Infineon Technologies - MB95F652LNPFT-G-SNERE2 Datasheet

Welcome to E-XFL.COM

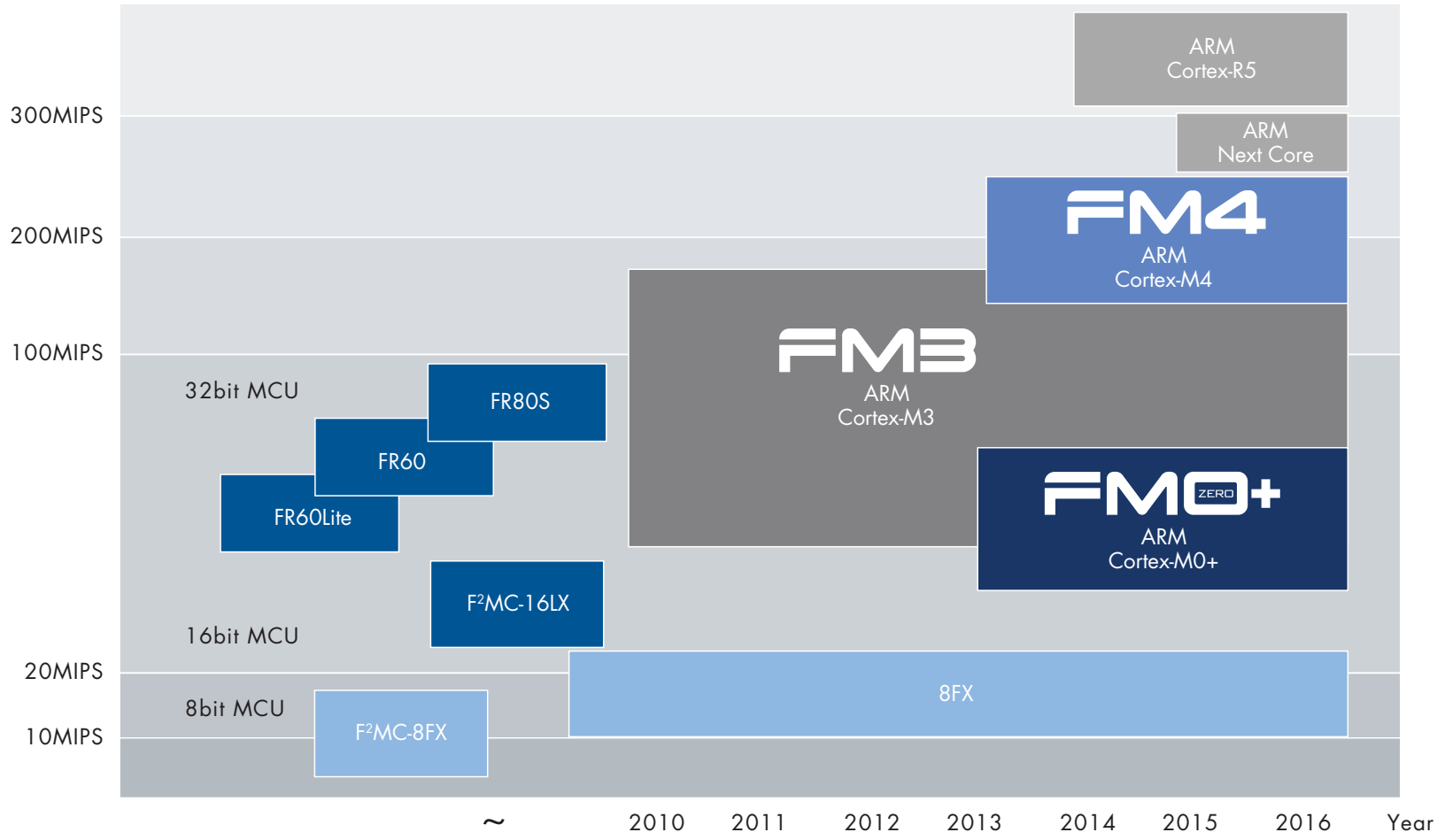
What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

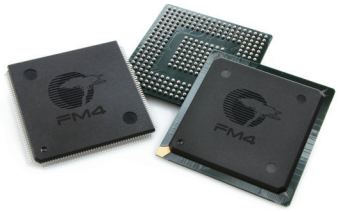
Applications of "Embedded - Microcontrollers"

Details	
Product Status	Obsolete
Core Processor	F²MC-8FX
Core Size	8-Bit
Speed	16MHz
Connectivity	I²C, LINbus, SIO, UART/USART
Peripherals	POR, PWM, WDT
Number of I/O	20
Program Memory Size	8KB (8K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	256 x 8
Voltage - Supply (Vcc/Vdd)	1.8V ~ 5.5V
Data Converters	A/D 6x8/12b
Oscillator Type	External
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	24-TSSOP (0.173", 4.40mm Width)
Supplier Device Package	24-TSSOP
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/mb95f652lnpft-g-snere2

Consumer and Industrial MCU Core Roadmap

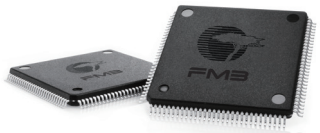


Consumer and Industrial MCU Family



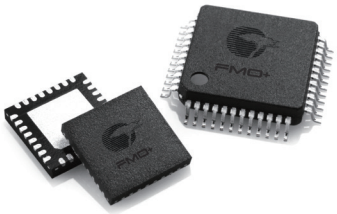
FM4 FAMILY

Cypress ARM® Cortex®-M4F microcontroller family is a high range line providing maximum CPU frequency of 200MHz, a high speed flash memory with DSP and FPU hardware instructions. Customers can select the best fitting device from a range of products, coming in packages from 48 pin to 216 pin and flash memory densities between 256KB and 2MB. The wide operation supply voltage range up to 5.5V which improves the signal to noise ratio, results in a robust design and is unique among Cortex-M4F microcontroller families. The MCUs are designed for applications that require advanced, high-speed computing performance such as general-purpose inverters, servomotors, PLCs and other industrial equipment, as well as inverter-based home appliances such as washing machines and air conditioners.



FM3 FAMILY

Cypress ARM Cortex-M3 microcontroller family is a scalable platform for many industrial applications. Customers can select the best fitting device from a range of products, coming in packages from 32 pin to 176 pin and flash memory densities between 32KB and 1MB. With a maximum CPU frequency of 144MHz and high speed flash memory, FM3 supports the fastest ARM Cortex-M3 devices on the market. The wide operation supply voltage range up to 5.5V, which improves the signal to noise ratio, results in a robust design and is quite unique among Cortex-M3 microcontroller families. The FM3 MCU family is split into four groups: high performance, basic, low power and ultra low leakage groups. The main differences between the groups are CPU operation frequency and supply voltage. All products are based on the same architecture (software compatible), use the same peripherals and are pin compatible in most cases. The ultra low leakage line products are based on an optimized low leakage process technology. Development tools and evaluation boards are offered from different vendors and Cypress.



