Discovery kits with STM32H745XI and STM32H750XB MCUs

Introduction

The STM32H745I-DISCO and STM32H750B-DK Discovery kits are complete demonstration and development platforms for STMicroelectronics Arm® Cortex®-M7 and Cortex®-M4 core-based STM32H745XI (STM32H745XIH6 order code), and Cortex®-M7 core-based STM32H750XB (STM32H750XBH6 order code) microcontrollers. Both devices feature four I^2Cs, six SPIs with three multiplexed simplex I^2Ss, two SD/SDIO/SDMMC interfaces, four USARTs, four UARTs, one LPUART, two CAN controllers, three 16-bit ADCs, two 12-bit DACs, four SAIs, 8- to 14-bit digital camera interface, 1 Mbyte (STM32H745XIH6) or 128 Kbytes (STM32H750XBH6) of internal SRAM and 2 Mbytes of flash memory, a USB OTG HS and a USB OTG FS, an Ethernet MAC interface, an FMC interface, a Quad-SPI interface, and SWD debugging support. The STM32H745I-DISCO and STM32H750B-DK Discovery kits enable users to get started quickly and develop applications.

In addition, the STM32H745I-DISCO and STM32H750B-DK, shown in Figure 1 and Figure 2, can be used as a reference design for user application prototyping before porting to the final product.

The full range of hardware features available on the board helps users enhance their application development through an evaluation of almost all peripherals (such as USB OTG FS, Ethernet 10/100 Mbit/s, eMMC, USART, SAI audio DAC stereo with audio jack input and output, MEMS digital microphone, SDRAM, Quad-SPI flash memory, and RGB interface LCD with capacitive multi-touch panel). ARDUINO® Uno V3 connectors provide easy connection to extension shields or daughterboards for specific applications.

STLINK-V3E is integrated into the board, as an embedded in-circuit debugger and programmer for the STM32 MCU and the USB Virtual COM port bridge.

The STM32H745I-DISCO and STM32H750B-DK boards come with the STM32CubeH7 MCU Package, which provides an STM32 comprehensive software HAL library as well as various software examples.

Figure 1. STM32H745I-DISCO and STM32H750B-DK main boards (top view)

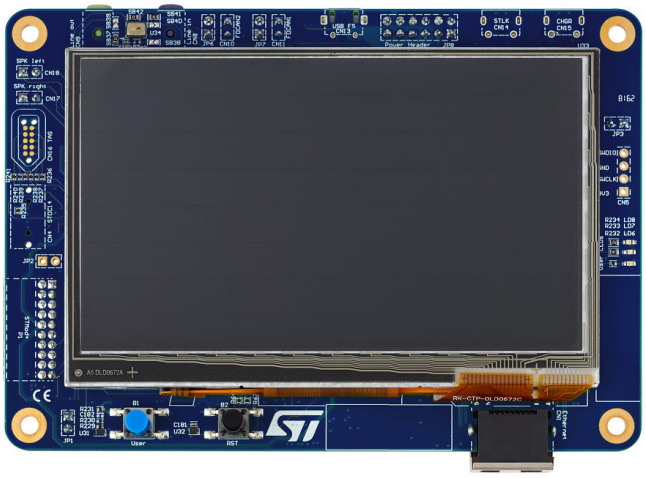
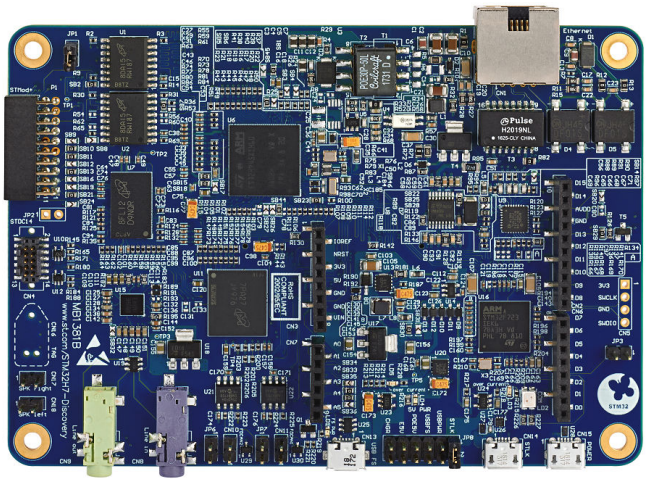


Figure 2. STM32H745I-DISCO and STM32H750B-DK main boards (bottom view)



Pictures are not contractual. PCB colors may differ.

1 Features

- Arm® Cortex® core-based microcontroller with 2 Mbytes (STM32H745XIH6) or 128 Kbytes (STM32H750XBH6) of flash memory and 1 Mbyte of RAM, in a TFBGA240+25 package
- 4.3” RGB interface LCD with touch panel connector
- Ethernet compliant with IEEE-802.3-2002, and PoE
- USB OTG FS
- SAI audio codec
- One MEMS digital microphone
- 2× 512-Mbit Quad-SPI NOR flash memory
- 128-Mbit SDRAM
- 4-Gbyte on-board eMMC
- 1 user and reset push-button
- STMod+ fan-out expansion board
- 2× CAN FDs
- Board connectors:
  - USB FS Micro-AB connectors
  - ST-LINK Micro-B USB connector
  - USB power Micro-B connector
  - Ethernet RJ45
  - Stereo headset jack including analog microphone input
  - Audio header for external speakers
  - Tag-Connect™ (TAG) 10-pin footprint
  - Arm® Cortex® 10-pin 1.27 mm pitch debug connector over STDC14 footprint
  - ARDUINO® Uno V3 expansion connectors
  - STMod+
- Flexible power-supply options:
  - STLINK-V3E USB connector, USB FS connector
  - 5 V delivered by RJ45 (Power over Ethernet)
  - 5 V delivered by ARDUINO® or external connector
  - USB charger
  - USB power
- On-board STLINK-V3E debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
- Comprehensive free software libraries and examples available with the STM32CubeH7 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 STM32H745I-DISCO and STM32H750B-DK Discovery kits, refer to Table 1. Additional information is available from the datasheet and reference manual of the target STM32.

Table 1. List of available products

Order code	Board reference	Target STM32
STM32H745I-DISCO	• MB1280(1) • MB1381(2)	STM32H745XIH6
STM32H750B-DK		STM32H750XBH6

1. *STMod+ fan-out expansion board.*
2. *Main board.*

2.1 Codification

The meaning of the codification is explained in Table 2.

Table 2. Codification explanation

STM32XXYYZ-DISCO STM32XXYYZ-DK	Description	Example: STM32H745I-DISCO
STM32XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32H7 series
YY	MCU product line in the series	STM32H745/755 includes the STM32H745xx MCUs
Z	STM32 flash memory size: • B for 128 Kbytes • I for 2 Mbytes	2 Mbytes
DISCO/DK	Toolkit type: • Discovery kit	Discovery kit

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 STM32H745I-DISCO and STM32H750B-DK 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 such as 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 hurting yourself
- 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 the board close to water or at a high humidity level.
- Do not operate the board if dirty or dusty.

