Hitachi Releases 16-Bit Microcontroller with On-Chip Large Flash Memory

— Suitable for control of storage devices such as CD-R/RW and DVD-ROM/RAM, and incorporating large 512- Kbyte on-chip flash memory for shorter development time —

Tokyo, August 2, 2001— Hitachi, Ltd. (TSE: 6501) today announced the H8/3069F F-ZTAT™ microcontroller*, with large 512-Kbyte flash memory and 16-Kbyte RAM on-chip, as an addition to the H8/300H Series lineup of 16-bit microcontrollers. Sample shipments will begin in November 2001 in Japan.

With its large-capacity on-chip flash memory and RAM, the H8/3069F is suitable for control of storage devices such as CD-R/RW, DVD-ROM/RAM, and combined CD-RW and DVD-ROM/RAM devices. The provision of on-chip flash memory also allows program modifications to be carried out on-board, enabling system development time to be shortened.

Featuring a high-performance 16-bit H8/300H CPU core and a rich set of peripheral functions that include 16-bit timers, an A/D converter, DMA controller, and serial interface, and offering a comprehensive lineup that includes F-ZTAT versions with on-chip flash memory that enables shorter development times to be achieved, the H8/300H Series is widely used in the communication, information, OA, and industrial fields. Among such applications, the use of storage devices such as CD-R/RW, DVD-ROM/RAM, and HDDs as devices for handling large-volume multimedia data, including still and moving images, has experienced rapid growth in recent years.

Hitachi has previously released the H8/3062F, H8/3064F, and H8/3068F, with on-chip flash memory capacities of 128, 256, and 384 Kbytes, respectively, as F-ZTAT products for storage device control. But the increasingly sophisticated functionality of application products, including the advent of combined CD-RW and DVD-ROM/RAM devices, means ever larger program sizes, and at the same time there is a demand for large-capacity on-chip flash memory to enable extended system development times to be cut.

The H8/3069F has been developed to meet these market needs, offering the following features around a H8/300H CPU core.

[Product Features]

(1) Largest on-chip memory capacity in H8/300H Series
   512 Kbytes of single-power-supply flash memory and 16 Kbytes of RAM are provided on-chip, allowing storage of a large system program. In addition, the flash memory programming speed is approximately three times faster than current products, offering a shorter write time despite the larger capacity.

(2) Enhanced flash memory programming method

Flash memory programming methods now inlcude the industry's first user boot mode in addition to the conventional boot mode and user programming mode. Previously, the boot program run when the device is powered on has only operated in a boot mode that initiates a fixed program that cannot be modified by the user, but in user boot mode, a user-written program can be run. This makes it possible to run a program written to meet specific user needs after powering on, such as selection of the interface to be used, or erasure of the flash memory.

In addition, the flash memory program/erase control program is built in as firmware, enabling programming/erasing to be executed simply by calling this program from the user program. This eliminates the previous need for a user-written control program, enabling the application device's system program to be simplified and development time to be shortened.

(3) High-speed operation, with a 25 MHz operating frequency at a power supply voltage of 5 V or 3.3 V

Logic circuits such as the CPU core run at a low voltage of approximately 1.9 V. An on-chip step-down circuit generates a voltage of approximately 1.9 V from a 5 V or 3.3 V external power supply voltage, making it possible to select the power supply voltage according to the voltage of the interface used, and to achieve high-speed operation with a minimum instruction execution time of 80 nanoseconds at the maximum operating frequency of 25 MHz on either power supply voltage.

On-chip peripheral functions include functions suited to storage device control such as three 16-bit timer channels, four 8-bit timer channels, eight high-precision 10-bit A/D converter channels, four DMA controller channels, and three serial interface channels.

The following software and hardware products are available to provide a development environment for the H8/300H Series:

- Software: C compiler, assembler, linkage editor, simulator/debugger

- Hardware: E6000 realtime emulator

The H8/3069F is available in a 100-pin plastic 0.5 mm pin pitch QFP or TQFP package. Use of the thin TQFP makes it possible to create slimmer systems.

Future plans include further extension of the product lineup with the development of higher-speed models and mask ROM models.

Note: * F-ZTAT (Flexible Zero Turn-Around Time) is a trademark of Hitachi, Ltd.   F-ZTAT microcontroller is with on-chip flash memory and can be easy rewritten for program and system adjustment data.

< Typical Applications >

- Storage devices: CD-R/RW devices, DVD-ROM/RAM devices, combined CD-RW and DVD-ROM/RAM devices, HDD devices, etc.

< Prices in Japan > (For Reference)

Product Code		Package	Sample Unit Price (Yen)
H8/3069F	HD64F3069F	QFP-100	1,400
	HD64F3069TE	TQFP-100	1,500

< Specifications >

Item	Specification
Model Name	H8/3069F
CPU core	H8/300H
Operating frequency/power supply voltage	25MHz / 3.0 V to 3.6 V 25MHz / 4.5 V to 5.5 V
ROM	512-Kbyte flash memory Programming methods (3 kinds) ・Boot mode ・User programming mode ・User boot mode
RAM	16 Kbytes
Address space	16 Mbytes
External data bus width	16/8 bits
Bus type	Non-multiplexed
DMA controller	4 channels
16-bit timer	3 channels
8-bit timer	4 channels
Watchdog timer	1 channel
Programmable timing pattern controller	16-bit output
SCI (synchronous/asynchronous)	3 channels
10-bit A/D converter	Inputs	8 channels
	External trigger function	Yes
8-bit D/A converter outputs	2 channels
External interrupts	7 channels
I/O ports	79
CS outputs	8
Packages	QFP-100 (14 mm × 14 mm, 0.5 mm pin pitch) TQFP-100 (14 mm × 14 mm, 0.5 mm pin pitch)