Discovery kit with STM32H573II MCU

Introduction

The STM32H573I-DK Discovery kit is a complete demonstration and development platform for the STM32H573IIK3Q microcontroller, featuring an Arm® Cortex®-M33 core with Arm® TrustZone®, frequency up to 240 MHz, 2-Mbytes of embedded Flash memory and 640 Kbytes of SRAM, as well as smart peripheral resources.

The STM32H573IIK3Q microcontroller features four I^2C, one I^3C, six SPIs with three multiplexed full-duplex I^2S interfaces, up to 12 USARTs and one LPUART, two CAN FD, two 12-bit ADCs and two 12-bit DACs, two SAIs, one Octo-SPI interfaces with OTFDEC crypto and support for serial PSRAM/NOR/NAND/HyperRAM™ flash memories, FMC interface, two SD/SDIO/MMC interfaces, one USB 2.0 full-speed host and device, one USB Type-C® / USB power-delivery controller, one Ethernet MAC interface with DMA controller, one 8-bit to 14-bit camera interface, TFT LCD controller interface, JTAG, SWD and Embedded Trace Microcell™ (ETM) for debugging support.

The STM32H573I-DK Discovery kit offers everything required for users to get started quickly and develop applications easily.

The hardware features on the board help to evaluate the following peripherals: USB Type-C® (Sink / Source mode), 10-Mbit / 100-Mbit Ethernet, microSD™, USART, SAI audio DAC stereo with one audio jack for input / output, ST MEMS digital microphone with PDM interface, 512-Mbit Octo-SPI NOR flash memory, 20-pin microphone MEMS connector with PDM interface, 1.54-inch TFT LCD with LED backlight and touch panel. The ARDUINO® Uno V3 compatible connectors, Pmod™, and STMod+ connectors allow easy connection of extension shields or daughterboards for specific applications. A fan-out daughterboard and a Wi-Fi® module are provided with the STM32H573I-DK Discovery kit.

The integrated STLINK-V3EC provides an embedded in-circuit debugger and programmer for the STM32 MCU.

Figure 1. STM32H573I-DK top view

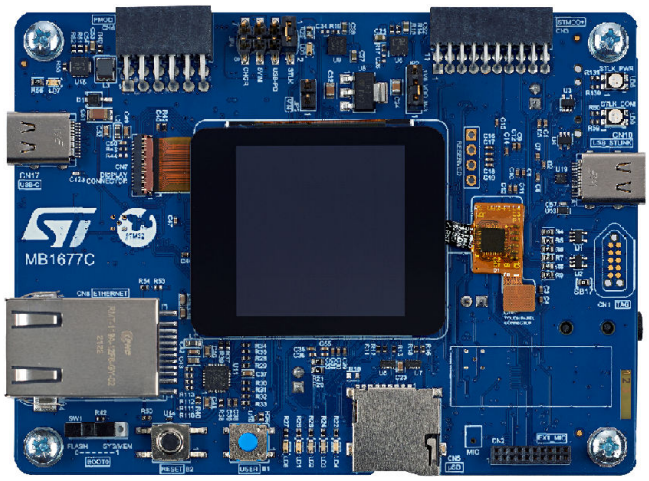
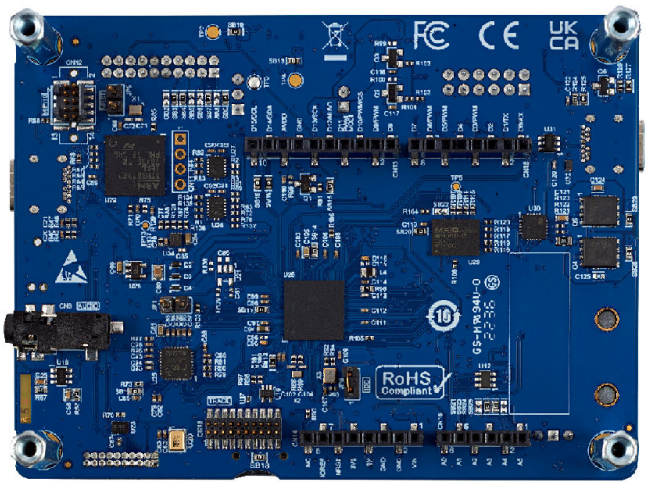


Figure 2. STM32H573I-DK bottom view



Pictures are not contractual.

1 Features

- STM32H573IIK3Q microcontroller based on the Arm® Cortex®-M33 core with Arm® TrustZone®, featuring 2 Mbytes of flash memory, 640 Kbytes of SRAM, and cryptography in a UFBGA176 package SMPS option
- 1.54" TFT 240 × 240 pixels color LCD with LED backlight and touch panel
- User USB with USB 2.0 full-speed interface, Sink/Source up to 15 W (5 V / 3 A)
- Ethernet 10/100 Mbit/s, compliant with IEEE-802.3-2002
- SAI audio codec
- One ST-MEMS digital microphone
- 512-Mbit Octo-SPI NOR flash memory
- Fan-out daughterboard
- Wi-Fi® module (802.11 b/g/n compliant)
- Four user LEDs
- User and reset push-buttons
- Board connectors:
  - ST-LINK USB Type-C®
  - User USB Type-C®
  - Ethernet RJ45
  - Stereo headset jack including analog microphone input
  - microSD™ card
  - Tag-Connect™ 10-pin footprint
  - Arm® Cortex® 10-pin 1.27 mm pitch debug connector (SWD/JTAG)
  - Arm® Cortex® MIPI20 connector (SWD/JTAG/trace)
  - ARDUINO® Uno V3 expansion
  - STMod+ expansion
  - Pmod™ Type-2A and Type-4A expansion
  - Audio MEMS daughterboard expansion
- Flexible power-supply options: ST-LINK USB V_{BUS}, USB connector, or external sources
- On-board STLINK-V3EC debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
- Comprehensive free software libraries and examples available with the STM32CubeH5 MCU Package
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE

Note: Arm and TrustZone are registered trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

2 Ordering information

To order the STM32H573I-DK Discovery kit, 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
STM32H573I-DK	• MB1280(1) • MB1400(2) • MB1677(3)	STM32H573IIK3Q

1. *Fan-out daughterboard*
2. *Wi-Fi® module*
3. *Main board*

2.1 Codification

The meaning of the codification is explained in Table 2.

Table 2. Codification explanation

STM32TTXXY-DK	Description	Example: STM32H573I-DK
STM32TT	MCU series in STM32 32-bit Arm Cortex MCUs	STM32H5 series
XX	MCU product line in the series	STM32H563/573 product line
Y	STM32 flash memory size: • I for 2 Mbytes	2 Mbytes
DK	Toolkit configuration: • Discovery kit	Discovery kit

3 Development environment

3.1 System requirements

- Multi-OS support: Windows® 10, Linux® 64-bit, or macOS®
- USB Type-A or USB Type-C® to USB Type-C® 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*.

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
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. As for all products of this type, the user must be careful about the following points:

- The connection pins on the board might be sharp. Handle the board carefully to avoid getting hurt.
- This board contains static-sensitive devices. To avoid damaging it, handle the board in an ESD-proof environment.
- While powered, do not to touch the electric connections on the board with fingers or anything conductive. The board operates at voltage levels that are not dangerous, but some components might be damaged when shorted.
- Do not put any liquid on the board; avoid operating it close to water or at high humidity level.
- Do not operate the board if it is dirty or dusty.

6 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 that none is loose in the plastic bag.

7 Hardware layout and configuration

7.1 Hardware layout

The STM32H573I-DK is designed around the STM32H573IIK3Q microcontroller in a 176-pin BGA package.
Figure 3 illustrates the connection between the STM32H573IIK3Q microcontroller and the peripherals (STLINK-V3EC, push-buttons, LEDs, Octo-SPI flash memory, LCD, microSD™ card, USB, Ethernet, audio codec, MEMS digital microphones, STMod+/Pmod™/ARDUINO® connectors).

