

68HC(9)08GZxx

Target Applications

Various automotive applications including:

- > Power door
- > Seat motor control
- > Wiper control
- > Light leveling
- > Sunroof
- > Security

Overview

Freescale Semiconductor's 68HC08GZxx family of microcontrollers (MCUs) are pin-compatible LIN master and LIN slave devices that offer a revolutionary concept in LIN hardware and software design. The HC08GZ Family provides a low-cost CAN-to-LIN master MCU incorporating an enhanced LIN SCI, 10-bit ADC, automotive Flash and low-cost ROM versions, and is also the best-selling Freescale CAN module. There are 26 different versions to choose from, in 8 KB–60 KB memory, available in QFP packages with 32, 48 and 64 pins.

All products are fully LIN 2.0 and J2602 compliant.

WHICH FLASH OR ROM LIN MCU?

| | |
|-----------------------------|------------------------|
| HC08 CPU | Up to 60 KB Flash |
| Up to 24-ch., 10-bit ADC | Up to 2 KB RAM |
| Up to 53 GPIO | ESCI |
| COP | SPI |
| Wake-Ups | Clock Generator Module |
| Up to 2+6-ch., 16-bit Timer | CAN |

Low-Cost CAN—LIN Gateway

| Features | Benefits |
|---|--|
| Second-Generation Flash or Low-Cost ROM Memory Options | |
| <ul style="list-style-type: none"> > Embedded fully automotive Flash > Range of memory from 8 KB to 60 KB > 10K write/erase cycles at -40°C to +125°C | <ul style="list-style-type: none"> > Qualified for high temperatures, shock, vibrations and humidity as required by the automotive industry |
| <ul style="list-style-type: none"> > Low-cost ROM versions available—contact your sales representative | <ul style="list-style-type: none"> > Cost-reduction path for high-volume stable programs |
| <ul style="list-style-type: none"> > Ultra-fast programming: 64 bytes in 2 ms | <ul style="list-style-type: none"> > Reduced production programming costs through ultra-fast programming at operating voltage |
| <ul style="list-style-type: none"> > Flash block protection | <ul style="list-style-type: none"> > Helps protect code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code |
| <ul style="list-style-type: none"> > Flash reprogrammable in circuit | <ul style="list-style-type: none"> > Allows real-time Flash updates |

MSCAN08 Embedded CAN Controller

- > Implementation of the CAN protocol: version 2.0 A/B
- > Double-buffered receive storage scheme
- > Triple-buffered transmit storage scheme with internal prioritization using a local priority concept
- > Flexible maskable identifier filter supports alternatively one full-size extended identifier filter or two 16-bit filters or four 8-bit filters
- > Separate signaling and interrupt capabilities for all CAN receiver and transmitter error states (Warning, Error Passive, Bus-Off)
- > Triple transmit buffer scheme in order to allow multiple messages to be set up in advance and to achieve an optimized real-time performance
- > Optimized design for maximum price/performance ratio

Enhanced SCI—LIN SCI Controller

- > Programmable 8-bit or 9-bit character length
- > Programmable baud rates
- > Separately enabled transmitter and receiver
- > Interrupt-driven operation with eight interrupt flags
- > Capable of communication rates up to 115,000 bps, encompassing all LIN baud rates
- > Full-duplex operation allows simultaneous transmission and reception of data
- > ESCI arbiter allows measurement of LIN synchronization data without separate timer hardware
- > Finely adjustable baud rate prescalers allow extremely precise control of baud rate
- > Enhanced detection of LIN break symbols to prevent false interrupts

Clock Generation Module and PLL

- > Supports 1 MHz–8 MHz crystals
- > User-selectable clockout feature with divide by 1, 2 and 4 crystal frequency
- > User selection of having the oscillator enabled or disabled during stop mode

Freescale understands the critical importance that development tools play in the success of your microcontroller (MCU) design. That is why we provide a comprehensive selection of hardware and software development tools: Everything from high-quality, downloadable software to advanced emulators is available to speed your HC08 MCU-based design to market time. These tools form a critical part of the complete system solution that makes it easy to use our products, a solution that includes silicon, software, development tools, reference designs and service, all in one package.

HC08 Demonstration Boards (Order Number: DEMOGZ60)

Freescale's cost effective demo boards provide everything that a designer needs to develop and evaluate applications for the targeted HC08 MCU family.

- > Integrated debugging and Flash programming capabilities
- > RS-232 communication port(s)
- > User I/O for developing application code
- > MCU breakout headers for access to the MCU's I/O and bus lines
- > User manual and cables included
- > Large prototyping area for custom circuit design and evaluation
- > Some EVBs include Zero Insertion Force (ZIF) sockets
- > Universal power supply
- > CodeWarrior Development Studio for HC(S)08, Special Edition included

HC08 Evaluation Boards (Order Number: M68EVB908xxxx or EVB908xxxx)

Advance application development platforms that allow designers to conduct detail evaluation of HC08 MCUs.

- > Integrated debugging and Flash programming capabilities
- > Demonstration code written in C
- > User I/O for developing application code
- > Quick start guide, user manual and cables included
- > RS-232 communication port
- > Header connectors for access to the MCU's I/O and bus lines
- > CodeWarrior™ Development Studio for HC(S)08, Special Edition included

MON08 MULTILINK (Order Number: USBMULTILINK08)

The MON08 Multilink is an easy-to-use, low-cost development tool for Freescale HC08 Flash MCUs. It provides in-circuit emulation, debugging and Flash programming through the HC08's standard MON08 serial debug/breakpoint interface.

