STM32H723/733
STM32H725/735
STM32H730 Value lines
MCUs for rich and complex applications
Marketing presentation
### “High Perf” series among STM32 MCU portfolio

#### MPU

<table>
<thead>
<tr>
<th>Model</th>
<th>CoreMark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32MP1</td>
<td>4158</td>
<td>650 MHz Cortex-A7, 209 MHz Cortex-M4</td>
</tr>
</tbody>
</table>

#### High Perf MCUs

<table>
<thead>
<tr>
<th>Model</th>
<th>CoreMark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32F2</td>
<td>Up to 398</td>
<td>120 MHz Cortex-M3</td>
</tr>
<tr>
<td>STM32F4</td>
<td>Up to 608</td>
<td>180 MHz Cortex-M4</td>
</tr>
<tr>
<td>STM32F7</td>
<td>1082</td>
<td>216 MHz Cortex-M7</td>
</tr>
<tr>
<td>STM32H7</td>
<td>Up to 3224</td>
<td>Up to 550 MHz Cortex-M7, 240 MHz Cortex-M4</td>
</tr>
</tbody>
</table>

#### Mainstream MCUs

<table>
<thead>
<tr>
<th>Model</th>
<th>CoreMark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32F0</td>
<td>106</td>
<td>48 MHz Cortex-M0+</td>
</tr>
<tr>
<td>STM32G0</td>
<td>142</td>
<td>64 MHz Cortex-M0+</td>
</tr>
<tr>
<td>STM32F1</td>
<td>177</td>
<td>72 MHz Cortex-M3</td>
</tr>
<tr>
<td>STM32F3</td>
<td>245</td>
<td>72 MHz Cortex-M4</td>
</tr>
<tr>
<td>STM32G4</td>
<td>550</td>
<td>170 MHz Cortex-M4</td>
</tr>
</tbody>
</table>

- **Optimized for mixed-signal Applications**

#### Ultra-low Power MCUs

<table>
<thead>
<tr>
<th>Model</th>
<th>CoreMark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32L0</td>
<td>75</td>
<td>32 MHz Cortex-M0+</td>
</tr>
<tr>
<td>STM32L1</td>
<td>93</td>
<td>32 MHz Cortex-M3</td>
</tr>
<tr>
<td>STM32L4</td>
<td>273</td>
<td>80 MHz Cortex-M4</td>
</tr>
<tr>
<td>STM32L4+</td>
<td>409</td>
<td>120 MHz Cortex-M4</td>
</tr>
<tr>
<td>STM32L5</td>
<td>443</td>
<td>110 MHz Cortex-M33</td>
</tr>
<tr>
<td>STM32U5</td>
<td>651</td>
<td>160 MHz Cortex-M33</td>
</tr>
</tbody>
</table>

- **Optimized for mixed-signal applications**

#### Wireless MCUs

<table>
<thead>
<tr>
<th>Model</th>
<th>CoreMark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32WL</td>
<td>162</td>
<td>48 MHz Cortex-M4, 48 MHz Cortex-M0+</td>
</tr>
<tr>
<td>STM32WB</td>
<td>216</td>
<td>64 MHz Cortex-M4, 32 MHz Cortex-M0+</td>
</tr>
</tbody>
</table>

- **Cortex-M0+ Radio co-processor**
"If only I could address the design challenges in factory automation systems"
STM32H7 single core - Building a factory automation product

- High performance for optimized control or HMI
- Large embedded memory and external memory support
  - Up to 1 MB of Flash & up to 564 KB of SRAM
  - 2 x Octo-SPI interface
- Extended connectivity with Ethernet MAC, 3x FD-CAN and USB
- Fast 16-bit and 12-Bit ADC, and extended Temp range support up to 125 °C
- SIL ready enabled by native hardware features
"If only I could run deeply embedded applications with advanced performance at minimum cost"
STM32H7 - Creating a smartphone-like graphic UI for your embedded device

