Introduction to the STM32MP1 Microprocessor Series

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Product Marketing





Technology Tour 2019

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Extending STM32 Success and Commitment with Microprocessors



Continuing the STM32 Success Story

Leader in Arm Cortex-M 32-bit General Purpose MCU



life.auamented

STM32 Rolling Longevity Commitment

Longevity commitment is renewed every year



starting January 1st 2019 → Until 2029

• STM32F1 (launched in 2007)	22 years of commitment
• STM32L1 (launched in 2009)	20 years of commitment
 STM32F2 (launched in 2010) 	19 years of commitment
 STM32F4 (launched in 2011) 	18 years of commitment
 STM32F0 (launched in 2012) 	17 years of commitment
 STM32F3 (launched in 2012) 	17 years of commitment
 STM32L0 (launched in 2013) 	16 years of commitment
 STM32F7 (launched in 2014) 	15 years of commitment
 STM32L4 (launched in 2015) 	14 years of commitment
 STM32L4+ (launched in 2016) 	13 years of commitment
 STM32H7 (launched in 2016) 	13 years of commitment
• STM32WB (launched in 2018)	11 years of commitment
• STM32G0 (launched in 2018)	11 years of commitment



STM32MP1: A General Purpose MPU

Suitable for all Developer Types and Multiple Applications

STM32 **MP1**

Developer profile

MCU users new to MPU



Mixed MCU and MPU users



Pure MPU users



Possible applications











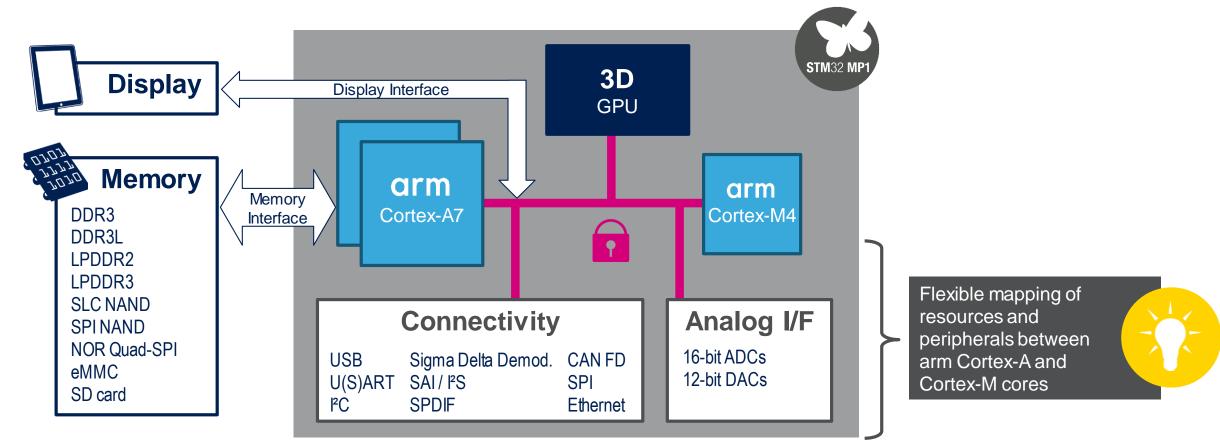


Flexible architecture for a wide range of applications



STM32MP1 Rich Feature Set

Advanced & Flexible Architecture with 3D GPU







STM32MP1 Block Diagram 8

STM32MP157

Core 2 @ 650MHz

L1 32KB I / 32KB D

NEON SIMD

System

5xLDOs

Crystal & Internal oscillators

MDMA + 2x DMA

Reset and Clock

Watchdogs(2x I & W)

