

## 8-bit Development Tools



### Demonstration Boards (DEMO):

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):

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):

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.



### Freescale Semiconductor's In-Circuit Emulator (FSICE):

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 the 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.



### Cyclone Pro (CYCLONEPROE):

Cyclone Pro provides all the capabilities of the USBMULTILINKBDME 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:

CodeWarrior Development Studio is a comprehensive special edition tool set 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 architectures. Some of the features include full-chip simulation, flash programming and ProcessorExpert™ technology, which provides automatic C-code generation for most HC(S)08 on-chip peripherals.



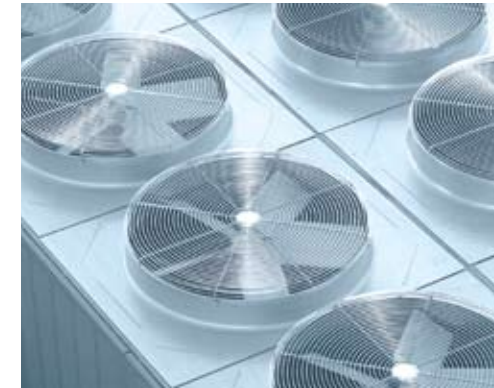
### USB Mini Board for Freescale's Low-End 8-bit

**Microcontrollers (USBSPYDER08):** To aid fast and easy development for embedded systems engineers working on our low-end microcontrollers, Freescale has developed the cost-effective, high-performance USB debug tool—the USBSPYDER08. With the USBSPYDER08 you can spy into your application software, debug 8 leg 8-bit microcontrollers before you have your application board and kill bugs in your application software. This complete package delivers a cost-effective, yet powerful way to develop your products and speed time to market.



### Evaluation Boards (EVB):

Evaluation boards allow users to program and debug advanced application code with expanded I/O functions and peripherals. HC(S)08 EVBs may include advanced 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.



The Entry Point on the Controller Continuum—Only from Freescale

# The Perfect 8-bit Compilation

## Product summary

**Learn More:** For more information about 8-bit family products, please visit [www.freescale.com/8bit](http://www.freescale.com/8bit).

