Infineon Technologies - MB95F563HPFT-G-112SNERE2 Datasheet

Welcome to E-XFL.COM

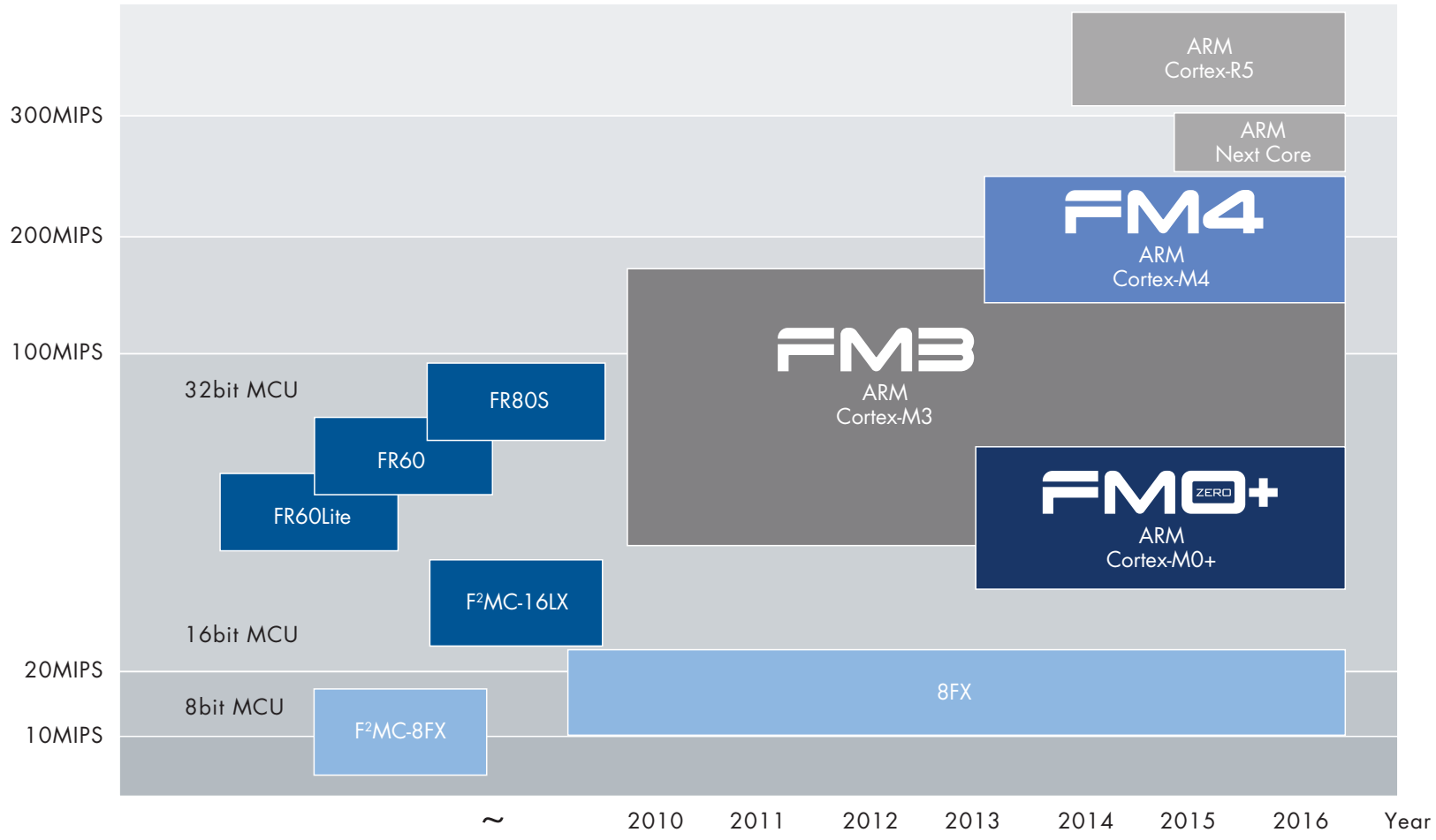
What is "Embedded - Microcontrollers"?

"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.

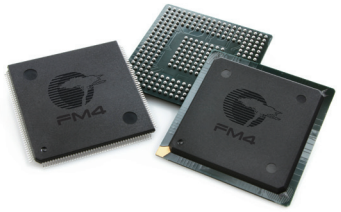
Applications of "Embedded - Microcontrollers"

Details	
Product Status	Obsolete
Core Processor	F²MC-8FX
Core Size	8-Bit
Speed	16MHz
Connectivity	LINbus, UART/USART
Peripherals	POR, PWM, WDT
Number of I/O	16
Program Memory Size	12KB (12K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	496 x 8
Voltage - Supply (Vcc/Vdd)	2.4V ~ 5.5V
Data Converters	A/D 6x8/10b
Oscillator Type	External
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	20-TSSOP (0.173", 4.40mm Width)
Supplier Device Package	20-TSSOP
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/mb95f563hpft-g-112snere2

Consumer and Industrial MCU Core Roadmap

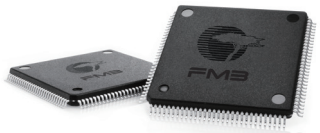


Consumer and Industrial MCU Family



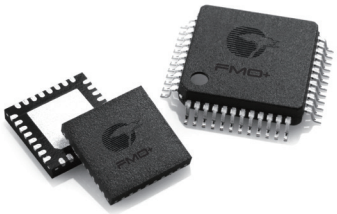
FM4 FAMILY

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.



