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STM32MP2 Series

The second-generation of microprocessors enabling secure, advanced edge AI in Industry 4.0

STM32

STM32MP2 microprocessor series

Robustness for complex industrial applications

Rich interfaces supporting the growth of connected applications

64-bit MPU with advanced compute capabilities

Strong security

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Designed for highly connected applications

Industrial & factory automation		• Gateways • PLCs • HMIs • Metering • Bar code reader	• Anomaly detection • Pose estimation • People / object detection • Face recognition • Character recognition	• Secure boot • Firmware & data encryption • Context isolation
Smart homes		• Gateways • HMIs • Whitegoods • Door bell	• People / object detection • Face recognition • Voice recognition	
Smart city and infrastructure		• Power grid • EV charging • Metering • HMIs	• Traffic management • Energy management • Vehicle / pedestrian recognition & tracking • People & object detection	

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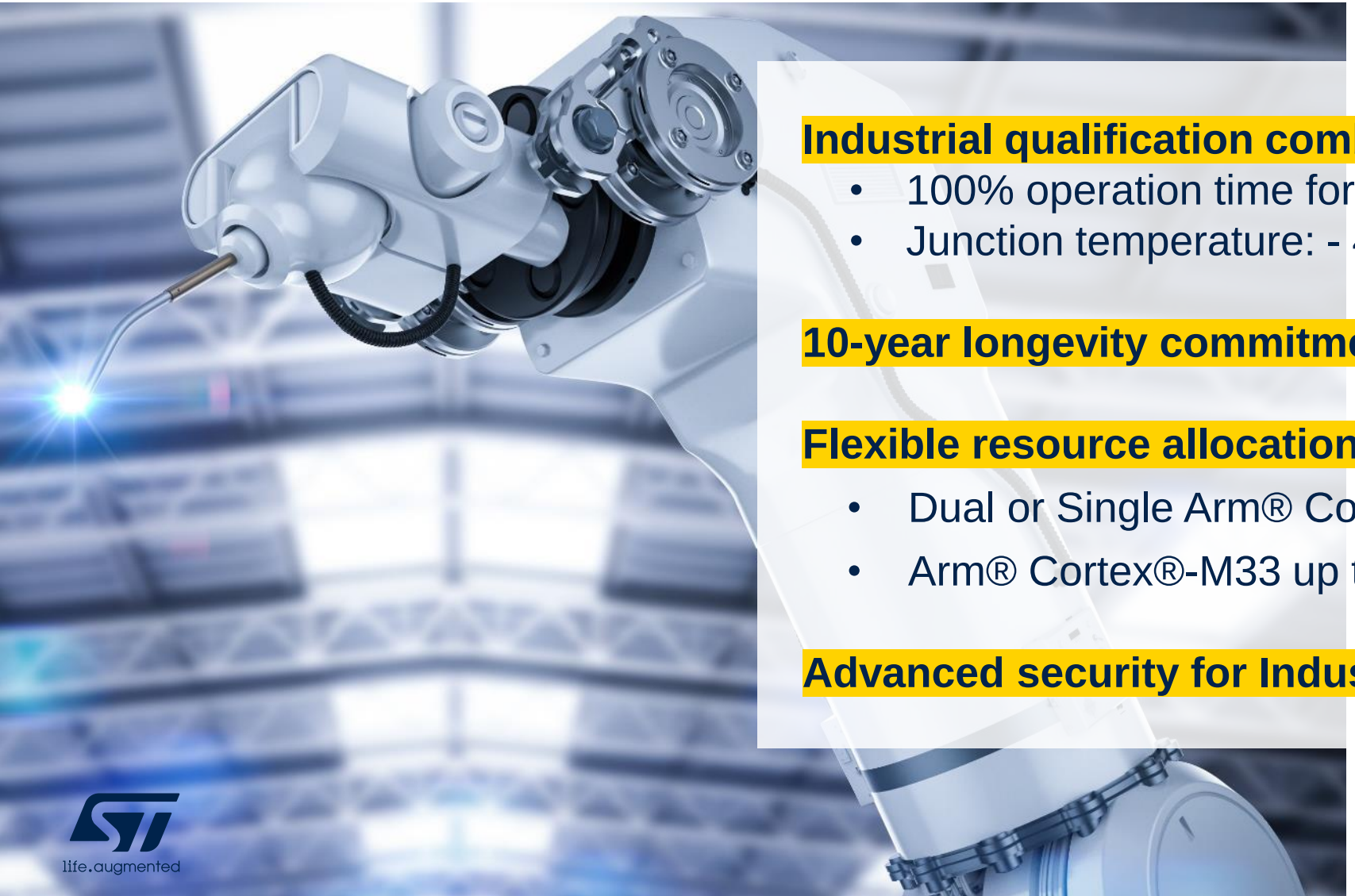
Robustness for complex industrial applications



Industrial qualification combining both:

- 100% operation time for 10 years
- Junction temperature: - 40°C to 125°C

10-year longevity commitment renewed every year

Flexible resource allocation between cores

- Dual or Single Arm® Cortex®-A35 up to 1.5 GHz
- Arm® Cortex®-M33 up to 400 MHz

Advanced security for Industry 4.0

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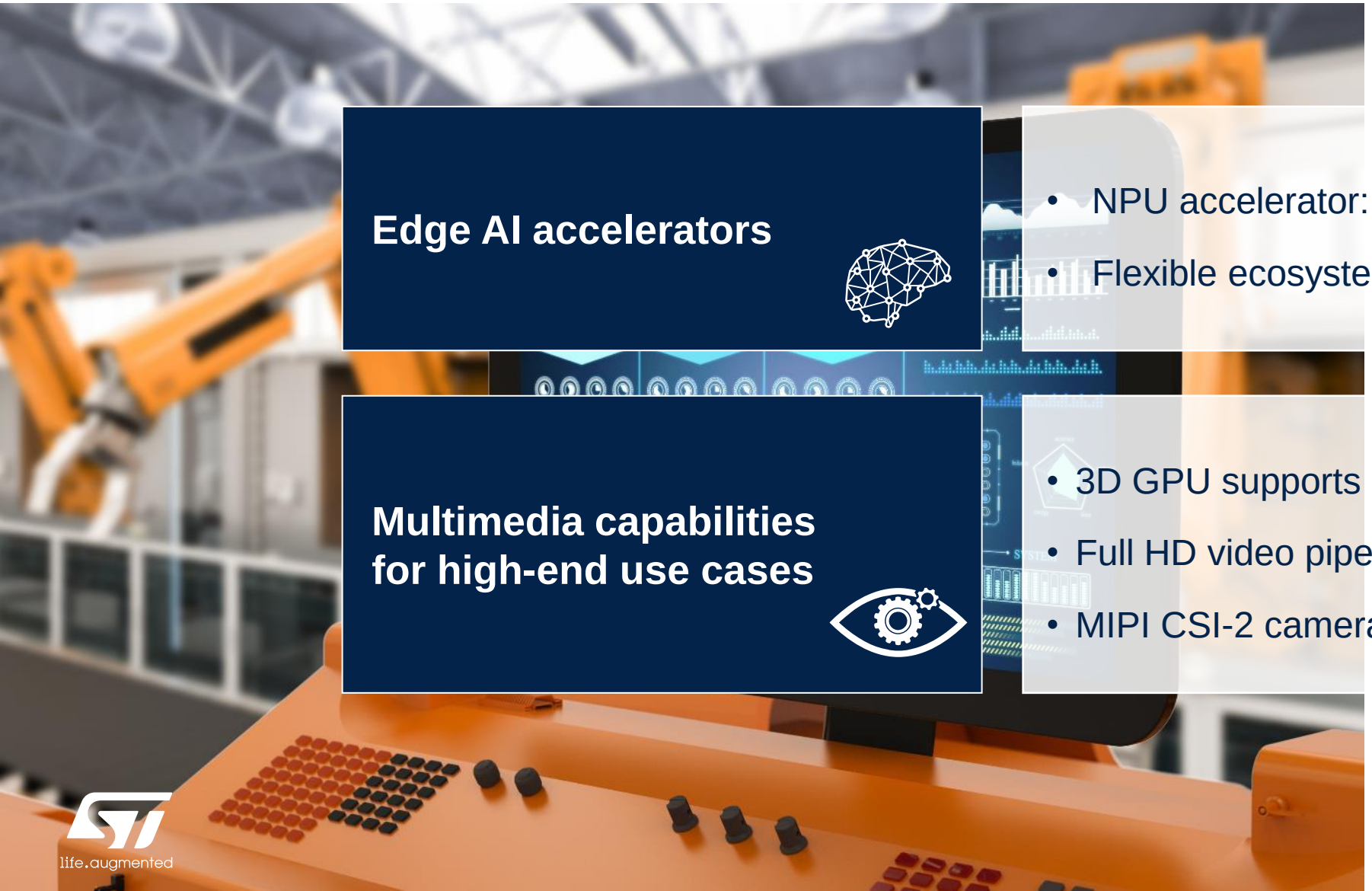
64-bit MPU with advanced Edge AI capabilities



Edge AI accelerators

- NPU accelerator: **up to 1.35 TOPS**
- Flexible ecosystem to run AI on CPU, GPU, or NPU

Multimedia capabilities for high-end use cases

- 3D GPU supports up to 1080p resolution
- Full HD video pipe with RGB, LVDS & DSI outputs
- MIPI CSI-2 camera interface with ISP