General Purpose Products

Device	Flash	RAM	USB	ADC Channels		SCI (UART)	SPI	I <sup>2</sup> C	COMP	Timer	Clock Type	Package					Dev Tools			Applications/Additional Features	Price	
				10-bit	12-bit							DFN/QFN	QFP/LQFP	TSSOP	SOIC	DIP	DEMO	EVB	BDM			
MC9RS08KA8	8 KB	254B			12			✓	✓	1 x 2-ch., MTIM	ICS				8	8	✓	✓	✓	More integration, new RS08 core with small MCUs	\$0.60	
MC9RS08KA4	4 KB	126B			12			✓	✓	1 x 2-ch., MTIM	ICS				8	8	✓	✓	✓	More integration, new RS08 core with small MCUs	\$0.55	
MC9RS08KA2	2 KB	62B						✓	✓	MTIM	ICS	6			8	8	✓	✓	✓	Ultra-low end, new RS08 core for small MCUs	\$0.35	
MC9RS08KA1	1 KB	62B						✓	✓	MTIM	ICS	6			8	8	✓	✓	✓	Ultra-low end, new RS08 core for small MCUs	\$0.32	
MC9RS08LA8	8 KB	256B			6		✓	✓	✓	1 + 2-ch.	ICS w/FLL	48	48				✓	✓	✓	Integrated Liquid Crystal Display (LCD) driver with high segment count	\$0.99	
MC9RS08LE4	4 KB	256B			8		✓	✓	✓	2 + 2-ch.	ICS w/FLL				28		✓	✓	✓	Integrated Liquid Crystal Display (LCD) driver with high segment count	\$0.90	
MC9S08AC128	128 KB	8 KB			16		✓	✓	✓	6 + 6 + 2-ch.	ICG w/FLL	48	80, 64				✓	✓	✓	High integration, flash programmable to 5V	\$2.67	
MC9S08AC96	96 KB	6 KB			16		✓	✓	✓	6 + 6 + 2-ch.	ICG w/FLL	48	80, 64				✓	✓	✓	High integration, flash programmable to 5V	\$2.48	
MC9S08AC60	60 KB	2 KB			16		✓	✓	✓	6 + 2 + 2-ch.	ICG w/FLL	48	64, 44, 32				✓	✓	✓	High integration, flash programmable to 5V	\$1.98	
MC9S08AC48	48 KB	2 KB			16		✓	✓	✓	6 + 2 + 2-ch.	ICG w/FLL	48	64, 44, 32				✓	✓	✓	High integration, flash programmable to 5V	\$1.91	
MC9S08AC32	32 KB	2 KB			16		✓	✓	✓	6 + 2 + 2-ch.	ICG w/FLL	48	64, 44, 32				✓	✓	✓	High integration, flash programmable to 5V	\$1.84	
MC9S08AC16	16 KB	1 KB			8		✓	✓	✓	6 + 2-ch.	ICG w/FLL	48	44, 32			42	✓	✓	✓	High integration, flash programmable to 5V	\$1.56	
MC9S08AC8	8 KB	1 KB			8		✓	✓	✓	6 + 2-ch.	ICG w/FLL	48	44, 32			42	✓	✓	✓	High integration, flash programmable to 5V	\$1.45	
MC9S08AW60	60 KB	2 KB			16		✓	✓	✓	6 + 2-ch.	ICG w/FLL	48	64, 44				✓	✓	✓	High integration, flash programmable to 5V	\$2.62	
MC9S08AW48	48 KB	2 KB			16		✓	✓	✓	6 + 2-ch.	ICG w/FLL	48	64, 44				✓	✓	✓	High integration, flash programmable to 5V	\$2.41	
MC9S08AW32	32 KB	2 KB			16		✓	✓	✓	6 + 2-ch.	ICG w/FLL	48	64, 44				✓	✓	✓	High integration, flash programmable to 5V	\$1.99	
MC9S08AW16	16 KB	1 KB			16		✓	✓	✓	4 + 2-ch.	ICG w/FLL	48	64, 44				✓	✓	✓	High integration, flash programmable to 5V	\$1.85	
MC9S08EL32	32 KB	1K			16/12		✓	✓	✓	1 x 4-ch., 1 x 2-ch.	ICS			28, 20			✓	✓	✓	Embedded SLIC and on-chip EEPROM	\$1.87	
MC9S08EL16	16 KB	1K			16/12		✓	✓	✓	1 x 4-ch., 1 x 2-ch.	ICS			28, 20			✓	✓	✓	Embedded SLIC and on-chip EEPROM	\$1.60	
MC9S08GB60A	60 KB	4 KB			8		✓	✓	✓	3 + 5-ch.	ICG		64				✓	✓	✓	High performance, flash programmable down to 1.8V	\$3.55	
MC9S08GB32A	32 KB	2 KB			8		✓	✓	✓	3 + 5-ch.	ICG		64				✓	✓	✓	High performance, flash programmable down to 1.8V	\$2.65	
MC9S08GT60A	60 KB	4 KB			8		✓	✓	✓	2 + 2-ch.	ICG	48	44			42	✓	✓	✓	High performance, flash programmable down to 1.8V	\$3.28	
MC9S08GT32A	32 KB	2 KB			8		✓	✓	✓	2 + 2-ch.	ICG	48	44			42	✓	✓	✓	High performance, flash programmable down to 1.8V	\$2.38	
MC9S08GT16A	16 KB	2 KB			8		✓	✓	✓	3 + 2-ch.	ICG	48, 32	44			42	✓	✓	✓	High performance, flash programming down to 1.8V	\$1.65	
MC9S08GT8A	8 KB	1 KB			8		✓	✓	✓	3 + 2-ch.	ICG	48, 32	44			42	✓	✓	✓	Flash programming down to 1.8V, small package	\$1.36	
MC9S08JM60	60 KB	4K	2.0		12		✓	✓	✓	1 x 2-ch., 1 x 6-ch.	MCG with PLL and FLL	48	64, 44				✓	✓	✓	USB S08 device with high performance and integration	\$2.60	
MC9S08JM32	32 KB	2K	2.0		12		✓	✓	✓	1 x 2-ch., 1 x 6-ch.	MCG with PLL and FLL	48	64, 44				✓	✓	✓	USB S08 device with high performance and integration	\$1.87	
MC9S08JM16	16 KB	1K	2.0		12		✓	✓	✓	1 x 4-ch., 1 x 2-ch.	MCG with PLL and FLL	48	44, 32				✓	✓	✓	USB S08 device with high performance and integration	\$1.62	
