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### What is "[Embedded - Microcontrollers](#)"?

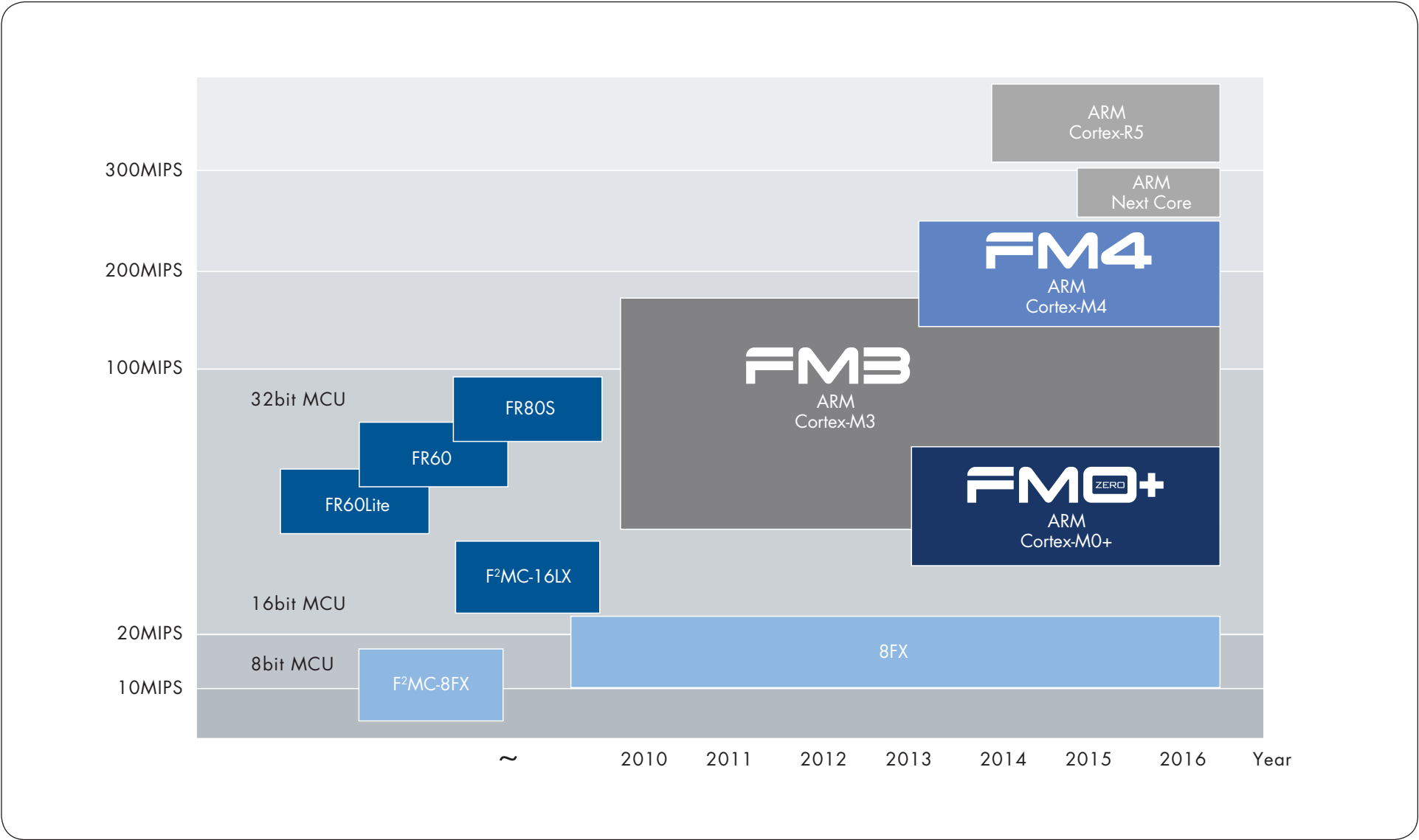
"[Embedded - Microcontrollers](#)" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" 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             | F <sup>2</sup> MC-8FX                                                                                                                                                                 |
| Core Size                  | 8-Bit                                                                                                                                                                                 |
| Speed                      | 16MHz                                                                                                                                                                                 |
| Connectivity               | I <sup>2</sup> C, LINbus, SIO, UART/USART                                                                                                                                             |
| Peripherals                | LVD, POR, PWM, WDT                                                                                                                                                                    |
| Number of I/O              | 21                                                                                                                                                                                    |
| Program Memory Size        | 20KB (20K x 8)                                                                                                                                                                        |
| Program Memory Type        | FLASH                                                                                                                                                                                 |
| EEPROM Size                | -                                                                                                                                                                                     |
| RAM Size                   | 1K 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               | <a href="https://www.e-xfl.com/product-detail/infineon-technologies/mb95f654enpft-g102snere2">https://www.e-xfl.com/product-detail/infineon-technologies/mb95f654enpft-g102snere2</a> |

Consumer and Industrial 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<sup>2</sup>C 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] | I <sup>2</sup> C [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                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2GH6H0A   |                                        | LQFP-144                   |                            |           |             | 512K       | 128K       |               |           |                     |              |                       | 121                          | -                            | 24 (3)                  |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2GH6J0A   |                                        | LQFP-176                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
| 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                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2G36H0A   |                                        | LQFP-144                   |                            |           |             | 512K       | 128K       |               |           |                     |              |                       | 121                          | -                            | 24 (3)                  |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2G36J0A   |                                        | LQFP-176                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
| 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                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2G26HHA   |                                        | LQFP-144                   |                            |           |             | 512K       | 128K       |               |           |                     |              |                       | 121                          | -                            | 24 (3)                  |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2G26JHA   |                                        | LQFP-176                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
| 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                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2G26H0A   |                                        | LQFP-144                   |                            |           |             | 512K       | 128K       |               |           |                     |              |                       | 121                          | -                            | 24 (3)                  |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
|                   | S6E2G26J0A   |                                        | LQFP-176                   |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |
| 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, SDC, 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                   |                              |                              |                         |                                                                                                                                                          |                     |                    |                   |                                                    |                |                |                      |                   |                       |                                                            |               |                                                             |          |                            |                                         |      |                                         |               |                                                                                                                           |                            |                                                                                             |                             |  |  |  |  |  |

