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A FLASH MCU SOLUTION

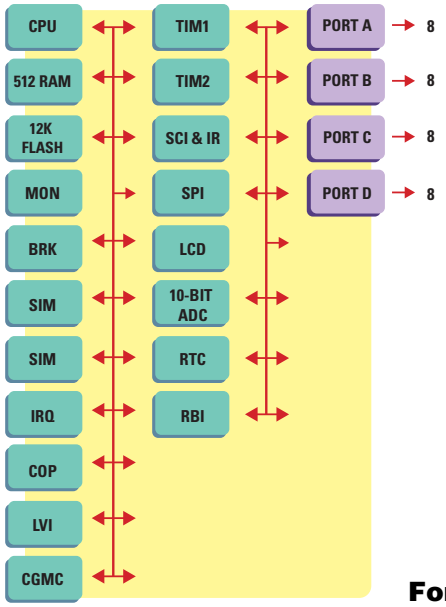
68HC908LJ12

8-bit Microcontroller

TARGET APPLICATIONS

- Portable audio/video
- Personal appliances
- Air conditioners
- Microwave ovens
- Boilers
- Cameras
- Medical instruments
- Remote controls
- Electric power meters
- Thermostats

The 68HC908LJ12 is a fully integrated microcontroller created to make system design easier by eliminating external peripherals, wherever possible. The 32 kHz phase-locked 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 previous FLASH solutions and offers in-application programming. Features include a synchronous serial peripheral interface (SPI), an asynchronous serial communications interface (SCI) with infrared modulator/demodulator, an analog-to-digital converter (ADC), a liquid crystal display (LCD) driver, a real-time clock, an auto wakeup-from-stop feature, low-voltage inhibit (LVI) and a watchdog timer.



FEATURES	BENEFITS

HIGH-PERFORMANCE 68HC08 CPU CORE

- 8 MHz bus operation (at 5V) for 125 nsec minimum instruction cycle time
- 4 MHz bus operation (at 3.3V) for 250 nsec minimum instruction cycle time
- 2 MHz bus operation (at 2.4V) for 500 nsec minimum instruction cycle time
- Efficient instruction set including multiply and divide
- 16 flexible addressing modes including multiply and divide
- Fully static low-voltage, low-power design with wait and stop modes

- Object code compatible with the 68HC08 family
- 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 devices' full operating supply voltage with no extra programming voltage
- 10K write/erase cycles minimum over temperature
- Flexible block protection and security
- ROM-resident in-circuit programming and emulated EEPROM routines

- 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 guards against unintentional erasing/writing of user-programmable segments of code
- ROM-resident programming routines simplify user codes

10-BIT ANALOG-TO-DIGITAL CONVERTER

- Six channels
- Single conversion in 8.5 µsec

- Fast, easy conversion from analog inputs—such as temperature, pressure and fluid levels—to digital values for CPU processing

CLOCK GENERATION MODULE WITH PLL

- 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

- Provides high performance using low-cost, low-frequency reference crystals
- Reduces generated noise while still providing high performance (up to 32 MHz)

TWO PROGRAMMABLE 16-BIT TIMERS, EACH WITH TWO CHANNELS

- 125 nsec resolution at 8 MHz bus
- Free-running counter or module up-counter

- Each channel independently programmable for input capture, output compare, unbuffered PWM
- Pairing timer channels provides a buffered PWM function

REAL-TIME CLOCK MODULE

- Second, minute, hour, day, day of week, month, year counters
- Automatic calendar with leap year adjustment
- 10 msec chronograph counter
- Alarm and seven periodic interrupts

- Provides auto-wakeup from low-power stop mode to check external device status (such as status of sensors)
- Auto-wakeup can be periodic or at a defined time

A FLASH MCU SOLUTION

68HC908LJ12

PART NUMBER	DESCRIPTION	RESALE*
EASY-TO-ORDER DEVELOPMENT TOOL KITS		
M68ICS08LJ	LJ Programmer/in-circuit debug kit	$245
KITMMEVS08LJ12	Cost-effective real-time in-circuit emulator kit	$1450
KITMMDS08LJ12	High-performance real-time in-circuit emulator kit	$3950
INDIVIDUAL DEVELOPMENT TOOL COMPONENTS		
M68MMDS0508	High-performance emulator	$2950
M68MMPFB0508	MMEVS platform board	$395
M68EML08LJ12	Emulation module daughter board	$495
M68CBL05C	Low-noise flex-cable	$120
M68TC08LJ12FB52	52-pin QFP target head adapter	$250
M68TC08LJ12PB64	64-pin LQFP target head adapter	$250
M68TC08LJ12FU64	64-pin QFP target head adapter	$250

ENGINEERING BULLETINS AND APPLICATION NOTES

- 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	BENEFITS

SERIAL COMMUNICATIONS INTERFACE WITH INFRARED MODULATOR/DEMODULATOR

- UART asynchronous communications system
- Optional infrared modulator/demodulator
- Flexible baud rate generator
- Double buffered transmit and receive
- Optional hardware parity checking and generation
- Enables asynchronous serial communications with peripheral devices
- Built-in infrared modulator/demodulator module eliminates external drivers and reduces system costs for remote controller applications

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 A/D and D/A converters, etc.

LIQUID CRYSTAL DISPLAY (LCD) DRIVER

- 26 frontplane x 4 backplane configuration
- 27 frontplane x 3 backplane configuration
- 27 frontplane x 1 backplane configuration
- LCD voltages generated by internal circuits
- Direct connection to LCD panel for easy circuit design and lower costs

COMPUTER OPERATING PROPERLY (COP) WATCHDOG TIMER

- Runs from an internal, independent 47 kHz RC clock
- Issues reset in the event of runaway codes
- Independent clock enables COP to operate even in the event of system clock failure.

SELECTABLE TRIP POINT LOW-VOLTAGE INHIBIT (LVI)

- Three trip points allow optimum operation in 5V, 3.3V and 2.5V nominal systems
- Improves reliability by resetting the MCU when voltage drops below trip point
- Integration reduces system cost

UP TO 32 BIDIRECTIONAL INPUT/OUTPUT (I/O) LINES

- 8 mA sink/source on four I/O pins
- 15 mA sink/source on two I/O pins
- Keyboard scan with programmable pullups eliminates external glue logic when interfacing to simple keypads
- High current I/O allows direct drive of LED and other circuits to eliminate external drivers and reduce system costs
- Keyboard scan with selectable interrupts on eight I/O pins

PACKAGE OPTIONS

PART NUMBER	PACKAGE	TEMPERATURE RANGE
MC68HC908LJ12CFU	64 QFP (14 X 14)	–40 to +85°C
MC68HC908LJ12CFB	52 QFP (10 X 10)	–40 to +85°C
MC68HC908LJ12CPB	64 LQFP (10 X 10)	–40 to +85°C
SAMPLE PACKS	**PACKAGE**	**TEMPERATURE RANGE**
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KMC908LJ12CFB	52 QFP (10 X 10)	–40 to +85°C
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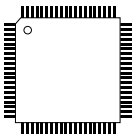
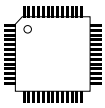
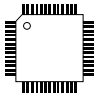
64-PIN QFP



64-PIN LQFP



52-PIN QFP



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* All prices are manufacturer's suggested resale for North America

68HC908LJ12BR/D
Rev. 1