EVAL, refer to Table 1. Additional information is available from the datasheet and reference manual of the target STM32.

Table 1. Ordering information

Order code	Board reference	Target STM32	Differentiating features
STM32H743I-EVAL	• MB1063(1) • MB1246(2) • MB1256(3)	STM32H743XIH6	• ST-LINK/V2-1
STM32H753I-EVAL		STM32H753XIH6	• ST-LINK/V2-1 • Cryptography
STM32H743I-EVAL2	• MB1063(1) • MB1246(2) • MB1256(3)	STM32H743XIH6	• STLINK-V3E
STM32H753I-EVAL2		STM32H753XIH6	• STLINK-V3E • Cryptography

1. *LCD board.*
2. *Main board.*
3. *microSD™ transceiver board.*

2.1 Codification

The meaning of the codification is explained in Table 2.

Table 2. Codification explanation

STM32XXYYZ-EVALT	Description	Example: STM32H753I-EVAL2
STM32XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32H7 series
YY	MCU product line in the series	STM32H743/753 includes the STM32H753xx MCUs
Z	STM32 flash memory size: • I for 2 Mbytes	2 Mbytes
-EVAL	Toolkit type: • Evaluation board	Evaluation board
T	Toolkit configuration: • None: with ST-LINK/V2-1 • 2: with STLINK-V3E	With STLINK-V3E

3 Development environment

3.1 System requirements

- Multi-OS support: Windows® 10 or 11, Linux® 64-bit, or macOS®
- USB Type-A or USB Type-C® to Micro-B cable

Note: macOS® is a trademark of Apple Inc., registered in the U.S. and other countries and regions.

Linux® is a registered trademark of Linus Torvalds.

Windows is a trademark of the Microsoft group of companies.

3.2 Development toolchains

- IAR Systems® - IAR Embedded Workbench®(1)
- Keil® - MDK-ARM(1)
- STMicroelectronics - STM32CubeIDE

1. *On Windows® only.*

3.3 Demonstration software

The demonstration software, included in the STM32Cube MCU Package corresponding to the on-board microcontroller, is preloaded in the STM32 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 *www.st.com*.

3.4 EDA resources

All board design resources, including schematics, EDA databases, manufacturing files, and the bill of materials, are available from the STM32H743I-EVAL and STM32H753I-EVAL product pages at *www.st.com*.

4 Conventions

Table 3 provides the conventions used for the ON and OFF settings in the present document.

Table 3. ON/OFF convention

Convention	Definition
Jumper JPx ON	Jumper fitted
Jumper JPx OFF	Jumper not fitted
Jumper JPx [1-2]	Jumper fitted between pin 1 and pin 2
Solder bridge SBx ON	SBx connections closed by 0 Ω resistor
Solder bridge SBx OFF	SBx connections left open
Resistor Rx ON	Resistor soldered
Resistor Rx OFF	Resistor not soldered
Capacitor Cx ON	Capacitor soldered
Capacitor Cx OFF	Capacitor not soldered

5 Safety recommendations

5.1 Targeted audience

This product targets users with at least basic electronics or embedded software development knowledge like engineers, technicians, or students.

This board is not a toy and is not suited for use by children.

5.2 Handling the board

This product contains a bare printed circuit board and like all products of this type, the user must be careful about the following points:

- The connection pins on the board might be sharp. Be careful when handling the board to avoid injury.
- This board contains static sensitive devices. To avoid damaging it, handle the board in an ESD-proof environment.
- While powered, do not touch the electric connections on the board with your fingers or anything conductive. The board operates at a voltage level that is not dangerous, but components might be damaged when shorted.
- Do not put any liquid on the board and avoid operating it close to water or at a high humidity level.
- Do not operate the board if it is dirty or dusty.
- The pins of the board are exposed and must not come into contact with a metal surface, as this can produce a short circuit and damage the board.

5.3 Battery

This product supports the use of a 3 V lithium coin cell battery to power specific microcontroller functions. Use either a CR1220 coin cell or a coin cell with similar characteristics. Always follow the instructions for disposing of used coin cells.

5.4 Delivery recommendations

Before the first use, inspect the board for any damage that may have occurred during shipment. Ensure that all socketed components are securely fixed in their sockets and that nothing is loose in the plastic bag.

6 Detailed STM32H7x3I-EVAL board description

This section provides a detailed description of the STM32H743I-EVAL and STM32H753I-EVAL Evaluation board:

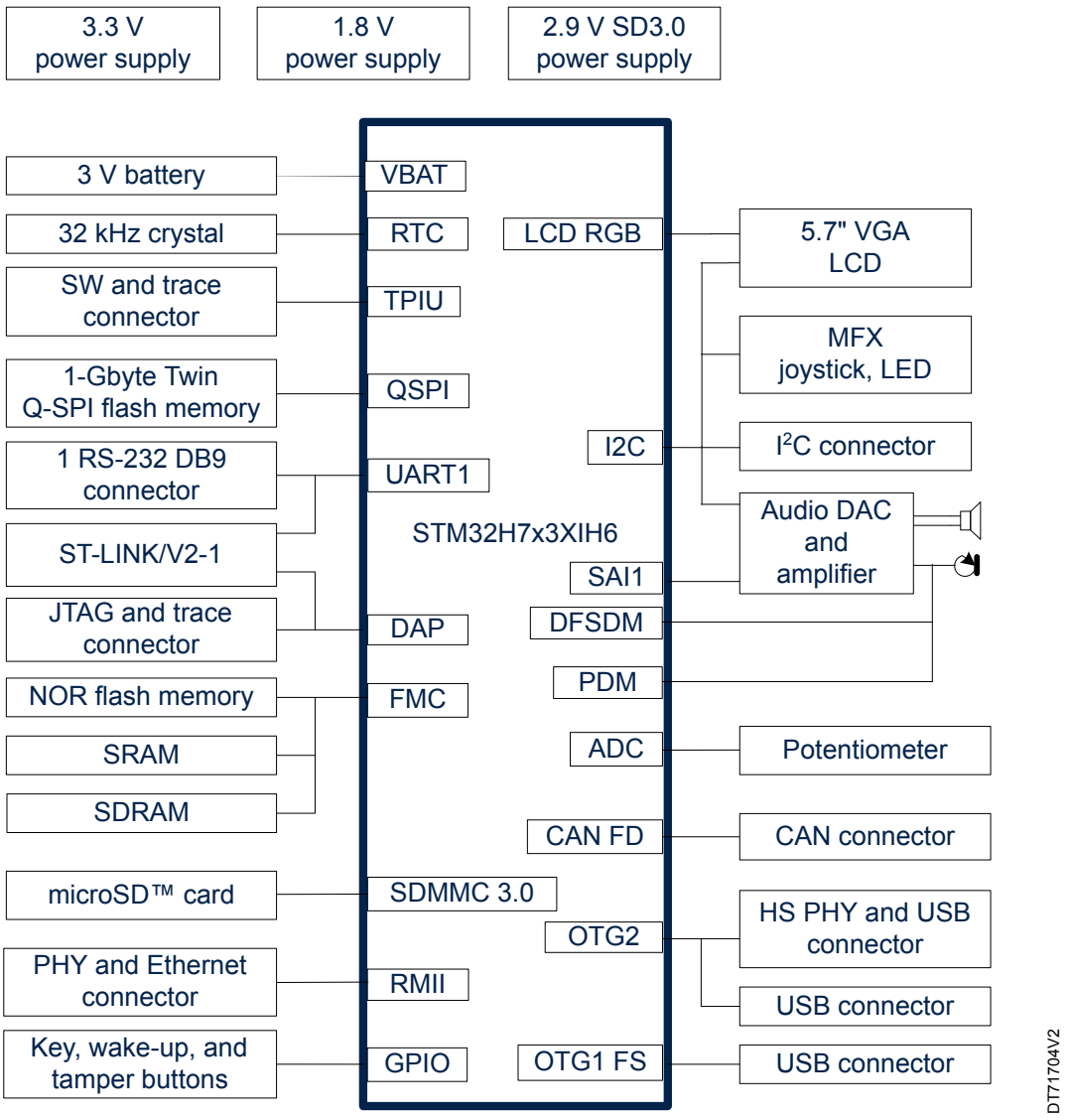
- For the STM32H7x3I-EVAL initial commercial versions (based on the main board MB1246 RevB), refer to Section 6.1: STM32H7x3I-EVAL (MB1246 RevB). While these versions are obsolete, their descriptions are maintained in this revision of the user manual for legacy reasons.
- For the STM32H7x3I-EVAL2 current commercial versions (based on the main board MB1246 RevE), refer to Section 6.2: STM32H7x3I-EVAL (MB1246 RevE).

6.1 STM32H7x3I-EVAL (MB1246 RevB)

6.1.1 STM32H7x3I-EVAL hardware layout and configuration (MB1246 RevB)

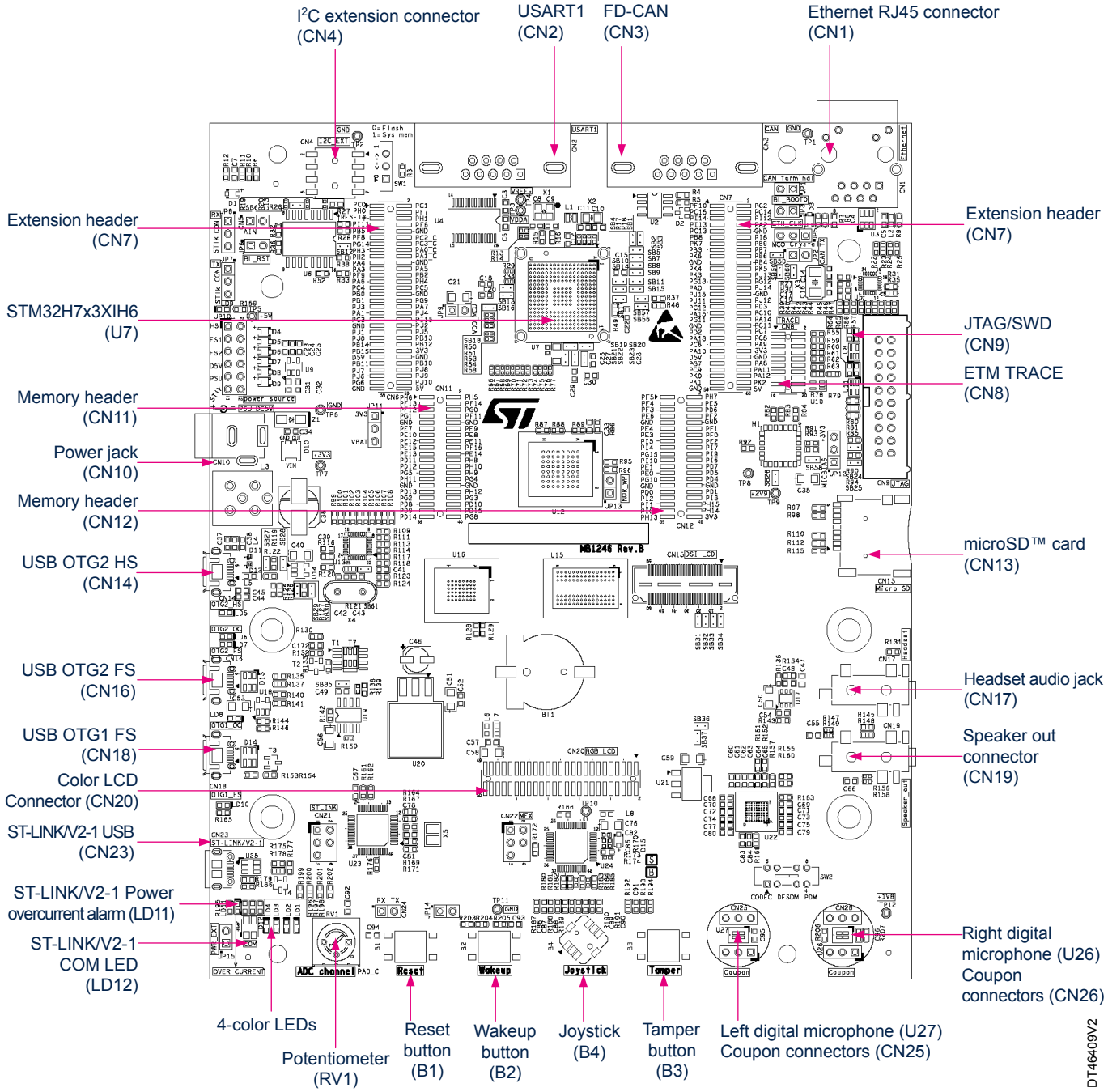
The STM32H7x3I-EVAL Evaluation boards are designed around the STM32H7x3XIH6 (240+25-pin TFBGA package) microcontroller. Figure 3 shows the hardware block diagram for STM32H7x3XIH6 and illustrates the connection between the microcontroller and the peripherals (SDRAM, SRAM, NOR flash memory, twin Quad-SPI flash memory, color LCD, USB OTG connectors, USART, Ethernet, audio, CAN FD, microSD™ 3.0 card and embedded ST-LINK). Figure 4 helps users locate these features on the Evaluation board. The mechanical dimensions of the board are shown in Figure 5.

Figure 3. Hardware block diagram (RevB)



6.1.1.1 STM32H7x3I-EVAL Evaluation board layout (RevB)

Figure 4. STM32H7x3I-EVAL RevB Evaluation board (top side)



6.1.1.2 *STM32H7x3I-EVAL Evaluation board mechanical drawing*

Figure 5 and Table 4 show the mechanical dimensions of the MB1246 board with the 5.7” LCD daughterboard.

Figure 5. STM32H7x3I-EVAL Evaluation board mechanical drawing

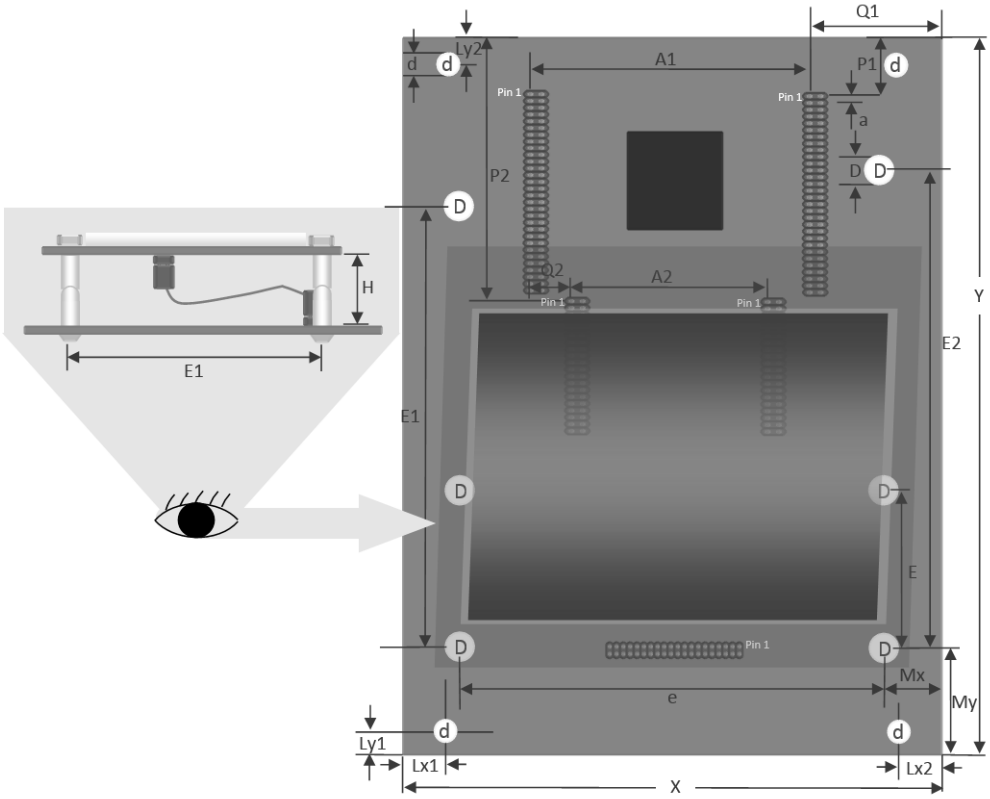


Table 4. Mechanical dimensions

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

6.1.1.3 *Embedded ST-LINK/V2-1*

The ST-LINK/V2-1 programming and debugging tool is integrated into the STM32H7x3I-EVAL board.