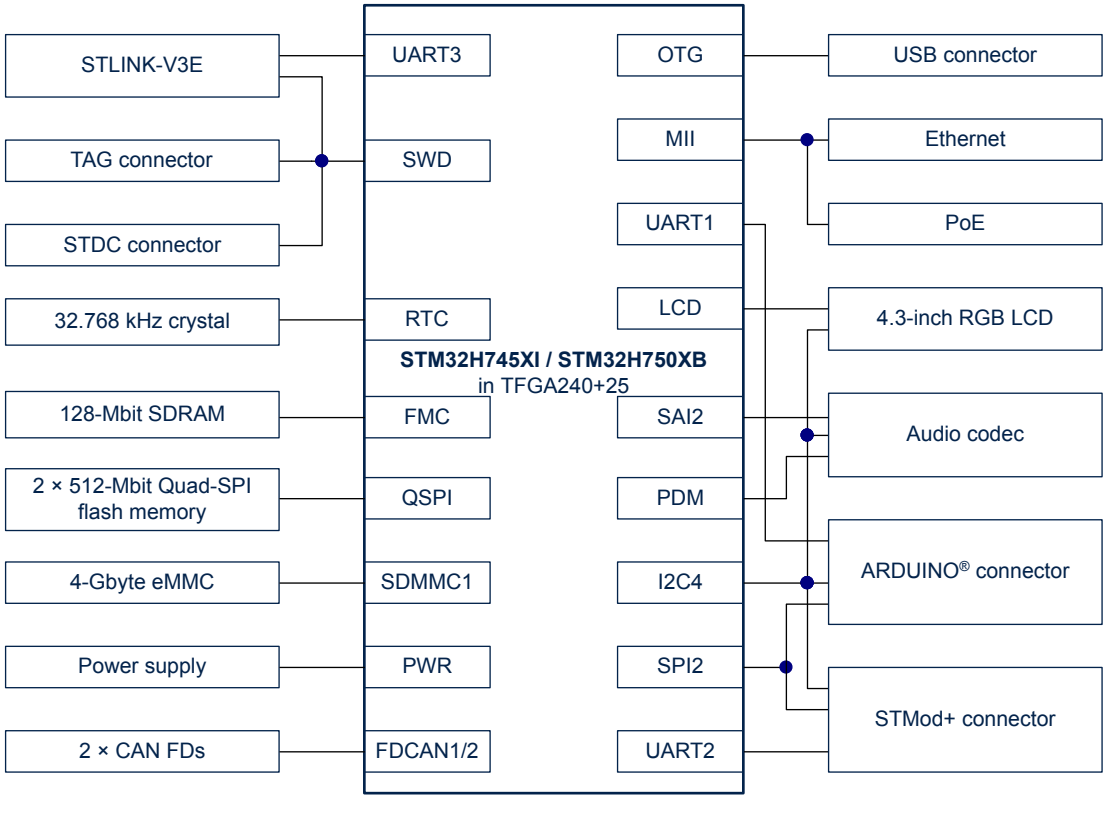
5.3 Delivery recommendations

Before the first use, check the board for any damage that might have occurred during shipment, and check that all socketed components are firmly fixed in their sockets and none is loose in the plastic bag.

6 Hardware layout and configuration

The STM32H745I-DISCO and STM32H750B-DK Discovery kits are designed around the STM32H745XIH6 and STM32H750XBH6 microcontrollers, respectively. Both microcontrollers are packaged in TFBGA240+25. The hardware block diagram (see Figure 3) illustrates the connection between the microcontroller and the peripherals (SDRAM, eMMC, Quad-SPI flash memory, CAN FD (FDCAN), LCD RGB connector, USB OTG connectors, UART, Ethernet, audio, TAG connector, STDC connector, ARDUINO® Uno shields, and embedded ST-LINK). Figure 4 and Figure 5 help to locate these features on the STM32H745I-DISCO and STM32H750B-DK boards.

Figure 3. Hardware block diagram



6.1 STM32H745I-DISCO and STM32H750B-DK layout

Figure 4. STM32H745I-DISCO and STM32H750B-DK Discovery main board top layout

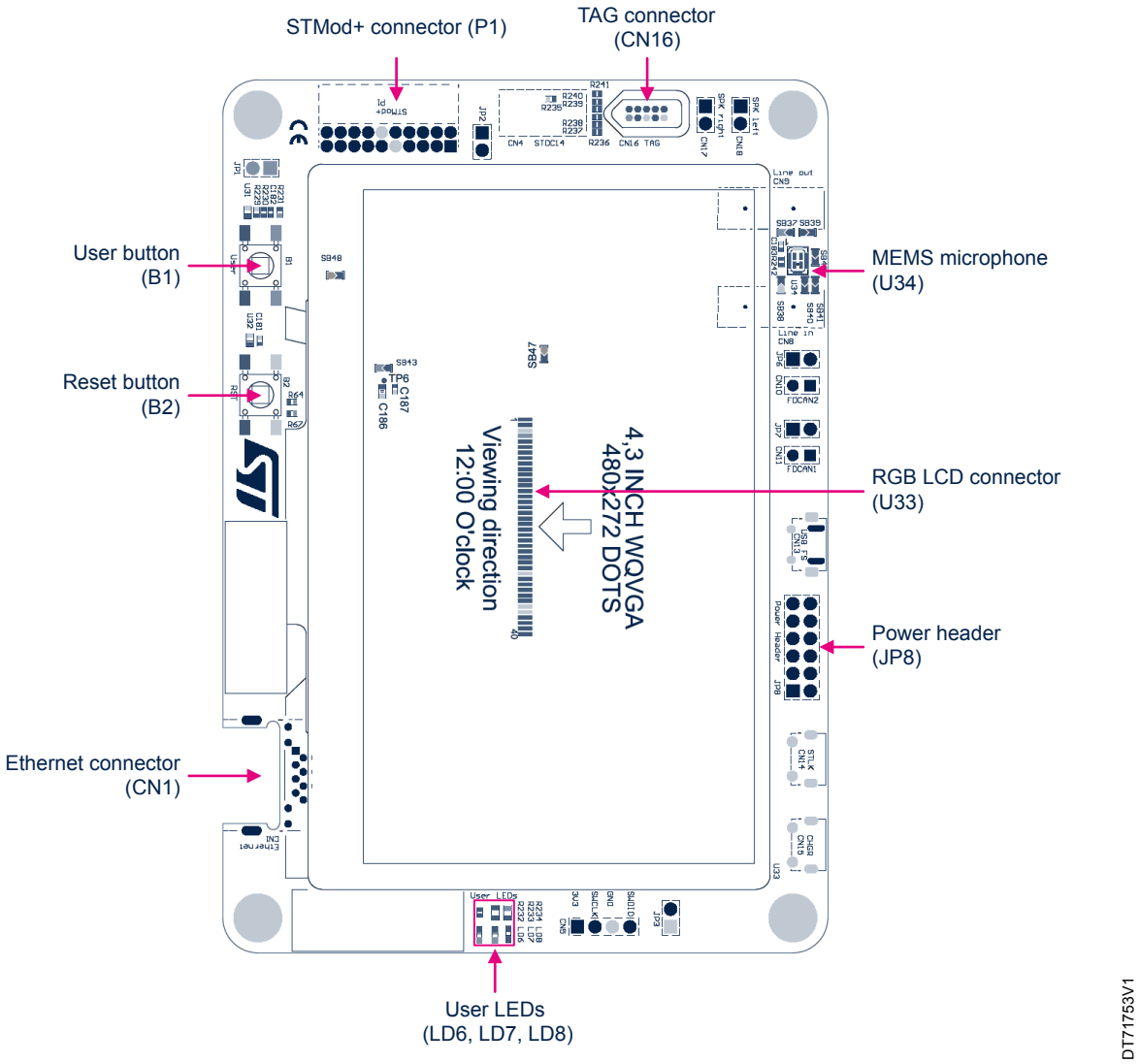
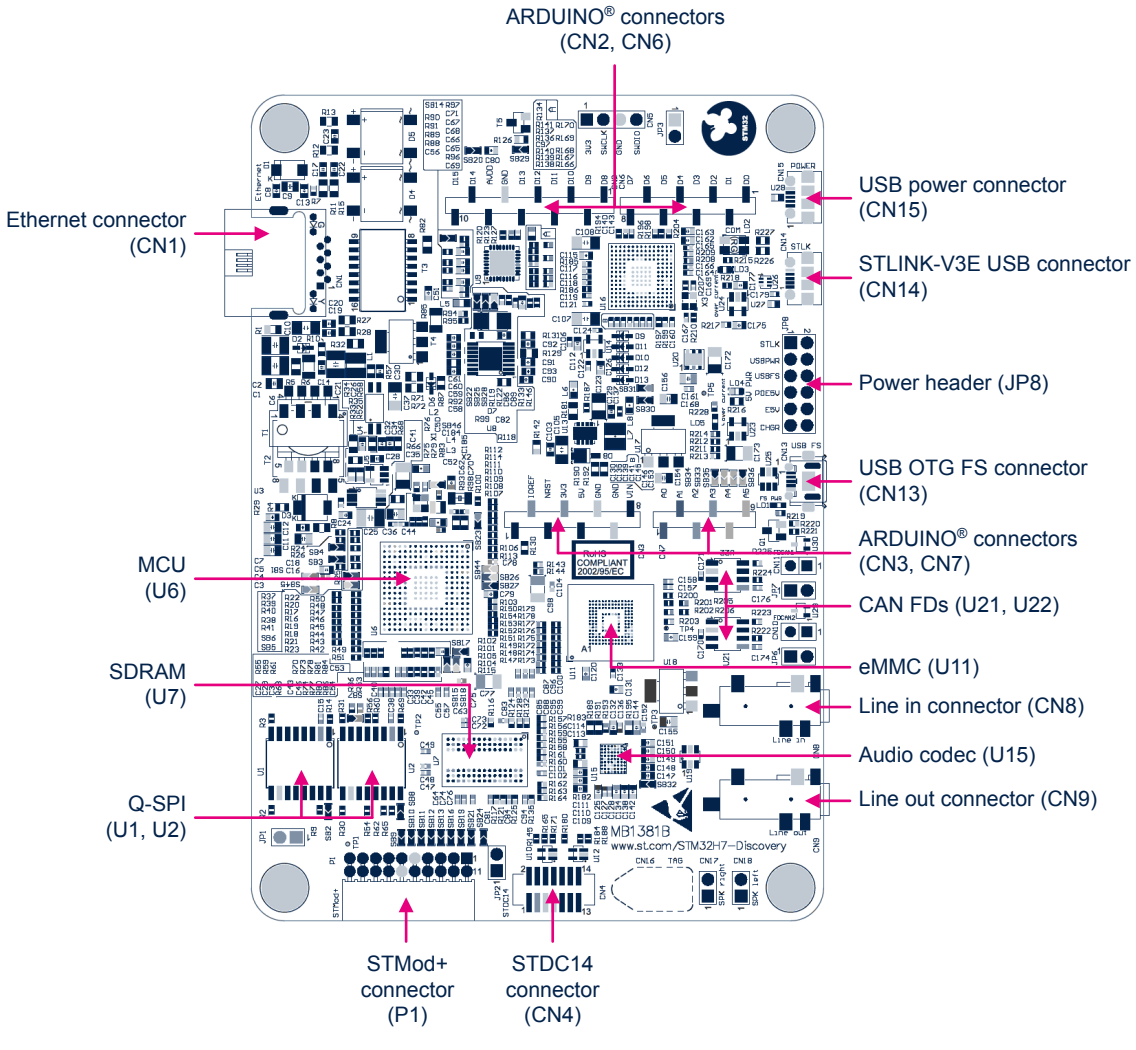


