



FOR IMMEDIATE RELEASE

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Renesas Technology to Release MS7724, First Product in Renesas Multimedia Solution Line of Linux Platforms for Development of Systems Incorporating SH-Mobile R Series Application Processors

—Aims to expand market share of SH-Mobile R Series of application processors for mobile devices by enabling quicker system development at an affordable price and providing a comprehensive collection of software supporting the Linux OS —

SAN JOSE, Calif., December 8, 2009—Renesas Technology America, Inc., today announced the development of the Renesas Multimedia Solution Linux*¹ platform, which enables low-cost and rapid development of systems incorporating the SH-Mobile R Series*² application processor for mobile devices. The first product in the series is the MS7724 platform for the SH-Mobile R2R (SH7724), the newest entry in the SH-Mobile R Series. Shipments began on November 26, 2009, in Japan.

The MS7724 provides improved functionality, a compact area that is approximately 60% that of previous products, and lower cost in comparison with earlier evaluation and development boards from Renesas Technology. In addition, it includes software for developing systems running the Linux OS, which is widely used in the application fields of the SH-Mobile R2R (SH7724), including navigation systems with support for terrestrial digital broadcasts, portable media players, and IP Security cameras. This allows evaluation of the device immediately after purchase, contributing to shorter system development cycles and more timely release of products to the market.

< Product Background >

The SH-Mobile R Series is an application processor based on the SH-Mobile, which is widely used in mobile phones in Japan and overseas. It was developed to allow multimedia technologies of the SH-Mobile such as camera processing, as well as video and audio processing, to be applied in fields other than mobile phones. The SH-Mobile R2R (SH7724), announced in May 2009, is the newest and most advanced product in the SH-Mobile R Series. It incorporates multi-codec high-performance video processing IP supporting the H.264/MPEG-4 AVC*³ (H.264) video compression standard used by ISDB-T*⁴ terrestrial digital broadcasts in Japan, as well as One-Seg*⁵ and formats used for terrestrial digital broadcasts in Europe, China, and other regions.*⁶ To support playback and recording of HD (High Definition, 1,280 × 720 pixels) video, functionality is provided for encoding (recording) and decoding (playback) of HD format video at 30 frames per second (fps). Also, the operating frequency of 500 MHz provides power to spare when running a general-purpose OS such as Linux.

In addition to the above features, camera inputs have been increased to two channels and an Ethernet MAC (Media Access Control)*⁷ supporting data transfer at 10/100 megabits per seconds (Mbps) has

been newly added. This extends the range of suitable applications beyond low-end navigation systems, where Renesas Technology application processors already have an extensive track record, to include IP security cameras, videoconferencing systems, video and voice over IP (V2IP), networked household appliances, drive recorders, digital signage, etc.

Renesas technology expects the SH-Mobile R2R (SH7724) to achieve full-scale adoption. Since Linux is widely used as the OS for systems such as those previously mentioned, there is growing demand for low-cost and compact evaluation and development boards to be provided as part of a package that includes Linux System development tools. Such products allow systems to be developed at a lower cost and in less time.

In response to this demand, Renesas Technology has developed the Renesas Multimedia Solution line of system development Linux platforms. Each incorporates an SH-Mobile R Series application processor; provides enhanced functionality, reduced cost, and greater compactness than previous evaluation and development boards; and includes Linux software necessary for system development in a single package. The first product to be released is the MS7724 platform for the SH-Mobile R2R (SH7724).

< Features >

The MS7724 covers almost all the functions of the SH-Mobile R2R (SH7724), while providing additional functions designed for flexible system development. Its features are summarized below.

(1) Very low price is approximately 35% that of comparable earlier Renesas Technology products

The MS7724 exceeds the functionality and performance of current evaluation and development boards incorporating the SH-Mobile R Series, while achieving a smaller area that is only about 40% that of its predecessors and a very low price that is approximately 35% that of earlier Renesas Technology products. This contributes to a reduction in overall system development costs; for example, by enabling customers to purchase multiple boards to shorten development cycles.

(2) Package including software resources required for development of systems running Linux OS

The MS7724 includes, at no additional cost as part of the package, a Linux kernel, board support package (BSP=device drivers), video middleware, and sample applications to enable customers to develop systems incorporating the SH-Mobile R2R (SH7724) and running the Linux OS. This means that customers who purchased the MS7724 can immediately commence SH-Mobile R2R (SH7724) device evaluation and system development work, thereby reducing the amount of time required to develop a system.

