

Renesas Technology Releases SH7720 32-Bit RISC Microprocessor With On-chip SSL Accelerator and Comprehensive On-Chip Peripheral Functions Such As Color LCD Controller and USB

— Suitable for IT terminals equipped with a secure and smooth browser display function, enabling fast and easy development of sophisticated products —

Tokyo, December 18, 2003 — Renesas Technology Corp. today announced the SH7720 32-bit SuperH*¹ RISC microprocessor, incorporating an SSL*² hardware accelerator plus a comprehensive set of peripheral functions including a color LCD controller and USB (Universal Serial Bus), for use in various kinds of IT terminal devices equipped with a secure browser display function. Sample shipments will begin in March 2004 in Japan.

The SH7720 is a functionally enhanced version of Renesas Technology's current SH7727, and offers the following features.

(1) On-chip SSL hardware accelerator, enabling speedy secure browser display

The SH7720 incorporates a hardware accelerator for 3DES*³ processing and RSA*⁴ computations, which impose an especially heavy software processing load on the CPU during SSL processing. Reducing the CPU load allows smooth secure browser display processing, for more speedy operation.

(2) Comprehensive on-chip peripheral functions, including a color LCD controller, USB Host and Function, and various memory card interfaces

A full range of on-chip peripheral functions is provided, including a color LCD controller, USB Host and Function, and a CompactFlash*⁵ (CF) memory card interface, which have been highly acclaimed in the SH7727, and a newly added MultiMediaCard*⁶ (MMC) interface, I²C bus*⁷ interface, and IrDA interface (Ver. 1.0 support). These peripheral functions make it possible to create highly sophisticated systems.

(3) Selectable of 17 mm × 17 mm or 11 mm × 11 mm 256-pin CSP package to suit the application

The 17 mm × 17 mm 256-pin CSP employs a pin arrangement with I/O power supply pins outermost pins and the CPU core power supply innermost, enabling inexpensive 4-layer board mounting. A smaller 11 mm × 11 mm 256-pin CSP is also available for use in compact IT terminal devices, offering the user a choice of package to suit the end-product design criteria, such as low cost or small size.

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<Product Background>

A browser is a function for viewing Internet home pages, previously found mainly in personal computers. However, with the expansion of the Internet, an increasing range of products are being provided with a browser function, including personal digital assistants (PDAs), mobile phones, and Internet-connectable phones. In addition, browser functions are rapidly being introduced for a variety of Internet-connectable gadgets such as DSC printers, IP phones, digital TVs, audio products, and musical instruments. These trends have brought a greater demand for semiconductor devices that will enable such products to be implemented with a simple configuration. Meanwhile, in the field of IT terminals equipped with a display function, secure network connectivity is essential for the use of e-commerce and home banking services. Renesas Technology has previously released the SH7727 32-bit RISC microprocessor for display-equipped IT terminals, which has been well received by the market. Now, to meet the need for secure network connectivity, Renesas Technology has developed the SH7720 offering enhanced peripheral and interface functions.

<Product Details>

The SH7720 incorporates a hardware accelerator compatible with SSL, a browser protocol provided with security functions. This accelerator is a hardware circuit that performs RSA encryption public key and private key processing, and common key encryption/decryption processing in DES/3DES encryption, which impose an especially heavy software processing load within the SSL processing protocol, thereby enabling SSL protocol processing to be speeded up and also helping to reduce the CPU's software processing load.

Users and partner vendors can also use this hardware accelerator to develop SSL software capable of faster processing. Today ACCESS Co., Ltd. and EASTON Co., Ltd. announce that ACCESS' browser software NetFront^{®8}, using the SH7720's SSL hardware accelerator, will be provided by EASTON.

The SH7720 has an SH3-DSP CPU core with a maximum operating frequency of 133 MHz, and achieves high processing performance of 173 MIPS (at 133 MHz operation). This makes it possible to implement high-speed communication processing, while an on-chip DSP supports various kinds of middleware, such as a voice codec and echo canceller required by VoIP, and JPEG processing for still-image display.

The SH7720 incorporates a comprehensive range of peripheral functions, including such tried and tested peripheral functions as a color LCD controller and Ver. 1.1 support USB interface (Host and Function), as well as CF, MMC, and other memory card interfaces, an I²C bus interface ideal for controlling various peripheral devices, and a 16-bit timer (TPU) capable of PWM (Pulse Width Modulation) waveform output for stepping motor control, enabling various kinds of IT terminals to be implemented with a simple configuration.

