



Welcome to STM32H5 MCU series introduction



## Introducing the **STM32H5** MCU series for high performance designs



### **Most powerful Arm® Cortex®-M33 MCU**

Industry-first 32-bit MCU with Arm® Cortex®-M33 core running as high as 250 MHz

### **Scalable security to address every need**

From the most essential security building blocks to fully certified services maintained by ST

### **Optimized cost/performance trade-off**

Based on ST's optimized 40 nm process technology  
Large choice of memory, peripherals, and package options

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The STM32H5 series based on Arm®, Cortex®-M33 core extends the STM32 high performance portfolio. It is a unique combination of high performance, strong security, energy efficiency and affordability, to best address the mid-range class of MCU based applications.

- **High performance:** industry-first 32-bit MCU with Arm Cortex-M33 core running as high as 250 MHz

- **Scalable security:**

- From the most essential security services to fully certified building blocks, which are maintained by ST
- First STM32 MCU with a trusted execution environment (TEE), called the Secure Manager. This contributes to simplifying the customers' journey and provides seamless cloud to server support.

- Affordable:** the MCUs are based on ST's optimized 40 nm process technology and large choice of memory, peripherals, and package options.



## STM32H5 simplifies the design of secure industrial applications

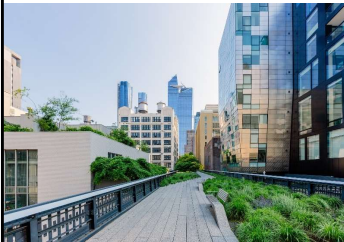


### Smart homes

Air conditioning systems  
Fridges  
Alarm systems

### Factory automation

PLC  
Motor control  
Industrial pumps



### Smart cities

Communication gateways  
Light control  
Energy conversion

### Consumer

Keyboards, tracking devices  
Medical accessories



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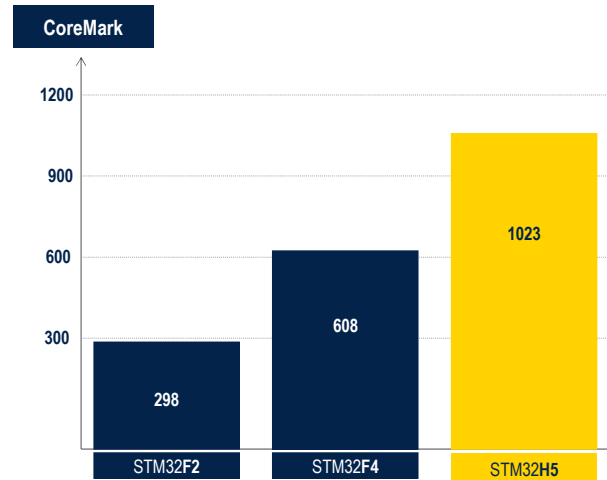
Typical applications for the STM32H5 series include air conditioning systems, appliances, and alarm systems, industrial programmable logic controllers (PLCs), motor controls, industrial pumps, communication gateways, lighting controls, and energy conversion. They are also used in consumer products such as PC peripherals, smartphones, and accessories



## Boosting application performance

### STM32H5

- Arm® Cortex®-M33 at **250 MHz**  
**375 DMIPS & 1023 CoreMark**
- **Instruction and data cache** for internal and external memory (ART Accelerator™)
- Mathematics accelerators:  
**FMAC** and **Cordic**

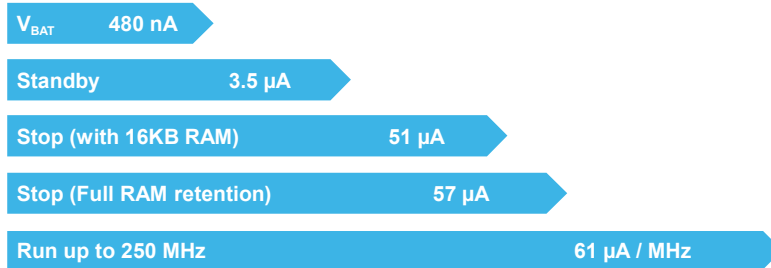


At 250 MHz, the STM32H5 series MCUs deliver 375 DMIPS and a 1023 CoreMark performance score, executing from the flash memory, with 0-wait states using ST's ART Accelerator. It also integrates mathematics accelerator FMAC and Cordic which boosts application performance.



## Flexible power modes

Efficient power consumption thanks to the switched mode power supply option (SMPS)



Typical: 25°C, V<sub>DD</sub> = 3V, SMPS mode



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The STM32H5 MCUs raise energy efficiency thanks to the flexible power modes and the switched mode power supply option, It reaches;

- 61  $\mu$ A/MHz typical at V<sub>DD</sub> = 3.3 V (drain power voltage) and 25°C in run mode (peripherals off) with SMPS option
- 51  $\mu$ A typically in stop mode with full RAM retention (low-power mode)
- 3.5  $\mu$ A typically in standby mode (low-power mode)
- 480 nA typically in V<sub>BAT</sub> (battery voltage mode) with RTC ON



## Scalable security to boost your time to market



### STM32H5 & Secure Manager

A Trusted Execution Environment (TEE)  
integrating core security services

A simplified customer journey

Seamless cloud/server support

Supporting remote provisioning

Multi-tenant IP protection

The first MCU supplier to offer a certified and maintained TEE solution to customers

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STM32H5 is the first MCU to offer a certified and maintained Trusted Execution Environment “Secure Manager” to customers with system-on-chip (SoC) security services owned and maintained by ST. With in-ST-factory pre-provisioned digital identities it will allow seamless cloud or server provisioning. Furthermore, remote provision is now made possible thanks to these identities and native Root of Trust. The Secure Manager linked to our tools and Ecosystem will allow us to provide multi-tenant IP protection.

