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STM32H5 series

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






The STM32 portfolio

Five product categories



Wireless
MCU

Short- and long-range connectivity



Ultra-low-power
MCU


32-bit general-purpose microcontrollers: from 75 to 3,224 CoreMark score



Mainstream
MCU



High-performance
MCU



Embedded
MPU

32- and 64-bit microprocessors



Enabling edge AI solutions



Scalable security



“

If only

an MCU could give me more design freedom and speed up my time to market.

This is where we come in



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“

If only

an MCU could offer certified & maintained security services.

This is where we come in



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STM32H5

Makes performance & security
more accessible



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Introducing the STM32H5 MCU series for high-performance designs



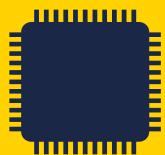
Most powerful Arm® Cortex®-M33 MCU

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



STM32H5 simplifies the design of secure industrial applications



Smart homes

Air conditioning systems
Fridges
Alarm systems

Factory automation

PLCs
Motor control
Industrial pumps



Smart cities

Communication gateways
Light control
Energy conversion

Consumer

Keyboards, tracking devices
Medical accessories



Key features for factory automation

STM32H5

Design freedom in harsh environments

- High performance core at 250 MHz
- Large and robust embedded memory
- Extended temperature range, up to 125°C

Ready for Industry 4.0

- PSA Certified level 3 & SESIP3 target certifications
- SIL-ready enabled by native hardware features
- Extended connectivity (Ethernet MAC, FDCAN, MIPI-I3C, and USB)



Key features for IoT and connectivity systems

STM32H5

Performance in space-constrained devices

- High performance at 250 MHz
- Low power dissipation
 - 61 $\mu\text{A}/\text{MHz}$ at 250 MHz
 - 1.7 V power supply
- Small package sizes

Simplified connectivity solution

- Preprovisioned security keys for registration to cloud & OEM servers
- Extended connectivity (MIPI- I3C, SDMMC, USB, UCPD)

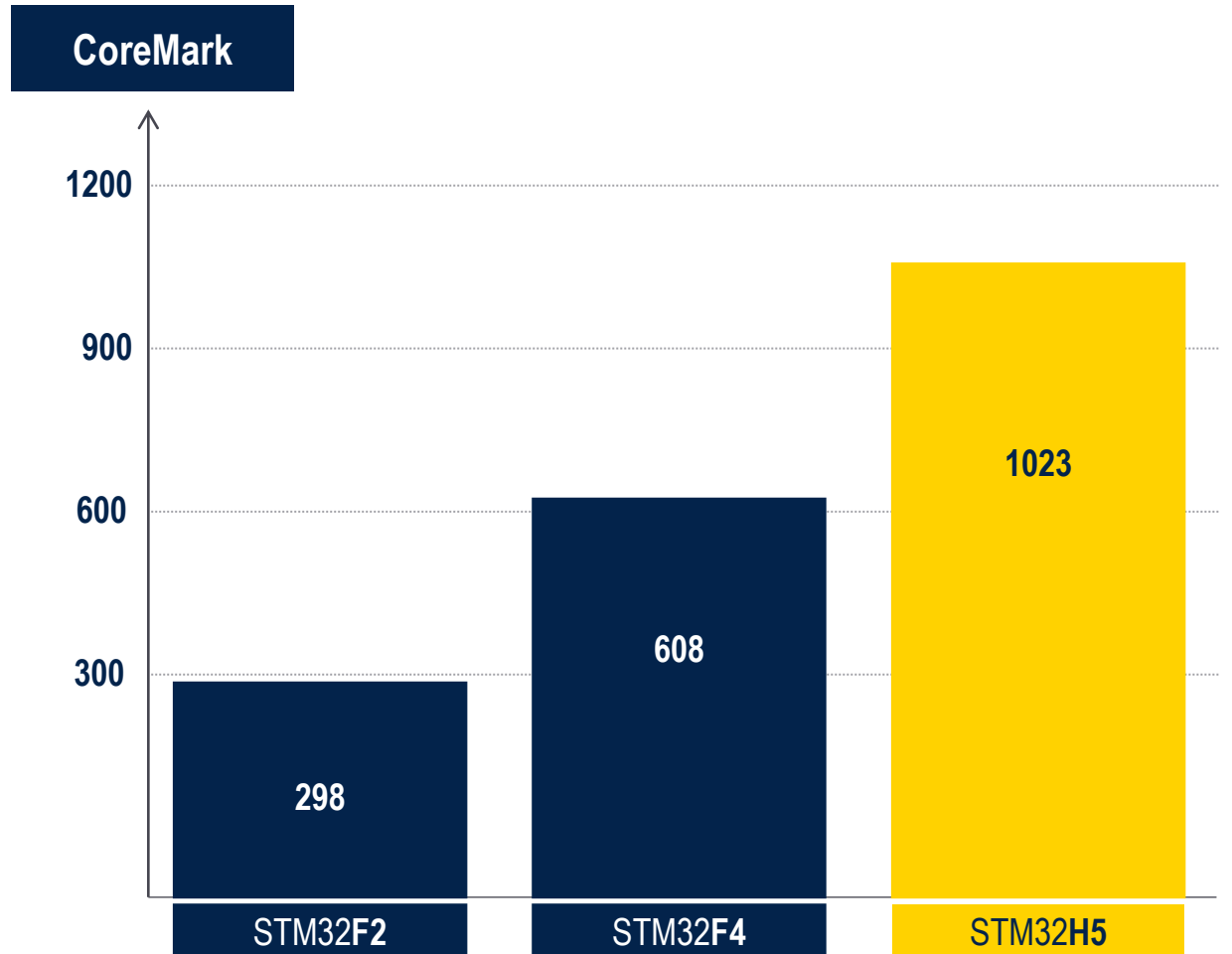




Boosting application performance

STM32H5

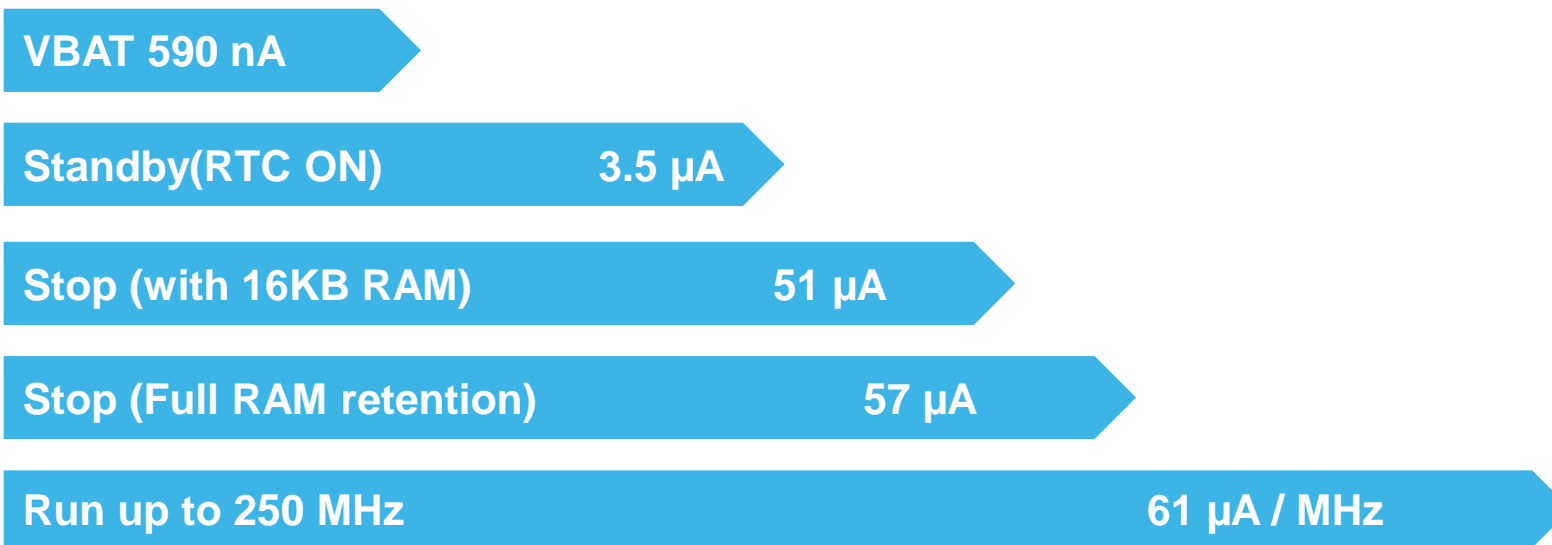
- Arm® Cortex®-M33 at **250 MHz**
375 DMIPS & 1023 CoreMark
- **Instruction and data cache** for internal and external memory (ART Accelerator)
- Mathematics accelerators: **FMAC** and **Cordic**





Flexible power modes

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



Typical: 25°C, $V_{DD} = 3V$, SMPS mode

Scalable security to boost your time to market

How many security building blocks do you need to reach your security goals?