For detailed information about the debugging and programming features of ST-LINK/V2-1, refer to the *ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32* user manual (UM1075) and *Overview of ST-LINK derivatives* technical note (TN1235).

Features supported by the ST-LINK/V2-1:

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

Features not supported on ST-LINK/V2-1:

- SWIM interface
- Minimum supported application voltage limited to 3.0 V

Note: 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).

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

ETM trace function might be abnormal as SAI_SDB shares the same pins with TRACE_D0, and TRACE_D0 might be forced high by SAI_SDB. When using the ETM trace, it is necessary to set the ADCDAT1 pin (SAI_SDB signal of the STM32) of the audio codec by software to be tri-state.

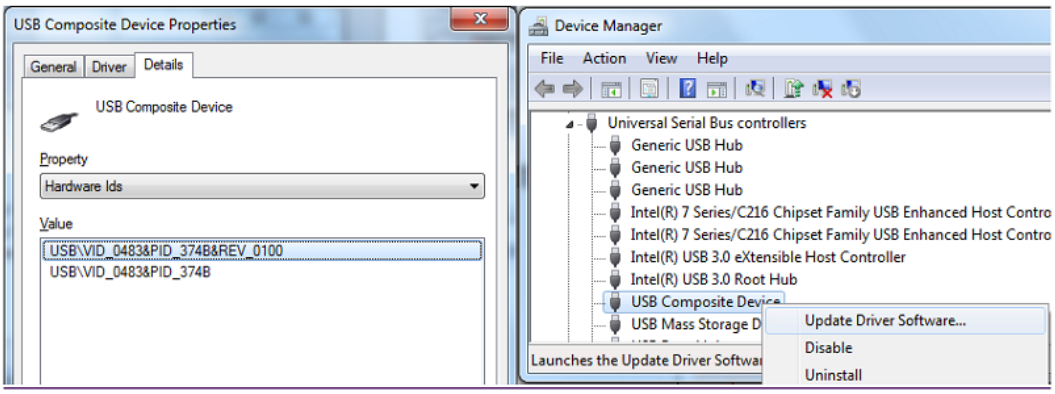
6.1.1.3.1 Drivers

ST-LINK/V2-1 requires a dedicated USB driver, which, for Windows 7®, Windows 8® and Windows 10®, is available from *www.st.com*.

In cases where the STM32H7x3I-EVAL board is connected to the PC before the driver is installed, some STM32H7x3I-EVAL interfaces might be declared as *Unknown* in the PC device manager. In this case, the user must install the dedicated driver files and update the driver of the connected device from the device manager, as shown in Figure 6.

Note: It is preferable to use the USB Composite Device to handle a full recovery.

Figure 6. USB composite device



6.1.1.3.2 ST-LINK/V2-1 firmware upgrade

ST-LINK/V2-1 embeds a firmware mechanism for the in-place upgrade through the USB port. As the firmware might evolve during the lifetime of the ST-LINK/V2-1 product (for example new functionalities, bug fixes, support for new microcontroller families), visiting the *www.st.com* website is recommended before starting to use the STM32H7x3I-EVAL board, then periodically to stay up-to-date with the latest firmware version.

6.1.1.4 Power supply

The STM32H7x3I-EVAL Evaluation board is designed to be powered by a 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 the silkscreen 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 the silkscreen of JP10 (STlk)). 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 that powers the board. This power switch also features a current limitation to protect the PC in case of a short circuit on the board. If an 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 the 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 the 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 the silkscreen of JP10 (FS2)).
- 5 V DC power from CN6 and CN7, the extension connectors for the daughterboard (the power source of the daughterboard on the silkscreen of JP10 (D5V)).

The STM32H7x3I-EVAL Evaluation board can be powered from U5V on the ST-LINK/V2-1 USB connector (CN23), 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 STM32H7x3I-EVAL board requires a current of 300 mA from the host PC. If the host can provide the required power, the enumeration succeeds, the power transistor (U19) is switched ON, the red LED LD9 is turned ON, and thus the STM32H7x3I-EVAL board is powered and can consume a maximum current of 300 mA. 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 STM32H7x3I-EVAL board exceeds the allowed current on the USB connector. 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.

Note: A power supply unit or auxiliary equipment complying with the EN 62368-1:2014+A11:2017 standard (or the one replacing it) and safety extralow voltage (SELV/ES1) with limited power capability (LPS/PS2) must power the STM32H7x3I-EVAL Evaluation board.

The following power sequence procedure must be respected:

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

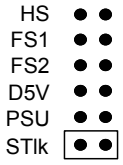
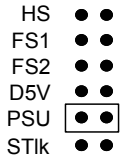
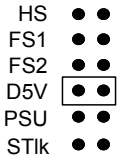
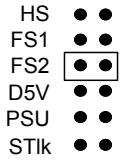
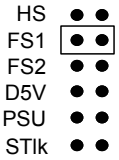
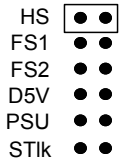
If this order is not respected, V_{BUS} might power the board first then E5V or D5V, and the following risks might be encountered:

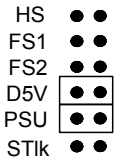
- If the board needs more than 300 mA current, the PC might be damaged, or the PC can limit the current. As a consequence, the board is not powered correctly.
- 300 mA is requested at the enumeration phase (since JP15 must be OFF). So, there is a risk that the request is rejected and the enumeration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

Note: In case a USB charger powers the STM32H7x3I-EVAL board, 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 5. Power-related jumpers.

Table 5. Power-related jumpers

Jumper	Description
JP9	JP9 is used to measure STM32 current consumption manually by a multimeter. Default setting: ON
JP10	JP10 is used to select one of the six possible power supply resources. To supply the STM32H7x3I-EVAL board through the USB connector of the ST-LINK/V2-1 (CN23) set JP10 as shown below: (default setting) 
	To supply the STM32H7x3I-EVAL board through **the jack** (CN10), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board through the **daughterboard connectors** (CN6 and CN7), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board through the USB OTG2_FS (CN16), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board through the USB OTG1_FS (CN18), set JP10 as shown below: 
JP10	To supply the STM32H7x3I-EVAL board through the USB OTG2_HS (CN14), set JP10 as shown below: 

Jumper	Description
JP10	To supply the STM32H7x3I-EVAL board and the daughterboard connected on CN6 and CN7 through the **power supply socket** (CN10), set JP10 as shown below (**the daughterboard must not have its power supply connected**) 
JP11	V_{BAT} is connected to +3.3 V when JP11 is set as shown below: (default setting) 
	V_{BAT} is connected to the battery when JP11 is set as shown below: 

The LED LD9 lights up when the STM32H7x3I-EVAL Evaluation board is powered by the 5 V correctly.

Note: To avoid the impact of USB and Ethernet PHYs, and get precise results about current consumption on JP9, consider the following cautions:

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

6.1.1.5 Clock source

Two clock sources (X1 and X2) are available on the STM32H7x3I-EVAL Evaluation board for the STM32H7x3XI, and embedded RTC. Other clock sources (X3 and X4) are used for their peripherals:

- X1, 25 MHz crystal for the STM32H7x3XI, it can be disconnected by removing R15 and R16 when an 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 6. 25 MHz crystal X1-related solder bridges

Solder bridge	Description
SB39	PH0 is connected to a 25 MHz crystal when SB39 is OFF (default setting).
	PH0 is connected to the extension connector (CN6) when SB39 is ON. In such a case, R15 must be OFF to avoid disturbance due to the 25 MHz quartz.
SB40	PH1 is connected to a 25 MHz crystal when SB40 is OFF (default setting).
	PH1 is connected to the extension connector (CN6) when SB40 is ON. In such a case, R16 must be OFF to avoid disturbance due to the 25 MHz quartz.

Table 7. 32 kHz crystal X2-related solder bridges

Solder bridge	Description
SB1	PC14 is connected to a 32 kHz crystal when SB1 is OFF (default setting).
	PC14 is connected to the extension connector (CN7) when SB1 is ON. In such a case, R18 must be OFF to avoid disturbance due to the 32 kHz quartz.
SB4	PC15 is connected to a 32 kHz crystal when SB4 is OFF (default setting).
	PC15 is connected to the extension connector (CN7) when SB4 is ON. In such a case, R17 must be OFF to avoid disturbance due to the 32 kHz quartz.

Note: For Ethernet clock and jumper JP5 configuration, refer to the Ethernet section.

6.1.1.6 Reset sources

The reset signal of the STM32H7x3I-EVAL Evaluation board is active at a low level and the reset sources include:

- Reset button (B1)
- Debugging tools from JTAG/SWD connector (CN9) and ETM trace connector (CN8)
- Daughterboard from the CN6 connector
- Embedded ST-LINK/V2-1
- RS-232 connector (CN2) for ISP.

Note: The jumper JP6 must be ON for RESET handled by pin 8 (CTS signal) of the RS-232 connector (CN2).

6.1.1.7 Boot option

The STM32H7x3I-EVAL Evaluation board can boot from:

- The embedded user flash memory,
- The system memory with the bootloader for ISP,
- Or the 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 also be configured through the RS-232 connector (CN2).

Table 8. Boot selection switch

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

Table 9. Boot related jumpers

Jumper	Description
JP3	Pin 6 (DSR signal) of the RS-232 connector (CN2) manages the Bootloader_BOOT0 when JP3 is ON. This configuration is used for the bootloader application only. Default setting: OFF

6.1.1.8 Audio

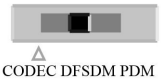
An audio codec with four DACs and two ADCs inside is connected to the SAI interface of the STM32H7x3I-EVAL microcontroller to support the TDM feature on the SAI port. This feature can implement audio recording on digital and analog microphones and audio playback of various audio streams on headphones and lineout at the same time.

It communicates with the STM32H7x3XI through the I2C1 bus, which is shared with LCD and MFX (multifunction expander).

The analog microphone on the headset is connected to the ADC of the audio codec through the audio jack (CN17). External speakers can be connected to the audio codec through the audio jack (CN19).

Two digital microphones are on the STM32H7x3I-EVAL Evaluation board. They can be connected to either an audio codec DFSDM or to the PDM port of the STM32H7x3XI, by setting the switch SW2 shown in the table below. For legacy, the coupon connectors (CN25 and CN26) can be used to support the MEMS microphone after removing the SB54 and SB55 solder bridges.

Table 10. Audio-related switch and jumper

Switch/ Jumper	Description
SW2	The digital microphone is connected to the audio codec when SW2 is set as shown below (default setting): 
	The digital microphone is connected to the DFSDM port of STM32H7x3XI when SW2 is set as shown below: 
	The digital microphone is connected to the PDM port of STM32H7x3XI when SW2 is set as shown below: 
JP12	The digital microphone power source is connected to +3.3 V power when JP12 is set as shown below (default setting): 
	The digital microphone power source is connected to MICBIAS1 from the audio codec when JP12 is set as shown below: 

Note: The I^2C address of the audio codec is 0b0011010.

The 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 OFF, and SB56 must be ON to move SAI_CLK to PG7.

6.1.1.9 USB OTG1_FS

The STM32H7x3I-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}. This USB connection at 5 V DC can power the Evaluation board at a current of up to 500 mA.

A green LED (LD10) lights up if either one of the following events occurs:

- The power switch (U18) is ON and the STM32H7x3I-EVAL board works as a USB Host.
- V_{BUS} is powered by another USB Host when the STM32H7x3I-EVAL board works as a USB Device.

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

Note: An external power supply must power the STM32H7x3I-EVAL board when using the OTG function.

Note: JP2 and SB50 must be OFF when using USB OTG_FS as mentioned in Table 13. CAN-related jumpers and solder bridges.

6.1.1.10 *USB OTG2_HS and FS*

The STM32H7x3I-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)

These USB connectors (CN14 or CN16) can power the Evaluation board 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 11. USB OTG2 and USART1 function configuration.

Table 11. USB OTG2 and USART1 function configuration

Function	Mounted	Removed
OTG2_HS-CN14 (default)	R104, R105, SB27, and SB30 ON	R254, SB48, SB28, and SB29 OFF
OTG2_FS-CN16	R254, SB48, SB28, and SB29 ON SB47 and SB49 ON	R104, R105, SB27, SB30, SB46, and SB51 OFF
USART1 (default)	SB46 and SB51 ON	SB47 and SB49 OFF

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

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

- The power switch (U14) is ON and the STM32H7x3I-EVAL board works as a USB Host.
- V_{BUS} is powered by another USB Host when the STM32H7x3I-EVAL board works as a USB Device.

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

Note: An external power supply must power the STM32H7x3I-EVAL board when using the OTG function.

6.1.1.11 *RS-232*

The D-type, 9-pin connector (CN2) supports the communication through RS-232 and is connected to the USART1 of the STM32H7x3XI on the STM32H7x3I-EVAL Evaluation board. The signals Bootloader_RESET and Bootloader_BOOT0 are added on the RS-232 connector (CN2) for ISP support.

The USART1 of the STM32H7x3XI is shared with the RS-232 of the ST-LINK/V2-1 controller. Connection is switched by setting JP7 and JP8.

Table 12. USART1 related jumpers

Jumper	Description
JP7	USART1_TX is connected to RS-232 when JP7 is set as shown below (default setting): 
	USART1_TX is connected to the USART_RX of the ST-LINK/V2-1 controller when JP7 is set as shown below: 
JP8	USART1_RX is connected to RS-232 when JP8 is set as shown below (default setting): 
	USART1_RX is connected to the USART_TX of the ST-LINK/V2-1 controller when JP8 is set as shown below: 

6.1.1.12 *microSD™ card*

The 8-Gbyte (or more) microSD™ card connected to the SDIO 3.0 port of the STM32H7x3XI microcontroller is available on the Evaluation board. MFX GPIO15 manages the detection of the microSD™ card.

IP4856CX25/C (M1) is an SD 3.0-compliant, 6-bit-bidirectional, dual-voltage-level translator. It is implemented on the STM32H7x3I-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.

6.1.1.13 *External I²C connector*

The I2C1 bus of the STM32H7x3XI is connected to CN4 on the STM32H7x3I-EVAL. The I²C functional daughterboard can be mounted on the CN4 connector and accessed by the microcontroller through the I2C1 bus.