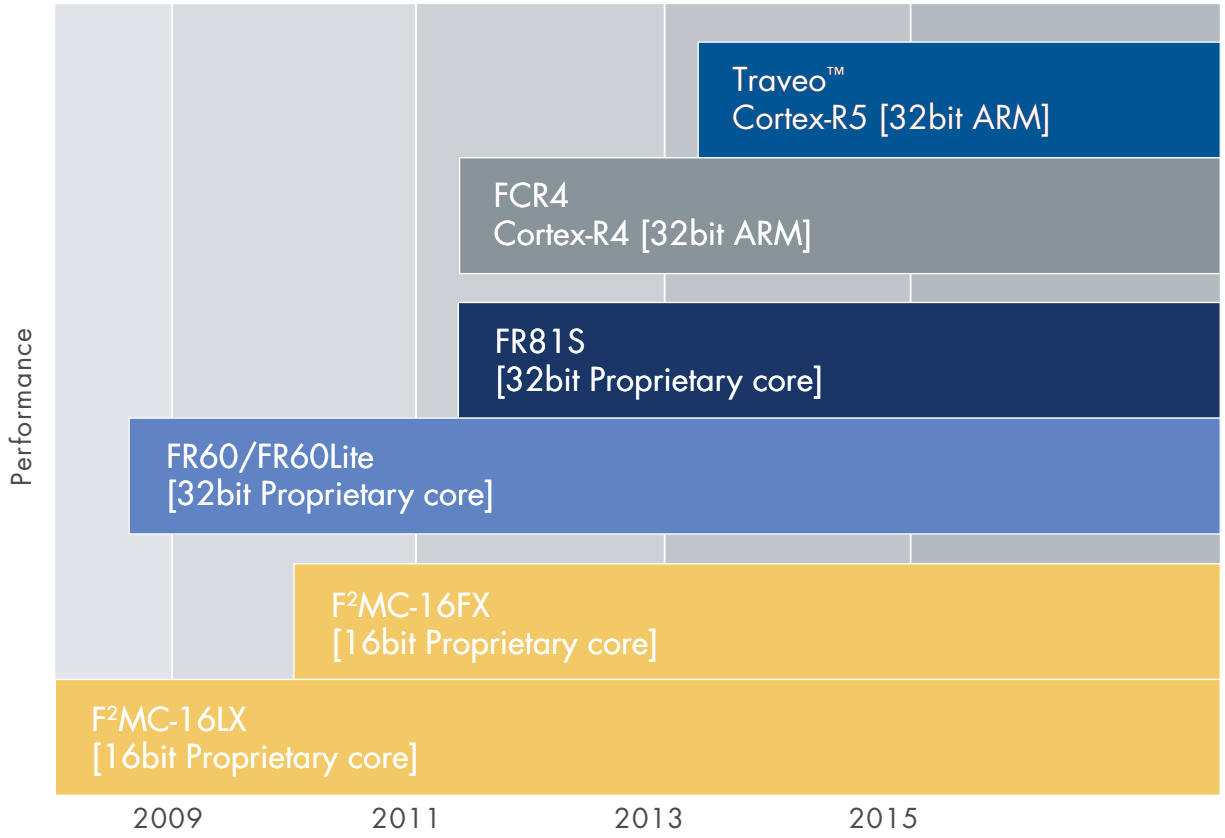
FM0+ FAMILY

The Cypress FM0+ family, which is based on the ARM Cortex-M0+ core, is designed for low power and cost-sensitive applications such as white goods, sensors, meters, HMI systems, power tools and Internet of Things (IoT) battery powered or energy harvesting wearable devices. These microcontrollers can be easily embedded into systems adopting 8-, 16- or 32-bit MCUs, accelerating product development and reducing development costs. The FM0+ family includes two groups for ultra-low-power and cost-effective applications. The devices in the ultra-low-power group have an operating voltage range of 1.65V to 3.6V, and a maximum CPU clock frequency of 40MHz, a RUN mode current of 70 µA/MHz, an RTC mode current of 0.7 µA and wake-up time of approximately 40 µs.

8FX FAMILY

Cypress 8FX MCU family is a high-performance 8-bit microcontroller utilizing a different embedded flash memory size. This series uses the F2MC-8FX CISC CPU, which offers industry leading class performance of an 8-bit microcontroller unit enabling more instructions to be executed per cycle. On top of delivering industry class performance MCUs, the 8FX family also delivers low power efficient MCU products for the customer's usage. This series also features a variety of on-chip timers, A/D converters, analog and digital peripheral and communication interfaces such as LIN-UART (Local Interconnect Network Universal Asynchronous Receiver-Transmitter), CAN (controller area network) and I2C (Inter-Integrated Circuit) interface for various application usages. For easy development, the 8FX family also employs a 1-line on-chip debug that uses only one pin on the microcontroller, thereby minimizing the number of pins used for debugging in product development. Cypress also provides easy to use and cost competitive development starter kits and development environments for this MCU series.

Automotive MCU Core Roadmap



Automotive MCU Family

TRAVEO FAMILY

The Cypress Traveo™ family expands the company's automotive application coverage, scalability and high performance into one line-up and at the same time adds new features to fulfill the latest requirements of the automotive industry. Based on the powerful ARM® Cortex®-R5 and R5F core in single and dual core operations, it offers state-of-the-art real-time performance, safety and security features.

The family supports the latest in-car networks and offers high performance graphics engines optimized for a minimum memory footprint and embeds dedicated features to increase data security in the car.

High-level Traveo Features

- ARM Cortex-R5 core
- Dual core
- Embedded twin-motor control with internal R/D converter
- Embedded 2D and 3D graphics engines
- High performance embedded flash memory
- Cypress HyperBus™: High speed serial interfaces to connect external memory
- Qualified for automotive use (AEC-Q100)
- Software support for Autosar, graphics drivers and more

FR FAMILY

Cypress 32bit MCU families have been designed in close co-operation with major automotive customers worldwide and inherit the high-performance core of Cypress's proprietary FR MCU architecture. They support communication interfaces such as CAN, FlexRay and LIN as well as up to 2MB on-chip memory capacity. The latest members (MB915xx) also include a single precision Floating Point Unit (FPU) providing additional computing power required by complex control algorithms.

This high computing performance combined with powerful peripheral functions such as on-chip graphics controller and motor control macros, offers a higher grade of flexibility and lower cost for automotive as well as industrial applications.

Many devices offer an external bus interface which can be connected to Cypress's stand alone FlexRay controller or to the latest generation of graphics controllers in order to build full-featured dashboards, driver information systems or advanced body systems.

FCR4 FAMILY

The FCR4 family has been specifically designed to offer an innovative, scalable solution for hybrid instrument clusters, which combine traditional meters and graphical displays. The devices offer a powerful architecture based on the ARM Cortex-R4 core and Cypress's 2D graphics engine.

High-level FCR4 Features

- ARM Cortex-R4 core
- Embedded 2D graphics engine
- 2MB flash, 64KB E2Flash
- Up to 208KB RAM
- Features including real-time clock/auto calibration, sound generator and I2S

F2MC-16FX FAMILY

Cypress 16-bit flexible microcontroller series offers a scalable family concept approach to a variety of automotive and industrial applications. The scalable flash/ROM/RAM sizes with different mixtures of peripherals saves development time and costs. CAN and LIN support, on-chip LCD controller, SMC (stepper motor controller), I^2C bus interface, analog input channels, external bus interface, selectable port levels for CMOS, TTL and Automotive Levels are some of the enhanced features. A security feature is incorporated, preventing unauthorized reading of the contents of the flash memory.