Choose between different security offers

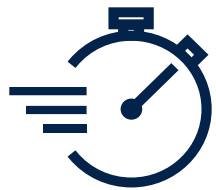
From secure hardware to a full solution owned & maintained by ST



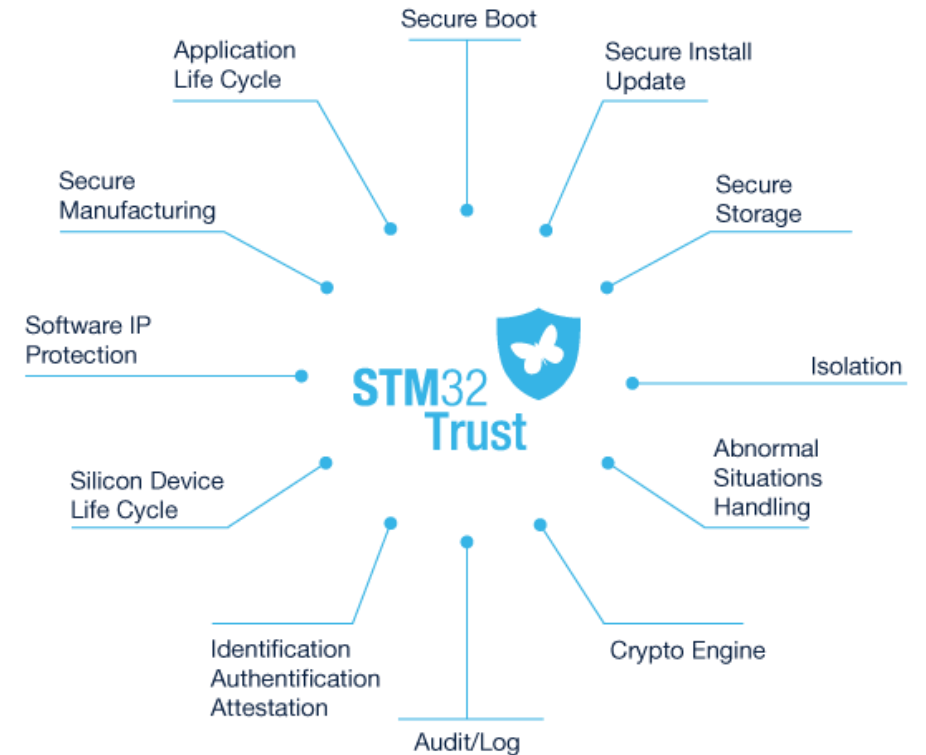
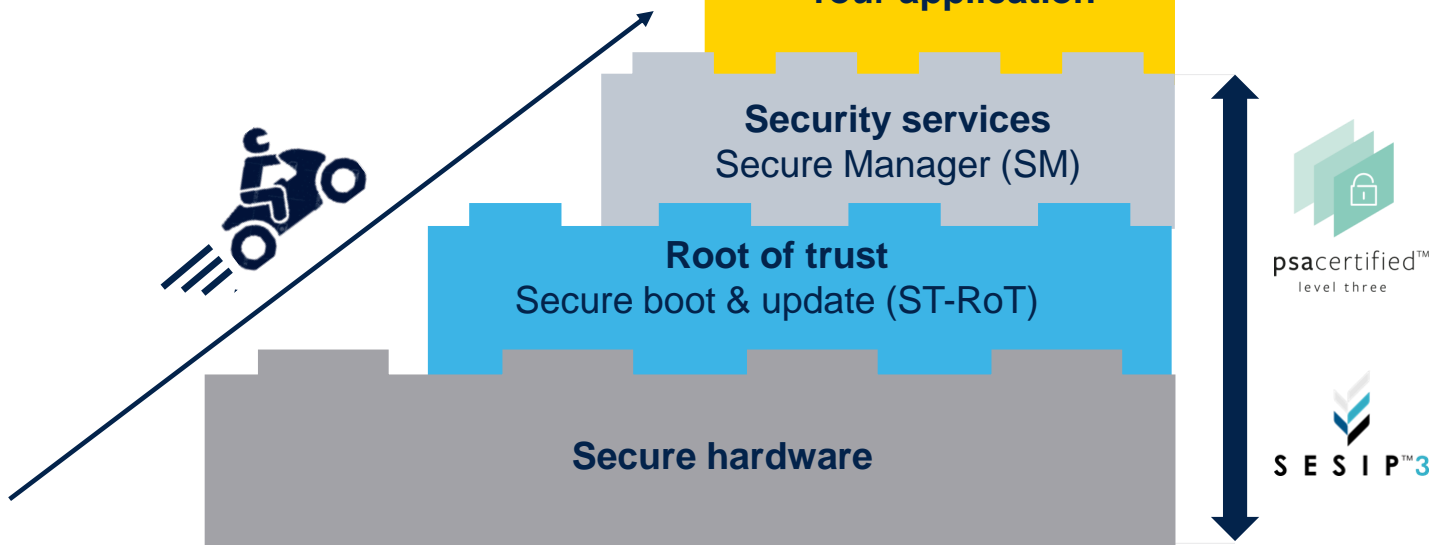
target certifications

A scalable security offer to address your needs

Choose your preferred security offer: from secure hardware to the complete STM32Trust function coverage



Innovate faster



The 12 STM32Trust security functions

Robust hardware features and turnkey SoC software implementations

Memory protections against illegal access control

OTP, HDP, WRP, MPU
Ext. Flash Decryption OTFDec
Secure Debug
Active Tamper

Cryptography for hardware robustness

Side channel AES, PKA
Additional AES, PKA, SHA,
TRNG, OTFDEC, HUK
NIST - CAVP certified CryptoLib

