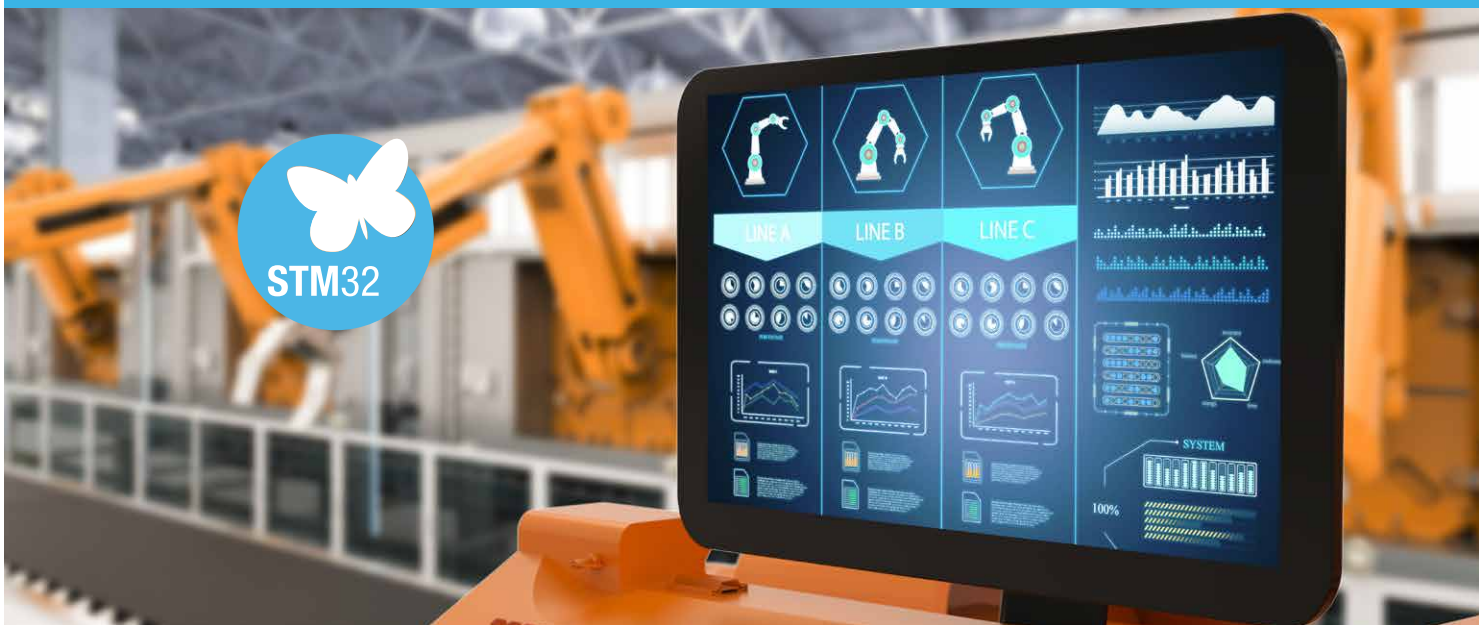
STM32MP25 MPU lines

64-bit microprocessors with Neural Processing Unit



Industrial-grade 64-bit MPU for secure Industry 4.0 and advanced edge computing applications that require high-end multimedia capabilities.

The STM32MP25 lines are built around single or dual Arm® Cortex®-A35 cores running up to 1.5 GHz and a single Arm® Cortex®-M33 core running up to 400 MHz.

STM32MP25 MPUs fit the requirements for industrial applications: 100% operating time for 10 years, extended temperature up to 125°C and a 10-year longevity program.

The STM32MP25 lines are designed for high connected applications: factory automation, smart homes or even smart city and infrastructure.

ADVANCED COMPUTE CAPABILITIES

- Enabling edge AI with the flexibility to run AI on CPU, GPU or NPU (up to 1.35 TOPS)
- Tailored for computer vision: anomaly detection, pose estimation, object detection, face and voice recognition or even traffic management

ENHANCED MULTIMEDIA CAPABILITIES

- Video processing unit
- 3D GPU supports up to 1080p resolution
- Full HD video pipe with LVDS and DSI interfaces
- MIPI CSI-2 interface with Lite-ISP

STRONG SECURITY

- SESIP3 and PSA certified level 3 Target certifications
- TrustZone® on Cortex®-A and Cortex®-M
- Secure provisioning ecosystem
- Secure isolation for edge confidential computing thanks to resource isolation framework

