Releasing your creativity

Discover the STM32 family of microcontrollers & microprocessors

STM32

STM32: a developer-first strategy since 2007

STM32 is a key enabler: empowering embedded developers around the world to release their creativity.

We provide embedded developers with cutting-edge hardware and software technology, comprehensive support, and high-quality, reliable supply. This helps them build designs that are smarter, more connected, and more secure.

The first choice for 32-bit MCU developers

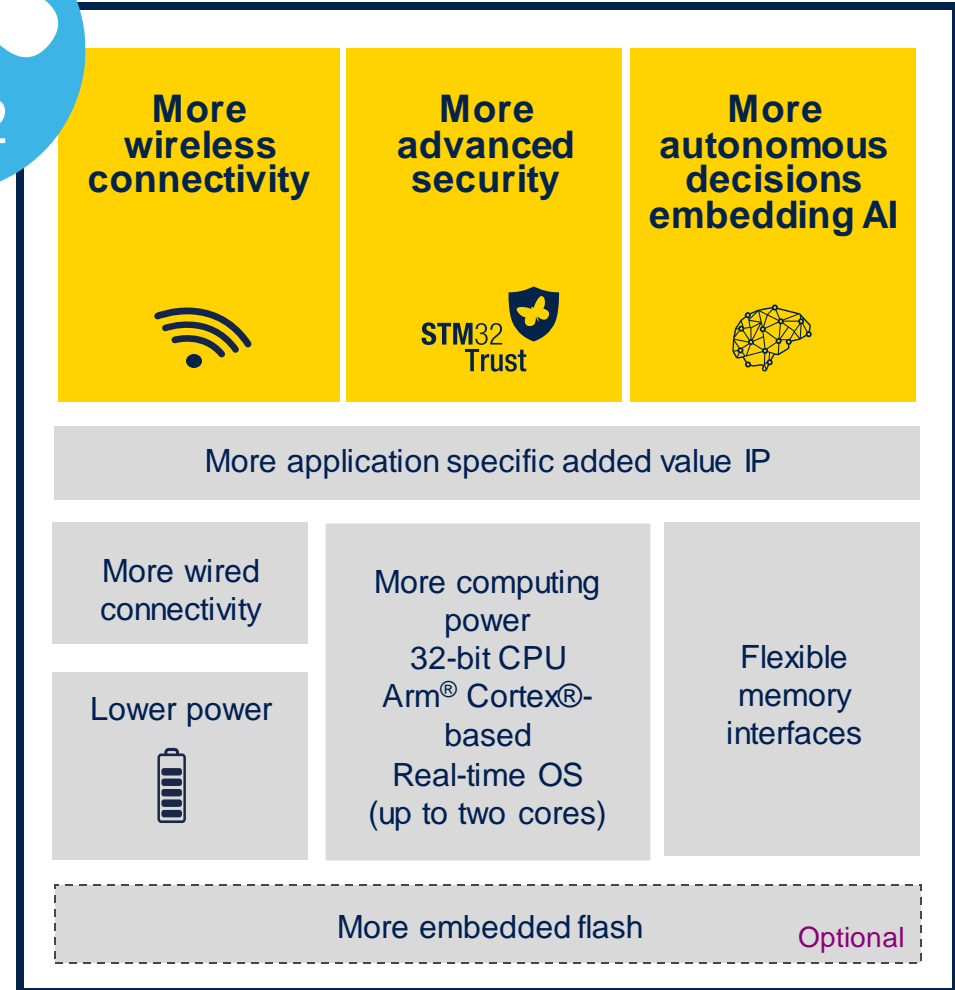Source: Aspencore embedded survey, 2022

#1 GP MCU Worldwide

Source: OMDIA CLT, 2022, 2023

100,000+ customers

Our technology starts with You

Supporting developers' needs

STM32

More wireless connectivity	More advanced security	More autonomous decisions embedding AI

More application specific added value IP

More wired connectivity	More computing power 32-bit CPU Arm® Cortex®-based Real-time OS (up to two cores)	Flexible memory interfaces
Lower power		

More embedded flash · Optional

life.augmented

What the STM32 family offers

Real-time performance

- Powerful Cortex® cores
- Multicore performance
- Fast interfaces
- Hardware accelerators

Outstanding power efficiency

- Ultra-low dynamic power consumption
- Long lifetime, small battery
- Sustainable technology

Advanced, innovative peripherals

- Graphic acceleration
- Digital & analog peripherals
- USB Type-C®
- Peripherals for wireless and edge AI solutions

Optimized integration

- Best fit for application requirements (package size, cost, performance)
- Safety & security features

Extensive ecosystem

- Comprehensive development tools
- Wide range of partners
- Community support

3,700+ part numbers

Rolling 10-year longevity commitment for continuous supply

STM32

Five product categories

Wireless MCU	Ultra-low-power MCU	Mainstream MCU	High-performance MCU	Embedded MPU

Short- and long-range connectivity 32-bit general-purpose microcontrollers: from 75 to 3,224 CoreMark score 32- and 64-bit microprocessors
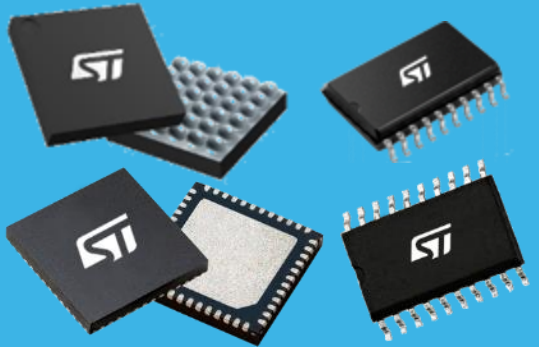
Enabling edge AI solutions

Scalable security

ST Public

Addressing entry-level to high-performance applications

90+ package types from 5 to 784 mm²

20- to 68-pin QFN
18- to 208-pin WLCSP
20-pin TSSOP
8-pin SO
32- to 208-pin LQFP
64- to 240-pin(+25) BGA

Multiple memory options

From 8 Kbytes to 4 Mbytes flash memory
From 2 Kbytes to 2 Mbytes RAM

XXL

STM32C0

XXS

8 pins
16 Kbytes flash memory
32 MHz

STM32H7

240+25 pins
2 Mbytes flash memory
550 MHz

STM32 portfolio

MPU

STM32**MP1**	STM32**MP2**
Up to 1 GHz Cortex-A7	Dual 1.5 GHz Cortex-A35
209 MHz Cortex-M4	400 MHz Cortex-M33

LONGEVITY 10 YEARS COMMITMENT

High-performance MCUs

	STM32**F7**	STM32**H7**	STM32**N6**
	1082 CoreMark	Up to 3224 CoreMark	MCU with neural
	216 MHz Cortex-M7	Up to 600 MHz Cortex -M7	processing unit
		240 MHz Cortex -M4	

STM32**F2**	STM32**F4**	STM32**H5**
Up to 398 CoreMark	Up to 608 CoreMark	Up to 1023 CoreMark
120 MHz Cortex-M3	180 MHz Cortex-M4	250 MHz Cortex-M33

Mainstream MCUs

STM32**F3**	STM32**G4**	Mixed-signal MCUs
245 CoreMark	569 CoreMark	
72 MHz Cortex-M4	170 MHz Cortex-M4	

