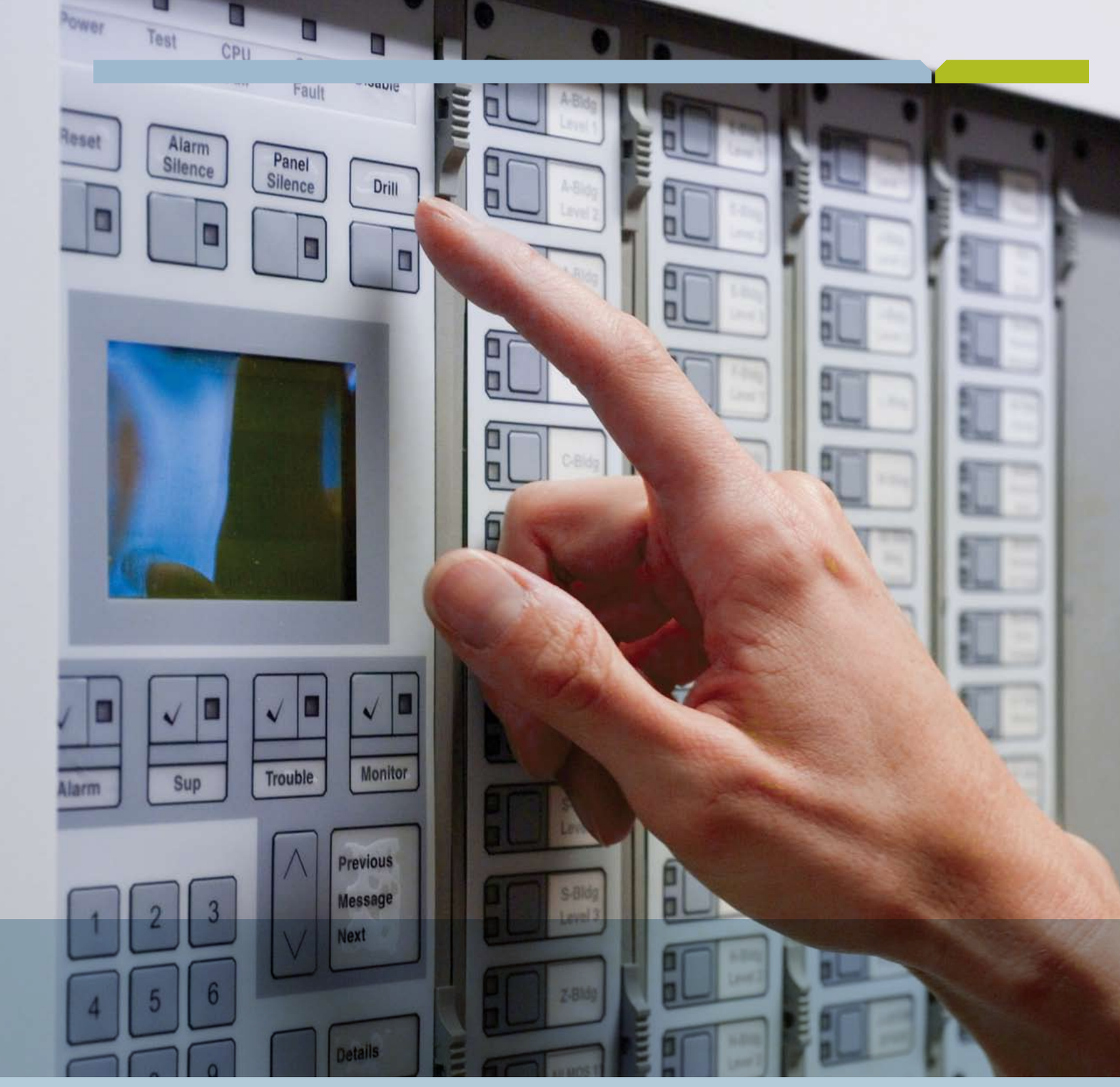

Microcontrollers

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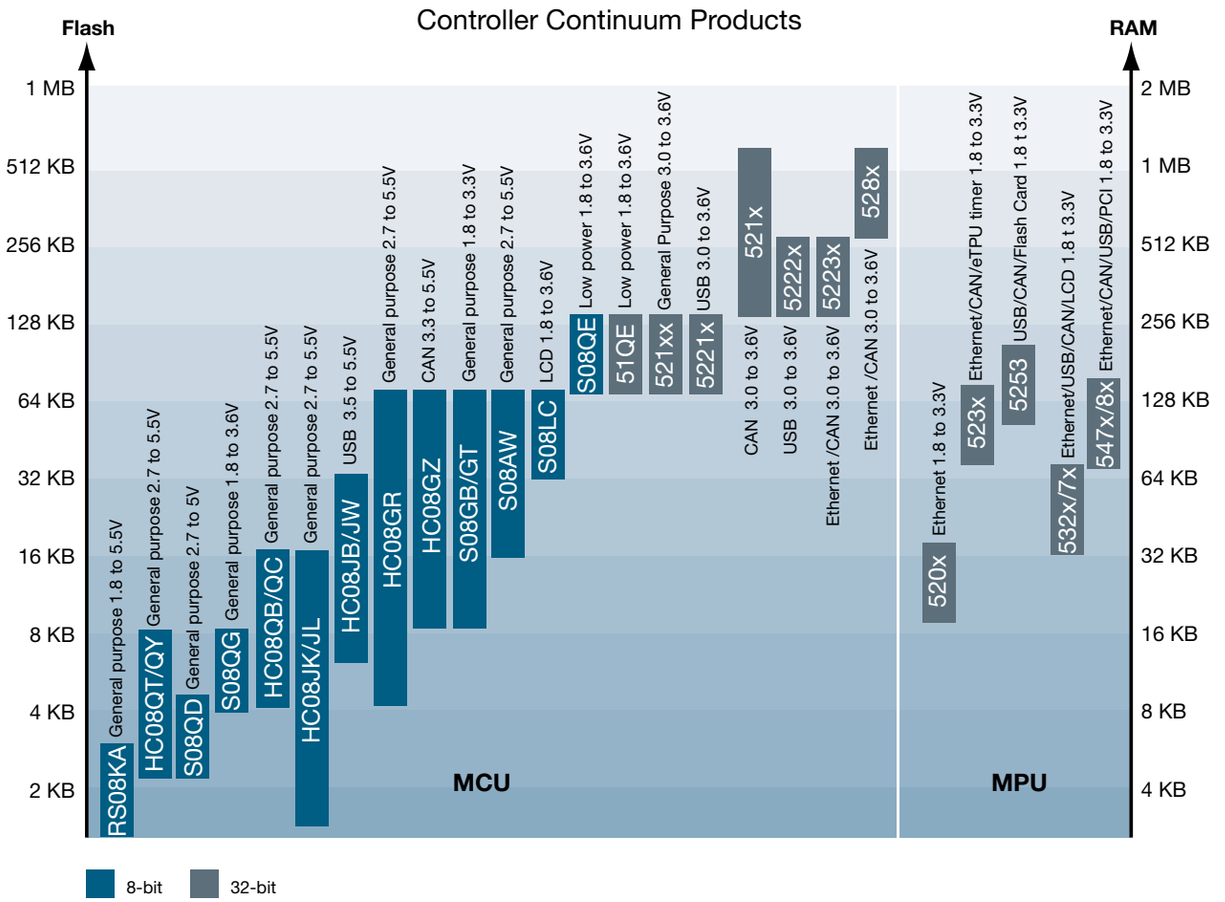
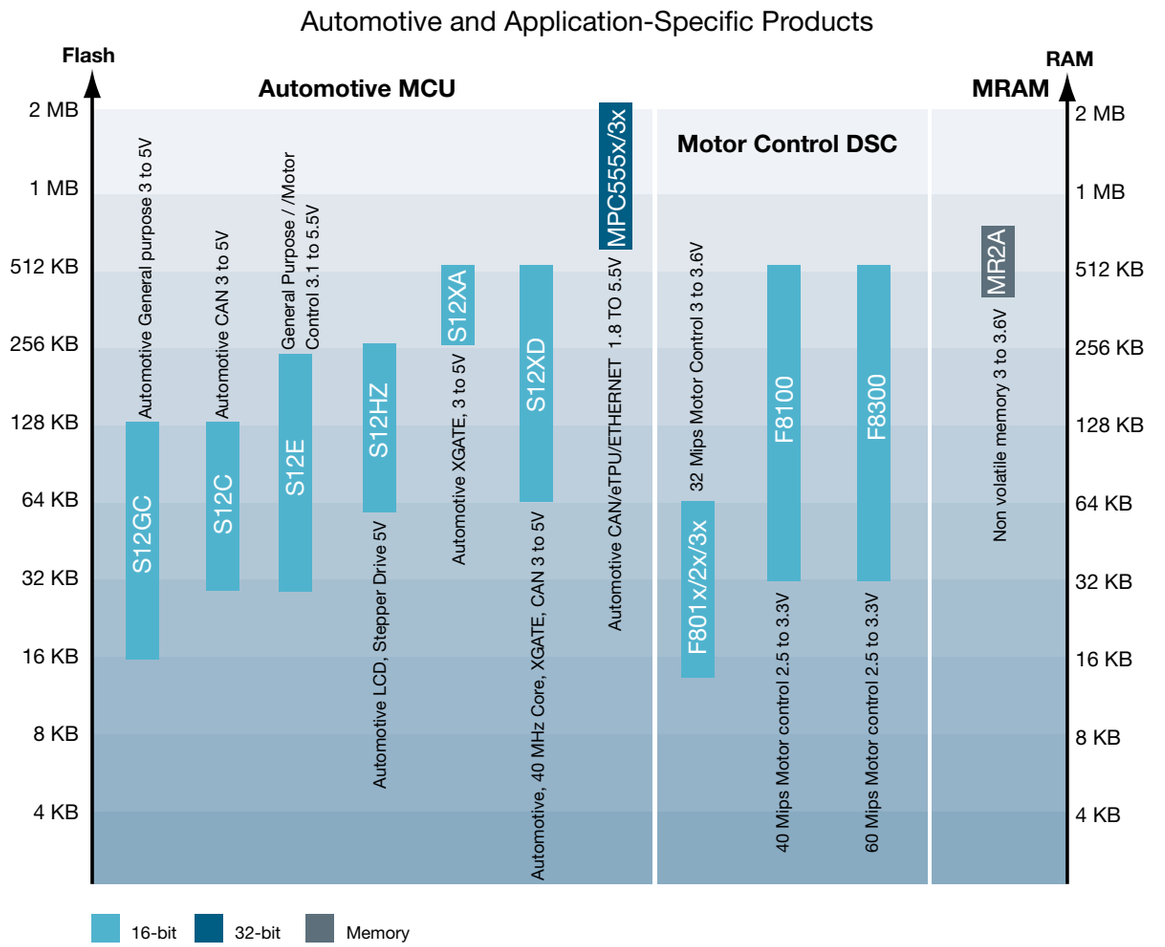
For a complete listing of available products with full orderable part numbers, visit **www.freescale.com/mcu**.

Roadmaps


Controller Continuum Products
Flash
RAM
1 MB
512 KB
256 KB
128 KB
64 KB
32 KB
16 KB
8 KB
4 KB
2 MB
RS08KA General purpose 1.8 to 5.5V
HC08QT/QY General purpose 2.7 to 5.5V
S08QD General purpose 2.7 to 5V
S08QG General purpose 1.8 to 3.6V
HC08QB/QC General purpose 2.7 to 5.5V
HC08JK/JL General purpose 2.7 to 5.5V
HC08JB/JW USB 3.5 to 5.5V
HC08GR General purpose 2.7 to 5.5V
HC08GZ CAN 3.3 to 5.5V
S08GB/GT General purpose 1.8 to 3.3V
S08AW General purpose 2.7 to 5.5V
S08LC LCD 1.8 to 3.6V
S08QE Low power 1.8 to 3.6V
51QE Low power 1.8 to 3.6V
521xx General Purpose 3.0 to 3.6V
5221x USB 3.0 to 3.6V
521x CAN 3.0 to 3.6V
5222x USB 3.0 to 3.6V
5223x Ethernet /CAN 3.0 to 3.6V
528x Ethernet /CAN 3.0 to 3.6V
520x Ethernet 1.8 to 3.3V
523x Ethernet/CAN/eTPU timer 1.8 to 3.3V
5253 USB/CAN/Flash Card 1.8 t 3.3V
532x/7x Ethernet/USB/CAN/LCD 1.8 t 3.3V
547x/8x Ethernet/CAN/USB/PCI 1.8 to 3.3V
MCU
MPU
8-bit
32-bit


Automotive and Application-Specific Products
Flash
RAM
Automotive MCU
MRAM
Motor Control DSC
2 MB
1 MB
512 KB
256 KB
128 KB
64 KB
32 KB
16 KB
8 KB
4 KB
S12GC Automotive General purpose 3 to 5V
S12C Automotive CAN 3 to 5V
S12E General Purpose / /Motor Control 3.1 to 5.5V
S12HZ Automotive LCD, Stepper Drive 5V
S12XA Automotive XGATE, 3 to 5V
S12XD Automotive, 40 MHz Core, XGATE, CAN 3 to 5V
MPC555x/3x Automotive CAN/eTPU/ETHERNET 1.8 TO 5.5V
F801x/2x/3x 32 Mips Motor Control 3 to 3.6V
F8100 40 Mips Motor control 2.5 to 3.3V
F8300 60 Mips Motor control 2.5 to 3.3V
MR2A Non volatile memory 3 to 3.6V
16-bit
32-bit
Memory

Freescale Semiconductor
Embedded Control Solutions—More than you expected!

We offer the full gamut of hardware and software tools, from cost-effective demo boards to advanced, high-performance debuggers, for our entire portfolio of MCUs. Our CodeWarrior® Special Edition integrated development environment (IDE) for microcontrollers can be downloaded, at no cost, directly from our website. In addition, you have direct access to application notes, reference designs, online tutorials, discussion groups, training events and many other useful design assistance programs at **www.freescale.com/mcu.**

It's More Than Just a Product

Freescale is dedicated to providing semiconductor solutions that build value into your products for your customers. When you purchase from us, you're buying more than just a product. You're getting access to a broad ecosystem of technical support services, development tools and training—all designed to make your job easier and your end products better.

S08 Core Software Efficiency

High-performance optimized for extreme operating economy with a number of low-power options, the S08 core is particularly attractive for battery-powered and handheld applications. Multiple Stop modes, along with Wait and Standby modes, will help product developers achieve new thresholds in low-power performance under a variety of operating conditions.

RS08 Core for Ultra Low-End Applications

The RS08 core is a reduced version of the S08 central processing unit (CPU) that has been specifically designed for small pin-count devices with under 16 KB memory. Thirty percent smaller than the S08 CPU, it's more efficient and cost effective for simple electro-mechanical devices that are migrating to fully solid-state electronic operation or to portable devices that have evolved into smaller or even disposable versions.

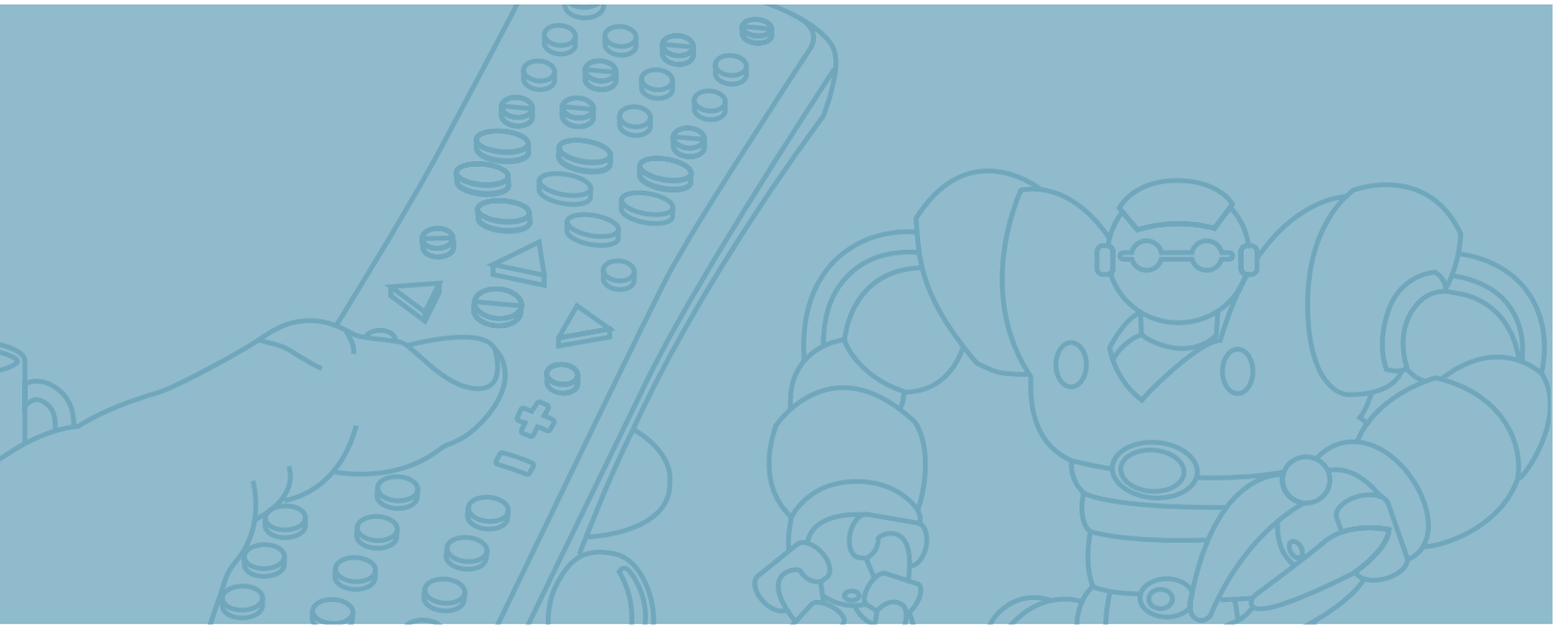
The HC08 Core

From a basic bare-bones controller in a tiny 8-pin quad flat no-lead (QFN) package to feature-rich silicon in a 64-lead quad flat package (QFP), the HC08 MCU is an industry workhorse that can flaunt an impressive array of peripherals.

The 32-bit ColdFire® Portfolio Advantage For Industrial And Consumer Markets

The ColdFire family of 32-bit embedded controllers is backed by a 25-year legacy of 68K development and support. The ColdFire family carries over the popular 68K instruction set and integrates new instructions to meet the demands of today's complex applications. The ColdFire core architecture has been designed to offer very specific benefits:

- 100 percent synthesizable cores that are easily adapted to new process technologies and easily integrated with memories system modules and communications peripherals



- The variable-length RISC architecture gives designers greater flexibility and exceptional code density versus leading industry rivals
- Efficient use of on-chip memory means designers don't have to sacrifice performance to keep system costs in line
- Pipelines optimization to minimize core redundancy, which in turn delivers exceptional performance and throughput

On top of the core, an extensive library of peripheral sets and memory sizes gives you the flexibility to custom fit an off-the-shelf embedded controller that suits your needs and benefits your customers. If an off-the-shelf solution is not right for you, Freescale gives you the flexibility to license the ColdFire architecture to create a custom embedded solution that best fits your specific application.

Freescale's 16-bit DSC Family, Ideal For Motion Control

Freescale has been the pioneer of digital signal controller (DSC) solutions. Our 56800/56800E DSC architecture combines the computational power of a DSP with the control functionality of an MCU onto a single core. The 56800/56800E family combines the advantages of hybrid architecture with leadership peripherals, advanced memory technology, software and development tools to give you the capability you need to develop winning solutions in complex motion control environments.

S12X—An Automotive Industry Standard

The S12X family of microprocessors (MCUs) is based on the popular HCS12 architecture and contains a RISC-based XGATE coprocessor, which addresses the design challenge of achieving higher MCU performance without the cost and complexity of adding separate processors. Running at twice the speed of the main CPU and without any CPU processing overhead, the XGATE coprocessor is engineered to boost system performance by an additional 80 MIPS at peak operation. S12X MCUs with XGATE are designed to deliver performance equivalent to many 32-bit MCUs, while retaining the low system cost and high code efficiency benefits of Freescale's S12 architecture.

You Are Never Very Far from Freescale

We have hundreds of salespeople and applications engineers in the field and an extensive network of distributors around the world. Your Freescale representatives are trained to understand your needs and help you find the best solutions for your products.

Our Fast Track online support resource is your portal to Freescale training, technical support and product documentation. It gives you the opportunity to contact us directly or access a number of self-help resources from a single web page—www.freescale.com/fasttrack. Fast Track is also your doorway to DevToolDirect, an e-commerce solution for ordering software and hardware development tools as well as Freescale's Really Simple Syndication (RSS) feeds, which allow you to quickly browse information from a variety of sources.

MC9RS08KA Family

Little doesn't mean limited–think big.

Designed specifically for the ultra low-end marketplace, the MC9RS08KA family of 8-bit microcontrollers is ideal for product developers transitioning from solid-state relays and switching systems to a full electronic solution.

The MC9RS08KA highlights include:

- Keeping the overall board design small—packages as small as the 3 mm x 3 mm 6-pin DFN
- Keeping design easy with the tools, code and technical support needed
- Analog control for increased system capabilities
- Suitable flash and RAM to give the software more functionality and the designer more possibilities

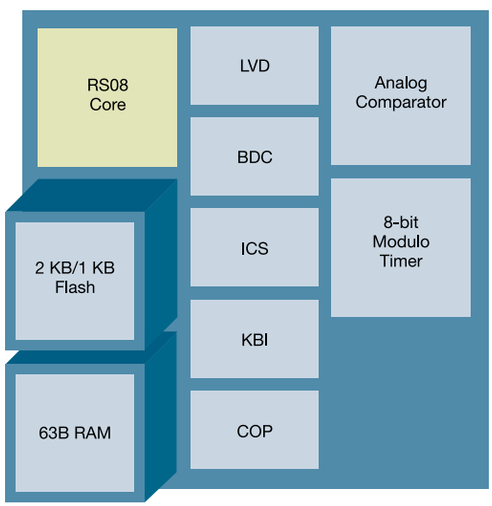
Key Features

- Up to 2 KB third-generation flash with extremely fast byte-writable programming
- 1.8-volt to 5.5-volt supply
- Integrated clock source (ICS) up to 10 MHz internal bus operation with 2 percent deviation over full temperature and voltage range
- 8-bit modulo timer with 8-bit prescalar
- Analog comparator with full rail-to-rail supply operation that can operate in STOP mode
- Real-time interrupt trigger with 3-bit prescalar
- Four bidirectional input/output (I/O) lines
- Computer operating properly (COP) feature
- 3-/5-channel keyboard interrupt (KBI)
- Low voltage detect (LVD) with Reset, Stop or Wakeup
- Auto Wakeup
- Background debugging system
- 6-pin DFN, 8-pin plastic dual in-line package (PDIP) and 8-pin narrow-body small outline integrated circuit (NB-SOIC) packaging options

Target Applications

- High-brightness LED
- Lighting system control
- Small handheld devices
- Toys
- AC line voltage monitoring
- Simple logic, analog driver and ASIC replacement

MC9RS08KA



DEMO9RS08KA2—MSRP $50*

The demo board integrates the USB-to-BDM interface, providing the capabilities of the USB multilink without the added cost of additional hardware.

DEMO9RS08KA2's built-in circuitry and USB-to-BDM programmer interface reduces hardware development time and allows faster code evaluation.

The cost-effective demo board is the first development tool supporting the new RS08 architecture. Connect, load, evaluate. Yes, it's that simple.

Board highlights include:

- 8-pin PDIP 9RS08KA2 microcontroller
- GPIO header connector 4 x 2-pin
- Built in USB-to-BDM interface
- Two push switches circuitry: one user, one reset
- Four LED circuitry connections: three user, one VDD
- BDM header connector
- Power input selector
- USB up to 500 mA
- Power connector 9 VDC typical (7V–18V)

*Prices subject to change.

Sample Application Notes

- AN3266—getting started with RS08
- DRM079—reference design for DC fan
- DRM080—reference design for multicolor HB-LED
- DRM081—reference design for low-end remote control

Device	Flash	RAM	ACMP	Timer	Clock Type	Package	Applications/Additional Features
MC9RS08KA2CDB	2 KB	63B	1	MTIM	ICS	6 DFN	Ultra small 3 mm x 3 mm package
MC9RS08KA2CSC	2 KB	63B	1	MTIM	ICS	8 NB-SOIC	Ultra low-end
MC9RS08KA2CPC	2 KB	63B	1	MTIM	ICS	8 PDIP	Ultra low-end
MC9RS08KA1CDB	1 KB	63B	1	MTIM	ICS	6 DFN	Ultra small 3 mm x 3 mm package
MC9RS08KA1CSC	1 KB	63B	1	MTIM	ICS	8 NB-SOIC	Ultra low-end
MC9RS08KA1CPC	1 KB	63B	1	MTIM	ICS	8 PDIP	Ultra low-end

Auto qualification not currently available.

MC9S08QD Family

Low-end 8-bit MCU bringing high performance 5V device with 10-bit ADC.

Extending the popular low end MC9S08Q family the MC9S08QD4/QD2 delivers the usual low power consumption performance of the S08 core, but is introducing a high performance 5V device with a 4-ch., 10-bit ADC and two 16-bit timers to the market in a small form 8-pin packages.

