

Renesas Technology Releases M32192 Group Microcontrollers for In-Vehicle Applications

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Renesas Technology Corp. announced the M32192 Group as an addition to the lineup of M32R/ECU Series 32-bit RISC (Reduced Instruction Set Computer) microcontrollers for in-vehicle applications, featuring a fast 160 MHz operating speed and large-capacity, high-reliability on-chip flash memory and SRAM, for use in automotive driving safety support systems and similar applications. Sample shipments will begin in December 2004 in Japan .

In the automobile field, safety and environmental issues have become major concerns alongside the achievement of higher performance and functionality. With safety-enhancing systems such as obstacle detection and danger avoidance, in particular, there is a need for high reliability as well as advanced technologies and high-speed processing, and high-quality, precise control is necessary to meet these requirements. In response to this need, Renesas Technology has developed the M32192 Group as an addition to the M32R/ECU Series 32-bit RISC microcontroller lineup.

M32R/ECU Series microcontrollers are widely used in a variety of automotive applications, and have gained a reputation as being suitable not only for applications such as engine control and AT control, but also for driving safety support systems such as obstacle detection and danger avoidance. The M32192 Group microcontrollers feature a doubled operating frequency, enhanced peripheral functions, and increased on-chip RAM capacity compared with current models, providing improved performance and functionality that make them ideally suited to driving

safety support systems that will require even higher levels of control precision and reliability in the future.

Product Details

M32192 Group uses a Renesas Technology original M32R-FPU 32-bit RISC CPU core, as well as large 1-Mbyte flash memory capable of handling the large programs necessary to implement high-precision control. They are high-performance microcontrollers achieving the industry's top-level operating speed of 160 MHz for in-vehicle control microcontrollers with on-chip flash memory.

New or enhanced functions are also incorporated compared with current models, providing a comprehensive set of peripheral functions ideally suited to automotive driving safety support systems.

The newly provided DRI is a parallel interface for fetching data directly into on-chip RAM, that performs clock-synchronized data capture. In writes to on-chip RAM, data is transferred directly to the RAM via a dedicated DRI bus in the chip, entailing no load on the CPU. A data width of 8, 16, or 32 bits can be selected for transfers from off-chip, enabling data to be fetched at a maximum speed of 40 Mbytes per second. When image data is fetched, the horizontal synchronization signal, vertical synchronization signal, and transfer clock are directly connected, and these signals can be used to thin-out data or fetch only necessary data such as the data for a specified area, allowing efficient use of the limited on-chip RAM capacity. The on-chip RAM is divided into two areas, enabling system performance to be improved by fetching data into one area while data in the other area is being processed by the CPU.

Other newly added peripheral functions are a PWM output timer with a shorting prevention function necessary for motor control, a

multiply-by-4 event count timer, and an A/D converter with simultaneous 2-channel sampling capability.

Functions provided in current models have also been enhanced. The CAN* 1 interface (CAN being the virtual industry standard for in-vehicle LANs) has been equipped with 32 message slots per channel instead of the previous 16, reducing the software load, and a choice of between 8 and 16 bits for the synchronous serial interface data length simplifies connection to external EEPROM (Electrically Erasable and Programmable Read Only Memory).

This comprehensive set of on-chip peripheral functions will enable users to create sophisticated driving safety support systems.

The package used is a small 144-pin LQFP (20 mm × 20 mm).

Renesas Technology plans to further extend the M32192 Group product lineup in response to market needs, including the development of a 64-Kbyte RAM version and a version with a maximum operating frequency of 80 MHz.

Note: 1. CAN (Controller Area Network): A network specification for use in vehicles, proposed by Robert Bosch GmbH of Germany

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