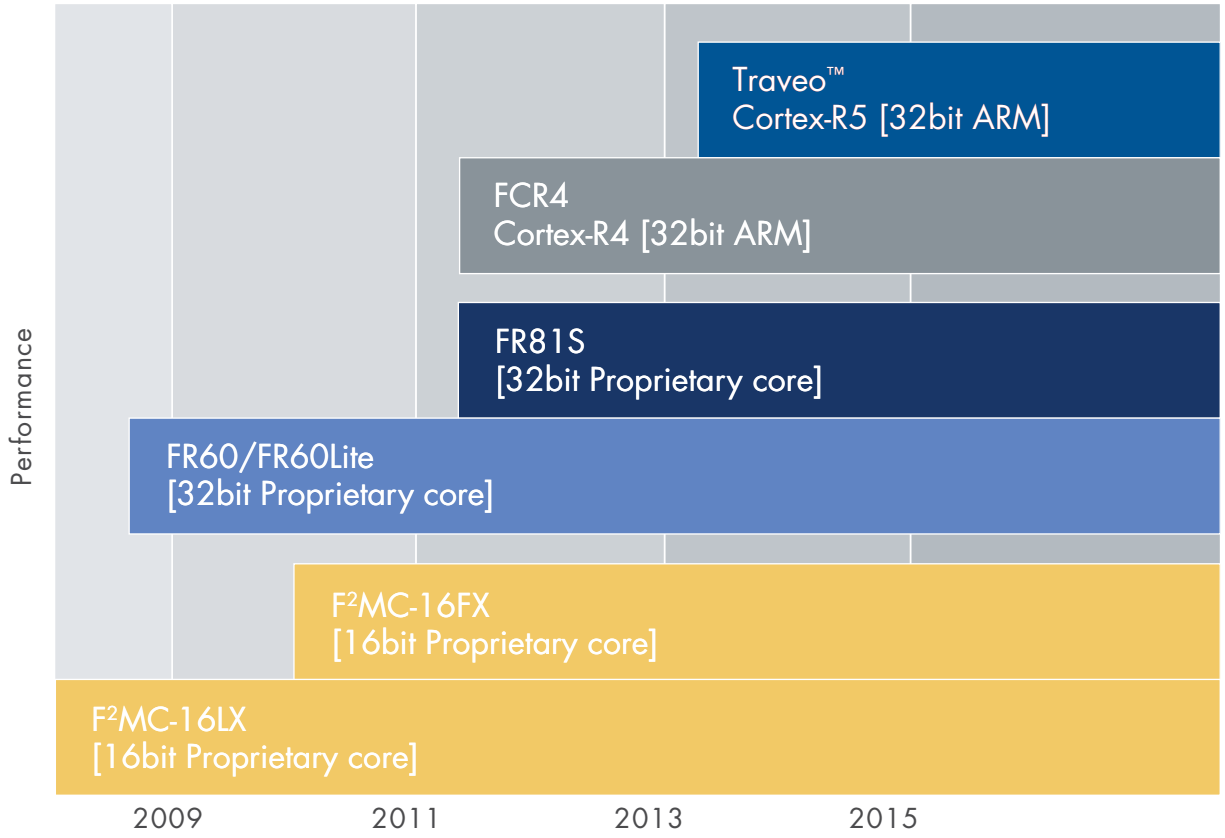
FM0+ FAMILY

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]				
S6E2HG	S6E2HG6E0A	160	LQFP-80	2.7 to 5.5	✓	Main Flash +Work Flash	512K + 32K	64K	–	8	16	✓	63	–	16 (3)	–	Multi-Function Timer x3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 9ch			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				2	–	–	✓	Dual Timer, Real Time Clock, Unique ID, DSTC x 256ch, SDC	On-Chip Debug (SWJ-DP/ ETM)
	S6E2HG6F0A		LQFP-100										80		24 (3)																				
	S6E2HG6G0A		LQFP-120 BGA-121										100																						
	S6E2HG4E0A	160	LQFP-80				256K + 32K	32K	-				63		16 (3)																				
	S6E2HG4F0A		LQFP-100										80		24 (3)																				
	S6E2HG4G0A		LQFP-120 BGA-121										100																						
S6E2HE	S6E2HE6E0A	160	LQFP-80	2.7 to 5.5	✓	Main Flash +Work Flash	512K + 32K	64K	-	8	16	✓	63	–	16 (3)	–	Multi-Function Timer x3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 9ch			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				–	–	–	✓	Dual Timer, Real Time Clock, Unique ID, DSTC x 256ch, SDC	On-Chip Debug (SWJ-DP/ ETM)
	S6E2HE6F0A		LQFP-100										80		24 (3)																				
	S6E2HE6G0A		LQFP-120 BGA-121										100																						
	S6E2HE4E0A	160	LQFP-80				256K + 32K	32K	-				63		16 (3)																				
	S6E2HE4F0A		LQFP-100										80		24 (3)																				
	S6E2HE4G0A		LQFP-120 BGA-121										100																						
S6E2H4	S6E2H46E0A	160	LQFP-80	2.7 to 5.5	✓	Main Flash +Work Flash	512K + 32K	64K	-	8	16	✓	63	–	16 (3)	–	Multi-Function Timer x3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 9ch			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				2	–	–	✓	Dual Timer, Real Time Clock, Unique ID, DSTC x 256ch	On-Chip Debug (SWJ-DP/ ETM)
	S6E2H46F0A		LQFP-100										80		24 (3)																				
	S6E2H46G0A		LQFP-120 BGA-121										100																						
	S6E2H44E0A	160	LQFP-80				256K + 32K	32K	-				63		16 (3)																				
	S6E2H44F0A		LQFP-100										80		24 (3)																				
	S6E2H44G0A		LQFP-120 BGA-121										100																						
S6E2H1	S6E2H16E0A	160	LQFP-80	2.7 to 5.5	✓	Main Flash +Work Flash	512K + 32K	64K	-	8	16	✓	63	–	16 (3)	–	Multi-Function Timer x3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 9ch			Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 3	1	Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)				–	–	–	✓	Dual Timer, Real Time Clock, Unique ID, DSTC x 256ch	On-Chip Debug (SWJ-DP/ ETM)
	S6E2H16F0A		LQFP-100										80		24 (3)																				
	S6E2H16G0A		LQFP-120 BGA-121										100																						
	S6E2H14E0A	160	LQFP-80				256K + 32K	32K	-				63		16 (3)																				
	S6E2H14F0A		LQFP-100										80		24 (3)																				
	S6E2H14G0A		LQFP-120 BGA-121										100																						
S6E2GM w/security	S6E2GM8HHA	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 Time Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, ETH, SDC, Chipher	On-Chip Debug (SWJ-DP/ ETM)
	S6E2GM8JHA		LQFP-176										153		32 (3)																				
	S6E2GM6HHA		LQFP-144				512K	128K					121		24 (3)																				
	S6E2GM6JHA		LQFP-176										153		32 (3)																				
S6E2GM	S6E2GM8H0A	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 Time Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, ETH, SDC	On-Chip Debug (SWJ-DP/ ETM)
	S6E2GM8J0A		LQFP-176										153		32 (3)																				
	S6E2GM6H0A		LQFP-144				512K	128K					121		24 (3)																				
	S6E2GM6J0A		LQFP-176										153		32 (3)																				
S6E2GK w/security	S6E2GK8HHA	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 Time Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, ETH, SDC, Chipher	On-Chip Debug (SWJ-DP/ ETM)
