**News Release**

No.: REN0804(A)

**Renesas Electronics Introduces 32-Bit RX66T MCU Group**

**Optimized for Motor Control in Industrial, Home Appliance, and Robotics Devices**

*First MCUs Incorporating Third-Generation RXv3 CPU Core Deliver Dramatic Performance Boost for Enhanced System Integration and Superior Motor Fault Prediction in Motor-Control Applications with Embedded AI*

Düsseldorf, November 27, 2018 – Renesas Electronics Corporation (TSE:6723), a premier supplier of advanced semiconductor solutions, today unveiled the [RX66T Group](https://www.renesas.com/products/microcontrollers-microprocessors/rx/rx600/rx66t.html) of microcontrollers (MCUs) – the first members of Renesas’ flagship 32-bit RX MCU family based on the new third-generation [RXv3 CPU core](https://www.renesas.com/products/microcontrollers-microprocessors/rx/rx-features.html). The new MCUs leverage cutting-edge CPU core technology to achieve substantially improved performance1, as much as 2.5 times better than previous RX family MCUs. Combining the powerful new RXv3 core with the strengths of the current [RX62T](https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rx/rx600/rx62t.html) and [RX63T](https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rx/rx600/rx63t.html) MCUs, the new RX66T MCUs address the real-time performance and enhanced stability required by inverter control. The new MCUs are ideal for use in industrial applications in next-generation smart factory equipment, such as industrial motors, power conditioners and robots, as well as smart home appliances, including air conditioners and washing machines.

When operating at 160 MHz, the RX66T MCUs achieve best-in-class performance of 928 CoreMark®2, enabling more precise inverter control. The MCUs can control up to four motors simultaneously, making them ideal for conventional motor control and applications requiring multi-axis motor control, such as compact industrial robots and personal robots, which are quickly growing in popularity. In addition, the RX66T’s extra processing capacity allows developers to add programs utilizing embedded AI (e-AI) for motor fault detection. Such programs can detect motor faults and identify fault location in real time based on the motor’s current or vibration characteristics. Providing this capability offers developers the significant value-add of productivity, safety, and quality. The RX66T MCUs also integrate a 5V power supply that delivers excellent noise tolerance.

“AI technology is transforming the industrial equipment and home appliance industries, and the emergence of e-AI in these markets will be a catalyst for new innovation at the endpoint,” commented Akira Denda, General Manager, IA Solutions Business Division, Industrial Solution Business Unit. “The new RX66T MCU Group will help further accelerate the use of intelligent endpoints employing real-time e-AI performance. This trend will drive smarter home appliances and improve production efficiency in smart factories.”

With more and more devices ranging from robots and power conditioners to washers and dryers joining the Internet of Things, motorized devices in the field will require online firmware updates throughout their life cycles. Applying e-AI for predictive failure diagnostics requires endpoint MCUs to be securely updated with learning results generated in the cloud. The RX66T MCU Group incorporates Renesas’ Trusted Secure IP (TSIP), which has a track record of CAVP certification3 and provides secure firmware updates and encrypted communication.

Renesas is demonstrating the new RX66T MCUs in Booth 130 (Hall 10.1) at [SPS IPC Drives](https://www.mesago.de/en/SPS/For_visitors/Welcome/index.htm), November 27-29, 2018 in Nuremberg, Germany.

**Key Features of the RX66T MCU Group**

* Supports inverter control with a maximum operating frequency of 160 MHz, 928 CoreMark, on-chip floating point-unit (FPU), and 5V power supply
* High-speed flash memory with 120 MHz maximum read operation to reduce speed differential with the CPU and realize both high performance and a consistent execution
* Reduces footprint and component count by generating three-phase complementary pulse width modulation (PWM) output for up to four motors using 112-pin and 144-pin package MCUs, and up to three motors using 64-pin, 80-pin and 100-pin package MCUs
* Configurations available with 16 KB of error correction code (ECC) SRAM, and up to 128 KB of SRAM with single-cycle access and single-bit error detection (parity checking) for high reliability
* Ability to generate high-resolution PWM signals with a minimum state change duration of 195 picoseconds (1.6 times better than existing RX products) for power conditioner or digital power supply control applications
* Renesas’ Trusted Secure IP (TSIP) provides secure firmware updates and encrypted communication with a track record of CAVP certification

**Robust Development Environment**

The Renesas Motor Workbench 2.0 supports 20kHz real-time debugging and adds 10 new functions and an RX66T CPU card for the 24V Motor Control Evaluation Kit are available now.

**Pricing and Availability**

The new RX66T Group comprises 80 MCUs with pin counts ranging from 64 to 144 pins and on-chip flash memory sizes of 256 KB to 1024KB. Mass production starts today for the widely used 100-pin package MCU with 256 KB or 512 KB of program flash and 64 KB of SRAM. Other MCU versions will release over time. Pricing for the RX66T MCU Group starts at US$3.25 per unit in 10,000-unit quantities. (Pricing and availability is subject to change without notice.)

For more information on the RX66T MCU Group, please visit <https://www.renesas.com/products/microcontrollers-microprocessors/rx/rx600/rx66t.html>.

For more information on Renesas’ Motor Workbench development support tool, please visit

<http://www.renesas.com/us/en/software/D3017970.html>.

For more information on Renesas’ motor control solutions, please visit <https://www.renesas.com/solutions/proposal/motor-control.html>.

Learn more about Renesas e-AI: <https://www.renesas.com/solutions/key-technology/e-ai.html>.

**Notes**

1. Performance in CPU operations when running a vector control program created by Renesas was 2.5 times better on the RX66T (160 MHz) compared to earlier products (RX62T/RX63T, 100 MHz).

2. CoreMark: A benchmark test designed specifically for evaluating CPU core performance by the Embedded Microprocessor Benchmark Consortium (EEMBC) of the United States. It consists of a collection of programs written in C that execute data reads and writes, integer calculations, control operations, etc. The score, a numeric value representing performance per unit of operating frequency, was obtained using the CC-RX V3 RX Family C/C++ compiler.

3. CAVP (Cryptographic Algorithm Validation Program) certification: Given by the National Institute of Standards and Technology (NIST) of the United States to certify that encryption algorithms are correctly implemented.

**About Renesas Electronics Corporation**

Renesas Electronics Corporation ([TSE: 6723](https://www.jpx.co.jp/english/)) delivers trusted embedded design innovation with complete semiconductor solutions that enable billions of connected, intelligent devices to enhance the way people work and live—securely and safely. A [global](https://www.renesas.com/about/company/profile/global.html) leader in microcontrollers, analog, power, SoC products and integrated platforms, Renesas provides the expertise, quality, and comprehensive solutions for a broad range of Automotive, Industrial, Home Electronics, Office Automation and Information Communication Technology applications to help shape a limitless future. Learn more at [renesas.com](https://www.renesas.com).

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