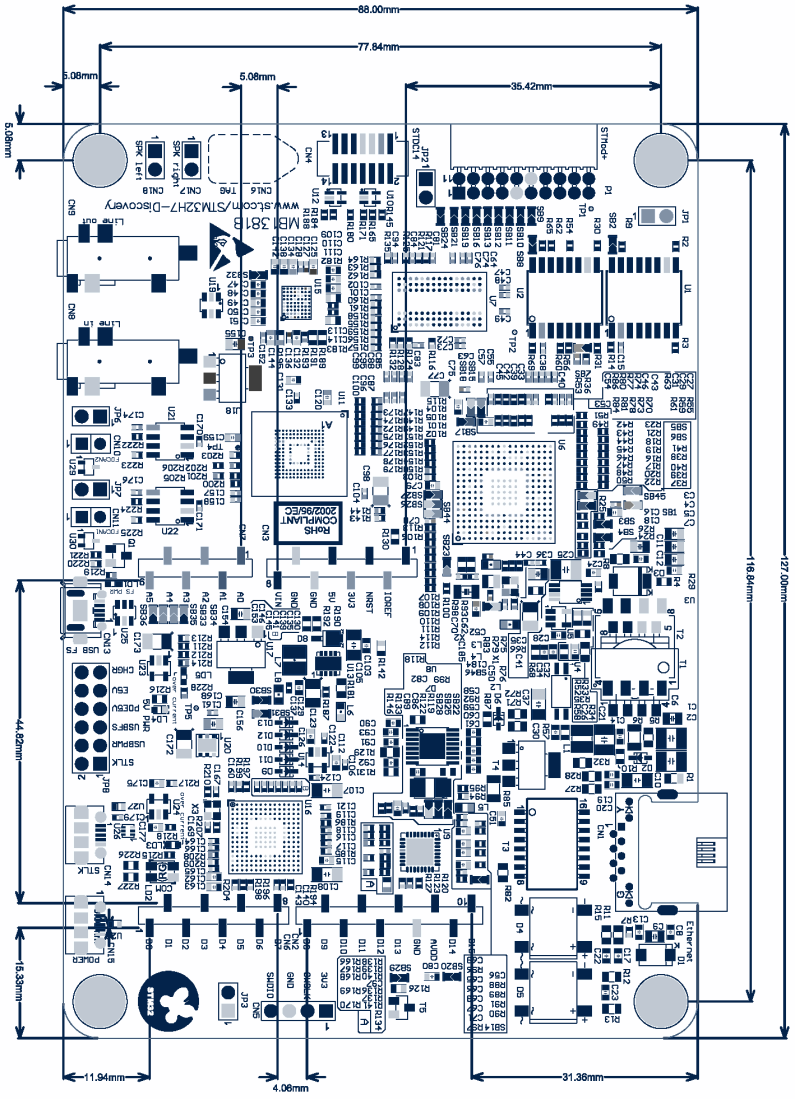
Figure 5. STM32H745I-DISCO and STM32H750B-DK Discovery main board bottom layout



6.2 STM32H745I-DISCO and STM32H750B-DK mechanical drawing

Figure 6 shows the mechanical dimensions of the STM32H745I-DISCO and STM32H750B-DK main boards.

Figure 6. STM32H745I-DISCO and STM32H750B-DK Discovery main board mechanical drawing (bottom view)



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6.3 Embedded STLINK-V3E

The STLINK-V3E programming and debugging tool is integrated into the STM32H745I-DISCO and STM32H750B-DK Discovery kits. It supports:

- 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

The USB connector (CN14) can be used to power the STM32H745I-DISCO and STM32H750B-DK regardless of the STLINK-V3E facility used for debugging or programming the STM32H745XIH6 and STM32H750XBH6. This also holds when the STLINK-V3E standalone tool is connected to the CN4 or CN16 connector and used for debugging or programming the STM32H745XIH6 and STM32H750XBH6. Section 6.4: Power supply provides more details about STM32H745I-DISCO and STM32H750B-DK powering.

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

Drivers and firmware upgrade

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

6.4 Power supply

The STM32H745I-DISCO and STM32H750B-DK Discovery kits are designed to be powered from a 5 V DC power source. Either of the following five 5 V DC power inputs can be used, upon appropriate board configuration:

- Micro-B USB receptacle CN14 of STLINK-V3E without enumeration: up to 500 mA can be supplied to the board (JP8 jumper setting on CHGR position on the silkscreen).
- 7 to 12 V DC power from CN3 pin 8: named VIN on the silkscreen, extension connectors for ARDUINO® Uno shields or daughterboard (JP8 jumper setting on E5V on the silkscreen).
- 48 V DC power from RJ45 connector CN1 (Ethernet):
  In this case, the on-board module PoE (Power over Ethernet) generates the 5 V supply voltage with up to 600 mA. This module is a powered device complying with IEEE 802.3af, class 1/2 standard. The external power supply must be fully IEEE 802.3af compliant (JP8 jumper setting on POE5V on the silkscreen).
- Micro-AB USB receptacle CN13 of the USB OTG_FS interface: marked USB OTG FS on the board (JP8 jumper setting on USBFS on the silkscreen), and supplying up to 500 mA to the board.
- Micro-B USB receptacle CN15 of the USB power: marked USB PWR on the board (JP8 jumper setting on USBPWR on the silkscreen), and supplying up to 500 mA to the board.
- Micro-B USB receptacle CN14 of STLINK-V3E with enumeration: with enumeration feature (see Supplying the board through the STLINK-V3E USB port), up to 500 mA can be supplied to the board (JP8 jumper setting on STLK on the silkscreen).

The LD4 green LED turns ON when the voltage on the power line marked as +5 V is present. All the supply voltage lines required for the operation of the STM32H745I-DISCO/STM32H750B-DK components are derived from this +5 V line.

A power supply unit or auxiliary equipment complying with the EN 62368 1:2014/A11:2017 standard or the standard replacing it must power the product. It must also be a safety extra-low voltage (SELV) with limited power capability.

Supplying the board through the STLINK-V3E USB port

To power the STM32H745I-DISCO and STM32H750B-DK in this way, the USB host (a PC) gets connected to the Micro-B USB receptacle of the board via a USB cable. The connection event starts the USB enumeration procedure. In its initial phase, the host USB port current supply capability is limited to 100 mA. This is sufficient since only the STLINK-V3E part of the STM32H745I-DISCO/STM32H750B-DK draws power at that time: the power switch (U24) is set to the OFF position, which isolates the rest of the board from the power source. In the next phase of the enumeration procedure, the host PC informs the STLINK-V3E that it can supply current up to 300 mA. If the answer is positive, the STLINK-V3E sets the U24 switch to the ON position to supply power to the rest of the board. Alternatively, pin 8 of CN3 (VIN) or CN15 can power the board instead.