## 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     |          |               | 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 <sup>2</sup> C [ch]                                                                                                                                                | UART/SI [ch]                                                                         | SIO [ch]                   | LIN/UART/SIO [ch] | CAN [ch] | USB-Host [ch] |                      |      |                   |
| S6E2C1-E    | S6E2C10H2A       | 200                                    | LQFP-144                 | 2.7 to 5.5                 | ✓         | -                      | 0M         | 256K       | -             | 8         | 32                  | ✓            | 120                   | -                            | 152                          | 12 x 2                  | Multi-Function Timer x3units (Free-Run 3ch/ Output Compare 6ch/ Input Capture 4ch/ PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 6ch Selectable), PPG 9ch | Base Timer x 16ch (Reload/PPG/PWM/ PWC Selectable) | QPRC x 4           | 1                 | Multi Function Serial x 16ch (UART/CSIO/I2C/LIN Selectable)             | -              | -                                       | -                    | ✓                 | Dual Timer, Real Timer Clock, Unique ID, DSTC x 256ch, SDC, I2S 1ch(without 144pin), HDMI-CEC 2ch, High Speed Quad SPI x1(without 144pin), Programmable CRC, Chipper | On-Chip Debug (SWJ-DP/ETM/ HTM)                                                      |                            |                   |          |               |                      |      |                   |
|             | S6E2C10J2A       |                                        | LQFP-176 BGA-192         |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | S6E2C10L2A       |                                        | LQFP-216                 |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
| MB9B560R    | MB9BF566M        | 160                                    | LQFP-80                  | 2.7 to 5.5                 | ✓         | Main Flash +Work Flash | 512K +32K  | 64K        | -             | 8         | 16                  | ✓            | 63                    | -                            | 16(3)                        | 12 x 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)         | 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, Real Time Clock, DSTC x 128ch, Unique ID, SD Card I/F                                                                                 | On-chip Debug (SWJ-DP/ETM)                                                           |                            |                   |          |               |                      |      |                   |
|             | MB9BF566N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      | 80                         |                   |          |               |                      |      |                   |
|             | MB9BF566R        |                                        | LQFP-120 BGA-144         |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      | 100                        |                   |          |               |                      |      |                   |
|             | MB9BF567M        |                                        | LQFP-80                  |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      | 63                         |                   |          |               |                      |      |                   |
|             | MB9BF567N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        | 80         | 24(3)      |               |           |                     |              | 100                   | 16(3)                        |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF567R        |                                        | LQFP-120 BGA-144         |                            |           |                        | 100        |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF568M        |                                        | LQFP-80                  |                            |           |                        | 63         |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF568N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        | 80         |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF568R        |                                        | LQFP-120 BGA-144         |                            |           |                        | 100        |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
| MB9B460R    | MB9BF466M        | 160                                    | LQFP-80                  | 2.7 to 5.5                 | ✓         | Main Flash +Work Flash | 512K +32K  | 64K        | -             | 8         | 16                  | ✓            | 63                    | -                            | 16(3)                        | 12 x 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)         | 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, Real Time Clock, DSTC x 128ch, Unique ID, SD Card I/F | On-chip Debug (SWJ-DP/ETM) |                   |          |               |                      |      |                   |
|             | MB9BF466N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            | 80                |          |               |                      |      |                   |
|             | MB9BF466R        |                                        | LQFP-120 BGA-144         |                            |           |                        | 100        |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF467M        |                                        | LQFP-80                  |                            |           |                        | 63         |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF467N        | LQFP-100 QFP-100 BGA-112               | 80                       | 24(3)                      | 100       | 16(3)                  |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF467R        | LQFP-120 BGA-144                       | 100                      |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF468M        | LQFP-80                                | 63                       |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF468N        | LQFP-100 QFP-100 BGA-112               | 80                       |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
| MB9BF468R   | LQFP-120 BGA-144 | 100                                    |                          |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
| MB9B360R    | MB9BF366M        | 160                                    | LQFP-80                  | 2.7 to 5.5                 | ✓         | Main Flash +Work Flash | 512K +32K  | 64K        | -             | 8         | 16                  | ✓            | 63                    | -                            | 16(3)                        | 12 x 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)         | Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)  | QPRC x 2           | 1                 | Multi Function Serial x 8ch (UART/CSIO/I <sup>2</sup> C/LIN Selectable) | -              | 1ch (USB-Host/ USB-Function Selectable) | -                    | ✓                 | Dual Timer, Real Time Clock, Unique ID, SD Card I/F                                                                                                                  | On-chip Debug (SWJ-DP/ETM)                                                           |                            |                   |          |               |                      |      |                   |
|             | MB9BF366N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      | 80                         |                   |          |               |                      |      |                   |
|             | MB9BF366R        |                                        | LQFP-120 BGA-144         |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      | 100                        |                   |          |               |                      |      |                   |
|             | MB9BF367M        |                                        | LQFP-80                  |                            |           |                        |            |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      | 63                         |                   |          |               |                      |      |                   |
|             | MB9BF367N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        | 80         | 24(3)      |               |           |                     |              | 100                   | 16(3)                        |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF367R        |                                        | LQFP-120 BGA-144         |                            |           |                        | 100        |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF368M        |                                        | LQFP-80                  |                            |           |                        | 63         |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF368N        |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                        | 80         |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |
|             | MB9BF368R        |                                        | LQFP-120 BGA-144         |                            |           |                        | 100        |            |               |           |                     |              |                       |                              |                              |                         |                                                                                                                                                                    |                                                    |                    |                   |                                                                         |                |                                         |                      |                   |                                                                                                                                                                      |                                                                                      |                            |                   |          |               |                      |      |                   |

## 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] | I <sup>2</sup> C [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         | -                   | -            | -                     | 12 x 2                        | 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) | 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 |                            |           |                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                           |                                                   |                     |                    |                                                            |                |                |                |                      |                   |                                                                         |                        |          |                   |          |               |                            |                      |                                                                                                                                                            |                   |                   |    |    |      |                                                                                                                                                           |
|             | MB9BF465K    |                                        | LQFP-48 QFN-48 |                            |           |                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                           |                                                   |                     |                    |                                                            |                |                |                |                      |                   |                                                                         |                        |          |                   |          |               |                            |                      |                                                                                                                                                            |                   |                   |    |    |      |                                                                                                                                                           |
|             | MB9BF465L    |                                        | LQFP-64 QFN-64 |                            |           |                        | 384K +32K  | 48K        |               |           |                     |              |                       |                               |                               |                                                                                                                                                           |                                                   |                     |                    |                                                            |                |                |                |                      |                   |                                                                         |                        | -        | 8                 | -        | -             | 12 x 2                     | 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 |                            |           |                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                           |                                                   |                     |                    |                                                            |                |                |                |                      |                   |                                                                         |                        |          |                   |          |               |                            |                      |                                                                                                                                                            |                   |                   |    |    |      |                                                                                                                                                           |

