

# 8/16/32 Bit Microcontrollers

Quarter 1, 2007  
SG1006Q12007 Rev 0



[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

# FREESCALE'S 8-BIT PRODUCTS SUMMARY

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-9.

## General Purpose Products

Product	Flash Program Memory (bytes)	RAM (bytes)	16-bit Timers	I/O	Communication	ADC	Operating Voltage (V)	Bus Frequency (max.)	Temperature Options	Packaging	Development Tools	Additional Information <sup>Note</sup>
<b>HCS08 &amp; RS08 Families</b>												
MC9S08AW16	16K	1K	2-CH + 6-CH, IC/OC or PWM	Up to 50	SPI, 2 SCI, I <sup>2</sup> C	16-CH, 10-bit	3.0, 5.0	20.0	M	44-pin LQFP (FG) 48-pin QFN (FD) 64-pin QFP (FU) 64-pin LQFP (PU)	DEMO9S08AW60E	Low voltage inhibit; Low voltage warning; Highly accurate internal oscillator
MC9S08AW32	32K											
MC9S08AW60	60K											
MC9S08GB32A	32K	2K	3-CH + 5-CH, IC/OC or PWM	56	2 SCI, 1 SPI, I <sup>2</sup> C	8-CH, 10-bit	1.8 to 3.6	20.0	C	64-pin LQFP (FU)	M68DEMO908GB60 M68EVB908GB60	www.freescale.com
MC9S08GT32A			Dual 2-CH, IC/OC or PWM	Up to 39						44-pin QFP (FB) 48-pin QFN (FD)		
MC9S08GB60A	60K	4K	3-CH + 5-CH, IC/OC or PWM	56						64-pin LQFP (FU)		
MC9S08GT60A			Dual 2-CH, IC/OC or PWM	Up to 39						44-pin QFP (FB) 48-pin QFN (FD)		
MC9S08GT16	16K	1K	Dual 2-CH, IC/OC or PWM	Up to 36						42-pin DIP (B) 44-pin QFP (FB) 48-pin QFN (FD)		
MC9S08GT8A	8K	1K	3-CH + 2-CH	Up to 39	2 SCI, 1 SPI, I <sup>2</sup> C	8-CH, 10-bit		20.0		42-pin SDIP 44-pin QFP 48-pin QFN 32-pin QFN		
MC9S08GT16A	16K	2K	3-CH + 2-CH	Up to 39	2 SCI, 1 SPI, I <sup>2</sup> C	8-CH, 10-bit		20.0		42-pin SDIP 44-pin QFP 48-pin QFN 32-pin QFN		
MC9S08LC36	36	2.5K	Dual 2-CH, TPM	24 GPIO on 80 LQFP 18 GPIO on 64 LQFP	2xSPI, SCI, I <sup>2</sup> C	2-CH, 12-bit	1.8 to 3.6	20 MHz	C	80-pin LQFP (LK) 64-pin LQFP (LH)	DEMO9S08LC60	Integrated Liquid Crystal Display (LCD) driver microcontroller
MC9S08LC60	60	4K	Dual 2-CH, TPM	24 GPIO on 80 LQFP 18 GPIO on 64 LQFP	2xSPI, SCI, I <sup>2</sup> C	8-CH, 12-bit	1.8 to 3.6	20 MHz	C	80-pin LQFP (LK) 64-pin LQFP (LH)	DEMO9S08LC60	
MC9S08QD2	2K	256	Dual 2-CH + 1-CH			4-CH, 10-bit	2.7 to 5.5	8.0	C, V	8-pin DIP 8-pin SOIC		
MC9S08QD4	4K	256	Dual 2-CH + 1-CH			4-CH, 10-bit	2.7 to 5.5	8.0	C, V	8-pin DIP 8-pin SOIC		
MC9S08QG4	4K	256	2-CH, IC/OC or PWM + MTIM	Up to 12	SPI, SCI, I <sup>2</sup> C	8-CH, 10-bit	1.8 to 3.6	10.0	C	16-pin DIP (PB) 16-pin QFN (FF) 16-pin TSSOP (DT) 8-pin DFN (FO) 8-pin DIP (PA) 8-pin SOIC (DN)	DEMO9S08QG8	Temp. sensor, on-chip debug interface, internal clock source (ICS) containing a frequency-locked-loop (FLL), Analog Comparator (ACMP)
MC9S08QG8	8K	512										
MC9RS08KA1	1K	63	MTIM		ACMP					6-pin DFN 8-pin DIP 8-pin SOIC		Internal clock source (ICS); Ultra-low end, new RS08 core for small MCUs
MC9RS08KA2	2K											
<b>HC08 Family</b>												
MC908AB32	32K	1K	4+4-CH		SCI, SPI	8-CH, 8-bit				64-pin LQFP, 64-pin QFP		24 analog inputs and increased RAM
MC68HC908AP16	16K	1K	Dual 2-CH, IC/OC or PWM	Up to 32	2 SCI, 1SPI, I <sup>2</sup> C	8-CH, 10-bit	3.0, 5.0	8.0	C, V, M	48-pin LQFP (FA), 44-pin QFP (FB), 42-pin SDIP (B)	DEMO908AP64 FSICEKITAP64	32 kHz PLL, RC oscillator, timebase module, low-voltage inhibit, up to 8 keyboard interrupts, 6 open-drain pins with 25 mA sink
MC68HC908AP32	32K	2K										
MC68HC908AP64	64K											
MC908GP32	32K	512B	2+2-CH		SCI, SPI	8-CH, 8-bit				64-pin LQFP, 64-pin QFP		Embedded EERPOM (512B) and add'l timer channels

Note: All RS08, S08, and HC08 products include COP, LVI, POR and KBI.

A change bar appears in the left margin to mark the location of new or revised information.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

## FREESCALE'S 8-BIT PRODUCTS SUMMARY (continued)

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-9.

### General Purpose Products (continued)

Product	Flash Program Memory (bytes)	RAM (bytes)	16-bit Timers	I/O	Communication	ADC	Operating Voltage (V)	Bus Frequency (max.)	Temperature Options	Packaging	Development Tools	Additional Information <sup>Note</sup>						
MC68HC908GR4	4K	384	2-CH + 1-CH, IC/OC, or PWM	21	SCI, SPI	6-CH, 8-bit	3.0, 5.0	8.0	C	32-pin LQFP (FA) 28-pin SOIC (DW) 28-pin DIP (P)	FSICEKITGR8	32 kHz timebase module; two extra ADC channels on LQFP32						
MC68HC908GR8	7.5K																	
MC68HC908GR16	16K	1K	Dual 2-CH, IC/OC or PWM	Up to 37	ESCI, SPI	6-CH, 10-bit			C, V, M	32-pin LQFP (FJ) 48-pin LQFP (FA)	DEMO908GZ60 FSICEKITGRGZ	www.freescale.com						
MC68HC908GR16A						8-CH, 10-bit												
MC68HC908GR32A	32K	1.5K	2-CH, 6-bit IC/OC or PWM	Up to 50	ESCI, SPI	24-CH, 10-bit			3.0, 5.0	8.0	C, V, M	32-pin LQFP (FJ) 48-pin LQFP (FA) 64-pin QFP (FU)	DEMO908GZ60 FSICEKITGRGZ	1-8 MHz high-frequency oscillator				
MC68HC908GR48A	48K																	
MC68HC908GR60A	60K																	
MC68HC908GT8	8K	512B	Dual 2-CH, IC/OC or PWM	36	SCI, SPI	8-CH, 8-bit			3.0, 5.0	8.0	C	44-pin QFP (FB), 42-pin DIP (B)	FSICEKITGPGT	Internal clock generator; low-voltage inhibit				
MC68HC908GT16	16K											44-pin QFP (FB), 42-pin DIP (B), 40-pin DIP (P)	M68EVB908GP32 FSICEKITGPGT	www.freescale.com				
MC68HC908JK1E	1.5K	128	2-CH, IC/OC or PWM	15	—	12-CH, 8-bit			3.0, 5.0	8.0	C, M	20-pin DIP (P) 20-pin SOIC (DW)	FSICEKITJLJK	RC oscillator option available; LVR with selectable trip point; 6-pin LED drive				
MC68HC908JK3E	4K																	
MC68HC908JK8	8K	256	Dual 2-CH, IC/OC or PWM	Up to 23	SCI	13-CH, 8-bit	3.0, 5.0	8.0	C	28-pin DIP (P) 28-pin SOIC (DW) 28-pin LQFP (FA)	FSICEKITJLJK	RC oscillator option available; LVR with selectable trip point; 6-pin LED drive						
MC68HC908JL3E	4K	128	2-CH, IC/OC or PWM			12-CH, 8-bit							C, M					
MC908QB4	4K	256	4-CH, IC/OC or PWM	Up to 13	ESCI, SPI	10-CH, 10-bit	3.0, 5.0	8.0	M	16-pin TSSOP (DT) 16-pin SOIC (DW) 16-pin PDIP (P)	DEMO908QB8 FSICEKITQBLTY	Auto wakeup module, KBI						
MC908QB8	8K																	
MC908QT1A	1.5K	128	2-CH Input Capture (IC) / Output Compare (OC) or PWM	6	—	—			3.0, 5.0	8.0	C, V, M	8-pin SOIC (DW) 8-pin PDIP (P) 8-pin DFN (FQ)	DEMO908QB8 M68DEMO908QT4 FSICEKITQBLTY	www.freescale.com				
MC908QT2A	2K					6-CH, 10-bit												
MC908QT4A	4K					—												
MC908QY1A	1.5K			13		—			13	6-CH, 10-bit		3.0, 5.0	8.0		C, V, M	16-pin SOIC (DW) 16-pin PDIP (P) 16-pin TSSOP (DT)	DEMO908QB8 FSICEKITQBLTY	www.freescale.com
MC908QY2A	2K																	
MC908QY4A	4K																	

Note: All RS08, S08, and HC08 products include COP, LVI, POR and KBI.

## FREESCALE'S 8-BIT PRODUCTS SUMMARY (continued)

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-9.

Application-Specific Products												
Product	Flash Program Memory (bytes)	RAM (bytes)	16-bit Timers	I/O	Communication	ADC	Operating Voltage (V)	Bus Frequency (max.)	Temperature Options	Packaging	Development Tools	Additional Information <sup>Note</sup>
<b>HCS08 Family</b>												
MC9S08RC8	8K	1K	2-CH, IC/OC or PWM	Up to 39	—	—	1.8 to 3.6	8.0	C	32-pin LQFP (FJ) 44-pin LQFP (FG)	DEMO9S08RG60	Analog Comparator, Low voltage warning
MC9S08RC16	16k											
MC9S08RC32	32K											
MC9S08RC60	60K											
MC9S08RD8	8K											
MC9S08RD16	16K	1K			SCI							
MC9S08RD32	32K											
MC9S08RD60	60K											
MC9S08RE8	8K											
MC9S08RE16	16K											
MC9S08RE32	32K	2K	SCI, SPI									
MC9S08RE60	60K											
MC9S08RG32	32K											
MC9S08RG60	60K											
<b>HC08 Family</b>												
MC908AZ32A	32K	512	6-CH, IC/OC or PWM	50	SCI, SPI	15-CH, 8-bit	5.0	8.4	C, V, M	64-pin QFP (FU)	FSICEKITASAZ	www.freescale.com
MC908AS32A				40						64-pin QFP (FU), 52-pin PLCC (FN)		
MC908AZ60A				52						64-pin QFP (FU)		
MC908AS60A				Up to 52								
MC68HC908EY8	8K	384	Dual 2-CH, IC/OC or PWM	24	ESCI, SPI	8-CH, 10-bit	3.0, 5.0	8.0	C, V, M	32-pin LQFP (FA)	FSICEKITEY	ESCI is LIN ready
MC68HC908EY16	16K	512	2-CH, IC/OC or PWM	6	ESCI, SPI	8-CH, 10-bit	—	—	—	32-pin QFP	—	Low voltage inhibit
MC68HC908EY8A	7680	256										
MC68HC908EY16A	16K	512										
MC68HC908GZ8	7.5K	512	Dual 2-CH, IC/OC or PWM	Up to 37	ESCI, SPI, CAN	8-CH, 10-bit	3.0, 5.0	8.0	C, V, M	32-pin LQFP (FJ) 48-pin LQFP (FA)	DEMO908GZ60 FSICEKITGRGZ	www.freescale.com 1-8 MHz high-frequency oscillator
MC68HC908GZ16	16K	1K										
MC68HC908GZ32	32K	1.5K	2-CH, 6-bit IC/OC or PWM									
MC68HC908GZ48	48K											
MC68HC908GZ60	60K											
MC68HC908JB8	8K	256	2-CH, IC/OC or PWM	Up to 37	USB 1.1	—	4.0-5.5	3.0	—	20-pin DIP (P) 28-pin SOIC (DW) 44-pin QFP (FB) 20-pin SOIC (JDW)	FSICEKITJB8	Low-speed USB 1.1 compliant; on-chip 3.3V regulator
MC68HC908JB12	12K	384	Dual 2-CH, IC/OC or PWM	Up to 21	SCI, USB 1.0/1.1							
MC68HC908JB16	16K									20-pin SOIC (JDW) 28-pin SOIC (DW) 32-pin LQFP (FA) 28-pin SOIC (DW) 20-pin SOIC (JDW)	FSICEKITJBJG	Supports USB and PS/2; low-voltage reset, dual 27 MHz PLL; 6 LED drive I/Os
MCHC908JW32	32K	1K	2-CH	—	SPI	—	—	—	—	48-pin QFP 48-pin LQFP 48-pin QFN	—	USB

A change bar appears in the left margin to mark the location of new or revised information.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

## FREESCALE'S 8-BIT PRODUCTS SUMMARY (continued)

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-9.

Application-Specific Products (continued)												
Product	Flash Program Memory (bytes)	RAM (bytes)	16-bit Timers	I/O	Communication	ADC	Operating Voltage (V)	Bus Frequency (max.)	Temperature Options	Packaging	Development Tools	Additional Information <sup>Note</sup>
MC68HC908LB8	8K	128	2-CH, IC/OC or PWM	Up to 18	—	7-CH, 8-bit	5.0	8.0	C, V, M	20-pin DIP (P) 20-pin SOIC (DW)	DEMO908LB8 FSICEKITLB8	High resolution PWM
MC68HC908LJ12	12K	512	Dual 2-CH, IC/OC or PWM	Up to 32	SCI, SPI	6-CH, 10-bit	3.3, 5.0	8.0	C	52-pin LQFP (FB) 64-pin QFP (FU) 64-pin LQFP (PB)	FSICEKITLJK	LCD driver with 4/3 backplanes and maximum 26 front planes; real-time clock
MC68HC908LJ24	24K	768		Up to 48	SCI, SPI, I <sup>2</sup> C					64-pin QFP (FU) 64-pin LQFP (PB) 80-pin LQFP (PK)		LCD driver with 4/3 backplanes and maximum 33 front planes; real-time clock; 32 kHz PLL
MC68HC908LK24				IrSCI, SPI, I <sup>2</sup> C	64-pin QFP (FU) 80-pin QFP (FQ)							
MC908LV8	8K	512	2-CH			6-CH, 10-bit				52-pin QFP 52-pin LQFP		LCD
MC68HC908MR8	8K	256	Dual 2-CH, IC/OC or PWM	14	SCI	7-CH, 10-bit	5.0	8.0	C, V, M	28-pin PDIP (P) 28-pin SOIC (DW) 32-pin LQFP (FA)	FSICEKITMR8	6-CH, 12-bit PWM
MC68HC908MR16	16K	768	2-CH + 4-CH, IC/OC or PWM	44	SCI, SPI	10-CH, 10-bit			C, V	56-pin SDIP (B) 64-pin QFP (FU)	FSICEKITMR32	See Timer + 6-CH, 12-bit
MC68HC908MR32	32K											
MC908QL2	2K	128	2-CH, IC/OC or PWM	13	SLIC (LIN)	6-CH, 10-bit	3.0 to 5.0	8.0	C, V, M	16-pin TSSOP (DT) 16-pin SOIC (DW)	M68EVB908QL4 FSICEKITOBLTY	SLIC (Slave-LIN Interface Controller) featuring autobauding/ auto synchronization
MC908QL3	4K					—						
MC908QL4						6-CH, 10-bit						
MM908E621	16K	512B	2+2-CH		SPI, IIO	8-CH, 10-bit				54-pinSOIC		Integrated Quad Half-Bridge and Triple High-Side, LIN
MM908E624										54-pinSOIC		Motor Control, Integrated VReg and LIN PHY, KBI
MM908E626										54-pinSOIC		Lighting, Integrated VReg and LIN PHY, KBI

### 68HC08 Reference Manuals

CPU08RM, HC08 CPU Reference Manual

TIM08RM, HC08 Timer Reference Manual

A change bar appears in the left margin to mark the location of new or revised information.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

## FREESCALE'S 8-BIT PRODUCTS SUMMARY

### 8-Bit Development Tools



#### **Demonstration Boards (DEMO) (MSRP starting at \$49):**

Demonstration boards are cost-effective development tools that allow users to program and debug application code with basic I/O functions and peripherals. Designers save on design time and costs with these demo boards targeted at specific HC(S)08/RS08 MCUs. CodeWarrior™ Development Studio for HC(S)08/RS08, Special Edition is included along with the board.