Platform authentication during product life cycle

2 boot stages
Protection level states
Debug authentication

Code isolation for runtime protection

7 isolation stages
Arm® TrustZone® technology
Dedicated keystores

Turnkey SoC security services

Secure Manager and ST-RoT

Easy registration to clouds & servers

Single or multitenant IP protection

Preintegrated third-party PKI life cycle

Immutable & Updatable Root of Trust

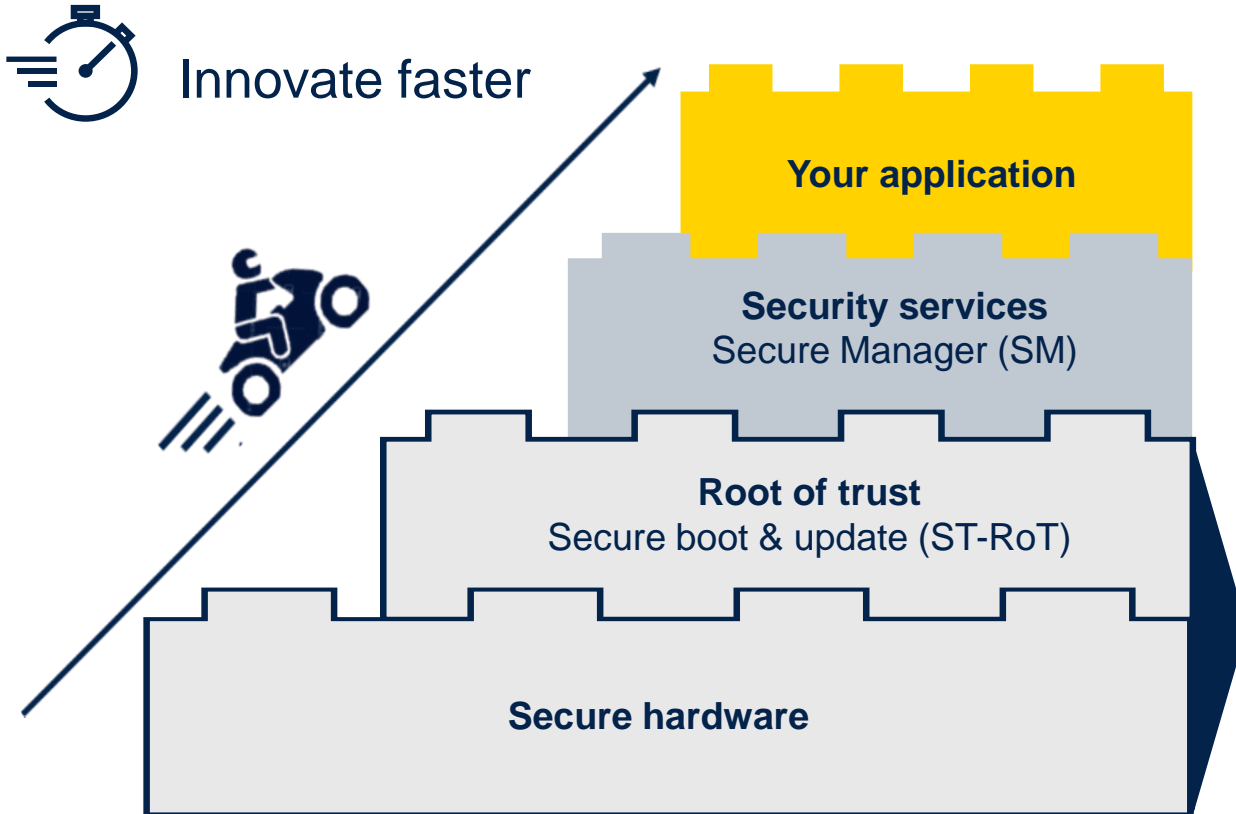
State-of-the-art security assurance level



psacertified™
level three

target certifications

Protect your application and IPs with a turnkey Root-of-Trust solution maintained and certified by ST



ST-RoT

A turnkey Root of Trust solution
certified by ST

*Delivered as X-CUBE-STROT**

- Single-tenant IP protection
- Optimized security footprint
- Simplified customer journey

**availability Q4 2024*

Enhance security while reducing costs and complexity

Availability Q4 2024



Single-tenant IP protection

- OEM/OEM or Third-party/OEM business cases
- Isolation for confidentiality at installation & runtime
- Protected development flow



Simplified customer journey

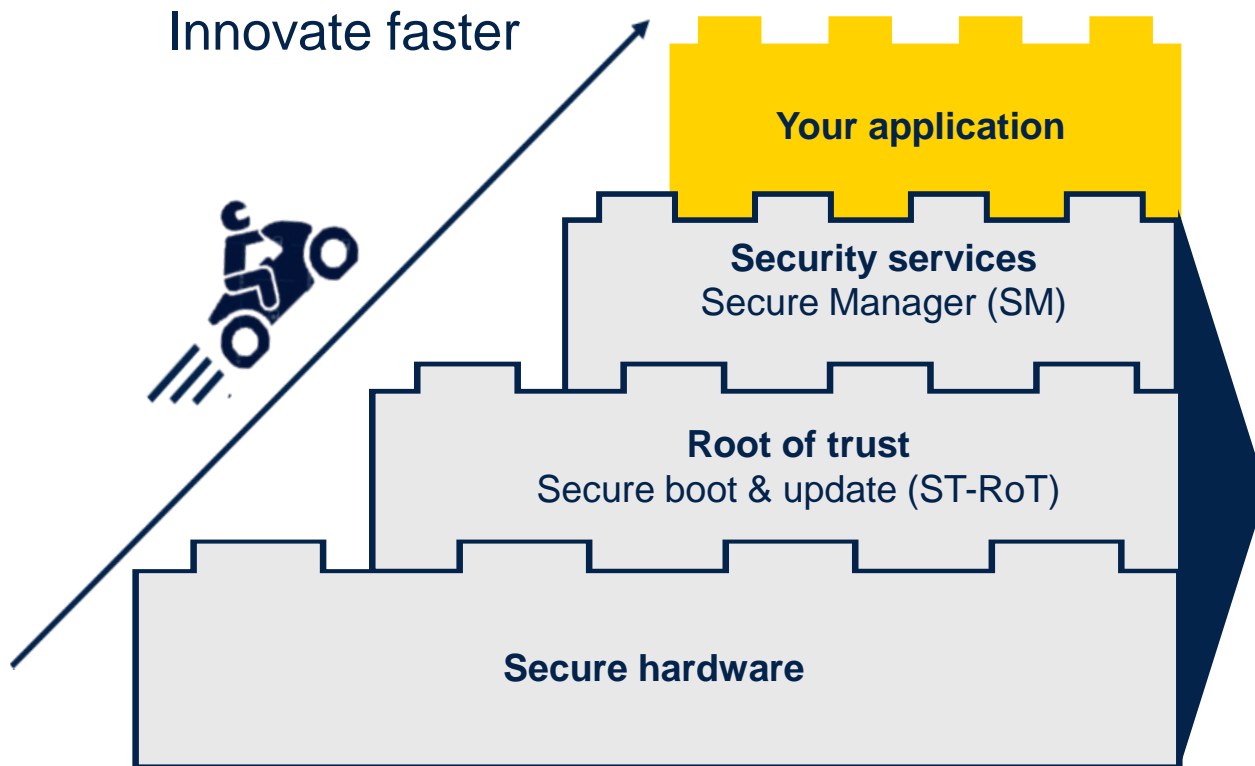
- Turnkey Root of Trust solution
- Launching application and secure services
- Certified secure implementation
- TrustZone® complexity abstraction
- Designed for LTS – long-term service



Optimized security footprint

- Target from low to high density Flash products
- Focus on Secure Boot and Updates
- Remote software update capability
- Compliant with real time application needs
- Allows OEM to choose its security framework

ST is the world's first MCU supplier to offer a certified and maintained TEE solution



Secure Manager

A Trusted Execution Environment (TEE) integrating core security services

Delivered as X-CUBE-SEC-M

- **Simplified customer journey**
- **Seamless cloud/server support**
- **Supporting remote provisioning**
- **Single/Multi-tenant IP protection**

Enhancing security while reducing costs and complexity



Multitenant IP protection

- Multiple business case made possible
- Isolation for confidentiality at installation & runtime
- Protected development flow



Cloud / Server

- Seamless cloud/server registration
- Preprovisioned keys & certificate
- PSA compliant attestation

Simplified customer journey

- Turnkey TEE security solution including services
- Certified secure implementation
- TrustZone® complexity abstraction
- Designed for LTS – long-term service
- PSA API compliant



Remote secret admin.

