FS fact sheet

FUJITSU

MB91580 Series

32-bit Motor Control MCU for Electric (EV) and Hybrid Electric Vehicles (HEV)

Description

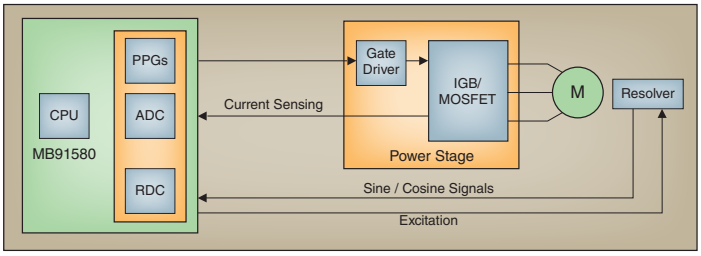
The new MB91580 series, a part of the Fujitsu FR family of 32-bit RISC microcontrollers (MCUs), offers 3-phase inverter motor control and an embedded resolver interface for electric (EV) and hybrid electric vehicles (HEV).

The MCU series offer high performance combined with optimized peripherals for electric and hybrid electric vehicles. The MB91580 series was designed to provide special features for efficient loopback control. The device offers a 12-bit Analog to Digital Converter (ADC) and a 12-bit Resolver to Digital Converter (RDC) to detect motor current and position at high speed and with high resolution. The electric angle of the revolver, which is calculated by the RDC, is latched into dedicated registers and synchronized with the three phase current detected by the ADC. Control algorithms will benefit from the floating point Unit (FPU) and will speed up vector conversion and calculations using decimal point numbers by 10-15% compared to standard integer processing.

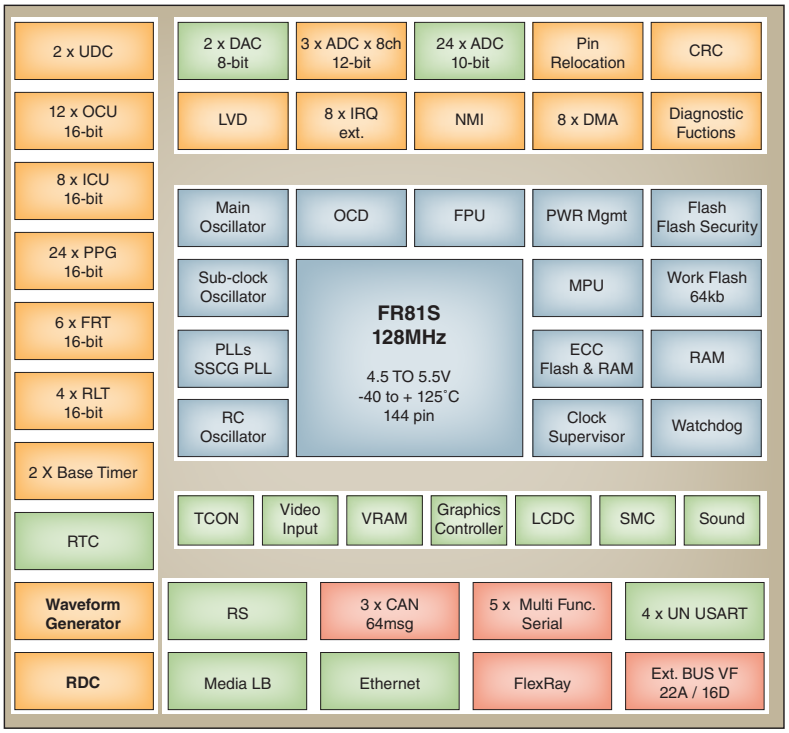
The MB91580 series feature Fujitsu's advanced Flash memory technology, including dedicated program memory and a separate work Flash for EEPROM emulation storage.

Applications

- Generic electric motor control
- HEV/EV inverter
- HEV/EV generator control



MB91580 Motor Control: Current, Positioning Detection and Feedback Control



MB91580 Series Block Diagram

Key Features

Main processor

- FR81S core
- Single precision FPU
- 128MHz CPU frequency
- 8ch DMA

Motor control features

- Integrated RDC
- RDC excitation signal waveform generation
- 12ch motor timing waveform generator
- Quadrature encoder

Connectivity

- 3ch CAN / 64Msg buffers
- 5ch multifunctional serial (LIN, SPI, I²C, UART)
- FlexRay™ interface (A+B)

Functional safety features

- MPU
- ECC for all memory types
- Watchdog
- Low voltage detector for internal/external power supply
- Clock supervisor
- CPU diagnostic
- Bus diagnostic
- RAM diagnostic
- NMI
- 16/32-bit CRC generator

Development Tools

Development tools, including debuggers, evaluation boards, starter kits and compilers, are available to support the Fujitsu MB91580 series.

Product	Flash	RAM	Work Flash
MB91F585	576kB	48kB	64kB
MB91F587	108.8kB	96kB	64kB

Product Lineup

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