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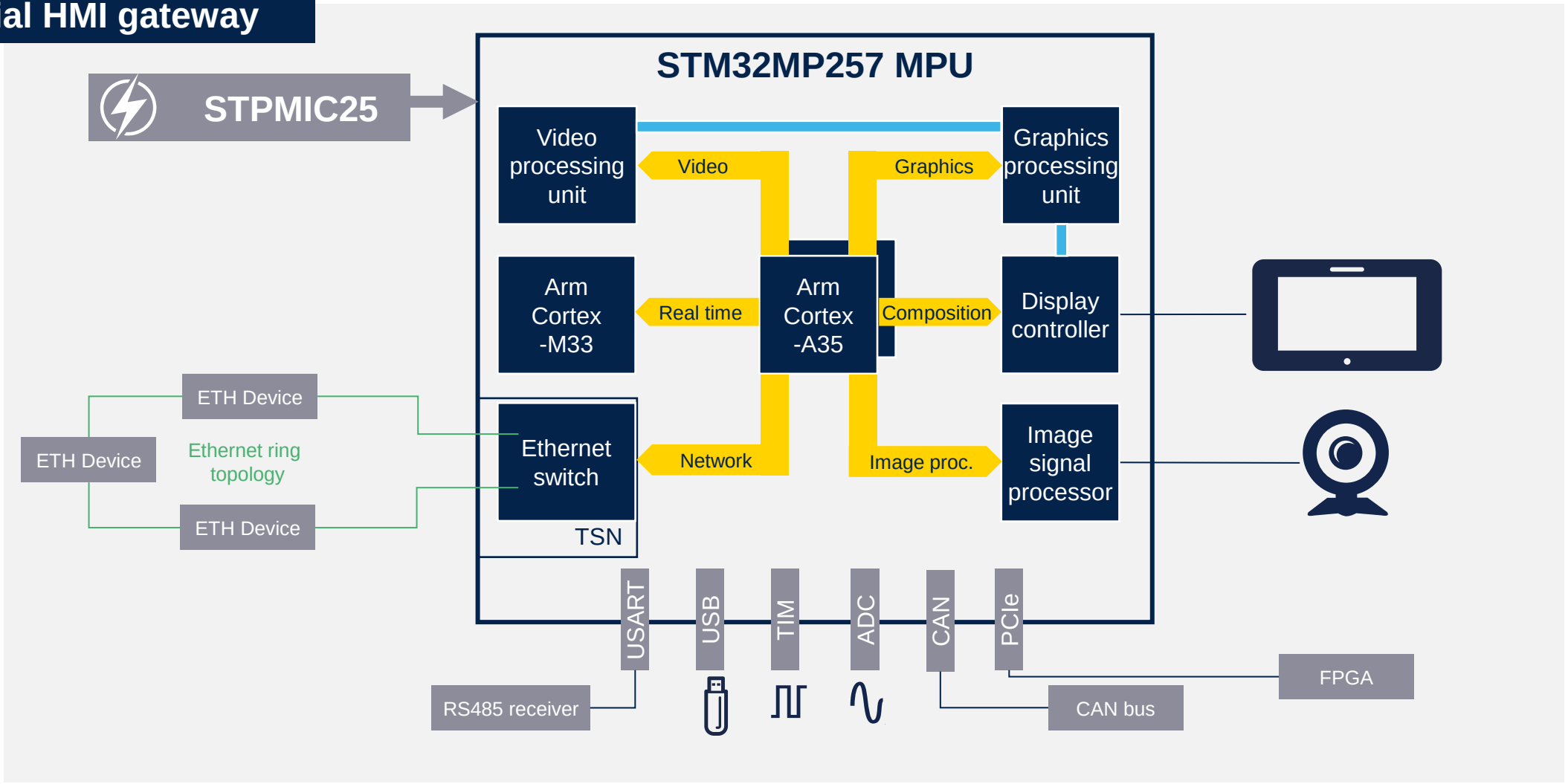
Rich interfaces offloading the CPU for connected applications

Industrial HMI gateway



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Enhanced security

SESIP3*
PSA certified Level 1*

TrustZone® on Cortex®-A & Cortex®-M: secure boot, secure firmware updates and cryptographic operations

Secure provisioning ecosystem

Edge confidential computing thanks to resource isolation

*target certifications

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STM32MP25 security overview

SESIP™3

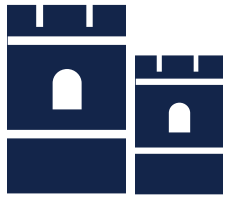
Target certification

psacertified™ level one

Target certification

Memory & peripheral protections against illegal access control

Secure cryptographic accelerator for robustness against physical attacks



Device authentication & attestation during product life cycle

Code isolation for runtime protection

Security assurance level 1

Software robustness

STM32 Trust

Security ecosystem

Trusted execution with OP-TEE

In-factory secure secret provisioning (SSP)

STM32Cube framework for MPU (Signing & key generation)

and more!

STM32MP2 MPU series for 64-bit applications

Security options available for all STM32MP2 MPUs

Product lines	Cortex-A35	CPU	Cortex-M33	Co-processor	AI NPU	GPU LVDS/DSI	FD-CAN	Ethernet	Video Hardware accelerator	PCIe Gen2 / USB3
STM32MP257	2	Up to 1.5GHz	1	400 MHz	●	●	3	3	H.264	●
STM32MP255	2	Up to 1.5GHz	1	400 MHz	●	●	3	2	H.264	●
STM32MP253	2	Up to 1.5GHz	1	400 MHz			3	2		●
STM32MP251	1	Up to 1.5GHz	1	400 MHz				1		●
STM32MP23x	2	Up to 1.5GHz	1	400 MHz	●	●	2	2	H.264 dec	
STM32MP21x	1	Up to 1.5GHz	1	300 MHz			2	2		