Figure 3. STM32H573I-DK hardware block diagram

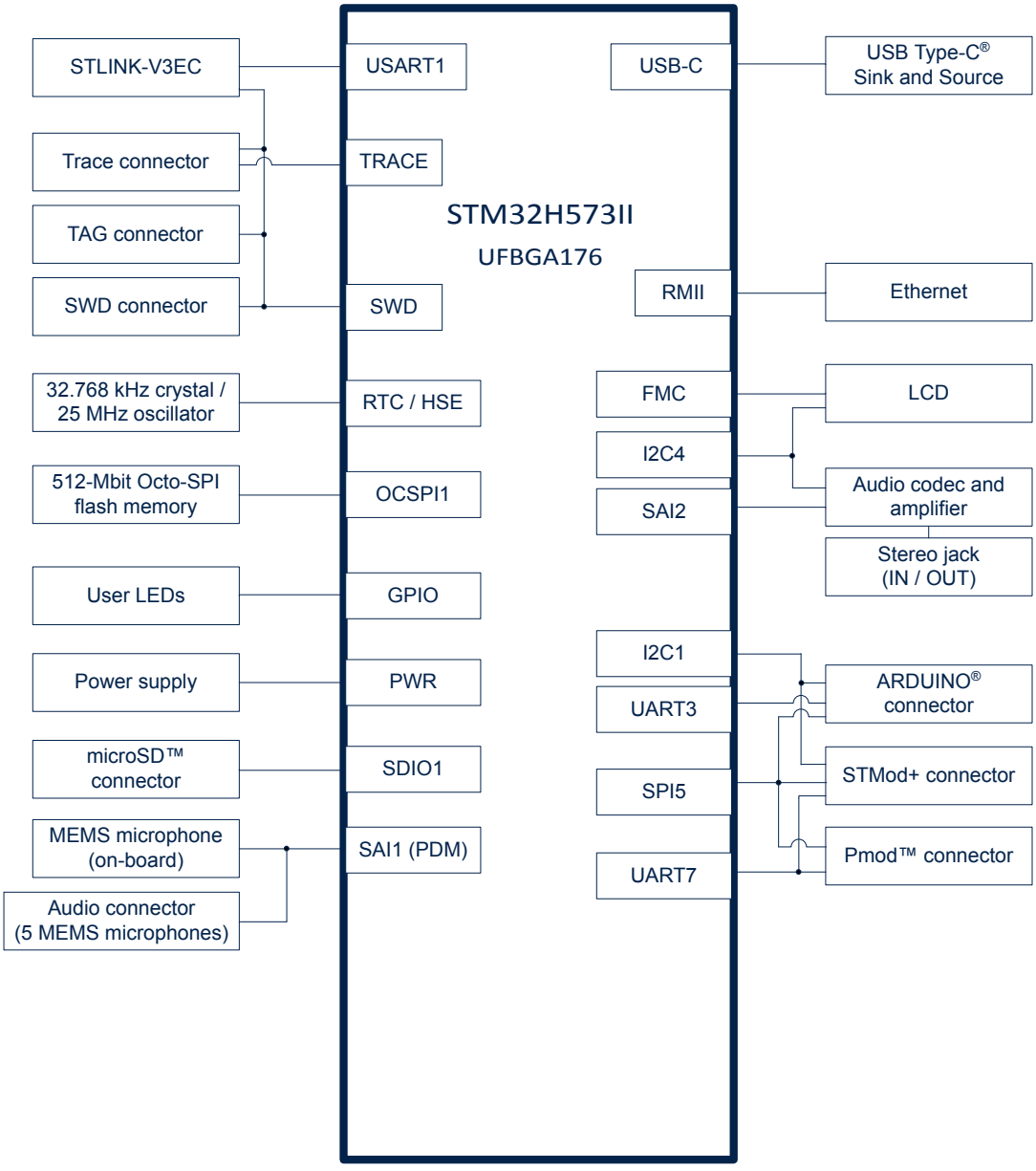


Figure 4 and Figure 5 show the locations of these features on the STM32H573I-DK.

Figure 4. STM32H573I-DK PCB layout: top side

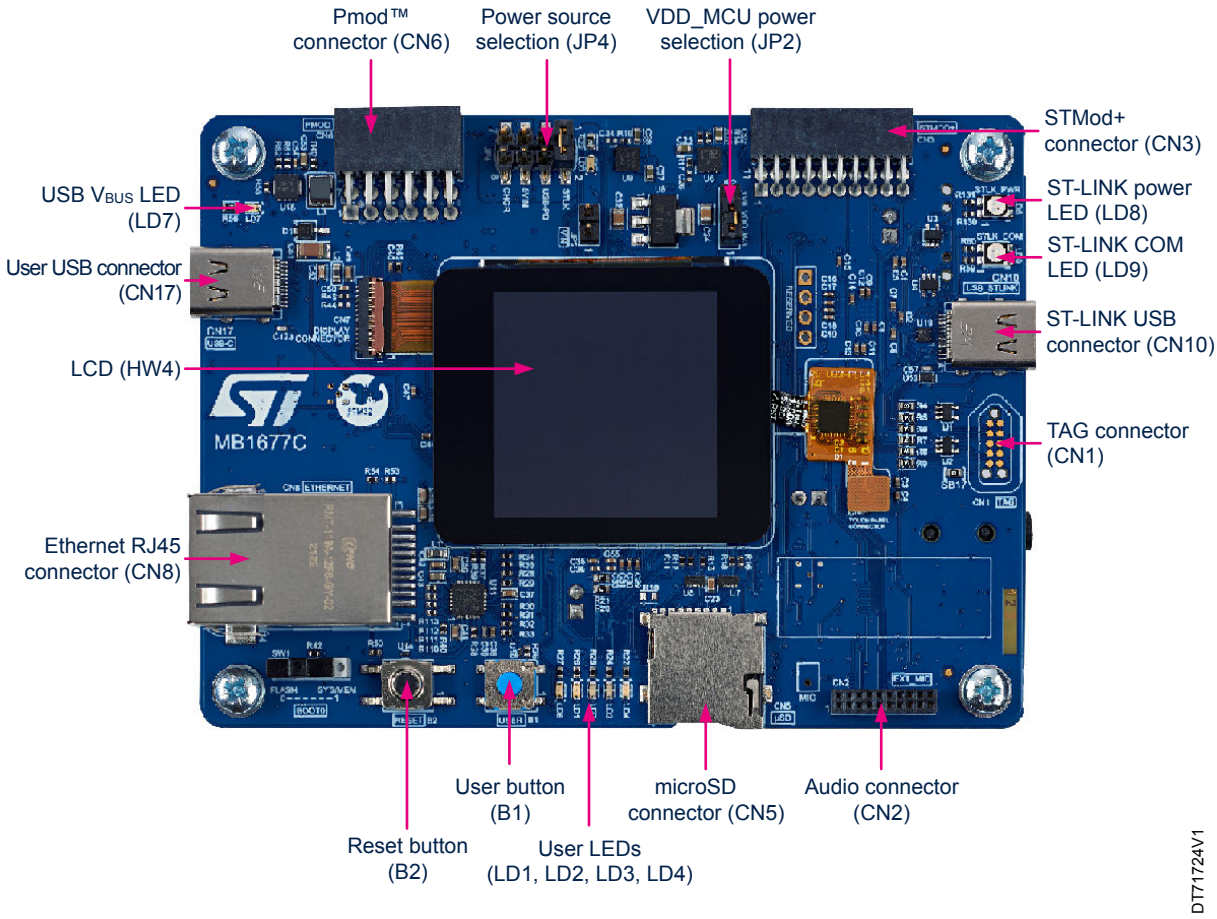
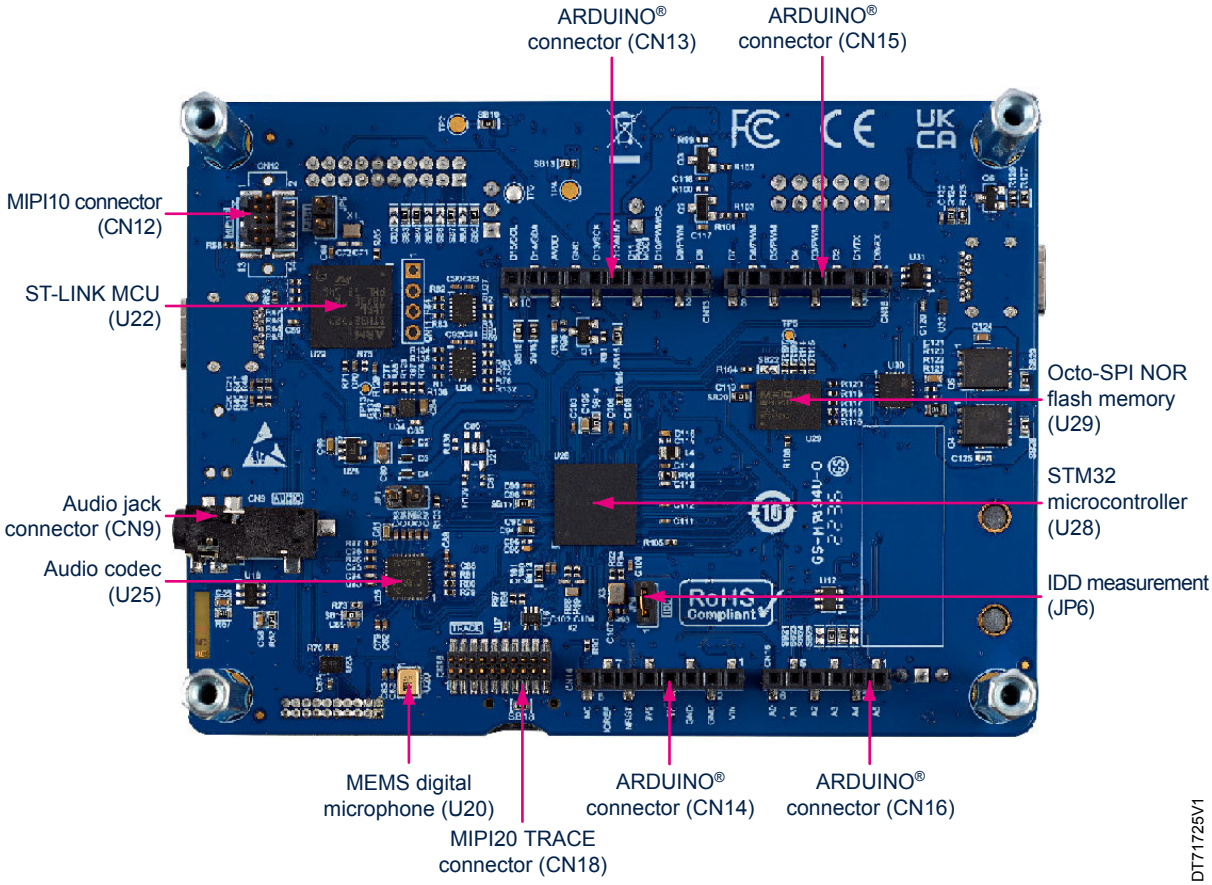
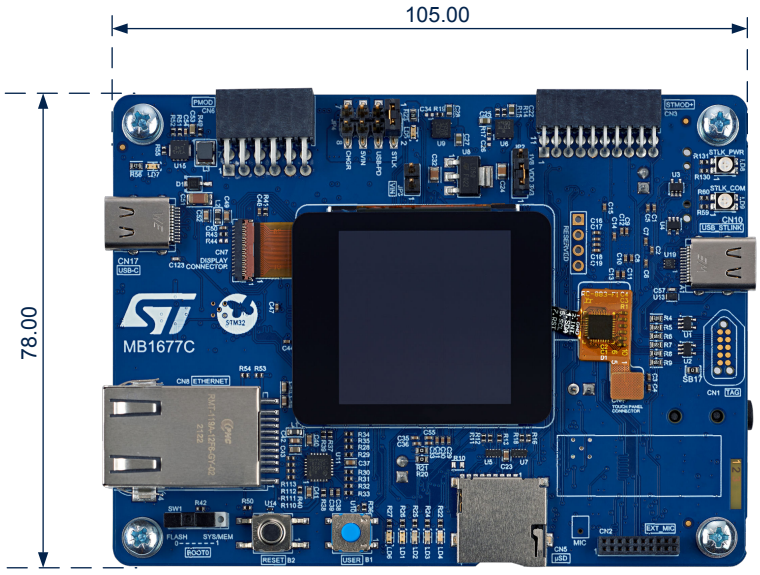