FM4 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch.(unit)]	12bit AD Converter [ch.(unit)]	DA Converter [bit x ch]	Timer								Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I²C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
S6E2GH	S6E2GH8H0A	180	LQFP-144	2.7 to 5.5	✓	Main Flash	1024K	192K	-	8	32	✓	121	–	24 (3)	–	Multi-Function Timer x2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 6ch			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 4		Multi Function Serial x 10ch (UART/CSIO/I2C/LIN Selectable)				1	2ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer, Real Timer Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, SDC	On-Chip Debug (SWJ-DP/ ETM)
	S6E2GH8J0A		LQFP-176										153		32 (3)																			
	S6E2GH6H0A		LQFP-144				512K	128K					121		24 (3)																			
	S6E2GH6J0A		LQFP-176										153		32 (3)																			
S6E2G3	S6E2G38H0A	180	LQFP-144	2.7 to 5.5	✓	Main Flash	1024K	192K	-	8	32	✓	121	–	24 (3)	–	Multi-Function Timer x2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 6ch			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 4		Multi Function Serial x 10ch (UART/CSIO/I2C/LIN Selectable)				–	2ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer, Real Timer Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F	On-Chip Debug (SWJ-DP/ ETM)
	S6E2G38J0A		LQFP-176										153		32 (3)																			
	S6E2G36H0A		LQFP-144				512K	128K					121		24 (3)																			
	S6E2G36J0A		LQFP-176										153		32 (3)																			
S6E2G2 w/security	S6E2G28HHA	180	LQFP-144	2.7 to 5.5	✓	Main Flash	1024K	192K	-	8	32	✓	121	–	24 (3)	–	Multi-Function Timer x2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 6ch			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 4		Multi Function Serial x 10ch (UART/CSIO/I2C/LIN Selectable)				–	2ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer, Real Timer Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, ETH, Chipher	On-Chip Debug (SWJ-DP/ ETM)
	S6E2G28JHA		LQFP-176										153		32 (3)																			
	S6E2G26HHA		LQFP-144				512K	128K					121		24 (3)																			
	S6E2G26JHA		LQFP-176										153		32 (3)																			
S6E2G2	S6E2G28H0A	180	LQFP-144	2.7 to 5.5	✓	Main Flash	1024K	192K	-	8	32	✓	121	–	24 (3)	–	Multi-Function Timer x2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 6ch			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 4		Multi Function Serial x 10ch (UART/CSIO/I2C/LIN Selectable)				–	2ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer, Real Timer Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, ETH	On-Chip Debug (SWJ-DP/ ETM)
	S6E2G28J0A		LQFP-176										153		32 (3)																			
	S6E2G26H0A		LQFP-144				512K	128K					121		24 (3)																			
	S6E2G26J0A		LQFP-176										153		32 (3)																			
S6E2DH	S6E2DH5G0A	160	LQFP-120 TEQFP-120 BGA-161	2.7-3.6	✓	Main Flash	384K	36K	-	8	16	✓	98	-	24 (3)	-	Multi-Function Timer x 3units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG6ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				QPRC x 1	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				1	1ch (USB-Host/ USB-Function Selectable)		-	-	Dual Timer, Real Timer Clock, Unique ID, DSTC x128ch, CAN-FD 1ch, SDC, I2S 2ch, High Speed Quad SPI x1, Hyper Bus x1, GDC	On-Chip Debug (SWJ-DP/ETM)
	S6E2DH5GJA		LQFP-120 (SiP)										90																					
	S6E2DH5J0A		LQFP-176										154																					
S6E2DF	S6E2DF5G0A	160	LQFP-120 TEQFP-120 BGA-161	2.7-3.6	✓	Main Flash	384K	36K	-	8	16	✓	98	-	24 (3)	-	Multi-Function Timer x 3units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG6ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				QPRC x 1	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				1	1ch (USB-Host/ USB-Function Selectable)		-	-	Dual Timer, Real Timer Clock, Unique ID, DSTC x128ch, CAN-FD 1ch, I2S 2ch, High Speed Quad SPI x1, Hyper Bus x1, GDC	On-Chip Debug (SWJ-DP/ETM)
	S6E2DF5GJA		LQFP-120 (SiP)										90																					
	S6E2DF5J0A		LQFP-176										154																					
S6E2D5	S6E2D55G0A	160	LQFP-120 TEQFP-120 BGA-161	2.7-3.6	✓	Main Flash	384K	36K	-	8	16	✓	98	-	24 (3)	-	Multi-Function Timer x 3units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG6ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				QPRC x 1	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				-	1ch (USB-Host/ USB-Function Selectable)		-	-	Dual Timer, Real Timer Clock, Unique ID, DSTC x128ch, SDC, I2S 2ch, High Speed Quad SPI x1, Hyper Bus x1, GDC	On-Chip Debug (SWJ-DP/ETM)
	S6E2D55GJA		LQFP-120 (SiP)										90																					
	S6E2D55J0A		LQFP-176										154																					
S6E2D3	S6E2D35G0A	160	LQFP-120 TEQFP-120 BGA-161	2.7-3.6	✓	Main Flash	384K	36K	-	8	16	✓	98	-	24 (3)	-	Multi-Function Timer x 3units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG6ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				QPRC x 1	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				-	1ch (USB-Host/ USB-Function Selectable)		-	-	Dual Timer, Real Timer Clock, Unique ID, DSTC x128ch, I2S 2ch, High Speed Quad SPI x1, Hyper Bus x1, GDC	On-Chip Debug (SWJ-DP/ETM)
	S6E2D35GJA		LQFP-120 (SiP)										90																					
	S6E2D35J0A		LQFP-176										154																					

** In development; **Planning*

FM4 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch.(unit)]	12bit AD Converter [ch.(unit)]	DA Converter [bit x ch]	Timer								Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I²C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
MB9B460L	MB9BF464K	160	LQFP-48 QFN-48	2.7 to 5.5	✓	Main Flash +Work Flash	256K +32K	32K	–	8	15	–	33	–	8(2)	12 x 2	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 1	1	Multi Function Serial x 6ch (UART/CSIO/I2C/LIN Selectable)				1	–	–	–	✓	CAN: 32Msg-buffer, Dual Timer, Real Time Clock, Unique ID, DSTC x 128ch	On-chip Debug (SWJ-DP)
	MB9BF464L		LQFP-64 QFN-64								16		48		15(2)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable)																				
	MB9BF465K		LQFP-48 QFN-48				384K +32K	48K			15		33		8(2)		Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable)																				
	MB9BF465L		LQFP-64 QFN-64								16		48		15(2)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable)																				
	MB9BF466K		LQFP-48 QFN-48				512K +32K	64K			15		33		8(2)		Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable)																				
	MB9BF466L		LQFP-64 QFN-64								16		48		15(2)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable)																				

** In development; **Planning*

FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
HIGH-PERFORMANCE GROUP																																			
MB9BD10T	MB9BFD16T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I²C/LIN Selectable)	2	2ch (USB-Host/ USB-Function Selectable)	–	✓	CAN: 32Msg-buffer, Dual Timer, Ethernet-MAC x 2ch	On-chip Debug (SWJ-DP/ETM)
	MB9BFD16S		LQFP-144										122		24(3)																				
	MB9BFD17T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BFD17S		LQFP-144										122		24(3)																				
	MB9BFD18T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
	MB9BFD18S		LQFP-144										122		24(3)																				
MB9B610T	MB9BF616T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I²C/LIN Selectable)	–	2ch (USB-Host/ USB-Function Selectable)	–	✓	Dual Timer, Ethernet-MAC x 2ch	On-chip Debug (SWJ-DP/ETM)
	MB9BF616S		LQFP-144										122		24(3)																				
	MB9BF617T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BF617S		LQFP-144										122		24(3)																				
	MB9BF618T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
	MB9BF618S		LQFP-144										122		24(3)																				
MB9B510T	MB9BF516T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I²C/LIN Selectable)	2	2ch (USB-Host/ USB-Function Selectable)	–	✓	CAN: 32Msg-buffer, Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF516S		LQFP-144										122		24(3)																				
	MB9BF517T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BF517S		LQFP-144										122		24(3)																				
	MB9BF518T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
	MB9BF518S		LQFP-144										122		24(3)																				
MB9B410T	MB9BF416T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I²C/LIN Selectable)	2	–	–	–	✓	CAN: 32Msg-buffer, Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF416S		LQFP-144										122		24(3)																				
	MB9BF417T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BF417S		LQFP-144										122		24(3)																				
	MB9BF418T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
MB9B310T	MB9BF316T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)	–	2ch (USB-Host/ USB-Function Selectable)	–	✓	Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF316S		LQFP-144										122		24(3)																				
	MB9BF317T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BF317S		LQFP-144										122		24(3)																				
	MB9BF318T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
	MB9BF318S		LQFP-144										122		24(3)																				
MB9B210T	MB9BF216T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)	–	2ch (USB-Host/ USB-Function Selectable)	–	✓	Dual Timer, Ethernet-MAC x 1ch	On-chip Debug (SWJ-DP/ETM)
	MB9BF216S		LQFP-144										122		24(3)																				
	MB9BF217T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BF217S		LQFP-144										122		24(3)																				
	MB9BF218T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
	MB9BF218S		LQFP-144										122		24(3)																				
MB9B110T	MB9BF116T	144	LQFP-176 BGA-192	2.7 to 5.5	✓	FLASH	512K	64K	–	8	32	✓	154	–	32(3)	–	Multi-Function Timer x 3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)	–	–	–	–	✓	Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF116S		LQFP-144										122		24(3)																				
	MB9BF117T		LQFP-176 BGA-192				768K	96K					154		32(3)																				
	MB9BF117S		LQFP-144										122		24(3)																				
	MB9BF118T		LQFP-176 BGA-192				1M	128K					154		32(3)																				
	MB9BF118S		LQFP-144										122		24(3)																				

