

Hitachi Releases "Reduced Size MultiMediaCard", the World's Smallest Flash Card

— 16/32/64-Mbyte capacity cards approximately half the size of a MultiMediaCard,
for use in wearable mobile devices —

Tokyo, November 21, 2002— Hitachi, Ltd. (TSE: 6501) today announced the Reduced Size MultiMediaCard (RS-MMC™) offering the same functions as a MultiMediaCard™*¹ in a package approximately half the size, as a data storage medium for small mobile devices including next-generation mobile phones and PDAs, and portable imaging products such as digital cameras.

As the first step, sample shipments of the 16 Mbyte HB28H016RM2, 32 Mbyte HB28D032RM2, and 64 M byte HB28B064RM2 will start on November 25, 2002 in Japan.

A reduced-size standard for the MultiMediaCard was approved at the MultiMediaCard Association (MMCA), the MultiMediaCard standardization body, and MMCA announced RS-MMC on November 11 , 2002 (<http://www.mmca.org/>). Hitachi's cards are the first commercial models of RS-MMC, featuring the world's smallest flash card size of 18 mm × 24 mm × 1.4 mm. They will respond to the needs of end-product downsizing, and will also contribute to the future advent of even smaller, wearable devices.

Hitachi plans to release 128- and 256-Mbyte models in the latter half of 2003.

< Background >

MultiMediaCards are small-sized, large-capacity, removable data storage media whose ease of use has led to their widespread use in such products as mobile phones, digital cameras, PDAs, and portable music players, and demands for these cards are expected to continue to grow in the future.

Hitachi currently offers a lineup of 16-, 32-, 64-, and 128-Mbyte MultiMediaCards, meeting demands for small size, large capacity, and high speed. Now, Hitachi has developed three models of the RS-MMC based on MMCA standard specifications, and approximately half the size of current MultiMediaCards, to meet the need for higher density and smaller size in next-generation mobile phones and similar portable devices, and contribute to the development of wearable devices.

< About this product >

The RS-MMC employs Hitachi's Multi Chip Module mounting technology, and incorporates Multi Level Cell*² AND type flash memories and a controller in a card approximately half the size of a current MultiMediaCard. The RS-MMC uses the same flash memory and controller as Hitachi's HB28xxxxMM2

-more-

Series high-speed MultiMediaCard series, and provides the same performance in a smaller size.

The main features of the RS-MMC are as follows.

1. World's smallest and lightest flash card

The RS-MMC has the same 1.4 mm (typ.) thickness as a MultiMediaCard, but is virtually half the size, with dimensions of 18 mm × 24 mm as compared with 32 mm × 24 mm, as well as approximately half the weight of 0.8g. This enables high density and small size to be achieved in high-performance portable devices such as next-generation mobile phones, and allows RS-MMCs to be used not only as removable media but also as ultra-compact built-in memory modules that can be easily added or replaced.

2. MultiMediaCard compatibility

Functions, pin count, and thickness are all identical to those of standard-size MultiMediaCards, providing MultiMediaCard compatibility.

This means that, by using an adapter (called a mechanical expander) planned to be offered separately by third-party suppliers, the package size can be made the same as that of a standard-size MultiMediaCard, enabling RS-MMCs to be used in products designed for MultiMediaCard use.

3. Industry's top-level write speed and low power consumption

The RS-MMC achieved the same 1.0 Mbyte/sec* write speed as Hitachi's high-speed version MultiMediaCards.

(* Write time for the card itself, not including processing time in the player)

In addition, low power consumption has been achieved, with a read current of 28 mA (typ.) and write current of 33 mA (typ.), helping to extend the battery life of mobile devices.

< Support Tools >

When designing a system using an RS-MMC, the same kind of support tools can be used as for Hitachi MultiMediaCards. Support tools developed by third-party suppliers include driver, file manager, and other software*³, hardware such as an H8S microcomputer-based development platform, and also analytical tools such as a dedicated MultiMediaCard protocol analyzer*⁴.

Various third-party suppliers*⁵ also plan to offer an adapter for making the package size the same as that of a standard-size MultiMediaCard to allow use of an RS-MMC in a product designed for MultiMediaCard use, and smaller sockets for mounting an RS-MMC on a mounting board for embedded applications.

Hitachi will continue with the development of larger-capacity models, and plans to release 128- and 256-Mbyte versions in the latter half of 2003.

- Notes: 1. MultiMediaCard is a trademark of Infineon Technologies AG of Germany, and is licensed to the MMCA (MultiMediaCard Association). Hitachi is an MMCA board member. <http://www.mmca.org/>
2. Multi Level Cell technology: A technology suitable for large density flash memory, effective in reducing chip size, whereby four or more values, such as 00, 01, 10, and 11, can be held as opposed to the usual two values, 0 and 1, of ordinary memory. When four values are used, one cell does the work of two ordinary cells.
3. Driver and file manager software are marketed in Japan by AI Corporation.

4. An H8S microcomputer-based development platform and dedicated MultiMediaCard protocol analyzer are marketed by KOKUSAI ELECTRIC ALPHA CO.,LTD.
(<http://www.ke-alpha.co.jp/e/index.html>)
5. An adapter is marketed by Sanwa Denki Kogyo Co., Ltd.
(<http://www.snwd.co.jp/english/index.html>).
Smaller sockets will be developed by J.S.T. Mfg.CO.,LTD.(<http://www.jst-mfg.com/>),
Yamaichi Electronics Co., Ltd. (<http://www.yamaichi.co.jp/e/index.shtml>),
and ALPS ELECTRIC CO., LTD.(<http://www.alps.co.jp/index-e.htm>).

< Typical Applications >

- Portable communication devices such as mobile phones and pagers
- PDAs, electronic organizers, and similar portable information devices
- Portable imaging products such as digital cameras
- Portable music players, game machines, and similar portable entertainment products

< Prices in Japan >(For Reference)

Product Name	Capacity	Price
HB28H016RM2	16 Mbytes	Open price
HB28D032RM2	32 Mbytes	
HB28B064RM2	64 Mbytes	

< Specifications >

Item	Specifications		
	HB28H016RM2	HB28D032RM2	HB28B064RM2
Memory capacity	16 Mbytes	32 Mbytes	64 Mbytes
Interfaces	<ul style="list-style-type: none"> • MultiMediaCard • SPI (Serial Peripheral Interface) * Compliant with MultiMediaCard System Specification Version 3.1		
Read speed	1.7 Mbytes/sec		
Write speed*	1.0 Mbytes/sec		
Read/write specifications	512-byte block read/write plus multiblock read/write capability		
Read current (single)	28 mA (typ.)		
Write current (single)	33 mA (typ.)		
Operating voltage	2.7 V to 3.6 V		
Operating temperature	-25°C to +85°C		
Package dimensions	18 mm (typ.) × 24 mm (typ.) × 1.4 mm (typ.), 7 pins, 0.8g		

* Write speed for card itself, excluding player processing time

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.
