

GigaDevice Launches the GD32H7 Arm® Cortex®-M7 MCU Product Family, Delivering Exceptional Performance for Embedded Systems



The [GD32H7](#) series offers superior processing power with power efficiency, rich connectivity, and comprehensive security functions. The GD32H7 MCU portfolio consists of 27-part numbers in three series, available in five package types: BGA176, LQFP176, LQFP144, BGA100, and LQFP100. The product samples and development tools will be gradually introduced starting June 2023, with mass production targeted in Q4 2023.

Powerful On-chip Integration

The GD32H7 MCU series adopts an Arm® Cortex®-M7 high-performance core based on Armv7E-M architecture, with up to 600MHz clock frequency. Its performance is further enhanced by the high bandwidth AXI + AHB bus and the six-stage pipeline architecture with branch prediction capability. The integrated advanced Digital Signal Processing (DSP) hardware accelerator and double-precision Floating-Point Unit (FPU), as well as the hardware Trigonometric Mathematic Unit (TMU) and Filter ACcelerator (FAC), significantly reduce the CPU loading and increase its processing efficiency. The GD32H7 MCU series can operate up to 1552 DMIPS at its highest frequency, and achieve an outstanding performance of 2888 points in CoreMark® benchmark tests, improving code execution efficiency by approximately 10% compared to similar products in the market running at the same frequency. The product's performance is more than 40% higher than that of Cortex®-M4 products.

The integrated memories on GD32H7 MCU series are 1024 KB to 3840 KB Flash and 1024 KB SRAM, including 512 KB of configurable Tightly Coupled Memory (TCM) for zero-wait state execution of critical instructions and data. The 64KB high-speed L1-Cache (I-Cache, D-Cache) further increases CPU processing efficiency and real-time performance. Its EXternal Memory Controller (EXMC) enables access to various external memory types such as SDRAM, SRAM, ROM, NOR Flash, and NAND Flash. The built-in Embedded Trace Macrocell (ETM) can trace instructions and data in real time, providing advanced debug functions without interfering with normal CPU operations. The GD32H7 MCU series internal large memory space can support rich operating systems, embedded ML /AI, and other advanced algorithms, thus enabling high-performance and low-latency real-time control.