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FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
HIGH-PERFORMANCE GROUP																																				
MB9B500B	MB9BF504NB	80	LQFP-100 BGA-112	2.7 to 5.5	✓	FLASH	256K	32K	–	8	16	✓	80	–	16(3)	–	Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 2	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				2	1ch (USB-Host/ USB-Function Selectable)		-	✓	CAN: 32Msg-buffer, Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF504RB		LQFP-120										100																							
	MB9BF505NB		LQFP-100 BGA-112				384K	48K					80																							
	MB9BF505RB		LQFP-120										100																							
	MB9BF506NB		LQFP-100 BGA-112				512K	64K					80																							
	MB9BF506RB		LQFP-120										100																							
MB9B400A	MB9BF404NA	80	LQFP-100 BGA-112	2.7 to 5.5	✓	FLASH	256K	32K	–	8	16	✓	80	–	16(3)	–	Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 2	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				2	–	–	–	✓	CAN: 32Msg-buffer, Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF404RA		LQFP-120										100																							
	MB9BF405NA		LQFP-100 BGA-112				384K	48K					80																							
	MB9BF405RA		LQFP-120										100																							
	MB9BF406NA		LQFP-100 BGA-112				512K	64K					80																							
	MB9BF406RA		LQFP-120										100																							
MB9B300B	MB9BF304NB	80	LQFP-100 BGA-112	2.7 to 5.5	✓	FLASH	256K	32K	–	8	16	✓	80	–	16(3)	–	Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 2	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				–	1ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF304RB		LQFP-120										100																							
	MB9BF305NB		LQFP-100 BGA-112				384K	48K					80																							
	MB9BF305RB		LQFP-120										100																							
	MB9BF306NB		LQFP-100 BGA-112				512K	64K					80																							
	MB9BF306RB		LQFP-120										100																							
MB9B100A	MB9BF102NA	80	LQFP-100 BGA-112	2.7 to 5.5	✓	FLASH	128K	16K	–	8	16	✓	80	–	16(3)	–	Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 2	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				–	–	–	–	✓	Dual Timer	On-chip Debug (SWJ-DP/ETM)
	MB9BF102RA		LQFP-120										100																							
	MB9BF104NA		LQFP-100 BGA-112				256K	32K					80																							
	MB9BF104RA		LQFP-120										100																							
	MB9BF105NA		LQFP-100 BGA-112				384K	48K					80																							
	MB9BF105RA		LQFP-120										100																							
	MB9BF106NA		LQFP-100 BGA-112				512K	64K					80																							
	MB9BF106RA		LQFP-120										100																							
BASIC GROUP																																				
MB9B520M	MB9BF521K	72	LQFP-48 QFN-48	2.7 to 5.5	✓	Dual Op. Flash (Main area + Work area)	64K +32K	16K	–	8	14	–	35	–	14(2)	10bit x 2	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 1	1	Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)				1	1ch (USB-Host/ USB-Function Selectable)		–	✓	CAN: 32Msg-buffer, Dual Timer, Unique ID, Real Time Clock	On-chip Debug (SWJ-DP)
	MB9BF521L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF521M		LQFP-80 BGA-96								23		65		26(2)																					
	MB9BF522K		LQFP-48 QFN-48				128K +32K				14		35		14(2)									QPRC x 1		Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF522L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF522M		LQFP-80 BGA-96								23		65		26(2)																					
	MB9BF524K		LQFP-48 QFN-48				256K +32K	32K			14		35		14(2)									QPRC x 1		Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF524L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF524M		LQFP-80 BGA-96								23		65		26(2)																					

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FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch/unit)]	12bit AD Converter [ch/unit)]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
BASIC GROUP																																				
MB9A310A	MB9AF311LA	40	LQFP-64 QFN-64	2.7 to 5.5	✓	FLASH	64K	16K	-	8	8	-	51	-	9(2)	-	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 2	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)	-	1ch (USB-Host/ USB-Function Selectable)	-	✓	Dual Timer	On-chip Debug (SWJ-DP)
	MB9AF311MA		LQFP-80								11		66		12(3)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	
	MB9AF311NA		LQFP-100 QFP-100 BGA-112								16	✓	83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF312LA		LQFP-64 QFN-64				128K				8	-	51		9(2)		Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																On-chip Debug (SWJ-DP)
	MB9AF312MA		LQFP-80								11		66		12(3)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	
	MB9AF312NA		LQFP-100 QFP-100 BGA-112								16	✓	83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF314LA		LQFP-64 QFN-64				256K	32K			7	-	51		9(2)		Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																On-chip Debug (SWJ-DP)
	MB9AF314MA		LQFP-80								11		66		12(3)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	
	MB9AF314NA		LQFP-100 QFP-100 BGA-112								16		83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF315MA		LQFP-80				384K				11		66		12(3)																				On-chip Debug (SWJ-DP)
	MB9AF315NA		LQFP-100 QFP-100 BGA-112**								16	✓	83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF316MA		LQFP-80				512K				11		66		12(3)																				On-chip Debug (SWJ-DP)
	MB9AF316NA		LQFP-100 QFP-100 BGA-112**								16		83		16(3)																				On-chip Debug (SWJ-DP/ETM)

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FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
BASIC GROUP																																				
MB9A110A	MB9AF111LA	40	LQFP-64 QFN-64	2.7 to 5.5	✓	FLASH	64K	16K	–	8	8	-	51	–	9(2)	–	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 2	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)	–	–	–	–	✓	Dual Timer	On-chip Debug (SWJ-DP)
	MB9AF111MA		LQFP-80								11		66		12(3)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																		
	MB9AF111NA		LQFP-100 QFP-100 BGA-112								16	✓	83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF112LA		LQFP-64 QFN-64				128K				8	–	51		9(2)		Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	On-chip Debug (SWJ-DP)
	MB9AF112MA	40	LQFP-80				128K	16K			11		66		12(3)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	On-chip Debug (SWJ-DP)
	MB9AF112NA		LQFP-100 QFP-100 BGA-112								16	✓	83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF114LA		LQFP-64 QFN-64				256K	32K			8	-	51		9(2)		Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	On-chip Debug (SWJ-DP)
	MB9AF114MA		LQFP-80								11		66		12(3)		Multi-Function Timer x 2units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)																	On-chip Debug (SWJ-DP)
	MB9AF114NA		LQFP-100 QFP-100 BGA-112								16		83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF115MA		LQFP-80				384K				11		66		12(3)																				On-chip Debug (SWJ-DP)
	MB9AF115NA		LQFP-100 QFP-100 BGA-112**								16	✓	83		16(3)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF116MA		LQFP-80				512K				11		66		12(3)																				On-chip Debug (SWJ-DP)
	MB9AF116NA		LQFP-100 QFP-100 BGA-112**								16		83		16(3)																				On-chip Debug (SWJ-DP/ETM)
MB9A310K	MB9AF311K	40	LQFP-48 LQFP-52 QFN-48	2.7 to 5.5	✓	Main Flash +Work Flash	64K +32K	16K	–	4	6	–	36	–	8(2)	–	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 1	1	Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)	–	1ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer, Real Time Clock	On-chip Debug (SWJ-DP)
	MB9AF312K						128K +32K																												
MB9A110K	MB9AF111K	40	LQFP-48 LQFP-52 QFN-48	2.7 to 5.5	✓	Main Flash +Work Flash	64K+ 32K	16K	–	4	6	–	36	–	8(2)	–	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 1	1	Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)	–	–		–	✓	Dual Timer, Real Time Clock	On-chip Debug (SWJ-DP)