In production **In development**

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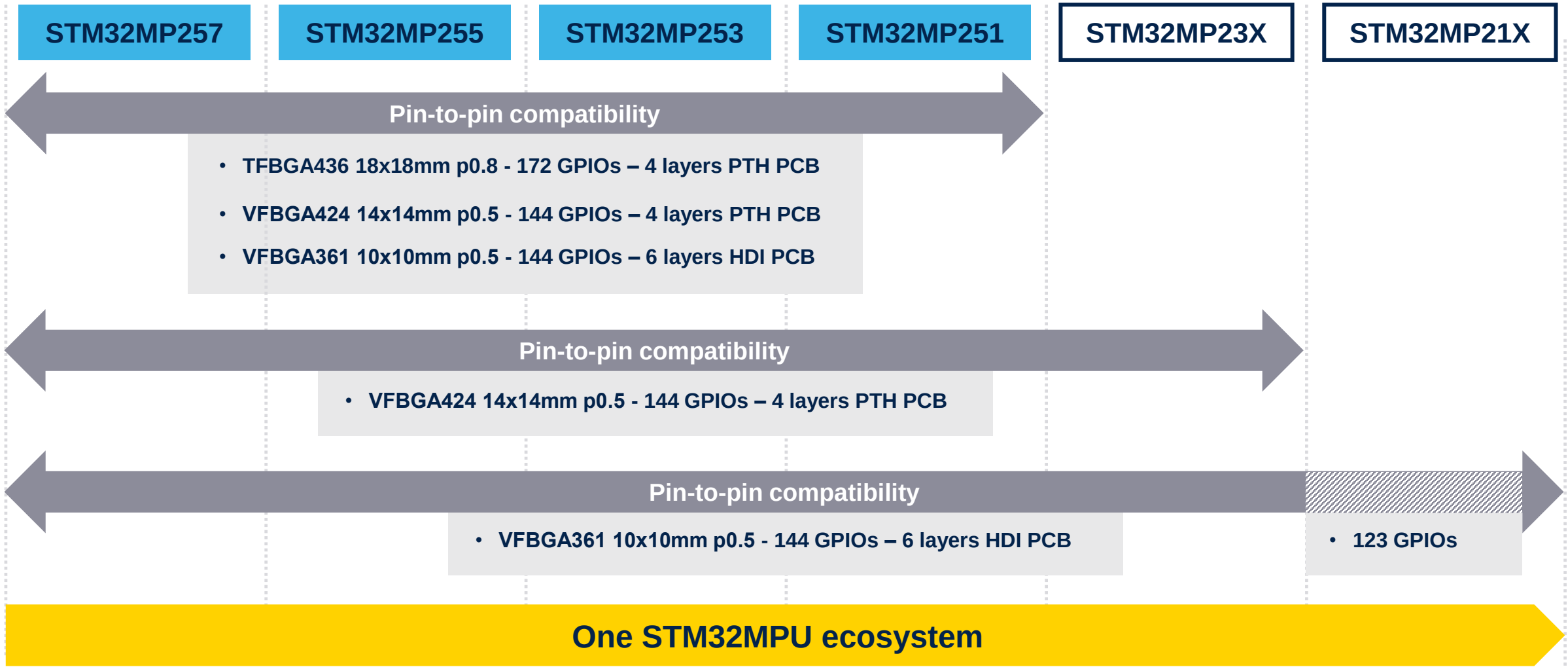
A scalable offering



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In production

In development

STPMIC25 power management IC for STM32MP2 MPU series

Simplify your design and optimize power consumption

DC/DCs & **LDOs** for
- STM32MP2
- Memories
- External devices

STPMIC25

Optimized power consumption

BOM savings for typical applications

Small PCB footprint vs. full discrete solution

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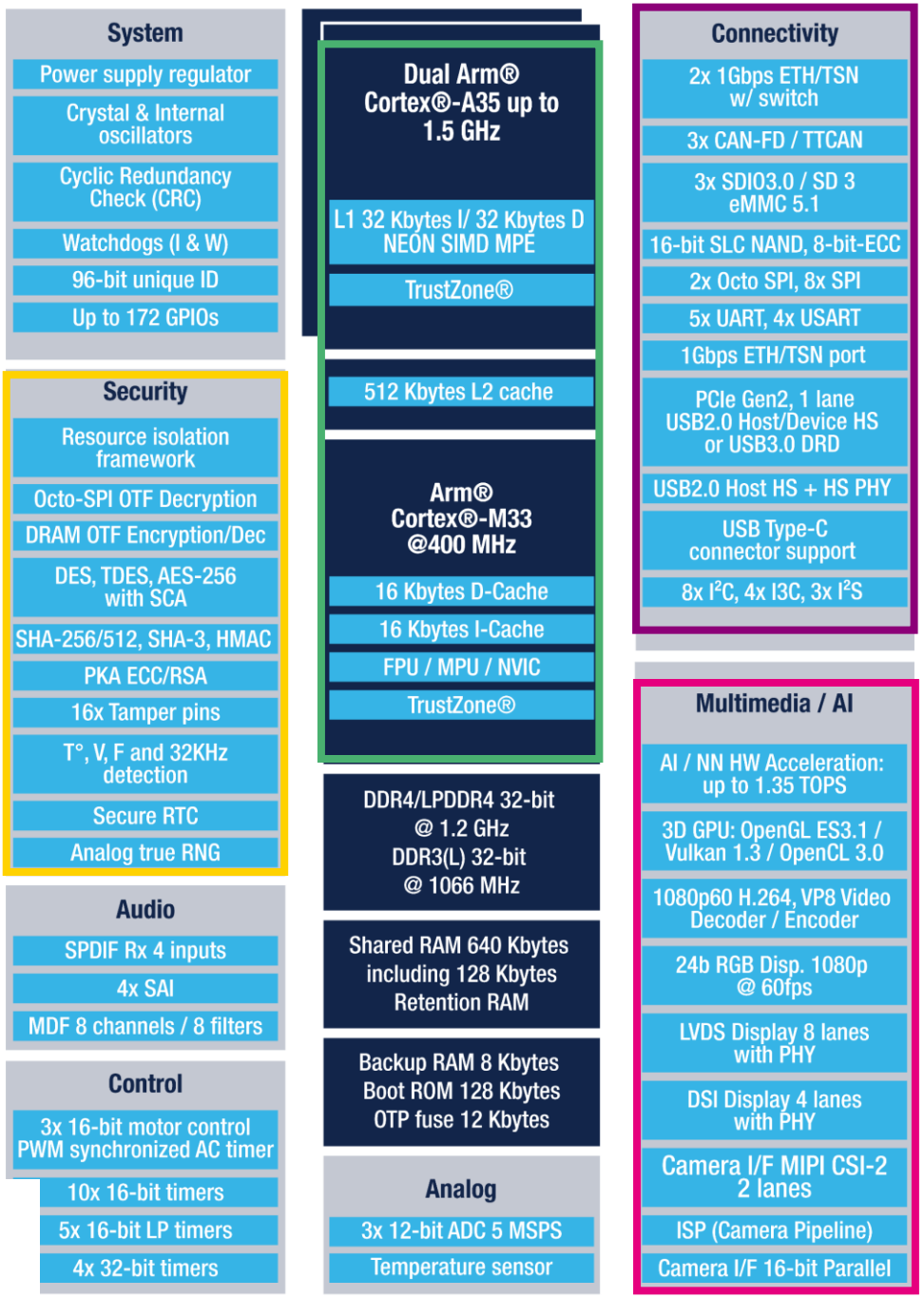
STM32MP257 Block Diagram