MC9S08JM8	8 KB	1K	2.0		12		✓	✓	✓	1 x 4-ch., 1 x 2-ch.	MCG with PLL and FLL	48	44, 32				✓	✓	✓	USB S08 device with high performance and integration	\$1.57	
MC9S08JS16	16 KB	512B	2.0		1		✓	✓	✓	1 x 2-ch., MTIM	MCG with PLL and FLL	24			20		✓	✓	✓	USB S08 device with high performance and integration	\$1.27	
MC9S08JS8	8 KB	512B	2.0		1		✓	✓	✓	1 x 2-ch., MTIM	MCG with PLL and FLL	24			20		✓	✓	✓	USB S08 device with high performance and integration	\$1.06	
MC9S08LC60	60 KB	4 KB			8		✓	✓	✓	2 + 2-ch.	ICG w/FLL		80, 64				✓	✓	✓	Integrated Liquid Crystal Display (LCD) driver with high segment count	\$3.52	
MC9S08LC36	36 KB	2.5 KB			8		✓	✓	✓	2 + 2-ch.	ICG w/FLL		80, 64				✓	✓	✓	Integrated Liquid Crystal Display (LCD) driver with high segment count	\$2.99	
MC9S08LL16	16 KB	2 KB			8		✓	✓	✓	2 + 2-ch.	ICS w/FLL	48	64, 48				✓	✓	✓	Integrated Liquid Crystal Display (LCD) driver with high segment count	\$1.59	
MC9S08LL8	8 KB	2 KB			8		✓	✓	✓	1 + 2-ch.	ICS w/FLL	48	48				✓	✓	✓	Integrated Liquid Crystal Display (LCD) driver with high segment count	\$1.50	
MC9S08QA4	4 KB	256B			4		✓	✓	✓	1-ch., MTIM	ICS	8			8	8	✓	✓	✓	Low-end S08 device with 1.8V to 3.6V op range	\$0.63	
MC9S08QA2	2 KB	160B			4		✓	✓	✓	1-ch., MTIM	ICS	8			8	8	✓	✓	✓	Low-end S08 device with 1.8V to 3.6V op range	\$0.59	
MC9S08QB8	8 KB	512B			8		✓	✓	✓	1 + 1-ch.	ICS	24		16	16, 28	16	✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$0.85	
MC9S08QB4	4 KB	256B			8		✓	✓	✓	1 + 1-ch.	ICS	24		16	16, 28	16	✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$0.77	
MC9S08QD4	4 KB	256B			4		✓	✓	✓	2 + 3-ch.	ICS				8	8	✓	✓	✓	Low-end, flash programmable to 5V	\$0.64	
MC9S08QD2	2 KB	128B			4		✓	✓	✓	2 + 3-ch.	ICS					8	8	✓	✓	✓	Low-end, flash programmable to 5V	\$0.60
MC9S08QE128	128 KB	8 KB				24	✓	✓	✓	1 + 6-ch., 2 + 3-ch.	ICS	48	80, 64, 44				✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$2.42	
MC9S08QE96	96 KB	6 KB				24	✓	✓	✓	1 + 6-ch., 2 + 3-ch.	ICS	48	64, 44				✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$2.30	
MC9S08QE64	64 KB	4 KB				24	✓	✓	✓	1 + 6-ch., 2 + 3-ch.	ICS	48	80, 64, 44, 32				✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$2.13	
MC9S08QE32	32 KB	2 KB			10 (12-bit)		✓	✓	✓	1 + 6-ch., 2 + 3-ch.	ICS	48	44, 32			28	✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$1.68	
MC9S08QE16	16 KB	1 KB			10 (12-bit)		✓	✓	✓	1 + 6-ch., 2 + 3-ch.	ICS	48	44, 32			28	✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$1.48	
MC9S08QE8	8 KB	512B				10	✓	✓	✓	2 + 3-ch.,	ICS w/FLL		32	16	20, 28	16	✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$1.08	
MC9S08QE4	4 KB	256B				10	✓	✓	✓	2 + 3-ch.,	ICS w/FLL		32	16	20, 28	16	✓	✓	✓	Ultra-low power S08 device with 1.8V to 3.6V op range	\$0.94	
MC9S08QG8	8 KB	512B			8		✓	✓	✓	2-ch., MTIM	ICS	8, 16, 24			16	8	16	✓	✓	✓	High performance, low voltage, small package	\$0.75
MC9S08QG4	4 KB	256B			8		✓	✓	✓	2-ch., MTIM	ICS	8, 16, 24			16	8	16, 8	✓	✓	✓	High performance, low voltage, small package	\$0.70
MC9S08SE8	8 KB	512B			10		✓	✓	✓	1 + 2-ch., 1 + 1-ch.	ICS				16	28	28	✓	✓	✓	Low-end S08 device with 2.7V to 5.5V op range	\$0.85
MC9S08SE4	4 KB	256B			10		✓	✓	✓	1 + 2-ch., 1 + 1-ch.	ICS				16	28	28	✓	✓	✓	Low-end S08 device with 2.7V to 5.5V op range	\$0.77
MC9S08SH32	32 KB	1 KB			16		✓	✓	✓	2 x 2-ch., MTIM	ICS			28, 20, 16	28			✓	✓	✓	Low-end S08 device with 2.7V to 5.5V op range	\$1.47
MC9S08SH16	16 KB	1 KB			16		✓	✓	✓	2 x 2-ch., MTIM	ICS			28, 20, 16	28			✓	✓	✓	Low-end S08 device with 2.7V to 5.5V op range	\$1.31
MC9S08SH8	8 KB	512B			12		✓	✓	✓	2 + 2-ch.	ICS							✓	✓	✓	Low-end S08 device with 2.7V to 5.5V op range	\$0.96
MC9S08SH4	4 KB	256B			12		✓	✓	✓	2 + 2-ch.	ICS	24			20, 16	8	20	✓	✓	✓	Low-end S08 device with 2.7V to 5.5V op range	\$0.86
MC9S08SL16	16 KB	512B			16/12		✓	✓	✓	2 x 2-ch.	ICS							✓	✓	✓	Embedded SLIC and on-chip EEPROM	\$1.54
MC9S08SL8	8 KB	512B			16/12		✓	✓	✓	2 x 2-ch.	ICS							✓	✓	✓	Embedded SLIC and on-chip EEPROM	\$1.41