## STM32H5 portfolio offers a multiple package size/type for all our application needs

System		Memory Interfaces
LDO, SMPS POR/PDR/PVD/BOR Xtal oscillators 32 kHz + 4 ~26 MHz Internal RC oscillators 32 kHz + 4.48 & 64 MHz RTC, 128-Byte back-up registers		FMC 8-/16-bit (SDRAM, NOR, NAND, TFT-LCD) 1x Octo-SPI 2x SD/SDIO/MMC
Analog	Arm® Cortex®-M33	Connectivity
2x 12-bit ADC 2x 12-bit DACs 1x Digital temperature sensor	250 MHz FPU MPU TrustZone® ETM	1x USB 2.0 FS, UCPD 6x SPI (including 3x I2S), 2x SAJ 3x I²C, 1x I3C/I2C HDMI-CEC 2x CAN-FD 6x UART, 6x USART 1x LPUART DCM/PSI
Crypto/Hash/Security	2x GPDMA ART Accelerator™ CORDIC FMAC	Ethernet MAC 10/100 with IEEE 1588
AES, SAES SHA-1, SHA-2 (512-bit) HMAC, CRC RSA, ECC, ECDSA HUKE, TRNG, OTFDEC 96-bit unique ID Active tampering Secure Boot ST-iRot Secure manufacturing SFI	Up to 2-Mbyte dual-bank Flash memory Data Flash 640-Kbyte RAM 4-Kbyte backup RAM	Timers
		2x 16-bit advanced motor control timers 2x 32-bit TIM 6x 16-bit low power timers 10x 16-bit TIM 2x W/D

Numerous integrated peripherals

Advanced accelerators

Large embedded memory



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The STM32H5 portfolio offers up to 2 Mbytes of flash memory in dual-bank memory , up to 640 Kbytes of SRAM , advanced accelerators and high peripheral integration.

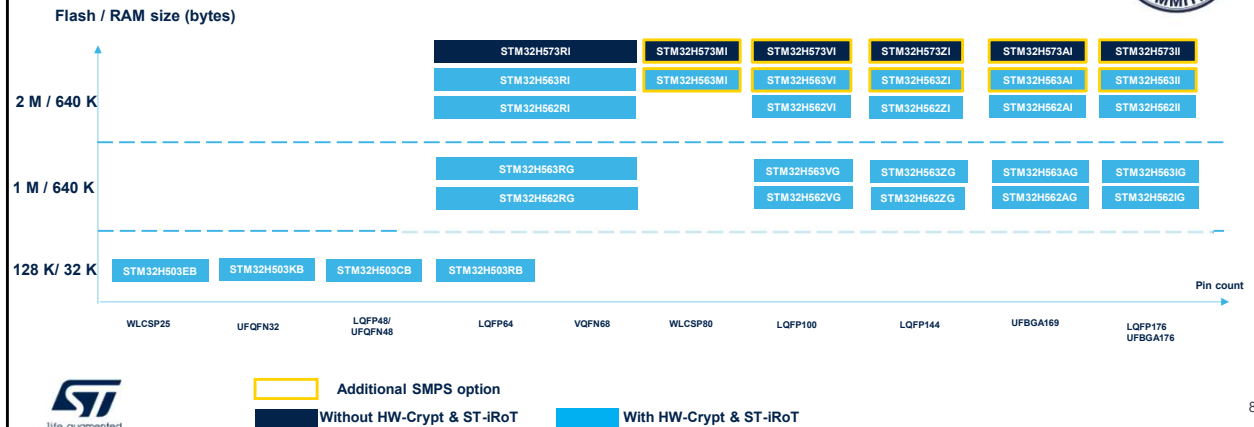
- Up to 34 communication peripherals including: I<sup>3</sup>C interface
- FDCAN
- USB 2.0 full-speed host and device
- USB Type-C®/USB Power Delivery
- Ethernet MAC
- Camera interface





## STM32H5 portfolio

Large offer with multiple package choice



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This slide presents the STM32H5 portfolio.



## Development tools for STM32H5 series

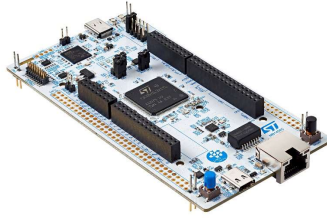
Jump-start your evaluation, prototyping, and design



**NUCLEO-H503RB**

**Affordable prototyping**

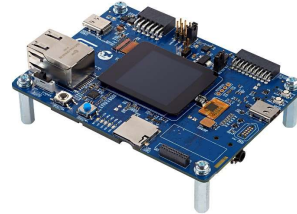
USB, Arduino uno IF, 64-pin MCU



**NUCLEO-H563ZI**

**Affordable prototyping**

USB, Ethernet, Arduino uno IF,  
144-pin MCU



**STM32H573I-DK**

**Multi-connectivity kit**

USB, Ethernet, MicroSD, Display,  
512-Mbit Octo-SPI flash, Audio,  
Multi-extension IFs, 176-pin MCU

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Three development boards are available to evaluate the STM32H5 series:

- An STM32H563ZI Nucleo-144 for flexible prototyping expansion capabilities,
- An STM32H506RB Nucleo-64 for flexible prototyping expansion capabilities,
- A Discovery kit, with a multi connectivity and extension interfaces: Ethernet, USB, Audio, display, OctoSPI Flash

# Our technology starts with You



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