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FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer								Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I²C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
LOW-POWER GROUP																																		
MB9A150R	MB9AF154MA	40	LQFP-80 BGA-96	1.65 to 3.6	✓	Dual Op. Flash (Main area + Work area)	256K +32K	32K	–	8	23	✓	66	–	17(2)	–	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 15ch (Reload/PPG/PWM/ PWC Selectable)	QPRC x 2	1	Multi Function Serial x 10ch (UART/CSIO/I2C Selectable)				–	–	–	–	✓	Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP)
	MB9AF154NA		LQFP-100 BGA-112								24		83		24(2)					Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)			Multi Function Serial x 14ch (UART/CSIO/I2C Selectable)												On-chip Debug (SWJ-DP/ETM)
	MB9AF154RA		LQFP-120										103										Multi Function Serial x 16ch (UART/CSIO/I2C Selectable)											
	MB9AF155MA		LQFP-80 BGA-96				384K +32K	48K			23		66		17(2)					Base Timer x 15ch (Reload/PPG/PWM/ PWC Selectable)			Multi Function Serial x 10ch (UART/CSIO/I2C Selectable)												On-chip Debug (SWJ-DP)
	MB9AF155NA		LQFP-100 BGA-112								24		83		24(2)					Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)			Multi Function Serial x 14ch (UART/CSIO/I2C Selectable)												On-chip Debug (SWJ-DP/ETM)
	MB9AF155RA		LQFP-120										103										Multi Function Serial x 16ch (UART/CSIO/I2C Selectable)											
	MB9AF156MA		LQFP-80 BGA-96				512K +32K	64K			23		66		17(2)					Base Timer x 15ch (Reload/PPG/PWM/ PWC Selectable)			Multi Function Serial x 10ch (UART/CSIO/I2C Selectable)												On-chip Debug (SWJ-DP)
	MB9AF156NA		LQFP-100 BGA-112								24		83		24(2)					Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable)			Multi Function Serial x 14ch (UART/CSIO/I2C Selectable)												On-chip Debug (SWJ-DP/ETM)
	MB9AF156RA		LQFP-120										103										Multi Function Serial x 16ch (UART/CSIO/I2C Selectable)											
MB9AB40NA	MB9AFB41LB	40	LQFP-64 QFN-64	1.65 to 3.6	✓	Dual Op. Flash (Main area + Work area)	64K +32K	16K	–	8	8	-	51	–	12(2)	–	–	–	–	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	–	1	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)	–	1ch (USB-Host/ USB-Function Selectable)		20 x 8	–	Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP)
	MB9AFB41MB		LQFP-80 BGA-96								11	✓	66		17(2)												33 x 8			
	MB9AFB41NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)												40 x 8			
	MB9AFB42LB		LQFP-64 QFN-64				128K +32K				8	-	51		12(2)												20 x 8			
	MB9AFB42MB		LQFP-80 BGA-96								11	✓	66		17(2)												33 x 8			
	MB9AFB42NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)												40 x 8			
	MB9AFB44LB		LQFP-64 QFN-64				256K +32K	32K			8	-	51		12(2)												20 x 8			On-chip Debug (SWJ-DP/ETM)
	MB9AFB44MB		LQFP-80 BGA-96								11	✓	66		17(2)												33 x 8			
	MB9AFB44NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)												40 x 8			
MB9AA40NA	MB9AFA41LB	40	LQFP-64 QFN-64	1.65 to 3.6	✓	Dual Op. Flash (Main area + Work area)	64K +32K	16K	–	8	8	-	51	–	12(2)	–	–	–	–	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	–	1	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)	–	–	–	20 x 8	–	Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP)
	MB9AFA41MB		LQFP-80 BGA-96								11	✓	66		17(2)												33 x 8			
	MB9AFA41NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)												40 x 8			
	MB9AFA42LB		LQFP-64 QFN-64				128K +32K				8	-	51		12(2)												20 x 8			
	MB9AFA42MB		LQFP-80 BGA-96								11	✓	66		17(2)												33 x 8			
	MB9AFA42NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)												40 x 8			
	MB9AFA44LB		LQFP-64 QFN-64				256K +32K	32K			8	-	51		12(2)												20 x 8			On-chip Debug (SWJ-DP/ETM)
	MB9AFA44MB		LQFP-80 BGA-96								11	✓	66		17(2)												33 x 8			
	MB9AFA44NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)												40 x 8			

** In development; **Planning*

FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
LOW-POWER GROUP																																				
MB9A340NA	MB9AF341LB	40	LQFP-64 QFN-64	1.65 to 3.6	✓	Dual Op. Flash (Main area + Work area)	64K +32K	16K	–	8	8	-	51	–	12(2)	–	–	–	–	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	–	1	Multi Function Serial x 8ch (UART/CSIO/I²C Selectable)	–	1ch (USB-Host/ USB-Function Selectable)		–	–	Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP)
	MB9AF341MB		LQFP-80 BGA-96								11	✓	66		17(2)																				
	MB9AF341NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)																				
	MB9AF342LB		LQFP-64 QFN-64				128K +32K				8	-	51		12(2)																				
	MB9AF342MB		LQFP-80 BGA-96								11	✓	66		17(2)																				
	MB9AF342NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)																				
	MB9AF344LB		LQFP-64 QFN-64				256K +32K	32K			8	-	51		12(2)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF344MB		LQFP-80 BGA-96								11	✓	66		17(2)																				
	MB9AF344NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)																				
MB9A140NA	MB9AF141LB	40	LQFP-64 QFN-64	1.65 to 3.6	✓	Dual Op. Flash (Main area + Work area)	64K +32K	16K	–	8	8	-	51	–	12(2)	–	–	–	–	Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)	–	1	Multi Function Serial x 8ch (UART/CSIO/I²C Selectable)	–	–	–	–	–	Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP)
	MB9AF141MB		LQFP-80 BGA-96								11	✓	66		17(2)																				
	MB9AF141NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)																				
	MB9AF142LB		LQFP-64 QFN-64				128K +32K	16K			8	-	51		12(2)																				
	MB9AF142MB		LQFP-80 BGA-96								11	✓	66		17(2)																				
	MB9AF142NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)																				
	MB9AF144LB		LQFP-64 QFN-64				256K +32K	32K			8	-	51		12(2)																				On-chip Debug (SWJ-DP/ETM)
	MB9AF144MB		LQFP-80 BGA-96								11	✓	66		17(2)																				
	MB9AF144NB		LQFP-100 QFP-100 BGA-112								16		83		24(2)																				

** In development; **Planning*

FM3 Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch.(unit)]	12bit AD Converter [ch.(unit)]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
ULTRA LOW LEAK GROUP																																				
MB9AAA0N	MB9AFAA1L	20	LQFP-64 QFN-64	1.8 to 5.5	✓	FLASH	64K	12K	–	–	8	–	52	–	9(1)	10bit x 2	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)			–	–	Multi Function Serial x 8ch (UART/CSIO/I²C Selectable)				–	–	–	24 x 4 or 20 x 8	✓	HDMI-CEC/Remote Control Reception x 2, Real Time Clock	On-chip Debug (SWJ-DP)
	MB9AFAA1M		LQFP-80								11		67		12(1)																	37 x 4 or 33 x 8			
	MB9AFAA1N		LQFP-100 QFP-100								16		84		16(1)																	44 x 4 or 40 x 8			
	MB9AFAA2L		LQFP-64 QFN-64				128K	16K			8		52		9(1)																	24 x 4 or 20 x 8			
	MB9AFAA2M		LQFP-80								11		67		12(1)																	37 x 4 or 33 x 8			
	MB9AFAA2N		LQFP-100 QFP-100								16		84		16(1)																	44 x 4 or 40 x 8			
MB9A1A0N	MB9AF1A1L	20	LQFP-64 QFN-64	1.8 to 5.5	✓	FLASH	64K	12K	–	–	8	–	52	–	9(1)	10bit x 2	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)			–	–	Multi Function Serial x 8ch (UART/CSIO/I²C Selectable)				–	–	–	–	✓	HDMI-CEC/Remote Control Reception x 2, Real Time Clock	On-chip Debug (SWJ-DP)
	MB9AF1A1M		LQFP-80								11		67		12(1)																				
	MB9AF1A1N		LQFP-100 QFP-100								16		84		16(1)																				
	MB9AF1A2L		LQFP-64 QFN-64				128K	16K			8		52		9(1)																				
	MB9AF1A2M		LQFP-80								11		67		12(1)																				
	MB9AF1A2N		LQFP-100 QFP-100								16		84		16(1)																				
MB9A130LA	MB9AF131LB	20	LQFP-64 QFN-64	1.8 to 5.5	✓	FLASH	64K	8K	–	–	8	–	52	–	8(1)	–	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)			–	–	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)				–	–	–	–	✓	Real Time Clock	On-chip Debug (SWJ-DP)
	MB9AF131KB		LQFP-48 QFN-48								6		37		6(1)										Multi Function Serial x 4ch (UART/CSIO/I2C Selectable, CSIO/I2C up to 3ch)										
	MB9AF132LB		LQFP-64 QFN-64				128K				8		52		8(1)										Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)										
	MB9AF132KB		LQFP-48 QFN-48								6		37		6(1)										Multi Function Serial x 4ch (UART/CSIO/I2C Selectable, CSIO/I2C up to 3ch)										