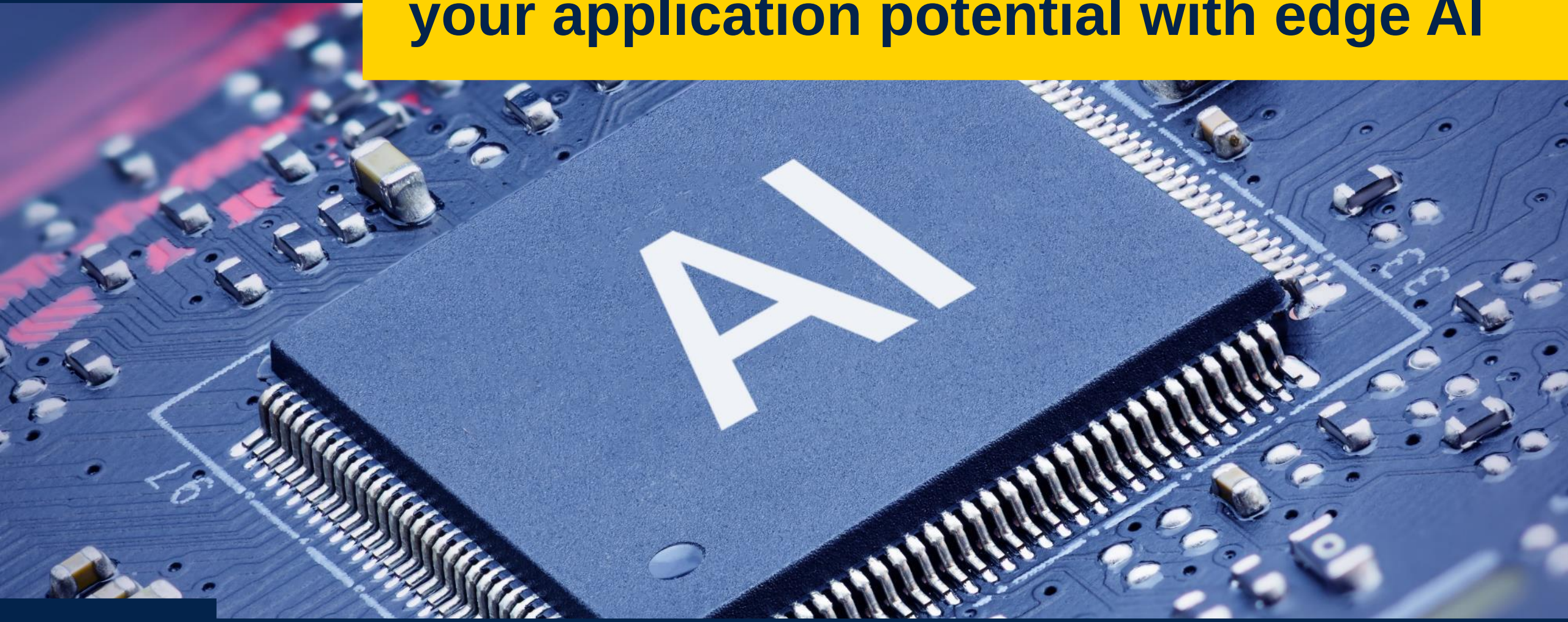
Processing

Enhanced security

Edge AI and multimedia

Connectivity

Neural processing unit (NPU) to unlock your application potential with edge AI



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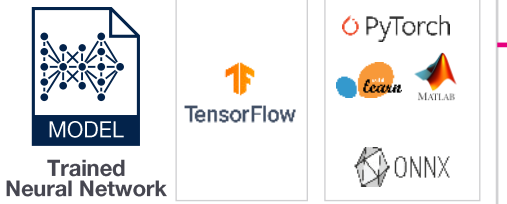
Seamlessly integrate AI in your STM32MP2 projects

1. Train

Bring your own model



or

Start from **STM32 model zoo**

Collection of pre-trained models and training scripts.

