MCF521x Family

Overview

Pressing its leadership in 32-bit processing into new territory, Freescale Semiconductor introduces a single-chip solution to address the need for a cost-sensitive, low-power, 32-bit microcontroller that fills the gap between existing 16-bit and 32-bit products. Applications requiring traditional general purpose microcontroller functionality have rising computational performance and memory requirements. The challenge is to provide a microcontroller that offers it all—low power operation in small footprint configurations with options for computational-intensive tasks. There is also a requirement for a roadmap with seamless migration that includes robust full-featured embedded controllers. Freescale's MCF521x embedded controller family encompasses all this and more. It features power management options and low power modes along with right-sized feature sets offering a host of peripherals commonly used in microcontroller applications.

Trends

As a competitive advantage in the embedded marketplace becomes harder to secure, protecting a company's intellectual property (IP) becomes more critical. The robust and secure flash technology offered by the MCF521x family of embedded controllers gives designers a tool for protecting intellectual property. For applications requiring code security, the MCF521x family of embedded controllers offers a single-chip solution with up to 256 KB of high performance, near-single access, interleaved and securable embedded Flash memory. Moreover, the MCF521x embedded controller communication peripherals provide easy connection to other systems. Three universal asynchronous receiver/transmitters (UARTs) enable medium to long distance communication

to other control systems or computers. An inter-integrated circuit (I²C) and queued serial peripheral interface (QSPI) enable in-system communication to connected peripherals and systems, including LCDs and keyboards. All this is offered along with the high performance V2 ColdFire core that even incorporates a multiply and accumulate module (MAC) for DSP-like operation.

Building on years of experience in industrial control and communications, the MCF521x embedded controller family adds to a portfolio that today includes 32-bit embedded controllers with Flash memory and on-chip Ethernet and CAN networking interfaces as well as 16-bit microcontrollers that offer optimized system solutions with Ethernet and Physical interfaces for complete networking solutions. The MCF521x family of embedded controllers offers

designers a powerful, cost-effective solution with a variety of supporting software and development tools that ease the transition into 32-bit technology.

Tools and Support

The ColdFire embedded controller family benefits from extensive support by a development tools suites offered through leading third party tools developers. The MCF5213EVB development system includes, at no extra cost, CodeWarrior Special Edition software in each kit and professional tools and systems from such partners as Green Hills, Wind River Systems, Accelerated Technology, ARC and others. The open source software and graphical initialization tools used in the MCF5213EVB system make no-cost development easy to get and easy to use.

![NXP logo]

Part Number	Flash/SRAM	Key Features	Package	Speed	10 K FSRP*
MCF5211	**128 KB/ 16 KB**	**3 UARTs, I²C, QSPI, 16-bit, 32-bit, PWM timers, A/D**	**64-pin LQFP 81-ball MAPBGA**	**66 80**	**$4.99 $5.50**
MCF5212	**256 KB/ 32 KB**	**3 UARTs, I²C, QSPI, 16-bit, 32-bit, PWM timers, A/D**	**64-pin LQFP 81-ball MAPBGA**	**66 80**	**$6.25 $6.70**
MCF5213	**256 KB/ 32 KB**	**3 UARTs, I²C, QSPI, 16-bit, 32-bit, PWM timers, A/D, CAN**	**81-ball MAPBGA, 100-pin LQFP**	**80 80**	**$7.59 $7.69**
MCF5214	256 KB/ 64 KB	3 UARTs, I²C, QSPI, 16-bit, 32-bit, PWM Timers, DMA, A/D, CAN	256-ball MAPBGA	66	$13.30
MCF5216	512 KB/ 64 KB	3 UARTs, I²C, QSPI, 16-bit, 32-bit, PWM Timers, DMA, A/D, CAN	256-ball MAPBGA	66	$14.88
M5213EVB		MCF5213/12/11 Eval Board			$299

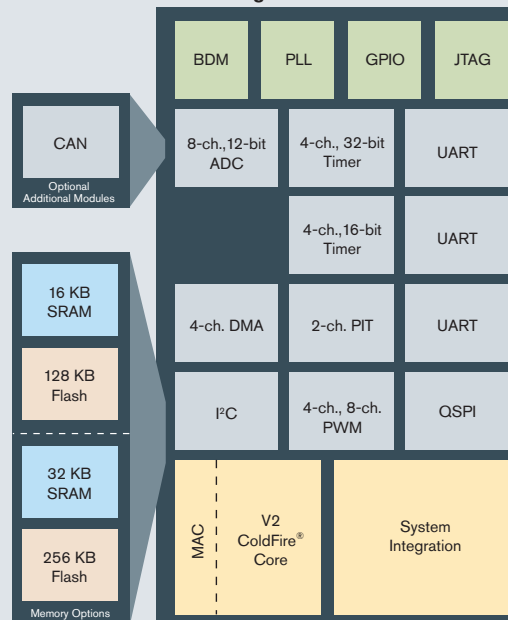*Freescale Suggested Resale Price.

MCF5211/12/13 Block Diagram

MCF521x Specifications

> ColdFire® V2 Core

> Temperature range: -40°C to +85°C

> Up to 76 Dhrystone 2.1 MIPS @ 80 MHz

> MAC Module and HW Divide

> Low-power optimization

> No external bus

Integration

> Up to 32 KB SRAM

> Up to 256 KB Flash: 100K W/E cycles, 10 years data retention

> Enhanced CAN 2.0B controller (FlexCAN) interface with 16 message buffers (5213 Only)

> Three UARTs with DMA capability

> Queued serial peripheral interface (QSPI) with four peripheral chip selects

> Inter-integrated circuit (I²C) bus controller

> Four 32-bit timer channels with DMA capability

> Four 16-bit timer channels for capture, compare and pulse width modulation (PWM)

> 4-channel 16-bit/8-channel 8-bit PWM generator

> Two periodic interrupt timers (PITs) for alarm and countdown timing

> 4-channel DMA controller

> 8-channel 12-bit ADC

> Up to 55 general-purpose I/O

> System integration (PLL, SW watchdog)

> Single 3.3V supply

MCF5213 Features
> 256 KB of Embedded Flash memory

> 32 KB of static RAM

> CAN 2.0B Controller

> 14 mm x 14 mm x 1.4 mm (0.5 mm pitch) 100-pin LQFP package

> 10 mm x 10 mm x 1.6 mm (1 mm pitch) 81-ball MAPBGA package

MCF5212 Features
> 256 KB of Embedded Flash memory

> 32 KB of static RAM

> 10 mm x 10 mm x 1.6 mm (1 mm pitch) 81-ball MAPBGA package

> 10 mm x 10 mm x 1.4 mm (0.5 mm pitch) 64-pin LQFP package

MCF5211 Features
> 128 KB Embedded Flash memory

> 16 KB of static RAM

> 10 mm x 10 mm x 1.6 mm (1 mm pitch) 81-ball MAPBGA package

> 10 mm x 10 mm x 1.4 mm (0.5 mm pitch) 64-pin LQFP package

Learn More: For more information about Freescale products, please visit **www.freescale.com**.

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