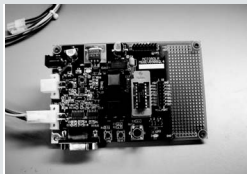
#### **MON08 Multilink (USBMULTILINK08E) (MSRP \$99):**

The MON08 Multilink is a cost-effective development tool for all HC08 MCUs, and provides in-circuit debugging and programming through the standard MON08 serial debug/breakpoint interface. CodeWarrior Development Studio for HC(S)08/RS08, Special Edition is included along with the MON08 Multilink.



#### **BDM Multilink (USBMULTILINKBDME) (MSRP \$99):**

The BDM Multilink is a cost-effective development tool for RS08, HCS08 and HCS12 MCUs, and provides real-time, in-circuit Flash programming, emulation and debugging through the BDM interface. CodeWarrior Development Studio for RS08, HC(S)08 and HC(S)12, Special Edition is included along with the BDM Multilink.



#### **Evaluation Boards (EVB) (MSRP starting at \$168.20):**

Evaluation boards allow users to program and debug advance application code with expanded I/O functions and peripherals. HC(S)08 EVBs may include advance features including zero insertion force (ZIF) sockets, LCDs and large prototype areas. CodeWarrior Development Studio for RS08, HC(S)08, and HC(S)12, Special Edition is included along with the board.



#### **Freescale Semiconductor's In-Circuit Emulator (FSICE) Kits (MSRP starting at \$1495):**

The Freescale Semiconductor in-circuit emulator (FSICE) is a high-performance emulator system for HC08 MCUs. In addition to incorporating the debug features of traditional emulators, the FSICE system adds advanced features such as USBMULTILINK08E cable for in-circuit Flash programming, Ethernet interface for remote debugging and a real-time bus analyzer. The kit consists of the FSICE base station, the corresponding MCU emulator module (EM), all the cables and adapters needed, and CodeWarrior Development Studio for HC(S)08/RS08, Special Edition.

## FREESCALE'S 8-BIT PRODUCTS SUMMARY (continued)

### 8-Bit Development Tools (continued)



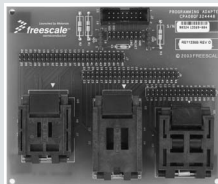
#### **Cyclone Pro (CYCLONEPROE) (MSRP \$499):**

Cyclone Pro provides all the capabilities of the USBMULTILINKBDM and USBMULTILINK08E plus USB/Ethernet serial interfaces. In addition, the Cyclone Pro has the ability to function as a stand-alone programmer with push buttons and LEDs to control operations. Cyclone Pro is the universal debugging and real-time emulation tool for all RS08, HC(S)08, and HC(S)12 MCUs. CodeWarrior Development Studio for HC(S)08/RS08 and HC(S)12, Special Edition is included along with Cyclone Pro.



#### **CodeWarrior™ Development Studio for HC(S)08/RS08 Special Edition (Free-of-Charge):**

CodeWarrior Development Studio is a comprehensive special edition toolset for fast and easy MCU development. This tool suite provides the capabilities required by every engineer in the development cycle to exploit the capabilities of the RS08 and HC(S)08 architecture. Some of the features include: project manager for up to 32 files, full-chip simulation, Flash programming and Processor Expert™ technology, which provides automatic C-code generation for most HC(S)08 on-chip peripherals.



#### **HC(S)08 Programming Adapters (MSRP Starting at \$99 and up):**

The HC(S)08 Programming adapter boards allow a P&E CyclonePro, USBMULTILINK08, USBMULTILINKBDM, or other compatible MON08/BDM programmers to program loose HC(S)08 MCUs. The programming adapter boards feature ZIF sockets, standard MON08/BDM header, and MCU breakout headers.

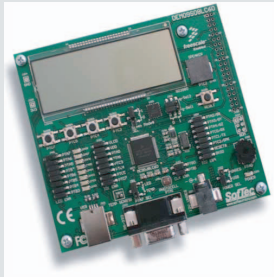
##### **PAS08 Part Numbers**

- PAS08QF324448 supports 32-pin 0.8mm QFP packages, 44-pin 0.8mm QFP packages and 48-pin 0.5mm QFP packages.
- PAS08QF80 supports 80-pin 0.5mm QFP and 80-pin 0.65mm QFP packages.
- PAS08QF5264 supports 52-pin 0.65mm QFP packages, 64-pin 0.5mm QFP packages and 64-pin 0.8mm QFP packages.
- PAS08W1628T28 supports 7.5mm SOIC packages up to 28 pins, 5.3mm SOIC packages up to 16 pins, and TSSOP packages up to 28 pins.
- PAS08P40B3256 supports DIP packages up to 40 pins and SDIP packages up to 56 pins.
- PAS08FN82448 supports 8-pin DFN packages, 24-pin QFN packages and 48-pin QFN packages.

The order numbers for these products are PAS08QF324448, PAS08QF80, PAS08QF5264, PAS08W1628T28, PAS08P40B3256, and PAS08FN82448.

## FREESCALE'S 8-BIT PRODUCTS SUMMARY (continued)

### 8-Bit Development Tools (continued)



#### ***DEMO9S08LC60 (MSRP \$75):***

The 9S08LC60 demonstration kit contains everything a designer needs to develop and evaluate application code. An integrated BDM requires only a USB cable to connect the board to begin development. Included custom LCD glass demonstrates the capabilities of all LCD segments in an end application format.



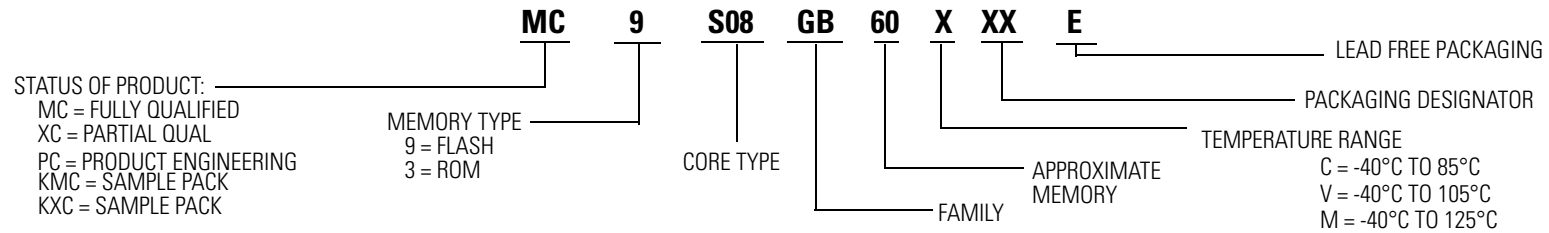
#### ***inDART-One In-Circuit Programmer/Debugger (MRSP \$399):***

The inDART-One In-Circuit Programmer/Debugger is a powerful programming and debugging tool for Freescale HC08-, S08-, RS08-, S12- and S12X-based systems

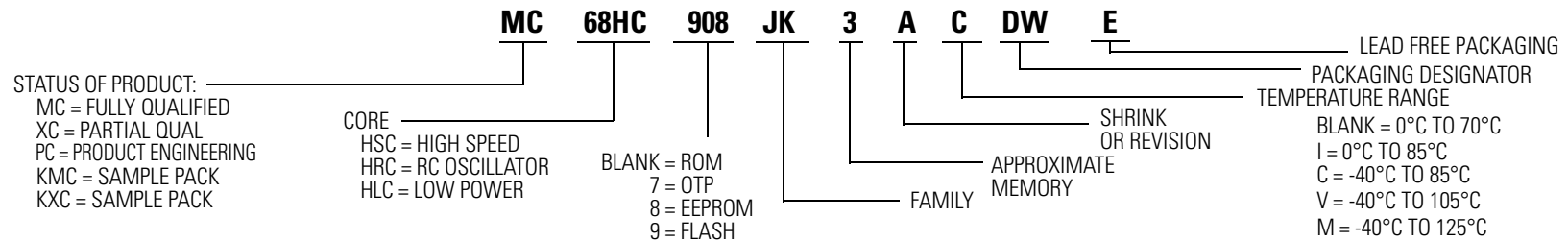


## FREESCALE'S 8-BIT PRODUCTS SUMMARY (continued)

### Product Numbering System for HCS08 & RS08



### Product Numbering System for 68HC08



# 68HC12 FAMILY

## 68HC12 Product Table Note

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-11.

Product	ROM (KB)	RAM (KB)	EEPROM (Bytes)	Flash (KB)	Timer	I/O	Serial	A/D	PWM	Operating Voltage (V)	Max Bus Frequency (MHz)	Temp Options	Packaging	Status	Additional Information	Documentation
<b>HC12A Family</b>																
MC68HC812A4	n/a	1	4K	n/a	8-CH, 16-bit IC or OC RTI, pulse accumulator	Up to 91	Dual SCI, SPI	8-CH, 8-bit	n/a	3.3, 5.0	8.0 5.0	C	112-pin LQFP (PV)	Available	Non-muxed bus, 7 programmable chip selects, KBI (24 pins), PLL, BDM, 5M-byte external memory, 3.0–3.6 V, 5 MHz version (XC68C812A4)	MC68HC812A4
<b>HC12B Family</b>																
MC68HC912B32	n/a	1	768	32	8-CH, 16-bit IC or OC RTI, pulse accumulator	Up to 63	SCI, SPI J1850	8-CH, 10-bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	80-pin QFP (FU)	Available	J1850, muxed bus, BDM	MC68HC912B
MC68HC12BC32	32			n/a	8-CH, 16-bit		SCI, SPI		4-CH, 8-bit						Part equipped with CAN 2.0A/B	MC68HC912B32TS
XC912BC32	n/a			32	8-CH, 16-bit IC or OC RTI, pulse accumulator		SCI, SPI CAN		4-CH, 8-bit or 2-CH, 16-bit	4.5 to 5.5					MSCAN CAN 2.0B, BDM	MC68HC912B
MC68HC12BE32	32			n/a	8-CH, 16-bit IC or OC RTI, pulse accumulator		SCI, SPI J1850		4-CH, 8-bit or 2-CH, 16-bit	5.0		C			BDM, enhanced timer Evaluation product with on-chip monitor: XC12BE32DCFU8	
<b>HC12DG Family</b>																
XC68HC12D60	60	2	1K	n/a	8-CH, 16-bit	Up to 66 I/O and 18 i	Dual SCI SPI	Dual 8-CH, 10-bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	80-pin QFP (FU) 112-pin LQFP (PV)	Available	Part equipped with CAN 2.0A/B	MC68HC912D60
MC912D60A	n/a			60	8-CH, 16-bit IC or OC RTI, pulse accumulator		Dual SCI SPI, CAN	8-CH, 10-bit							Replaces the XC68HC912D60 with 5 V Flash voltage and a different programming algorithm	
MC912DG128	MC912DG128A is a pin-compatible replacement.															
MC912DG128A	n/a	8	2K	128	8-CH, 16-bit IC or OC RTI, pulse accumulator	Up to 67 I/O and 18 i	Dual SCI SPI, CAN	8-CH or 16-CH, 10-bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	112-pin LQFP (PV)	Available	Replaces the XC912DG128 with 5 V Flash voltage and a different programming algorithm	MC68HC912DG128
<b>HC12DT Family</b>																
MC68HC912DT128A	n/a	8	2K	128	8-CH, 16-bit	Up to 66 I/O and 18 i	Dual SCI, SPI	Dual 8-CH, 10-bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	112-pin LQFP (PV)	Available	Part equipped with 3xCAN 2.0A/B	MC68HC912DT128

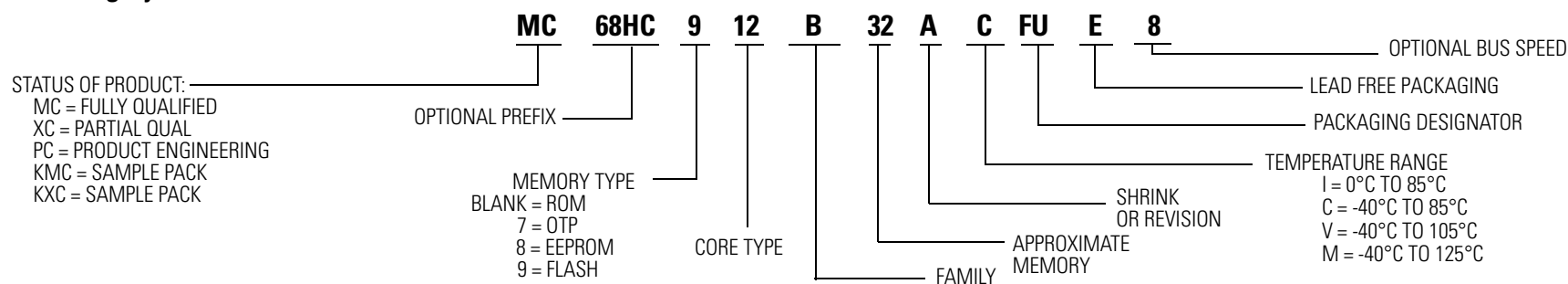
Note: All 68HC12 MCUs incorporate a COP watchdog timer.

## 68HC12 Reference Manual

CPU12RM, HC12 CPU Reference Manual

## 68HC12 FAMILY (continued)

### Product Numbering System for 68HC12



## HCS12 FAMILY

### HCS12 Product Table

HCS12 Dx and A Family devices offer pin-for-pin compatibility.

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-15.