6.1.1.14 *CAN FD*

The STM32H7x3I-EVAL Evaluation board supports one channel of the flexible data rate CAN (CAN FD) communication bus, based on the 3.3 V CAN transceiver.

PD3 of the STM32H7x3XI controls the standby signal on the CAN FD transceiver. Other CAN FD signals are shared with USB OTG1 FS signals.

Table 13. CAN-related jumpers and solder bridges

Jumper	Description
JP1	CAN terminal resistor is enabled when JP1 is ON. Default setting: OFF
JP2	PA12 is connected with the CAN FD Tx signal when JP2 is ON. Default setting: OFF
SB50	PA11 is connected with the CAN FD Rx signal when SB50 is ON. Default setting: OFF

6.1.1.15 *Ethernet*

The STM32H7x3I-EVAL Evaluation board supports 10M/100M Ethernet communication by a PHY (U5) and integrates an RJ45 connector (CN1). Ethernet PHY is connected to STM32H7x3XI through the RMII interface.

A PHY with a 25 MHz crystal or with a 25 MHz MCO from STM32H7x3XI can generate a 50 MHz reference clock. These two resources can be selected by setting jumper JP5 as shown in the table below.

Table 14. Ethernet-related jumpers

Jumper	Description
JP5	An external crystal X3 generates the 50 MHz RMII reference clock when JP5 is set as shown below: (default setting) 
	The MCO at PA8 generates the 50 MHz RMII reference clock when JP5 is set as shown below: 

6.1.1.16 *Memories*

An 8M×32-bit SDRAM is connected to the SDRAM bank1 of the FMC interface of the STM32H7x3XI microcontroller.

A 1M×16-bit SRAM is connected to the NOR/PSRAM2 bank1 of the FMC interface and BLN0 and BLN1, connected to BLE and BHE of SRAM respectively, allow both 8-bit and 16-bit access.

A 128-Mbit NOR flash memory is connected to the NOR/PSRAM1 bank1 of the FMC interface. The pull-up resistor connected to the BYTE pin of the NOR flash memory selects the 16-bit operation mode. The write protection can be enabled or disabled, depending on how the jumper JP13 is set, as shown in the table below.

Table 15. NOR flash memory-related jumpers

Jumper	Description
JP13	Write protection is enabled when JP13 is ON while write protection is disabled when JP13 is OFF. Default setting: OFF

All signals for memory are also connected to memory connectors (CN11 and CN12) for memory daughterboards.

Limitations can happen when using other peripherals:

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

In such cases, the serial resistors R236 (A19), R231 (A20), R217 (A21) and R230 (A22) must be OFF. 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 the (SAI_SDB) ADCDAT1 pin of the audio codec (U22) by software to be tri-state.

6.1.1.17 *Twin Quad-SPI NOR flash memory*

The Quad-SPI flash memory is implemented on the STM32H7x3XI microcontroller of the Evaluation board either as one twin Quad-SPI NOR flash memory (1-Gbit (2×512 Mbytes)) memory or as two Quad-SPI NOR flash memories (512 Mbytes).

The two dies in the twin Quad-SPI flash memory share the same clock and chip select signals of the STM32H7x3XI microcontroller.

6.1.1.18 *Analog input*

The two-pin header CN5 and 10 kΩ potentiometer RV1 are connected to PA0_C of STM32H7x3XI as an analog input. A low-pass filter can be implemented by replacing R11 and C7 with the right values of resistor and capacitor as requested by the end-user application.

6.1.1.19 *Display and input devices*

Four general-purpose-color LEDs (LD 1, 2, 3, and 4) are available as a display device. LD1 and LD3 are connected on STM32H7x3XI, and LD2 and LD4 are connected to MFX.

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

The 5.7-inch 640x480 TFT color LCD with a capacitive touch panel is connected to the RGB LCD interface of the STM32H7x3XI microcontroller.

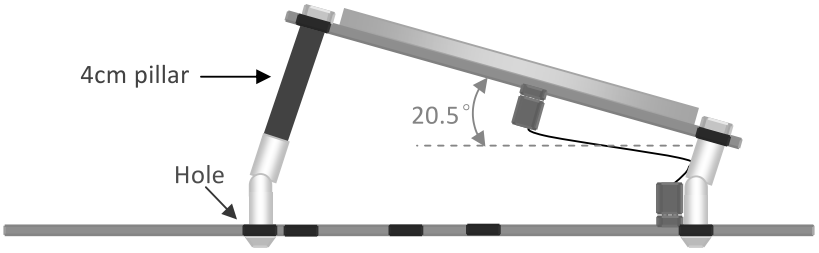
Note: When using a 5.7-inch LCD, the PSU extension power supply is mandatory because of the high current consumption of this type of LCD.

Table 16. 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	5 V	-	46	-	-
47	BLGND	-	48	-	-
49	BLGND	-	50	3.3 V	-

The orientation of the 5.7-inch LCD daughterboard can be changed using hinged standoffs and pillars. Refer to Figure 7. Orientation setting of 5.7-inch LCD daughterboard for details.

Figure 7. Orientation setting of 5.7-inch LCD daughterboard



6.1.1.20 *MFX (multifunction eXpander)*

MFX circuit on STM32H7x3I-EVAL Evaluation board acts as IO-expander. The communication interface between MFX and STM32H7x3XI is the I2C1 bus.

The signals connected to MFX are listed in Table 17.

Table 17. MFX signals

Pin number of MFX	Pin name of MFX	MFX functions	Function of STM32H7x3I-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

6.1.2 STM32H7x3I-EVAL connectors (MB1246 RevB)

6.1.2.1 Ethernet RJ45 connector (CN1)

Figure 8. Ethernet RJ45 connector (CN1) front view

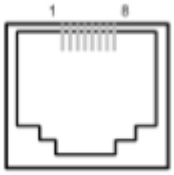


Table 18. RJ45 connector (CN1)

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

6.1.2.2 RS-232 connector (CN2)

Figure 9. RS-232 connector (CN2) front view

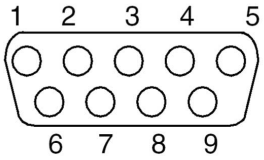


Table 19. RS-232 connector (CN2) with ISP support

Pin number	Description	Pin number	Description
1	NC	6	Bootloader_BOOT0
2	RS232_RX (PB15)	7	NC
3	RS232_TX (PB14)	8	Bootloader_RESET
4	NC	9	NC
5	GND	-	-

6.1.2.3 CAN D-type, 9-pin male connector (CN3)

Figure 10. CAN D-type, 9-pin connector (CN3) front view

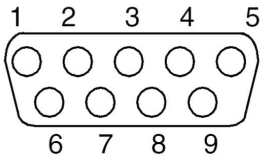


Table 20. CAN D-type 9-pin male connector (CN3)

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

6.1.2.4 External I^2C connector (CN4)

Figure 11. I^2C EXT connector (CN4) front view

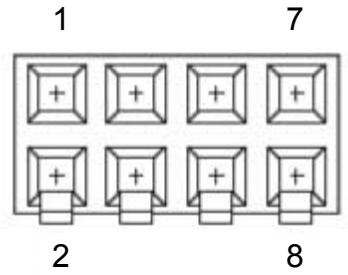


Table 21. I^2C EXT connector (CN4)

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

6.1.2.5 *Analog input-output connector (CN5)*

Figure 12. Analog input-output connector (CN5) top view

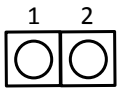


Table 22. Analog input-output connector (CN5)

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

6.1.2.6 *Daughterboard extension connectors (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 STM32H7x3I-EVAL Evaluation board. All GPIOs 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 the development of common daughterboards for several ST Evaluation boards. The standard width between CN6 pin1 and CN7 pin1 is 2700 mils (68.58 mm).

A daughterboard can use each pin on CN6 and CN7 after disconnecting the board from the corresponding function block on the STM32H7x3I-EVAL Evaluation board. For details refer to Table 23. Daughterboard extension connector (CN6) and Table 24. Daughterboard extension connector (CN7).

Table 23. Daughterboard extension connector (CN6)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
1	PC0	ULPI_STP	R124 OFF
3	PH0	OSC_IN	R15 OFF and SB39 ON
5	RESET#	-	-
7	PI11	ULPI_DIR	R123 OFF
9	PB5	ULPI_D7	R101 OFF
11	PF8	QSPI_BK1_IO0	R38 OFF
13	PG14	QSPI_BK2_IO3	R27 OFF
15	PH3	QSPI_BK2_IO1	R28 OFF
17	PH2	QSPI_BK2_IO0	R52 OFF
19	PA4	EXT_RESET/LED3	R296 and CN4 OFF
21	PA3	ULPI_D0	R114 OFF
23	PF9	QSPI_BK1_IO1	R32 OFF
25	PA6	GPIO_LCD_BL_CTRL	CN15 OFF
27	PC4	RMII_RXD0	R41 OFF
29	PB0	ULPI_D1	R113 OFF
31	PB1	ULPI_D2	R111 OFF
33	PJ3	RGB_LCD_R4	CN20 OFF
35	PA1	RMII_RX_CLK	R31 OFF
37	PC3	DFSDM_DATA1	Do not dial SW2 to the middle
39	GND	-	-

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
41	PJ1	RGB_LCD_R2	CN20 OFF
43	PJ0	RGB_LCD_R1	CN20 OFF
45	PB14	USART1_TX/USB_FS2_DM	SB46 and SB47 OFF
47	PB15	USART1_RX/USB_FS2_DP	SB49 and SB51 OFF
49	D5V	-	-
51	PB11	ULPI_D4	R109 OFF
53	PJ7	RGB_LCD_G0	R24 CN20 OFF
55	PJ6	RGB_LCD_R7	CN20 OFF
57	PG6	QSPI_BK1_NCS	SB6 and R19 OFF
59	GND	-	-
2	PC1	RMII_MDC/PDM1_D1	SB38 OFF, not to dial SW2 to the right
4	PF7	QSPI_BK1_IO2	R36 OFF
6	PH1	OSC_OUT	R16 OFF
8	PF6	QSPI_BK1_IO3	R26 OFF
10	GND	-	-
12	PC2_C	-	-
14	PC3_C	-	-
16	PA0_C	Potentiometer	SB43 OFF
18	PA1_C	-	-
20	GND	-	-
22	PA5	ULPI_CK	R118 OFF
24	PB2	QSPI_CLK	-
26	PH4	ULPI_NXT	R117 OFF
28	PC5	RMII_RXD1	R39 OFF
30	GND	-	-
32	PG9	QSPI_BK2_IO2	R33 OFF
34	PA7	RMII_CRS_DV	R44 OFF
36	PJ4	RGB_LCD_R5	CN20 OFF
38	PI15	RGB_LCD_R0	CN20 OFF
40	PJ2	RGB_LCD_R3	CN15 and CN20 OFF
42	PJ5	RGB_LCD_R6	CN20 OFF
44	PB13	ULPI_D6/USB_FS2_VBUS	R104 and R254 OFF
46	PB12	ULPI_D5/USB_FS2_ID	R105 and SB48 OFF
48	+3V3	-	-
50	GND	-	-
52	PB10	ULPI_D3	R109 OFF
54	PJ8	RGB_LCD_G1	CN20 OFF
56	PJ9	RGB_LCD_G2	CN20 OFF
58	PJ10	RGB_LCD_G3	CN20 OFF
60	+5 V	-	-

Table 24. Daughterboard extension connector (CN7)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
1	PF10	LED1	R286, R294, and CN15 OFF
3	PC15	OSC32_OUT	R17 OFF and SB4 ON
5	PI14	RGB_LCD_CLK	CN20 OFF
7	PI13	RGB_LCD_VSYNC	CN20 OFF
9	PC13	KEY_TAMP_1/WKUP2	R193 OFF
11	PB8	SDIO_1_CKIN	-
13	PK7	RGB_LCD_DE	CN20 OFF
15	PB3	JTDO/TRACESWO	R60 OFF
17	PK6	RGB_LCD_B7	R199 and CN20 OFF
19	GND	-	-
21	PK4	RGB_LCD_B5	R201 and CN20 OFF
23	PK3	RGB_LCD_B4	R202 and CN20 OFF
25	PG13	RMII_TXD0	-
27	PA0	KEY_WKUP0	R173 and R203 OFF
29	PJ15	RGB_LCD_B3	CN20 OFF
31	PJ11	RGB_LCD_G4	CN20 OFF
33	PC12	SDIO_1_CK	R83 OFF
35	PA15	JTDI/CEC	R61 and CN15 OFF
37	PG11	RMII_TX_EN	-
39	GND	-	-
41	PD2	SDIO_1_CMD	-
43	PA13	JTMS-SWDIO	R55 OFF
45	PC6	SDIO_1_D0DIR	SB58 OFF
47	PA10	USB_FS1_ID	CN18 OFF
49	D5V	-	-
51	PG7	SAI_1_MCLK_A	SB56 OFF
53	PC9	SDIO_1_D1	-
55	PK0	RGB_LCD_G5	CN20 OFF
57	PK1	RGB_LCD_G6	CN20 OFF
59	GND	-	-
2	PC2	DFSDM_CKOUT	Do not dial SW2 to the left
4	PC14	OSC32_IN	R18 OFF and SB1 ON
6	PI12	RGB_LCD_HSYNC	CN20 OFF
8	PA2	RMII_MDIO	R47 OFF
10	GND	-	-
12	PI8	GPIO_EXPANDER_INT	R185 OFF
14	PB9	SDIO_1_CDIR	R91 OFF
16	PB7	I2C_1_SDA	R160, R181, R209, CN4, CN15, and CN20 OFF
18	PB6	I2C_1_SCL	R155, R180, R212, CN4, CN15, and CN20 OFF
20	PB4	NJTRST	R79 OFF

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
22	PK5	RGB_LCD_B6	R200 and CN20 OFF
24	PJ13	RGB_LCD_B1	CN20 OFF
26	PG12	RMII_TXD1	-
28	PJ14	RGB_LCD_B2	CN20 OFF
30	GND	-	-
32	PJ12	RGB_LCD_B0	R25 and CN20 OFF
34	PD3	GPIO_CAN_STBY	R4 OFF
36	PC10	SDIO_1_D2	-
38	PA14	JTCK-SWCLK	R59 OFF
40	PC11	SDIO_1_D3	SB45 OFF
42	PC7	SDIO_1_D123DIR	R92 OFF
44	PC8	SDIO_1_D0	-
46	PA9	USB_FS1_VBUS	R255 OFF
48	+3.3 V	-	-
50	GND	-	-
52	PA8	MCO1	CN15 and JP5 OFF
54	PA11	USB_FS1_DM/FDCAN_1_RXFD	SB50 and SB59 OFF
56	PA12	USB_FS1_DP/FDCAN_1_TXFD	JP2 and SB60 OFF
58	PK2	RGB_LCD_G7	CN20 OFF
60	+5 V	-	-

6.1.2.7 *ETM trace debugging connector (CN8)*

Figure 13. ETM trace debugging connector (CN8) top view

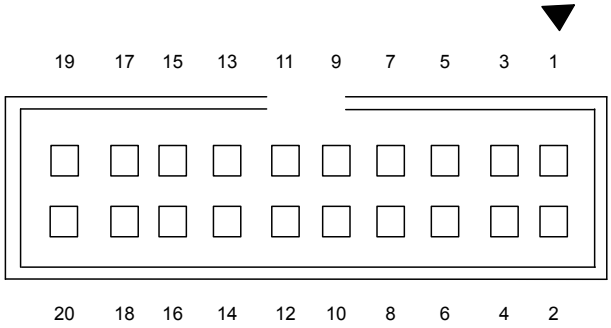


Table 25. ETM trace debugging connector (CN8)

Pin number	Description	Pin number	Description
1	+3.3 V	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

6.1.2.8 JTAG/SWD connector (CN9)

Figure 14. **JTAG/SWD debugging connector (CN9) top view**

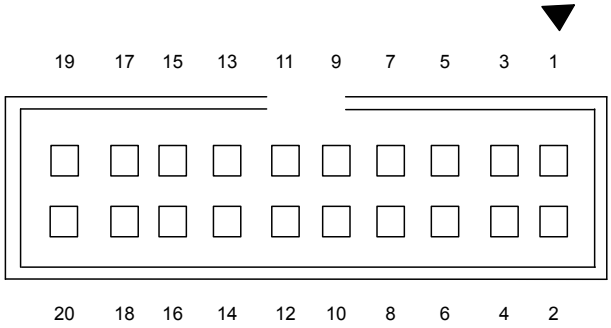


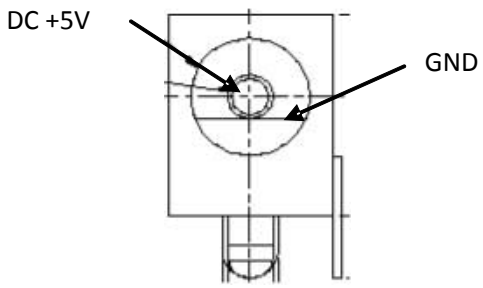
Table 26. **JTAG/SWD debugging connector (CN9)**

Pin number	Description	Pin number	Description
1	+3.3 V	2	+3.3 V
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	DBGRQ(PJ7)	18	GND
19	DBGACK(PJ12)	20	GND

6.1.2.9 *Power connector (CN10)*

A 5 V DC power supply can supply the STM32H7x3I-EVAL Evaluation board through the external power supply socket (CN10) shown in the figure below. The central pin of CN10 must be positive.

