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April 21, 2011  
Fujitsu Semiconductor Limited

## Fujitsu Semiconductor Releases 52 Products as Second Offering of New FM3 Family of 32-bit Microcontrollers

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**Yokohama, Japan, April 21, 2011** — Fujitsu Semiconductor Limited today announced the release of 52 microcontrollers, the second offering of chips from its new FM3 family of 32-bit general purpose RISC microcontrollers, announced last November, that employ the ARM® Cortex™-M3 core. Recently, a total of 52 new products, including MB9AF316NBGL from the MB9A310 Series and MB9AF116NBGL from the MB9A110 Series, will gradually begin shipping in sample quantities.

FM3 is a family of 32-bit microcontrollers that employ the ARM® Cortex™-M3 global-standard processor core and incorporate a wide variety of peripheral features that have been cultivated during Fujitsu's years of experience developing its FR microcontrollers.

The MB9A310 Series and the MB9A110 Series achieve a balance between cost-performance and low power consumption. They have been designed for applications including inverter control in major home appliances, particularly those in emerging countries, as well as motor control used in printers, copy machines and other devices.

The FM3 family, which employs the high-performance ARM® Cortex™-M3 core, combines Fujitsu Semiconductor's wealth of experience in implementing ASIC products using ARM® cores with the peripheral features cultivated through the FR microcontroller family, which has gained broad market acceptance. With the addition of the latest 52 products, Fujitsu Semiconductor has expanded the FM3 family's basic product line to a total of 60 chips. The lineup has been expanded with a focus on applications in major home appliances (air conditioners, refrigerators, washing machines, etc.), digital consumer devices, and office automation devices. The FM3 family now boasts a total of 96 products, including both the high-performance and basic product lines.

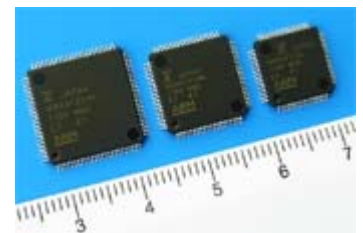


Figure 1. MB9A310 Series

### Product Overview

#### 1. Basic Product Line: MB9A310 and MB9A110 Series

The basic product line is based on the ARM® Cortex™-M3 core, which was designed to enable a balance between superior processing performance and low power consumption, and features peripheral functions from the FR family of microcontrollers. It is equipped with advanced peripheral functions inherited from the high-performance product line of high-end chips, thereby achieving a balance between cost and dramatically-reduced power consumption. By increasing the series' flash memory to 512 KB-64 KB and expanding the package lineup to 112pin-64pin, Fujitsu Semiconductor has developed a line of microcontrollers that enable superior freedom of choice and high cost-performance.

With high-speed CPUs and flash memory, the microcontrollers can respond without time lag at up to 40MHz. In addition, using a high-speed 12-bit A/D converter (1.0µs), as well as a rich array of timers, USB2.0 Host/Function, and the ability to operate with a wide

range of voltage (5.5 to 2.7V), the microcontrollers are suited for applications in a diversity of devices, especially major home appliances (external air conditioner units, refrigerators, washing machines, air purifiers, etc.), digital consumer devices, audio devices, and office automation devices. Furthermore, there has been an increased need for inverter control products in markets for emerging countries. By employing products from the FM3 series, companies can achieve high processing performance and streamlined software development compared to conventional systems that use 16-bit processors.

## Features of FM3 Family

### 1. Expanded product lineup

While the product package announced last year featured 120-100 pins, the new version has been revamped with only 112-64 pins. Moreover, the chips' memory variations have been expanded to 512 KB-64 KB, and they are equipped with USB2.0 Host/Function.

### 2. Supports a wide range of voltage applications using different power supply systems, reduces power consumption

The FM3 family of microcontrollers can operate on a wide range of power supply voltage, from 5.5V to 2.7V. They can handle the 5V power-supply voltage needs of major home appliances, office automation devices, and other consumer electronics designed for emerging countries, and they have been optimized for motor control applications. Furthermore, the new products consume less power than the high-performance line announced last year, and, when compared to existing processors, they cut energy consumption in half on an identical clock ratio.

### 3. High-reliability, high-speed flash memory is among the industry's fastest

The microcontrollers are embedded with high-speed, high-reliability NOR flash memory that has been designed for 100,000 write cycles and can retain data for up to 20 years. The processors' high-speed flash memory enables access at up to 40MHz with no lag time.