- Remote PKI life cycle management **enabled**
- Customizable (for example, Matter)
- Certificate installation/rotation/...
- Via partnership



STM32H5 series offers a scalable portfolio

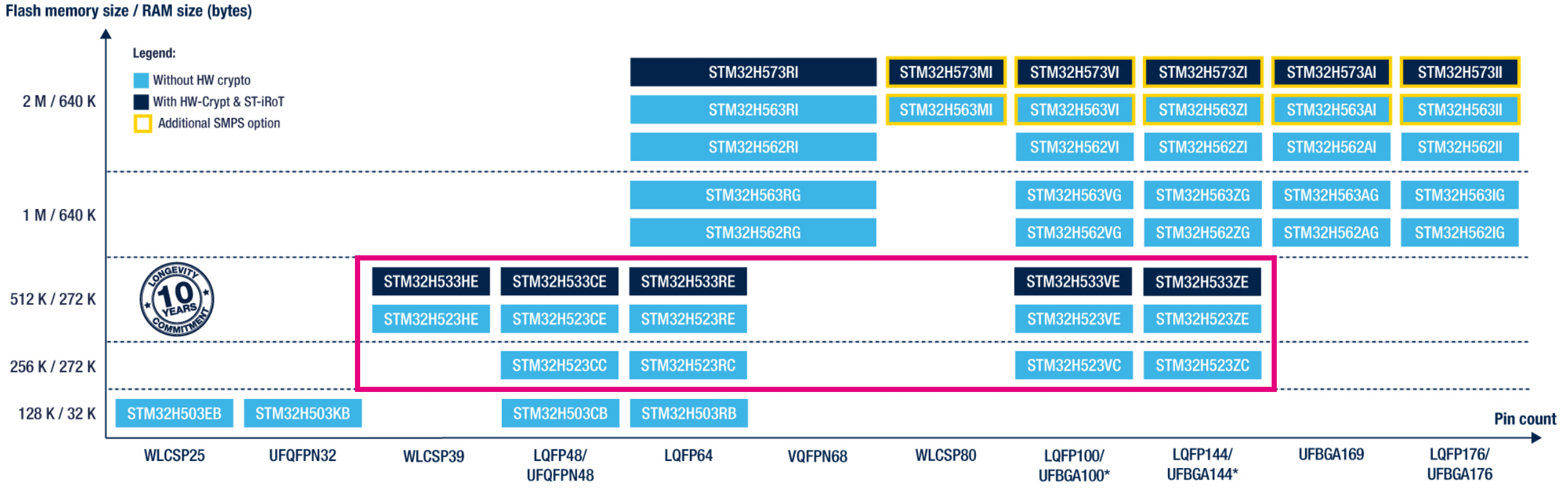
Expanding the STM32H5 series with STM32H523/533 MCUs

	STM32H503	STM32H523	STM32H533	STM32H562	STM32H563	STM32H573
Flash size (KB)	128	256 to 512	512	1024 to 2048	1024 to 2048	2048
RAM size (KB)	32	272	272	640	640	640
USB	FS	FS/UCPD	FS/UCPD	FS/UCPD	FS/UCPD	FS/UCPD
12-bit ADC	1	2	2	2	2	2
Memory I/F		1x SDMMC, FMC, 1x Octo SPI	1x SDMMC, FMC, 1x Octo SPI	1x SDMMC, FMC, 1x Octo SPI	2x SDMMC, FMC, 1x Octo SPI	2x SDMMC, FMC, 1x Octo SPI
FDCAN	1	2	2	1	2	2
Ethernet					Yes	Yes
Power Supply	LDO	LDO	LDO	LDO	SMPS, LDO	SMPS, LDO
Trust Zone		Yes	Yes	Yes	Yes	Yes
AES/SAES, PKA, OTFDEC, HUK, ST-iRoT			Yes			Yes

Latest release

STM32H5 portfolio

A large offer with multiple package choices

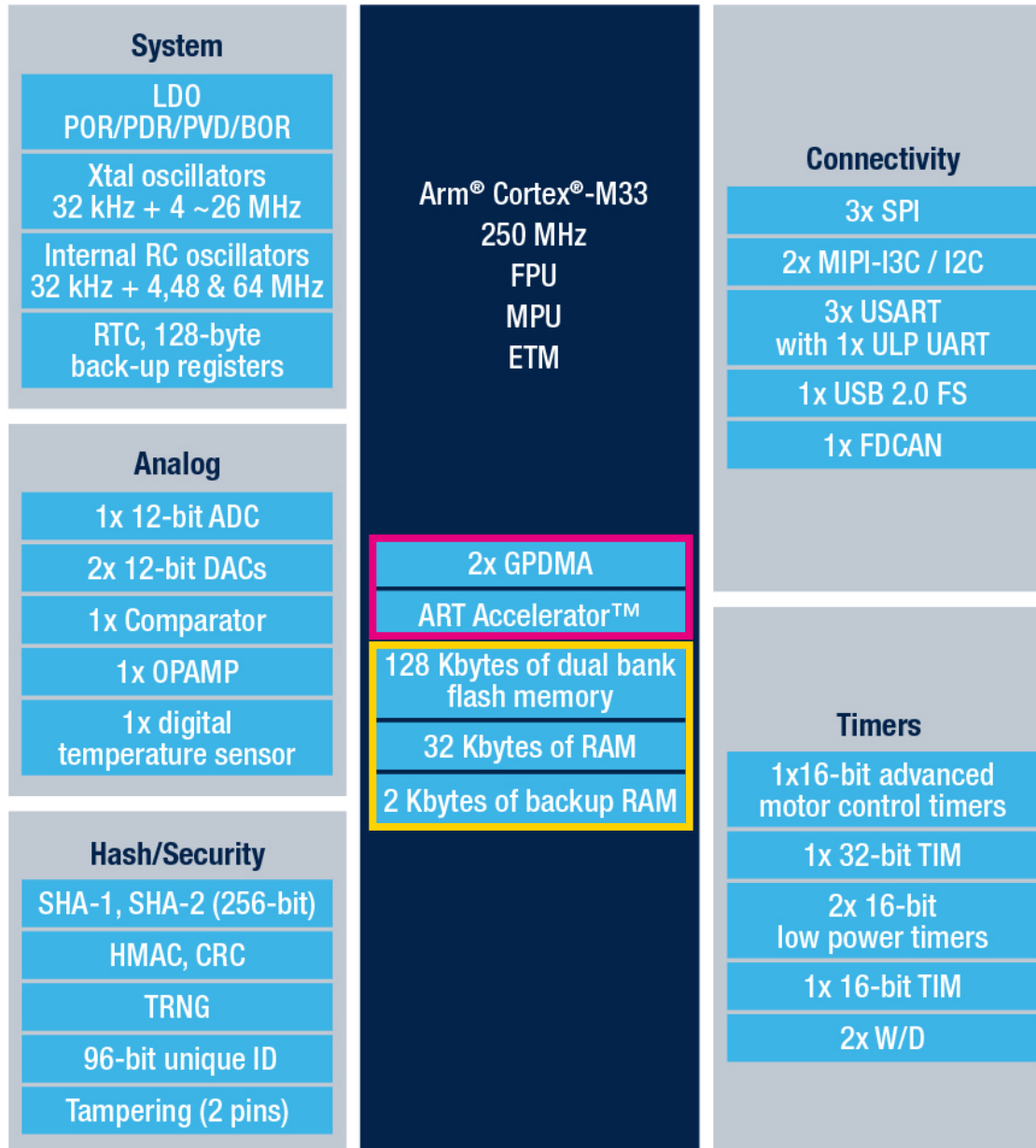


Note: UFBGA100/UFBGA144 are available on STM32H523xx/STM32H533xx only.





