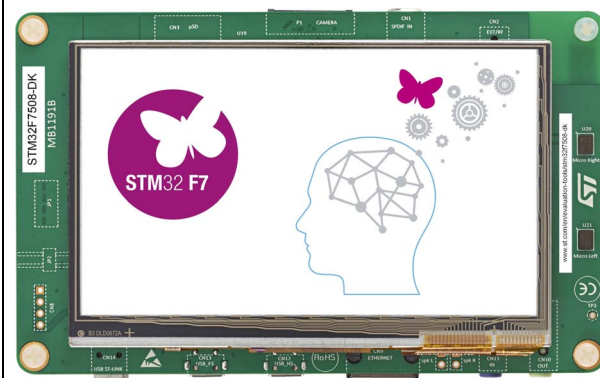
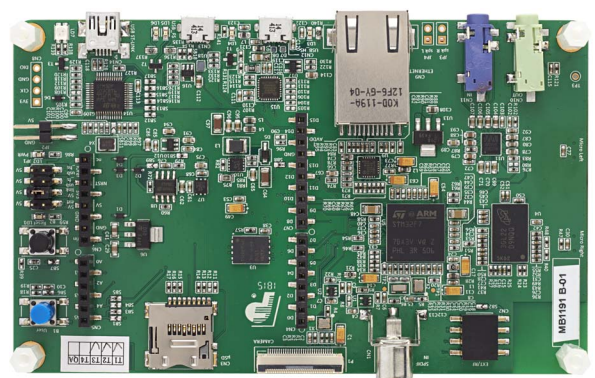


Discovery kit for STM32F7 Series with STM32F750N8 MCU**Introduction**

The STM32F7508-DK Discovery kit is a complete demonstration and development platform for the STMicroelectronics Arm® Cortex®-M7 core-based STM32F750N8H6 microcontroller. This microcontroller features four I²Cs, six SPIs with three multiplexed simplex I²S, SDMMC, four USARTs, four UARTs, two CANs, three 12-bit ADCs, two 12-bit DACs, two SAIs, 8- to 14-bit digital camera module interface, internal 320+16+4-Kbyte SRAM and 64-Kbyte Flash memory, USB OTG HS and FS, Ethernet MAC, FMC interface, Quad-SPI interface, SWD debugging support. This Discovery kit offers everything required for users to get started quickly and develop applications easily.

The full range of hardware features on the board helps users to evaluate almost all peripherals (USB OTG HS and FS, 10/100-Mbit Ethernet, microSD™ card, USART, SAI Audio DAC stereo with audio jack input and output, ST-MEMS digital microphones, SDRAM, Quad-SPI Flash memory, 4.3-inch color LCD-TFT with a capacitive multi-touch panel, SPDIF RCA input and others) and to develop their applications. ARDUINO® Uno V3 connectors make it possible to easily connect extension shields or a daughterboard for users' specific applications. The integrated ST-LINK/V2-1 provides an embedded in-circuit debugger and programmer for the STM32.

The STM32F7508-DK kit comes with the STM32 comprehensive software HAL library together with various packaged software examples.

Figure 1. STM32F7508-DK board (top view)**Figure 2. STM32F7508-DK board (bottom view)**

Pictures are not contractual.

Contents

- 1 Features 6**
- 2 Ordering information 7**
 - 2.1 Product marking 7
 - 2.2 Codification 7
- 3 Development environment 8**
 - 3.1 System requirements 8
 - 3.2 Development toolchains 8
 - 3.3 Demonstration software 8
- 4 Hardware layout and configuration 9**
 - 4.1 The STM32F7508-DK Discovery board layout 10
 - 4.2 STM32F7508-DK Discovery board mechanical drawing 12
 - 4.3 Embedded ST-LINK/V2-1 13
 - 4.3.1 Drivers 13
 - 4.3.2 ST-LINK/V2-1 firmware upgrade 14
 - 4.4 Power supply 14
 - 4.5 Programming/debugging when the power supply is not from
ST-LINK (5V link) 16
 - 4.6 Clock sources 17
 - 4.7 Reset sources 17
 - 4.8 Audio 17
 - 4.9 USB OTG FS 18
 - 4.10 USB OTG HS 18
 - 4.11 microSD card 18
 - 4.12 Ethernet 19
 - 4.13 SDRAM memory 19
 - 4.14 Quad-SPI NOR Flash memory 19
 - 4.15 Camera module 20
 - 4.16 Display LCD-TFT 20

5	Connectors	21
5.1	I ² C extension connector CN2	21
5.2	Camera module connector P1	21
5.3	ARDUINO [®] Uno V3 connectors	22
5.4	USB OTG HS Micro-AB connector CN12	24
5.5	Ethernet RJ45 connector CN9	24
5.6	USB OTG FS Micro-AB connector CN13	25
5.7	microSD connector CN3	26
5.8	ST-LINK/V2-1 USB Type-B connector CN14	26
5.9	Audio stereo speakers JP3 and JP4	27
5.10	Audio green jack (line Out) CN10	27
5.11	Audio blue jack (line In) CN11	27
5.12	SPDIF input RCA connector CN1	27
Appendix A	STM32F7508-DK I/O assignment	28
Appendix B	Compliance Statements	35
B.1	Federal Communications Commission (FCC) and Industry Canada (IC) Compliance Statement	35
B.1.1	FCC Compliance Statement	35
B.2	IC Compliance Statement	35
B.2.1	Compliance Statement	35
B.2.2	Déclaration de conformité	35
Revision history	36

List of tables

Table 1.	Ordering information	7
Table 2.	Codification explanation	7
Table 3.	I ² C extension connector CN2	21
Table 4.	Camera module connector P1	21
Table 5.	ARDUINO [®] connectors (CN4, CN5, CN6 and CN7)	23
Table 6.	USB OTG HS Micro-AB CN12	24
Table 7.	RJ45 connector CN9	25
Table 8.	USB OTG FS Micro-AB connector CN13	25
Table 9.	microSD connector CN3	26
Table 10.	USB Type-B connector CN14	27
Table 11.	SPDIF input RCA connector CN1	27
Table 12.	STM32F7508-DK I/O assignment	28
Table 13.	Document revision history	36

List of figures

Figure 1.	STM32F7508-DK board (top view)	1
Figure 2.	STM32F7508-DK board (bottom view)	1
Figure 3.	Hardware block diagram	9
Figure 4.	STM32F7508-DK Discovery board top layout	10
Figure 5.	STM32F7508-DK Discovery board bottom layout	11
Figure 6.	Mechanical drawing	12
Figure 7.	USB composite device	13
Figure 8.	JP1 (5V ext) from JP2 (5V)	14
Figure 9.	JP1 (5V ext) from CN6 (Vin)	14
Figure 10.	JP1 (5V link)	15
Figure 11.	JP1 (usb_fs)	16
Figure 12.	JP1 (usb_hs)	16
Figure 13.	Inside RJ45 jack	19
Figure 14.	I ² C extension connector CN2 (front view)	21
Figure 15.	Camera module connector P1 (front view)	21
Figure 16.	USB OTG Micro-AB connector CN12 (front view)	24
Figure 17.	Ethernet RJ45 connector CN9 (front view)	24
Figure 18.	USB OTG Micro-AB connector CN13 (front view)	25
Figure 19.	microSD connector CN3 (front view)	26
Figure 20.	USB Type-B connector CN14 (front view)	26

1 Features

- STM32F750N8H6 Arm^{®(a)} Cortex[®]-M7 core-based microcontroller featuring 64 Kbytes of Flash memory and 340 Kbytes of RAM, in BGA216 package
- 4.3-inch 480x272 color LCD-TFT with capacitive touch screen
- Ethernet connector compliant with IEEE-802.3-2002
- USB OTG HS FS
- SAI audio codec
- 2 ST-MEMS digital microphones
- 128-Mbit Quad-SPI Flash memory
- 128-Mbit SDRAM (64 Mbits accessible)
- 1 user and reset push-button
- Board connectors:
 - Camera 8 bit
 - USB with Micro-AB
 - Ethernet RJ45
 - SPDIF RCA input
 - Audio jack for external speakers and microphone
 - microSD[™] card
 - ARDUINO[®] Uno V3 expansion connectors
 - RF-EEPROM daughterboard expansion connectors
- Flexible power-supply options:
 - ST-LINK USB V_{BUS} or external sources
- Power supply output for external applications: 3.3 V or 5 V
- On-board ST-LINK/V2-1 supporting USB re-enumeration capability: mass storage, Virtual COM port, debug port
- Comprehensive free software libraries and examples available with the STM32Cube MCU Package
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR[™], Keil[®] and STM32CubeIDE



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

2 Ordering information

To order the STM32F7508-DK Discovery kit, refer to [Table 1](#). For a detailed description, refer to the user manual on the product web page. Additional information is available from the datasheet and reference manual of the target STM32.

