icrocontrollers

MC68HC908AB32

Target Applications

> Appliances
> Data loggers
> Industrial equipment
> Automotive body electronics

Overview

The MC68HC908AB32 Flash microcontroller (MCU) uses Freescale Semiconductor's highly successful 68HC08 architecture and is code-compatible with 68HC05 microcontrollers, providing an efficient migration path to higher performance Flash MCUs. With 32,256 bytes of in-system, programmable Flash memory and in-circuit programming capability, the MC68HC908AB32 delivers high-performance while lowering costs. The MC68HC908AB32 provides security and reliability with innovative features, such as a computer operating properly (COP) watchdog, selectable Flash security, memory-mapped input/output registers, low-voltage inhibit (LVI) and stop and wait modes.

HC08 CPU	KBI
32 KB Flash	8-ch., 8-bit ADC
1 KB RAM	SCI
512B EEPROM	SPI
COP	4-ch. + 4-ch., 16-bit Timer
LVI	51 GPIO

Features	Benefits
High-Performance 68HC08 CPU Core	
> 8 MHz bus operation at 5V operation for 125 ns minimum instruction cycle time	> Object code compatible with the 68HC05
> Efficient instruction set, including multiply and divide	> Easy to learn and use architecture
> 16 flexible addressing modes, including stack relative with 16-bit stack pointer	> C-optimized architecture provides compact code
> Fully static, low-voltage, low-power design with wait and stop modes	
Integrated Second-Generation Flash Memory	
> In-application reprogrammable	> Cost-effective programming changes and field software upgrades via in-application programmability and reprogrammability
> Extremely fast programming, encoding 64B in as fast as 2 ms	> Reduces production programming costs through ultra-fast programming
> Flash programming across the 68HC08's full operating supply voltage with no extra programming voltage	> Allows reprogrammable battery-powered applications
> 10K write/erase cycles minimum over temperature	> Byte-writable for data as well as for program memory
> Flexible block protection and security	> Protects code from unauthorized reading and guards against unintentional writing/erasing of user-programmable segments of code
Integrated EEPROM	
	> Byte-erasable
8-bit Analog-to-Digital Converter (ADC)	
> 8 channels	> Fast, easy conversion from analog inputs, such as temperature, pressure and fluid levels, to digital values for CPU processing
> Single conversion in 17 µs	
Clock Generation Module with Phase-Lock Loop (PLL)	
> Programmable clock frequency in integer multiples of external crystal reference	> Provides high performance using low-cost, low-frequency reference crystals
> Crystal reference of 1 MHz to 8 MHz	> Reduces generated noise while still providing high performance (up to 32 MHz internal clock)
> External clock option with or without PLL	
8 Programmable 16-bit Timer Channels	
> 125 ns resolution at 8 MHz bus	> Each channel independently programmable for input capture, output compare or unbuffered PWM
> Free-running counter or modulo up-counter	> Pairing timer channels provides a buffered PWM function

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Features	Benefits
Serial Communications Interface (SCI)	
> UART asynchronous communications system > Flexible baud rate generator > Double-buffered transmit and receive > Optional hardware parity checking and generation	> Asynchronous communication between the MCU and a terminal, computer or a network of microcontrollers
Serial Peripheral Interface (SPI)	
> Full-duplex, three-wire synchronous transfers > Maximum master bit rate of 4 MHz for 8 MHz system clock	> High-speed synchronous communication between multiple MCUs or between MCU and serial peripherals > Cost-effective serial peripheral expansion to EEPROM, high-precision analog-to-digital and digital-to-analog converters, real-time clocks, etc.
Periodic Interrupt Timer	
	> Provides periodic interrupts
Computer Operating Properly (COP) Watchdog Timer	
	> Provides system protection in the event of runaway code by resetting the MCU to a known state
Low-Voltage Inhibit (LVI)	
	> Improves reliability by resetting the MCU when voltage drops below trip point > Integration reduces system cost
Up to 51 Bidirectional Input/Output (I/O) Lines	
> 10 mA sink/source capability on all I/O pins > 15 mA sink capability on eight I/O pins > Keyboard scan with selectable interrupts on five I/O pins > Software programmable pull-ups on I/O pins	> High-current I/O allows direct drive of LED and other circuits to eliminate external drivers and reduce system costs > Keyboard scan with programmable pull-ups eliminates external glue logic when interfacing to simple keypads

Application Notes

AN1050	Designing for Electromagnetic Compatibility (EMC) with HCMOS Microcontrollers
AN1218	HC05 to HC08 Optimization
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
AN1705	Noise Reduction Techniques for Microcontroller-Based Systems
AN1752	Data Structures for 8-bit MCUs
AN1837	Non-Volatile Memory Technology Overview
AN2093	Creating Efficient C Code for the MC68HC08

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

Cost-Effective Development Tools

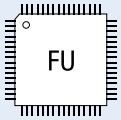
For more information on development tools, please refer to the Freescale Development Tool Selector Guide (SG1011).

FSICEKITAB32 ***$1,495***	Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters
M68EML08AB32 ***$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
M68CPA08QF5264 ***$199***	Programming adapter for MON08 cables and single MCU: 52-pin 0.65 mm QFP packages, 64-pin 0.5 mm QFP packages and 64-pin 0.8 mm QFP packages
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
MC68HC908AB32CFU	64 QFP	-40°C to +85°C
MC68HC908AB32VFU	64 QFP	-40°C to +105°C
MC68HC908AB32MFU	64 QFP	-40°C to +125°C

64-Lead QFP



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

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