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CAN FD MCUs enable high-speed communication

Renesas launches the 5-V RX660 32-bit MCUs (micro-controller unit) with noise tolerance for home appliances and industrial applications. They are the first RX family MCUs with CAN FD and enable high-speed communication for industrial equipment and robotics.

The RX660 5-V and 32-bit MCUs with noise tolerance are suitable for home appliances and industrial applications (Source: Renesas)

Renesas Electronics, supplier of semiconductor solutions, announced an addition to the RX 32-bit MCU family. The RX660 supports operating voltages of up to 5 V, offers noise tolerance for home appliances and industrial equipment, and is exposed to electromagnetic interference, said the company. The series is the first in Renesas' higher-end RX general-purpose MCU units to support 5 V and the first in the RX family to feature an on-chip CAN FD controller that enables bit rates above 1 Mbit/s. The operating voltages of the MCUs eliminate the need for external noise-suppression components that are required for many 3-V MCUs today, explained the company.

In recent years, the scale of software has grown as functional safety and security have become a critical part of electronic systems. As the number of product models has also increased, more products are equipped with real-time operating systems in order to simplify software maintenance, the company continued explaining. Additionally, products need to be designed to accommodate future functional enhancements using over-the-air (OTA) updates. To meet these needs, Renesas developed the RX660 using its RXv3 core (6,00 Coremark/MHz) with a maximum operating frequency of 120 MHz.

The units feature ROM of up to 1 MiB and RAM of up to 128 KiB and are available in several package options (48-pin to 144-pin). In particular, the effective pin count for general-purpose I/O pins is 10 % higher than on the earlier RX210, which is also 5-V compatible. For example, the 144-pin version of the RX660 has an effective pin count of 134, 11 more than on the RX210. With this increase in I/O count, more sensors can be connected to an MCU for a given package, making it simpler to upgrade existing systems, concluded the company.

CAN FD support

According to the company, CAN is becoming widely popular in industrial equipment and robotics, but the increasing volume of data communication due to the use of many sensors is causing insufficient bandwidth and higher costs for requiring multiple networks. The RX660 is the first group in the RX family to integrate a CAN FD controller that supports fast, high-volume, data transfer, the company further explained. CAN FD allows security signals in large volume to be transmitted in a single frame, making it possible to build stronger security into devices.

Two development boards available

Two development boards are available for the RX660 group for both prototyping and detailed evaluation. Target Board is a prototyping board that enables users to transform their ideas into working hardware and software. Renesas Starter Kit is intended for detailed evaluation and allows users to make use of the full functionality of the RX660 when developing applications, said the company.

Renesas has combined the MCUs with a variety of analog and power management devices for power conversion systems to create the "On-line Type UPS (Uninterruptible Power Supply) Winning Combination." The solution integrates the key power conversion

components including inverters, buck regulators, battery boost regulators, and PFC in a single chip, and offers the ability to remotely monitor activities via Bluetooth. Renesas offers more than 300 Winning Combinations with a range of products from their portfolio.

"Noise suppression is essential for home appliances and industrial products since ambient electromagnetic waves in the surrounding environment can cause system malfunctions or reduce performance," said Sakae Ito, Vice President of the IoT (Internet of Things) Platform Business Division at Renesas. "We introduced the new RX660 MCUs in response to strong demand from customers who need to design products with high power supply voltages. We are happy to assist our customers to make their product design process simpler."

"At Daikin, we have been using Renesas' RX MCUs in our main air conditioner products for over 10 years, and we welcome the new RX660 MCUs with superior noise tolerance," said Eisuke Yamada, Group Leader of Procurement Strategy Department, Global Procurement Division at Daikin Industries, Ltd. "The RX MCUs offer excellent CPU (central processing unit) performance, flash memory that boosts real-time operation, and scalable development with pin-compatible devices. These advantages are everything we consider essential in MCU products."

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