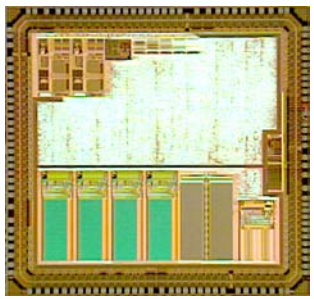
HCS12
16-bit Microcontroller Overview



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Agenda

- Market Focus
- HCS12 Family Overview
- Benefits of Flash
- Converging Technologies
- Motorola 16-bit MCU Roadmap
- Block Diagrams
- Development Kit
- More Information About the HCS12 Family

Market Focus

8- and 16-bit Microcontrollers

Embedded Networking

General-Purpose Products

White Goods/ Electronic Motor Control

PC Peripherals

Service
+
Reference Designs
+
Development Tools
+
Software
+
Silicon

Automotive

Displays

.HCS12 Family Overview

The Next Generation of the Highly Successful 68HC12 Architecture

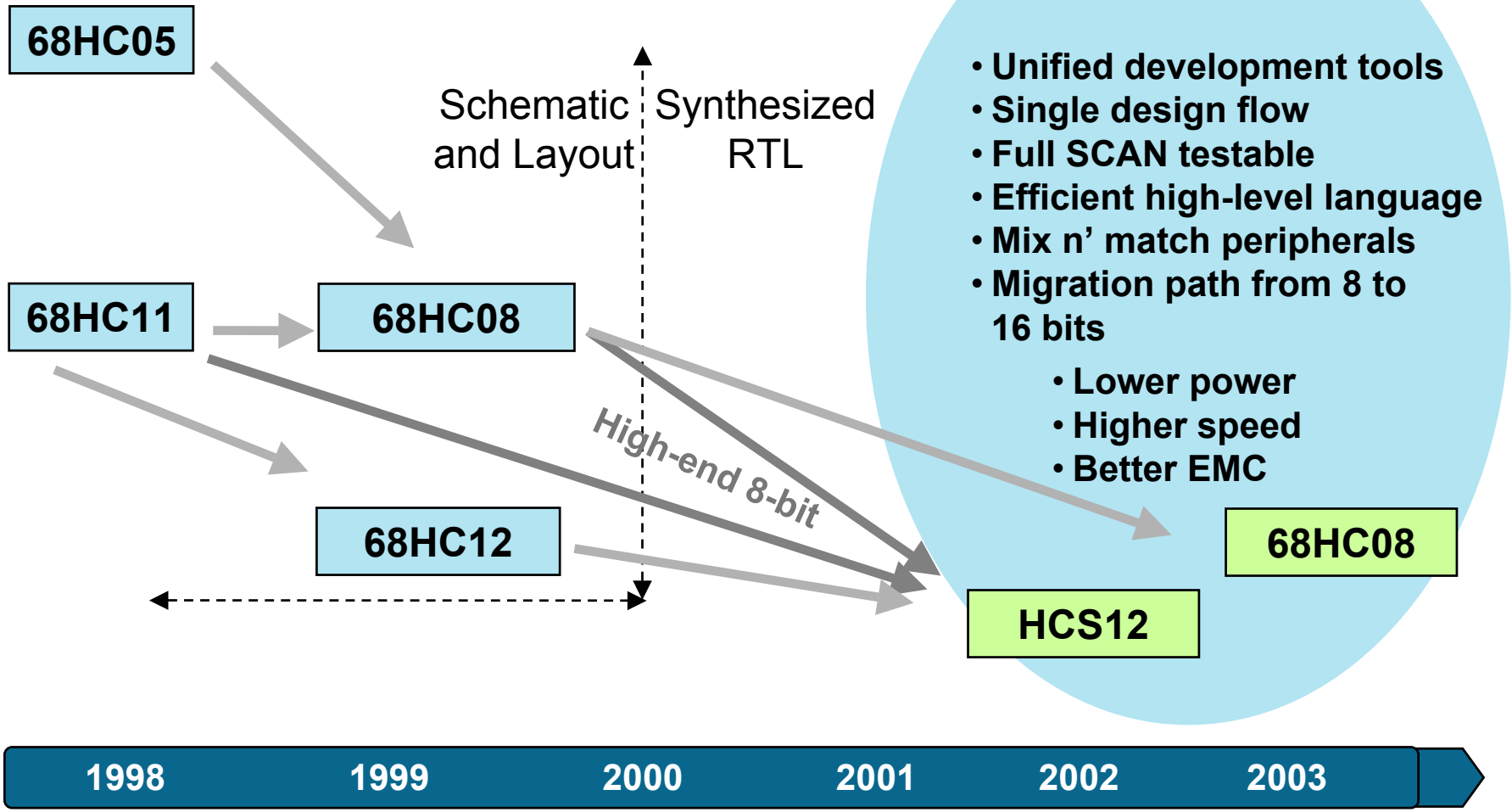
- Utilizes Motorola's industry-leading, third-generation Flash technology
- Provides an upward migration path from the 68HC08, 68HC11, and 68HC12
- One of the world's largest 16-bit MCU development teams
- Offers a wide variety of memory and peripheral options for scalable system designs
- Supported by revolutionary cost-effective, high-performance development tools

