icrocontrollers

68HC(9)08QT/QYxx

Target Applications

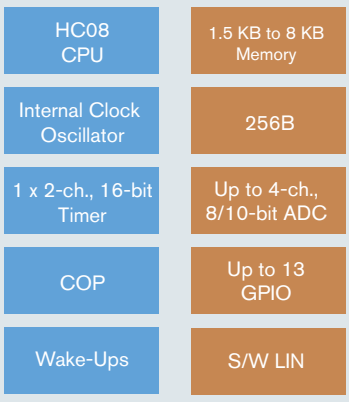
> Various automotive applications including:

- Mirrors
- Climate control
- Wiper control
- Lighting

Overview

Freescale Semiconductor's 68HC(9)08QT/QYxx family of QT/QY devices are the lower end of the Nitron Family. They are intended to be used as LIN slaves when there is spare CPU capacity. But these devices are also highly suited to applications requiring low-cost microcontrollers with 1.5 KB to 8 KB Flash or ROM. The small packages and optimized peripheral sets make them the ideal low-end controller, yet they still integrate the powerful HC08 CPU.

All products are fully LIN 2.0 and J2602 compatible.



Low-Cost LIN Family

Features	Benefits
Second-Generation Flash or Low-Cost ROM Memory Options	
> Embedded fully automotive Flash > Range of memory from 1.5 KB to 8 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
> Low-cost ROM versions available—contact your sales representative	> Cost-reduction path for high-volume stable programs
> Ultra-fast programming: 64 bytes in 2 ms	> Reduced production programming costs through ultra-fast 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
Software LIN Driver	
> Can simply emulate the LIN module in software > Utilizes spare CPU power to get the most out of the powerful HC08 processor	> Cuts down on the size of the microcontroller and hence lowers cost > No wasted CPU capacity
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, easy-to-use architecture > C-optimized architecture provides compact code

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opment Tools

HC08 Demonstration Boards (Order Number: DEMO908QTY)

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 MULTLINK (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

MC68HC908QY4

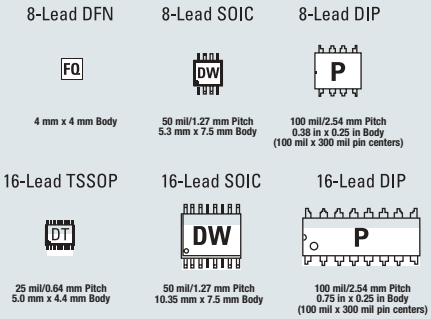
MC68HC08QY4

MC68HC908QB8

Application Notes: A Selection of More Than 300 Available

AN2103	Local Interconnect Network (LIN) Demonstration
AN2205	Car Door Keypad using LIN
AN2264	LIN Node Temperature Display
AN2305	User Mode Monitor Access for MC68HC908QY/QT Series MCUs
AN2310	MC68908QT4 Low Power Application
AN2322	Reprogramming the M68DEMO908QT4
AN2346	EEPROM Emulation Using Flash in MC68HC908QY/QT MCUs
AN2432	LIN Sample Application for the MC68HC908EY16 Evaluation Board
AN2470	MC68HC908EY16 Controlled Robot Using the LIN Bus
AN2573	LINkits LIN Evaluation Boards
AN2690	Low Frequency EEPROM Emulation on the MC68HLC908QY4
AN2767	LIN 2.0 Connectivity on Freescale 8/16-bit MCUs Using Volcano LTP

Device and Package Options



8-lead version only available in low-cost consumer grade quality option.

68HC(9)08QYxx FAMILY PERIPHERAL OPTIONS

	FLASH	ROM	RAM	CAN	ESCI	SCI	SLIC	SPI	TIMER (UP TO)	ADC (UP TO)	OPERATING VOLTAGE	TEMP.	PACKAGE
908QY8	8 KB	-	256B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC
908QY4A	4 KB	-	128B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
908QY2A	1.5 KB	-	128B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
908QY1A	1.5 KB	-	128B	-	-	-	-	-	2 ch., 16-bit	-	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
908QY4	4 KB	-	128B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
908QY2	1.5 KB	-	128B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
908QY1	1.5 KB	-	128B	-	-	-	-	-	2 ch., 16-bit	-	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
08QY8	-	8 KB	256B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC
08QY4	-	4 KB	128B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
08QY2	-	1.5 KB	128B	-	-	-	-	-	2 ch., 16-bit	4 ch., 10-bit	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP
08QY1	-	1.5 KB	128B	-	-	-	-	-	2 ch., 16-bit	-	5V/3V	-40°C to +125°C	16 TSSOP/SOIC/PDIP

Consumer qualified 8-pin versions also available (68HC(9)08QTxx). Contact marketing for further details.

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

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