

A FLASH MCU SOLUTION

68HC908GT16/GT8

8-bit Microcontroller

TARGET APPLICATIONS

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

The 68HC908GT16 and 68HC908GT8 are fully integrated microcontrollers created to make system design easier by eliminating external peripherals wherever possible. The internal clock generator eliminates the need for an external clock source and helps reduce system costs. The integrated second generation FLASH memory programs up to 100 times faster than prior FLASH solutions and offers in-application programming. Features include a synchronous serial peripheral interface (SPI), an asynchronous serial communications interface (SCI), an analog-to-digital converter (ADC), an auto wakeup from stop feature, low-voltage inhibit (LVI) and a watchdog timer.

HC08 CPU

KBI

16K/8K Flash

8-ch 8-bit
ADC

512 RAM

SCI

LVI

SPI

COP

2 x 2-ch
16-bit Timer

Internal
Clock
Generator

Up to 36 GPIO

FEATURES

BENEFITS

HIGH-PERFORMANCE 68HC08 CPU CORE

- 8 MHz bus operation at 5V operation for 125 nsec minimum instruction cycle time
- 4 MHz bus operation at 3V for 250 nsec 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
- 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 re-programmable
- Extremely fast programming, encoding 64 bytes in as fast as 2 msec
- 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 re-programmability
- Reduces production programming costs through ultra-fast programming
- Allows re-programmable battery-powered applications
- Byte-writable for data as well as program memory
- Protects code from unauthorized reading and to guard against unintentional erasing/writing of user-programmable segments of code

UP TO 33 BI-DIRECTIONAL 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 pullups 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 pullups eliminates external glue logic when interfacing to simple keypads

TWO PROGRAMMABLE 16-BIT TIMER CHANNELS

- 125 nsec resolution at 8 MHz bus
- Free-running counter or modulo up-counter
- Each channel independently programmable for input capture, output compare or unbuffered PWM
- Pairing timer channels provides a buffered PWM function

INTERNAL CLOCK GENERATOR

- Software-selectable bus frequencies
- 2% accurate with trim capability
- Clock monitor
- Option to allow use of external clock source or external crystal/ceramic resonator
- Eliminates the need and cost for an external clock source
- Improved accuracy across temperature and voltage

TIMEBASE MODULE

- 8 user-selectable periodic real-time interrupts
- Optionally operate in low-power stop mode
- Provides auto wakeup from low-power stop mode to maintain real-time clock or check external device status such as sensors

**For More Information On This Product,
Go to: www.freescale.com**

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68HC908GT16/GT8

PART NUMBER	DESCRIPTION	RESALE*
EASY-TO-ORDER DEVELOPMENT TOOL KITS		
M68ICS08GPGT	Programmer/in-circuit debug kit	\$295
KITMMEVS08GPGT	Cost-effective real-time in-circuit emulator kit	\$1450
KITMMDS08GPGT	High-performance real-time in-circuit emulator kit	\$3950
INDIVIDUAL DEVELOPMENT TOOL COMPONENTS		
M68MMDS0508	High performance emulator	\$2950
M68MMPFB0508	MMEVS platform board	\$395
M68EML08GPGT	Emulation module daughter board	\$495
M68CBL05B	Low-noise flex cable	\$120
M68CBL05C	Low-noise flex cable	\$120
M68TC08GT16FB44	44-pin QFP target head adapter	\$250
M68TB08GT16B42	42-pin SDIP target head adapter	\$100
M68TQS044SAG1	44-pin TQ socket with guides	\$50
M68TQP044SAMO1	44-pin TQPACK	\$70

APPLICATION NOTES AND ENGINEERING BULLETINS

- AN1831/D Using MC68HC908 On-Chip FLASH Programming Routines
- EB366/D In-Circuit Programming of 68HC908GP32 FLASH Memory
- AN2093/D Creating Efficient C Code for the MC68HC08
- AN1219/D M68HC08 Integer Math Routines
- AN1218/D HC05 to HC08 Optimization
- AN1837/D Non-Volatile Memory Technology Review
- AN1752/D Data Structures for 8-bit MCUs
- AN1705/D Noise Reduction Techniques for MCU-Based Systems
- AN1259/D System Design and Layout Techniques for Noise Reduction in MCU-Based Systems
- AN1263/D Designing for Electromagnetic Compatibility with Single-Chip Microcontrollers
- AN1050/D Designing for Electromagnetic Compatibility (EMC) with HCMOS Microcontrollers
- AN1705/D Noise Reduction Techniques for Microcontroller-Based Systems

And many more—see our Web site at <http://www.motorola.com/mcu>

FEATURES 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

FEATURES SERIAL PERIPHERAL INTERFACE

- Full-duplex 3-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 A/D D/A converters, real-time clocks, etc.

FEATURES COMPUTER OPERATING PROPERLY WATCHDOG TIMER

- Issues reset in the event of runaway code

FEATURES SELECTABLE TRIP POINT LOW-VOLTAGE INHIBIT

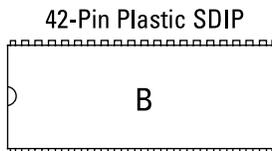
- Improves reliability by resetting the MCU when voltage drops below trip point
- Two trip points allow optimum operation in both 5V and 3V nominal systems
- Integration reduces system cost

FEATURES 8-BIT ANALOG-TO-DIGITAL CONVERTER

- 8 channels
- Single conversion in 17 μsec
- Fast, easy conversion from analog inputs—such as temperature, pressure and fluid levels—to digital values for CPU processing

PACKAGE OPTIONS

PART NUMBER	PACKAGE	TEMPERATURE RANGE
MC68HC908GT16CFB	44 QFP	-40 to 85°C
MC68HC908GT16CB	42 SDIP	-40 to 85°C
MC68HC908GT8CFB	44 QFP	-40 to 85°C
MC68HC908GT8CB	42 SDIP	-40 to 85°C
SAMPLE PACKS		
KMC908GT16CFB	44 QFP	-40 to 85°C
KMC908GT16CB	42 SDIP	-40 to 85°C



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