Key Features/Benefits

- 2 KB or 4 KB flash with 256B of RAM
- 2.7–5.5V operation
  - 4 MHz bus @ 3.0V ±10%, 8 MHz bus @ 5.0V ±10% operation
- Low-power operation
- 4-ch. 10-bit Analog to Digital Converter (ADC) with intenral reference voltages
- Internal Clock Source (ICS)
- Two 16-bit timer modules
- Flexible timer channels
- Pin compatibility with RS08KA2 and MC9S08QG8 to provide both downward and upward migration paths
- Low pin count MCU 8-pin PDIP & 8 NB SOIC

Target Applications

- Small appliances
  - Toasters
  - Low-end microwaves
- Large appliances
- Security system
- Watchdog co-processors
- Camera zoom control
- Walkie talkies
- Chargers
- Portable TVs
- DVD players
- Treadmills
- Vacuum cleaners
- DC cooling fan applications in computers
  - Low-power supplies
  - Telecommunications equipment
- AC voltage line monitor
- Battery chargers
- Digital capacitive discharge ignition (CDI) for motor cycles
- Industrial compressors
- Industrial control

Sample Application Notes

- AN3041—Internal Clock Source (ICS) Module on the HCS08s in Depth
- AN2111—A Coding Standard for HCS08 Assembly Language
- AN2717—M68HC08 to HCS08 Transition
- AN2497—HCS08 Background Debug Mode versus HC08 Monitor Mode

DEMO9S08QD4—MSRP $59*

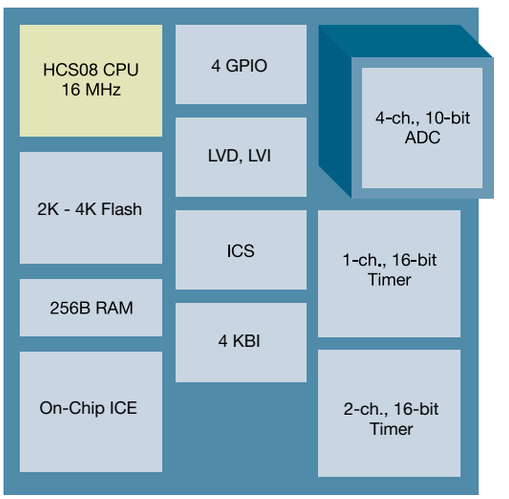
Application development is quick and easy with the integrated programmer/debugger tools (USB-BDM) and software (CodeWarrior) included. A 32-pin connector allows connecting the DEMO9S08QD4 board to an expanded evaluation environment.

Features include:
MC9S08QD4 MCU, 8 PDIP Socketed

- 4 KB flash
- 256B RAM
- Four KBI inputs
- Four GPIO, one input only, one output only
- Internal oscillator trimmable to 0.2%
- 1-Ch., 16-bit, timer/pulse width modulator
- 2-Ch., 16-bit, timer/pulse width modulator
- 4-Ch., 10-bit analog to digital converter
- 32 kHz, internal clock source
- Low-voltage detect with reset or interrupt
- Integrated USB-BDM
- BDM_PORT header for BMD cable support (not installed)
- 5V or 3.3V operation

*Prices subject to change.

MC9S08QD



Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package	Applications/ Additional Features
			10-bit	8-bit								
MC9S08QD4CPC	4 KB	256B	4-ch.		-	-	-	-	1 + 1-ch./1 + 2-ch.	ICS	8-pin PDIP	All HC08 and S08 include COP, LVI, POR, KBI
MC9S08QD4CSC	4 KB	256B	4-ch.		-	-	-	1	1 + 1-ch./1 + 2-ch.	ICS	8NB SOIC	
MC9S08QD2CPC	2 KB	128B	4-ch.		-	-	-	-	1 + 1-ch./1 + 2-ch.	ICS	8-pin PDIP	
MC9S08QD2CSC	2 KB	128B	4-ch.		-	-	-	1	1 + 1-ch./1 + 2-ch.	ICS	8NB SOIC	

For details on auto qualification please contact your local Freescale Sales Representative.

MC9S08QG Family

So highly integrated, it's redefining low-end.

Often it's not just the individual features, but the full feature set that matters. The MC9S08QG family enhances system functionality by integrating embedded modules that are frequently left off low-end MCUs.

These modules help to:

- Reduce system size
- Lessen the probability of board quality problems and conflicts
- Cut system cost
- Reduce design time

Key Features

- Powerful, advanced S08 core
- Multiple communications options—SCI, SPI and I^2C
- High-resolution analog—8-ch., 10-bit ADC and analog comparator
- "Extras" included—2-ch., 16-bit timer; internal/external oscillator; LVI; COP and up to 13 GPIOs
- Multiple memory options—8 KB or 4 KB flash memory and up to 512B RAM

Target Applications

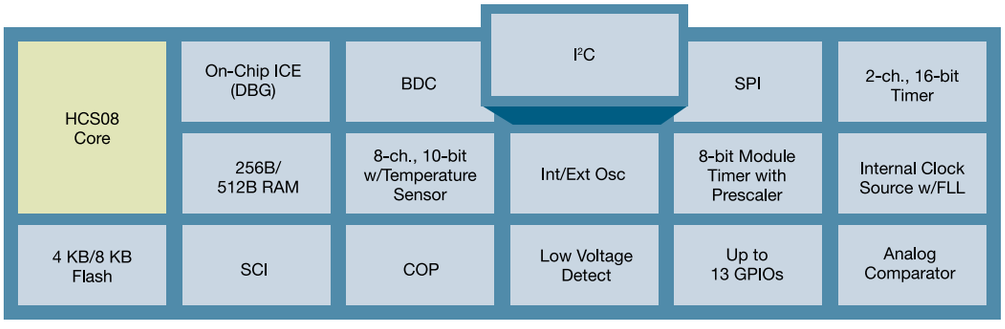
General-purpose use is only the beginning.

- Wireless sensors, including SMAC
- Watchdog coprocessors
- Small appliances
- Handheld devices
- Secure boot coprocessors
- Security systems
- Control systems

Sample Application Notes

- AN2717/D—Transitioning from the HC08 Core to the MC9S08 Core
- AN3048—Analog-to-Digital Converter on an I^2C Bus Using MC9S08QG8
- AN1818—Software SCI Routines with the 16-bit Timer Module

MC9S08QG



DEMO9S08QG8E—MSRP $50*

The demo board integrates the USB-to-BDM interface, providing the capabilities of USB Multilink without the added cost of additional hardware. It allows in-circuit debugging and flash programming without the emulation requirements of serial monitors or other debugging techniques used in the industry.

Board highlights include:

- Socketed MC9S08QG8 16-pin DIP
- Integrated USB-to-BDM cable
- 32-pin I/O header
- Power LED
- Reset push button
- Two push buttons
- Two LEDs
- Potentiometer
- Light sensor
- Jumpers to disable the user I/O functions
- RS-232 Transceiver circuit, 9-pin D-shell connector
- Onboard 12-volt to 5-volt voltage regulator with 3.3-volt output to MCU
- Barrel-style power connector
- Optional BDM connector (6-pin header)
- Optional external oscillator circuit
- CodeWarrior® Development Studio for Microcontrollers included with demo board

*Prices subject to change.

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I^2C	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features All HC08 and S08 include COP, LVI, POR, KBI
			10-bit	8-bit								
MC9S08QG4CFQE	4 KB	256B	4-ch.					1	1-ch.	OSC	DFN8	Fully integrated small packages
MC9S08QG4CDNE	4 KB	256B	4-ch.					1	1-ch.	OSC	SOIC8	Fully integrated small packages
MC9S08QG4CPAE	4 KB	256B	4-ch.					1	1-ch.	OSC	PDIP8	Fully integrated small packages
MC9S08QG4CDTE	4 KB	256B	8-ch.		1		1	1	2-ch.	OSC	TSSOP16	Fully integrated small packages
MC9S08QG4CFFE	4 KB	256B	8-ch.		1		1	1	2-ch.	OSC	QFN16	Fully integrated small packages
MC9S08QG8CDTE	8 KB	512B	8-ch.		1		1	1	2-ch.	OSC	TSSOP16	Fully integrated small packages
MC9S08QG8CFFE	8 KB	512B	8-ch.		1		1	1	2-ch.	OSC	QFN16	Fully integrated small packages
MC9S08QG8CPBE	8 KB	512B	8-ch.		1		1	1	2-ch.	OSC	PDIP16	Fully integrated small packages
MC9S08QG8CDNE	8 KB	512B	4-ch.					1	1-ch.	OSC	SOIC8	Fully integrated small packages
MC9S08QG8CFQE	8 KB	512B	4-ch.					1	1-ch.	OSC	DFN8	Fully integrated small packages

Auto qualification not currently available.

MC908QT/QY Family

The foundation of the HC08 Q family—cost-effective and general purpose.

MC908QT/QY are versatile, cost-effective, small-packaged HC08 devices designed for a variety of applications. Family derivatives provide a wide range of choices, and all devices support the DEMO908QB8 demo board for product development.

- QY devices are 16-pin packages—extra GPIO
- QT devices are 8-pin packages—smaller form factor

Key Features

- HC08 core—3-volt to 5-volt operation standard
- High-resolution analog available—up to 10-ch., 10-bit ADC
- Multiple memory options—1.5 KB to 8 KB flash memory and up to 256B RAM

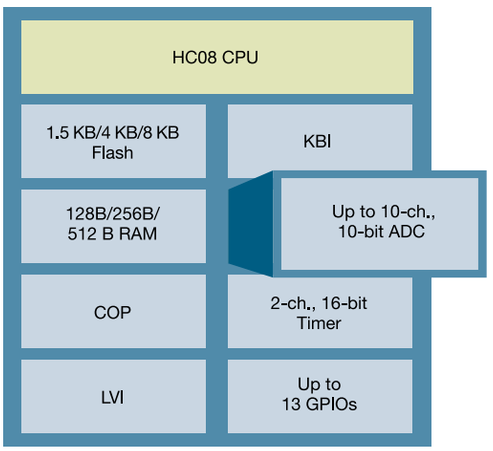
Target Applications

- Discrete replacement
- Appliances
- Control systems
- Battery chargers
- Home and industrial security
- Toys

Sample Application Notes

- AN2984/D—Programming the ADC
- AN2637/D—Creating a Software SCI for a System

MC908QT/QY



DEMO908QB8E—MSRP $75*

Demo board fuses USBMULTILINK08E (USB in-circuit debug and flash programming cable) into the board design.

Development for the MC908QT/QY can be achieved without additional hardware.

Board can be powered from the USB, eliminating an external power supply requirement.

User components for application development include:

- Reset push button
- Two input push buttons
- Light sensor and potentiometer for ATD input
- Two output LEDs
- Local Interconnect Network (LIN) communication interface
- I/O header for external circuit development

*Prices subject to change.

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I^2C	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features All HC08 and S08 include COP, LVI, POR, KBI
			10-bit	8-bit								
MC908QY1ACDTE	1.5 KB	128B							2-ch.	OSC	TSSOP16	Small packages
MC908QY1ACDWE	1.5 KB	128B							2-ch.	OSC	SOIC16	Small packages
MC908QY1ACPE	1.5 KB	128B							2-ch.	OSC	PDIP16	Small packages
MC908QT1ACFQE	1.5 KB	128B	6-ch.						2-ch.	OSC	DFN8	Small packages
MC908QT1ACDWE	1.5 KB	128B	6-ch.						2-ch.	OSC	SOIC8	Small packages
MC908QT1ACPE	1.5 KB	128B	6-ch.						2-ch.	OSC	PDIP8	Small packages
MC908QY4ADTE	2 KB	128B	6-ch.						2-ch.	OSC	TSSOP16	Small packages
MC908QY2ADWE	2 KB	128B	6-ch.						2-ch.	OSC	SOIC16	Small packages
MC908QY2ACPE	2 KB	128B	6-ch.						2-ch.	OSC	PDIP16	Small packages
MC908QY2ACFQE	2 KB	128B	4-ch.						2-ch.	OSC	DFN8	Small packages
MC908QY2ACDWE	2 KB	128B	4-ch.						2-ch.	OSC	SOIC8	Small packages
MC908QY2ACPE	2 KB	128B	4-ch.						2-ch.	OSC	PDIP8	Small packages
MC908QT4ACFQE	4 KB	128B	4-ch.						2-ch.	OSC	DFN8	Small packages
MC908QT4ACDWE	4 KB	128B	4-ch.						2-ch.	OSC	SOIC8	Small packages
MC908QT4ACPE	4 KB	128B	4-ch.						2-ch.	OSC	PDIP8	Small packages
MC908QY4ACDTE	4 KB	128B	6-ch.						2-ch.	OSC	TSSOP16	Small packages
MC908QY4ACDWE	4 KB	128B	6-ch.						2-ch.	OSC	SOIC16	Small packages
MC908QY4ACPE	4 KB	128B	6-ch.						2-ch.	OSC	PDIP16	Small packages
MC908QY8CDTE	8 KB	256B	4-ch.						2-ch.	OSC	TSSOP16	Small packages
MC908QY8CDWE	8 KB	256B	4-ch.						2-ch.	OSC	SOIC6	Small packages

Auto qualification available on family.

MC908QB Family

Increased integration in the smallest places.

MC908QB family feature-rich HC08 devices are designed to extend MCU capabilities in small pin count packages.

Family highlights include:

- Increased analog resolution
- Three-phase motion control capability with additional timers
- Expanded communications options

Key Features

- HC08 core—3-volt to 5-volt operation
- Multiple communications options—ESCI and SPI
- High-resolution analog—10-ch., 10-bit ADC
- Motion-control ready—4-ch., 16-bit timer
- Multiple memory options—8 KB or 4 KB flash memory and up to 256B RAM
- Low-voltage (2.2 volts) option available

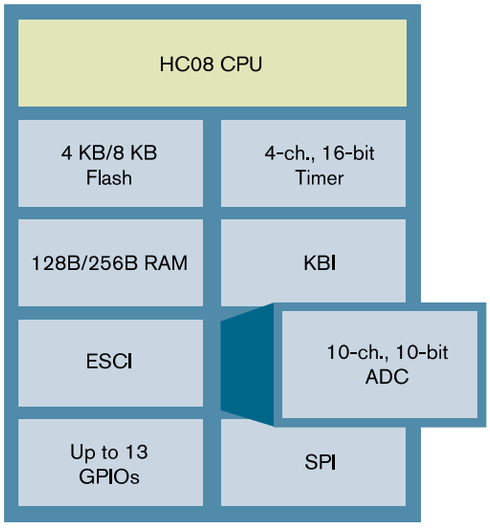
Target Applications

- Fire detectors
- Security systems
- Battery chargers
- Analog control replacement
- ASIC and discrete replacement
- Motion control
- Toys
- Small appliances

Sample Application Notes

- AN2984/D—Programming the ADC
- AN2637/D—Creating a Software SCI for a System

MC908QB8



DEMO908QB8E—MSRP $75*

Demo board fuses USBMULTILINK08E (USB in-circuit debug and flash programming cable) into the board design. Development for the MC908QB can be achieved without additional hardware. Board can be powered from the USB, eliminating an external power supply requirement.

User components for application development include:

- Reset push button
- Two input push buttons
- Light sensor and potentiometer for ATD input
- Two output LEDs
- Local Interconnect Network (LIN) communication interface
- I/O header for external circuit development

*Prices subject to change.

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features All HC08 and S08 include COP, LVI, POR, KBI
			10-bit	8-bit								
MC908QB4CDTE	4 KB	128B	10-ch.			1	1		4-ch.	OSC	TSSOP16	Small packages, extra timers
MC908QB4CDWE	4 KB	128B	10-ch.			1	1		4-ch.	OSC	SOIC16	Small packages, extra timers
MC908QB8CDTE	8 KB	256B	10-ch.			1	1		4-ch.	OSC	TSSOP16	Analog resolution, extra timers, small packages
MC908QB8CDWE	8 KB	256B	10-ch.			1	1		4-ch.	OSC	SOIC16	Analog resolution, extra timers, small packages
MC908QB8MPE	8 KB	256B	10-ch.			1	1		4-ch.	OSC	PDIP16	Analog resolution, extra timers, small packages

Auto qualification available on family.

MC908QC Family

Extending the existing Q family, doubling flash and RAM with higher pin-count packages, pin compatibility and rich feature sets.

Freescale's general market QC family of small-package, 8-bit microcontrollers is based on the popular HC08 core. The QC family members have strong analog capabilities, a complete set of serial modules and robust memory options. With higher pin-count packaging than other 908Q family devices, the MC908QC16 accommodates more input/output (I/0), allowing designers to take advantage of the integrated feature sets.

The QC family is fully local interconnect network (LIN) 2.0 and J2602 compliant and can function as LIN slaves for applications that require a cost-effective hardware solution.

Key Features

- 8 KB or 16 KB flash device to extend existing popular 908Q family
- Low pin count MCU
- Communications; Enhanced Serial Communications Interface (ESCI) ; SPI; Full-duplex high speed asynchronous operation
- 10-ch. x 10-bit ADC with internal reference voltage
- Internal clock oscillator
- 2nd timer block
  - 4-ch, 16-bit timers
  - Can provide 3-phase motion control
- Pin compatible with other Q family derivatives
- Code development made easier

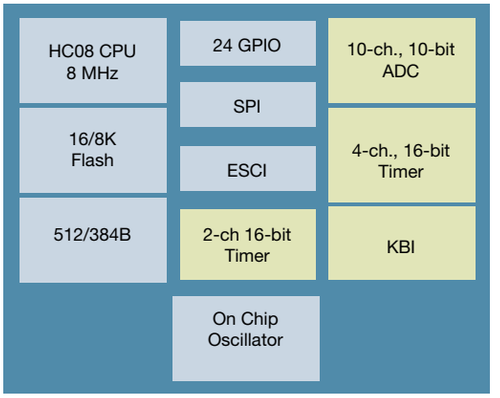
Target Applications

- Appliances
- Industrial compressors
- Automotive body electronics
- Industrial motor control
- HVAC
- Toys
- Security access and control

Sample Application Notes

- AN2627—Cycle-by-Cycle Instruction Set Details for the M68HC08 Family of MCUs
- AN1818—Software SCI Routines with the 16-Bit Timer Module
- AN2295—Developer's Serial Bootloader for M68HC08 and HCS08 MCUs

MC908QC16/8



DEMO908QC16 Development Kit—MSRP $75*

The DEMO908QC16 is an evaluation or demonstration board for the MC908QC16 microcontroller. Development of application code is quick and easy with the integrated USB-to-MON08 interface, CodeWarrior Development Studio, and software examples. A 28-pin connector allows connecting the DEMO908QC16 board to an expanded evaluation environment.

Features

- MC68HC908QC16 MCU, 28 SOIC
- Integrated MON08 Debugger
- MON08 Header for MON08 Debug cable support (not installed)
- RS-232 Serial Port w/ DB9 Connector
- LIN Bus PHY w/ 2, 4-pin connectors
- Internal Oscillator, trimmable to ±0.4%, selectable frequency
- User Components Provided
- 3 Push Switches; 2 User, 1 Reset
- 7 LED Indicators; 4 User, +5V, USB, POWER_OUT
- Jumpers
- Connectors

*Prices subject to change.

Part Number	Flash	RAM	I/O	ADC 10-bit	Timer	Serial	Package
MC908QC16CDZE	16 KB	512B	26	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	28 SOIC
MC908QC8CDZE	8 KB	384B	26	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	28 SOIC
MC908QC16DRE	16 KB	512B	26	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	28 TSSOP
MC908QC8DRE	8 KB	384B	26	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	28 TSSOP
MC908QC16DSE	16 KB	512B	18	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	20 TSSOP
MC908QC8DSE	8 KB	384B	18	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	20 TSSOP
MC908QC16CDTE	16 KB	512B	14	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	16 TSSOP
MC908QC8 CDTE	8 KB	384B	14	10-ch.	2x16-bit, 4x16-bit	ESCI, SPI	16 TSSOP

Auto qualification available on family.

MC908JK/JL Family

Low-end devices with larger I/O count for greater user flexibility.

The MC908JK/JL family provides pin compatibility across different flash sizes and a clear migration path to packages with larger I/O count.

- JL devices have up to 32-pin packages—extra GPIO
- JK devices are in 20-pin packages—smaller form factor

Key Features

- HC08 core—3-volt to 5-volt operation standard
- Multiple communications options—SCI and I^2C
- Analog included—up to 13-ch., 8-bit ADC
- Multiple memory options—1.5 KB to 16 KB flash memory and up to 512B RAM

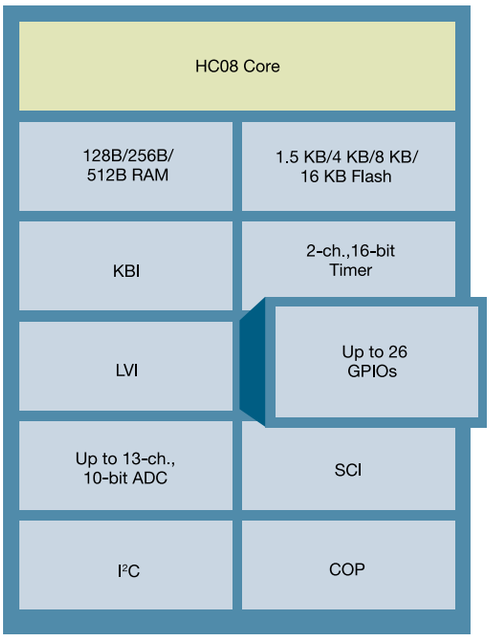
Target Applications

- Industrial compressor (HVAC)
- Instrument control panels
- Control systems
- Sensors and flow measurement
- Appliances
- Home and industrial security

Sample Application Notes

- AN2764/D—Reducing Electromagnetic Interference in End-Consumer Equipment
- AN2562/D—Full Duplex SCI is Required for a Design
- AN2984/D—Programming the ADC

MC908JK/JL



DEMO908JL16E—MSRP $50*

An MC68HC908JL16 microcontroller in 32-pin SDIP package is already programmed with a demo application—in addition, you can also use any other pin-to-pin-compatible device.

- One clock source: a 9.8304 MHz crystal, selectable via the "OSC ENA" jumper
- A power supply section containing:
  - A 12V DC power supply input connector
  - Power input selection jumpers for selecting the input voltage input source
    - 12V DC input connector
    - USB connector
    - I/O header connector
- A built-in "USB TO MON08" section which allows the host PC to communicate with the microcontroller through a standard USB interface. USB 2.0 is fully supported. When using an external in-circuit debugger (via the "MON08" connector), the "USB TO MON08" circuitry must be bypassed by removing all of the J402 jumpers.

*Prices subject to change.

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I^2C	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features All HC08 and S08 include COP, LVI, POR, KBI
			10-bit	8-bit								
MC68HC908JK1ECP	1.5 KB	128B		12-ch.					2-ch.	OSC	PDIP20	Low pin count
MC68HC908JK1ECDW	1.5 KB	128B		12-ch.					2-ch.	OSC	SOIC20	Low pin count
MC68HC908JL3ECDW	4 KB	128B		12-ch.					2-ch.	OSC	SOIC28	Low pin count
MC68HC908JL3ECFA	4 KB	128B		12-ch.					2-ch.	OSC	LQFP48	Low pin count
MC68HC908JL3ECP	4 KB	128B		12-ch.					2-ch.	OSC	PDIP28	Low pin count
MC68HC908JK3ECP	4 KB	128B		12-ch.					2-ch.	OSC	PDIP20	Low pin count
MC68HC908JK3ECDW	4 KB	128B		12-ch.					2-ch.	OSC	SOIC20	Low pin count
MC68HC908JK8CDWE	8 KB	256B		13-ch.	1				2-ch.+2-ch.	OSC	SOIC20	Low pin count
MC68HC908JK8CPE	8 KB	256B		13-ch.	1				2-ch.+2-ch.	OSC	PDIP20	Low pin count
MC68HC908JL8CFAE	8 KB	256B		13-ch.	1				2-ch.+2-ch.	OSC	LQFP32	Low pin count, more analog channels
MC68HC908JL8CSPE	8 KB	256B		13-ch.	1				2-ch.+2-ch.	OSC	PDIP32	Low pin count, more analog channels
MC908JL8CDWE	8 KB	256B		13-ch.	1				2-ch.+2-ch.	OSC	SOIC28	Low pin count, more analog channels
MC908JL16CFJE	16 KB	512B	13-ch.		1			1	2-ch.+2-ch.	OSC	LQFP32	Expanded memory and communications options
MC908JL16CSPE	16 KB	512B	13-ch.		1			1	2-ch.+2-ch.	OSC	SDIP32	Expanded memory and communications options
MC908JL16CDWE	16 KB	512B	12-ch.		1			1	2-ch.+2-ch.	OSC	SOIC28	Expanded memory and communications options
MC908JL16CPE	16 KB	512B	12-ch.		1			1	2-ch.+2-ch.	OSC	PDIP28	Expanded memory and communications options

Auto qualification not currently available.

MC908JB/JW Family

USB-enabled, RF capable, 68HC05 code compatible.

The innovative design of the MC68HC908JB/JW families feature an on-chip USB module for fast, reliable PC peripheral applications and dual 27 MHz clock generators. An energy-saving, low-power solution, the MC68HC908JB family is embedded with Freescale's second-generation flash technology to enable in-system programmability.