- Object detection
- Pose estimation
- Semantic segmentation
- ...

via

2. Benchmark and optimize

Get optimal performance on STM32MP2 NPU

MPU Offline Compiler

Desktop version | Cloud version

- Model **optimization**
- Model **quantization***
- **Benchmark** service
- Model **conversion**

*only available on Cloud version

3. Create your apps and deploy

Integrate your customized model in your application and deploy

X-LINUX-AI

Selection of AI application examples

Delivered for OpenSTLinux

Tested and approved on STM32MPU Discovery Kit and Evaluation Boards

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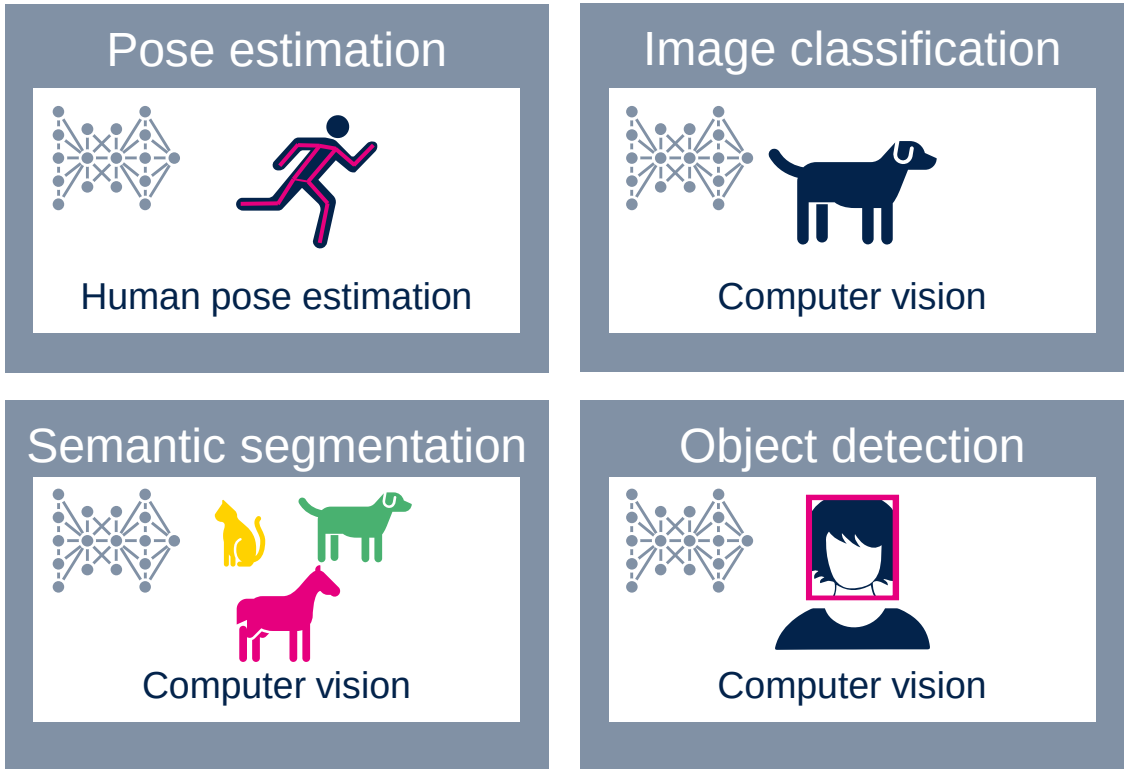
STM32 model zoo

A collection of application-oriented models optimized for STM32



Hosted on Github

< | > Model training scripts

- Scripts to train models with your own dataset
- Generate and validate your model

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MPU offline compiler

MPU Offline compiler

Desktop version

- ✓ Model **optimization**
- ✓ **Benchmark** on local MP2 board
- ✓ Model **conversion**

STM32 Model Zoo

Cloud version

- ✓ Model **optimization**
- ✓ Model **quantization**
- ✓ **Benchmark** on remote board farm
- ✓ Model **conversion**

Supported AI models

TensorFlow | ONNX

Supported AI formats

- INT8 Quantized per tensor (NPU)
- INT8 Quantized per channel (GPU)
- Dynamic Fixed Point 16b (GPU)

AI execution engines

- NPU (prefered)
- GPU
- CPU

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X-LINUX-AI

All-in-one solution

All needed packages to bring AI to the edge

AI frameworks and Apps

- AI frameworks to execute Neural Network models
- Selection of AI application examples
- AI model benchmark application tools for STM32 MPU

Tooling framework

- Python3, Gstreamer, OpenCV to quickly develop applications

STM32 MPU agnostic

Compatible with all STM32 MPU series

OpenSTLinux Distribution

Delivered for OpenSTLinux

Tested and approved on STM32MPU discovery kit and evaluation boards

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Reduce development time & cost with our STM32 ecosystem

