STM32MP1 Microprocessor
Continuing the STM32 Success Story

Press Presentation
What Happens when STM32 meets Linux?
The STM32MP1 Microprocessor Happens!

Available NOW!

STM32 MP1

OpenSTLinux Distribution
Extending STM32 success and commitment with Microprocessors
Continuing the STM32 Success Story

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

- World 1st Cortex-M MCU
- World 1st Cortex-M Ultra-low-power
- 1st High Perf. 120 MHz, 90nm
- 1st High Perf. Cortex-M4 168 MHz
- 1st Mixed Signal DSP + Analog STM32F3 Cortex-M4
- Entry Cost STM32F0 Cortex-M0
- Entry Cost Ultra-low-power
- World 1st Cortex-M7
- World 1st Ultra-low-power Cortex-M4
- #1 ULP 273 ULPBench™
- Leadership Ultra-low-power Excellence
- #1 Performance 2020 CoreMark
- Mainstream Cortex-M0+ MCUs Efficiency at its best!
- Introduction of M33 Excellence in ULP with more security
- Dual-core, multiprotocol and open radio
- Efficiency at its best!

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

Developer profile

- MCU users new to MPU
  - MCU ➔ MPU
- Mixed MCU and MPU users
  - MCU + MPU
- Pure MPU users
  - MPU

Possible applications

- Industrial
- Consumer
- Health & Wellness
- Home
Supported by the STM32 Ecosystem
All the Tools for Successful MPU Development

Software

Hardware

Customer support

Discovery boards

Evaluation boards

FAE - Worldwide Customer Support

community.st.com
Flexible architecture for a wide range of applications
Rich Feature Set

Advanced & Flexible Architecture with 3D GPU

Display

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

Connectivity
- USB
- U(S)ART
- I²C
- Sigma Delta Demod.
- SAI / I²S
- SPDIF
- CAN FD
- SPI
- Ethernet

Analog I/F
- 16-bit ADCs
- 12-bit DACs

Flexible mapping of resources and peripherals between arm Cortex-A and Cortex-M cores
Simplify your design and optimize power consumption

- Optimized power consumption
- BOM savings for typical applications
- Small PCB footprint vs. full discrete solution
Arm Cortex-A + Cortex-M Architecture

High speed I/F & processing

24-bit Parallel RGB
WXGA @ 60fps
MIPI DSI 2L @ 1 Gbps

DDR3 / DDR3L
LPDDR2 / LPDDR3
16/32-bit @ 533 MHz

1 Gbps Ethernet GMAC

3x USB2.0
2x with HS PHY

3D GPU @ 533MHz
OpenGL ES 2.0
26 Mtri/sec
133 Mpix/sec

dedicated RAM
448 kB

Cortex-M4
@ 209 MHz

Real-time

STPMIC1

Motor Control
Sensors &
Low Power acquisition
Flexible Architecture for Power Efficiency

Processing for HMI and communication + motor control & 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
Flexible Architecture for Power Efficiency

Motor control & sensing

- DRAM Self refresh mode
- Cortex-A7
- Cortex-M4
- 3D GPU
- Dedicated RAM
- Motor Control, Sensors & Low Power acquisition
- Graphic and Communication processing
- STOP MODE
- Power Divided by 4 vs. full power mode
- 260 DMIPS on Cortex-M4
Flexible Architecture for Power Efficiency

Standby mode

- DRAM Self refresh mode
- arm Cortex-A7
- arm Cortex-M4
- 3D GPU
- dedicated RAM

Graphic and Communication processing
STANDBY MODE

Motor Control, Sensors and low power acquisition
STANDBY MODE

Power Divided by 2.5K vs. previous mode

Motor Control, Sensors & Low Power acquisition
Flexible Architecture for Power Efficiency

Processing for HMI and communication + motor control & sensing

DRAM Memory

ARM Cortex-A7

3D GPU

ARM Cortex-M4

dedicated RAM

Full Power

Motor Control Sensors & Low Power acquisition

Back to full performance

~1 second to move back to Linux console

~3 seconds for 3D graphic application
Accelerated development leveraging the STM32 Ecosystem
A Fully Integrated Design Suite
Leveraging the STM32Cube Environment

STM32MP1 Embedded Software Distribution
Simplify your Linux Development

Fully manlined 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

Full re-use of STM32 MCU Cube 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
STM32MP1 Software Tools

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

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

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

*System on Module
Software, Training and Services
a Broad Ecosystem to Support Development

STM32 MPU wiki by ST

ST’s wiki user guide
for beginners and experts
https://wiki.st.com/stm32mpu

Large selection of partners already engaged for:
- Graphics UI
- Security
- Training and services
STM32MP1 Tailored for Multiple Applications

24 Sales Type in Production Now

STM32MP157
- Dual Arm Cortex-A7 + Cortex-M4
- 3D GPU – DSI – CAN FD

STM32MP153
- Dual Arm Cortex-A7 + Cortex-M4
- CAN FD

STM32MP151
- Arm Cortex-A7 + Cortex-M4

TFBGA257 10x10mm p0.5
- 4 layers PTH PCB

TFBGA361 12x12mm p0.5
- 4 layers PTH + Laser via PCB

LFBGA354 16x16mm p0.8
- 4 layers PTH PCB

LFBGA448 18x18mm p0.8
- 6 layers PTH PCB

3 Product Lines

Optional Security

4 Packages

smallest package for dual Cortex-A GP MPU
Building the Future
STM32 MPU Portfolio Expansion

Step-up in performance, features and security

Cost and power optimization
STM32MP1 - Your New Companion for Advanced Applications

Available NOW!

Extending STM32 success and commitment with Microprocessors

Flexible architecture for a wide range of applications

Accelerated development leveraging the STM32 Ecosystem
STM32MP157 Block Diagram
Flexible Architecture for Power Efficiency

Power figures

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

Optimize power vs. processing needs

From STANDBY to Linux console in around a second

Keep track of the time & ensure system security allowing RTC (Real Time Clock) and Tamper protection

- 353 mW (RUN) Dual Arm Cortex-A7 @ 650 MHz / Cortex-M4 @ 209MHz
- 275 mW (RUN) Arm Cortex-A7 @ 650 MHz / Cortex-M4 @ 209MHz
- 92 mW (RUN) Arm Cortex-M4 @ 209 MHz
- 36 µW (STANDBY)
- 4.5 µW (VBAT)

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