The sample application is a complete software program supporting implementation of an IP security camera. It encodes video captured by a camera in H.264 format using the SH7724 hardware, then transfers the resulting signal from the Ethernet interface of the SH7724 to a LAN network or display device via an HTTP server. (Note: See the specifications for a listing of the contents of the Linux sample software package.)

(3) Extended functions for greater flexibility

The MS7724 covers most of the capabilities of SH-Mobile R2R (SH7724), including the following key functions.

- Encoding (recording) and decoding (playback) of HD video (1,280 × 720 pixels) at 30 frames per second (fps)
- 10/100 Mbps Ethernet MAC
- Camera input pins for two channels to support systems requiring input from two cameras, such as security cameras or Event Data Recorder (EDR)

In addition, the following functions are provided for system development and enhanced flexibility.

- Power over Ethernet (PoE) function utilizing 10/100 Mbps Ethernet interface. This allows power to be supplied via a LAN cable and eliminates the need for an AC adapter.
- Three-axis motion sensor to detect the orientation of the board and movement
- DVI (Digital Visual Interface), an interface designed to provide maximum picture quality on digital display devices, for connecting to an LCD controller

The following boards are also available as options to help reduce system development time.

- LCD board

A 7-inch WVGA TFT LCD (800 × 480 pixels) with resistive touch-panel functionality that is useful for developing an intuitive user interface. It is configured to mount on top of the main board, which is roughly the same size.

- Camera boards

This set of two boards incorporates a 3.2-megapixel 1/4-inch CMOS image sensor and a camera module with an autofocus function. It is capable of capturing video in HD format.

(4) Environmental considerations

With the environment in mind, neither the MS7724, nor its packaging, contain toxic substances. All materials used comply with the RoHS Directive.*⁸ The MS7724 is both compact in size and environmentally friendly.

Future plans call for the Renesas Multimedia Solution line to be extended to all the products in the SH-Mobile R Series that are developed in the future. (Note: This does not apply to products already in mass production.)

Furthermore, the Renesas Multimedia Solution line, of which the MS7724 is the first product to be released, will eventually cover a wide range of general-purpose operating systems, including Windows CE*⁹ and µITRON*¹⁰, in addition to Linux.

< Notes >

- Notes: 1. Linux is a registered trademark of Linus Torvalds in the United States and other countries.
2. An offshoot of the SH-Mobile (SuperH™ Mobile Application Processor) Series of application processors for mobile phone systems, the SH-Mobile R Series is intended for mobile devices other than mobile phones. These application processors are exclusive to Renesas Technology and are designed specifically for multimedia applications such as video and audio. SuperH is a trademark of Renesas Technology Corp.
3. H.264/MPEG-4 AVC (Advanced Video Coding): A video compression standard established jointly by the Telecommunication Standardization Sector of the International Telecommunication Union (ITU-T) and the international standards organizations ISO and IEC.
4. ISDB-T (Integrated Services Digital Broadcasting – Terrestrial): A terrestrial digital broadcasting standard developed in Japan. Broadcasting for mobile devices such as mobile phones uses only one of the 13 ISDB-T segments, and is therefore known as one-segment (or One-Seg) broadcasting.
5. One-Seg: A service offering terrestrial digital broadcasts in Japan for mobile and portable devices. See note 4.
6. Terrestrial digital broadcasts in Europe, China, and other regions: The supported standards include DVB-H (Europe), DMB (South Korea), and CM-MB (China).
- DVB-H (Digital Video Broadcast for Handhelds) is a mobile device version of the Digital Video Broadcast (DVB) standard developed in Europe.
 - DMB (Digital Multimedia Broadcasting) is a digital TV broadcasting standard for mobile devices developed in South Korea. There are two versions: Terrestrial DMB (T-DMB) and Satellite DMB (S-DMB).
 - China Mobile Multimedia Broadcasting (CM-MB) is a digital mobile broadcasting standard used in China.