- High performance STM32 with Arm Cortex-M7 up to 550 MHz
- TFT LCD controller and Graphic hardware accelerations for better effects, transitions and fluidity
- Multiple high-speed memory interfaces
- Graphic support from 68-pin QFN packages (improved cost effectiveness) up to UFBGA / LQFP176
- TouchGFX free graphic tool suite for stunning HMI and simplified development
STM32H7
STM32H723/725 lines & STM32H730 Value line

New product lines expanding the STM32 portfolio

- New Performance Record
  - Up to 2778 CoreMark (Cortex®-M7 @550MHz)

- Flexible architecture for industrial, security or AI applications
  - Accelerated graphics, fast data transfer, advanced peripherals

- Advanced security features
  - Crypto Hash, Cortex®-M7 Security services

- Rich eco-system to speed-up your design
  - SW tools, HW boards, community and partners
Performance record
STM32H723/725 lines & STM32H730 Value line
High performance range

Arm® Cortex® -M7 up to 550 MHz

Most powerful Cortex core with double precision FPU, MPU, advanced DSP and L1 cache
Single Core Architecture Approach for performance and advanced HMI

Factory automation

Cortex-M7 = HMI, process control, power management

Connectivity & security

Cortex-M7 = Alarm panel, Wireless Modules
Create a rich human machine interface

Cortex-M7 - handling audio and rich HMI, Real Time control tasks

- **Display** (High Resolution)
- **Memory** (NOR, PSRAM-Octo-SPI, eMMC, SDRAM, SD card)
- **Audio decoding and output**
- **Chrom-ART Accelerator™ JPEG codec**
- **Crypto Hash**
- **STM32H7**

- **ARM Cortex-M7**
  - Main DMA
  - RAM
  - FLASH

Optional components:
- **RAM**

STM32H7 chip components:
Powerful core supported by a powerful architecture

Display nice graphic
The Chrom-ART Accelerator™ and LCD-TFT controller offload the CPU by more than 90%

Transfer data efficiently across peripherals
The Main DMA takes care of the most complex schemes between memories and peripherals with up to 16 channels to offload the CPU

Manage security
Use dedicated cryptography and Hashing HW acceleration to offload the CPU by more than 90%

Data acquisition with multiple fast ADCs
2 x 16-bit ADC and 12-bit ADC for real time control of application in factory automation or appliance applications
## Extensive STM32H7 portfolio

### Dual-core Line
- **STM32H7A3/B3**
  - 280 MHz
  - 599 DMIPS
  - RAM 1.4 MB
  - Flash up to 2 MB

- **STM32H742**
  - 480 MHz
  - 1027 DMIPS
  - RAM 692 KB
  - Flash up to 2 MB

- **STM32H743/753**
  - 480 MHz
  - 1027 DMIPS
  - RAM 1 MB
  - Flash up to 2 MB

- **STM32H747/757**
  - 480+240 MHz
  - 1027 + 300 DMIPS
  - RAM 1 MB
  - Flash up to 2 MB

- **STM32H745/755**
  - Extended temperature range 125 °C ambient

### Single-core Line
- **STM32H742**
  - 480 MHz
  - 1027 DMIPS
  - RAM 1 MB
  - Flash up to 2 MB

- **STM32H743/753**
  - 480 MHz
  - 1027 DMIPS
  - RAM 1 MB
  - Flash up to 2 MB

- **STM32H747/757**
  - 480+240 MHz
  - 1027 + 300 DMIPS
  - RAM 1 MB
  - Flash up to 2 MB

### Value Line
- **STM32H7B0**
  - 280 MHz
  - 599 DMIPS
  - RAM 1.4 MB
  - Flash 128 KB

- **STM32H750**
  - 480 MHz
  - 1027 DMIPS
  - RAM 1 MB
  - Flash 128 KB

- **STM32H7B50**
  - 480 MHz
  - 1027 DMIPS
  - RAM 1 MB
  - Flash 128 KB

### Cortex-M7 & -M4
- **STM32H723/733**
  - 550 MHz
  - 1177 DMIPS
  - RAM 564 KB
  - Flash up to 1 MB

- **STM32H725/735**
  - 550 MHz
  - 1177 DMIPS
  - RAM 564 KB
  - Flash up to 1 MB