STM32H503 MCU block diagram



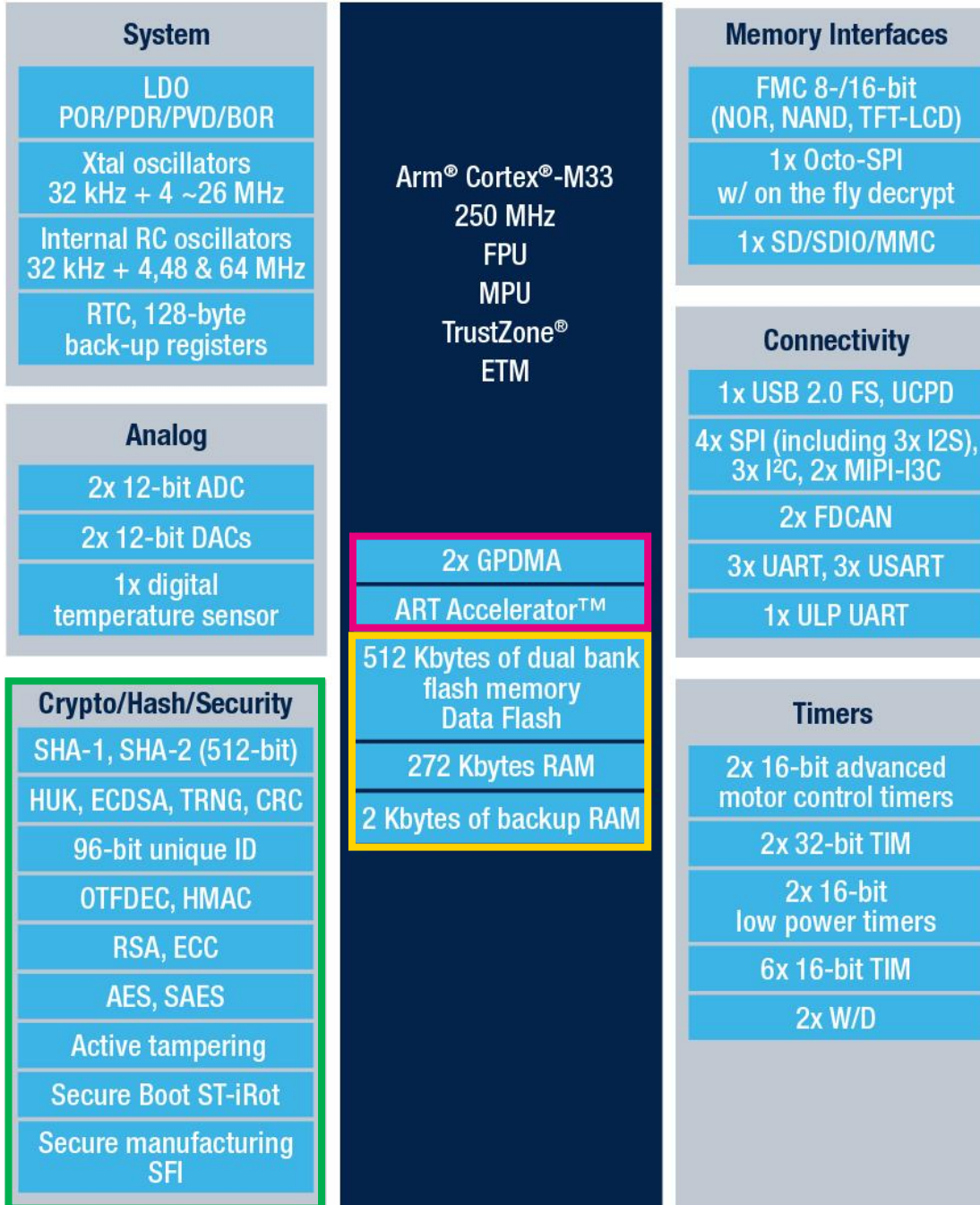
Embedded peripherals

Performance and power efficiency

Embedded memory



STM32H523/33 MCU block diagram



Numerous integrated peripherals

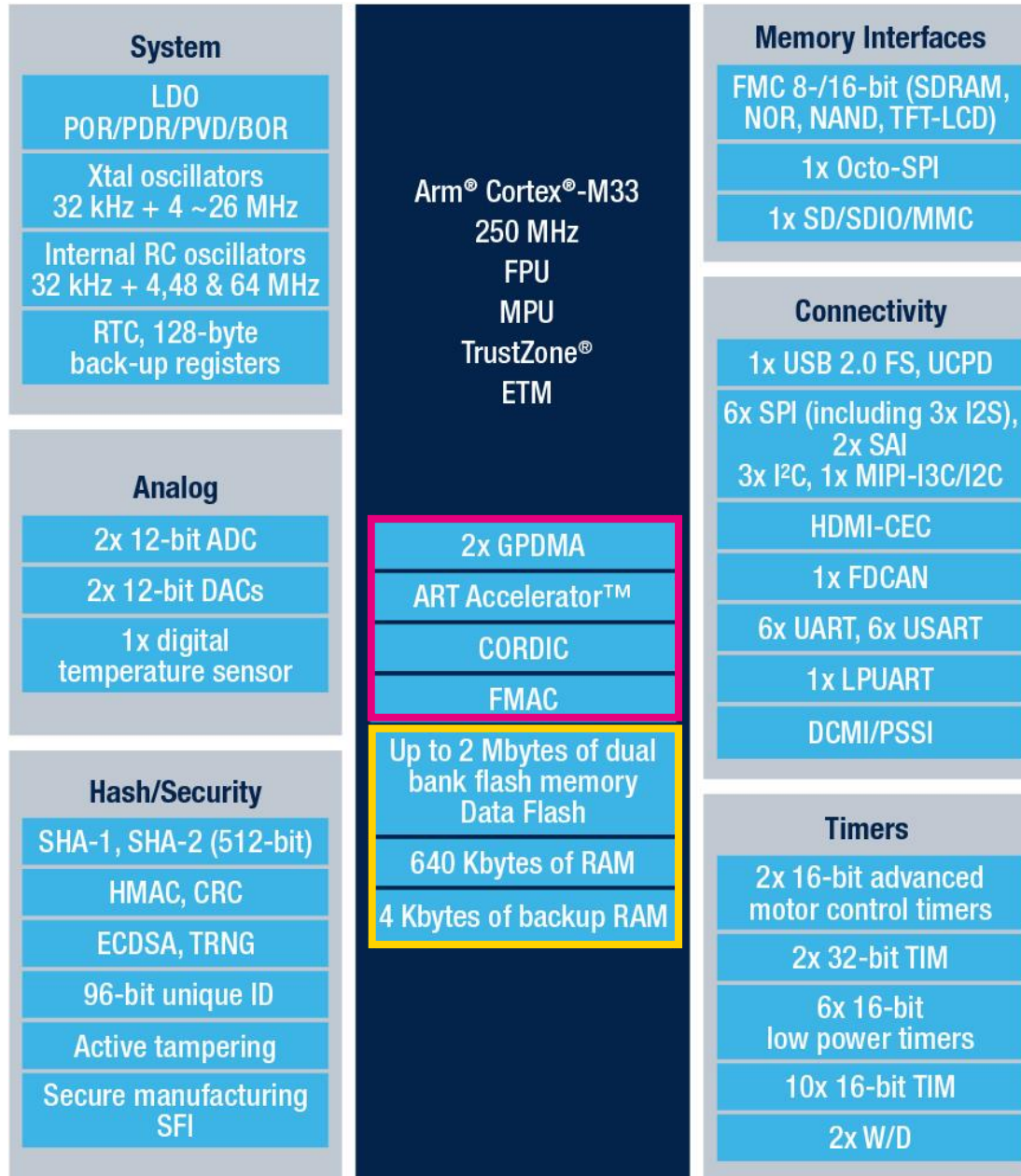
Performance and power efficiency

Embedded memory

Advanced security
on STM32H533 only



STM32H562 MCU block diagram



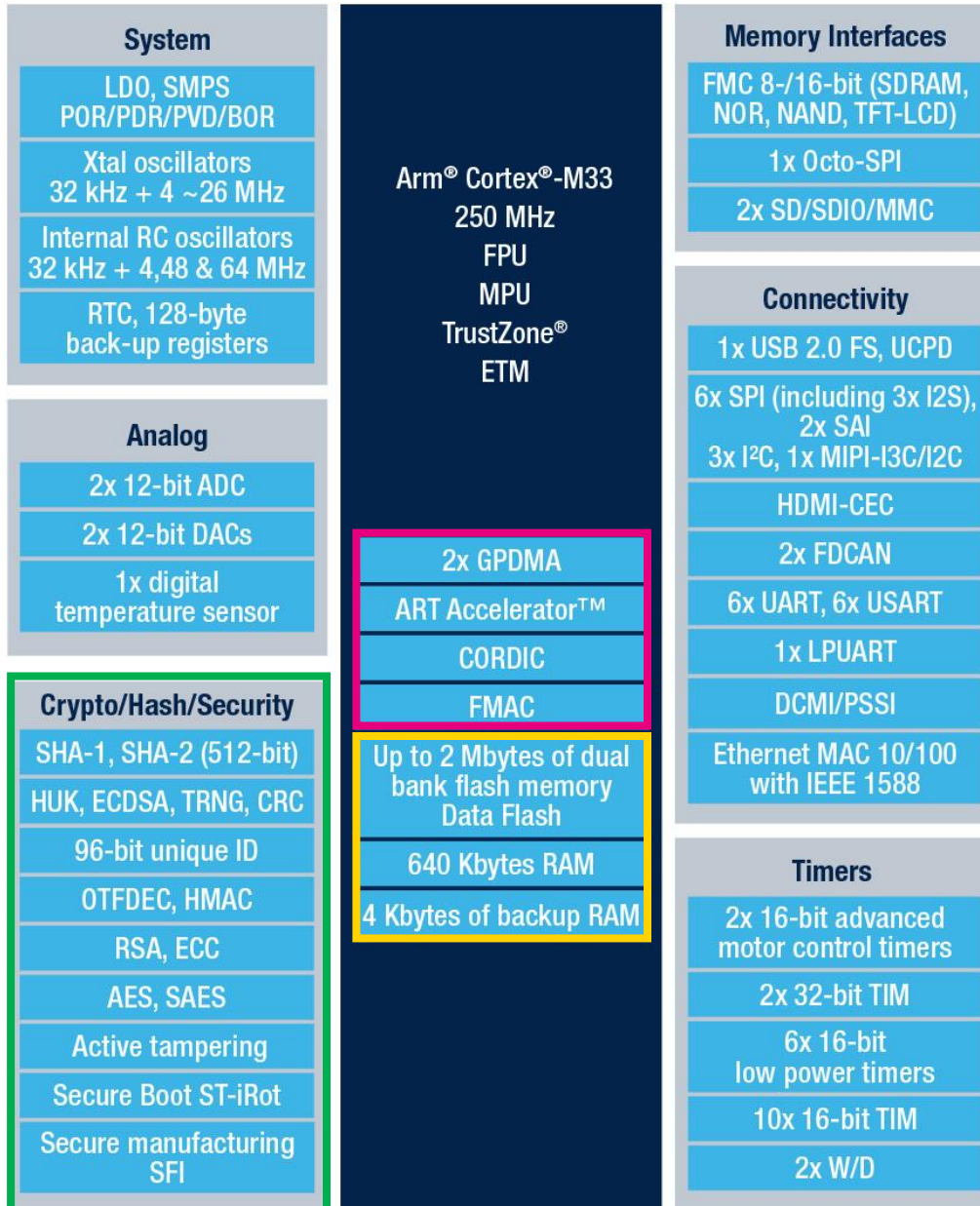
Embedded peripherals

Advanced accelerator

Embedded memory



STM32H563/73 MCU block diagram



Numerous integrated peripherals

Advanced accelerators

Large embedded memory

Advanced security
on STM32H573 only



Multiple package options



32/48/68-pin QFN
25/39/80-pin WLCSP

48/64/100/144/176-pin LQFP
100/144/169/176-pin UFBGA



5 memory size options

1 or 2 Mbytes Flash / 640 Kbytes RAM
256 or 512 Kbytes Flash / 272 Kbytes RAM
128 Kbytes Flash / 32 Kbytes RAM



Security options

With hardware crypto and ST-iRoT
Without hardware crypto and ST-iRoT

**More than
45 products**



STM32Cube framework

Tools and software supporting you during all your design steps

Evaluation,
prototyping
and selection

Hardware and
software
configuration

Application development and debug

Code and hardware
options
programming

Run-time
application
monitoring



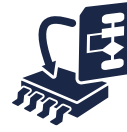
STM32
Finder
STM32
evaluation
Tools



STM32
CubeMX



STM32
CubeMCU Packages