STM32**C0**	STM32**F0**	STM32**G0**	STM32**F1**
114 CoreMark	106 CoreMark	142 CoreMark	177 CoreMark
48 MHz Cortex M0+	48 MHz Cortex-M0	64 MHz Cortex-M0+	72 MHz Cortex-M3

Ultra-low-power MCUs

STM32**L0**	STM32**U0**	STM32**L4**	STM32**L4+**	STM32**L5**	STM32**U5**
75 CoreMark	140 CoreMark	273 CoreMark	409 CoreMark	443 CoreMark	651 CoreMark
32 MHz Cortex-M0+	48 MHz Cortex-M0+	80 MHz Cortex-M4	120 MHz Cortex-M4	110 MHz Cortex-M33	160 MHz Cortex-M33

Wireless MCUs

STM32**WL**	STM32**WB0**	STM32**WB**	STM32**WBA**
162 CoreMark	64 MHz Cortex-M0+	216 CoreMark	407 CoreMark
48 MHz Cortex-M4		64 MHz Cortex-M4	100 MHz Cortex-M33
48 MHz Cortex-M0+		32 MHz Cortex-M0+ ●	

Legend:
- ■ Latest product generation
- ● Radio coprocessor only
- ▭ New series or lines introduced in 2024
- ▭ Pre-announcement

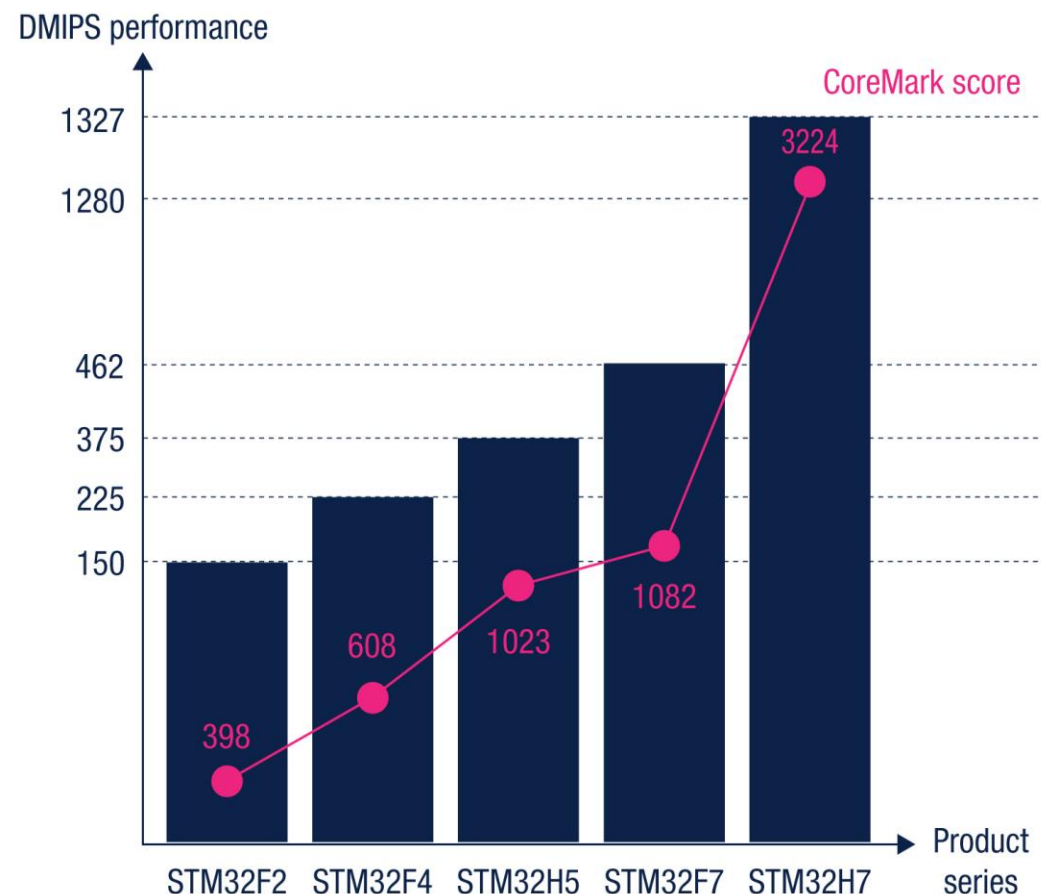life.augmented

STM32 high-performance MCUs

STM32 high-performance MCUs

Up to 3224 CoreMark and a rich set of peripherals

STM32H5
- Arm® Cortex®-M33 at 250 MHz – 375 DMPIS
- From 128 Kbytes to 2 Mbytes of Flash memory
- High performance, scalable security, affordable

STM32H7
- Arm® Cortex®-M7 + Arm® Cortex®-M4 FPU at 480 MHz – 1327 DMIPS and up to 600 MHZ - 1284 DMIPS on single core Arm® Cortex®-M7
- From 64 Kbytes to 2 Mbytes of Flash memory
- High Performance, scalable memory and security

STM32F7
- Arm® Cortex®-M7 + FPU at 216 MHz – 462 DMPIS
- From 256 Kbytes to 2 Mbytes of Flash memory
- Embedded flash & external memories

STM32F4
- Arm® Cortex®-M4 + FPU up to 180 MHz – 225 DMIPS
- From 64 Kbytes to 2 Mbytes of Flash memory
- Cost-effective and power efficiency

STM32F2
- Arm® Cortex®-M3 at 120 MHz – 150 DMIPS
- From 128 Kbytes to 1 Mbyte of Flash memory
- Foundation lines for performance and connectivity

Legend: ◼ Latest product series/lines generation

DMIPS performance

CoreMark score

DMIPS	CoreMark
1327	3224
1280	
462	
375	
225	
150	

398 — 608 — 1023 — 1082 — 3224

STM32F2 STM32F4 STM32H5 STM32F7 STM32H7

Product series

Max performance: 600 MHz bootflash MCU

- Real-time execution from internal or external memories
- High speed serial & parallel memory interfaces up to 200MHz DTR.

Large internal SRAM

High scalability to optimize your design & reduce costs

- Flexible external memory capacity
- 10 packages from cost-effective 68 up to 225 pins

Security assurance: ready for future security directives

- Target security certifications: SESIP Level 3 and PSA certified L3.
- On-the-fly decrypt/encrypt & secure boot

Best-in-class platform for graphics applications

- Powerful 2.5D NeoChrom GPU. Smart DMA architecture memory/GPU
- Enabling UIs with HD resolution

STM32H5 MCU series
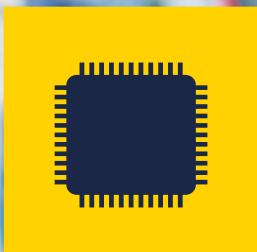# for high performance and strong security

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. First STM32 with TEE.