	S6E2GK8JHA		LQFP-176										153		32 (3)																				
	S6E2GK6HHA		LQFP-144				512K	128K					121		24 (3)																				
	S6E2GK6JHA		LQFP-176										153		32 (3)																				
S6E2GK	S6E2GK8H0A	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 Time Clock, Unique ID, DSTC×256ch, Tiny I2S, Smart Card I/F, ETH, SDC	On-Chip Debug (SWJ-DP/ ETM)
	S6E2GK8J0A		LQFP-176										153		32 (3)																				
	S6E2GK6H0A		LQFP-144				512K	128K					121		24 (3)																				
	S6E2GK6J0A		LQFP-176										153		32 (3)																				

** 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]				
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*

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]				
HIGH-PERFORMANCE GROUP																																			
MB9B510R	MB9BF512N	144	QFP-100 LQFP-100 BGA-112	2.7 to 5.5	✓	Main Flash +Work Flash	128K +32K	16K	–	8	16	✓	83	–	16(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 8ch (Reload/PPG/PWM/ PWC Selectable)		QPRC x 3	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)
	MB9BF512R		LQFP-120										103																						
	MB9BF514N		QFP-100 LQFP-100 BGA-112				256K +32K	32K					83																						
	MB9BF514R		LQFP-120										103																						
	MB9BF515N		QFP-100 LQFP-100 BGA-112				384K +32K	48K					83																						
	MB9BF515R		LQFP-120										103																						
	MB9BF516N		QFP-100 LQFP-100 BGA-112				512K +32K	64K					83																						
	MB9BF516R		LQFP-120										103																						
MB9B410R	MB9BF412N	144	QFP-100 LQFP-100 BGA-112	2.7 to 5.5	✓	Main Flash +Work Flash	128K +32K	16K	–	8	16	✓	83	–	16(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 8ch (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)
	MB9BF412R		LQFP-120										103																						
	MB9BF414N		QFP-100 LQFP-100 BGA-112				256K +32K	32K					83																						
	MB9BF414R		LQFP-120										103																						
	MB9BF415N		QFP-100 LQFP-100 BGA-112				384K +32K	48K					83																						
	MB9BF415R		LQFP-120										103																						
	MB9BF416N		QFP-100 LQFP-100 BGA-112				512K +32K	64K					83																						
	MB9BF416R		LQFP-120										103																						
MB9B310R	MB9BF312N	144	QFP-100 LQFP-100 BGA-112	2.7 to 5.5	✓	Main Flash +Work Flash	128K +32K	16K	–	8	16	✓	83	–	16(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 8ch (Reload/PPG/PWM/ PWC Selectable)		QPRC x 3	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)
	MB9BF312R		LQFP-120										103																						
	MB9BF314N		QFP-100 LQFP-100 BGA-112				256K +32K	32K					83																						
	MB9BF314R		LQFP-120										103																						
	MB9BF315N		QFP-100 LQFP-100 BGA-112				384K +32K	48K					83																						
	MB9BF315R		LQFP-120										103																						
	MB9BF316N		QFP-100 LQFP-100 BGA-112				512K +32K	64K					83																						
	MB9BF316R		LQFP-120										103																						
MB9B110R	MB9BF112N	144	QFP-100 LQFP-100 BGA-112	2.7 to 5.5	✓	Main Flash +Work Flash	128K +32K	16K	–	8	16	✓	83	–	16(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 8ch (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)
	MB9BF112R		LQFP-120										103																						
	MB9BF114N		QFP-100 LQFP-100 BGA-112				256K +32K	32K					83																						
	MB9BF114R		LQFP-120										103																						
	MB9BF115N		QFP-100 LQFP-100 BGA-112				384K +32K	48K					83																						
	MB9BF115R		LQFP-120										103																						
	MB9BF116N		QFP-100 LQFP-100 BGA-112				512K +32K	64K					83																						

