68HC(9)08GZxx

**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.

**Target Applications**
Various automotive applications including:
- Power door
- Seat motor control
- Wiper control
- Light leveling
- Sunroof
- Security

**Low-Cost CAN—LIN Gateway**

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second-Generation Flash or Low-Cost ROM Memory Options</td>
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</tr>
<tr>
<td>&gt; Embedded fully automotive Flash</td>
<td>&gt; Qualified for high temperatures, shock, vibrations and humidity as required by the automotive industry</td>
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<tr>
<td>&gt; Range of memory from 8 KB to 60 KB</td>
<td>&gt; Cost-reduction path for high-volume stable programs</td>
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<tr>
<td>&gt; 10K write/erase cycles at -40°C to +125°C</td>
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<tr>
<td>&gt; Low-cost ROM versions available—contact your sales representative</td>
<td>&gt; Reduced production programming costs through ultra-fast programming at operating voltage</td>
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<td>&gt; Ultra-fast programming: 64 bytes in 2 ms</td>
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<tr>
<td>&gt; Flash block protection</td>
<td>&gt; Helps protect code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code</td>
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<td>&gt; Flash reprogrammable in circuit</td>
<td>&gt; Allows real-time Flash updates</td>
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**MSCAN08 Embedded CAN Controller**

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

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

**Clock Generation Module and PLL**

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<tbody>
<tr>
<td>&gt; Supports 1 MHz–8 MHz crystals</td>
<td></td>
</tr>
<tr>
<td>&gt; User-selectable clockout feature with divide by 1, 2 and 4 crystal frequency</td>
<td>&gt; User selection of having the oscillator enabled or disabled during stop mode</td>
</tr>
</tbody>
</table>

**Which Flash or ROM LIN MCU?**

- **HC08 CPU**
- Up to 24-ch., 10-bit ADC
- Up to 53 GPIO
- COP
- Wake-Ups
- Clock Generation Module
- Up to 60 KB Flash
- Up to 2 KB RAM
- ESCI
- SPI
- CAN

Launched by Motorola™

freescale semiconductor™
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

**HC08 Evaluation Boards (Order Number: M68EVB908xxxx or EVB908xxxxx)**

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

**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
> Autodeetects baud rate and frequency
> Provides optional override clock to target
> Supports 2V to 5.5V HC08s

**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

**HC08 Programming Adapters (Order Number: M68CPA08xxxxx)**

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

**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.

**Device and Package Options**

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**Data Sheets**

MC68HC908GZ60
MC68HC908GZ16

**Application Notes:**

A Selection of More Than 300 Available

- AN2285: 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 68HC908JS12 and 68HC908 Microcontrollers
- AN2438: ADC Definitions and Specifications
- AN2508: Generating Clocks for HC08 MCU Families
- AN2545: Using MC68HC09(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

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