icrocontrollers

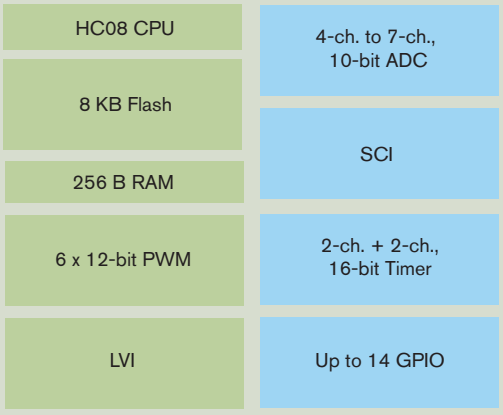
MC68HC908MR8

Target Applications

- > Appliance compressors
- > Smart appliances
- > Industrial compressors (HVAC)
- > Variable speed pumps (well, gas)
- > HVAC blowers and fans
- > General-purpose drives
- > Exercise equipment
- > Electric-powered recreational vehicles
- > Medical scanners/pumps
- > Printers/scanners/fax machines
- > Electric lawn equipment
- > Throttle control
- > Seat module control
- > Uninterruptible power supplies

Overview

The MC68HC908MR8 improves design capabilities for three-phase, variable-speed motion control. Each device incorporates fault-tolerant and flexible 6-channel, 12-bit pulse-width modulation (PWM), supporting center- and edge-aligned modes with automatic dead-time insertion and patented dead-time compensation capability. The MC68HC908MR8 is designed to save money and space and includes powerful features, such as 8 KB of Flash memory, a 10-bit analog-to-digital converter (ADC), an asynchronous serial communications interface (SCI) and small outline packages.



Features	Benefits
High-Performance 68HC08 CPU Core	
> 8 MHz bus operation at 5V operation for 125 ns minimum instruction cycle time	> Object code compatible with the 68HC05
> Efficient instruction set, including multiply and divide	> Easy to learn and use architecture
> 16 flexible addressing modes, including stack relative with 16-bit stack pointer	> C-optimized architecture provides compact code
> Fully static, low-voltage, low-power design with wait and stop modes	
Integrated Second-Generation Flash Memory	
> In-application reprogrammable	> Cost-effective programming changes and field software upgrades via in-application programmability and reprogrammability
> Extremely fast programming, encoding 64B in as fast as 2 ms	> Reduces production programming costs through ultra-fast programming
> Flash programming across the 68HC08's full operating supply voltage with no extra programming voltage	> Byte-writable for data as well as program memory
> 10K write/erase cycles minimum over temperature	> Protects code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code
> Flexible block protection and security	
10-bit Analog-to-Digital Converter (ADC)	
> Seven channels	> Provides single or continuous conversion
> Single conversion in 8.5 µs	> Generates an interrupt when input signal exceeds a software programmable limit
12-bit Pulse-Width Modulation for Motor Control (PWMMC)	
> Three complementary or six independent PWM signals	> Provides multiple motor or multiphase control capability
> Programmable output polarity	> Reduces system cost through integration of digital-to-analog circuitry
> Edge- or center-aligned waveforms	> Drastically reduces system noise and improves efficiency of the drive without the need for external current sensors with patented dead-time compensation
> Automatic dead-time generation/compensation	> Allows direct drive of the optocoupling stage
> 20 mA sink on all PWMMC pins	> Guarantees immediate shutdown of the PWM outputs ensuring motor and consumer safety
> Programmable fault detection	
Clock Generation Module with Phase-Lock Loop (PLL)	
> Programmable clock frequency in integer multiples of external crystal reference	> Provides high performance using low-cost, low-frequency reference crystals
> Crystal reference of 1 MHz to 8 MHz	> Reduces generated noise while still providing high performance (up to 32 MHz internal clock)
> External clock option with or without PLL	