** 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
BASIC GROUP																																				
MB9B320M	MB9BF321K	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)				–	1ch (USB-Host/ USB-Function Selectable)		–	✓	Dual Timer, Unique ID, Real Time Clock	On-chip Debug (SWJ-DP)
	MB9BF321L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF321M		LQFP-80 BGA-96								23		65		26(2)																					
	MB9BF322K		LQFP-48 QFN-48				128K +32K				14		35		14(2)									QPRC x 1		Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF322L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF322M		LQFP-80 BGA-96								23		65		26(2)																					
	MB9BF324K		LQFP-48 QFN-48				256K +32K	32K			14		35		14(2)									QPRC x 1		Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF324L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF324M		LQFP-80 BGA-96								23		65		26(2)																					
MB9B120M	MB9BF121K	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)				–	–	–	–	✓	Dual Timer, Unique ID, Real Time Clock	On-chip Debug (SWJ-DP)
	MB9BF121L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF121M		LQFP-80 BGA-96								23		65		26(2)																					
	MB9BF122K		LQFP-48 QFN-48				128K +32K				14		35		14(2)									QPRC x 1		Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF122L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF122M		LQFP-80 BGA-96								23		65		26(2)																					
	MB9BF124K		LQFP-48 QFN-48				256K +32K	32K			14		35		14(2)									QPRC x 1		Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF124L		LQFP-64 QFN-64								19		50		23(2)									QPRC x 2		Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable)										
	MB9BF124M		LQFP-80 BGA-96								23		65		26(2)																					
MB9B120J	MB9BF121J	72	LQFP-32 QFN-32	2.7 to 5.5	✓	FLASH	64K	8K	–	4	7	–	23	–	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)				QPRC x 1	1	Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)				–	–	–	–	✓	Dual Timer, Real Time Clock, Unique ID	On-chip Debug (SW-DP)
MB9B520T	MB9BF528S*	60	LQFP-144	2.7 to 5.5	✓	Dual Op. Flash (Main area + Work area)	1M +64K	160K	–	8	32	✓	122	–	24(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 16ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 1	1	Multi Function Serial x 16ch (UART/CSIO/I2C/LIN Selectable)				1	1ch (USB-Host/ USB-Function Selectable)		–	✓	CAN: 32Msg-buffer, Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP/ETM)
	MB9BF528T*		LQFP-176 BGA-192										154											QPRC x 2												
	MB9BF529S*		LQFP-144				1.5M +64K	192K					122											QPRC x 1												
	MB9BF529T*		LQFP-176 BGA-192										154											QPRC x 2												
MB9B420T	MB9BF428S*	60	LQFP-144	2.7 to 5.5	✓	Dual Op. Flash (Main area + Work area)	1M +64K	160K	–	8	32	✓	122	–	24(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 16ch (Reload/PPG/PWM/ PWC Selectable)				QPRC x 1	1	Multi Function Serial x 16ch (UART/CSIO/I2C/LIN Selectable)				1	–	–	–	✓	CAN: 32Msg-buffer, Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID	On-chip Debug (SWJ-DP/ETM)
	MB9BF428T*		LQFP-176 BGA-192										154											QPRC x 2												
	MB9BF429S*		LQFP-144				1.5M +64K	192K					122											QPRC x 1												
	MB9BF429T*		LQFP-176 BGA-192										154											QPRC x 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]	Timer										Serial				Communication			LCD Controller [seg x com]	Three-phase Inverter	Note	Evaluation Device
											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]	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]				
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
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)																				

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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]	I^2C [ch]	UART/SI [ch]	SIO [ch]	LIN/UART/SIO [ch]	CAN [ch]	USB-Host [ch]	USB-Function [ch]				
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/I^2C 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/I^2C 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)
	S6E1A11C0A		LQFP-48 LQFP-52 QFN-48										37		8(1)																				
	S6E1A12B0A		LQFP-32 QFN-32				88K						23		5(1)																				
	S6E1A12C0A		LQFP-48 LQFP-52 QFN-48										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*

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																												

** In development; **Planning*

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																																			
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+3D Graphic Engine, Display Output x 1ch,	
	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, Sound system,	
	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			
	S6J32CALU												128	50(1)																		32 x 4			
	S6J32DAKS		TEQFP -208										120	46(1)																		30 x 4			
	S6J32DAKU												128	50(1)																		32 x 4			
	S6J32DALS		TEQFP -216 (0.4mm pitch)																																	
	S6J32DALU																																			