Key Features

- Universal Serial Bus (USB)
  - Full universal serial bus specification 1.1/2.0 low-speed functions
  - 1.5 Mbps data rate
  - 3.3V voltage regulator
  - Endpoint 0 functions as a transmit/receive control endpoint
  - Endpoint 1 functions as an interrupt transmit endpoint
  - Endpoint 2 functions as an interrupt transmit/receive endpoint
- Dual Phase Locked Loop (JB16 only)
  - MCU has two CGM modules
  - Generates frequencies in the 27 MHz range
  - Frequency range targeted for RF applications such as in a local oscillator in a down conversion mixer receiver
- PS2 clock generator
- Time-base wake-up module

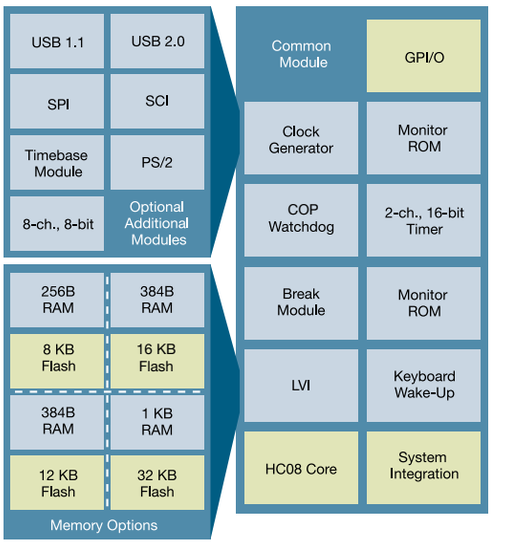
Target Applications

- PC peripherals (keyboard, mouse)
- USB converters
- RF wireless receivers
- USB security keys for e-commerce
- Set-top box peripherals
- Telecommunications equipment

Application Notes and Reference Designs

- RD68HC908USB—Universal Serial Bus (USB) Based Sensor-Actuator Interface Reference Design
- AN2399—In-Circuit Programming of Flash Memory via the Universal Serial Bus for the MC68HC908JB16

MC68HC908JB8



Device	Flash	RAM	USB Device	SCI	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features
								All HC08 and S08 include COP, LVI, POR, KBI
MC908JB1DWE	1 KB	128B	1	1	4-ch.	PLL	PDIP20	5V Tolerant
MC908JB8FBE	8 KB	256B	1	1	4-ch.	PLL	QFP44	5V Tolerant
MC908JB8ADWE	8 KB	256B	1	1	4-ch.	PLL	SOIC28	5V Tolerant
MC908JB8JDWE	8 KB	256B	1	1	4-ch.	PLL	SOIC20	5V Tolerant
MC908JB8EPE	8 KB	256B	1	1	4-ch.	PLL	QFP64	5V Tolerant
MC908JB12JDWE	12 KB	384B	1	1	4-ch.	PLL	SOIC28	5V Tolerant
MC908JB16DWE	16 KB	384B	1	1	4-ch.	PLL	SOIC28	5V Tolerant
MC908JB16FAE	16 KB	384B	1	1	4-ch.	PLL	LQFP32	5V Tolerant
MCHC908JW32FAE	32 KB	1KB	1	1	4-ch.	PLL	LQFP48	5V Tolerant
MCHC908JW32FC	32 KB	1KB	1	1	4-ch.	PLL	QFN48	5V Tolerant

Auto qualification not currently available.

MC908GR Family

Small package and memory size option with a clear upward migration path.

MC908GR family focuses on those peripherals often needed in low-end applications. The MC908GR family includes options for up to 60 KB of flash with increased advanced analog capability.

Even at the low end, the GR still features:

- A 32 kHz integrated oscillator as part of its clock generator module that eliminates the need for expensive high-speed crystals or a noisy oscillator
- On-chip timebase module (TBM) that removes any requirements for an external clock

Key Features

- HC08 core—3-volt to 5-volt operation standard
- Multiple communications options—SPI and SCI
- Analog included—up to 8-ch., 10-bit ADC
- Multiple memory options—4 KB to 60 KB robust flash memory and 384B to 2 KB RAM

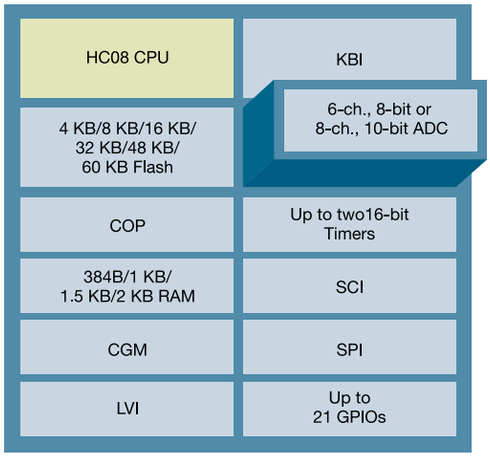
Target Applications

- Sensors
- Home appliances
- Home and industrial security
- Industrial and consumer communications
- Control systems
- Toys

Sample Application Notes

- AN2985/D—Programming the ADC
- AN2524/D—Using On-Chip Flash Programming Routines
- AN2884—Implementing the LIN2.0 Communications Protocol

MC908GR



DEMO908GZ60E—MSRP $49.95*

DEMO908GZ60E contains the essential tools a designer needs to develop and evaluate initial applications code on the MC908GR family, including DB9 serial cable, a Quick Start Guide, and an Axiom CD that contains board and CodeWarrior® Development Studio Special Edition information.

- MC908GZ60 microcontroller
- Regulated +5-volt power supply
- Power input-selection jumper
- Optional power input and output from Connector J1
- 8 MHz ceramic resonator
- RS-232 COM serial port with DB9 connector
- Optional MON08 interface through COM port
- User components include:
  - Three push switches; two user, reset
  - Three LED indicators; two user, +5V
  - Run/load slide switch
  - On/off side switch
  - Connectors and option jumpers

*Prices subject to change.

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features All HC08 and S08 include COP, LVI, POR, KBI
			10-bit	8-bit								
MC908GR4CDWE	4 KB	348B		6-ch.	1		1		2-ch.	CGM	SOIC28	
MC68HC908GR4CFAE	4 KB	348B		6-ch.	1		1		2-ch.	CGM	LQFP32	
MC908GR8CBE	8 KB	348B		6-ch.	1		1		2-ch.	CGM	PDIP42	
MC908GR8CDWE	8 KB	348B		6-ch.	1		1		2-ch.	CGM	SOIC28	
MC908GR8CPE	8 KB	348B		6-ch.	1		1		2-ch.	CGM	PDIP28	
MC908GR16CFAE	16 KB	1 KB	8-ch.		1		1		2-ch. + 2-ch.	CGM	LQFP48	
MC908GR16ACFAE	16 KB	1 KB	8-ch.		1		1		2-ch. + 2-ch.	CGM	LQFP48	1–8 MHz Crystal Oscillator
MC908GR16ACFJE	16 KB	1 KB	8-ch.		1		1		2-ch. + 2-ch.	CGM	LQFP32	1–8 MHz Crystal Oscillator
MC908GR32ACFAE	32 KB	1.5 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	LQFP48	1–8 MHz Crystal Oscillator
MC908GR32ACFJE	32 KB	1.5 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	LQFP32	1–8 MHz Crystal Oscillator
MC908GR32ACFUE	32 KB	1.5 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	QFP64	1–8 MHz Crystal Oscillator
MC908GR48ACFAE	48 KB	1.5 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	LQFP48	1–8 MHz Crystal Oscillator
MC908GR48ACFJE	48 KB	1.5 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	LQFP32	1–8 MHz Crystal Oscillator
MC908GR48ACFUE	48 KB	1.5 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	QFP64	1–8 MHz Crystal Oscillator
MC908GR60ACFAE	60 KB	2 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	LQFP48	1–8 MHz Crystal Oscillator
MC908GR60ACFJE	60 KB	2 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	LQFP32	1–8 MHz Crystal Oscillator
MC908GR60ACFUE	60 KB	2 KB	8-ch.		1		1		2-ch. + 6-ch.	CGM	QFP64	1–8 MHz Crystal Oscillator

Auto qualification available on family.

MC908GZ Family

General-purpose, LIN-enabled family with integrated msCAN2.0.

The MC908GZ family of microcontrollers are pin-compatible devices and feature an integrated CAN controller that is used as a networking standard in a host of industrial and automotive applications. The family also integrates an enhanced SCI that is capable of emulating both LIN master and LIN slave devices, which makes it specifically suited for automotive applications. Additionally, the strong networking capabilities of the MC908GZ family offers a 10-bit ADC and up to 60 KB of automotive-qualified flash. The family is the best-selling CAN-enabled MCU. Within the family there is a wide variety of memory options—from 8 KB to 60 KB flash—and package sizes and temperature ranges span industrial and automotive specifications.

Key Features

- Up to 60 KB flash and up to 2 KB RAM
- Integrated msCAN2.0 controller
- Clock generator module (CGM) with phase locked loop
- 32 kHz or 8 MHz integrated oscillator
- Two 2-ch., 16-bit timers
- Timebase module (TBM)
- Generates periodic interrupts at user-selectable rates
- Software programmable at a wide range of frequencies, between 1 Hz and 4096 Hz
- Can be enabled in Stop mode
- Provides very low power operation in microamps
- Range of serial communications modules; SCI, SPI and msCAN2.0 controller
- Up to 24-ch., 10-bit ADC
- Available in industrial and automotive temperature specifications

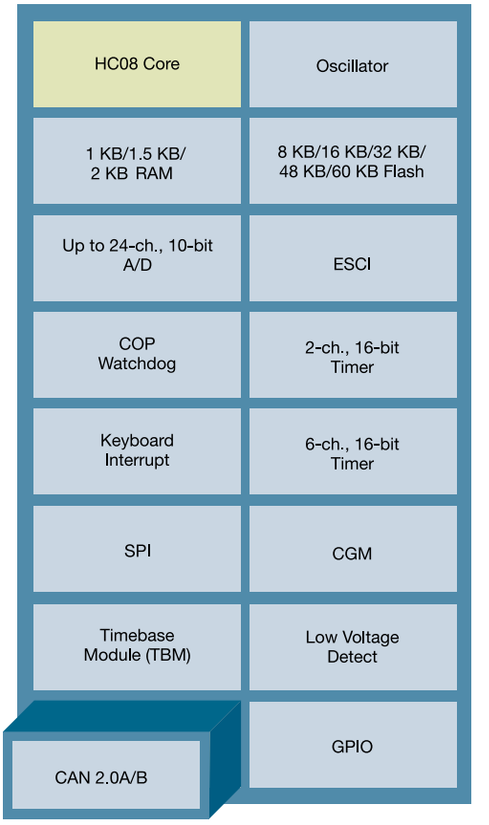
Target Applications

- Industrial motion control
- Building control
- Industrial networking
- Light leveling
- Automotive wiper control
- Window lift
- Seat controls

Sample Application Notes

- AN2984/D—Effectively Programming the A/D Converter on the HC08 Family
- AN2524/D—Using On-Chip Flash Programming Routines
- AN2396—Servo Motor Control Application on a Local Area Interconnect Network (LIN)
- AN2778—Using the Romeo2 Monitor Program to Evaluate the Performance of the MC33591/2/3/4 Family of RF Receiver ICs (Romeo2) Along with the MC908GZ60

MC908GZ



DEMO908GZ60E—MSRP $49.95*

DEMO908GZ60E contains the essential tools a designer needs to develop and evaluate initial applications code on the MC908GZ family, including DB9 serial cable, a Quick Start Guide and an Axiom CD that contains board and CodeWarrior® Development Studio Special Edition information.

- MC908GZ60 microcontroller
- Regulated +5-volt power supply
- Power input-selection jumper
- Optional power input and output from Connector J1
- 8 MHz ceramic resonator
- RS-232 COM serial port with DB9 connector
- Optional MON08 interface through COM port
- User components include:
  - Three push switches; two user, reset
  - Three LED indicators; two user, +5V
  - Run/load slide switch
  - On/off side switch
  - Connectors and option jumpers

*Prices subject to change.

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package
			10-bit	8-bit							
MC68908GZ8CFAE	4 KB	1 KB	8-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP48
MC68908GZ8CFJE	4 KB	1 KB	8-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP32
MC908GZ16CFAE	16 KB	1 KB	8-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP48
MC908GZ16CFJ	16 KB	1 KB	8-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP32
MC908GZ32CFAE	32 KB	1.5 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP48
MC908GZ32CFJE	32 KB	1.5 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP32
MC908GZ48CFUE	32 KB	1.5 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	QFP64
MC908GZ48CFAE	48 KB	1.5 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP48
MC908GZ48CFJE	48 KB	1.5 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP32
MC908GZ16CFUE	48 KB	1.5 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	QFP64
MC908GZ16CFAE	60 KB	2 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP48
MC908GZ16CFJE	60 KB	2 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	LQFP32
MC908GZ16CFUE	60 KB	2 KB	24-ch.			1	1		2-ch. + 6-ch.	CGM	QFP64

Auto qualification available on family.

MC9S08LC60/36 Family

Driving displays with the performance, low-voltage and C compatibility of S08 architecture.

The S08LC microcontroller expands the Freescale 8-bit portfolio by offering an integrated LCD controller with the low power and feature-rich capabilities of the S08 family. It is the first LCD S08 8-bit microcontroller for battery-powered and handheld applications. The S08LC is a flash-based device with enhanced EEPROM emulation, eliminating the need for off-chip EEPROM, saving both board space and cost.

It is specifically crafted to provide high segment count that is easy on the batteries. A larger segment display of up to 160 segments offers total flexibility with a graphical display and sufficient memory to act as application and LCD controller without added cost of a dot matrix or “chip-on-glass,” fulfilling the need for a broad spectrum of applications with displays.

Key Features

- Operating Voltage/ Performance
  - 1.8V/8MHz – 3.6V/20 MHz, -40°C to +85°C range
- Up to 60 KB flash/4 KB RAM with two flash arrays for enhanced EEPROM emulation
- SCI, 2xSPI, I2C bus module up to 100kbps
- Integrated LCD module;
  - 40/41 front planes, 4/3 backplane LCD driver
  - Can be configured to blink individual segments or entire LCD panel
  - 3V and 5V glass LCD voltages supported
- 8 channel, 12-bit A/D with internal bandgap reference voltage with Analog comparator
- Two configurable 16-bit TIM modules (4-ch total)
- Low power consumption
  - <10uA in Stop 3 with LCD & Osc enabled (typical)

Target Applications

- Battery operated hand-held devices
- Thermostat
- Alarms/clocks
- Exercise equipment
- Heart rate monitors
- Cycling computers
- Glucose monitors
- Calculators
- Portable medical devices
- Home appliances

Sample Application Notes

- AN3280—Interfacing an LCD to the MC9S08LC60
- AN3404—How to do EEPROM Emulation Using Double Flash Array on MC9S08LC60
- AN3405—Hardware-Triggered ATD Using Internal Hardware to Start an Analog Conversion v1.0
- AN3041—Internal Clock Source (ICS) Module on the HCS08s in Depth

DEMO9S08LC60—MSRP $75*

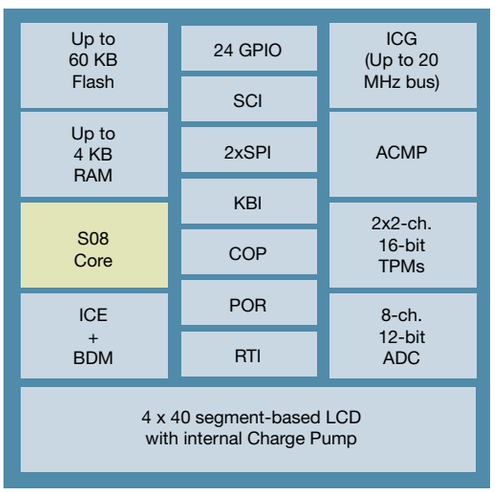
The 9S08LC60 demonstration kit contains everything a designer needs to develop and evaluate application code including an integrated BDM that requires only a USB cable to connect to the board to begin development. Also in the package there is a custom LCD glass display to demonstrate the capabilities of all LCD segments in “an end-application format."

Features

- MC9S08LC60 in 80-pin LQFP package
- Power via USB or 12V DC input4 buttons
- Potentiometer
- NTC-based temperature sensor
- Photocell
- Eight high efficiency LEDs
- Piezoelectric speaker
- Custom 3V LCD
- DEMO9S08LC60 board
- CodeWarrior™ Development Studio CD
- CodeWarrior Service pack CD
- USB cable
- Quick start guide

*Prices subject to change. Compatible LCD display kits available for individual purchase

9S08LC60/36



Device	Flash	RAM	ADC Channels (12-bit)	SCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package	Applications/ Additional Features
MC9S08LC60LH	60 KB	4 KB	2-ch.	1	2	1	2 x 2-ch.	ICG	64 LQFP	All HC08 and S08 include COP, LVI, POR, KBI
MC9S08LC60LK	60 KB	4 KB	8-ch.	1	2	1	2 x 2-ch.	ICG	80 LQFP	
MC9S08LC36LH	36 KB	2.5 KB	2-ch.	1	2	1	2 x 2-ch.	ICG	64 LQFP	
MC9S08LC36LK	36 KB	2.5 KB	8-ch.	1	2	1	2 x 2-ch.	ICG	80 LQFP	

Auto qualification not currently available.

MC9S08AW Family

5-volt capability, high-resolution analog, multiple communications options and all the extras.

The MC9S08AW family introduces 5-volt capability to our S08 devices. This continuation of Freescale's high-end 8-bit MCU offering is an ideal upgrade for customers using HC08AZ60. It offers a high pin count along with high-performance analog, including improved ADC, enhanced LVD and multiple communications modules. This family brings together design functionality and maximum flexibility.

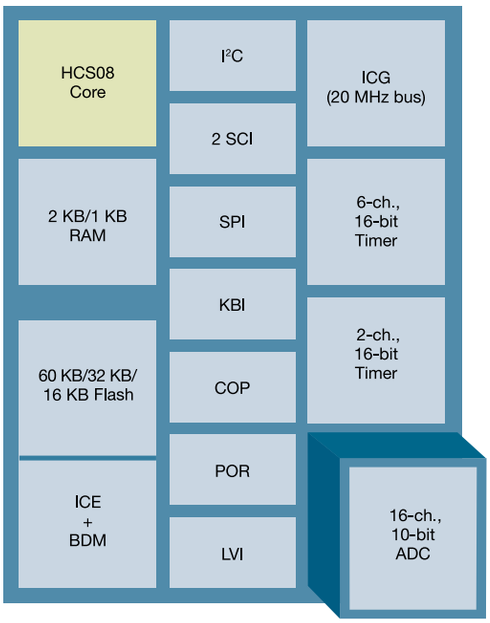
Key Features

- Powerful, advanced S08 core
- 5-volt capability
- Multiple memory options—up to 64 KB flash, 2 KB RAM
- High-resolution analog—16-ch., 10-bit with enhanced LVD
- Multiple communications options—I²C, SPI, dual SCI
- 2-ch., 16-bit and 6-ch., 16-bit timer—both capable of PWM generation for motion control applications
- COP, LVI, KBI, POR, BDM module and an internal clock generator
- Pin compatibility with HC08AZ60 in some packages

Target Applications

- Home appliances
- Kitchen appliances
- Automotive
- LIN applications
- Watchdog coprocessors
- Industrial control
- Security systems
- Lighting control systems

MCS908AW



DEMO9S08AW60E—MSRP Special Introductory Price $85*

The DEMO9S08AW60E kit contains the essential tools a designer needs to develop and evaluate application code, including an integrated USB to BDM circuit. The board allows the user to debug and program the flash memory without any limitations.

- Socketed MC9S08AW60 64-pin LQFP
- Integrated USB to BDM cable
- Power LED
- Reset switch
- Two push buttons
- Four LEDs
- Potentiometer and low-cost light sensor
- Jumpers to disable the user I/O functions
- CodeWarrior® Special Edition

*Prices subject to change.

Sample Application Notes

- AN2493/D—Implementing the Low-Power Modes on MC9S08AW Products
- AN2496/D—Calibrating the Internal Clock Generator
- AN3257—Meeting IEC 60730 Class B Compliance with the MC9S08AW60
- AN2764—Improving the Transient Immunity Performance of Microcontroller-Based Applications

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package	Applications/Additional Features All HC08 and S08 include COP, LVI, POR, KBI
			10-bit	8-bit								
MC9S08AW16CFDE	16 KB	1 KB	16-ch.			2	1	1	8-ch.	ICG	QFN48	5V Tolerant
MC9S08AW16CFGE	16 KB	1 KB	16-ch.			2	1	1	8-ch.	ICG	LQFP44	5V Tolerant
MC9S08AW16CFUE	16 KB	1 KB	16-ch.			2	1	1	8-ch.	ICG	QFP64	5V Tolerant
MC9S08AW16CPUE	16 KB	1 KB	16-ch.			2	1	1	8-ch.	ICG	LQFP64	5V Tolerant
MC9S08AW32CFDE	32 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	QFN48	5V Tolerant
MC9S08AW32CFGE	32 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	LQFP44	5V Tolerant
MC9S08AW32CFUE	32 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	QFP64	5V Tolerant
MC9S08AW32CPUE	32 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	LQFP64	5V Tolerant
MC9S08AW60CFDE	60 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	QFN48	5V Tolerant
MC9S08AW60CFGE	60 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	LQFP44	5V Tolerant
MC9S08AW60CFUE	60 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	QFP64	5V Tolerant
MC9S08AW60CPUE	60 KB	2 KB	16-ch.			2	1	1	8-ch.	ICG	LQFP64	5V Tolerant

Auto qualification not currently available.

MC9S08GBxxA/GTxxA Family

Low voltage, low power, with powerful timer options, multiple communications and loads of I/O.

The MC9S08GBxxA/GTxxA family delivers low power and low voltage—all of the features that set the S08 core apart from the rest. Count on large amounts of on-chip memory, flash programmable down to 1.8V, powerful timer options with multiple communications options and a large amount of I/O.

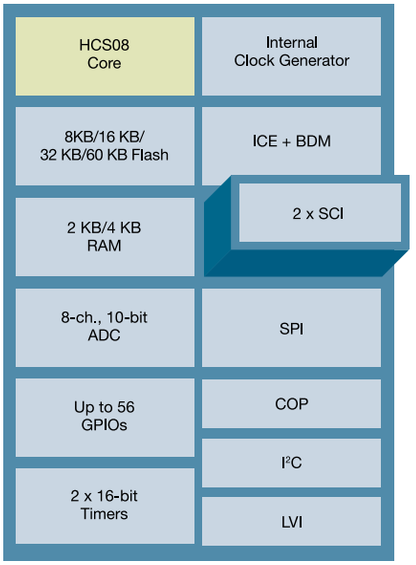
Key Features

- Powerful, advanced S08 core
- Multiple memory options—up to 60 KB flash, 4 KB RAM and new low end 8K flash option
- Dual 16-bit timers capable of PWM generation:
  - GB family includes 3-ch., 16-bit timer and 5-ch., 16-bit timer
  - GT family includes dual 2-ch., 16-bit timers
- Up to 56 GPIOs available with MC9S08GBxxA
  - With up to 39 GPIO on MC9S08GTxxA
- Multiple communications options—I^2C, SPI and dual SCI
- High-resolution analog—8-ch., 10-bit ADC
- "Extras" include COP, LVI, BDM module and an internal clock generator

Target Applications

- Electronic power meters
- Sensors
- Wireless communications
- Home appliances
- Security systems

MC9S08GB/GTxxA



M68DEMO908GB60E—MSRP $49*

The Demo Kits for the MC9S08GBxxA and MC9S08GTxxA families allow you to program and debug code using a complimentary copy of CodeWarrior® Development Studio for HCS08 Special Edition, through DB9 serial port and included RS232 serial cable or optional BDM Multilink.

- MC9S08GB60A MCU
- Dual DB9 RS232 serial ports
- Switches
- LEDs
- MCU pin-breakout header and small prototype area
- Powered by two AA batteries (included) or optional external power supply
- Demonstration code including A/D, timer, PWM and keyboard interrupt routines
- CodeWarrior Special Edition

*Prices subject to change.

Sample Application Notes

- AN2140—Serial Monitor for MC9S08GB/GT
- AN2494—Configuring the System and Peripheral Clocks
- AN2496—Calibrating the Internal Clock Generator
- AN2493/D—Implementing the Low-Power Modes
- AN2717/D—Transitioning from the HC08 Core to the MC9S08 Core
- EB652—Differences Between MC9S08GBxx/GTxx and MC9S08GBxxA/GTxxA

Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I^2C	16-bit Timer Channels	Clock Type
			10-bit	8-bit						
MC9S08GT8ACBE	8 KB	1 KB	8-ch.			2	1	1	2-ch. + 2-ch.	ICG
MC9S08GT8ACFBE	8 KB	1 KB	8-ch.			2	1	1	2-ch. + 2-ch.	ICG
MC9S08GT8ACFCE	8 KB	1 KB	4-ch.			2	1	1	1-ch. + 2-ch.	ICG
MC9S08GT8ACFDE	8 KB	1 KB	8-ch.			2	1	1	2-ch. + 2-ch.	ICG
MC9S08GT16ACBE	16 KB	2 KB	8-ch.			2	1	1	2-ch. + 2-ch.	ICG
MC9S08GT16ACFBE	16 KB	2 KB	8-ch.			2	1	1	2-ch. + 2-ch.	ICG
MC9S08GT16ACFCE	16 KB	2 KB	4-ch.			2	1	1	1-ch. + 2-ch.	ICG
MC9S08GT16ACFDE	16 KB	2 KB	8-ch.			2	1	1	2-ch. + 2-ch.	ICG
MC9S08GB32ACFUE	32 KB	2 KB	8-ch.			1	1	1	1-ch. + 3-ch./1-ch. + 5-ch.	ICG
MC9S08GT32ACFBE	32 KB	2 KB	8-ch.			1	1	1	2-ch. + 2-ch.	ICG
MC9S08GT32ACFDE	32 KB	2 KB	8-ch.			1	1	1	2-ch. + 2-ch.	ICG
MC9S08GB60ACFUE	60 KB	4 KB	8-ch.			1	1	1	1-ch. + 3-ch./1-ch. + 5-ch.	ICG
MC9S08GT60ACFBE	60 KB	4 KB	8-ch.			1	1	1	2-ch. + 2-ch.	ICG
MC9S08GT60ACFDE	60 KB	4 KB	8-ch.			1	1	1	2-ch. + 2-ch.	ICG

Auto qualification not currently available.

MC9S08QE Family

The 8-bit MC9S08QE family delivers outstanding low-power consumption and is part of the industry's first 8- and 32-bit pin, peripheral and tool compatible MCUs which makes the design process quick, easy and limitless.