Product	ROM (KB)	RAM (KB)	Flash or OTP (KB)	EEPROM (KB)	Timer	I/O	Serial	MUX	A/D	PWM	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation													
<b>S12A Family—General Purpose with I<sup>2</sup>C</b>																															
MC9S12A32	n/a	2	32 Flash	1	8-CH, 16-bit ECT	Up to 59	2 SCI 1 SPI	n/a	8-CH, 10-bit	7-CH, 8-bit or 3-CH, 16-bit	3.0, 5.0	25.0	C	80-pin QFP (FU)	n/a	Available	www.freescale.com	MC9S12DP256													
MC9S12A64		4	64 Flash		8-CH, 16-bit IC, OC, PA	Up to 91	Up to 2 SCI 1 SPI 1 IIC		Up to 2x8-CH, 10-bit	Up to 8-CH, 8-bit or 4-CH, 16-bit	5.0			80-pin QFP (FU) 112-pin LQFP (PV)			The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM	9S12A64DGV1													
MC9S12A128		8	128 Flash	2														Up to 2 SCI 2 SPI 1 IIC										www.freescale.com	9S12A128DGV1		
MC9S12A256		12	256 Flash	4														Up to 2 SCI 3 SPI 1 IIC													9S12A256DGV1
MC9S12A512		14	512 Flash															8-CH, 16-bit ECT		2 SCI 3 SPI 1 I <sup>2</sup> C		8-CH, 8-bit or 4-CH, 16-bit			25.0, 33.0		112-pin LQFP (PV)				
<b>S12B Family—Automotive/Industrial with Intermediate Cost CAN</b>																															
MC9S12B128	n/a	4	128 Flash	1	8-CH, 16-bit IC, OC, or PWM	Up to 91	SCI, SPI, I <sup>2</sup> C	CAN	8-CH, 16-bit	See Timer	3.0 to 5.0	25	C, V, M	112-pin LQFP (PV) 80-pin QFP (FU)	n/a	Available	www.freescale.com		9S12B128DGV1												
MC9S12B64		2	64 Flash																												

# HCS12 FAMILY (continued)

## HCS12 Product Table (continued)

HCS12 Dx and A Family devices offer pin-for-pin compatibility.

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-15.

Product	ROM (KB)	RAM (KB)	Flash or OTP (KB)	EEPROM (KB)	Timer	I/O	Serial	MUX	A/D	PWM	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation	
<b>S12C Family—Low Pin Count, Low Cost CAN</b>																			
MC9S12C128	0	4	128 Flash	0	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	3.0 to 5.0	25	C, V, M	48-pin LQFP	n/a	Available	www.freescale.com	9S12C128DGV1	
						35								52-pin LQFP					
						60								80-pin QFP					
MC9S12C96	0	4	96 Flash	0	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	3.0 to 5.0	25	C, V, M	48-pin LQFP	n/a	Available	www.freescale.com	9S12C128DGV1	
						35								52-pin LQFP					
						60													
MC9S12C64	0	4	64 Flash	0	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	3.0 to 5.0	25	C, V, M	48-pin LQFP	n/a	Available	www.freescale.com	9S12C128DGV1	
						35								52-pin LQFP					
						60								80-pin QFP					
MC9S12C32	0	2	32 Flash	n/a	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	3.15 to 5.5	16, 25	C, M	48-pin LQFP	n/a	Available	www.freescale.com	9S12C32D6V1	
						35								52-pin LQFP					
						60								80-pin QFP					
MC3S12C128	128	4	0	0	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	—	—	—	48-pin LQFP	n/a	Available	www.freescale.com		
						35								52-pin LQFP					
						60								80-pin QFP					
MC3S12C96	96	4	0	0	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	—	—	—	48-pin LQFP	n/a	Available	www.freescale.com		
						35								52-pin LQFP					
						60								80-pin QFP					
MC3S12C64	64	4	0	0	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	—	—	—	48-pin LQFP	n/a	Available	www.freescale.com		
						35								52-pin LQFP					
						60								80-pin QFP					
MC3S12C32	32	2	0	n/a	8-CH, 16-bit IC, OC, or PWM	31	1 SCI 1 SPI	1 CAN	8-CH, 16-bit	6-CH	—	—	—	48-pin LQFP	n/a	Available	www.freescale.com		
						35								52-pin LQFP					
						60								80-pin QFP					

A change bar appears in the left margin to mark the location of new or revised information.

# HCS12 FAMILY (continued)

## HCS12 Product Table (continued)

HCS12 Dx and A Family devices offer pin-for-pin compatibility.

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-15.

Product	ROM (KB)	RAM (KB)	Flash or OTP (KB)	EEPROM (KB)	Timer	I/O	Serial	MUX	A/D	PWM	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation	
<b>S12D Family—Automotive/Industrial with CAN</b>																			
MC9S12D32	n/a	2	32 Flash	1	8-CH, 16-bit ECT	Up to 59	2 SCI 1 SPI	CAN	8-CH, 10-bit	7-CH, 8-bit or 3-CH, 16-bit	5.0	25.0	C, V, M	80-pin QFP (FU)	n/a	Available	www.freescale.com	MC9S12DP256	
MC9S12D64		4	64 Flash		8-CH, 16-bit IC, OC, PA	Up to 91	Up to 2 SCI 1 SPI 1 IIC	1 CAN 2.0A/2.0B	Up to 2x8-CH, 10-bit	Up to 8-CH, 8-bit or 4-CH, 16-bit	5.0			80-pin QFP (FU) 112-pin LQFP (PV)			The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM	9S12D64DGV1	
MC9S12DB128		8	128 Flash	2			Up to 2 SCI 2 SPI	1 CAN Byteflight									www.freescale.com	9S12DT128BDGV1	
MC9S12DG128							Up to 2 SCI 2 SPI 1 IIC	2 CAN										The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM	
MC9S12DG256		12	256 Flash	4			2 SCI 3 SPI 1 IIC							112-pin LQFP (PV)			www.freescale.com	9S12DP256BDGV2	
MC9S12DJ64		4	64K Flash	1			Up to 2 SCI 1 SPI 1 IIC	1 CAN 2.0A/2.0B and 1 x J1850										The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM	9S12DJ64DGV1
MC9S12DJ128		8	128 Flash	2	8-CH, 16-bit IC, OC, PA	Up to 91	Up to 2 SCI 2 SPI 1 IIC	2 CAN and 1 x J1850	Up to 2x8-CH, 10-bit	Up to 8-CH, 8-bit or 4-CH, 16-bit	5.0			80-pin QFP (FU) 112-pin LQFP (PV)			The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM	9S12DT128BDGV1	
MC9S12DJ256		12	256 Flash	4			Up to 2 SCI 3 SPI 1 IIC	5 CAN											9S12DP256BDGV2
MC9S12DP256																	www.freescale.com		
MC9S12DP512		14	512 Flash	4	8-CH, 16-bit ECT		2 SCI 3 SPI 1 <sup>2</sup> C					25.0, 33.0							MC9S12DP512
MC9S12DT128		8	128 Flash	2	8-CH, 16-bit IC, OC, PA		2 SCI 2 SPI 1 IIC	3 CAN				25.0							9S12DT128BDGV1
MC9S12DT256		12	256 Flash	4			2 SCI 3 SPI 1 IIC												9S12DP256BDGV2
<b>S12E Family—General Purpose, 3 Volts with D/A</b>																			
MC9S12E64	n/a	4	64 Flash	n/a	Three 4-CH, 16-bit IC, OC or PWM	Up to 90	3 SCI SPI 1 <sup>2</sup> C	n/a	16-CH, 10-bit	See Timer	3.3 to 5.0	16.0, 25.0	C, M	112-pin LQFP (PV) 80-pin QFP (FU)	n/a	Available	Two D/A Converters	9S12E128DGV1	
MC9S12E128		8	128 Flash																
<b>S12GC Family—Low Cost, Low Pin Count</b>																			
MC9S12GC128	n/a	4	128 Flash	0	8-CH, 16-bit IC, OC, PWM	Up to 60	SCI SPI	n/a	8-CH, 10-bit	See Timer	3.0 to 5.0	25.0	C, V, M	52-pin LQFP (PB) 48-pin LQFP (FA)	n/a	Available	www.freescale.com	9S12C128DGV1	
MC9S12GC96			96 Flash																
MC9S12GC64			64 Flash																
MC9S12GC32		2	32 Flash								16.0								
MC9S12GC16			16 Flash																

# HCS12 FAMILY (continued)

## HCS12 Product Table (continued)

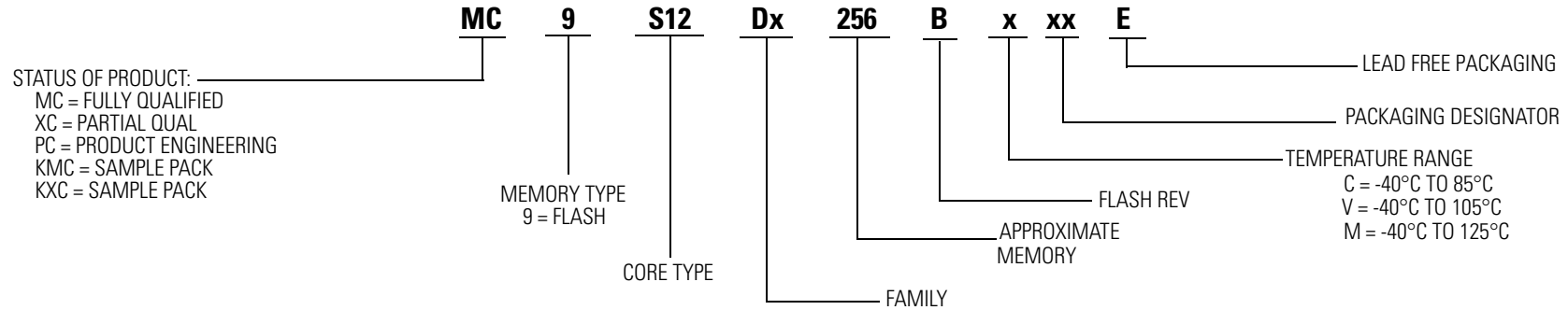
HCS12 Dx and A Family devices offer pin-for-pin compatibility.

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-15.

Product	ROM (KB)	RAM (KB)	Flash or OTP (KB)	EEPROM (KB)	Timer	I/O	Serial	MUX	A/D	PWM	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation	
<b>S12H Family—LCD/H-Bridge Drivers with CAN</b>																			
MC9S12H128B	n/a	12	128 Flash	4	8-CH, 16-bit IC, OC, PA	99 plus 18 inputs	SCI SPI IIC	2 CAN 2.0A/2.0B	16-CH, 10-bit	6-CH, 8-bit or 3-CH, 16-bit	5.0	16.0	V	112-pin LQFP (PV)	n/a	Available	LCD driver module: up to 32 frontpanes and 4 backpanes.	9S12H256BDGV1	
MC9S12H256B			256 Flash										C, V, M	112-pin LQFP (PV) 144-pin LQFP (FV)					
<b>S12NE Family—Single Chip with 10/100 Base-T with Integrated MAC and PHY</b>																			
MC9S12NE64	n/a	8	64 Flash	n/a	4-CH, 16-bit IC, OC or PWM	Up to 70	2 SCI SPI I <sup>2</sup> C	n/a	8-CH, 10-bit	See Timer	3.0	16.0, 25.0	C (PV) V (TU)	112-pin LQFP (PV) 80-pin TOFP-EP (TU)	n/a	Available	Integrated Media Access Controller (EMAC), 10/100 Ethernet PHY (EPHY)	9S12NE64BDUG	
<b>S12Q Family</b>																			
MC9S12Q128	0	4	128 Flash	—	6-CH	31 35 60	1 SCI 1 SPI	1 CAN	8-CH,	4-CH	—	—	—	48-pin LQFP 52-pin LQFP 80-pin QFP	n/a	Available	www.freescale.com		
MC9S12Q96	0	3	96 Flash	—	6-CH	31 35	1 SCI 1 SPI	1 CAN	8-CH,	4-CH	—	—	—	48-pin LQFP 52-pin LQFP	n/a	Available	www.freescale.com		
MC9S12Q64	0	2	64 Flash	—	6-CH	31 35	1 SCI 1 SPI	1 CAN	8-CH,	0	—	—	—	48-pin LQFP 52-pin LQFP	n/a	Available	www.freescale.com		
MC9S12Q32	0	1	32 Flash	—	6-CH	31 35	1 SCI 1 SPI	1 CAN	8-CH,	0	—	—	—	48-pin LQFP 52-pin LQFP	n/a	Available	www.freescale.com		
MC3S12Q128	128	4	0	—	6-CH	31 35 60	1 SCI 1 SPI	1 CAN	8-CH,	4-CH	—	—	—	48-pin LQFP 52-pin LQFP 80-pin QFP	n/a	Available	www.freescale.com		
MC3S12Q96	96	3	0	—	6-CH	31 35 60	1 SCI 1 SPI	1 CAN	8-CH,	4-CH	—	—	—	48-pin LQFP 52-pin LQFP 80-pin QFP	n/a	Available	www.freescale.com		
MC3S12Q64	64	2	0	—	6-CH	31 35	1 SCI 1 SPI	1 CAN	8-CH,	0	—	—	—	48-pin LQFP 52-pin LQFP	n/a	Available	www.freescale.com		
MC3S12Q32	32	1	0	—	6-CH	31 35	1 SCI 1 SPI	1 CAN	8-CH,	0	—	—	—	48-pin LQFP 52-pin LQFP	n/a	Available	www.freescale.com		
<b>S12T Family—CALRAM with Fast BDM</b>																			
MC9S12T64	n/a	2 + 2 CALRAM	64 Flash	n/a	8-CH, 16-bit IC, OC, PA	25	2 SCI 1 SPI	n/a	8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	5.0	16.0	C, V, M <sup>1</sup>	80-pin QFP (PK)	n/a	Available	FBDM (Fast Background Debug Mode)	9S12T64BDGV1	
<b>S12UF Family—USB 2.0</b>																			
MC9S12UF32	n/a	3.5	32 Flash	n/a	8-CH, 16-bit IC, OC, or PWM	Up to 75	SCI USB 2.0	n/a	n/a	See Timer	5.0	30.0	0°C to 70°C	100-pin LQFP (PU) 64-pin LQFP	n/a	Available	Built-in host controller modules for ATA-5 interface, CompactFlash, Secure Digital/Multimedia Card, SmartMedia, and Memory Stick	9S12UF32DGV1	

Note: M temperature range limited to single-chip mode

## Product Numbering System for HCS12



## HCS12X FAMILY

### HCS12X Product Table

HCS12 Dx and A Family devices offer pin-for-pin compatibility.  
 For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-18.