If a short circuit occurs on the board, the power switch (U24) protects the USB port of the host PC against a current demand exceeding 500 mA. In such an event, the LD4 LED lights up.

The STM32H745I-DISCO and STM32H750B-DK boards can also be supplied from a USB power source that does not support enumeration, such as a USB charger. In this particular case, jumper JP6 must be activated with a jumper cap as shown in Table 4. Power-supply-related jumper and solder bridge settings. STLINK-V3E bypasses the power switch (U24) regardless of the enumeration procedure result and passes the power unconditionally to the board.

The LD4 green LED turns ON whenever the whole board is powered.

Using STLINK-V3E along with powering through external power

Occasionally, the board might require a supply current over 300 mA. It consequently cannot be supplied from the host PC connected to the STLINK-V3E USB port for debugging or programming the STM32H745XIH6 or STM32H750XBH6 microcontroller. In such a case, the board can be supplied through CN3 pin 8 (marked VIN on the board) or by CN15.

To do this, it is important to power the board before connecting it with the host PC, which requires the following sequence to be respected:

1. Set jumper JP8 in the E5V or CHGR position.
2. Connect the external power source to CN3 pin 8 or CN15.
3. Check that the green LED LD4 is turned ON.
4. Connect the host PC to the USB connector (CN14).

Caution: *If the board requests more than 300 mA and the host PC is connected via USB before the board is powered from CN3 pin 8 or CN15, the following events may occur (listed in reverse severity order):*

1. *The host PC can supply 300 mA (the enumeration succeeds) but does not feature overcurrent protection on its USB port. It is damaged due to overcurrent.*
2. *The host PC can supply 300 mA (the enumeration succeeds) and it has built-in overcurrent protection on its USB port, limiting or shutting down the power out of its USB port when the excessive current demand from STM32H745I-DISCO/STM32H750B-DK is detected. This causes the card to malfunction.*
3. *The host PC is not capable of supplying 300 mA (the enumeration fails). The STLINK-V3E does not supply the rest of the STM32H745I-DISCO/STM32H750B-DK from its USB port VBUS line.*

SMPS/LDO power supply

There are three solutions to provide power to the microcontroller V_{CORE} logic supply: SMPS, LDO, and SMPS and LDO. Power consumption in Run mode is significantly improved by generating V_{CORE} from the internal DC-DC converter (SMPS) and the default connection must be set to SMPS. Some modifications are required to supply the microcontroller from the LDO. Below is the board configuration for each case:

- LDO mode (default on the STM32H750XB): mount SB6, SB17, and SB45; remove SB5, SB18, SB26, SB27, SB44, SB46, and L4.
- SMPS mode (default on the STM32H745XI): mount SB5, SB18, SB44, SB46, and L4; remove SB6, SB17, SB27, SB26, and SB45.
- SMPS plus LDO mode: mount SB6, SB17, SB44, SB46, and L4; remove SB26, SB5, SB18, SB27, and SB45.

Caution: *A deadlock occurs if the STM32H745I-DISCO SMPS/LDO firmware PWR configuration does not match the board hardware configuration: after the reset, the ST-LINK cannot connect to the target anymore.*

The PWR configuration of the firmware must be defined as follows in the `SystemClock_Config` function in the `main.c` file:

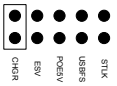
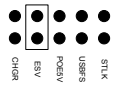
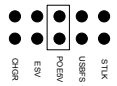
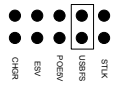
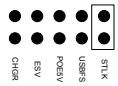
- *If the hardware configuration is Direct SMPS (default configuration):*
  `HAL_PWREx_ConfigSupply(PWR_DIRECT_SMPS_SUPPLY);`
- *If the hardware configuration is LDO:*
  `HAL_PWREx_ConfigSupply(PWR_LDO_SUPPLY);`

If a deadlock occurs because of a mismatch between hardware and firmware PWR settings (SMPS/LDO), the user can recover the STM32H745I-DISCO board by applying the following procedure:

1. *Power off the board.*
2. *Remove the 10 kΩ resistor from R143 and mount it on R144.*
   This changes the BOOT0 pin to 1 instead of 0, thus changing the device boot address to boot address 1 and making the bootloader start in the system memory. This avoids starting firmware in the user flash memory with a wrong SMPS/LDO configuration versus the hardware board configuration.
3. *Power on the board and connect using STM32CubeProgrammer (STM32CubeProg).*
4. *Erase the user flash memory.*
5. *Power off the board, remove the 10 kΩ resistor from R144, and mount it back on R143.*
6. *The board is recovered and can be used normally with matching PWR firmware.*

Table 4 describes the settings of all the jumpers related to the powering of the STM32H745I-DISCO/ STM32H750B-DK and the extension board. VDD_MCU corresponds to the STM32H745XIH6/STM32H750XBH6 digital supply voltage line. It can be connected to a fixed 3.3 V supply.

Table 4. Power-supply-related jumper and solder bridge settings

Jumper/older bridge	Setting	Configuration
JP8 Power source selector		The STM32H745I-DISCO/STM32H750B-DK is supplied through the CN14 Micro-B USB receptacle.
		The STM32H745I-DISCO/STM32H750B-DK is supplied through pin 8 of CN3 (marked VIN).
		The STM32H745I-DISCO/STM32H750B-DK is supplied through the RJ45 connector CN1.
		The STM32H745I-DISCO/STM32H750B-DK is supplied through the CN13 Micro-AB USB receptacle.
		**Default setting** The STM32H745I-DISCO/STM32H750B-DK is supplied through the CN14 Micro-B USB receptacle. It depends on the host PC USB port powering capability declared in the enumeration.
SB23 VBAT connection	SB23 ON	**Default setting** VBAT is connected to +3V3.
	SB23 OFF	VBAT is not connected to +3V3.
SB15 VDD_USB connection	SB15 ON	**Default setting.** VDD_USB (VDDUSB terminal of STM32H745XIH6/STM32H750XBH6) is connected to VDD_MCU.
	SB15 OFF	VDD_USB is not connected to VDD_MCU.
JP1 VDD_MCU connection		**Default setting** VDD_MCU (VDD terminals of STM32H745XIH6/STM32H750XBH6) is connected to fixed +3.3 V.
		VDD_MCU (VDD terminals of STM32H745XIH6/STM32H750XBH6) is not connected to fixed +3.3 V

Note: STM32H750B-DK only supports the LDO mode.

6.5 Clock sources

Three clock sources are available on the STM32H745I-DISCO and STM32H750B-DK boards:

- X1: 25 MHz oscillator for STM32H745XIH6/STM32H750XBH6 microcontroller and Ethernet PHY.
- X2: 32.768 kHz crystal for STM32H745XIH6/STM32H750XBH6 embedded RTC.
- X3: 25 MHz oscillator for STLK.

6.6 Reset sources

The reset signal of the STM32H745I-DISCO and STM32H750B-DK Discovery kits is active at a low level. The reset sources include:

- B2 reset button
- ARDUINO® Uno shield board from CN3
- Embedded STLINK-V3E
- TAG connector
- STDC14 receiver
- eMMC
- Ethernet

6.7 Audio

An audio codec with four DACs and two ADCs is connected to the STM32H745XIH6 and STM32H750XBH6 SAI interface. It communicates with the STM32H745XIH6 and STM32H750XBH6 microcontrollers via an I^2C bus shared with the touch panel of the RGB LCD, ARDUINO®, and STMod+ connectors.

- The analog input line is connected to the audio codec ADC through the blue audio jack (CN8).
- The analog output line is connected to the audio codec DAC via the green audio jack (CN9).
- Two external speakers can be connected to the audio codec via CN18 for the left speaker and CN17 for the right speaker.
- The STM32H745I-DISCO and STM32H750B-DK feature one digital ST MEMS microphone. It is connected to the digital microphone input of the STM32H745XIH6/STM32H750XBH6 and managed by the PDM functionality.

6.8 USB OTG FS

The STM32H745I-DISCO and STM32H750B-DK boards support USB OTG full-speed communications via the CN13 USB Micro-AB connector.

The USB connectors can power the Discovery kit with a 5 V DC supply voltage, at a current up to 500 mA.