Table 1. Ordering information

Order code	Board reference	Target STM32
STM32F7508-DK	MB1191	STM32F750N8H6

2.1 Product marking

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

‘E’ or ‘ES’ marking examples of location:

- on the targeted STM32 that is soldered on the board (For an illustration of STM32 marking, refer to the section ‘Package information’ of the STM32 datasheet at www.st.com).
- next to the evaluation tool ordering part number, that is stuck or silkscreen printed on the board

2.2 Codification

The meaning of the codification is explained in [Table 2](#).

Table 2. Codification explanation

STM32XXYYZ-DK	Description	Example: STM32F7508-DK
STM32XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32F7 Series
YY	MCU product line in the series	STM32F750
Z	STM32 Flash memory size: – 8 for 64 Kbytes	64 Kbytes
DK	Discovery kit	Discovery kit

The order code is mentioned on a sticker placed on the top or bottom side of the board.

3 Development environment

3.1 System requirements

- Windows® OS (7, 8 and 10), Linux® 64-bit or macOS®(a) (b)
- USB Type-A to Mini-B cable

3.2 Development toolchains

- IAR™ - EWARM^(c)
- Keil® - MDK-ARM^(c)
- STMicroelectronics - STM32CubeIDE

3.3 Demonstration software

The demonstration software, included in the STM32Cube MCU Package, 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 the www.st.com/en/evaluation-tools/stm32f7508-dk.html webpage.

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

b. All other trademarks are the property of their respective owners.

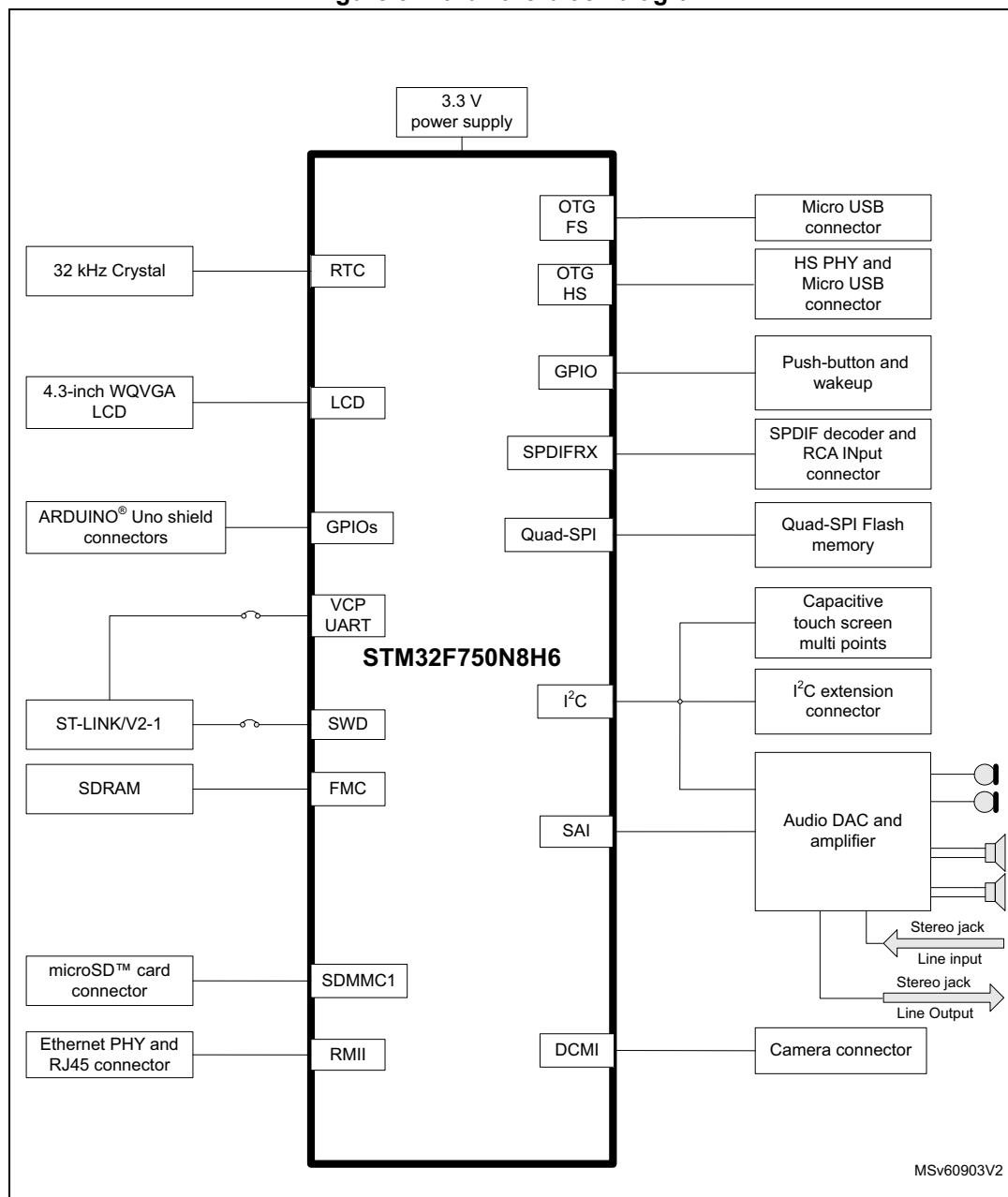
c. On Windows® only

4 Hardware layout and configuration

The STM32F7508-DK Discovery kit is designed around the STM32F750N8H6 microcontroller (216-pin in TFBGA package). The hardware block diagram (see [Figure 3](#)) illustrates the connections between STM32F750N8H6 and peripherals (SDRAM, Quad-SPI Flash memory, camera module, color LCD, USB OTG connectors, USART, Ethernet, Audio, SPDIFRX, microSD™ card, ARDUINO® Uno shields and embedded ST-LINK). [Figure 4](#) and [Figure 5](#) help users to locate these features on the Discovery board.

The mechanical dimensions of the Discovery board are showed in [Figure 6](#).