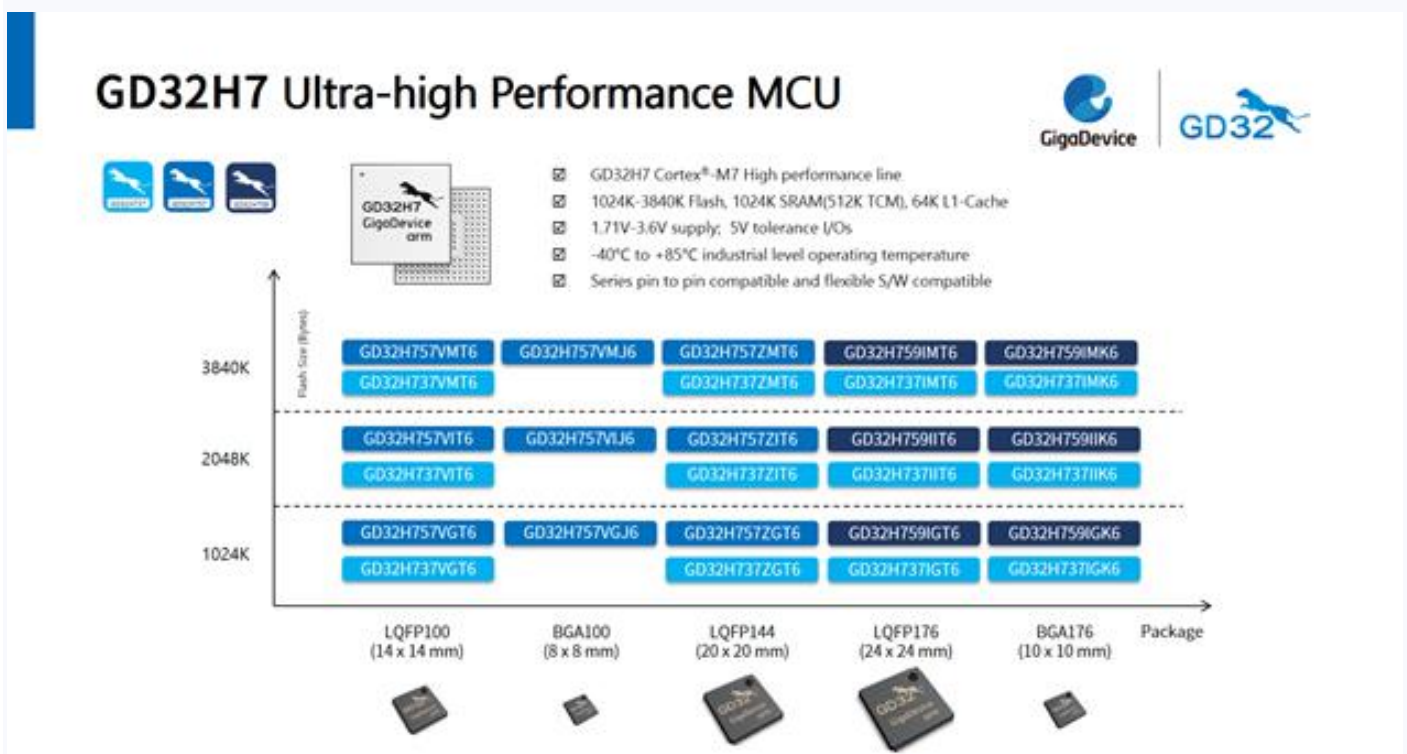
Significantly Expanded System Resources

The GD32H7 MCU series integrates various peripherals, including 8 U(S)ARTs, 4 I2Cs, 6 SPIs, 4 I2Ss, 2 SDIOs, and 2 Octal SPI (OSPI, backward compatible with QSPI) with real-time decryption supported by Real-Time Detection (RTDEC) module. The GD32H7 has 2 USB2.0 OTG interfaces, supporting Full-Speed and High-Speed operation modes. It also integrates 3 CAN-FD modules and 2 Ethernet interfaces to meet the demand for high-speed communication.

The GD32H7 MCU series provides excellent graphics display and audio/video connectivity solutions. It has a TFT-LCD controller and an Image Processing Accelerator (IPA) for 2D image processing operations such as overlay, rotation, zoom in/out, and conversion among multiple color modes. The product also integrates a Serial Audio Interface (SAI), a SPDIF audio interface, and an 8-bit to 14-bit digital camera interface for video and image capture and transmission.

The GD32H7 MCU series adopts the supply voltage range from 1.71V to 3.6V DC, with its advanced power management capability. It has three power supply modes (LDO/SMPS/direct power supply) and five low-power modes for a flexible power supply scheme with balanced system power consumption. The GD32H7 MCU has four general-purpose 32-bit timers, twelve general-purpose 16-bit timers, four basic 64-bit/32-bit timers, and two PWM advanced timers, which demonstrate more quantities and higher resolution than competition products, providing the designers more choices with accuracy. The sample rate of two internal 14-bit ADCs can reach 4MSPS, and the 12-bit ADC sampling rate goes up to 5.3MSPS. It also integrates a fast comparator, DAC, and other high-precision analog peripherals to support types of motor control applications.

The GD32H7 MCU series supports various security functions. It has built-in hardware encryption of DES, 3DES, or AES algorithms and hash algorithms for different security applications to ensure data integrity and protect the transmitted information. The GD32H7 MCU series' SRAM supports ECC verification, effectively enhancing system reliability. The integrated RTDEC module can decrypt the data on AXI or AHB bus in real-time for the confidentiality of read-only firmware stored in external SPI NOR Flash memories.



GD32H7 product family

The GD32H7 product family is compatible with existing GD32 MCU products, and it offers three product types with different system resources configuration: the GD32H737 product type supports three channels of CAN 2.0B, while the GD32H757 and GD32H759 support three channels of high-speed CAN-FD. From the packaging point of view, GD32H757 is offered in BGA100 and LQFP144/100 package options, while GD32H759 is available in BGA176 and LQFP176 packages.

[The GD32 development ecosystem](#) is now gaining further ground. GigaDevice provides a free development environment for the new GD32H7 MCU series, the GD32 Eclipse IDE, and the GD32 All-In-One Programmer. The product supports direct programming with GD-LINK's SWD/JTAG mode or via the host's UART, USB, and I2C interfaces. Other popular embedded tools such as Arm® KEIL, IAR, and SEGGER will also provide comprehensive support on GD32H7 MCUs, including their integrated development environment (IDE) and debug or trace functions. GigaDevice will also partner with mainstream real-time operating systems (RTOS), middleware such as graphical user interfaces (GUI), and embedded AI algorithms to accelerate the customer project design with a short time-to-market.

GigaDevice showcased its latest GD32H759I-EVAL full-function development board earlier this year at Embedded World 2023 in Nuremberg, Germany. Other planned starter kits include the GD32H759I-START, GD32H757Z-START, GD32H757J-START, and the GD32H757V-START, and will be available with different

package types, enabling designers' faster application development and debugging. The above development tools will be released to all public distribution channels.

For more details, contact us directly.

Quotation request:

k.kowalska-aziz@maritex.com.pl

Mob. +48 886 199 314

Technical Question:

m.piotrowski@maritex.com.pl

Mob. +48 539 313 508

source:

<https://www.gigadevice.com/about/news-and-event/news/mcu-gd32h7>

** All trademarks, logos, and brand names are the property of their respective owners and are not listed in any particular order.*