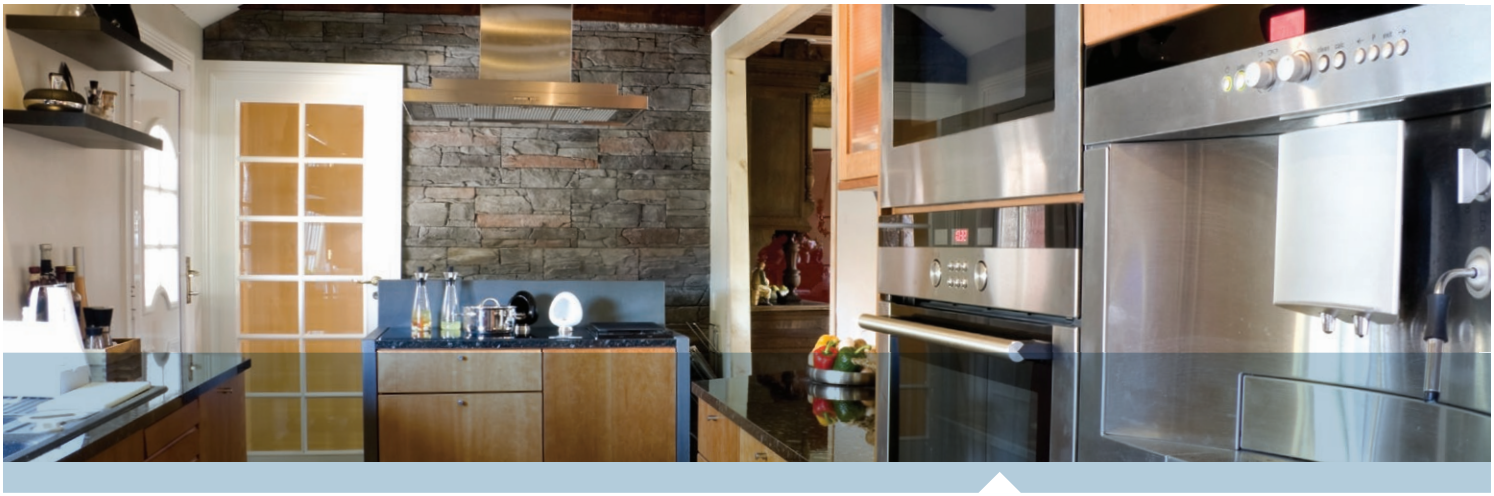


8-bit HCS08 Embedded Controllers

MC9S08FL16/8
8-bit microcontrollers

Target Applications

- Home appliances
  - Air conditioners
  - Microwave ovens
  - Washing machines
  - Dishwashers
  - Water heaters
  - Refrigerators
- UPS
- E-bikes
- Step machines
- Induction ovens
- Note counters
- Disinfectors

Overview

The 8-bit MC9S08FL16/8 (FL16/8) MCU family is a cost-sensitive solution ideal for home appliance applications that require I/O flexibility.

The family has the right amount of on-chip integration to help reduce system development costs, including such well-used features as an interrupt priority controller, 8-bit analog-to-digital controller (ADC), timers/PWM and SCI. These features, plus rich GPIO resources (an industry-leading 30 pins) improve design flexibility. Plus, enhanced EMC/EMI (5V) performance gives designers peace of mind when developing products for noisy environments.

Features	Benefits
8-bit HCS08 Central Processing Unit (CPU)	
• Up to 10 MHz internal bus (20 MHz HCS08 core) frequency with 4.5V to 5.5V operation across temperature range of -40°C to +85°C	• Offers reliable performance across the entire voltage range
On-Chip Memory	
• Up to 16K flash read/program/erase across entire operating voltage and temperature ranges	• Allows user to take full advantage of in-application re-programmability benefits in virtually any environment
• Up to 1024 bytes random access memory (RAM)	• Reduces development time by providing more RAM for programming
• Security circuitry	• Protects data/code in flash and RAM from unauthorized access
Power-Saving Modes	
• Two low-power stop modes, reduced-power wait mode	• Allows uninterrupted sampling application in a reduced-power state which cuts overall system power consumption
Clock Source Options	
• Oscillator (XOSC) clock source options include oscillator, crystal or ceramic resonator • Up to 20 MHz internal clock source (ICS) module	• Optimizes power consumption and provides greater design flexibility • Provides accurate on-chip clock source and saves cost by eliminating the need for external components
Peripherals	
• Interrupt priority controller (IPC)	• Provides hardware-based nested interrupt capability to simplify software design
• Analog-to-digital converter (ADC)—12-channel, 8-bit resolution	• Provides fast and easy conversion of analog inputs • Features integrated on-chip temperature sensor and bandgap
• Timer/pulse-width modulator module (TPM)—1 x 4-channel and 1 x 2-channel	• Flexible multiple time bases and channels provide system timing and functions
• MTIM16—One 16-bit modulo timer with optional prescaler	• Supports precise and fast sensing and control
• SCI module with optional 13-bit break, LIN extensions	• Provides UART communications