Figure 3. Hardware block diagram



4.1 The STM32F7508-DK Discovery board layout

Figure 4. STM32F7508-DK Discovery board top layout

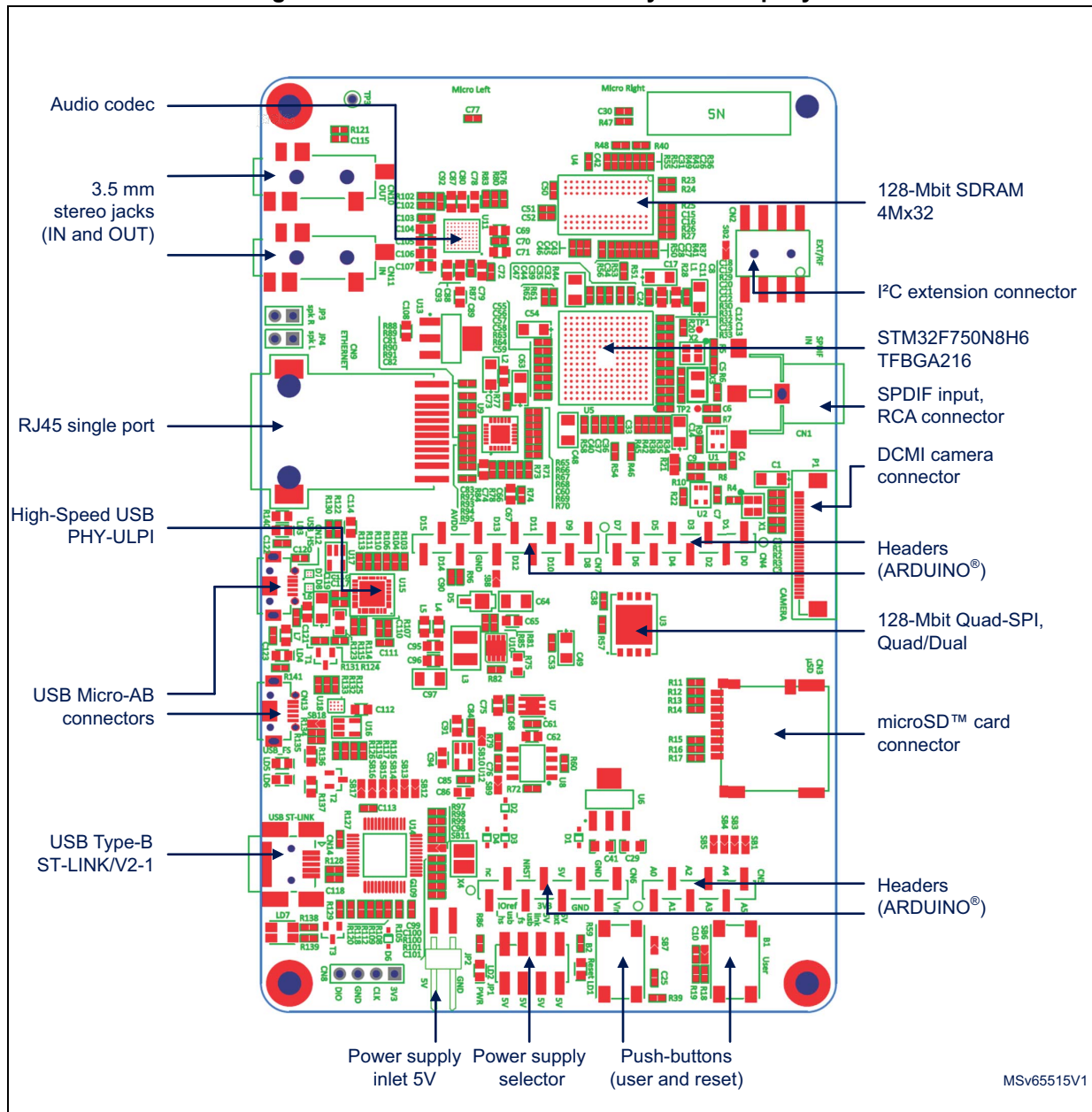
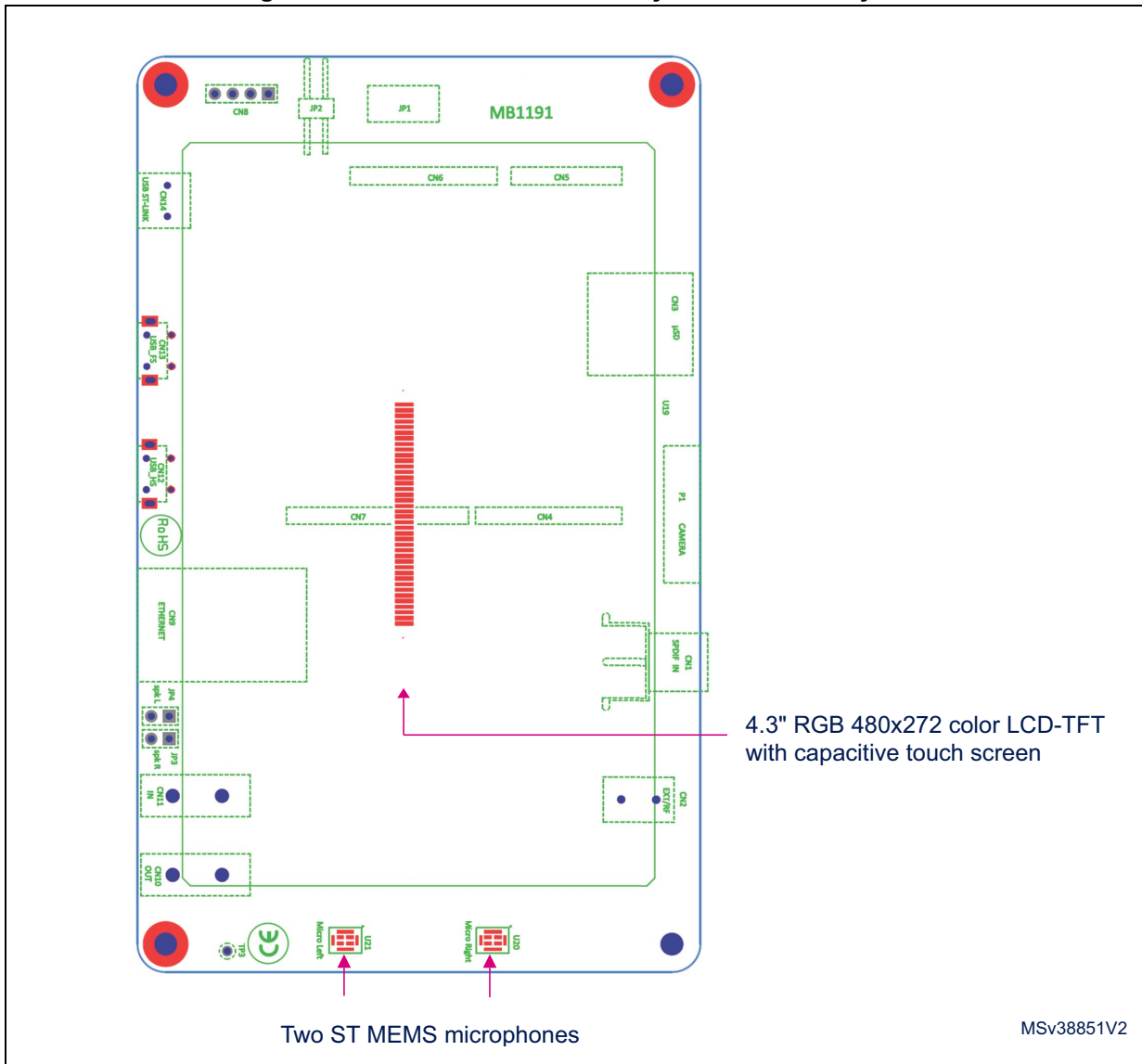


Figure 5. STM32F7508-DK Discovery board bottom layout



4.3 Embedded ST-LINK/V2-1

The ST-LINK/V2-1 programming and debugging tool is integrated on the STM32F7508-DK Discovery kit. Compared to ST-LINK/V2 the changes are listed below.

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

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

These features are no more supported on ST-LINK/V2-1:

- SWIM interface
- Application voltage lower than 3 V

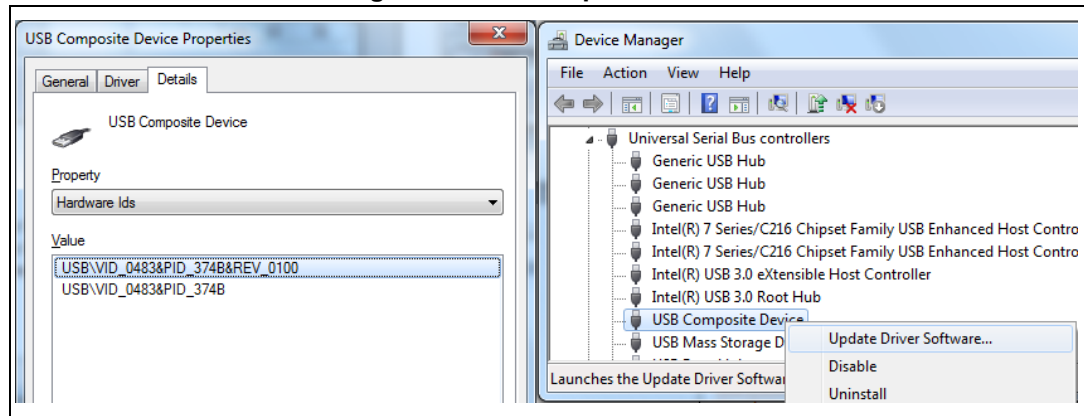
For all general information concerning debugging and programming features common between V2 and V2-1 refer to *ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32* User manual (UM1075).

4.3.1 Drivers

Before connecting the STM32F7508-DK kit to a Windows® personal computer (7, 8 and 10) through the USB, a driver for the ST-LINK/V2-1 must be installed. It is available at the www.st.com website. In case the STM32 Discovery is connected to the PC before the driver is installed, some Discovery interfaces may be declared as “Unknown” in the PC device manager. To recover from this situation, after installing the dedicated driver, the association of “Unknown” USB devices found on the STM32F7508-DK board to this dedicated driver, must be updated in the device manager manually.

Note: It is recommended to proceed by using USB Composite Device, as shown in [Figure 7](#).

Figure 7. USB composite device



4.3.2 ST-LINK/V2-1 firmware upgrade

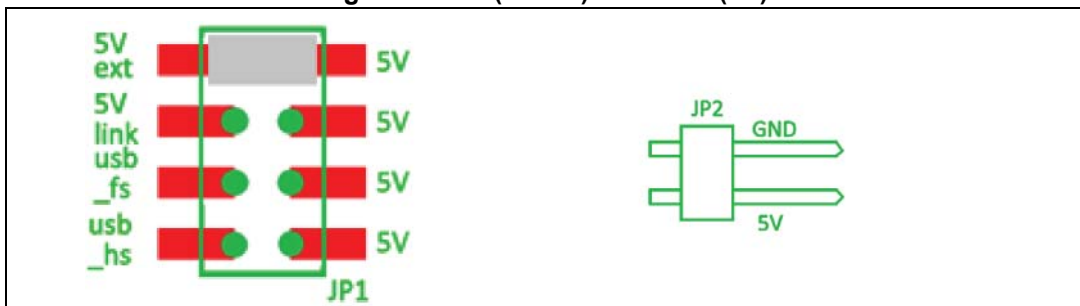
The ST-LINK/V2-1 embeds a firmware upgrade mechanism for in-situ upgrade through the USB port. As the firmware may evolve during the life time of the ST-LINK/V2-1 product (for example new functionality, bug fixes, support for new microcontroller families), it is recommended to visit the www.st.com website before starting to use the STM32F7508-DK board and periodically, to stay up-to-date with the latest firmware version.

