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### What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

## Applications of "<u>Embedded -</u> <u>Microcontrollers</u>"

#### Details

Product Status	Not For New Designs
Core Processor	HCS12X
Core Size	16-Bit
Speed	80MHz
Connectivity	CANbus, EBI/EMI, I <sup>2</sup> C, IrDA, LINbus, SCI, SPI
Peripherals	LCD, Motor control PWM, POR, PWM, WDT
Number of I/O	117
Program Memory Size	512KB (512K x 8)
Program Memory Type	FLASH
EEPROM Size	4K x 8
RAM Size	32K x 8
Voltage - Supply (Vcc/Vdd)	2.35V ~ 5.5V
Data Converters	A/D 16x8/10b
Oscillator Type	External
Operating Temperature	-40°C ~ 105°C (TA)
Mounting Type	Surface Mount
Package / Case	144-LQFP
Supplier Device Package	144-LQFP (20x20)
Purchase URL	https://www.e-xfl.com/product-detail/nxp-semiconductors/s912xhz512f1vag

Email: info@E-XFL.COM

Address: Room A, 16/F, Full Win Commercial Centre, 573 Nathan Road, Mongkok, Hong Kong



# 16-bit Microcontrollers

# **S9S12XHY Family** For automotive instrument cluster applications

# Overview

The cost-effective, high-performance, optimized automotive 16-bit S9S12XHY family is intended to bridge the gap between low-end 16-bit microcontrollers, such as the S9S12HY family, and high-performance 32-bit solutions. Targeting low-end automotive instrument cluster applications, the S9S12XHY family includes support for CAN and LIN/J2602 communication and delivers typical cluster requirements such as stepper motor control with stepper stall detection (SSD) and LCD driver. It's a cost-competitive solution to complement the 9S12HY64/32 devices and address emerging market needs for low-end clusters.

The S9S12XHY family uses many of the same features found in the S9S12HY family, including error correction code (ECC) on flash memory, a separate data flash module for diagnostic or data storage, a fast analog-to-digital converter (ADC) and a frequency modulated phase-locked loop (PLL) for improved EMC performance. These integrated features enable you to design a more cost-effective application. The S9S12XHY family delivers the advantages and efficiencies of a 16-bit MCU while retaining the low-cost, power consumption, EMC and code-size efficiency advantages of existing 8-bit and 16-bit MCU families.





Like the S9S12HY family, the S9S12XHY family will run 16-bit wide accesses without wait states for peripherals and memories. In addition to the I/O ports available in each module, further I/O ports are available with interrupt capability, allowing wake-up from stop or wait modes. The S9S12XHY family is available in 100-pin QFP and 112-pin LQFP package options and maximizes pin compatibility with the S9S12HY/HA family in the 100 LQFP.

## **Target Applications**

- Entry-level instrument clusters
- Automotive HVAC
- Automotive audio

### **Development Tools**

The S9S12XHY family leverages and expands the extensive suite of hardware and software development tools available for the S12 and S12X families.

DEMO board: DEMO9S12XHY256

Reference design: S12XHY-DEMO-V1

CodeWarrior Development Studio for Microcontrollers

Features	Benefits		
LCD driver, configurable up to 40 x 4	Does not need external LCD driver, which delivers lower cost		
Stepper motor controller with drivers for up to four motors, hardware SSD	Does not need external stepper motor driver, which lowers the cost. Hardware SSD is convenient in motor control application		
HCS12X CPU core with 40 MHz bus frequency	Higher performance		
Up to 256 KB on-chip flash with ECC	Adequate memory size for application code ECC provides extra data/program safety		
8 KB data flash with ECC	Convenient data storage ECC provides extra data/program safety		
Two multi-scalable controller area network (MSCAN) modules (supporting CAN protocol 2.0A/B)	CAN bus communication		
Up to two serial communication interface (SCI) modules supporting LIN 1.3, 2.0, 2.1 and SAE J2602 communications	LIN bus communication		

Refer to datasheet for more features

Package Options						
Part Number	Package	Flash Size	Ram Size	Temp Ranges		
S9S12XHY256F0MLM	112 LQFP (Pb-free)	256K	12K	Operating temperature (TA) of -40°C to +125°C		
S9S12XHY256F0MLL	100 LQFP (Pb-free)	256K	12K	Operating temperature (TA) of -40°C to +125°C		
S9S12XHY128F0MLM	112 LQFP Pb-free)	128K	8K	Operating temperature (TA) of -40°C to +125°C		
S9S12XHY128F0MLL	100 LQFP (Pb-free)	128K	8K	Operating temperature (TA) of -40°C to +125°C		

Learn More:

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