### 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
<table>
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<tr>
<th>Feature Type</th>
<th>Benefits</th>
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| High-Performance 68HC08 CPU Core | > Object code compatible with the 68HC05
> Easy to learn and use architecture
> C-optimized architecture provides compact code |
| Integrated Second-Generation Flash Memory | > Cost-effective programming changes and field software upgrades via in-application programmability and reprogrammability
> Reduces production programming costs through ultra-fast programming
> Byte-writable for data as well as program memory
> Protects code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code |
| 10-bit Analog-to-Digital Converter (ADC) | > Provides single or continuous conversion
> Generates an interrupt when input signal exceeds a software programmable limit |
| 12-bit Pulse-Width Modulation for Motor Control (PWMMC) | > Provides multiple motor or multiphase control capability
> Reduces system cost through integration of digital-to-analog circuitry
> Drastically reduces system noise and improves efficiency of the drive without the need for external current sensors with patented dead-time compensation
> Allows direct drive of the optocoupling stage
> Guarantees immediate shutdown of the PWM outputs ensuring motor and consumer safety |
| Clock Generation Module with Phase-Lock Loop (PLL) | > Provides high performance using low-cost, low-frequency reference crystals
> Reduces generated noise while still providing high performance (up to 32 MHz internal clock) |

### MC68HC908MR8 Pinouts
- HC08 CPU
- 8 KB Flash
- 256 B RAM
- 6 x 12-bit PWM
- LVI

### Clock Generation Module with Phase-Lock Loop (PLL)
- Programmable clock frequency in integer multiples of external crystal reference
- Crystal reference of 1 MHz to 8 MHz
- External clock option with or without PLL

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The MC68HC908MR8 is a powerful 8-bit microcontroller designed for various applications, including appliances, industrial equipment, and medical applications. Its advanced features and high-performance capabilities make it a versatile choice for developers looking to optimize their designs.
Features

Serial Communications Interface (SCI)
- UART asynchronous communications system
- 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
- 15 mA sink capability on five I/O pins
- Keyboard scan with selectable interrupts on five I/O pins
- Software programmable pull-ups on five I/O pins

Cost-Effective Development Tools

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 $199
- 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

Learn More: For more information about Freescale’s products, please visit www.freescale.com.