



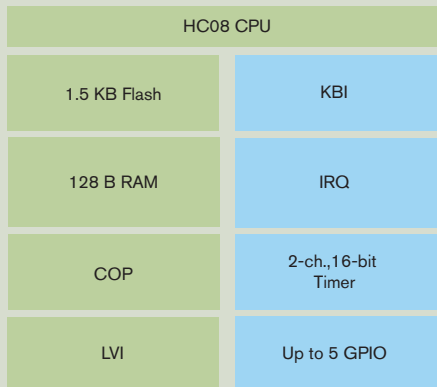
MC68HC908QT1

Target Applications

- > Discrete replacement
- > Appliances
- > Control systems
- > Home and industrial security systems
- > Fluorescent light ballasts
- > Electromechanical replacement

Overview

Freescale Semiconductor's MC68HC908QT1 microcontroller (MCU) helps reduce system cost by eliminating the need for external low-voltage inhibit (LVI), external drivers with high-current input/output (I/O) and external data EEPROM and helps reduce programming cost with fast Flash programming. Other valuable features include an internal clock oscillator. It helps maximize efficiency and speed time to market with the ability to change code in-application with Flash and free, professional-quality development tools including a C compiler, simulator, assembler, linker, Flash programmer and auto-code generator, all specifically geared to function with Freescale's QT/QY line of MCUs.



Features

High-Performance 68HC08 CPU Core

- > 8 MHz bus operation at 5V operation for 125 ns minimum instruction cycle time
- > 4 MHz bus operation at 3V operation for 250 ns minimum instruction cycle time
- > Efficient instruction set including multiply and divide
- > 16 flexible addressing modes including stack relative with 16-bit stack pointer

1.5 KB Integrated Second-Generation Flash Memory

- > In-application reprogrammable
- > Extremely fast programming
 - As fast as 32 μ s/byte
 - Up to 100x faster than most embedded Flash
- > Flash easily used for data EEPROM
 - 10K minimum write/erase cycles across temperature
 - Byte-writable
 - No restrictions or special instructions to access data in Flash program memory
- > Flexible block protection and security

Benefits

- > Easy to learn and use
- > Object compatible with 68HC05
- > Allows for efficient, compact modular coding in assembly or C compiler
- > Cost-effective programming changes and field software upgrades via in-application programmability and reprogrammability
- > Virtually eliminates scrap, costly rework and cost of socket
- > The benefits of Flash at competitive one-time programmable (OTP) prices
- > Helps to reduce production programming costs through ultra-fast programming
- > Helps to reduce power and speed application when writing nonvolatile data is required
- > Virtually eliminates the need and cost for external serial data EEPROM
- > Easily performs table lookup and data manipulation without slow and cumbersome special table instructions
- > Helps to protect code from unauthorized reading
- > Guards against unintentional writing/erasing of user-programmable segments of code

Internal Clock Oscillator

- > 3.2 MHz nominal bus frequency
- > ± 25 percent trimmable
- > ± 5 percent accurate to 105°C
- > Can eliminate the cost of all external clock components
- > Helps to reduce board space
- > Can eliminate electromagnetic interference (EMI) generated from external clocks
- > Allows option of external radio controller (RC), external clock or external crystal/resonator

Up to 5 Bidirectional Input/Output (I/O) Lines

- > High-current drive
- > Programmable pull-ups/keyboard interrupt
- > High-current I/O allows direct drive of LED and other circuits to virtually eliminate external drivers and reduce system costs
- > Keyboard scan with programmable pull-ups virtually eliminates external glue logic when interfacing to simple keypads

Features
Benefits
Two Programmable 16-bit Timer Channels

- > 125 ns resolution at 8 MHz
- > Free-running counter or modulo up-counter
- > Each channel independently programmable for input capture, output compare or unbuffered pulse-width modulation (PWM)
- > Pairing timer channels provides a buffered PWM function

System Protection

- > COP watchdog timer with autowake-up from stop capability
- > Low-voltage inhibit with selectable trip points
- > Provides system protection in the event of runaway code by resetting the MCU to a known state
- > Helps to reduce power usage while automatically providing wake-up to check external sensors or perform periodic servicing
- > Designed to improve reliability by resetting the MCU when voltage drops below trip point

Cost-Effective Development Tools

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

M68DEMO908QT4 \$25*	Cost-effective demonstration board in small form factor with potentiometer, LEDs, and a serial port for debugging and programming
FSICEKITQBLTY \$1,695*	Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters
M68EML08QBLTY \$495*	Emulation module for FSICE system
M68CYCLONEPRO \$499*	HC08/HCS08/HC12/HCS12 stand-alone Flash programmer or in-circuit emulator, debugger, Flash programmer; USB, serial or Ethernet interface options
USBMULTILINK08 \$99*	Universal HC08 in-circuit debugger and Flash programmer; USB PC interface
M68CPA08W1628T20 \$149*	Programming adapter for MON08 cables and single MCU: 32-pin 0.8 mm QFP packages, 44-pin 0.8 mm QFP packages and 48-pin 0.5 mm QFP packages
M68CPA08P40B56 \$99*	Programming adapter for MON08 cables and single MCU: DIP packages up to 40 pins and SDIP packages up to 56 pins
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

- AN2305 User Mode Monitor Access for MC68HC908QT/QY Series MCUs
- AN2310 MC68HC908QT4 Low-Power Application
- AN2312 QY4 Internal Oscillator Usage Notes
- AN2317 Low-Cost Programming and Debugging Options for M68HC08 MCUs
- AN2322 Reprogramming the M68DEMO908QT4

Data Sheets

- MC68HC908QY4 Data Sheet for QY4/QY2/QY1/QT4/QT2/QT1

Package Options

Part Number	Package	Temp. Range**
MC68HC908QT1CFQ	8 DFN	-40°C to +85°C
MC68HC908QT1VFQ	8 DFN	-40°C to +105°C
MC68HC908QT1MFQ	8 DFN	-40°C to +125°C
MC68HC908QT1CP	8 DIP	-40°C to +85°C
MC68HC908QT1VP	8 DIP	-40°C to +105°C
MC68HC908QT1MP	8 DIP	-40°C to +125°C
MC68HC908QT1CDW	8 SOIC	-40°C to +85°C
MC68HC908QT1VDW	8 SOIC	-40°C to +105°C
MC68HC908QT1MDW	8 SOIC	-40°C to +125°C

8-Lead DIP



8-Lead SOIC



8-Pin DFN



**Contact your sales representative for extended temperature availability

Learn More: For more information about Freescale's products, please visit www.freescale.com.

*Price indicated is MSRP.

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