96-bit unique ID

Up to 176 GPIOs

Cortex-M4 @ 209MHz

256KB L2 cache

Dual Cortex-A7 @ 650MHz

FPU

MPU

Security

DES. TDES. AES-256

SHA-256, MD5, HMAC

3x Tamper Pins with 1 active

To, V and 32KHz detection

Secure ROM and RAMs

Secure Peripherals

Secure RTC

Analog true RNG

DDR3/DDR3L 32-bit @ 533MHz

LPDDR2/LPDDR3 32-bit @ 533MHz

System RAM 256KB

Core 1 @ 650MHz

L1 32KB I / 32KB D

NEON SIMD

MCU System RAM 384KB

Retention RAM 64KB

Backup RAM 4KB

Boot ROM 128KB

OTP Fuse 3Kb

Control

2x 16-bit motor control PWM synchronized AC timer

10x 16-bit timer

5x 16-bit LP timer

2x 32-bit timer

3D GPU OpenGL ES2.0 @ 533MHz 26Mtri/sec, 133Mpix/sec

Connectivity

24-bit Parallel RGB Display MIPI DSI 2 lanes @ 1Gbps

Camera Interface

HDMI CEC 2x FDCAN / TTCAN

2x USB2.0 Host HS

USB2.0 OTG FS/HS

DFSDM 8 channels/6 filters 4x UART, 4x USART

4x SAI

6x SPI / 3x I2S SPDIFTx/Rx4inputs

Dual Quad SPI

3x SDIO3.0 / SD3 / eMMC 4.51

16-bit SLC NAND, 8-bit-ECC

Analog

2x 16-bit ADC 3MSPS 22 channels

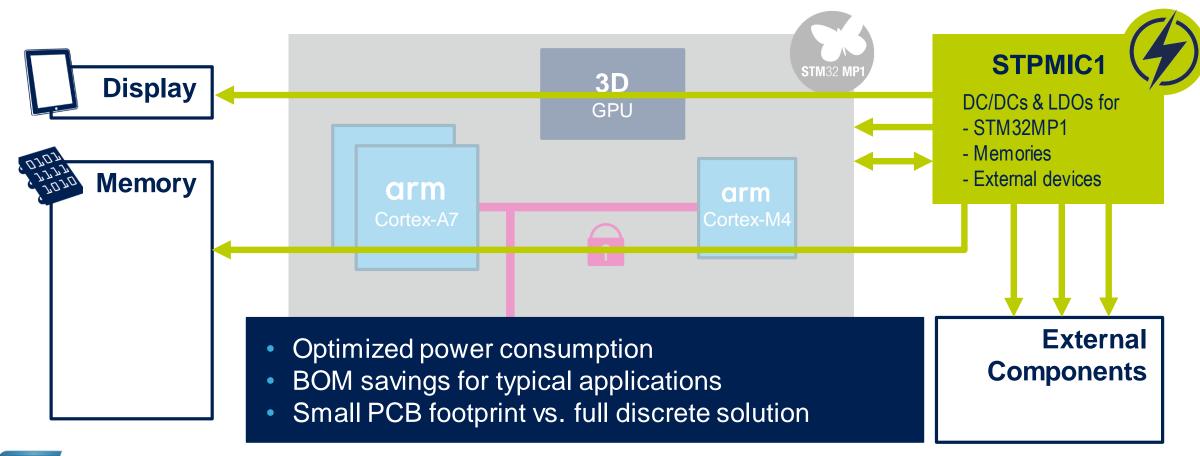
2x 12-bit DAC

Temperature sensor



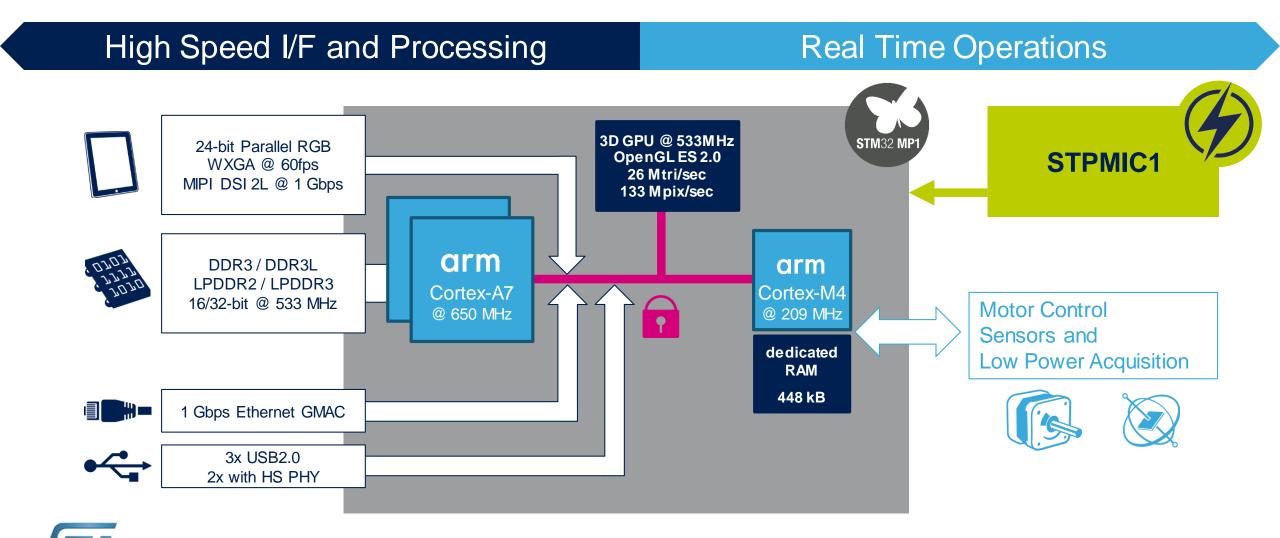
STPMIC1 Power Management IC

Simplify your design and optimize power consumption

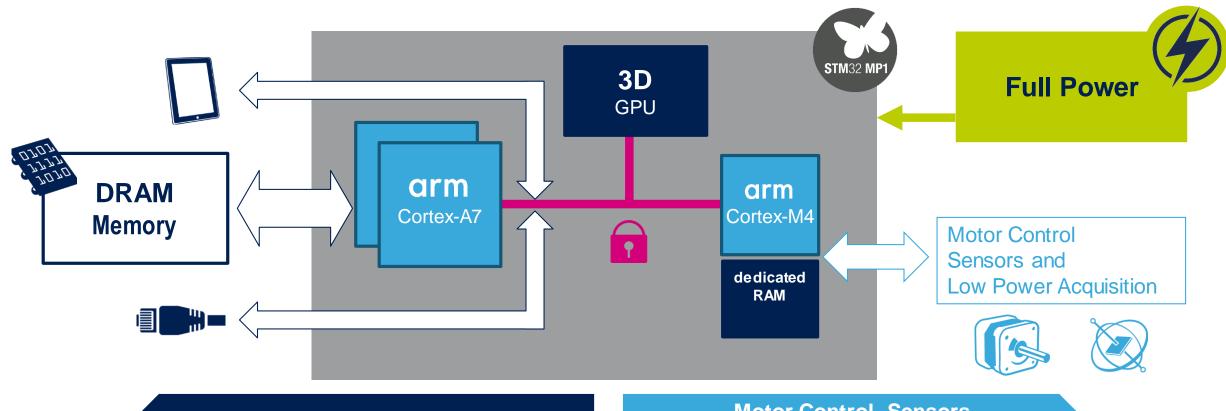




Arm Cortex-A + Cortex-M Architecture



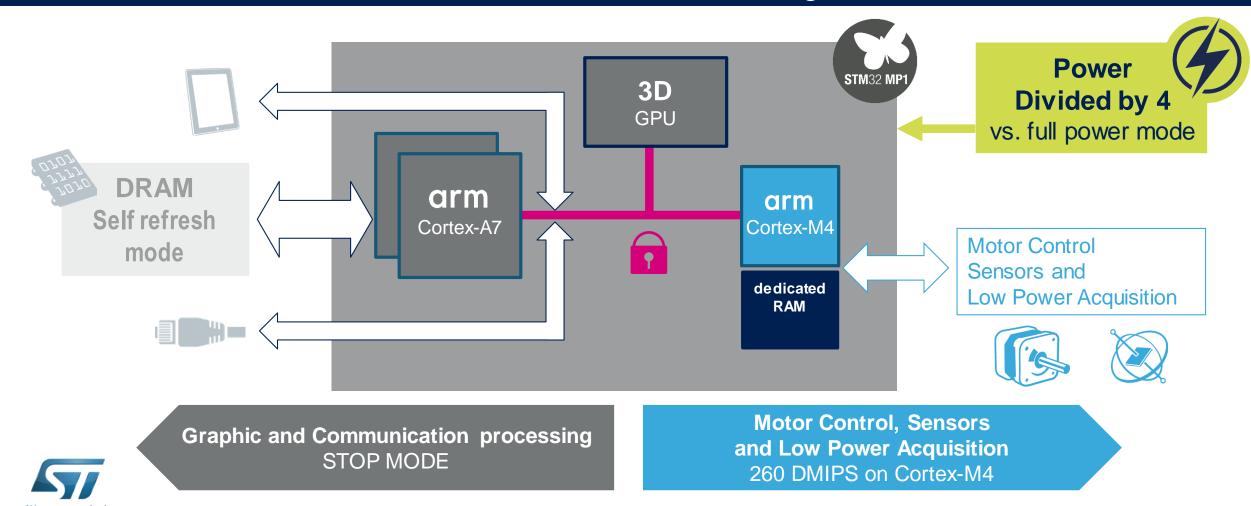
Processing for HMI and Communication + Motor Control and Sensing