freescale semiconductor

Cost-Effective Development Tools
DEMO9S08FL16 ($49 USD*)

This demonstration kit comes with everything required to complete an entire project using the FL16/8 family. Complimentary** built-in OSBDM circuitry is available for debugging and programming. A getting-started DVD includes necessary software, documents and resources to jumpstart new product development.

CodeWarrior™ Development Studio for Microcontrollers v6.2

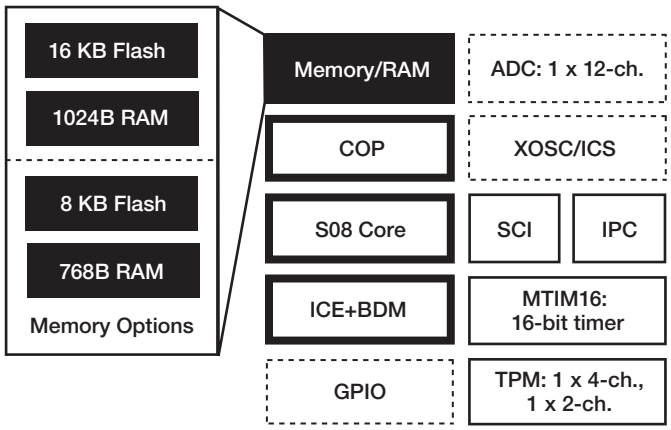
Special Edition (complimentary**) CodeWarrior Development Studio for Microcontrollers is an integrated tool suite that supports software development for Freescale's microcontrollers. Designers can further accelerate application development with the help of the award-winning Processor Expert™ tool in the CodeWarrior tool suite.

* Prices indicated are MSRP

** Subject to license agreement

Features (continued)	Benefits
Input/Output	
• 30 general purpose input/output (GPIO) pins including one input-only pin and one output-only pin	• Improves flexibility by allowing interfacing to a large number of pins that are capable of generating interrupts
System Protection	
• Watchdog computer operating properly (COP) module can be reset with option to run from dedicated 1 kHz internal clock source or bus clock	• Provides system protection using backup oscillator by resetting the MCU to a known state
• Low-voltage detection with reset or interrupt, selectable trip points	• Built-in system protection to help secure data and warn of possible voltage loss conditions
• Illegal opcode detection with reset	• Allows the device to recognize erroneous code and to reset the processor to help avoid lock-up states
• Illegal address detection with reset	• Resets the MCU to a known state following inadvertent access to unimplemented or reserved address space
• Flash block protection	• Helps provide security by protecting code from unauthorized reading and guards against unintentional write/erase of user-code/data
Development Support	
• Single-wire background debug interface	• Allows developers to use the same interface for multiple platforms
• Breakpoint setting capability	• Allows single breakpoint setting during in-circuit debugging, helping simplify the software development and debugging
• On-chip in-circuit emulator (ICE) debug module containing two comparators and nine trigger points	• Reduces development time by enabling real-time, on-chip emulation without the added expense of traditional emulator hardware

MC9S08FL16/8 Block Diagram



Package Options

Part Number	Temp Ranges	Package
MC9S08FL16CBM	-40°C to +85°C	32 SDIP
MC9S08FL16CLC	-40°C to +85°C	32 LQFP
MC9S08FL8CBM	-40°C to +85°C	32 SDIP
MC9S08FL8CLC	-40°C to +85°C	32 LQFP

Learn more: For more information about the FL16/8 family, please visit **www.freescale.com/8bit**.

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