** In development; **Planning*

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																																				
MB91520	MB91F522B MB91F523B MB91F524B MB91F525B MB91F526B	80	LQFP-64	2.7 to 5.5	* See "part number suffix" in Note	Main Flash +Work Flash	320K+64K 448K+64K 576K+64K 832K+64K 1088K+64K	56K 72K 104K 136K	–	16	16	–	44	–	13(1) 13(1)	8bit x 1	16bit x 6 32bit x 4	16bit x 3 32bit x 1	16bit x 4 32bit x 5	Reload Timer x 7ch + PPG Timer x 21ch (Reload/PPG/PWM/PWC Selectable)	2	–	Multi Function Serial x 8ch (LIN/UART/SIO/I2C Selectable)	3	–	–	–	✓	LIN, FPU, MPU, Tuning RAM MB91520B/D/F/J/K/L series: CAN: 64Msg-buffer x 2ch, 128Msg-buffer x 1ch, MB91520R/U/M/Y series: CAN: 128Msg-buffer x 6ch, FlexRay: 1 unit Details of part number suffix Dual clock system: xWC / xJC; CSV initial value: ON / OFF Single clock system: xSC / xHC; CSV initial value: ON / OFF	On-chip Debug
	MB91F522D MB91F523D MB91F524D MB91F525D MB91F526D		LQFP-80				320K+64K 448K+64K 576K+64K 832K+64K 1088K+64K	56K 72K 104K 136K					56		16(1) 16(1)			16bit x 3 32bit x 2		Reload Timer x 7ch + PPG Timer x 27ch + Base Timer x 1ch (Reload/PPG/PWM/PWC Selectable)			Multi Function Serial x 9ch (LIN/UART/SIO/I2C Selectable)										
	MB91F522F MB91F523F MB91F524F MB91F525F MB91F526F		LQFP-100				320K+64K 448K+64K 576K+64K 832K+64K 1088K+64K	56K 72K 104K 136K					76		16(1) 21(1)	8bit x 2	16bit x 6 32bit x 6	16bit x 3 32bit x 3	16bit x 4 32bit x 6	Reload Timer x 8ch + PPG Timer x 34ch + Base Timer x 1ch (Reload/PPG/PWM/PWC Selectable)			Multi Function Serial x 12ch (LIN/UART/SIO/I2C Selectable)										
	MB91F522J MB91F523J MB91F524J MB91F525J MB91F526J		LQFP-120				320K+64K 448K+64K 576K+64K 832K+64K 1088K+64K	56K 72K 104K 136K					96		16(1) 26(1)					Reload Timer x 8ch + PPG Timer x 38ch + Base Timer x 2ch (Reloa d/PPG/PWM/ PWC Selectable)													
	MB91F522K MB91F523K MB91F524K MB91F525K MB91F526K	80	LQFP-144	2.7 to 5.5	* See "part number suffix" in Note	Main Flash +Work Flash	320K+64K 448K+64K 576K+64K 832K+64K 1088K+64K	56K 72K 104K 136K	–	16	16	✓	120	–	16(1) 32(1)	8bit x 2	16bit x 6 32bit x 6	16bit x 3 32bit x 3	16bit x 4 32bit x 6	Reload Timer x 8ch + PPG Timer x 44ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	2	–	Multi Function Serial x 12ch (LIN/UART/SIO/I2C Selectable)	3	–	–	–	✓						
	MB91F527R MB91F528R		LQFP-144 TEQFP-144				1600K+64K 2112K+64K	192+16K 320K;16K					115																				
	MB91F522L MB91F523L MB91F524L MB91F525L MB91F526L		LQFP-176				320K+64K 448K+64K 576K+64K 832K+64K 1088K+64K	56K 72K 104K 136K					152		16(1) 32(1)					Reload Timer x 8ch + PPG Timer x 48ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)													
	MB91F527U MB91F528U		LQFP-176 TEQFP-176				1600K+64K 2112K+64K	192+16K 320K;16K					147																				
	MB91F527M	128	LQFP-208 TEQFP-208				1600K+64K	192+16K			24		177		32(1) 32(1)		16bit x 6 32bit x 8	16bit x 3 32bit x 8	16bit x 4 32bit x 8	Reload Timer x 8ch + PPG Timer x 64ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	4		Multi Function Serial x 20ch (LIN/UART/SIO/I2C Selectable)										
	MB91F528M						2112K+64K	320K;16K																											
	MB91F527Y		BGA-416				1600K+64K	192+16K					219							Reload Timer x 8ch + PPG Timer x 88ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)													
	MB91F528Y						2112K+64K	320K;16K																											
MB91550	MB91F552	80	LQFP-64	4.5 to 5.5	-	Main Flash +Work Flash	192K+64K	24K	-	8	4	-	30	-	8(1) 4ch S/H(1)	-	-	1	1	Reload Timer ×5ch + PWM Timer ×6ch(2ch×3 pairs) + PWC Timer ×2ch + Base Timer ×4ch (Reload/PPG/PWM/PWC Selectable)	-	-	Multi Function Serial×3ch (UART/SIO/LIN Selectable)	-	1	-	-	-	-	Comparator: 3ch, Slope Compensation: 1ch	On-Chip Debug