4.4 Power supply

The STM32F7508-DK Discovery board is designed to be powered by 5V DC power supply. It is possible to configure the Discovery board to use any of the following five sources for the power supply:

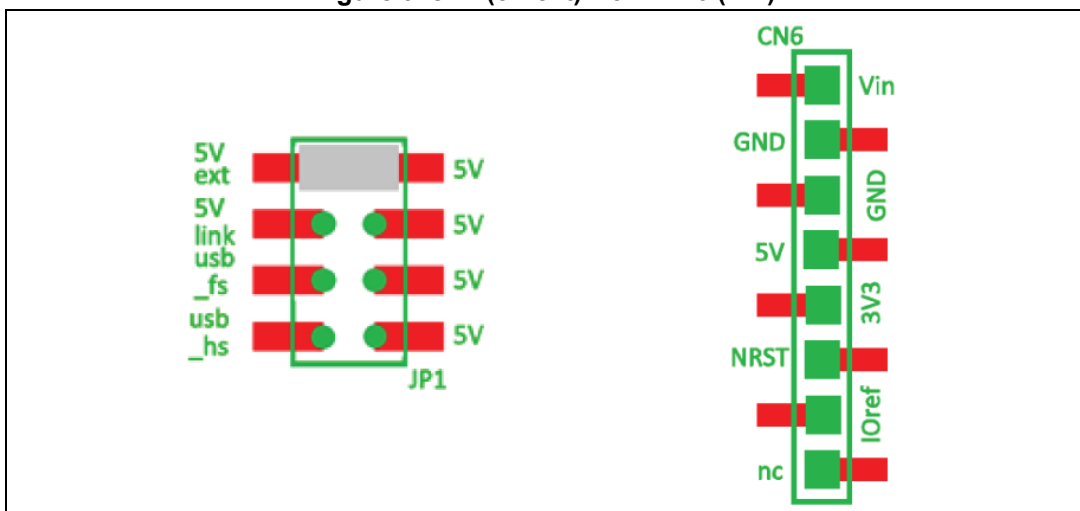
- 5V DC power adapter connected to JP2 (external power supply on silkscreen of JP1 (5V ext)). In this case, the STM32F7508-DK Discovery board must be powered by a power supply unit or by an auxiliary equipment complying with the standard EN-60950-1: 2006+A11/2009, and must be Safety Extra Low Voltage (SELV) with limited power capability (see [Figure 8](#)).

Figure 8. JP1 (5V ext) from JP2 (5V)



- 7-12V DC power from CN6 pin named Vin on silkscreen, the extension connectors for ARDUINO® Uno shields or daughterboard (external power source on silkscreen of JP1 (5V ext)), see [Figure 9](#).

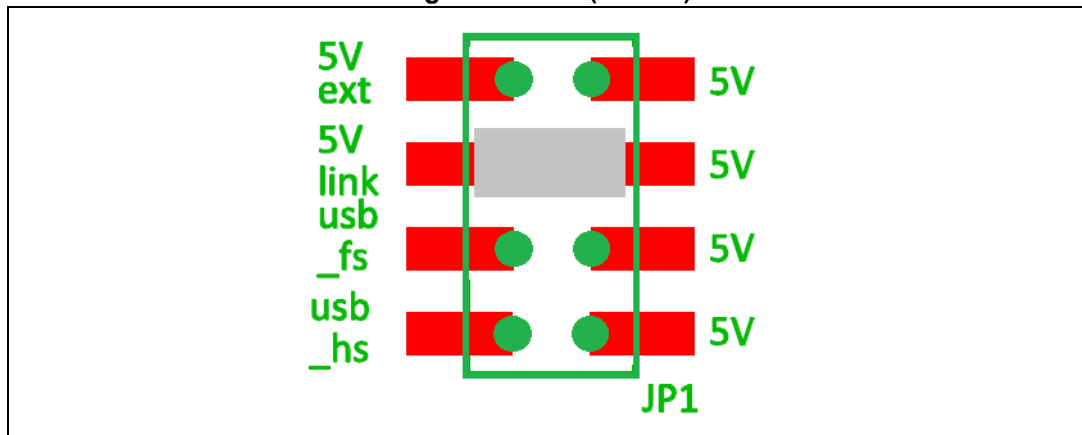
Figure 9. JP1 (5V ext) from CN6 (Vin)



- 5V DC power with limitation from CN14, the USB Type-B connector of ST-LINK/V2-1 (USB 5V power source on silkscreen of JP1 (5V link)). It is the default setting. If the USB enumeration succeeds (as explained below), the ST-LINK 5V link power is enabled, by asserting the PWR_ENn signal. This pin is connected to a power switch (ST890), which powers the board. This power switch features also a current limitation to protect the PC in case of a short-circuit on the board (more than 600 mA).

The STM32F7508-DK Discovery board can be powered from the ST-LINK USB connector CN14 (5V link), but only the ST-LINK circuit has the power before USB enumeration, because the host PC only provides 100 mA to the board at that time. During the USB enumeration, the STM32F7508-DK board asks for the 500 mA power to the host PC. If the host is able to provide the required power, the enumeration ends by a “SetConfiguration” command and then, the power transistor U8 (ST890) is switched ON, the red LED LD2 is turned ON, thus the STM32F7508-DK board can consume no more than 500 mA of current. If the host is not able to provide the requested current, the enumeration fails. Therefore the ST890 (U8) remains OFF and the STM32 part including the extension board will not be powered. As a consequence the red LED LD2 remains turned OFF. In this case it is mandatory to use an external power supply (see [Figure 10](#)).

Figure 10. JP1 (5V link)



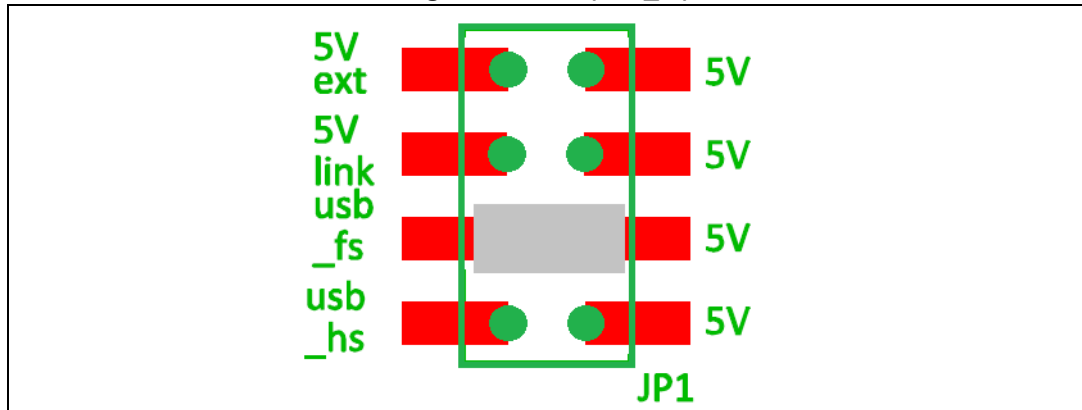
Note: *In case the board is powered by a USB charger, there is no USB enumeration, so the led LD2 remains set to OFF permanently and the board is not powered. Only in this specific case, the resistor R109 needs to be soldered, to allow the board to be powered anyway.*

The LED LD2 is lit when the STM32F7508-DK Discovery board is powered by the 5V correctly.

Caution: Do not connect the PC to the ST-LINK (CN14) when R109 is soldered. The PC may be damaged or the board not powered correctly.

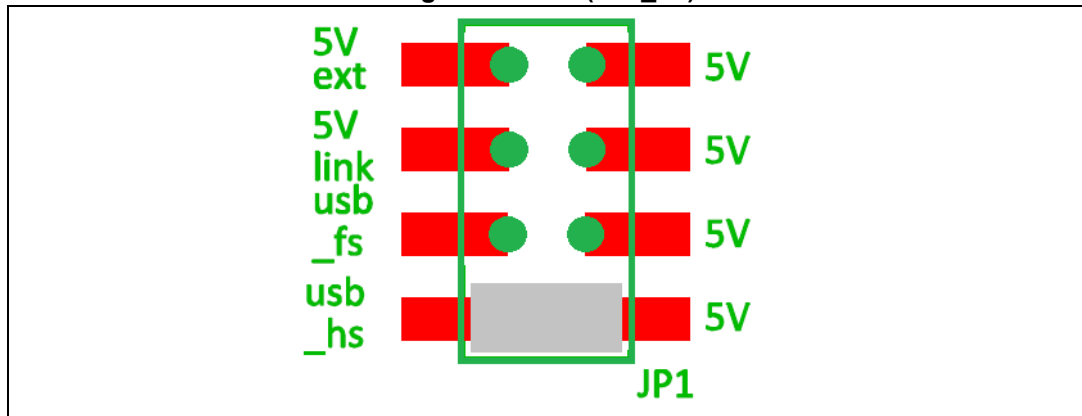
- 5V DC power with 500 mA limitation from CN13, the USB OTG FS Micro-AB connector (USB 5V power source on silkscreen of JP1 (usb_fs)), see [Figure 11](#).