- **STM32H720**
  - 550 MHz
  - 1177 DMIPS
  - RAM 564 KB
  - Flash 128 KB

- **STM32H730**
  - 550 MHz
  - 1177 DMIPS
  - RAM 564 KB
  - Flash 128 KB

- **STM32H730Q**
  - 550 MHz
  - 1177 DMIPS
  - RAM 564 KB
  - Flash 128 KB

---

STM32, Arm, Cortex, and Cortex-M are trademarks of ARM Ltd. or its subsidiaries. Extensive STM32H7 portfolio is a high-performance, cost-effective, and energy-efficient family of microcontrollers with advanced features for today’s demanding applications.
## STM32H7 MCU Series
### 32-bit Arm® Cortex®-M7

<table>
<thead>
<tr>
<th>CORE, MEMORIES AND ACCELERATION</th>
<th>Single-core lines</th>
<th>Value line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High performance up to 550 MHz in Single core Arm® Cortex®-M7</td>
<td>• High performance up to 550 MHz in Single core Arm® Cortex®-M7</td>
<td>• High performance up to 550 MHz in Single core Arm® Cortex®-M7</td>
</tr>
<tr>
<td>• 128 KB to 1 MB embedded Flash</td>
<td>• 128 KB to 1 MB embedded Flash</td>
<td>• 128 KB to 1 MB embedded Flash</td>
</tr>
<tr>
<td>• 564 KB RAM</td>
<td>• 564 KB RAM</td>
<td>• 564 KB RAM</td>
</tr>
<tr>
<td>• Security features (Boot, Tamper …), OTFDEC on external memories, Crypto/Hash and security services (optional)</td>
<td>• Security features (Boot, Tamper …), OTFDEC on external memories, Crypto/Hash and security services (optional)</td>
<td>• Security features (Boot, Tamper …), OTFDEC on external memories, Crypto/Hash and security services (optional)</td>
</tr>
<tr>
<td>• Graphic support with TFT-LCD controller and Chrom-ART Accelerator™</td>
<td>• Graphic support with TFT-LCD controller and Chrom-ART Accelerator™</td>
<td>• Graphic support with TFT-LCD controller and Chrom-ART Accelerator™</td>
</tr>
<tr>
<td>• 35 communication peripherals</td>
<td>• 35 communication peripherals</td>
<td>• 35 communication peripherals</td>
</tr>
<tr>
<td>• 16-bit ADC up to 3.6 MSPS, up to 5 Mspps in 12-bit, Comparators, Op Amp</td>
<td>• 16-bit ADC up to 3.6 MSPS, up to 5 Mspps in 12-bit, Comparators, Op Amp</td>
<td>• 16-bit ADC up to 3.6 MSPS, up to 5 Mspps in 12-bit, Comparators, Op Amp</td>
</tr>
<tr>
<td>• TT-FD-CAN and FD-CAN</td>
<td>• TT-FD-CAN and FD-CAN</td>
<td>• TT-FD-CAN and FD-CAN</td>
</tr>
<tr>
<td>• Low-Power Timers</td>
<td>• Low-Power Timers</td>
<td>• Low-Power Timers</td>
</tr>
<tr>
<td>• LDO and SMPS option</td>
<td>• LDO and SMPS option</td>
<td>• LDO and SMPS option</td>
</tr>
<tr>
<td>• Up to 140 °C junction temperature / 125 °C ambient (optional)</td>
<td>• Up to 140 °C junction temperature / 125 °C ambient (optional)</td>
<td>• Up to 140 °C junction temperature / 125 °C ambient (optional)</td>
</tr>
<tr>
<td>• Available in Value Line version</td>
<td>• Available in Value Line version</td>
<td>• Available in Value Line version</td>
</tr>
</tbody>
</table>

**Notes:**
1. Optional – dedicated CPU, STM32H723 and STM32H730 for the Crypto Variants
2. LDF°C ambient / 40°C junction. Dedicated part numbers on STM32H723/30.
4. SMPS available only on STM32H730 CPU.
5. SMPS only on the 64MHz variant (no LDO).
STM32H735xG

