The MB9B10S/T and MB9B610S/T series belong to Fujitsu’s FM3 ARM Cortex-M3 based Microcontroller Family. With an operation frequency of up to 144MHz and a very fast and reliable Flash memory, these devices mark the high end of Cortex-M3 based MCUs. Along with many other peripherals, these devices are provided with two Ethernet MAC channels. A single Ethernet MAC MCU series, with similar features, is also available with the MB9B210S/T.

**Lineup of FM3 TwinMAC Ethernet MCUs**

<table>
<thead>
<tr>
<th>FM3 TwinMAC Ethernet MCUs</th>
<th>CAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB9BFD16S/M810S</td>
<td>MB9BFD18T/M812S</td>
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</tbody>
</table>

**TwinMAC Ethernet**

Both the MB9B10S/T and MB9B610S/T series offers 2 channel Ethernet MAC. This feature allows for the design of gateway applications. Two network domains can be separated to improve security or to assure a certain bandwidth for sub networks by filtering irrelevant Ethernet frames. Another advantage of a dual channel Ethernet MAC is the possibility to create line- or ring-topologies (daisy chaining) without separate switches.

**Ethernet - MAC Features**

- 2 channel Ethernet MAC
- Single channel Ethernet MAC MCUs also available
- Compliant with IEEE802.3 specification
- 10Mbps / 100 Mbps data transfer rates supported
- MII/RMII for external PHY device supported
- Full-Duplex and Half-Duplex mode supported
- Wake-ON-LAN supported
- Built-in dedicated descriptor-system DMAC
- Built-in 2Kbyte Transmit FIFO and 2Kbyte Receive FIFO
- Compliant to IEEE1588-2008(PTP)
MCU Features

High Performance
- High Speed Flash: True zero wait state Flash operation at 72MHz, prefetch buffer for zero wait state operation at 144MHz
- Wide range of power supply voltages supported: 2.7 V to 5.5 V

High Quality Flash Memory
- Highly reliable flash memory: 100,000 write/erase cycles, up to 20 years data retention
- Flash security function

Functional Safety
- Internal, trimmed RC oscillator
- Clock Supervisor
- Two stage (interrupt and reset), programmable LVD (Low Voltage Detector)
- CRC hardware module
- MPU (Memory Protection Unit)
- Programmable Emergency Stop Input for Motor Control PWM

Connectivity
- Up to 2 channels CAN Controller
- Full Speed USB Host & Function
- Flexible resource pin relocation
- Multifunction serial (UART, SIO, SPI, and I2C)

Advanced Peripherals
- 3 independent high-speed 12-bit A/D converters, 32channels
- 3 ch Multifunction timer (for motor control)
- 3 Quadrature Decoder Units
- 8/16bit external bus interface

Debug Interface
- JTAG, SWj- and Trace Debug Interface

Development Tools
The Fujitsu FM3 family is supported by market leading tool chain suppliers like IAR Systems, Keil, Code Sourcery and others. These companies offer enhanced IDEs (integrated development environments). A free of charge OpenSource GNU/Eclipse based tool chain is also available.

Diverse middleware components are offered from Fujitsu, as well as 3rd parties. In many cases the user can choose between commercial and free of charge solutions. The offering includes Realtime Operating Systems, Low Level Peripheral Libraries and Protocol Stacks.

Fujitsu Middleware Components
- Peripheral Library
- USB Library
- Functional Safety Self Test Libraries (IEC60730 - class B, IEC61508 SIL2)
- Motor Control Platform
- Capacitive Touch Library
- Ethernet Low Level Driver
- Example implementations uIP, lwIP TCP/IP stacks

Partner Middleware Components
- USB Library
- Ethernet TCP/IP stacks and Application Layers
- CANopen protocol stacks

Evaluation Boards
Hardware Evaluation Boards for the FM3 Ethernet MCUs are provided by Fujitsu and partners.

SK-FM3-176PMC-ETHERNET Features
- Microcontroller MB9BF18T
- 2x Ethernet connectors
- 2x USB-Host (Type-A connector)
- 1x USB-Device (Type-B connector)
- 1x High-speed CAN-Transceiver (SUB-D9 connector)
- 1x UART-Transceiver (SUB-D9 connector)
- 1x USB to serial converter (Type-B connector)
- JTAG-and Trace Interface each on a 20 pin-header
- 2x LED-Display (7-Segment)
- All 176 pins routed to pin-header
- On-board 5V and 3V voltage regulators, ‘Power’-LED
- 3 x motor control connector

Starterkit SK-FM3-176PMC-ETHERNET
mcu.fseu@de.fujitsu.com
http://emea.fujitsu.com/fm3

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