## 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 [bit] | Ext. Interrupt [bit] | External Bus | Maximum I/O port [bit] | 10bit AD Converter [bit(unit)] | 12bit AD Converter [bit(unit)] | DA Converter [bit x bit]                                                                                                                                   | 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 [bit]                                | i <sup>2</sup> C [bit]        | UART/SIO [ch]             | SIO [ch]      | LIN/UART/SIO [ch] |                            |                      |      |                   |
| 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/I <sup>2</sup> C/LIN Selectable) | 2              | 2ch (USB-Host/ USB-Function Selectable) | -              | ✓                    | CAN: 32Msg-buffer, Dual Timer, Ethernet-MAC x 2ch | On-chip Debu (SWJ-DP/ETM)     |                           |               |                   |                            |                      |      |                   |
|                        | MB9BFD16S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BFD17T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BFD17S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BFD18T    |                                        | LQFP-176 BGA-192 |                            |           |             | 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/I <sup>2</sup> C/LIN Selectable) | -              | 2ch (USB-Host/ USB-Function Selectable) | -              | ✓                    | Dual Timer, Ethernet-MAC x 2ch                    | On-chip Debu (SWJ-DP/ETM)     |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF616S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF617T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF617S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF618T    |                                        | LQFP-176 BGA-192 |                            |           |             | 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/I <sup>2</sup> C/LIN Selectable) | 2              | 2ch (USB-Host/ USB-Function Selectable) | -              | ✓                    | CAN: 32Msg-buffer, Dual Timer                     | On-chip Debu (SWJ-DP/ETM)     |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF516S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF517T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF517S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF518T    |                                        | LQFP-176 BGA-192 |                            |           |             | 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/I <sup>2</sup> C/LIN Selectable) | 2              | -                                       | -              | -                    | ✓                                                 | CAN: 32Msg-buffer, Dual Timer | On-chip Debu (SWJ-DP/ETM) |               |                   |                            |                      |      |                   |
|                        | MB9BF416S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF417T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF417S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF418T    |                                        | LQFP-176 BGA-192 |                            |           |             | 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/I <sup>2</sup> C/LIN Selectable) | -              | 2ch (USB-Host/ USB-Function Selectable) | -              | ✓                    | Dual Timer                                        | On-chip Debu (SWJ-DP/ETM)     |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF316S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF317T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF317S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF318T    |                                        | LQFP-176 BGA-192 |                            |           |             | 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/I <sup>2</sup> C/LIN Selectable) | -              | 2ch (USB-Host/ USB-Function Selectable) | -              | ✓                    | Dual Timer, Ethernet-MAC x 1ch                    | On-chip Debu (SWJ-DP/ETM)     |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF216S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF217T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF217S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF218T    |                                        | LQFP-176 BGA-192 |                            |           |             | 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/I <sup>2</sup> C/LIN Selectable) | -              | -                                       | -              | -                    | ✓                                                 | Dual Timer                    | On-chip Debu (SWJ-DP/ETM) |               |                   |                            |                      |      |                   |
|                        | MB9BF116S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF117T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF117S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF118T    |                                        | LQFP-176 BGA-192 |                            |           |             | 154        | 32(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |
|                        | MB9BF118S    |                                        | LQFP-144         |                            |           |             | 122        | 24(3)      |               |            |                      |              |                        |                                |                                |                                                                                                                                                            |                                                    |                     |                    |                                                                         |                |                                         |                |                      |                                                   |                               |                           |               |                   |                            |                      |      |                   |

## 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 [bit] | Ext. Interrupt [bit] | External Bus | Maximum I/O port [bit] | 10bit AD Converter [bit(unit)] | 12bit AD Converter [bit(unit)] | DA Converter [bit x bit]                                                                                                                                  | Timer                                                                                                                                                      |                                                   |                     |                                                            |                                                            |                                         |                                         |                       | Serial                                                    |                               |                               | Communication                                              |                    |           | Note | Evaluation Device |
|------------------------|--------------|----------------------------------------|------------------|----------------------------|-----------|----------------------------------------|------------|------------|---------------|------------|----------------------|--------------|------------------------|--------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|---------------------|------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------|-----------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------------------|--------------------|-----------|------|-------------------|
|                        |              |                                        |                  |                            |           |                                        |            |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           | Output Compare [bit]                                                                                                                                       | Free-Run Timer [bit]                              | Input Capture [bit] | Reload Timer [bit]                                         | PWM Timer [bit]                                            | PWC Timer [bit]                         | PPG Timer [bit]                         | Up/Down Counter [bit] | Other timers [bit]                                        | I <sup>2</sup> C [bit]        | UART/ISI [bit]                | SIO [bit]                                                  | LIN/UART/SIO [bit] | CAN [bit] |      |                   |
| 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 |                            |           |                                        | 80         |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF505RB   |                                        | LQFP-120         |                            |           |                                        | 100        |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF506NB   |                                        | LQFP-100 BGA-112 |                            |           |                                        | 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 |                            |           |                                        | 80         |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF405RA   |                                        | LQFP-120         |                            |           |                                        | 100        |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF406NA   |                                        | LQFP-100 BGA-112 |                            |           |                                        | 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 |                            |           |                                        | 80         |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF305RB   |                                        | LQFP-120         |                            |           |                                        | 100        |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF306NB   |                                        | LQFP-100 BGA-112 |                            |           |                                        | 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 |                            |           |                                        | 80         |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF104RA   |                                        | LQFP-120         |                            |           |                                        | 100        |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF105NA   |                                        | LQFP-100 BGA-112 |                            |           |                                        | 80         |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF105RA   |                                        | LQFP-120         |                            |           |                                        | 100        |            |               |            |                      |              |                        |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF106NA   |                                        | LQFP-100 BGA-112 |                            |           |                                        | 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                     | -                              | 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)                                                      |                                                            |                                         |                                         |                       |                                                           |                               | QPRC x 1                      | Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable) |                    |           |      |                   |
|                        | MB9BF522K    |                                        | LQFP-48 QFN-48   |                            |           |                                        |            |            |               |            |                      |              | 14                     |                                |                                |                                                                                                                                                           |                                                                                                                                                            | 35                                                |                     | 14(2)                                                      |                                                            |                                         |                                         |                       |                                                           |                               | QPRC x 2                      | Multi Function Serial x 8ch (UART/CSIO/I2C/LIN Selectable) |                    |           |      |                   |
|                        | MB9BF522L    |                                        | LQFP-64 QFN-64   |                            |           |                                        | 19         | 50         |               |            |                      |              | 23(2)                  |                                |                                |                                                                                                                                                           |                                                                                                                                                            | QPRC x 1                                          |                     | Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable) |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF522M    |                                        | LQFP-80 BGA-96   |                            |           |                                        | 23         | 65         |               |            |                      |              | 26(2)                  |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF524K    |                                        | LQFP-48 QFN-48   |                            |           |                                        | 14         | 35         |               |            |                      |              | 14(2)                  |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF524L    |                                        | LQFP-64 QFN-64   |                            |           |                                        | 19         | 50         |               |            |                      |              | 23(2)                  |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |
|                        | MB9BF524M    |                                        | LQFP-80 BGA-96   |                            |           |                                        | 23         | 65         |               |            |                      |              | 26(2)                  |                                |                                |                                                                                                                                                           |                                                                                                                                                            |                                                   |                     |                                                            |                                                            |                                         |                                         |                       |                                                           |                               |                               |                                                            |                    |           |      |                   |

