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STM32MP13 lines

Cost-efficient MPUs for industrial and secure applications

“

If only

I could optimize my MPU design while meeting the highest security standards!

This is where we come in

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The best of three worlds in a cost-effective MPU

Arm® Cortex®-A7 core running up to 1 GHz

LONGEVITY 10 YEARS COMMITMENT

Accessible

- Strong, user-friendly ecosystem for STM32 MPUs (OpenSTLinux, Linux-RT, RTOS)
- PCB layout reference designs

Secure

- Strong robustness
- Certified for faster time to market

Power efficient

- Best-in-class consumption in low power modes
- Over 90% energy savings in Standby and V_{BAT} modes

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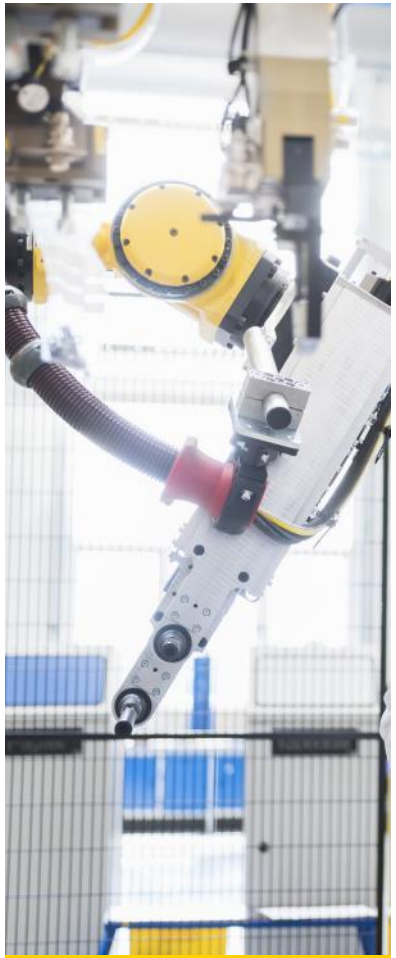
Making your applications future proof

Industry 4.0



Factory automation

Payment terminals & secure applications

Smart metering

Smart homes

EV charging infrastructure

The right choice for your industrial applications

Industrial grade

Industrial qualification for demanding applications:

- 100% operating time for 10 years
- Junction temperature support from -40°C to +125°C

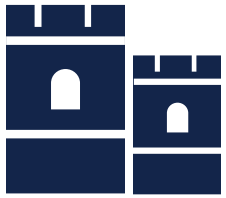
System performance

- Built on Arm® Cortex®-A7 core running from 650 MHz and up to 1 GHz
- System performances:
  - DRAM interface at 533 MHz
  - Optimized interconnect

Certified security services for faster time to market

Memory protections
against illegal access control

Cryptographic accelerator
for hardware robustness



Platform authentication
during product lifecycle

Code isolation
for runtime protection

Hardware - security assurance level 3

Security ecosystem

Trusted execution with OP-TEE

Secure Secret Provisioning (SSP)

STM32Cube framework for MPU

and more!

SESIP™3

PCI ready

psacertified™ level one

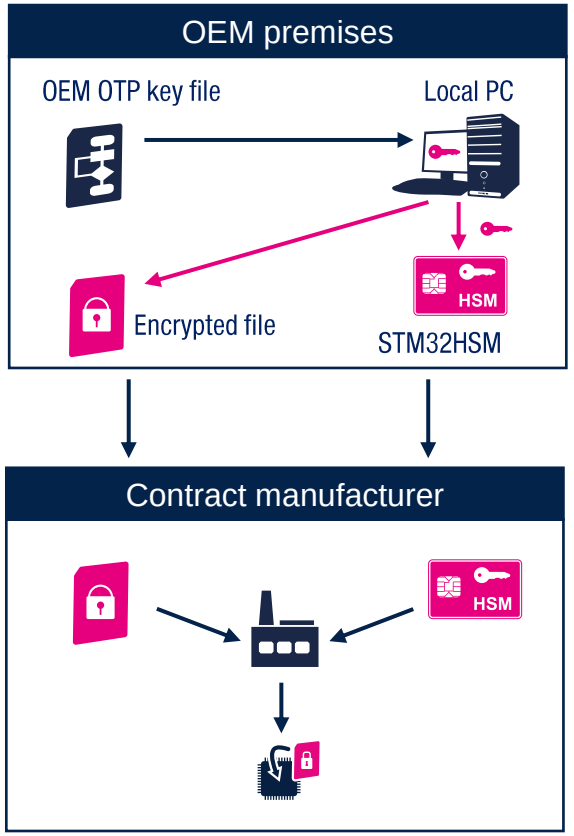
OP-TEE* at a glance

- A **certified SoC security offer** around Secure Boot chain & TrustZone®
- **Open-source solution** with long term support
- **Ready-to-use secure functions**: code isolation, crypto functions, secure key & data storage, firmware update
- **Complete STM32 ecosystem** tools integration & support

* Open Portable - Trusted Execution Environment

Secure your production flow
Secure Secret Provisioning (SSP)

Protect application one-time programmable (OTP) keys at the contract manufacturer



