

Renesas Technology Releases SH7761 32-Bit Microprocessor for Car Information Systems such as Telematics and Handsfree Equipment

— High-speed operation at 400 MHz, twice as fast as the comparable previous Renesas Technology product, and enhanced peripheral functions to enable systems with improved performance and lower cost —

Tokyo, May 21, 2009—Renesas Technology Corp. today announced the SH7761, a 32-bit microprocessor for car information systems, such as telematics devices providing services via wireless communication links, and handsfree systems, that delivers high-speed operation at 400 MHz and improved connectivity with functions essential for next-generation systems, including high-speed communication, sophisticated voice recognition, in-vehicle LANs, and memory cards. Sample shipments will begin in August 2009 in Japan.

Features of the SH7761 are summarized below.

(1) High processing performance of 720 MIPS at maximum operating speed of 400 MHz

The SH7761 incorporates the SuperH*¹ Family's top-end SH-4A CPU core, and achieves processing performance of 720 MIPS at a maximum operating frequency of 400 MHz, twice as fast as the earlier SH7760. This enables it to support the ever more sophisticated voice recognition processing functionality (such as the ability to respond to natural language input) essential for handsfree applications.

The SH-4A core is upward-compatible with the SH-4 core of the existing SH7760.

Since this CPU core is widely used in SH-Navi Series*² system-on-chip (SoC) devices for in-vehicle information equipment such as car navigation systems, existing program code can be reused and software development cycles shortened.

(2) DDR2-SDRAM interface for faster-speed data transfer

The DDR2-SDRAM (Double Data Rate 2 Synchronous DRAM) interface allows connection of DDR2-SDRAM, which is faster than the SDRAM supported by the earlier SH7760. This enables data transmission at higher speeds and improved system performance overall.

(3) Integration of peripheral functions required by next-generation equipment on a single chip, helping to reduce overall system cost

Essential on-chip peripheral functions are provided in order to implement the main functions of next-generation telematics and handsfree systems with a single chip.

Bluetooth*³ is used for connections with mobile phones, and a high-speed serial communication interface (max. 4 Mbps) is provided to accommodate Bluetooth modules with Bluetooth 2.0 + EDR support. Also included are a 2-port USB interface supporting USB 2.0 high-speed mode for connecting portable music players, and multiple sound interfaces for voice input and output.

In addition, a NAND flash memory interface and an SD card*⁴ interface have been newly added. To simplify the configuration of an in-vehicle LAN, two CAN*⁵ interfaces, the in-vehicle networking standard for connecting in-vehicle electronic devices for control applications, have been equipped, and a MOST (Media Oriented Systems Transport) interface, commonly used for data applications, has been newly added. This full complement of peripheral functions reduces the total number of components required by the system, thereby helping to reduce the overall cost.

< Product Background >

The field of telematics, and the field of handsfree which enables drivers to talk on the phone without taking their hands off the wheel, have attained a certain share in the market, especially in the North America and Europe. These fields are beginning to fuse into one, with the integration of entertainment functions, and are expected to show continued growth in the future.

Along with this trend, to support increasingly sophisticated voice recognition, as well as high-speed connections with mobile phones and the ability to connect entertainment devices such as portable music players, implementation of these functions and use of microprocessors with higher processing performance for telematics and handsfree devices is required.

Renesas Technology already mass produces the SH7760, a microprocessor for telematics and handsfree devices with processing performance of 360 MIPS at its maximum operating speed of 200 MHz. The new SH7761 32-bit microprocessor is designed to respond to the above-mentioned demand. It is built around the high-performance SH-4A CPU core, which has an established track record in in-vehicle information applications such as car navigation systems, and integrates on a single chip the main functions required by telematics and handsfree devices from among Renesas Technology's wide range of peripheral function IPs.

< Product Details >

In addition to the peripheral functions mentioned above, the SH7761 incorporates standard on-chip functions such as serial interfaces (serial communication interface and I²C bus interface) and an A/D converter.

The package used is a 449-pin BGA (21 mm × 21 mm).

The SH7761 also has an on-chip debug function that supports realtime debugging at the microprocessor's maximum operating frequency. The E10A-USB on-chip debugging emulator, which connects to a PC via a USB port, is available as a development environment.

A reference platform equipped with a variety of interfaces is available for use in system development by the customer. This platform enables product development to proceed efficiently. The reference platform is scheduled to become available, along with samples of the SH7761, in August 2009.

Future plans call for the release of a high-speed version to support more sophisticated voice recognition functions as well as a low-end version with a simplified function set. There will also be a need for product versions providing interoperability with car navigation systems and support for a variety of high-speed interfaces. Renesas Technology plans to continue to release new products in a timely manner in response to evolving market demand.

<Notes>

- Notes: 1. SuperH is a trademark of Renesas Technology Corp.
2. SH-Navi Series: SoCs for car information systems such as car navigation, using a Renesas Technology 32-bit RISC CPU core SuperH. Three products are currently in mass production, including the SH7774 featuring an on-chip image recognition engine. In addition, Renesas also released a dual-core SoC product.
 3. The Bluetooth word mark, figure mark, and combination mark are all trademarks that are owned by the Bluetooth SIG and licensed out for use to companies that are incorporating Bluetooth wireless technology into their products. To become a licensee, a company must become a member of the Bluetooth SIG.
 4. An SD card license must be obtained in order to use an SD card.
 5. CAN (Controller Area Network): A network specification for use in vehicles, proposed by Robert Bosch GmbH of Germany.

* Other product names, company names, or brands mentioned are the property of their respective owners.

< Typical Applications >

- Car information systems such as telematics systems and handsfree equipment

< Prices in Japan > *For Reference

Product Name	Package	Sample Price [Tax Included] (Yen)
SH7761 (R8A77610DA01BGV)	449-pin BGA (21 mm × 21 mm)	4,500

< Specifications >

Item	SH7761 Specifications
Product name	R8A77610DA01BGV
Power supply voltage	1.25 V (internal)/ 3.3 V (external)/ 1.8 V (external)
Maximum operating frequency	400 MHz
Processing performance	720 MIPS, 2.8 GFLOPS (at 400 MHz operation)
CPU core	SH-4A core
On-chip RAM	16 Kbytes
Cache memory	4-way set associative type with separate 32 Kbytes for instructions and 32 Kbytes for data
External memory	DDR2-SDRAM (data transfer rate: 266 MHz) directly connectable to dedicated DDR2 bus SRAM or ROM directly connected to extension bus
Extension bus	Address space: 64 Mbytes × 3
Main on-chip peripheral functions	USB 2.0 host/function interface NAND flash memory controller SD card host interface × 2 channels Audio codec interface × 1 channel Serial sound interface × 4 channels High speed serial communication interface × 1 channel Serial communication interface × 8 channels I ² C bus interface × 2 channels Clock synchronous serial I/O with FIFO Controller area network (RCAN) interface × 2 channels MOST interface module Dedicated DMAC × 21 channels A/D converter (10-bit) × 4 channels Timer × 9 channels On-chip debugging function Interrupt controller Clock pulse generator: built-in PLL frequency multiplier
Power-down modes	Sleep mode Module standby mode DDR-SDRAM power supply backup mode
Package	449-pin BGA (21 mm × 21 mm)

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*** Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice. ***