

Cooking Products

Overview

Home appliance controls are changing from purely mechanical to fully electronic as microcontrollers are incorporated into the designs.

The migration in the industry from mechanical to electromechanical control, then to full electronic control has been ongoing for several years.

Today, microcontrollers provide the intelligence to every electronic solution.

The primary reasons driving the adoption of electronics are reliability, cost, and improved energy efficiency.

The functionality of the oven/cooker/range has been changing gradually over the last five years and is driven by consumer

demand for new features.

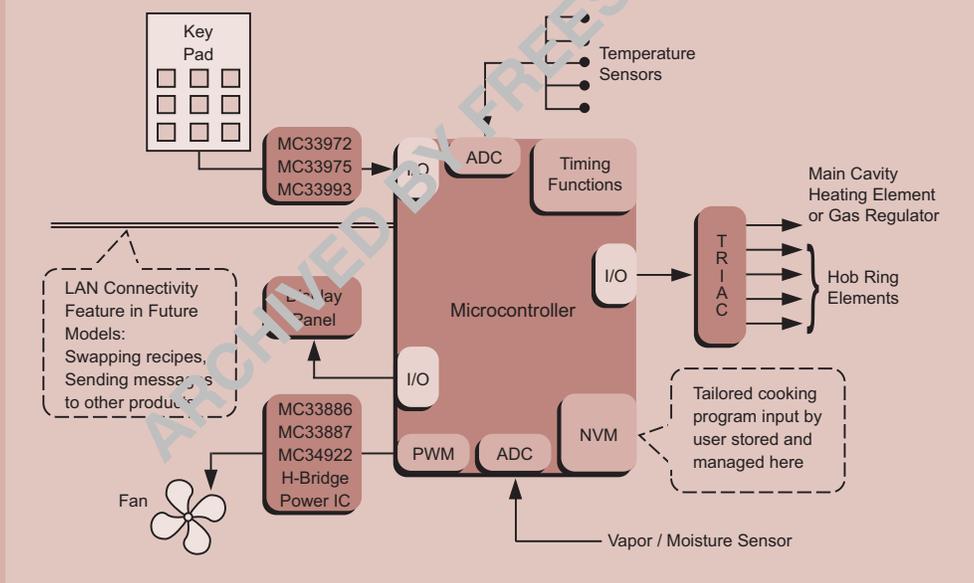
Microcontrollers support these new, innovative cooking appliance features.

Freescale's *SMARTMOS™* analog portfolio provides power actuation (MC33887), sensing (MC33794), and multiple switch detect (Flexible I/O) family ICs. The MC33794 provides water level sensing. The Flexible I/O family provides a simple system power conservation solution providing a WAKE output with which the MCU power supply can be enabled when MCU activation is required. It also provides optimized switch OPEN/CLOSE status verification of multiple switches with changes immediately reported to the MCU.

Key Benefits

- > Delivers high precision control over the cooking process using microcontrollers' intelligent management programs
- > Offers intelligence in the appliance that results in improved energy efficiency and reduced energy cost

TYPICAL MICROPROCESSOR APPLICATION DIAGRAM



Freescale Ordering Information^{Note}

Part Number	Product Highlights	Additional Information	
MC33794	Electric Field Imaging Devices	www.freescale.com/analog	
MC33886	H-Bridge Driver (5.2 A)		
MC33887	H-Bridge Driver with Sleep Mode (5.2 A)		
MC33972	22 Input Multiple Switch Detection Interface with Suppressed Wake-Up		
MC33975	22 Input Multiple Switch Detection Interface with Higher Wetting Current		
MC33993	22 Input Multiple Switch Detection Interface		
MC34922	Dual Power H-Bridge (4.0 A)		
MC68HC(9)08ABxx	ADC, SCI, SPI, EEPROM		www.freescale.com
MC68HC(9)08AZxx	ADC, SCI, SPI, CAN, EEPROM		
MC68HC(9)08GPxx	ADC, SCI, SPI		
MC68HC(9)08GTxx	ADC, SCI, SPI, ICG		
MC68HC(9)08JKxx	ADC		
MC68HC(9)08JLxx	ADC		
MC68HC(9)08SRxx	ADC, SCI, I ² C, Temp Sensor		
MC68HC908GRxx	ADC, SCI, SPI		
MC68HC908KXxx	ADC, SCI		
MC68HC908MRxx	ADC, PWM, SCI, SPI		
MC68HC908QXxx	Low Pin Count, Low Cost		

Note: Search on the listed part number.

Design Challenges

Cost

The appliance market is highly competitive and cost sensitive. Eliminating just a few cents from the cost of a solution can save thousands of dollars in this high-volume market.