## 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 <sup>2</sup> C [ch]                                                         | UART/SI [ch]               | SIO [ch]      | LIN/UART/SIO [ch] | CAN [ch] |                            |                      |      |                   |
| BASIC GROUP |              |                                        |                              |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
| MB9B320T    | MB9BF328S*   | 60                                     | LQFP-144                     | 2.7 to 5.5                 | ✓         | Dual Op. Flash (Main area + Work area) | 1M +64K    | 160K       | -             | 8         | 32                  | ✓            | -                     | 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<br>QPRC x 2<br>QPRC x 1<br>QPRC x 2 | 1                  | Multi Function Serial x 16ch (UART/CSIO/I2C/LIN 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/ETM)                                                    |                            |               |                   |          |                            |                      |      |                   |
|             | MB9BF328T*   |                                        | LQFP-176 BGA-192             |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
|             | MB9BF329S*   |                                        | LQFP-144                     |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
|             | MB9BF329T*   |                                        | LQFP-176 BGA-192             |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
| MB9B120T    | MB9BF128S*   | 60                                     | LQFP-144                     | 2.7 to 5.5                 | ✓         | Dual Op. Flash (Main area + Work area) | 1M +64K    | 160K       | -             | 8         | 32                  | ✓            | -                     | 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<br>QPRC x 2<br>QPRC x 1<br>QPRC x 2 | 1                  | Multi Function Serial x 16ch (UART/CSIO/I2C/LIN Selectable) | -              | -                                       | -              | -                    | ✓                                                                             | Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID | On-chip Debug (SWJ-DP/ETM) |               |                   |          |                            |                      |      |                   |
|             | MB9BF128T*   |                                        | LQFP-176 BGA-192             |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
|             | MB9BF129S*   |                                        | LQFP-144                     |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
|             | MB9BF129T*   |                                        | LQFP-176 BGA-192             |                            |           |                                        |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
| MB9A420L    | MB9AF421K    | 40                                     | LQFP-48<br>LQFP-52<br>QFN-48 | 2.7 to 5.5                 | ✓         | FLASH                                  | 64K        | 4K         | -             | -         | 14                  | 36           | -                     | 8(1)                          | 10bit x 1                     | Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 3ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable) | Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)  | -                                            | 1                  | Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)  | 1              | -                                       | -              | -                    | ✓                                                                             | CAN: 32Msg-buffer, Dual Timer, Real Time Clock, Unique ID                     | On-chip Debug (SWJ-DP)     |               |                   |          |                            |                      |      |                   |
|             | MB9AF421L    |                                        | LQFP-64 QFN-64               |                            |           |                                        | 19         | 51         |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |
| MB9A120L    | MB9AF121K    | 40                                     | LQFP-48<br>LQFP-52<br>QFN-48 | 2.7 to 5.5                 | ✓         | FLASH                                  | 64K        | 4K         | -             | -         | 14                  | 36           | -                     | 8(1)                          | 10bit x 1                     | Multi-Function Timer x 1unit (Free-Run 3ch/ Output Compare 6ch/ Input Capture 3ch/PPG 3ch/ Waveform Generator 3ch/ AD Activation Compare 3ch Selectable) | Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable)  | -                                            | 1                  | Multi Function Serial x 4ch (UART/CSIO/I2C/LIN Selectable)  | -              | -                                       | -              | -                    | ✓                                                                             | Dual Timer, Real Time Clock, Unique ID                                        | On-chip Debug (SWJ-DP)     |               |                   |          |                            |                      |      |                   |
|             | MB9AF121L    |                                        | LQFP-64 QFN-64               |                            |           |                                        | 19         | 51         |               |           |                     |              |                       |                               |                               |                                                                                                                                                          |                                                    |                                              |                    |                                                             |                |                                         |                |                      |                                                                               |                                                                               |                            |               |                   |          |                            |                      |      |                   |

## 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 <sup>2</sup> C [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       |            | -          | 8             | 8         | -                   | 51           |                       | 9(2)                          | -                             | Multi-Function Timer x 1unit<br>(Free-Run 3ch/<br>Output Compare 6ch/<br>Input Capture 4ch/PPG 3ch/<br>Waveform Generator 3ch/<br>AD Activation Compare 3ch Selectable) |                     |                     |                            |                            |                                                                                                                                                                         |                                                                                                                                                                          |                            | Base Timer x 8ch<br>(Reload/PPG/PWM/<br>PWC Selectable) | QPRC x 2          | 1                     | Multi Function Serial x 8ch<br>(UART/CSIO/I2C/LIN Selectable) |               |                   | -        | 1ch<br>(USB-Host/<br>USB-Function Selectable) | -                    | ✓    | Dual Timer        | On-chip Debug (SWJ-DP) |                                                                                                                                                                          |                            |
|             | MB9AF311MA   |                                        | LQFP-80                    |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 11                                                                                                                                                                      | 66                  | 12(3)               | On-chip Debug (SWJ-DP/ETM) |                            |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          |                            |
|             | 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)                       | On-chip Debug (SWJ-DP)                                                                                                                                                  |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          |                            |
|             | MB9AF312MA   |                                        | LQFP-80                    |                            |           |             |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                                         | 11                  | 66                  | 12(3)                      | On-chip Debug (SWJ-DP/ETM) |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          |                            |
|             | MB9AF312NA   |                                        | LQFP-100 QFP-100 BGA-112   |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 256K                                                                                                                                                                    | 16                  | ✓                   | 83                         | -                          | 16(3)                                                                                                                                                                   | Multi-Function Timer x 2units<br>(Free-Run 3ch/<br>Output Compare 6ch/<br>Input Capture 4ch/PPG 3ch/<br>Waveform Generator 3ch/<br>AD Activation Compare 3ch Selectable) | On-chip Debug (SWJ-DP/ETM) |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          |                            |
|             | MB9AF314LA   |                                        | LQFP-64 QFN-64             |                            |           |             |            |            |               |           |                     |              |                       |                               |                               |                                                                                                                                                                         | 7                   | -                   | 51                         | 9(2)                       | Multi-Function Timer x 1unit<br>(Free-Run 3ch/<br>Output Compare 6ch/<br>Input Capture 4ch/PPG 3ch/<br>Waveform Generator 3ch/<br>AD Activation Compare 3ch Selectable) | On-chip Debug (SWJ-DP)                                                                                                                                                   |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          |                            |
|             | MB9AF314MA   |                                        | LQFP-80                    |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 11                                                                                                                                                                      | 66                  | 12(3)               | 32K                        | 384K                       | 16                                                                                                                                                                      | ✓                                                                                                                                                                        | 83                         |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   | 16(3)                  | Multi-Function Timer x 2units<br>(Free-Run 3ch/<br>Output Compare 6ch/<br>Input Capture 4ch/PPG 3ch/<br>Waveform Generator 3ch/<br>AD Activation Compare 3ch Selectable) | On-chip Debug (SWJ-DP/ETM) |
|             | MB9AF314NA   |                                        | LQFP-100 QFP-100 BGA-112   |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 16                                                                                                                                                                      | 83                  | 16(3)               |                            |                            |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          | On-chip Debug (SWJ-DP)     |
|             | MB9AF315MA   |                                        | LQFP-80                    |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 11                                                                                                                                                                      | 66                  | 12(3)               |                            |                            |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          | On-chip Debug (SWJ-DP/ETM) |
|             | MB9AF315NA   |                                        | LQFP-100 QFP-100 BGA-112** |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 16                                                                                                                                                                      | 83                  | 16(3)               |                            |                            |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          | On-chip Debug (SWJ-DP/ETM) |
|             | MB9AF316MA   |                                        | LQFP-80                    |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 11                                                                                                                                                                      | 66                  | 12(3)               |                            |                            |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          | On-chip Debug (SWJ-DP)     |
|             | MB9AF316NA   |                                        | LQFP-100 QFP-100 BGA-112** |                            |           |             |            |            |               |           |                     |              |                       |                               |                               | 512K                                                                                                                                                                    | 16                  | 83                  | 16(3)                      | On-chip Debug (SWJ-DP/ETM) |                                                                                                                                                                         |                                                                                                                                                                          |                            |                                                         |                   |                       |                                                               |               |                   |          |                                               |                      |      |                   |                        |                                                                                                                                                                          |                            |