Figure 5. **STM32H573I-DK PCB layout: bottom side**



7.2 Mechanical dimensions

Figure 6. **STM32H573I-DK mechanical dimensions (top, in millimeters)**



8 Embedded STLINK-V3EC

The chapters below give some information about the implementation of the STLINK-V3EC.

For more details on the STLINK-V3EC (for example LEDs management, drivers, firmware, and others), refer to the technical note *Overview of ST-LINK derivatives* (TN1235).

For information about the debugging and programming features of the STLINK-V3EC, refer to the user manual *STLINK-V3SET debugger/programmer for STM8 and STM32* (UM2448).

8.1 Description

There are three different ways to program and debug the onboard STM32 MCU.

- Using the embedded STLINK-V3EC programming and debugging tool on the STM32H573I-DK Discovery kit
- Using an external debug tool connected to the CN12 MIPI10 connector (SWD/JTAG)
- Using an external debug tool connected to the CN18 MIPI20 connector (SWD/JTAG/TRACE)

The STLINK-V3EC facility for debugging and flashing is integrated into the STM32H573I-DK.

Supported features in STLINK-V3EC:

- 5 V / 3.2 A power supply capability through the CN10 USB Type-C® connector
- USB 2.0 high-speed-compatible interface
- JTAG and serial wire debugging (SWD) with serial wire viewer (SWV)
- Virtual COM port (VCP)
- 1.7 V to 3.6 V application voltage
- An ST-LINK com LED, which blinks during communication with the PC
- An ST-LINK power LED, which gives information about STLINK-V3EC target power.
- USB-C® over voltage protection (U34) with current limitation.

Two tricolor LEDs (green, orange, and red) provide information about the STLINK-V3EC communication status (LD9) and STLINK-V3EC power status (LD8).

For detailed information about the management of these LEDs, refer to the technical note *Overview of ST-LINK derivatives* (TN1235).

8.2 Drivers

Installing drivers is not mandatory from Windows® 10 onwards, but it allocates an ST-specific name to the ST-LINK COM port in the system device manager.

For detailed information on the ST-LINK USB drivers, refer to the technical note *Overview of ST-LINK derivatives* (TN1235).

8.3 STLINK-V3EC firmware upgrade

The STLINK-V3EC embeds a firmware upgrade (`stsw-link007`) mechanism through the USB-C® port. As the firmware may evolve during the lifetime of the STLINK-V3EC product (for example to add new functionalities, fix bugs, and support new microcontroller families), it is recommended to keep the STLINK-V3EC firmware up to date before starting to use the STM32H573I-DK board. The latest version of this firmware is available from the *www.st.com* website.

For detailed information on the ST-LINK USB drivers, refer to the technical note *Overview of ST-LINK derivatives* (TN1235).

8.4 Using an external debug tool to program and debug the on-board STM32

Before connecting any external debug tool to the MIPI10 or MIPI20 debug connector, the SWD and VCP signals from STLINK-V3EC must be isolated. For this, set the jumper JP1. This disables the U26 level shifter and then isolates SWD and VCP signals from STLINK-V3EC (a high-impedance state exists between both ports of U26). Once JP1 is set, an external debug tool can be connected to CN12 MIPI10 debug connector or to CN18 MIPI20 debug/trace connector.

When using the external debug connectors (CN12 or CN18), the STLINK-V3EC can be used to supply the STM32H573I-DK board through CN10 USB Type-C® connector. Otherwise, another power supply source can be used as described on Section 9 Power supply.

Two level shifters are used on VCP and SWD interfaces to offer a debug capability when operating the target MCU at 1.8 V. The level shifters are used to allow compatibility between target MCU signals (1V8 or 3V3) and STLINK-V3EC signals (3V3).

The U26 level shifter is disabled with the JP1 jumper to isolate the output I/Os from STLINK-V3EC when an external debug tool is used. The configuration of the JP1 jumper is explained in Table 15. JP1 jumper settings.

Figure 7. Connecting an external debug tool to program the on-board STM32

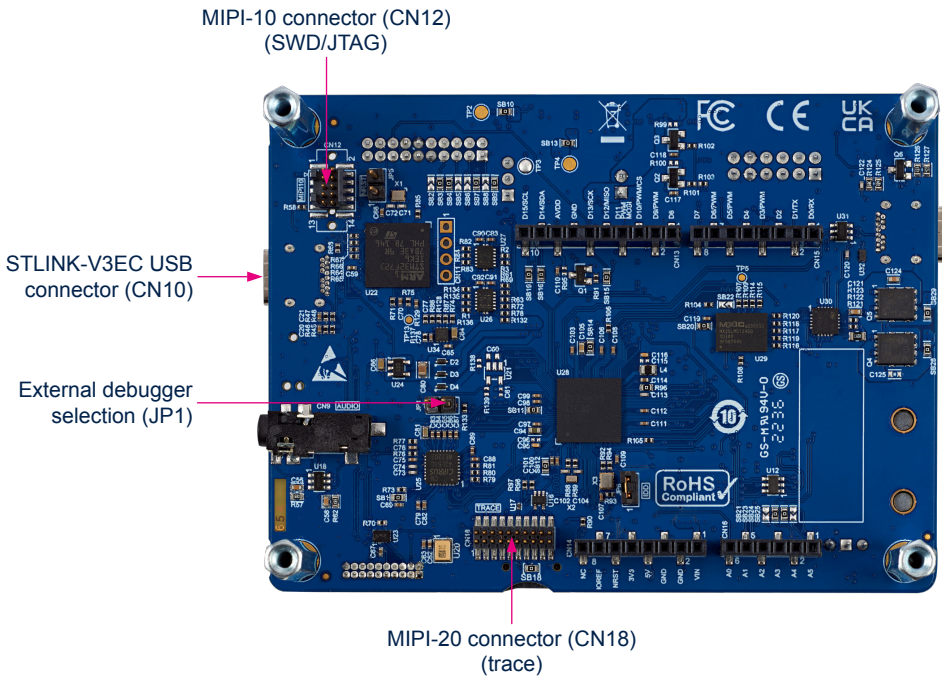


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Table 4 describes the STDC14 / MIPI10 connector pinout (CN12).

Table 4. STDC14 / MIPI10 debug connector pinout (CN12)

MIPI10 pin	STDC14 pin	CN12	Designation
-	1	NC	Reserved
-	2	NC	Reserved
1	3	T_VCC	Target VCC
2	4	T_SWDIO	Target SWDIO using SWD protocol or target JTMS (T_JTMS) using JTAG protocol
3	5	GND	Ground
4	6	T_SWCLK	Target SWCLK using SWD protocol or target JCLK (T_JCLK) using JTAG protocol
5	7	GND	Ground
6	8	T_SWO	Target SWO using SWD protocol or target JTDO (T_JTMS) using JTAG protocol
7	9	T_JRCLK	Not used by SWD protocol, Target JRCLK (T_JRCLK) using JTAG protocol, only for specific use
8	10	T_JTDI	Not used by SWD protocol, Target JTDI (T_JTDI) using JTAG protocol, only for external tools
9	11	GNDDetect	GND detect for plug indicator, used on SWD and JTAG neither
10	12	T_NRST	Target NRST using SWD protocol or target JTMS (T_JTMS) using JTAG protocol
-	13	T_VCP_RX	Target RX used for VCP (must be UART dedicated to Bootloader)
-	14	T_VCP_TX	Target TX used for VCP (must be UART dedicated to Bootloader)

Table 5 describes the MIPI20 connector pinout (CN18).