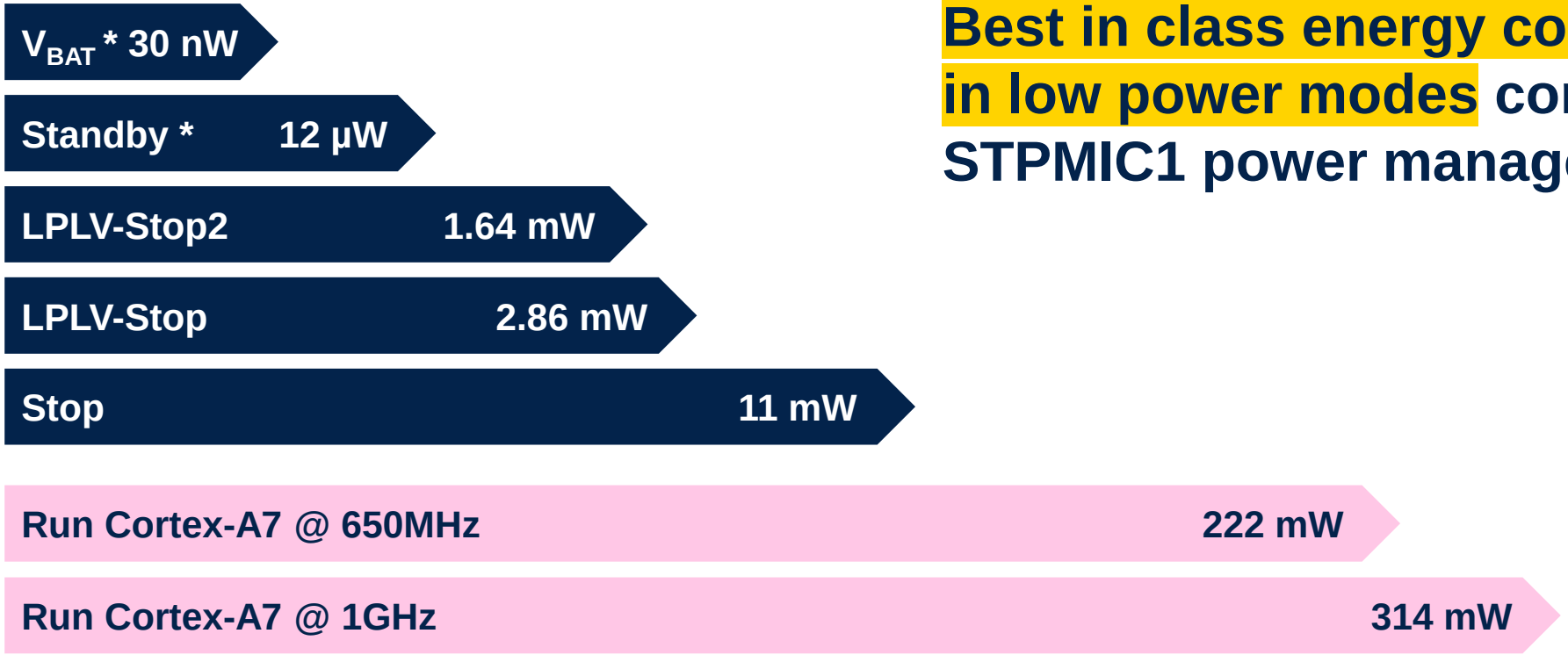
Complete toolset to generate and encrypt OEM OTP key file with the **STM32 Trusted Package** Creator software

Securely provision the STM32MP1 series with licenses from a **STM32HSM** at the programming partner location

Control the **number of devices** programmed with the firmware

End-to-end security provisioning

STM32MP13 power consumption



Best in class energy consumption in low power modes combined with STPMIC1 power management IC

Typ @ V_{DDCORE} = 1.25V, V_{DD} = 3.3V @ 25 °C, Peripherals OFF
* Backup SRAM, RTC, LSE/CSS, Tº monitoring OFF