Benefits of Flash

- Motorola was first to market with fully qualified AEC Flash.
- Motorola's third-generation 0.25µ Flash technology becomes more affordable as size of Flash approaches size of ROM.
- Byte block erasable Flash can be used as data EEPROM.
- In-application programming makes field upgrades easy.
- Fast programming reduces development, debug, and production programming times.
- Third-generation Flash programs across the full operating voltage range.
- Third-generation Flash offers flexible block protection and security.

Converging Technologies

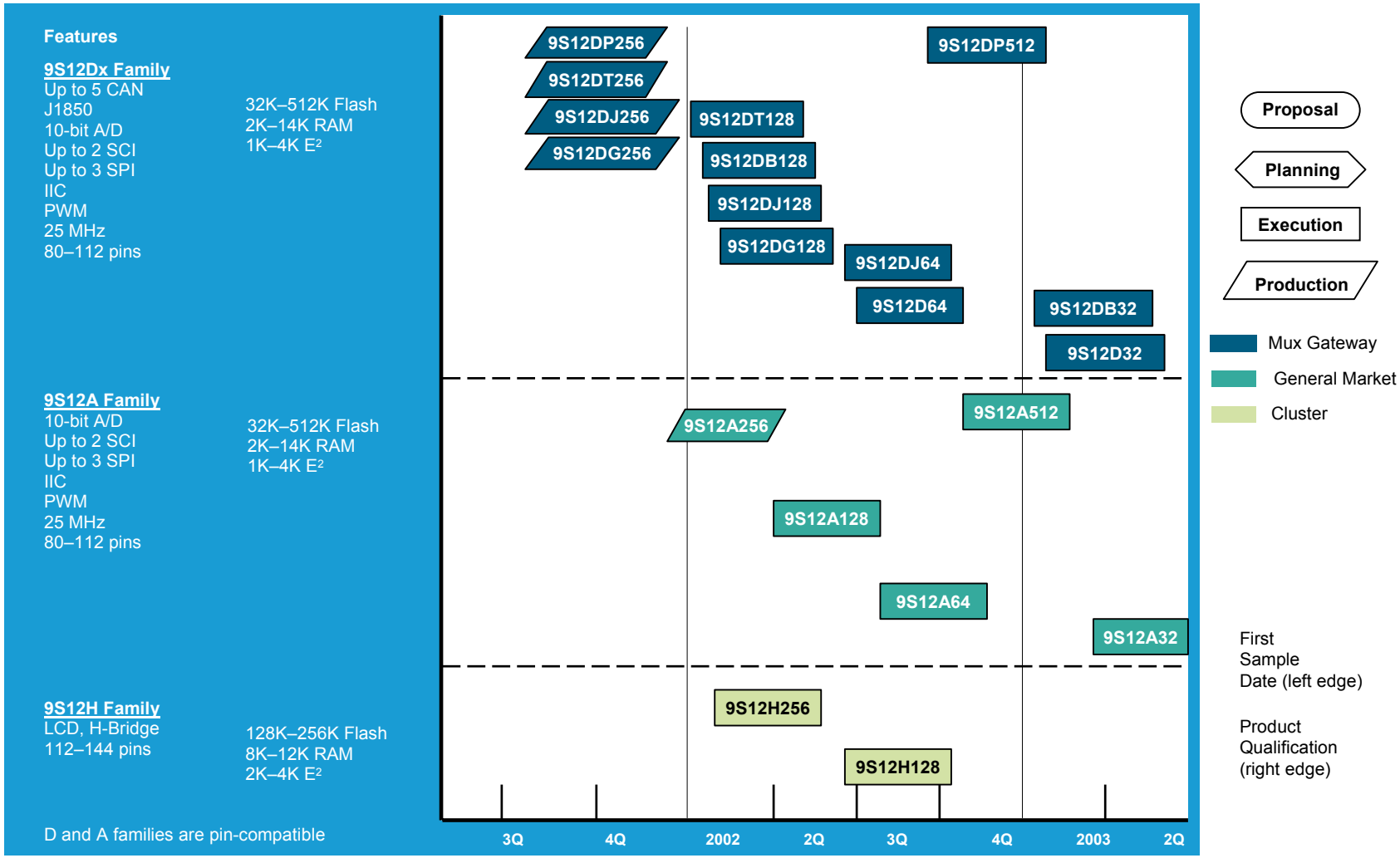
8- and 16-bit MCU Migration



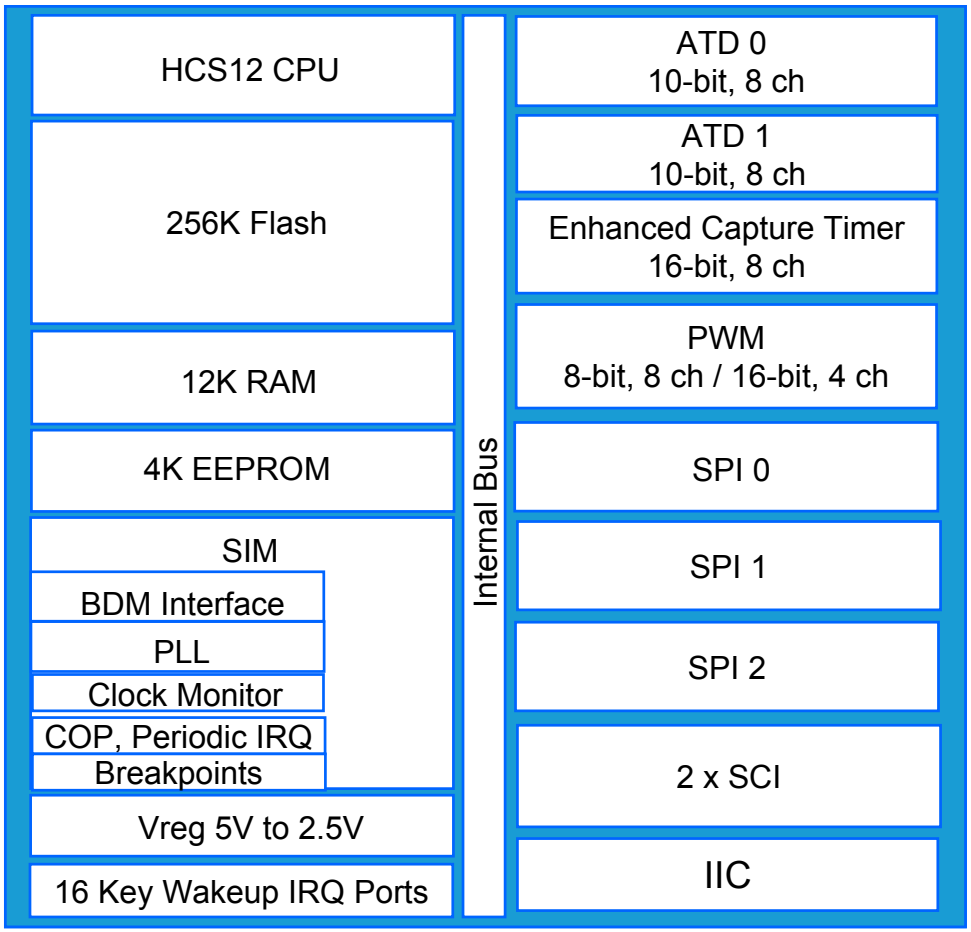
Converging Technologies
Migration from HC12 to HCS12

- Identical programming model
- Same instruction set (mnemonic and opcodes)
- 0.25µ technology
- Higher bus speed of up to 25 MHz
- Many instructions with reduced cycle count
- 5V Flash cell technology with internal programming logic
- 2.5V logic with internal voltage regulator (5V to 2.5V)
- Full 5V I/O ports
- Fully synthesized design/design for test
- Technical conversion document available at www.motorola.com/semiconductors