## 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 |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|             |              |                                        |                            |                            |           |                        |            |            |               |           |                     |              |                                                                                                                                                           |                               |                                                                                                                                                           |                         | 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 <sup>2</sup> C [ch]       | UART/SI [ch]           | SIO [ch]                                          | LIN/UART/SIO [ch] | CAN [ch] |                                                            |                      |      |                   | USB-Host [ch] | USB-Function [ch] |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 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) |                         | On-chip Debug (SWJ-DP/ETM)                                                                                                                               |                                                   |                    |                   |                                                            |                |                                         |                      |                   |                             |                        |                                                   |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF111NA   |                                        | LQFP-100 QFP-100 BGA-112   |                            |           |                        |            |            |               |           | 16                  | ✓            | 83                                                                                                                                                        |                               | 16(3)                                                                                                                                                     |                         | 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)                            |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF112LA   | 40                                     | LQFP-64 QFN-64             |                            |           |                        | 128K       | 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)                            |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF112MA   |                                        | 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)                                                                                                                                    |                         |                                                                                                                                                          |                                                   |                    |                   |                                                            |                |                                         |                      |                   |                             |                        |                                                   |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF112NA   |                                        | LQFP-100 QFP-100 BGA-112   |                            |           |                        | 16         |            |               |           | ✓                   | 83           | 16(3)                                                                                                                                                     |                               | 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/ETM)                                                                                                                               |                                                   |                    |                   |                                                            |                |                                         |                      |                   |                             |                        |                                                   |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF114LA   | 40                                     | LQFP-64 QFN-64             |                            |           |                        | 256K       | 32K        | -             | 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) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | 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/ETM)                                                                                                                               |                                                   |                    |                   |                                                            |                |                                         |                      |                   |                             |                        |                                                   |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF114NA   |                                        | LQFP-100 QFP-100 BGA-112   |                            |           |                        |            |            |               |           | 16                  | 83           | 16(3)                                                                                                                                                     |                               |                                                                                                                                                           |                         | On-chip Debug (SWJ-DP)                                                                                                                                   |                                                   |                    |                   |                                                            |                |                                         |                      |                   |                             |                        |                                                   |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             | MB9AF115MA   |                                        | LQFP-80                    |                            |           |                        | 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                    |                            |           |                        | 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 QFN-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                  |                            |           |                        |            |            |               |           |                     |              |                                                                                                                                                           |                               |                                                                                                                                                           |                         |                                                                                                                                                          |                                                   |                    |                   |                                                            |                |                                         |                      |                   |                             |                        |                                                   |                   |          |                                                            |                      |      |                   |               |                   |            |                                                   |          |   |                                                            |   |   |   |   |   |            |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## FM3 Family – 32bit Microcontrollers

[illegible]

## 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 <sup>2</sup> C [ch] | UART/SI [ch] | SIO [ch]      | LIN/UART/SIO [ch] | CAN [ch] |                            |                                                                               |                        |                   | USB-Host [ch] | USB-Function [ch]                                 |   |                                                   |                                                                     |   |                                                                     |   |   |   |   |   |   |   |   |   |                                                                               |                                                                               |                            |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |
| 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/I <sup>2</sup> C 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           |                            |           |                                        |            |            |               |           | 8                   | -            | 51                    |                              | 12(2)                        |                         |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               |                        |                   |               |                                                   |   |                                                   |                                                                     |   |                                                                     |   |   |   |   |   |   |   |   |   |                                                                               |                                                                               |                            |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |
|                 | MB9AF342MB               |                                        | LQFP-80 BGA-96           |                            |           |                                        | 128K +32K  | 32K        |               |           | 11                  | -            | 66                    | 17(2)                        | -                            |                         |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               | -                      | -                 | -             | Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable) | - | 1                                                 | Multi Function Serial x 8ch (UART/CSIO/I <sup>2</sup> C 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/ETM) |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |
|                 | MB9AF342NB               |                                        | LQFP-100 QFP-100 BGA-112 |                            |           |                                        | 16         |            |               |           | ✓                   | 83           | 24(2)                 |                              |                              |                         |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               |                        |                   |               |                                                   |   |                                                   |                                                                     |   |                                                                     |   |   |   |   |   |   |   |   |   |                                                                               |                                                                               |                            |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |
|                 | MB9AF344LB               |                                        | LQFP-64 QFN-64           |                            |           |                                        | 8          |            |               |           | -                   | 51           | 12(2)                 |                              |                              |                         |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               |                        |                   |               |                                                   |   |                                                   |                                                                     |   |                                                                     |   |   |   |   |   |   |   |   |   |                                                                               |                                                                               |                            |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |
|                 | 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/I <sup>2</sup> C 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            | 8                     | -                            | 51                           | -                       |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               | 12(2)                  | -                 | -             | -                                                 | - | Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable) | -                                                                   | 1 | Multi Function Serial x 8ch (UART/CSIO/I <sup>2</sup> C Selectable) | - | - | - | - | - | - | - | - | - | Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID | On-chip Debug (SWJ-DP/ETM)                                                    |                            |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |
|                 | 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)                   |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               | -                      |                   |               |                                                   |   |                                                   |                                                                     |   |                                                                     |   |   |   |   |   |   |   |   |   |                                                                               | -                                                                             | -                          | - | Base Timer x 8ch (Reload/PPG/PWM/ PWC Selectable) | - | 1 | Multi Function Serial x 8ch (UART/CSIO/I <sup>2</sup> C Selectable) | - | - | - | - | - | - | - | - | - | - | - | Dual Timer, HDMI-CEC/Remote Control Reception x 2, Real Time Clock, Unique ID | 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)                   |                     |                     |                    |                                                   |                                                   |                |                                                                     |                                                                     |                                         |                       |              |               |                   |          |                            |                                                                               |                        |                   |               |                                                   |   |                                                   |                                                                     |   |                                                                     |   |   |   |   |   |   |   |   |   |                                                                               |                                                                               |                            |   |                                                   |   |   |                                                                     |   |   |   |   |   |   |   |   |   |   |   |                                                                               |                            |

