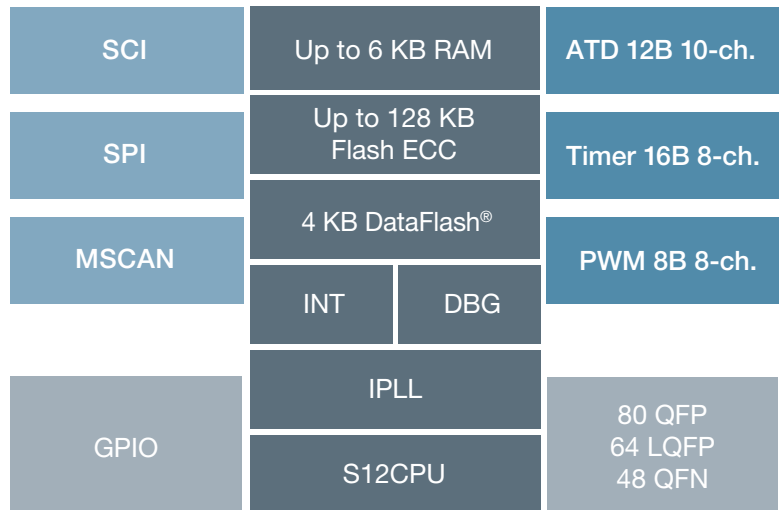16-bit Microcontrollers

S12P Family
Pushing the boundaries of 16-bit CAN microcontrollers

Overview

The S12P family of CAN microcontrollers (MCUs) offers the enhanced features of 16-bit performance but at the value of 8-bit MCUs. The S12P family bridges the gap between 8- and 16-bit automotive CAN MCUs and serves as the entry point into Freescale's 16-bit family offerings. Compatible and scalable with the S12XS family, the S12P now allows for you to have a range of lower sized memory and feature set options for your applications.

The family includes four devices that offer an array of program and data flash memory sizes with ECC, RAM, a MSCAN module and package options that scale from 48–80 pins. An advanced 48-pin "Punch" QFN packaging option is available that is optimized from small footprint applications and enhances visual inspection at final assembly as opposed to using costly X-ray inspection. With an array of feature set and packaging options available, the S12P family is ideal for a range of body control applications.

S12P Family Block Diagram

SCI	Up to 6 KB RAM	ATD 12B 10-ch.
SPI	Up to 128 KB Flash ECC	Timer 16B 8-ch.
MSCAN	4 KB DataFlash®	PWM 8B 8-ch.
	INT / DBG	
GPIO	IPLL	80 QFP 64 LQFP 48 QFN
	S12CPU	

Applications

- Space-constrained applications
- Window lift
- Door modules
- Seat controllers
- HVAC control
- Anti-Lock Braking (ABS) and Electronic Power Assisted Steering (EPAS) systems
- Occupant detection
- Power steering modules

S12P Product Table

Product	Frequency	Flash	ECC	RAM	DataFlash®	I/O	CAN	SCI	SPI	ADC	PWM	Timer	Package Options
9S12P128	32 MHz	128 KB	✓	6 KB	4 KB	Up to 64	1	1	1	10-ch., 12-bit	6-ch., 8-bit	8-ch., 16-bit	80 QFP, 64 LQFP, 48 QFN
9S12P96	32 MHz	96 KB	✓	6 KB	4 KB	Up to 64	1	1	1	10-ch., 12-bit	6-ch., 8-bit	8-ch., 16-bit	80 QFP, 64 LQFP, 48 QFN
9S12P64	32 MHz	64 KB	✓	4 KB	4 KB	Up to 64	1	1	1	10-ch., 12-bit	6-ch., 8-bit	8-ch., 16-bit	80 QFP, 64 LQFP, 48 QFN
9S12P32	32 MHz	32 KB	✓	2 KB	4 KB	Up to 64	1	1	1	10-ch., 12-bit	6-ch., 8-bit	8-ch., 16-bit	80 QFP, 64 LQFP, 48 QFN

Key Features

- S12 core, 32 MHz Bus
- Up to 128K of on-chip flash with ECC
- Up to 6K RAM
- 4K DataFlash® with ECC
- 1 MSCAN module supporting CAN protocol 2.0 A/B
- 1 SCI supporting LIN communications, 1 SPI
- 8-channel, 16-bit timer supporting input capture, output compare, counter and pulse accumulator functions
- 10-channel, 12-bit resolution successive approximation analog-to-digital converter (ATD)
- Pulse width modulation (PWM) module with 6 x 8-bit channels
- Phase locked loop (IPLL) frequency multiplier with internal filter
- 4-16 MHz amplitude controlled Pierce oscillator
- 1 MHz internal RC oscillator
- Autonomous periodic interrupt (API)

Hardware Development Selector Guide

Part Number	Description	Pricing*
DEMO9S12PFAME	Demonstration board with soldered 9S12P128 in a 80 QFP package	$99
LFSMPBS12PFM	S12P family 80-pin QFP adapter board for use with the EVB9S12XEP100 evaluation board	$250
LFSMPBS12PE2M	S12P family 64-pin LQFP adapter board for use with the EVB9S12XEP100 evaluation board	$250
LFSMPBS12PC1M	S12P family 48-pin QFN adapter board for use with the EVB9S12XEP100 evaluation board	$250

* Manufacturer's Suggested Resale Price

Enablement Tools

The S12P family leverages and expands on the extensive suite of hardware and software development tools available today for the S12 and S12X families. Cost sensitive S12P family demo boards are available, as well as adapter boards for the existing, fully featured, EVB9S12XEP100 evaluation kits. CodeWarrior® Development Tool Suite and a range of third-party development software support are available for rapid application development.

Learn More: For current information about Freescale products and documentation, please visit **www.freescale.com/s12.**

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