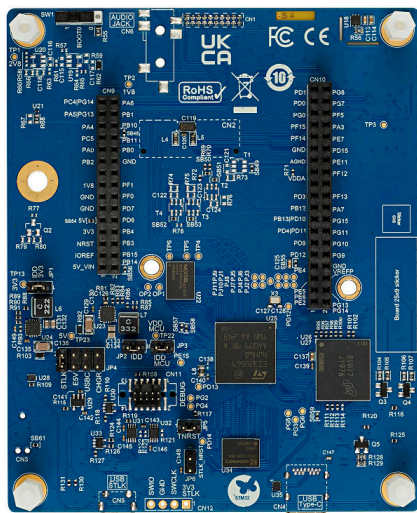


## Discovery kits with STM32U5x9NJ MCUs



STM32U5G9J-DK1 top and bottom views.  
Pictures are not contractual.

### Features

- Ultra-low-power STM32U5x9NJH6Q microcontroller based on the Arm® Cortex®-M33 core with Arm® TrustZone®, featuring 4 Mbytes of flash memory, 3 Mbytes of SRAM for STM32U5G9NJH6Q or 2.5 Mbytes for STM32U5A9NJH6Q, and SMPS in a TFBGA216 package
- 2.47" RGB 480 × 480 pixels TFT round LCD module with 16.7M color depth, with MIPI DSI® 2-data lane interface and capacitive touch panel
- USB Type-C® with USB 2.0 HS interface, sink only
- Low-power system designed for VDD at 1.8 V only
- MEMS sensors from STMicroelectronics
  - Time-of-Flight and gesture-detection sensor
  - Temperature sensor
- 512-Mbit Octo-SPI NOR flash memory
- 512-Mbit Hexadeca-SPI PSRAM
- 4-Gbyte eMMC flash memory
- Two user LEDs
- User and reset push-buttons
- Board connectors:
  - USB ST-LINK Micro-B
  - USB Type-C®
  - Two double-row 2.54 mm pitch expansion connectors for additional peripherals prototyping
  - Audio MEMS daughterboard expansion (for STM32U5G9J-DK1)
  - MIPI10
  - Tag-Connect™ 10-pin footprint
- Flexible power-supply options: ST-LINK USB V<sub>BUS</sub>, USB connector, or external sources
- On-board STLINK-V3E debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
- Comprehensive free software libraries and examples available with the [STM32CubeU5](#) MCU Package
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE

#### Product status link

[STM32U5A9J-DK](#)

[STM32U5G9J-DK1](#)

## 1 Description

The STM32U5x9J-DKx Discovery kits (order codes [STM32U5A9J-DK](#) and [STM32U5G9J-DK1](#)) are complete demonstration and development platforms for the STM32U5x9NQH6Q microcontrollers, featuring an Arm® Cortex®-M33 core with Arm® TrustZone®.

Leveraging the innovative ultra-low-power oriented features, 3 Mbytes of embedded SRAM for STM32U5G9NQH6Q or 2.5 Mbytes for STM32U5A9NQH6Q, 4 Mbytes of embedded flash memory, and rich graphics features, the STM32U5x9J-DKx Discovery kits enable users to easily prototype applications with state-of-the-art energy efficiency, as well as provide stunning and optimized graphics rendering with the support of specific graphic features associated with each microcontroller.

The full range of hardware features available on the board helps users to enhance their application development by an evaluation of all the peripherals such as a 2.47-inch RGB 480 × 480 pixels TFT round LCD module with MIPI DSI® interface and capacitive touch panel, USB Type-C® HS, Octo-SPI flash memory device, Hexadeca-SPI PSRAM memory device, eMMC flash memory device, Time-of-Flight and gesture detection sensor, temperature sensor, 20-pin audio MEMS connector (for STM32U5G9J-DK1), and two 2.54 mm pitch double-row flexible expansion connectors for easy prototyping with daughterboards for specific applications (USART, LPUART, two SPIs, SAI, three I<sup>2</sup>C, SDMMC, ADCs, timers, and GPIOs).

The STM32U5x9J-DKx Discovery kits integrate an STLINK-V3E embedded in-circuit debugger and programmer for the STM32 microcontroller with a USB Virtual COM port bridge and comes with the [STM32CubeU5](#) MCU Package, which provides an STM32 comprehensive software HAL library as well as various software examples.

## 2 Ordering information

To order the STM32U5x9J-DKx Discovery kits, refer to [Table 1](#). For a detailed description of each board, refer to its user manual on the product web page. Additional information is available from the datasheet and reference manual of the target STM32.

**Table 1. List of available products**

Order code	Board reference	User manual	Target STM32	Differentiating feature
STM32U5A9J-DK			STM32U5A9NJH6Q	-
STM32U5G9J-DK1	<ul style="list-style-type: none"> <li>• MB1829<sup>(1)</sup></li> <li>• MB1835<sup>(2)</sup></li> </ul>	UM2967	STM32U5G9NJH6Q	<ul style="list-style-type: none"> <li>• Audio MEMS daughterboard expansion</li> </ul>

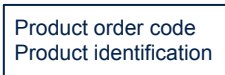
1. Main board

2. LCD daughterboard

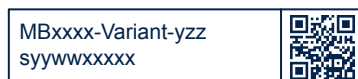
### 2.1 Product marking

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:



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



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-yyz*”, 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](http://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.

## 2.2 Codification

The meaning of the codification is explained in Table 2.

**Table 2. Codification explanation**

STM32XXYYZ-DKT	Description	Example: STM32U5G9J-DK1
XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32U5 series
YY	MCU product line in the series	STM32U5F9/5G9 product line
Z	STM32 flash memory size: • J for 4 Mbytes	4 Mbytes
DK	Discovery kit	Discovery kit
T	Sequential number	First Discovery kit version

## 3 Development environment

The STM32U5x9J-DKx Discovery kits feature the STM32U5x9NJH6Q 32-bit microcontrollers based on the Arm® Cortex®-M33 processor with Arm® TrustZone®.

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



### 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
- USB Type-A or USB Type-C® to Micro-B cable

*Note:* macOS® is a trademark of Apple Inc., registered in the U.S. and other countries and regions.  
Linux® is a registered trademark of Linus Torvalds.  
Windows is a trademark of the Microsoft group of companies.

### 3.2 Development toolchains

- IAR Systems® - IAR Embedded Workbench®<sup>(1)</sup>
- Keil® - MDK-ARM<sup>(1)</sup>
- 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](http://www.st.com).

## 4 Laser consideration

The Time-of-Flight and gesture-detection sensor contains a laser emitter and the corresponding drive circuitry. The laser output is designed to remain within Class 1 laser safety limits under all reasonably foreseeable conditions including single faults in compliance with IEC 60825-1:2014 (third edition). The laser output remains within Class 1 limits as long as the STMicroelectronics recommended device settings are used and the operating conditions specified in the datasheets are respected. The laser output power must not be increased by any means and no optics are used to focus the laser beam. [Figure 1](#) shows the warning label for Class 1 laser products.

**Figure 1. Class 1 laser product label**



## Revision history

**Table 3. Document revision history**

Date	Revision	Changes
4-Nov-2022	1	Initial release.
22-Aug-2023	2	Updated <i>Features</i> , <i>Description</i> , <i>Ordering information</i> , <i>Development environment</i> , and <i>Laser consideration</i> . Added <i>Demonstration software</i> .
14-Sep-2023	3	Updated both cover images.
04-Apr-2024	4	Updated <a href="#">Table 2</a> in <a href="#">Codification</a> and <a href="#">Laser consideration</a> .



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