A USB power switch is also connected to VBUS and provides power to CN13. The green LED LD1 is lit when either one of the following events occurs:

- The power switch is ON and the STM32H745I-DISCO/STM32H750B-DK operates as a USB Host.
- VBUS is powered by another USB Host when the STM32H745I-DISCO/STM32H750B-DK operates as a USB Device.

The red LED LD5 is lit when an overcurrent occurs.

Note: The STM32H745I-DISCO and STM32H750B-DK boards must be powered by an external power supply when using the OTG function.

6.9 eMMC

The STM32H745I-DISCO and STM32H750B-DK embed a 4-Gbyte eMMC chip. It is connected to the STM32H745XIH6 and STM32H750XBH6 SDMMC1 port.

6.10 Ethernet

The STM32H745I-DISCO and STM32H750B-DK boards support 10/100 Mbit/s Ethernet communications by a PHY, which supports IEEE 802.3az Energy Efficient Ethernet (EEE) and integrated RJ45 connector CN1. The Ethernet PHY is connected to the STM32H745XIH6/STM32H750XBH6 microcontroller through an MII interface.

The PHY 25 MHz clock is generated from the X1 oscillator, while the STM32H745XIH6/STM32H750XBH6 50 MHz clock is generated by the PHY MII_REF_CLK.

Half-duplex operation

With default settings, Ethernet half-duplex operation does not work due to I/O multiplexing between Ethernet MII_CRS and MII_COL, and Q-SPI flash memory QSPI_BK2_IO0 and QSPI_BK2_IO1. Table 5 shows the possible settings of all solder bridges or resistors associated with Ethernet on the boards.

Table 5. Ethernet-related solder bridge and resistor settings

Solder bridges / Resistors	Setting	Configuration
SB3, SB4, R38, R40	SB3 and SB4 OFF R38 and R40 ON	Default setting. PH2 and PH3 are connected to the Q-SPI flash memory. Ethernet half-duplex operation is not supported.
	SB3 and SB4 ON R38 and R40 OFF	PH2 and PH3 are connected to the Ethernet PHY. Ethernet half-duplex operation is supported.

6.11 Power over Ethernet

The STM32H745I-DISCO and STM32H750B-DK Discovery boards embed a power module that uses Ethernet. This module is an IEEE802.3af compliant class 1 / 2 PoE converter, based on a simple diode rectified flyback topology built around a PoE-PD interface and PWM controller. This *"powered device"* module accepts a 48 V input voltage and can deliver 5 V with 600 mA.

6.12 SDRAM

A 128-Mbit SDRAM is connected to the STM32H745XIH6/STM32H750XBH6 FMC interface.

Limitation: Only half of the memory density is available by hardware design.

6.13 Quad-SPI NOR flash memory

By default, two 512-Mbit Quad-SPI NOR flash memories are connected to the STM32H745XIH6/ STM32H750XBH6 Quad-SPI interface. A single 1-Gbit Quad-SPI NOR flash memory can also be plugged into the board. The settings for each configuration are detailed in Table 6.

Table 6. Quad-SPI flash memory configuration settings

Configurations	Flash memory devices	Solder bridges and resistors
Two Quad-SPI flash memories	U1: 512-Mbit Quad-SPI NOR flash memory U2: 512-Mbit Quad-SPI NOR flash memory	• R53/R62/R54/R56/R60/SB8/SB48 OFF • R14/R3/R2/R9/SB2/C15 ON
One twin Quad-SPI flash memory	U1: 1-Gbit Quad-SPI NOR flash memory U2: -	• R53/R62/R54/R56/R60/SB8/SB48 ON • R14/R3/R2/R9/SB2/C15 OFF

6.14 Virtual COM port

Quad-SPI NOR flash memory

The USART3 serial interface is directly available as a Virtual COM port of the PC, connected to the STLINK-V3E USB connector (CN14). The Virtual COM port settings are the following:

- 115200 bauds
- 8-bit data
- no parity
- 1 stop bit
- no flow control

6.15 RGB LCD

The onboard color display is a 4.3-inch 480×272 TFT LCD with a capacitive touch panel. It is connected to the STM32H745XIH6/STM32H750XBH6 LCD interface.

6.16 Buttons and LEDs

The black button (B2), located on the board top side, is the reset of the STM32H745XIH6 and STM32H750XBH6 microcontrollers. Refer to Figure 4. STM32H745I-DISCO and STM32H750B-DK Discovery main board top layout. The blue button (B1), located on the top side, is available for use as a digital input or as a wake-up alternate function.

Table 7 summarizes the assignment of the control ports to the LED indicators.

Table 7. Assignment of control ports to LEDs

Reference	Color	Name	Comment
B1	Blue	USER	Wake-up alternate function
B2	Black	RESET	-
LD1	Green	VBUS USB FS	PA9
LD2	Green/Red	STLK COM	Green when communication is in progress
LD3	Red	STLK Over Current	-
LD4	Green	PWR	-
LD5	Green	OTG Over Current	PH11
LD6	Red	USER1	PI13
LD7	Green	USER2	PJ2
LD8	Green	ARDUINO	PD3

7 Connectors

7.1 ARDUINO® Uno V3 connectors

CN2, CN3, CN6, and CN7 are female connectors compatible with the ARDUINO® standard. Most shields designed for ARDUINO® can fit into the STM32H745I-DISCO and STM32H750B-DK Discovery kits. The STM32H745I-DISCO/STM32H750B-DK ARDUINO® connectors support ARDUINO® Uno V3.

Caution: *The STM32 microcontroller I/Os are 3.3 V compatible instead of 5 V for ARDUINO® Uno.*

Table 8. ARDUINO® connectors (CN2, CN3, CN6, and CN7)

Left connectors					Right connectors				
Connector	Pin number	Pin name	MCU pin	Function	Function	MCU pin	Pin name	Pin number	Connector
					I2C4_SCL	PD12	D15	10	CN2 Digital
					I2C4_SDA	PD13	D14	9	
					AVDD	-	AREF	8	
					Ground	-	GND	7	
CN3 Power	1	NC	-	-	SPI2_SCK	PD3	D13	6	
	2	IOREF	-	3.3 V Ref	SPI2_MISO	PI2	D12	5	
	3	RESET	NRST	RESET	TIM12_CH2, SPI2_MOSI	PB15	D11	4	
	4	3V3	-	3.3 V input/ output	TIM3_CH1, SPI2_NSS	PB4	D10	3	
	5	5V	-	5 V output	TIM8_CH3N	PH15	D9	2	
	6	GND	-	Ground	-	PE3	D8	1	
	7	GND	-	Ground					
	8	VIN	-	Power input	-	PI8	D7	8	CN6 Digital
					TIM15_CH2	PE6	D6	7	
CN7 Analog	1	A0	PC0	ADC123_IN10	TIM1_CH1	PA8	D5	6	
	2	A1	PF8	ADC3_IN7	-	PK1	D4	5	
	3(1)	A2	PA0_C	ADC12_IN0	TIM3_CH1	PA6	D3	4	
	4(1)	A3	PA1_C	ADC12_IN1	-	PG3	D2	3	
	5(1)	A4	PC2_C or PD13	ADC3_IN0 (PC2) or I2C4_SDA (PD13)	USART3_TX	PB10	D1	2	
	6(1)	A5	PC3_C or PD12	ADC3_IN1 (PC3) or I2C4_SCL (PD12)	USART3_RX	PB11	D0	1	

1. *Supports analog input only. The current capability is limited to 1 mA when used as digital output or input.*

7.2 USB OTG FS Micro-AB connector (CN13)

Figure 7. **USB OTG Micro-AB connector (CN13) front view**

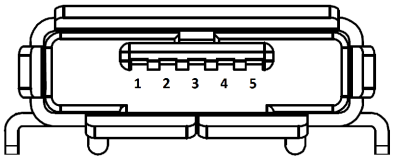


Table 9. **USB OTG FS Micro-AB connector (CN13)**

Pin number	Description	Pin number	Description
1	VBUS	4	ID
2	D-	5	GND
3	D+	-	-

7.3 Ethernet RJ45 connector (CN1)

Figure 8. **Ethernet RJ45 connector (CN1) front view**

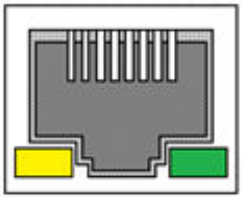


Table 10. **Ethernet RJ45 connector (CN1)**

Pin number	Description	Pin number	Description
1	Tx+	7	Nc7
2	Tx-	8	Nc8
3	Rx+	9	K, yellow LED
4	Nc4	10	A, yellow LED
5	Nc5	11	K, green LED
6	Rx-	12	A, green LED