Figure 15. Power supply connector (CN10) front view



6.1.2.10 *Memory connectors (CN11 and CN12)*

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

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

The space between these two connectors is defined as a standard that helps the development of a common daughterboard. The standard width between CN11 pin1 and CN12 pin1 is 1914 mils (48.62 mm). For details on signal assignment, refer to the tables below.

Table 27. Memory connector (CN11)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-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	-

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
28	PG4	A14/BA0	-
30	GND	-	-
32	PH12	D20	-
34	PG3	A13	-
36	PD10	D15	-
38	PD15	D1	-
40	PG8	SDCLK	-

Table 28. Memory connector (CN12)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
1	PF5	A5	-
3	PF4	A4	-
5	PF3	A3	-
7	PE6	A22/SAI1_SD_A/TRACED3	SB2 and SB3 OFF
9	GND	-	-
11	PE4	A20/SAI1_FS_A/TRACED1	SB5 and SB7 OFF
13	PE3	A19/SAI1_SD_B/TRACED0	SB8 and SB9 OFF
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	SB41 and SB42 OFF
6	PD6	NWAIT	-
8	PF2	A2	-
10	GND	-	-
12	PF1	A1	-
14	PF0	A0	-
16	PE2	A23/PDM1_CK1/SAI1_MCLK_A/TRACECLK	SB11, SB15, and SB57 OFF
18	PI7	D29	-
20	PI9	D30	-

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
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	+3.3 V	-	-

6.1.2.11 *microSD™ connector (CN13)*

Figure 16. microSD™ connector (CN13) top view

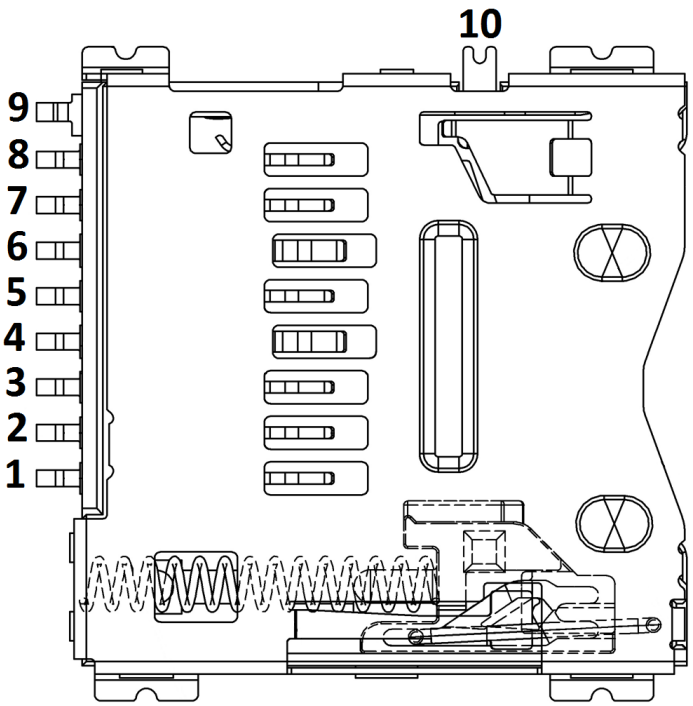


Table 29. microSD™ connector (CN13)

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)

6.1.2.12 USB OTG2_HS Micro-AB connector (CN14)

Figure 17. **USB OTG2_HS Micro-AB connector (CN14) front view**

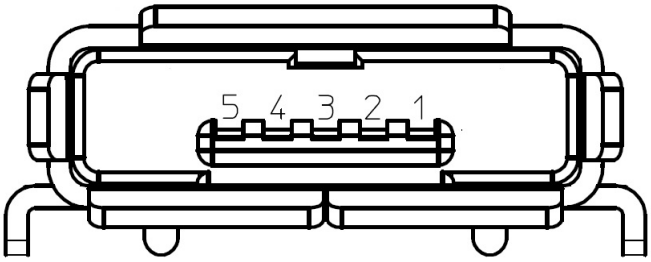


Table 30. **USB OTG2_HS Micro-AB connector (CN14)**

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

6.1.2.13 USB OTG2_FS Micro-AB connector (CN16)

Figure 18. **USB OTG2_FS Micro-AB connector (CN16) front view**

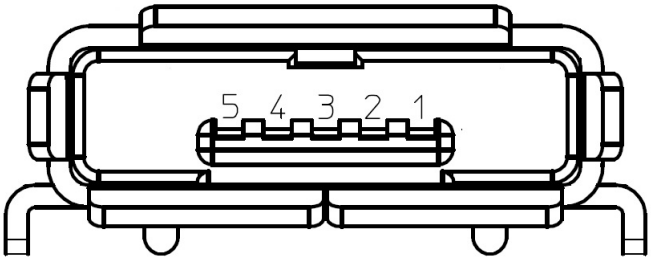


Table 31. **USB OTG2_FS Micro-AB connector (CN16)**

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

6.1.2.14 Audio jack (CN17)

A 3.5 mm stereo audio jack (CN17) is available on the STM32H7x3I-EVAL Evaluation board to support a headset (headphone and microphone integrated).

6.1.2.15 *USB OTG1_FS Micro-AB connector (CN18)*

Figure 19. USB OTG1_FS Micro-AB connector (CN18) front view

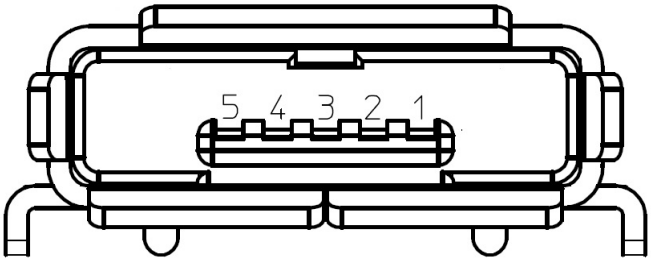


Table 32. USB OTG1_FS Micro-AB connector (CN18)

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

6.1.2.16 *Audio jack (CN19) for speaker*

A 3.5 mm stereo audio jack (CN19) for speaker-out is available on the STM32H7x3I-EVAL Evaluation board to support an external speaker.

6.1.2.17 *TFT LCD connector (CN20)*

A TFT-color LCD board is mounted on the CN20 connector. Refer to Section 6.1.1.19: Display and input devices for details.

6.1.2.18 *ST-LINK/V2-1 programming connector (CN21)*

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

6.1.2.19 *MFX programming connector (CN22)*

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

6.1.2.20 *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 20. USB Micro-B connector (CN23) front view

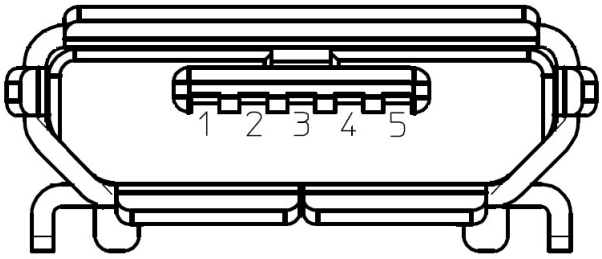


Table 33. USB Micro-B connector (CN23) front view

Pin number	Description	Pin number	Description
1	V_{BUS} (power)	4	ID
2	DM	5	GND
3	DP	-	-

6.1.2.21 *MEMS microphone coupon connectors (CN25 and CN26)*

Figure 21. MEMS microphone coupon connectors (CN25 and CN26) top view

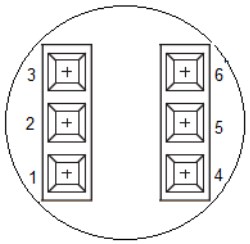


Table 34. MEMS microphone coupon connectors (CN25 and CN26)

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

6.1.3 STM32H7x3I-EVAL RevB I/O assignment

Table 35. STM32H7x3I-EVAL RevB 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
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	-

Pin No.	Pin name	Default function	Alternative function
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	-
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	-

Pin No.	Pin name	Default function	Alternative function
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	-
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	-

Pin No.	Pin name	Default function	Alternative function
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	-
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	-

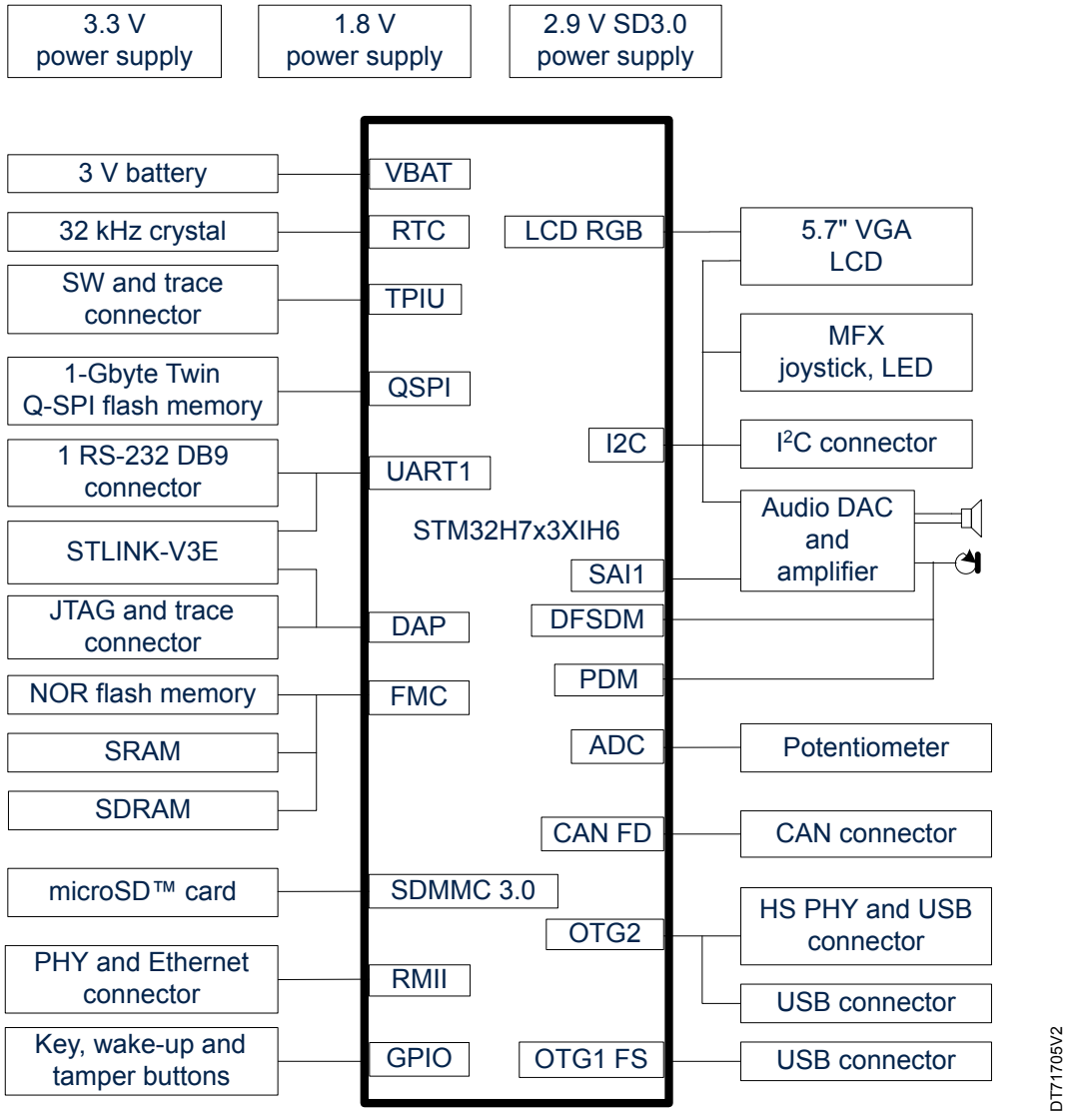
Pin No.	Pin name	Default function	Alternative function
J15	PK1	RGB_LCD_G6	-
H17	PK2	RGB_LCD_G7	-
C8	PK3	RGB_LCD_B4	-
B8	PK4	RGB_LCD_B5	-
A8	PK5	RGB_LCD_B6	-
C7	PK6	RGB_LCD_B7	-
D7	PK7	RGB_LCD_DE	-
T1	PA0_C	Potentiometer	-
T2	PA1_C	-	-
R1	PC2_C	-	-
R2	PC3_C	-	-