Optimized cost/performance trade-off
Based on ST's optimized 40 nm process technology.
Large choice of memory, peripherals, and package options.
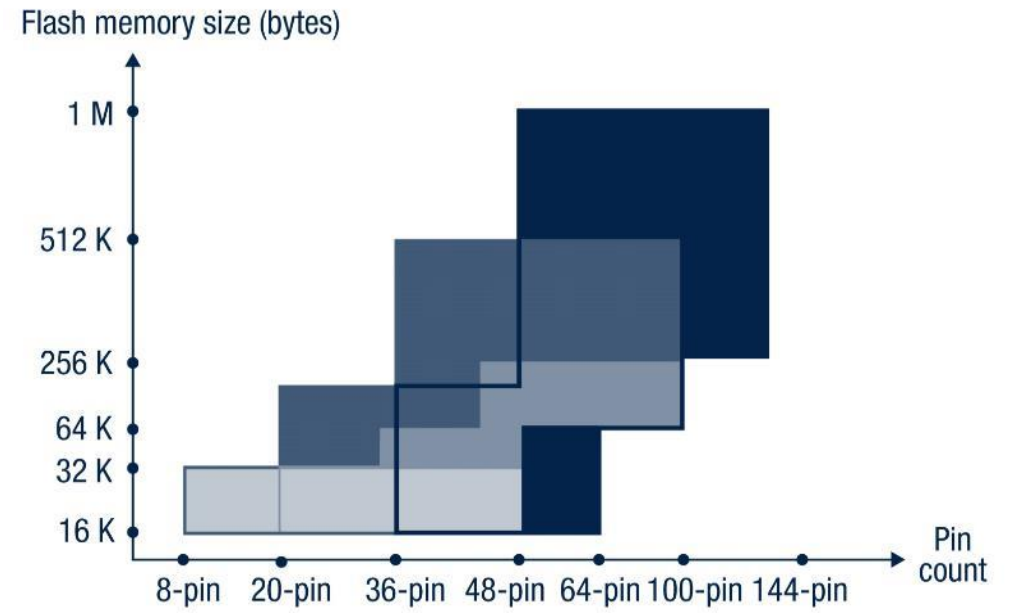
STM32 mainstream MCUs

STM32 mainstream MCUs

STM32G4
- Arm Cortex-M4 + FPU at 170 MHz – 213 DMIPS
- Rich analog peripheral set
- High-resolution timer
- Mathematical accelerators

STM32F3
- Arm Cortex-M4 + FPU at 72 MHz – 90 DMIPS
- Rich analog peripheral set
- High-resolution timer

Instrumentation & Measurement

Digital Power

Motor Control

Mixed-signal MCUs

STM32F1
- Arm Cortex-M3 at 72 MHz – 61 DMIPS
- STM32 Foundation line
- Wide range of performance and peripherals, easy-to-tuse tools

STM32G0
- Arm Cortex-M0+ at 64 MHz – 59 DMIPS
- Maximum IO count per package
- Advanced function is analog, low-power, control

STM32F0
- Entry-level MCU for cost-sensitive operations
- Arm Cortex-M0 at 48 MHz – 38 DMIPS

LATEST GENERATION

STM32C0
- Arm Cortex-M0+ at 48 MHz – 44 DMIPS
- Most affordable entry-cost STM32 32-bit MCU
- Affordable, reliable, continuum with STM32G0

Flash memory size (bytes)

1 M
512 K
256 K
64 K
32 K
16 K

8-pin 20-pin 36-pin 48-pin 64-pin 100-pin 144-pin

Pin count

Legend: ▮ Latest product series/lines generation

14

ST Public

**Streamline costs without compromising performance
with ST's most affordable 32-bit MCU**

$

Affordability
Helps you reduce costs thanks to an attractive price point and an optimized BOM.

Reliability
Benefits from proven STM32 quality & reliability.

Continuity
Consistent pinout with STM32G0 & shares same technological platform.
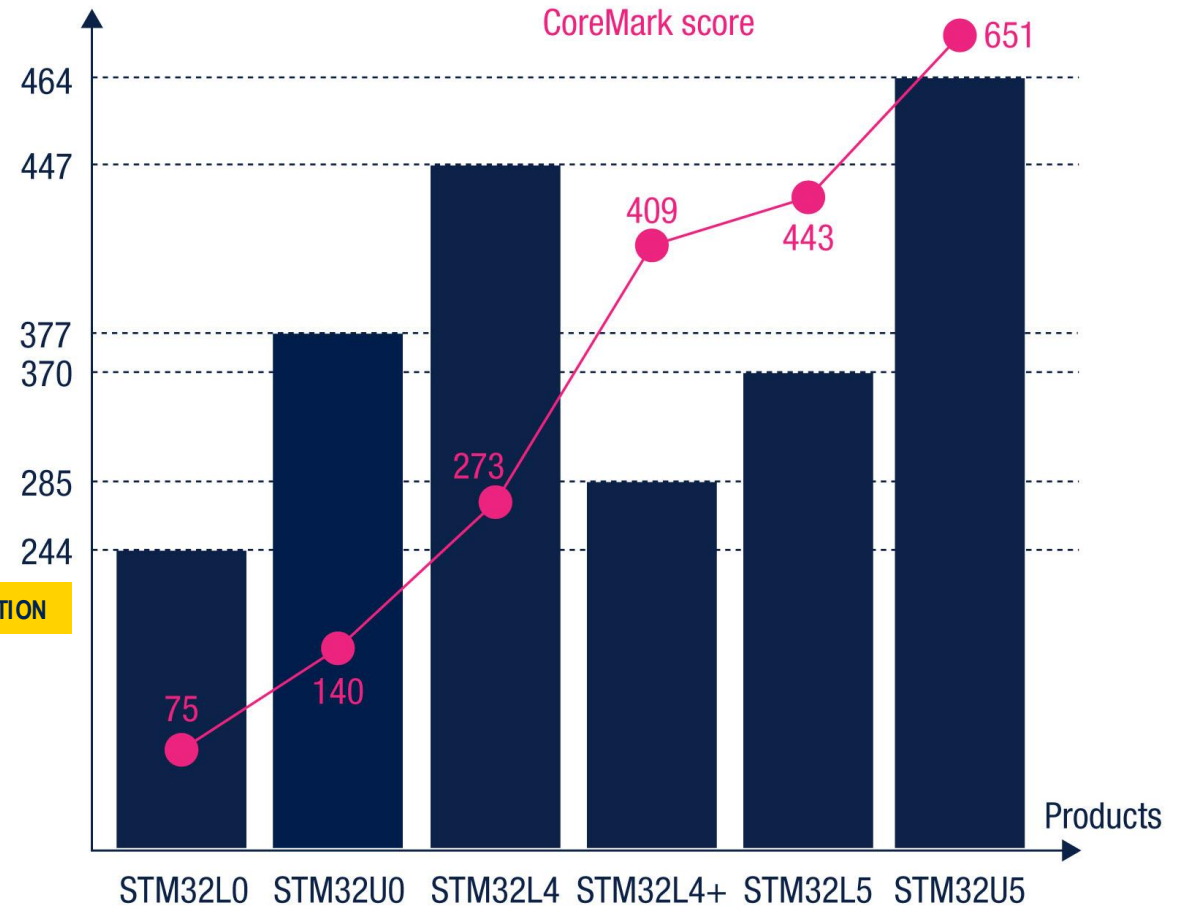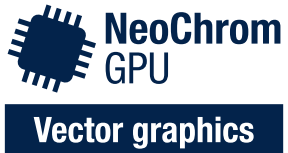
STM32 ultra-low-power MCUs

STM32 ultra-low-power MCUs

STM32U5
- 32-bit Arm® Cortex®-M33 + FPU at 160 MHz
- From 128 to 4 Mbytes of Flash memory
- Lowest power mode with RAM + RTC: 0.35 µA

STM32L5
- 32-bit Arm® Cortex®-M33 + FPU at 110 MHz
- From 256 to 512 Kbytes of Flash memory
- Lowest power mode with RAM + RTC: 0.35 µA

STM32L4+
- 32-bit Arm® Cortex®-M4 + FPU at 120 MHz
- From 512 Kbytes up to 2 Mbytes of Flash memory
- Lowest power mode with RAM + RTC: 0.39 µA

