STM32H7 series
Powered by Arm® Cortex®-M7 & -M4
releasing your creativity
The STM32H7 series offer the performance of the Arm® Cortex®-M7 core running up to 550 MHz and add a 240 MHz Arm® Cortex®-M4 core in dual-core lines. Combined with a smart architecture based on a multi-power domain, developers can always use the best configuration to optimize data transfers and CPU load while minding the power budget.

With its embedded hardware accelerators and its extensive digital and analog peripherals, the feature-rich STM32H7 is ideal for industrial environments where fast reaction time is essential. The HMI components (graphic and audio support) allow the device to provide an outstanding user-experience.

Two powerful cores supported by a robust architecture

**CORE, MEMORIES AND ACCELERATION**
- Arm® Cortex®-M7 core up to 480 MHz and Arm® Cortex® M4* core up to 240 MHz in dual core variants
- Arm® Cortex® -M7 core up to 550 MHz in single core variants
- Up to 32 KB + 32 KB I/D L1 Cache
- Double-precision FPU
- 4 x DMA controllers
- 128 KB up to 2 MB dual bank Flash and up to 1.4 MB RAM

**CONNECTIVITY**
- Up to 2 x USB 2.0 OTG FS/HS
- USART, UART, SPI, and PC
- 2 x CAN (1 x FD and 1 x TT/FD)
- Ethernet MAC
- FMC, Quad-SPI and Dual Octal-SPI
- 2 x SDMMC

**AUDI0**
- 3 x PS + audio PLL
- 4 x SAI
- 2 x 12-bit DAC
- SPDIF-RX

**GRAPHICS**
- LCD TFT controller
- JPEG Codec
- Chrom-ART Accelerator™
- Chrom-GRC™

**OTHER**
- Optional crypto
- DFSDM
- 16- and 32-bit timers
- Up to 3 x ADCs with 16-bit max. resolution (up to 3.6 MSPS)
- 1 x ADC with 12-bit max. resolution (up to 5 MSPS)
- Analog (comp, AOP)
- Power supply 1.7V to 3.6V down to 1.62V in regulator bypass mode
- Up to 140 °C supported as maximum junction temperature
### UP TO SEVEN LINES FOR MORE VERSATILITY

#### CORE, MEMORIES AND ACCELERATION
- Single-core Cortex-M7 up to 550 MHz
- Dual-core Cortex-M7 480 MHz and Cortex-M4 240 MHz
- Flash and RAM acceleration
- SP-FPU and DP-FPU
- 4 x DMA

#### CONNECTIVITY
- Up to 2 x USB2.0 OTG FS/HS
- 2 x SDMMC
- USART, UART, SPI, PC
- Up to 3 x CAN (2 x FD and 1 x TT)
- HDMI-CEC
- FMC, Dual-mode Quad-SPI or 2 x Octo-SPI
- Camera I/F

#### AUDIO
- 3 x I²S + audio PLL
- 4 x SAI
- 2 x 12-bit DAC
- SPDIF-RX

#### GRAPHIC
- Chrom-ART Accelerator™

#### OTHER
- Crypto/Hash option (except H742)
- Security services option (except H742)
- TRNG
- DFSDM
- 16- and 32-bit timers
- HRTimer (except STM32H7A/H7B/H7B0/H723/H725/H730/H733/H735)
- Up to 3 x 16-bit ADC (up to 3.6 MSPS)
- Analog (compl.ADP)
- Voltage range 1.62 to 3.6 V (except 100-pin and VFQFPN68 packages: 1.71 to 3.6 V)
- Multi-power domains
- -40°C up to 105°C ambient
- -40°C up to 125°C ambient

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<table>
<thead>
<tr>
<th>Product line</th>
<th>f_cpu (MHz)</th>
<th>Dual-Bank Flash memory (bytes)</th>
<th>RAM (bytes)</th>
<th>OctoSPI &amp; OTFDEC¹</th>
<th>Ethernet</th>
<th>Graphic</th>
<th>Power supply</th>
<th>Stop mode (typical) / RAM retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32H747/757¹</td>
<td>480 + 240</td>
<td>Up to 2 Mbytes</td>
<td>1 Mbyte (incl. 128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup¹) + 4 Kbytes backup²</td>
<td>•</td>
<td>TFT-LCD JPEG codec</td>
<td>SMPS + LDO</td>
<td>360 μA / 1MB 250 μA / 768KB</td>
<td></td>
</tr>
<tr>
<td>STM32H745/755¹</td>
<td>480 + 240</td>
<td>Up to 2 Mbytes</td>
<td>1 Mbyte (incl. 128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup¹) + 4 Kbytes backup²</td>
<td>•</td>
<td>TFT-LCD JPEG codec</td>
<td>SMPS + LDO</td>
<td>360 μA / 1MB 250 μA / 768KB</td>
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<tr>
<td>STM32H7A3/7B3¹</td>
<td>280</td>
<td>Up to 2 Mbytes</td>
<td>1.4MB (incl. 128K DTCM, 64K ITCM, 1184K+SRAM, 4K backup)</td>
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<td>TFT-LCD JPEG codec</td>
<td>SMPS + LDO</td>
<td>32 μA / 1.4MB 28 μA / 32KB</td>
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<tr>
<td>STM32H743/753¹</td>
<td>480</td>
<td>Up to 2 Mbytes</td>
<td>1 Mbyte (incl. 128 Kbytes DTCM + 64 Kbytes ITCM + 16 Kbytes backup¹) + 4 Kbytes backup²</td>
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<td>TFT-LCD JPEG codec</td>
<td>LDO</td>
<td>1270 μA / 1MB 910 μA / 768KB</td>
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<td>STM32H742</td>
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<td>TFT-LCD JPEG codec</td>
<td>SMPS + LDO</td>
<td>32 μA / 1.4MB 28 μA / 32KB</td>
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<tr>
<td>STM32H725/735¹</td>
<td>550</td>
<td>Up to 1 Mbyte</td>
<td>564KB (incl. 128K DTCM, 432KB Syst + 4K backup)</td>
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<td>TFT-LCD JPEG codec</td>
<td>SMPS + LDO</td>
<td>200 μA / 564KB</td>
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<tr>
<td>STM32H723/733¹</td>
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<td>TFT-LCD JPEG codec</td>
<td>SMPS + LDO</td>
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<tr>
<td>STM32H750</td>
<td>480</td>
<td>128 Kbytes</td>
<td>1 Mbyte (incl. 128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup¹) + 4 Kbytes backup²</td>
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<td>TFT-LCD JPEG codec</td>
<td>LDO</td>
<td>1270 μA / 1MB 910 μA / 768KB</td>
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<tr>
<td>STM32H730</td>
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<td>SMPS + LDO</td>
<td>200 μA / 564KB 520 μA / 564KB</td>
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</table>

