Renesas’ Business Strategies Toward a “Smart Society”

The networking of existing segments and applications for which the Group provides semiconductor products will bring about a “Smart Society” that allows for an ecologically friendly, secure, safe, convenient and comfortable life.

We will reinforce the Analog & Power Devices business, which has many synergies with MCUs, by using our position as the world’s leading supplier of MCUs.

We will optimize the SoC business portfolio by selecting and focusing businesses.
Electricity consumption is climbing year after year worldwide along with steady economic growth in developed countries and faster growth in emerging countries. Efficiently using the world’s limited energy resources has subsequently become a critical issue. This is why the transition to a “Smart Society” is gaining momentum on a global scale.

Achieving this type of society will protect the environment while making our lives more convenient. Furthermore, the shift to a “Smart Society” will probably progress simultaneously in developed and emerging countries. One reason is a change in the outlook for the global energy supply due in part to the Great East Japan Earthquake. Strong growth in electricity demand in emerging countries is also behind this shift. The Renesas Group is the world’s leading MCU supplier in all categories of this market. We make general-purpose and automotive MCUs and our lineup extends from the low-end to the high-end. By using MCUs as the primary means of helping create a “Smart Society,” we plan to build a robust base for sustainable growth and higher profitability.

**HELPING CREATE A “SMART SOCIETY”**

China and other emerging markets are expected to drive future growth of the semiconductor market. That means stepping up our activities outside Japan, and particularly in emerging markets, will be vital to increasing sales of the Renesas Group in China, we have been expanding and upgrading our on-site design and development operations in order to meet the needs of local customers. These initiatives give us a powerful foundation with increased market share in the Chinese MCU market to establish a prominent position in China. Furthermore, we are starting to use this same business cycle with deep local roots to promote operations in other emerging markets with excellent prospects for growth. We intend to step up initiatives for expanding our business in these markets, taking actions including opening of a branch in India and establishing of a sale support company in Brazil.

**STEPPING UP INITIATIVES OVERSEAS AND IN EMERGING MARKETS**

**“RENESAS ELECTRONICS BRASIL-SERVICOS” ESTABLISHED IN SAO PAULO (ANNOUNCED IN FEBRUARY 2012)**

Brazil’s semiconductor market is poised for strong growth. Manufacturers from Japan, North America, Europe and other areas have been entering into the Brazilian market. Companies based in Brazil are growing too, especially in automotive, industrial equipment and consumer electronics segments. The new subsidiary will allow us to supply extensive technical support, mainly for companies based in Brazil. Another goal is increasing sales of kit solutions that combine our expertise in MCUs and analog and power devices to expand our market share in Brazil.
Reinforce Core Competences to Grow in Strategic Markets

Why Renesas is No. 1 in MCUs

Three MCU cores and embedded flash memory technology

Two key strengths are instrumental to the Renesas Group’s leading position in the global MCU market. One is the ability to offer three MCU cores, each ideally suited to a specific growing market sector. The other is expertise in flash memory technology to embed in MCUs.

Three MCU cores
Following the merger that formed Renesas Electronics two years ago, we had five MCU cores. Today they are consolidated into three: RL78 for the low-end, RX for the mid-range, and RH850 for the high-end market. Making one core for each market sector better enables us to focus our design, development and marketing resources.

All three cores will be available in a full lineup of variations and feature low power consumption and outstanding reliability. The RL78 is catered toward emerging markets, the RX mainly toward “Smart Society” applications, and the RH850 mainly toward the automobile industry. Supplying cores that cover a broad array of applications while placing emphasis on markets that will continue to grow, will allow us to utilize our strengths to the greatest possible advantage.

Built-in flash memory technology
The Renesas Group has been embedding its independently developed MONOS*-type flash memory technology in MCUs. Anticipating demand for more sophisticated flash memory with more reliability and higher integration, we began to create flash memory that uses a MONOS structure for use in 150nm MCUs. This technology is being developed for use in a wide variety of areas, so that flash MCUs can be further applied in automobiles, general consumer products, the manufacturing industry, and other sectors.

In 2007, we were the first company to begin sample shipments of 90nm flash MCUs. Late in 2011, utilizing the experiences in 90nm process technology, we achieved another industry first with the development of embedded flash memory IP at 40nm.

Applying the 40nm process realized the world’s smallest memory cell, taking up only one-fourth the size of the current cell using the 90nm process.

Our 40nm technology thus makes possible the capacity for large-volume program storage while still realizing high reliability, high speed and low power consumption all in one chip. We will apply the 40nm process technology to our high-end RH850 MCUs for automotive segments which will require higher reliability, higher speed and lower power consumption.

* Metal-Oxide-Nitride-Oxide-Silicon

Full lineup
- Provide various memory sizes and packages for each application

Low power consumption
- Demonstrated ultra-low power MCU with a single lemon
- Realized industry’s lowest power in each RL78, RX and RH850

High reliability
- Defect ratio of 0.4 ppm (1 defective out of 2.5 million)
- Received awards from auto/electric component makers for products with high reliability and thorough support

Flashing MCU sampling periods

Flashing MCU power consumption

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Smart Analog—the Combination of MCU and Analog
—Making it possible to support multiple types of sensors and to easily reconfigure analog circuits as well as to change their properties by controlling from MCUs—

The Renesas Group has developed a family of products called “Smart Analog,” which combines MCUs with reconfigurable analog circuits.

Sensors have become vital components of a variety of electronic devices. The reason is constantly increasing demands for better functions, performance and convenience, along with requirements for low power consumption and security. To meet these demands, a different analog IC had to be developed for each sensor, resulting in longer launch times for new products. “Smart Analog,” which was developed by the Renesas Group, solves this problem by allowing customers themselves to reconfigure with ease their analog circuits suitable for each sensor; therefore, no custom analog IC is required. These advantages enable customers to develop products faster and at a lower cost while reducing the size of their system.

The Group plans to support an even larger variety of sensors with “Smart Analog”. We will also make more progress in supplying the products with low and high voltages, low power consumption, and outstanding functions. By taking these actions, we will continue to provide a timely supply of products that precisely reflect customers’ needs.

The Global No. 1 Track Record in SoCs for Car Information Systems

“R-Car series” covering high-end, mid-range and entry-class products

In recent years there has been demand for even lower power consumption in car information devices such as embedded car navigation devices, toward a “Smart Society” in which hybrid and electric vehicles are becoming ever more popular. At the same time, advanced user interfaces that provide improved operability such as “real” 3D graphics displays and touch panels are also in demand, in response to the available high-quality multimedia. Moreover, in emerging countries and also developed countries where smartphones are spreading, the markets for lower-priced display and audio devices that can use the content of mobile devices as is in vehicles, are continuing to grow.

To meet these wide-ranging needs, the Group is developing the “R-Car” series by integrating the “EMMA CAR” and the “SH-Navi,” which are SoCs with the global No. 1 track record for car information systems. In 2011, we started to ship samples of this product lineup: “R-Car H1” which targets high-end devices for luxury vehicles, “R-Car M1” for mid-range devices that are assumed to account for the largest share of the car information device market, and “R-Car E1” that is designed for entry-class information terminals and audio equipment with displays. By providing products that realize the optimum functions required for each device, we will maintain and even expand our leading position in the world.

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