STM32L4
- 32-bit Arm® Cortex®-M4 + FPU at 80 MHz
- From 64 Kbytes to 1 Mbyte of Flash memory
- Lowest power mode with RAM + RTC: 0.34 µA

STM32U0   LATEST GENERATION
- 32-bit Arm® Cortex®-M0+ at 56 MHz
- From 16 to 256 Kbytes of Flash memory
- Lowest power mode with RAM + RTC: 0.25 µA

STM32L0
- 32-bit Arm® Cortex®-M0+ at 32 MHz
- From 8 to 192 Kbytes of Flash memory
- Lowest power mode with RAM + RTC: 0.67 µA

ULPBench score

CoreMark score

Product	ULPBench	CoreMark
STM32L0	244	75
STM32U0	377	140
STM32L4	447	273
STM32L4+	285	409
STM32L5	370	443
STM32U5	464	651

Products

Legend: ▮ Latest product series/lines generation

NeoChrom GPU

Vector graphics

For IoT & embedded applications, up to 4 Mbytes of flash memory

1st MCU certified by the NIST*

High energy efficiency/integration
Innovative power management features. Low power background autonomous mode (LPBAM), DMA, and IP autonomous in LP mode.

High security & safety
AES and PKA, side attack resistant. PSA-Certified and SESIP Level 3 target certifications.
ECC on flash memory and SRAM.

Enhanced graphic performance
First STM32 with advanced graphics accelerators (ART Accelerator) & NeoChrom Vector Graphics GPU based on Arm® Cortex® -M33 running at 160 MHz.

*** the National Institute of Standards and Technology** promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.
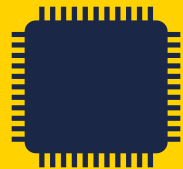
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STM32U0 series: the latest generation of entry-level, ultra-low-power MCUs

**The ideal combination between energy consumption, features, and cost.
Enabling more design freedom in entry-level, battery-operated devices**

Energy savings & longer product usage
Best-in-class static consumption.
Many ultra-low-power modes for greater flexibility.

Integrated features
High integration, incl. LCD driver, MSI internal oscillator, ART accelerator, security and more.

Cost effectiveness
Lower BOM costs thanks to high integration.
Attractive price point.
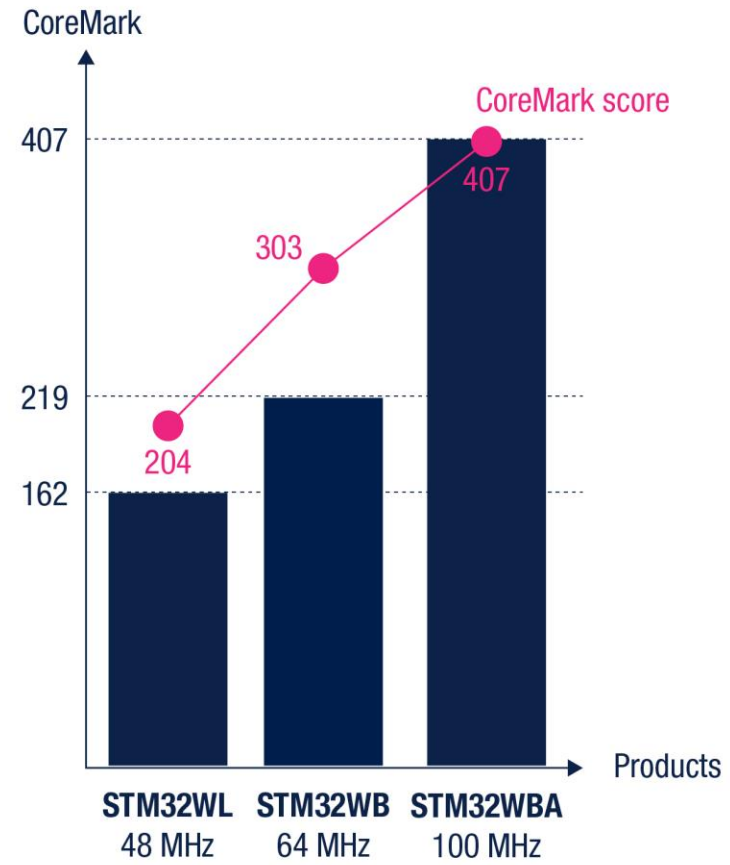Building on proven STM32 ULP series for faster time to market.

STM32 wireless MCUs

STM32WBA

LATEST GENERATION

- Arm® Cortex®-M33 + FPU at 100 MHz
- From 512 Kbytes to 1 Mbyte of Flash memory
- Output power: +10 dBm
- Sensitivity BLE: -96 dBm, 802.15.4: -97.5 dBm

STM32WB

- Arm® Cortex®-M4 at 64 MHz and dedicated M0+ at 32 MHz supporting RF
- From 256 Kbytes to 1 Mbyte of Flash memory
- Output power: +6 dBm
- Sensitivity BLE: -96 dBm, 802.15.4: -100dBm

STM32WB0

- Arm® Cortex®-M0+ at 64 MHz
- From 64 Kbytes to 512 Kbytes of Flash memory
- Output power: +8 dBm
- Sensitivity: -97 dBm (1Mbps) / -104 dBm (125Kbps)

STM32WL

- Arm® Cortex®-M4 and -M0+ at 48 MHz supporting RF
- From 64 Kbytes to 256 Kbytes of Flash memory
- Dual output power: Up to 15 dBm / Up to 22 dBm
- Sensitivity LoRa®: -148 dBm

CoreMark

CoreMark score

407

303

219

204

162

Products

| STM32WL | STM32WB | STM32WBA |
| 48 MHz | 64 MHz | 100 MHz |

Note (*): CoreMark from Flash memory @ 3 V
Pending certification

Legend: Latest product series/lines generation

Faster time-to-market and higher performance for wireless short-range devices

Enhanced wireless performance

Multiprotocol: Bluetooth® LE 5.4, Zigbee, OpenThread, Matter.

+10 dBm output power with low power consumption.

Compliant with the latest security regulations

Featuring TrustZone® technology.

SESIP level 3 target certification.

Simpler and faster development

Rich ecosystem offering hardware, embedded software & tools, documentation.

STM32 microprocessors

STM32MP25

Single or dual Arm® Cortex®-A35 up to 1.5 GHz
Arm® Cortex®-M33 at 400 GHz
NPU at 1.35 TOPS
time-sensitive networking support
3D GPU, 1080p platform

STM32MP2 series

Sampling at OEMs

STM32MP15

Single or dual Arm® Cortex®-A7 up to 800 MHz
Arm® Cortex®-M4 at 209 MHz
3D GPU 720p

STM32MP1 series

STM32MP13

Arm® Cortex®-A7 up to 1 GHz
Power- and cost-efficient with high security

Mass market availability

Cost-efficient MPUs for industrial and secure applications

Power efficiency
- Best-in-class consumption in low power modes
- Over 90% energy savings in standby and VBAT modes

Certified security services for faster time to market
- SESIP L3 and PSA certified
- PCI ready

Accessible
- Strong, user-friendly ecosystem (OpenSTLinux, Linux-RT, RTOS)
- PCB layout reference designs

