

Renesas Technology Releases HD Video Middleware for SH-Mobile Application Processor

— Simplifies development of HD size video recording and playback applications for devices such as mobile phones —

Tokyo, December 24, 2008 — Renesas Technology Corp. today announced the HD Video Middleware, which will facilitate the development of applications for the SH-Mobile*¹ application processor supporting recording and playback of video in the 1280 × 720-pixel High Definition (HD) resolution. The new middleware will be available from April in Japan.

Renasant Technology is developing the SH-Mobile application processor for mobile phones with an on-chip hardware accelerator supporting Full HD (1920 × 1080 pixels) resolution video complying with the H.264/MPEG-4 AVC*² (H.264) video compression standard. HD Video Middleware is designed for use with these SH-Mobile products, enabling recording and playback of video up to HD resolution in the MP4 format,*³ which is widely used for video files on existing mobile phones, with the H.264 standard. HD Video Middleware also supports MPEG-2 TS (Transport Stream), a multiplexed*⁴ HD video format that is rapidly gaining adoption in the digital home electronics field. This will simplify the process of turning video captured with the camera of a mobile phone into HD video files that can be displayed on digital home electronics products.

HD Video Middleware was developed in collaboration with Systems Development Laboratory, Hitachi, Ltd.

< Product Background >

In recent years, cameras have become almost a standard feature on mobile phones, which often now are equipped with functions for recording and playing video content in addition to still photos. As the pixel count of the cameras increases, support is being provided for higher definition video contents. Some recent mobile phone handsets have the capability to capture video content in VGA (640 × 480 pixels) resolution. In addition, with higher camera resolution and communication speeds, there is growing anticipation of features such as the ability to view video files captured on a mobile phone on TVs and to post them to sites on the Internet.

At the same time, products such as digital TVs supporting HD picture quality are becoming more widespread in the digital home electronics field. This is expected to trigger demand for HD quality recording and playback capability for mobile phones in order to provide a clearer picture when video captured on a mobile phone is displayed on a TV or similar device.

Previously, video formats based on the MPEG-4 compression standard, such as MP4, were the norm on mobile phones, but these can only be used to record short video clips due to memory capacity limitations and the enormous data size at high resolutions. This has led to increased adoption of the H.264 format, which provides a higher compression ratio than MPEG-4. Video content encoded in

H.264 has smaller file size than the same content encoded in MPEG-4. This means that longer video clips can be recorded, assuming the same memory capacity (for storage). Use of the H.264 format is becoming widespread for One-Segment terrestrial digital TV broadcasting for mobile phone handsets in Japan and in applications such as digital cameras.

In addition, since mobile phones operate on battery power, it is important that power consumption be as low as possible during video recording and playback.

Renesas Technology has developed a video hardware accelerator combining high performance and low power consumption that is integrated into products such as system on chip (SoC) devices for mobile phones. The company also develops and supplies middleware to enable customers to reduce the time required for system development.

The development and release of HD Video Middleware will help meet demand from developers of future mobile phones handsets with support for recording and playback of HD video.

< Features >

The features of HD Video Middleware are summarized below.

(1) Ability to record and play long video clips with HD picture quality and excellent audio quality

The hardware accelerator with Full HD support draws on the technological expertise accumulated by Renesas Technology to process H.264 data using the fewest possible resources (such as on-chip memory capacity and circuit scale). It enables display of Full HD video at 30 frames per second (fps) with low power consumption.

HD Video Middleware is software that provides efficient control of the hardware accelerator. In addition, it can be combined with Renesas Technology middleware supporting high-quality audio compression standards, such as AAC-LC (Low Complexity Advanced Audio Coding) and Dolby Digital (Dolby Digital middleware currently under development), to implement recording and playback of long video clips with excellent picture and sound quality.

(2) High bitrate and support for multiplexed formats popular on digital home electronics products

HD Video Middleware employs zero-copy technique*⁵ and asynchronous high-speed transfer technique*⁶ to move data between its function modules. These make it possible to achieve a bitrate of 9 megabits per second (Mbps), which is 4.5 times as fast as the previous maximum bitrate in the mobile phone field of 2 Mbps, and enables handling of the large data sizes required for high-definition video.

HD Video Middleware also supports B-frame, as defined in the H.264 standard. B-frame makes it possible to reduce the bit rate while maintaining picture quality, allowing smaller file sizes and recording of longer video clips.

In addition to the MP4 format that is widely used on mobile phones and PCs, HD Video Middleware supports the MPEG2-TS multiplexed format. This facilitates playback on digital home electronics products of HD video content captured and recorded using a mobile phone.

(3) Simplified development of applications with HD video support

By using the SH-Mobile incorporating the hardware accelerator with H.264 Full HD support and HD Video Middleware, developers can easily create HD video-capable applications for mobile phones with limited resources such as memory capacity.

In addition, since HD Video Middleware supports the above hardware accelerator, it can also be used in devices such as digital cameras, portable media players, and in-vehicle information systems using an SoC incorporating the accelerator.

All basic functions for supporting HD video are provided by HD Video Middleware. Functions requiring customization, such as camera input and LCD display orientation, have a flexible configuration that can be changed by the customer. This reduces system development time by about 30%, according to comparisons by Renesas Technology, and enables customers to bring new products to market in a timely manner.

Following on the release of HD Video Middleware, Renesas Technology plans to enhance Full HD support to meet the ability of Full HD video camera for mobile phone, and will continue to develop and supply middleware products that contribute to development solutions for customers, in response to evolving market.

< Notes >

- Notes:
1. SH-Mobile (SuperH™ Mobile Application Processor): An exclusive Renesas Technology processor for mobile phone systems that is connected to a baseband processor and performs dedicated processing for multimedia applications using audio and video. SuperH is a trademark of Renesas Technology Corp.
 2. H.264/MPEG-4 AVC (Advanced Video Coding) is a video compression standard established jointly by the ITU-T (International Telecommunication Union Telecommunication Standardization Sector) and the international standardization organizations ISO/IEC.
 3. MP4 format: A file format in which compressed video data, such as MPEG-4 or H.264, and compressed audio data, such as AAC, are multiplexed.
 4. Multiplexed: As used in this press release, the term multiplexing refers to the synchronizing and combining of a video file and an audio file into a single file.
 5. Zero-copy technique: A technique for maintaining coherence of data alignment among processing modules and reducing the amount of data copied between them.
 6. Asynchronous high-speed transfer technique: A technique that achieves high throughput by enabling consecutive writing to and reading from memory cards, etc., without synchronization with the data processing.
- * Other product names, company names, or brands mentioned are the property of their respective owners.

< Typical Applications >

- Development of HD video recording and playback applications using SH-Mobile versions incorporating the hardware accelerator with Full HD video support.

< **Specifications** >

Item		Specification
Supported file formats		MP4 file format, MPEG2-TS (Renesas Technology middleware standard support)
Max. recording time(*1)		120 minutes
Max. recording size(*1)		2 GB
Video	H.264/AVC	Profile: High Profile Video sizes: 848 x 480, 1280 x 720 Frame rate: Max. 30 fps Bitrate: Max. 9 Mbps Picture encoding: I-picture, P-picture, B-picture
Audio	AAC-LC	Sampling frequency: 44.1 kHz Channels: 2(*2) Bitrate: 8 to 128 kbps
	Dolby Digital	Sampling frequency: 48 kHz Channels: 2(*2) Bitrate: 128 kbps

Notes:

1. The actual upper limit is when either the maximum recording time or size is reached, whichever is first.
2. In monaural recording mode the same audio data is recorded for both channels.

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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. ***