** In development; **Planning*

FM0 + Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer									Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I²C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
S6E1A	S6E1A11B0A	40	LQFP-32 QFN-32	2.7 to 5.5	✓	Flash	56K	6K	–	2	8	–	23	–	5(1)	–	Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable)			Base Timer x 4ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 1	1	Multi Function Serial x 3ch (UART/CSIO/I²C/LIN Selectable)				–	–		–	✓	Dual Timer, Real Time Clock, Unique ID, Fast I/O	On-chip Debug (SW-DP/MTB)
	S6E1A12B0A		LQFP-32 QFN-32				88K						23		5(1)																				
	S6E1A11C0A		LQFP-48 LQFP-52 QFN-48				56K						37		8(1)																				
	S6E1A12C0A		LQFP-48 LQFP-52 QFN-48				88K						37		8(1)																				
S6E1B8 w/security	S6E1B86GHA	40	LQFP-120	1.65 to 3.6	✓	Main Flash +Work Flash	512K + 40K	64K	–	–	24	–	102	–	24	-	Multi-Function Timer x 1units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /PPG3ch/Waveform Generator 3ch /AD Activation Compare 6ch Selectable), PPG3ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				–	1	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)				–	1ch (USB-Host/ USB-Function Selectable)		40 SEG x 8 COM / 44 SEG x 4 COM	–	Dual Timer, Real Time Clock, Unique ID, DSTC x 64ch, Tiny I2S, HDMI-CEC 2ch, CRC, Smart Card I/F, Chipher	On-Chip Debug (SWJ-DP/ Boundary SCAN)
	S6E1B84GHA						256K + 40K	32K																										
	S6E1B86FHA		LQFP-100				512K + 40K	64K					82		23																	32 SEG x 8 COM / 36 SEG x 4 COM				
	S6E1B84FHA						256K + 40K	32K																										
	S6E1B86EHA		BGA-96/ LQFP-80/ WLCSP-80				512K + 40K	64K					65		16																	20 SEG x 8 COM / 24 SEG x 4 COM				
	S6E1B84EHA						256K + 40K	32K																										
S6E1B8	S6E1B86G0A	40	LQFP-120	1.65 to 3.6	✓	Main Flash +Work Flash	512K + 40K	64K	–	–	24	–	102	–	24	-	Multi-Function Timer x 1units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /PPG3ch/Waveform Generator 3ch /AD Activation Compare 6ch Selectable), PPG3ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				–	1	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)				–	1ch (USB-Host/ USB-Function Selectable)		40 SEG x 8 COM / 44 SEG x 4 COM	–	Dual Timer, Real Time Clock, Unique ID, DSTC x 64ch, Tiny I2S, HDMI-CEC 2ch, CRC, Smart Card I/F	On-Chip Debug (SWJ-DP/ Boundary SCAN)
	S6E1B84G0A						256K + 40K	32K																										
	S6E1B86F0A		LQFP-100				512K + 40K	64K					82		23																	32 SEG x 8 COM / 36 SEG x 4 COM				
	S6E1B84F0A						256K + 40K	32K																										
	S6E1B86E0A		BGA-96/ LQFP-80/ WLCSP-80				512K + 40K	64K					65		16																	20 SEG x 8 COM / 24 SEG x 4 COM				
	S6E1B84E0A						256K + 40K	32K																										
S6E1B3	S6E1B36G0A	40	LQFP-120	1.65 to 3.6	✓	Main Flash +Work Flash	512K + 40K	64K	–	–	24	–	102	–	24	-	Multi-Function Timer x 1units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /PPG3ch/Waveform Generator 3ch /AD Activation Compare 6ch Selectable), PPG3ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				–	1	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)				–	1ch (USB-Host/ USB-Function Selectable)		–	–	Dual Timer, Real Time Clock, Unique ID, DSTC x 64ch, Tiny I2S, HDMI-CEC 2ch, CRC, Smart Card I/F	On-Chip Debug (SWJ-DP/ Boundary SCAN)
	S6E1B34G0A						256K + 40K	32K																										
	S6E1B36F0A		LQFP-100				512K + 40K	64K					82		23																	–			
	S6E1B34F0A						256K + 40K	32K																										
	S6E1B36E0A		BGA-96/ LQFP-80/ WLCSP-80				512K + 40K	64K					65		16																	–			
	S6E1B34E0A						256K + 40K	32K																										
S6E1B1	S6E1B16G0A	40	LQFP-120	1.65 to 3.6	✓	Main Flash +Work Flash	512K + 40K	64K	–	–	24	–	102	–	24	-	Multi-Function Timer x 1units (Free-Run 3ch/Output Compare 6ch/Input Capture 4ch /PPG3ch/Waveform Generator 3ch /AD Activation Compare 6ch Selectable), PPG3ch			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				–	1	Multi Function Serial x 8ch (UART/CSIO/I2C Selectable)				–	–		–	–	Dual Timer, Real Time Clock, Unique ID, DSTC x 64ch, Tiny I2S, HDMI-CEC 2ch, CRC, Smart Card I/F	On-Chip Debug (SWJ-DP/ Boundary SCAN)
	S6E1B14G0A						256K + 40K	32K																										
	S6E1B16F0A		LQFP-100				512K + 40K	64K					82		23																	–			
	S6E1B14F0A						256K + 40K	32K																										
	S6E1B16E0A		LQFP-80				512K + 40K	64K					65		16																	–			
	S6E1B14E0A						256K + 40K	32K																										

** In development; **Planning*

FM0 + Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer									Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I²C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
S6E1C3	S6E1C32D0A	40	LQFP-64	1.65 to 3.6	✓	Main Flash	128K	16K	–	–	12	–	54	–	8	–	–			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				–	1	Multi Function Serial x 6ch (UART/CSIO/I2C Selectable)				–	1ch (USB-Host/ USB-Function Selectable)		–	–	Dual Timer, Real Time Clock, Unique ID, DSTC×64ch, Tiny I2S, Wakeup I2C, HDMI-CEC 2ch, CRC, Smart Card I/F	On-Chip Debug (SWJ-DP)
	S6E1C31D0A						64K	12K																											
	S6E1C32C0A		LQFP-48				128K	16K			9		38																						
	S6E1C31C0A						64K	12K																											
	S6E1C32B0A		WLCSP-26				128K	16K			5		20		4					Base Timer x 3ch (Reload/PPG/PWM/PWC Selectable)						Multi Function Serial×4ch (UART/CSIO/I2C Selectable)										
	S6E1C31B0A		LQFP-32				64K	12K			7		24		6											Multi Function Serial×2ch (UART/CSIO/I2C Selectable)										
	S6E1C32D0A		QFN-64				128K	16K			12		54		8					Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)						Multi Function Serial×6ch (UART/CSIO/I2C Selectable)										
	S6E1C31D0A						64K	12K																											
	S6E1C32C0A		QFN-48				128K	16K			9		38							Base Timer x 5ch (Reload/PPG/PWM/PWC Selectable)																
	S6E1C31C0A						64K	12K																											
	S6E1C32B0A		QFN-32				128K	16K			7		24							Base Timer x 3ch (Reload/PPG/PWM/PWC Selectable)						Multi Function Serial×4ch (UART/CSIO/I2C Selectable)										
	S6E1C31B0A						64K	12K																											
S6E1C1	S6E1C12D0A	40	LQFP-64	1.65 to 3.6	✓	Main Flash	128K	16K	-	-	12	-	54	-	8	-	-			Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)				-	1	Multi Function Serial x 6ch (UART/CSIO/I2C Selectable)				-	-		-	-	Dual Timer, Real Time Clock, Unique ID, DSTC x 64ch, Tiny I2S, HDMI-CEC 2ch, CRC, Smart Card I/F	On-Chip Debug (SWJ-DP)
	S6E1C11D0A						64K	12K																											
	S6E1C12C0A		LQFP-48				128K	16K			9		38							Base Timer x 5ch (Reload/PPG/PWM/PWC Selectable)																
	S6E1C11C0A						64K	12K																											
	S6E1C12B0A		LQFP-32				128K	16K			7		24		6					Base Timer x 3ch (Reload/PPG/PWM/PWC Selectable)						Multi Function Serial×4ch (UART/CSIO/I2C Selectable)										
	S6E1C11B0A						64K	12K																											
	S6E1C12D0A		QFN-64				128K	16K			12		54		8					Base Timer x 8ch (Reload/PPG/PWM/PWC Selectable)						Multi Function Serial×6ch (UART/CSIO/I2C Selectable)										
	S6E1C11D0A						64K	12K																											
	S6E1C12C0A		QFN-48				128K	16K			9		38							Base Timer x 5ch (Reload/PPG/PWM/PWC Selectable)																
	S6E1C11C0A						64K	12K																											
	S6E1C12B0A		QFN-32				128K	16K			7		24		6					Base Timer x 3ch (Reload/PPG/PWM/PWC Selectable)						Multi Function Serial×4ch (UART/CSIO/I2C Selectable)										
	S6E1C11B0A						64K	12K																											