- STM32H735 is the crypto variant of the STM32H725
- It offers the Security services (SFI and SB-SFU) for secure programming or secure firmware update
- LDO and SMPS
- Optional 125 °C ambient Temp support / Max 140 °C junction temperature(*)

(*) : on dedicated part numbers
STM32H723/725/730Q lines
SMPS mode

Typical 25°C data
in RUN and LOW POWER modes

- CM7 RUN (VOS0) at 550 MHz - PERIPH OFF: 147 µA / MHz*
- CM7 RUN (VOS1) at 400 MHz - PERIPH OFF: 117 µA / MHz*
- BAM mode** (D3 RUN, D1 and D2 STDBY): 25 µA / MHz
- STOP Mode (D3 STOP, D1 and D2 STDBY): 74 µA***
- STANDBY + 4 KB RAM: 4.0 µA / 4.3 µA****
- STANDBY: 2.5 µA / 2.8 µA****
- VBAT: 25 nA / 0.75 µA****

Typ @ VDD = 3.3 V, @ 25 °C

Notes:
* from Flash (Cache ON and Reg. ON)
** Autonomous Mode - run at 64MHz, I2C4 and BDMA
*** VOS5; Flash OFF, no IWDG
**** without and with RTC, At 3V

Numbers are typical. More details available in product Sheet available at www.st.com
ST's new STM32H7 microcontrollers combine the high performance of a single core with rich feature integration.
Performance and smart architecture are yours to innovate
## Industrial and health & wellness DNA

### Industrial

- Error Code Correction on all Flash and RAM
- Large choice of packages
- Advanced digital and analog
  
  (16-bit and 12-bit ADC, Op-Amp, Ethernet, CANFD…)
- High temperature -40°C up to 140°C junction temperature (125°C ambient)
Industrial and health & wellness DNA

**Industrial**

- **Inverters**
  Advanced timers and analog peripherals

- **Communication gateway**
  Rich connectivity

- **Human Machine Interface**
  Chrom-ART Accelerator™ and display interfaces for TFT and MIPI-DSI

**Health & Wellness**

- **Health and wellness**
  Chrom-ART Accelerator™ and display interfaces for TFT displays

- **Individual assistance** (hearing, respiratory)
  Advanced timers and analog

- **Measurements and Data logger**
  Advanced Analog
Consumer DNA

- Small packages
- Power efficiency and high performance
- Advanced audio and graphic
- High-speed peripherals
- Large expandable memories to support ever increasing communication protocols
Consumer DNA

Consumer

• **IoT gateway**
  Large memory and rich communication peripherals

• **Access control**
  Chrom-ART Accelerator™ and display interfaces for TFT

• **Drones**
  High processing architecture, advanced timers and analog peripherals, small packages
Secure your production and your applications
STM32Trust on STM32H7 Series

Global security ecosystem and services

STM32 concept
Support customer’s Secure Boot / Root Of Trust

SFI
A Secure Installer of Secure Boot / Root Of Trust

SBSFU
A reference SW package for FW Update and Secure Boot / Root Of Trust

www.st.com/stm32trust
Secure your production flow with secure firmware install (SFI*)

Manage STM32 authentication, firmware decryption and installation

Customer premises

- FW
- ST Hardware Secure Module (HSM)
- Store encryption key into HSM

Untrusted environment

- STM32H7 SFI
- Authenticate target STM32
- Generate installation license

Encrypted FW transfer

Encrypted FW

HSM physical transfer

HSM

(*) : optional – SFI service available on specific part numbers
**Embedded Secure Firmware Install - SFI**

**Manage STM32 authentication, firmware decryption and installation**

**Customer premises**
- SFI
  - FW
  - Encrypted FW
  - Store encryption key in HSM
  - Trusted Package Creator
  - ST Hardware Secure Module (HSM)

**3rd Party premises**
- SMI
  - Module
  - Encrypted Module
  - Store encryption key in HSM
  - Trusted Package Creator
  - ST Hardware Secure Module (HSM)

**Untrusted environment**
- Encrypted FW Transfer
- HSM
- Physical transfer
- SFI
  - Authenticate target STM32
  - Generate installation license

