



MC68HC908GP32

Target Applications

- > Radar detectors
- > Industrial and home lighting
- > Security systems
- > Home appliances
- > Sensors
- > Electronic power meters
- > Wireless communication
- > PDA attachments

Overview

Freescale Semiconductor's MC68HC908GP32 is a fully integrated microcontroller (MCU) created to make system design easier by eliminating external peripherals wherever possible. The 32 kHz Phase-Lock Loop (PLL) eliminates the need for expensive, high-speed crystals or noisy oscillators. The integrated second-generation Flash memory programs up to 100 times faster than prior Flash solutions and offers in-application programming. Features include an asynchronous serial peripheral interface (SPI), an asynchronous serial communications interface (SCI), an analog-to-digital converter (ADC), an autowake-up from stop feature, low-voltage inhibit (LVI) and a watchdog timer.

HC08 CPU	KBI
32 KB Flash	8-ch., 8-bit ADC
512B RAM	SCI
PLL	SPI
COP	2 x 2-ch., 16-bit Timer
LVI	Up to 33 GPIO

Features	Benefits
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High-Performance 68HC08 CPU Core

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| <ul style="list-style-type: none"> > 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 | <ul style="list-style-type: none"> > Object code compatible with the 68HC05 > Easy to learn and use architecture > C-optimized architecture provides compact code |
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Integrated Second-Generation Flash Memory

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| <ul style="list-style-type: none"> > 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 | <ul style="list-style-type: none"> > 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 guards against unintentional writing/erasing of user-programmable segments of code |
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8-bit Analog-to-Digital Converter (ADC)

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| <ul style="list-style-type: none"> > 8 channels > Single conversion in 17 μs | <ul style="list-style-type: none"> > Fast, easy conversion from analog inputs, such as temperature, pressure and fluid levels, to digital values for CPU processing |
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Clock Generation Module with Phase-Lock Loop (PLL)

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| <ul style="list-style-type: none"> > Programmable clock frequency in integer multiples of external crystal reference > Crystal reference of 32 kHz to 100 kHz > External clock option with or without PLL | <ul style="list-style-type: none"> > Provides high performance using low-cost, low-frequency reference crystals > Reduces generated noise while still providing high performance (up to 32 MHz internal clock) > Fast, easy conversion from analog inputs, such as temperature, pressure and fluid levels, to digital values for CPU processing |
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Four Programmable 16-bit Timer Channels

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| <ul style="list-style-type: none"> > 125 ns resolution at 8 MHz bus > Free-running counter or modulo up-counter | <ul style="list-style-type: none"> > Each channel independently programmable for input capture, output compare or unbuffered pulse-width modulation (PWM) > Pairing timer channels provides a buffered PWM function |
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Features

Benefits

Timebase Module

- > Eight user-selectable periodic real-time interrupts
- > Optionally operate in low-power stop mode

- > Provides autowake-up from low-power stop mode to maintain real-time clock or check external device status such as sensors

Serial Communications Interface

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

- > Enables synchronous serial communications with peripheral devices

Serial Peripheral Interface

- > 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 applications including EEPROM, high-precision analog-to-digital and digital-to-analog converters, and real-time clocks

Computer Operating Properly Watchdog Timer

- > Issues reset in the event of runaway code

Selectable Trip Point Low-Voltage Inhibit

- > Improves reliability by resetting the 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 33 Bidirectional Input/Output (I/O) Lines

- > 10 mA sink/source on all I/O pins
- > 15 mA sink capability on five I/O pins
- > Keyboard scan with selectable interrupts on eight I/O pins
- > Software programmable pull-ups on 23 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

AN2120 PPP for GP32 (Internet)

EB366 In-Circuit Programming of 68HC908GP32 Flash Memory

Cost-Effective Development Tools

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

M68EVB908GP32
\$168

Evaluation board with large 2" x 4" prototype area, two serial ports, input/output (I/O) header and universal power supply

FSICEKITGPGT
\$2,495

Complete FSICE high-performance emulator kit; includes emulator module, cables, head adapters and programming adapters

M68EML08GPGT
\$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

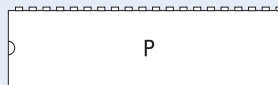
CWX-H08-SE
Free

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

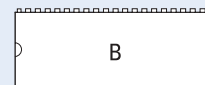
Package Options

Part Number	Package	Temp. Range
MC68HC908GP32CP	40 DIP	-40°C to +85°C
MC68HC908GP32CFB	44 QFP	-40°C to +85°C
MC68HC908GP32CB	42 SDIP	-40°C to +85°C

40-Pin Plastic DIP



42-Pin Plastic SDIP



44-Lead QFP



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