STM32H750 & STM32H7B0
High-performance value lines
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 PC
- 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
## STM32 HIGH-PERFORMANCE VALUE LINES

<table>
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<tr>
<th>Product lines</th>
<th>Core</th>
<th>f&lt;sub&gt;cpu&lt;/sub&gt; (MHz)</th>
<th>ID cache (KB)</th>
<th>ITCM/ DTCM (KB)</th>
<th>Flash memory (KB)</th>
<th>RAM (KB)</th>
<th>Graphic</th>
<th>Advanced analog</th>
<th>USB OTG</th>
<th>Ethernet</th>
<th>Camera I/F</th>
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<th>Packages</th>
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<tbody>
<tr>
<td>STM32H750</td>
<td>CM7</td>
<td>480</td>
<td>16+16</td>
<td>64/ 128</td>
<td>128</td>
<td>864</td>
<td>Chrom-ART Accelerator™ TFF-LCD JPEG Codec</td>
<td>3x 16-bit ADCs (3.6 MSPS), 2x Opamps, 2x Comparators, 2x 12-bit DACs</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1 TFFD CAN, 1 FDCAN, Yes, PCROP, SFI, SBSFU</td>
<td>LQFP100, LQFP144, LQFP176, UFBGA176, TFBGA240</td>
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<tr>
<td>STM32H7B0</td>
<td></td>
<td>280</td>
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<td></td>
<td></td>
<td>1376</td>
<td>Chrom-GRC™ TFF-LCD JPEG codec</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
<td>LQFP64, LQFP100, LQFP144, UFBGA169, LQFP176, UFBGA176</td>
<td></td>
</tr>
</tbody>
</table>

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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### STM32H750 VALUE LINE BLOCK DIAGRAM

**System**
- LDO, USB and backup regulators
- POR/PDR/PVD/BOR
- Multi-power domains
- XTAL oscillators
  - 32 kHz + 4 ~48 MHz
- Internal RC oscillators
  - 32 kHz + 48 & 64 MHz
- 3x PLL
- Clock control
- RTC/AWU
- 1x SysTick timer
- 2x watchdogs (independent and window)
- 82/140/168 I/Os
- Cyclic redundancy check (CRC)
- Unique ID

**Control**
- 2x 16-bit motor control
- PWM synchronized AC timer
- 10x 16-bit timers
- 2x 32-bit timers
- 5x Low-power timers
- 16-bit high-resolution timer

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

**Chrom-ART Accelerator™**
- JPEG Codec Acceleration
- Cache I/D 16+16 Kbytes

**ARM® Cortex™-M7**
- 480 MHz
- 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)

**128-Kbyte Flash memory**
- RAM 1056 Kbytes incl.
- 64 Kbytes ITCM
- FMC/SRAM/NOR/NAND/SDRAM
- Dual-mode Quad-SPI
- 1024-byte + 4-Kbyte backup SRAM

**Connectivity**
- TFT LCD controller
- HDMI-CEC
- 6x SPI, 3x I²S, 4x PC
- Camera interface
- Ethernet MAC 10/100 with IEEE 1588
- MDIO slave
- 2x FDCAN (Flexible Data rate)
- 1x USB 2.0 OTG FS/HS
- 1x USB 2.0 OTG FS
- 2x SDMMC
- 4x USB + 4 UART
- LIN, smartcard, IrDA, modem control
- 1x Low-power UART
- 4x SAI (Serial audio interface)
- SPDIF input x4
- DFDSM (8 inputs/4 filters)
- SWP (Single Wire Protocol)

**Analog**
- 2x 12-bit, 2-channel DACs
- 3x 16-bit ADC (up to 3.6 Msps)
- 20 channels/up to 2 MSPS
- Temperature sensor
- 2x COMP
- 2x Op amp
SECURE YOUR PRODUCTION FLOW WITH SECURE FIRMWARE INSTALL (SFI*)

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

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

(*) : optional – SFI service available on specific part numbers