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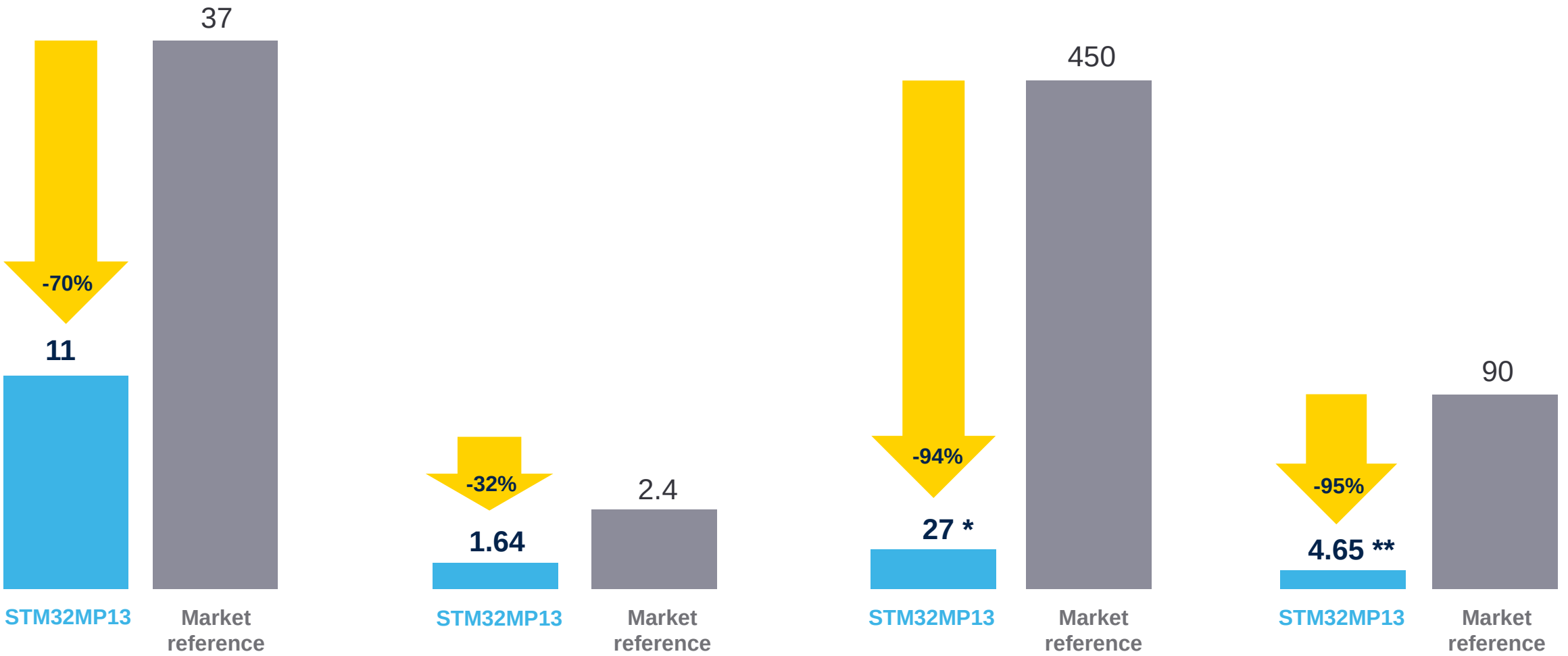
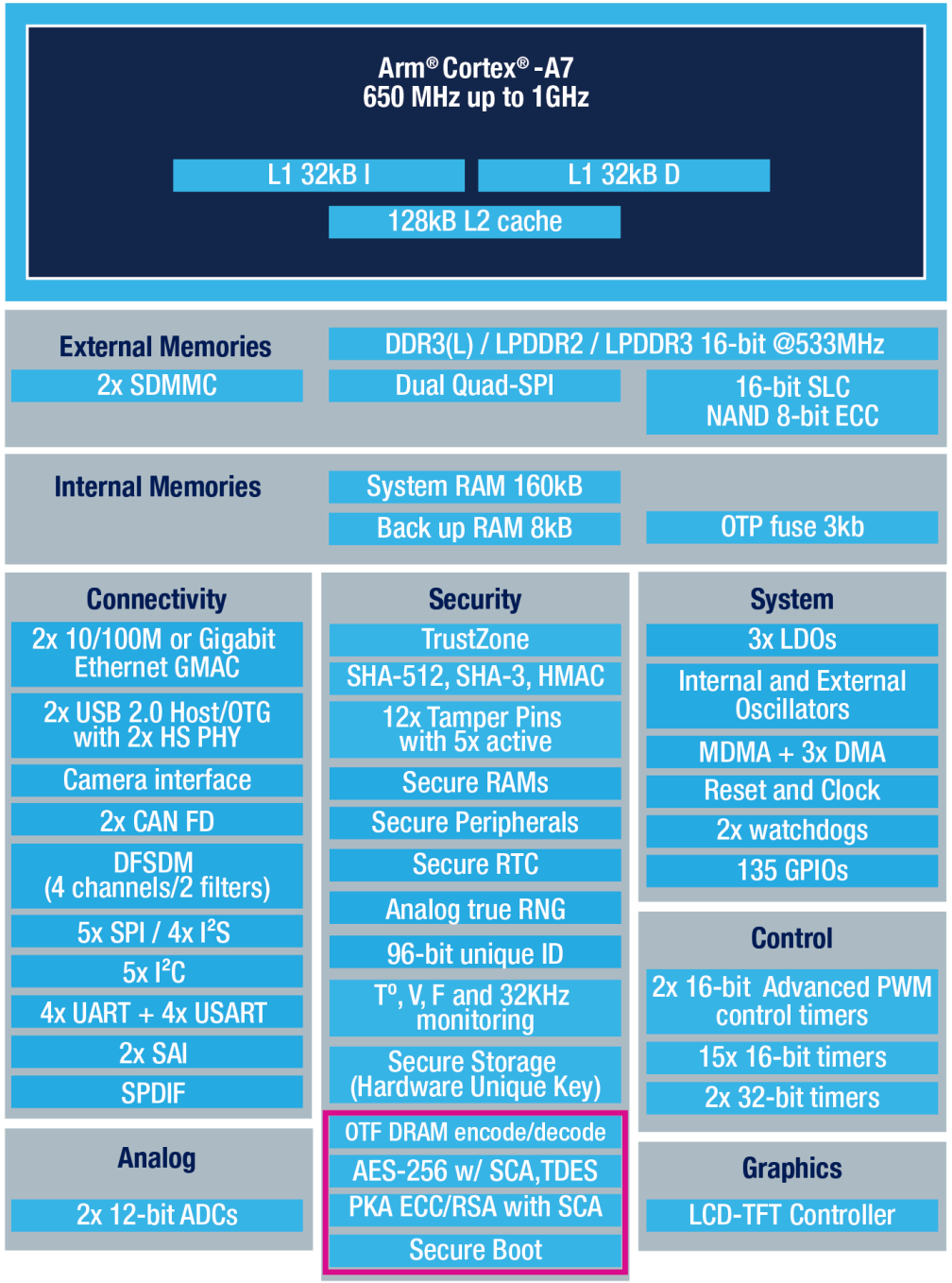
How the STM32MP13 compares to the market reference



Notes: * Backup SRAM, RTC & LSE ON // ** with RTC/Tampers & LSE ON

STM32MP135 block diagram

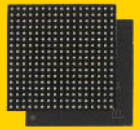


Arm® Cortex®-A7 @ 650MHz from -40°C < T_J < 125°C
Arm® Cortex®-A7 @ 1GHz from -40°C < T_J < 105°C

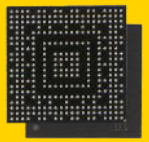
available for STM32MP135C and STM32MP135F only

