MC68HC908QY2

Target Applications

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

Overview

Freescale Semiconductor's MC68HC908QY2 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 analog-to-digital converter (ADC) and 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.

HC08 CPU	
1.5 KB Flash	KBI
128 B RAM	4-ch., 8-bit ADC
COP	2-ch., 16-bit Timer
LVI	Up to 13 GPIO

Features	Benefits
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	> Easy to learn and use architecture > Object compatible with 68HC05 > Allows for efficient, compact modular coding in assembly or C compiler
1.5 KB Integrated Second-Generation Flash Memory	
> In-application reprogrammable	> 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
> Extremely fast programming ▪ As fast as 32 µs/byte ▪ Up to 100x faster than most embedded Flash	> Helps to reduce production programming costs through ultra-fast programming > Helps to reduce power and speed application when writing nonvolatile data is required
> 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	> 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
> Flexible block protection and security	> 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 > $\pm$ 25 percent trimmable > $\pm$ 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 13 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

freescale™
semiconductor

![NXP]

Features	Benefits
8-bit Analog-to-Digital Converter (ADC)	
> Four channels	> Fast conversion in 17 μs
	> Easy interface to analog inputs such as sensors
Two Programmable 16-bit Timer Channels	
> 125 ns resolution at 8 MHz	> Each channel independently programmable for input capture, output compare or unbuffered pulse-width modulation (PWM)
> Free-running counter or modulo up-counter	
	> Pairing timer channels provides a buffered PWM function
System Protection	
> COP watchdog timer with autowake-up from stop capability	> Provides system protection in the event of runaway code by resetting the MCU to a known state
> Low-voltage inhibit with selectable trip points	
	> 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

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

Data Sheets

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

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: 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

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

Package Options

Part Number	Package	Temp. Range
MC68HC908QY2CF	16 DIP	-40°C to +85°C
MC68HC908QY2VP	16 DIP	-40°C to +105°C
MC68HC908QY2MP	16 DIP	-40°C to +125°C
MC68HC908QY2CDW	16 SOIC	-40°C to +85°C
MC68HC908QY2VDW	16 SOIC	-40°C to +105°C
MC68HC908QY2MDW	16 SOIC	-40°C to +125°C
MC68HC908QY2CDT	16 TSSOP	-40°C to +85°C
MC68HC908QY2VDT	16 TSSOP	-40°C to +105°C
MC68HC908QY2MDT	16 TSSOP	-40°C to +125°C

16-Lead DIP **P**   16-Lead SOIC **DW**

16-Lead TSSOP **DT**

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

![freescale™ semiconductor]