Freescale's Controller Continuum provides unique flexibility to transition from 8-bit to 32-bit. With pin, peripheral and tool compatibility, the QE128 devices simplify and speed the design process. Through an optimized architecture that provides lower operating voltage and current, the QE128 devices offer industry-leading ultra-low power benefits to extend battery life. The S08's selection criteria in end applications are:

- Absolute minimum power consumption required
- Lower pin count or pin count options desired
- No application requirement for higher performance calculations or peripherals
- Greater cost sensitivity

Key Features

- High performance 8-bit core
- 25 MHz Bus Frequency
- Memory
  - Up to 8 KB bytes SRAM
  - Up to 128 KB bytes flash
- 2x SCI, 2x I²C, 2x SPI
- 16-bit timers: 1 x 6-ch., 2 x 3-ch.
- 12-bit 24-channel ADC with 2 analog comparators
- Real time counter
- 70 (mux-ed) GPIOs for 80-pin package
- Low-power features:
  - Internal Clock Source (ICS)
  - Vreg with fast start-up time and low regulation voltage
  - Ultra low power 32 kHz oscillator (standby current 1.5uA)
  - Optimized clock tree and clock gating techniques
- Single wire background debug interface
- On-chip in-circuit emulator

Applications

- Health care monitoring and instrumentation
- HVAC and building control
- Gas, water and heater meters
- Security cameras
- Digital cameras
- Measurement equipment

Application Notes

- AN3041—Internal Clock Source (ICS) Module on the HCS08s in Depth
- AN2497—HCS08 Background Debug Mode versus HC08 Monitor Mode
- AN2111—A Coding Standard for HCS08 Assembly Language
- AN2717—M68HC08 to HCS08 Transition

DEMOQE128—MSRP $99*
(Supports 8- and 32-bit QE families)

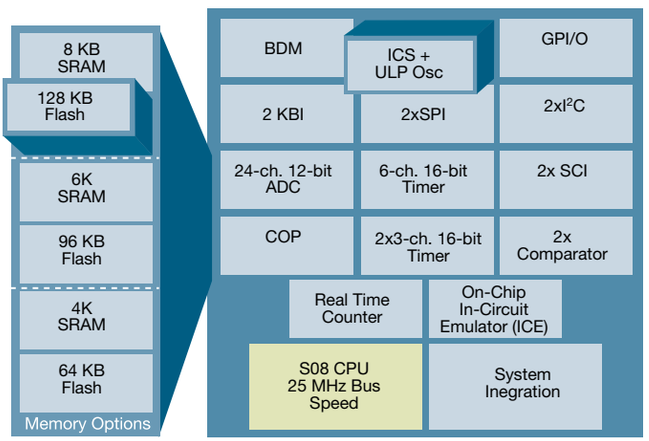
DEMO9S08QE128—MSRP $89*
(Supports only 8-bit MC9S08QE family)

Features

- MCU operates from internal clock source
- Footprint for ext. crystal components
- RS232 COM port
- Piezzo buzzer
- Potentiometer
- 3-axis accelerometer
- 5 pushbuttons
- 8 LEDs
- USB MCU Debug Interface (MDI)
  - BDM protocol
  - Logic analyzer
  - SCI traffic
- External BDM connector
- Prototyping areas
- Supports plug-in RF daughter cards for SMAC and 802.15.4

*Prices subject to change.

MC9S08QE



Device	Flash	RAM	ADC Channels		SCI	ESCI	SPI	I²C	16-bit Timer Channels	Clock Type	Package
			12-bit	10-bit							
MC9S08QE128CLK	128 KB	8 KB	24-ch.		-	2	2	2	2 x 3-ch. + 1 x 6-ch.	ICS	80 LQFP
MC9S08QE128CLH	128 KB	8 KB	24-ch.		-	2	2	2	2 x 3-ch. + 1 x 6-ch.	ICS	64 LQFP
MC9S08QE128CFT	128 KB	8 KB	24-ch.		-	2	2	2	2 x 3-ch. + 1 x 6-ch.	ICS	48 QFN
MC9S08QE128CQD	128 KB	8 KB	24-ch.		-	2	2	2	2 x 3-ch. + 1 x 6-ch.	ICS	44 QFP
MC9S08QE128CLC	128 KB	8 KB	24-ch.		-	2	2	2	2 x 3-ch. + 1 x 6-ch.	ICS	32 LQFP
MC9S08QE64CLH	64 KB	4 KB	24-ch.		-	2	2	2	2 x 3-ch. + 1 x 6-ch.	ICS	64 LQFP

Auto qualification not currently available.

MCF51QE ColdFire Family

The 32-bit ColdFire MCF51QE128 delivers outstanding low power consumption and is part of the industry's first 8- and 32-bit pin, peripheral and tool compatible MCUs which makes the design process quick, easy and limitless.

Freescale's Controller Continuum provides unique flexibility to transition from 8-bit to 32-bit. With pin, peripheral and tool compatibility, the QE128 devices simplify and speed the design process. Through an optimized architecture that provides lower operating voltage and current, the QE128 devices offer industry-leading ultra-low power benefits to extend battery life.

Key Features

- New Coldfire V1 50 MHz core
  - Improved handling of byte and word operands
  - Standardized 8-bit bus to S08 peripherals
  - Same programming model as other ColdFire cores (V2 – V4)
- Peripheral compatible with MC9S08QE family
- Pin compatible with MC9S08QE family
- Development Tool compatible with MC9S08QE family
  - New BDM interface compatible S08's single wire BDM
  - Single CodeWarrior IDE
- New ultra low power features
  - Clock gating (turns clocks off to unused peripherals)
  - Low power RUN and WAIT modes
  - Internal clock source and ultra-low-power 32 kHz oscillator
  - Voltage regulator with fast start-up (6-7us)
  - Ultra-low-power real time counter

Applications

- HVAC building and control systems
- Health care monitoring and instrumentation
- Fire/security control and monitoring systems
- Factory and automation systems
- Measurement equipment
- Hand-held medical/industrial applications
- Low-power industrial applications

DEMOQE128—MSRP $99* (Supports 8- and 32-bit QE Families)

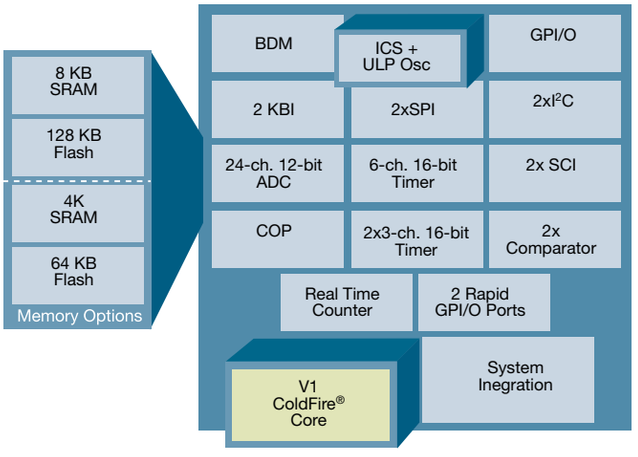
DEMO51QE128—MSRP $89* (Supports only ColdFire MCF51QE Family)

Features

- MCU operates from internal clock source
- Footprint for ext. crystal components
- RS232 COM port
- Piezzo buzzer
- Potentiometer
- 3-axis accelerometer
- 5 pushbuttons
- 8 LEDs
- USB MCU Debug Interface (MDI)
  - BDM protocol
  - Logic analyzer
  - SCI traffic
- External BDM connector
- Prototyping areas
- Supports plug-in RF daughter cards for SMAC and 802.15.4

* Prices subject to change.

MCF51QE



Device	Flash	RAM	ADC Channels (12-bit)	ESCI	SPI	I²C	16-bit Timer Channels	ACMP	Clock Type	RTC	Package
MCF51QE128CLK	128 KB	8 KB	24-ch.	2	2	2	2 x 3-ch. + 1 x 6-ch.	2	ICS	yes	80 LQFP
MCF51QE128CLH	128 KB	8 KB	24-ch.	2	2	2	2 x 3-ch. + 1 x 6-ch.	2	ICS	yes	64 LQFP
MCF51QE64CLH	64 KB	4 KB	22-ch.	2	2	2	2 x 3-ch. + 1 x 6-ch.	2	ICS	yes	64 LQFP

Auto qualification not currently available.

MCF5221x and MCF521xx ColdFire Families

The lowest cost 32-bit ColdFire MCUs with optional USB On-The-Go.

The MCF5221x family features an integrated USB On-The-Go (OTG) controller and a wide variety of serial interface offerings including up to three UARTs, one SPI and two I²C modules, making it ideal for applications requiring device or host USB with easy connection to other systems. This family is based on the popular low-cost, low-power Version 2 ColdFire core (up to 80MHz and 76 MIPS performance @ 3.3V CPU). Combined with the on-chip physical interface and the low power consumption, the MCF5221x is the ideal USB solution. The MCF521xx family offers the same features without the USB OTG module, in case it is not needed.

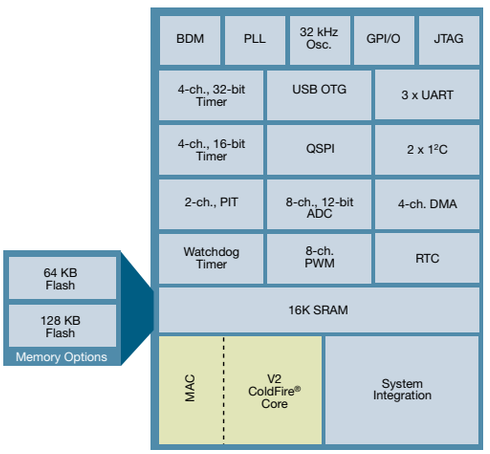
Key Features

- 68 KB/ColdFire® V2 Core
- Up to 76 Dhrystone 2.1 MIPS @ 80 MHz
- MAC Module and HW Divide
- USB 2.0 full-speed Host/Device/On-The-Go Controller with Integrated PHY
- Real time clock with 32kHz crystal
- 16 KB bytes SRAM
- Up to 128 KB bytes flash
- Up to 3 UARTs
- Queued serial peripheral interface (QSPI)
- Two I²C bus interface modules
- 4 channel, 32-bit timers with DMA support
- 4 channel, 16-bit Capture/Compare/PWM timers
- 2 channel, periodic interrupt timer
- 8 channel, PWM timer with enhanced DAC capabilities
- 2nd Watchdog timer with independent clock
- 8 channel, 12-bit A-to-D converter with simultaneous sampling
- Up to 56 5V tolerant general-purpose I/O

Applications

- HVAC building and control systems
- Medical instrumentation and monitors
- Fire/security control and monitoring systems
- Factory and automation systems
- Measurement equipment
- Hand-held medical/industrial applications
- Lighting control
- Industrial instrumentation
- Consumer electronics
- Low power industrial applications

MCF5221x



M52211EVB—MSRP $299*

Features

- Evaluation board with fully functional USB OTG
- Supports plug-in ZigBee™ daughter card
- On-board Super Cap
- Includes CD ROM, power supply, P&E BDM cable and USB flash drive
- Complimentary open source USB stack from CMX

M52210DEMO—MSRP $149* – Available July 2007

Features

- Cost-effective evaluation board with a reduced feature set
- Supports both USB Host and USB Device
- On-board Accelerometer and Super Cap
- Includes CD ROM, USB Cable, and USB flash drive

*Prices subject to change.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	SRAM (KB)	Flash (KB)	DMA	GPT	Other	I²C	UART	SPI	ADC	Package
MCF52100CAE66	V2	66	MAC	√	16	64	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	QFP64
MCF52100CEP66	V2	66	MAC	√	16	64	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	QFN64
MCF52100CVM66/80	V2	66, 80	MAC	√	16	64	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	MAPBGA81
MCF52110CAE66	V2	66	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	QFP64
MCF52110CEP66	V2	66	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	QFN64
MCF52110CVM66/80	V2	66, 80	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	MAPBGA81
MCF52110CAF80	V2	80	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit		2	2	QSPI	8-ch. 12-bit	LQFP100
MCF52210CAE66	V2	66	MAC	√	16	64	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	2	QSPI	8-ch. 12-bit	QFP64
MCF52210CEP66	V2	66	MAC	√	16	64	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	2	QSPI	8-ch. 12-bit	QFN64
MCF52210CVM66/80	V2	66, 80	MAC	√	16	64	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	2	QSPI	8-ch. 12-bit	MAPBGA81
MCF52211CAE66	V2	66	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	3	QSPI	8-ch. 12-bit	QFP64
MCF52211CEP66	V2	66	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	3	QSPI	8-ch. 12-bit	QFN64
MCF52211CVM66/80	V2	66, 80	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	3	QSPI	8-ch. 12-bit	MAPBGA81
MCF52211CAF80	V2	80	MAC	√	16	128	4-ch.	4-ch.16-bit, 4-ch. 32-bit	FS USB Host/Device/OTG	2	3	QSPI	8-ch. 12-bit	LQFP100

Auto qualification not currently available.

MCF521x ColdFire Family

High-performance, low-cost, 32-bit microcontroller with integrated flash, CAN and 12-bit ADC.

The MCF521x family combines a 32-bit ColdFire® V2 core, delivering 76 MIPs @ 80 MHz, with up to 256 KB of secure flash memory, CAN and an 8-ch 12-bit ADC. Multiple power management options such as distributed clocking and a PLL bypass mode for low-speed operation, make this family an ideal starting point for entry into the high performance ColdFire architecture.

Key Features

- ColdFire V2 core–76 MIPS @ 80 MHz
- MAC module and HW divide
- Memory—up to 256 KB flash, up to 32 KB SRAM
- Up to one CAN 2.0B controller (FlexCAN)
- 4-ch. 32-bit timers with DMA support
- 4-ch. 16-bit capture/compare/PWM timers
- 2-ch. periodic interrupt timer
- 4-channel, 16-bit/8-channel, 8-bit PWM generator
- 8-channel, 12-bit ADC
- System integration with PLL and SW watchdog

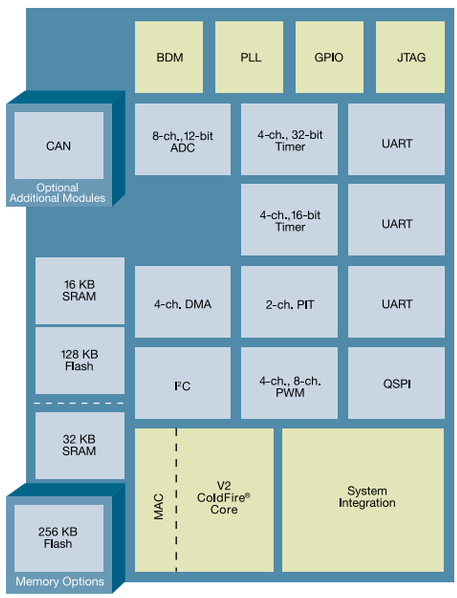
Target Applications

- Medical pumps and monitors
- Point-of-sale terminals
- Lighting control nodes
- Security/access control panels
- Wireless control nodes
- Machine controls
- Factory service and maintenance systems
- Process and temperature controls
- Vending machines
- Health care related monitoring systems
- Noise suppression

Sample Application Note

- AN3236—Designing for Low Power with the MCF5213

MCF521x



M5211DEMO—MSRP $99*

Comes fully equipped with the low-cost, efficient, and powerful MCF5211 microcontroller as well as useful output utilities such as a potentiometer and analog-to-digital converter utility for application demonstration.

Features

- MCF5211 CPU, 64-pins
- 40-pin I/O port
- Integrated USB BDM port
- BDM / JTAG Port, 26-pins, development port
- RS-232 serial port w/DB9-S connector
- Power input selection jumper
- Four user LEDs
- Two user push switches
- 5 KB ohm POT with enable jumper
- DB9 serial cable, USB cable, utility/support CD
- Supporting software and documentation:
  - CodeWarrior® 6.1 Special Edition
  - Quick Start Guide
  - Initialization software
  - Analog-to-digital converter utility
  - Demonstration code and example project

*Prices subject to change.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Flash (KB)	DMA	GPT	PWM	Other	I²C	UART/ USART/ PSC	SPI	ADC	Package
MCF5211CAE66	V2	66	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	LQFP64
MCF5211CEP66	V2	66	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	QFN64
MCF5211LCEP66	V2	66	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	QFN64
MCF5211LCVM66	V2	66	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	MAP-BGA81
MCF5211LCVM80	V2	80	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	MAP-BGA81
MCF5212CAE66	V2	66	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	LQFP 64
MCF5212CVM66	V2	66	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	MAPBGA 81
MCF5212CVM80	V2	66	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit		1	3 UART	QSPI	12-bit	MAPBGA 81
MCF5213CAF66	V2	66	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	CAN	1	3 UART	QSPI	12-bit	LQFP 100
MCF5213CAF80	V2	80	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	CAN	1	3 UART	QSPI	12-bit	LQFP 100
MCF5213CVM66	V2	66	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	CAN	1	3 UART	QSPI	12-bit	MAPBGA 81
MCF5213CVM80	V2	80	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	CAN	1	3 UART	QSPI	12-bit	MAPBGA 81

Auto qualification not currently available.

MCF5223x ColdFire Family

The all-in-one 32-bit single-chip Ethernet solution.

The MCF5223x includes an integrated Ethernet MAC and PHY, FlexCAN, Cryptographic Acceleration Unit (CAU) and up to 256 KB of embedded flash. The result is a secure, low-cost Ethernet solution for virtually any embedded design.

Key Features

- ColdFire V2 core–57 MIPS @ 60 MHz
- eMAC module and HW divide
- Up to 256 KB flash, up to 32 KB SRAM
- 10/100 Ethernet MAC with PHY
- Cryptographic acceleration unit with random number generator
- CAN 2.0B controller (FlexCAN)
- 4-ch. 32-bit timers with DMA support
- 4-ch. 16-bit capture/compare/PWM timers
- 2-ch. Periodic Interrupt Timer
- 8-ch./8-bit or 4-ch./16-bit PWM timer
- 2 x 4-ch. 12-bit analog-to-digital converter
- Real-time clock
- Up to 73 GPIO
- Supported with Open Source TCP/IP protocol stacks from InterNiche

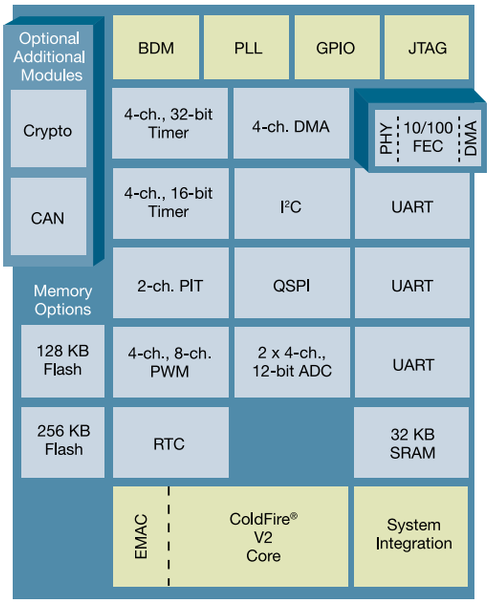
Target Applications

- Remote data collection
- Power-over-Ethernet
- ZigBee® control nodes
- Security/access control panels
- Health care pumps and monitors
- Lighting control nodes
- Home/industrial automation

Sample Application Notes

- AN2168—ColdFire Microprocessor DMA Controller
- AN3298—Solder Joint Temperature and Package Peak Temperature
- AN3300—General Soldering Temperature Process Guidelines

MCF5223x



M52233DEMO—MSRP $99*

The M52233DEMO is a low-cost development system for the M52233 MCU. Application is quick and easy with the included DB9 serial cable and integrated BDM. Includes CodeWarrior® Special Edition to support application development and debug.

Features

- MCF52233 device—256 KB, 80 QFP
- 40-pin I/O port
- Integrated USB BDM port
- RS-232 serial port with standard DB9 connector
- 3-axis accelerometer
- 4 user LEDs with enable
- 2 use, push switches
- 5K ohm POT with enable
- DB9 serial cable, USB cable, Ethernet cable
- 128 KB CodeWarrior Special Edition

*Prices subject to change.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	SRAM (KB)	Flash (KB)	DMA	GPT	PWM	Other	I²C	UART/USART/ PSC	SPI	ADC	Package
MCF52230CAF60	V2	60	eMAC	√	32	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP80
MCF52230CAL60	V2	60	eMAC	√	32	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP112
MCF52231CAF60	V2	60	eMAC	√	32	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP80
MCF52231CAL60	V2	60	eMAC	√	32	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP112
MCF52233CAF60	V2	60	eMAC	√	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP80
MCF52233CAL60	V2	60	eMAC	√	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP112
MCF52234CAL60	V2	60	eMAC	√	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP112
MCF52235CAL60	V2	60	eMAC	√	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	LQFP112
MCF52235CVM60	V2	60	eMAC	√	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	10/100FEC & EPHY, RTC	1	3 UART	QSPI	12-bit	MAPBGA121

Auto qualification not currently available.

MCF5222x ColdFire Family

256 KB flash and full-speed USB-OTG—high-performance, low-cost consumer/industrial networking solutions.

Building upon the success of the MCF5213 family, the MCF522x brings USB On-The-Go (OTG) to the low-end ColdFire® MCU portfolio, making it ideal for applications requiring USB Device or Host connectivity functionality.

Key Features

- ColdFire V2 core–76 MIPS @ 80 MHz
- MAC module and hardware divide
- Memory—Up to 256 KB flash, up to 32 KB SRAM
- USB 2.0 full-speed Host/Device/OTG controller
- 4-channel, 16-bit capture/compare/PWM timers
- 8-channel, 12-bit ADC with simultaneous sampling
- 8-channel, 8-bit PWM timer or 4-channel, 16-bit PWM timer
- 4-channel, 32-bit timers
- 2-channel periodic interrupt timer
- Real-time clock
- Supported with Open Source USB Protocol Stacks from CMX

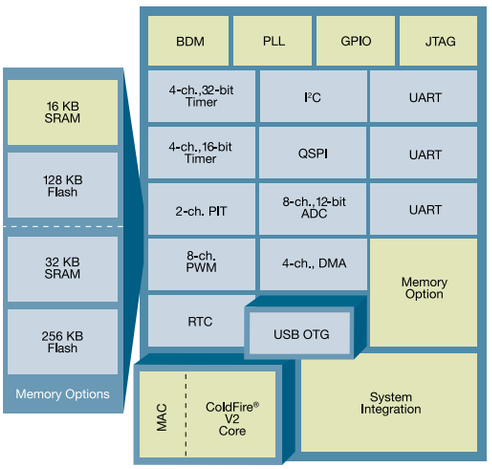
Target Applications

- ZigBee® control nodes
- Security/access control panels
- Health care pumps and monitors
- Lighting control nodes
- Home/industrial automation
- Point-of-sale terminals
- Factory service and maintenance systems

Sample Application Note

- AN2168—ColdFire Microprocessor DMA Controller Application Note

MCF5222x



M52223EVB—MSRP $99*

With USB 2.0 OTG connectivity, breakout connectors for serial interfaces (including I²C, QSPI, GPIO and ADC), and support for a ZigBee-ready daughter card, this complete package includes all the components for realizing a MCF5222x design quickly and easily.

Features

- USB 2.0 OTG module
- Abort/IRQ7 logic switch (debounced)
- PLL clocking options—oscillator, crystal or SMA for external clocking signals
- Three UART interfaces (auxiliary RS-232 serial port) and standard DB9 connections
- Supports ZigBee-ready RF daughter card
- Breakout connector for serial interfaces (including I²C, QSPI, GPIO and ADC)
- LEDs for power-up indication, general-purpose I/O and timer output signals
- Potentiometer and light sensor dedicated to the ADC
- CAN transceiver interface
- BDM/JTAG interface

*Prices subject to change.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Flash (KB)	DMA	GPT	PWM	Other	I²C	UART/USART/ PSC	SPI	ADC	Package
MCF52221CAE66	V2	66	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	Full-Speed Device/ Host/OTG, RTC	1	3 UART	QSPI	12-bit	LQFP 64
MCF52221CAF60/80	V2	66, 80	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	Full-Speed Device/ Host/OTG, RTC	1	3 UART	QSPI	12-bit	LQFP 100,
MCF52221CVM60/80	V2	66, 80	MAC	√	—	16	128	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	Full-Speed Device/ Host/OTG, RTC	1	3 UART	QSPI	12-bit	MAP-BGA81
MCF52223CAF66/80	V2	66, 80	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	Full-Speed Device/ Host/OTG, RTC	1	3 UART	QSPI	12-bit	LQFP 100,
MCF52223CVM66/80	V2	66, 80	MAC	√	—	32	256	4-ch.	4-ch., 32-bit + 4-ch., 16-bit	4-ch., 16-bit	Full-Speed Device/ Host/OTG, RTC	1	3 UART	QSPI	12-bit	MAP-BGA81

Auto qualification not currently available.

MCF5207/8 ColdFire Family

Low-cost microprocessors deliver 160 MIPS performance with robust SDR/DDR memory controller and an optional 10/100 Fast Ethernet controller.

The MCF520x combines an industrial tuned peripheral set including UARTs, I²C, QSPI and 10/100 Fast Ethernet Controller with a 166 MHz capable V2 core. Support for SDR and DDR external SDRAM enables operating system support while maintaining a low overall system cost.

Key Features

- ColdFire® V2 core—159 MIPS @ 166 MHz
- eMAC module and HW divide
- Memory—8 KB I/D-Cache, 16 KB SRAM, external bus interface
- Optional 10/100 Ethernet MAC with PHY
- 4 ch., 32-bit timers with DMA support
- 16 ch. DMA controller
- 16-bit DDR/32-bit SDR SDRAM controller
- Queued serial peripheral interface (QSPI)
- System integration with PLL and SW watchdog

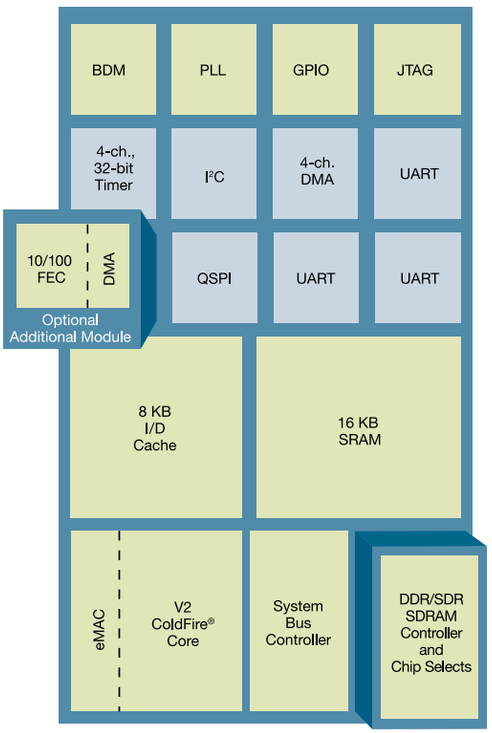
Target Applications

- EPOS printers and terminals
- Network attached storage
- Security/access control systems
- Process control equipment
- Remote monitoring
- Data security
- Voice-over-IP phone
- Gaming equipment
- Health care instrumentation and monitoring

Sample Application Notes

- AN2982—System Design Using the ColdFire MCF5208 Split Bus Architecture
- AN2981—Migrating from the MCF5206e to the ColdFire MCF5208

MCF5207/8



M5208EVBE—MSRP $349*

Provides full access to the 196-pin MCF5208 controller and integrates the MC13192 ZigBee™ ready transceiver and antenna. Each kit features a uCLinux™ "Getting Started" demonstration pre-flashed on the board such that users can immediately examine the compelling features of the MCF520x family.