| 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 [bit]                                    | Ext. Interrupt [bit]                          | External Bus | Maximum I/O port [bit]      | 10bit AD Converter [bit(unif)] | 12bit AD Converter [bit(unif)] | DA Converter [bit x ch] | Timer                                                                                                         |                                                                                                               |                     |                    |                 | Serial          |                 |                       | Communication      |                        |               | LCD Controller [seg x com] | Three-phase Inverter | Note                | Evaluation Device                                                                                             |                                                                                                               |                   |           |
|-----------------|--------------|----------------------------------------|-----------------------------------------|----------------------------|-----------------------------------------------|----------------|------------|------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|--------------|-----------------------------|--------------------------------|--------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|-----------------|-----------------|-----------------------|--------------------|------------------------|---------------|----------------------------|----------------------|---------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------|-----------|
|                 |              |                                        |                                         |                            |                                               |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         | Output Compare [bit]                                                                                          | Free-Run Timer [bit]                                                                                          | Input Capture [bit] | Reload Timer [bit] | PWM Timer [bit] | PWC Timer [bit] | PPG Timer [bit] | Up/Down Counter [bit] | Other timers [bit] | I <sup>2</sup> C [bit] | UART/SI [bit] |                            |                      |                     |                                                                                                               | SIO [bit]                                                                                                     | LINUART/SIO [bit] | CAN [bit] |
| LCD CONTROLLERS |              |                                        |                                         |                            |                                               |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95610H        | MB95F613H    | 16                                     | LQFP-80                                 | 2.4 to 5.5                 | ✓                                             | Dual Op. Flash | 12K        | 512        |                                               |                                               |                                               |              | 40                          | 4(1)                           | -                              | -                       | -                                                                                                             | Reload Timer x 1ch<br>+ 8/16bit Compound Timer x 2ch<br>(Interval Timer/PWM/PWC/<br>Input Capture Selectable) | 2                   | -                  | -               | 1               | 2               | -                     | -                  | -                      | -             | -                          | -                    | 52 x 4<br>or 48 x 8 | -                                                                                                             | Clock Supervisor                                                                                              | On-chip Debug     |           |
|                 | MB95F613K    |                                        |                                         |                            |                                               |                |            | 41         |                                               | Low-voltage Detection Reset, Clock Supervisor |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F614H    |                                        |                                         |                            |                                               |                |            | 40         |                                               | Clock Supervisor                              |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F614K    |                                        |                                         |                            |                                               |                | 20K        | 1024       | -                                             | -                                             | 8                                             | -            | 41                          |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               | Low-voltage Detection Reset, Clock Supervisor                                                                 |                   |           |
|                 | MB95F616H    |                                        |                                         |                            |                                               |                | 36K        | 1024       |                                               | 40                                            | Low-voltage Detection Reset, Clock Supervisor |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95710M        | MB95F616K    |                                        | 41                                      |                            | Low-voltage Detection Reset, Clock Supervisor |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F714J    | 16                                     | LQFP-80                                 | 1.8 to 5.5                 | ✓                                             | Dual Op. Flash | 20K        | 512        |                                               |                                               |                                               |              | 75                          | -                              | 8(1)                           | -                       | -                                                                                                             | Reload Timer x 1ch<br>+ 8/16bit Compound Timer x 2ch<br>(Interval Timer/PWM/PWC/<br>Input Capture Selectable) | 2                   | -                  | -               | 1               | 3               | -                     | -                  | -                      | -             | -                          | 40 x 4<br>or 36 x 8  | -                   | Clock Supervisor                                                                                              | On-chip Debug                                                                                                 |                   |           |
|                 | MB95F714M    |                                        |                                         |                            |                                               |                |            | 74         |                                               | Low-voltage Detection Reset, Clock Supervisor |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F716J    |                                        |                                         |                            |                                               |                |            | 75         |                                               | Clock Supervisor                              |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F716M    |                                        |                                         |                            |                                               |                | 36K        | 1K         | -                                             | -                                             | 8                                             | -            | 74                          |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     | Low-voltage Detection Reset, Clock Supervisor                                                                 |                                                                                                               |                   |           |
| MB95F718J       |              |                                        |                                         |                            |                                               |                | 75         |            | Low-voltage Detection Reset, Clock Supervisor |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95770M        | MB95F718M    |                                        | 74                                      |                            | Clock Supervisor                              |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F774J    | 16                                     | LQFP-64                                 | 1.8 to 5.5                 | ✓                                             | Dual Op. Flash | 20K        | 512        |                                               |                                               |                                               |              | 59                          | -                              | 8(1)                           | -                       | -                                                                                                             | Reload Timer x 1ch<br>+ 8/16bit Compound Timer x 2ch<br>(Interval Timer/PWM/PWC/<br>Input Capture Selectable) | 2                   | -                  | -               | 1               | 3               | -                     | -                  | -                      | -             | -                          | 32 x 4<br>or 28 x 8  | -                   | Low-voltage Detection Reset, Clock Supervisor                                                                 | On-chip Debug                                                                                                 |                   |           |
|                 | MB95F774M    |                                        |                                         |                            |                                               |                |            | 58         |                                               | Clock Supervisor                              |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F776J    |                                        |                                         |                            |                                               |                |            | 59         |                                               | Low-voltage Detection Reset, Clock Supervisor |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F776M    |                                        |                                         |                            |                                               |                | 36K        | 1K         | -                                             | -                                             | 8                                             | -            | 58                          |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     | Low-voltage Detection Reset, Clock Supervisor                                                                 |                                                                                                               |                   |           |
| MB95F778J       |              |                                        |                                         |                            |                                               |                | 59         |            | Clock Supervisor                              |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95778M        | MB95F778M    |                                        | 58                                      |                            | Clock Supervisor                              |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F778M    |                                        | 58                                      |                            | Low-voltage Detection Reset, Clock Supervisor |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F778M    |                                        | 58                                      |                            | Clock Supervisor                              |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F778M    |                                        | 58                                      |                            | Low-voltage Detection Reset, Clock Supervisor |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F778M    |                                        | 58                                      |                            | Clock Supervisor                              |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| INVERTER        |              |                                        |                                         |                            |                                               |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95630H        | MB95F632H    | 16                                     | LQFP-32<br>SH-DIP-32<br>QFN-32          | 2.4 to 5.5                 | ✓                                             | Dual Op. Flash | 8K         | 256        |                                               |                                               |                                               |              | 28                          | 8(1)                           | -                              | -                       | -                                                                                                             | Reload Timer x 1ch<br>+ 8/16bit Compound Timer x 2ch<br>(Interval Timer/PWM/PWC/<br>Input Capture Selectable) | 3                   | -                  | 1               | 1               | 1               | -                     | 1                  | -                      | -             | -                          | -                    | -                   | ✓                                                                                                             | Low-voltage Detection Reset,<br>Multi-pulse Generator<br>(Reload/PPG/Waveform Sequencer),<br>Clock Supervisor | On-chip Debug     |           |
|                 | MB95F632K    |                                        |                                         |                            |                                               |                |            | 29         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F633H    |                                        |                                         |                            |                                               |                |            | 28         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F633K    |                                        |                                         |                            |                                               |                |            | 29         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F634H    |                                        |                                         |                            |                                               |                |            | 28         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F634K    |                                        |                                         |                            |                                               |                |            | 29         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F636H    |                                        |                                         |                            |                                               |                |            | 28         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95690K        | MB95F636K    |                                        | 29                                      |                            |                                               |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F694K    | 16                                     | LQFP-44<br>LQFP-48<br>LQFP-52<br>QFN-48 | 2.88 to 5.5                | ✓                                             | Dual Op. Flash | 20K        | 512        |                                               |                                               |                                               | 45           | 12(1)<br>LQFP44<br>only: 41 | -                              | -                              | -                       | Reload Timer x 1ch<br>+ 8/16bit Compound Timer x 2ch<br>(Interval Timer/PWM/PWC/<br>Input Capture Selectable) | 3                                                                                                             | -                   | 1                  | 1               | 1               | -               | 1                     | -                  | -                      | -             | -                          | -                    | ✓                   | Low-voltage Detection Reset,<br>Multi-pulse Generator<br>(Reload/PPG/Waveform Sequencer),<br>Clock Supervisor | On-chip Debug                                                                                                 |                   |           |
|                 | MB95F696K    |                                        |                                         |                            |                                               |                | 36K        | 1K         | -                                             | -                                             | 8                                             | -            |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               | 45                |           |
|                 | MB95F698K    |                                        |                                         |                            |                                               |                | 60K        | 2K         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| STANDARD        |              |                                        |                                         |                            |                                               |                |            |            |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
| MB95560H        | MB95F562H    | 16                                     | SOP-20<br>TSSOP-20<br>QFN-32            | 2.4 to 5.5                 | ✓                                             | Dual Op. Flash | 8K         | 240        |                                               |                                               |                                               |              | 16                          | 6(1)                           | -                              | -                       | -                                                                                                             | 8/16bit Compound Timer x 2ch<br>(Interval Timer/PWM/PWC/<br>Input Capture Selectable)                         | -                   | -                  | -               | -               | -               | -                     | 1                  | -                      | -             | -                          | -                    | -                   | -                                                                                                             | Clock Supervisor                                                                                              | On-chip Debug     |           |
|                 | MB95F562K    |                                        |                                         |                            |                                               |                |            | 17         |                                               | Low-voltage Detection Reset, Clock Supervisor |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |
|                 | MB95F563H    |                                        |                                         |                            |                                               |                |            | 16         |                                               |                                               |                                               |              |                             |                                |                                |                         |                                                                                                               |                                                                                                               |                     |                    |                 |                 |                 |                       |                    |                        |               |                            |                      |                     |                                                                                                               |                                                                                                               |                   |           |