STM32MP2 MPU series
a step up in performance

Robustness for complex industrial applications

- Industrial-grade MPU
- 10-year rolling longevity program

64-bit MPU with advanced compute capabilities, including edge AI acceleration

- NPU accelerator (up to 1.35 TOPS), run AI on CPU, GPU, or NPU
- Multimedia capabilities (1080p, 3D GPU, LVDS/DSI, and more)

Supporting the growth of connected applications

- Hardware interfaces: TSN support, up to 3 gigabit Ethernet ports (with 2-port switch), PCIe Gen2, USB 3.0, 3 x CAN-FD
- Software & third-party ecosystem

Strong security

- SESIP3 certification target, TrustZone® on Cortex®-A & Cortex®-M,
- Secure provisioning ecosystem, Secure isolation for edge confidential computing
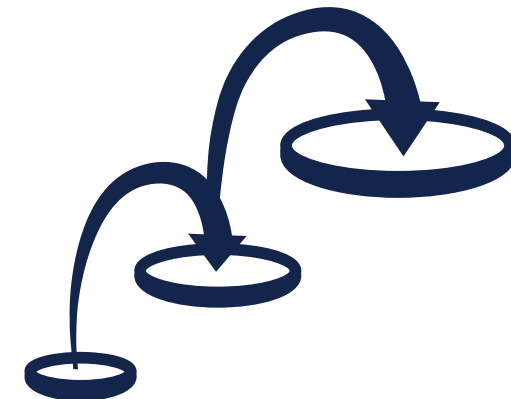
Sampling Q4 2023 / Production Q2 2024

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ST Public

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Developer-first strategy: STM32Cube

STM32 Cube

Hardware tools and software helping you every step of your design journey

STM32Cube framework

Helping developers release their creativity

Comprehensive offer helping you accelerate your development

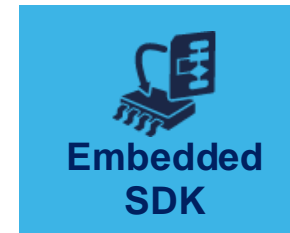Focus on quality, compatibility, and stability

Documentations, training and worldwide support channels

STM32 MCU and MPU 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

STM32Cube framework

Tools and software supporting you during all your design steps

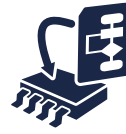| Evaluation, prototyping, and selection	Hardware and software configuration	Application development and debug	Code and hardware options programming	Runtime application monitoring

STM32 Finder · STM32 boards

STM32 CubeMX

STM32 Cube MCU Packages

STM32 Cube Expansion
&
Verticals and partner solutions

STM32 Cube IDE
&
Partner IDEs

STM32 Cube Programmer
&
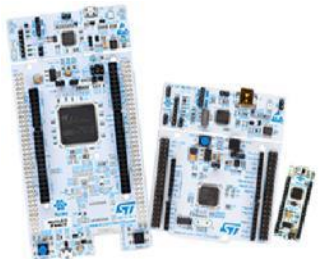**Programmers from partners**

STM32 Cube Monitor

Worldwide support channels

life.augmented

STM32 hardware evaluation tools

Easy prototyping, accurate evaluation, and board design references

$10 → $30*

$10 → $100*

$100 → $500*

STM32 Nucleo boards	Discovery kits	Evaluation boards	Expansion boards	Accessories	Partner boards
Flexible prototyping	Evaluating key features	Full feature evaluation	Add-on functionalities		From full evaluation to open hardware
70+ references	**40+** references	**25+** references	**100+** references		**20+** references

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STM32CubeMCU Packages

Efficient and flexible access to the MCU features

LL drivers	HAL drivers
Lower abstraction level Lower code size	Higher abstraction level Higher portability and reuse

MISRA C compliant, statically analyzed, rigorously tested

A large set of production-ready examples

Available from st.com, GitHub, or STM32Cube tools

STM32CubeMCU Packages

Faster development with an optimized and ported selection of market-reference middleware stacks

Middleware

AzureRTOS ThreadX and FreeRTOS™
AzureRTOS USBX
   With support of audio, CDC, HID, DFU, PIMA, printer, and storage host and device classes
AzureRTOS NetXDuo
   With support of TCP, UDP, IPv4, IPv6, http, MQTT, LWM2M, FTP, PPP, SMTP, and telnet
FileX and levelX
USB PD and open bootloader
Secure boot, Secure Manager API

Expansions

TouchGFX graphics solution,

Motor control,

Artificial intelligence

MEMS and sensors

Secure cloud connectors

Functional safety self-test library

A large set of applicative examples

Available from st.com, GitHub, or STM32Cube tools

STM32 Developer Zone for MCUs & MPUs

Everything for STM32 MCU & MPU developers, in one place

A user-friendly environment to help developers every step of their design journey

Direct access to products, hardware and software tools, embedded software, developer resources

STM32 MCU Developer Zone

STM32 MPU Developer Zone

Watch the short video

STM32 Cube

A growing base of partners addressing customer challenges

- Software development tools
- Hardware development tools
- Embedded software
- Evaluation boards
- Development boards
- Companion devices
- Hardware integrated devices

- Training
- Engineering services
- Design houses
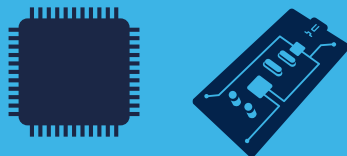- Global services

Click to discover our partners

Partner Program

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Solutions with STM32

Helping you build advanced HMIs with a comprehensive STM32 graphic offering

STM32 hardware
STM32 silicon and development boards

STM32 software
GUI development tools, GUI code Examples, library of graphical assets

Extensive ecosystem

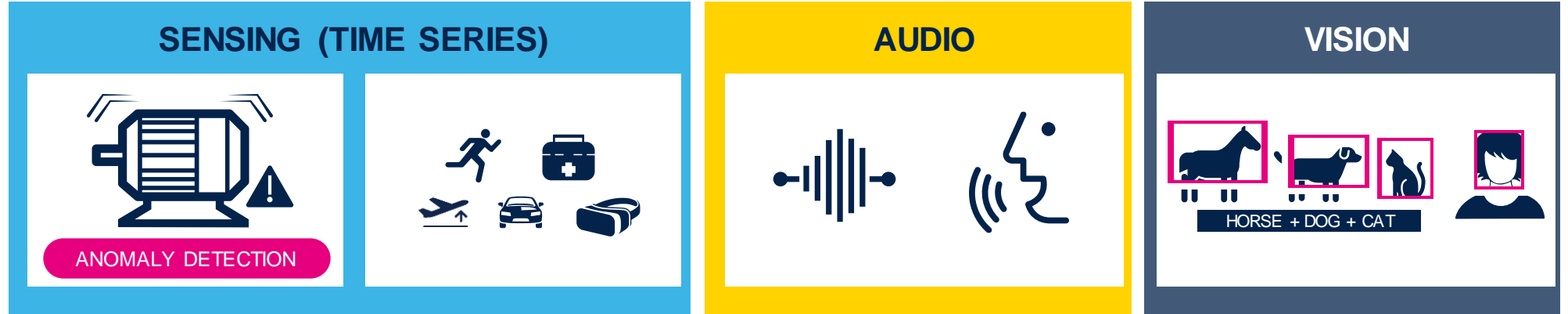**Introducing NeoChrom and NeoChrom VG GPU**

