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STM32H7 series Powered by Arm[®] Cortex[®]-M7 & -M4 releasing your creativity



STM32H7

high performance

High-performance MCUs with Arm® Cortex®-M7 core and Arm® Cortex®-M4

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.

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

Note: * only in STM32H745, STM32H755, STM32H747 and STM32H757

CONNECTIVITY

- Up to 2 x USB 2.0 OTG FS/HS
- USART, UART, SPI, and I²C
- 2 x CAN (1 x FD and 1 x TT/FD)
- Ethernet MAC
- FMC, Quad-SPI and Dual Octal-SPI
- 2 x SDMMC

AUDIO

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

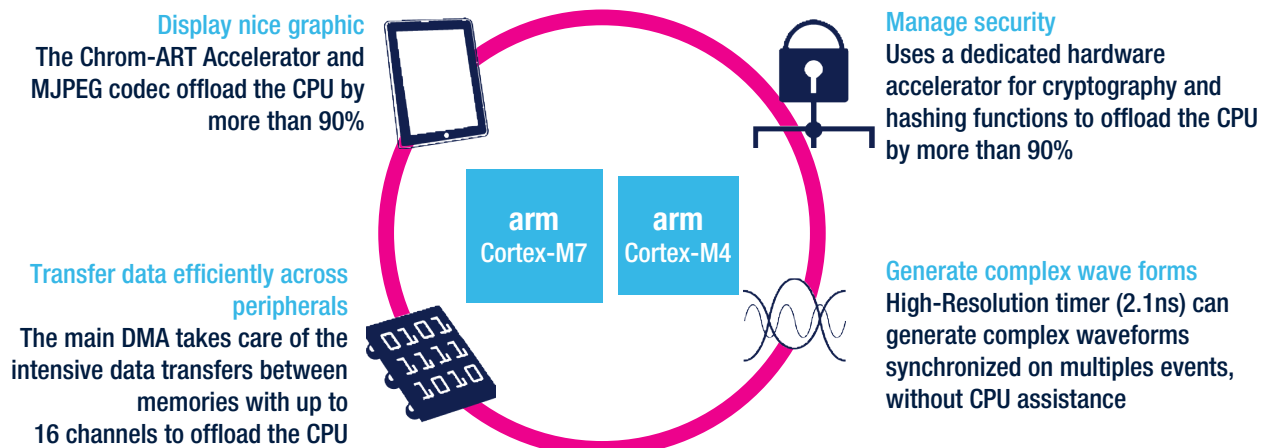
GRAPHICS

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

OTHER

- Optional crypto
- DFSDM
- 16- and 32-bit timers
- Up to 3x 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