### 4. Peripheral macros for high-precision motor control

In addition to keeping existing peripheral functions from the FR microcontroller family, which has a proven reputation in motor control applications, Fujitsu Semiconductor has implemented a wide variety of newly-improved peripheral macros in order to meet the needs for high-precision motor control.

In particular, equipped with a high-precision and high-speed 12-bit A/D converter (+/-2LSB 1.0 $\mu$ s conversion), the microcontroller's high-precision sampling enables fine-tuned motor control and demonstrates its true potential when employed in high-precision, high-speed servo motors and other equipment in factory automation applications. The microcontroller's 3-unit 12-bit A/D with up to 16 channels allows for improved motor positional accuracy, making fine-tuned control possible.

Although the rotational position of the motor has conventionally been detected through software using the CPU, the FM3 family now equipped with quad counter (motor rotational position sensing counter) which enables detection over hardware, making it possible to reduce the CPU workload. Employing this product makes it possible to reduce the amount of power consumed by inverter systems.

## Sample Price and Release Schedule

Product	Sample Price	Sample release schedule
MB9AF314NPMC	400 Yen (At 1,000 pcs order)	Sequentially, from April 2011

## Sales Target

1 million units/month from Fiscal Year 2011 (Mass-product)

## For More Information

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## About Fujitsu Semiconductor

Fujitsu Semiconductor Limited designs, manufactures, and sells semiconductors, providing highly reliable, optimal solutions and support to meet the varying needs of its customers. Products and services include microcontrollers, ASICs, ASSPs, and power management ICs, with wide-ranging expertise focusing on mobile, ecological, automotive, imaging, security, and high-performance applications. Fujitsu Semiconductor also drives power efficiency and environmental initiatives. Headquartered in Yokohama, Fujitsu Semiconductor Limited (formerly named Fujitsu Microelectronics Limited) was established as a subsidiary of Fujitsu Limited on March 21, 2008. Through its global sales and development network, with sites in Japan and throughout Asia, Europe, and the Americas, Fujitsu Semiconductor offers semiconductor solutions to the global marketplace.

For more information: <http://jp.fujitsu.com/group/fsl/en/>

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Lineup

Key Specification of Basic Group MB9A310/110 Series

MAX Frequency	Package	Peripheral	Flash/RAM				
		USB2.0 Host/function	64KB/8KB	128KB/16KB	256KB/32KB	384KB/32KB	512KB/32KB
40MHz	BGA-112pin 0.8mmpitch/200μm	1	MB9AF311NBGL	MB9AF312NBGL	MB9AF314NBGL	MB9AF315NBGL	MB9AF316NBGL
		-	MB9AF111NBGL	MB9AF112NBGL	MB9AF114NBGL	MB9AF115NBGL	MB9AF116NBGL
	LQFP-100pin 0.5mm pitch	1	MB9AF311NPMC	MB9AF312NPMC	MB9AF314NPMC	MB9AF315NPMC	MB9AF316NPMC
		-	MB9AF111NPMC	MB9AF112NPMC	MB9AF114NPMC	MB9AF115NPMC	MB9AF116NPMC
	QFP-100pin 0.65mm pitch	1	MB9AF311NPF	MB9AF312NPF	MB9AF314NPF	MB9AF315NPF	MB9AF316NPF
		-	MB9AF111NPF	MB9AF112NPF	MB9AF114NPF	MB9AF115NPF	MB9AF116NPF
	LQFP-80pin 0.5mm pitch	1	MB9AF311MPMC	MB9AF312MPMC	MB9AF314MPMC	MB9AF315MPMC	MB9AF316MPMC
		-	MB9AF111MPMC	MB9AF112MPMC	MB9AF114MPMC	MB9AF115MPMC	MB9AF116MPMC
	LQFP-64pin 0.5mm pitch	1	MB9AF311LPMC1	MB9AF312LPMC1	MB9AF314LPMC1	-	-
		-	MB9AF111LPMC1	MB9AF112LPMC1	MB9AF114LPMC1	-	-
	LQFP-64pin 0.65mm pitch	1	MB9AF311LPMC	MB9AF312LPMC	MB9AF314LPMC	-	-
		-	MB9AF111LPMC	MB9AF112LPMC	MB9AF114LPMC	-	-

Roadmap