7. MAC (Media Access Control): A sub-layer of the data link layer. It specifies the method of frame transmission and reception, the frame format, data error detection, etc.
8. RoHS Directive: A European Union (EU) Directive for “the restriction of the use of certain hazardous substances in electrical and electronic equipment.” It went into effect on July 1, 2006, and covers six substances: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE).
9. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation of the U.S.A. in the United States and other countries.
10. μ ITRON: TRON stands for “The Real-time Operating system Nucleus.” ITRON stands for “Industrial TRON.” μ ITRON stands for “Micro Industrial TRON.”

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

< Typical Applications >

- Navigation systems and personal navigation devices (PNDs) with support for terrestrial digital broadcasts
- Portable media players and handheld terminals with support for terrestrial digital broadcasts
- IP security cameras, video conferencing systems, and video and voice over IP (V2IP) terminals
- Digital signage systems

< Configurations and Prices in U.S.> *For Reference

Product Name	Product No. and Size	Configuration	Sample Price
MS7724 main board	R0P7724LC0021RL 165 mm x 135 mm	<ul style="list-style-type: none"> • MS7724 main board • Linux kernel 2.6.31 • SH-Linux board support package (BSP) • Sample programs • User’s manual • Hardware design data • AC adapter (DC 5 V/4 A) 	\$734
MS7724 LCD board	R0P7724LE0011RL 165 mm x 106 mm	<ul style="list-style-type: none"> • WVGA (7-inch) LCD extension board (touch panel) • User’s manual • Hardware design data 	\$522
MS7724 camera board	R0P7724LE0021RL 1 unit: 70 mm x 45 mm	<ul style="list-style-type: none"> • HD (720p) camera module extension board • User’s manual • Hardware design data 	\$226

< MS7724 Specifications >

Item	MS7724 Main Board Specifications
Product No.	R0P7724LC0021RL
Supported MCU	• SH-Mobile R2R (SH7724 R8A77240D500BG)
Main functions	(CPU specifications) SH-Mobile R2R: 449-pin BGA (0.8 mm pitch, 21 mm x 21 mm) CPU max. operating frequency: 500 MHz DDR max. operating frequency: 166.7 MHz (DDR2-333) 64 MB NOR Flash ROM Max. 512 MB on-board DDR2-SDRAM (Note: 256 MB on the MS7724) VPU5F (H.264, MPEG-4, VC-1) Video output unit LCD controller for 24-bit TFT color LCD panel 2-D graphics accelerator Sound processing unit (24-bit dedicated audio DSP) Ethernet controller x 1 channel (10/100 Mbps) USB2.0 host (USB type A) USB2.0 host/function (USB type-mini-AB) Camera input x 2 channels (max. 5 megapixels: 2,560 x 1,920) SD card interface MMC/SD card interface TS interface SH-JTAG connector (debugging interface) (MS7724 functions) DVI interface Composite video output Composite video input Headphone stereo jack Mic stereo jack IrDA 3-axis motion sensor Power over Ethernet (PoE)
External dimensions (main board)	H165 mm x V135 mm

< Contents of Linux sample software package >

Boot loader	Program for reading OS from disk and booting it
Kernel.	2.6.31-rc7 vanilla kernel
Tool chain	
GCC	4.3.4 Free compiler available under the GNU project
Glibc	2.9 Standard C. library used by the GNU project
Binutils	2.19.51 Binary utilities (commands, etc.)
Kernel-headers	2.6.29
Userland(rootfs)	Debian distribution
Device Driver	Ether, USB, I ² C, etc.
DirectFB	Graphics API
Renesas lib	Libshcodecs, libshjpu (planned), ibshbeu (planned), etc.
Sample Middleware	H.264/MPEG-4 AVC encoder and decoder
Sample Application	Camera capture application, sighttpd (HTTP server) etc.

About Renesas Technology Corp.

Renesas Technology Corp. is the world's No.1 supplier of microcontrollers and one of the world's leading semiconductor system solutions providers for mobile, automotive and PC/AV (Audio Visual) markets. It is also a leading provider of Power MOSFETs, Smart Card microcontrollers, RF-ICs, High Power Amplifiers, Mixed Signal ICs, System-on-Chip Devices (SoCs), System-in-Package Devices (SiPs) 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 702.7 billion JPY in FY2008 (end of March 2009). Renesas Technology is based in Tokyo, Japan and has a global network of manufacturing, design and sales operations in 16 countries with 25,000 employees worldwide. For further information, please visit <http://www.renesas.com>