

CAN Newsletter Online

CONNECTED DEVICES

MCU running at 550-MHz core speed

The STM32H7 single-core MCUs (micro-controller unit) from STMicroelectronics (ST) are built on an Arm Cortex-M7 core and operate at 550 MHz. The chips are available with up to 1 MiB of flash memory and support CAN FD.



The MCUs integrate flash storage on-chip and run deeply embedded applications (Source: STMicroelectronics)

The company's STM32 series of micro-controllers (MCUs) with embedded flash bring features such as graphics, artificial intelligence (AI), and cyber-protection. The STM32H7 MCUs provide three CAN FD interfaces. The products can interact with off-chip storage while providing performance and security, explained the company. Their performance figures of 2778 Coremark1 and 1177 DMIPS are realized whether working from internal or external memory, aided by features such as the Flexible Memory Controller (FMC) and Octal SPI memory interface. This lets designers tackle memory-hungry applications, such as high-resolution, full-color graphics and video that demand a large frame buffer, to create products. Further assisting the creation of full-color user interfaces, the TouchGFX graphic framework STM32Cube Expansion Package and TouchGFX Designer programming tool are available free of charge.

Features powered by AI technology can be developed due to STM32Cube ecosystem and STM32Cube.AI to port neural networks and leverage computer vision through the parallel camera interface. By connecting the STM32H7 to one or multiple sensors, condition monitoring, and other machine learning techniques will also help bringing added value to the STM32-based product, said the company.

As part of the STM32Trust security suite, cyber-protection is enhanced with support for on-the-fly decryption (OTFDEC) and secure firmware install (SFI). OTFDEC enables encrypted code to be executed from external memory. SFI lets OEMs (original equipment manufacturer) order standard products in the world, to be programmed only with encrypted code. These two solutions safeguard OEM intellectual property in flash memory.

Security features include support for secure boot, symmetric (by hardware or software library) encryption, and cryptographic key provisioning. Asymmetric encryption (by software library) is also available. Cryptographic processing is handled with a true random number generator, hardware acceleration for AES-128, AES-192, and AES-256 encryption, and support for GCM and CCM2, Triple DES, and hash (MD5, SHA-1 and SHA-2) algorithms.

"Our latest STM32H7 MCUs enable small, low-power products to deliver extraordinary functionality and performance, while leveraging the outstanding value and efficiency of the STM32 family," said Ricardo de Sa Earp, Group Vice President, Microcontroller Division General Manager, STMicroelectronics. "Home appliances, small medical devices, and industrial sensors and actuators that might previously have been unable to incorporate computationally intensive features such as AI, graphics, and voice interaction now have an appropriate solution."

Integrated switched-mode power supply that overcomes dissipation constraints to allow extended-temperature operation up to +125 °C is delivered. In addition, fault-resilience is provided through error correction (ECC) for all memories.

ST has updated the STM32 development ecosystem to let users get started with the added series of chips. Prototyping and demonstrations can leverage the STM32H735G-DK discovery kit, while the NUCLEO-H723ZG Nucleo-144 board provides an option for building prototypes and proof-of-concept models. The latest STM32H7 MCUs are also supported in the STM32Cube ecosystem, which comprises tools, embedded software, and middleware including graphics libraries, communication stacks, and application-code examples such as motor control, AI, and advanced security. The MCUs' capabilities can also be exercised using appropriate software tools for application and security development published by Arm Keil and IAR Systems.