# 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 |               |                   | 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] | LCD Controller [seg x com] |      |                   |  |  |
| CAN/AUTOMOTIVE |              |                                                           |               |                            |           |                        |              |                                                           |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
| S6J3110        | S6J3118HA    | 96                                                        | TEQFP -144    | 4.5 to 5.25                | -         | Main Flash +Work Flash | 576K + 48K   | TC-RAM: 32KB System<br>- RAM: 16KB Backup<br>- RAM: 8KB   | Instruction: 16<br>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<br>- RAM: 16KB Backup<br>- RAM: 8KB   |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311AHA    |                                                           |               |                            |           |                        | 1088K + 48K  | TC-RAM: 64KB System<br>- RAM: 16KB Backup<br>- RAM: 8KB   |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311BHA    | 144                                                       | TEQFP -176    |                            |           |                        | 1600K + 112K | 192K                                                      |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                | 64(2)                                                 | Multi Function Serial x 22ch (LIN/UART/SIO Selectable) | CAN - FD x 2ch    |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311CHA    |                                                           |               |                            |           |                        | 2112K + 112K | 256K                                                      |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311DHA    |                                                           |               |                            |           |                        | 3136K + 112K | 320K                                                      |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311EHA    |                                                           |               |                            |           |                        | 4160K + 112K | TC-RAM: 64KB System<br>- RAM: 256KB Backup<br>- RAM: 64KB |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311BJA    |                                                           |               |                            |           |                        | 1600K + 112K | 192K                                                      |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311CJA    |                                                           |               |                            |           |                        | 2112K + 112K | 256K                                                      |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
|                | S6J311DJA    |                                                           |               |                            |           |                        | 3136K + 112K | 320K                                                      |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |
| S6J311EJA      | 4160K + 112K | TC-RAM: 64KB System<br>- RAM: 256KB Backup<br>- RAM: 64KB |               |                            |           |                        |              |                                                           |                             |           |                     |              |                       |                              |                                           |                         |                     |                     |                    |                                                         |                |                |                                                       |                                                        |                   |          |              |          |                                                |               |               |                   |                            |      |                   |  |  |