Two powerful cores supported by a robust architecture



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 - Mathematics (only H723/733/725/735/730) CONNECTIVITY - Up to 2 x USB2.0 OTG FS/HS 2 x SDMMC - USART, UART, SPI, I²C - 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)¹ - 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 (compt.AOP) - 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 ambient²	Product line	f _{CPU} (MHz)	Dual-Bank Flash memory (bytes)	RAM (bytes)	OctoSPI & OTFDEC ³	Ethernet	Graphic	Power supply	Stop mode (typical) / RAM retention
	Dual-core lines								
	STM32H747/757 ¹	480 + 240	Up to 2 Mbytes	1 Mbyte (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup ¹) + 4 Kbytes backup ²		•	TFT-LCD JPEG codec MIPI-DSI	SMPS + LDO	360 µA / 1MB 250 µA / 768KB
	STM32H745/755 ¹	480 + 240	Up to 2 Mbytes	1 Mbyte (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup ¹) + 4 Kbytes backup ²		•	TFT-LCD JPEG codec	SMPS + LDO	360 µA / 1MB 250 µA / 768KB
	Single-core lines								
	STM32H7A3/7B3 ¹	280	Up to 2 Mbytes	1,4MB (incl.128K DTCM, 64K ITCM, 1184K+SRAM, 4K backup)	•		TFT-LCD JPEG codec Chrom-GRC	SMPS + LDO	32 µA / 1.4MB 28 µA / 32KB
	STM32H743/753 ¹	480	Up to 2 Mbytes	1 Mbyte (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup ¹) + 4 Kbytes backup ²		•	TFT-LCD JPEG codec	LDO	1270 µA / 1MB 910 µA / 768KB
	STM32H742	480	Up to 2 Mbytes	692 Kbytes (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 16 Kbytes backup ¹) + 4 Kbytes backup ²		•		LDO	1270 µA / 692KB 910 µA / 704KB
	STM32H725/735 ³	550	Up to 1 Mbyte	564KB (incl.128K DTCM, 432KB Syst + 4K bckup)	•	•	TFT-LCD	SMPS ⁵ + LDO	200 µA / 564KB
	STM32H723/733 ³	550	Up to 1 Mbyte	564KB (incl.128K DTCM, 432KB Syst + 4K bckup)	•	•	TFT-LCD	LDO	520 µA / 564KB
	Value line								
	STM32H7B0	280	128 Kbytes	1,4MB (incl.128K DTCM, 64K ITCM, 1184K+SRAM, 4K backup)	•		TFT-LCD JPEG codec Chrom-GRC	SMPS + LDO	32 µA / 1.4MB 28 µA / 32KB
	STM32H750	480	128 Kbytes	1 Mbyte (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup ¹) + 4 Kbytes backup ²		•	TFT-LCD JPEG codec	LDO	1270 µA / 1MB 910 µA / 768KB
	STM32H730	550	128 Kbytes	564KB (incl.128K DTCM, 432KB Syst + 4K bckup)	•	•	TFT-LCD	SMPS ⁴ + LDO	200 µA / 564KB 520 µA / 564KB

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)

System
SMPS, LDO, USB and backup regulators POR/PDR/PVD/BOR
Multi-power domains
Xtal oscillators 32 kHz + 4 ~48 MHz
Internal RC oscillators 32 kHz + 4, 48 & 64 MHz
3x PLL
Clock control
RTC/AWU
1x SysTick timer
2x watchdogs (independent and window)
46/67/97/119/121/128 I/Os
Cyclic redundancy check (CRC)
Unique ID
Digital Temperature sensor

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)

3DES, AES 256, GCM, CCM
SHA-1, SHA-256, MD5, HMAC
Security services SFI and SB-SFU