Application Specific Products

Device	Flash	RAM	USB	ADC Channels	SCI (UART)	SPI	I <sup>2</sup> C	COMP	Timer	Clock Type	Package					Dev Tools			Applications/Additional Features	Price		
											DFN/QFN	QFP/LQFP	TSSOP	SOIC	DIP	DEMO	EVB	BDM				
MC9S08DN60	60 KB	4 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with EEPROM	\$2.84
MC9S08DN48	48 KB	2 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with EEPROM	\$2.65
MC9S08DN32	32 KB	2 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with EEPROM	\$2.47
MC9S08DN16	16 KB	1 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with EEPROM	\$2.28
MC9S08DV128	128 KB	8 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN	\$3.45
MC9S08DV96	96 KB	6 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN	\$3.16
MC9S08DV60	60 KB	4 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN	\$2.93
MC9S08DV48	48 KB	2 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN	\$2.74
MC9S08DV32	32 KB	2 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN	\$2.56
MC9S08DV16	16 KB	1 KB			16		✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN	\$2.37
MC9S08DZ128	128 KB	8 KB				24	✓	✓	✓	8-ch.	OSC			100, 64, 48				✓	✓	✓	S08 5V device with CAN and EEPROM	\$3.62
MC9S08DZ96	96 KB	6 KB				24	✓	✓	✓	8-ch.	OSC			100, 64, 48				✓	✓	✓	S08 5V device with CAN and EEPROM	\$3.32
MC9S08DZ60	60 KB	4 KB				24	✓	✓	✓	8-ch.	OSC			64, 48, 32				✓	✓	✓	S08 5V device with CAN and EEPROM	\$3.07