# 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 |          | 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<br>- RAM: 16KB Backup<br>- RAM: 8KB                | Instruction: 16<br>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<br>- RAM: 16KB Backup<br>- RAM: 8KB                |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J312AHA                |                                        |                          |                                        |           |                        | 1088K +112K  | TC-RAM: 64KB System<br>- RAM: 16KB Backup<br>- RAM: 8KB                |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
| S6J3200        | S6J32AAKS                | 160                                    | TEQFP -208               | 1.1 to 1.3<br>3.0 to 3.6<br>4.5 to 5.5 | ✓         | Main Flash +Work Flash | 1088K + 112K | TC-RAM: 64KB System<br>- RAM: 128KB Backup<br>- RAM: 16KB VRAM: 1024KB | Instruction: 16<br>Data: 16 | 16        | 16                  | -            | 120                   | 46(1)                          | -                                         | -                       | 24                  | 12                  | 24                 | Reload Timer x 14ch<br>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                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32AALS                |                                        | TEQFP -216 (0.4mm pitch) |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       | 50(1)                          |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          | 32 x 4        |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32AALU                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32BAKS                |                                        | TEQFP -208               |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       | 46(1)                          |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          | 30 x 4        |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32BAKU                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32BALS                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32BALU                |                                        | TEQFP -216 (0.4mm pitch) |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       | 50(1)                          |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          | 32 x 4        |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32CAKS                |                                        | TEQFP -208               |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       | 46(1)                          |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          | 30 x 4        |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32CAKU                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32CALS                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32CALU                |                                        | TEQFP -216 (0.4mm pitch) |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       | 50(1)                          |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          | 32 x 4        |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32DAKS                |                                        | TEQFP -208               |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       | 46(1)                          |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          | 30 x 4        |          |                                                                                                                          |               |                   |                   |          |               |                   |
|                | S6J32DAKU                |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
| S6J32DALS      |                          |                                        |                          |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |
| S6J32DALU      | TEQFP -216 (0.4mm pitch) | 50(1)                                  | 32 x 4                   |                                        |           |                        |              |                                                                        |                             |           |                     |              |                       |                                |                                           |                         |                     |                     |                    |                                                                                |                |                |                                                            |                      |                   |          |               |          |                                                                                                                          |               |                   |                   |          |               |                   |

## FCR4 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/SPI [ch] | SIO [ch] | LIN/UART/SIO [ch] | CAN [ch]      | USB-Host [ch] | USB-Function [ch] |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                   |
| HYBRID AUTOMOTIVE INSTRUMENTS CLUSTER |              |                                        |               |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                     |                     |                    |                   |                |                |                |                      |                   |          |               |          |                   |               |               |                   |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                   |
| MB9DF125                              | MB9DF125PMC  | 128                                    | LQFP-176      | 1.1 to 1.3<br>3.0 to 5.5   | ✓         | FLASH       | 1088       | 128        | 8             | 8         | 32                  | -            | 123                   | 50(1)                        | -                            | -                       | 8                   | 8                   | 8                  | 10                | -              | -              | 24             | 2                    | -                 | 1        | 2             | 3        | 2                 | 2             | -             | -                 | -                                                                                                                                                                                                                                                                                                                                          | ARM Cortex R4, SHE (Secure Hardware Extension), Real Time Clock, Stepper Motor Controller (SMC): 4 ch, Data Flash: 48KB, Windows Watchdog, Clock supervisor, Sound Generator, I2S: 2 ch, Quad SPI Flash Interface: 1 ch, NMI (intern/extern): 32/1 ch, CRC Hardware Module: 1 ch, Protection Unit: MPU, PPU, TPU, various Power Down modes                                                                                                                                                                                                                                                                                                                              | On-chip Debug |                   |
|                                       | MB9DF125EPMC |                                        |               |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                     |                     |                    |                   |                |                |                |                      |                   |          |               |          |                   |               |               |                   | ARM Cortex R4, SHE (Secure Hardware Extension), Real Time Clock, Stepper Motor Controller (SMC): 6 ch, Data Flash: 48KB, Windows Watchdog, Clock supervisor, Sound Generator, I2S: 2 ch, Quad SPI Flash Interface: 1 ch, NMI (intern/extern): 32/1 ch, CRC Hardware Module: 1 ch, Protection Unit: MPU, PPU, TPU, various Power Down modes | On-chip Debug                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                   |
| MB9DF126                              | MB9DF126BPMC | 128                                    | LQFP-176      | 1.1 to 1.3<br>3.0 to 5.5   | ✓         | FLASH       | 2176       | 208        | 16            | 8         | 32                  | -            | 110                   | 50(1)                        | -                            | -                       | 8                   | 8                   | 8                  | 10                | -              | -              | 24             | 2                    | -                 | 1        | 2             | 3        | 2                 | 3             | -             | -                 | -                                                                                                                                                                                                                                                                                                                                          | ARM Cortex R4, APIX Remote handler with 2 ch AIC (APIX Inter Connect), APIX1 Phy: 1 ch, Real Time Clock, Stepper Motor Controller (SMC): 6 ch, Data Flash: 64KB, Windows Watchdog, Clock supervisor, Sound Generator, I2S: 2 ch, Quad SPI Flash Interface: 1 ch, NMI (intern/extern): 32/1 ch, CRC Hardware Module: 1 ch, Protection Unit: MPU, PPU, TPU, various Power Down modes                                                                                                                                                                                                                                                                                      | On-chip Debug |                   |
| MB9EF226                              | MB9EF226PMC  | 128                                    | LQFP-176      | 1.1 to 1.3<br>3.0 to 5.5   | ✓         | FLASH       | 2176       | 128        | 16            | 8         | 32                  | -            | 117                   | 50(1)                        | -                            | -                       | 8                   | 8                   | 8                  | 10                | -              | -              | 24             | 2                    | -                 | 1        | 2             | 3        | 2                 | 2             | -             | -                 | -                                                                                                                                                                                                                                                                                                                                          | ARM Cortex R4, 2D Graphics Engine: scaler, color palette, gamma correction, blending, raster operation, various alpha blending modes, run-length decoding, hor/ver flip and rotation, affine transformations, Embedded Video-RAM: 1MB, TFT Output Interface: RGB888/RSDS Output, SHE (Secure Hardware Extension), Real Time Clock, Stepper Motor Controller (SMC): 4 ch, Data Flash: 48KB, Windows Watchdog, Clock supervisor, Sound Generator, I2S: 2 ch, Quad SPI Flash Interface: 2 ch(1 ch for MCU and 1 ch for Graphic), NMI (intern/extern): 32/1 ch, MediaLB (3 wire): 1 ch, CRC Hardware Module: 1 ch, Protection Unit: MPU, PPU, TPU, various Power Down modes | On-chip Debug |                   |
|                                       | MB9EF226EPMC |                                        |               |                            |           |             |            |            |               |           |                     |              |                       |                              |                              |                         |                     |                     |                    |                   |                |                |                |                      |                   |          |               |          |                   |               |               |                   |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                   |

[illegible]

## F<sup>2</sup>MC-16FX – 16bit Microcontrollers

[illegible]

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



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