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8FX – 8bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch(unit)]	12bit AD Converter [ch(unit)]	DA Converter [bit x ch]	Timer									Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I²C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
STANDARD																																			
MB95650L	MB95F652E	16	TSSOP-24 SOP-24 QFN-32	1.8 to 5.5	✓	Dual Op. Flash	8K	256	-	-	6	-	21	-	6(1)	-	-	8/16bit Compound Timer x 2ch (Interval Timer/PWM/PWC/ Input Capture Selectable)	-	-	-	2	1	-	1	-	-	-	-	-	Low-voltage Detection Reset, Clock Supervisor	On-chip Debug
	MB95F652L												20																					Clock Supervisor	
	MB95F653E						12K	512					21																					Low-voltage Detection Reset, Clock Supervisor	
	MB95F653L												20																					Clock Supervisor	
	MB95F654E						20K	1024					21																					Low-voltage Detection Reset, Clock Supervisor	
	MB95F654L												20																					Clock Supervisor	
	MB95F656E						36K						21																					Low-voltage Detection Reset, Clock Supervisor	
	MB95F656L												20																					Clock Supervisor	
MB95810K	MB95F814K	16	LQFP-64	2.88 to 5.5	✓	Dual Op. Flash	20K	512	-	-	12	-	58	12(1)	-	-	-	Reload Timer x 1ch + 8/16bit Compound Timer x 2ch (Interval Timer/PWM/PWC/ Input Capture Selectable)	4	-	-	1	1	-	1	-	-	-	-	-	-	-	Low-voltage Detection Reset, Clock Supervisor	On-chip Debug
	MB95F816K						36K	1K																											
	MB95F818K						60K	2K																											

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Traveo Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	12bit AD Converter [ch(unit)]	12bit AD Converter with 4-ch sample & hold	DA Converter [bit x ch]	Timer									Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I2C [ch]	UART/SI [ch	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
CAN/AUTOMOTIVE																																			
S6J3110	S6J3118HA	96	TEQFP -144	4.5 to 5.25	-	Main Flash +Work Flash	576K + 48K	TC-RAM: 32KB System - RAM: 16KB Backup - RAM: 8KB	Instruction: 16 Data: 16	16	16	-	116	56(2)	-	-	12	6	12	16bit Base Timer x 30ch (PWM/PPG/Reload/PWC Selectable)	-	RTC x 1ch	Multi Function Serial x 4ch (LIN/UART/SIO Selectable)				CAN - FD x 1ch	-	-	-	-	ARM Cortex-R5, SHE(Secure Hardware Extension),	On-Chip Debug
	S6J3119HA						832K + 48K	TC-RAM: 48KB System - RAM: 16KB Backup - RAM: 8KB																												
	S6J311AHA						1088K + 48K	TC-RAM: 64KB System - RAM: 16KB Backup - RAM: 8KB																												
	S6J311BHA	144					1600K + 112K	192K						64(2)									Multi Function Serial x 22ch (LIN/UART/SIO Selectable)				CAN - FD x 2ch	-	-	-	-	ARM Cortex-R5, SHE(Secure Hardware Extension),	
	S6J311CHA						2112K + 112K	256K																											
	S6J311DHA						3136K + 112K	320K																											
	S6J311EHA						4160K + 112K	TC-RAM: 64KB System - RAM: 256KB Backup - RAM: 64KB																												
	S6J311BJA		TEQFP -176				1600K + 112K	192K					150																						
	S6J311CJA						2112K + 112K	256K																											
	S6J311DJA						3136K + 112K	320K																											
	S6J311EJA						4160K + 112K	TC-RAM: 64KB System - RAM: 256KB Backup - RAM: 64KB																												

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Traveo Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	12bit AD Converter [ch.(unit)]	12bit AD Converter with-4ch sample & hold	DA Converter [bit x ch]	Timer									Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
																	Output Compare [ch]	Free-Run Timer [ch]	Input Capture [ch]	Reload Timer [ch]	PWM Timer [ch]	PWC Timer [ch]	PPG Timer [ch]	Up/Down Counter [ch]	Other timers [ch]	I2C [ch]	UART/SI [ch	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
CAN/AUTOMOTIVE																																			
S6J3120	S6J3128HA	112	TEQFP -144	4.5 to 5.25	–	Main Flash +Work Flash	576K + 48K	TC-RAM: 32KB System - RAM: 16KB Backup - RAM: 8KB	Instruction: 16 Data: 16	16	16	A24/ D16	112	50(2)	–	–	12	6	12	16bit Base Timer x 30ch (PWM/PPG/Reload/PWC Selectable)	2	RTC x 1ch	Multi Function Serial x 10ch (LIN/UART/SIO Selectable)					CAN - FD x 3ch	–	–	32 x 4	–	ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 4ch, Sound generator x 3ch	On-Chip Debug
	S6J3129HA						832K + 48K	TC-RAM: 48KB System - RAM: 16KB Backup - RAM: 8KB																											
	S6J312AHA						1088K +112K	TC-RAM: 64KB System- RAM: 16KB Backup- RAM: 8KB																											
S6J3200	S6J32AAKS	160	TEQFP -208	1.1 to 1.3 3.0 to 3.6 4.5 to 5.5	✓	Main Flash +Work Flash	1088K + 112K	TC-RAM: 64KB System - RAM: 128KB Backup - RAM: 16KB VRAM: 1024KB	Instruction: 16 Data: 16	16	16	-	120	46(1)	-	-	24	12	24	Reload Timer x 14ch 16bit Base Timer x 24ch (PWM/PPG/Reload/PWC Selectable)	2	RTC x 1ch	Multi Function Serial x 12ch (LIN/UART/SIO/I2C Selectable)					CAN-FD x 4ch	-	-	30 x 4	-	ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D Graphic Engine, Display Output x 1ch	On-Chip Debug
	S6J32AAKU												128	50(1)																			32 x 4		
	S6J32AALS		TEQFP -216 (0.4mm pitch)										120	46(1)																			30 x 4		ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D Graphic Engine, Display Output x 1ch, Sound system,
	S6J32AALU												128	50(1)																			32 x 4		
	S6J32BAKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D Graphic Engine, Display Output x 1ch, Sound system,
	S6J32BAKU												128	50(1)																			32 x 4		
	S6J32BALS		TEQFP -216 (0.4mm pitch)										120	46(1)																			30 x 4		ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 1ch,
	S6J32BALU												128	50(1)																			32 x 4		
	S6J32CAKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 1ch, Sound system,
	S6J32CAKU												128	50(1)																			32 x 4		
	S6J32CALS		TEQFP -216 (0.4mm pitch)										120	46(1)																			30 x 4		ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 1ch, Sound system,
	S6J32CALU												128	50(1)																			32 x 4		
	S6J32DAKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 1ch, Sound system,
	S6J32DAKU												128	50(1)																			32 x 4		
	S6J32DALS		TEQFP -216 (0.4mm pitch)										120	46(1)																			30 x 4		
	S6J32DALU												128	50(1)																			32 x 4		

