MC908QC16/8

Target Applications

- > Various applications including:
 - Mirrors
 - Climate control
 - Wiper control
 - Lighting
 - Window lift
 - Sunroof
- Appliances
- Control systems
- Home and industrial security systems
- Motion control

Overview

Freescale Semiconductor's MC908QC family of microcontrollers (MCUs) is positioned to support HC08 core small-package 8-bit microcontrollers and the low-end LIN market. QC devices are low voltage with on-chip in-circuit Flash memory programmable down to 1.8 volts. The functionality is completed with strong analog capabilities, a complete set of serial modules and robust memory options. These products are fully LIN 2.0 and J2602 compliant. They are intended to be used as LIN slaves where the application requires cost-effective hardware solutions. A variety of small packages (16-, 20- and 28-pin), together with the optimized peripheral sets and the powerful HC08 CPU, make this an ideal low-end controller.

HC08 CPU	8 KB/16 KB	
Internal Clock Oscillator	Up to 512 KB RAM	
1 x 2-ch., 16-bit Timer	Up to 10-ch., 10-bit ADC	
1 x 4-ch., 16-bit Timer	Up to 24 GPIO	
Periodic Wake-Up Module	ESCI	
Computer Operating Properly	SPI	
Wake-Ups		
LVI		
KBI		
POR		

Cost-Effective LIN Family

> Exit from low-power STOP mode without

> Accessible in all modes of operation (RUN,

> Full-duplex operation allows simultaneous transmission and reception of data

> Dedicated low-power 32 kHz internal oscillator separate from the main system

external signals

clock sources

WAIT and STOP)

Cost-Effective LIN Family				
Features	Benefits			
Second-Generation Flash or Cost-Effective RC	OM Memory Options			
> Embedded, fully automotive Flash > Range of memory from 8 KB to 16 KB > 10K write/erase cycles at -40°C to +125°C	 Qualified for high temperatures, shock, vibrations and humidity as required by the automotive industry Cost-reduction path for high-volume stable programs 			
> Ultrafast programming: 64 bytes in 2 ms	> Reduced production programming costs through ultrafast programming at operating voltage			
> Flash block protection	> Helps protect code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code			
> Flash reprogrammable in circuit	> Allows real-time Flash updates			
Internal Clock Oscillator				
 1 MHz, 2 MHz and 3.2 MHz nominal bus frequency Fully trimmable internal oscillator Less than 0.4 percent oscillator accuracy within a LIN frame 	 Eliminates the cost of all external clock components Helps to reduce board space Eliminates or reduces EMI generated from external clocks Allows option of external RC and external crystal 			
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 kbps, 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 			
High-Performance CPU				
 Efficient instruction set, including multiply and divide 16 flexible addressing modes, including stack relative with 16-bit stack pointer Fully static, low-voltage, low-power design with WAIT and STOP modes 	 Object code compatible with 68HC05 Easy to learn and use architecture C-optimized architecture provides compact code 			
Periodic Wake-Up Module				
> Selectable timeout periods (40 µs to three minutes)	> ESCI arbiter allows measurement of LIN synchronization data without separate			

timer hardware

> Finely adjustable baud rate prescalers allow

extremely precise control of baud rate

symbols to prevent false interrupts

> Enhanced detection of LIN break



Cost-Effective Development Tools

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

DEMO9S08QC16

Cost-effective demonstration board with potentiometer, LEDs, serial port

FSICEKITQC16

and built-in USB-MON08 cable for debugging and programming

\$1,695*

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

EML08QCBLTYE

\$495*

\$75*

Emulation module for FSICE system

\$499*

M68CYCLONEPRO HC08/HCS08/HC12/HCS12 stand-alone Flash programmer or

in-circuit emulator, debugger and Flash programmer; USB, serial or Ethernet

interface options

USBMULTILINK08 Universal HC08 in-circuit debugger and Flash programmer; USB PC interface

\$99*

PAS08W1628T28

\$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 28 pins

PAS08P40B3256

\$99*

Programming adapter for MON08 cables and single MCU: DIP packages up

to 40 pins and SDIP packages

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

Application Notes: A Selection of More Than 300 Available

AN2767	LIN 2.0 Connectitivity on Freescale 8/16-bit Using Volcano LTP

AN2575 MC68HC908EY16 ESCI LIN Drivers

AN2884 LIN 2.0 Door Lock Slave

AN2885 LIN 2.0 Mirror Slave Unit

AN2573 LINkits LIN Evaluation Boards

AN2560 MC68HC908EY16 IR Receiver for Remote Control of LIN Robot

AN2470 MC68HC908EY16 Controlled Robot Using the LIN Bus

AN2343 HC908EY16 LIN Monitor

AN2264 LIN Node Temperature Display

AN2205 Car Door Keypad Using LIN

AN2295 Developer's Serial Bootloader for M68HC08 and HCS08 MCUs

AN2312 MC68HC908QY4 Internal Oscillator Usage Notes

AN2317 Low-Cost Programming and Debugging Options for M68HC08 MCUs

AN2438 ADC Definitions and Specifications

Data Sheets MC908QC16

Device and Package Options

Part Number	Package	Temp. Range
MC908QC16CDRE	28 TSSOP	-40°C to +85°C
MC908QC16CDSE	20 TSSOP	-40°C to +85°C
MC908QC16CDTE	16 TSSOP	-40°C to +85°C
MC908QC16CDXE	16 SOIC	-40°C to +85°C
MC908QC16CDYE	20 SOIC	-40°C to +85°C
MC908QC16CDZE	28 SOIC	-40°C to +85°C
MC908QC16VDRE	28 TSSOP	-40°C to +105°C
MC908QC16VDSE	20 TSSOP	-40°C to +105°C
MC908QC16MDRE	28 TSSOP	-40°C to +125°C
MC908QC16MDSE	20 TSSOP	-40°C to +125°C
MC908QC8CDRE	28 TSSOP	-40°C to +85°C
MC908QC8CDSE	20 TSSOP	-40°C to +85°C
MC908QC8CDTE	16 TSSOP	-40°C to +85°C
MC908QC8CDXE	16 SOIC	-40°C to +85°C
MC908QC8CDYE	20 SOIC	-40°C to +85°C
MC908QC8CDZE	28 SOIC	-40°C to +85°C
MC908QC8VDRE	28 TSSOP	-40°C to +105°C
MC908QC8VDSE	20 TSSOP	-40°C to +105°C
MC908QC8MDRE	28 TSSOP	-40°C to +125°C
MC908QC8MDSE	20 TSSOP	-40°C to +125°C

16-Lead TSSOP

DT

25.6 mil/0.65 mm Pitch 5 mm x 4.4 mm Body

20-Lead SOIC DY 0 0

50 mil/1.27 mm Pitch 1.28 mm x 7.5 mm Body

16-Lead SOIC



50 mil/1.27 mm Pitch 10.3 mm x 7.5 mm Body

28-Lead TSSOP

DR 25.6 mil/.65 mm Pitch 20-Lead TSSOP



28-Lead SOIC DZ

50 mil/1.27 mm Pitch 18 mm x 7.5 mm Body

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



^{*}Manufacturer Suggested Resale Price