

Renesas Technology Releases M37544G2A 8-Bit Microcontroller with On-Chip QzROM and Achieving Short Delivery Time and Low

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Time from receipt of ROM code data to shipment roughly half that for existing products

[Renesas Technology Corp.](#) today announced the release of the M37544G2A, an 8-bit microprocessor that incorporates QzROM (Renesas Technology name) in the 7544 Group. The use of on-chip QzROM, a newly developed type of programmable memory, makes possible shorter delivery times than were previously possible. Sample shipments will begin on August 3, 2004 in Japan.

Renesas Technology plans to expand the line-up of “QzROM microcontrollers” incorporating on-chip QzROM. The M37544G2A is the first such product to appear. A successor to the M37544M2 mask-ROM M37544G2 and OTP (one-time programmable) in 7544 Group 8-bit microcontroller products for home appliances and mobile equipment, the M37544G2A offers the following features.

(1) Time from receipt of ROM code to shipment cut by more than half
The new M37544G2A incorporates on-chip QzROM, which makes it possible to reduce by approximately half or more the time required from when the ROM code is received from the customer to shipment of the product, compared with conventional mask-ROM products from Renesas Technology. In addition, a dedicated QzROM production system has been built to deliver leading package options, such as LQFP,

within a target period of seven days. The cost of the newly developed QzROM programmable memory is similar to that of mask-ROM. This means that customers can bring their new products to market in a timely manner while keeping costs down.

(2) Improvement of tamper resistance

QzROM incorporates a protection function that prevents unauthorized reading of data. This results in better resistance to tampering*1 than was the case with existing products and provides enhanced security against unauthorized reading of data, etc.

(3) Expanded Operating Voltage Range

The operating voltage range has been expanded to 1.8 V to 5.5 V from the 4.0 V to 5.5 V of previous products. Since the M37544G2A can operate at voltages as low as 1.8 V, it is available to use for battery drive equipment and so on.

In recent years home appliances and mobile equipment have become increasingly complex specifications with higher functions. At the same time, however, system development cycles have been getting shorter, while system cost have been lower. This has created strong demand for microcontrollers to achieve shorter development times and lower cost.

Renesas Technology has worked to meet this demand with products designed to shorten development cycles, such as microcontrollers with on-chip flash memory, or the products designed to reduce the system cost, such as low-end microcontrollers with on-chip mask-ROM.

Nevertheless, demand has continued to grow for even shorter development times and lower prices. In response, Renesas Technology has developed the M37544G2A incorporating newly developed QzROM programmable memory. The M37544G2A is a version of the highly regarded 740 Series 7544 Group low-end 8-bit microcontroller combining low pin count, low cost, and high performance.

The M37544G2A incorporates an original 8-bit CPU of Renesas Technology. It retains the features of the 740 series, which was well regarded for its low pin count, low cost, and high performance. These include a simple instruction set with highly ROM efficiency that is suitable for control applications, low power consumption, and low-voltage operation. The maximum operating frequency is 8 MHz..

With conventional mask-ROM products, the customer first provided the ROM code, a mask was produced from the ROM code, and then the wafers were fabricated. QzROM is produced by writing the customer's ROM code to completed wafers before shipment. This means that no additional wafer fabrication time is needed after the customer's ROM code is received. As a result, the time from order receipt to product shipment is reduced by half or more. And “blank” product, which no data has been written to ROM, is also prepared.

The results of noise level evaluation etc. at the system development stage are almost same as the result of the end-product evaluation. This cuts the time needed for evaluation and contributes to shorter development times as well. The M37544G2A also supports on-board ROM programming, so development efficiency is improved and it is possible to implement data tweaks right up to the final stage of development.

Furthermore, QzROM incorporates a ROM protection function that operates even if the ROM is programmed by the customer. It is an anti-tampering measure designed to prevent unauthorized access to ROM contents by third persons and make backward engineering of ROM firmware more difficult. In addition, the use of QzROM widens the operating voltage range to 1.8 to 5.5 V from the 4.0 to 5.5 V of the earlier M37544M2 and M37544G2. This provides to be able to use for the equipment such as battery drives.

Two package options are being offered: 32-pin SDIP (shrink dual inline

package) and 32-pin LQFP (low-profile quad flat package). The small LQFP package is suitable for use in equipment with compact sizes.

Two development environments are available: the PC4701U and M38000TL2-FPD full emulator and the M38000T2-CPE compact emulator. Future plans call for the development of versions compatible with the same low-cost development environments available for the R8C/Tiny Series and H8/Tiny Series, as well as the creation of a starter kit.

In the years ahead Renesas Technology plans to respond to the requirements of the market by expanding its lineup of low-end 4-bit and 8-bit microcontroller products incorporating QzROM to realize shorter delivery times and lower cost.

Notes:1. Resistance to tampering: This refers to the incorporation of measures designed to combat unauthorized reading, use, and manipulation of ROM data, as well as attempts to cause the system to malfunction intentionally.

* Product names, company names, or brands mentioned are the property of their respective owners.

The original press release can be found [here](#).

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