

MCU features embedded Ferroelectric Random Access Memory

Fujitsu Semiconductor America, Inc. (FSA) today introduced a new single-chip 8-bit MCU featuring embedded Ferroelectric Random Access Memory (FRAM) for a variety of general-purpose applications, including consumer electronics products, healthcare, and industrial systems.

Embedding FRAM into an MCU reduces total footprint and cost and simplifies system design. The architecture eliminates chip-to-chip interconnects, which significantly improves the transaction speed and internal bus interface between MCU and memory, enabling performance that Flash or EEPROM cannot provide.

The new MB95R203A MCU is the newest member of the Fujitsu F2MC-8FX family of high-performance 8-bit MCUs. It incorporates state-of-the-art non-volatile FRAM, featuring ultra-high access speeds and the ability to retain data in memory without power. The FRAM can be erased and rewritten 10¹⁵ times, with data retention guaranteed for 10 years. The MB95R203A MCU incorporates 8 kilobytes of user-accessible FRAM, which can be partitioned as either ROM or RAM. The ability to easily interchange data and work memory space makes the MB95R203A ideal for a variety of different applications and programming requirements.

The Fujitsu MB95R203A operates with power supplies ranging from 1.8V to 3.6V (1.8V power supplies are typically used in home healthcare devices, such as blood pressure and glucose meters.) It incorporates a full complement of timers and communication functions, as well as high-precision A/C converters, UART, I2C, and 16 I/O ports. The controller employs one-line on-chip debug, which requires only a single MCU pin. An embedded oscillator circuit maximizes the number of pins available for use in smart meters, consumer appliances, electric tools, and other designs.

Advantages of Embedding FRAM

In addition to endurance, high-speed access, and low power consumption, FRAM incorporates anti-tampering protection to enhance data security. The high speed non-volatile nature of FRAM offers another unique advantage: it writes so fast that the MCU need not wait for the write operation to complete. This high-speed write operation allows data to be written quickly even if power is lost suddenly. When power is reinstated, the MCU can resume operations from the previous state. This capability is useful in applications where important data must be stored instantaneously and operations restored quickly following blackout periods.

In addition, programming code can be reduced, because there is no need to poll memory to complete a write operation, a process required by conventional memory. The operation is completed before polling takes effect. FRAM does not require code

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for wear leveling, which is common in Flash and EEPROM given their limited endurance cycles. FRAM's much longer endurance cycle makes wear leveling redundant. Assuming that memory is accessed with four cycles at a constant 10MHz rate, it will take more than 12.5 years to exhaust the ferroelectric material.

Pricing and Availability

The MB95R203A is shipped in 24-pin DIP or 20-pin SOP packages. Samples are available now at \$1.60 each, and production quantities will be ready by the end of November 2010. A comprehensive, user-friendly development toolkit is also available upon request.

For product information, visit the company's website at <http://us.fujitsu.com/micro/fram> [1], e-mail FSA_inquiry@us.fujitsu.com [2] or call 1-800-866-8608.

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