Features

- 196-pin MAPBGA MCF5208 microprocessor (MCF520x Superset)
- Ethernet physical interface
- DDR SDRAM memory: 32 MB
- Flash memory: 2 MB
- Two RS-232 physical interfaces with standard DB9 connectors
- Standard BDM interface (26-pin)
- MC13192 ZigBee-ready transceiver with integrated antenna
- Breakout connector for I²C, QSPI, GPIO
- LEDs for power-up indication, GPIO and timer output signals
- uCLinux "Getting Started" demonstration—pre-loaded in flash

*Prices subject to change.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Memory Controller	EBI	DMA	GPT	Other	I²C	UART/USART/ PSC	SPI	Package
MCF5207CAG166	V2	166	eMAC	√	8 KB I/D	16	DDR/SDR SDRAAM	√	16-ch.	4-ch., 32-bit		1	3 UART	QSPI	LQFP144
MCF5207CVM166	V2	166	eMAC	√	8 KB I/D	16	DDR/SDR SDRAAM	√	16-ch.	4-ch., 32-bit		1	3 UART	QSPI	MAPBGA 144
MCF5208CAB166	V2	166	eMAC	√	8 KB I/D	16	DDR/SDR SDRAAM	√	16-ch.	4-ch., 32-bit	10/100 FEC	1	3 UART	QSPI	QFP 160
MCF5208CVM166	V2	166	eMAC	√	8 KB I/D	16	DDR/SDR SDRAAM	√	16-ch.	4-ch., 32-bit	10/100 FEC	1	3 UART	QSPI	MAPBGA 196

Auto qualification not currently available.

MCF5253 ColdFire

Designed for applications that require robust high speed consumer communications protocols.

Anchored by the Version 2 ColdFire core, the MCF5253 is an excellent general-purpose, cost-effective system controller with over 125 Dhrystone 2.1 MIPS of performance at 140 MHz. The MCF5253 is a unique addition to the ColdFire family because it features two CAN modules, the largest SRAM block in the portfolio at 128K and is the first to offer high-speed USB On-the-Go (OTG) with integrated Physical Layer (PHY).

Key Features

- 68 KB/ColdFire® V2 core
- Up to 125 Dhrystone 2.1 MIPS @ 140 MHz
- Enhanced MAC module and HW divide
- USB 2.0 high speed On-the-Go (OTG) controller with integrated PHY
- Two CAN 2.0B modules
- I^2S interface (Rx x2/Tx x3)
- Three UARTs (with flow control)
- Queued Serial Peripheral Interface (QSPI)
- Two I^2C Controllers
- Dedicated ATA hard disk interface
- SmartMedia interface (including IDE and compact flash)
- Flash media card interface
- Real time clock module
- Two ch. 16-bit capture/compare/PWM timers
- Four ch. DMA controller with 4 DMA channels
- Six ch. 12-bit A/D converter

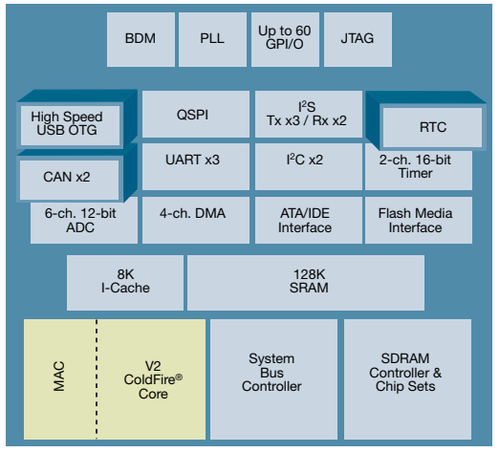
Applications

- Card payment terminals
- Barcode scanners and printers
- Automatic teller machines
- Portable data collection terminals
- Home health and patient monitoring
- Voice over Internet Protocol (VoIP)
- HVAC and building control systems
- Factory automation
- Fire/security
- Medical instrumentation

Application Notes

- AN3385—Building an MP3 Player on uClinux Using ColdFire MCF5249

MCF5253



M5253EVBE—MSRP $680*

CodeWarrior Development Studio
Complimentary Special Edition
Single tool suite that supports software development and includes: ColdFire Init Graphical Initialization Tool

Third Party Tools
Free USB Stack Support planned from CMX uCLinux: USB Host and Device stacks included

Features

- Evaluation board featuring USB 2.0 high-speed OTG
- ATA/IDE connector
- CAN and serial ports
- SmartMedia interface
- Universal power supply
- One RS232 communication cable
- P&E Micro USB “wiggler” cable

*Prices subject to change.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Memory Controller	DMA	GPT	Other	I²C	UART	SPI	ADC	Package
MCF5253VM140	V2	140	eMAC	√	8 KB I/D	16	SDRAM	4-ch.	2-ch., 16-bit	HS USB Host/Device/ OTG with PHY, ATA interface, 2 CAN, RTC	2	3	QSPI	6-ch., 12-bit	225 MAPBGA

Auto qualification not currently available.

MCF523x ColdFire Family

ColdFire + eTPU (programmable I/O controller for complex timing and I/O management).

The MCF523x family combines the ColdFire® V2 core with a 16-channel enhanced Time Processing Unit (eTPU), a 10/100 Ethernet MAC and other communications peripherals along with hardware-accelerated encryption. This family is ideal for applications requiring advanced timing, measurement and motor control.

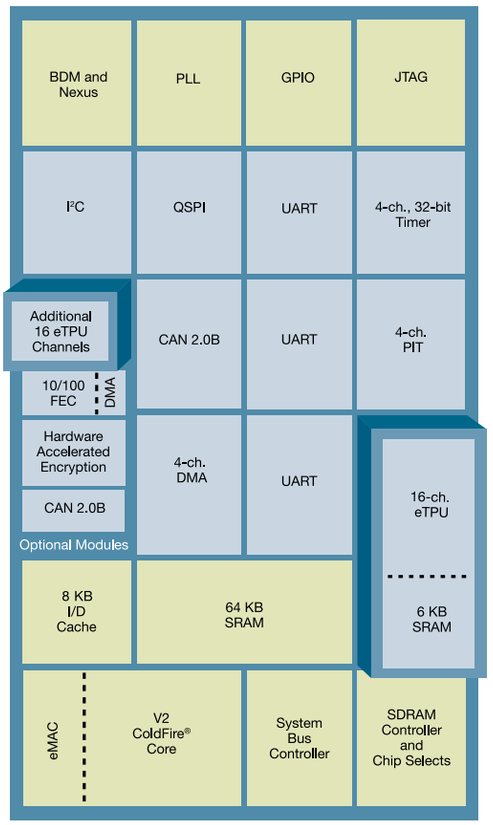
Key Features

- 68 KB/ColdFire V2 core
- Up to 144 Dhrystone 2.1 MIPS @ 150 MHz
- Optional 10/100 Ethernet MAC
- Optional hardware-accelerated encryption
- Optional CAN 2.0B controller
- 16 or 32 ch. eTPU
- Intelligent programmable I/O controller with its own core and memory system
- 24-bit timer resolution
- 6 KB code memory, 1.5 KB data memory
- Variable number of parameters per channel
- Angle mode support
- DMA and interrupt request support
- Debug support
- Up to 113 general-purpose I/O

Target Applications

- Timing control
- I/O handling
- Serial communications: UARTs, I²C, SPI, proprietary protocols
- Motor control: stepper motor, DC motors, AC motors
- Engine control—spark timing, fuel injection

MCF523x



M5235BCCKITE—MSRP $250*
M5235BCCE—MSRP $180*

Measuring only 3.5 x 2.5 inches, the M5235BCCE module includes the MCF5235 device, 2 MB flash, 16 MB SDRAM, a 10/100 Ethernet port and ColdFire debug module. A **M5235BCCKITE** is also available which includes a P&E wiggler cable, a CE certified power supply and associated components.

Features

- MCF5235 MPU
- 2 MB flash (16-bit, external)
- 16 MB SDRAM (32-bit, external)
- Serial ports, DB-9 connectors
- 10/100TX Ethernet port w/RJ45 connector
- Four status indicators, auto MDI-X crossover

*Prices subject to change.

Sample Application Notes

- AN2892—3-Phase BLDC Motor with Speed Closed Loop, Driven by eTPU on MCF523x
- AN2948—Three 3-Phase BLDC Motors with Speed Closed Loop, Driven by eTPU on MCF523x
- AN2866—Migrating from the MC68332 to the ColdFire MCF523x

Device	Core	Freq. (MHz)	MIPS @ Max Freq.	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Flash (KB)	Memory Controller	EBI	DMA	GPT	Other	I²C	UART/USART/ PSC	SPI	Package
MCF5232CAB80	V2	80	144	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	16-ch. eTPU, CAN	1	3 UART	QSPI	QFP 160
MCF5232CVM100/150	V2	100/150	144	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	16-ch. eTPU, CAN	1	3 UART	QSPI	MAPB-GA 196
MCF5233CVM100/150	V2	100, 150	144	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	32-ch. eTPU, 2 CAN	1	3 UART	QSPI	MAPB-GA 256
MCF5234CVM100/150	V2	100, 150	144	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	16-ch. eTPU, 10/100 FEC, CAN	1	3 UART	QSPI	MAPB-GA 256
MCF5235CVM100/150	V2	100, 150	144	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	16-ch. eTPU, 10/100FEC, 2 CAN, Encryption	1	3 UART	QSPI	MAPB-GA 256

Auto qualification not currently available.

MCF532x/7x ColdFire Family

SVGA LCD controller and USB On-the-Go meets 240 MHz 32-bit performance.

The MCF532x and MCF537x introduce an on-chip SVGA LCD controller (532x) and USB On-The-Go functionality to the ColdFire® architecture. Add in a 10/100 Ethernet Controller, hardware encryption and CAN, and the result is a hard-to-beat solution for secure, networked user interface systems.

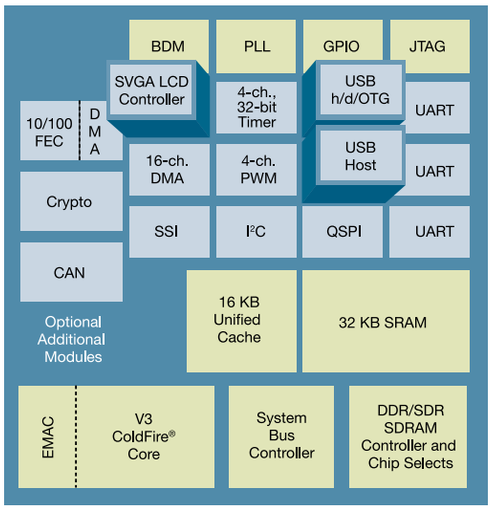
Key Features

- ColdFire V3 core—211 MIPS @ 240 MHz
- eMAC module and HW Divide
- Integrated SVGA LCD controller
- 16-bit DDR/32-bit SDR SDRAM controller
- 16 KB I/D-Cache, 32 KB SRAM
- Optional USB 2.0 full-speed host controller
- Optional USB 2.0 full-speed On-The-Go controller
- Up to one 10/100 Fast Ethernet Controller (FEC)
- Optional hardware-accelerated encryption (AES, DES, 3DES)
- CAN 2.0B Controller (FlexCAN)
- Serial synchronous interface (SSI)
- 4-channel, 32-bit timer with DMA support
- 4-channel PWM timer
- 16-channel DMA controller
- Up to 94 GPIO

Target Applications

- Electronic point-of-sale terminals
- Medical monitoring equipment
- Fire and security control panels
- Factory service and maintenance systems
- HVAC control panels
- Industrial machine control

MCF532x



M5329EVBE—MSRP $699*

Embedded Graphical User Interface (GUI) system development is simplified using the M5329EVBE and the supporting software suite. In addition to a complimentary CodeWarrior® Special Edition license, several open source tools are available including a µCLinux™ board support package and Nano-X. Nano-X provides a small footprint Linux® based tool for configuring embedded GUIs and contains a full set of widgets (tool bars, lines, tables, etc.) to simplify display configuration.

Features

- 256-ball MAPBGA MCF5329
- Application board with plug-in "Fire-Engine" module
- LCD interface, integrated LCD touch and backlight connecter
- USB host and USB On-The-Go physical interface
- 10/100 Ethernet PHY with RJ-45 Ethernet jack
- CAN 2.0B physical interface circuits and standard DB9 connectors
- P&E Micro® BDM debug cable, power supply, Ethernet crossover cable

*Prices subject to change.

Compatible LCD display kits available for individual purchase.

Device	Core	Freq. (MHz)	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Memory Controller	EBI	DMA	GPT	PWM	Other	I²C	UART/USART/ PSC	SPI	Package
MCF5327CVM240	V3	240	eMAC	√	16 KB I/D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	2-ch., 16-bit	SVGA LCD, USB Host (FS), USB OTG (FS/HS)	1	3 UART	QSPI	MAPBGA 196
MCF5328CVM240	V3	240	eMAC	√	16 KB I/D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	SVGA LCD, USB Host (FS), USB OTG (FS/HS), 10/100 FEC	1	3 UART	QSPI	MAPBGA 256
MCF5329CVM204	V3	240	eMAC	√	16 KB I/D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	SVGA LCD, USB Host (FS), USB OTG (FS/HS), 10/100 FEC, CAN, Encryption	1	3 UART	QSPI	MAPBGA 256
MCF5372LCVM240	V3	240	eMAC	√	16 KB I/D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	10/100 FEC, USB Host (FS), USB OTG (FS/HS)	1	3 UART	QSPI	MAPGBA 196
MCF5373LCVM204	V3	240	eMAC	√	16 KB I/D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	10/100 FEC, USB Host (FS), USB OTG (FS/HS), Encryption	1	3 UART	QSPI	MAPBGA 196

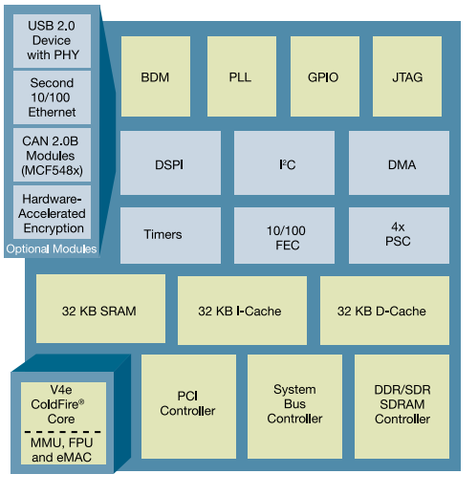
Auto qualification not currently available.

MCF547x/8x ColdFire Family

Higher performance ColdFire V4e Core with MMU and FPU with multiple communications interfaces.

Based on the high-performance ColdFire® V4e core, the MCF547x/8x features an MMU for implementing full Linux® solutions. Also included are multiple connectivity peripherals, including dual Ethernet Controllers, USB device (HS) and PCI. In addition, an encryption accelerator is included for secure communications in network connected control applications.

MCF547/8x



Key Features

- Up to 308 Dhrystone 2.1 MIPS @ 266 MHz
- MMU, FPU, EMAC
- 32 KB I-Cache, 32 KB D-Cache
- 32 KB SRAM
- Up to two 10/100 Ethernet MACs
- Optional hardware-accelerated encryption
- Optional USB 2.0 high-speed device with integrated PHY
- Up to two CAN 2.0B Modules
- 4 x Programmable Serial Controllers (PSC)
- DMA Supported Serial Peripheral Interface (DSPI)
- 32-bit v2.2 PCI interface, 33/66 MHz, five external masters
- 4-ch. 32-bit timers with DMA support
- 2-ch. periodic interrupt (Slice) timer
- 16-ch. DMA controller
- SDRAM controller
- Up to 99 general-purpose I/O

Target Applications

- Fire and security systems
- Robotics
- Factory/building automation
- Process control equipment
- Health care monitoring equipment
- Instrumentation

M5484LITEKITE/M5474LITEKITE—MSRP $350*

Contains a system-on-module "Fire Engine" containing 64 MB of DDR-SDRAM, 4 MB boot flash and a USB device output. Together with the Ethernet ports, PCI slot, Serial and CAN (548x only) interfaces, the kit provides a complete package to enable quick development on the MCF548x/7x.

Features

- M5484 "Fire Engine" module (SOM-ETX), including:
- Two 10/100 RJ45 Ethernet connectors
- PCI slot (32-bit, 33 or 66 MHz, 3.3V)
- CAN interface (5484 version only)
- RS-232 Serial Port
- USB 2.0 high-speed device (on Fire Engine)
- Serial cable (null modem), BDM and Ethernet crossover cables
- Linux BSP: v2.4.26 Kernel, core tools, open source compiler, serial, I²C, DSPI, Ethernet, USB and PCI drivers

*Prices subject to change.

Sample Application Notes

- AN2950—MCF547x/8x Linux BSP Quick Start
- AN2826—DDR-SDRAM Layout Considerations for MCF547x/8x Processors
- AN2761—Understanding Cryptographic Performance
- AN3038—Using the ColdFire EMAC Unit to Improve RSA Performance

Device	Core	Freq. (MHz)	MMU and FPU	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Memory Controller	EBI	DMA	GPT	Other	I²C	UART/ USART/ PSC	SPI	Package
MCF5470VR200	V4e	200	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, PCI	1	4 PSC	DSPI	PBGA 388
MCF5471VR200	V4e	200	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, PCI, Encryption	1	4 PSC	DSPI	PBGA 388
MCF5472VR200	V4e	200	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR	√	16-ch.	4-ch., 16-bit	10/100 FEC, USB Device (HS), PCI	1	4 PSC	DSPI	PBGA 388
MCF5473VR200	V4e	200	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR	√	16-ch.	4-ch., 16-bit	10/100 FEC, USB Device (HS), PCI, Encryption	1	4 PSC	DSPI	PBGA 388
MCF5474VR200/266	V4e	200/266	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, USB Device (HS), PCI	1	4 PSC	DSPI	PBGA 388
MCF5475VR200/266	V4e	200/266	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, USB Device (HS), PCI, Encryption	1	4 PSC	DSPI	PBGA 388
MCF5480CVR166	V4e	166	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, 2 CAN, PCI	1	4 PSC	DSPI	PBGA 388
MCF5481CVR166	V4e	166	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, 2 CAN, PCI, Encryption	1	4 PSC	DSPI	PBGA 388
MCF5482CVR166	V4e	166	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	10/100 FEC, USB Device (HS), 2 CAN, PCI	1	4 PSC	DSPI	PBGA 388
MCF5483CVR166	V4e	166	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	10/100 FEC, USB Device (HS), 2 CAN, PCI, Encryption	1	4 PSC	DSPI	PBGA 388
MCF5484CVR200	V4e	200	√	eMAC	√	32 KB I / 32 KB D	32	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	2 10/100 FEC, USB Device (HS), 2 CAN, PCI,	1	4 PSC	DSPI	PBGA 388

Auto qualification not currently available.

MC56F8013/14 Family

32 MIPS DSP/MCU core + 96 MHz PWM/Timers + Fast 12-bit ADC = an unbeatable price/performance solution.

Key Features

- 56800E core—32 MIPS @ 32 MHz
- Single-cycle 16 x 16-bit parallel multiplier-accumulator (MAC)
- Memory—16 KB of program flash, 4 KB of unified data/program RAM
- Up to 6-channel high-speed pulse-width modulator (PWM) that can be clocked at up to 96 MHz
- Four 16-bit timers that can be clocked at up to 96 MHz
- Up to 2 x 4-ch. 12-bit high performance analog-to digital converters ADCs
- Serial communication interface (SCI) with LIN slave functionality
- Serial peripheral interface (SPI)
- Computer operating properly (COP)
- I^2C communication module

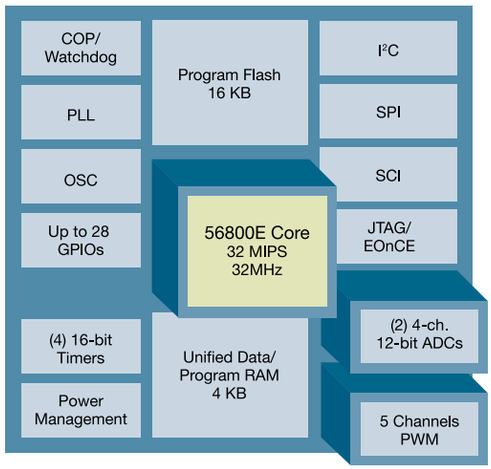
Target Applications

- Dimming lamp ballasts
- Switched-mode power supply
- Soft-switching PFC
- DC-DC power supplies
- Industrial motor control
- Appliance motor control
- Smart sensors
- Instrumentation

Sample Application Notes

- AN1916-3—Phase BLDC Motor Control with Hall Sensors Using 56800/E Digital Signal Controllers
- AN3102—Unique Features of the 56F801x Family of Devices
- AN3103-56F8000—Clock Generation Guidelines to Insure Correct Functionality
- AN3118—Production Flash Programming for the 56F8000 Family

56F8014



DEMO56F8013-EE—MSRP $75*
DEMO56F8014-EE—MSRP $95*

The 56F8013/14 Demonstration Board is an evaluation module board that includes a 56F8013/14 DSC, RS-232 interface, user LEDs, user pushbutton switches and a daughter card connector. The daughter card connector allows signal monitoring and expandability of user features.

- 56F8013/14 digital signal controller
- JTAG port interface connector, for an external debug host target interface
- RS-232 interface, for easy connection to a host processor [U2 and P3]
- Daughter card connector, to allow the user to connect his own PWM, ADC, SCI, SPI or GPIO-compatible peripheral to the digital signal controller
- On-board power regulation provided from an external +9V DC-supplied power input
- Light Emitting Diode (LED) power indicator
- Six on-board, real-time user debugging LEDs
- Manual Reset push-button
- Manual interrupt No. 1 push-button/ Manual interrupt No. 2 push-button

*Prices subject to change.

Device	MIPS/MHz	Flash	RAM	Timers (16-Bit)	PWM (6-ch.)	Oper. Volt. (V)	PWM Fault Inputs	ADC (12-Bit)	SCI	SPI	I^2C	Temp.	Package
MC56F8011VFAE	32	12 KB	2 KB	4 (96 MHz)	1 x 6-ch. (96 MHz)	3 - 3.6V	4	2 x 3-ch., 12-bit	1	1	1	-40°C to +125°C	32LQFP
MC56F8013MFAE	32	16 KB	4 KB	4 (96 MHz)	1 x 6-ch. (96 MHz)	3 - 3.6V	4	2 x 3-ch., 12-bit	1	1	1	-40°C to +125°C	32LQFP
MC56F8014VFAE	32	16 KB	4 KB	4 (96 MHz)	1 x 6-ch. (96 MHz)	3 - 3.6V	4	2 x 3-ch., 12-bit	1	1	1	-40°C to +125°C	32LQFP
MC56F8014VFAE	32	16 KB	4 KB	4 (96 MHz)	1 x 6-ch. (96 MHz)	3 - 3.6V	3	2 x 4-ch., 12-bit	1	1	1	-40°C to +105°C	32LQFP

Auto qualification available on family.

MC56F802x/3x Family

32 MIPS with extensive analog features combined for reduced system cost.

The MC56F802x/3x family combines the processing power of a digital signal processor with the functionality and ease of use of a microcontroller on a single chip. With a flexible set of peripherals, package and memory options from 16 KB to 64KB flash memory, CAN and high resolution PWM/Timers running at up to 96MHz, the 56F8000 series provides a cost-effective yet high-performance solution.

This family exceeds the requirements for Class B Components for IEC60730: Safety standards on automatic controls for household use, making it ideal for the appliance market.

Key Features

- 56800E core @ 32 MIPS/32MHz
- 32–64 KB Bytes program/data flash
- 4K-8K Bytes program/data RAM
- Tunable internal relaxation oscillator
- Eight 16-bit timers that can run at 96 MHz
- 6 channel high speed Pulse Width Modulator (PWM) module with 4 programmable fault inputs, that can be clocked at 96 MHz
- Two 12-bit ADCs for 6-8 inputs with internal or external Vref
- Up to two 12-bit digital to analog converters
- Two analog comparators
- Synchronization between PWM and ADC
- Optional MSCAN

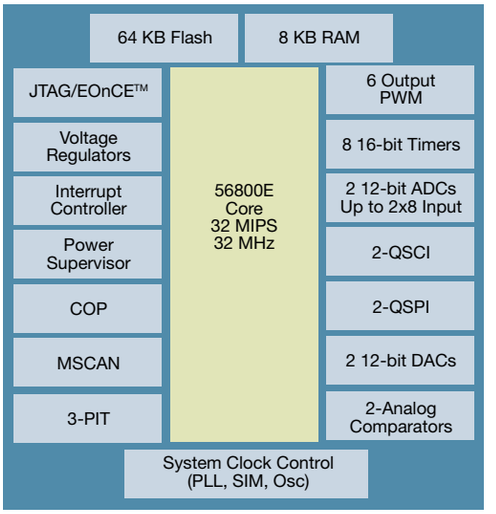
Target Applications

- Advanced appliances requiring motor control
- Power monitoring
- Multiple stepper control
- High speed dual loop BLDC control (compressors)
- Remote and handheld sensing
- Instrumentation
- Switching power supply

Sample Application Notes

- AN3118—Production Flash Programming for the 56F8000 Family
- AN1965—Design of Indirect Power Using the 56F800/E
- AN1975—Multiple Target Features Using Processor Expert and CodeWarrior
- AN1983—HCS12/16 to 56800/E Software Porting Considerations

MC56F8037EVM



MC56F8037EVM—MSRP $199*

The MC56F8037EVM evaluation module allows easier and faster development for 56F802x and 56F803x digital signal controllers. The module includes an MC56F8037 digital signal controller, RS-232 interface, user LEDs, user push button switches, and a daughter card connector.

