Hitachi Releases SH7300 High-Performance Processor for Next-Generation Mobile Phones with Videophones Capability as Third Product in SuperH™ Mobile Application Processors 'SH-Mobile Series'

— On-chip MPEG-4 accelerator, etc., enabling fast and convenient operation of next-generation applications such as Videophones —

Tokyo, September 30, 2002— Hitachi, Ltd. (TSE: 6501) today announced the high-performance SH7300 processor, offering high-speed execution of moving-image and audio processing for high-speed data communication based next-generation mobile phone applications such as Videophones, as the third product in the SH-Mobile (SuperH™*[1] Mobile Application Processor) Series of mobile phone oriented application processors. Sample shipments will begin in November 2002 in Japan.

The SH-Mobile Series comprises processors that are connected to a baseband LSI handling mainly communication processing in a mobile phone system, and perform dedicated audio, moving-image, and similar multimedia application processing. The SH7300 includes an MPEG-4*[2] hardware accelerator for image processing, enabling high-speed execution of processing. An SXGA camera interface is also incorporated to support next-generation mobile phones equipped with Videophone functions and a high-definition camera, while an application development platform and a various kinds of middleware enables speedy and efficient development of application software.

Mobile phones now offer a wide variety of sophisticated applications in addition to voice communication, including games and moving-image distribution. Hitachi developed the SH-Mobile Series of processors to handle dedicated processing of such applications in mobile phone systems, and this series has been highly acclaimed in the market. However, with the higher communication speed of 3G mobile phones, data transfer speed becomes higher and further expansion is expected in such application areas as Videophones, and there is a demand for processors with faster image processing performance. At the same time, there has been a remarkable increase in the pixel count of cameras built into mobile phones, and the trend is expected to be away from the current CIF*[3] and VGA*[4] sizes to SXGA*[5] size, bringing a need for processors capable of handling this display size.

In response to such needs, Hitachi has developed the SH7300 as the third product in the SH-Mobile Series, based on the initially released SH7290 but featuring an on-chip MPEG-4 accelerator, increased image processing speed, and enhanced functions such as SXGA camera interface.

As with previous SH-Mobile Series products, the SH7300 has an SH3-DSP SuperH family CPU core suited to portable multimedia devices such as digital cameras, and allows individual modules to be shut down according to the functions being used, enabling overall system power consumption to be reduced. The SH7300 has an operating frequency of 133 MHz, and includes the following major features.

< Features >

1. On-chip MPEG-4 hardware accelerator for increased over twice MPEG-4 processing performance
    The SH7300 incorporates a hardware accelerator for encoding/decoding processing capable of high-speed MPEG-4 processing. Not only is lower power consumption achieved through hardware processing, but also the CPU load for processing has been cut to approximately $1/5^{th}$ and increase over twice MPEG-4 processing performance that of current SH-Mobile Series models that handle most MPEG-4 processing by means of middleware. This makes it possible to implement high-performance, low-power-consumption systems incorporating moving-picture playback, Videophone, and similar sophisticated functions.

2. Built-in interface supporting high-definition SXGA cameras, for smooth and attractive displays
    The SH7300 includes an interface allowing direct connection of an SXGA-size camera. Large volume image data through high-definition camera can be captured at high speed, enabling fast image processing to be achieved. A variety of high-definition camera image display functions are available, including electronic zoom, providing smooth and attractive displays on devices such as Videophones

3. Middleware selection enhanced with the provision of moving-picture recording middleware, facilitating the development of a video mail function
    Moving-picture recording middleware is provided that supports the MP4*[6] format enabling simultaneous recording of moving-picture and audio data. Simply calling this middleware from an application enables moving pictures and audio to be saved as MP4 file format data, and to be played back simultaneously. The user can thus develop a video mail function simply by creating a user interface to call this middleware from an application program. This moving-picture recording middleware also supports an after-recording function that allows audio to be added later to previously stored moving-picture data, facilitating the development of extended video mail functions.

4. Application program development simplified by the provision of a development platform incorporating a variety of peripheral modules and interfaces
    A development platform is available that incorporates a variety of peripheral modules and interfaces necessary for next-generation mobile phones, including an interface to AND-type and NAND-type flash memory. Also included is fast SDRAM capable of handling high-speed applications, as well as a keyboard, small QVGA*[7] size color LCD panel, and VGA size ultra-miniature camera, enabling easy and speedy development of various multimedia-oriented application programs.

The package used is a small CSP-256 ($11 \times 11 \times 1.40$ mm, 0.5 mm pin pitch). Use of the SH7300 will make it possible to implement a next-generation mobile phone system incorporating multimedia applications in a short time-frame, while keeping development costs low, and also to respond rapidly to the need for application development or modification brought about by future service diversification and changes in service content.

Hitachi will continue to develop and release products that meet the needs of successive mobile phone generations, in line with the ever-increasing functional sophistication of mobile phone systems.

Notes: 1. SuperH is a trademark of Hitachi, Ltd.

2. MPEG-4 (Moving Picture Experts Group phase 4): A standard for compression/decompression of moving images.

3. CIF (Common Immediate Format): Worldwide common video format. .A display format comprising 352×288 dots.

4. VGA (Video Graphics Array): A display definition standard of 640×480 dots. VGA is a trademark of IBM Corporation.

5. SXGA (Super Extended Graphics Array): A display definition standard of $1,280 \times 1,024$ dots.

6.   MP4: A file format of compression/decompression for moving-image with audio.

7. QVGA (Quarter Video Graphics Array): A display definition standard of 320×240 dots.

< Typical Applications >

- Next-generation mobile phone terminals incorporating multimedia applications

< Prices in Japan >(For Reference)

Product Code	Operating Frequency	Package	Unit Price for 10,000-Unit Lot (Yen)
SH7300 (HD6417300BL133)	133 MHz	CSP-256	3,000

< Specifications >

Item	SH7300 Specifications
Product code	HD6417300BL133
CPU core	SH3-DSP
Power supply voltage	Internal: 1.4 V to 1.6 V, external: 2.7 V to 3.6 V
Operating frequency	133 MHz
Processing performance	173 MIPS
On-chip RAM	128 Kbytes
Cache memory	32 Kbytes
X/Y memory (for DSP)	16 Kbytes
On-chip peripheral functions	- MPEG-4 accelerator - SXGA camera support - DMAC $\times$ 6 channels - MMU
Interfaces	- Dedicated interface (baseband LSI connection, etc.) - NAND/AND-type flash memory interface - SDRAM interface - Video I/O (camera module connection interface) - Sound interface - SIM card interface - Key-scan interface I^2C interface - Serial communication interface $\times$ 1 channel - Serial communication interface with FIFO $\times$ 1 channel - Asynchronous serial communication interface $\times$ 1 channel
Package	256-pin CSP (11 $\times$ 11 $\times$ 1.40 mm, 0.5 mm pitch)