**Secure Loader**
- embedded services provisioned by ST
- ➔ Mass Market approach

**ST ecosystem**
- with Encryption, HSM and programming tools

**Firmware cloning**
- protection on the first installation
- via UART / SPI / USB

**Protect 3rd party Software IP (SMI)**
Secure Boot Secure FW Update - SBSFU

Reference library source code for IAP

Demonstrate SW modules for:
- Secure Boot
- Secure Engine for Crypto and key
- Firmware Update image management

Ensure authentication and secure programming of in the field products

Reference implementation of STM32H7 hardware memory protections
A full set of security

Encryption
Decryption
Authentication

• AES-128/256 Encryption
• DES/TDES crypto engine
• SHA-256 Authentication
• Certified Crypto library
• True Random Number Generator
• Unique ID
• Key provisioning for STM32 authentication

Memory and IP protection

• Anti-tamper detection
• Memory Protection Unit (MPU)
• Secure Boot
• Read and Write Protection
• Secure User Area (Hide Protect)
• PC-ROP
• JTAG fuse
• Octo-SPI On The Fly Decrypt engine on external NOR Flash

Some of the above features are optional and require to procure dedicated part numbers.
Please refer to product specification
## STM32H7 detailed security functions

<table>
<thead>
<tr>
<th>STM32Trust Security function</th>
<th>CM7/CM4</th>
<th>CM7 Crypto CM7/CM4 Crypto</th>
<th>CM7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure Boot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure User Memory for SBSFU software package</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure Install/Update</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By SBSFU software package</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure Storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for Boot only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Debug</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read Out Protection RDPL0/1/2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource Isolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory Protection Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure Execution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By SBSFU software package</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crypto Engine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware crypto accelerator</td>
<td>TRNG Fips</td>
<td>AES / DES / SHA / TRNG Fips</td>
<td>AES / DES / SHA / TRNG Fips</td>
</tr>
<tr>
<td>Crypto Engine</td>
<td>On-the-fly decryption from external memories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWIP Protection/Collaborative Dev</td>
<td>Secure Module Install (SMI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure Manufacturing</td>
<td>Secure Firmware Install (SFI)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: a crypto library is available on request for both crypto and non crypto parts.
Solutions for STM32H7 Graphics
Enhance your product with great graphic
Enhanced graphic UI for any resolution

- **Internal RAM**
  - STM32H7A3/7B3/7B0
  - STM32H723/725/730
  - STM32H743/745/747/750

- **External RAM**
  - STM32H7A3/7B3/7B0
  - STM32H723/725/730
  - STM32H743/745/747/750

**Display configurations**:
- **Display with GRAM**
  - Single frame buffer
  - **STM32H7A3/7B3/7B0**
  - **STM32H723/725/730**
  - **STM32H743/745/747/750**

- **Display without GRAM**
  - Double frame buffer
  - **2” – 3”**
  - **4” – 5”**
  - **7”**
  - **+10”**
## STM32H7 detailed graphic features

<table>
<thead>
<tr>
<th>Features</th>
<th>STM32H7A3/7B0</th>
<th>STM32H723/725/730</th>
<th>STM32H745/747</th>
<th>STM32H743/750</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware acceleration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrom-ART Accelerator™</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Chrom-GRC™</td>
<td>●</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>JPEG CODEC</td>
<td>●</td>
<td>-</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Memory interfaces</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quad-SPI</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Octo-SPI</td>
<td>●</td>
<td>●</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>FMC</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SDMMC</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Display interfaces</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCD-TFT display controller</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>MIPI-DSI</td>
<td>-</td>
<td>-</td>
<td>●</td>
<td>-</td>
</tr>
<tr>
<td>Parallel 8080/6800</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Embedded memory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embedded SRAM for framebuffers</td>
<td>Up to 1024 Kbytes</td>
<td>Up to 364 Kbytes</td>
<td>Up to 512 Kbytes</td>
<td>Up to 512 Kbytes</td>
</tr>
<tr>
<td>Embedded flash for code and data</td>
<td>128 Kbytes to 2048 Kbytes</td>
<td>128 Kbytes to 1024 Kbytes</td>
<td>1024 Kbytes to 2048 Kbytes</td>
<td>128 Kbytes to 2048 Kbytes</td>
</tr>
</tbody>
</table>
X-CUBE-TouchGFX
Graphical User Interface development

