FS fact sheet

FUJITSU

FM3 Family of 32-bit MCUs with ARM Cortex-M3 Core

High-Performance MB9BF500/400/300/100 and Basic MB9AF100 /110/310 Series



Description

The FM3 family of 32-bit general purpose microcontrollers, features the industry's leading-edge ARM Cortex-M3™ CPU, and integrates Fujitsu's highly reliable and high-speed secure embedded flash technology and a host of robust peripheral features, including motor control timers, ADCs and a wide range of communication interfaces. The FM3 family is optimized to address the 16-bit and 32-bit microcontroller market for a variety of industrial and consumer applications.

The initial offerings in the Fujitsu FM3 family are the High-Performance MB9BF500/400/300/100 and Basic MB9AF100 /110/310 Series products.

High-Performance MB9B500/400/300/100 Series

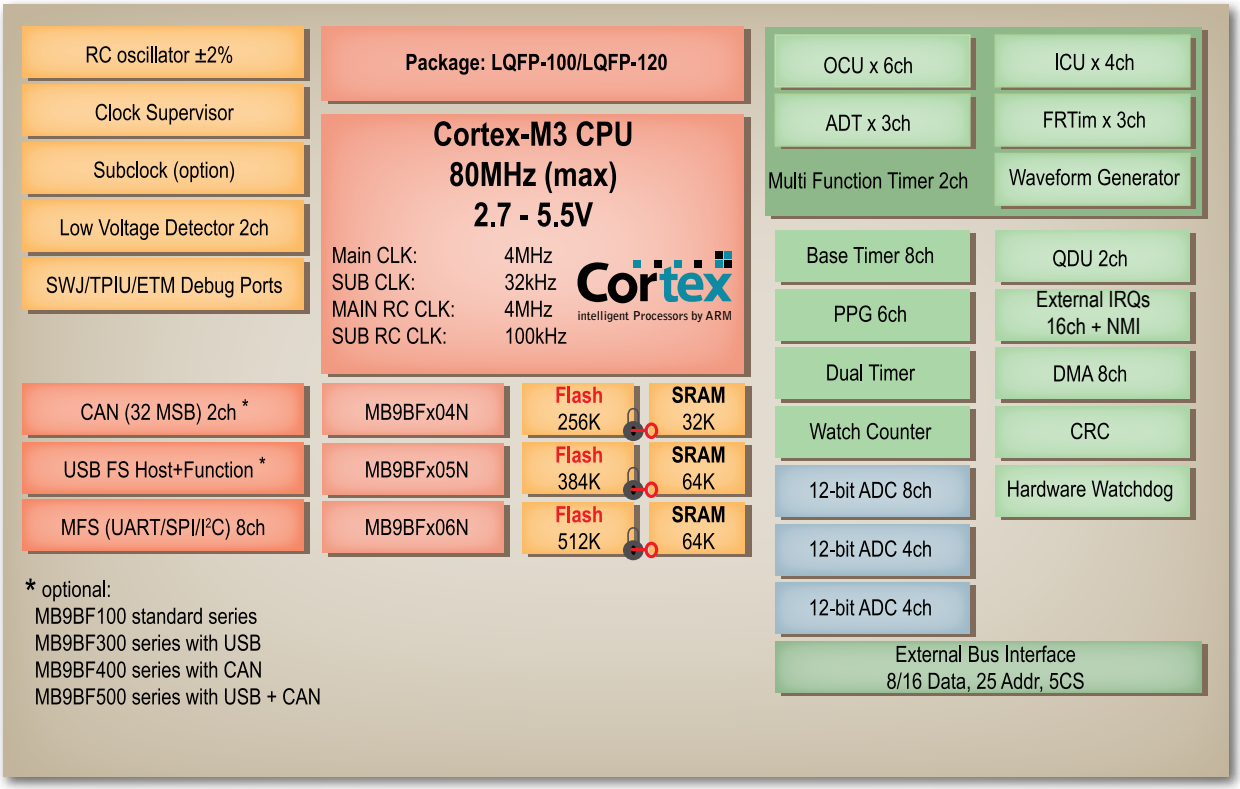
The High-Performance Series is designed to provide the full range of integrated advanced peripheral functions as well as the higher speed and greater memory density required by the 32-bit market.

Devices in the High-Performance series operate at 80MHz and support up to 512KB high-speed flash memory and up to a 64KB SRAM (with plans for speeds up to 144MHz, 1MB Flash/128KB SRAM). The MCUs in the series are available in configurations capable of supporting USB, CAN, UART, SIO, I^2C, and LIN communications protocols, and will be available in LQFP120, LQFP100, and BGA112 packages.

Basic MB9AF100/110/310 Series

The Basic Series features the lower cost, power-saving technology and compact design required by the 16-bit market. The Basic Series includes limited versions of the advanced peripheral functions of the High-Performance Series and are optimized for use primarily in major home appliances, digital consumer devices and office automation devices.