Figure 11. JP1 (usb_fs)



- 5V DC power with 500 mA limitation from CN12, the USB OTG HS Micro-AB connector (USB 5V power source on silkscreen of JP1 (usb_hs)), see [Figure 12](#).

Figure 12. JP1 (usb_hs)



4.5 Programming/debugging when the power supply is not from ST-LINK (5V link)

It is mandatory to power the board first using JP1 (5V ext) or (usb_hs) or (usb_fs), then connecting the USB cable to the PC. Proceeding this way the enumeration succeeds thanks to the external power source.

The following power sequence procedure must be respected:

1. Connect the jumper JP1 on (5V ext) or (usb_hs) or (usb_fs)
2. Connect the external power source to JP2 or CN6 or CN12 or CN13
3. Check the red LED LD2 is turned ON
4. Connect the PC to USB connector CN14

If this order is not respected, the Discovery board may be powered by VBUS first from ST-LINK, and the following risks may be encountered:

1. If more than 500 mA current is needed by the board, the PC may be damaged or current can be limited by the PC. As a consequence the board is not powered correctly.
2. 500 mA will be requested at the enumeration, so there is a risk that the request is rejected and enumeration does not succeed if the PC cannot provide such current.

4.6 Clock sources

Up to 3 clock sources as described below:

- X1, 24 MHz oscillator for the USB OTG HS PHY and camera module (daughterboard)
- X2, 25 MHz oscillator for the STM32F750N8H6 microcontroller and Ethernet PHY
- X3, 32 KHz crystal for the STM32F750N8H6 embedded RTC

4.7 Reset sources

The reset signal of STM32F7508-DK Discovery board is active low and the reset sources include:

- Reset button B2
- ARDUINO® Uno shield board from CN6
- Embedded ST-LINK/V2-1

4.8 Audio

An audio codec WM8994ECS/R from CIRRUS with 4 DACs and 2 ADCs is connected to the SAI interface of the STM32F750N8H6 microcontroller. It communicates with STM32F750N8H6 via I²C bus shared with the camera module and I²C extension connector.

- The analog line input is connected to the ADC of WM8994ECS/R through the blue audio jack CN11.
- The analog line output is connected to the DAC of WM8994ECS/R via the green audio jack CN10.
- Two external speakers can be connected to WM8994ECS/R via JP3 for right speaker and JP4 for left speaker.
- Two digital microphones (ST-MEMS microphones) are on the STM32F7508-DK Discovery board. They are connected to the input digital microphones of WM8994ECS/R.
- One coaxial connector CN1 is implemented on STM32F7508-DK to receive external audio data compatible with the SPDIF specification.

4.9 USB OTG FS

The STM32F7508-DK Discovery board supports USB OTG full speed communication via a USB Micro-AB connector (CN13) and a USB power switch (U6) connected to VBUS. The Discovery board can be powered by this USB connection at 5V DC with 500mA current limitation.

A green LED LD5 will be lit in one of these cases:

- Power switch (U6) is ON and STM32F7508-DK works as an USB host
- VBUS is powered by another USB host when STM32F7508-DK works as an USB device.

The red LED LD6 will be lit when an overcurrent occurs.

Note: The STM32F7508-DK board must be powered by an external power supply when using OTG function.

4.10 USB OTG HS

The STM32F7508-DK Discovery board supports the USB OTG high speed communication via a USB Micro-AB connector (CN12), USB high speed PHY (U15) USB3320C-EZK from MICROCHIP for high speed function.

The Discovery board can be powered by the USB connectors (CN12) at 5V DC with 500mA current limitation.

A USB power switch (U7) is also connected on VBUS and provides power to CN12.

The green LED LD4 will be lit in one of these cases:

- Power switch (U17) is ON and STM32F7508-DK works as a USB host
- VBUS is powered by another USB host when STM32F7508-DK works as a USB device.

The red LED LD3 will be lit when an overcurrent occurs.

Note: The STM32F7508-DK board must be powered by an external power supply when using OTG function.

4.11 microSD card

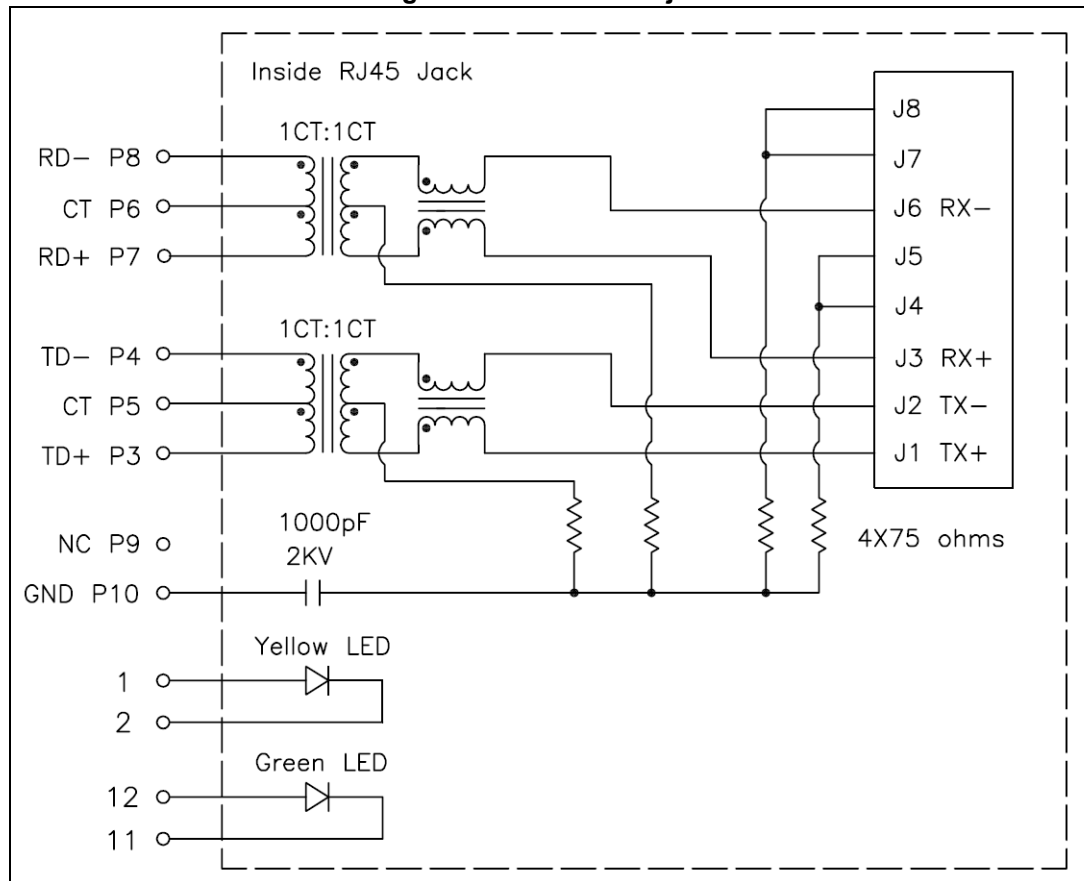
The STM32F7508-DK board supports the 2-Gbyte (or more) microSD™ card connected to the SDMMC1 port of STM32F750N8H6.

4.12 Ethernet

The STM32F7508-DK Discovery board supports 10/100-Mbit Ethernet communication by a PHY LAN8742A-CZ-TR (U9) from MICROCHIP and RJ45 jack (CN9). Ethernet PHY is connected to STM32F750N8H6 via RMII interface.

The 25-MHz clock for the PHY is generated by the oscillator X2, while the 50-MHz clock for STM32F750N8H6 is generated by the PHY RMII_REF_CLK.

Figure 13. Inside RJ45 jack



4.13 SDRAM memory

The 128-Mbit SDRAM is connected to the FMC interface of the STM32F750N8H6 microcontroller. Only the lowest 16-bit data are used (64 Mbits accessible). DQ16 to DQ31 are unused and connected to a 10 kohm pull-down resistor.

4.14 Quad-SPI NOR Flash memory

The 128-Mbit Quad-SPI NOR Flash memory is connected to the Quad-SPI interface of the STM32F750N8H6 microcontroller.

4.15 Camera module

A connector P1 with the DCMI signals is available to connect a camera module such as STM32F4DIS-CAM (ST order code).

4.16 Display LCD-TFT

The 4.3" 480x272 LCD-TFT with capacitive touch panel is connected to the RGB LCD interface of the STM32F750N8H6 microcontroller.