7.4 RGB LCD connector

Figure 9. **RGB LCD connector (footprint)**

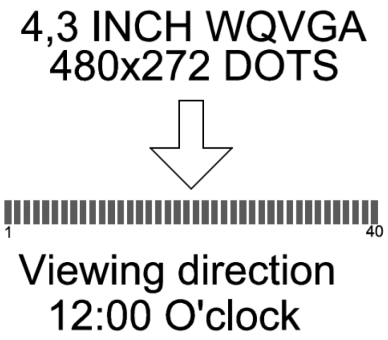


Table 11. **RGB LCD connector**

Pin number	Description	Pin connection	Pin number	Description	Pin connection
1	LCD_BL_K	-	2	LCD_BL_A	-
3	GND	-	4	VDD	-
5	LCD_R0	PI15	6	LCD_R1	PJ0
7	LCD_R2	PJ1	8	LCD_R3	PH9
9	LCD_R4	PJ3	10	LCD_R5	PJ4
11	LCD_R6	PJ5	12	LCD_R7	PJ6
13	LCD_G0	PJ7	14	LCD_G1	PJ8
15	LCD_G2	PJ9	16	LCD_G3	PJ10
17	LCD_G4	PJ11	18	LCD_G5	PI0
19	LCD_G6	PI1	20	LCD_G7	PK2
21	LCD_B0	PJ12	22	LCD_B1	PJ13
23	LCD_B2	PJ14	24	LCD_B3	PJ15
25	LCD_B4	PK3	26	LCD_B5	PK4
27	LCD_B6	PK5	28	LCD_B7	PK6
29	GND	-	30	LCD_CLK	PI14
31	LCD_DISP	PD7	32	LCD_HSYNC	PI12
33	LCD_VSYNC	PI9	34	LCD_DE	PK7
35	GND	-	36	GND	-
37	LCD_RST	-	38	LCD_INT	PG2
39	LCD_SCL	PD12	40	LCD_SDA	PD13

7.5 STMod+ connector (P1)

An STMod+ connector is available on the STM32H745I-DISCO and STM32H750B-DK Discovery kits. It provides flexibility in small form factor applications. In addition, the STMod+ connector expands the SPI interface and frees I/Os that can be used by other peripheral expansions.

The STMod+ connector (P1) can be used to connect the MB1280 STMod+ fan-out expansion board. For more detailed information, refer to the STMicroelectronics MB1280 STMod+ fan-out expansion board user manual (UM2695).

Table 12. STMod+ connector (P1)

Pin number	Description	Pin number	Description
1	SS/CTS (PA15/PA0)	11	INT (PH12)
2	MOSI/TXD (PB15/PD5)	12	RESET (PH10)
3	MISO/RXD (PI2/PD6)	13	ADC (PA4)
4	SCK/RTS (PD3/PD4)	14	PWM (PA3)
5	GND	15	5V
6	5V	16	GND
7	I2C_SCL (PD12)	17	GPIO (PH1)
8	MOSIs (PI3)	18	GPIO (PI11)
9	MISOs (PB14)	19	GPIO(PH4)
10	I2C_SDA (PD13)	20	GPIO(PH8)

7.6 STLINK-V3E USB Micro-B connector (CN14)

The USB connector (CN14) is used to connect the embedded STLINK-V3E to the host PC to program and debug the STM32H745XIH6/STM32H750XBH6 microcontroller.

Figure 10. USB Micro-B connector (CN14) front view

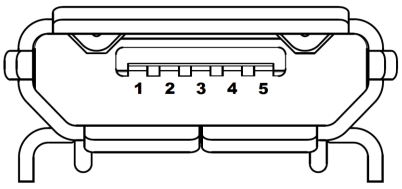


Table 13. USB Micro-B connector (CN14)

Pin number	Description	Pin number	Description
1	VBUS (power)	4	GND
2	DM	5, 6	Shield
3	DP	-	-

7.7 Audio stereo speaker header connectors (CN17 and CN18)

The stereo audio outputs (CN17 and CN18) can support the left and right stereo speakers, respectively.

7.8 Audio green jack line output connector (CN9)

A 3.5 mm stereo audio green jack output (CN9) can support headphones.

7.9 Audio blue jack line input connector (CN8)

A 3.5 mm stereo audio green jack input (CN8) can support the audio line input.

7.10 TAG connector (CN16)

The TAG connector (CN16) is used to connect the STM32H745XIH6/STM32H750XBH6 microcontroller for the board programming and debugging.

Figure 11. TAG debugging connector (CN16) top view

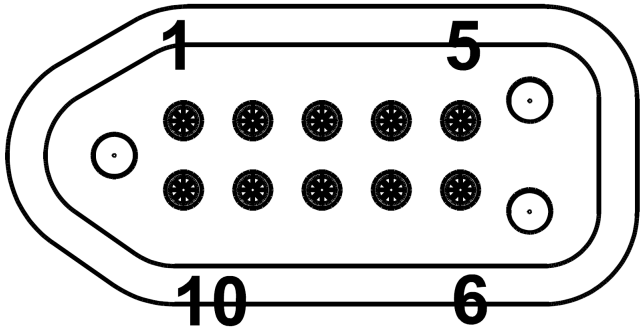


Table 14. TAG connector (CN16)

Pin number	Description	Pin number	Description
1	VDD	10	RESET#
2	SWDIO(PA13)	9	NA
3	GND	8	TDI(PA15)
4	SWCLK(PA14)	7	NA
5	GND	6	SWO(PB3)

7.11 STDC14 connector (CN4)

The STDC14 connector (CN4) can be used to program/debug the microcontroller in an external application board using a cable connected to it.

Table 15. STDC14 connector (CN4)

Pin number	Description	Pin number	Description
1	NC	8	T_SWO
2	NC	9	NC
3	3V3	10	T_JTDI
4	T_SWDIO	11	GNDDETECT
5	GND	12	T_NRST
6	T_SWCLK	13	T_VCP_RX
7	GND	14	T_VCP_TX

7.12 USB power connector (CN15)

Figure 12. **USB Micro-B connector (CN15) front view**

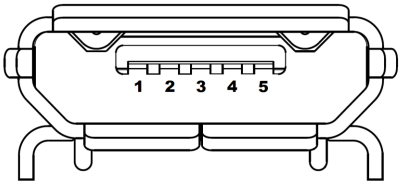


Table 16. **USB Micro-B connector (CN15)**

Pin number	Description	Pin number	Description
1	VBUS	4	NC
2	NC	5	GND
3	NC	-	-

8 STM32H745I-DISCO and STM32H750B-DK I/O assignment

Table 17. STM32H745I-DISCO and STM32H750B-DK I/O assignment

Pin name	Pin number	Signal or label
PA0	N5	STMOD#1-CTS
PA1	N4	MII_RX_CLK
PA2	N3	MII_MDIO
PA3	U2	STMOD#14-PWM
PA4	U3	STMOD#13-ADC
PA5	T3	OTG_FS2_PSO
PA6	R3	ARD_D3
PA7	R5	MII_RX_DV
PA8	E5	ARD_D5
PA9	D15	VBUS_FS2
PA10	D14	USB_OTG_FS2_ID
PA11	E17	USB_OTG_FS2_N
PA12	E16	USB_OTG_FS2_P
PA13	C15	SWDIO
PA14	B14	SWCLK
PA15	A14	STMOD#1_SPI_CS or T_JTDI
PB0	U5	MII_RXD2
PB1	T5	MII_RXD3
PB2	R6	MII_TX_ER
PB3	C6	SWO
PB4	B7	ARD_D10
PB5	A5	FDCAN2_RX
PB6	B5	ARD_D1
PB7	C5	ARD_D0
PB8	D5	SDIO1_D4
PB9	D4	SDIO1_D5
PB10	P11	VCP_TX (USART3)
PB11	P12	VCP_RX (USART3)
PB12	T14	LCD_RST
PB13	U14	FDCAN2_TX
PB14	U15	STMOD#9-MISOs
PB15	T15	ARD_D11
PC0	L2	ARD_A0
PC1	M2	MII_MDC
PC2	M3	MII_TXD2
PC3	M4	MII_TX_CLK
PC4	T4	MII_RXD0
PC5	U4	MII_RXD1