** In development; **Planning*

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)]	D/A 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																																				
MB91570	MB91F575B	80	LQFP-144	4.5 to 5.5	✓	Main Flash +Work Flash	576K +64K	48K	–	16	16	✓	109	40(1)	–	8bit x 2	12	6	12	Reload Timer x 7ch (3ch for Periodic Timer Interrupt Occurrence) + PPG Timer x 24ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	2	–	Multi Function Serial x 4ch (LIN/UART/SIO/ I2C Selectable. However, I2C only supports ch0/ ch1)	6	3	–	–	32 x 4	–	CAN: 32/64Msg-buffer, LIN, Sound generator, SMC x 6ch From among the RAM, 8KB can be used as BackUpRAM For models with H suffix on part number, the initial status of the clock supervisor is off	On-chip Debug
	MB91F575BS				–								111																						
	MB91F575BH				✓								109																						
	MB91F575BHS				–								111																						
	MB91F577B				✓		1088K +64K	72K					109																						
	MB91F577BS				–								111																						
	MB91F577BH				✓								109																						
	MB91F577BHS				–								111																						
	MB91F578C				✓		1600K +64K	112K					109																						
	MB91F578CS				–								111																						
	MB91F578CH				✓								109																						
	MB91F578CHS				–								111																						
	MB91F579C				✓		2112K +64K	144K					109																						
	MB91F579CS				–								111																						
	MB91F579CH				✓								109																						
	MB91F579CHS				–								111																						
	MB91F578CM		LQFP-208		✓		1600K +64K	112K					157																						
	MB91F578CSM				–								159																						
	MB91F578CHM				✓								157																						
	MB91F578CHSM				–								159																						
	MB91F579CM				✓		2112K +64K	144K					157																						
	MB91F579CSM				–								159																						
	MB91F579CHM				✓								157																						
	MB91F579CHSM				–								159																						
MB91580	MB91F583ASG	128	LQFP-64	4.5 to 5.5	–	Main Flash +Work Flash	320K +64K	32K	–	8	8	–	44	–	8(1) 7(1) 2(1)	10bit x 1	7	6	4	Reload Timer x 4ch + PPG Timer x 6ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	2	–	Multi Function Serial x 2ch (LIN/UART/SIO/I²C Selectable)	1	–	–	–	✓	CAN: 64Msg-buffer, LIN, FPU, MPU, with no built-in RDC, Models with H or K suffix on part number have no built-in FlexRay. Models with J or K suffix on part number stop the built-in CR oscillator while in standby mode. From among the RAM, 8KB can be used as BackUpRAM	On-chip Debug
	MB91F583ASH																																		
	MB91F583ASJ						448K +64K	48K																											
	MB91F583ASK																																		
	MB91F584ASG						576K +64K	48K																											
	MB91F584ASH																																		
	MB91F584ASJ																																		
	MB91F584ASK																																		
	MB91F585ASG																																		
	MB91F585ASH																																		
	MB91F585ASJ																																		
	MB91F585ASK																																		
	MB91F583AMG	128	LQFP-100	4.5 to 5.5	–	Main Flash +Work Flash	320K +64K	32K	–	8	8	–	76	–	8(1) 7(1) 8(1)	10bit x 1	7	6	4	Reload Timer x 4ch + PPG Timer x 6ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)	2	–	Multi Function Serial x 4ch (LIN/UART/SIO/I2C Selectable)	2	–	–	–	✓	CAN: 64Msg-buffer, LIN, FPU, MPU, with no built-in RDC, Models with H or K suffix on part number have no built-in FlexRay. Models with J or K suffix on part number stop the built-in CR oscillator while in standby mode. From among the RAM, 8KB can be used as BackUpRAM	On-chip Debug
	MB91F583AMH																																		
	MB91F583AMJ						448K +64K	48K																											
	MB91F583AMK																																		
	MB91F584AMG						576K +64K	48K																											
	MB91F584AMH																																		
	MB91F584AMJ																																		
	MB91F584AMK																																		
	MB91F585AMG																																		
	MB91F585AMH																																		
	MB91F585AMJ																																		
	MB91F585AMK																																		
	MB91F585LA		LQFP-144				576K +64K	64K				–	98		8(1) 8(1) 8(1)	–		6	8	Reload Timer x 4ch + PPG Timer x 24ch + Base Timer x 2ch (Reload/PPG/PWM/PWC Selectable)			Multi Function Serial x 5ch (LIN/UART/SIO/I2C Selectable)	3					CAN: 64Msg-buffer, LIN, FPU, MPU, FlexRay, Models with B or D suffix on part number have no built-in RDC. Models with A or B suffix on part number stop the built-in CR oscillator while in standby mode. From among the RAM, 8KB can be used as BackUpRAM	
	MB91F585LB											✓	111			10bit x 1																		
	MB91F585LC											–	98			–																		
	MB91F585LD											✓	111			10bit x 1																		
	MB91F586LA						832K +64K	64K				–	98			–																		
	MB91F586LB											✓	111			10bit x 1																		
	MB91F586LC											–	98			–																		
	MB91F586LD											✓	111			10bit x 1																		
	MB91F587LA						1088K +64K	128K				–	98			–																		
	MB91F587LB											✓	111			10bit x 1																		
	MB91F587LC											–	98			–																		
	MB91F587LD											✓	111			10bit x 1																		