STM32H7 ecosystem

HARDWARE TOOLS

www.st.com/stm32hardwaretools

Part numbers	Product Line	Core	SMPS	Crypto-HASH	Display	Ethernet	NOR Serial Flash (Mbits)	SDRAM (Mbits)	HyperRAM™	SRAM (Mbits)	NOR (Mbits)	eMMC (Gbytes)	SDCard (Bbytes)
Nucleo-144 boards													
	NUCLEO-H723ZG	General-purpose	1	-	No	No	Yes	No	-	-	-	-	-
	NUCLEO-H743ZI2	General-purpose	1	-	No	No	Yes	No	-	-	-	-	-
	NUCLEO-H745ZI-Q	Industrial	2	Internal	No	No	Yes	No	-	-	-	-	-
	NUCLEO-H753ZI	General-purpose	1	-	Yes	No	Yes	No	-	-	-	-	-
	NUCLEO-H755ZI-Q	Industrial	2	Internal	Yes	No	Yes	No	-	-	-	-	-
	NUCLEO-H7A3ZI-Q	General-purpose	1	Internal	Yes	No	No	No	-	-	-	-	-
Discovery kits													
	STM32H735G-DK	Industrial	1	Internal	Yes	4.3" RGB	Yes	1 x 512 Mb Octo-SPI	-	128 Mb	-	-	-
	STM32H745I-DISCO	Industrial	2	Internal	No	4.3" RGB	Yes	2 x 512 Mb Quad-SPI	128 Mb	-	-	4 GB	-
	STM32H747I-DISCO	Graphic	2	Internal	No	4" DSI	Yes	2 x 512 Mb Quad-SPI	256 Mb	-	-	-	-
	STM32H747I-DISC1	Graphic	2	Internal	No	No	Yes	2 x 512 Mb Quad-SPI	256 Mb	-	-	-	-
	STM32H750B-DK	Value	1	-	Yes	4.3" RGB	Yes	2 x 512 Mb Quad-SPI	128 Mb	-	-	4 GB	-
	STM32H7B3I-DK	Graphic	1	Internal	Yes	4.3" RGB	No	1 x 512 Mb Octo-SPI	128 Mb	-	-	-	-
Evaluation boards													
	STM32H743I-EVAL2	General-purpose	1	-	No	5.7" RGB	Yes	2 x 512 Mb Quad-SPI	256 Mb	-	16 Mb	128 Mb	8 GB
	STM32H753I-EVAL2	General-purpose	1	-	Yes	5.7" RGB	Yes	2 x 512 Mb Quad-SPI	256 Mb	-	16 Mb	128 Mb	8 GB
	STM32H747I-EVAL	Graphic	2	Internal	No	4" DSI	Yes	2 x 512 Mb Quad-SPI	256 Mb	-	16 Mb	128 Mb	8 GB
	STM32H757I-EVAL	Graphic	2	Internal	Yes	4" DSI	Yes	2 x 512 Mb Quad-SPI	256 Mb	-	16 Mb	128 Mb	8 GB
	STM32H7B3I-EVAL	Graphic	1	Internal	Yes	7" RGB	No	1 x 512 Mb Octo-SPI	256 Mb	-	16 Mb	128 Mb	-

SOFTWARE TOOLS

www.st.com/stm32softwaretools

STM32CubeMX



IDEs



Free IDE

STM32CubeProgrammer
STM32CubeMonitor



Note:

- Arm Keil, IAR-EWARM, STM32CubeIDE and ac6 support multi-core debugging

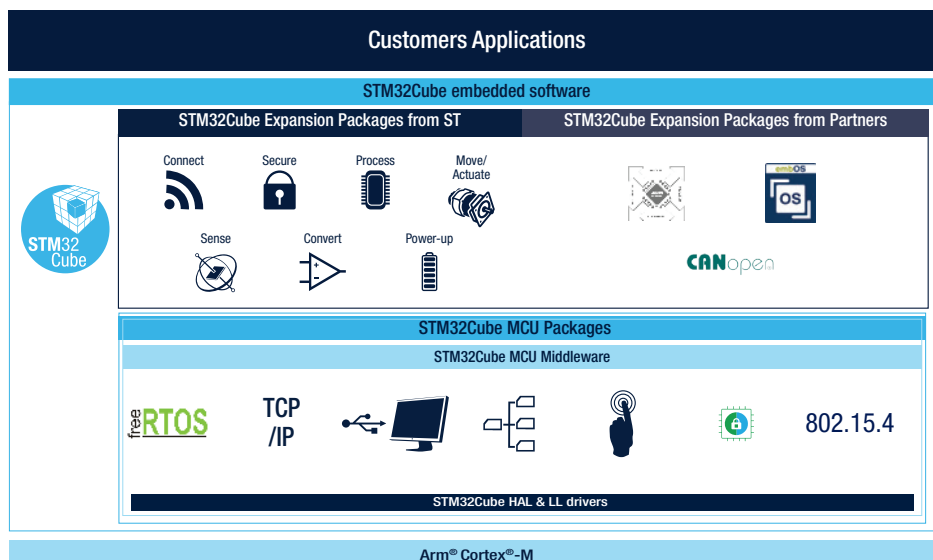
Configure and generate code

Compile and debug

Monitor & program

EMBEDDED SOFTWARE

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