ENRICHED CONNECTIVITY

- TSN support (Time-sensitive networking)
- Up to 3 gigabit Ethernet ports (with 2-port switch)
- PCIe Gen2, USB 3.0, 3 x CAN-FD

www.st.com/stm32mp25

System
- Power supply regulator
- Crystal & Internal oscillators
- Cyclic Redundancy Check (CRC)
- Watchdogs (I & W)
- 96-bit unique ID
- Up to 172 GPIOs

Security
- Resource isolation framework
- Octo-SPI OTF Decryption
- DRAM OTF Encryption/Dec
- DES, TDES, AES-256 with SCA
- SHA-256, SHA-3, HMAC
- PKA ECC/RSA
- 16x Tamper pins
- T°, V, F and 32KHz detection
- Secure RTC
- Analog true RNG

Audio
- SPDIF Rx 4 inputs
- 4x SAI
- MDF 8 channels / 8 filters

Control
- 3x 16-bit motor control PWM synchronized AC timer
- 10x 16-bit timers
- 5x 16-bit LP timers
- 4x 32-bit timers

Dual Arm® Cortex®-A35 up to 1.5 GHz
- L1 32 Kbytes I/ 32 Kbytes D NEON SIMD MPE
- TrustZone®

512 Kbytes L2 cache

Arm® Cortex®-M33 @400 MHz
- 16 Kbytes D-Cache
- 16 Kbytes I-Cache
- FPU / MPU / NVIC
- TrustZone®

DDR4/LPDDR4 32-bit @ 1.2 GHz
DDR3(L) 32-bit @ 1066 MHz

Shared RAM 640 Kbytes including 128 Kbytes Retention RAM

Backup RAM 8 Kbytes
Boot ROM 128 Kbytes
OTP fuse 12 Kbytes

Analog
- 3x 12-bit ADC 5 MSPS
- Temperature sensor

Connectivity
- 2x 1Gbps ETH/TSN w/ switch
- 3x CAN-FD / TTCAN
- 3x SDIO3.0 / SD 3 eMMC 5.1
- 16-bit SLC NAND, 8-bit-ECC
- 2x Octo SPI, 8x SPI
- 5x UART, 4x USART
- 1Gbps ETH/TSN port
- PCIe Gen2, 1 lane USB2.0 Host/Device HS or USB3.0 DRD
- USB2.0 Host HS + HS PHY
- USB Type-C connector support (UCPD)
- 8x I²C, 4x I3C, 3x I²S

Multimedia / AI
- AI / NN HW Acceleration: up to 1.35 TOPS
- 3D GPU: OpenGL ES3.1 / Vulkan 1.3 / OpenCL 3.0
- 1080p60 H.264, VP8 Video Decoder / Encoder
- 24b RGB Disp. 1080p @ 60fps
- LVDS Display 8 lanes with PHY
- DSI Display 4 lanes with PHY
- Camera I/F MIPI CSI-2 2 lanes
- ISP (Camera Pipeline)
- Camera I/F 16-bit Parallel

Dedicated STPMIC25 for power management

STPMIC

Software tools

STM32Cube framework

Enhanced STM32CubeMX, Multi-Core IDE solutions (including STM32CubeIDE for device tree management) and STM32CubeProgrammer.

Drivers, middleware & examples

The STM32Cube MPU package provides BSP, HAL, middleware components, and application packages in source code for development. The **STM32CubeMP13** supports both RTOS and bare-metal applications.

Embedded software distribution

Linux® distribution based on Yocto, so called **OpenSTLinux**, or Buildroot running on the Arm®Cortex®-A processor(s). OpenSTDroid distribution is available for GPU equiped lines.

OpenSTLinux Distribution · OpenSTDroid · yocto PROJECT COMPATIBLE · OpenBMC · Buildroot · OpenWrt

To enable the use of additional components like AI, graphics, real-time and more, we can rely on **OpenSTLinux expansion packages**, to use on top of main distribution.

Hardware tools

A full set of evaluation boards enables flexible prototyping

Discovery kit
STM32MP257F-DK

Evaluation board
STM32MP257F-EV1

EDT LCD panel display
B-LVDS7-WSVGA

Camera module adapter board
B-CAMS-IMX

DSI to HDMI adapter board
B-LCDAD-HDMI1

3rd party software and hardware providers

Strong collaboration with ST Authorized partners, providing software solutions and **system-on-modules** to ease your MPU development.

Authorized Partner

Getting started

Explore articles about the STM32MPU family and its associated ecosystems at: **wiki.st.com/stm32mpu/**

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