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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: I^2C [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																																				
MB96340	MB96345RS	56	LQFP-100	3.0 to 5.5	–	MASK	160K	8K	–	6	16	✓	82	24(1)	–	–	8	2	8	4 +1 (Dedicated for PPG)	–	16	–	–	–	2	–	–	7	2	–	–	–	–	Option without CAN	MB96V300C
	MB96345RW				✓								80																						
	MB96346RS				–		288K	16K					82																						
	MB96346RW				✓								80																						
	MB96F345DS	40			–	FLASH	160K +64K	8K					82																	1					
	MB96F345DW				✓								80																						
	MB96F346AS	56			–		288K	16K					82																	-					
	MB96F346AW				✓								80																						
	MB96F346RS				–								82																	2					
	MB96F346RW				✓								80																						
	MB96F347AS				–		416K						82																	-					
	MB96F347AW				✓								80																						
	MB96F347RS				–								82																	2					
	MB96F347RW				✓								80																						
	MB96F348AS				–		544K	24K					82																	-					
	MB96F348AW				✓								80																						
	MB96F348RS				–								82																	2					
	MB96F348RW				✓								80																						
	MB96F348HS				–		544K +32K						82																4						
	MB96F348HW				✓								80																						
MB96350	MB96F353AS	56	LQFP-64	3.0 to 5.5	–	FLASH	96K	8K	–	4	13	✓	51	15(1)	–	–	4	4	6 +3 (Dedicated for LIN)	4 +1 (Dedicated for PPG)	–	–	20	–	–	1	–	–	4	1	–	–	–	–	Option without CAN	MB96V300C
	MB96F353AW				✓								49																						
	MB96F353RS				–								51																						
	MB96F353RW				✓								49																						
	MB96F355AS				–		160K						51																						
	MB96F355AW				✓								49																						
	MB96F355RS				–								51																						
	MB96F355RW				✓								49																						
	MB96F356AS				–		288K	12K					51																						
	MB96F356AW				✓								49																						
	MB96F356RS				–								51																						
	MB96F356RW				✓								49																						
MB96370	MB96F378HS	40	LQFP-144	3.0 to 5.5	–	FLASH	544K +32K	28K	–	7	8	✓	120	22(1)	–	–	6	2	8	4 +1 (Dedicated for PPG)	–	–	12	–	–	2	–	–	6	2	–	–	72 x 4	-	SMC x 6ch Sound generator x 2ch	MB96V300C
	MB96F378HW				✓								118																						
	MB96F379RS				–		832K	32K					120																						
	MB96F379RW				✓								118																						
MB96380	MB96384RS	56	LQFP-120	3.0 to 5.5	–	MASK	128K	6K	–	7	8	✓	96	16(1)	–	–	4	2	8	4 +1 (Dedicated for PPG)	5	–	8	–	–	1	–	–	5	1	–	–	65 x 4	–	SMC x 5ch Sound generator x 2ch	MB96V300C
	MB96384RW				✓								94																						
	MB96385RS				–		160K	8K					96																						
	MB96385RW				✓								94																						
	MB96F385RS	40			–	FLASH	160K	6K					96																						
	MB96F385RW				✓								94																						
	MB96F386RS	56			–		288K	16K					96																	2					
	MB96F386RW				✓								94																						
	MB96F387RS				–		416K						96																						
	MB96F387RW				✓								94																						
	MB96F388HS	40			–		544K +32K	28K					96																						
	MB96F388HW				✓								94																						
	MB96F389RS				–		544K +288K	32K					96																						
	MB96F389RW				✓								94																						
MB96390	MB96393RS	40	LQFP-100	3.0 to 5.5	–	MASK	96K	5K	–	–	8	–	76	11(1)	–	–	4	2	4	4 +1 (Dedicated for PPG)	4	–	4	–	–	1	–	–	3	1	–	–	49 x 4	–	SMC x 4ch Sound generator x 1ch	MB96V300C
	MB96393RW				✓								74																						
	MB96395RS				–		160K	8K					76																						
	MB96395RW				✓								74																						
	MB96F395RS				–	FLASH	160K						76																						
	MB96F395RW				✓								74																						

