Renesas Technology Releases SH-Mobile3 with Support for Terrestrial Digital TV Broadcasts and 5-Megapixel Camera Modules

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Renesas Technology Corp. today announced the SH-Mobile3A (product name: SH73380) as part of SH-Mobile Series of mobile phone application processors. The SH-Mobile3A incorporates the latest multimedia processing functions, including support for terrestrial digital TV broadcasts and 5-megapixel camera modules, and features such as a JPEG hardware accelerator for still images. Sample shipments will begin in April 2005 in Japan.

SH-Mobile3A is an application processor designed for use in high-end models of mobile phone. Major features are as follows.

Newly developed video processing IP core with support for the video compression standard H.264 and MPEG-4

The SH-Mobile3A integrates the VPU4 (Video Processing Unit 4), a newly developed video processing IP that supports the H.264/MPEG-4 AVC (H.264) video compression standard. H.264 adopted for ISDB-T (Terrestrial Integrated Services Digital Broadcasting), a “one-segment broadcasting” system for delivering terrestrial digital TV broadcasts to portable devices such as mobile phones. The VPU4 is capable of decoding VGA size video at a rate of 30 frames per second (fps).

Furthermore, it incorporates a transport stream (TS) interface that allows separate processing of video and audio data without CPU load. Moves toward the introduction of digital TV broadcasting are advancing in many countries worldwide, and the SH-Mobile3A is available to support multiple digital TV broadcasting formats for mobile phones, including DVB-H (Digital Video Broadcasting for Handheld) and DMB (Digital Multimedia Broadcasting). In addition, the VPU4 can process MPEG-4 content and provides the high-quality video processing capabilities required for applications such as video e-mail, videophone functionality, and movies.

Support for 5-megapixel class camera modules and image processing functions

The SH-Mobile3A is equipped with a camera interface that supports direct connection to a 5-megapixel class camera module (the highest resolution supported by the SH-Mobile Series) and incorporates image processing functions. It can capture large volumes of image data from a high-definition camera module rapidly and process it in a variety of ways. Furthermore, by connecting the mobile phone to a TV set it is possible to display high-resolution images captured using the mobile phone's built-in camera on the TV screen.
In addition, the SH-Mobile3A incorporates a hardware accelerator for processing JPEG data. It can help in the creation of attractive applications by allowing users to snap photos in rapid succession smoothly.

High-performance CPU core for speedy display processing for one-segment broadcasts

The SH4AL-DSP CPU core can achieve a processing performance of 389 million instructions per second (MIPS) when operating at the maximum frequency of 216 MHz. This provides plenty of processing power to handle the browser for viewing one-segment broadcasts. And also this processing capability enables the SH-Mobile3A to easily handle parallel processing of multiple high-load applications, and operations using a general-purpose OS such as Linux involving a greater processing load than a dedicated OS.

Product Background

In recent years mobile phone systems have come to offer an ever wider range of high-functionality multimedia applications, such as games, camera functions, and videophone capabilities. Furthermore, these applications are becoming more sophisticated, complex, and varied as communication speeds increase. This trend is expected to intensify in future. One such new service is “one-segment broadcasting,” which will bring to mobile phones the ability to receive terrestrial digital TV broadcasts, and this service is expected to become a killer app for future mobile phones.

Renesas Technology led the world in developing the SH-Mobile Series specifically for performing such application processing in mobile phone systems, and the lineup of products for high-end through popular mobile phone models has been well received by the market. Now, Renesas Technology has developed the new SH-Mobile3A incorporating the latest multimedia processing functions including support for one-segment broadcasting, for the high-end models.

Product Details

An SH-Mobile Series processor is connected to the baseband LSI of a mobile phone system and performs voice, image, or similar multimedia application processing. The use of dedicated interfaces allows connection to various types of baseband LSIs, and mobile phone

customization or product differentiation is possible by means of an on-chip accelerator function, a variety of interfaces, and a mobile phone oriented power management system.

The SH-Mobile3A incorporates the newly developed VPU4 video processing IP. The VPU4 delivers high-speed processing support for the video compression standards of both H.264 adopted for one-segment broadcasting and the MPEG-4 used for movie and videophone applications. The VPU4 incorporates 7-stage pipeline processing technology that reduces power consumption either through the use of lower clock frequency or through dynamic variation of the clock numbers of the individual stages. As a result, current consumption by the IP core while operating at 66 MHz is only approximately 36 mA when decoding VGA size video at a rate of 30 fps.

SMobile3A incorporates the SH4AL-DSP CPU core, which is capable of delivering processing performance of 389 MIPS at maximum operating frequency 216MHz. The performance by frequency unit of the CPU core is 1.8 MIPS/MHz, which is to enable speedy operation of a browser supporting one-segment broadcasting.

The SH-Mobile3A also incorporates a camera interface that supports direct connection to a 5-megapixel class camera module which is the highest resolution in the SH-Mobile Series, providing support for the higher-pixel cameras incorporated mobile phone in recent years. The camera interface allows capture of large volumes of image data from a high-definition camera and a variety of display options, including digital zoom display and overlay display capabilities using on-screen display (OSD) functions, hardware cursor (HWC) functions, etc. The SH-Mobile3A also incorporates a video output unit compatible with the NTSC and PAL, so the mobile phone can be connected to a TV to display high-resolution images captured using the mobile phone's built-in camera on the TV screen.

The SH-Mobile3A is the first offering in the SH-Mobile Series to incorporate a JPEG hardware accelerator. It realizes a maximum still photo successive capture speed of 0.02 seconds/photo or better for VGA size and 0.1 seconds/photo or better for SXGA size. This makes possible the creation of a wide array of attractive camera applications by allowing users to snap photos in rapid succession.

The SH-Mobile3A also incorporates a variety of peripheral functions ideal for mobile phone systems, including an LCD controller compatible with TFT color LCD panels and a sound interface.

The package used is a 409-pin CSP (12 mm × 12 mm × 1.4 mm, 0.5 mm pin pitch).

Renesas Technology will continue to develop products matching the trend in mobile phones toward increasingly advanced and higher-level multimedia applications. The company aims to make available in a timely manner products optimized to the requirements of the market.