The NeoChrom GPU offloads the CPU from the graphic computations, freeing up the memory and boosting performance. Fully supported in X-CUBE-TOUCHGFX.
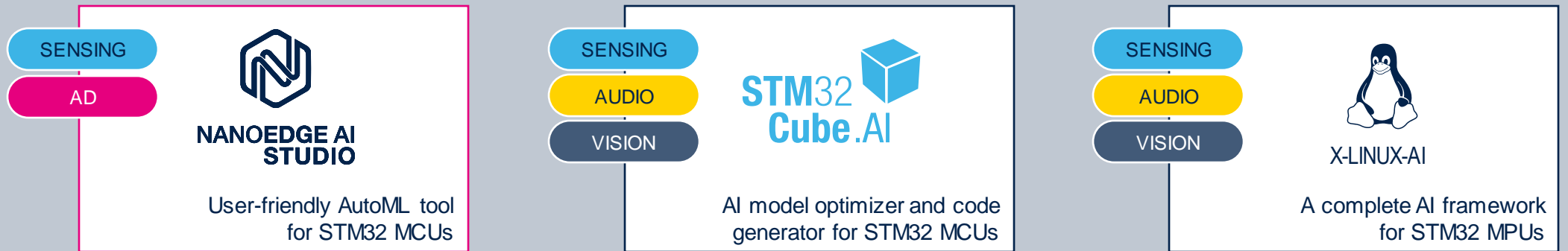
Watch demos, tutorials, and more
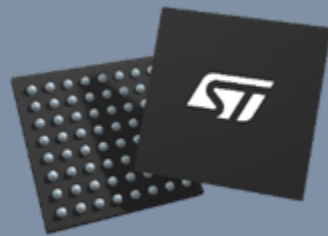
Making edge AI more accessible with STM32 solutions

Enabling major edge AI technologies

SENSING (TIME SERIES)		AUDIO	VISION
ANOMALY DETECTION			HORSE + DOG + CAT

Software tools for any user profile

SENSING
AD

NANOEDGE AI STUDIO
User-friendly AutoML tool for STM32 MCUs

SENSING
AUDIO
VISION

STM32 Cube.AI
AI model optimizer and code generator for STM32 MCUs

SENSING
AUDIO
VISION

X-LINUX-AI
A complete AI framework for STM32 MPUs

Large choice of general purpose & accelerated hardware

STM32 MCUs

STM32N6 MCU (available soon)
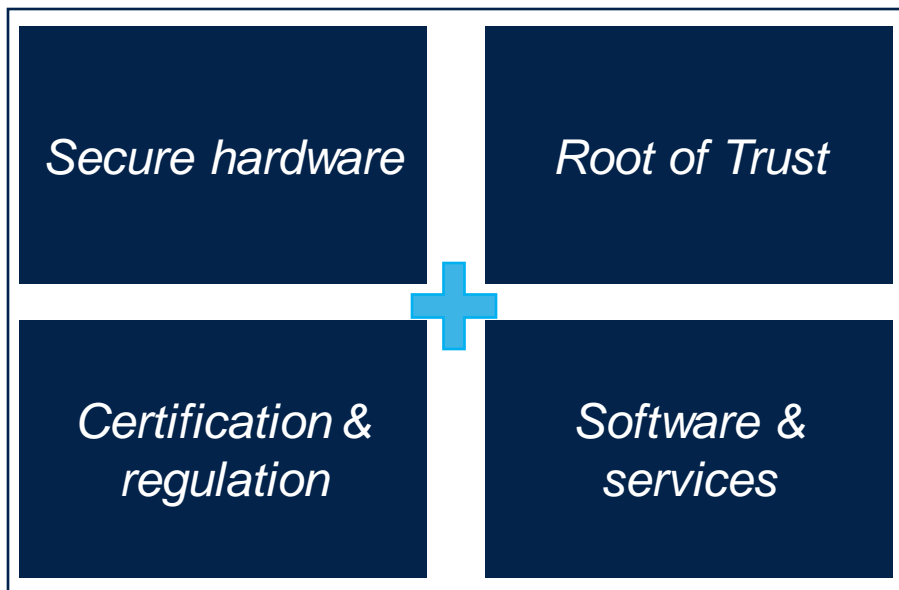
STM32MP1 & STM32MP2 MPUs

Fast-track your certification journey to meet functional safety standards with STM32

ST provides certified **functional safety packages** and documentation based on robust built-in MCU/MPU safety features.
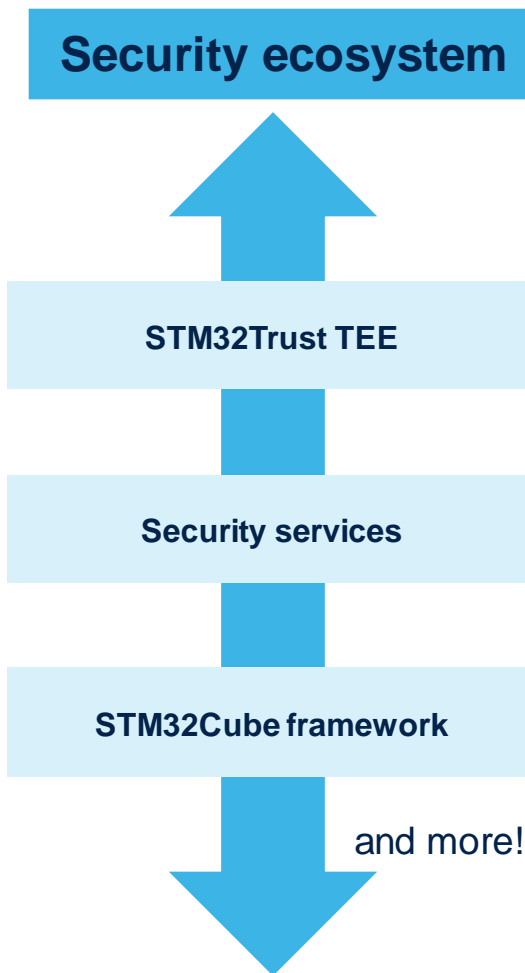
- **SIL functional safety package**
  for industrial IEC 61508 (STM32)

- **ASIL functional safety package**
  for automotive ISO 26262 (STM8A)

- **Class B functional safety package**
  for household electrical appliances
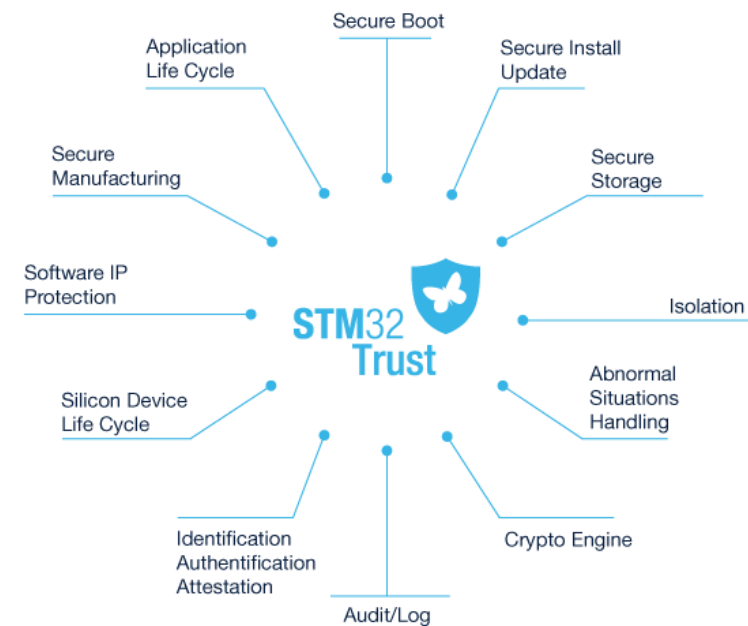 IEC 60335-1/60730-1 (STM32 & STM8)

SIL
Ready

ASIL
Ready

ClassB
Ready

STM32 Functional Safety

Building trust in embedded systems: the pillars of STM32Trust

Secure hardware

Root of Trust

Certification & regulation

Software & services

Security ecosystem

STM32Trust TEE

Security services

STM32Cube framework

and more!