6.2 STM32H7x3I-EVAL (MB1246 RevE)

6.2.1 STM32H7x3I-EVAL hardware layout and configuration (MB1246 RevE)

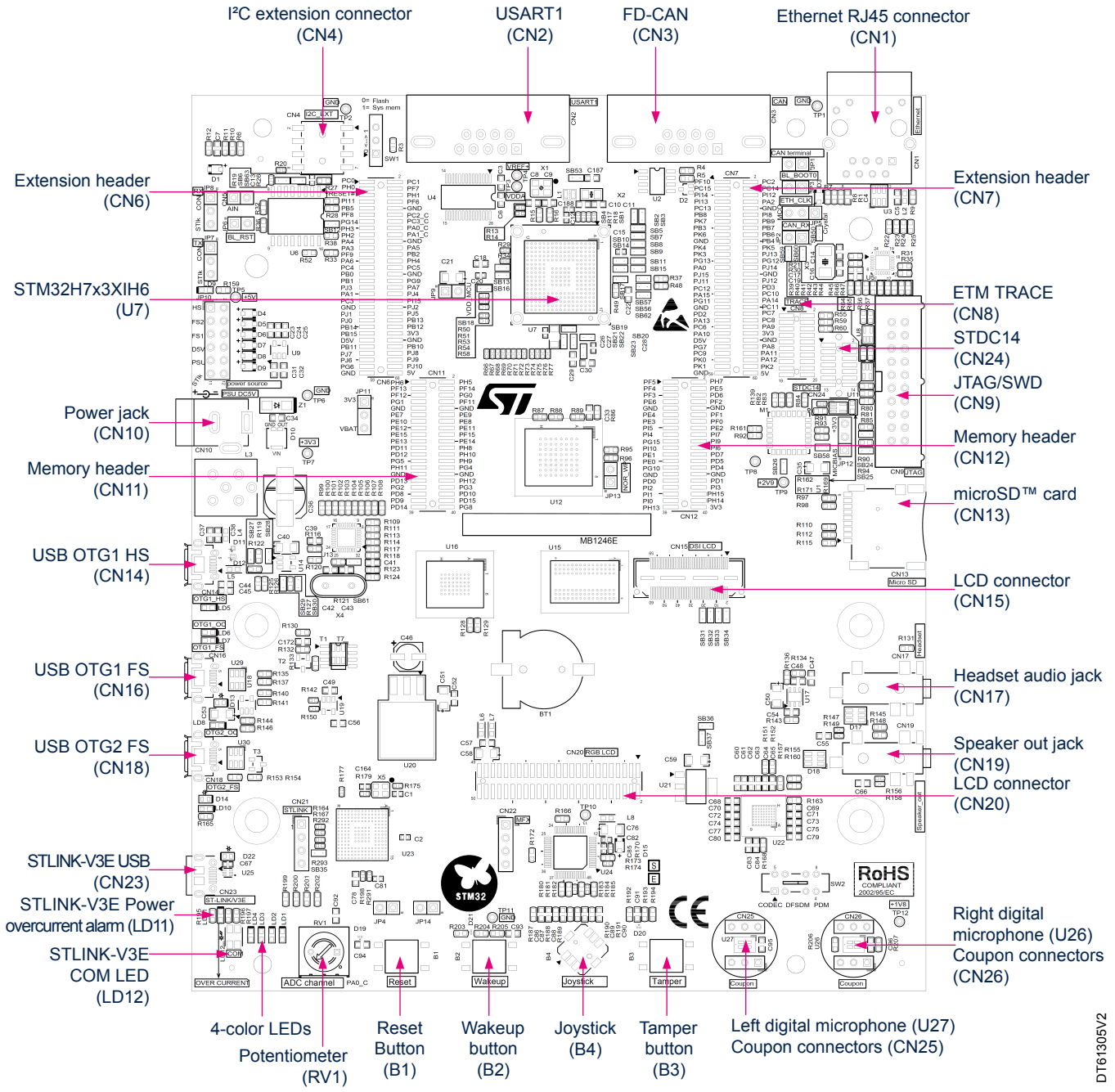
The STM32H7x3I-EVAL Evaluation boards are designed around the STM32H7x3XIH6 (240+25-pin TFBGA package) microcontroller. Figure 22 shows the hardware block diagram for STM32H7x3XIH6 and illustrates the connection between the microcontroller and the peripherals (SDRAM, SRAM, NOR flash memory, twin Quad-SPI flash memory, color LCD, USB OTG connectors, USART, Ethernet, audio, CAN FD, microSD™ 3.0 card and embedded ST-LINK). Figure 23 helps users locate these features on the Evaluation board. The mechanical dimensions of the board are shown in Section 6.2.1.2: STM32H7x3I-EVAL Evaluation board mechanical drawing.

Figure 22. Hardware block diagram (RevE)



6.2.1.1 STM32H7x3I-EVAL Evaluation board layout (RevE)

Figure 23. STM32H7x3I-EVAL RevE Evaluation board (top side)



6.2.1.2 *STM32H7x3I-EVAL Evaluation board mechanical drawing*

Figure 24 and Table 36 show the mechanical dimensions of the MB1246 board with the 5.7” LCD daughterboard.

Figure 24. STM32H7x3I-EVAL Evaluation board mechanical drawing

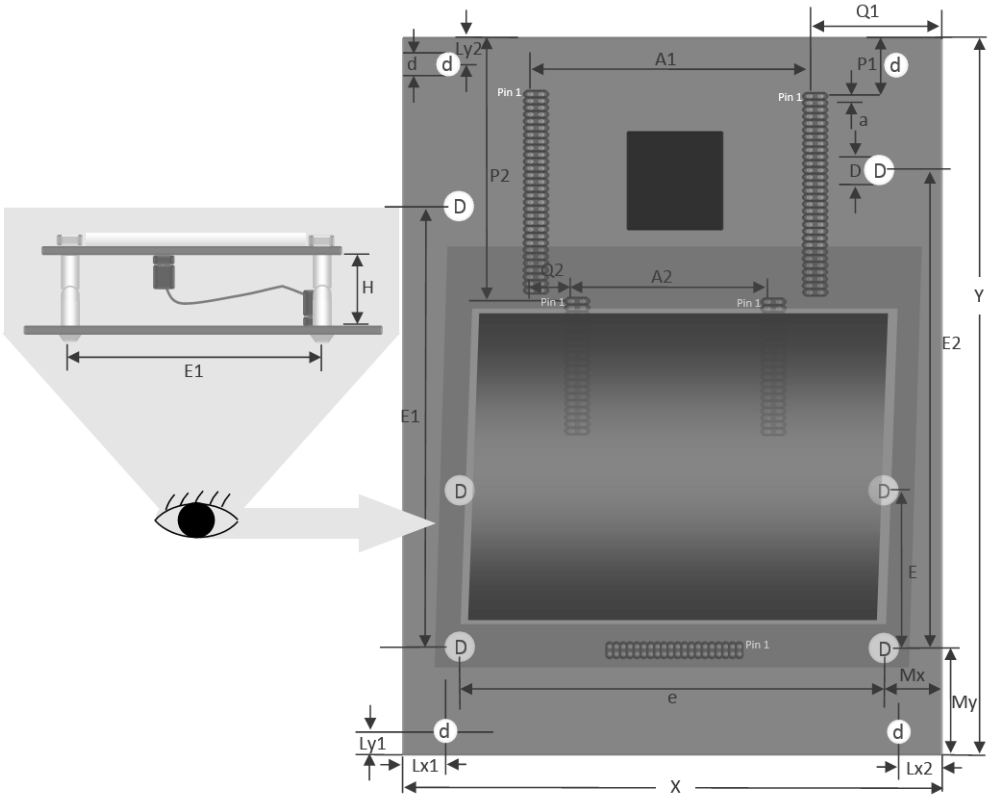


Table 36. Mechanical dimensions

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

6.2.1.3 *Embedded STLINK-V3E*

The STLINK-V3E programming and debugging tool is integrated into the STM32H7x3I-EVAL Evaluation board.

The key STLINK-V3E features are the following:

- Standalone probe with modular extensions
- Self-powered through a USB connector (Micro-B)
- USB 2.0 high-speed compatible interface
- Direct firmware update support (DFU)
- JTAG/serial wire debugging (SWD) specific features:
  - 3 V to 3.6 V application voltage support and 5 V tolerant inputs
  - Flat cables STDC14 to MIPI10/STDC14/MIPI20 (connectors with 1.27 mm pitch)
  - JTAG communication support
  - SWD and serial wire viewer (SWV) communication support
- Virtual COM port (VCP) specific features:
  - 3 V to 3.6 V application voltage support on the UART interface and 5 V tolerant inputs
  - VCP frequency up to 15 MHz
  - Available on STDC14 debug connector (not available on MIPI10)
- Multipath bridge USB to SPI/UART/I^{2}C/CAN/GPIOs specific features:
  - 3 to 3.6 V application voltage support and 5 V tolerant inputs
  - Signals available on adapter board only (MB1440)
- Drag-and-drop flash memory programming
- Two color LEDs: communication, power

Refer to *www.st.com* for details about STLINK-V3E.

Note: It is possible to power the Evaluation board through CN23 (embedded STLINK-V3E USB connector) even if an external tool is connected to CN8 (ETM trace connector) or CN9 (external JTAG and SWD connector).

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

ETM trace function might be abnormal as SAI_SDB shares the same pins with TRACE_D0 and TRACE_D0 might be forced high by SAI_SDB. When using the ETM trace, it is necessary to set the ADCDAT1 pin (SAI_SDB signal of the STM32) of the audio codec (U22) by software to be tri-state.

6.2.1.3.1 Drivers and firmware upgrade

The STLINK-V3E requires drivers to be installed on Windows®. It embeds firmware, which needs to be updated from time to time to benefit from new functionalities and bug corrections. Refer to the technical note *Overview of ST-LINK derivatives* (TN1235) for details.

6.2.1.4 *Power supply*

The STM32H7x3I-EVAL Evaluation board is designed to be powered by a 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 the silkscreen of JP10 (PSU)).
- 5 V DC power with 500 mA limitation from CN23, the USB Micro-B connector of STLINK-V3E (USB 5 V power source on the silkscreen of JP10 (STlk)). If the USB enumeration succeeds (as explained below), the STLINK-V3E U5V power is enabled, by asserting the PWR_EN pin. This pin is connected to a power switch that powers the board. This power switch also features a current limitation to protect the PC in case of a short circuit on the board. If an 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 OTG1_HS Micro-AB connector (USB 5 V power source on the silkscreen of JP10 (HS)).
- 5 V DC power with 500 mA limitation from CN18, the USB OTG2_FS Micro-AB connector (USB 5 V power source on silkscreen of JP10 (FS2)).

- 5 V DC power with 500 mA limitation from CN16, the USB OTG1_FS Micro-AB connector (USB 5 V power source on silkscreen of JP10 (FS1)).
- 5 V DC power from CN6 and CN7, the extension connectors for the daughterboard (daughterboard power source on the silkscreen of JP10 (D5V)).

The STM32H7x3I-EVAL Evaluation board can be powered from U5V on the STLINK-V3E USB connector (CN23), but only the STLINK-V3E 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 STM32H7x3I-EVAL board requires 300 mA power from the host PC. If the host can provide the required power, the enumeration succeeds, the power transistor U19 is switched ON, the green LED LD9 is turned ON, and thus the STM32H7x3I-EVAL board is powered and can consume a 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 green 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 STM32H7x3I-EVAL board exceeds the allowed current on the 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.

Note: A power supply unit or auxiliary equipment complying with the EN 62368-1:2014+A11:2017 standard (or the one replacing it) and safety extralow voltage (SELV/ES1) with limited power capability (LPS/PS2) must power the STM32H7x3I-EVAL Evaluation board.

The following power sequence procedure must be respected:

1. Connect jumper JP10 for PSU or D5V side.
2. Check that SB35 is OFF.
3. Connect the external power source to the PSU or D5V (daughterboard mounted).
4. Check that the green LED LD9 is turned ON.
5. Connect the PC to the USB connector (CN23).

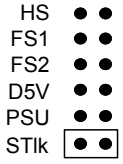
If this order is not respected, V_{BUS} might power the board first then E5V or D5V, and the following risks might be encountered:

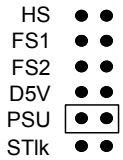
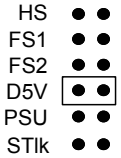
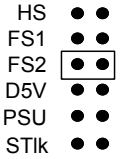
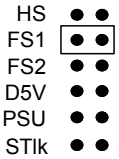
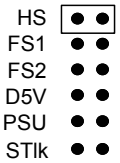
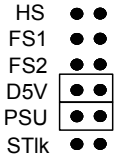
1. If the board needs more than 300 mA current, the PC might be damaged, or the PC might limit the current. As a consequence, the board is not powered correctly.
2. The enumeration phase requests 300 mA (since JP15 must be OFF), so there is a risk that the request is rejected and the enumeration does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

Note: In case a USB charger powers the STM32H7x3I-EVAL board, 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 37.

Table 37. Power-related jumpers

Jumper	Description
JP9	JP9 is used to measure STM32 current consumption manually by a multimeter. Default setting: ON
JP10	JP10 is used to select one of the six possible power supply resources. To supply the STM32H7x3I-EVAL board through the USB connector of the STLINK-V3E (CN23) set JP10 as shown below: (default setting) 

Jumper	Description
JP10	To supply the STM32H7x3I-EVAL board through **the jack** (CN10), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board through the **daughterboard connectors** (CN6 and CN7), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board through the USB OTG1_FS (CN16), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board through the USB OTG2_FS (CN18), set JP10 as shown below: 
JP10	To supply the STM32H7x3I-EVAL board through the USB OTG1_HS (CN14), set JP10 as shown below: 
	To supply the STM32H7x3I-EVAL board and the daughterboard connected on CN6 and CN7 through the **power supply socket** (CN10), set JP10 as shown below (**the daughterboard must not have its power supply connected**) 
JP11	V_{BAT} is connected to +3.3 V when JP11 is set as shown below: (Default setting) 
	V_{BAT} is connected to the battery when JP11 is set as shown below: 

The LED LD9 lights up when the STM32H7x3I-EVALEvaluation board is powered by the 5 V correctly.

Note: To avoid the impact of USB and Ethernet PHYs, and get precise results about current consumption on JP9, think of the following cautions:

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

6.2.1.5 Clock source

Two clock sources (X1 and X2) are available on the STM32H7x3I-EVAL Evaluation board for the STM32H7x3XI, and embedded RTC. Other clock sources (X3 and X4) are used for their peripherals:

- X1, 25 MHz crystal for the STM32H7x3XI, it can be disconnected by removing R15 and R16 when an 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 38. 25 MHz crystal X1-related solder bridges

Solder bridge	Description
SB39	PH0 is connected to a 25 MHz crystal when SB39 is OFF (default setting).
	PH0 is connected to the extension connector (CN6) when SB39 is ON. In such a case, R15 must be OFF to avoid disturbance due to the 25 MHz quartz.
SB40	PH1 is connected to a 25 MHz crystal when SB40 is OFF (default setting).
	PH1 is connected to the extension connector (CN6) when SB40 is ON. In such a case, R16 must be OFF to avoid disturbance due to the 25 MHz quartz.

Table 39. 32 kHz crystal X2-related solder bridges

Solder bridge	Description
SB1	PC14 is connected to a 32 kHz crystal when SB1 is OFF (default setting).
	PC14 is connected to the extension connector (CN7) when SB1 is ON. In such a case, R18 must be OFF to avoid disturbance due to the 32 kHz quartz.
SB4	PC15 is connected to a 32 kHz crystal when SB4 is OFF (default setting).
	PC15 is connected to the extension connector (CN7) when SB4 is ON. In such a case, R17 must be OFF to avoid disturbance due to the 32 kHz quartz.

Note: For Ethernet clock and jumper JP5 configuration, refer to the Ethernet section.