Product	ROM (KB)	RAM (KB)	Flash (KB) Serial	EEPROM (KB)	Timer	I/O	XGATE	Serial	MUX	A/D	PWM	LCD	Motor	SSD	KWU	ECT	PIT	Oper Voltage (V)	Oper Freq (MHz)	Temp Options	Packaging	Status	Documentation
<b>S12XHZ and S12HZ Families</b>																							
MC9S12XHZ512	0	32	512	4	8-CH	117 / 85	Yes	2 SCI, 1 SPI, 2 I <sup>2</sup> C	2 CAN	16-CH	8-CH / 6-CH	32 x 4	24 / 6 / 16 / 4	6 / 4	8	—	—	—	—	—	144-pin LQFP / 112-pin LQFP	Production	
MC9S12HZ256	0	12	256	2	8-CH	85	No	2 SCI, 1 SPI, 1 I <sup>2</sup> C	2 CAN	16-CH	6-CH	32 x 4	16 / 4	4	8	—	—	—	—	—	112-pin LQFP	Production	
MC9S12HZ128	0	6	128	2	8-CH	85	No	2 SCI, 1 SPI, 1 I <sup>2</sup> C	2 CAN	16-CH	6-CH	32 x 4	16 / 4	4	8	—	—	—	—	—	112-pin LQFP	Production	
MC9S12HZ64	0	4	64	1	8-CH / 4-CH	69 / 59	No	1 SCI, 1 SPI / 1 SCI	1 CAN	8-CH / 7-CH	4-CH	24 x 4 / 20 x 4	16 / 4	4	8 / 7	—	—	—	—	—	112-pin LQFP / 80-pin LQFP	Production	
MC3S12HZ256	256	12	0	0	8-CH	85	No	2 SCI, 1 SPI, 1 I <sup>2</sup> C	2 CAN	16-CH	6-CH	32 x 4	16 / 4	4	8	—	—	—	—	—	112-pin LQFP	Production	
MC3S12HZ128	128	6	0	0	8-CH	85	No	2 SCI, 1 SPI, 1 I <sup>2</sup> C	1 CAN	16-CH	6-CH	32 x 4	16 / 4	4	8	—	—	—	—	—	112-pin LQFP	Production	
MC3S12HZ64	64	4	0	0	8-CH / 4-CH	69 / 59	No	1 SCI, 1 SPI / 1 SCI	1 CAN	8-CH / 7-CH	4-CH	24 x 4 / 20 x 4	16 / 4	4	8 / 7	—	—	—	—	—	112-pin LQFP / 80-pin LQFP	Production	
MC3S12HZ32	32	2	0	0	4-CH	59	No	1 SCI	1 CAN	7-CH	4-CH	20 x 4	16 / 4	4	7	—	—	—	—	—	80-pin LQFP	Production	
<b>S12XA Family</b>																							
MC9S12XA512	n/a	32	512	4	8-CH, 16-bit IC, OC, PWM	59 / 91 / 119	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C / 4 SCI, 3 SPI, 1 I <sup>2</sup> C / 6 SCI, 3 SPI, 2 I <sup>2</sup> C	n/a	1 x 8-CH, 10-bit / 2 x 8-CH, 10-bit / 2 x 12-CH, 10-bit	7-CH, 8-bit or 3-CH, 16-bit / 8-CH, 8-bit or 4-CH, 16-bit / 8-CH, 8-bit or 4-CH, 16-bit	—	—	—	—	—	—	3.3 to 5.5	40.0	C, V	80-pin QFP / 112-pin LQFP / 144-pin LQFP	Production	9S12XDP512DVG1

A change bar appears in the left margin to mark the location of new or revised information.

# HCS12X FAMILY (continued)

## HCS12X Product Table (continued)

HCS12 Dx and A Family devices offer pin-for-pin compatibility.

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-18.

Product	ROM (KB)	RAM (KB)	Flash (KB) Serial	EEPROM (KB)	Timer	I/O	XGATE	Serial	MUX	A/D	PWM	LCD	Motor	SSD	KWU	ECT	PIT	Oper Voltage (V)	Oper Freq (MHz)	Temp Options	Packaging	Status	Documentation	
MC9S12XA256	n/a	16	267	4	8-CH, 16-bit IC, OC, PWM	59	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C	-	1 x 8-CH, 10-bit	7-CH, 8-bit or 3-CH, 16-bit	-	-	-	-	-	-	3.3 to 5.5	40.0	C, V	80-pin QFP	Production	9S12XDP512DVG1	
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit										112-pin LQFP			
						119		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2 x 12-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit										144-pin LQFP			
<b>S12XB Family</b>																								
MC9S12XB256	-	10	256	2	-	91	Yes	2 SCI, 1 SPI, 1 I <sup>2</sup> C	1 CAN	1/16-CH	-	-	-	-	-	-	-	-	-	-	112-pin LQFP	Production		
						59				1/8-CH											80-pin LQFP			
MC9S12XB128	-	6	128	1	-	91	Yes	2 SCI, 1 SPI, 1 I <sup>2</sup> C	1 CAN	1/16-CH	-	-	-	-	-	-	-	-	-	-	112-pin LQFP	Production		
						59				1/8-CH											80-pin LQFP			
<b>S12XD Family</b>																								
MC9S12XDP512	0	32	512	4	8-CH, 16-bit ECT	119	Yes	3 SCI, 3 SPI, 2 I <sup>2</sup> C	5 CAN	2/24-CH	8-CH, 8-bit or 4-CH, 16-bit	-	-	-	-	-	8	4-CH	3.3 to 5.5	40.0	C, V, M	144-pin LQFP	Production	9S12XDP512DVG1
						91		6 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH												112-pin LQFP		
MC9S12XDT512	0	20	512	4	8-CH, 16-bit ECT	119	Yes	6 SCI, 3 SPI, 1 I <sup>2</sup> C	3 CAN	2/24-CH	8-CH, 8-bit or 4-CH, 16-bit	-	-	-	-	-	8	4-CH	3.3 to 5.5	40.0	C, V, M	144-pin LQFP	Production	9S12XDP512DVG1
						91		6 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH												112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH												80-pin LQFP		
MC9S12XDT384	0	20	384	4	-	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	3 CAN	2/24-CH	-	-	-	-	-	-	8	4-CH	-	-	-	144-pin LQFP	Production	
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH												112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH												80-pin LQFP		
MC9S12XDQ256	0	16	256	4	-	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	4 CAN	2/24-CH	-	-	-	-	-	-	8	4-CH	-	-	-	144-pin LQFP	Production	
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH												112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH												80-pin LQFP		
MC9S12XDT256	0	16	256	4	8-CH, 16-bit ECT	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	3 CAN	2/24-CH	8-CH, 8-bit or 4-CH, 16-bit	-	-	-	-	-	8	4-CH	3.3 to 5.5	40.0	C, V, M	144-pin LQFP	Production	9S12XDP512DVG1
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH												112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH												80-pin LQFP		

A change bar appears in the left margin to mark the location of new or revised information.



# HCS12X FAMILY (continued)

## HCS12X Product Table (continued)

HCS12 Dx and A Family devices offer pin-for-pin compatibility.  
For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-18.

Product	ROM (KB)	RAM (KB)	Flash (KB) Serial	EEPROM (KB)	Timer	I/O	XGATE	Serial	MUX	A/D	PWM	LCD	Motor	SSD	KWU	ECT	PIT	Oper Voltage (V)	Oper Freq (MHz)	Temp Options	Packaging	Status	Documentation
MC9S12XD256	0	14	256	4	8-CH, 16-bit ECT	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	1 CAN	2/24-CH	8-CH, 8-bit or 4-CH, 16-bit	-	-	-	-	8	4-CH	3.3 to 5.5	40.0	C, V, M	144-pin LQFP	Production	9S12XDP512DVG1
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH	8-CH, 8-bit or 4-CH, 16-bit										112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH	7-CH, 8-bit or 3-CH, 16-bit										80-pin LQFP		
MC3S12XDT256	256	16	0	0	-	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	3 CAN	2/24-CH	-	-	-	-	-	8	4-CH	-	-	-	144-pin LQFP	Production	
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH											112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH											80-pin LQFP		
MC9S12XDG128	0	12	128	2	-	91	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C	2 CAN	1/16-CH	-	-	-	-	-	8	4-CH	-	-	-	112-pin LQFP	Production	
						59				1/8-CH											80-pin LQFP		
MC3S12XDT128	128	12	0	0	-	91	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C	2 CAN	1/16-CH	-	-	-	-	-	8	4-CH	-	-	-	112-pin LQFP	Production	
						59				1/8-CH											80-pin LQFP		
MC9S12XD128	0	8	128	2	-	91	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C	1 CAN	1/16-CH	-	-	-	-	-	8	4-CH	-	-	-	112-pin LQFP	Production	
						59				1/8-CH											80-pin LQFP		
MC9S12XD64	0	4	64	1	-	59	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C	1 CAN	1/8-CH	-	-	-	-	-	8	2-CH	-	-	-	80-pin LQFP	Production	
<b>S12XE Family</b>																							
MC9S12XEP100	-	64	1000	4	8-CH	152	Yes	8 SCI, 3 SPI, 2 I <sup>2</sup> C	5 CAN	2/32-CH	-	-	-	-	-	8	8-CH	-	-	-	208-ball MAPBGA	Production	
					8-CH	119		8 SCI, 3 SPI, 2 I <sup>2</sup> C		2/24-CH							8-CH				144-pin LQFP		
					0	91		4 SCI, 3 SPI, 2 I <sup>2</sup> C		2/16-CH							4-CH				112-pin LQFP		
MC9S12XEP768	-	48	768	4	8-CH	152	Yes	8 SCI, 3 SPI, 2 I <sup>2</sup> C	5 CAN	2/32-CH	-	-	-	-	-	8	8-CH	-	-	-	208-ball MAPBGA	Production	
					8-CH	119		8 SCI, 3 SPI, 2 I <sup>2</sup> C		2/24-CH							8-CH				144-pin LQFP		
					0	91		4 SCI, 3 SPI, 2 I <sup>2</sup> C		2/16-CH							4-CH				112-pin LQFP		
MC9S12XEQ512	-	32	512	4	0	119	Yes	6 SCI, 3 SPI, 2 I <sup>2</sup> C	4 CAN	2/24-CH	-	-	-	-	-	8	4-CH	-	-	-	144-pin LQFP	Production	
						91		4 SCI, 3 SPI, 2 I <sup>2</sup> C		2/16-CH											112-pin LQFP		
						59		4 SCI, 3 SPI, 2 I <sup>2</sup> C		1/8-CH											80-pin QFP		
MC9S12XEQ384	-	24	384	4	0	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	4 CAN	2/24-CH	-	-	-	-	-	8	4-CH	-	-	-	144-pin LQFP	Production	
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH											112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH											80-pin QFP		

A change bar appears in the left margin to mark the location of new or revised information.

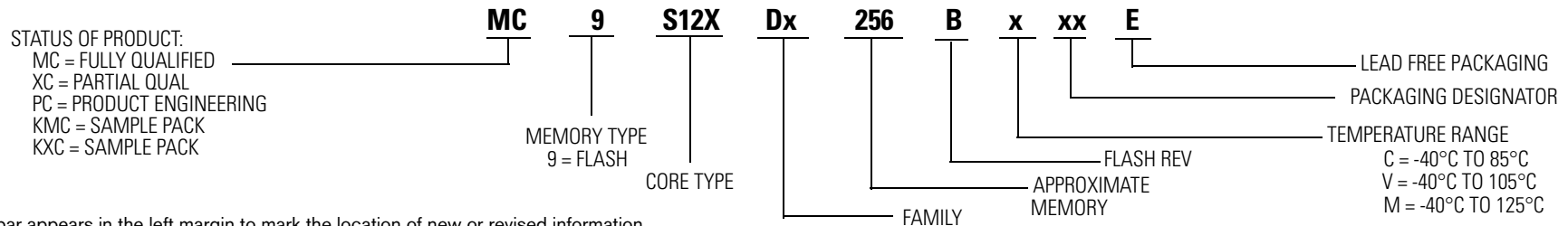
# HCS12X FAMILY (continued)

## HCS12X Product Table (continued)

HCS12 Dx and A Family devices offer pin-for-pin compatibility.  
For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-18.

Product	ROM (KB)	RAM (KB)	Flash (KB) Serial	EEPROM (KB)	Timer	I/O	XGATE	Serial	MUX	A/D	PWM	LCD	Motor	SSD	KWU	ECT	PIT	Oper Voltage (V)	Oper Freq (MHz)	Temp Options	Packaging	Status	Documentation
MC9S12XET256	—	16	256	4	0	119	Yes	4 SCI, 3 SPI, 1 I <sup>2</sup> C	3 CAN	2/24-CH	—	—	—	—	—	8	4-CH	—	—	—	144-pin LQFP	Production	
						91		4 SCI, 3 SPI, 1 I <sup>2</sup> C		2/16-CH											112-pin LQFP		
						59		2 SCI, 3 SPI, 1 I <sup>2</sup> C		1/8-CH											80-pin QFP		
MC9S12XEG128	—	12	128	2	0	59	Yes	2 SCI, 2 SPI, 1 I <sup>2</sup> C	2 CAN	2/16-CH 1/8-CH	—	—	—	—	—	8	2-CH	—	—	—	112-pin LQFP 80-pin QFP	Production	
<b>S12XS Family</b>																							
MC9S12XS256	—	12	256; Data Flash - 8 KB	—	8-CH	—	—	2 SCI, 1 SPI	1 CAN	16-CH	8-CH	—	—	—	—	—	4-CH	—	—	—	112-pin LQFP	Production	
										8-CH	7-CH										80-pin QFP		
										8-CH	7-CH										64-pin QFP		
										8-CH	7-CH										48-pin QFP		
MC9S12XS128	—	8	128; Data Flash - 8 KB	—	8-CH	—	—	2 SCI, 1 SPI	1 CAN	16-CH	8-CH	—	—	—	—	—	4-CH	—	—	—	112-pin LQFP	Production	
										8-CH	7-CH										80-pin QFP		
										8-CH	8-CH										64-pin LQFP		
										8-CH	8-CH										48-pin QFN		
MC9S12XS64	—	4	64; Data Flash - 4 KB	—	8-CH	—	—	2 SCI, 1 SPI	1 CAN	16-CH	8-CH	—	—	—	—	—	4-CH	—	—	—	112-pin LQFP	Production	
										8-CH	7-CH										80-pin QFP		
										8-CH	8-CH										64-pin LQFP		
										8-CH	8-CH										48-pin QFN		
MC3S12XS256	256	12	—	—	8-CH	—	—	2 SCI, 1 SPI	1 CAN	16-CH	8-CH	—	—	—	—	—	4-CH	—	—	—	112-pin LQFP	Production	
										8-CH	7-CH										80-pin QFP		
MC3S12XS128	128	8	—	—	8-CH	—	—	2 SCI, 1 SPI	1 CAN	16-CH	8-CH	—	—	—	—	—	4-CH	—	—	—	112-pin LQFP	Production	
										8-CH	7-CH										80-pin QFP		
										8-CH	8-CH										64-pin LQFP		
										8-CH	8-CH										48-pin QFN		
MC3S12XS64	64	4	—	—	8-CH	—	—	2 SCI, 1 SPI	1 CAN	16-CH	8-CH	—	—	—	—	—	4-CH	—	—	—	112-pin LQFP	Production	
										8-CH	7-CH										80-pin QFP		
										8-CH	8-CH										64-pin LQFP		
										8-CH	8-CH										48-pin QFN		

### Product Numbering System for HCS12X



A change bar appears in the left margin to mark the location of new or revised information.

# MCF5xxx FAMILY

## MCF5xxx Product Table Note

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-21.