Features

- 56F8037 digital signal controller
- JTAG port interface for external debug connection
- Built-in circuitry for RS-232 communication to host processor
- User LEDs
- User push button switches
- Daughter card connectors enabling connection to additional features such as the motor control daughter card (APMOTOR56F8000E)

*Prices subject to change.

Device	MIPS /MHz	Program / Data Flash (KB)	Program / Data RAM (KB)	Timer (16-bit)	PWM (6-ch.)	Operating Voltage	PWM Fault Inputs	ADC (12-bit)	DAC (12-bit)	QSCI	QSPI	I²C	CAN	Comparators	Temp	Package
MC56F8023VLC	32	32	4	4	1 x 6	3-3.6	4	2 x 3-ch.	2(Internal)	1	1	1	-	2	-40°C to +105°C	32LQFP
MC56F8025VLD	32	32	4	4	1 x 6	3-3.6	4	2 x 4-ch.	2(Internal)	1	1	1	-	2	-40°C to +105°C	44LQFP
MC56F8036VLF	32	64	8	4	1 x 6	3-3.6	4	2 x 5-ch.	2(Internal)	1	1	1	1	2	-40°C to +105°C	48LQFP
MC56F8037VLH	32	64	8	8	1 x 6	3-3.6	4	2 x 8-ch.	2(External)	2	2	1	1	2	-40°C to +105°C	64LQFP

Auto qualification not currently available.

MC56F8300 Family

60 MIPS DSP/MCU performance from 48 KB to 560 KB with numerous safety features for the most demanding motor control application environments.

The 56F8300 series combines the ease-of-use of an MCU with the raw protocol and control processing power of a 32-bit RISC DSP. 60 MHz/MIPS performance, multiple Quadrature Decoders/Timers, FlexCAN, SPI, and SCI modules are all combined in a range of extended temperature small footprint packages.

Key Features

- 60 MIPS Harvard architecture core
- 32 KB–512 KB programmable flash, 4 KB programmable RAM
- 8 KB–32 KB data flash, 8 KB–32 KB data RAM, 8 KB–16 KB boot flash
- Up to two FlexCAN Module–CAN 2.0 A/B compliant
- Up to two 6-output PWM modules
- Up to four 4-input 12-bit ADC
- Up to two quadrature decoders
- Up to four 16-bit quad timer modules
- Optional temperature sensor
- Automotive temperature range (-40°C to +125°C) RoHS-compliant packages

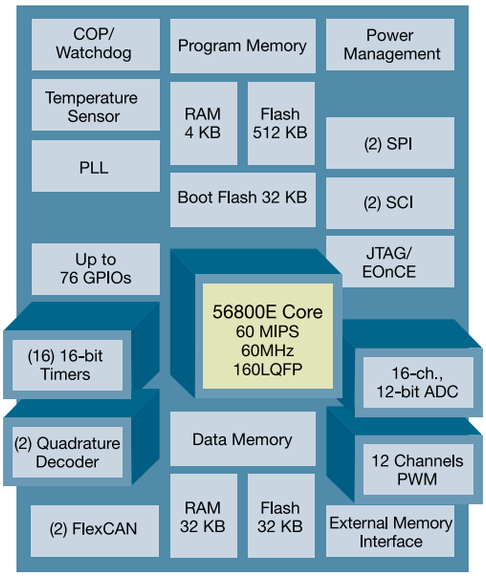
Target Applications

- Electronic power-assisted steering
- Active suspension
- Electronic valve actuation
- UPS
- SMPS
- Inverters
- Motors

Sample Application Notes

- AN1973—Production Flash Programming for 56F8300/8100
- AN1974—56F8300/8100 ADC
- AN1991—Controlling Power Consumption in 56F8300 and 56F8100 Family Devices
- AN1994—Start-Up Considerations for 56F8300 and 56F8100 Family Devices

56F836X



MC56F8323EVM—MSRP $299*
Supports MC56F832x family

MC56F8367EVM—MSRP $299*
Supports MC56F833x, MC56F834x, MC56F835x and MC56F836x families. Both EVBs can be used alone, or in conjunction with Freescale's broad range of modular motion control development hardware.

MC56F836EVME Features:

- MC56F8367 16-bit digital signal controller
- External fast static RAM (FSRAM) memory
- Joint Test Action Group (JTAG) port interface connector to interface to an external command converter
- On-board parallel port command converter, with a connector for a PC printer port cable
- Pair of standard daughter card connectors enabling connection of application specific and user generated daughter cards
- High-speed 1 Mbps CAN interface

*Prices subject to change.

Device	MIPS/ MHz	Program Flash (KB)	Program RAM (KB)	Data Flash (KB)	Data RAM (KB)	BOOT Flash (KB)	Timers (16-bit)	QDEC (4-ch.)	PWM (6-ch.)	PWM Fault Inputs	ADC (12-bit)	FlexCAN	SCI	SPI	Package
MC56F8322VFAE	60	32	4	8	8	8	2x4-ch.	1	1	1	2x3-ch.	1	2	2	48 LQFP
MC56F8323VFBE	60	32	4	8	8	8	2x4-ch.	1	1	3	2x4-ch.	1	2	2	64 LQFP
MC56F8335VFGE	60	64	4	8	8	8	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	128 LQFP
MC56F8345VFGE	60	128	4	8	8	8	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	128 LQFP
MC56F8346VFVE	60	128	4	8	8	8	4x4-ch.	2	2	3+4	4x4-ch.	1	2	2	144 LQFP
MC56F8347VPYE	60	128	4	8	8	8	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	160 LQFP
MC56F8347VVFE	60	128	4	8	8	8	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	160 BGA
MC56F8355VFGE	60	256	4	8	16	16	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	128 LQFP
MC56F8356VFVE	60	256	4	8	16	16	4x4-ch.	2	2	3+4	4x4-ch.	1	2	2	144 LQFP
MC56F8357VPYE	60	256	4	8	16	16	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	160 LQFP
MC56F8357VVFE	60	256	4	8	16	16	4x4-ch.	2	2	4+4	4x4-ch.	1	2	2	160 BGA
MC56F8365VFGE	60	512	4	32	32	16	4x4-ch.	2	2	4+4	4x4-ch.	2	2	2	128 LQFP
MC56F8366VFVE	60	512	4	32	32	16	4x4-ch.	2	2	3+4	4x4-ch.	2	2	2	144 LQFP
MC56F8367VPYE	60	512	4	32	32	16	4x4-ch.	2	2	4+4	4x4-ch.	2	2	2	160 LQFP
MC56F8367VVFE	60	512	4	32	32	16	4x4-ch.	2	2	4+4	4x4-ch.	2	2	2	160 BGA

Auto qualification available on family.

MC56F8100 Family

40 MIPS DSP/MCU performance with a peripheral set streamlined for cost-sensitive non-automotive applications.

For non-automotive applications that don't require the full complement of 56F8300 peripherals, the 56F8100 series offers a cost reduced alternative. With performance scaled back to 40 MIPS and Program RAM, data flash, FlexCAN and the temperature sensor all removed, the 56F8100 series delivers a high-performance and cost-effective solution for applications such as motor control and digital power conversion.

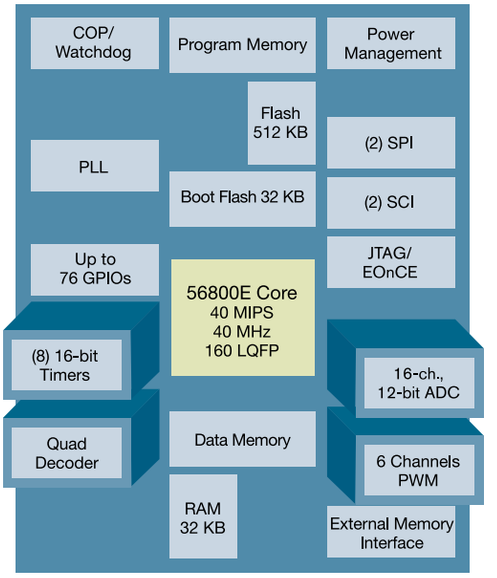
Key Features

- 40 MIPS Harvard architecture core
- 32 KB–512 KB programmable flash, 8 KB–32 KB data RAM, 8 KB–16 KB boot flash
- 6-output PWM modules
- Up to four 4-input 12-bit ADC
- Quadrature decoder
- Up to two 16-bit quad timer modules
- Up to industrial temperature range (-40°C to +105°C) RoHS-compliant packages

Target Applications

- UPS
- SMPS
- Inverters
- Motors
- Valve actuators
- Vending machines
- Health care-related monitoring systems
- Noise suppression

56F816X



MC56F8323EVM—MSRP $299*
Supports MC56F812x family

MC56F8367EVM—MSRP $299*
Supports MC56F813x, MC56F814x, MC56F815x and MC56F816x families.

Both EVBs can be used alone, or in conjunction with Freescale's broad range of modular motion control development hardware.

*Prices subject to change.

Sample Application Notes

- AN1973—Production Flash Programming for 56F8300/8100
- AN1974—56F8300/8100 ADC
- AN1991—Controlling Power Consumption in 56F8300 and 56F8100 Family Devices
- AN1994—Start-Up Considerations for 56F8300 and 56F8100 Family Devices

Device	MIPS/ MHz	Program Flash (KB)	Program RAM (KB)	Data Flash (KB)	Data RAM (KB)	BOOT Flash (KB)	Timers (16-bit)	QDEC (4-ch.)	PWM (6-ch.)	PWM Fault Inputs	ADC (12-bit)	FlexCAN	SCI	SPI	Package
MC56F8122VFAE	40	32			8	8	2x4-ch.				2x3-ch.		2	2	48 LQFP
MC56F8123VFBE	40	32			8	8	2x4-ch.				2x4-ch.		2	2	64 LQFP
MC56F8135VFGE	40	64			8	8	2x4-ch.	1	1		4x4-ch.		2	2	128 LQFP
MC56F8145VFGE	40	128			8	8	2x4-ch.	1	1		4x4-ch.		2	2	128 LQFP
MC56F8146VFVE	40	128			8	8	2x4-ch.	1	1		4x4-ch.		2	2	144 LQFP
MC56F8147VPYE	40	128			8	8	2x4-ch.	1	1		4x4-ch.		2	2	160 LQFP
MC56F8147VVFE	40	128			8	8	2x4-ch.	1	1		4x4-ch.		2	2	160 BGA
MC56F8155VFGE	40	256			16	16	2x4-ch.	1	1		4x4-ch.		2	2	128 LQFP
MC56F8156VFVE	40	256			16	16	2x4-ch.	1	1		4x4-ch.		2	2	144 LQFP
MC56F8157VPYE	40	256			16	16	2x4-ch.	1	1		4x4-ch.		2	2	160 LQFP
MC56F8157VVFE	40	256			16	16	2x4-ch.	1	1		4x4-ch.		2	2	160 BGA
MC56F8165VFGE	40	512			32	32	2x4-ch.	1	1		4x4-ch.		2	2	128 LQFP
MC56F8166VFVE	40	512			32	32	2x4-ch.	1	1		4x4-ch.		2	2	144 LQFP
MC56F8167VPYE	40	512			32	32	2x4-ch.	1	1		4x4-ch.		2	2	160 LQFP
MC56F8167VVFE	40	512			32	32	2x4-ch.	1	1		4x4-ch.		2	2	160 BGA

Auto qualification available on family.

S12XD/A Family

High performance extension to the industry leading S12 architecture featuring the unique XGATE co-processor module.

S12XD/A families deliver 32-bit performance with all the advantages of a 16-bit MCU including code size efficiency, low system cost, low EMC, and reduced power consumption. Running at twice the CPU speed, the XGATE co-processor is a versatile, programmable 16-bit RISC engine for high speed data transfer between peripheral modules, RAM and I/O ports without impacting CPU performance. Additional enhancements include an 8-level interrupt controller, memory management controller, enhanced timers, and an enhanced external bus interface.

Key Features

- Enhanced S12X CISC core operates @ 40 MHz (upwards compatible with S12 instruction set)
- 80 MHz XGATE peripheral co-processor
- Up to 512 KB flash, 32 KB RAM, 4 KB EEPROM
- Up to 5 CAN, 6 SCI, 3 SPI
- Programmable 8 level interrupt controller
- Enhanced memory management controller
- Enhanced timer with new 4 ch Periodic Interrupt Timer
- Non-multiplexed 8 MB expanded memory bus

Target Applications

- Central body computer
- Passenger safety solutions
- Dashboard cluster
- Climate control
- Security
- Industrial control gateways
- Factory automation
- Programmable logic controllers

Sample Application Notes

- AN3224—Introducing the XGATE Module to Consumer & Industrial Application Developers
- AN2685—How to Configure and Use the XGATE on S12X Devices
- AN2734—HCS12X Family Memory Organization
- AN3289—Low-Power Techniques for the S12X Family
- AN3144—Using XGATE to Implement a Simple Buffered SCI
- AN2732—Using XGATE to Implement LIN Communication on HCS12X
- AN2726 MSCAN Driver for MC9S12XDP512 Using XGATE

DEMO9S12XDT512E—$75 MSRP*

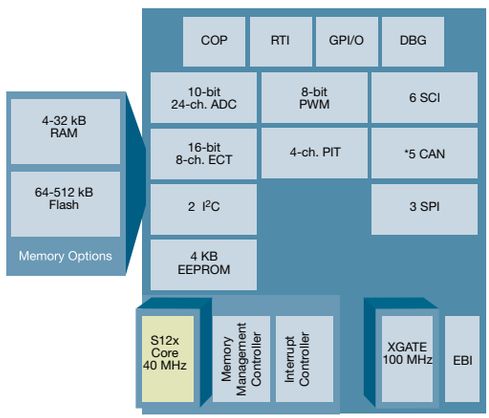
The DEMO9S12XDT512E is an evaluation or demontration board for the Freescale MC9S12XDT512 MCU. Development of applications is quick and easy with the integrated USB-Multilink BDM, sample software tools, and examples. A standard BDM debug port is also provided, but not populated, to allow use of an external BDM pod. Two 40-pin connectors allow the demonstration board to be connected to an expanded evaluation environment or to external test equipment.

Features

- MC9S12XDT512 MCU, 80 LQFP
- Integrated USB-Multilink BDM for DEBUG access
- Optional power from USB bus through USB-Multilink BDM
- Optional on-board, regulated +5V power supply for standalone operation
- Optional power through MCU I/O connector

*Prices subject to change.

MC9S12XD/A



*CAN module offered on S12XD family. S12XA has no CAN.

Device	XGATE	Flash	RAM	EE	CAN	SCI	SPI	I²C	ADC (10-bit) #	Total # Channels	ECT (16-bit)	TIM (16-bit)	PIT	I/O	Package
MC9S12XDP512	yes	512	32	4	5	6	3	2	2	24	1 x 8-ch.		4-ch.	119	144 LQFP
MC9S12XDP512	yes	512	32	4	5	4	3	1	2	16	1 x 8-ch.		4-ch.	91	112 LQFP
MC9S12XDT512	yes	512	20	4	3	6	3	1	2	24	1 x 8-ch.		4-ch.	119	144 LQFP
MC9S12XDT512	yes	512	20	4	3	4	3	1	2	16	1 x 8-ch.		4-ch.	91	112 LQFP
MC9S12XDT512	yes	512	20	4	3	2	2	1	1	8	1 x 8-ch.		4-ch.	59	80 QFP
MC9S12XDT384	yes	384	20	4	3	4	3	1	2	24	1 x 8-ch.		4-ch.	119	144 LQFP
MC9S12XDT384	yes	384	20	4	3	4	3	1	2	16	1 x 8-ch.		4-ch.	91	112 LQFP
MC9S12XDT384	yes	384	20	4	3	2	3	1	1	8	1 x 8-ch.		4-ch.	59	80 QFP
MC9S12XDT256	yes	256	16	4	3	4	3	1	2	24	1 x 8-ch.		4-ch.	119	144 LQFP
MC9S12XDT256	yes	256	16	4	3	4	3	1	2	16	1 x 8-ch.		4-ch.	91	112 LQFP
MC9S12XDT256	yes	256	16	4	3	2	2	1	1	8	1 x 8-ch.		4-ch.	59	80 QFP
MC9S12XA512	yes	512	32	4	-	6	3	1	2	24	1 x 8-ch.		4-ch.	119	144 LQFP
MC9S12XA512	yes	512	32	4	-	4	3	1	2	16	1 x 8-ch.		4-ch.	91	112 LQFP
MC9S12XA512	yes	512	32	4	-	2	2	1	1	8	1 x 8-ch.		4-ch.	59	80 QFP
MC9S12XA256	yes	256	16	4	-	4	3	1	2	24	1 x 8-ch.		4-ch.	119	144 LQFP
MC9S12XA256	yes	256	16	4	-	4	3	1	2	16	1 x 8-ch.		4-ch.	91	112 LQFP
MC9S12XA256	yes	256	16	4	-	2	2	1	1	8	1 x 8-ch.		4-ch.	59	80 QFP

Auto qualification available on family.

MPC55xx Family

Power Architecture™ e200z6 core, 2 MB flash and powerful control functionality.

The MPC5500 family is the next generation microcontroller family based on the Power Architecture for embedded applications. Offering large amounts of embedded flash, and a vast set of integrated functionality such as: DSP and floating point capabilities, several CAN modules, a modular I/O system, enhanced queued ADC units, serial communication interface modules, enhanced Time Processor Units (eTPU), and a true Nexus development interface, the MPC5500 family is a superb solution for highly integrated real-time needs.

Key Features

- 40-132 MHz Power Architecture™ ISA e200z6 core with nteger binary user mode compatible with RCPU(MPC500) and new SIMD module for DSP and floating point features
- 2 MB byte RWW flash with ECC
- 115 KB total SRAM (including cache and eTPU memory)
- 88 timed I/O channels
- 2 x 32 channel eTPU
- 24 channel eMIOS with unified channels
- 3 x FlexCAN - compatible with TouCAN, 64 buffers each
- 40 channel dual ADC - with DMA support
- 64 Channel DMA controller
- 308 source interrupt controller
- Nexus IEEE-ISTO 5001-2003 class 3+
- 5/3.3V IO, 5V ADC, 3.3V/1.8V bus, 1.5V core (from internal regulator controller)

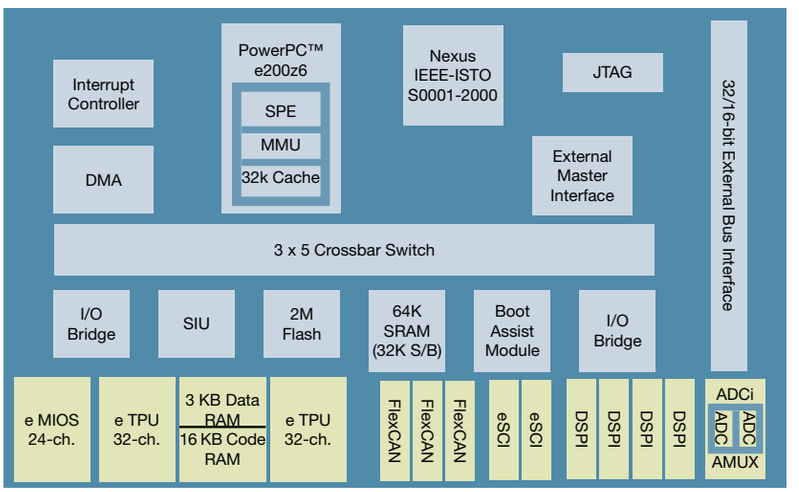
Applications

- Motion control / industrial control
- Avionics
- Turbine control
- Utilities/power management
- Engine control
- Industrial equipment / robotics
- Autonomous vehicles

Application Notes

- AN2989—Design, Accuracy, and Calibration of Analog to Digital Converters on the MPC5500 Family
- AN2867—Using the DSPI Module on the MPC5500 Family
- AN2865—MPC5500 Simple Cookbook
- AN3215—Interfacing MPC55xx Microcontrollers to the MFR4200 FlexRay Controller

MPC5554



MPC55xxEVB—MSRP $750*

The MPC55xxEVB Evaluation Kits include everything necessary to begin development with the MPC55xx family of microcontrollers. A comprehensive set of hardware and software development tool options are available including a free a flash programmer, initialization tools, and assembly level debug tool. The kit also includes the MPC5554/MPC5553 Revealed, a comprehensive book that is a great introduction to the MPC55xx architecture.

Features

- Breadboard area, access to all signals
- Nexus connectors (MICTOR and 14-pin Berg). Footprint for robust connector
- 32-channel eTPU connector
- 1 LIN transceiver with PHY
- 1 RS-232 Transceiver with PHY
- 8 LED
- 2 potentiometers
- 1 audio speaker with amplifier
- UNI-3 motor interface connector plus sensor connector
- MPC5554EVB & MPC5567EVB - 128Kx32 external SRAM
- MPC5553EVB & MPC5534EVB - 256Kx16 external SRAM
- MPC5553EVB - 10/100 Ethernet with PHY (National Semiconductor's PHY, DP83848YB, available in -40 to 125°C)

*Prices subject to change.

Part Number	Frequency (MHz)	Flash	SRAM	Cache	eTPU	eMIOS	FlexCAN + Comms	SCI	DSPI	ADC	DMA	Package
MPC5554MVR132	132	2 MB	64 KB	32 KB	2 x 32-ch.	1 x 24-ch.	3	2	4	2 x 40-ch.	64-ch.	PBGA 416
MPC5553MVR	80, 112, 132	2 MB	64 KB	32 KB	1 x 32-ch.	1 x 24-ch.	3 x FlexCAN, 1 x Ethernet	2	4	2 x 40-ch.	64-ch.	PBGA 416
MPC5553MVZ	80, 112, 132	2 MB	64 KB	32 KB	1 x 32-ch.	1 x 24-ch.		2	4	2 x 40-ch.	64-ch.	PBGA 304
MPC5553MVM	80, 112, 132	2 MB	64 KB	32 KB	1 x 32-ch.	1 x 24-ch.		2	4	2 x 40-ch.	64-ch.	PBGA 208

Auto qualification available on family.

MRAM Family

Magnetoresistive Random Access Memory—the speed of SRAM and the non-volatile data retention of flash; it's cycled at full-speed and it never wears out.

Freescale Semiconductor delivers the world's first commercial magnetoresistive random access memory (MRAM) products. Our MRAM products store data using magnetic polarization rather than electric charge. MRAM stores data for decades while reading and writing at SRAM speed without wear-out. MRAM products use small, simple cells to deliver the highest density and best price/performance in the non-volatile RAM marketplace. With our new expanded product line, we serve a growing portion of the non-volatile RAM market.

The MRAM Advantage; Price/ Performance Leader

The simple MRAM cell structure makes it the price/performance leader among competing stand-alone non-volatile RAM (nvRAM) products. Better combined price-permegabit and performance than ferroelectric RAM (FRAM), battery-backed static RAM (BBSRAM), and nvSRAM.

Key Features

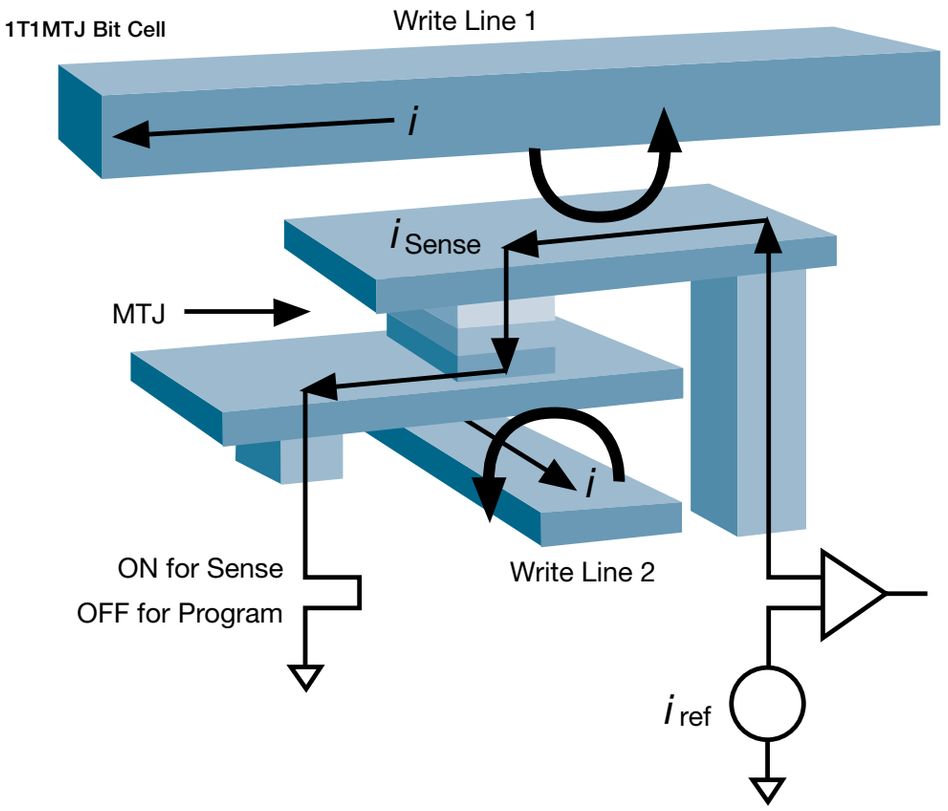
- 35 ns read/write cycle time
- Unlimited read/write endurance
- 3.3V ± 10 percent power supply
- Always non-volatile with greater than 20-year retention
- Magnetically shielded to greater than 25 oersted (Oe)
- Commercial, industrial and extended temperature options

MRAM Benefits

- Small size—up to 4 MB on one chip
- Fast, simple interface—35 ns cycle, SRAM timing and pin out
- Cost effective—simple one transistor and one magnetic tunnel junction (1T-1MTJ) bit cell structure
- Extremely reliable—soft error rate significantly better than SRAM, BBSRAM and nvSRAM
- Alternate sources—pin-compatible with 4MB SRAM, nvSRAM and FRAM products
- RoHS compliant—no battery, no lead (Pb)

Applications

- RAID systems and servers
- POS terminals
- Industrial controllers
- Data-acquisition systems
- Gaming
- Fire alarms
- Routers/switches
- Data logging
- Parameter storage
- System status
- Buffers
- Metering
- Printer/copiers



Part Number	Density	Configuration	Voltage	Speed	Temp	Package
MR2A16ATS35C	4 MB	256 KB x16	3.3V	35ns	0°C to +70°C	TSOP 44
MR1A16AYS35	2 MB	128 KB x 16	3.3V	35ns	0°C to +70°C	TSOP 44
MR0A16AYS35	1 MB	64 KB x 16	3.3V	35ns	0°C to +70°C	TSOP 44
MR2A16ACYS35	4 MB	256 KB x16	3.3V	35ns	-45°C to +85°C	TSOP 44
MR1A16ACYS35	2 MB	128 KB x 16	3.3V	35ns	-45°C to +85°C	TSOP 44
MR0A16ACYS35	1 MB	64 KB x 16	3.3V	35ns	-45°C to +85°C	TSOP 44
MR2A16AVYS35	4 MB	256 KB x16	3.3V	35ns	-45°C to +105°C	TSOP 44
MR1A16AVYS35	2 MB	128 KB x 16	3.3V	35ns	-45°C to +105°C	TSOP 44
MR0A16AVYS35	1 MB	64 KB x 16	3.3V	35ns	-45°C to +105°C	TSOP 44

Auto qualification not currently available.