Faster and easier GUI Development

Free for all STM32 Developers

Maximum Performance on minimum footprint

Interoperable with STM32Cube Ecosystem
Simplify your GUI development with TouchGFX

- STM32H7 is included in the X-CUBE-TouchGFX toolchain
  - Available through STM32CubeMX on STM32CubeIDE, Arm® Keil and IAR Embedded Workbench®
- Out-of-the-box support of the STM32H735G-DK Discovery Kit
- Application template and demo available in TouchGFX Designer
STM32 Graphics Extended Ecosystem

**TouchGFX Implementers**
World-wide network for TouchGFX expertise and design services

**Advanced Graphics Solutions**
Software partners taking the full advantages of STM32 graphic capabilities
Solutions for STM32H7
Artificial Intelligence
Embed AI in your applications with STM32H7

- People detection
- Food classification
- Voice recognition
- Industrial applications
The key steps behind Neural Networks on STM32

- Pre-trained model from Keras, TensorFlowLite, ONNX, PyTorch, and more, pre-compiled and linked only with used ops.
- Optimized C code generated by STM32Cube.AI.
- User app, NN C files, STM32.AI lib, STM32 BSP, STM32 device for run-time.
## STM32 high performance built-in safety features

<table>
<thead>
<tr>
<th>Features</th>
<th>STM32F2/F4</th>
<th>STM32F7</th>
<th>STM32H7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual watchdogs: Independent watchdog and system window watchdog</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Backup clock circuitry with clock security system (CSS)</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Hardware CRC unit / Programmable polynomial</td>
<td>● / -</td>
<td>● / ●</td>
<td>● / ●</td>
</tr>
<tr>
<td>Supply monitoring (POR, BOR, PVD)</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>I/O function locking</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>PWM critical register protections (write-once registers)</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Memory protection unit (MPU) 8 zones – to ensure data integrity from invalid behavior</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Multiple Flash memory protection levels</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>PWM stop on core lockup</td>
<td>-</td>
<td>-</td>
<td>●</td>
</tr>
<tr>
<td>ECC Error Code Correction (SECDED) for SRAM</td>
<td>-</td>
<td>-</td>
<td>●</td>
</tr>
<tr>
<td>ECC Error Code Correction (SECDED) for Flash memory</td>
<td>-</td>
<td>-</td>
<td>●</td>
</tr>
</tbody>
</table>

**Note:** Arm Cortex-M cores also have built-in safety features (dual stack pointer, fault exceptions, and debug module).
Reduce time and cost to build STM32-based systems certified to IEC 61508 industrial safety standard

This Safety solution will be available on STM32H723/33; STM32H725/35 & STM32H730 Value line in Q1-2021
ST provides a complete, certified offering to
- Lower project costs
- Reduce design complexity
- Ease SIL certification assessment

STL functional safety package
for STM32
Drive your motor with STM32H7

- Robotic
- High end Appliance
- Servo motor - Industrial
- Medical
FOC (field-oriented control) for BLDC/PMSM motors

STM32 tools and software provide an integrated development environment to ease and support the design of motor control solutions.
STM32H7 features for Motor control