Motorola 16-bit MCU Roadmap



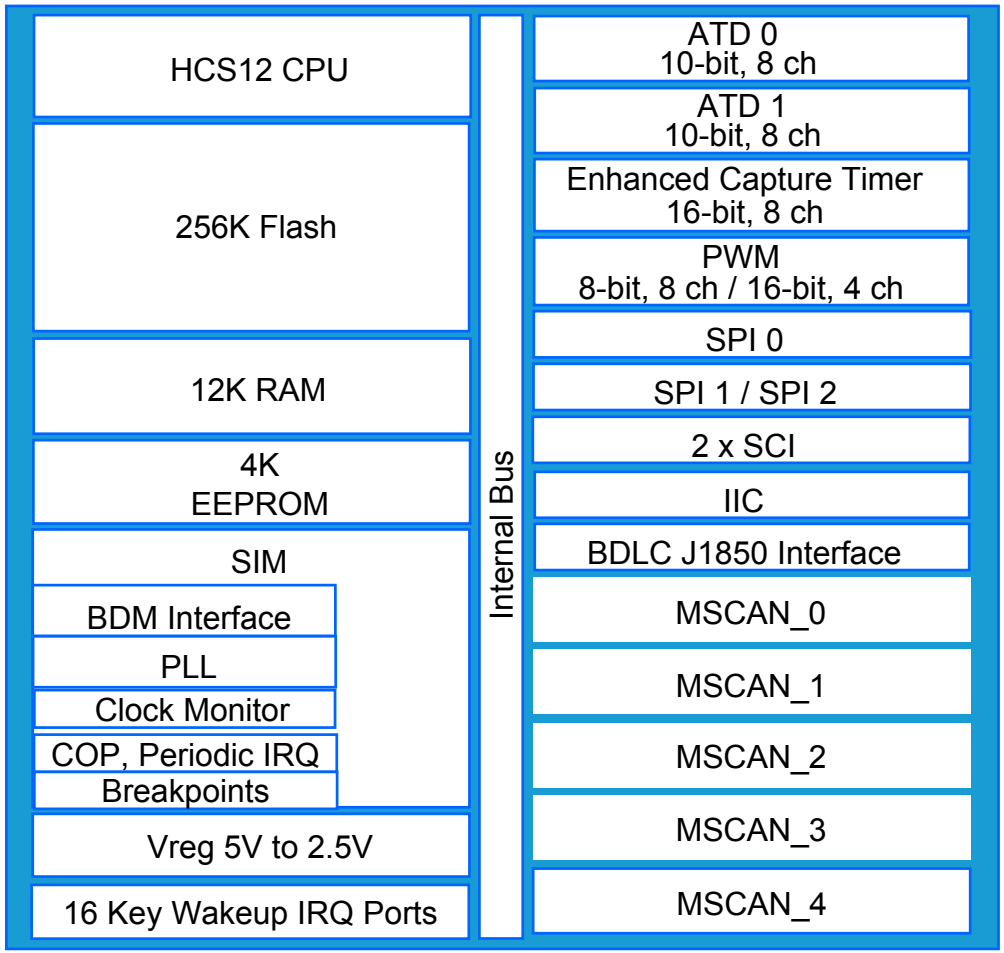
MC9S12A256



80/112 QFP Package

- 0.25µ CDR 3 technology
  - synthesized core
- 5V supply voltage / 5V I/O
  - 2.5V internal core
- 25 MHz HCS12 core
  - 3x performance increase over HC12 core
- Memory
  - 256K Flash comprised of 4 x 64K blocks, 12K RAM, 4K EEPROM
- Communications
  - 3 x SPI, 2 x SCI
  - IIC
- 2 x 8 channels, 10-bit ATD
- 4 channels, 16-bit / 8 channels, 8-bit PWM
- 8 channels, 16-bit ECT