- > Universal development tool for all MON08 HC08s
- > Real-time, in-circuit emulation and debug
- > Fast in-circuit Flash programming
- > Autodetects baud rate and frequency
- > Provides optional overdrive clock to target
- > Supports 2V to 5.5V HC08s
- > Automatically cycles power for security checks (up to 125 mA)
- > Standard MON08, 16-pin target application interface
- > USB interface
- > CodeWarrior Development Studio for HC(S)08, Special Edition included

Cyclone Pro (Order Number: M68CYCLONEPRO)

The Cyclone Pro is a stand-alone programmer with push buttons and LEDs to control operation, but also has all the capabilities of the MON08 and BDM Multilink cables. Cyclone Pro is the universal in-circuit debugging, Flash programming, and real-time emulation development tool for Freescale HC08, HCS08, HC12, and HCS12 MCUs.

- > Fast, in-circuit stand-alone programming
- > Simple push button and LED user interface
- > Host-based programming with scripting capability to execute a series of commands
- > Automates programming of test routines, test execution, erase and final software programming
- > Real-time, in-circuit emulation and debug
- > Integrated BDM and MON08 interfaces
- > CodeWarrior Development Studio for HC(S)08 and HCS12, Special Edition included

HC08 Programming Adapters (Order Number: M68CPA08xxxx)

HC08 Programming Adapters are designed to work with in-circuit programmers that use the standard 16-pin MON08 interface. The M68CPA08xxxx are ideal for programming engineering samples and small volumes of prototype MCUs.

- > Standard 16-pin MON08 header
- > Package-specific ZIF sockets
- > ZIF Socket breakout header
- > Jumper wires
- > CodeWarrior Development Studio for HC(S)08, Special Edition included

Third-Party Hardware and Software

Freescale works closely with a broad range of companies to provide extensive development support from adapters to C compilers to real-time operating systems. The software and development tool selector guide (Order Number: SG1011) has a summary listing of these solutions along with contact information.

Data Sheets

MC68HC908GZ60

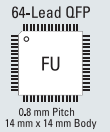
MC68HC908GZ16

Application Notes:

A Selection of More Than 300 Available

- AN2295 Developer's Serial Bootloader for M68HC08 and HCS08 MCUs
- AN2321 Designing for Board Level Electromagnetic Compatibility
- AN2342 Opto Isolation Circuits for In-Circuit Debugging of 68HC9(S)12 and 68HC908 Microcontrollers
- AN2438 ADC Definitions and Specifications
- AN2508 Generating Clocks for HC908 MCU Families
- AN2545 Using MC68HC(9)08GR/GZ On-Chip Flash Programming Routines
- AN2573 LINkits LIN Evaluation Boards
- AN2701 PWM Generation with the HC08 Timer
- AN2767 LIN 2.0 Connectivity on Freescale 8/16-bit MCUs Using Volcano LTP
- AN2784 HC08 Timer with an External Clock Source

Device and Package Options



68HC(9)08GZxx FAMILY PERIPHERAL OPTIONS

| | FLASH | ROM | RAM | CAN | ESCI | SCI | SLIC | SPI | TIMER (UP TO) | ADC (UP TO) | OPERATING VOLTAGE | TEMP. | PACKAGE |
|---------|-------|-------|--------|-----|------|-----|------|-----|-----------------|----------------|-------------------|-----------------|--------------|
| 908GZ60 | 60 KB | - | 2 KB | 1 | 1 | - | - | 1 | 2+6-ch., 16-bit | 24-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48/64 QFP |
| 908GZ48 | 48 KB | - | 1.5 KB | 1 | 1 | - | - | 1 | 2+6-ch., 16-bit | 24-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48/64 QFP |
| 908GZ32 | 32 KB | - | 1.5 KB | 1 | 1 | - | - | 1 | 2+6-ch., 16-bit | 24-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48/64 QFP |
| 908GZ16 | 16 KB | - | 1 KB | 1 | 1 | - | - | 1 | 2+2-ch., 16-bit | 8-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48 QFP |
| 908GZ8 | 8 KB | - | 1 KB | 1 | 1 | - | - | 1 | 2+2-ch., 16-bit | 8-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48 QFP |
| 08GZ60 | - | 60 KB | 2 KB | 1 | 1 | - | - | 1 | 2+6-ch., 16-bit | 24-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48/64 QFP |
| 08GZ48 | - | 48 KB | 1.5 KB | 1 | 1 | - | - | 1 | 2+6-ch., 16-bit | 24-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48/64 QFP |
| 08GZ32 | - | 32 KB | 1.5 KB | 1 | 1 | - | - | 1 | 2+6-ch., 16-bit | 24-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48/64 QFP |
| 08GZ16 | - | 16 KB | 1 KB | 1 | 1 | - | - | 1 | 2+2-ch., 16-bit | 8-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48 QFP |
| 08GZ8 | - | 8 KB | 1 KB | 1 | 1 | - | - | 1 | 2+2-ch., 16-bit | 8-ch., 10-bit | 5V/3.3V | -40°C to +125°C | 32/48 QFP |

Learn More: For more information about Freescale's LIN products and services, please visit us at www.freescale.com/lin.

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