Pin name	Pin number	Signal or label
PC6	F14	SDIO1_D6
PC7	F13	SDIO1_D7
PC8	E13	SDIO1_D0
PC9	E14	SDIO1_D1
PC10	A13	SDIO1_D2
PC11	B13	QSPI_BK2_NCS / SDIO_D3
PC12	C12	SDIO1_CK
PC13	E3	WAKEUP
PC14	C2	OSC32_IN
PC15	C1	OSC32_OUT
PD0	D13	SDRAM_D2
PD1	E12	SDRAM_D3
PD2	D12	SDIO1_CMD
PD3	B12	ARD_D13
PD4	A12	STMOD#4-RTS
PD5	A11	STMOD#2-TX
PD6	B11	STMOD#3-RX
PD7	C11	LCD_DISP
PD8	U16	SDRAM_D13
PD9	T17	SDRAM_D14
PD10	T16	SDRAM_D15
PD11	R15	QSPI_BK1_IO0
PD12	R16	IIC4_SCL
PD13	R17	IIC4_SDA
PD14	P16	SDRAM_D0
PD15	P15	SDRAM_D1
PE0	C4	SDRAM_NBL0
PE1	B4	SDRAM_NBL1
PE2	C3	MII_TXD3
PE3	D3	ARD_D8
PE4	D2	SAI4_D2
PE5	D1	SAI4_CK2
PE6	E5	ARD_D6
PE7	U9	SDRAM_D4
PE8	T9	SDRAM_D5
PE9	P9	SDRAM_D6
PE10	N9	SDRAM_D7
PE11	P10	SDRAM_D8
PE12	R10	SDRAM_D9
PE13	T10	SDRAM_D10
PE14	U10	SDRAM_D11

Pin name	Pin number	Signal or label
PE15	R11	SDRAM_D12
PF0	G4	SDRAM_A0
PF1	G3	SDRAM_A1
PF2	G1	SDRAM_A2
PF3	H4	SDRAM_A3
PF4	J5	SDRAM_A4
PF5	J4	SDRAM_A5
PF6	K2	QSPI_BK1_IO3
PF7	K3	QSPI_BK1_IO2
PF8	K4	ARD_A1
PF9	L4	QSPI_BK1_IO1
PF10	L3	QSPI_CLK
PF11	T7	SDRAM_SDNRAS
PF12	R7	SDRAM_A6
PF13	P7	SDRAM_A7
PF14	P8	SDRAM_A8
PF15	R9	SDRAM_A9
PG0	T8	SDRAM_A10
PG1	U8	SDRAM_A11
PG2	H16	LCD_INT
PG3	H15	ARD_D2
PG4	H14	SDRAM_BA0
PG5	G14	SDRAM_BA1
PG6	G15	QSPI_BK1_NCS
PG7	F16	Audio_Int
PG8	F15	SDRAM_SDCLK
PG9	A10	QSPI_BK2_IO2
PG10	A9	SAI2_SDB
PG11	B9	MII_TX_EN
PG12	C9	MII_TXD1
PG13	D9	MII_TXD0
PG14	D8	QSPI_BK2_IO3
PG15	D6	SDRAM_SDNCAS
PH0	J2	OSC_25M
PH1	J1	STMOD#17
PH2	N2	QSPI_BK2_IO0 or MII_CRS(1)
PH3	P2	QSPI_BK2_IO1 or MII_COL(1)
PH4	P3	STMOD#19
PH5	P4	SDRAM_SDNWE
PH6	T11	SDRAM_SDNE1
PH7	U13	SDRAM_SDCKE1

Pin name	Pin number	Signal or label
PH8	T13	STMOD#20
PH9	R13	LCD_R3
PH10	P13	STMOD#12-RST
PH11	P14	OTG_FS2_Overcurrent
PH12	R14	STMOD#11-INT
PH13	D16	FDCAN1_TX
PH14	B17	FDCAN1_RX
PH15	PF6	ARD_D9
PI0	A16	LCD_G5
PI1	A15	LCD_G6
PI2	B15	ARD_D12
PI3	C14	STMOD#8-MOSIs
PI4	A4	SAI2_MCLKA
PI5	A3	SAI2_SCKA
PI6	A2	SAI2_SDA
PI7	B3	SAI2_FSA
PI8	E4	ARD_D7
PI9	E2	LCD_VSYNC
PI10	F3	MII_RX_ER
PI11	F4	STMOD#18
PI12	H1	LCD_HSYNC
PI13	H2	LED2
PI14	H3	LCD_CLK
PI15	P5	LCD_R0
PJ0	N6	LCD_R1
PJ1	P6	LCD_R2
PJ2	T6	LED1
PJ3	U6	LCD_R4
PJ4	U7	LCD_R5
PJ5	R12	LCD_R6
PJ6	N15	LCD_R7
PJ7	N14	LCD_G0
PJ8	N13	LCD_G1
PJ9	M14	LCD_G2
PJ10	L14	LCD_G3
PJ11	K14	LCD_G4
PJ12	D11	LCD_B0
PJ13	E10	LCD_B1
PJ14	D10	LCD_B2
PJ15	B10	LCD_B3
PK0	J14	LCD_BL

Pin name	Pin number	Signal or label
PK1	J15	ARD_D4
PK2	H17	LCD_G7
PK3	C8	LCD_B4
PK4	B8	LCD_B5
PK5	A8	LCD_B6
PK6	C7	LCD_B7
PK7	D7	LCD_DE
-	L16	DSI_CK_P
-	L17	DSI_CK_N
-	M16	DSI_D0_P
-	M17	DSI_D0_N
-	K16	DSI_D1_P
-	K17	DSI_D1_N
-	T1	ARD_A2
-	T2	ARD_A3
-	R1	ARD_A4
-	R2	ARD_A5
-	E9	VDD
-	E11	VDD
-	F5	VDD
-	G5	VDD
-	G13	VDD
-	H5	VDD
-	H13	VDD
-	J13	VDD
-	K13	VDD
-	L13	VDD
-	M13	VDD
-	N12	VDD
-	N11	VDD
-	N10	VDD
-	N7	VDD
-	L5	VDD
-	K5	VDD
-	E6	VDD
P11	F1	VDDIO_SD1
P12	E1	VLX
P13	F2	VSSIO_SD
P14	U11	VCAP1
P15	D17	VCAP2
R1	A7	VCAP3

Pin name	Pin number	Signal or label
R2	N8	VDDIO1
R3	M5	VDDIO2
R4	U12	VDDIO33_LDO1
R5	C17	VDDIO33_LDO2
R6	A6	VDDIO33_LDO3
R7	G17	VDD50_USB
R8	F17	VDD_USB33
-	L1	VDDA
-	M1	VREF+
-	B1	VBAT
-	A1	VSS
-	C10	VSS
-	C13	VSS
-	C16	VSS
-	G16	VSS
-	J3	VSS
-	N16	VSS
-	U17	VSS
-	T12	VSS
-	R8	VSS
-	L9	VSS
-	L11	VSS
-	K10	VSS
-	K11	VSS
-	A17	VSS
-	L10	VSS
-	B6	VSS
-	B2	VSS
-	R2	VSS
-	G7	VSS
-	G8	VSS
-	G9	VSS
-	G10	VSS
-	G11	VSS
-	H7	VSS
-	H8	VSS
-	H9	VSS
-	H10	VSS
-	H11	VSS
-	J7	VSS
-	J8	VSS

Pin name	Pin number	Signal or label
-	J9	VSS
-	J10	VSS
-	J11	VSS
-	K7	VSS
-	K8	VSS
-	K9	VSS
-	L7	VSS
-	L8	VSS
-	U1	VSS
-	P1	VSSA
-	N1	VREF-
-	P17	VDD33_DSI
-	N17	VDD12_DSI_CAP
-	J16	VSSDSI1
-	J17	VSSDSI2
-	K15	VSSDSI3
-	L15	VSSDSI4
-	M15	VSSDSI5

1. *For 10 Mbit/s half-duplex MII communication, SB3 and SB4 must be ON.*

9 STM32H745I-DISCO and STM32H750B-DK product information

9.1 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:

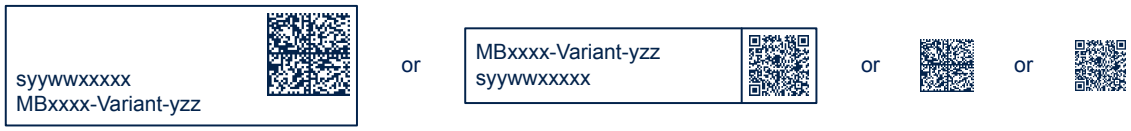
  

  Dual-sticker example:

- 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.