5 Connectors

5.1 I²C extension connector CN2

Figure 14. I²C extension connector CN2 (front view)

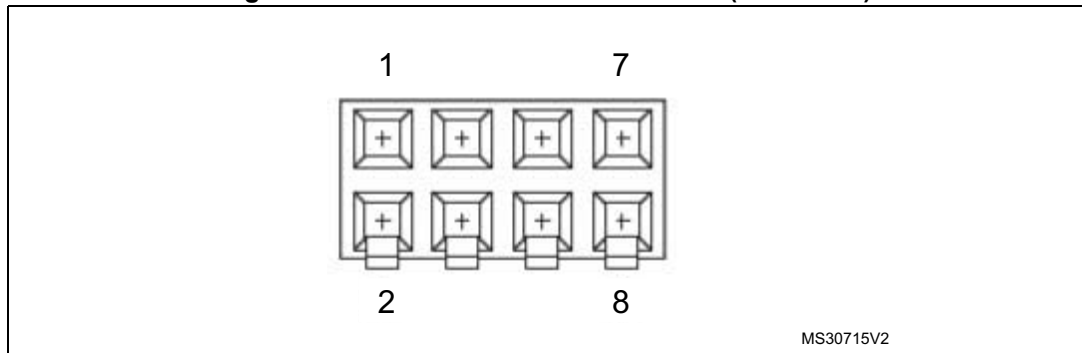


Table 3. I²C extension connector CN2

Pin number	Description	Pin number	Description
1	I2C_SDA (PB9)	5	+3V3
2	NC	6	NC
3	I2C_SCL (PB8)	7	GND
4	RESET(PC10)	8	NC or 5V

5.2 Camera module connector P1

Figure 15. Camera module connector P1 (front view)

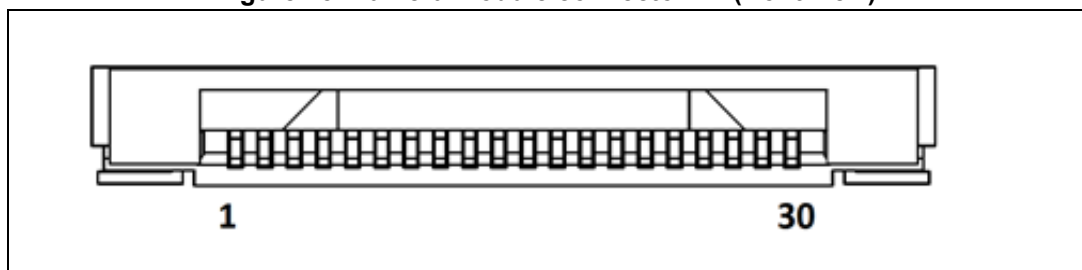


Table 4. Camera module connector P1

Pin number	Description	Pin number	Description
1	GND	16	GND
2	NC	17	DCMI_HSYNC
3	NC	18	NC
4	DCMI_D0	19	DCMI_VSYNC
5	DCMI_D1	20	3V3

Table 4. Camera module connector P1 (continued)

Pin number	Description	Pin number	Description
6	DCMI_D2	21	Camera_CLK (OSC_24M)
7	DCMI_D3	22	NC
8	DCMI_D4	23	GND
9	DCMI_D5	24	NC
10	DCMI_D6	25	DCMI_PWR_EN
11	DCMI_D7	26	DCMI_NRST
12	NC	27	DCMI_SDA
13	NC	28	DCMI_SCL
14	GND	29	GND
15	DCMI_PIXCK	30	3V3

5.3 ARDUINO® Uno V3 connectors

CN4, CN5, CN6 and CN7 are female connectors compatible with ARDUINO® standard. Most shields designed for ARDUINO® can fit to the STM32F7508-DK Discovery board.

The ARDUINO® connectors on the STM32F7508-DK Discovery board support the ARDUINO® Uno V3 (see [Table 5](#)).

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

Table 5. ARDUINO® connectors (CN4, CN5, CN6 and CN7)

Left connectors					Right connectors				
CN No.	Pin No.	Pin name	STM32 pin	Function	Function	STM32 pin	Pin name	Pin No.	CN No.
					I2C1_SCL	PB8	D15	10	CN7 digital
					I2C1_SDA	PB9	D14	9	
					AVDD	-	AREF	8	
					Ground	-	GND	7	
CN6 power	1	NC	-	-	SPI2_SCK	PI1	D13	6	
	2	IOREF	-	3.3V Ref	SPI2_MISO	PB14	D12	5	
	3	RESET	NRST	RESET	TIM12_CH2, SPI2_MOSI	PB15	D11	4	
	4	+3V3	-	3.3V input/output	TIM1_CH1	PA8	D10	3	
	5	+5V	-	5V output	TIM2_CH1	PA15	D9	2	
	6	GND	-	Ground	-	PI2	D8	1	
	7	GND	-	Ground	-				
	8	VIN	-	Power input	-	PI3	D7	8	
-					TIM12_CH1	PH6	D6	7	CN4 digital
CN5 analog	1	A0	PA0	ADC3_IN0	TIM5_CH4, SPI2_NSS	PI0	D5	6	
	2	A1	PF10	ADC3_IN8	-	PG7	D4	5	
	3	A2	PF9	ADC3_IN7	TIM3_CH1	PB4	D3	4	
	4	A3	PF8	ADC3_IN6	-	PG6	D2	3	
	5	A4	PF7 or PB ⁽¹⁾	ADC3_IN5 (PF7) or I2C1_SDA (PB9)	USART6_TX	PC6	D1	2	
	6	A5	PF6 or PB ⁽¹⁾	ADC3_IN4 (PC0) or I2C1_SCL (PB8)	USART6_RX	PC7	D0	1	

1. Refer to [Table 12](#) for details.

5.4 USB OTG HS Micro-AB connector CN12

Figure 16. USB OTG Micro-AB connector CN12 (front view)

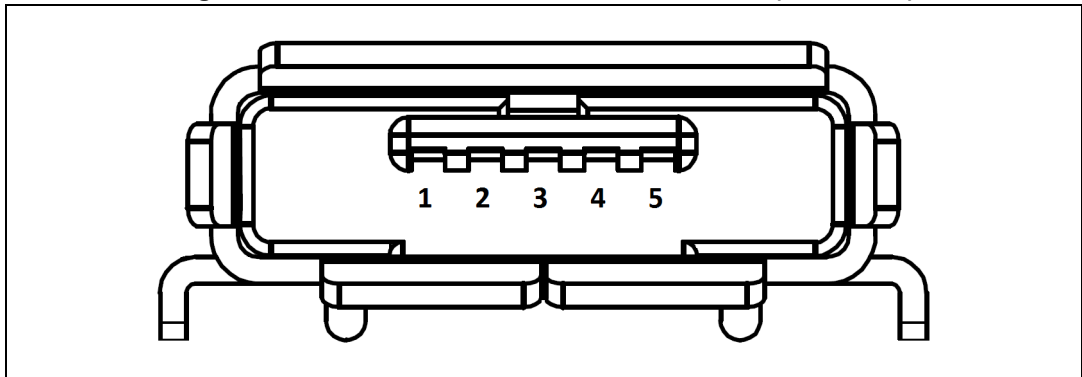


Table 6. USB OTG HS Micro-AB CN12

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

5.5 Ethernet RJ45 connector CN9

Figure 17. Ethernet RJ45 connector CN9 (front view)

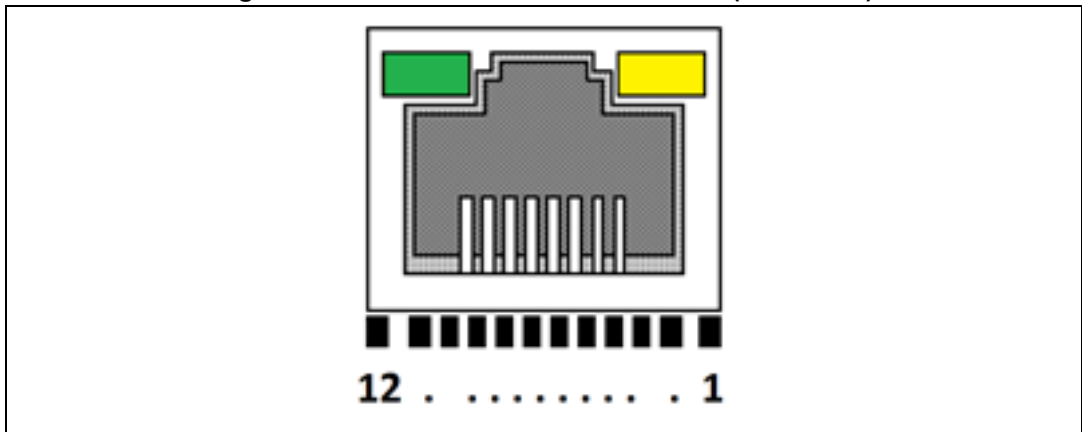


Table 7. RJ45 connector CN9

Pin number	Description	Pin number	Description
1	A, yellow LED	7	RD+
2	K, yellow LED	8	RD-
3	TD+	9	NC
4	TD-	10	GND
5	CT, 3V3	11	K, green LED
6	CT, 3V3	12	A, green LED

