



# STM32MP2 MPU series

## 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 1 Target certifications
- TrustZone® on Cortex®-A and Cortex®-M
- Secure provisioning ecosystem
- Secure isolation for edge confidential computing thanks to resource isolation framework

| 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-256/512, 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<br>DDR3(L) 32-bit @ 1066 MHz        |
| Shared RAM 640 Kbytes including 128 Kbytes Retention RAM         |
| Backup RAM 8 Kbytes<br>Boot ROM 128 Kbytes<br>OTP fuse 12 Kbytes |
| Analog   |
| 3x 12-bit ADC 5 MSPS   |
| Temperature sensor   |
| Connectivity   |
| 2x 1 Gbps 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<br>USB2.0 Host/Device HS or USB3.0 DRD         |
| USB2.0 Host HS + HS PHY  |
| USB Type-C connector support                                     |
| 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                                       |

## STM32MP25x supporting the growth of connected applications

## Hardware interfaces

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

**Dedicated  
STPMIC25 for power  
management**



## Software tools

**Embedded software distribution**  
Linux® distribution based on Yocto  
or Buildroot running on the Arm®  
Cortex®-A processor(s): OpenSTLinux  
Distribution.



## Drivers, middleware & examples

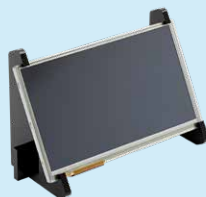
STM32Cube MPU Package, provides BSP, HAL, middleware components and application packages in source code for development.

## Hardware tools

## A full set of evaluation boards enables flexible prototyping



Evaluation board  
STM32MP257F-EV1



EDT LCD panel  
display



Camera module  
adapter board  
B-CAMS-IMX

DSI to HDMI  
adapter board

## STM32Cube framework

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



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