STM32MP1 Microprocessor
Broadening STM32 MPU Family

Press Presentation
Creating a Smart Home Gateway with advanced HMI and HD video?
Advanced HMI with Graphics and Video on Top of Real Time Applications

HD video decode with Dual Arm Cortex-A7 @ 800 MHz

Better user experience powered by advanced 3D GPU

Wide range of partners ready to support you on many topics: Graphics, HW & SW Services…

Seamless and flexible combination of audio and real time processing with Cortex-A + Cortex-M architecture
Need an Industrial grade processor for your applications?
Industrial Grade Microprocessor for Demanding Applications

Industrial qualification combining both:
• 100% operating time during 10 years
• Junction temperature: -40°C to 125°C

10 years longevity commitment renewed every year

Industrial connectivity, advanced analog Cortex-M4 for real time processing

Advanced security for Industry 4.0

4 packages available in pitch 0.5 & 0.8mm
Easily improve your application with artificial intelligence?
Embedding Various Neural Networks for Cutting-edge Applications

- TensorFlow Lite native support running on Cortex-A / Linux
- STM32Cube.AI tool for machine learning running on Cortex-M4
- Camera and audio interfaces to simplify input devices’ integration
STM32MP1 - Constantly Improving

Boosting performances with Dual Cortex-A7 @ 800MHz

A broader STM32 MPU ecosystem to reduce development time & cost
Boosting performances with Dual Cortex-A7 @ 800MHz
Boosting Performances
Broadening Possibilities

Pin to pin compatibility across all part numbers
Full HW compatibility with STPMIC1

@ 650 MHz

@ 800 MHz

SW compatibility across the family

A Scalable Solution to best meet customers’ needs
Boosting Application Possibilities

STM32MP1

- **Cortex-M4**: 209 MHz
- **3D GPU**: @ 533MHz, OpenGL ES 2.0
  - 26 Mtri/sec
  - 133 Mpix/sec
- **dedicated RAM**: 448 kB

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**Real-time & Low Power applications**

- **260 DMIPS**

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STM32MP1

- **ARM Cortex-A7**: up to 800 MHz
- **ARM Cortex-M4**: 209 MHz
- **Connectivity**: Sensors
- **Open OS**
- **Real time OS**

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**Graphic and communication**

- **High Performance processing**
  - up to 3040 DMIPS

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**Advanced GUI & HD Video Decode**

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**Motor Control**

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**STPMIC1**

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**Real time OS**
Secure Architecture for Trusted Devices

**Encryption Decryption Authentication**
- Duplicated resources on Cortex-A7 and Cortex-M4
- Crypto and Hash Hardware Engines
- TRNG
- Secure boot (ROM)
- Unique ID

**Confidentiality Anti-Tampering**
- TrustZone
- Secure RAMs and Peripherals
- Secure RTC with Active Tamper
- Tº, V and 32KHz sensor monitoring
- Cortex-M4 resources HW isolation
- Secure OS support: OP-TEE

**Secure Manufacturing**
- Paired Keys Tools Generator
- Signing Tools for boot
- Development and production programmers with provisioning and authentication

Some of the above features are optional and require to procure dedicated part numbers. Please refer to product specification.
A broader STM32 MPU ecosystem to reduce development time & cost
Enhance Your Added Value
by Relying on ST and Authorized Partners’ Solutions

Solutions for EDGE computing & IoT from sensors up to the Cloud

Simplifying Android™ development

A growing base of ST Authorized Partners

ST continuous investment into the most recognized Open Source standards

*Android is a trademark of Google LLC.*
Create Cloud Based Applications with STM32MP1 Solutions

Complete support of main cloud provider

aws qualified device

Microsoft Azure IoT Platform

IBM Watson support soon

Example of STM32MP1 Discovery board used for EDGE processing
Simplifying Android™ Development

Reduce development time & cost with pre-build Solutions provided by ST:
- Free of charge AOSP enablement
- Various Android™ packages

Extra headroom (up to 800MHz Cortex-A) for better user experience

Exclusive plug-in to bridge real-time Cortex-M and Android environments provided in the SDK

Android is a trademark of Google LLC.
Continuous Investment in Linux to Make Customers’ Design Simpler and More Efficient