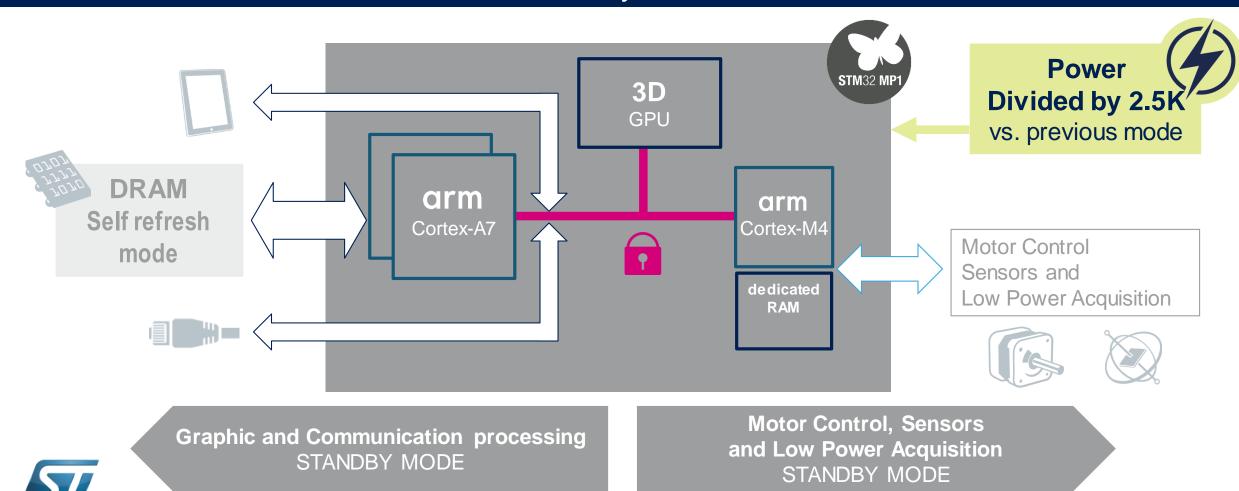
Graphic and Communication processing 2470 DMIPS on dual Cortex-A7 + 3D GPU