The Basic Series operates at 40MHz, supports 64KB to 512KB Flash and 8KB to 32KB RAM. These devices are available from 64 pin to 120 pin with LQFP, QFP and BGA112 packages.



High-Performance MB9B500/400/300/100 Series Block Diagram

Key Features of the FM3 Family

ARM Cortex-M3 CPU Core

- Leading-edge architecture with the latest Cortex-M3 core from ARM
- Excellent real-time behavior
- Outstanding power efficiency
- MPU and ETM full real-time trace
- CPU operating speed up to 80MHz, with plans for up to 144MHz
- Easy development, fast time to market

Flash technology unique to Fujitsu Semiconductor

- Highly reliable, high speed secure embedded flash memory technology
- High-speed flash zero-wait states at 60MHz
- Memory densities up to 1MBytes
- Embedded conventional and dual-operation flash memory technology
- Program cycles: Maximum 100,000 times
- Data retention period: Maximum 20 years
- Supports data-protection functionality
- Flash with ECC (Error Correction and Code)

Peripheral Features

- High-speed, high-resolution ADCs
- Multiple timers – Software enabled switching of functions between the Reload, PPG, PWM, and PWC timers
- Products with LCD controller

Multiple communicati on control macros

- Robust multiple CAN2.0A/B (active) with 32 message buffers
- USB 2.0 Full Speed communication macro (Host and Slave Function)
- Multifunction serial interfaces – LIN/SPI, I²C, UART
- Plan for Ethernet communication interfaces planned

Wide range of products

- Wide voltage range
  - Single power supply 2.7V to 5.5V supporting 3V and 5V system designs
  - Future Low Power Line will support 1.8V to 5.5V
- Wide range of pin and package options ranging from 32- to 176-pin
- Product features to address industrial, white-goods and handheld consumer applications

Applications

- Industrial applications
- Motor control
- Factory automation
- Consumer appliances / white goods
- Power tools
- Medical and healthcare
- Handheld devices

FM3 Family Roadmap

The Fujitsu FM3 Family roadmap will offer a range of solutions extending from high-performance applications that require advanced control, such as factory automation systems, to basic applications, such as major home appliances (air conditioners, refrigerators, washing machines, etc.), digital consumer devices and office automation equipment.

Future offerings will include other High-Performance, Basic, Low-Power, and Low-Leak product lines. The FM3 Family will be available in configurations supporting 20MHz to 144MHz and in pin/package options ranging from 32-pin to 176-pin products. The Low-Power line will support voltage ranges of 1.8V to 5.5V.

Development Tools

The Fujitsu FM3 family is supported by the two market-leading tool-chain suppliers: IAR Systems and Keil. These companies offer enhanced IDEs (integrated development environments) which integrate the compiler, debugger and GUI (graphical user interface). A GNU/Eclipse-based tool chain will be available.

Several third parties offer middleware tools such as CMSIS- compliant firmware, driver libraries, drivers, protocol stacks and RTOSs such as CANopen stacks, USB drivers and file systems.

Evaluation boards are available from IAR, Keil and Fujitsu, ranging from full-featured system boards to simple, low-cost products. Fujitsu also offers software modules, application notes and example software.

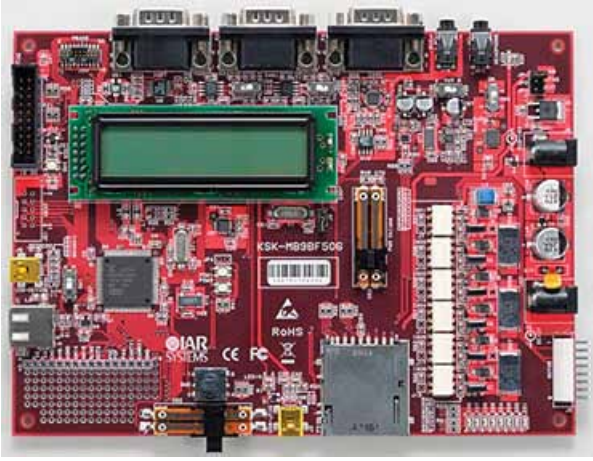
- Motor Control libraries
- Self test library (IEC 60730)
- USB drivers, mass storage class

Starter Kits

IAR Starter Kit (MB9BF506-SK)

The IAR MDK starter kit "MB9BF506-SK" includes following support package:

- Full-featured evaluation board with MB9B500 series, 100-pin microcontroller
- Standalone or embedded J-Link in-circuit debugger/ programmer (USB/JTAG)
- Embedded Workbench® for the ARM (EWARM) development environment
- IAR C/C++ compiler (output of code up to 32 Kbytes)
- Sample projects to evaluate a range of device peripherals



Keil Evaluation Board with ULINK-ME (MCB9BF500)

Designed for low-cost, simplicity and ease of use, the Keli evaluation board will provide software engineers a quick and easy way to develop their applications.

