

MC68HC908QL4/3/2

Target Applications

- > Automotive LIN applications
 - Mirror and window motor control
 - Power seat motors
 - HVAC actuators and sensors
- > Network and control systems
- > Home and industrial security systems
- > Industrial networked motor and actuator control

Overview

Freescale Semiconductor's MC68HC908QL4/3/2 is a low pin count, fully integrated microcontroller (MCU) created to make system design easier by eliminating external peripherals wherever possible. The Slave LIN Interface Controller (SLIC) module, a dedicated hardware LIN module, minimizes the resource requirement of the CPU and reduces system costs. The integrated second-generation Flash memory programs up to 100 times faster than prior Flash solutions and offers in-application programming. Features include a 10-bit analog-to-digital converter (ADC), an autowake-up from stop feature, low-voltage inhibit (LVI) and a watchdog timer.

All products are fully LIN 2.0 and SAE J2602 compliant.

HC08 CPU	4 KB/2 KB Flash
ICO	128B RAM
1 x 2-ch., 16-bit, Timer	Up to 6-ch., 10-bit ADC
COP	Up to 13 GPIO
Wake-Ups	SLIC

Low-Cost LIN Family

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 2 KB to 4 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: 64B 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"> > Protects code from unauthorized reading and guards 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
Internal Clock Oscillator (ICO)	
<ul style="list-style-type: none"> > Fully trimmable internal oscillator 	<ul style="list-style-type: none"> > Eliminates the cost of external clock components
<ul style="list-style-type: none"> > Multiple speeds 	<ul style="list-style-type: none"> > Reduces board space
	<ul style="list-style-type: none"> > Minimizes or reduces EMI generated from external clocks
Slave LIN Interface Controller (SLIC) Module	
<ul style="list-style-type: none"> > Automatic baud rate and LIN message frame synchronization 	<ul style="list-style-type: none"> > Input clock tolerance as high as ±50 percent, allowing internal oscillator to remain untrimmed
<ul style="list-style-type: none"> > Full LIN message buffering of identifier and eight data bytes 	<ul style="list-style-type: none"> > Incoming break symbols allowed to be 10 to 20 bit times without message loss
<ul style="list-style-type: none"> > Automatic processing and verification of LIN header (SYNCH break and byte) 	<ul style="list-style-type: none"> > Minimizes CPU resource requirement, maintaining performance, even in traffic-intensive applications
<ul style="list-style-type: none"> > Automatic checksum calculation and verification with error reporting 	
<ul style="list-style-type: none"> > Maximum of two interrupts per LIN message frame 	
<ul style="list-style-type: none"> > Streamlined interrupt servicing through use of a state vector register 	
Powerful HC08 CPU	
<ul style="list-style-type: none"> > Efficient instruction set, including multiply and divide 	<ul style="list-style-type: none"> > Object code compatible with 68HC05
<ul style="list-style-type: none"> > 16 flexible addressing modes, including stack relative with 16-bit stack pointer 	<ul style="list-style-type: none"> > Easy to learn and use architecture
<ul style="list-style-type: none"> > Fully static, low-voltage, low-power design with wait and stop modes 	<ul style="list-style-type: none"> > C-optimized architecture provides compact code

Benefits

10-bit Analog-to-Digital Converter (ADC)

- > Six channels
- > Single conversion in 17 μ s
- > Fast, easy conversion from analog inputs, such as temperature, pressure and fluid levels, to digital values for CPU processing

Selectable Trip Point Low-Voltage Inhibit (LVI)

- > Programmable LVI reset
- > Selectable LVI trip voltage
- > Programmable stop mode operation
- > Improves reliability by resetting the MCU when voltage drops below trip point
- > Selectable trip points allow optimum operation in both 5V and 3V nominal systems
- > Integration reduces system cost

13 Bidirectional Input/Output (I/O) Lines and One Input Only

- > Six shared with keyboard interrupt function
- > One shared with reset
- > One input only shared with external interrupt (IRQ)
- > High current sink/source capability
- > Selectable pull-ups on all ports (pull-up/down on port A)
- > High-current I/O allows direct drive of LED and other circuits to eliminate external drivers and reduce system costs

Cost-Effective Development Tools

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

M68EVB908QL4
\$199

Evaluation board with serial port, switches, LEDs, potentiometer, ZIF sockets and demo software including source code

FSICEKITQBLTY
\$1,695

Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters

M68EM08QBLTY
\$495

Emulation module for FSICE system

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

USBMULTILINKBDM
\$99

Universal HCS08/HCS12 in-circuit emulator, debugger and Flash programmer; USB PC interface

M68CYCLONEPRO
\$499

HC08/HCS08/HCS12/HCS12 stand-alone Flash programmer or in-circuit emulator, debugger, Flash programmer; USB, serial or Ethernet interface options

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

Data Sheet

MC68HC908QL4

Package Options

PART NUMBER	FLASH	ADC	PACKAGE	TEMP. RANGE
MC908QL4CDW	4 KB	Yes	16 SOIC	-40°C to +85°C
MC908QL4VDW	4 KB	Yes	16 SOIC	-40°C to +105°C
MC908QL4MDW	4 KB	Yes	16 SOIC	-40°C to +125°C
MC908QL4CDT	4 KB	Yes	16 TSSOP	-40°C to +85°C
MC908QL4VDT	4 KB	Yes	16 TSSOP	-40°C to +105°C
MC908QL4MDT	4 KB	Yes	16 TSSOP	-40°C to +125°C
MC908QL3CDW	4 KB	-	16 SOIC	-40°C to +85°C
MC908QL3VDW	4 KB	-	16 SOIC	-40°C to +105°C
MC908QL3MDW	4 KB	-	16 SOIC	-40°C to +125°C
MC908QL3CDT	4 KB	-	16 TSSOP	-40°C to +85°C
MC908QL3VDT	4 KB	-	16 TSSOP	-40°C to +105°C
MC908QL3MDT	4 KB	-	16 TSSOP	-40°C to +125°C
MC908QL2CDW	2 KB	Yes	16 SOIC	-40°C to +85°C
MC908QL2VDW	2 KB	Yes	16 SOIC	-40°C to +105°C
MC908QL2MDW	2 KB	Yes	16 SOIC	-40°C to +125°C
MC908QL2CDT	2 KB	Yes	16 TSSOP	-40°C to +85°C
MC908QL2VDT	2 KB	Yes	16 TSSOP	-40°C to +105°C
MC908QL2MDT	2 KB	Yes	16 TSSOP	-40°C to +125°C

Application Notes

AN2103	Local Interconnect Network (LIN) Demonstration
AN2205	Car Door Keypad Using LIN
AN2264	LIN Node Temperature Display
AN2343	HC908 LIN Monitor
AN2432	LIN Sample Application for the MC68HC908EY16
AN2470	MC68HC908EY16 Controlled Robot Using the LIN Bus
AN2573	LINKits LIN Evaluation Boards
AN2633	LIN Drivers for SLIC Module on the MC68HC908QL4
AN2767	LIN 2.0 Connectivity on Freescale 8/16-bit MCUs Using Volcano LTP

Device and Package Options

16-Lead SOIC 16-Lead TSSOP



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