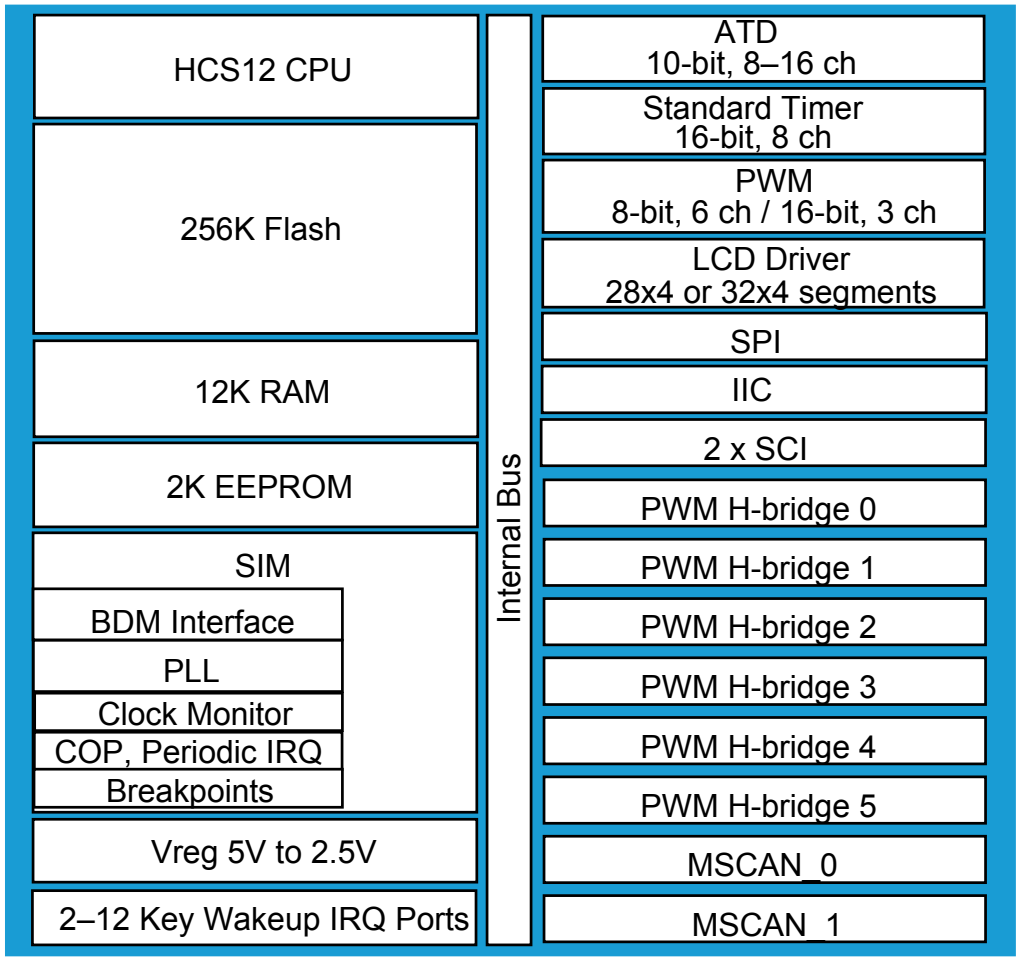
MC9S12DP256



80/112 QFP Package

- 0.25µ CDR 3 technology
  - synthesized core
- 5V supply voltage / 5V I/O
  - 2.5V internal core
- 25 MHz HCS12 core
  - 3x performance increase over HC12 core
- Memory
  - 256K Flash comprised of 4 x 64K blocks, 12K RAM, 4K EEPROM
- Communications
  - 5 x Motorola Scalable CAN (MSCAN) 2.0 A/B-compliant
  - 3 x SPI, 2 x SCI
  - J1850
- 2 x 8 channels, 10-bit ATD
- 4 channels, 16-bit / 8 channels, 8-bit PWM
- 8 channels, 16-bit ECT

IC9S12H256



144/112 QFP Package

- 0.25µ CDR 3 technology
  - synthesized core
- 5V supply voltage / 5V I/O
  - 2.5V internal core
- 16 MHz HCS12 core
  - 2x performance increase over HC12 core
- Memory
  - 128–256K Flash, 12K RAM, 2K EEPROM
- Communications
  - 2 x MSCAN 2.0 A/B-compliant
  - 2 x SCI, IIC, SPI
- 8 or 16 channels, 10-bit ATD
- 3 channels, 16-bit / 6 channels, 8-bit PWM
- 8 channels, 16-bit timer
- 12 channels, 7–11-bit PWM H-bridge for motor control
- 128 segment LCD driver

Development Kit

HCS12 D and A Families: M68KIT912DP256

BDM Multilink Cable

- **Real-time in-circuit emulation and debug through the MCU's dedicated BDM interface**
- **Fast Flash programming**

Evaluation Board

- **MC9S12DP256 with 256K Flash**
- **Prototyping area**

US$950*
Limited time special offer:
US$495

CodeWarrior™ Integrated Development Environment

- **Debugger, assembler, linker, Flash programmer**

*** North American suggested retail price**

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More Information About the HCS12 Family

Visit us at www.motorola.com/semiconductors

- HCS12 Family Product Library
- Motorola's HCS12 Family of Microcontrollers Brochure (8/16BITPAK/D)
- Microcontroller Selector Guide (SG1006/D, SG1011/D)
- Online Third-Party Tool Vendor Listing
- Microcontroller Design Resources

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