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Renesas Electronics Announces New 32-Bit RX63T MCUs for Single Motor and Inverter Control Applications

Renesas Electronics, a premier supplier of advanced semiconductor solutions, today announced the release of the RX63T the latest member of the broad RX series of microcontrollers (MCUs). The RX63T features special inverter control timers and analog functions required for today's inverter control applications. The new MCUs help to reduce system costs and power consumption in applications like air conditioners, washing machines, solar inverter solutions and lighting control.

The RX platform is built around the new RX CPU and is part of the next-generation of MCUs, which integrate the functions of Renesas' existing 16-bit and 32-bit MCU products. The new RX63T group comprises six individual products.

As an expansion of the RX62T lineup, the new RX63T group underlines Renesas' contribution to further miniaturization and lower costs due to the smaller pin package, smaller memory size and enhanced safety functions. The RX63T maintains a close compatibility with RX62T, allowing current customers to design lower memory versions of their RX62T designs easily with RX63T.



The RX63T MCUs include two three-phase motor control timer units: a multifunction timer pulse unit 3 (MTU3) and a 16-bit general-purpose PWM timer (GPT). Both timer units support the design of high efficiency drives with a low sys-

tem cost. The MTU3 supports the complementary PWM. The GPT can independently control four-channel of single phase inverter, and control of the right and the left dead-time can be controlled individually.

The timer uses the same clock as the CPU at 80 megahertz (MHz). This enables it to achieve a wide range of width measurements for PWM output waveforms with resolutions as small as 12.5 nanoseconds (ns).

Improved analog functions to enable increased system cost reduction and improve ease of use in motor vector control applications have also been implemented with the new RX63T family. It features one 12-bit A/D converter unit which can capture analog input values with a minimum conversion time of one μ s.

The 12-bit A/D converters can easily be used for sensorless vector control methods, such as three-shunt or single-shunt current detection as simultaneous sampling of three input channels is possible. Continuous A/D conversion is supported by the double data registers installed in the 12-bit A/D module. In addition, the RX63T has three-channel analogue comparators assigned to the 12-bit A/D inputs. Each comparator has three detection levels, enabling easy monitoring and emergency shutdown of external IGBTs.

The RX63T group of MCUs also incorporate many safety features, such as an independent watchdog with its own on-chip clock source (IWDT), a self-check function, a DOC (Data Operation Circuit) enabling RAM checking without CPU involvement, a CAC (clock frequency accuracy measurement circuit) to check clock frequencies and a RWP (Register Write Protection) function that protects important registers from being accidentally overwritten.

As fractional calculations are required in vector control algorithms, the RX63T supports a single precision floating point unit (FPU). This simplifies decimal point calculation, boosting the overall processing performance.

The devices in the RX63T group provide a scalable memory solution from 32K flash to 64KB flash with up to 8KB of embedded SRAM. They also include an additional indepen-

dent 8 KB of data flash memory with a background operation (BGO) function that enables data to be written while a program is executing. The embedded flash memory is based on Renesas' proven MONOS (metal oxide nitride oxide silicon) technology that can be accessed without wait state insertion. This enables a maximum performance level of 1.65DMIPS/MHz at any CPU frequency, without any limitation from flash technology. These products will be offered in 48-pin and 64-pin LQFP packaging.

To help customers shorten the development cycles of new embedded systems, Renesas, third-party suppliers and the alliance partner network support the RX with a variety of hardware and software tools.

The RX600 series comes with a JTAG debugger interface. This enables customers to connect a Renesas E1 or E20 on-chip debugger or enable access to similar JTAG third party systems like J-Link (by Segger).

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Renesas Electronics Unveils New-Generation RH850/X1 Microcontroller for Automotive Applications

Renesas Electronics, today introduced the new RH850 family of 32-bit microcontrollers (MCUs) for automotive applications. The RH850 is based on 40 nanometer (nm) MONOS (metal oxide nitride oxide silicon) embedded flash technology, making Renesas the first semiconductor supplier to provide this technology in the automotive sector. The RH850 MCU family is based on the new RH850 32-bit core, which provides the benefits of ultra low power process technology with the superior computing power of the world's leading 32-bit core.

The RH850 family is the latest in a row of commonly developed product generations, following the merger of Renesas Technology and NEC Electronics back in April 2010, which will continue to enhance both former companies' successful, reliable and committed automotive history.

Renesas' RH850/X1 addresses all major trends of the changing automotive market across all car segments. These include functional safety requirements up to ASIL D level, integration of security functions and – especially – low power consumption, in order to support environmental considerations such as CO2 reduction.

The RH850 family covers performance classes from 64 megahertz (MHz) up to 320MHz as single core performance. Multi-core systems will achieve even higher overall performance. The embedded flash memory will range from 256 KB to 8 MB, while additional blocks for data flash, emulating EEPROM functionality, are also included and deliver write/erase endurance values of more than 125 K write/erase cycles at data retention times of minimum 20 years.

The roll-out will involve multiple, application-tailored product line-ups (series), each equipped with the RH850 32-bit core architecture. The series will span single-core, dual-performance cores, dual lock-step cores and multiple-core architectures, addressing virtually all 32-bit MCU performance and safety requirements in the various automotive segments. Combined with scalable functional IP blocks, memory and pin counts, Renesas' series concept allows customers to select the most appropriate product for their needs, safe in the knowledge that they have the flexibility to up- or down-scale without changing the application software.

To ensure software compatibility for customers, all product series are based on the same platform development concept, re-using the same IPs across the entire RH850/X1 generation. One integrated development environment (IDE) will support the entire RH850 family products, enabling a smooth migration path from legacy automotive products as well as a further reduction of overall development investment.

Samples of Renesas' first RH850 family of MCU product will be available in the autumn of 2012. Mass production is scheduled to begin in 2014. (Availability is subject to change without notice.)

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