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Traveo Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	12bit AD Converter [ch.(unit)]	12bit AD Converter with-4-ch sample & hold	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I2C [ch]	Serial: UART/SI [ch	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
CAN/AUTOMOTIVE																																				
S6J3200	S6J323CKS	240	TEQFP -208	1.1 to 1.3 3.0 to 3.6 4.5 to 5.5	✓	Main Flash +Work Flash	2112K + 112K	TC-RAM: 128KB System - RAM: 128KB Backup - RAM: 16KB VRAM: 2048KB	Instruction: 16 Data: 16	16	16	-	120	46(1)	-	-	24	12	24	Reload Timer x 14ch 16bit Base Timer x 24ch (PWM/PPG/Reload/PWC Selectable)	2	RTC x 1ch	Multi Function Serial x 12ch (LIN/UART/SIO/I2C Selectable)	CAN-FD x 4ch	-	-	30 x 4	-	ARM Cortex-R5, Ethernet AVB, Media-LB, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D Graphic Engine, Display Output x 2ch,	On-Chip Debug
	S6J323CKU																																		
	S6J323CLS																																		
	S6J323CLU		TEQFP -216 (0.4mm pitch)										128	50(1)																			32 x 4			
	S6J324CKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, Ethernet AVB, Media-LB, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D Graphic Engine, Display Output x 2ch, Sound system,	
	S6J324CKU																																		
	S6J324CLS																																		
	S6J324CLU		TEQFP -216 (0.4mm pitch)										128	50(1)																			32 x 4			
	S6J325CKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, Ethernet AVB, Media-LB, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 2ch,	
	S6J325CKU																																		
	S6J325CLS																																		
	S6J325CLU		TEQFP -216 (0.4mm pitch)										128	50(1)																			32 x 4			
	S6J326CKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, Ethernet AVB, Media-LB, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 2ch, FPD-Link, Sound system,	
	S6J326CKU																																		
	S6J326CLS																																		
	S6J326CLU		TEQFP -216 (0.4mm pitch)										128	50(1)																			32 x 4			
	S6J327CKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, Ethernet AVB, Media-LB, SHE(Secure Hardware Extension) SMC x 6ch, Sound generator x 4ch, 2D Graphic Engine, Display Output x 2ch, Sound system	
	S6J327CKU																																		
	S6J327CLS																																		
	S6J327CLU		TEQFP -216 (0.4mm pitch)										128	50(1)																			32 x 4			
	S6J328CKS		TEQFP -208										120	46(1)																			30 x 4		ARM Cortex-R5, Ethernet AVB, Media-LB, SHE(Secure Hardware Extension), SMC x 6ch, Sound generator x 4ch, 2D+3D Graphic Engine, Display Output x 2ch, FPD-Link, Sound system	
	S6J328CKU																																		
	S6J328CLS																																		
	S6J328CLU		TEQFP -216 (0.4mm pitch)										128	50(1)																			32 x 4			

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FR Family – 32bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch/unit]	12bit AD Converter [ch/unit]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
CAN/AUTOMOTIVE																																				
MB91590	MB91F591B	80	LQFP-208	3.0 to 3.6 4.5 to 5.5 (2 power supplies)	✓	Main Flash +Work Flash	576K +64K	48K	–	16	16	Dedicated for GDC External Memory	61	32(1)	–	–	4	2	6	Reload Timer x 4ch + PPG Timer x 24ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	–	–	Multi Function Serial x 2ch (LIN/UART/ SIO/I2C Selectable)	6	3	–	–	–	–	CAN: 32/64Msg-buffer, LIN, FPU, MPU, Sound generator, SMC x 6ch, From among the RAM, 8KB can be used as BackUpRAM, Built-in 2D GDC For models with H suffix on part number, the initial status of the clock supervisor is off	On-chip Debug
	MB91F591BS				–								63																							
	MB91F591BH				✓								61																							
	MB91F591BHS				–								63																							
	MB91F592B				✓								61																							
	MB91F592BS				–								63																							
	MB91F592BH				✓								61																							
	MB91F592BHS				–								63																							
	MB91F594B				✓		1088K +64K	72K					61																							
	MB91F594BS				–								63																							
	MB91F594BH				✓								61																							
	MB91F594BHS				–								63																							
	MB91F59AC	128	BGA-320		✓		1600K +64K	264K					61				4	8	12	Reload Timer x 8ch + PPG Timer x 24ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	3		Multi Function Serial x 6ch (LIN/UART SIO/I2C Selectable. However, I2C only supports ch0/ ch1)											
	MB91F59ACS				–								63																							
	MB91F59ACH				✓								61																							
	MB91F59ACHS				–								63																							
	MB91F59BC				✓		2112K +64K	264K					61																							
	MB91F59BCS				–								63																							
	MB91F59BCH				✓								61																							
	MB91F59BCHS				–								63																							

F²MC-16FX – 16bit Microcontrollers

Series Name	Product Name	Maximum Internal Clock Frequency [MHz]	Package [pin]	Operating Voltage: VCC [V]	Sub Clock	Memory Type	ROM [byte]	RAM [byte]	Cache [Kbyte]	DMAC [ch]	Ext. Interrupt [ch]	External Bus	Maximum I/O port [ch]	10bit AD Converter [ch/unit]	12bit AD Converter [ch/unit]	DA Converter [bit x ch]	Timer: Output Compare [ch]	Timer: Free-Run Timer [ch]	Timer: Input Capture [ch]	Timer: Reload Timer [ch]	Timer: PWM Timer [ch]	Timer: PWC Timer [ch]	Timer: PPG Timer [ch]	Timer: Up/Down Counter [ch]	Timer: Other timers [ch]	Serial: I²C [ch]	Serial: UART/SI [ch]	Serial: SIO [ch]	Serial: LIN/UART/SIO [ch]	Communication: CAN [ch]	Communication: USB-Host [ch]	Communication: USB-Function [ch]	LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
AUTOMOTIVE																																				
MB96310	MB96F313AS	56	LQFP-48	3.0 to 5.5	–	FLASH	96K	8K	–	4	11	–	36	12(1)	–	–	2	4	4 +3 (Dedicated for LIN)	4 +1 (Dedicated for PPG)	–	–	14	–	–	–	–	–	3	–	–	–	–	–	LVD, built-in CR Option without CAN	MB96V300C
	MB96F313AW				✓								34																	1						
	MB96F313RS				–								36																	–						
	MB96F313RW				✓								34																	1						
	MB96F315AS				–		160K						36																							
	MB96F315AW				✓								34																							
	MB96F315RS				–								36																							
	MB96F315RW				✓								34																							
MB96320	MB96F326AS	56	LQFP-80	3.0 to 5.5	–	FLASH	288K	12K	–	4	15	✓	66	18(1)	–	–	6	4	12	4 +1 (Dedicated for PPG)	–	–	20	–	–	1	–	–	4	-	–	–	–	–	LVD, built-in CR Option without CAN	MB96V300C
	MB96F326AW				✓								64																	2						
	MB96F326RS				–								66																							
	MB96F326RW				✓								64																							
MB96330	MB96F336US	48	LQFP-144	3.0 to 5.5	–	FLASH	288K	24K	–	10	16	✓	124	36(1)	–	–	12	4	10	4 +1 (Dedicated for PPG)	–	–	20	–	–	2	–	–	8	1	1ch (USB-Host/ USB-Function Selectable)		–	–	LVD, built-in CR	MB96V300C
	MB96F336UW				✓								122																							
	MB96F338RS				–		544K	32K					124	40(1)																3	–	–				
	MB96F338RW				✓								122																							
	MB96F338US				–								120	36(1)																						
	MB96F338UW				✓								118																		1ch (USB-Host/ USB-Function Selectable)					

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