Freescale's 8-bit Products Summary

Device	Flash	RAM	USB	ADC Channels		SCI (UART)	ESCI	SPI	I²C	ACMP	Timer	Clock Type	Package					Dev Tools			Applications/Additional Features	Price
				10-bit	8-bit								DFN/QFN	QFP/LQFP	TSSOP	SOIC	DIP	DEMO	EVB	FSICE	*All RS08, S08 and HC08 products include COP, LVI, POR and KBI	
General-Purpose Products																						
HCS08 and RS08 Families																						
MC9S08AW60	60 KB	2 KB		16		2		√	√		6 + 2-ch.	ICG w/FLL	48	64, 44				√			High integration, flash programmable to 5V	$4.19
MC9S08AW32	32 KB	2 KB		16		2		√	√		6 + 2-ch.	ICG w/FLL	48	64, 44				√			High integration, flash programmable to 5V	$3.38
MC9S08AW16	16 KB	1 KB		16		2		√	√		4 + 2-ch.	ICG w/FLL	48	64, 44				√			High integration, flash programmable to 5V	$2.98
MC9S08GB60A	60 KB	4 KB		8		√		√	√		3 + 5-ch.	ICG		64				√	√		High performance, flash programmable down to 1.8V	$3.95
MC9S08GT60A	60 KB	4 KB		8		√		√	√		2 + 2-ch.	ICG	48	44			42	√	√		High performance, flash programmable down to 1.8V	$3.65
MC9S08GB32A	32 KB	2 KB		8		√		√	√		3 + 5-ch.	ICG		64				√	√		High performance, flash programmable down to 1.8V	$2.95
MC9S08GT32A	32 KB	2 KB		8		√		√	√		2 + 2-ch.	ICG	48	44			42	√	√		High performance, flash programmable down to 1.8V	$2.75
MC9S08QG8	8 KB	512B		8		√		√	√	√	2-ch., MTIM	ICS	8, 16		16	8	16	√			High performance, low voltage, small package	$0.99
MC9S08QG4	4 KB	256B		8		√		√	√	√	2-ch., MTIM	ICS	8, 16		16	8	16, 8	√			High performance, low voltage, small package	$0.89
MC9RS08KA2	2 KB	62B								√	MTIM	ICS	6			8	8	√			Ultra-low end, new RS08 core for small MCUs	$0.52
MC9RS08KA1	1 KB	62B								√	MTIM	ICS	6			8	8	√			Ultra-low end, new RS08 core for small MCUs	$0.43
MC9S08GT16A	16 KB	2 KB		8		√		√	√		3 + 2-ch.	ICG	48, 32	44			42	√	√		High performance, flash programming down to 1.8V	$2.39
MC9S08GT8A	8 KB	1 KB		8		√		√	√		3 + 2-ch.	ICG	48, 32	44			42	√			Flash programming down to 1.8V, small package	$2.19
MC9S08QD4	4 KB	256B		4							2 + 3-ch.	ICS				8	8	√			Low-end, flash programmable to 5V	$0.69
MC9S08QD2	2 KB	128B		4							2 + 3-ch.	ICS				8	8	√			Low-end, flash programmable to 5V	$0.65
MC9S08LC60 New!	60 KB	4 KB		8 (12-bit)		√		2	√	√	2 x 2-ch.	ICG w/FLL		80, 64				√			Integrated Liquid Crystal Display (LCD) driver with high segment count	$3.70
MC9S08LC36 New!	36 KB	2.5 KB		8 (12-bit)		√		2	√	√	2 x 2-ch.	ICG w/FLL		80, 64				√			Integrated Liquid Crystal Display (LCD) driver with high segment count	$3.40
MC9S08QE128 New!	128 KB	8 KB		24 (12-bit)		2		2	2	2	1 + 6-ch, 2 + 3-ch.	ICS	48	80, 64, 44				√	√		Ultra-low power S08 device with 1.8V to 3.6V op range	$3.69
MC9S08QE64 New!	64 KB	4 KB		24 (12-bit)		2		2	2	2	1 + 6-ch, 2 + 3-ch.	ICS	48	80, 64, 44, 32				√	√		Ultra-low power S08 device with 1.8V to 3.6V op range	$2.69
HC08 Family																						
MC908GR60A	60 KB	2 KB		24			√	√			2 + 6-ch.	PLL		64, 48, 32				√		√	24 analog inputs and increased RAM	$5.20
MC908GR48A	48 KB	1.5 KB		24			√	√			2 + 6-ch.	PLL		64, 48, 32				√		√	24 analog inputs and increased RAM	$4.70
MC908GP32	32 KB	512B			8	√		√			2 + 2-ch.	PLL		44			40, 42		√	√	2, 2-ch. timers	$5.50
MC908GR32A	32 KB	1.5 KB		24			√	√			2 + 6-ch.	PLL		64, 48, 32				√		√	24 analog inputs and increased RAM	$4.20
MC908GT16	16 KB	512B			8		√	√			2 + 2-ch.	ICG		44			42			√	Internal clock	$4.50
MC908GR16	16 KB	1 KB		8			√	√			2 + 2-ch.	PLL		48, 32				√		√	High resolution ADC; supporting 32 kHz to 100 kHz crystals	$4.00
MC908GR16A	16 KB	1 KB		8			√	√			2 + 2-ch.	PLL		48, 32				√		√	High resolution ADC; supporting 1 MHz to 8 MHz crystals	$4.20
MC908JL16	16 KB	512B		13		√			√		2 + 2-ch.	OSC		32		28	28, 32	√		√	Multiple clock options, up to 26 GPIO	$1.50
MC908JK8	8 KB	256B			13	√					2 + 2-ch.	OSC				20	20			√	Low pin count	$2.75
MC908JL8	8 KB	256B			13	√					2 + 2-ch.	OSC		32		28	32, 28			√	Low pin count, more analog channels	$2.95
MC908GT8	8 KB	512B			8		√	√			2 + 2-ch.	ICG		44			32			√	Internal clock	$3.50
MC908QY8	8 KB	256B		10							2-ch.	OSC			16	16	16	√		√	Small packages	$1.31
MC908QB4	4 KB	128B		4			√	√			4-ch.	OSC			16	16	16	√		√	Small packages, extra timers	$1.31
MC908JL3E	4 KB	128B			12						2-ch.	OSC		48		28	28			√	Low pin count	$2.10
MC908JK3E	4 KB	128B			12						2-ch.	OSC				20	20			√	Low pin count	$1.65
MC908QT4A	4 KB	128B		6							2-ch.	OSC	8			8	8	√		√	Small packages	$0.99
MC908QY4A	4 KB	128B		6							2-ch.	OSC			16	16	16	√		√	Small packages	$1.21
MC908JK1E	1.5 KB	128B			12						2-ch.	OSC				20	20			√	Low pin count	$1.25
MC908QT2A	1.5 KB	128B		6							2-ch.	OSC	8			8	8	√		√	Small packages	$0.84
MC908QY2A	1.5 KB	128B		6							2-ch.	OSC			16	16	16	√		√	Small packages	$0.93
MC908QT1A	1.5 KB	128B									2-ch.	OSC	8			8	8	√		√	Small packages	$0.70
MC908QY1A	1.5 KB	128B									2-ch.	OSC			16	16	16	√		√	Small packages	$0.79
MC908QC16 New!	16 KB	512B		10			√	√			2-ch. 16-bit 4-ch. 16-bit	OSC			16, 20, 28	16, 20, 28		√		√	Two independent timer blocks, increased flash and RAM	$1.90
MC908QC8 New!	8 KB	384B		10			√	√			2-ch. 16-bit 4-ch. 16-bit	OSC			16, 20, 28	16, 20, 28		√		√	Two independent timer blocks, increased flash and RAM	$1.65

Freescale's 8-bit Products Summary

Device	Flash	RAM	USB	ADC Channels		SCI (UART)	ESCI	SPI	I²C	ACMP	Timer	Clock Type	Package					Dev Tools			Applications/Additional Features	Price
				10-bit	8-bit								DFN/QFN	QFP/ LQFP	TSSOP	SOIC	DIP	DEMO	EVB	FSICE	*All RS08, S08 and HC08 products include COP, LVI, POR and KBI	
Application-Specific Products																						
HCS08 Family																						
MC9S08RD60	60 KB	2 KB				√					2-ch.	OSC				28	28	√			Remote control, carrier modulator timer	$4.85
MC9S08RG60	60 KB	2 KB				√		√		√	2-ch.	OSC		44, 32				√			Remote control, carrier modulator timer	$5.05
MC9S08RD32	32 KB	2 KB				√					2-ch.	OSC				28	28	√			Remote control, carrier modulator timer	$3.85
MC9S08RG32	32 KB	2 KB				√		√		√	2-ch.	OSC		44, 32				√			Remote control, carrier modulator timer	$4.05
MC9S08RD16	16 KB	1 KB				√					2-ch.	OSC				28	28	√			Remote control, carrier modulator timer	$3.05
MC9S08RE16	16 KB	1 KB				√				√	2-ch.	OSC	48	44, 32				√			Remote control, carrier modulator timer	$3.20
MC9S08RD8	8 KB	1 KB				√					2-ch.	OSC				28	28	√			Remote control, carrier modulator timer	$2.15
MC9S08RE8	8 KB	1 KB				√				√	2-ch.	OSC		44, 32				√			Remote control, carrier modulator timer	$2.25
HC08 Family																						
MC908JW32	32 KB	1 KB	2.0					√			2-ch.	PLL	48	48						√	USB	$3.15
MC908LJ24	24 KB	768B		6		√		√	√		2-ch.	PLL		80, 64						√	LCD	$4.90
MC908LK24	24 KB	768B		6		√		√	√		2-ch.	PLL		80, 64						√	LCD	$4.60
MC908EY16	16 KB	512B		8			√	√			2 + 2-ch.	PLL		32						√	Auto/industrial communication	$3.95
MC908JB16	16 KB	384B	1.0, 1.1			√					2 + 2-ch.	PLL		32		28, 20				√	USB	$1.81
MC908LJ12	12 KB	512B		6		√		√			2-ch.	PLL		64, 52						√	LCD	$4.17
MC908JB12	12 KB	384B	1.0, 1.1			√					2 + 2-ch.	PLL				28, 20				√	USB	$1.64
MC908JB8	8 KB	256B	1.1								2 + 2-ch.	OSC		44		28, 20	20			√	USB, ROM available	$1.47
MC908EY8	8 KB	384B		8			√	√			2 + 2-ch.	PLL		32						√	Auto/industrial communication	$2.50
MC908LV8	8 KB	512B		6							2-ch.	OSC		52						√	LCD	$3.00
MC908QL4	4 KB	128B		6							2-ch.	OSC			16	16			√	√	Auto/industrial communication, SLIC (LIN)	$2.19
MM908E626	16 KB	512B		8			√	√			2 + 2-ch.	ICG				54					Stepper moter, integrated Vreg, LIN, PHY, 4 half-bridge	$5.34
MM908E625	16 KB	512B		8			√	√			2 + 2-ch.	ICG				54					Lighting, integrated Vreg and LIN PHY, KBI	$5.12
MM908E624	16 KB	512B		8			√	√			2 + 2-ch.	ICG				54					Motor control, integrated Vreg and LIN PHY, KBI	$3.41
MM908E621	16 KB	512B		8			√	√			2 + 2-ch.	ICG				54					Integrated quad half-bridge and triple high-side, LIN	$5.99

For a complete listing of available products with full orderable part numbers please see our Web site. *All listed pricing is manufacturer suggested resale pricing (MSRP) for 1,000 units or less and may vary with package and temperature. Prices subject to change.

Freescale's 32-bit Products Summary

Part Number	Core	Freq. (MHz)	MIPS @ Max Freq.	MMU and FPU	MAC/ eMAC	HW Divide	Cache (KB)	SRAM (KB)	Flash (KB)	Memory Controller	EBI	DMA	GPT*	PWM	PIT	10/100 FEC	Crypto	USB	CAN
MCF5206E	V2	40, 54	50	—	MAC	√	4 KB I	8	—	EDO, FPM	√	2-ch.	2-ch., 16-bit	—	—	—	—	—	—
MCF5207	V2	166	159	—	eMAC	√	8 KB I/D	16	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	—	2	—	—	—	—
MCF5208	V2	166	159	—	eMAC	√	8 KB I/D	16	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	—	2	1	—	—	—
MCF5211	V2	66, 80	76	—	MAC	√	—	16	128	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	—	—	—	—
MCF5212	V2	66, 80	76	—	MAC	√	—	32	256	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	—	—	—	—
MCF5213	V2	66, 80	76	—	MAC	√	—	32	256	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	—	—	—	1
MCF5214	V2	66	63	—	eMAC	√	2 KB I/D	64	256	SDR SDRAM	√	4-ch.	4-ch., 32-bit 8-ch., 16-bit	—	4	—	—	—	1
MCF5216	V2	66	63	—	eMAC	√	2 KB I/D	64	512	SDR SDRAM	√	4-ch.	4-ch., 32-bit 8-ch., 16-bit	—	4	—	—	—	1
MCF52100	V2	66, 80	76	—	MAC	√	—	16	64	—	—	4-ch.	4-ch., 32-bit 8-ch., 16-bit	4-ch., 16-bit	2	—	—	—	—
MCF52110	V2	66, 80	76	—	MAC	√	—	16	128	—	—	4-ch.	4-ch., 32-bit 8-ch., 16-bit	4-ch., 16-bit	2	—	—	—	—
MCF52210	V2	66, 80	76	—	MAC	√	—	16	64	—	—	4-ch.	4-ch., 32-bit 8-ch., 16-bit	4-ch., 16-bit	2	—	—	Full-Speed Device/Host/ OTG	—
MCF52211	V2	66, 80	76	—	MAC	√	—	16	128	—	—	4-ch.	4-ch., 32-bit 8-ch., 16-bit	4-ch., 16-bit	2	—	—	Full-Speed Device/Host/ OTG	—
MCF52221	V2	66, 80	76	—	MAC	√	—	16	128	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	—	—	Full-Speed Device/Host/ OTG	—
MCF52223	V2	66, 80	76	—	MAC	√	—	32	256	—	—	4-ch.	4-ch., 32-bit 4-ch., 32-bit	4-ch., 16-bit	2	—	—	Full-Speed Device/Host/ OTG	—
MCF52230	V2	60	57	—	eMAC	√	—	32	128	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	1	—	—	—
MCF52231	V2	60	57	—	eMAC	√	—	32	128	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	1	—	—	1
MCF52233	V2	60	57	—	eMAC	√	—	32	256	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	1	—	—	—
MCF52234	V2	60	57	—	eMAC	√	—	32	256	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	1	—	—	1
MCF52235	V2	60	57	—	eMAC	√	—	32	256	—	—	4-ch.	4-ch., 32-bit 4-ch., 16-bit	4-ch., 16-bit	2	1	√	—	1
MCF5232	V2	80, 100, 150	144	—	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	—	4	—	—	—	1
MCF5233	V2	100, 150	144	—	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	—	4	—	—	—	2
MCF5234	V2	100, 150	144	—	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	—	4	1	—	—	1
MCF5235	V2	100, 150	144	—	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	—	4	1	√	—	2
MCF5249L	V2	120	107	—	eMAC	√	8 KB I	96	—	SDR SDRAM	√	4-ch.	2-ch., 16-bit	—	—	—	—	—	—
MCF5249	V2	140	125	—	eMAC	√	8 KB I	96	—	SDR SDRAM	√	4-ch.	2-ch., 16-bit	—	—	—	—	—	—
MCF5253	V2	140	125	—	eMAC	√	8 KB I	128	—	SDR SDRAM	√	4-ch.	2-ch., 16-bit	—	—	—		High-Speed On-the-Go	2
MCF5270	V2	100	96	—	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	—	4	1	—	—	—
MCF5271	V2	100	96	—	eMAC	√	8 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit	—	4	1	√	—	—
MCF5272	V2	66	63	—	MAC	√	1KB I	4	—	SDR SDRAM	√	2-ch.	4-ch., 16-bit	3-ch., 8-bit	—	1	—	Full-Speed Device	—
MCF5274L	V2	133, 166	159	—	eMAC	√	16 KB I/D	64	—	DDR SDRAM	√	4-ch.	4-ch., 32-bit	4-ch., 8-bit	4	1	—	Full-Speed Device	—
MCF5274	V2	133, 166	159	—	eMAC	√	16 KB I/D	64	—	DDR SDRAM	√	4-ch.	4-ch., 32-bit	4-ch., 8-bit	4	2	—	Full-Speed Device	—
MCF5275L	V2	133, 166	159	—	eMAC	√	16 KB I/D	64	—	DDR SDRAM	√	4-ch.	4-ch., 32-bit	4-ch., 8-bit	4	1	√	Full-Speed Device	—
MCF5275	V2	133, 166	159	—	eMAC	√	16 KB I/D	64	—	DDR SDRAM	√	4-ch.	4-ch., 32-bit	4-ch., 8-bit	4	2	√	Full-Speed Device	—
MCF5280	V2	66, 80	76	—	eMAC	√	2 KB I/D	64	—	SDR SDRAM	√	4-ch.	4-ch., 32-bit 8-ch., 16-bit	—	4	1	—	—	1
MCF5281	V2	66, 80	76	—	eMAC	√	2 KB I/D	64	256	SDR SDRAM	√	4-ch.	4-ch., 32-bit 8-ch., 16-bit	—	4	1	—	—	1
MCF5282	V2	66, 80	76	—	eMAC	√	2 KB I/D	64	512	SDR SDRAM	√	4-ch.	4-ch., 32-bit 8-ch., 16-bit	—	4	1	—	—	1
MCF5307	V3	66, 90	75	—	MAC	√	8 KB U	4	—	SDR SDRAM	√	4-ch.	2-ch., 16-bit	—	—	—	—	—	—
MCF5327	V3	240	211	—	eMAC	√	16 KB I/D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	2-ch., 16-bit	4	—	—	Full Host, Full OTG	—
MCF5328	V3	240	211	—	eMAC	√	16 KB I/D	32	—	DDR/SDR	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	4	1	—	Full Host, Full/High** OTG	—
MCF5329	V3	240	211	—	eMAC	√	16 KB I/D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	4	1	√	Full Host, Full/High** OTG	1
MCF5372	V3	180	158	—	eMAC	√	16 KB I/D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	4	1	—	—	—
MCF5372L	V3	240	211	—	eMAC	√	16 KB I/D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	4	1	—	Full Host, Full OTG	—
MCF5373	V3	180	158	—	eMAC	√	16 KB I/D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	4	1	√	—	—
MCF5373L	V3	240	211	—	eMAC	√	16 KB I/D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 32-bit	4-ch., 16-bit	4	1	√	Full Host, Full OTG	—
MCF5407	V4	162, 220	316	—	MAC	√	16 KB I 8 KB D	4	—	SDR SDRAM	√	4-ch.	2-ch., 16-bit	—	—	—	—	—	—
MCF5470	V4e	200	308	√	eMAC 32K D	√	32 KB I	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	2	—	—	—
MCF5471	V4e	200	308	√	eMAC 32K D	√	32 KB I	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	2	√	—	—
MCF5472	V4e	200	308	√	eMAC 32K D	√	32 KB I	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	1	—	High-Speed Device	—
MCF5473	V4e	200	308	√	eMAC	√	32 KB I 32 KB D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	1	√	High-Speed Device	—
MCF5474	V4e	266	410	√	eMAC	√	32 KB I 32 KB D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	2	—	High-Speed Device	—
MCF5475	V4e	266	410	√	eMAC	√	32 KB I	32	—	DDR/SDR	√	16-ch.	4-ch., 16-bit	—	2	2	√	High-Speed	—
MCF5480	V4e	166	256	√	eMAC	√	32 KB I 32 KBD	32	—	DDR/SDR DSRAM	√	16-ch.	4-ch., 16-bit	—	2	2	—	—	2
MCF5481	V4e	166	256	√	eMAC	√	32 KB I	32	—	DDR/SD	√	16-ch.	4-ch., 16-bit	—	2	2	√	—	2
MCF5482	V4e	166	256	√	eMAC	√	32 KB I 32 KB D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	1	—	High-Speed Device	2
MCF5483	V4e	166	256	√	eMAC	√	32 KB I	32	—	DDR/SDR	√	16-ch.	4-ch., 16-bit	—	2	1	√	High-Speed	2
MCF5484	V4e	200	308	√	eMAC	√	32 KB I 32 KB D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	2	—	High-Speed Device	2
MCF5485	V4e	200	308	√	eMAC	√	32 KB I 32 KB D	32	—	DDR/SDR SDRAM	√	16-ch.	4-ch., 16-bit	—	2	2	√	High-Speed Device	2