Notes:
1. Optional - dedicated CPN, STM32H733, STM32H735, STM32H753, STM32H755, STM32H757, STM32H7B3 for the Crypto Variants
2. 125 °C ambient / 140 °C junction. Dedicated part numbers on STM32H725/H735, STM32H745/H755
3. Crypto and Security services on CPN : STM32H733, STM32H735 and STM32H730
4. SMPS available only on STM32H730Q CPN
5. SMPS only on the QFN68 variant (no LDO)
**STM32H735 BLOCK DIAGRAM**

**System**
- Chrom-ART Accelerator™
- Arm® Cortex®-M7 550 MHz
- Cache I/D 32+32 Kbytes

**Connectivity**
- TFT LCD controller
- HDMI-CEC
- 6x SPI, 4x I²S, 5x I²C
- Camera interface, PSSI
- Ethernet MAC 10/100 with IEEE 1588
- MDIO slave
- 2x CAN (Flexible Data rate)
- 1x USB 2.0 OTG FS/HS

**Control**
- 2x 16-bit motor control
- PWM synchronized AC timer
- 10x 16-bit timers
- 4x 32-bit timers
- 5x Low-power timer
- Optional extended temperature range support (125°C)

**Crypto/Hash processor**
- 3DES, AES 256, GCM, CCM
- SHA-1, SHA-256, MD5, HMAC
- Security services SFI and SB-SFU

**Analog**
- Floating point unit (DP-FPU)
- Nested vector interrupt controller (NVIC)
- JTAG/SW debug/ETM
- Memory Protection Unit (MPU)
- ROP, PC-ROP anti-tamper

**AXI and Multi-AHB bus matrix**
- 4x DMA
- True random number generator (RNG)

**STM32 ONLINE TRAINING**
www.st.com/stm32h7-online-training

**STM32 Trust**

The STM32Trust ecosystem combines knowledge, design tools, and ready-to-use original ST software to build strong cyber-protection into new IoT devices, leveraging industry best-practices. www.st.com/stm32trust

**Secure your production flow with Secure Firmware Install (SFI*)**

Manage STM32 authentication, firmware decryption and installation

<table>
<thead>
<tr>
<th>Customer premises</th>
<th>Untrusted environment</th>
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<tr>
<td>FW</td>
<td>ST32H7 SFI</td>
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<tr>
<td>Store encryption key in HSM</td>
<td>Authenticate target STM32</td>
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<tr>
<td>ST Hardware Secure Module (HSM)</td>
<td>Generate installation license</td>
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<td>HSM physical transfer</td>
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</table>

*Note: *optional – SFI service available on specific part numbers
# STM32H7 ecosystem

## Hardware Tools

www.st.com/stm32hardwaretools

<table>
<thead>
<tr>
<th>Part numbers</th>
<th>Product Line</th>
<th>Core</th>
<th>SMPS</th>
<th>Crypto-Hash</th>
<th>Display</th>
<th>Ethernet</th>
<th>NOR Serial Flash (Mbits)</th>
<th>SDRAM (Mbits)</th>
<th>HyperRAM (Mbits)</th>
<th>SRAM (Mbits)</th>
<th>NOR (Mbits)</th>
<th>eMMC (Gbytes)</th>
<th>SDCard (Gbytes)</th>
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<td>1 x 512 Mb Octo-SPI</td>
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<td>No</td>
<td>5.7'' RGB</td>
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<td>2 x 512 Mb Quad-SPI</td>
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</table>
SOFTWARE TOOLS

www.st.com/stm32softwaretools

STM32CubeMX

IDEs

STM32CubeProgrammer
STM32CubeMonitor

STM32Cube hal & LL drivers

Note:
- Arm Keil, IAR-EWARM, STM32CubeIDE and aG6 support multi-core debugging

Configure and generate code
Compile and debug
Monitor & program

EMBEDDED SOFTWARE

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STM32Cube embedded software

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STM32Cube Expansion Packages from Partners

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Secure
Process
Move/Actuate
Sense
Convert
Power-up

STM32Cube MCU Packages
STM32Cube MCU Middleware

STM32 Cube

STM32Cube IDE

Free IDE

STM32CubeMonitor
STM32CubeProgrammer

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