3 different BGA packages to fit many applications

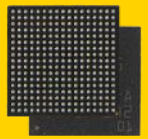
Lower your PCB cost: down to 4-layer PTH PCB / without costly lasers vias



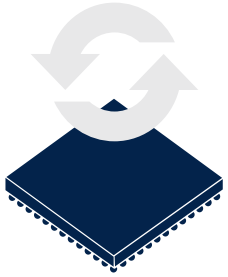
LFBGA289 14 x 14 mm
p0.8 mm
135 GPIOs – 4-layer PTH PCB



TFBGA320 11 x 11 mm
p0.5 mm
135 GPIOs – 4-layer PTH PCB



TFBGA289 9 x 9 mm
p0.5 mm
135 GPIOs – 6-layer HDI PCB



Software & pin-to-pin compatibility between all STM32MP13x part numbers for more scalability

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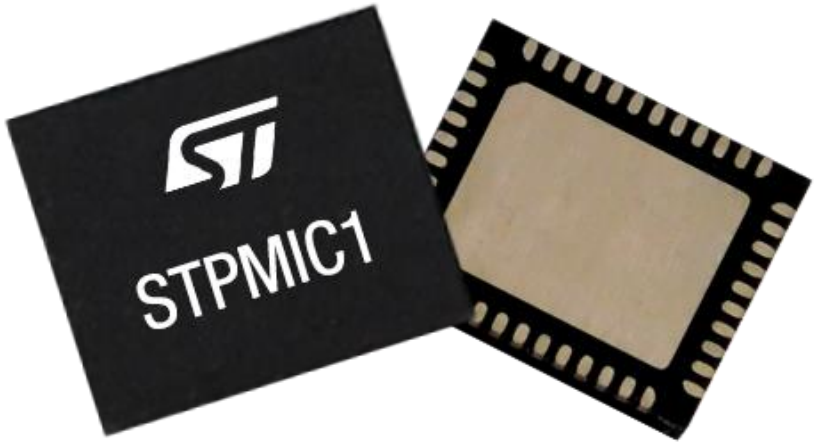
STPMIC1 power management IC dedicated to STM32MP1 series MPU

Simplify your design and optimize power consumption



DC/DCs & **LDOs** for
- STM32MP1 series
- Memories
- External devices

Optimized power consumption

BOM savings for typical applications

Small PCB footprint vs. full discrete solution

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Reduce development time & cost with our STM32 ecosystem

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Accelerate your time to market

Get STM32 MPU embedded software

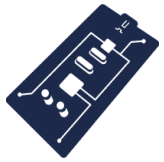
Software development

Security management & board provisioning

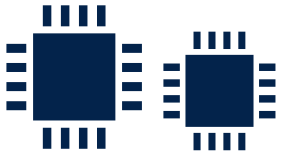
- Keys generator
- Signing tool
- OTP programming
- Flash programming

Your application

Development boards



PCB layout examples



Hardware configuration

- Pinout
- Clock tree
- DRAM Tuning tool

Where to find help online

- wiki.st.com/stm32mpu
- Community

Partner tools & ecosystem

- System-on-modules
- Software services

Quickly build your custom projects

PCB layout examples based on Altium projects provide you with a modular approach to build your designs

- All different BGAs packages, STPMIC1, Flash and different DRAM types (DDR3L, LPDDR2 & LPDDR3)
- Signal integrity and power integrity checks completed
- Developers can reuse the layouts and add their own interfaces linked to their end projects

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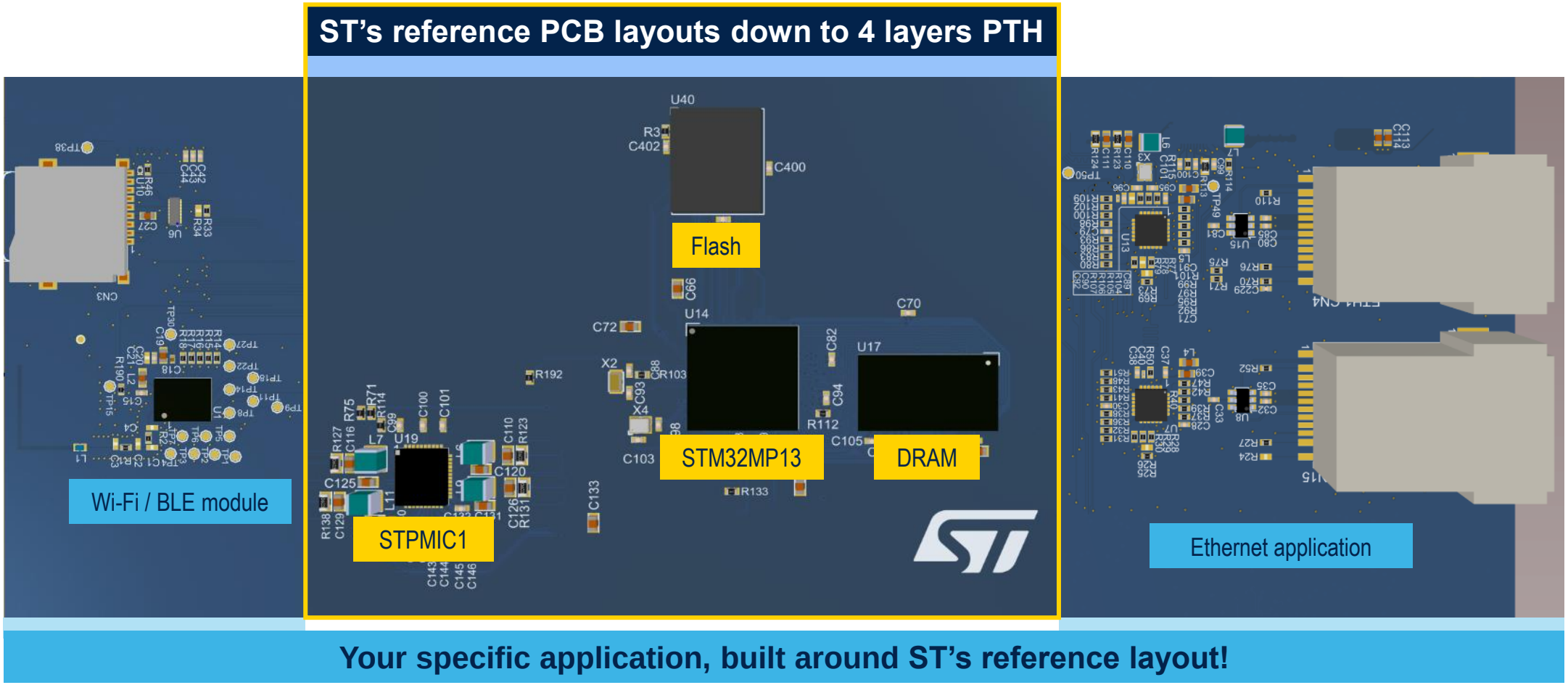
A plug & play solution for project reuse