Product	Core	Dhrys 2.1 MIPS @ max MHz	Processor Cache (Bytes)	Processor Flash (Kbytes)	Processor SRAM (Bytes)	Serial Interface, UART	Timers/CS/ GPIO	DMA	DRAM Controller	10/100 Eth/USB1.1	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	Rev	Additional Information																	
MCF5206	V2	17	512 I	n/a	512K	2 UARTs	2/8/8	n/a	FPM, EDO	n/a	5	16, 25, 33	C	160-pin QFP	A	www.freescale.com																	
MCF5206E		50	4K I		8K				2-CH			3.3	40, 54			n/a	Enhanced pin-compatible version of 5206 with MAC, HW divide, BDM, I <sup>2</sup> C, 5V tolerant I/O.																
MCF5207		159	8K Config. I/D	n/a	16K	3 UARTs	8/8/up to 30	16-CH	DDR/SDR	One 10/100	1.5, 2.5, 3.3	166		144-pin LQFP			32x32 EMAC, QSPI, I <sup>2</sup> C.																
MCF5208							8/8/up to 50							144-ball MAPBGA																			
MCF5211		76	n/a	256	32K	3 UARTs	16/0/up to 33	4-CH	None	n/a	3.3	66, 80		64-pin LQFP			32x32 EMAC, QSPI, I <sup>2</sup> C, 10-CH, 12-bit ADC.																
MCF5212							128							81-ball MAPBGA																			
MCF5213							16/0/up to 44							100-pin LQFP																			
MCF5214		66	2K I	n/a	64K	3 UARTs, 1 PC, 1 CAN	16/0/up to 56	SDRAM			3.3, 5			81-ball MAPBGA			256 KB Flash.																
MCF5216							8 + 4 DAM/7/ up to 150							256-ball MAPBGA																			
MCF52221		76	n/a	128	16K	3 UARTs	4 Timers, 32-Bit DMA Timers			n/a	USB otg	3.3	80	C	64-pin LQFP																		
MCF52223															256				81-ball MAPBGA														
MCF52230															56				128	32K						10/100 Ethernet	60			80-pin LQFP			
MCF52231																														112-pin LQFP			
MCF52233																														112-pin LQFP			
MCF52234	121-ball MAPBGA																																
MCF52235																																	
MCF5232	142	8K Config.	n/a	64K	3 UARTs	24/8/up to 102	SDRAM			1.5, 3.3	80, 100, 150	C	160-pin QFP			16-CH eTPU.																	
MCF5233						40/8/up to 142							196-ball MAPBGA																				
MCF5234						24/8/up to 142							256-ball MAPBGA																				
MCF5235						1x 10/100, 1x CAN																											
MCF5249	125	8K I		96K	2 UARTs, I <sup>2</sup> C, QSPI	2/4/up to 47			n/a	1.8, 3.3	140		160-ball MAPBGA			EMAC, HW divide, BDM, 12-bit ADC, CDROM block. CD text, hard disk drive, Memory stick interfaces. Audio decoders.																	
MCF5249L						2/3/up to 34							144-pin LQFP																				
MCF5270	144	8K Config. I/D		64K	3 UARTs	8/8/up to 39			One 10/100	1.5, 3.3	100	B	160-pin QFP			32x32 EMAC, QSPI, I <sup>2</sup> C.																	
MCF5270						8/8/up to 61							196-ball MAPBGA																				
MCF5271	V2	144	8K Config I/D		64K	3 UARTs	8/8/up to 39	4-CH	SDRAM	One 10/100	1.5, 3.3	100	C	160-pin QFP			Hardware Encryption, 32x32 EMAC, QSPI, I <sup>2</sup> C.																
MCF5271	V3						8/8/up to 61							196-ball MAPBGA																			
MCF5272		63	1K I		4K	10/100 FEC, 2 UARTs, USB, QSPI	4/8/up to 32	2-CH		MAC/ MAC+PHY	3.3	66	C			MAC, HW divide, BDM, 4 TDM GCI/IDL ports, software HDCL module, QSPI, 3 PWMs, 5 V tolerant I/O.																	
MCF5274L	159	16K Config I/D		64K	3 UARTs	8/8/up to 61	4-CH	DDR	One 10/100, USB 2.0 Full-Sp Device	1.5, 2.5, 3.3	166		B	256-ball MAPBGA			32x32 EMAC, QSPI, I <sup>2</sup> C.																
MCF5274						8/8/up to 69																											
MCF5275L						8/8/up to 61																											
MCF5275						8/8/up to 69								196-ball MAPBGA																			
																Hardware Encryption, 32x32 EMAC, QSPI, I <sup>2</sup> C.																	

A change bar appears in the left margin to mark the location of new or revised information.

# MCF5xxx FAMILY (continued)

## MCF5xxx Product Table <sup>Note</sup> (continued)

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-21.

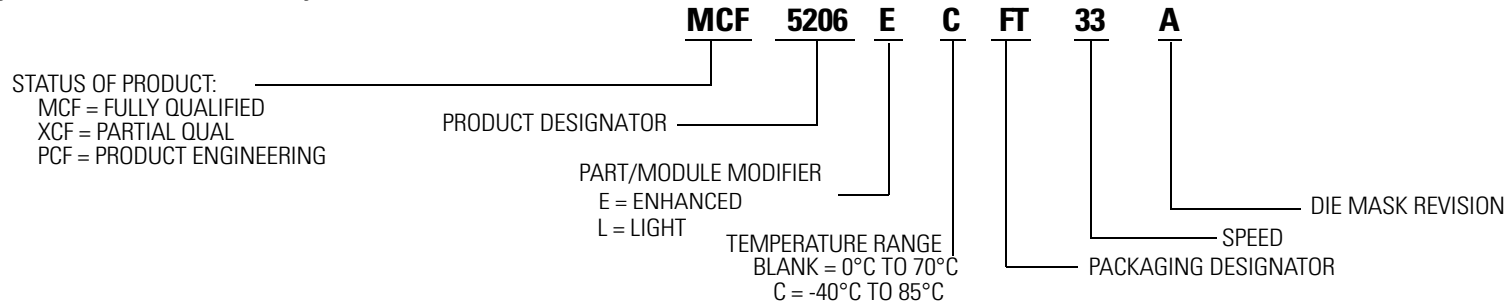
Product	Core	Dhrvs 2.1 MIPS @ max MHz	Processor Cache (Bytes)	Processor Flash (Kbytes)	Processor SRAM (Bytes)	Serial Interface, UART	Timers/CS/ GPIO	DMA	DRAM Controller	10/100 Eth/USB1.1	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	Rev	Additional Information		
MCF5280		63	2K I			3 UARTs, I <sup>2</sup> C, QSPI, FlexCAN	4 Timers, +4 DMA Timers, 7 Chip Sel., Up to 150 I/Os		SDRAM	MAC (FEC)/n/a	3.3, 5.0	66, 80				Enhanced CAN 2.0B controller. Flashless version of MCF5282.		
MCF5281		54																Enhanced CAN 2.0B controller, 256 KB Flash. This product incorporates SuperFlash® technology licensed from SST.
MCF5282																		Enhanced CAN 2.0B controller, 512 KB Flash. This product incorporates SuperFlash® technology licensed from SST.
MCF5307		75	8K I		4K	2 UARTs, I <sup>2</sup> C	2/8/16		SDRAM, FPM, EDO	n/a	3.3	66, 90		208-pin FQFP	B	MAC, HW divide, BDM, PLL, I <sup>2</sup> C, 5 V tolerant I/O.		
MCF5327	V3	200	16K Unified	n/a	32K	3 UARTs	8/6/up to 94	16-CH	DDR	One USB 2.0 Full-SP Host One USB 2.0 Full-SP Device	1.5, 3.3	240	C	196-ball MAPBGA	n/a	32x32 EMAC, QSPI, I <sup>2</sup> C.		
MCF5328										One 10/100 Full-SP Host One USB 2.0 Full-SP Device						256-ball MAPBGA	Hardware Encryption, 32x32 EMAC, QSPI, I <sup>2</sup> C.	
MCF5329										One 10/100 Full-SP Host One USB 2.0 Full-SP Device						196-ball MAPBGA	32x32 EMAC, QSPI, I <sup>2</sup> C.	
MCF5372L										One 10/100						160-ball QFP	Hardware Encryption, 32x32 EMAC, QSPI, I <sup>2</sup> C.	
MCF5373L																	Hardware Encryption, 32x32 EMAC, QSPI, I <sup>2</sup> C.	
MCF5372										150								Hardware Encryption, 32x32 EMAC, QSPI, I <sup>2</sup> C.
MCF5373																		
MCF5407	V4	316	16K I, 8K D		4K	UART, USART, I <sup>2</sup> C	2/8/16	4-CH	SDRAM, FPM, EDO	n/a	1.8, 3.3	162, 220	C	208-pin FQFP	A	Pin-compatible 5307 performance upgrade with MAC, HW divide, BDM, PLL, I <sup>2</sup> C, 3.3 V tolerant I/O.		
MCF5470	V4e	308	32K I, 32K D		32K	4 UARTs	6/6/up to 99	16-CH	DDR/SDR	Two 10/100, PCI	1.5, 2.5, 3.3	200	B	388-ball TEPBGA	n/a	www.freescale.com		
MCF5471																One 10/100, USB 2.0D, PCI		Crypto Enabled.
MCF5472																		www.freescale.com
MCF5473																		Crypto Enabled.
MCF5474		410				Two 10/100, USB 2.0D, PCI	266	C		www.freescale.com								
MCF5475						Crypto Enabled.												
MCF5480		255				Two 10/100, Two CAN, PCI	166			www.freescale.com								
MCF5481						Crypto Enabled.												
MCF5482						One 10/100, USB 2.0D, Two CAN, PCI	200			www.freescale.com								
MCF5483						Crypto Enabled.												
MCF5484		308				Two 10/100, USB 2.0D, Two CAN, PCI	200			www.freescale.com								
MCF5485						Crypto Enabled. Contact Freescale for product status.												

Note: Extended temperature products with minimum order requirements. All temperature/speed combinations may not be valid. Consult the factory to verify.

A change bar appears in the left margin to mark the location of new or revised information.

# MCF5xxx FAMILY (continued)

Product Numbering System for MCF5xxx Family



## 56800 FAMILY

56F800 Series General Purpose 16-bit Fixed Point <sup>Note</sup>

Product	Performance	Program ROM/RAM/Flash	Data ROM/RAM/Flash	Peripherals	Packaging	Additional Information
DSP56F801FA80 DSP56F801FA80E	80 MHz 40 MIPS	n/a/1K/8K (words)	n/a/1K/2K (words)	SCI, SPI, ADC, PWM, Quad Timer	48-pin LQFP 48-pin LQFP*	MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 11 GPIO.
DSP56F801FA60 DSP56F801FA60E	60 MHz 30 MIPS					MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 11 GPIO.
DSP56F802TA80 DSP56F802TA80E	80 MHz 40 MIPS			SCI, ADC, PWM, Quad Timer	32-pin LQFP 32-pin LQFP*	MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 4 GPIO.
DSP56F802TA60 DSP56F802TA60E	60 MHz 30 MIPS					MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 4 GPIO.
DSP56F803BU80 DSP56F803BU80E	80 MHz 40 MIPS	n/a/512K/32K (words)	n/a/2K/4K (words)	CAN, SCI, SPI, ADC, PWM, Quadrature Decoder, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 16 GPIO.
DSP56F805FV80 DSP56F805FV80E					144-pin LQFP 144-pin LQFP*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 32 GPIO.
DSP56F807PY80 (LQFP) DSP56F807PY80E (LQFP) DSP56F807VF80 (MAPBGA) DSP56F807VF80E (MAPBGA)		n/a/2K/60K (words)	n/a/4K/8K (words)		160-pin LQFP 160-pin LQFP* 160-ball MAPBGA 160-ball MAPBGA*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 32 GPIO. M0Q of 40 for LQFP.
DSP56F826BU80 DSP56F826BU80E		n/a/512K/32K (words)	n/a/4K/2K (words)	SCI, SPI, SSI, TOD, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 48 GPIO.
DSP56F827FG80 DSP56F827FG80E		n/a/1K/64K (words)	n/a/4K/4K (words)	SCI, SPI, SSI, TOD, ADC, Quad Timer	128-pin LQFP 128-pin LQFP*	MCU-friendly instruction set, OnCE for debug, external memory expansion available, up to 52 GPIO.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

## 56800E FAMILY

56850 Series General Purpose 16-bit Fixed Point <sup>Note</sup>

Product	Performance	Boot ROM/Program RAM/Data RAM	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
DSP56852VF120 DSP56852VFE	120 MHz 120 MIPS	1K/6K/4K (words)	Up to 2M program and 6M of data	SCI, SPI, ISSI, EMI, COP, Quad Timer	81-ball MAPBGA 81-ball MAPBGA*	MCU-friendly instruction set, Enhanced OnCE for debug, up to four programmable chip select signals, and up to 11 GPIO.
DSP56853FG120 DSP56853FGE		1K/12K/4K (words)	Up to 2M program and 8M of data	2 SCI, SPI, ESSI, HI, EMI, COP, DMA, TOD, Quad Timer	128-pin LQFP 128-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, up to four programmable chip select signals, and up to 41 GPIO.
DSP56854FG120 DSP56854FGE		1K/16K/16K (words)				MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, up to four programmable chip select signals, and up to 41 GPIO.
DSP56855BU120 DSP56855BUE		1K/24K/24K (words)		2 SCI, ESSI, EMI, COP, DMA, TOD, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, on-chip relaxation oscillator, up to four programmable chip select signals, and up to 18 GPIO.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

SG1006-21  
SG1006Q12007

## 56800E FAMILY (continued)

### 56850 Series General Purpose 16-bit Fixed Point <sup>Note</sup> (continued)

Product	Performance	Boot ROM/ Program RAM Data RAM	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
DSP56857BU120 DSP56857BUE	120 MHz 120 MIPS	1K/40K/24K (words)	n/a	2 SCI, SPI, 2 ESSI, HI, COP, DMA, TOD, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, and up to 47 GPIO.
DSP56858FV120 (LQFP) DSP56858FVE (LQFP) DSP56858VF120 (MAPBGA)			Up to 2M program and 8M of data	2 SCI, SPI, 2 ESSI, HI, EMI, COP, DMA, TOD, Quad Timer	144-pin LQFP 144-pin LQFP* 144-ball MAPBGA	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, up to four programmable chip select signals, and up to 47 GPIO.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

### 56F8300 Series General Purpose 16-bit Fixed Point <sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
<b>F832x Family</b>						
MC56F8322MFA60 MC56F8322MFAE	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, FlexCAN	48-pin LQFP 48-pin LQFP*	Extended (-40°C to 125°C) MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 21 GPIOs.
MC56F8322VFA60 MC56F8322VFAE					48-pin LQFP 48-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor and up to 21 GPIOs.
MC56F8323MFB60 MC56F8323MFB6E					64-pin LQFP 64-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
MC56F8323VFB60 MC56F8323VFB6E					64-pin LQFP 64-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
<b>F833x Family</b>						
MC56F8335VFG60	60 MHz 60 MIPS	80/12	n/a	2 SPI, 2 SCI, 4ADC, PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8335MFG60						Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
<b>F834x Family</b>						
MC56F8345MFG60 MC56F8345MFG6E	60 MHz 60 MIPS	144/12	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8345VFG60 MC56F8345VFG6E					128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8346MVF60 MC56F8346MVF6E			Yes		144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8346VVF60 MC56F8346VVF6E					144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8347MPY60 MC56F8347MPYE					160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8347VPY60 (LQFP) MC56F8347VPYE (LQFP) MC56F8347VVE (MAPBGA)						Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
<b>F835x Family</b>						
MC56F8355MFG60 MC56F8355MFG6E	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8355VFG60 MC56F8355VFG6E			n/a		128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8356MVF60 MC56F8356MVF6E			Yes		144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

## 56800E FAMILY (continued)

### 56F8300 Series General Purpose 16-bit Fixed Point<sup>Note</sup> (continued)

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
<b>F835x Family</b>						
MC56F8356VVFV60 MC56F8356VFFE					144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8357MPY60 MC56F8357MPYE			Yes		160-pin LQFP 160-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8357VPY60 (LQFP) MC56F8357VPYE (LQFP) MC56F8357VFFE (MAPBGA)					160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
<b>F836x Family</b>						
MC56F8365VFG60 MC56F8365VFGE			n/a		128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8365MFG60 MC56F8365MFGE						Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8366VVFV60 MC56F8366VFFE	60 MHz 60 MIPS	576/36	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8366MFV60 MC56F8366MFVE						Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8367VPY60 (LQFP) MC56F8367VPYE (LQFP) MC56F8367VFFE (MAPBGA)						Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8367MPY60 MC56F8367MPYE (LQFP)						Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

### 56F8000 Series General Purpose 16-bit Fixed Point<sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Peripherals	Packaging	Additional Information
MC56F8013VFAE	32 MHz 32 MIPS	16/4	6-CH PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 3-CH, 12-bit ADCs, COP, POR, I <sup>2</sup> C, On-Chip oscillator	32-pin LQFP	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.
MC56F8014VFAE			5-CH PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 4-CH, 12-bit ADCs, COP, POR, I <sup>2</sup> C, On-Chip oscillator		Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.

