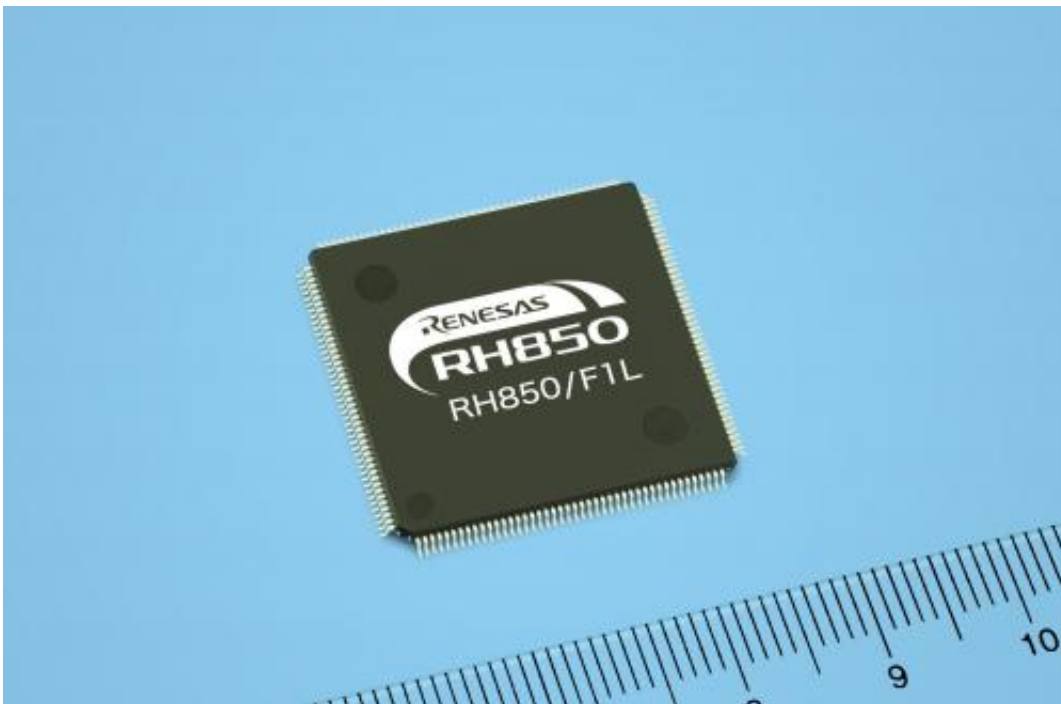


New Renesas ultra-low power consumption MCUs to be used in variety of auto applications

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Renesas Electronics RH850/F1x Microcontroller Series Employing 40nm Process.

Renesas Electronics Corporation today announced the RH850/F1x Series of 32-bit microcontrollers (MCUs) for automotive body applications as the first products to be released in the RH850 Family of automotive MCUs with on-chip flash memory employing the industry's

most advanced 40 nanometer (nm) process.

The new MCUs are designed for use in a variety of automotive body applications and provide many advantages. The RH850/F1x [Series](#) is composed of three groups and has a total of more than 50 products from Low-end to High-end, the RH850/F1L, RH850/F1M and RH850/F1H. Larger on-chip flash [memory capacity](#) from 256KB up to 8MB is offered along with more compact package options (48-pin and up). Dual-core versions are also planned to be available in the RH850/F1H Group. The RH850/F1x Series uses the same architecture CPU core and common peripheral functions, and has software compatibility within the same group. The RH850/F1x Series uses the 40 nm process and metal oxide nitride oxide silicon (MONOS) structure for [flash memory](#) with [lower power consumption](#) (0.5 mA/MHz for RH850/F1L) and higher reliability. Renesas improved automotive network functions (example: number of local interconnect network (LIN) channels expanded to 18) and added data encryption function with the RH850/F1x Series. These features will help customers build electronic body control units combining energy efficiency, high performance, and improved safety.