<table>
<thead>
<tr>
<th>Features</th>
<th>STM32H723/733/725/735/730</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>Cortex-M7</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>FPU</td>
<td>yes</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>MPU</td>
<td>yes</td>
<td>Safety</td>
</tr>
<tr>
<td>Freq CPU max</td>
<td>550MHz</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>DMIPS</td>
<td>1177</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>Flash / SRAM data size</td>
<td>128KB to 1MB / 564KB</td>
<td>Performance and integration/cost</td>
</tr>
<tr>
<td>Including : ITCM/DTCM RAM</td>
<td>Up to 256KB (configurable) / 128KB</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>Error Code Correction</td>
<td>SECDED on full memory map</td>
<td>Safety</td>
</tr>
<tr>
<td>ADC SAR</td>
<td>2x16bit 3.6Msps, 1x12bit 5Msps</td>
<td>Efficiency</td>
</tr>
<tr>
<td>Other Analog</td>
<td>2x Comp, 2x PGA, 2xDAC, 1xDFSDM</td>
<td>Integration/cost</td>
</tr>
<tr>
<td>Advanced Motor Control timer</td>
<td>2x (275MHz)</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>Cache and Accelerator</td>
<td>32KB+32KB L1 cache Graphic, Cordic, FMAC, Crypto(**)</td>
<td>Performance and efficiency</td>
</tr>
<tr>
<td>Security Services (SFI and SB-SFU)</td>
<td>yes(*)</td>
<td>System Integrity</td>
</tr>
<tr>
<td>Package</td>
<td>VQFPN68, LQFP100/144/176, BGA100/144/169/176, WLCS115</td>
<td>Cost/Integration/flexibility</td>
</tr>
<tr>
<td>Max Temperature range °C</td>
<td>[-40 .. +125] Tj max 140 ° C</td>
<td>Integration and cost</td>
</tr>
</tbody>
</table>

(*) : on crypto part numbers
A complete ecosystem for single and dual-core architecture
Supported by the STM32 ecosystem

Software

- CubeMX
- CubeIDE
- CubeProgrammer
- CubeMonitor

Embedded Software

- Configuration
- Development
- Programming
- Monitor

Hardware

- STM32 Nucleo-144 boards

Customer support

- FAE - Worldwide Customer Support
  community.st.com

Discovery kits

- Discovery kits

Packages

- STM32 CubeMX Packages
- STM32 CubeIDE Packages
- STM32 CubeProgrammer Packages
- STM32 CubeMonitor Packages

Expansions

- STM32 CubeExpansion

Tools

- Software
- Embedded Software

STM32

- STM32asic
- STM32 embedded
- STM32 development
- STM32 programming

Life augmented

Partner Program
Software tools for STM32H7

Complete support of Arm Cortex-M architecture

STM32CubeMX
- Graphical tool for easy configuration
  - Configure and generate Code
  - Peripherals configuration

IDEs
- Compile and Debug
  - Partners IDE
  - Free IDE based on Eclipse

STM32 Programming & Monitoring tools
- STM32CubeProg
- STM32CubeMonitor
  - Program the application into the chip
  - Sign the application and generate license
  - Monitor variables at run-time

STM32CubeProg
STM32CubeMonitor

STM32CubeMX
IDEs
STM32 Programming & Monitoring tools
Pick the right STM32H72x/H73x development tools

Speed-up evaluation, prototyping and design
(board selection guide available at the end of this presentation)

<table>
<thead>
<tr>
<th>STM32H7 class</th>
<th>Cores/Speed</th>
<th>Part numbers</th>
<th>Discovery Kit</th>
<th>Nucleo-144 board</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32H72x/3x</td>
<td>Single Core 550 MHz</td>
<td>STM32H723/733</td>
<td>-</td>
<td>NUCLEO-H723ZG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STM32H725/735</td>
<td>STM32H735G-DK</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STM32H730, Value line, Crypto enabled</td>
<td>STM32H735G-DK *</td>
<td>-</td>
</tr>
</tbody>
</table>

* Recommended board (no dedicated board for this part number)

1 Discovery Kit
Flexible prototyping & demo

1 Nucleo-144 Board
Affordable and quick prototyping

Starting at $87
Starting at $29

Starting at $29

* Recommendation board (no dedicated board for this part number)
Software, tools and services
a broad ecosystem to support development

Large selection of partners already engaged for:
• Embedded software
• Software tools
• Graphics UI
• Security
• Training and services
and many more …
Releasing your creativity

/STM32
@ST_World
community.st.com
www.st.com/STM32H7
wiki.st.com/stm32mcu
github.com/STMicroelectronics
STM32H7 online training
STM32H7 blog article
Thank you