6.2.1.6 Reset sources

The reset signal of the STM32H7x3I-EVAL Evaluation board is active at a low level and the reset sources include:

- The reset button B1,
- The debugging tools from JTAG/SWD connector (CN9) and ETM trace connector (CN8),
- The daughterboard from CN6,
- The embedded STLINK-V3E,
- And the RS-232 connector (CN2) for ISP.

Note: The jumper JP6 must be ON for RESET handled by pin 8 (CTS signal) of the RS-232 connector (CN2).

6.2.1.7 *Boot option*

The STM32H7x3I-EVAL Evaluation board can boot from:

- The embedded user flash memory,
- The system memory with the bootloader for ISP,
- Or the 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 also be configured through the RS-232 connector (CN2).

Table 40. Boot selection switch

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

Table 41. Boot related jumpers

Jumper	Description
JP3	Pin 6 (DSR signal) of the RS-232 connector (CN2) manages the Bootloader_BOOT0 when JP3 is ON. This configuration is used for the bootloader application only. Default setting: OFF

6.2.1.8 *Audio*

An audio codec with four DACs and two ADCs inside is connected to the SAI interface of the STM32H7x3I-EVAL microcontroller to support the TDM feature on the SAI port. This feature can implement audio recording on digital and analog microphones and audio playback of various audio streams on headphones and lineout at the same time.

It communicates with the STM32H7x3XI through the I2C1 bus, which is shared with LCD and MFX (multifunction expander).

The analog microphone on the headset is connected to the ADC of the audio codec through the audio jack (CN17). External speakers can be connected to the audio codec through the audio jack (CN19).

Two digital microphones are on the STM32H7x3I-EVAL Evaluation board. They can be connected to either an audio codec DFSDM or to the PDM port of the STM32H7x3XI, by setting the switch SW2 shown in the table below. For legacy, the coupon connectors (CN25 and CN26) can be used to support the MEMS microphone after removing the SB54 and SB55 solder bridges.

Table 42. Audio-related switch and jumper

Switch/ Jumper	Description
SW2	The digital microphone is connected to the audio codec when SW2 is set as shown below (default setting):  CODEC DFSDM PDM
	The digital microphone is connected to the DFSDM port of STM32H7x3XI when SW2 is set as shown below:  CODEC DFSDM PDM

Switch/ Jumper	Description
SW2	The digital microphone is connected to the PDM port of STM32H7x3XI when SW2 is set as shown below: 
JP12	The digital microphone power source is connected to +3.3 V power when JP12 is set as shown below (default setting): 
	The digital microphone power source is connected to MICBIAS1 from the audio codec when JP12 is set as shown below: 

Note: The I²C address of the audio codec is 0b0011010.

The 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 OFF, and SB56 must be ON to move SAI_CLK to PG7.

6.2.1.9 *USB OTG1_HS and FS*

The STM32H7x3I-EVAL Evaluation board supports USB OTG1:

- 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)

These USB connectors (CN14 or CN16) can power the Evaluation board at 5 V DC with 500 mA current limitation.

As several OTG1_FS signals are shared with the OTG1_HS ULPI bus and USART1, some PCB reworks are needed when using OTG1_FS (CN16) as shown in Table 43.

Table 43. USB OTG1 and USART1 function configuration

Function	Mount	Removed
OTG1_HS-CN14 (default)	R104, R105, SB27, and SB30 ON	R254, SB48, SB28, and SB29 OFF
OTG1_FS-CN16	R254, SB48, SB28, and SB29 ON SB47 and SB49 ON	R104, R105, SB27, SB30, SB46, and SB51 OFF
USART1 (default)	SB46 and SB51 ON	SB47 and SB49 OFF

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

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

- The power switch (U14) is ON and the STM32H7x3I-EVAL board works as a USB Host.
- V_{BUS} is powered by another USB Host when the STM32H7x3I-EVAL board works as a USB Device.

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

Note: An external power supply must power the STM32H7x3I-EVAL when using an OTG function.

6.2.1.10 USB OTG2_FS

The STM32H7x3I-EVAL Evaluation board supports USB OTG2 full-speed communication through a USB Micro-AB connector (CN18) and USB power switch (U18) connected to V_{BUS}. This USB connection can power the Evaluation board at 5 V DC at a current of up to 500 mA.

A green LED (LD10) lights up if either one of the following events occurs:

- The power switch (U18) is ON and the STM32H7x3I-EVAL board works as a USB Host.
- V_{BUS} is powered by another USB Host when the STM32H7x3I-EVAL board works as a USB Device.

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

Note: An external power supply must power the STM32H7x3I-EVAL board when using the OTG function.

Note: JP2 and SB50 must be OFF when using USB OTG_FS as mentioned in Table 45.

6.2.1.11 RS-232

The D-type, 9-pin connector (CN2) supports communication through RS-232 and is connected to the USART1 of the STM32H7x3XI on the STM32H7x3I-EVALEvaluation board. The signals Bootloader_RESET and Bootloader_BOOT0 are added on the RS-232 connector (CN2) for ISP support.

The USART1 of the STM32H7x3XI is shared with the RS-232 of the STLINK-V3E controller. Connection is switched by setting JP7 and JP8.

Table 44. USART1 related jumpers

Jumper	Description
JP7	USART1_TX is connected to RS-232 when JP7 is set as shown below (default setting): 1 2 3 ●● ●
	USART1_TX is connected to the USART_RX of the STLINK-V3E controller when JP7 is set as shown below: 1 2 3 ● ●●
JP8	USART1_RX is connected to RS-232 when JP8 is set as shown below (default setting): 1 2 3 ●● ●
	USART1_RX is connected to the USART_TX of the STLINK-V3E controller when JP8 is set as shown below: 1 2 3 ● ●●

6.2.1.12 microSD™ card

The 8-Gbyte (or more) microSD™ card connected to the SDIO 3.0 port of the STM32H7x3XI microcontroller is available on the Evaluation board. MFX GPIO15 manages the detection of the microSD™ card.

IP4856CX25/C (M1) is an SD 3.0-compliant, 6-bit-bidirectional, dual-voltage-level translator. It is implemented on the STM32H7x3I-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.

6.2.1.13 External I²C connector

The I2C1 bus of the STM32H7x3XI is connected to CN4 on the STM32H7x3I-EVAL. The I²C functional daughterboard can be mounted on the CN4 connector and accessed by the microcontroller through the I2C1 bus.

6.2.1.14 *CAN FD*

The STM32H7x3I-EVAL Evaluation board supports one channel of the flexible data rate CAN (CAN FD) communication bus, based on the 3.3 V CAN transceiver.

PD3 of the STM32H7x3XI controls the standby signal on the CAN FD transceiver. Other CAN FD signals are shared with USB OTG1_FS signals.

Table 45. CAN-related jumpers and solder bridges

Jumper	Description
JP1	The CAN terminal resistor is enabled when JP1 is ON. Default setting: OFF
JP2	PA11 is connected to the CAN FD Rx signal when JP2 is ON. Default setting: OFF

6.2.1.15 *Ethernet*

The STM32H7x3I-EVAL Evaluation board supports 10M/100M Ethernet communication by a PHY (U5) and integrates an RJ45 connector (CN1). Ethernet PHY is connected to STM32H7x3XI through the RMII interface.

A PHY with a 25 MHz crystal or with a 25 MHz MCO from STM32H7x3XI can generate a 50 MHz reference clock. These two resources can be selected by setting jumper JP5 as shown in the table below.

Table 46. Ethernet-related jumpers

Jumper	Description
JP5	An external crystal X3 generates the 50 MHz RMII reference clock when JP5 is set as shown below: (default setting) 
	The MCO at PA8 generates the 50 MHz RMII reference clock when JP5 is set as shown below: 

6.2.1.16 *Memories*

An 8M×32-bit SDRAM is connected to the SDRAM bank1 of the FMC interface of the STM32H7x3XI microcontroller.

A 1M×16-bit SRAM is connected to the NOR/PSRAM2 bank1 of the FMC interface and BLN0 and BLN1, connected to BLE and BHE of SRAM respectively, allow both 8-bit and 16-bit access.

A 128-Mbit NOR flash memory is connected to the NOR/PSRAM1 bank1 of the FMC interface. The pull-up resistor connected to the BYTE pin of the NOR flash memory selects the 16-bit operation mode. The write protection can be enabled or disabled, depending on how the jumper JP13 is set, as shown in the table below.

Table 47. NOR flash memory-related jumpers

Jumper	Description
JP13	Write protection is enabled when JP13 is ON while write protection is disabled when JP13 is OFF. Default setting: OFF

All signals for memory are also connected to memory connectors (CN11 and CN12) for memory daughterboards.

Limitations can happen when using other peripherals:

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

In such cases, the serial resistors R236 (A19), R231 (A20), R217 (A21) and R230 (A22) must be OFF. 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 the (SAI_SDB) ADCDAT1 pin of the audio codec (U22) by software to be tri-state.

6.2.1.17 *Twin Quad-SPI NOR flash memory*

The Quad-SPI flash memory is implemented on the STM32H7x3XI microcontroller of the Evaluation board either as one twin Quad-SPI NOR flash memory (1-Gbit (2×512 Mbytes)) memory or as two Quad-SPI NOR flash memories (512 Mbytes).

The two dies in the twin Quad-SPI flash memory share the same clock and chip select signals of the STM32H7x3XI microcontroller.

6.2.1.18 *Analog input*

The two-pin header CN5 and 10 kΩ potentiometer RV1 are connected to PA0_C of STM32H7x3XI as an analog input. A low-pass filter can be implemented by replacing R11 and C7 with the right values of resistor and capacitor as requested by the end-user application.

6.2.1.19 *Display and input devices*

Four general-purpose-color LEDs (LD 1, 2, 3, and 4) are available as a display device. LD1 and LD3 are connected on STM32H7x3XI, and LD2 and LD4 are connected to MFX.

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

The 5.7-inch 640x480 TFT color LCD with a capacitive touch panel is connected to the RGB LCD interface of the STM32H7x3XI microcontroller.

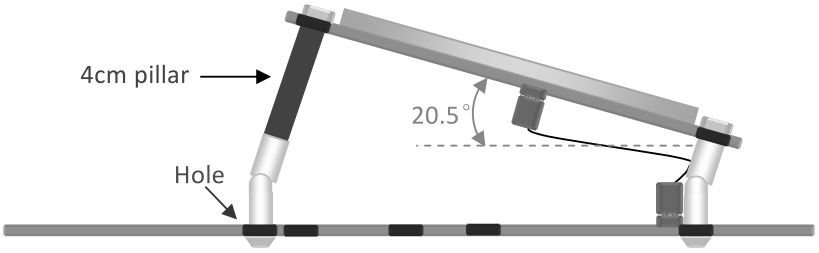
Note: When using a 5.7-inch LCD, the PSU extension power supply is mandatory because of the high current consumption of this type of LCD.

Table 48. 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	5 V	-	46	-	-
47	BLGND	-	48	-	-
49	BLGND	-	50	3.3 V	-

The orientation of the 5.7-inch LCD daughterboard can be changed using hinged standoffs and pillars. Refer to Figure 25. Orientation setting of 5.7-inch LCD daughterboard for details.

Figure 25. Orientation setting of 5.7-inch LCD daughterboard



6.2.1.20 *MFX (multifunction expander)*

MFX circuit on STM32H7x3I-EVAL Evaluation board acts as IO-expander. The communication interface between MFX and STM32H7x3XI is an I2C1 bus. The signals connected to MFX are listed in Table 49. MFX signals.

Table 49. MFX signals

Pin number of MFX	Pin name of MFX	MFX functions	Function of STM32H7x3I-EVAL	Direction (for MFX)	Terminal device
15	PA5	MFX_GPIO5	Audio_INT	Input	Codec
16	PA6	MFX_GPIO6	OTG_FS2_ OverCurrent	Input	USB_FS2
17	PA7	MFX_GPIO7	OTG_FS2_ PowerSwitchOn	Output	USB_FS2
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_FS1_ OverCurrent	Input	USB_FS1
30	PA9	MFX_GPIO9	OTG_FS1_ PowerSwitchOn	Output	USB_FS1
31	PA10	MFX_GPIO10	-	-	-
32	PA11	MFX_GPIO11	-	-	-
33	PA12	MFX_GPIO12	-	-	-
39	PB3	MFX_GPIO3	JOY_RIGHT	Input	Joystick
40	PB4	MFX_GPIO4	JOY_UP	Input	Joystick

6.2.2 STM32H7x3I-EVAL connectors (MB1246 RevE)

6.2.2.1 *Ethernet RJ45 connector (CN1)*

Figure 26. Ethernet RJ45 connector (CN1) front view

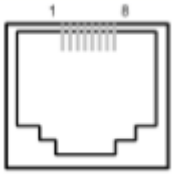


Table 50. RJ45 connector (CN1)

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

6.2.2.2 *RS-232 connector (CN2)*

Figure 27. RS-232 connector (CN2) front view

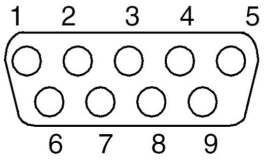


Table 51. RS-232 connector (CN2) with ISP support

Pin number	Description	Pin number	Description
1	NC	6	Bootloader_BOOT0
2	RS232_RX (PB15)	7	NC
3	RS232_TX (PB14)	8	Bootloader_RESET
4	NC	9	NC
5	GND	-	-

6.2.2.3 *CAN D-type, 9-pin male connector (CN3)*

Figure 28. CAN D-type, 9-pin connector (CN3) front view

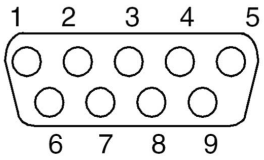


Table 52. CAN D-type 9-pin male connector (CN3)

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

6.2.2.4 *External I²C connector (CN4)*

Figure 29. I²C EXT connector (CN4) front view

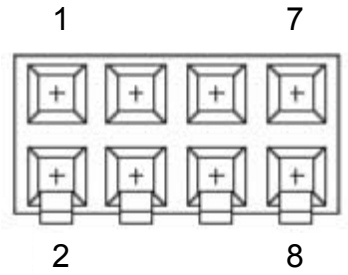


Table 53. I²C EXT connector (CN4)

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

6.2.2.5 *Analog input-output connector (CN5)*

Figure 30. Analog input-output connector (CN5) top view

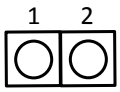


Table 54. Analog input-output connector (CN5)

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

6.2.2.6 *Daughterboard extension connectors (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 STM32H7x3I-EVAL Evaluation board. All GPIOs 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 helps the development of common daughterboards for several ST Evaluation boards. The standard width between CN6 pin1 and CN7 pin1 is 2700 mils (68.58 mm).

A daughterboard can use each pin on CN6 and CN7 after disconnecting the board from the corresponding function block on the STM32H7x3I-EVAL Evaluation board. For details refer to Table 55 and Table 56.