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STM32MP1 series OpenSTLinux

Same Linux software for STM32MP1 series for easy project migration

- **Linux Kernel Mainlined**
- **Yocto & BuildRoot Support**
- **Yearly LTS supported for 2 years**
- **Linux-RT capable**
- **Pre-integrated Secure OS (OP-TEE)**

THE LINUX FOUNDATION

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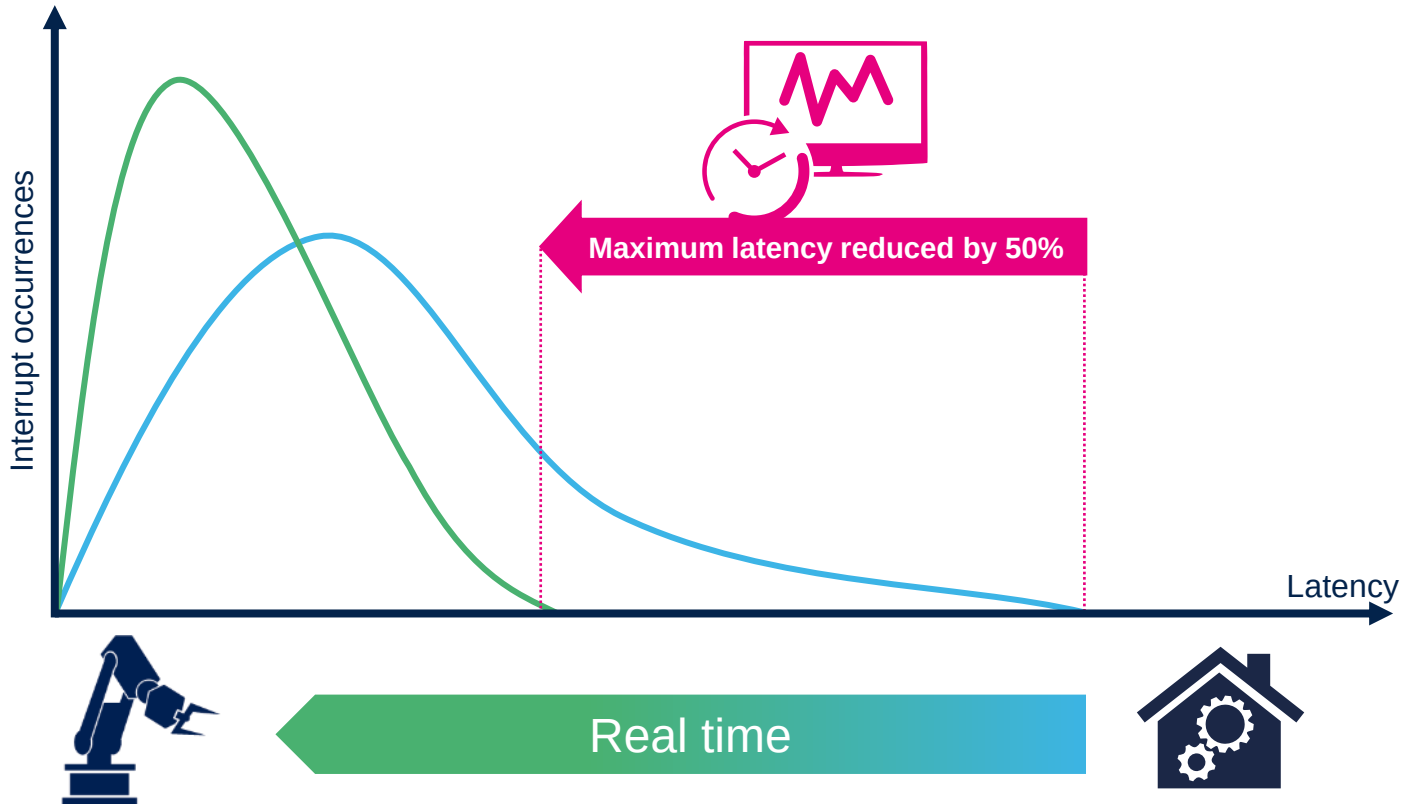
Delivering real-time performance with OpenSTLinux!