STM32
CubeExpansion

&
Verticals and
partner solutions



STM32
CubeIDE

&
Partner IDEs



STM32
CubeProgrammer

&
Programmers from partners



STM32
CubeMonitor

Worldwide support channels



STM32Cube framework

Helping developers release their creativity

Comprehensive offer helping you accelerate your development

Focus on quality, compatibility, and stability

Documentations, training and worldwide support channels

STM32 MCU Developer Zone
Everything for STM32 developers in one place



Applicative reference implementations

Extension libraries and AI toolkit

Hardware

Embedded SDK

Development tool kit

Development resources

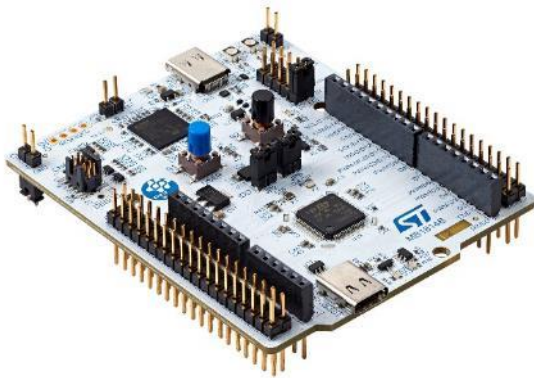




Development tools for the STM32H5 series

Jump-start your evaluation, prototype, and design

* \$15

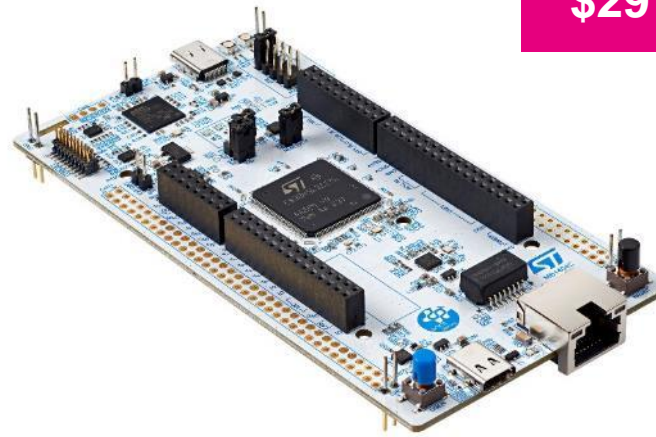


NUCLEO-H503RB
NUCLEO-H533RE

Affordable prototyping

USB, Arduino uno IF, 64-pin MCU

* \$29

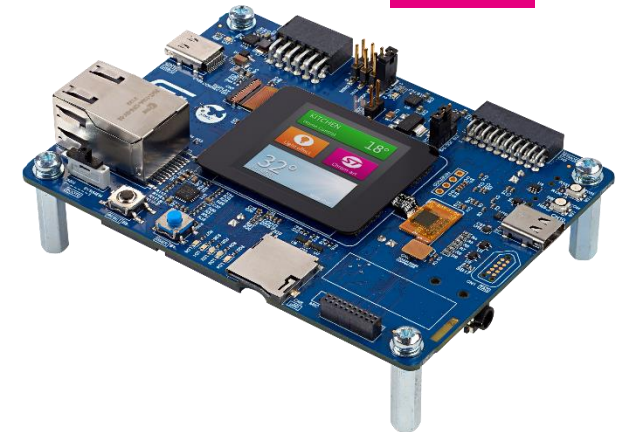


NUCLEO-H563ZI

Affordable prototyping

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

* \$99



STM32H573I-DK

Multi-connectivity kit

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



STM32Cube expansions cloud reference integrations

Easily connect your devices to main cloud service providers

Security

- ✓ Secure boot
- ✓ Private key and secrets storage
- ✓ Seamless registration process
- ✓ X509 certificate

