A FLASH MCU SOLUTION

68HC908QT1

8-bit Microcontroller

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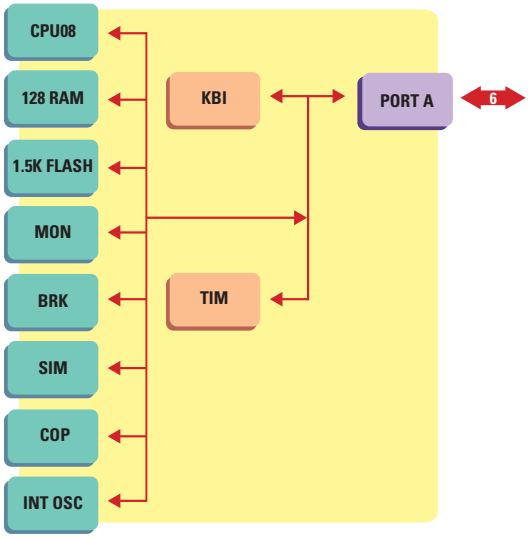
TARGET APPLICATIONS

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

The 68HC908QT1 helps reduce system cost by eliminating the need for external low-voltage inhibit, external drivers with high-current 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 change code in-application with FLASH and free, professional-quality development tools including a QT/QY C compiler, simulator, assembler, linker, FLASH programmer and auto-code generator.



FEATURES	BENEFITS
HIGH-PERFORMANCE 68HC08 CPU CORE	
• 8 MHz bus operation at 5V operation for 125 nsec minimum instruction cycle time • 4 MHz bus operation at 3V operation for 250 nsec 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, easy-to-use architecture • Object compatible with 68HC05 • Allows for efficient, compact modular coding in assembly or C
1.5K BYTES 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 OTP prices
• Extremely fast programming – As fast as 32 µsec/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 non-volatile data is required
• FLASH easily used for data EEPROM – 10K minimum write/erase cycles across temperature – Byte writeable – 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 erasing/writing 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 EMI generated from external clocks • Allows option of external RC, external clock or external crystal/resonator
FLEXIBLE I/O	
• Up to five bidirectional I/O and one input • 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

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PART NUMBER	DESCRIPTION	RESALE*
EASY-TO-ORDER DEVELOPMENT TOOL KITS		
KITMMEVS08QTQY (KITMMEVS08QTQY-E for Europe)	Cost-effective real-time, in-circuit emulator and debug kit. Includes MON08 Multilink.	$1450
KITMMDS08QTQY (KITMMDS08QTQY-E for Europe)	High-performance real-time, in-circuit emulation and debug. Includes MON08 Multilink.	$3950
INDIVIDUAL DEVELOPMENT TOOL COMPONENTS		
CodeWarrior™ Development Studio Special Edition for HC08	CodeWarrior IDE, QT/QY C compiler, assembler, linker, debugger, full-chip simulation, FLASH programming and automatic C code generation for on-chip peripherals with Processor Expert™.	Free
M68DEMO908QT4 Demonstration Board	Evaluation board with tutorial, demonstration code and CodeWarrior	$25
M68MULTILINK08 (M68MULTILINK08-EUR for Europe)	Fast in-circuit programming and debug. Utilizes HC08 monitor mode and on-chip breakpoint.	$168
M68CYCLONE08 (M68CYCLONE08-EUR for Europe)	All capabilities of MON08 Multilink, plus functions as standalone programmer.	$399
M68EML08QTQY	Emulation module daughter board	$495
M68CBL05A	Low-noise flex cable	$120
M68TA08QTP8	8-pin DIP and SOIC target head adapter	$100
M68DIP8SOIC	8-pin DIP to SOIC adapter	$50

FEATURES	BENEFITS
TWO PROGRAMMABLE 16-BIT TIMER CHANNELS	
• 125 nsec resolution at 8 MHz • Free-running counter or modulo up-counter	• Each channel independently programmable for input capture, output compare or unbuffered PWM • Pairing timer channels provides a buffered PWM function
SYSTEM PROTECTION	
• COP watchdog timer with auto-wakeup 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 wakeup to check external sensors or perform periodic servicing • Designed to improve reliability by resetting the MCU when voltage drops below trip point

APPLICATION NOTES/DATA SHEET

APPLICATION NOTES

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

DATA SHEET

MC68HC908QY4/D Data Sheet for QY4/QY2/QY1/QT4/QT2/QT1
MC68HC908QY4SM/D Data Sheet Summary for QY4/QY2/QY1/QT4/QT2/QT1

PACKAGE OPTIONS**

PART NUMBER	PACKAGE	TEMPERATURE RANGE
MC68HC908QT1CP	8 DIP	-40 to 85°C
MC68HC908QT1VP	8 DIP	-40 to 105°C
MC68HC908QT1MP	8 DIP	-40 to 125°C
MC68HC908QT1CDW	8 SOIC	-40 to 85°C
MC68HC908QT1VDW	8 SOIC	-40 to 105°C
MC68HC908QT1MDW	8 SOIC	-40 to 125°C
SAMPLE PACKS	**PACKAGE**	**TEMPERATURE RANGE**
KMC908QT1CP	8 DIP	-40 to 85°C
KMC908QT1CDW	8 SOIC	-40 to 85°C

8-Lead DIP

8-Lead SOIC

* All prices are manufacturer's suggested resale for North America.

** Contact your sales representative for extended temperature availability.

MOTOROLA

68HC908QT1/D
REV 1

Freescale Semiconductor, Inc.