X-LINUX-RT expansion package enables OpenSTLinux real time extension, so called Linux-RT, reaching the determinism level needed for **factory automation** in key components such as **PLC** (Programmable Logic Controller)



One step further in real-time performance: bare metal & Azure RTOS

Professional grade, highly reliable & market-proven middleware suite

- **Bare metal access**
  - All IP supported with **HAL Interface**
  - You can add you own **RTOS**
- **Microsoft Azure RTOS pre-integrated:**
  - **Industrial grade networking stack**: optimized for performance coming with many IoT protocols
  - **Advanced FS/FTL:** fully featured to support NAND/NOR Flash memories
  - **USB host and device stacks** coming with many classes
  - **Safety pre-certifications**: IEC 61508 SIL4, IEC 62304 Class C and ISO 26262 ASIL D

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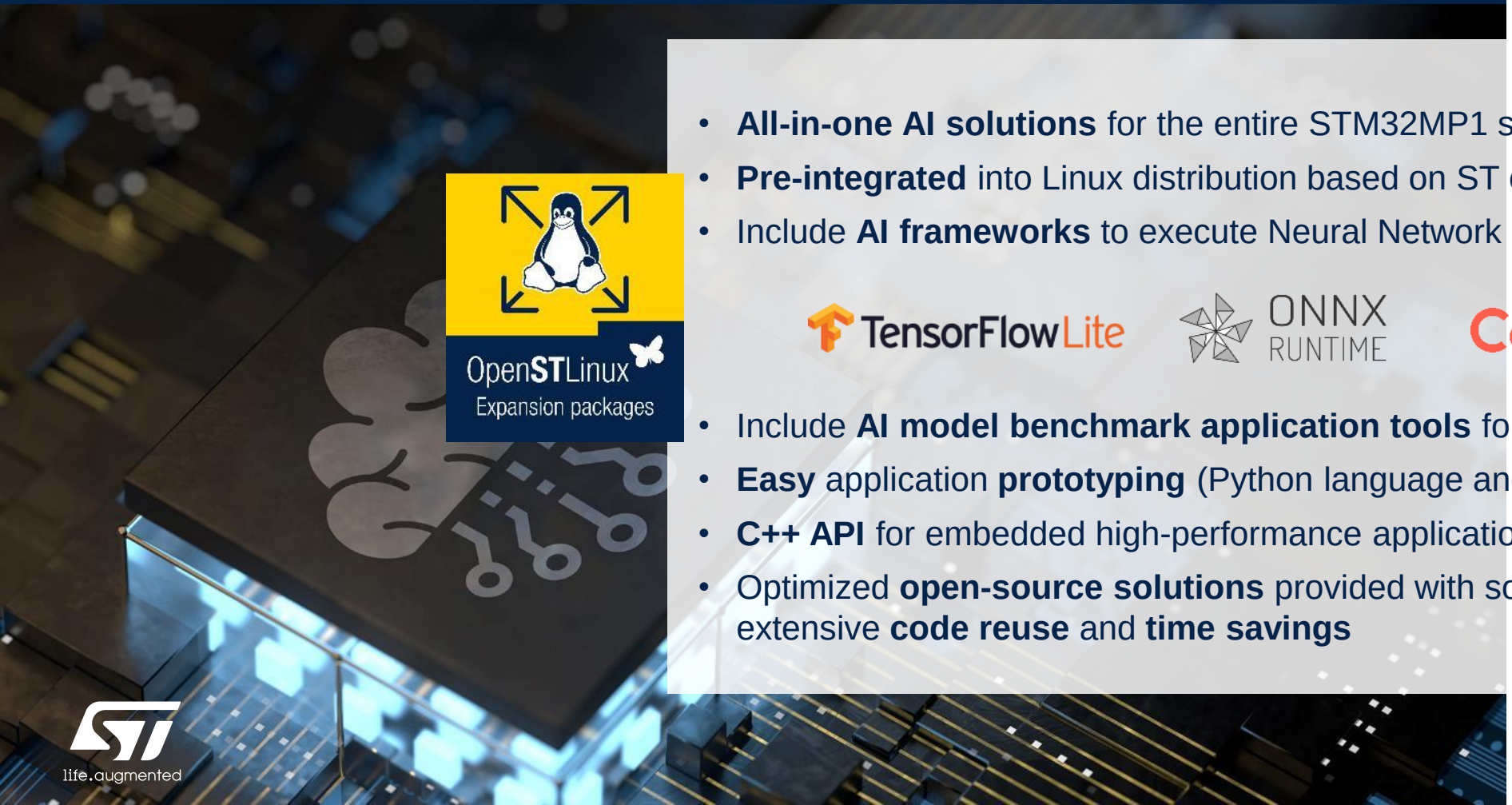
Microsoft Azure

Enabling AI on cost-efficient STM32MP13 with X-LINUX-AI

A free open-source software package dedicated to AI



OpenSTLinux
Expansion packages

- **All-in-one AI solutions** for the entire STM32MP1 series
- **Pre-integrated** into Linux distribution based on ST environment
- Include **AI frameworks** to execute Neural Network models

TensorFlow Lite ONNX RUNTIME Coral

- Include **AI model benchmark application tools** for MPU
- **Easy** application **prototyping** (Python language and AI frameworks Python API)
- **C++ API** for embedded high-performance applications
- Optimized **open-source solutions** provided with source codes that allow for extensive **code reuse** and **time savings**

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STM32MP135 & Qt Graphics solution

