

MC68HC908JB16

Target Applications

- > PC peripherals (keyboard, mouse)
- > USB security keys for e-commerce
- > USB converters
- > Set-top box peripherals
- > RF wireless receivers

Overview

The MC68HC908JB16 is an upwardly compatible, versatile migration from Freescale Semiconductor's MC68HC908JB8 Universal Serial Bus (USB) microcontroller unit (MCU). The innovative design features an on-chip USB module for fast, reliable PC peripheral applications and dual 27 MHz clock generators. An energy-saving, low-power solution, the MC68HC908JB16 is embedded with 16 KB of Freescale's second-generation Flash technology to enable in-system programmability.

HC08 CPU	
16 KB Flash	USB 2.0 Low Speed
384B RAM	Keyboard Interrupt
COP	2-ch., 16-bit Timer
LVI	Up to 21 GPIO
SCI	Dual 27 MHz PLL

Features

High-Performance 68HC08 CPU Core

- > 6 MHz bus operation at 4V to 5.5V operation for 167 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

16 KB Integrated Second-Generation Flash Memory

- > In-application reprogrammable
- > Extremely fast programming, encoding 64B in as fast as 32 μ s per byte
- > Flash programming across the 68HC08 device'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
- > Helps to reduce production programming costs through ultra-fast programming
- > Byte-writable for data as well as program memory
- > Protects code from unauthorized reading and guards against unintentional writing/erasing of user-programmable segments of code

USB 2.0 Specification Low-Speed Functions

- > 1.5 Mbps data rate
- > On-chip 3.3V regulator
- > Endpoint 0 with 8B transmit buffer and 8B receive buffer
- > Endpoint 1 with 8B transmit buffer
- > Endpoint 2 with 8B transmit buffer and 8B receive buffer

- > Designed to serve as low-speed (LS) USB device, in accordance with Universal Serial Bus Specification Rev. 2.0 Low-Speed Functions
- > Integrated 3.3V regulator helps to reduce system cost

Dual 27 MHz Phase-Lock Loops (PLL)

- > Two programmable 27 MHz PLLs
- > Reference frequency from MCU input clock: 12 MHz crystal

- > Provides two independent, high-performance 27 MHz clocks for RF applications

Two Programmable 16-bit Timers, Each with Two Channels

- > 167 ns resolution at 6 MHz bus
- > Free-running counter or modulo up-counter
- > External clock input option

- > Each channel independently programmable for input capture, output compare or unbuffered pulse-width modulation (PWM)
- > Pairing timer channels designed for a buffered PWM function

Serial Communications Interface (SCI)

- > UART asynchronous communications system
- > Flexible baud rate generator
- > Double-buffered transmit and receive
- > Optional hardware parity checking and generation

- > Designed to enable asynchronous serial communications with peripheral devices

Features

Benefits

Computer Operating Properly (COP) Watchdog Timer

- > Issues reset in the event of runaway code

Selectable Trip Point Low-Voltage Inhibit (LVI)

- > Improves reliability by resetting the MCU when voltage drops below trip point
- > Integration helps to reduce system cost

Up to 21 Bidirectional Input/Output (I/O) Lines

- > 10 mA high-current drive for PS/2 connection on two pins (with USB module disabled)
- > One dedicated I/O pin with 25 mA direct drive for infrared LED (32-pin package)
- > Six dedicated I/O pins with 25 mA direct drive for infrared LED on two pins and 10 mA direct drive for normal LED on four pins (28-pin package)
- > Keyboard scan with selectable interrupts on eight I/O pins
- > High current I/O designed to allow direct drive of LED and other circuits to eliminate external drivers and help to reduce system costs
- > Keyboard scan with programmable pull-ups virtually eliminates external glue logic when interfacing to simple keypads

Application Notes

- AN2093 Creating Efficient C Code for the HC08
- AN1219 M68HC08 Integer Math Routines
- AN1218 HC05 to HC08 Optimization
- AN1837 Non-Volatile Memory Technology Overview
- AN1752 Data Structures for 8-bit MCUs
- AN1705 Noise Reduction Techniques for Microcontroller-Based Systems

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

Cost-Effective Development Tools

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

FSICEKITBJG \$2,495	Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters
M68EM08JBJG \$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
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
MC68HC908JB16FA	32 LQFP	0°C to +70°C
MC68HC908JB16DW	28 SOIC	0°C to +70°C
MC68HC908JB16JDW	20 SOIC	0°C to +70°C

32-Pin LQFP



28-Pin SOIC



20-Lead SOIC



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