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Renesas Technology Boosts Throughput of Microcontrollers in H8SX 32-Bit CISC Family, Offering Enhanced Devices that Deliver 89 MIPS of Processing Performance

Microcontrollers in the 80MHz H8SX/1700 series use Renesas' advanced MONOS embedded flash memory technology that offers speed, size, and reliability advantages.

SAN JOSE, Calif. — December 4, 2007 — Renesas Technology America, Inc. today announced the H8SX/1700 microcontroller series, featuring an enhanced H8SX 32-bit CISC (Complex Instruction Set Computer) CPU core with a higher maximum operating frequency of 80MHz. This speed, combined with the new powerful H8SX CPU that incorporates a barrel shifter, enables the new devices to achieve 89 MIPS performance in the Dhrystone benchmark — 85 percent more than the 48MHz devices with the previous H8SX CPU core. The initial product in the H8SX/1700 series is the H8SX/1725F, a device with 256Kbytes of on-chip flash memory built with Renesas' advanced 0.15-micron process MONOS (Metal Oxide Nitride Oxide Silicon) process technology for embedded flash.

The new H8SX device has a rich array of peripherals ideal for automotive and industrial equipment. Its built-in two-channel synchronous serial interface (SCI) enables high-speed communication with a number of external chips. It also has CAN and LIN interfaces that handle inter-system communications in networked control architectures. And a DMAC (direct memory access controller) and DTC (data transfer controller) allow high-speed data transfers to external memory and peripheral devices. Using these functions in combination reduces the processing load on the CPU and enables different types of processing to be executed in parallel. Other H8SX/1725 on-chip peripherals include timers and a 10-bit 16-channel A/D converter.

"The H8SX/1725F microcontroller combines speed, performance and optimized peripherals to support the needs of various applications. The device also has a flash memory built with Renesas' MONOS technology, which provides speed, size and reliability advantages and a full-time single-cycle random access capacity," said Paul Fox, director of marketing, automotive business unit, Renesas Technology America, Inc. "The combination of these features allows microcontrollers to achieve excellent application performance and to respond quickly to various system inputs. This is extremely critical to real-time control systems such as airbag control for automobiles, as well as factory automation equipment in the industrial field."

About the MONOS flash technology

One of the advantages of the MONOS technology used in the H8SX/1725F microcontroller is speed. With the use of MONOS and the single-cycle access capability, the new device enables rapid program execution, allowing the CPU to access data stored in the flash memory even when the device is operating at its maximum speed. Besides the speed advantage, the MONOS technology reduces chip area. For a given amount of flash memory capacity, the MONOS implementation uses almost 60-percent less chip area than floating-gate NOR flash technology. Another advantage is that the MONOS embedded flash is more reliable because its cell design minimizes losses. Additionally, the on-chip flash memory can be programmed at high speed within a temperature range of -40°C to +85°C. Programming also takes much less time. Compared with the devices in Renesas' current H8SX/1520 series, the programming time for the H8SX/1725's entire 256Kbyte code-storage capacity has been reduced by approximately two-thirds — from approximately 10 seconds to about 3 seconds.

In addition to the 256Kbytes of flash memory that the H8SX/1725 provides for storing code, the microcontroller has another 16Kbytes of high-endurance on-chip data flash — that is, flash memory for data storage — for which 15-year data retention is guaranteed after 480,000 rewrites. This special flash memory can be used to replace external EEPROM (electrically erasable and programmable read only memory) previously needed for storing data, thereby helping to reduce parts count and save cost. The data flash is a new design incorporating a background operation (BGO) function that allows program storage flash memory to be accessed by the CPU. This capability makes it possible for the CPU to execute application code even while the content of the data flash memory is being rewritten.

System development tools

A C-compiler, assembler, linkage editor, librarian, simulator, debugger are available as a software development environment. The E10A-USB on-chip debugger and a full emulator will be offered as a hardware development environment.

Renesas plans to expand the H8SX/1700 series by adding models offering a range of ROM and RAM capacities and pin count variations.

Price and availability

Group Name	Product Name (Type Name)	Flash Memory/ RAM Capacity	Package	Unit Price for 10,000 Unit Lot/ Availability
H8SX/1720 group	H8SX/1725F (R5F61725FPV)	256 KB/ 24 KB	100-pin LQFP	\$10.00*/ October 2007

* Sample pricing includes a product with an extended temperature range (-40 to 85C) for automotive applications.

About Renesas Technology Corp.

Renesas Technology Corp. is one of the world's leading semiconductor system solutions providers for mobile, automotive and PC/AV (Audio Visual) markets and the world's No.1 supplier of microcontrollers. It is also a leading provider of LCD Driver ICs, Smart Card microcontrollers, RF-ICs, High Power Amplifiers, Mixed Signal ICs, System-on-Chip (SoC), System-in-Package (SiP) and more. Established in 2003 as a joint venture between Hitachi, Ltd. (TSE:6501, NYSE:HIT) and Mitsubishi Electric Corporation (TSE:6503), Renesas Technology achieved consolidated revenue of 953billion JPY in FY2006 (end of March 2007). Renesas Technology is based in Tokyo, Japan and has a global network of manufacturing, design and sales operations in around 20 countries with about 26,500 employees worldwide. For further information, please visit <http://www.renesas.com>

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Specifications: Renesas Technology H8SX/1725F 32-bit Flash Microcontroller

Item	H8SX/1725F Specifications
Type name	R5F61725FPV
CPU core	32-bit H8SX CPU core, CISC type (General registers: 32 bits x 8)
Maximum operating frequency/power supply voltage	80MHz/4.5V to 5.5V
Maximum processing performance	89 MIPS (at 80MHz, Dhrystone benchmark)
Operating ambient temperature	-40°C to +85°C
On-chip flash memory	256Kbytes
On-chip data flash	16Kbytes (15-year data retention, 480,000 rewrites, guaranteed)
On-chip RAM	24Kbytes
On-chip peripheral functions	<ul style="list-style-type: none"> • DMA controller (DMAC) x 4 channels • 16-bit general-purpose timer (TPU) x 12 channels • 8-bit watchdog timer (WDT) x 1 channel • Serial communication interface (SCI) x 2 channels (asynchronous, synchronous) • High-speed synchronous serial interface (SSI) x 4 channels • CAN (RCAN-TL1) x 2 channels: Bosch CAN Ver. 2.0B active compliant Full CAN support; 32 message buffers • Hardware LIN • A/D converter (10-bit resolution) x 16 channels (Unit 0: 8 channels, Unit 1: 8 channels)
Package	100-pin LQFP (14mm x 14mm, 0.5mm pin pitch)

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