5.6 USB OTG FS Micro-AB connector CN13

Figure 18. USB OTG Micro-AB connector CN13 (front view)

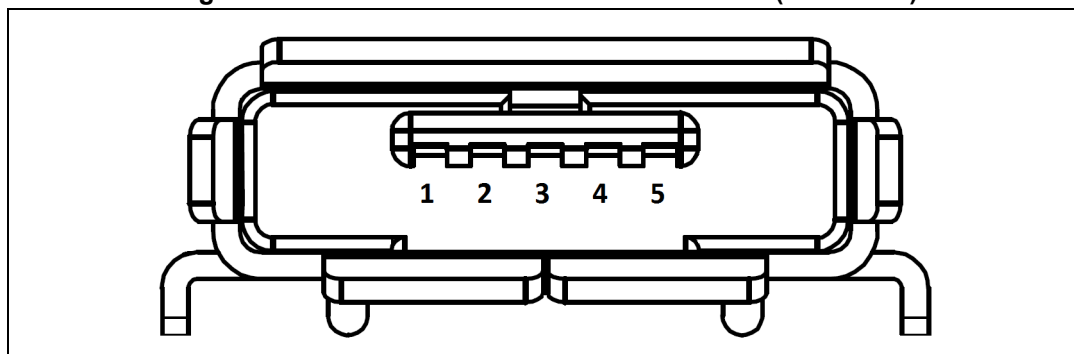


Table 8. USB OTG FS Micro-AB connector CN13

Pin number	Description	Pin number	Description
1	VBUS (PA9)	4	ID (PA10)
2	D- (PA11)	5	GND
3	D+ (PA12)	-	-

5.7 microSD connector CN3

Figure 19. microSD connector CN3 (front view)

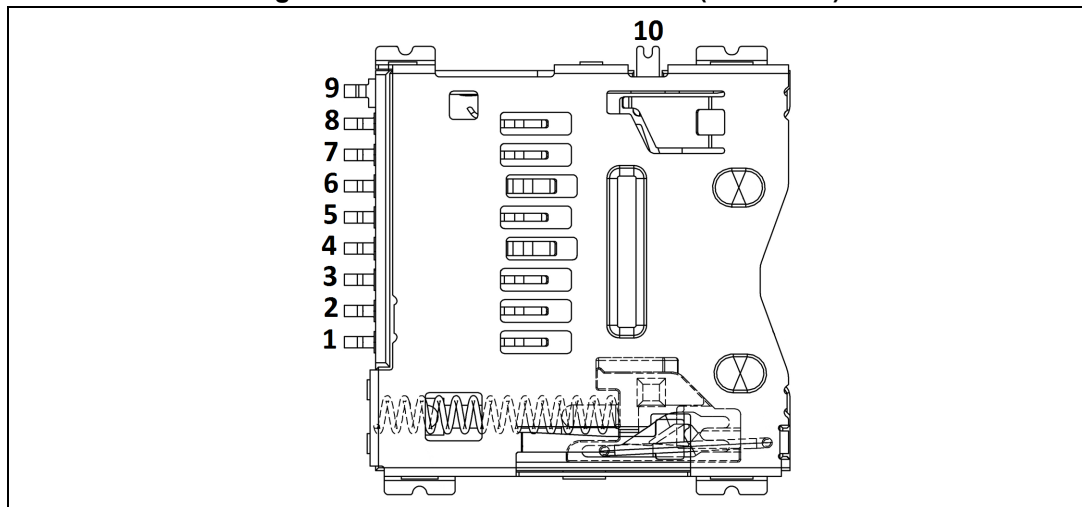


Table 9. microSD connector CN3

Pin number	Description	Pin number	Description
1	SDMMC_D2 (PC10)	6	Vss/GND
2	SDMMC_D3 (PC11)	7	SDMMC_D0 (PC8)
3	SDMMC_CMD (PD2)	8	SDMMC_D1 (PC9)
4	+3.3V	9	GND
5	SDMMC_CK (PC12)	10	MicroSDcard_detect (PC13)

5.8 ST-LINK/V2-1 USB Type-B connector CN14

The USB connector CN14 is used to connect the embedded ST-LINK/V2-1 to the PC for programming and debugging the STM32F750N8H6 microcontroller.

Figure 20. USB Type-B connector CN14 (front view)

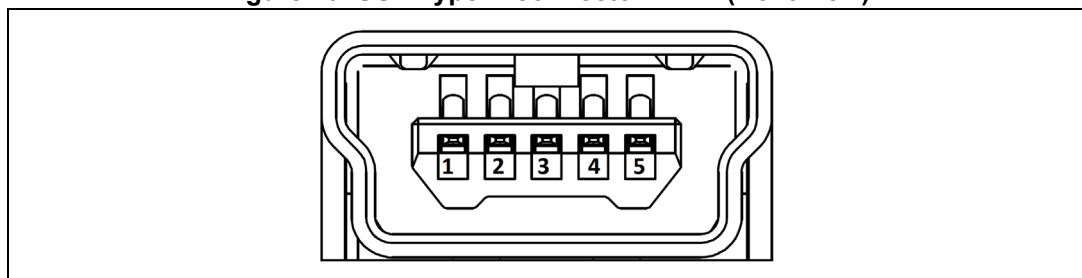


Table 10. USB Type-B connector CN14

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

5.9 Audio stereo speakers JP3 and JP4

The stereo audio output JP3 and JP4 are available to support the stereo speakers (left and right).

5.10 Audio green jack (line Out) CN10

A 3.5 mm stereo audio green jack output CN10 is available to support the headphone.

5.11 Audio blue jack (line In) CN11

A 3.5 mm stereo audio blue jack input CN11 is available to support the audio-line input.

5.12 SPDIF input RCA connector CN1

Table 11. SPDIF input RCA connector CN1

Pin number	Description	Pin number	Description
1	SPDIF_RX0 (PD7)	2	GND
2	GND	-	-

Appendix A STM32F7508-DK I/O assignment

Table 12. STM32F7508-DK I/O assignment

Pin No.	Pin Name	Signal or Label	Comment
A1	PE4	LTDC_B0	-
A2	PE3	OTG_HS_OverCurrent	-
A3	PE2	QUADSPI_BK1_IO2	-
A4	PG14	ETH_TXD1	-
A5	PE1	FMC_NBL1	-
A6	PE0	FMC_NBL0	-
A7	PB8	ARDUINO SCL/D15	-
A8	PB5	USB_OTG_HS_ULPI_D7	-
A9	PB4	ARDUINO PWM/D3	-
A10	PB3	SYS_JTDO-SWO	-
A11	PD7	SPDIF_RX0	-
A12	PC12	SDMMC_CK	-
A13	PA15	ARDUINO PWM/D9	-
A14	PA14	SYS_JTCK-SWCLK	-
A15	PA13	SYS_JTMS-SWDIO	-
B1	PE5	DCMI_D6	-
B2	PE6	DCMI_D7	-
B3	PG13	ETH_TXD0	-
B4	PB9	ARDUINO SDA/D14	-
B5	PB7	VCP_RX	-
B6	PB6	QUADSPI_BK1_NCS	-
B7	PG15	FMC_SDNCAS	-
B8	PG11	ETH_TX_EN	-
B9	PJ13	LTDC_B1	-
B10	PJ12	OTG_FS_VBUS	(1)
B11	PD6	Audio_INT	-
B12	PD0	FMC_D2_DA2	-
B13	PC11	SDMMC_D3	-
B14	PC10	SDMMC_D2	-
B15	PA12	USB_OTG_FS_DP	-
C1	VBAT	-	Connected to VDD
C2	PI8	NC1	-

Table 12. STM32F7508-DK I/O assignment (continued)

Pin No.	Pin Name	Signal or Label	Comment
C3	PI4	SAI2_MCLK_A	-
C4	PK7	LTDC_DE	-
C5	PK6	LTDC_B7	-
C6	PK5	LTDC_B6	-
C7	PG12	LTDC_B4	-
C8	PG10	SAI2_SD_B	-
C9	PJ14	LTDC_B2	-
C10	PD5	OTG_FS_PowerSwitchOn	-
C11	PD3	DCMI_D5	-
C12	PD1	FMC_D3_DA3	-
C13	PI3	ARDUINO D7	-
C14	PI2	ARDUINO D8	-
C15	PA11	USB_OTG_FS_DM	-
D1	PC13	uSD_Detect	-
D2	PF0	FMC_A0	-
D3	PI5	SAI2_SCK_A	-
D4	PI7	SAI2_FS_A	-
D5	PI10	LTDC_HSYNC	-
D6	PI6	SAI2_SD_A	-
D7	PK4	LTDC_B5	-
D8	PK3	LCD_BL_CTRL	-
D9	PG9	DCMI_VSYNC	-
D10	PJ15	LTDC_B3	-
D11	PD4	OTG_FS_OverCurrent	-
D12	PD2	SDMMC_CMD	-
D13	PH15	TP3	-
D14	PI1	ARDUINO SCK/D13	-
D15	PA10	USB_OTG_FS_ID	-
E1	PC14/OSC32_IN	RCC_OSC32_IN	-
E2	PF1	FMC_A1	-
E3	PI12	LCD_DISP	-
E4	PI9	LTDC_VSYNC	-
E5	PDR_ON	-	Connected to PU R38
E6	BOOT0	-	Connected to PD R45
E7	VDD	-	-