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Features	Benefits
Four Programmable 16-bit Timer Channels	
> 125 ns resolution at 8 MHz bus	> Configurable for input capture, output compare or unbuffered PWM
> External clock input pin	> Pairing timer channels provides a buffered PWM function
> Free-running counter or modulo up-counter	
Serial Communications Interface (SCI)	
> UART asynchronous communications system	> Asynchronous communication between the microcontroller (MCU) and a terminal, computer or a network of microcontrollers
> Flexible baud rate generator	
> Double-buffered transmit and receive	
> Optional hardware parity checking and generation	
Computer Operating Properly (COP) Watchdog Timer	
	> Provides system protection in the event of runaway code by resetting the MCU to a known state
Low-Voltage Inhibit (LVI)	
	> Improves reliability by resetting the MCU when voltage drops below trip point
	> Integration reduces system cost
Up to 14 Bidirectional Input/Output (I/O) Lines	
> 10 mA sink/source capability on all I/O pins	> High-current I/O allows direct drive of LED and other circuits to eliminate external drivers and reduce system costs
> 15 mA sink capability on five I/O pins	
> Keyboard scan with selectable interrupts on five I/O pins	> Keyboard scan with programmable pull-ups eliminates external glue logic when interfacing to simple keypads
> Software programmable pull-ups on five I/O pins	

Application Notes

AN1857	A 3-Phase AC Induction Motor Control System
AN2093	Creating Efficient C Code for the MC68HC08
AN1219	M68HC08 Integer Math Routines
AN1218	HC05 to HC08 Optimization
AN1837	Non-Volatile Memory Technology Review
AN1752	Data Structures for 8-bit MCUs
AN1259	System Design and Layout Techniques for Noise Reduction in MCU-Based Systems
AN1263	Designing for Electromagnetic Compatibility with Single-Chip Microcontrollers
AN1050	Designing for Electromagnetic Compatibility (EMC) with HCMOS Microcontrollers
AN1705	Noise Reduction Techniques for Microcontroller-Based Systems

And many more—see our Web site at **www.freescale.com/mcu**.

Cost-Effective Development Tools

For more information on development tools, please refer to the Freescale Development Tool Selector Guide (SG1011).

FSICEKITMR8 ***$2,495***	Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters
M68EM08MR8 ***$495***	Emulation module for FSICE system
M68CYCLONEPRO ***$499***	HC08/HCS08/HC12/HCS12 stand-alone Flash programmer or in-circuit emulator, debugger, Flash programmer; USB, serial or Ethernet interface options
USBMULTILINK08 ***$99***	Universal HC08 in-circuit debugger and Flash programmer; USB PC interface
M68CPA08QF324448 ***$199***	Programming adapter for MON08 cables and single MCU: 32-pin 0.8 mm QFP packages, 44-pin 0.8 mm QFP packages and 48-pin 0.5 mm QFP packages
M68CPA08W1628T20 ***$149***	Programming adapter for MON08 cables and single MCU: 7.5 mm SOIC packages up to 28 pins, 5.3 mm SOIC packages up to 16 pins and TSSOP packages up to 20 pins
M68CPA08P40B56 ***$99***	Programming adapter for MON08 cables and single MCU: DIP packages up to 40 pins and SDIP packages up to 56 pins
CWX-H08-SE ***Free***	CodeWarrior™ Special Edition for HC(S)08 MCUs; includes integrated development environment (IDE), linker, debugger, unlimited assembler, Processor Expert™ auto-code generator, full-chip simulation and 16 KB C compiler

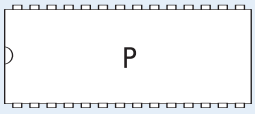
Package Options

Part Number	Package	Temp. Range
MC68HC908MR8CFA	32 QFP	-40°C to +85°C
MC68HC908MR8CP	28 DIP	-40°C to +85°C
MC68HC908MR8CDW	28 SOIC	-40°C to +85°C
MC68HC908MR8VFA	32 QFP	-40°C to +105°C
MC68HC908MR8VP	28 DIP	-40°C to +105°C
MC68HC908MR8VDW	28 SOIC	-40°C to +105°C

32-Lead QFP

28-Lead SOIC

28-Pin DIP



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Document Number: 68HC908MR84FS
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