Applications	Development Tools	Benefits
<ul style="list-style-type: none"> <li>Smart sensors</li> <li>Industrial motor control</li> <li>Dimming lamp ballast</li> <li>Switched-mode power supply</li> <li>Soft-switching PFC</li> <li>Appliance motor control</li> <li>DC-DC power supplies</li> </ul>	Refer to Development Tools beginning on page SG1004-23.	Because of its low cost, configuration flexibility, and compact program code, the 56F8013 is well suited for many applications. The 56800E core is based on a Harvard architecture consisting of three execution units operating in parallel, allowing as many as six operations per instruction cycle. The microprocessor-style programming model and optimized instruction set allow straightforward generation of efficient, compact code for both DSP and MCU applications.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

## 56800E FAMILY (continued)

### 56F8100 Series General Purpose 16-Bit Fixed Point <sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8122VFA MC56F8122VFAE	40 MHz 40 MIPS	40/8	n/a	2 SPI, 2 SCI, 2 ADC, COP, PLL, Quad Timer	48-pin LQFP 48-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, and up to 21 GPIOs.
MC56F8123VFB MC56F8123VFBE					64-pin LQFP 64-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, and up to 27 GPIOs.
MC56F8135VFGE					128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, and up to 49 GPIOs.
MC56F8145VFG MC56F8145VFGE		72/8	n/a	2 SPI, 2 SCI, 4ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 49 GPIOs.
MC56F8146VFV MC56F8146VFVE					144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 62 GPIOs.
MC56F8147VPY MC56F8147VPYE		136/8	Yes	n/a	160-pin LQFP 160-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8155VFG MC56F8155VFGE					128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 49 GPIOs.
MC56F8156VFV MC56F8156VFVE					144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 62 GPIOs.
MC56F8157VPY MC56F8157VPYE		272/16	Yes	n/a	160-pin LQFP 160-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8165VFG MC56F8165VFGE					128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 49 GPIOs.
MC56F8166VFV MC56F8166VFVE					144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 62 GPIOs.
MC56F8167VPY MC56F8167VPYE		544/32	Yes	n/a	160-pin LQFP 160-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

## 68HC16 FAMILY

### 68HC16 Product Table

Product	ROM (KB)	RAM (KB)	Flash (KB)	Product Integration	Timer	Serial	Analog	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	Flash	Status	Additional Information	Documentation
MC68HC16Z1	0	1	0	SIM	GPT	SCI, queued SPI	8-CH 10-bit	5.0 2.7 to 3.6	16, 20, 25	C, V, M	132-pin PQFP 144-pin LQFP	n/a	Available	2.7 V to 3.6 V, 16 MHz version MC68CK16Z1 with 32kHz crystal in 144-pin LQFP package only; MC68CM16Z1 with 4MHz crystal in 144-pin LQFP package only	MC68HC16ZUM
MC68HC16Z3	8	4						5.0	16, 25	C, V				www.freescale.com	

Note: All package, speed, and temperature combinations may not be valid. Consult factory to verify.

### 68HC16 Reference Manuals

CPU16RM, HC16 CPU Reference Manual

SIMRM, System Integration Module Reference Manual

TPURM, Timer Processor Unit Reference Manual

GPTRM, General-Purpose Timer Reference Manual

QSMRM, Queued Serial Module Reference Manual

ADCRM, Analog-to-Digital Converter Reference Manual

CTMRM, Configurable Timer Module Reference Manual

MCCIRM, Multi-Channel Communication Interface Reference Manual

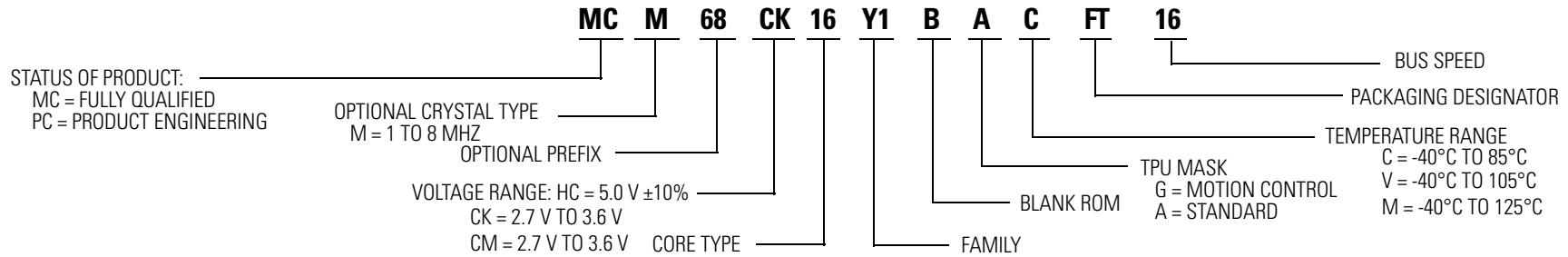
SCIMRM, Single-Chip Integration Module Reference Manual

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)



## 68HC16 FAMILY (continued)

Product Numbering System for 68HC16



## 683xx FAMILY

### 683xx Product Table

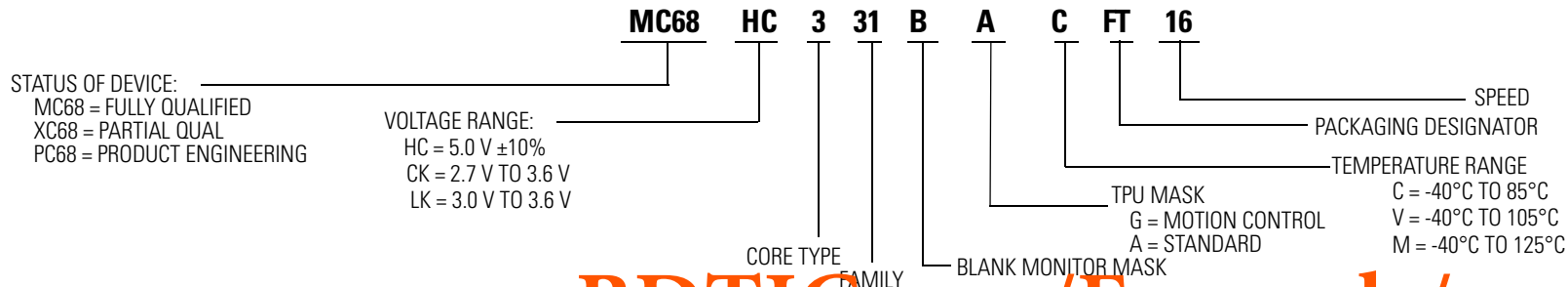
Product	ROM (KB)	RAM (KB)	Flash (KB)	Device Integration	Timer	Serial	A/D	Operating Voltage (V)	Operating Frequency (MHz)	Temp Options	Packaging	Status	Additional Information	Documentation
MC68331	0	0	0	SIM	GPT	SCI, queued SPI	n/a	5.0	16, 20, 25	C, V, M	132-pin PQFP 144-pin LQFP	Available	2.7 V to 3.6 V, 16 MHz version (MC68CK331). MC68CK331 is on end of life	MC68331UM MC68CK331EC16
MC68332		2	TPU											
MC68336		4 + 3.5			TPU CTM4		Queued 16-CH 10-bit		20, 25			160-pin QFP		www.freescale.com
MC68376	8					CAN, SCI, queued SPI								

Note: All package, speed, and temperature combinations may not be valid. Consult factory to verify.

### 683xx Reference Manuals

- CPU32RM, CPU32 Reference Manual
- SIMRM, System Integration Module Reference Manual
- TPURM, Timer Processor Unit Reference Manual
- GPTRM, General-Purpose Timer Reference Manual
- QSMRM, Queued Serial Module Reference Manual
- ADCRM, Analog-to-Digital Converter Reference Manual
- CTMRM, Configurable Timer Module Reference Manual

### Product Numbering System for 683xx Family



[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)



# MPC500 FAMILY

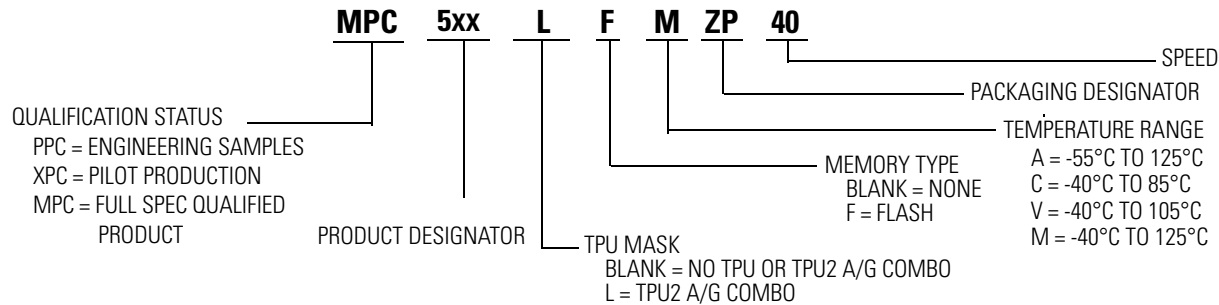
## MPC500 Product Table<sup>Note</sup>

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-27.

Product	ROM (KB)	RAM (KB)	Flash (KB)	Product Integration	Timer	Serial	MUX	A/D	PWM	Operating Voltage	Operating Frequency (MHz)	Temp Options	Packaging	Status	Additional Information	Documentation
MPC533	0	32	512	USIU	22-channel timer system; MIOS14	QSMCM (2 SCI + QSPI) + 1 TouCAN	1 x TouCAN	1 QADC (10-bit A/D with 64 result registers) 32 channels on chip	12 x PWM	2.6, 5.0	40	C	388-ball PBGA	Available	www.freescale.com	MPC533UM
MPC534		Offers code compression	MPC533PB													
MPC535		40	1M					1 QADC (10-bit A/D with 64 result registers) 40 channels on chip							www.freescale.com	MPC535UM
MPC536		Offers code compression	MPC535PB													
MPC555		26 + 6 for TPU	448		50-channel timer system; 2 TPU3 + MIOS1	QSMCM (2 SCI + QSPI) + 2 TouCAN	2 x TouCAN	2 QADC (10-bit A/D with 64 result register) 32 channels on chip	8 x PWM	3.3 Vdc for core, 5.0 Vdc for Flash		A, C, M	272-ball PBGA		www.freescale.com	MPC555UM
MPC561		32 + 8 for TPU + 2 for DEGRAM	0		54-channel timer system; 2 TPU3 + MIOS14	QSMCM (2 SCI + 1 QSPI) + 3 TouCAN	3 x TouCAN		12 x PWM	2.6 Vdc for core, 5.0 Vdc for A/D and I/O		40, 56, 66	C, M		388-ball PBGA	MPC561RM
MPC562			512													Offers code compression
MPC563			MPC563RM													
MPC564															Offers code compression	TPURM
MPC565															MPC565RM	
MPC566	36 + 10 for TPU + 4 for DEGRAM	1M	1M	70-channel timer system; 3 TPU3 + MIOS14	QSMCM x 2 (4 SCI + 2 QSPI) + 3 TouCAN	3 x TouCAN	1 x J1850	2 QADC (10-bit A/D with 64 result registers) 40 channels on chip	8 x PWM	2.6 Vdc for core, 5.0 Vdc for Flash	40 or 56	A, C, M	388-ball PBGA	www.freescale.com	MPC566UM	
															Offers code compression	TPURM
																RCPURM

Note: Extended temperature products with minimum order requirements. All package/speed/temperature combinations may not be valid - consult factory to verify.

## Product Numbering System for MPC500



# MPC5500 FAMILY

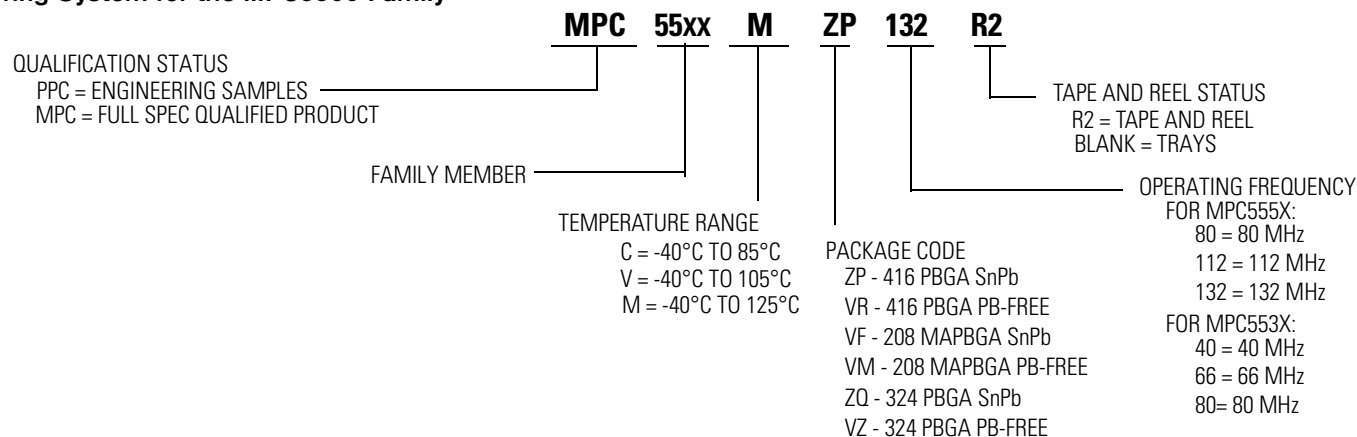
## MPC5500 Family Comparison

Device	PowerPC Core	Variable Length Instruction Support	Cache	Memory Mngt Unit	Crossbar	Core Nexus	SRAM	FLASH Main Array	External Bus (EBI) Data Bus	External Bus (EBI) Address Bus	DMA	DMA Nexus	Serial	Controller Area Network (CAN)	SPI	eMIOS	eTPU	Code Memory	Parameter RAM	Nexus Class	Interrupt Controller	Analog to Digital Converter (eQADC)	Fast Ethernet Controller	PLL	VRC
MPC5534	e200z3	Yes	None	16 entry	4x5	Class 3 + (NZ3C3)	64k	1M <sup>1</sup>	16-bit	24	32-CH	None	2	2 (64 buf)	3	24-CH	32-CH	12K	2.5K	3	210-CH	40-CH	No	FM	Yes
MPC5553	e200z6	No	8K Unified	32 entry	4x4	Class 3 + (NZ3C3)	64k	1.5M <sup>2</sup>	16-bit	24	32-CH	Class 3	2	2 (64 buf)	2	24-CH	32-CH	12K	2.5K	3	210-CH	40-CH	Yes <sup>3</sup>	FM	Yes
MPC5554	e200z6	No	32K Unified	32 entry	4x5	Class 3 + (NZ3C3)	64k	2M <sup>2</sup>	32-bit	24	64-CH	Class 3	2	3 (64 buf)	3	24-CH	64-CH	16K	3K	3	300-CH	40-CH	No	FM	Yes

- Notes:
1. 16-Byte flash page size for programming
  2. 32-Byte flash page size for programming.
  3. The FEC signals are shared with Data Bus pins DATA[16:31].