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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									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]				
AUTOMOTIVE																																				
MB96610	MB96F612A MB96F612R MB96F613A MB96F613R MB96F615A MB96F615R	32	LQFP-48	2.7 to 5.5	✓	Dual Op. Flash	32.5K +32K 64.5K +32K 128.5K +32K	4K 10K	–	2	11	–	37 (Single clock) 35 (Dual clock)	16(1)	–	–	5	4	4 +3 (Dedicated for LIN)	2 +1 (Dedicated for PPG)	–	–	8bit x 16 16bit x 8	-	QPRC x 2	–	–	-	3	– 1 – 1 – 1	–	–	–	–	Option without CAN	On-chip Debug
MB96620	MB96F622A MB96F622R MB96F623A MB96F623R MB96F625A MB96F625R	32	LQFP-64	2.7 to 5.5	✓	Dual Op. Flash	32.5K +32K 64.5K +32K 128.5K +32K	4K 10K	–	2	13	–	52 (Single clock) 50 (Dual clock)	21(1)	–	–	6	4	6 +2 (Dedicated for LIN)	2 +1 (Dedicated for PPG)	-	-	8bit x 16 16bit x 8	-	QPRC x 2	1	–	–	3	– 1 - 1 – 1	–	–	–	–	Option without CAN	On-chip Debug
MB96630	MB96F633A MB96F633R MB96F635A MB96F635R MB96F636R MB96F637R	32	LQFP-80	2.7 to 5.5	✓	Dual Op. Flash	64.5K +32K 128.5K +32K 256.5K +32K 384.5K +32K	10K 16K 24K 28K	–	4	15	–	64 (Single clock) 66 (Dual clock)	21(1)	–	–	7	3	6 +1 (Dedicated for LIN)	3	–	–	8bit x 20 16bit x 15	-	QPRC x 2	2	–	–	5	– 1 – 1	–	–	–	–	Option without CAN	On-chip Debug
MB96640	MB96F643A MB96F643R MB96F645A MB96F645R MB96F646R MB96F647R	32	LQFP-100	2.7 to 5.5	✓	Dual Op. Flash	64.5K +32K 128.5K +32K 256.5K +32K 384.5K +32K	10K 16K 24K 28K	–	4	16	–	81 (Single clock) 79 (Dual clock)	24(1)	–	–	7	3	6 +1 (Dedicated for LIN)	5	–	–	8bit x 24 16bit x 16	-	QPRC x 2	2	–	–	6	– 1 – 1	–	–	–	–	Option without CAN	On-chip Debug
MB96650	MB96F653A MB96F653R MB96F655A MB96F655R MB96F656R MB96F657R	32	LQFP-120	2.7 to 5.5	✓	Dual Op. Flash	64.5K +32K 128.5K +32K 256.5K +32K 384.5K +32K	10K 16K 24K 28K	-	4	16	-	101 (Single clock) 99 (Dual clock)	29(1)	-	-	7	3	6 +1 (Dedicated for LIN)	5	-	-	8bit x 32 16bit x 16	-	QPRC x 2	2	-	-	6	- 1 - 1	-	-	-	-	Option without CAN	On-chip Debug
MB96670	MB96F673A MB96F673R MB96F675A MB96F675R	32	LQFP-64	2.7 to 5.5	✓	Dual Op. Flash	64.5K +32K 128.5K +32K	4K	-	2	7	-	50 (Single clock) 48 (Dual clock)	12(1)	-	-	-	2	4	3	-	-	8bit x 8 16bit x 4	-	-	1	-	-	2	- 1 - 1	-	-	24 x 4	-	SMC x 2ch Sound generator Option without CAN	On-chip Debug
MB96680	MB96F683A MB96F683R MB96F685A MB96F685R	32	LQFP-80	2.7 to 5.5	✓	Dual Op. Flash	64.5K +32K 128.5K +32K	4K	-	2	7	-	65 (Single clock) 63 (Dual clock)	14(1)	-	-	-	2	4	3	-	-	8bit x 8 16bit x 4	-	-	1	-	-	2	- 1 - 1	-	-	32 x 4	-	SMC x 2ch Sound generator Option without CAN	On-chip Debug
MB96690	MB96F693A MB96F693R MB96F695A MB96F695R MB96F696R	32	LQFP-100	2.7 to 5.5	✓	Dual Op. Flash	64.5K +32K 128.5K +32K 256.5K +32K	8K 16K	-	4	16	-	79 (Single clock) 77 (Dual clock)	27(1)	-	-	4	2	6	5	-	-	8bit x 14 16bit x 10	-	-	1	-	-	5	- 1 - 1	-	-	36 x 4	-	SMC x 4ch Sound generator x 2ch Option without CAN	On-chip Debug
MB966A0	MB96F6A5A MB96F6A5R MB96F6A6R	32	LQFP-120	2.7 to 5.5	✓	Dual Op. Flash	128.5K +32K 256.5K +32K	8K 16K	-	4	16	-	97 (Single clock) 95 (Dual clock)	32(1)	-	-	4	2	8	5	-	-	8bit x 24 16bit x 12	-	-	1	-	-	5	- 1	-	-	44 x 4	-	SMC x 5ch Sound generator x 2ch Option without CAN	On-chip Debug
MB966B0	MB96F6B5A MB96F6B5R MB96F6B6R	32	LQFP-100	2.7 to 5.5	✓	Dual Op. Flash	128.5K +32K 256.5K +32K	8K 16K	-	4	16	-	79 (Single clock) 77 (Dual clock)	27(1)	-	-	4	2	6	5	-	-	8bit x 16 16bit x 12	-	QPRC x 2	1	-	-	5	- 1	-	-	36 x 4	-	Sound generator x 2ch Option without CAN	On-chip Debug
MB966C0	MB96F6C5A MB96F6C5R MB96F6C6R	32	LQFP-120	2.7 to 5.5	✓	Dual Op. Flash	128.5K +32K 256.5K +32K	8K 16K	-	4	16	-	99 (Single clock) 97 (Dual clock)	32(1)	-	-	4	2	8	5	-	-	8bit x 24 16bit x 12	-	QPRC x 2	1	-	-	5	- 1	-	-	44 x 4	-	Sound generator x 2ch Option without CAN	On-chip Debug

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