Provide the right levels of security assurance thanks to the STM32Trust security functions

www.st.com/STM32Trust

STM32Trust – target certifications

Motor control with STM32

Ease STM32 adoption for motor control

Providing development platform: MC-SDK (firmware library + workbench), MC pilot, MC profiler, hardware boards, documentation.

Innovative products/peripherals and software algorithms

- Advanced motor control timer
- Rich and advanced analog peripherals embedded in the STM32
- Motor profiler
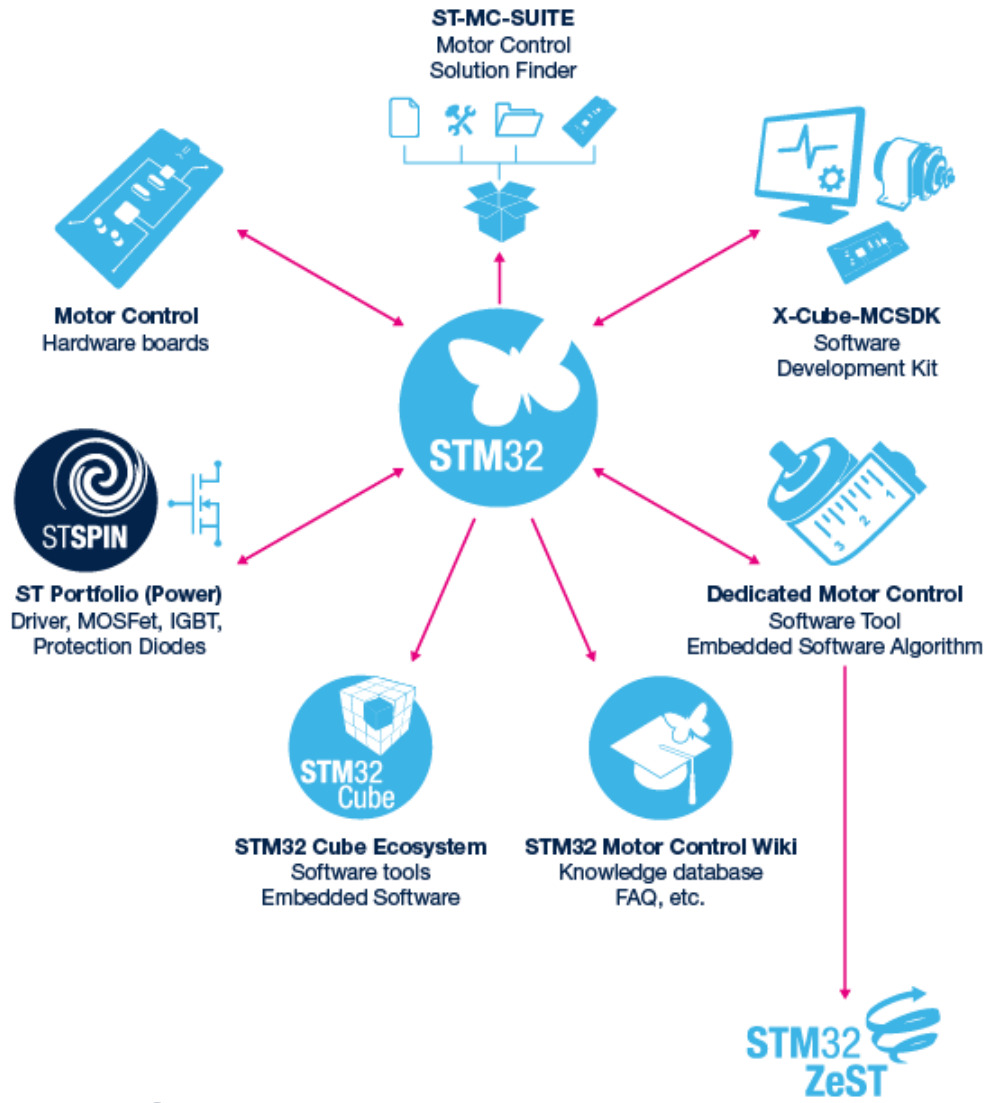- STM32 ZeST and HSO / sensorless algorithms

Leverage ST portfolio

Large choice of power components and STM32 to create end-to-end motor control solutions.

STM32 ZeST

Software algorithm providing full torque at zero speed for any kind of BLDC/PMSM motor in sensorless mode (in addition to the observer HSO algorithm)

LATEST NEWS

ST-MC-SUITE
Motor Control Solution Finder

Motor Control
Hardware boards

X-Cube-MCSDK
Software Development Kit

ST Portfolio (Power)
Driver, MOSFet, IGBT, Protection Diodes

Dedicated Motor Control
Software Tool
Embedded Software Algorithm

STM32 Cube Ecosystem
Software tools
Embedded Software

STM32 Motor Control Wiki
Knowledge database
FAQ, etc.

STM32 ZeST

STM32 Ecosystem for motor control

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Digital power with STM32

Ease STM32 adoption for digital power converters

Development platforms:
DP SDK (PFC and PSU topology examples generator, firmware lib), hardware boards, docs, development tools.