## MPC5500 FAMILY (continued)

Product Numbering System for the MPC5500 Family



## CONTROLLER AREA NETWORK MICROCONTROLLERS

### 68HC08 Family CAN MCUs

Product	ROM (KB)	RAM (KB)	Flash or OTP (KB)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	COP	Operating Voltage (V)	Max Bus Frequency (MHz)	Temp <sup>1</sup>	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation							
XC68HC08AZ32	32	1	n/a	512	4-CH + 2-CH, 16-bit IC, OC, or PWM	40/50	SCI SPI CAN	8-CH or 15-CH, 8-bit	See Timer	Y	5.0	8.4	C, V, M	64-pin QFP (FU) 52-pin PLCC (FN)	908AZ60A	Available	CAN 2.0A and 2.0B	MC68HC08AZ32/D							
MC908AZ60A	n/a	2	60 Flash	1K	6-CH + 2-CH, 16-bit IC, OC, or PWM	50		15-CH, 8-bit						64-pin QFP (FU)	n/a		MC908AZ60A is pin-for-pin compatible replacement for MC68HC908AZ60. CAN 2.0A and 2.0B	MC68HC908AZ60A/D							
MC68HC08AZ60	60	n/a			48										908AZ60			CAN 2.0A and 2.0B	MC68HC08AZ60/D						
MC68HC908GZ8	n/a	1	8 Flash	n/a	Dual 2-CH, 16-bit IC, OC, or PWM	Up to 37	ESCI SPI	8-CH, 10-bit	See Timer	Y	3.0, 5.0	8.0	C, V, M	32-pin QFP (FJ) 48-pin LQFP (FA)	n/a	Available	MSCAN 2.0	MC68HC908GZ16/D MC68HC908GZ16/D							
MC68HC908GZ16			16 Flash																						
MC68HC908GZ32 MC68HC908GZ48			32 Flash 48 Flash											1.5											
MC68HC908GZ60		2	60 Flash		2-CH + 6-CH, 16-bit IC, OC, or PWM	Up to 50	1 SPI 1 ESCI	24-CH, 10-bit									1 to 8 MHz high frequency oscillator	MC68HC908GZ32/D MC68HC908GZ48/D MC68HC908GZ60/D							

Note: C = -40°C to 85°C, M = -40°C to 125°C, and V = 85°C to 105°C.

# CONTROLLER AREA NETWORK MICROCONTROLLERS (continued)

## 68HC12 Family CAN MCUs

Product	ROM (Bytes)	RAM (KB)	Flash (KB)	EEPROM (Bytes)	Timer <sup>1</sup>	I/O	Serial	A/D	PWM	Operating Voltage (V)	Max Bus Frequency (MHz)	Temp <sup>2</sup>	Packaging	Status	Additional Information	Documentation
XC912BC32		1	32	768	8-CH, 16-bit IC or OC RTI, pulse accumulator	Up to 63	SCI, SPI, CAN	8-CH, 10-bit	4-CH, 8-bit or 2-CH, 16-bit	4.5 to 5.5	8.0	C, V, M	80-pin QFP (FU)	Available	MSCAN CAN 2.0B, BDM Sample pack part number: KXC912BC32CFU8	MC68HC912B
MC912D60A	n/a	2	60	1K		Up to 66 I/O and 18 i	Dual SCI, SPI, CAN			80-pin QFP (FU) 112-pin LQFP (PV)			5.0			Replaces the XC68HC912D60 with 5 V Flash voltage and a different programming algorithm
MC912DG128A		8	128	2K				8-CH or 16-CH, 10-bit					112-pin LQFP (PV)			Replaces the XC912DG128 with 5 V Flash voltage and a different programming algorithm

Notes:

- All 68HC12 MCUs incorporate a COP watchdog timer.
- C = -40°C to 85°C, M = -40°C to 125°C, and V = -40°C to 105°C.

## HCS12 Family CAN MCUs

HCS12 Dx and A Family devices offer pin-for-pin compatibility.

For complete part number information and temperature definitions, refer to Product Numbering System on page SG1006-15.

Product	ROM (Bytes)	RAM (KB)	Flash or OTP (KB)	EEPROM (KB)	Timer	I/O	Serial	MUX	A/D	PWM	Operating Voltage (V)	Operating Frequency (MHz)	Temp <sup>1</sup>	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation														
MC9S12C128		4	128 Flash	0	8-CH, 16-Bit IC, OC or PWM	Up to 60	SCI, SPI	CAN	8-CH, 10-Bit	See Timer	3.0-5.0	25	C, V, M	48-pin QFP (FA) 52-pin QFP (FB) 80-pin QFP (FU)	n/a	Available	www.freescale.com	9S12C128DGV1														
MC9S12C96			96 Flash															n/a	1	8-CH, 16-bit ECT	Up to 59	2 SCI, 1 SPI	7-CH, 8-bit or 3-CH, 16-bit	3.15, 5.5	16, 25	C, M	80-pin QFP (FU)	9S12C32D6V1/D CPU12RM/AD				
MC9S12C64			64 Flash	2							8-CH, 16-bit IC, OC, PA	Up to 91	2 SCI, 2 SPI, IIC															2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	5.0	25, 33	C, V, M
MC9S12C32			32 Flash															2	8-CH, 16-bit IC, OC, PA	Up to 91	2 SCI, 2 SPI, IIC	2 CAN and 1 x J1850	8-CH, 8-bit or 4-CH, 16-bit	5.0	25, 33	C, V, M	80-pin QFP (FU) 112-pin LQFP (PV)					
MC9S12D32		2	32 Flash	1	8-CH, 16-bit ECT	Up to 59	2 SCI, 1 SPI	7-CH, 8-bit or 3-CH, 16-bit	3.15, 5.5	16, 25	C, M	80-pin QFP (FU)	MC9S12DP256/D CPU12RM/AD																			
MC9S12DB128B	n/a	8	128 Flash	2	8-CH, 16-bit IC, OC, PA	Up to 91	2 SCI, 2 SPI, IIC	2 CAN	2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	5.0	25.0	C, V, M	80-pin QFP (FU) 112-pin LQFP (PV)	n/a	Samples Available	The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM	9S12DT128BDGV1/D CPU12RM/AD														
MC9S12DG128B																			2	128 Flash	2	8-CH, 16-bit IC, OC, PA	Up to 91	2 SCI, 2 SPI, IIC	3 CAN	2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	25.0	112-pin LQFP (PV)	Samples Available	9S12DT128BDGV1/D CPU12RM/AD	
MC9S12DP512																			14	512 Flash	4	8-CH, 16-bit ECT	Up to 91	2 SCI, 3 SPI, I <sup>2</sup> C	5 CAN	2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	25, 33	112-pin LQFP (PV)	Available	www.freescale.com	MC9S12DP512/D CPU12RM/AD
MC9S12DT128B																			8	128 Flash	2	8-CH, 16-bit IC, OC, PA	Up to 91	2 SCI, 2 SPI, IIC	3 CAN	2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	25.0	112-pin LQFP (PV)	Samples Available	www.freescale.com	9S12DP256BDGV2/D CPU12RM/AD
MC9S12DG256B	n/a	12	256 Flash	4	8-CH, 16-bit IC, OC, PA	Up to 91	2 SCI, 3 SPI, IIC	2 CAN	2 x 8-CH, 10-bit	8-CH, 8-bit or 4-CH, 16-bit	5.0	25.0	C, V, M	112-pin LQFP (PV)	n/a	Samples Available	www.freescale.com	The 80 QFP differs from the 112 LQFP in that it offers only up to 59 I/O, has 1 x 8-CH A/D, and has 7-CH PWM														
MC9S12DJ256B								2 CAN and 1 x J1850						80-pin QFP (FU) 112-pin LQFP (PV)					9S12DP256BDGV2/D CPU12RM/AD													
MC9S12DP256B								5 CAN						112-pin LQFP (PV)					9S12DP256BDGV2/D CPU12RM/AD													
MC9S12DT256B								3 CAN																								
MC9S12H128B								128 Flash						99 plus 18 inputs					SCI, SPI, IIC	2 CAN, 2.0A/2.0B	16-CH, 10-bit	6-CH, 8-bit or 3-CH, 16-bit	16.0	C, V, M	112-pin LQFP (PV) 144-pin LQFP (FV)	www.freescale.com	9S12H256BDGV1/D CPU12RM/AD					
MC9S12H256B								256 Flash																								

Note: M = -40°C to 125°C, C = -40°C to 85°C, V = -40°C to 105°C.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

# CONTROLLER AREA NETWORK MICROCONTROLLERS (continued)

## 683xxx Family CAN MCUs

Product	ROM (KB)	RAM (KB)	Flash (Bytes)	Product Integration	Timer	Serial	A/D	Operating Voltage (V)	Operating Frequency (MHz)	Temp <sup>1</sup>	Packaging	Status	Additional Information	Documentation
MC68376	8	4 + 3.5	0	SIM	TPU CTM4	TouCAN, SCI, queued SPI	Queued 16-CH 10-bit	5.0	20, 25	C, V, M	160-pin QFP	Available	www.freescale.com	MC68336/376PP MC68336/376UM

Note: M = -40°C to 125°C, C = -40°C to 85°C, V = -40°C to 105°C.

## MPC500 Family CAN MCUs

Product	ROM (Bytes)	RAM (KB)	Flash (Bytes)	Product Integration	Timer	Serial	MUX	A/D	PWM	Operating Voltage (V)	Operating Frequency (MHz)	Temp <sup>1</sup>	Packaging	Status	Additional Information	Documentation	
MPC533	0	32	512K	USIU	22-channel timer system; MIOS14	QSMCM (2SCI + QSPI) +1 TouCAN	1 x TouCAN	1 QADC (10-bit A/D with 64 result registers) 32 channels on chip	12 x PWM	2.6, 5.0	40	C	388-ball PBGA	Available	www.freescale.com	MPC533UM	
MPC534								Offers code compression							MPC533PB		
MPC535		40	1M					1 QADC (10-bit A/D with 64 result registers) 40 channels on chip								Offers code compression	
MPC536								Offers code compression									
MPC555		26 + 6 for TPU	448K		50-channel timer system; 2 TPU3 + MIOS1	QSMCM (2 SCI + QSPI) + 2 TouCAN	2 x TouCAN	8 x PWM	3.3 Vdc for core, 5.0 Vdc for Flash	A, C, M	272-ball PBGA	www.freescale.com	MPC555UM TPURM RCPURM				
MPC561		32 + 8 for TPU + 2 for DEGRAM	0		512K	54-channel timer system; 2 TPU3 + MIOS14	QSMCM (2 SCI + 1 QSPI) + 3 TouCAN	3 x TouCAN	2 QADC (10-bit A/D with 64 result registers) 32 channels on chip	12 x PWM	2.6 Vdc for core, 5.0 Vdc for A/D and I/O	40, 56, 66	C, M		388-ball PBGA	Offers code compression	MPC561RM TPURM RCPURM
MPC562																www.freescale.com	MPC563RM TPURM RCPURM
MPC563																Offers code compression	
MPC564																Offers code compression	
MPC565		36 + 10 for TPU + 4 for DEGRAM	1M		70-channel timer system; 3 TPU3 + MIOS14	QSMCM x 2 (4 SCI + 2 QSPI) + 3 TouCAN	3 x TouCAN 1 x J1850	2 QADC (10-bit A/D with 64 result registers) 40 channels on chip			40 or 56	A, C, M			www.freescale.com	MPC566UM TPURM RCPURM	
MPC566	Offers code compression																

Note: A = -55°C to 125°C, C = -40°C to 85°C, and M = -40°C to 125°C.

## 56800 Family CAN MCUs

Product	Performance	Program ROM/RAM/Flash	Data ROM/RAM/Flash	Peripherals	Packaging	Additional Information
<b>F80X Family</b>						
DSP56F803BU80	80 MHz	n/a/512/32K	n/a/2K/4K	CAN, SCI, SPI, ADC, PWM, Quadrature Decoder, Quad Timer	100-pin LQFP	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 16 GPIO. Order two-unit sample pack as SPAK56F803BU80. S, MOQ of 90.
DSP56F805FV80					144-pin LQFP	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 32 GPIO. SPAK56F805FV80. S, MOQ of 60.
DSP56F807PY80 (LQFP) DSP56F807VF80 (MAPBGA)		n/a/2K/60K	n/a/2K/8K		160-pin LQFP 160-ball MAPBGA	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 32 GPIO. MOQ of 60 for LQFP. SPAK56F807PY80 or SPAK56F807VF80. MOQ of 24 for MAPBGA.

# LOCAL AREA NETWORK MICROCONTROLLERS

## 56F8300 Family CAN MCUs <sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
<b>F832x Family</b>						
MC56F8322MFA60 MC56F8322MFAE	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, FlexCAN	48-pin LQFP 48-pin LQFP*	Extended (-40°C to 125°C) MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 21 GPIOs.
MC56F8322VFA60 MC56F8322VFAE					48-pin LQFP 48-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor and up to 21 GPIOs.
MC56F8323MFB60 MC56F8323MFBFE					64-pin LQFP 64-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
MC56F8323VFB60 MC56F8323VFBFE					64-pin LQFP 64-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
<b>F833x Family</b>						
MC56F8335VFG60	60 MHz 60 MIPS	80/12	n/a	2 SPI, 2 SCI, 4ADC, PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8335MFG60						Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
<b>F834x Family</b>						
MC56F8345MFG60 MC56F8345MFG60	60 MHz 60 MIPS	144/12	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8345VFG60 MC56F8345VFG60					128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8346MFV60 MC56F8346MFVE					144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8346VPY60 MC56F8346VPYE			Yes		144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8347MPY60 MC56F8347MPYE					160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8347VPY60 (LQFP) MC56F8347VPYE (LQFP) MC56F8347VVE (MAPBGA)					Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.	
<b>F835x Family</b>						
MC56F8355MFG60 MC56F8355MFG60	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8355VFG60 MC56F8355VFG60			n/a		128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8356MFV60 MC56F8356MFVE			Yes		144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8356VPY60 MC56F8356VPYE			Yes		144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8357MPY60 MC56F8357MPYE					160-pin LQFP 160-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8357VPY60 (LQFP) MC56F8357VPYE (LQFP) MC56F8357VVE (MAPBGA)					160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

# LOCAL AREA NETWORK MICROCONTROLLERS (continued)

## 56F8300 Family CAN MCUs <sup>Note</sup> (continued)

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
<b>F336x Family</b>						
MC56F8365VFG60 MC56F8365VFGE	60 MHz 60 MIPS	576/36	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8365MFG60 MC56F8365MFGE			Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.			
MC56F8366VVF60 MC56F8366VFVE			Yes		144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8366MFV60 MC56F8366MFVE			Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.			
MC56F8367VPY60 (LQFP) MC56F8367VPYE (LQFP) MC56F8367VVE (MAPBGA)			160-pin LQFP 160-pin LQFP* 160-ball MAPBGA*		Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.	
MC56F8367MPY60 MC56F8367MPYE (LQFP)			Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.			

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

## LIN Slave MCUs

Product	ROM (KB)	RAM (Bytes)	Flash or OTP (KB)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	COP	Operating Voltage (V)	Max Bus Freq (MHz)	Temp <sup>1</sup>	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation
MC68HC08AB16A	16	512	n/a	512	4-CH + 4-CH, 16-bit IC, OC, or PWM	51	SCI SPI	8-CH, 8-bit			5.0	8.0	C, M	64-pin QFP (FU)	908AB32	Available	Programmable interrupt timer module.	MC68HC08AB16A/D
MC68HC908AB32	1K	32 Flash	Sample pack part numbers: KMC908AB32CFU/MFU/VFU															MC68HC908AB32/D
MC68HC908EY16	n/a	512	16 Flash	n/a	2-CH + 2-CH, 16-bit I/C, O/C, or PWM	24	ESCI SPI	8-CH, 10-bit	See Timer	Y	8.0 Max	8.0	C, V, M	32-pin QFP (FA)	n/a	Production	First product of the MC68HC908EYx Family for LIN and general market.	MC68HC908EY16/D
MC68HC908JL3	4 Flash	RC oscillator option, LVR with selectable trip points, 6-pin LED drive. Sample pack part numbers: KMC908JL3CP, KMC908JL3CDW, KMCR908JL3CP, KMCR908JL3CDW	MC68HC908JL3/H															
MC68HC08JL3	4	128	n/a	n/a	2-CH, 16-bit IC, OC, or PWM	23	n/a	12-CH, 8-bit			3.0, 5.0	8.0	C, M	28-pin DIP (P) 28-pin SOIC (DW) 48-pin LQFP (FA)	908JL3	Available	RC oscillator option: 68HRC08JL3, LVR with selectable trip points, 6-pin LED drive.	MC68HC908JL3/H
MC908QL4	n/a	4	SLIC (Slave-LIN Interface Controller) featuring Autobauding/Auto Synchronization															
MC908QL3	n/a	4		n/a	2-CH, 16-Bit IC, OC or PWM	13	SLIC (LIN)	6-CH, 10-Bit			3.0, 5.0	8.0	C, V, M	16-pin TSSOP (DT) 16-pin SOIC (DW)	n/a	Available	SLIC (Slave-LIN Interface Controller) featuring Autobauding/Auto Synchronization	MC68HC908QL4
MC908QL2	2																	

Note: C = -40°C to 85°C, M = -40°C to 125°C, and V = -40°C to 105°C.