Table 55. Daughterboard extension connector (CN6)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
1	PC0	ULPI_STP	R124 OFF
3	PH0	OSC_IN	R15 OFF and SB39 ON
5	RESET#	-	-
7	PI11	ULPI_DIR	R123 OFF
9	PB5	ULPI_D7	R101 OFF
11	PF8	QSPI_BK1_IO0	R38 OFF
13	PG14	QSPI_BK2_IO3	R27 OFF
15	PH3	QSPI_BK2_IO1	R28 OFF
17	PH2	QSPI_BK2_IO0	R52 OFF
19	PA4	EXT_RESET/LED3	R296 and CN4 OFF
21	PA3	ULPI_D0	R114 OFF
23	PF9	QSPI_BK1_IO1	R32 OFF
25	PA6	GPIO_LCD_BL_CTRL	CN15 OFF
27	PC4	RMII_RXD0	R41 OFF
29	PB0	ULPI_D1	R113 OFF
31	PB1	ULPI_D2	R111 OFF
33	PJ3	RGB_LCD_R4	CN20 OFF
35	PA1	RMII_RX_CLK	R31 OFF
37	PC3	DFSDM_DATA1	Do not dial SW2 to the middle.
39	GND	-	-
41	PJ1	RGB_LCD_R2	CN20 OFF

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
43	PJ0	RGB_LCD_R1	CN20 OFF
45	PB14	USART1_TX/USB_FS1_DM	SB46 and SB47 OFF
47	PB15	USART1_RX/USB_FS1_DP	SB49 and SB51 OFF
49	D5V	-	-
51	PB11	ULPI_D4	R109 OFF
53	PJ7	RGB_LCD_G0	R24 and CN20 OFF
55	PJ6	RGB_LCD_R7	CN20 OFF
57	PG6	QSPI_BK1_NCS	R19 and SB6 OFF
59	GND	-	-
2	PC1	RMII_MDC/PDM1_D1	SB38 OFF. Do not dial SW2 to the right.
4	PF7	QSPI_BK1_IO2	R36 OFF
6	PH1	OSC_OUT	R16 OFF
8	PF6	QSPI_BK1_IO3	R26 OFF
10	GND	-	-
12	PC2_C	-	-
14	PC3_C	-	-
16	PA0_C	Potentiometer	SB43 OFF
18	PA1_C	-	-
20	GND	-	-
22	PA5	ULPI_CK	R118 OFF
24	PB2	QSPI_CLK	-
26	PH4	ULPI_NXT	R117 OFF
28	PC5	RMII_RXD1	R39 OFF
30	GND	-	-
32	PG9	QSPI_BK2_IO2	R33 OFF
34	PA7	RMII_CRS_DV	R44 OFF
36	PJ4	RGB_LCD_R5	CN20 OFF
38	PI15	RGB_LCD_R0	CN20 OFF
40	PJ2	RGB_LCD_R3	CN15 and CN20 OFF
42	PJ5	RGB_LCD_R6	CN20 OFF
44	PB13	ULPI_D6/USB_FS1_VBUS	R104 and R254 OFF
46	PB12	ULPI_D5/USB_FS1_ID	R105 and SB48 OFF
48	+3V3	-	-
50	GND	-	-
52	PB10	ULPI_D3	R109 OFF
54	PJ8	RGB_LCD_G1	CN20 OFF
56	PJ9	RGB_LCD_G2	CN20 OFF
58	PJ10	RGB_LCD_G3	CN20 OFF
60	+5 V	-	-

Table 56. Daughterboard extension connector (CN7)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
1	PF10	LED1	R286, R294, and CN15 OFF
3	PC15	OSC32_OUT	R17 OFF and SB4 ON
5	PI14	RGB_LCD_CLK	CN20 OFF
7	PI13	RGB_LCD_VSYNC	CN20 OFF
9	PC13	KEY_TAMP_1/WKUP2	R193 OFF
11	PB8	SDIO_1_CKIN	R161 OFF
13	PK7	RGB_LCD_DE	CN20 OFF
15	PB3	JTDO/TRACESWO	R60 OFF
17	PK6	RGB_LCD_B7	R199 and CN20 OFF
19	GND	-	-
21	PK4	RGB_LCD_B5	R201 and CN20 OFF
23	PK3	RGB_LCD_B4	R202 and CN20 OFF
25	PG13	RMII_TXD0	-
27	PA0	KEY_WKUP0	R173 and R203 OFF
29	PJ15	RGB_LCD_B3	CN20 OFF
31	PJ11	RGB_LCD_G4	CN20 OFF
33	PC12	SDIO_1_CK	R139 (10 kΩ) ON and R83 OFF
35	PA15	JTDI/CEC	R61 and CN15 OFF
37	PG11	RMII_TX_EN	-
39	GND	-	-
41	PD2	SDIO_1_CMD	R139 (10 kΩ) ON
43	PA13	JTMS-SWDIO	R55 OFF
45	PC6	SDIO_1_D0DIR	R139 (10 kΩ) and SB58 OFF
47	PA10	USB_FS2_ID	CN18 OFF
49	D5V	-	-
51	PG7	SAI_1_MCLK_A	SB56 and SB62 OFF
53	PC9	SDIO_1_D1	R139 (10 kΩ) ON
55	PK0	RGB_LCD_G5	CN20 OFF
57	PK1	RGB_LCD_G6	CN20 OFF
59	GND	-	-
2	PC2	DFSDM_CKOUT	Do not dial SW2 to the left.
4	PC14	OSC32_IN	R18 OFF and SB1 ON
6	PI12	RGB_LCD_HSYNC	CN20 OFF
8	PA2	RMII_MDIO	R47 OFF
10	GND	-	-
12	PI8	GPIO_EXPANDER_INT	R185 OFF
14	PB9	SDIO_1_CDIR	R139 (10 kΩ) ON and R91 OFF
16	PB7	I2C_1_SDA	R160, R181, R209, CN4, CN15, and CN20 OFF
18	PB6	I2C_1_SCL	R155, R180, R212, CN4, CN15, and CN20 OFF
20	PB4	NJTRST	R79 OFF

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
22	PK5	RGB_LCD_B6	R200 and CN20 OFF
24	PJ13	RGB_LCD_B1	CN20 OFF
26	PG12	RMII_TXD1	-
28	PJ14	RGB_LCD_B2	CN20 OFF
30	GND	-	-
32	PJ12	RGB_LCD_B0	R25 and CN20 OFF
34	PD3	GPIO_CAN_STBY	R4 OFF
36	PC10	SDIO_1_D2	Add R139 10 kΩ
38	PA14	JTCK-SWCLK	R59 OFF
40	PC11	SDIO_1_D3	R139 (10 kΩ) ON and SB45 OFF
42	PC7	SDIO_1_D123DIR	R139 (10 kΩ) ON and R92 OFF
44	PC8	SDIO_1_D0	R139 (10 kΩ) ON
46	PA9	USB_FS2_VBUS	R255 OFF
48	+3.3 V	-	-
50	GND	-	-
52	PA8	MCO1	CN15 and JP5 OFF
54	PA11	USB_FS2_DM/FDCAN_1_RXFD	SB59 and JP2 OFF
56	PA12	USB_FS2_DP/FDCAN_1_TXFD	SB50 and SB60 OFF
58	PK2	RGB_LCD_G7	CN20 OFF
60	+5 V	-	-

6.2.2.7 *ETM trace debugging connector (CN8)*

Figure 31. ETM trace debugging connector (CN8) top view

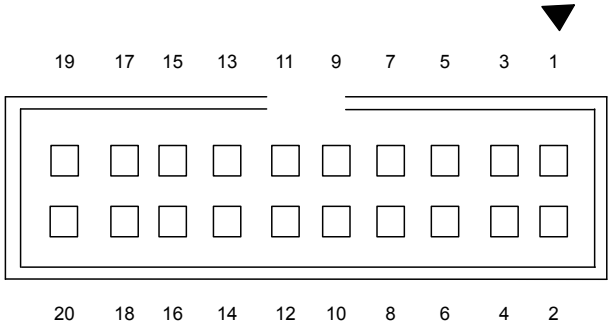


Table 57. ETM trace debugging connector (CN8)

Pin number	Description	Pin number	Description
1	+3.3 V	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

6.2.2.8 JTAG/SWD connector (CN9)

Figure 32. **JTAG/SWD debugging connector (CN9) top view**

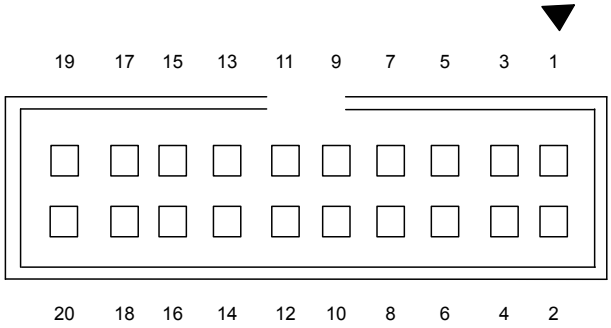


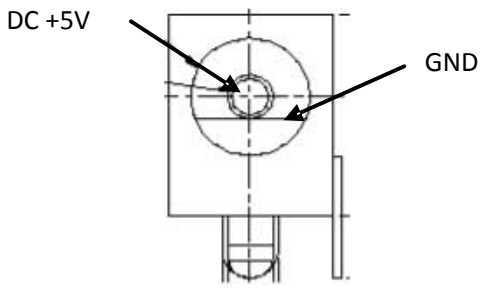
Table 58. **JTAG/SWD debugging connector (CN9)**

Pin number	Description	Pin number	Description
1	+3.3 V	2	+3.3 V
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	DBGRQ(PJ7)	18	GND
19	DBGACK(PJ12)	20	GND

6.2.2.9 *Power connector (CN10)*

A 5 V DC power supply can supply the STM32H7x3I-EVAL Evaluation board through the external power supply socket (CN10) shown in the figure below. The central pin of CN10 must be positive.

Figure 33. Power supply connector (CN10) front view



6.2.2.10 *Memory connectors (CN11 and CN12)*

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

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

The space between these two connectors is defined as a standard that helps the development of a common daughterboard. The standard width between CN11 pin1 and CN12 pin1 is 1914 mils (48.62 mm). For details on signal assignment, refer to the tables below.

Table 59. Memory connector (CN11)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-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	-

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
28	PG4	A14/BA0	-
30	GND	-	-
32	PH12	D20	-
34	PG3	A13	-
36	PD10	D15	-
38	PD15	D1	-
40	PG8	SDCLK	-

Table 60. Memory connector (CN12)

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
1	PF5	A5	-
3	PF4	A4	-
5	PF3	A3	-
7	PE6	A22/SAI1_SD_A/TRACED3	SB2 and SB3 OFF
9	GND	-	-
11	PE4	A20/SAI1_FS_A/TRACED1	SB5 and SB7 OFF
13	PE3	A19/SAI1_SD_B/TRACED0	SB8 and SB9 OFF
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	SB41 and SB42 OFF
6	PD6	NWAIT	-
8	PF2	A2	-
10	GND	-	-
12	PF1	A1	-
14	PF0	A0	-
16	PE2	A23/PDM1_CK1/SAI1_MCLK_A/TRACECLK	SB11, SB15, and SB57 OFF
18	PI7	D29	-
20	PI9	D30	-

Pin	Description	Alternative function	How to disconnect with function block on STM32H7x3I-EVAL board
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	+3.3 V	-	-

6.2.2.11 *microSD™ connector (CN13)*

Figure 34. microSD™ connector (CN13) top view

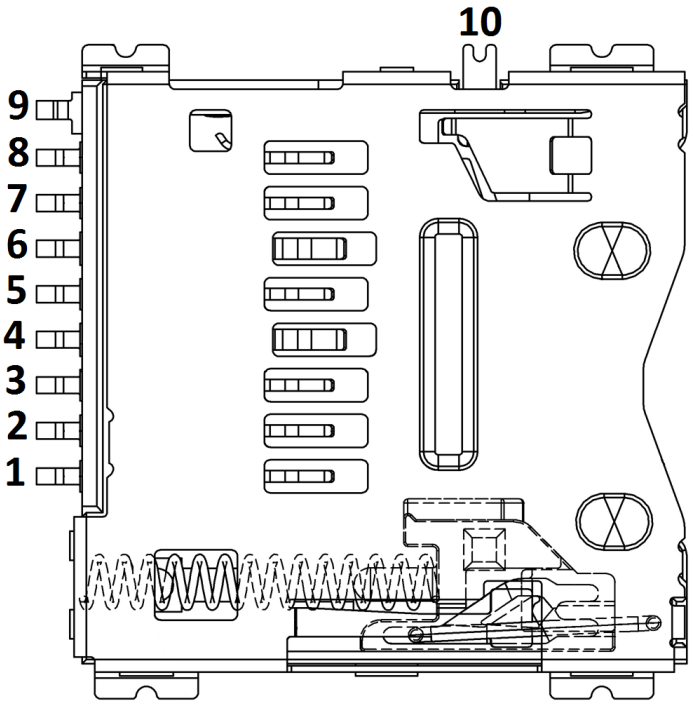


Table 61. microSD™ connector (CN13)

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)

6.2.2.12 *USB OTG1_HS Micro-AB connector (CN14)*

Figure 35. USB OTG1_HS Micro-AB connector (CN14) front view

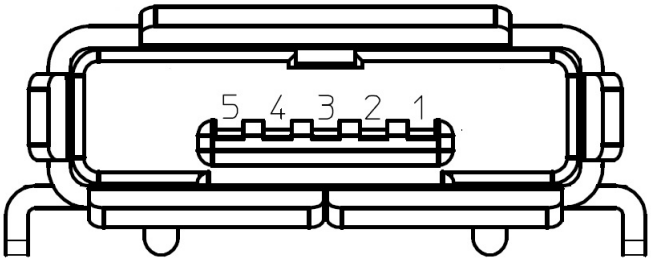


Table 62. USB OTG1_HS Micro-AB connector (CN14)

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

6.2.2.13 *USB OTG1_FS Micro-AB connector (CN16)*

Figure 36. USB OTG1_FS Micro-AB connector (CN16) front view

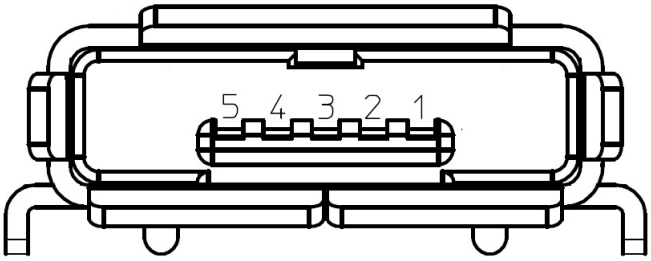


Table 63. USB OTG1_FS Micro-AB connector (CN16)

Pin number	Description	Pin number	Description
1	V_{BUS} (PB13)	4	ID (PB12)
2	D- (PB14)	5	GND
3	D+ (PB15)	-	-

6.2.2.14 *Audio jack (CN17)*

A 3.5 mm stereo audio jack (CN17) is available on the STM32H7x3I-EVAL Evaluation board to support a headset (headphone and microphone integrated).

6.2.2.15 *USB OTG2_FS Micro-AB connector (CN18)*

Figure 37. USB OTG2_FS Micro-AB connector (CN18) front view

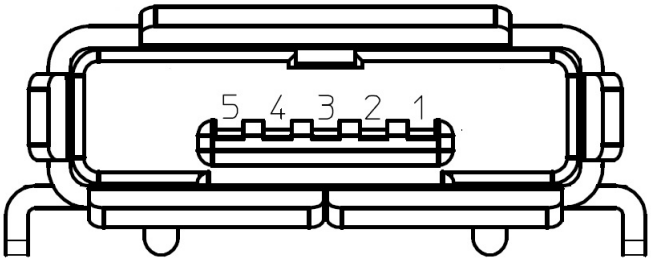


Table 64. USB OTG2_FS Micro-AB connector (CN18)

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

6.2.2.16 *Audio jack (CN19) for speaker*

A 3.5 mm stereo audio jack (CN19) for speaker-out is available on the STM32H7x3I-EVAL Evaluation board to support an external speaker.