Ready-to-run project

- ✓ Quick Connect script
- ✓ Project example
- ✓ Secure and non secure project

STM32H5 connects smart things
to major cloud providers in a
secure way

STM32 
CubeExpansion



Connectivity

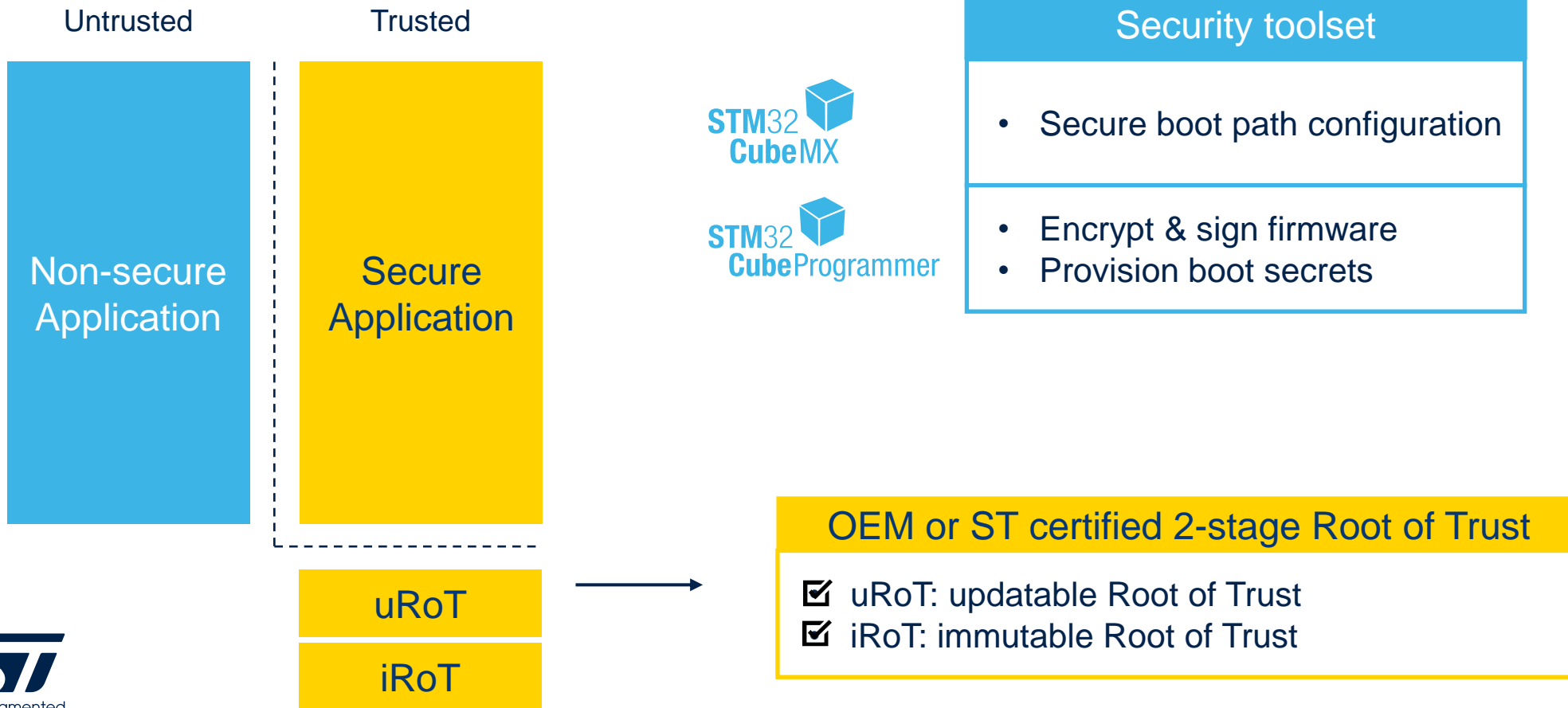
- ✓ Cellular
- ✓ Wi-Fi
- ✓ Ethernet

Cloud SDK

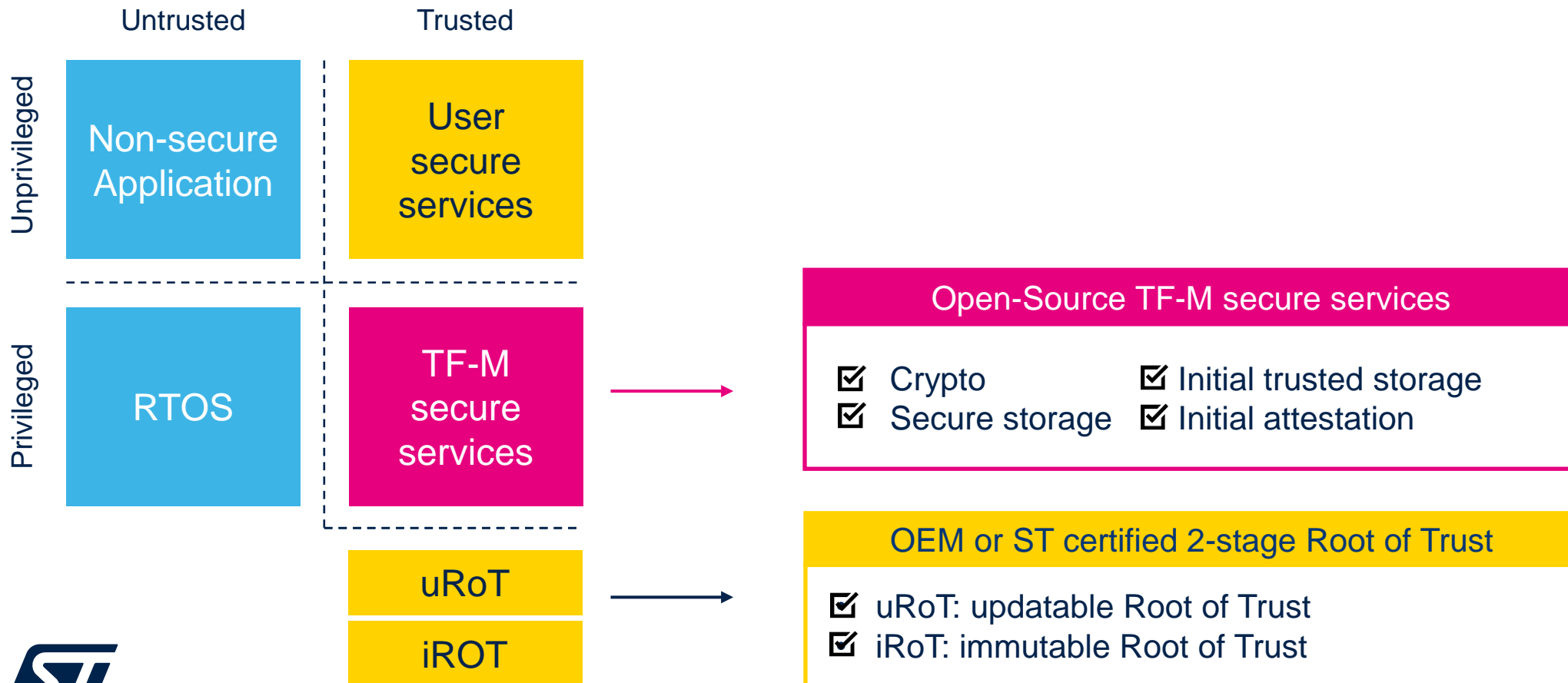
- ✓ Secure cloud connection
- ✓ MQTT based secure communication
- ✓ Secure Firmware update



