MC68HC908AZ60A

Target Applications

> Automotive applications
> Industrial controls
> Medical electronics
> Sensors/measurement devices

Overview

Freescale Semiconductor's highly integrated, high-performance microcontroller, the MC68HC908AZ60A, with integrated controller area network (CAN), creates new opportunities for cost-effective product design. Using the proven 68HC08 architecture and embedded Flash memory for enhanced speed, power and functionality, the MC68HC908AZ60A is upwardly compatible with 68HC05 architecture. Freescale's 68HC08 family of microcontrollers reduces operating and programming costs with low power usage and by eliminating the need for external serial EEPROM. Features include an analog-to-digital converter (ADC), scalable controller area network (MSCAN), synchronous serial peripheral interface (SPI), asynchronous serial communications interface (SCI) and keyboard interrupts (KBI).

HC08 CPU	KBI
60 KB Flash	15-ch., 8-bit ADC
2 KB RAM	SCI
1 KB EEPROM	SPI
CAN 2.0a/2.0b	6-ch. + 2-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	
> Flash programming across the 68HC08's full operating supply voltage with no extra programming voltage	> Reduces production programming costs through ultra-fast programming
> 10K write/erase cycles minimum over temperature	> Allows reprogrammable battery-powered applications
> Flexible block protection and security	> Byte-writable for data as well as for program memory
	> 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)	
> 15 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	
Eight Programmable Two-Channel, 16-bit Timers	
> 125 ns resolution at 8 MHz bus	> 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

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Features	Benefits
Periodic Interrupt Timer	
	> Provides periodic interrupts
Serial Communications Interface (SCI)	
> UART asynchronous communications system	> Asynchronous communication between the microcontroller and a terminal, computer or a network of microcontrollers
> Flexible baud rate generator	
> Double-buffered transmit and receive	
> Optional hardware parity checking and generation	
Serial Peripheral Interface (SPI)	
> Full-duplex, three-wire synchronous transfers	> High-speed synchronous communication between multiple MCUs or between MCU and serial peripherals
> Maximum master bit rate of 4 MHz for 8 MHz system clock	> Cost-effective serial peripheral expansion to EEPROM, high-precision ADC and DAC, real-time clocks, etc.
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
51 Bidirectional Input/Output (I/O) Lines	
> 10 mA sink/source capability on all I/O pins	> High-current I/O allows direct drive of LED and other circuits to eliminate external drivers and reduce system costs
> 15 mA sink capability on eight I/O pins	> Keyboard scan with programmable pull-ups eliminates external glue logic when interfacing to simple keypads
> Keyboard scan with selectable interrupts on five I/O pins	

Cost-Effective Development Tools

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

FSICEKITASAZ *$1,895*	Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters
M68EM08AS/AZ60A *$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

Application Notes

AN1828	Flash Programming Via CAN
AN1798	CAN Bit Timing Requirements
AN2093	Creating Efficient C Code for the MC68HC08
AN1752	Data Structures for 8-bit MCUs
AN1219	M68HC08 Integer Math Routines
AN1218	HC05 to HC08 Optimization
AN1837	Non-Volatile Memory Technology Review
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

Package Options

Part Number	Package	Temp. Range
MC908AZ60ACFU	64 QFP	-40°C to +85°C
MC908AZ60AVFU	64 QFP	-40°C to +105°C
MC908AZ60AMFU	64 QFP	-40°C to +125°C

64-Lead QFP

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

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