6.2.2.17 *TFT LCD connector (CN20)*

A TFT-color LCD board is mounted on the CN20 connector. Refer to Section 6.1.1.19: Display and input devices for details.

6.2.2.18 *STLINK-V3E programming connector (CN21)*

The CN21 connector is used only for embedded STLINK-V3E programming during board manufacturing. It is not populated by default and is not for end users.

6.2.2.19 *MFX programming connector (CN22)*

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

6.2.2.20 *STLINK-V3E USB Micro-B connector (CN23)*

The USB Micro-B connector (CN23) is used to connect the embedded STLINK-V3E to a PC for programming and debugging purposes.

Figure 38. USB Micro-B connector (CN23) front view

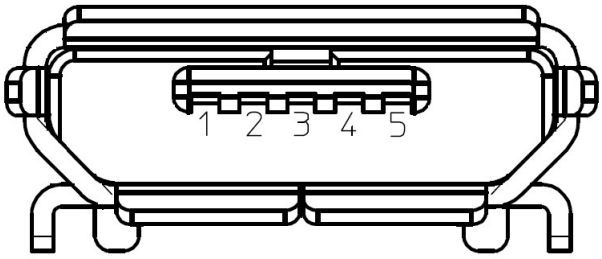


Table 65. USB Micro-B connector (CN23) front view

Pin number	Description	Pin number	Description
1	V_{BUS} (power)	4	ID
2	DM	5	GND
3	DP	-	-

6.2.2.21 *STDC14 debugging connector (CN24)*

Figure 39. STDC14 debugging connector (CN24) top view

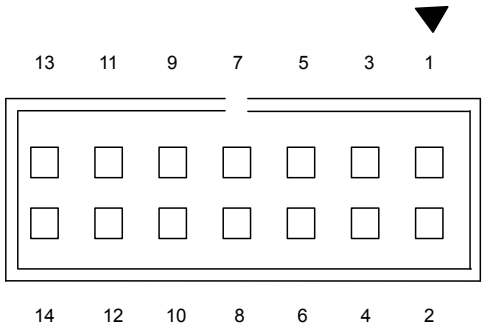


Table 66. STDC14 debugging connector (CN24)

Pin number	Description	Pin number	Description
1	NC	2	NC
3	+3.3 V	4	SWDIO-TMS/PA13
5	GND	6	SWCLK-TCK/PA14
7	GND	8	SWO-TDO/PB3
9	KEY	10	TDI/PA15
11	GNDDetect	12	RESET#
13	VCP_USART_RX/PB14	14	VCP_USART_TX/PB15

6.2.2.22 *MEMS microphone coupon connectors (CN25 and CN26)*

Figure 40. MEMS microphone coupon connectors (CN25 and CN26) top view

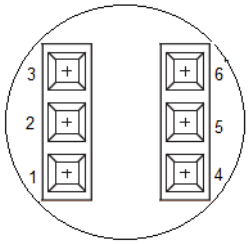


Table 67. MEMS microphone coupon connectors (CN25 and CN26)

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

6.2.3 STM32H7x3I-EVAL RevE I/O assignment

Table 68. STM32H7x3I-EVAL RevE 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_FS2_VBUS	-
D14	PA10	USB_FS2_ID	-
E17	PA11	USB_FS2_DM	FDCAN_1_RXFD
E16	PA12	USB_FS2_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	-

Pin No.	Pin name	Default function	Alternative function
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_FS1_ID
U14	PB13	ULPI_D6	USB_FS1_VBUS
U15	PB14	USART1_TX	USB_FS1_DM
T15	PB15	USART1_RX	USB_FS1_DP
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	-

Pin No.	Pin name	Default function	Alternative function
P16	PD14	FMC_D0	-
P15	PD15	FMC_D1	-
C4	PE0	FMC_NBL0	-
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	-
H15	PG3	FMC_A13	-
H14	PG4	FMC_A14/SDR_BA0	-
G14	PG5	FMC_A15/SDR_BA1	-
G15	PG6	QSPI_BK1_NCS	-

Pin No.	Pin name	Default function	Alternative function
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	-
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	-

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

7 STM32H743I-EVAL and STM32H753I-EVAL product information

7.1 Product marking

The product and each board composing the product are identified with one or several stickers. The stickers, located on the top or bottom side of each PCB, provide product information:

- Main board featuring the target device: product order code, product identification, serial number, and board reference with revision.

  Single-sticker example:

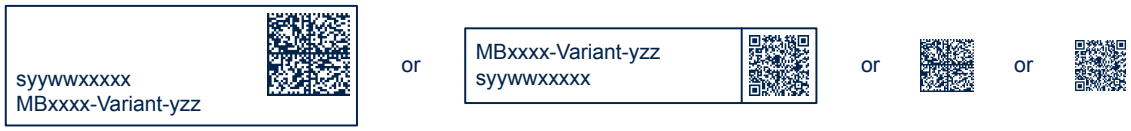
  

  Dual-sticker example:

- Other boards if any: board reference with revision and serial number.

  Examples:

On the main board sticker, the first line provides the product order code, and the second line the product identification.

On all board stickers, the line formatted as *"MBxxxx-Variant-yzz"* shows the board reference *"MBxxxx"*, the mounting variant *"Variant"* when several exist (optional), the PCB revision *"y"*, and the assembly revision *"zz"*, for example B01. The other line shows the board serial number used for traceability.

Products and parts labeled as *"ES"* or *"E"* are not yet qualified or feature devices that are not yet qualified. STMicroelectronics disclaims any responsibility for consequences arising from their use. Under no circumstances will STMicroelectronics be liable for the customer's use of these engineering samples. Before deciding to use these engineering samples for qualification activities, contact STMicroelectronics' quality department.

"ES" or *"E"* marking examples of location:

- On the targeted STM32 that is soldered on the board (for an illustration of STM32 marking, refer to the STM32 datasheet *Package information* paragraph at the *www.st.com* website).
- Next to the ordering part number of the evaluation tool that is stuck, or silk-screen printed on the board.

Some boards feature a specific STM32 device version, which allows the operation of any bundled commercial stack/library available. This STM32 device shows a *"U"* marking option at the end of the standard part number and is not available for sales.

To use the same commercial stack in their applications, the developers might need to purchase a part number specific to this stack/library. The price of those part numbers includes the stack/library royalties.

7.2 STM32H7x3I-EVAL product history

Table 69. Product history

Order code	Product identification	Product details	Product change description	Product limitations
STM32H743I-EVAL	STM32743I-EVAL/	MCU: • STM32H743XIH6 silicon revision "Y" MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392) Boards: • MB1246-H743-B01, MB1246-H743-B02, or MB1246-H743-B03 (main board) • MB1063-Default-B01 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)	Initial revision	No limitation
STM32H743I-EVAL2	VAH743I$AT1	MCU: • STM32H743XIH6 silicon revision "V" MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392) Boards: • MB1246-H743-E02 (main board) • MB1063-Default-B02 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)	Initial revision	No limitation
	VA32H743I2$AT2	MCU: • STM32H743XIH6 silicon revision "V" MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392)	• Packaging: plastic blister replaced by a carton box • Main board revision changed	No limitation

Order code	Product identification	Product details	Product change description	Product limitations
STM32H743I-EVAL2	VA32H743I2$AT2	Boards: • MB1246-H743-E03 (main board) • MB1063-Default-B02 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)	• Packaging: plastic blister replaced by a carton box • Main board revision changed	No limitation
STM32H753I-EVAL	32H753I-EVAL/	MCU: • STM32H753XIH6 silicon revision "Y" MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392) Boards: • MB1246-H753-B01, MB1246-H753-B02, or MB1246-H753-B03 (main board) • MB1063-Default-B02 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)	Initial revision	No limitation
STM32H753I-EVAL2	VAH753I$AT1	MCU: • STM32H753XIH6 silicon revision "V" MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392) Boards: • MB1246-H753-E02 (main board) • MB1063-Default-B02 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)	Initial revision	No limitation
	VA32H753I2$AT2	MCU: • STM32H753XIH6 silicon revision "V" MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392)	• Packaging: plastic blister replaced by a carton box • Main board revision changed	No limitation

Order code	Product identification	Product details	Product change description	Product limitations
STM32H753I-EVAL2	VA32H753I2$AT2	Boards: • MB1246-H753-E03 (main board) • MB1063-Default-B02 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)	• Packaging: plastic blister replaced by a carton box • Main board revision changed	No limitation
	VA32H753I2$AT3	MCU: • STM32H753XIH6 silicon revision "V"	LCD daughterboard revision changed	No limitation
		MCU errata sheet: • *STM32H742xI/G, STM32H743xI/G, STM32H750xB, STM32H753xI device errata* (ES0392)		
		Boards: • MB1246-H753-E03 (main board) • MB1063-Default-B03 (LCD board) • MB1256-Default-A01 (microSD™ transceiver board)		

7.3 Board revision history

Table 70. Board revision history

Board reference	Board variant and revision	Board change description	Board limitations
MB1063 (LCD board)	Default-B01	Initial revision	No limitation
	Default-B02	LCD AM-640480G5TNQW-T00H replaced by AM-640480GFTNQW-T07H-A or AM-640480GFTNQW-T06H-A	No limitation
	Default-B03	Several part references are updated due to obsolescence (such as LCD AM-640480GFTNQW-T06H-A replaced by AM-640480VWTZQW-T06H with impact on firmware, refer to the bill of materials for details).	No limitation
MB1246 (main board)	H743-B01 H753-B01	Initial revision	No limitation
	H743-B02 H753-B02	Default setting of JP10 updated from closed pin11-12 to closed pin 9-10	No limitation
	H743-B03 H753-B03	NOR FLASH PC28F128M29EWLA replaced by MT28EW128ABA1LPC-0SIT	No limitation
	H743-E02 H753-E02	ST-LINK/V2-1 replaced by STLINK-V3E	No limitation
	H743-E03 H753-E03	• Memory IS42S32800G-6BLI replaced by IS42S32800J-6BLI without impact on firmware • Refer to the bill of materials for further details	No limitation
MB1256 (microSD™ transceiver board)	Default-A01	Initial revision	No limitation

8 Compliance statements and conformity declarations

8.1 Federal Communications Commission (FCC) compliance statement

Part 15.19

These devices comply with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) these devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

Part 15.21

Any changes or modifications to this equipment not expressly approved by STMicroelectronics may cause harmful interference and void the user's authority to operate this equipment.

Part 15.105

This equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Note: Use only shielded cables.

Responsible Party - U.S. Contact Information:

Francesco Doddo
STMicroelectronics, Inc.
200 Summit Drive | Suite 405 | Burlington, MA 01803
USA
Telephone: +1 781-472-9634

8.2 Innovation, Science and Economic Development Canada (ISED) compliance statement

These products comply with the ICES-003 standard class A of the ISED regulation.

ISED Canada ICES-003 Compliance Label: CAN ICES (A)/NMB (A).

Note: Use only shielded cables.

Ces produits sont conformes à la norme NMB-003 classe A de la ISDE.

Étiquette de conformité à la NMB-003 d'ISDE Canada : CAN ICES (A) / NMB (A).

Note: Utiliser uniquement des câbles blindés.

8.3 UKCA conformity

Simplified UK declaration of conformity

Hereby, the manufacturer STMicroelectronics, declares that the equipment types STM32H743I-EVAL and STM32H753I-EVAL are in compliance with the UK Electromagnetic Compatibility Regulations 2016 (UK SI 2016 No. 1091) and with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (UK SI 2012 No. 3032).

Note: Use only shielded cables.

8.4 CE conformity

8.4.1 Simplified EU declaration of conformity

Hereby, STMicroelectronics declares that the equipment types STM32H743I-EVAL and STM32H753I-EVAL are in compliance with directives 2011/53/EU and 2015/863/EU (RoHS), and 2014/30/EU (EMC).

Note:
- *RoHS: Restriction of hazardous substances*
- *EMC: Electromagnetic compatibility*

Warning

These devices are compliant with Class A of EN55032/CISPR32. In a residential environment, this equipment may cause radio interference.

Note: Use only shielded cables.

8.4.2 Déclaration de conformité UE simplifiée

STMicroelectronics déclare que les équipements électriques des types STM32H743I-EVAL et STM32H753I-EVAL sont conformes aux directives 2011/53/UE et 2015/863/UE (LdSD), et à la directive 2014/30/UE (CEM).

Note:
- *LdSD : directive sur la limitation de l'utilisation des substances dangereuses*
- *CEM : compatibilité électromagnétique*

Avertissement

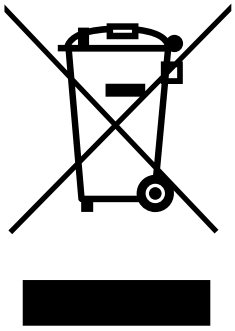
Ces équipements sont conformes à la Classe A de la EN55032 / CISPR 32. Dans un environnement résidentiel, ces équipements peuvent créer des interférences radio.

Note: Utiliser uniquement des câbles blindés.

9 Product disposal

Disposal of this product: WEEE (Waste Electrical and Electronic Equipment)

(Applicable in Europe)



This symbol on the product, accessories, or accompanying documents indicates that the product and its electronic accessories must not be disposed of with household waste at the end of their working life.

To prevent possible harm to the environment and human health from uncontrolled waste disposal, separate these items from other types of waste and recycle them responsibly at a designated collection point to promote the sustainable reuse of material resources.

Household users:

Contact the retailer that you purchased the product from or your local authority for details of your nearest designated collection point.

Business users:

Contact your dealer or supplier for further information.

Revision history

Table 71. **Document revision history**

Date	Revision	Changes
26-Jun-2017	1	Initial release.
14-Dec-2018	2	Added *Section 8 Conventions*, and aligned jumper and solder bridge statuses. Added description of STM32H753I-EVAL board. Added description of MB1246 revision E main board for both STM32H743I-EVAL and STM32H745IEVAL. Added *Section 2 General information*.
29-Mar-2019	3	Reorganized the beginning of the document: updated *Features* and *Ordering information*. Added *Codification*. Updated the schematics in *Section 6.1.4 STM32H7x3I-EVAL RevB electrical schematics* and *Section 6.2.4 STM32H7x3I-EVAL RevE electrical schematics*. Updated the corresponding entries in *Section 6.1.5 STM32H7x3I-EVAL RevB board revision history and limitations* and *Section 6.2.5 STM32H7x3I-EVAL RevE board revision history and limitations*.
19-Mar-2020	4	Updated *Section 5 Delivery recommendations*.
15-Dec-2025	5	Added: • Section 3.4: EDA resources • Section 5: Safety recommendations • Section 9: Product disposal Updated: • Section 6.1.1.4: Power supply and Section 6.2.1.4: Power supply • Section 7: STM32H743I-EVAL and STM32H753I-EVAL product information • Section 8: Compliance statements and conformity declarations

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