Motor Control, Sensors and Low Power Acquisition 260 DMIPS on Cortex-M4

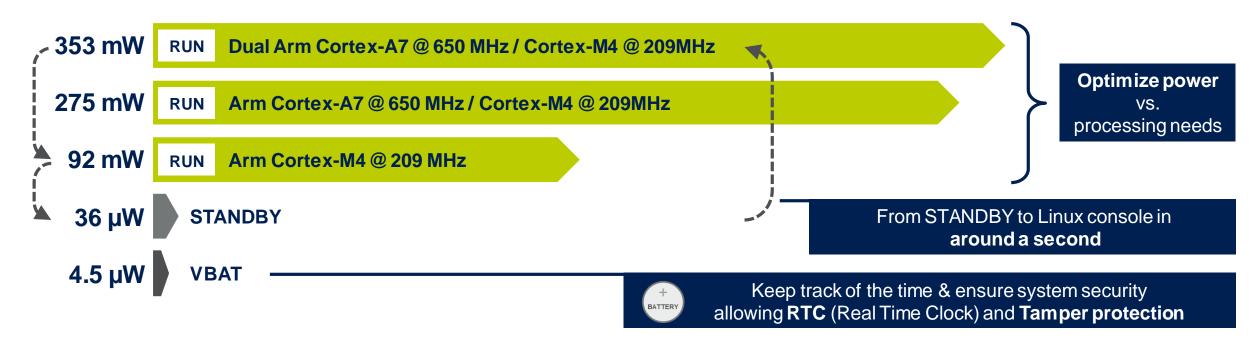
Motor Control and Sensing



Standby Mode



Power Figures



Typ @ VDDCORE = 1.2V, VDD = 3.3V @ 25 °C, Peripherals OFF

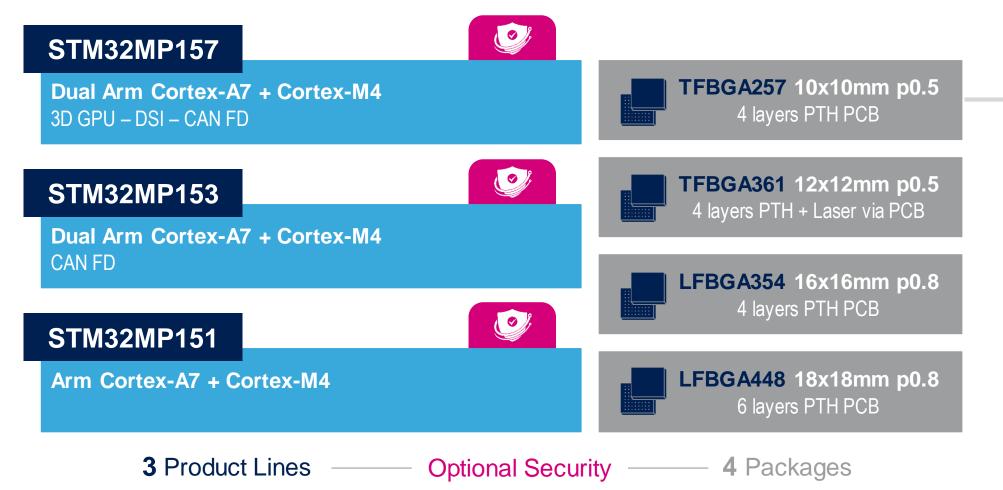


smallest

package for dual Cortex-A

GP MPU

STM32MP1 Tailored for Multiple Applications 15







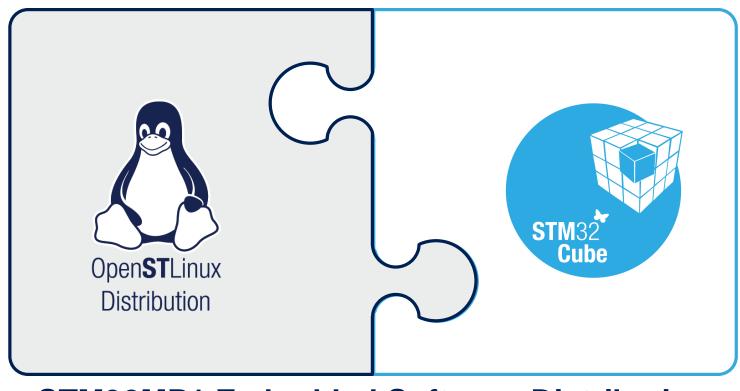
Accelerated development leveraging the STM32 Ecosystem



A Fully Integrated Design Suite

Leveraging the STM32Cube Environment





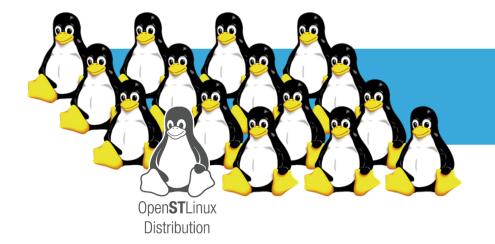


STM32MP1 Embedded Software Distribution



Simplify your Linux Development 18

Fully mainlined open source Linux distribution for Arm Cortex-A7



STM32MP1 SoC drivers already adopted by the Linux community

STM32MP1 supported in Linux 4.19 LTS

Fully compliant with open-source standards



Pre-integrated Secure OS





Benefit from Field-Proven RTOS Tools 19

Full re-use of STM32Cube Firmware on Arm Cortex-M





Several APIs to access peripherals



Collection of Middleware components for Cortex-M



Hundreds of Examples



Production-ready Quality



Business-friendly license terms



Supported by the STM32 Ecosystem

All the Tools for Successful MPU Development

Software

Hardware

Customer support











Discovery boards



Evaluation boards









STM32MP1 Software Tools 21

Complete support of Arm Cortex-A + Cortex-M architecture





All-in-one STM32 programming tool Multi-mode, user-friendly



STM32CubeMX

STM32CubeMX enhanced for MPU

- Configure and generate code
- DRAM interface tuning tool
- Device Tree generation

IDEs Compile and Debug

Multi-Core Solutions

- Partners IDE
- Free IDE based on Eclipse
- Multi-core debugging

STM32 Programming Tool

STM32CubeProgrammer

- Flash, DRAM and/or system memory
- **OTP** programming
- Signing tool & Keys generation



STM32MP1 Hardware Solutions 22

Speed-up evaluation, prototyping and design











Evaluation Board

Full feature STM32MP1 evaluation

- STM32MP157A-EV1
- STM32MP157C-EV1

Discovery Board

Flexible prototyping & demo

- STM32MP157A-DK1
- STM32MP157C-DK2
 - + MIPI DSI WVGA display
 - + Wi-Fi/BT combo module

Boards & SoM*s

3rd Parties Boards for prototyping and production

- Board Specification from Linaro (96boards.org)
- Commercial SoM w/ different forms



Software, Training and Services

a Broad Ecosystem to Support Development





ST's wiki user guide for beginners and experts https://wiki.st.com/

Large selection of partners already engaged for:

- Graphics UI
- Security
- Training and services





STM32MP1 - Your New Companion

for Advanced Applications





Extending STM32 success and commitment with **Microprocessors**



Flexible architecture for a wide range of applications



Accelerated development leveraging the STM32 Ecosystem



Releasing Your Creativity 25