Table 12. STM32F7508-DK I/O assignment (continued)

Pin No.	Pin Name	Signal or Label	Comment
E8	VDD	-	-
E9	VDD	-	-
E10	VDD	-	-
E11	VCAP_2	-	Connected to C48
E12	PH13	DCMI_PWR_EN	-
E13	PH14	DCMI_D4	-
E14	PI0	ARDUINO PWM/CS/D5	-
E15	PA9	VCP_TX	(1)
F1	PC15/OSC32_OUT	RCC_OSC32_OUT	-
F2	VSS	-	-
F3	PI11	B_USER	-
F4	VDD	-	-
F5	VDD	-	-
F6	VSS	-	-
F7	VSS	-	-
F8	VSS	-	-
F9	VSS	-	-
F10	VSS	-	-
F11	VDD	-	-
F12	PK1	LTDC_G6	-
F13	PK2	LTDC_G7	-
F14	PC9	SDMMC_D1	-
F15	PA8	ARDUINO PWM/D10	-
G1	PH0/OSC_IN	RCC_OSC_IN	-
G2	PF2	FMC_A2	-
G3	PI13	LCD_INT	-
G4	PI15	LTDC_R0	-
G5	VDD	-	-
G6	VSS	-	-
G10	VSS	-	-
G11	VDDUSB	-	Connected to VDD
G12	PJ11	LTDC_G4	-
G13	PK0	LTDC_G5	-
G14	PC8	SDMMC_D0	-
G15	PC7	ARDUINO RX/D0	-

Table 12. STM32F7508-DK I/O assignment (continued)

Pin No.	Pin Name	Signal or Label	Comment
H1	PH1/OSC_OUT	RCC_OSC_OUT	-
H2	PF3	FMC_A3	-
H3	PI14	LTDC_CLK	-
H4	PH4	USB_OTG_HS_ULPI_NXT	-
H5	VDD	-	-
H6	VSS	-	-
H10	VSS	-	-
H11	VDD	-	-
H12	PJ8	LTDC_G1	-
H13	PJ10	LTDC_G3	-
H14	PG8	FMC_SDCLK	-
H15	PC6	ARDUINO TX/D1	-
J1	NRST	-	Hardware RESET
J2	PF4	FMC_A4	-
J3	PH5	FMC_SDNWE	-
J4	PH3	FMC_SDNE0	-
J5	VDD	-	-
J6	VSS	-	-
J10	VSS	-	-
J11	VDD	-	-
J12	PJ7	LTDC_G0	-
J13	PJ9	LTDC_G2	-
J14	PG7	ARDUINO D4	-
J15	PG6	ARDUINO D2	-
K1	PF7	ARDUINO A4	-
K2	PF6	ARDUINO A5	-
K3	PF5	FMC_A5	-
K4	PH2	NC2	-
K5	VDD	-	-
K6	VSS	-	-
K7	VSS	-	-
K8	VSS	-	-
K9	VSS	-	-
K10	VSS	-	-
K11	VDD	-	-

Table 12. STM32F7508-DK I/O assignment (continued)

Pin No.	Pin Name	Signal or Label	Comment
K12	PJ6	LTDC_R7	-
K13	PD15	FMC_D1_DA1	-
K14	PB13	USB_OTG_HS_ULPI_D6	-
K15	PD10	FMC_D15_DA15	-
L1	PF10	ARDUINO A1	-
L2	PF9	ARDUINO A2	-
L3	PF8	ARDUINO A3	-
L4	PC3	FMC_SDCKE0	-
L5	BYPASS_REG	-	Connected to PD R20
L6	VSS	-	-
L7	VDD	-	-
L8	VDD	-	-
L9	VDD	-	-
L10	VDD	-	-
L11	VCAP_1	-	Connected to C47
L12	PD14	FMC_D0_DA0	-
L13	PB12	USB_OTG_HS_ULPI_D5	-
L14	PD9	FMC_D14_DA14	-
L15	PD8	FMC_D13_DA13	-
M1	VSSA	-	Connected to GND
M2	PC0	USB_OTG_HS_ULPI_STP	-
M3	PC1	ETH_MDC	-
M4	PC2	USB_OTG_HS_ULPI_DIR	-
M5	PB2/BOOT1	QUADSPI_CLK	-
M6	PF12	FMC_A6	-
M7	PG1	FMC_A11	-
M8	PF15	FMC_A9	-
M9	PJ4	LTDC_R5	-
M10	PD12	QUADSPI_BK1_IO1	-
M11	PD13	QUADSPI_BK1_IO3	-
M12	PG3	EXT_RST	-
M13	PG2	RMII_RXER	-
M14	PJ5	LTDC_R6	-
M15	PH12	DCMI_D3	-
N1	VREF-	-	Connected to GND

Table 12. STM32F7508-DK I/O assignment (continued)

Pin No.	Pin Name	Signal or Label	Comment
N2	PA1	ETH_REF_CLK	-
N3	PA0/WKUP	ARDUINO A0	-
N4	PA4	DCMI_HSYNC	-
N5	PC4	ETH_RXD0	-
N6	PF13	FMC_A7	-
N7	PG0	FMC_A10	-
N8	PJ3	LTDC_R4	-
N9	PE8	FMC_D5_DA5	-
N10	PD11	QUADSPI_BK1_IO0	-
N11	PG5	FMC_A15_BA1	-
N12	PG4	FMC_A14_BA0	-
N13	PH7	I2C3_SCL	-
N14	PH9	DCMI_D0	-
N15	PH11	DCMI_D2	-
P1	VREF+	-	Connected to VDDA
P2	PA2	ETH_MDIO	-
P3	PA6	DCMI_PIXCK	-
P4	PA5	USB_OTG_HS_ULPI_CK	-
P5	PC5	ETH_RXD1	-
P6	PF14	FMC_A8	-
P7	PJ2	LTDC_R3	-
P8	PF11	FMC_SDNRAS	-
P9	PE9	FMC_D6_DA6	-
P10	PE11	FMC_D8_DA8	-
P11	PE14	FMC_D11_DA11	-
P12	PB10	USB_OTG_HS_ULPI_D3	-
P13	PH6	ARDUINO PWM/D6	-
P14	PH8	I2C3_SDA	-
P15	PH10	DCMI_D1	-
R1	VDDA	-	Connected to VREF+
R2	PA3	USB_OTG_HS_ULPI_D0	-
R3	PA7	ETH_CRD_DV	-
R4	PB1	USB_OTG_HS_ULPI_D2	-
R5	PB0	USB_OTG_HS_ULPI_D1	-
R6	PJ0	LTDC_R1	-

Table 12. STM32F7508-DK I/O assignment (continued)

Pin No.	Pin Name	Signal or Label	Comment
R7	PJ1	LTDC_R2	-
R8	PE7	FMC_D4_DA4	-
R9	PE10	FMC_D7_DA7	-

1. By default OTG_FS_VBUS is driven by the software and not by the alternate function of the STM32F7508H6 (R64 = ON, R63 = OFF, R58 = ON and PA9 = VCP_TX (Virtual Com Port) and PJ12 = OTG_FS_VBUS).

To use the alternate function OTG_FS_VBUS of the STM32F7508H6, it is needed to have: R64 = OFF, R63 = ON, R58 = OFF. In this configuration, VCP_TX is no longer available and PA9 = OTG_FS_VBUS, PJ12 = not connected.

Appendix B Compliance Statements

B.1 Federal Communications Commission (FCC) and Industry Canada (IC) Compliance Statement

B.1.1 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 15.105

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 instructions, 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 the interference by one or more of the following measures:

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

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.

B.2 IC Compliance Statement

B.2.1 Compliance Statement

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

B.2.2 Déclaration de conformité

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

Revision history

Table 13. Document revision history

Date	Revision	Changes
18-Oct-2018	1	Initial release.
17-Mar-2020	2	Removed <i>Technology partners</i> and <i>Electrical schematics</i> . Updated <i>Audio</i> , <i>SDRAM memory</i> , <i>Quad-SPI NOR Flash memory</i> , and <i>Display LCD-TFT</i> . Reorganized the beginning of the document: <ul style="list-style-type: none">– Updated <i>Features</i>, <i>Ordering information</i>, and <i>Development toolchains</i>– Added <i>Product marking</i> and <i>Codification</i>

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2020 STMicroelectronics – All rights reserved