The SH7720 employs a 0.15 -micron CMOS process, and achieves reduced power consumption through the use of special on-chip memory control circuit techniques.

Two sizes of 256-pin CSP package are available. The 17 mm × 17 mm 256-pin CSP with a 0.8 mm ball pitch employs a pin arrangement with I/O power supply pins outermost and the CPU core power supply innermost to allow inexpensive 4-layer board mounting, and FENWAL CONTROLS OF JAPAN, LTD. plans to support 4-layer board mounting technology.

A smaller 11 mm × 11 mm 256-pin CSP with a 0.5 mm ball pitch is also available, offering the user a choice of package to suit the end-product design criteria, such as low cost or small size.

Available development environment tools comprise evaluation boards such as Hitachi ULSI Systems Co., Ltd.'s Solution Engine^{*9}, and Renesas Technology's E10A emulator.

Renesas Technology will continue to develop SH7720-based products offering higher speed and extended peripheral functions, functions supporting increasingly important encryption capability and various kinds of data processing, as well as lower power consumption, in order to provide products that meet market requirements and offer various kinds of IT terminal solutions.

- Notes: 1. SuperH is a trademark of Renesas Technology Corp.
2. SSL (Secure Socket Layer): An HTTP protocol with added security functions proposed by Netscape Communications Corporation of the United States.
 3. 3DES (Triple Data Encryption Standard): A method for achieving secure encryption through triple application of encryption processing by means of DES.
 4. RSA (Rivest Shamir Adleman): A public key encryption technology. RSA is a registered trademark of RSA Security Inc.
 5. CompactFlash and CF are trademarks of SanDisk Corporation of the United States, and are licensed to the CFA (CompactFlash Association).
 6. MultiMediaCard is a trademark of the MMCA (MultiMediaCard Association). MMC is a trademark of Infineon Technologies AG of Germany.
 7. I²C bus (Inter IC Bus): An interface specification proposed by Royal Philips Electronics of the Netherlands.
 8. NetFront is a micro-browser for portable information devices. NetFront is a registered trademark or trademark of ACCESS Co., Ltd. in Japan or other countries.
 9. Solution Engine is a registered trademark of Hitachi ULSI Systems Co., Ltd.

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

<Typical Applications>

- Various IT terminals: Internet-compatible phones, PDAs, digital TVs, network-connectable audio devices, musical instruments, DSC printers with display function, etc.
- Mobile devices: IP phones (wireless LAN support products, etc.), USB keys, smart phones, etc.

<Prices in Japan> *For Reference

Product Name	Package	Sample Price (Yen)
HD6417720BP133	256-pin CSP (17 mm × 17 mm)	2,500
HD6417720BL133	256-pin CSP (11 mm × 11 mm)	2,600

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<Specifications>

Item	SH7720 Specifications	
Product name	HD6417720BP133	HD6417720BL133
CPU core	SH3-DSP (32-bit RISC CPU core)	
Maximum operating frequency	133 MHz	
Processing performance	173 MIPS (at 133 MHz operation)	
Power supply voltage	Internal: 1.5 V I/O: 3.3 V [3.3 V or 1.8 V selectable for SDRAM I/F]	
Cache memory	32 Kbytes, mixed instructions/data type, 4-way set associative	
X/Y memory	16 Kbytes	
On-chip peripheral functions	<ul style="list-style-type: none">• SSL hardware accelerator (RSA, DES/3DES support)• Color LCD controller• USB interface<ul style="list-style-type: none">– Host (Ver. 1.1): 1.5/12 Mbps– Function (Ver. 1.1): 12 Mbps* Host and Function both connectable to USB2.0 device• I²C bus interface: Multimaster transmission/reception support• DMAC × 6 channels [2 with external activation capability]• TMU: 32-bit timer × 3 channels• TPU: 16-bit timer × 4 channels [PWM output, counter input clock]• SCIF: Serial interface with FIFO × 2 channels• IrDA interface (Ver. 1.0)• SIOF: Audio serial interface with FIFO × 2 channels (SPI mode provided)• Smart Card interface• AFE interface• A/D converter (10-bit resolution) × 4 channels• D/A converter (8-bit resolution) × 2 channels• PCMCIA interface• MultiMediaCard interface	
Package	256-pin CSP (17 mm × 17 mm, 0.8 mm ball pitch)	256-pin CSP (11 mm × 11 mm, 0.5 mm ball pitch)
Process	0.15-micron CMOS process	

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.