



MC68HC908JK1E/JK3E/JL3E

Target Applications

- > Appliances
- > Security systems
- > Microwave applications
- > Satellite receivers
- > Automotive body electronics
- > Sensors and flow measurement devices
- > Industrial compressor (HVAC)
- > Instrument control panels
- > HVAC blowers and fans

Overview

The MC68HC908JL3E, the MC68HC908JK3E and the MC68HC908JK1E use a 68HC08 CPU core and provide cost-effective reprogrammable Flash with an integrated analog-to-digital converter (ADC). This family also includes multiple clock options, two 16-bit timer channels, low-voltage inhibit (LVI) and a watchdog timer.

HC08 CPU	
4 KB/1.5 KB Flash	KBI
128 B RAM	Up to 12-ch., 8-bit ADC
COP	2-ch., 16-bit Timer
LVI	Up to 23 GPIO

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 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
- > Fully static, low-voltage, low-power design with wait and stop modes

Benefits

- > Object code compatible with the 68HC05
- > Easy to learn and use architecture
- > C-optimized architecture provides compact code

Integrated Second-Generation Flash Memory

- > In-application reprogrammable
- > Extremely fast programming, encoding 64B in as fast as 2 ms
- > Flash programming across the 68HC08's full operating supply voltage with no extra programming voltage
- > 10K write/erase cycles minimum over temperature
- > Flexible block protection and security
- > Cost-effective programming changes and field software upgrades via in-application programmability and reprogrammability
- > Reduces production programming costs through ultra-fast programming
- > Allows reprogrammable battery-powered applications
- > Byte-writable for data as well as program memory
- > Protects code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code

8-bit Analog-to-Digital Converter (ADC)

- > Up to 12 channels
- > Single conversion in 17 μ s
- > Fast, easy conversion from analog inputs, such as temperature, pressure and fluid levels, to digital values for CPU processing

Multiple Clock Options

- > Crystal, ceramic or RC oscillator
- > External clock
- > Flexible clock options optimize timing accuracy with system cost

Two Programmable 16-bit Timer Channels

- > 125 ns resolution at 8 MHz bus
- > 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

Computer Operating Properly (COP) Watchdog Timer

- > Provides system protection

Features
Benefits
Selectable Trip Point Low-Voltage Inhibit (LVI)

- > Improves reliability by resetting the microcontroller (MCU) when voltage drops below trip point
- > Two trip points allow optimum operation in both 5V and 3V nominal systems
- > Integration reduces system cost

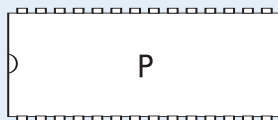
Up to 23 Bidirectional Input/Output (I/O) Lines

- > 25 mA sink capability on two I/O pins
- > Keyboard scan with selectable interrupts on seven I/O pins
- > Software programmable pull-ups on nine I/O pins
- > High-current capable I/O allows direct drive of LED and other circuits to eliminate external drivers and reduce system costs
- > Keyboard scan with programmable pull-ups eliminate external glue logic when interfacing to simple keypads

Package Options

Part Number	Package	Oscillator Option	Flash Size	Temperature Range
MC68HC908JL3ECP	28 DIP	XTAL	4 KB	-40°C to +85°C
MC68HC908JL3ECDW	28 SOIC	XTAL	4 KB	-40°C to +85°C
MC68HC908JL3ECFA	48 LQFP	XTAL	4 KB	-40°C to +85°C
MC68HC908JL3EMP	28 DIP	XTAL	4 KB	-40°C to +125°C
MC68HC908JL3EMDW	28 SOIC	XTAL	4 KB	-40°C to +125°C
MC68HC908JL3EMFA	48 LQFP	XTAL	4 KB	-40°C to +125°C
MC68HRC908JL3ECP	28 DIP	RC	4 KB	-40°C to +85°C
MC68HRC908JL3ECDW	28 SOIC	RC	4 KB	-40°C to +85°C
MC68HRC908JL3ECFA	48 LQFP	RC	4 KB	-40°C to +85°C
MC68HRC908JL3EMP	28 DIP	RC	4 KB	-40°C to +125°C
MC68HRC908JL3EMDW	28 SOIC	RC	4 KB	-40°C to +125°C
MC68HRC908JL3EMFA	48 LQFP	RC	4 KB	-40°C to +125°C
MC68HC908JK3ECP	20 DIP	XTAL	4 KB	-40°C to +85°C
MC68HC908JK3ECDW	20 SOIC	XTAL	4 KB	-40°C to +85°C
MC68HC908JK3EMP	20 DIP	XTAL	4 KB	-40°C to +125°C
MC68HC908JK3EMDW	20 SOIC	XTAL	4 KB	-40°C to +125°C
MC68HRC908JK3ECP	20 DIP	RC	4 KB	-40°C to +85°C
MC68HRC908JK3ECDW	20 SOIC	RC	4 KB	-40°C to +85°C
MC68HRC908JK3EMP	20 DIP	RC	4 KB	-40°C to +125°C
MC68HRC908JK3EMDW	20 SOIC	RC	4 KB	-40°C to +125°C
MC68HC908JK1ECP	20 DIP	XTAL	1.5 KB	-40°C to +85°C
MC68HC908JK1ECDW	20 SOIC	XTAL	1.5 KB	-40°C to +85°C
MC68HC908JK1EMP	20 DIP	XTAL	1.5 KB	-40°C to +125°C
MC68HC908JK1EMDW	20 SOIC	XTAL	1.5 KB	-40°C to +125°C
MC68HRC908JK1ECP	20 DIP	RC	1.5 KB	-40°C to +85°C
MC68HRC908JK1ECDW	20 SOIC	RC	1.5 KB	-40°C to +85°C
MC68HRC908JK1EMP	20 DIP	RC	1.5 KB	-40°C to +125°C
MC68HRC908JK1EMDW	20 SOIC	RC	1.5 KB	-40°C to +125°C

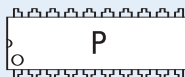
28-Pin DIP



28-Lead SOIC



20-Pin Plastic DIP



48-Lead QFP



20-Lead SOIC


Cost-Effective Development Tools

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

FSICEKITJLJK \$2,495	Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters
M68EML08JLJK \$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
M68CPA08QF324448 \$199	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
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

Application Notes and Engineering Bulletins

AN1218	68HC05 to 68HC08 Optimization
AN1831	Using MC68HC908 On-Chip Flash Programming Routines
AN1837	Non-Volatile Memory Technology Overview
AN2093	Creating Efficient C Code for the MC68HC08
AN1752	Data Structures for 8-bit MCUs
AN1219	M68HC08 Integer Math Routines
AN1259	System Design and Layout Techniques for Noise Reduction in MCU-Based Systems
AN1263	Designing for Electromagnetic Compatibility with Single-Chip Microcontrollers
AN1050	Designing for Electromagnetic Compatibility (EMC) with HCMOS Microcontrollers
AN1705	Noise Reduction Techniques for Microcontroller-Based Systems
AN2158	Designing with the MC68HC908JL/JK Microcontroller Family
EB367	In-Circuit Programming of 68HC908JL/JK

And many more—see our Web site at www.freescale.com/mcu.

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