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Accelerate your time to market

STM32MPU Distribution for Android™

OpenSTLinux

OpenWrt

STM32 Cube

Get STM32 MPU embedded software

Build Root

yocto PROJECT SILVER COMPATIBLE

STM32 CubeIDE

Software development

STM32 CubeProgrammer

Security management & board provisioning

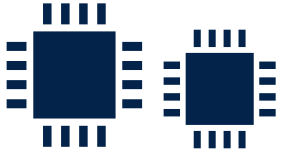
- Keys generator
- Signing tool
- OTP programming
- Flash programming

Your application

STM32 CubeMX

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

Partner Program

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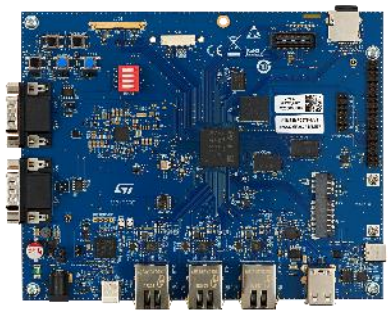
Development tools for the STM32MP2 series

Speed-up evaluation, prototyping, and design



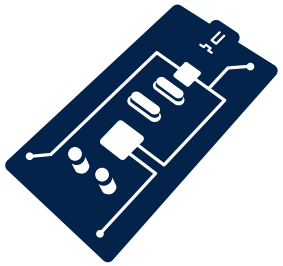
Evaluation board STM32MP257F-EV1

Available April 2024

EDT LCD Panel Display

Camera module adapter board B-CAMS-IMX

DSI to HDMI adapter board



Discovery kit STM32MP257-DK

Available Q3 2024

More STM32-based dev tools available with our partners

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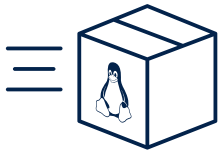
STM32 MPU embedded software

Same Linux software for STM32MP2 series for easy project migration

OpenSTLinux Distribution

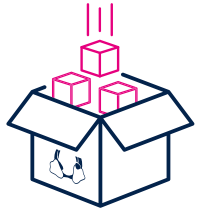


STM32MP2 Starter package*

To quickly and easily start with any STM32MP2 microprocessor device

STM32MP2 Developer package*

To add your own code on top of the STM32MP2 Embedded Software distribution



STM32MP2 Distribution package*

To create your own Linux ® distribution as well as your own Starter and Developer packages

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*Available upon request

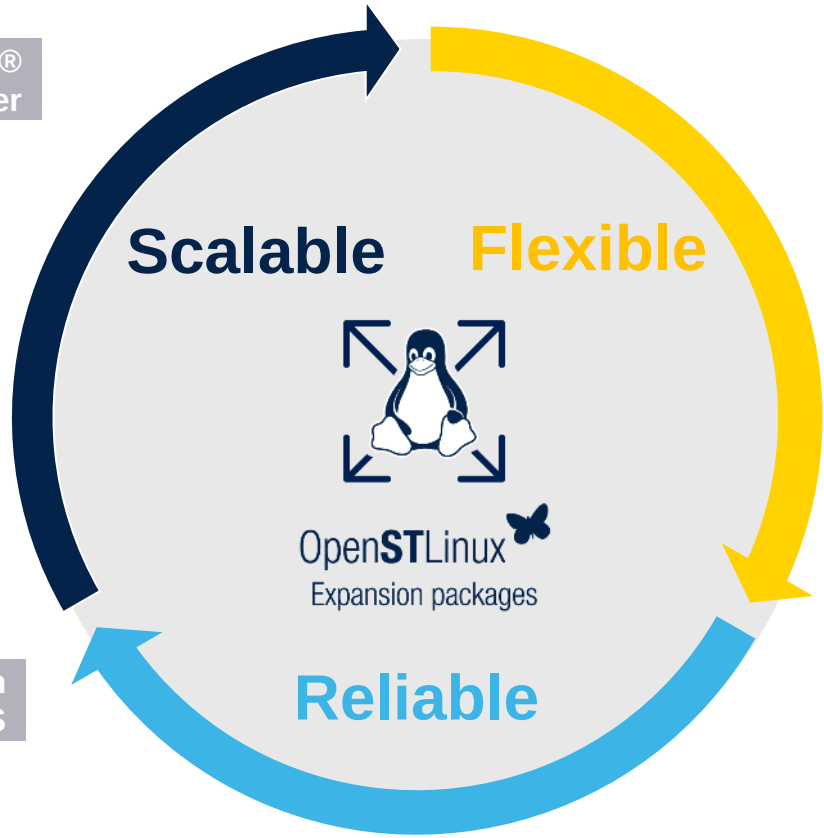
STM32 MPU embedded software

Accelerate your time to market using expansion packages

LoRa® — LoRaWAN® Server

Microsoft Azure IoT Platform — Microsoft Azure IoT Edge

aws qualified device — Amazon AWS



- X-LINUX-NFC
- X-LINUX-GNSS
- X-LINUX-AI
- X-LINUX-RT
- X-LINUX-PREDMNT
- X-LINUX-IOT01E/A
- X-LINUX-AZURE
- X-LINUX-AWS
- X-LINUX-MSP01
- X-LINUX-Qt
- X-LINUX-TPM
- X-LINUX-TSN
- X-LINUX-ACM