Table 5. MIPI20 debug connector pinout (CN18)

MIPI20 pin	CN18	Designation
1	VCC	Target VCC
2	SWDIO/JTMS	Target SWDIO using SWD protocol or target JTMS using JTAG protocol
3	GND	Ground
4	SWCLK/JCLK	Target SWCLK using SWD protocol or target JCLK using JTAG protocol
5	GND	Ground
6	JTDO/SWO	Target SWO using SWD protocol or target JTDO using JTAG protocol
7	KEY	Not connected
8	JTDI	Not used by SWD protocol, target JTDI (T_JTDI) using JTAG protocol, only for external tools
9	GND	Ground
10	NRST	Target NRST using SWD protocol or target JTMS (T_JTMS) using JTAG protocol
11	TgtPwr	5 V target power to the target MCU – To be disconnected
12	TRACECLK	Trace clock
13	TgtPwr	5V target power to the target MCU – To be disconnected
14	TRACED0	Trace Data0
15	GND	Ground
16	TRACED1	Trace Data1
17	GND	Ground
18	TRACED2	Trace Data2
19	GND	Ground
20	TRACED3	Trace Data3

9 Power supply

For powering the STM32H573I-DK kit, there are several options. With this, the user gets the flexibility to choose the power supply which suits the application most.

The JP4 jumper allows the user to select any of the following power sources:

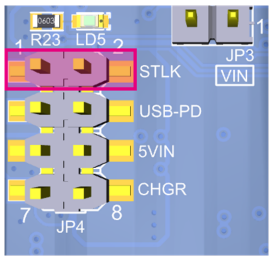
- STLK: 5 V from STLINK-V3EC USB Type-C® connector (CN10)
- USB-PD: 5 V from user USB Type-C® connector (CN17)
- 5VIN: 5 V to 12 V from ARDUINO® connector (pin 1 of CN14)
- CHGR: 5 V from STLINK-V3EC (CN10) without enumeration.

The green power LED (LD5) indicates the presence of 5 V supply voltage.

9.1 Supplying the board by the STLINK-V3EC USB Type-C® connector (default setting)

To power the STM32H573I-DK in this way, the USB Host (a PC) needs to be connected to the STLINK-V3EC USB Type-C® connector of the STM32H573I-DK via a USB cable. In this case, JP4 must be fitted on pin [1-2] to select the STLK power source. This is the default setting.

Figure 8. JP4 set on the STLK pin



If the USB enumeration succeeds, the STLK power is enabled, by asserting the T_PWR_EN signal (from STLINK-V3EC). This pin is connected to an over voltage protection (U34) with management of the max current delivery.

- If the host can provide the required power, the U34 power switch is enabled, the green power LED (LD5) is turned ON, and the STM32H573I-DK board and its shield can consume up to 3 A max.
- If the host is not able to provide the requested current, the enumeration fails. The U34 power switch remains OFF and the MCU part including the extension board is not powered. As a consequence, the green power LED (LD5) remains OFF. In this case, it is recommended to use another external power supply.

Table 6. External power source: 5V_STLK (5 V)

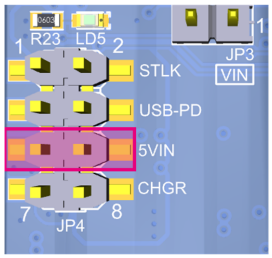
Input power name	Connector pins	Voltage range	Max. current
5V_STLK	CN10	5 V	3 A

9.2 Supplying the board by VIN (7-12 V, 800 mA max.)

The STM32H573I-DK can be supplied also through the pin 1 of the CN14 ARDUINO® Uno V3 connector (marked 'VIN' on the board).

In this case, the 5 V power source selector (JP4) must be fitted between pin 5 and pin 6 to select the VIN power source.

Figure 9. JP4 set on the VIN pin



When using STLINK-V3EC for debug when powering the board with an external power supply from VIN, it is important to power the board first, before connecting the host PC to CN10, which requires the following sequence to be respected:

1. Set the jumper between the pins 5-6 of JP4 “5VIN.”
2. Connect the external power source to pin 1 of CN14.
3. Check that the green LED LD5 is turned ON.
4. Connect the host PC to USB connector CN10.

Table 7. External power source: VIN (7-12 V)

Input power name	Connector pins	Voltage range	Max. current	Limitation
VIN	CN14 pin 1	7 to 12 V	800 mA	From 7 to 12 V only; and input capability is linked to input voltage: • 800 mA input current when VIN = 7 V • 450 mA input current when 7 V < VIN < 9 V • 250 mA input current when 9 < VIN < 12 V

9.3 Supplying the board by an external USB charger

The STM32H573I-DK can also be supplied by an external charger through the STLINK-V3EC USB Type-C® connector (CN10).

In this case, the 5 V power source selector (JP4) must be placed on pin 7-8 (“CHGR” on the silkscreen). In this power supply mode, the debug features are not available.

Figure 10. JP4 set on the CHGR pin

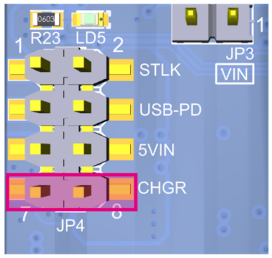


Table 8. External power source: VBUS_STLK (5 V)

Input power name	Connector	Voltage range	Max. current
VBUS_STLK	CN10	5 V	3 A

9.4 Supplying the board by the user USB Type-C® connector

The STM32H573I-DK can be supplied from the user USB Type-C® connector (CN17).
In this case, the 5 V power source selector (JP4) must be placed on pin 3-4 (“USB-PD” on the silkscreen).

Figure 11. JP4 set on the USB_PD pin

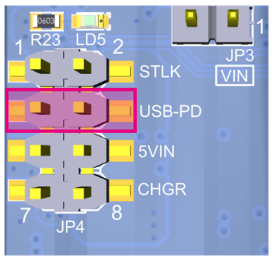


Table 9. External power source: 5V_USB_CHGR (5 V)

Input power name	Connector	Voltage range	Max. current
5V_UCPD	CN17	5 V	3 A

10 MCU power supply

The STM32H573I-DK board is assembled with STM32H573IIK3Q MCU (internal SMPS version). Consequently, the MCU V_{CORE} logic supply is provided by the internal DC/DC converter (SMPS).

The hardware implementation is detailed below:

Table 10. Internal SMPS configuration

SMPS ON	
C95, C113, C114, C116	ON
C96, C115	OFF
L4	ON

11 Measurement of MCU current consumption

The jumper JP6 allows the current consumption of the STM32H573IIK3Q MCU to be measured directly by removing the jumper and replacing it by an external ammeter. If there is no ammeter, the STM32H573IIK3Q MCU cannot be powered.

12 Clock source

Three clock sources are available on the STM32H573I-DK board, as described below:

- X3: 25 MHz oscillator for the STM32H573IIK3Q HSE system clock and for the Ethernet PHY
- X2: 32.768 kHz crystal for the STM32H573IIK3Q embedded RTC
- X1: 24 MHz crystal for the STLINK-V3EC

13 Reset sources

The general reset of the STM32H573I-DK board is active low. The reset sources include:

- The B2 reset button
- The embedded STLINK-V3EC
- The ARDUINO® Uno shield board through the CN14 ARDUINO® Uno V3 connector (pin 6).
- The STDC14 receiver (MIPI10)
- The TAG connector (CN1)
- The trace connector (MIPI20)

The general reset is connected to the following peripheral reset functions:

- STM32H573IIK3Q MCU reset
- Octo-SPI flash memory reset
- Ethernet PHY reset

14 Board functions

14.1 TFT LCD 240 × 240 pixels and capacitive touch panel

The STM32H573I-DK board includes a 1.54-inch TFT LCD with 240 × 240 pixel resolution (which is driven by the on-board display controller), white LED backlight, and capacitive touch panel. Each pixel can display 262 000 different colors.

No external RAM is needed. Display data are stored in the on-chip display data RAM of 240 × 320 × 18 bits. It performs display data RAM read/write operations with no external operation clock to minimize power consumption.

The TFT LCD is covered with a capacitive touch panel.

The LCD_BL_CTRL signal (PI3) allows the backlight to be switched ON/OFF through the LED backlight driver IC.

14.2 USB full speed

The STM32H573I-DK board supports USB full-speed communications via the user USB Type-C® connector CN17.

The USB Type-C® connector can also be used to power the STM32H573I-DK board with a 5 V DC supply voltage, at a current up to 3 A.

The on-board companion chip (U30) provides overvoltage protection on CC1 and CC2 pins against short-to-V_{BUS} and functionalities to comply with the *USB-C® Power Delivery Specifications*.

The LD7 USB V_{BUS} LED serves as an indicator for V_{BUS} voltage detection and is ON when V_{BUS} is present on the USB Type-C® connector (CN17).

14.2.1 Device and Host modes

When a USB Host connection to the CN17 USB Type-C® connector of the STM32H573I-DK Discovery kit is detected, the board starts behaving as a USB Device. Depending on the powering capability of the USB Host, the board can take power from the V_{BUS} terminal of CN17. In the board schematic, the corresponding power voltage line is called 5V_UCPD.

Note:
1. *In Sink mode, the 5 V power source selector (JP4) must be set on the 'USB-PD: position [3-4].*
2. *In Source mode, the 5 V power source selector (JP4) must be set on 'STLK: position [1-2].*

14.2.2 Configuration channel I/Os

The UCPD_CCx signals are connected to the associated CCx line of the USB Type-C® connector through the on-board USB port protection. These lines are used for the configuration channel lines (CCx) to select the USB Type-C® current mode.

14.2.3 V_{BUS} fault detection

The UCPD_FLT signal is provided by the ST USB Type-C® port protection. It is used as fault reporting to the STM32H573II MCU after a bad V_{BUS} level detection. By design, the STM32H573I-DK V_{BUS} protection is set to 6 V maximum with the RSENSE. The USB port protection is driven by an I^2C bus. The base I^2C-bus address is 0b 0110 100x.

The hardware configuration for the USB FS interface is shown in Table 11.