## 56F8000 LIN Slave MCUs <sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Peripherals	Packaging	Additional Information
MC56F8013VFAE	32 MHz 32 MIPS	16/4	6-CH PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 3-CH, 12-bit ADCs, COP, POR, I <sup>2</sup> C, On-Chip oscillator	32-pin LQFP	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.
MC56F8014VFAE			5-CH PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 4-CH, 12-bit ADCs, COP, POR, I <sup>2</sup> C, On-Chip oscillator		Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)



## LOCAL AREA NETWORK MICROCONTROLLERS (continued)

### 68HC08 LIN Master MCUs

Product	ROM (KB)	RAM (KB)	Flash or OTP (KB)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	COP	Operating Voltage (V)	Max Bus Freq (MHz)	Temp <sup>1</sup>	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation
XC68HC08AZ32	32	1	n/a	512	4-CH + 2-CH, 16-bit IC, OC, or PWM	40/50	SCI SPI CAN	8-CH or 15-CH, 8-bit	See Timer	Y	5.0	8.4	C, V, M	64-pin QFP (FU) 52-pin PLCC (FN)	908AZ60A	Available	CAN 2.0A and 2.0B	MC68HC08AZ32
MC908AZ60A	n/a	2	60 Flash	1K	6-CH + 2-CH, 16-bit IC, OC, or PWM	50		15-CH, 8-bit						64-pin QFP (FU)	n/a		MC908AZ60A is pin-for-pin compatible replacement for MC68HC908AZ60. CAN 2.0A and 2.0B	MC68HC908AZ60A

Note: C = -40°C to 85°C, M = -40°C to 125°C, and V = -40°C to 105°C.

### 68HC12 LIN Master MCUs

Product	ROM (KB)	RAM (KB)	Flash (KB)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	Operating Voltage (V)	Max Bus Frequency (MHz)	Temp <sup>1</sup>	Packaging	Status	Additional Information	Documentation
MC68HC912B32	n/a	1	32	768	8-CH, 16-Bit IC or OC RTI, pulse accumulator	Up to 63	SCI, SPI J1850	8-CH, 10-bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	80-pin QFP (FU)	Available	J1850, muxed bus, BDM. Sample pack part numbers: KMC912B32CFU/VFU/MFU	MC68HC912B/D
MC68HC12BE32	32		n/a												C	
MC912D60A	n/a	2	60	1K	8-CH, 16-Bit	Up to 66 I/O and 18 i	Dual SCI SPI, CAN	Dual 8-CH, 10-Bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	80-pin QFP (FU) 112-pin LQFP (PV)	Available	Replaces the XC68HC912D60 with 5 V Flash voltage and a different programming algorithm.	MC68HC912D60/D
XC68HC12D60	60		n/a												Part equipped with CAN 2.0A/B.	
MC912DG128A	n/a	8	128	2K	8-CH, 16-Bit IC or OC RTI, pulse accumulator	Up to 67 I/O and 18 i	Dual SCI SPI, CAN	8-CH or 16-CH, 10-Bit	4-CH, 8-bit or 2-CH, 16-bit	5.0	8.0	C, V, M	112-pin LQFP (PV)	Available	Replaces the XC912DG128 with 5 V Flash voltage and a different programming algorithm.	MC68HC912DG128/D
MC68HC912DT128A															Up to 66 I/O and 18 i	

Note: C = -40°C to 85°C, M = -40°C to 125°C, and V = -40°C to 105°C.

# UNIVERSAL SERIAL BUS MICROCONTROLLERS

## 68HC08 Family USB MCUs

Product	ROM (Bytes)	RAM (Bytes)	Flash or OTP (Bytes)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	COP	Operating Voltage (V)	Max Bus Freq (MHz)	Temp	Packaging	OTP or Flash Equiv.	Status	Additional Information	Documentation
MC68HC08JB1	5.5K	128	n/a	n/a	2-CH, 16-bit IC, OC, or PWM	13	USB PS/2	n/a	See Timer	Y	5.0	3.0	0°C to 70°C only	20-pin DIP (P) 20-pin SOIC (JDW)	908JB8	Available	Supports both USB and PS/2; 1.5Mbps USB with 2 endpoints, low voltage reset, keyboard interrupt, 3.3 V bandgap reference	n/a
MC68HC908JB8	n/a	256	8K Flash			Up to 37	USB							20-pin DIP (P) 28-pin SOIC (DW) 44-pin QFP (FB)	n/a		Complies with USB 1.1 specification for low-speed USB (1.5Mbps) On-chip 3.3 V regulator	MC68HC908JB8/D
MC68HC908JB12		384	12K Flash		Up to 21	SCI USB 2.0	20-pin SOIC (DW) 28-pin SOIC (DW)							n/a	www.freescale.com		n/a	
MC68HC08JB8	8K	256	n/a		2-CH, 16-bit IC, OC, or PWM	Up to 37	USB							20-pin PDIP (JP) 20-pin SOIC (JDW) 28-pin SOIC (ADW) 44-pin QFP (FB)	908JB8		Complies with USB 1.1 specification for low-speed USB (1.5Mbps), LVI	MC68HC908JB8/D
MC68HC08KH12	12K	384				42								3.3 V	6.0		64-pin QFP (FU)	708KH12

# MOTOR CONTROL MICROCONTROLLERS

## Motor Control Unit Product Table

Product	COP	Operating Voltage (V)	Max Bus Frequency (MHz)	Temp	Packaging	OTP	Status	Additional Information	Documentation
MC3PHAC	Y	5.0	4.0	V	32-pin LQFP (FA) 28-pin SOIC (DW) 28-pin PDIP (P)	n/a	Samples Available	A complete solution, contains all functions required to implement control of open loop 3-phase AC motor drive	MC3PHAC DRM006

## 56F800 MCUs Note

Product	Performance	Program ROM/RAM/Flash	Data ROM/RAM/Flash	Peripherals	Packaging	Additional Information
DSP56F801FA80 DSP56F801FA80E	80 MHz 40 MIPS	n/a/1K/8K (words)	n/a/1K/2K (words)	SCI, SPI, ADC, PWM, Quad Timer	48-pin LQFP 48-pin LQFP*	MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 11 GPIO.
DSP56F801FA60 DSP56F801FA60E	60 MHz 30 MIPS					MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 11 GPIO.
DSP56F802TA80 DSP56F802TA80E	80 MHz 40 MIPS			SCI, ADC, PWM, Quad Timer	32-pin LQFP 32-pin LQFP*	MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 4 GPIO.
DSP56F802TA60 DSP56F802TA60E	60 MHz 30 MIPS					MCU-friendly instruction set, OnCE for debug, on-chip relaxation oscillator, 2K Boot Flash, up to 4 GPIO.
DSP56F803BU80 DSP56F803BU80E	80 MHz 40 MIPS	n/a/512K/32K (words)	n/a/2K/4K (words)	CAN, SCI, SPI, ADC, PWM, Quadrature Decoder, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 16 GPIO.
DSP56F805FV80 DSP56F805FV80E					144-pin LQFP 144-pin LQFP*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 32 GPIO.
DSP56F807PY80 (LQFP) DSP56F807PY80E (LQFP) DSP56F807VF80 (MAPBGA) DSP56F807VF80E (MAPBGA)		n/a/2K/60K (words)	n/a/4K/8K (words)		160-pin LQFP 160-pin LQFP* 160-ball MAPBGA 160-ball MAPBGA*	MCU-friendly instruction set, OnCE for debug, 2K Boot Flash, external memory expansion available, up to 32 GPIO. MOQ of 40 for LQFP.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)

# MOTOR CONTROL MICROCONTROLLERS (continued)

## 56F8300 MCUs <sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
<b>F832x Family</b>						
MC56F8322MFA60 MC56F8322MFAE	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, FlexCAN	48-pin LQFP 48-pin LQFP*	Extended (-40°C to 125°C) MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 21 GPIOs.
MC56F8322VFA60 MC56F8322VFAE					48-pin LQFP 48-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor and up to 21 GPIOs.
MC56F8323MFB60 MC56F8323MFBE					64-pin LQFP 64-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
MC56F8323VFB60 MC56F8323VFBE					64-pin LQFP 64-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
<b>F833x Family</b>						
MC56F8335VFG60	60 MHz 60 MIPS	80/12	n/a	2 SPI, 2 SCI, 4ADC, PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8335MFG60						Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
<b>F834x Family</b>						
MC56F8345MFG60 MC56F8345MFG60	60 MHz 60 MIPS	144/12	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8345VFG60 MC56F8345VFG60					128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8346MFB60 MC56F8346MFB60					Yes	144-pin LQFP 144-pin LQFP*
MC56F8346VFB60 MC56F8346VFB60			144-pin LQFP 144-pin LQFP*			Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8347MPY60 MC56F8347MPY60			160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*			Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8347VPY60 (LQFP) MC56F8347VPY60 (LQFP) MC56F8347VVF60 (MAPBGA)					Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.	
<b>F835x Family</b>						
MC56F8355MFG60 MC56F8355MFG60	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8355VFG60 MC56F8355VFG60			n/a		128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8356MFB60 MC56F8356MFB60			Yes		144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8356VFB60 MC56F8356VFB60			Yes		144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8357MPY60 MC56F8357MPY60					160-pin LQFP 160-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8357VPY60 (LQFP) MC56F8357VPY60 (LQFP) MC56F8357VVF60 (MAPBGA)					160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

## MOTOR CONTROL MICROCONTROLLERS (continued)

### 56F8300 MCUs<sup>Note</sup> (continued)

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
<b>F836x Family</b>						
MC56F8365VFG60 MC56F8365VFGE	60 MHz 60 MIPS	576/36	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8365MFG60 MC56F8365MFGE						Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8366VFE60 MC56F8366VFVE			Yes		144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8366MFV60 MC56F8366MFVE						Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8367VPY60 (LQFP) MC56F8367VPYE (LQFP) MC56F8367VVE (MAPBGA)			160-pin LQFP 160-pin LQFP* 160-ball MAPBGA*		Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.	
MC56F8367MPY60 MC56F8367MPYE (LQFP)					Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.	

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

\*This package is RoHS compliant.

### 56F8000 MCUs<sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Peripherals	Packaging	Additional Information
MC56F8013VFAE	32 MHz 32 MIPS	16/4	6-CH PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 3-CH, 12-bit ADCs, COP, POR, I <sup>2</sup> C, On-Chip oscillator	32-pin LQFP	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

## MOTOR CONTROL MICROCONTROLLERS (continued)

### 56F8100 MCUs <sup>Note</sup>

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8122VFA MC56F8122VFAE	40 MHz 40 MIPS	40/8	n/a	2 SPI, 2 SCI, 2 ADC, COP, PLL, Quad Timer	48-pin LQFP	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, and up to 21 GPIOs.
MC56F8123VFB MC56F8123VFBE					48-pin LQFP*	
MC56F8135VFGE					64-pin LQFP 64-pin LQFP*	
MC56F8145VFG MC56F8145VFGE		128-pin LQFP*				
MC56F8146VFV MC56F8146VFVE		128-pin LQFP 128-pin LQFP*				
MC56F8147VPY MC56F8147VPYE		144-pin LQFP 144-pin LQFP*				
MC56F8155VFG MC56F8155VFGE		136/8	Yes	2 SPI, 2 SCI, 4ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	160-pin LQFP 160-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8156VFV MC56F8156VFVE					128-pin LQFP 128-pin LQFP*	
MC56F8157VPY MC56F8157VPYE					144-pin LQFP 144-pin LQFP*	
MC56F8165VFG MC56F8165VFGE		272/16	n/a	Yes	160-pin LQFP 160-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8166VFV MC56F8166VFVE					128-pin LQFP 128-pin LQFP*	
MC56F8167VPY MC56F8167VPYE					144-pin LQFP 144-pin LQFP*	
MC56F8167VPY MC56F8167VPYE		544/32	n/a	Yes	160-pin LQFP 160-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8167VPY MC56F8167VPYE					128-pin LQFP 128-pin LQFP*	
MC56F8167VPY MC56F8167VPYE					144-pin LQFP 144-pin LQFP*	

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.  
\*This package is RoHS compliant.

## ZIGBEE™ -READY PLATFORM

### ZigBee-Ready and Proprietary RF Transceivers

Product	Data Rate (kbps)	Operating Voltage (V)	Band (MHz)	MCU Interface	Packaging	Status	Additional Information
MC13191FCR2	250 max	2.4 to 3.4	2.4 GHz	SPI	32-pin QFN 5 x 5	Available	2.4 GHz Proprietary RF transceiver data modem for Point-to-Point and Star applications
MC13192FCR2							2.4 GHz RF transceiver data modem for ZigBee™ applications

## **NOTES**

**[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)**

## **NOTES**

**[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)**

## How to Reach Us:

---

### Home Page:

[www.freescale.com](http://www.freescale.com)

### Web Support:

<http://www.freescale.com/support>

### USA/Europe or Locations Not Listed:

Freescale Semiconductor, Inc.  
Technical Information Center, EL516  
2100 East Elliot Road  
Tempe, Arizona 85284  
+1-800-521-6274 or +1-480-768-2130  
[www.freescale.com/support](http://www.freescale.com/support)

### Europe, Middle East, and Africa:

Freescale Halbleiter Deutschland GmbH  
Technical Information Center  
Schatzbogen 7  
81829 Muenchen, Germany  
+44 1296 380 456 (English)  
+46 8 52200080 (English)  
+49 89 92103 559 (German)  
+33 1 69 35 48 48 (French)  
[www.freescale.com/support](http://www.freescale.com/support)

### Japan:

Freescale Semiconductor Japan Ltd.  
Headquarters  
ARCO Tower 15F  
1-8-1, Shimo-Meguro, Meguro-ku,  
Tokyo 153-0064  
Japan  
0120 191014 or +81 3 5437 9125  
[support.japan@freescale.com](mailto:support.japan@freescale.com)

### Asia/Pacific:

Freescale Semiconductor Hong Kong Ltd.  
Technical Information Center  
2 Dai King Street  
Tai Po Industrial Estate  
Tai Po, N.T., Hong Kong  
+800 2666 8080  
[support.asia@freescale.com](mailto:support.asia@freescale.com)

### For Literature Requests Only:

Freescale Semiconductor Literature Distribution Center  
P.O. Box 5405  
Denver, Colorado 80217  
1-800-441-2447 or 303-675-2140  
Fax: 303-675-2150  
[LDCForFreescaleSemiconductor@hibbertgroup.com](mailto:LDCForFreescaleSemiconductor@hibbertgroup.com)

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in Freescale Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc.  
All other product or service names are the property of their respective owners.  
© Freescale Semiconductor, Inc. 2007. All rights reserved.

SG1006Q12007  
Rev 0  
1/2007



[www.BDTIC.com/Freescale/](http://www.BDTIC.com/Freescale/)