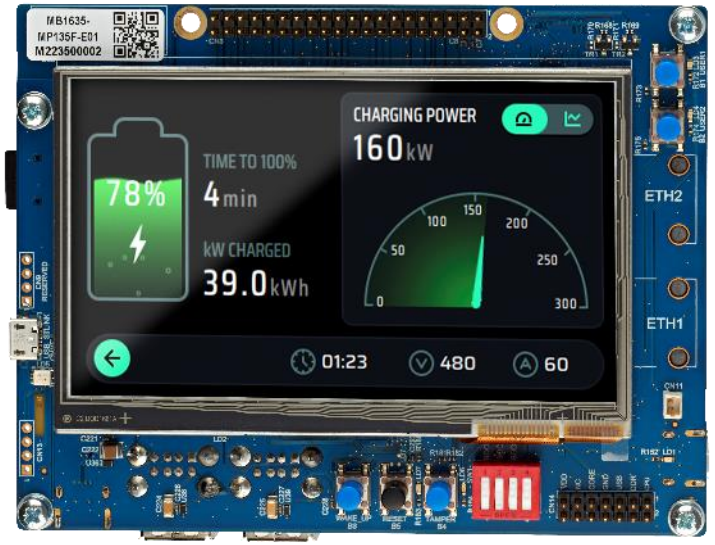
Extending STM32 graphic solutions using Qt for enhanced look & feel

Integrated into the Qt Toolchain for easier prototyping and faster development

Qt open-source solution integrated within OpenSTLinux Distribution

Qt commercial versions available through official QBSP for STM32MP135F-DK board

$99*



[STM32MP135F-DK board]

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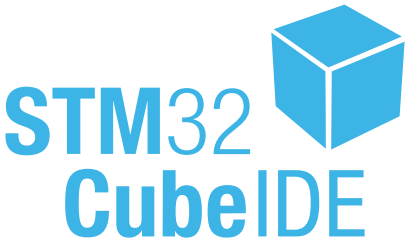
*Recommended resale price

STM32MP13 software tools

STM32Cube provides the same tools across the STM32MP1 series for greater ease of use



STM32CubeMX	IDEs Compile and Debug	STM32 Programming Tool
STM32CubeMX enhanced for MPU • Device Tree configuration • Device Tree generation • DRAM interface tuning tool	**Multi-core solutions** • Free STM32CubeIDE • OpenSTLinux Developer package support • Import DRAM tuning project	**STM32CubeProgrammer** • Flash, DRAM and/or system memory • OTP programming • Signing & key generation tools

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Enhance your added value by relying on ST and Authorized Partner solutions

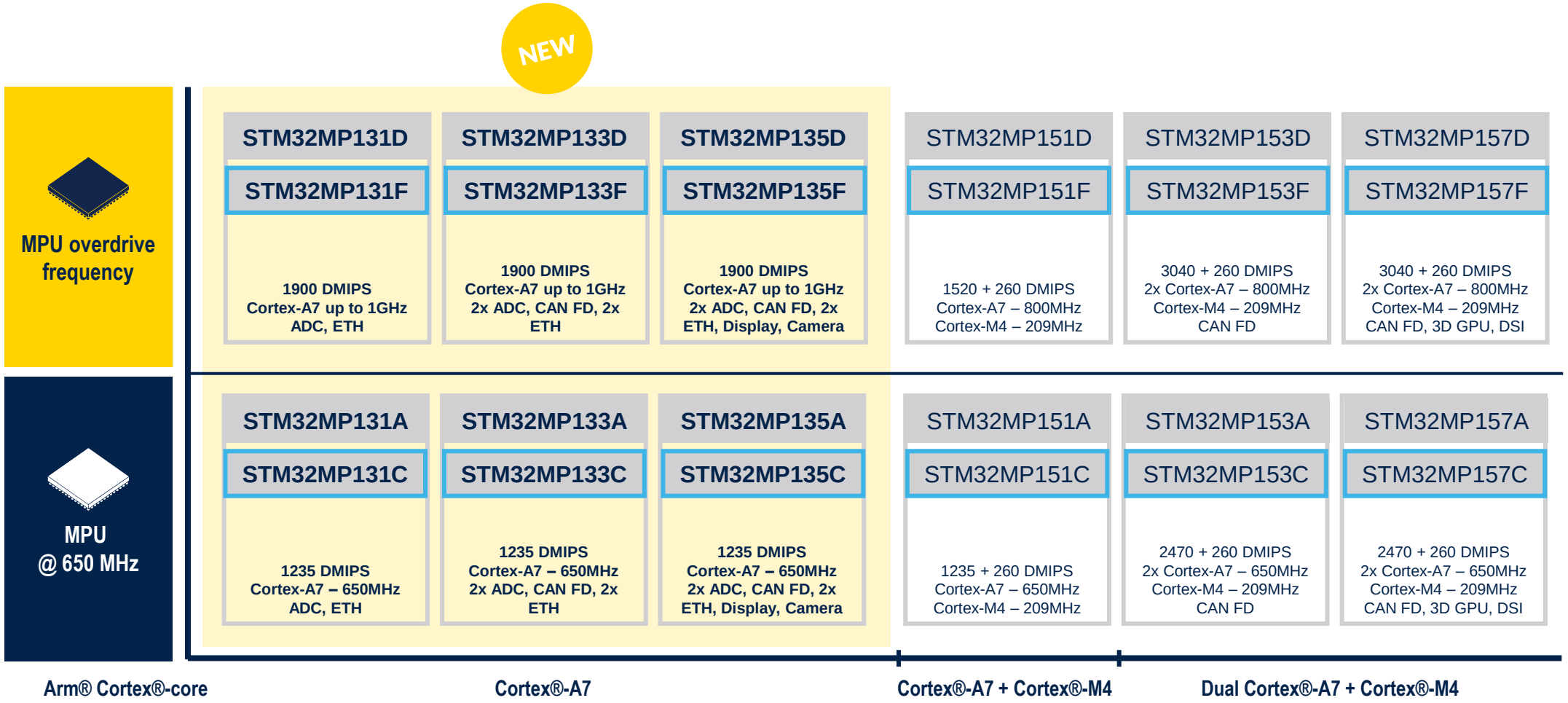
A growing base of ST Authorized Partners