Table 11. USB Type-C® FS power delivery configuration

I/Os	Configuration
PG0	EN (UCPD_PWR)
PF13	IANA (IBUS_SENSE)
PB13	CC1 (UCPD_CC1)
PB14	CC2 (UCPD_CC2)
PG1	FLGn (UCPD_FLT)

I/Os	Configuration
PF14	VBUS_SENSE
PB8	SCL (I2C4_SCL)
PB9	SDA (I2C4_SDA)

14.3 Ethernet

The STM32H573I-DK board supports 10/100-Mbit operating rates for Ethernet communication. The Ethernet subsystem is provided by the on-board Ethernet transceiver (U11) and the RJ45 (CN8) with integrated Magnetic.

The 25 MHz clock of the Ethernet PHY is sourced from the X3 oscillator, while the PHY RMII_REF_CLK provides the 50 MHz clock to the STM32H573IIK3Q RMII reference clock pin.

Note: The Ethernet can operate at 1.8 V or 3.3 V.

14.4 microSD™ card

A slot for a microSD™ card (CN4), SD 2.0 compliant, is available on the STM32H573I-DK board and is connected to the SDOI1 interface of the STM32H573IIK3Q.

The microSD™ card detection is managed by the uSD_Detect signal.

When a microSD™ card is inserted in the slot, the uSD_Detect signal level is 0, otherwise it is 1.

Note: The microSD™ operates at 3.3 V only. (JP2 must be ON [1-2]).

14.5 Audio

The audio codec used on the STM32H573I-DK is a low-power stereo codec with a headphone amplifier, which is connected to the STM32H573IIK3Q SAI2 interface. It communicates with the STM32H573IIK3Q microcontroller via an I^2C-bus shared with the touch panel of the LCD and the USB-C® protection. The I^2C-bus address of the audio codec is 0x94.

Several audio connections are available on the STM32H573I-DK board:

- Analog audio output lines of the audio codec are used to drive a headphone connected to the audio jack connector (CN9) since the analog input of the codec is used as microphone input when a microphone is connected to the audio jack connector (CN9)
- For microphone-based applications, a MEMS microphone daughterboard can be plugged into the audio connector CN2. The daughterboard interfaces with the STM32H573IIK3Q via the SAI1 peripheral using a PDM interface.

14.5.1 Digital MEMS microphone

The STM32H573I-DK Discovery kit also provides one digital MEMS microphone (U20) which is connected to the MCU's SAI1 interface. The I/O interface is described in Table 12.

Table 12. Digital MEMS microphones I/O interface

Microphone pin		STM32H573IIK3Q I/O
U20	CLK	PD11 (PDM_SAI1_CK1)
	DOUT	PD6 (PDM_SAI1_SD1)

The selection between the on-board digital MEMS microphone and the external digital MEMS microphone daughterboard plugged into the audio connector (CN2) is made by the U23 SPDT switch. The DETECn signal (PE0) controls the switch. Table 13 shows the selection between the on-board digital MEMS microphone and the external digital MEMS microphone daughterboard.

Table 13. **Digital MEMS microphones selection**

DETECn	MEMS microphone daughterboard	Digital MEMS microphone (U20)
HIGH	ON	OFF
LOW	OFF	ON

Note: The audio codec and digital MEMS microphones operate at 1.8 V and 3.3 V.

14.6 Octo-SPI NOR flash memory

The STM32H573I-DK board includes a 512-Mbit Octo-SPI NOR flash memory device, which is connected to the OCTOSPI1 interface of the STM32H573IIK3Q microcontroller. The Octo-SPI NOR flash memory device operates in single transfer rate (STR) or double transfer rate (DTR) mode.

The RESETn of the flash memory is connected to the general reset (NRST) of the STM32H573I-DK board.

Note: The Octo-SPI flash memory operates at 3.3 V only (JP2 must be fitted on [1-2]).

14.7 Virtual COM port

The serial interface USART1 (PA9/PA10) that supports the bootloader is directly available as the Virtual COM port of a PC connected to the STLINK-V3EC USB Type-C® connector (CN10). The VCP configuration is the following:

- 115200 b/s
- 8-bit data
- No parity
- 1 stop bit
- No flow control

14.8 RF module

The STM32H573I-DK Discovery kit includes one MB1400 Wi-Fi® module, which is based upon a 802.11 b/g/n-compliant chipset.

Figure 12. **MB1400 Wi-Fi® module**

The MB1400 Wi-Fi® module is addressable over UART or SPI interface. By default, the MB1400 uses the SPI interface (SPI5) to communicate with the STM32H573IIK3Q MCU.

The MB1400 Wi-Fi® module does not require any operating system. It contains a complete and integrated TCP/IP protocol stack that only requires AT commands to establish Wi-Fi® network access and to enable the STM32H573I-DK with Wi-Fi® communication.

Note:

1. *As the MB1400 Wi-Fi® module firmware might evolve during the lifetime of the Wi-Fi® module product, users must make sure the MB1400 Wi-Fi® module firmware is up to date before starting to use the MB1400 Wi-Fi® module.*
   Refer to the X-WIFI-EMW3080B product webpage to find the update procedure and the latest version of the MB1400 Wi-Fi® module firmware.
2. *The MB1400 Wi-Fi® module works only at 3.3 V with the help of the onboard 3.3-V regulator IC. Consequently, when using the MB1400, the user must ensure that JP2 is fitted on [1-2] on the STM32H573I-DK.*

Main features of the MB1400 Wi-Fi® module:

- Support for 802.11 b/g/n
- Integration of ARM-CM4F, WLAN MAC / Baseband / RF
- 256-Kbyte RAM / 2-Mbyte flash memory
- Maximum transmission rate up to 72.2 Mb/s with 20 MHz of bandwidth
- Support for WPA / WPA2 PSK / TKIP
- Support for WPA / WPA2 Enterprise
- One SPI interface, one SWD, GPIOs
- Lead-free design, compliant with RoHS requirements
- EMI / EMC metal shield for best RF performance in noisy environments and to accommodate for lower RF emissions/signature for easier FCC compliance
- FCC / ISED / CE compliance certification

Table 14. Wi-Fi® module I/O configuration

STM32H573IIK3Q I/O	Chipset pin
PH8 (STMO#8-MOSIs)	CHIP_EN
PF8 (SPI5_MISO)	MISO
PF9 (SPI5_MOSI)	MOSI
PF7 (SPI5_SCK)	CK
PF6 (SPI5_NSS)	CS

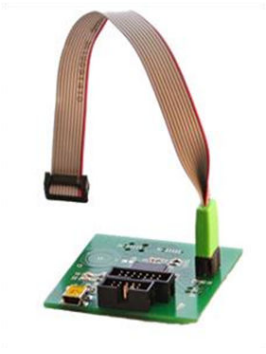
Note: The MB1400 Wi-Fi® module operates at 3.3 V only.

14.9 TAG

The STM32H573I-DK board includes one Tag-Connect™ footprint, to connect debuggers/programmers in a simple way with a 10-conductor cable and without any extra accessory or equipment.

The 10-conductor cable can be plugged directly into the TAG connector footprint on the STM32H573I-DK Discovery kit.

Figure 13. 10-connector cable



Note: The TAG supports 1.8 V or 3.3 V for target reference voltage.

14.10 JTAG/SWD/TRACE

The STM32H573I-DK Discovery kit offers different ways to connect an external debugging/programming probe.

Depending on the debugger tool and used cable, the STM32H573I-DK offers 10-pin or 20-pin target board connector solutions.

14.10.1 MIPI10 connector (CN12)

The STM32H573I-DK board includes a MIPI10 connector (CN12) for SWD/JTAG debugging/programming capabilities.

Note: The MIPI10 connector supports 1.8 V or 3.3 V for target reference voltage.

14.10.2 MIPI20 connector (CN18)

The STM32H573I-DK board also includes a MIPI20 connector (CN18) for debug features (SWD or JTAG) as well as ETM instruction trace.

Important: Always make sure to set the JP1 jumper before connecting any debugging probe to CN18 or CN12. Indeed, before connecting an external debugger to CN18 or CN12, it is mandatory to isolate the output I/Os (SWD and UART_VCP) from STLINK-V3EC.

Table 15 explains the JP1 jumper settings.

Table 15. JP1 jumper settings

Jumper	Definition	Settings	Comment
JP1	Debugger selection	ON [1-2]	An external debugger on MIPI20/MIPI10 connector (CN18/ CN12) can be used. The level shifter (U26) is in High Impedance (HZ). The STLINK-V3EC no longer drives the embedded STM32.
		OFF	The embedded STLINK-V3EC is selected (default configuration).

Note: The MIPI20 trace connector supports 1.8 V or 3.3 V for target reference voltage.

14.11 Buttons and LEDs

The black button B2 connected to NRST is the reset button and is used to reset the STM32H573IIK3Q microcontroller.

When the button B2 is pressed, the logic state is LOW, otherwise the logic state is HIGH.

The blue button B1 connected to PC13 is the user button.

When the button B1 is pressed, the logic state is HIGH, otherwise the logic state is LOW.

Four LEDs LD1-LD4 with colors green, orange, red, and blue respectively (refer to Figure 4), are available for the user. To light a LED, a low-logic state “1” should be written in the corresponding GPIO register. Table 16 shows the assignment of the control ports to the LED indicators.