Planned

Available

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STM32 MPU OpenSTLinux Expansion Packages

OpenSTLinux long-term Support Releases and support scheme

OpenSTLinux V4 (5.15 LTS / Kirkstone 4.0 LTS)

Features Migration & Corrective Support* | Corrective Support

2 Kernels +
2 Year Support

OpenSTLinux V5 (6.1 LTS / Mickledore 4.2)

Features Migration & Corrective Support* | Corrective Support

OpenSTLinux V6 (6.6 LTS / Scarthgap 5.0 LTS)

Features Migration & Corrective Support* | Corrective Support

2023 2024 2025 2026

THE LINUX FOUNDATION

Software Partners proposed by STMicroelectronics

(*) Feature migration: new features on current Kernel
(*) Corrective support: issues reported during this time

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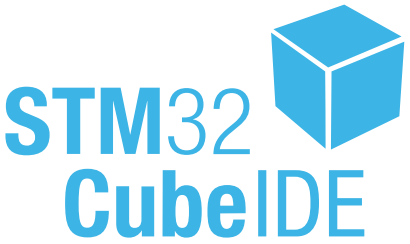
Software development tools

STM32Cube provides the same tools across the STM32MP2 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	**Multicore 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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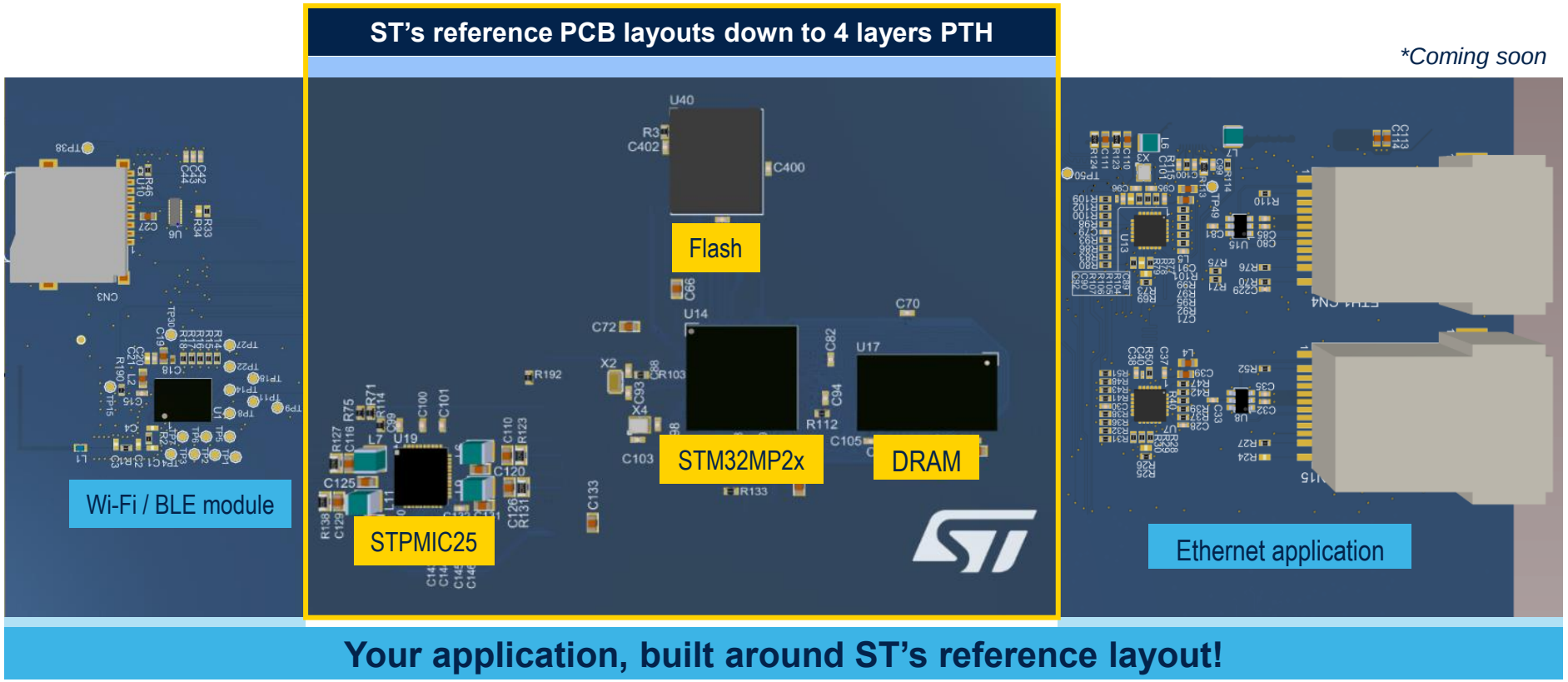
Plug & play solution for STM32MP2 series for project reuse



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

- All different BGAs packages, STPMIC25, Flash and different DRAM types (DDR3L, DDR4 & LPDDR4)
- 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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Advanced HMI with stunning graphics

Multiples libraries to run on STM32MP2

GTK

LVGL

Android™

Authorized Partner

Embedded Wizard

CANDERA

Qt

CRANK SOFTWARE

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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

Discover our partners products and services

Our technology starts with You

Find out more at www.st.com/STM32MP2

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