Reducing electric [power consumption](#) in vehicles is becoming an ever more pressing issue. At the same time, automotive networks are becoming more diverse and more complex, and the amount of data handled by electronic control units is growing. As these networks begin to connect with access points outside the vehicle, [security measures](#) become essential. In response to these trends, automakers are working to develop platforms for electronic units to enable them to build better cars more efficiently. The RH850/F1x Series comprises a lineup of more than 50 products offering a variety of package types, on-chip flash memory sizes, and peripheral function options. This broad array of product is intended to meet a wide variety of requirements in the automotive field.

More information:

Key Features of the RH850/F1x Series MCUs:

(1) Wide array of products for ample scalability

The RH850/F1x Series is made up of three groups from Low-end to High-end. All the groups share the same CPU core architecture and the same selection of peripheral functions, which allows common software to be used for different system units and makes it easy to switch MCUs across groups. In addition, all products in all groups incorporate power supply shutoff circuit technology for reduced current consumption.

RH850/F1L Group

The CPU core of G3 was designed to achieve lower power consumption and is capable of operating at 80 MHz. It delivers performance of more than 2 DMIPS/MHz [Note 3] while maintaining low current consumption of 0.5 mA/MHz. Available in a 48-pin QFP package that is even more compact than that of comparable earlier Renesas products, this MCU enables customers to achieve high-performance system control with a 32-bit CPU core even in units with limited mounting space. It is ideal for applications such as air conditioner control or LED headlight control.

RH850/F1M Group (under development)

This MCU aims to combine high performance and power efficiency. Its core is capable of operating at 120 MHz, and incorporates a floating-point arithmetic unit. The available packages range from 100-pin to 208-pin, and the flash memory capacity is selectable over a range from 1.5 MB to 4 MB. The RH850/F1M is suitable for use in body control modules that require a large number of I/O pins.

RH850/F1H Group (under development)

This group uses a dual-core configuration to deliver the highest performance in the RH850/F1x Series. The individual cores each have a maximum operating frequency of 120 MHz and can share the on-chip peripheral functions. The available packages extend up to a 276-pin BGA. Ethernet functionality is included in addition to controller area network (CAN), LIN, and FlexRay, allowing for complex control using data obtained from a variety of automotive networks. An example application for the RH850/F1H would be as a control MCU in a gateway module, and the adoption rate of such modules has been increasing in recent years.

(2) On-chip flash memory combining low-power consumption and large capacity

The on-chip flash memory of the RH850/F1x Series employs the industry's most advanced 40 nm process and a MONOS Flash structure to achieve low-power consumption and high reliability. The flash memory available for storing instructions ranges across the series from 256 KB to 8 MB, allowing customers to choose the optimal memory size for automotive system units ranging from high-functionality to popularly priced versions. An independent flash memory area is available for data storage, and it can be reprogrammed up to 125,000 times per 64-byte block. The ability to store data that previously would have required external EEPROM reduces the number of external components required and contributes to smaller board sizes.

(3) Additional new functions for security and diagnosis

An intelligent cryptographic unit (ICU) for data encryption has been

added to enable security functions needed in automotive units that are increasingly adding network capabilities. These functions can provide protection against alteration or theft of the system. Also, diagnostic functions have been incorporated into the on-chip peripheral functions to provide support for the ISO 26262 standard scheduled to be adopted by the auto industry moving forward. For example, the A/D converter can be used together with the on-chip self-diagnostic circuit to verify conversion results. Additional ease-of-use is provided by an increase in the number of channels that support monitoring for changes in digital or analog input signals in low-power mode without the need to activate the CPU.

Samples of the RH850/F1L Group of MCUs are scheduled to be available from 2Q CY2013, priced at US\$30 per unit. Mass production of the RH850/F1L Group is scheduled to begin in FY2014, with the different product versions appearing soon after, and is expected to reach a scale of 3,000,000 units for each version per month by June 2015.

Provided by Renesas

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