Table 16. Buttons and LED control port

Reference	Color	Name	Comment
B2	Black	RESET	Reset function
B1	Blue	USER	Wake-up alternate function
LD1	Green	USER_LED1	PI9
LD2	Orange	USER_LED2	PI8
LD3	Red	USER_LED3	PF1
LD4	Blue	USER_LED4	PF4
LD5	Green	5V POWER	5 V power supply available
LD6	Green	ARDUINO	PI1
LD7	Green	5V_USB_LED	V_{BUS} available on USB Type-C® user connector

Reference	Color	Name	Comment
LD8	Tri-color (red/orange/green)	STLK PWR	-
LD9	Tri-color (red/orange/green)	STLK COM	-

15 Board connectors

15.1 USB Type-C® connector (CN17)

Figure 14. **USB Type-C® connector CN17**

The related pinout for the user USB Type-C® connector is listed in Table 17.

Table 17. **USB Type-C® connector CN17 pinout**

Connector	Pin number	Pin name	Signal name	STM32H5 pin	Function
CN17	A1	GND	GND	-	Ground
	A4	VBUS	VBUSc	-	Power
	A5	CC1	-	PB13	USB-PD controller side for the CC1 pin
	A6	USB_P	-	PA12	USB differential pair P
	A7	USB_N	-	PA11	USB differential pair M
	A8	SBU1	-	-	-
	A9	VBUS	VBUSc		Power
	A12	GND	GND	-	Ground
	B1	GND	GND	-	Ground
	B4	VBUS	VBUSc	-	Power
	B5	CC2	-	PB14	USB-PD controller side for the CC2 pin
	B6	USB_P	-	PA12	USB differential pair P
	B7	USB_N	-	PA11	USB differential pair M
	B9	VBUS	VBUSc	-	Power
	B12	GND	GND	-	Ground

15.2 microSD™ connector (CN5)

microSD™ cards with 4 Gbytes or more capacity can be inserted in the connector CN5. Four data bits of the SDIO1 interface, CLK, and CMD signals of the STM32H573IIK3Q are used to communicate with the microSD™ card at 3.3 V only. The µSD_Detect signal detects the card insertion: when a microSD™ card is inserted, the µSD_Detect level is 0, otherwise it is 1.

Figure 15. microSD™ connector CN5

The related pinout for the microSD™ connector is listed in Table 18.

Table 18. microSD™ connector CN5 pinout

Pin number	Description	MCU port	Pin number	Description	MCU
1	SDIO1_D2	PC10	6	GND	-
2	SDIO1_D3	PC11	7	SDIO1_D0	PC8
3	SDIO1_CMD	PD2	8	SDIO1_D1	PC9
4	VDD (3V3)	-	9	µSD_Detect	PH14
5	SDIO1_CK	PC12	11-12-13-14	GND (casing)	-

15.3 STMod+ connector (CN3)

A standard 20-pin STMod+ connector is available on the STM32H573I-DK board. The STMod+ connector increases compatibility with external boards and modules from the ecosystem of microcontrollers. The STMod+ connector extends UART, SPI, I/Os signals for different peripheral expansion like Wi-Fi® modules, cellular modems, and such.

Solder bridges are here to configure the UART7 or SPI5 serial interface of the STM32H573IIK3Q MCU depending on the external board to be controlled.

Table 19. STMod+ solder bridge configuration

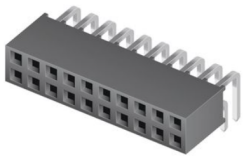
Solder bridge	Settings	Description
SB2, SB5, SB6, SB8 SB3, SB4, SB7, SB9	ON OFF	UART7 connected to STMod+ SPI5 disconnected from STMod+
SB2, SB5, SB6, SB8 SB3, SB4, SB7, SB9	**OFF** **ON**	**Default configuration** UART7 disconnected from STMod+ SPI5 connected to STMod+

By default, the SPI5 bus is connected to control the MB1400 Wi-Fi® module.

An MB1280 fan-out daughterboard is also provided with the STM32H573I-DK Discovery kit. For more information on the MB1280 fan-out daughterboard, refer to the STMod+ fan-out daughterboard's user manual (UM2695) and to the relevant datasheets of the associated modules.

For details about the STMod+ interface, refer to the STMod+ interface specification (TN1238).

Figure 16. STMod+ connector CN3



The related pinout for the STMod+ connector is listed in Table 20.

Table 20. STMod+ connector CN3 pinout

Pin number	Description	Pin number	Description
1	SPI5_NSS / USART7_CTS (PF6/PF9)	11	INT (PH9)
2	SPI5_MOSI / USART7_TX (PF9/PF7)	12	RESET (PH6)
3	SPI5_MISO / USART7_RX (PF8/PF6)	13	ADC (PF11)
4	SPI5_SCK / USART7_RTS (PF7/PF8)	14	PWM (PH12)
5	GND	15	+5V
6	+5V	16	GND
7	I2C1_SCL (PB6)	17	IO (PF3)
8	SPI5_MOSIs (PH8)	18	IO (PB12)
9	SPI5_MISOs (PH7)	19	IO (PH4)
10	I2C1_SDA (PB7)	20	IO (PH5)

Limitation: on the STM32H573I-DK board, SPI5 and UART7 signals are used to control a device connected to STMod+ or to Pmod™. Therefore, when using the STMod+ connector, the user must make sure that nothing is plugged into the Pmod™ connector.

15.4 Pmod™ connector (CN6)

The standard 12-pin Pmod™ connector is available on the STM32H573I-DK Discovery kit to support low frequency, low I/O pin count peripheral modules.

The Pmod™ interface that has been implemented on STM32H573I-DK Discovery kit is compatible with the Pmod™ type 2A and 4A I/O signal assignment convention.

Figure 17. Pmod™ connector CN6

The related pinout for the Pmod™ connector is listed in Table 21.

Table 21. **Pmod™ connector CN6 pinout**

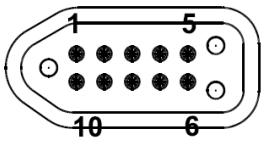
Pin number	Description	Pin number	Description
1	SPI5_NSS / USART7_CTS (PF6/PF9)	7	INT (PH9)
2	SPI5_MOSI / USART7_TX (PF9/PF7)	8	RESET (PH6)
3	SPI5_MISO / USART7_RX (PF8/PF6)	9	Not connected
4	SPI5_SCK / USART7_RTS (PF7/PF8)	10	Not connected
5	GND	11	GND
6	3V3	12	3V3

Limitation: On the STM32H573I-DK board, SPI5 and UART7 signals are used to control a device connected to STMod+ or to Pmod™. Therefore, when using the Pmod™ connector, the user must make sure that nothing is connected on the STMod+ connector.

15.5 TAG connector (CN1)

The TAG connector footprint CN1 is used to connect the STM32H573IIK3Q microcontroller for programming or debugging the board.

Figure 18. **TAG connector CN1**



The related pinout for the TAG connector is listed in Table 22.

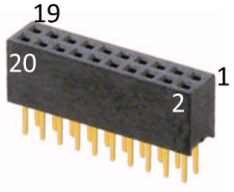
Table 22. **TAG connector CN1 pinout**

Pin number	Description	Pin number	Description
1	VDD (3V3)	10	NRST
2	SWDIO / JTMS (PA13)	9	NJTRST (PB4)
3	GND	8	JTDI (PA15)
4	SWCLK / JTCK (PA14)	7	NC
5	GND	6	TRACESWO / JTDO (PB3)

15.6 Audio connector (CN2)

The 2 × 10-male-pin 1.27 mm-pitch audio connector is used for audio MEMS daughterboard expansion using the PDM interface.

Figure 19. **Audio connector CN2**



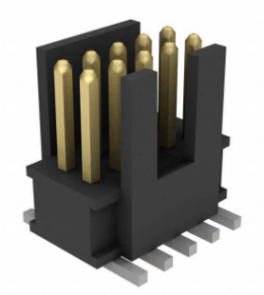
The related pinout for the audio connector is listed in Table 23.

Table 23. **Audio connector CN2 pinout**

Pin number	Description	Pin number	Description
1	GND	2	3V3
3	Not connected	4	PDM_SAI1_CK1_EXT (PD11)
5	PDM_SAI1_SD2 (PE4)	6	PDM_SAI1_SD1_EXT (PD6)
7	PDM_SAI1_SD3 (PC3)	8	Not connected
9	Not connected	10	DETECTn (PE0)
11	Not connected	12	MEMS_LED (PE1)
13	Not connected	14	Not connected
15	Not connected	16	Not connected
17	Not connected	18	Not connected
19	3V3	20	GND

15.7 MIPI10 connector (CN12)

Figure 20. **MIPI10 connector CN12**



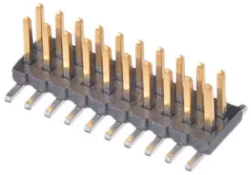
The related pinout for the MIPI10 connector is listed in Table 24.

Table 24. **MIPI10 connector CN12 pinout**

Pin number	Description	Pin number	Description
1	Not connected	2	Not connected
3	VDD (3V3)	4	SWDIO/JTMS (PA13)
5	GND	6	SWCLK/JTCK (PA14)
7	GND	8	SWO/JTDO (PB3)
9	Not connected	10	JTDI (PA15)
11	GND	12	RESETn (NRST)
13	Not connected	14	Not connected

15.8 MIPI20 connector (CN18)

Figure 21. **MIPI20 connector CN18**



The related pinout for the MIPI20 connector is listed in Table 25.