The Keil starter kit packages include:

- Evaluation board with MB9BF506 100pin microcontroller
- ULINK-ME in-circuit debugger/programmer (USB/JTAG)
- µVision4TM development environment (output of code up to 32 Kbytes)
- Sample projects for a range of device peripherals



For the latest information on starter kits and other development resources for the FM3 family, visit:
http://www.fujitsu.com/us/services/edevices/microelectronics/microcontrollers/datalib/fr/indexarm.html

FM3 Family Product Lineup

High-Performance – Product Lineup							
MHz	Package	Function		Flash/RAM Density			
		CAN	USB 2.0	128KB/16KB	256KB/32KB	348KB/48KB	512KB/64KB
80MHz	LQFP120	2	1		MB9BF504RPMC	MB9BF505RPMC	MB9BF506RPMC
		2	–		MB9BF404RPMC	MB9BF405RPMC	MB9BF406RPMC
		–	1		MB9BF304RPMC	MB9BF305RPMC	MB9BF306RPMC
		–	–		MB9BF104RPMC	MB9BF105RPMC	MB9BF106RPMC
	LQFP100	2	1		MB9BF504NPMC	MB9BF505NPMC	MB9BF506NPMC
		2	–		MB9BF404NPMC	MB9BF405NPMC	MB9BF406NPMC
		-	1		MB9BF304NPMC	MB9BF305NPMC	MB9BF306NPMC
		–	–		MB9BF104NPMC	MB9BF105NPMC	MB9BF106NPMC
	BGA112	2	1		MB9BF504NBGL	MB9BF505NBGL	MB9BF506NBGL
		2	–		MB9BF404NBGL	MB9BF405NBGL	MB9BF406NBGL
		–	1		MB9BF304NBGL	MB9BF305NBGL	MB9BF306NBGL
		1	1		MB9BF104NBGL	MB9BF105NBGL	MB9BF106NBGL

Basic Series – Product Lineup							
MHz	Package	Function	Flash/RAM Density				
		USB 2.0	64KB/8KB	128KB/16KB	256KB/32KB	348KB/32KB	512KB/32KB
40MHz	LQFP120	–		MB9AF102RPMC	MB9AF104RPMC		
	LQFP100	–		MB9AF102NPMC	MB9AF104NPMC		
	QFP100	–		MB9AF102NPF	MB9AF104NPF		
	BGA112	–		MB9AF102NBGL	MB9AF104NBGL		
	BGA-112pin	1	MB9AF311NBGL	MB9AF312NBGL	MB9AF314NBGL	MB9AF315NBGL	MB9AF316NBGL
		-	MB9AF111NBGL	MB9AF112NBGL	MB9AF114NBGL	MB9AF115NBGL	MB9AF116NBGL
	LQFP-100pin	1	MB9AF311NPMC	MB9AF312NPMC	MB9AF314NPMC	MB9AF315NPMC	MB9AF316NPMC
		-	MB9AF111NPMC	MB9AF112NPMC	MB9AF114NPMC	MB9AF115NPMC	MB9AF116NPMC
	QFP-100pin	1	MB9AF311NPF	MB9AF312NPF	MB9AF314NPF	MB9AF315NPF	MB9AF316NPF
		-	MB9AF111NPF	MB9AF112NPF	MB9AF114NPF	MB9AF115NPF	MB9AF116NPF
	LQFP-80pin	1	MB9AF311MPMC	MB9AF312MPMC	MB9AF314MPMC	MB9AF315MPMC	MB9AF316MPMC
		-	MB9AF111MPMC	MB9AF112MPMC	MB9AF114MPMC	MB9AF115MPMC	MB9AF116MPMC
	LQFP-80pin	1	MB9AF311MPMC1	MB9AF312MPMC1	MB9AF314MPMC1	MB9AF315MPMC1	MB9AF316MPMC1
		-	MB9AF111MPMC1	MB9AF112MPMC1	MB9AF114MPMC1	MB9AF115MPMC1	MB9AF116MPMC1
	LQFP-64pin	1	MB9AF311LPMC1	MB9AF312LPMC1	MB9AF314LPMC1	MB9AF315LPMC1	MB9AF316LPMC1
		-	MB9AF111LPMC1	MB9AF112LPMC1	MB9AF114LPMC1	MB9AF115LPMC1	MB9AF116LPMC1
	LQFP-64pin	1	MB9AF311LPMC	MB9AF312LPMC	MB9AF314LPMC	MB9AF315LPMC	MB9AF316LPMC
		-	MB9AF111LPMC	MB9AF112LPMC	MB9AF114LPMC	MB9AF115LPMC	MB9AF116LPMC

FUJITSU SEMICONDUCTOR AMERICA, INC.
Corporate Headquarters
1250 E. Arques Avenue, M/S 333, Sunnyvale, CA 94085-5401
Tel: (800) 866-8608 Fax: (408) 737-5999
E-mail: FSA_inquiry@us.fujitsu.com | Website: http://us.fujitsu.com/semi

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