

# STM32MP1 Series Microprocessors



Multicore STM32MP1 architecture accelerates the development of open-source Linux-based applications with real-time and power-constrained subsystems

The STM32MP1 series embeds a dual Arm® Cortex®-A7, a Cortex®-M4 and a 3D GPU. Its flexible architecture allows high processing and real-time tasks in a single chip. Moreover, a large package offering is available to achieve lowest PCB cost structure and smallest footprint. The STM32MP1 comes with a dedicated Power Management companion IC: STPMIC1

The STM32MP1 series drastically reduces development time thanks to ST's mainlined, opensource OpenSTLinux Distribution and our STM32Cube toolset specially upgraded for Cortex®-A7 Linux MPU development. All STM32MP1 peripherals can be seamlessly allocated to either the Cortex®-A7 (Linux) or Cortex®-M4 core (real time).

#### **TARGETED APPLICATIONS**

- Industrial
- Home
- Consumer
- Health and Wellness

#### CORE

- Dual Arm<sup>®</sup> Cortex<sup>®</sup>-A7 core @ 650 MHz
- 32kB+32kB I/D L1 cache
- 256kB L2 cache
- Arm<sup>®</sup> Cortex<sup>®</sup>-M4 core @ 209 MHz

#### **EXTERNAL MEMORIES SUPPORT**

- DDR3, DDR3L, LPDDR2, LPDDR3
- SLC NAND, SPI NAND
- eMMC, SD card, Quad-SPI NOR

#### **INTERNAL MEMORIES**

- 256kB System RAM
- 384kB MCU System RAM
- 64kB MCU Retention RAM

#### **ANALOG**

- 2x 16-bit ADCs
- 2x 12-bit DACs

#### GRAPHICS

- 3D GPU OpenGL ES 2.0
- LCD-TFT Controller
- MIPI-DSI® controller

#### **SECURITY**

- TrustZone
- AES 256, TDES
- SHA-256, MD5, HMAC
- Secure Boot, RAMs & peripherals

#### **OTHER**

- 37x Communication peripherals
- 29x timers & 3x watchdogs
- 5x LDOs
- Up to 176 GPIOs
- 125°C supported as maximum junction temperature



#### STM32MP157 BLOCK DIAGRAM

Arm <sup>®</sup> Dual Cortex 650 MHz L1 32kB I L1 3 256kB L2 Cact	°-A7 32kB D Ie	Arm <sup>®</sup> Cortex <sup>®</sup> -M4 209 MHz FPU MPU	
External Memories	DDR3/DDR3L/LPDDR2/LPDDR3 32-bit @ 533 MHz Dual Quad-SPI 16-bit SLC NAND 8-bit ECC		
3x SDMMC			
Internal Memories	MCU System RAM 384kB	MCU Retention RAM 64kB	
System RAM 256kB	Back up RAM 4kB	OTP fuse 3kb	
	Graphics	System	
Connectivity	3D GPU OpenGL ES 2.0	5x LDOs	
10/100M or Gigabit	@ 533 MHz MIPL-DSI controller	Internal and External Oscillators	
Ethernet GMAC	L CD-TET controller	MDMA + 2x DMA	
3x USB 2.0 Host/OTG		Reset and Clock	
Camera interface	Security	3x watchdogs	
HDMI-CEC	TrustZone	Up to 176 GPIOs	
2x CAN FD	AFS 256, TDFS*	Control	
MDIO slave	SHA-256, MD5, HMAC		
DFSDM (8 channels/6 filters)	3x Tamper Pins with	motor control timers	
6x SPI / 3x I <sup>2</sup> S	1 active	15x 16-bit timers	
6x I <sup>2</sup> C	Secure BOOL"	2x 32-bit timers	
4x UART + 4x USART	Secure Peripherals	Analog	
4x SAI	Secure RTC		
SPDIF	Analog true RNG	2x 16-bit ADCs	
	96-bit unique ID	2x 12-bit DACs	

\*available for STM32MP157C only

## STM32MP1 PORTFOLIO

#### Features

STM32MP157*	Dual Cortex-A7, Cort	ex-M4, 3D GPU, DSI, CA	AN FD	
STM32MP153*	Dual Cortex-A7, Cort	ex-M4, CAN FD		
STM32MP151*	Cortex-A7, Cortex-M	4		Packages
TFBGA 257 10x10mm, p0.5	TFBGA 361 12x12mm, p0.5	LFBGA 354 16x16mm, p0.8	LFBGA 448 18x18mm, p0.8	size
Packages	s can support low-c	ost PCB down to 4-	avers PTH	

\*With or without HW crypto and secure boot

## HARDWARE TOOLS

A full set of evaluation boards enables flexible prototyping as well as full STM32MP1 evaluation.



STM32MP157A-EV1 STM32MP157C-EV1 2 Evaluation boards STM32MP157A-DK1 STM32MP157C-DK2 2 Discovery Kits

# **SOFTWARE TOOLS**

STM32

The STM32MP1 Series comes with enhanced STM32CubeMX, Multi-Core IDE solutions and STM32CubeProgrammer.

# STM32MP1 EMBEDDED SOFTWARE DISTRIBUTION

It includes:

 Linux<sup>®</sup> distribution based on Yocto, running on the Arm<sup>®</sup> Cortex<sup>®</sup>-A processor(s): **OpenSTLinux Distribution**



 STM32Cube MPU Package, running on the Arm<sup>®</sup> Cortex<sup>®</sup>-M processor: STM32CubeMP1 Package ST



#### **SOFTWARE PACKAGES**

To optimize development at each stage of a project, 3 OpenSTLinux Distribution software packages let developers select the supports that best meet their needs:

- Starter Package (STM32MP1Starter) to quickly and easily start with any STM32MP1 microprocessor
- Developer Package (STM32MP1Dev) to add your own developments on top of the STM32MP1 Embedded Software distribution
- Distribution Package (STM32MP1Distrib) to create your own Linux<sup>®</sup> distribution or your own Starter and your own Developer packages



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