ST is continuously upstreaming Linux drivers to the Linux community

<table>
<thead>
<tr>
<th>Silver Member</th>
<th>Silver Member</th>
<th>Inventor of OP-TEE</th>
<th>Active Member</th>
<th>Club Member</th>
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Linux 4.19 LTS
Maintenance & support

Linux 5.4 LTS
Maintenance & support

Linux 5.x
Maintenance & support

2019 2020 2021 2022 2023
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<th>Embedded Software</th>
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STM32MP1 Line-up
## Expanding the STM32MP1 Portfolio

### Now 48 Part Numbers

### MPU @ 800 MHz

<table>
<thead>
<tr>
<th>STM32 MP151D</th>
<th>MP151F</th>
<th>STM32 MP153D</th>
<th>MP153F</th>
<th>STM32 MP157D</th>
<th>MP157F</th>
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<td>3040 + 260 DMIPS</td>
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<td>3040 + 260 DMIPS</td>
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<tr>
<td>800 MHz Cortex-A7</td>
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<td>800 MHz 2x Cortex A7</td>
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<td>800 MHz 2x Cortex-A7</td>
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<tr>
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### MPU @ 650 MHz

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<th>MP151C</th>
<th>STM32 MP153A</th>
<th>MP153C</th>
<th>STM32 MP157A</th>
<th>MP157C</th>
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<td>2470 + 260 DMIPS</td>
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<td>2470 + 260 DMIPS</td>
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<td>650 MHz Cortex-A7</td>
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<td>650 MHz 2x Cortex-A7</td>
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<td>650 MHz 2x Cortex-A7</td>
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</tr>
<tr>
<td>209 MHz Cortex-M4</td>
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<td>209 MHz Cortex-M4</td>
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### All references are available in 4 Packages

- **TFBGA257**: 10x10mm p0.5 (4 layers PTH PCB) - smallest package for dual Cortex-A GP MPU
- **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)

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**Arm® Cortex® core**

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<tr>
<th>Cortex-A7 + Cortex-M4</th>
<th>Dual Cortex-A7 + Cortex-M4</th>
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**All parts are software and pin to pin compatible**
Building the Future
STM32 MPU Portfolio Expansion

STM32 MPU FLAGSHIP
Big step-up in performance, features and security

STM32 MPU ACCESS
Cost optimization and improved security

@ 650 MHz  @ 800 MHz
STM32MP1 - Your New Companion for Advanced Applications

Boosting performances with Dual Cortex-A7 @ 800MHz

A broader STM32 MPU ecosystem to reduce development time & cost
Releasing Your Creativity

STM32 MP1

Facebook: /STM32
Twitter: @ST_World
Website: www.st.com/STM32MP1
STM32MP157
Block Diagram
Flexible Architecture for Power Efficiency

Power figures at 650MHz

- 361 mW \text{RUN} \quad \text{Dual Arm Cortex-A7 @ 650 MHz / Cortex-M4 @ 209MHz}
- 277 mW \text{RUN} \quad \text{Arm Cortex-A7 @ 650 MHz / Cortex-M4 @ 209MHz}
- 98 mW \text{RUN} \quad \text{Arm Cortex-M4 @ 209 MHz}
- 32 \mu W \text{STANDBY}
- 4 \mu W \text{VBAT}

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

VBAT
Flexible Architecture for Power Efficiency

Power figures at 800MHz

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

- 589 mW (RUN) Dual Arm Cortex-A7 @ 800 MHz / Cortex-M4 @ 209MHz
- 449 mW (RUN) Arm Cortex-A7 @ 800 MHz / Cortex-M4 @ 209MHz
- 98 mW (RUN) Arm Cortex-M4 @ 209 MHz
- 32 µW (STANDBY)
- 4 µW (VBAT)

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

Typ @ VDDCORE = 1.2V, VDD = 3.3V @ 25 °C, Peripherals OFF
STPMIC1 Power Management IC
Dedicated to STM32MP1 MPU

Simplify your design and optimize power consumption

- Optimized power consumption
- BOM savings for typical applications
- Small PCB footprint vs. full discrete solution

DC/DCs & LDOs for
- STM32MP1
- Memories
- External devices