Table 25. **MIPI20 connector CN18 pinout**

MIPI20 pin	CN18	Designation
1	VCC	Target VCC
2	SWDIO/JTMS	Target SWDIO using SWD protocol or target JTMS using JTAG protocol
3	GND	Ground
4	SWCLK/JCLK	Target SWCLK using SWD protocol or target JCLK using JTAG protocol
5	GND	Ground
6	JTDO/SWO	Target SWO using SWD protocol or target JTDO using JTAG protocol
7	KEY	Not connected
8	JTDI	Not used by SWD protocol, target JTDI (T_JTDI) using JTAG protocol, only for external tools
9	GND	Ground
10	NRST	Target NRST using SWD protocol or target JTMS (T_JTMS) using JTAG protocol
11	TgtPwr	5 V target power to the target MCU (to be disconnected)
12	TRACECLK	Trace clock
13	TgtPwr	5 V target power to the target MCU (to be disconnected)
14	TRACED0	Trace Data0
15	GND	Ground
16	TRACED1	Trace Data1
17	GND	Ground
18	TRACED2	Trace Data2
19	GND	Ground
20	TRACED3	Trace Data3

15.9 TFT LCD display connector (CN7)

To connect the 1.54-inch TFT LCD display, the STM32H573I-DK board includes a 0.3 mm pitch FPC connector (CN7).

Figure 22. **TFT LCD display connector CN7**

The related pinout for the TFT LCD display connector is listed in Table 26.

Table 26. TFT LCD display connector pinout

Connector	Pin number	Pin name	Signal name	STM32 pin	Function
CN7	1	GND	-	-	Ground
	2	FMARK	LCD_TE	PD3	Tearing effect
	3	DB15	LCD_D15	PD10	FMC_D15
	4	DB14	LCD_D14	PD9	FMC_D14
	5	DB13	LCD_13	PD8	FMC_D13
	6	DB12	LCD_D12	PE15	FMC_D12
	7	DB11	LCD_D11	PE14	FMC_D11
	8	DB10	LCD_D10	PE13	FMC_D10
	9	DB9	LCD_D9	PE12	FMC_D9
	10	DB8	LCD_D8	PE11	FMC_D8
	11	DB7	LCD_D7	PE10	FMC_D7
	12	DB6	LCD_D6	PE9	FMC_D6
	13	DB5	LCD_D5	PE8	FMC_D5
	14	DB4	LCD_D4	PE7	FMC_D4
	15	DB3	LCD_D3	PD1	FMC_D3
	16	DB2	LCD_D2	PD0	FMC_D2
	17	DB1	LCD_D1	PD15	FMC_D1
	18	DB0	LCD_D0	PD14	FMC_D0
	19	/RD	LCD_NOE	PD4	FMC_NOE
	20	/WR	LCD_NWE	PD5	FMC_NWE
	21	RS	LCD_A0_RS	PF0	FMC_RS
	22	/CS	LCD_NE1_CS	PC7	FMC_NE
	23	RESET	LCD_RST	PH13	RESET
	24	IM	-	-	8/16 bit mode selection
	25	IOVCC	3V3	-	Power
	26	VCI	3V3	-	Power
	27	GND	GND	-	Ground
	28	LEDA	LED_A	-	LED anode
	29	LEDK	LED_K	-	LED cathode

Table 27 shows the LCD connection for the backlight management.

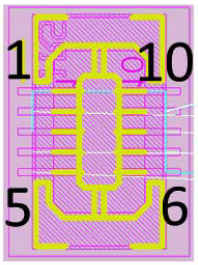
Table 27. LCD backlight management

Pin number	Pin name	Signal name	STM32 pin	Function
1	EN	LCD_BL_CTRL	PI3	Backlight enable

15.10 Touch panel connector (CN4)

The touch panel connector CN4 is designed to connect the touch panel.

Figure 23. **Touch panel connector CN4**



The related pinout for the touch panel connector is listed in Table 28.

Table 28. **Touch panel connector pinout**

Connector	Pin number	Pin name	Signal name	STM32 pin	Function
CN4	1	GND	-	-	Ground
	2	INT	LCD_CTP_INT	PG7	Interrupt
	3	GND	-	-	Ground
	4	SDA	I2C4_SDA	PB9	I2CFMP1_SDA
	5	SCL	I2C4_SCL	PB8	I2CFMP1_SCL
	6	GND	-	-	Ground
	7	RESET	LCD_CTP_RST	PG3	Reset
	8	GND	-	-	Ground
	9	VDD	3V3	-	Power
	10	GND	-	-	Ground

15.11 Ethernet RJ45 connector (CN8)

The STM32H573I-DK board supports 10 Mbit/s / 100 Mbit/s Ethernet communication with its PHY and the CN8 integrated Ethernet RJ45 connector. The Ethernet PHY is connected to the MCU via the RMII interface.

The 25 MHz clock for the PHY is sourced from the on-board 25 MHz oscillator X3.

The 50 MHz clock for the MCU (derived from the 25 MHz crystal oscillator) is provided by the RMII_REF_CLK of the PHY.

The yellow LED and the green LED are located inside the Ethernet RJ45 connector.

Figure 24. **Ethernet RJ45 connector CN8**

The related pinout for the Ethernet RJ45 connector is listed in Table 29.

Table 29. **Ethernet RJ45 connector pinout**

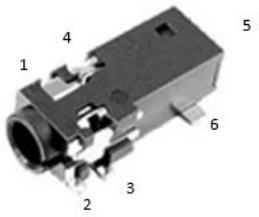
Connector	Pin number	Description	Pin number	Description
CN8	1	Yellow LED (A)	8	RD-
	2	Yellow LED (K)	9	NC
	3	TD+	10	CHS_GND(GND)

Connector	Pin number	Description	Pin number	Description
CN8	4	TD-	11	Green LED (K)
	5	TCT	12	Green LED (A)
	6	RCT	13	SHIELD_1 (GND)
	7	RD+	14	SHIELD_2 (GND)

15.12 Audio jack connector (CN9)

A 3.5 mm standard stereo audio green jack output called CN9 is available on the STM32H573I-DK board for headphones.

Figure 25. Audio jack connector CN9



The related pinout for the audio jack connector is listed in Table 30.

Table 30. Audio jack connector pinout

Pin number	Signal name	Audio codec pin	Function
1	Not connected	Not available	Not available
2	MIC_IN	MICIN1/AIN3A	Microphone input
3	GND	-	Ground
4	OUT_Right	AOUTB	HP right
5	Not connected	Not available	Not available
6	OUT_Left	OUTA	HP left

15.13 ARDUINO® Uno V3 connectors (CN13, CN14, CN15, CN16)

The ARDUINO® Uno V3 connectors CN13, CN14, CN15, and CN16 are female connectors. They are compatible with the ARDUINO® Uno V3 standard. Most shields designed for ARDUINO® Uno V3 fit to the STM32H573I-DK board.

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

Table 31 shows the references of the ARDUINO® Uno V3 connectors.

Before using any ARDUINO® Uno V3 shield, it is important to refer to Section 9.1 Supplying the board by the STLINK-V3EC USB Type-C® connector (default setting) for a correct configuration of JP4.

Table 31. ARDUINO® Uno V3 compatible connectors

Left connectors				
Connector	**Pin number**	**Pin name**	**MCU pin**	**Function**
CN14 Power	1	-	-	5V_IN test
	2	IOREF	-	3V3 ref
	3	NRST	NRST	Reset
	4	3V3	-	3.3 V output (1)
	5	5V	-	5 V input/output
	6	GND	-	Ground
	7	GND	-	Ground
	8	VIN	-	Power input (2)
CN16 Analog	1	A0	PB0	ADC1_INP9
	2	A1	PA4	ADC12_INP18
	3	A2	PA0	ADC12_INP0
	4	A3	PA5	ADC1_INP19
	5	A4	PA6 or PB7 (3)	ADC12_INP3 or I2C1_SDA (3)
	6	A5	PF12 or PB6 (3)	ADC1_INP6 or I2C1_SCL (3)

Right connectors				
Function	**MCU pin**	**Pin name**	**Pin number**	**Connector**
I2C1_SCL	PB6	D15	10	CN13 Digital
I2C1_SDA	PB7	D14	9	
AVDD	-	AVDD	8	
Ground	-	GND	7	
SPI2_SCK	PI1	D13	6	
SPI2_MISO	PI2	D12	5	
TIM12_CH2, SPI5_MOSI	PB15	D11	4	
TIM2_CH4, SPI5_NSS	PA3	D10	3	
TIM1_CH1	PA8	D9	2	
IO	PG8	D8	1	
IO	PG5	D7	8	CN15 Digital
TIM5_CH1	PH10	D6	7	
TIM5_CH2	PH11	D5	6	
IO	PG4	D4	5	
TIM3_CH2	PB5	D3	4	
IO	PG15	D2	3	
UART3_TX	PB10	D1	2	
UART3_RX	PB11	D0	1	

1. *The 3V3 on the pin 4 of the CN14 ARDUINO® Uno V3 connector is not a power input for the STM32H573I-DK board. This simplifies the power architecture.*
2. *The external voltage applied to pin VIN on pin 1 of CN14 must be less than 11.5 V at 25°C ambient temperature. If a higher voltage is applied on the regulator U8, it may overheat and could be damaged.*
3. *By default, the pin 1 and the pin 2 of the CN16 ARDUINO® Uno V3 connector are connected to ADC MCU input ports PF12 and PA6 respectively, by configuring the solder bridges: SB23 and SB24 ON, SB21 and SB25 OFF. In case it is necessary to connect the I^2C interface signals on pin 1 and pin 2 of CN16, instead of ADC inputs, SB23 and SB24 need to be OFF, and SB21 and SB25 need to be ON.*

