Renesas Technology Releases AE44C High-Security 16-Bit Smart Card Microcontroller for Financial Field

— Incorporating 18-Kbyte EEPROM, 128-Kbyte mask ROM, and encryption functions, ideal for smart cards such as credit cards and bank cards —

Tokyo, December 5, 2005 — Renesas Technology Corp. today announced the AE44C smart card microcontroller, incorporating a high-performance 16-bit CPU core, 18 Kbytes of EEPROM (Electrically Erasable and Programmable Read Only Memory), and 128 Kbytes of mask ROM, for use in smart cards in the financial field. Sample shipments will begin in Japan in May 2006.

The AE44C is a member of the AE-4 Series incorporating an AE-4 16-bit CPU core for smart card microcontrollers, employing an original Renesas Technology architecture.

Features of the AE44C are as follows.

(1) On-chip memory configuration suitable for financial card applications, and encryption functions

The on-chip memory configuration is ideally suited to financial card use. The 18 Kbytes of EEPROM and 128 Kbytes of mask ROM provided on-chip enable installation of a general-purpose OS and multiple applications, and storage of large volumes of data for applications such as biometric authentication. Encryption functions required in the financial field are also incorporated, including an exponential multiplication/division algorithm coprocessor and a coprocessor supporting DES (Data Encryption Standard) encryption. These features make it possible to implement versatile, high-security smart cards for use in the financial field.

(2) High reliability together with excellent cost-performance

The use of Renesas Technology's well-established proprietary MONOS (Metal Oxide Nitride Oxide Silicon) EEPROM enables highly reliable smart cards to be implemented. In addition, the use of special EEPROM circuit structure techniques has resulted in improved performance and smaller cell size, enabling excellent cost-performance to be achieved.

< Product Background >

Smart cards are becoming increasingly used as credit cards and bank cards to tackle the problem of card forgery, and there is also a growing demand for multi-application cards that enable a number of functions to be implemented with a single smart card. In response to these needs, general-purpose OSs capable of executing multiple applications, such as Java Card™*[1] and MULTOS™*[2], are becoming more widely used, and the overall size of application programs is also increasing. smart card microcontrollers are consequently being required to support high-speed general-purpose OS processing and incorporate large-capacity on-chip memory capable of storing the OS and application programs, while also providing high-security functions for preventing card forgery and alteration of information.

To meet these market needs, Renesas Technology developed the AE-4 Series incorporating a 16-bit CPU core. The AE-4 Series lineup has now been extended with the development of the AE44C that is designed for use in smart cards requiring still higher functionality in the financial field, and offers excellent cost-performance.

< Product Details >

The AE44C incorporates an AE-4 CPU core with a 16-bit ALU and internal bus width, operating at a maximum internal operating frequency of 10 MHz.

This is the same CPU core as currently used in the AE-4 Series, enabling existing AE-4 Series software assets to be used.

The AE44C also includes a memory configuration suitable for multifunction smart cards used as financial cards. On-chip 18-Kbyte EEPROM allows installation of multiple applications as well as storage of large volumes of data. Renesas Technology's well-established proprietary MONOS EEPROM is used, ensuring high reliability, while the use of special circuit techniques has enabled excellent cost-performance to be achieved. In addition, 128-Kbyte mask ROM allows storage of a general-purpose OS performing complex processing as well as advance storage of application programs and data that do not require rewriting, enabling the EEPROM capacity to be used to the full.

The AE44C also includes coprocessors necessary for the encryption required in the financial field. The on-chip memory configuration and encryption functions of the AE44C make it possible to implement smart cards offering high levels of security and reliability.

As with current Renesas Technology products, the E6000 full emulator is available as a development tool.

The AE44C can be shipped in wafer or COT (Chip On Tape) form.

Renesas Technology will continue to extend the lineup of AE-4 Series products for financial card applications with the development of smart card microcontroller products that offer a rapid response to the trends and requirements of the security market.

<Notes>

Notes: 1. Java and Java related trademarks and logos are trademarks of Sun Microsystems, Inc. of the United States.

2. MULTOS (Multi Application OS) is a trademark of MAOSCO. MAOSCO is a consortium for establishing, maintaining, and managing MULTOS specifications, with administrative functions handled by MAOSCO Limited.

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

< Typical Applications >

- Smart cards: Bank and credit cards, ID cards, multi-application cards, etc.
- Security authentication terminals: e-POS, PCs, etc.

< Prices in Japan > *For Reference

Product Name		Shipping Form	Minimum Shipping Unit	Minimum Shipping Unit Price [Tax Included] (Yen/Chip)
AE44C	HWD65244CT	Wafer	1 wafer	230
	HD65244CLB	COT (Chip on Tape)	1,000 chips	250

< **Specifications** >

Item	**AE44C Specifications**	
Product name	HWD65244CT	HD65244CLB
CPU core	16-bit AE-4 core	
On-chip EEPROM	18 Kbytes	
On-chip mask ROM	128 Kbytes	
On-chip RAM	4 Kbytes	
Coprocessors	?Exponential multiplication/division algorithm coprocessor ?Coprocessor for DES encryption	
Peripheral functions	?System clock multiplication function using PLL circuit	
Security functions	?Various abnormality detectors (voltage, frequency, etc.) ?Watchdog timer, random number generator, etc.	
Interface (contact)	ISO/IEC 7816	
Internal operating frequency/ operating voltage	1 to 10 MHz/3.0 V 1 to 10 MHz/5.0 V	
Shipping form	Wafer	COT

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.

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