Innovative products/peripherals and software algorithms

- High-resolution timer supporting numerous digital power topologies
- Rich and advanced analog peripherals embedded in STM32
- Hardware coprocessor usage
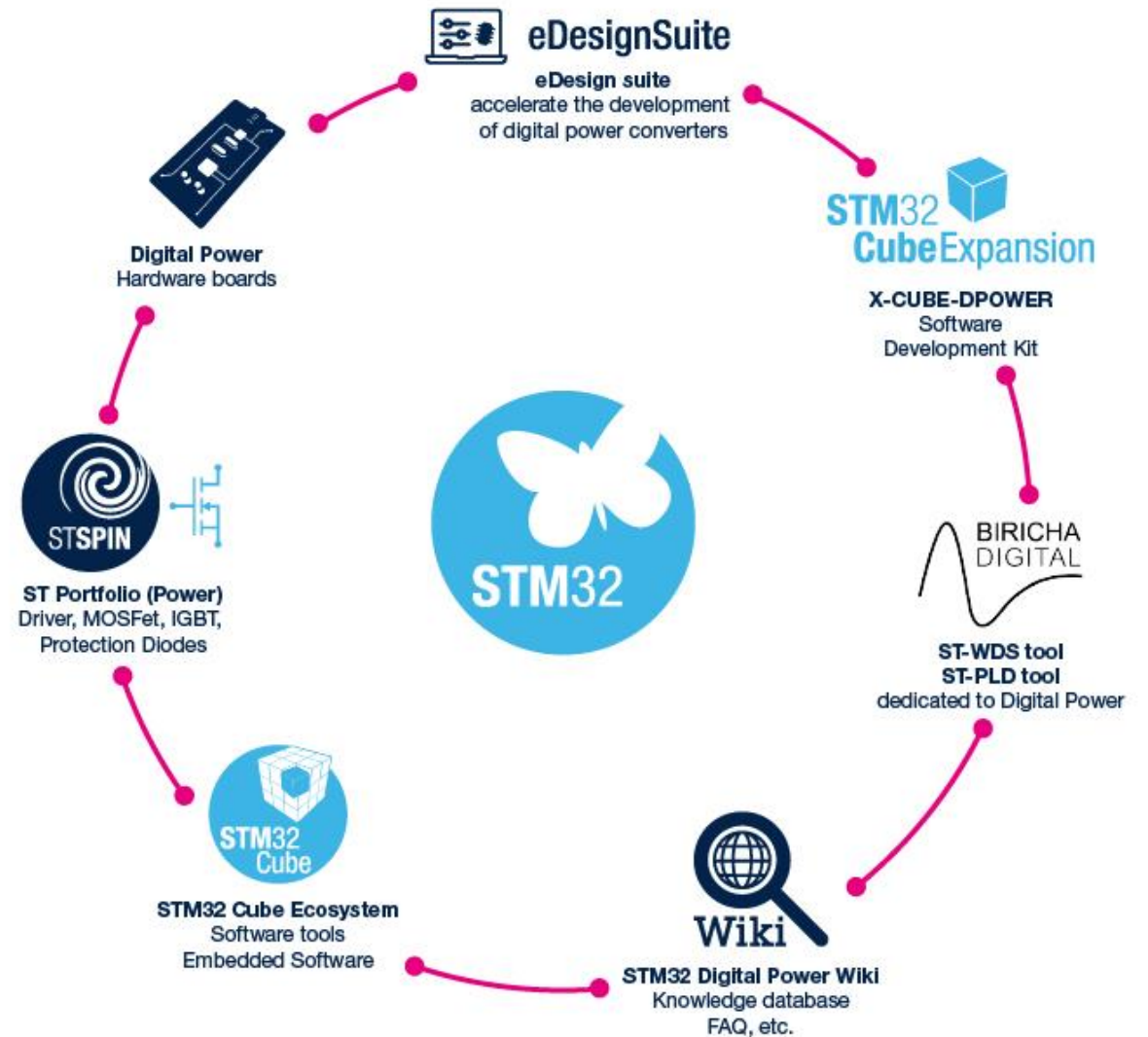- Biricha method implementation (ST Authorized Partner)

Leverage ST portfolio

Large choice of power components and STM32 to create end-to-end digital power solutions.

PFC and PSU within STM32CubeMX

Firmware pack importation with PFC and PSU topologies implementation in voltage or in current mode running on ST boards.

LATEST NEWS

eDesignSuite
eDesign suite
accelerate the development
of digital power converters

STM32 CubeExpansion
X-CUBE-DPOWER
Software
Development Kit

Digital Power
Hardware boards

BIRICHA DIGITAL
ST-WDS tool
ST-PLD tool
dedicated to Digital Power

STSPIN
ST Portfolio (Power)
Driver, MOSFet, IGBT,
Protection Diodes

STM32 Cube Ecosystem
Software tools
Embedded Software

Wiki
STM32 Digital Power Wiki
Knowledge database
FAQ, etc.

STM32 for digital power

USB Type-C® and power delivery with STM32

More than 560 STM32 MCUs feature a certified USB Type-C® and PD3.1 controller

STM32 supports the latest USB Type-C® and PD3.1 standards
- SPR and EPR power range up to 240 W, PPS ready
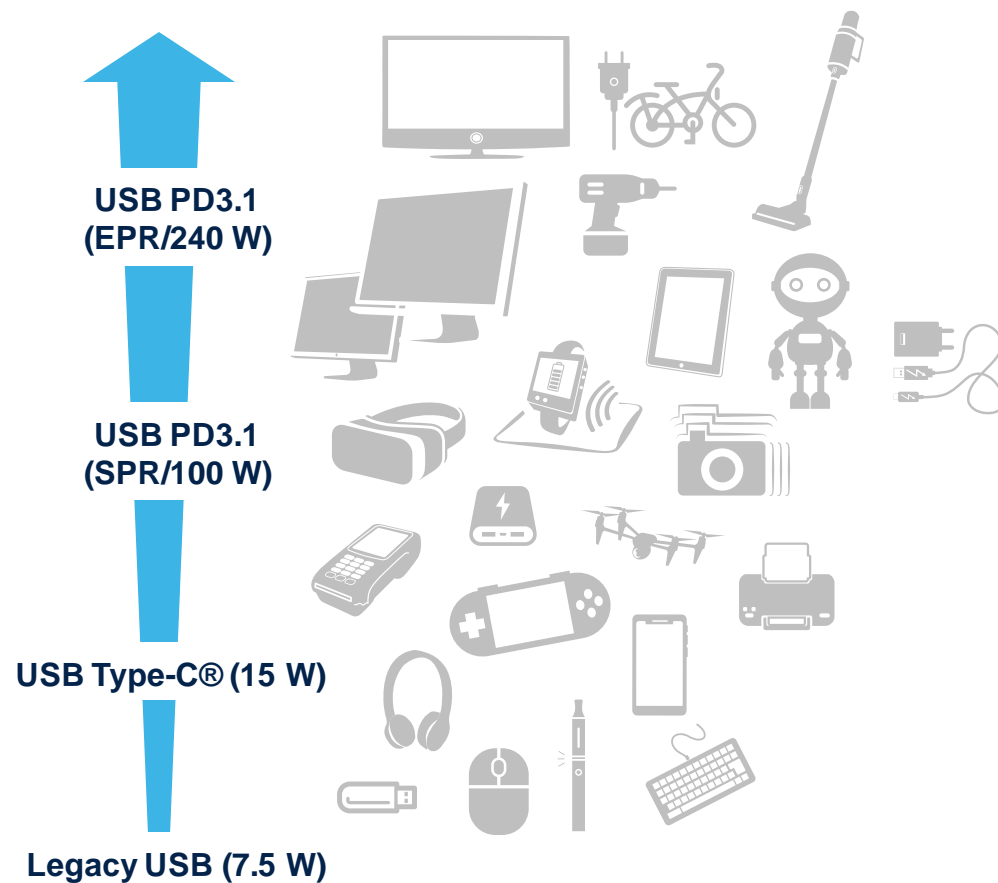- Sink, source, dual-role power and data roles

Optimize bill of material and safety
- CC logic, PD transceiver PHY, USB2 device/host interface
- Companion type-c port protection devices (TCPP0x)

Flexible solution and fast prototyping
- Ready-to-use hardware and firmware examples
- Easy debug with STM32CubeMonUCPD software tool

USB PD3.1
(EPR/240 W)

USB PD3.1
(SPR/100 W)

USB Type-C® (15 W)

Legacy USB (7.5 W)

www.st.com/STM32usbc

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Resources to move forward with your design

**1 Million developers worldwide are using STM32.
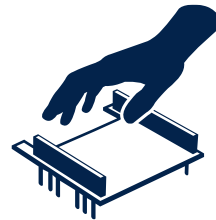Join them, share insights, and accelerate your design.**

FIND INSIGHTS

LEARN & PRACTICE NEW SKILLS

STAY UP TO DATE

Visit the STM32 Community

STM32 **MPU** Wiki
STM32 **MCU** Wiki

GitHub–STMicroelectronics
GitHub–STM32 hotspot

STM32 education

STM32 **MCU** Developer Zone
STM32 **MPU** Developer Zone

Check out our events, workshops, & webinars

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The ST blog

Our technology starts with You

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