Flexibility

A new model can be introduced every year, with products having a relatively short life cycle. This means software problems must be eliminated quickly, which requires professional development tools and faster, more efficient development cycles.

Legislation

Energy regulations and consumer demand for efficient appliances that use less energy are driving manufacturers to design products to meet these requirements.

Regional Variation

The White Goods market is dominated by global companies who are trying to minimize development costs by introducing common platforms with the capability to be used around the world. These platforms must be flexible enough

to accommodate regional variations in such areas as the user interface, where visual displays are required to support different language options.

Measurement Accuracy

Measuring temperatures in different zones is critical to the performance of the appliance.

Freescale Semiconductor Solution

Freescale Semiconductor is the industry leader in Flash microcontrollers. Flash memory is a nonvolatile memory (NVM) technology that provides access to the following features:

- > Faster programming and erase times of the Flash memory with reprogram capability
 - > In-application programming, which reduces time to market
 - > Improved write/erase and data retention performance for Flash
 - > Flexible block protection and security
 - > Emulation of EEPROM by Flash
- Embedded Flash brings new flexibility to your designs:

- > Provides end-of-line customizing for regional variations in consumer demands
- > Enables changing legislation to be satisfied with software-enabled intelligence
- > Supports remote diagnostics and preventative maintenance
- > Minimizes programming costs while increasing code flexibility with production line programming
- > Reduces code obsolescence, which saves on scrapped product costs
- > Improves time to market, which reduces lead times
- > Standardizes platforms, which reduces product variability
- > Eliminates sockets and rework with in-system programmable Flash
- > Provides field upgrade capability while allowing remote reprogramming of the microcontroller
- > Eliminates the need for external EEPROM with 10,000 write/erase cycles because Flash can emulate EEPROM

Development Tools^{Note}

Tool Type	Product Name	Vendor	Description	Additional Information
Software	CWHC08	Metrowerks	CW Full Package for HC08	www.metrowerks.com
Software	CWHC08ASM	Metrowerks	CW ASM Tools for HC08	
Software	CWHC08CC	Metrowerks	Stand-Alone C/C++/cC++/EC++ Compiler for HC08	
Software	CWHC08MIG	Metrowerks	CW Full Package for HC08 Migration	
Hardware	68HC08 Emulators, Cables, and Adapters	Freescale Semiconductor	Emulation Modules, Flex Cables, and Target Head Adapters in Support of 68HC08 MCUs	www.freescale.com
Hardware	68HC08 Programmers	Freescale Semiconductor	Programmer Boards in Support of 68HC08 MCUs	
Development	In-Circuit Simulator (ICS) Kits	Freescale Semiconductor	Low-Cost Tools for Developing and Debugging Target Systems Incorporating 68HC08 MCUs	
Development	Modular Development System (MMDS) Kits	Freescale Semiconductor	Full-Featured Emulator System for Developing Embedded Systems Using 68HC(9)08 MCUs	
Development	Modular Evaluation System (MMEVS) Kits	Freescale Semiconductor	Economical, Two-Board Emulator for the 68HC(9)08 MCUs	
Development	MON08 Cyclone	Freescale Semiconductor	Provides all the capabilities of the MON08 Multilink plus the ability to function as a stand-alone programmer with push buttons and LED user interface.	
Development	MON08 Multilink	Freescale Semiconductor	Low-Cost Development Tool for 68HC08 Flash MCUs	www.metrowerks.com
Evaluation Kit	KIT33794DWBEVM	Metrowerks	Electric Field Sensing Device	
Evaluation Kit	KIT33887DWBEVB	Metrowerks	225 mΩ 150 °C and Sleep Mode and Current Sense	
Evaluation Kit	KIT33993DWBEVB	Metrowerks	22 Input Multiple Switch Detection Interface	
Evaluation Kit	KIT34922PNAEVB	Metrowerks	Dual H-Bridge with Load Current Feedback	

Note: Search on the listed product name.

Related Documentation^{Note}

Document Number	Description	Additional Information
APDPAK	Analog ICs Integrated Solutions Data Book	www.freescale.com
BR68HC08FAMAM	68HC08 Family: High Performance and Flexibility	
CWDEVSTUDFACTHC08	CodeWarrior™ Developer's Studio for 68HC08, Special Edition Brochure	
FLYREMBEDFLASH	Embedded Flash: Changing the Technology World for the Better	
SG1002	Analog Product Selector Guide	
816PITCHPAK03	MCU 8- and 16-Bit Sales Binder	

Note: Search on the listed document number.

Notes

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For more information about Freescale products, please visit www.freescale.com.