

STM32H750 & STM32H7B0

High-performance Value lines



Extra flexibility to create affordable performance-oriented systems

Focusing on real-time performance and scalability, ST's new Value lines lower the barrier to access STM32H7 microcontrollers with products keeping just the essential Flash memory.

With execution performance up to 2424 CoreMark at the heart of a secure, power-efficient architecture, the new Value line microcontrollers are the entry point to IoT innovation in medical, industrial and consumer applications.

STM32H750 & STM32H7B0 devices embed 128-Kbyte Flash memory to accommodate the most critical and secure code, while supporting external memory extension using NOR, NAND, SDRAM, dual-mode Quad SPI and Octal-SPI Flash memory.

Notes:
 1. Tightly Coupled Memories
 2. Digital Filters for Sigma Delta Modulator

CORE, MEMORIES

- Arm® Cortex®-M7 core up to 480 MHz
- Up to 16-Kbyte data and 16-Kbyte instruction cache
- Up to 4 DMA controllers
- 128-Kbyte Flash memory and up to 1.4-Mbyte RAM
- ITCM/DTCM¹: 64-Kbyte ITCM RAM + 128-Kbyte DTCM RAM for time-critical routines

CONNECTIVITY

- Up to 2 x USB 2.0 OTG FS/HS with optional embedded HS PHY
- USART, UART, SPI, and I²C
- 2 x CAN FD
- Ethernet MAC
- FMC (supporting SDRAM in 32-bit mode up to 133 MHz), dual-mode Quad SPI Flash memory and dual Octal SPI
- 2 x SDMMC

EMBEDDED FLASH

- Secure Boot for customer Root of Trust
- Fast boot time
- High-execution speed from ultra fast embedded memory

ENERGY EFFICIENT

- Flexible power mode
- Gated power domains
- On-chip power management

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

- 8- to 14-bit Camera interface
- Crypto and Hash hardware acceleration
- DFSDM² interface to connect microphone MEMs or sigma delta ADC front ends
- 16- and 32-bit timers
- 3x ADCs with up to 16-bit resolution (up to 3.6 MSPS)
- Analog (comparators and Op amps)
- Power supply down to 1.62 V

STM32H7B0 & STM32H750 VALUE LINE BLOCK DIAGRAM

| STM32H7B0 | STM32H750 |
|--|--------------------------------------|
| Arm® Cortex®-M7, MPU, DFPU, ETM | |
| 280 MHz | 480 MHz |
| 2 x 16-Kbyte cache | |
| Embedded memories | |
| 1.4-Mbyte RAM including 128-Kbyte DTCM | 1-Mbyte RAM including 128-Kbyte DTCM |
| 64-Kbyte ITCM | |
| 128-Kbyte Flash memory | |
| 4-Kbyte backup RAM | |
| DMAs+ Main DMA | |
| Memory Interfaces | |
| FMC (SDRAM, NOR, NAND) | |
| 2 x Octal SPI with On-The-Fly Decryption | Dual-mode Quad SPI Flash |
| 2 x SD/SDIO/MMC | |
| Accelerators | |
| Chrom-ART Accelerator™ JPEG codec | |
| Chrom-GRC™ | - |
| Crypto/Hash accelerator and tamper detection | |
| Peripherals | |
| Advanced analog | |
| Advanced connectivity | |

HARDWARE TOOLS

All existing STM32H7 hardware development tools are fully compatible with the new Value lines.

Evaluation boards



STM32H7B3I-EVAL, STM32H753I-EVAL2

Discovery kits



STM32H750B-DK, STM32H7B3I-DK

Nucleo-144 development boards



NUCLEO-H753ZI



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

STM32 HIGH-PERFORMANCE VALUE LINES

| Product lines | Core | f _{CPU} (MHz) | ID cache (KB) | ITCM/DTCM (KB) | Flash memory (KB) | RAM (KB) | Graphic | Advanced analog | USB OTG | Ethernet | Camera I/F | CAN | Security & Crypto/Hash acceleration | Packages |
|---------------|------|------------------------|---------------|----------------|-------------------|----------|--|--|---------|----------|------------|---------------------|---|--|
| STM32H750 | CM7 | 480 | 16+16 | 64/128 | 128 | 864 | Chrom-ART Accelerator™ TTF controller JPEG Codec | 3x 16-bit ADCs (3.6 MSPS), 2x Opamps, 2x Comparators, 2x 12-bit DACs | 2 | 1 | 1 | 1 TTFD CAN, 1 FDCAN | Yes, PCROP ¹ , SFI ² , SBSFU ³ | LQFP100, LQFP144, LQFP176, UFBGA176 ⁴ , TFBGA240 ⁵ |
| STM32H7B0 | | 280 | | | | 1 376 | Chrom-GRC™ TTF-LCD JPEG codec | | 1 | - | | | | LQFP64, LQFP100, LQFP144, UFBGA169, LQFP176, UFBGA176 |

Notes:

1. PCROP: Proprietary Code Read Out Protection (protects part of the Flash memory to execution access only)
2. SFI: Secure Firmware Install. Security service and keys available on standard parts to securely install a Root of Trust (RoT)
3. SBSFU: Secure Boot and Secure Firmware Update dedicated hardware memory protection mechanism.
4. (0.65 mm pitch)
5. (0.8 mm pitch)

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