9.2 STM32H745I-DISCO and STM32H750B-DK product history

Table 18. Product history

Order code	Product identification	Product details	Product change description	Product limitations
STM32H745I-DISCO	DKH745IO$AT1	MCU: • STM32H745XIH6 silicon revision "V"	Initial revision	No limitation
		MCU errata sheet: • *STM32H745/747xI/G and STM32H755/757xI device limitations* (ES0445)		
		Boards: • MB1280-DEFAULT-B01 (STMod+ fan-out expansion board) • MB1381-H745XI-B01 (main board)		
	DKH745IO$AT2	MCU: • STM32H745XIH6 silicon revision "V"	• Packaging: plastic blister replaced by a carton box • Main board revision changed • STMod+ fan-out expansion board revision changed	No limitation
		MCU errata sheet: • *STM32H745/747xI/G and STM32H755/757xI device limitations* (ES0445)		
		Boards: • MB1280-3V3-C01 (STMod+ fan-out expansion board) • MB1381-H745XI-B02 (main board)		
	DK32H745I$AT3	MCU: • STM32H745XIH6 silicon revision "V"	• Board stickers format changed • Main board revision changed	No limitation
		MCU errata sheet: • *STM32H745/747xI/G and STM32H755/757xI device limitations* (ES0445)		
		Boards: • MB1280-3V3-C01 (STMod+ fan-out expansion board) • MB1381-H745XI-B03 (main board)		
	DK32H745I$AT4	MCU: • STM32H745XIH6 silicon revision "V"	Main board revision changed	No limitation
		MCU errata sheet: • *STM32H745/747xI/G and STM32H755/757xI device limitations* (ES0445)		

Order code	Product identification	Product details	Product change description	Product limitations
STM32H745I-DISCO	DK32H745I$AT4	Boards: • MB1280-3V3-C01 (STMod+ fan-out expansion board) • MB1381-H745XI-B04 (main board)	Main board revision changed	No limitation
STM32H750B-DK	DK32H750B$AT1	MCU: • STM32H750XBH6 silicon revision "V" MCU errata sheet: • *STM32H750xB and STM32H753xI device limitations* (ES0396) Boards: • MB1280-DEFAULT-B01 (STMod+ fan-out expansion board) • MB1381-H750XB-B01 (main board)	Initial revision	No limitation
	DK32H750B$AT2	MCU: • STM32H750XBH6 silicon revision "V" MCU errata sheet: • *STM32H750xB and STM32H753xI device limitations* (ES0396) Boards: • MB1280-3V3-C01 (STMod+ fan-out expansion board) • MB1381-H750XB-B04 (main board)	• Packaging: plastic blister replaced by a carton box • Board stickers format changed • Main board revision changed • STMod+ fan-out expansion board revision changed	No limitation

9.3 Board revision history

Table 19. Board revision history

Board reference	Board variant and revision	Board change description	Board limitations
MB1280 (STMod+ fan-out expansion board)	DEFAULT-B01	Altium project updated with the STMicroelectronics standard library	5 V I^2C interface not supported by the Grove connector
	3V3-C01	• Updated several parts due to obsolescence (such as transistors or others) • Updated T1 and T2 wiring • Updated silkscreens, logos, and PCB mechanical size • Refer to the bill of materials for further details	No limitation
MB1381 (main board)	H745XI-B01 H750XB-B01	Initial revision	No limitation
	H745XI-B02	• Updated LEDs • Refer to the bill of materials for further details	No limitation
	H745XI-B03	• Updated several part references due to obsolescence, such as LCD ROCKTECH RK043FN48H-CT672B replaced by ROCKTECH RK043FN88H-CT661C with impact on firmware. • Refer to the bill of materials for further details	No limitation
	H745XI-B04 H750XB-B04	• Updated several part references due to obsolescence, such as Micron Technology MTFC4GACAJCN-1M WT replaced with new memory KIOXIA THGBMTG5D1LBAL without impact on firmware. • Refer to the bill of materials for further details	No limitation

10 Federal Communications Commission (FCC) and ISED Canada Compliance Statements

10.1 FCC Compliance Statement

Part 15.19

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device 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 a Class A digital device, 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 his own expense.

Responsible party (in the USA)

Francesco Doddo
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10.2 ISED Compliance Statement

ISED Canada ICES-003 Compliance Label: CAN ICES-3 (A) / NMB-3 (A).

Étiquette de conformité à la NMB-003 d'ISDE Canada : CAN ICES-3 (A) / NMB-3 (A).

11 CE conformity

11.1 Warning

EN 55032 / CISPR32 (2012) Class A product

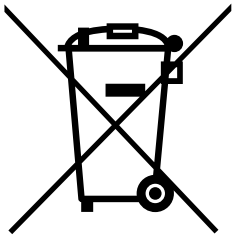
Warning: this device is compliant with Class A of EN55032 / CISPR32. In a residential environment, this equipment may cause radio interference.

Avertissement : cet équipement est conforme à la Classe A de la EN55032 / CISPR 32. Dans un environnement résidentiel, cet équipement peut créer des interférences radio.

12 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 should 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, please separate these items from other type of waste and recycle them responsibly to the designated collection point to promote the sustainable reuse of material resources.

Household users:

You should contact either the retailer where you buy the product or your local authority for further details of your nearest designated collection point.

Business users:

You should contact your dealer or supplier for further information.

Revision history

Table 20. **Document revision history**

Date	Revision	Changes
8-Jan-2019	1	Initial release.
1-Apr-2019	2	Updated *Figure 1* and *Figure 2* on the cover page and reorganized the beginning of the document: • Updated *Features* • Updated *Ordering information* • Updated *Product marking* • Added *Codification* • Added *Development environment*
6-May-2019	3	Updated the description of the *SMPS/LDO power supply* default modes in *Section 6.4 Power Supply*.
12-Sep-2019	4	Updated the descriptions of pins ARD_D0 and ARD_D1 of ARDUINO® connector CN6 in *Figure 29. ARDUINO® connectors* and correspondingly in *Table 6. ARDUINO® connectors (CN2, CN3, CN6, and CN7)*. Updated all schematics related to STM32H745I-DISCO in *Section 9 Electrical schematics*.
31-Jan-2020	5	Updated *SMPS/LDO power supply* in *Section 6.4 Power supply* for hardware/firmware mismatch deadlock recovery.
21-Apr-2020	6	Updated for Ethernet half-duplex support: • Updated *Section 6.10 Ethernet* • Updated PH2 and PH3 in *Table 16. STM32H745I-DISCO and STM32H750B-DK I/O assignment* Updated the document structure: • Updated *Federal Communications Commission (FCC) and Industry Canada (IC) Compliance Statements* • Added *CE conformity* • Removed *Electrical schematics*
27-Apr-2021	7	Updated LEDs LD6 and LD7 in *Table 6. Assignment of control ports to LED*. Added *Section 9 STM32H745I-DISCO and STM32H750B-DK product information* and included *Product marking* within.
9-Sep-2021	8	Updated *Figure 4* and *Figure 5*. Added limitation to pins A[2...5] of ARDUINO® connector CN7 in *Table 7. ARDUINO® connectors (CN2, CN3, CN6, and CN7)*.
16-Dec-2022	9	Updated *Product marking*, *STM32H745I-DISCO and STM32H750B-DK product history*, and *Board revision history*. Updated *Federal Communications Commission (FCC) and ISED Canada Compliance Statements*. Updated the section titles of *STM32H745I-DISCO and STM32H750B-DK layout* and *STM32H745IDISCO and STM32H750B-DK mechanical drawing*. Updated *Figure 4* and *Figure 5*. Updated *Power supply*, *Audio*, *USB OTG FS*, *Ethernet*, *SDRAM*, and *Quad-SPI NOR flash memory*. Updated USB Type-B to Micro-B in *CN14 STLINK-V3E USB Micro-B connector*. Updated *Features*, *Ordering information*, and *Development environment*.
24-Apr-2025	10	Added Safety recommendations and Product disposal. Updated Ordering information, Power supply, SDRAM, STMod+ connector (P1), STM32H745I-DISCO and STM32H750B-DK I/O assignment, ARDUINO® connectors (CN2, CN3, CN6, and CN7), and STM32H745I-DISCO and STM32H750B-DK product information.

Contents

List of tables

List of figures