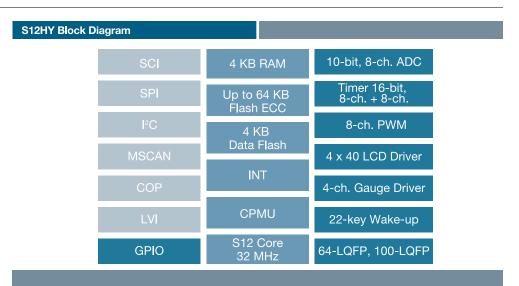16-bit Microcontrollers

S12HY Family
Scalable value line cluster solutions with CAN

Overview

The S12HY64 family of CAN microcontrollers (MCUs) offers the enhanced features of 16-bit performance and tailored features, such as LCD driver and stepper motor driver, for cost-effective instrument cluster applications, especially of interest to emerging markets.

Together with S12(X)HZ, MPC560xS and MPC5121e, Freescale provides a wide product portfolio covering diverse cluster requirements from mopeds to limousines.

The family includes six devices that offer an array of on-chip flash and data flash memory sizes with ECC, RAM, MSCAN and package options that scale from 64 to 100 pins. With an array of feature sets and packaging options available, the S12HY family is ideal for value line cluster applications.

S12HY Block Diagram

SCI	4 KB RAM	10-bit, 8-ch. ADC
SPI	Up to 64 KB Flash ECC	Timer 16-bit, 8-ch. + 8-ch.
I²C	4 KB Data Flash	8-ch. PWM
MSCAN	INT	4 x 40 LCD Driver
COP		4-ch. Gauge Driver
LVI	CPMU	22-key Wake-up
GPIO	S12 Core 32 MHz	64-LQFP, 100-LQFP

Applications

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

Hardware Development Selector Guide

Product	Package	Flash	RAM	Stepper (2)	LCD	DataFlash®	I/O	CAN	SCI	SPI	I²C	ADC	PWM (1)	Timer
MC9S12HY64	100 LQFP	64 KB	4 KB	4	4 x 40	4 KB	80	1	1	1	1	8-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
	64 LQFP	64 KB	4 KB	3	4 x 20	4 KB	50	1	1	1	1	6-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
MC9S12HA64	100 LQFP	64 KB	4 KB	4	4 x 40	4 KB	80	0	1	1	1	8-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
	64 LQFP	64 KB	4 KB	3	4 x 20	4 KB	50	0	1	1	1	6-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
MC9S12HY48	100 LQFP	48 KB	4 KB	4	4 x 40	4 KB	80	1	1	1	1	8-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
	64 LQFP	48 KB	4 KB	3	4 x 20	4 KB	50	1	1	1	1	6-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
MC9S12HA48	100 LQFP	48 KB	4 KB	4	4 x 40	4 KB	80	0	1	1	1	8-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
	64 LQFP	48 KB	4 KB	3	4 x 20	4 KB	50	0	1	1	1	6-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
MC9S12HY32	100 LQFP	32 KB	2 KB	4	4 x 40	4 KB	80	1	1	1	1	8-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
	64 LQFP	32 KB	2 KB	3	4 x 20	4 KB	50	1	1	1	1	6-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
MC9S12HA32	100 LQFP	32 KB	2 KB	4	4 x 40	4 KB	80	0	1	1	1	8-ch.	8-ch., 8-bit	8-ch. x 2 16-bit
	64 LQFP	32 KB	2 KB	3	4 x 20	4 KB	50	0	1	1	1	6-ch.	8-ch., 8-bit	8-ch. x 2 16-bit

1. 2-ch., 8-bit PWM can be used as 1-ch., 16-bit PWM
2. One stepper motor runs at reduced drive capacity in 64 LQFP. Please find more details in the Reference Manual.

Key Features

- HCS12 CPU core, 32 MHz bus frequency
- Up to 64 KB on-chip flash with ECC
- 4 KB data flash with ECC
- Up to 4 KB on-chip SRAM
- LCD driver, configurable up 40 x 4
- Stepper motor controller with up to four drivers
- Phase locked loop (PLL) frequency multiplier with internal filter
- 4–16 MHz amplitude controlled Pierce oscillator
- 1 MHz internal RC oscillator
- Two timer modules (TIM1 and TIM2) supporting input/output channels that provide a range of 16-bit input capture, output compare, counter and pulse accumulator functions
- Pulse width modulation (PWM) module with up to eight 8-bit channels
- Up to 8-channel, 10-bit resolution successive approximation analog-to-digital converter (ATD)
- One serial peripheral interface (SPI) module
- One serial communication interface (SCI) module supporting LIN 2.0, 2.1, and SAE J2602 communications
- One Inter-Integrated Circuit (I²C) module
- One multi-scalable controller area network (MSCAN) module (supporting CAN protocol 2.0A/B)
- On-chip voltage regulator (VREG) for regulation of input supply and all internal voltages
- Autonomous periodic interrupt (API)

Enablement Tools

The S12HY family leverages and expands the extensive suite of hardware and software development tools available for the S12 and S12X families. Cost-effective S12HY family demo boards will be available in Q1 2009. CodeWarrior™ Development Tool Suite and a range of third-party development software support will also help for rapid application development.

Hardware Development Selector Guide

Part Number	Description	Pricing*
DEMO9S12HY64	Demonstration board with soldered 9S12HY64 in a 100 LQFP package	$99

* Manufacturer's Suggested Resale Price

The cluster reference design board based on S12HY will be available by the end of Q1 2009. Please contact Freescale Sales Representatives in your region for more details.

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