16 STM32H573I-DK I/O assignment

Table 32. **STM32H573I-DK I/O assignment**

Pin number	GPIO port	Signal or label	Comment
P2	PA0	ARD_A2	ADC12_INP0
L3	PA1	RMII_REF_CLK	-
M3	PA2	RMII_MDIO	-
N5	PA3	ARD_D10	TIM2_CH4, SPI2_NSS
M5	PA4	ARD_A1	ADC12_INP18
R3	PA5	ARD_A3	ACD1_INP19
P5	PA6	ARD_A4	ACD12_INP3
R4	PA7	RMII_CRS_DV	-
F15	PA8	ARD_D9	TIM1_CH1
E15	PA9	USART1_TX	-
E14	PA10	USART1_RX	-
D15	PA11	USB_FS_N	-
C15	PA12	USB_FS_P	-
E13	PA13	JTMS	-
B13	PA14	JTCK	-
C13	PA15	JTDI	-
R5	PB0	ARD_A0	ADC1_INP9
N6	PB1	OSCSPI1_IO0	-
P6	PB2	OCSPI1_DQS	-
B7	PB3	JTDO/TRACESWO	-
B6	PB4	NJTRST	-
C6	PB5	ARD_D3	TIM3_CH2
C7	PB6	I2C1_SCL	-
A6	PB7	I2C1_SDA	-
B5	PB8	I2C4_SCL	-
A4	PB9	I2C4_SDA	-
M10	PB10	ARD_D1	USART3_TX
N12	PB11	ARD_D0	USART3_RX
L12	PB12	STMOD#18	IO
R15	PB13	UCPD_CC1	-
N15	PB14	UCPD_CC2	-
M14	PB15	ARD_D11	SPI2_MOSI, TIM12_CH2
L1	PC0	OCSPI1_IO7	-
L2	PC1	RMII_MDC	-
K4	PC2	OCSPI1_IO2	-
N3	PC3	PDM_SAI1_SD3	-
N4	PC4	RMII_RXD0	-
P4	PC5	RMII_RXD1	-

Pin number	GPIO port	Signal or label	Comment
G14	PC6	LCD_PWR_ON	-
G13	PC7	LCD_NE1_CS	-
F14	PC8	SDIO1_D0	-
F13	PC9	SDIO1_D1	-
D12	PC10	SDIO1_D2	-
C12	PC11	SDIO1_D3	-
C11	PC12	SDIO1_CK	-
E3	PC13	WAKEUP	-
D2	PC14-OSC32_IN	OSC32_IN	-
D1	PC15-OSC32_OUT	OSC32_OUT	-
B12	PD0	LCD_D2	-
A13	PD1	LCD_D3	-
C10	PD2	SDIO1_CMD	-
A12	PD3	LCD_TE	-
B11	PD4	LCD_NOE	-
A11	PD5	LCD_NWE	-
B10	PD6	PDM_SAI1_SD1	-
A10	PD7	NC	-
M15	PD8	LCD_D13	-
L13	PD9	LCD_D14	-
K12	PD10	LCD_D15	-
L14	PD11	PDM_SAI1_CK1	-
K14	PD12	OCSPI1_IO1	-
L15	PD13	OCSPI1_IO3	-
K13	PD14	LCD_D0	-
J13	PD15	LCD_D1	-
C5	PE0	DETECTn	-
B4	PE1	MEMS_LED	-
D4	PE2	TRACECLK	-
B2	PE3	TRACED0	-
C3	PE4	PDM_SAI1_SD2	-
D3	PE5	TRACED2	-
C2	PE6	TRACED3	-
R9	PE7	LCD_D4	-
P9	PE8	LCD_D5	-
N9	PE9	LCD_D6	-
R10	PE10	LCD_D7	-
P10	PE11	LCD_D8	-
R11	PE12	LCD_D9	-
P11	PE13	LCD_D10	-
N10	PE14	LCD_D11	-

Pin number	GPIO port	Signal or label	Comment
N11	PE15	LCD_D12	-
F2	PF0	LCD_A0_RS	-
F1	PF1	USER_LED3	-
G3	PF2	NC	-
G2	PF3	STMOD#17	IO
G1	PF4	USER_LED4	-
H3	PF5	NC	-
H1	PF6	STMOD#1	SPI5_NSS / USART7_RX
K2	PF7	STMOD#3	SPI5_SCK / UART7_TX
H2	PF8	STMOD#4	SPI5_MISO / UART7_RTS
J3	PF9	STMOD#2	SPI5_MOSI / UART7_CTS
J4	PF10	OCSPI1_CLK	-
R6	PF11	STMOD#13-ADC	ADC1_INP2
N7	PF12	ARD_A5	ADC1_INP6
P7	PF13	IBUS_SENSE	-
R7	PF14	VBUS_SENSE	-
N8	PF15	NC	-
R8	PG0	UCPD_PWR	-
P8	PG1	UCPD_FLT	-
K15	PG2	NC	-
H14	PG3	LCD_CTP_RST	-
J15	PG4	ARD_D4	IO
H15	PG5	ARD_D7	IO
J14	PG6	OCSPI1_NCS	-
H13	PG7	LCD_CTP_INT	-
G15	PG8	ARD_D8	IO
B9	PG9	OCSPI1_IO6	-
A9	PG10	SAI2_SD_B	-
C9	PG11	RMII_TX_EN	-
B8	PG12	RMII_TXD1	-
C8	PG13	RMII_TXD0	-
A8	PG14	TRACED1	-
A7	PG15	ARD_D2	IO
J1	PH0	OSC_25M	-
J2	PH1	NC	-
R2	PH2	OCSPI1_IO4	-
P3	PH3	OCSPI1_IO5	-
R1	PH4	STMOD#19	IO
P1	PH5	STMOD#20	IO
P13	PH6	STMOD#12-RST	-
P14	PH7	STMOD#9-MISOs	SPI5_MISO

Pin number	GPIO port	Signal or label	Comment
N13	PH8	STMOD#8-MOSIs	SPI5_MOSI
M12	PH9	STMOD#11-INT	-
N14	PH10	ARD_D6	TIM5_CH1
P15	PH11	ARD_D5	TIM5_CH2
M13	PH12	STMOD#14-PWM	TIM5_CH3
B15	PH13	LCD_RST	-
D13	PH14	uSD_DETECT	-
C14	PH15	NC	-
K3	NRST	NRST	-
A5	BOOT0	BOOT0	-
A15	PI1	ARD_D13	SPI2_SCK
B14	PI2	ARD_D12	SPI2_MISO
A14	PI3	LCD_BL_CTRL	-
B3	PI4	SAI2_MCLK_A	-
A2	PI5	SAI2_SCK_A	-
C4	PI6	SAI2_SD_A	-
A1	PI7	SAI2_FS_A	-
E2	PI8	USER_LED2	-
E1	PI9	USER_LED1	-
F4	PI10	RMII_RX_ER	-
F3	PI11	AUDIO_NRST	-

17 STM32H573I-DK product information

17.1 Product marking

The stickers located on the top or bottom side of all PCBs provide product information:

- First sticker: product order code and product identification, generally placed on the main board featuring the target device.
  Example:

  Product order code
  Product identification

- Second sticker: board reference with revision and serial number, available on each PCB.
  Example:

  MBxxxx-Variant-yzz
  syywwxxxxx

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

On the second sticker, the first line has the following format: *"MBxxxx-Variant-yzz"*, where *"MBxxxx"* is the board reference, *"Variant"* (optional) identifies the mounting variant when several exist, *"y"* is the PCB revision, and *"zz"* is the assembly revision, for example B01. The second line shows the board serial number used for traceability.

Parts marked as *"ES"* or *"E"* are not yet qualified and therefore not approved for use in production. ST is not responsible for any consequences resulting from such use. In no event will ST be liable for the customer using any of these engineering samples in production. ST's Quality department must be contacted prior to any decision to use these engineering samples to run a qualification activity.

"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 evaluation tool ordering part number 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.

17.2 STM32H573I-DK product history

Table 33. Product history

Order code	Product identification	Product details	Product change description	Product limitations
STM32H573I-DK	DK32H573I$MR1	MCU: • STM32H573IIK3Q silicon revision "X"	Initial revision	No limitation
		MCU errata sheet: • *STM32H562xx/563xx/573xx device errata* (ES0565)		
		Boards: • MB1280-3V3-C01 (fan-out daughterboard) • MB1400-STMod+_SPI-C01 (Wi-Fi® module) • MB1677-H573I-C02 (main board)		

17.3 Board revision history

Table 34. **Board revision history**

Board reference	Board variant and revision	Board change description	Board limitations
MB1280 (fan-out daughterboard)	3V3-C01	Initial revision	No limitation
MB1400 (Wi-Fi® module)	STMod+_SPI-C01	Initial revision	No limitation
MB1677 (main board)	H573I-C02	Initial revision	No limitation

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

18.1 FCC Compliance Statement

Contains FCC ID: P53-EMW3080.

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 B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Use only shielded cables.

Responsible party (in the USA)

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18.2 ISED Compliance Statement

This device complies with FCC and ISED Canada RF radiation exposure limits set forth for general population for mobile application (uncontrolled exposure). This device must not be collocated or operating in conjunction with any other antenna or transmitter.

Contains/Contient IC ID: 23507-EMW3080.

Compliance Statement

Notice: This device complies with ISED Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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

Déclaration de conformité

Avis: Le présent appareil est conforme aux CNR d'ISDE Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

Revision history

Table 35. **Document revision history**

Date	Revision	Changes
27-Jul-2023	1	Initial release.

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