Freescale's 32-bit Products Summary

Part Number	PCI	I²C	UART/ USART PSC	SPI	ADC	Other	GPIO Max	JTAG and BDM	Package	Operating Voltage	10 KB and Up	Evaluation Board	Unit MSRP***	Low-Cost Board	Unit MSRP***	Production-Ready Module
MCF5206E	—	1	2 UART	—	—	—	—	√	QFP 160	3.3V	$6.99	M5206EC3E	$549	—	—	—
MCF5207	—	1	3 UART	QSPI	—	—	30	√	LPFP144, MAPBGA 144	1.5V, 3.3V (2.5V DDR)	$4.99	M5208EVBE	$349	—	—	—
MCF5208	—	1	3 UART	QSPI	—	—	50	√	QFP 160, MAPBGA 196	1.5V, 3.3V (2.5V DDR)	$6.50					
MCF5211	—	1	3 UART	QSPI	12-bit	—	33	√	LQFP 64, MAPBGA 81	3.3V	$4.99	M5213EVBE	$299	M5211DEMO	$99	—
MCF5212	—	1	3 UART	QSPI	12-bit	—	44	√	LQFP 64, MAPBGA 81	3.3V	$6.25					
MCF5213	—	1	3 UART	QSPI	12-bit	—	55	√	LQFP 100, MAPBGA 81	3.3V	$7.59					
MCF5214	—	1	3 UART	QSPI	10-bit	—	142	√	MAPBGA 256	3.3V	$11.50	M5282EVBE	$650	—	—	—
MCF5216	—	1	3 UART	QSPI	10-bit	—	142	√	MAPBGA 256	3.3V	$12.50					
MCF52100	—	2	3 UART	QSPI	12-bit	RTC w/32kHz Osc	56	√	LQFP 64, MAPBGA 81	3.3V	$3.99	M52211EVB	$299	M52210DEMO	—	
MCF52110	—	2	3 UART	QSPI	12-bit	RTC w/32kHz Osc	56	√	LQFP 64, MAPBGA 81	3.3V	$5.49	M52211EVB	$299	M52210DEMO	—	
MCF52210	—	2	3 UART	QSPI	12-bit	RTC w/32kHz Osc	56	√	LQFP 64, MAPBGA 81	3.3V	$4.39	M52211EVB	$299	M52210DEMO	—	
MCF52211	—	2	3 UART	QSPI	12-bit	RTC w/32kHz Osc	56	√	LQFP 64, MAPBGA 81	3.3V	$5.14	M52211EVB	$299	M52210DEMO	—	
MCF52221	—	1	3 UART	QSPI	12-bit	RTC	56	√	LQFP 64, MAPBGA 81	3.3V	$5.49	M5223EVB	$299	M52221DEMO	$99	—
MCF52223	—	1	3 UART	QSPI	12-bit	RTC	56	√	LQFP 100, MAPBGA 81	3.3V	$6.99					
MCF52230	—	1	3 UART	QSPI	12-bit	EPHY, RTC	73	√	LQFP 80, LQFP 112	3.3V	$7.99	M522335EVB	$299	M52233DEMO	$99	—
MCF52231	—	1	3 UART	QSPI	12-bit	EPHY, RTC	73	√	LQFP 80, LQFP 112	3.3V	$8.79					
MCF52233	—	1	3 UART	QSPI	12-bit	EPHY, RTC	73	√	LQFP 80, LQFP 112	3.3V	$8.69					
MCF52234	—	1	3 UART	QSPI	12-bit	EPHY, RTC	73	√	LQFP 112, MAPBGA 121	3.3V	$9.62					
MCF52235	—	1	3 UART	QSPI	12-bit	EPHY, RTC	73	√	LQFP 112, MAPBGA 121	3.3V	$11.32					
MCF5232	—	1	3 UART	QSPI	—	16-ch. eTPU	142	√	QFP 160, MAPBGA 121	1.5V, 3.3V	$10.00	M523XEVBE	$695	M5235BCCE M5235BCCKITE	$180 $250	—
MCF5233	—	1	3 UART	QSPI	—	32-ch. eTPU	142	√	MAPBGA 256	1.5V, 3.3V	$13.50					
MCF5234	—	1	3 UART	QSPI	—	16-ch. eTPU	142	√	MAPBGA 256	1.5V, 3.3V	$13.00					
MCF5235	—	1	3 UART	QSPI	—	16-ch. eTPU	142	√	MAPBGA 256	1.5V, 3.3V	$15.00					
MCF5249L	—	2	2 UART	QSPI	12-bit	IDE, Audio, I²S	47	√	LQFP 144	1.8V, 3.3V	$9.30	M5249C3E	$649	—	—	—
MCF5249	—	2	2 UART	QSPI	12-bit	IDE, Audio, I²S	47	√	MAPBGA 160	1.8V, 3.3V	$9.79					
MCF5253	—	2	3 UART	QSPI	12-bit	IDE, I2S	60	√	MAPBGA 225	1.2V, 3.3V	$8.68	M5253EVBE	$680	—	—	—
MCF5270	—	1	3 UART	QSPI	—	—	97	√	QFP 160, MAPBGA 196	1.5V, 3.3V	$7.50	M5271EVBE	$649	M5270PROMOE M5270PRO	$249 $499	MOD5270
MCF5271	—	1	3 UART	QSPI	—	—	97	√	QFP 160, MAPBGA 196	1.5V, 3.3V	$9.50					
MCF5272	—	—	2 UART	QSPI	—	PLIC, TDM Soft HDLC	32	√	MAPBGA 196	3.3V	$9.95	M5272C3E	$649	—	—	—
MCF5274L	—	1	3 UART	QSPI	—	—	61	√	MAPBGA 196	1.5V, 3.3V (2.5V DDR)	$8.25	M5275EVBE	$649	—	—	—
MCF5274	—	1	3 UART	QSPI	—	—	69	√	MAPBGA 256	1.5V, 3.3V (2.5V DDR)	$10.25					
MCF5275L	—	1	3 UART	QSPI	—	—	61	√	MAPBGA 196	1.5V, 3.3V (2.5V DDR)	$10.25					
MCF5275	—	1	3 UART	QSPI	—	—	69	√	MAPBGA 256	1.5V, 3.3V (2.5V DDR)	$12.25					
MCF5280	—	1	3 UART	QSPI	10-bit	—	150	√	MAPBGA 256	3.3V	$14.66	M5282EVBE	$650	M5282ZIGBEEE M5282LITEE M5282LITEKITE	$299 $179 $249	—
MCF5281	—	1	3 UART	QSPI	10-bit	—	150	√	MAPBGA 256	3.3V	$16.05					
MCF5282	—	1	3 UART	QSPI	10-bit	—	150	√	MAPBGA 256	3.3V	$17.45					
MCF5307	—	1	2 UART	—	—	—	16	√	FQFP 208	3.3V	$11.35	M5307C3E	$539	—	—	—
MCF5327	—	1	3 UART	QSPI	—	SVGA LCD	63	√	MAPBGA 196	1.5V, 3.3V	$10.00	M5329EVBE	$699	—	—	M5329AFE M5329BFE
MCF5328	—	1	3 UART	QSPI	—	SVGA LCD	97	√	MAPBGA 256	1.5V, 3.3V	$12.00					
MCF5329	—	1	3 UART	QSPI	—	SVGA LCD	97	√	MAPBGA 256	1.5V, 3.3V	$14.00					
MCF5372	—	1	3 UART	QSPI	—	—	46	√	QFP 160	1.5V, 3.3V	$11.00	M5373EVB	$699	—	—	—
MCF5372L	—	1	3 UART	QSPI	—	—	62	√	MAPGBA 196	1.5V, 3.3V	$11.00					
MCF5373	—	1	3 UART	QSPI	—	—	46	√	QFP 160	1.5V, 3.3V	$12.50					
MCF5373L	—	1	3 UART	QSPI	—	—	62	√	MAPBGA 196	1.5V, 3.3V	$12.50					
MCF5407	—	1	1 UART, 1 USART	—	—	—	16	√	FQFP 208	1.8V, 3.3V	$18.95	M5407C3E	$649	—	—	—
MCF5470	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388 (2.5V DDR)	1.5V, 3.3V	$16.44	M5475EVBE	$850	M5474LITEKITE	$350	M5475AFEE M5475BFEE M5475CFEE M5475DFEE M5475EFEE M5475FFEE
MCF5471	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388 (2.5V DDR)	1.5V, 3.3V	$19.35					
MCF5472	√	1	4 PSC	DSPI	—	—	83	√	PBGA 388 (2.5V DDR)	1.5V, 3.3V	$16.44					
MCF5473	√	1	4 PSC	DSPI	—	—	83	√	PBGA 388	1.5V, 3.3V	$19.35					
MCF5474	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388	1.5V, 3.3V (2.5V DDR)	$19.35					
MCF5475	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388	1.5V, 3.3V	$22.26					
MCF5480	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388	1.5V, 3.3V (2.5V DDR)	$19.34	M5485EVBE	$850	M5484LITEKITE	$350	M5485AFEE M5485BFEE M5485CFEE M5485DFEE M5485EFEE M5485FFEE
MCF5481	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388	1.5V, 3.3V	$22.25					
MCF5482	√	1	4 PSC	DSPI	—	—	83	√	PBGA 388	1.5V, 3.3V (2.5V DDR)	$19.34					
MCF5483	√	1	4 PSC	DSPI	—	—	83	√	PBGA 388	1.5V, 3.3V	$22.25					
MCF5484	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388	1.5V, 3.3V (2.5V DDR)	$22.77					
MCF5485	√	1	4 PSC	DSPI	—	—	99	√	PBGA 388	1.5V, 3.3V (2.5V DDR)	$26.68					

Freescale's DSC Products Summary

Device	MHz	Flash (KB)	RAM (KB)	I2C	SCI / QSPI	SPI / QSPI	CAN	PWM	PWM Fault Inputs	12 bit ADC	Analogue Comparator	12 bit DAC	Quad Decoder	16 bit Timers	Package	Temp Range		Additional Perihperals
																-40 to 105C	-40 to 125C	
MC56F8011	32	12	2	1	1 x SCI	1 x SPI	-	1 x 6ch	4	2 x 3ch	-	-	-	4	32LQFP	Y	N	On-chip relaxation Oscillator
MC56F8013	32	16	4	1	1 x SCI	1 x SPI	-	1 x 6ch	4	2 x 3ch	-	-	-	4	32LQFP	Y	N	On-chip relaxation Oscillator
MC56F8014	32	16	4	1	1 x SCI	1 x SPI	-	1 x 5ch	3	2 x 4ch	-	-	-	4	32LQFP	Y	N	On-chip relaxation Oscillator
MC56F8023	32	32	4	1	1 x QSCI	1 x QSPI	-	1 x 6ch	4	2 x 3ch	2	2 (Internal)	-	4	32LQFP	Y	N	On-chip relaxation Oscillator
MC56F8025	32	32	4	1	1 x QSCI	1 x QSPI	-	1 x 6ch	4	2 x 4ch	2	2 (Internal)	-	4	44LQFP(.8p)	Y	N	On-chip relaxation Oscillator
MC56F8036	32	64	8	1	1 x QSCI	1 x QSPI	1	1 x 6ch	4	2 x 5ch	2	2 (Internal)	-	4	48LQFP	Y	N	On-chip relaxation Oscillator
MC56F8037	32	64	8	1	2 x QSCI	2 x QSPI	1	1 x 6ch	4	2 x 8ch	2	2	-	4	64LQFP	Y	N	On-chip relaxation Oscillator
MC56F8322	60	48	12	-	2 SCI	2 SPI	1	1 x 6ch	1	2 x 3ch	-	-	1 x 4ch	8	48LQFP	N	Y	On-chip relaxation Oscillator
MC56F8323	60	48	12	-	2 SCI	2 SPI	1	1 x 6ch	3	2 x 4ch	-	-	1 x 4ch	8	64LQFP	N	Y	On-chip relaxation Oscillator
MC56F8335	60	80	12	-	2 SCI	2 SPI	1	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	128LQFP	N	Y	
MC56F8345	60	144	12	-	2 SCI	2 SPI	1	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	128LQFP	N	Y	
MC56F8346	60	144	12	-	2 SCI	2 SPI	1	2 x 6ch	3 + 4	4 x 4ch	-	-	2 x 4ch	16	144LQFP	N	Y	
MC56F8347	60	144	12	-	2 SCI	2 SPI	1	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	160LQFP	N	Y	
MC56F8355	60	280	20	-	2 SCI	2 SPI	1	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	128LQFP	N	Y	
MC56F8356	60	280	20	-	2 SCI	2 SPI	1	2 x 6ch	3 + 4	4 x 4ch	-	-	2 x 4ch	16	144LQFP	N	Y	
MC56F8357	60	280	20	-	2 SCI	2 SPI	1	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	160LQFP	N	Y	
MC56F8365	60	560	36	-	2 SCI	2 SPI	2	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	128LQFP	N	Y	
MC56F8366	60	560	36	-	2 SCI	2 SPI	2	2 x 6ch	3 + 4	4 x 4ch	-	-	2 x 4ch	16	144LQFP	N	Y	
MC56F8367	60	560	36	-	2 SCI	2 SPI	2	2 x 6ch	4 + 4	4 x 4ch	-	-	2 x 4ch	16	160LQFP	N	Y	

Freescale's MPC55xx Products Summary

Part Number	Frequency (MHz)	Flash	SRAM	Cache	eTPU	eMIOS	FlexCAN	Ethernet	eSCI	DSPI	ADC	DMA	Package
MPC5554MVR132	132	2 MB	64 KB	32 KB	2 x 32ch	1 x 24ch	3	-	2	4	2 x 40ch	64-ch.	PBGA 416
MPC5553MVR	80, 112, 132	2 MB	64 KB	32 KB	1 x 32ch	1 x 24ch	3	10/100 FEC	2	4	2 x 40ch	64-ch.	PBGA 416, 304, 208

Freescale's S12X Products Summary

Device	MHz	Flash (kB)	RAM (kB)	EE (kB)	CAN	SCI	SPI	I2C	#	ADC		Timers			Additional Peripherals	Package	Dev Tools	
										10bit	12bit	ECT (16-bit)	TIM (16-bit)	PIT			Demo	EVB
MC9S12XDP512	40 MHz	512	32	4	5	6	3	2	2	24	24	1 x 8ch	-	4ch	XGATE (80MHz)	112/144LQFP	√	√
MC9S12XDT512	40 MHz	512	20	4	3	6	3	1	2	24	24	1 x 8ch	-	4ch	XGATE (80MHz)	80QFP, 112/144LQFP	√	√
MC9S12XDT384	40 MHz	384	20	4	3	4	3	1	2	24	24	1 x 8ch	-	4ch	XGATE (80MHz)	80QFP, 112/144LQFP	√	√
MC9S12XDT256	40 MHz	256	16	4	3	4	3	1	2	24	24	1 x 8ch	-	4ch	XGATE (80MHz)	80QFP, 112/144LQFP	√	√
MC9S12XA512	40 MHz	512	32	4	-	6	3	1	2	24	24	1 x 8ch	-	4ch	XGATE (80MHz)	80QFP, 112/144LQFP	√	√
MC9S12XA256	40 MHz	256	16	4	-	4	3	1	2	24	24	1 x 8ch	-	4ch	XGATE (80MHz)	80QFP, 112/144LQFP	√	√
MC9S12HZ256	25 MHz	256	12	2	2	2	1	1	1	16	16	1 x 8ch (16-bit)			32x4 LCD, 4 Stepper Motor Drive, 4xSSD	112LQFP	-	√
MC9S12HZ128	25 MHz	128	6	2	2	2	1	1	1	16	16	1 x 8ch (16-bit)			32x4 LCD, 4 Stepper Motor Drive, 4xSSD	112LQFP	-	√
MC9S12HZ64	25 MHz	64	4	1	1	1	0/1	-	1	8	7/8	1 x 4ch/8ch (16-bit)			20/24x4 LCD, 4 Stepper Motor Drive, 4xSSD	80QFP / 112LQFP	-	√
MC9S12HN64	25 MHz	64	4	1	-	1	0/1	-	1	8	7/8	1 x 4ch/8ch (16-bit)			20/24x4 LCD, 4 Stepper Motor Drive, 4xSSD	80QFP / 112LQFP	-	√
MC9S12E256	25 MHz	256	16	-	-	3	1	1	1	16	16	3 x 4ch (16-bit)			2 x 8-bit DAC, 6 PWM + 6PMF	80QFP / 112LQFP	-	√
MC9S12E128	25 MHz	128	8	-	-	3	1	1	1	16	16	3 x 4ch (16-bit)			2 x 8-bit DAC, 6 PWM + 6PMF	80QFP / 112LQFP	-	√
MC9S12E64	25 MHz	64	4	-	-	3	1	1	1	16	16	3 x 4ch (16-bit)			2 x 8-bit DAC, 6 PWM + 6PMF	80QFP / 112LQFP	-	√
MC9S12E32	25 MHz	32	2	-	-	2/3	1	1	1	16	8/16	2/3 x 4ch (16-bit)			2 x 8-bit DAC, 6 PWM + 6PMF	64QFN / 80QFP	-	√
MC9S12C128	25 MHz	128	4	-	1	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12C96	25 MHz	96	4	-	1	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12C64	25 MHz	64	4	-	1	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12C32	25 MHz	32	2	-	1	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12GC128	25 MHz	128	4	-	-	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12GC96	25 MHz	96	4	-	-	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12GC64	25 MHz	64	4	-	-	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12GC32	25 MHz	32	2	-	-	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√
MC9S12GC16	25 MHz	16	1	-	-	1	1	-	1	8	8	1 x 8ch (16-bit)				48/52LQFP, 80QFP	√	√

Development Tools Summary

Hardware and software building blocks for your next MCU design.

HC08 Development Tool Summary						
Family	Part Numbers	Starter Kit			Advanced Development	
		Demo/Eval Board	Debug Interface Cable	Software	Emulator Kit	Software
GR & GZ	MC68HC908GR4/8	DEMO908GZ60E	USBMULTILINK08E	CWX-HC08-SE*		CWS-HC08-STDED-CX**
	MC908GR16/32/48/60				FSICEKITGRGZE	
	MC908GZ8/16/32/48/60					
JB	MC68HC908JB8	–			FSICEKITJB8E	
	MC68HC908JB16	–				
JW	MC68HC908JW32	–			FSICEKITJW32	
JL & JK	MC68HC908JK1/3/8	–			FSICEKITJLJKE	
	MC68HC908JL3/8/16	DEMO908JL16E				
QB	MC908QB4/8	DEMO908QB8E			FSICEKITQBLTYE	
QC	MC908QC8/16	DEMO908QC16			FSICEKITQC16E	
QT & QY	MC68HC908QT1/2/4	DEMO908QB8E			FSICEKITQBLTYE	
	MC68HC908QY1/2/4/8					

* CodeWarrior® Development Studio for Microcontrollers Special Edition is free-of-charge and is supplied with all Freescale HC08 development tools.

** CodeWarrior Development Studio for Microcontrollers Professional Edition also available, part number CWS-HC08-PROED-CX

HCS08/RS08 Development Tool Summary						
Family	Part Numbers	Starter Kit		Advanced Development		
		Demo Board	Software	Evaluation Board	Debug Interface Cable	Software
QE	MC9S08QE32/64/128	DEMOQE128	CWX-HC08-SE*	EVBQE128	USBMULTILINKBDME	CWS-HC08-STDED-CX**
AW	MC9S08AW16/32/60	DEMO9S08AW60E		-		
GB & GT	MC9S08GB32/60	M68DEMO908GB60E		M68EVB908GB60E		
	MC9S08GT8/16/32/60	M68DEMO908GB60E		-		
LC	MC9S08LC36/60	DEMO9S08LC60		-		
KA	MC9RS08KA1/2	DEMO9RS08KA2		-		
QD	MC9S08QD2/4	DEMO9S08QD4		-		
QE	MC9S08QE64/128	DEMOQE128		-		
QG	MC9S08QG4/8	DEMO9S08QG8E		-		

* CodeWarrior Development Studio for Microcontrollers Special Edition is free-of-charge and is supplied with all Freescale HCS08/RS08 development tools.

** CodeWarrior Development Studio for Microcontrollers Professional Edition also available, part number CWS-HC08-PROED-CX

DCS Development Tool Summary						
Family	PartNumbers	Starter Kit		Advanced Development		
		Demo Board	Software	Evaluation Board	Debug Interface Cable	Software
56F8000	MC56F8011	DEMO56F8014-EE	CWX-568-SE*	-	CWH-UTP-ONCE-HX^	CWS-568-CX
	MC56F8013	DEMO56F8013-EE		-		
	MC56F8014	DEMO56F8014-EE		-		
	MC56F802x/3x	-		56F8037EVM		
56F8300	MC56F8322/8323	-		MC56F8323EVME		
	MC56F8345/8346/8347	-		MC56F8367EVME		
	MC56F8355/8356/8357	-				
	MC56F8365/8366/8367	-				

* CodeWarrior Development Studio for 56800 Special Edition is free-of-charge and is supplied with all Freescale 56800 development tools. Upgrade available to support 32K or 64K memory with part numbers CWS-568-C32K-CX and CWS-568-C64K-CX

^ Parallel, Ethernet and PCI Debug Interface Cable solutions are also available. See SG1011 for details.

ColdFire Development Tool Summary					
Family	PartNumbers	Starter Kit^		Advanced Development	
		Demo Board	Software	Evaluation Board Kit^	Software
51QExxx	MCF51QE128/64	DEMOQE128	CWX-HC08-SE	EVBQE128	CWS-HC08-STDED-CX
520x	MCF5207/8	-	CWS-MCF-SE	M5208EVBE	CWS-MCF-STDED-CX**
521x	MCF5211/2/3	M5211DEMO		M5213EVBE	
	MCF5214/6	M5282LITEKIT		M5282EVBE	
521xx	MCF52100/52110	M52210DEMO		M52211EVB	
5221x	MCF52210/52211	M52210DEMO		M52211EVB	
5222x	MCF52221/3	-		M52223EVB	
5223x	MCF52230/1/3/4/5	M52233DEMO		M52235EVB	
523x	MCF5232/3/4/5	M5235BCCKIT		M523XEVBE	
5253	MCF5253	-		M5253EVBE	
527x	MCF5270/1	-		M5271EVBE	
	MCF5272	-		M5272C3E	
	MCF5274/5	-		M5275EVBE	
528x	MCF5280/1/2	M5282LITEKIT		M5282EVBE	
532x	MCF5327/8/9			M5329EVB	
537x	MCF5372/3			M5373EVB	
547x	MCF5470/1/2/3/4/5	M5474LITEKIT		M5475EVBE	
548x	MCF5480/1/2/3/4/5	M5484LITEKIT		M5485EVBE	

^ Starter Kits and Evaluation Board Kits contain BDM Debug Interface Cable and CodeWarrior for ColdFire® Evaluation Licence

** CodeWarrior Development Studio for ColdFire Professional Edition also available, part number CWS-MCF-PROED-CX

Development Tools Summary cont.

Hardware and software building blocks for your next MCU design.

S12(X) Development Tool Summary						
Family	Part Numbers	Starter Kit		Advanced Development^		
		Demo Board	Software	Evaluation Board	Debug Interface Cable	Software
S12XD	MC9S12XDP512	DEMO9S12XDT512	CWX-H12-SE*	EVB9S12XDP512	USBMULTILINKBDME	CWS-H12-STDED-CX**
	MC9S12XDT512/384/256					
S12XA	MC9S12XA512/256					

* Codewarrior Development Studio for HCS12(X) Special Edition is free-of-charge and is supplied with all Freescale HCS12X development tools. Upgrade available to support 64k memory with part number CWS-H12-C64K-CX
** Codewarrior Development Studio for HC12 Professional Edition also available, part number CWS-H12-PROED-CX
^ More advanced debugging than is possible using M68MULTILINKBDME can be achieved using 3rd Party emulators. See SG1011
^^ These kits contain an evaluation board and a M68MULTILINKBDME Debug Interface Cable compatible with all HCS12X derivatives

MPC55xx Development Tools Summary				
Family	PartNumbers	Starter Kit	Advanced Development	
			Evaluation Board Kit	Software
MPC55xx	MPC5553	-	MPC5553EVBE	CWS-MPC-5500B-CX
	MPC5554	-	MPC5554EVBE	

HC(S)08/RS08 Development Tools

Everything you need. Just add your imagination.

NEW! Low Cost USB Debug Tool

To aid fast and easy development for embedded systems engineers working on our low-end microcontrollers, Freescale has developed the low-cost, high-performance USB debug tool—the USBSPYDER08. With the USBSPYDER08 you can:

- SPY into your application software
- DEBUG 8 leg 8-bit microcontrollers before you have your application board
- KILL bugs in your application software. This complete package delivers a low cost, yet powerful way to develop your products and speed time to market.

The USBSPYDER08 works with any of our existing 8-bit, 8-pin families which includes the MC9RS08KA, MC9S08QD and MC9S08QG families.

Evaluation Boards (EVB)*

Evaluation boards allow users to program and debug advanced application code with expanded I/O functions and peripherals.

USBMULTILINK08E*

Provides in-circuit debugging and programming for HC08 products through the standard MON08 serial debug/breakpoint interface.

Demonstration Boards (DEMO)*

Demonstration boards are cost-effective and time-saving development tools that allow users to program and debug application code with basic I/O functions and peripherals.

Cyclone Pro (M68CYCLONEPROE)*

Cyclone Pro provides all the capabilities of the USBMULTILINKBDME and USMULTILINK08E plus USB/Ethernet serial interfaces.

BDM Multilink (USBMULTILINKBDME)*

A cost-effective development tool for HCS12X/HCS08/RS08 products that provides real-time, in-circuit flash programming, emulation and debugging through the BDM interface.

In-Circuit Emulators (FSICE)**

A high-performance emulator system for HC08-based products that, in addition to traditional debugging capabilities, incorporates advanced features, for in-circuit flash programming and remote debugging, and a real-time bus analyzer.

* Includes CodeWarrior Development Studio Special Edition, at no additional cost.

** Not needed for HCS08 and RS08 microcontrollers. HCS08 has integrated in-circuit emulation (ICE). RS08 has an on-chip background debugging system for single wire debugging and emulation interface.

New! CodeWarrior® Development Studio for Microcontrollers 6.0

A single, integrated tool suite designed to get you on the design fast track with RS08, HC(S)08 and ColdFire V1 members of the Freescale Controller Continuum. The award-winning CodeWarrior IDE goes well beyond basic code generation and debugging—it provides built-in features and utilities, so you can deliver better quality products to market faster.

More than 100 example projects are available to assist in your design efforts. Or by using the New Project Wizard you can create a working project in as few as seven mouse clicks. And when market requirements change mid-project, the MCU Change Wizard allows you to re-target the project to a new microcontroller in as few as four mouse clicks. Choose the microcontroller and the default connection. The IDE automatically reconfigures your project with the correct build tools (compiler, assembler, linker) and the appropriate support files (header, libraries, linker). For projects switching between 8- and 32-bit Flexis series microcontrollers this is the extent of the porting effort.

Designers who use Processor Expert—a rapid application design tool integrated into the CodeWarrior tool suite—will also find migration between other Freescale microcontrollers a very easy process. To set up a project using Processor Expert you define the functionality you need for your application and Processor Expert generates tested, optimized C-code tuned for your application and the particular microcontroller you have chosen. When you change the microcontroller with the MCU Change Wizard, Processor Expert maps the software and peripheral components that describe your application's functionality to the resources available on the new microcontroller. All you have to do is resolve any resource issues flagged by Processor Expert, and you're finished.

32-bit ColdFire Third-Party Developer Resources

Everything you need. Just add your imagination.

Development Tools for ColdFire Families	
Evaluation Boards and Development Kits	
Freescale Semiconductor	www.freescale.com
Axiom	www.axman.com
FSI Systems	www.fsisys.com
Logic Product Development	www.logicpd.com
NetBurner	www.netburner.com
Intec Automation	www.steroidmicros.com
Real-Time Operating Systems (RTOSes)	
Accelerated Technology/Mentor Graphics	www.acceleratedtechnology.com
eCosCentric	www.ecoscentric.com
CMX Systems	www.cmx.com
ExpressLogic	www.rtos.com
Green Hills Software, Inc.	www.ghs.com
InterNiche Technologies	www.iniche.com
Linux	www.linux.com
MicroDigital	www.smx-rtos.com
MQX Embedded	www.mqxembedded.com
NetBurner	www.netburner.com
Quadros Systems, Inc.	www.quadros.com
Wind River Systems Inc.	www.windriver.com
µClinux	www.uclinux.org
Compilers, Simulators, Debuggers	
Accelerated Technology/Mentor Graphics	www.acceleratedtechnology.com
CodeWarrior™ tools	www.codewarrior.com
GNU	www.gnu.org
Green Hills Software, Inc.	www.ghs.com
P&E Microcomputer Systems	www.pemicro.com
NetBurner	www.netburner.com
Wind River Systems Inc.	www.windriver.com
Stacks, Drivers, Translators	
Accelerated Technology/Mentor Graphics	www.acceleratedtechnology.com
CMX Systems	www.cmx.com
ExpressLogic	www.rtos.com
Freescale	www.freescale.com
Green Hills Software, Inc.	www.ghs.com
InterNiche Technologies	www.iniche.com
Ixxat	www.ixxat.com
Micro APL	www.microapl.com
Mocana Corporation	www.mocana.com
MQX Embedded	www.mqxembedded.com
NetBurner	www.netburner.com
98145.452	www.opentcp.org
Quadros Systems, Inc.	www.quadros.com
98145.452	www.treck.com
Wind River Systems Inc.	www.windriver.com
Specialized Tools	
ASH WARE Inc. (eTPU)	www.ashware.com
Byte Craft Limited (eTPU)	www.bytecraft.com
Freescale (eTPU)	www.freescale.com
Nano-X (LCD)	www.microwindows.org
Swell Software (LCD)	www.swellsoftware.com

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