Reference for PSA immutable Root of Trust



Scalable reference firmware leveraging STM32H5 security features

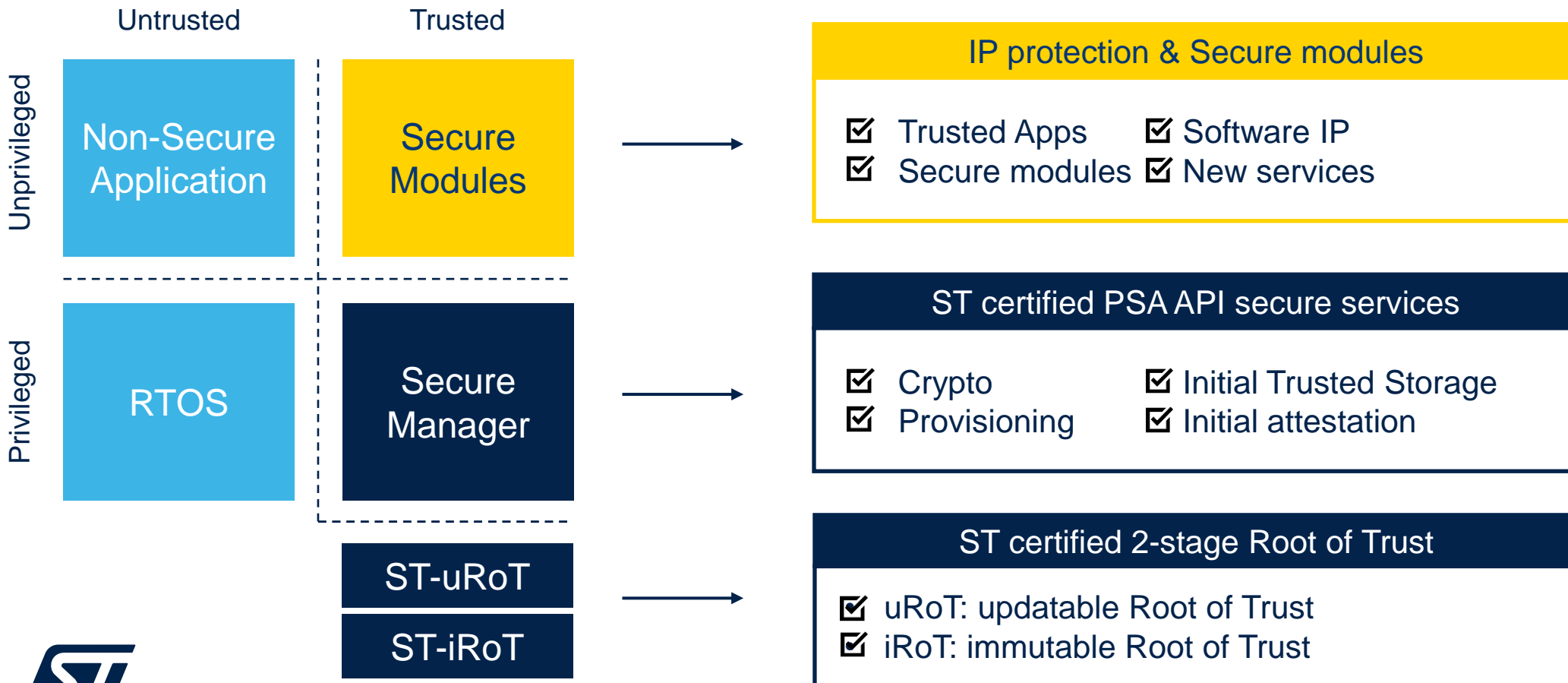


TrustedFirmware target certification



psacertified™ level three target certification

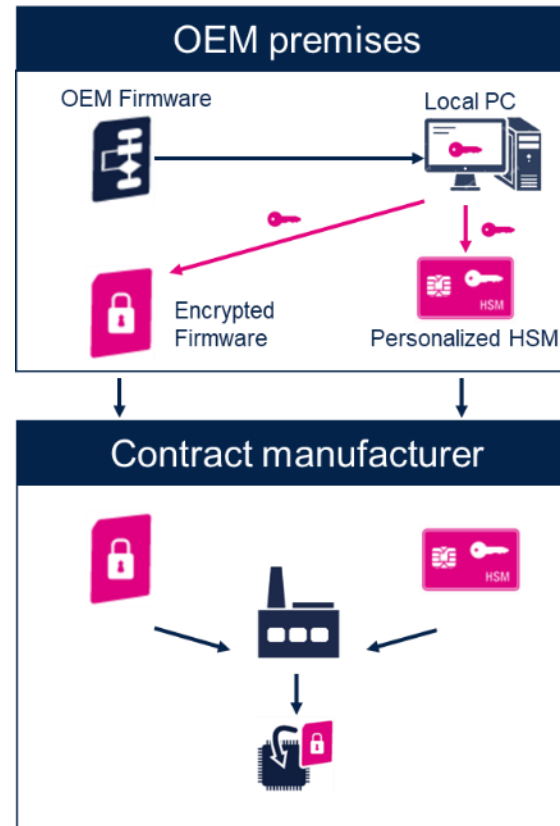
A certified set of SoC security services to reduce design effort



Secure your production flow

Secure Firmware Install (SFI)

Protect application firmware during the manufacturing stage



End-to-End security Programming

Complete toolset to encrypt OEM binaries with the [STM32 Trusted Package Creator](#) software

Securely flash the STM32 with licenses from a [STM32HSM](#) at the programming partner location

Control the [number of devices](#) programmed with the firmware



Start your project based on the STM32H5 now!

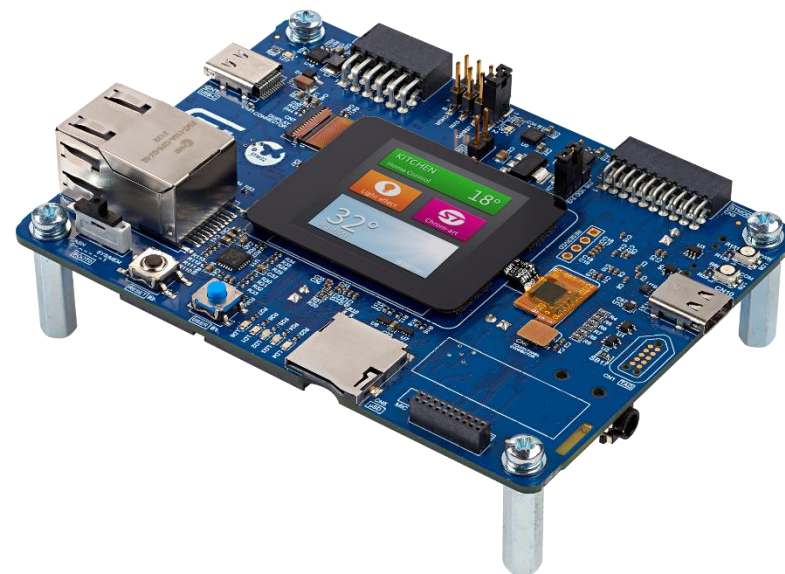
STM32H573I-DK

High performance

Scalable security

Optimized cost/performance

Available now!



Releasing your creativity



[@STM32](#)



[@ST_World](#)



[community.st.com](#)



[www.st.com/stm32h5](#)



[wiki.st.com/stm32mcu](#)



[github.com/stm32-hotspot](#)



[www.st.com/stm32-mcu-developer-zone](#)



Our technology starts with You



Find out more at www.st.com/STM32H5

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