Fact Sheet

S12XF Family

Making FlexRay™ satellite nodes affordable

Overview

The MC9S12XF family is Freescale's latest high-performance distributed control solution for embedded nodes on FlexRay™ networks used in body, chassis and safety applications based on our S12X architecture. The S12XF family features four highly integrated MCUs offering a range of memory configurations and our performance-boosting XGATE coprocessor. Package options range from the 112-pin low-profile quad flat-pack (LQFP) to the 10 mm x 10 mm 64-pin LQFP, making the S12XF family of MCUs one of the smallest FlexRay controllers available while helping reduce system cost.

Product Map

S12XF Family	Flash	RAM	EEPROM	I/O	Frequency	XGATE	ECC	FlexRay™	CAN	SCI	SPI	ADC	PWM	Timer	PIT	KWU	Package Options
S12XF512	512 KB	32 KB	4 KB	91	50 MHz	√	√	√	1	2	2	16-Ch., 12-bit	6-Ch., 15-bit	8-Ch, 16-bit	4-Ch.	11	112 LQFP, 64 LQFP
S12XF384	384 KB	24 KB	4 KB	91	50 MHz	√	√	√	1	2	2	16-Ch., 12-bit	6-Ch., 15-bit	8-Ch, 16-bit	4-Ch.	11	112 LQFP, 64 LQFP
S12XF256	256 KB	20 KB	2 KB	91	50 MHz	√	√	√	1	2	2	16-Ch., 12-bit	6-Ch., 15-bit	8-Ch, 16-bit	4-Ch.	11	112 LQFP, 64 LQFP
S12XF128	128 KB	16 KB	2 KB	91	50 MHz	√	√	√	1	2	2	16-Ch., 12-bit	6-Ch., 15-bit	8-Ch, 16-bit	4-Ch.	11	112 LQFP, 64 LQFP

Product Benefits

- Small package size (10 mm x 10 mm 64-pin LQFP) is ideal for space constrained applications
- Helps reduce system cost by offering a 16-bit alternative for satellite nodes
- Offers 16-bit code efficiency and range of memory options (128 KB–512 KB) to meet specific design needs
- Delivers up to 50 MHz CPU performance plus XGATE coprocessor
- Leverages extensive suite of hardware and software development tools available today for the S12X Architecture

Applications

- Suspension control
- Active rollover prevention
- Active braking
- Lane departure warning
- Parking maneuver assistance
- Electronic parking brakes
- Other active driving assistance features

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Features and Benefits Table

Features	Benefits
• 50 MHz 16-bit CPU12X • XGATE I/O coprocessor module with up to 100 MHz bus frequency • Enhanced Interrupt Module • Memory Protection Unit	• Proven S12X architecture: efficiency in cost, code, power consumption and EMC • XGATE enhances MCU performance by offloading main CPU, provides design flexibility, and enables system cost reductions by integrating functionality
• FlexRay protocol conforms to FlexRay V2.1 Specification • Supports data rates of 2.5, 5, 8 and 10 MBit/s on each of the two channels • Up to two channels for fault tolerant systems • 32 configurable message buffers configurable from 0 up to 254 bytes	• Enables next-generation vehicle networking: high bandwidth, determinism and fault tolerance
Memory	
• 128 KB to 512 KB embedded flash memory with error correction coding (ECC)	• Range of memory options (128 KB–512 KB) to meet specific design needs • Proven flash technology customers can count on
Clock	
• Internally filtered phase-locked-loop (IPLL)—no external components required • Fast wake up from STOP for power saving and immediate program execution	• Requires fewer off-chip components, reducing system cost and EMC
Package Options	
• 112-pin LQFP • 64-pin LQFP	• 64-pin provides the smallest FlexRay MCU available, ideal for size constrained requirements of FlexRay satellite nodes

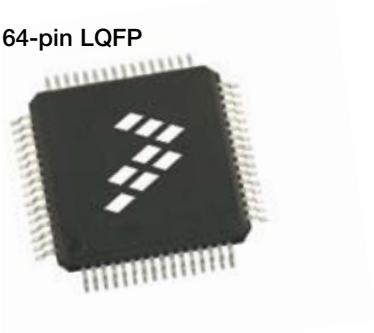
Device and Package Options with Part Numbers

Part Number	Package	Temperature
MC9S12XF512	64 LQFP, 112 LQFP	C, V, M
MC9S12XF384	64 LQFP, 112 LQFP	C, V, M
MC9S12XF256	64 LQFP, 112 LQFP	C, V, M
MC9S12XF128	64 LQFP, 112 LQFP	C, V, M

C = -40°C to +85°C, V = -40°C to +105°C, M = -40°C to +125°C

112-pin LQFP

64-pin LQFP



Development Tools

S12XFSTARTERKIT (Kit)

EVB9S12XF512 (EVB)

USBMULTILINKBDME (BDM Multilink)

M68CYCLONEPROE (Cyclone Pro Universal Stand-Alone In-Circuit Debugger/Programmer)

INDARTONE (Stand-Alone In-Circuit Debugger/Programmer)

CodeWarrior® Development Studio for Freescale HCS12(X) v4.x

- CWX-HXX-SE Special Edition
- CWS-H12-STDED-CX Standard Edition
- CWS-H12-PROED-CX Professional Edition
- CWS-H12-C64K-CX 64K C Upgrade for Special Edition
- CWX-H12-STDED-UX HCS12(X) Upgrade to Standard Edition
- CWX-H12-PROED-UX HCS12(X) Upgrade Standard to Professional Edition

Learn More: For more information about our FlexRay networking products, please visit **www.freescale.com/S12X**.

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