ST continues to invest in the most recognized open-source standards

From idea to final product, our partners help you build end-to-end solutions

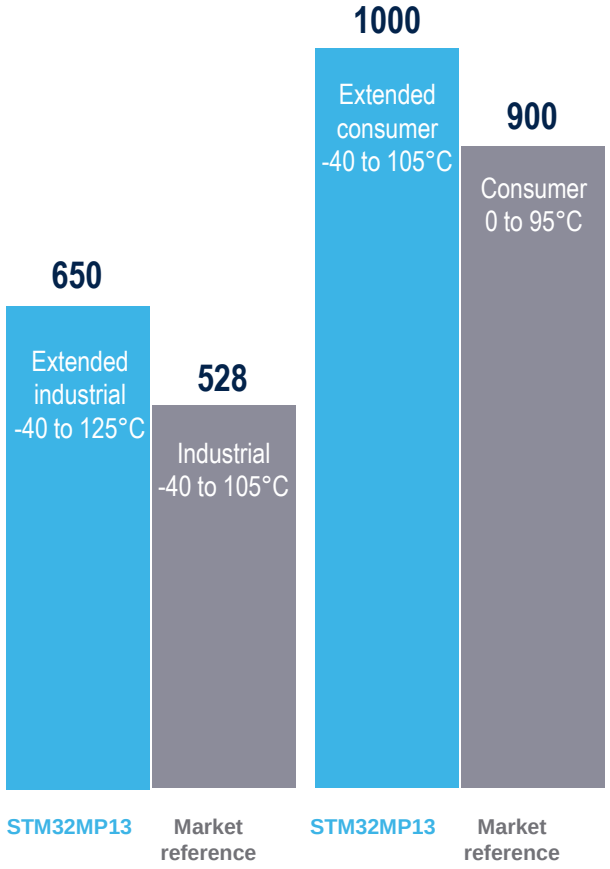
Solutions for edge computing & IoT from sensors to the cloud

STM32MP1 series portfolio extension
36 new part numbers

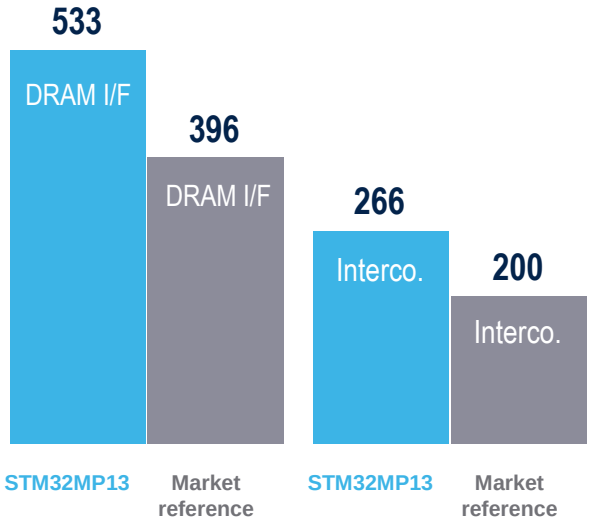


All security features enabled

How the STM32MP13 compares to the market reference



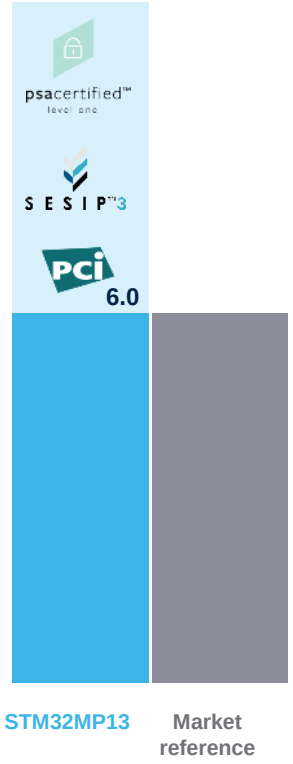
More CPU performance (MHz) over extended temperature range



Better system performance (MHz)

Lower power consumption (standby µW)

Lower PCB cost (BGA p0.5mm)



Enhanced security

STM32 MPU roadmap

Positioning/price range

Sampling now

Next-gen MPU series

Big step-up in performance, networking, multimedia, AI & security

STM32MP15 in mass production

Dual Arm® Cortex®-A7 up to 800 MHz

Arm® Cortex®-M4 & GPU

NEW

STM32MP13 in mass production

Single Arm® Cortex®-A7 up to 1 GHz

Power- and cost-efficient with enhanced security

Timeline

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STM32MP13 Key takeaways

Cost effective	Affordable price point and most cost-effective PCB design on the market today
Easy-to-use	Dedicated HW & ecosystem for very fast integration into customer applications
Industrial grade	100% operating time during 10 years combined with -40°C < T_J < 125°C
Security	Highly secured processor with certifications addressing different markets
Power efficient	Best-in-class low power modes
Ready to go	Available in mass production and sampling at your preferred distributor

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Releasing your creativity

/STM32

@ST_World

STM32 MPUs community.st.com

www.st.com/STM32MP1

wiki.st.com/stm32mpu

github.com/stm32-hotspot

STM32 MPU Developer Zone

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Our technology starts with You

Find out more at www.st.com/STM32MP1

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