MCF528x

Overview

Building on years of experience in industrial control and networking communications, Freescale Semiconductor is the first in the industry to introduce its 32-bit microcontroller with the combination of on-chip Ethernet and Controller Area Network (CAN) networking interfaces and Flash memory. The first MCU family based on Freescale's 32-bit ColdFire® architecture, the MCF528x Family offers designers a powerful, cost-effective option that includes advanced communications features, a rich peripheral set and a variety of supporting software and development tools.

ColdFire Architecture Answers New Market Trends

Designers have indicated that component availability with the right level of integration is one of the most critical design challenges causing changes in processor selection today. Freescale continues to meet market demands with its ColdFire architecture by offering a family of integrated solutions. This family offers built-in versatility to address a variety of new and emerging markets that are driving the growth of low-cost, high-volume embedded control.

More applications are being networked, requiring higher performance and integration with improved connectivity. The MCF528x Family is designed to make this process easier. The on-chip modules on the newest ColdFire devices are creating excitement in the design community and inspiring creativity in emerging applications.

Growing Demand for Embedded Ethernet

Traditionally, MCU networks have used CAN and universal asynchronous receiver/transmitter (UART) serial interfaces that have distance and bandwidth limitations. Ethernet—the standard upon which the Internet is built—provides more bandwidth than common serial interfaces and can be used to connect devices over virtually unlimited distances. With its integrated 10/100 Mbps Ethernet Media Access Controller (MAC) and network-ready applications software from Quadros Systems, OpenTCP™ and others, the MCF528x Family is designed to bring standards-based networking to a variety of traditional MCU applications in markets as diverse as security systems, lighting control, home automation and enterprise networking.

Applications in these areas can expect to benefit from the available software for networking functions, such as Web-based user interfaces and network time synchronization.

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MCF5280 Features
> 63 (Dhrystone 2.1) MIPS at 80 MHz

> No embedded Flash memory

> All other features identical to the MCF5282

MCF5281 Features
> 256 KB embedded Flash memory

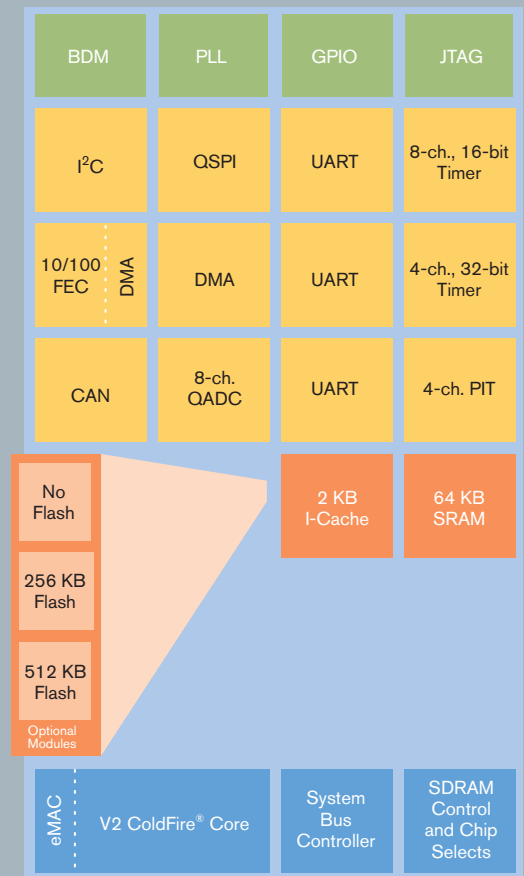> All other features identical to the MCF5282

MCF5282 Features
> Version 2 (V2) ColdFire core

> 512 KB embedded Flash memory

> 64 KB of static RAM

> 2 KB I-Cache

> SDRAM controller

> 10/100 Ethernet MAC

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

> Three UARTs with direct memory access (DMA) capability

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

> Inter-integrated circuit (I²C) bus controller

> 8-channel, 10-bit queued analog-to-digital converter (QADC)

> Four 32-bit timer channels with DMA capability

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

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

Product Specifications
> Up to 76 (Dhrystone 2.1) MIPS at 80 MHz (executing from internal Flash)

> -40°C to +85°C ambient operating temperature

> 80 MHz and 66 MHz available

> 3.3V, 5V tolerant I/O

> 17 mm x 17 mm x 1.6 mm 256-ball (1 mm pitch) mold array process ball grid array (MAPBGA) package

MCF528x BLOCK DIAGRAM

BDM	PLL	GPIO	JTAG
I²C	QSPI	UART	8-ch., 16-bit Timer
10/100 FEC / DMA	DMA	UART	4-ch., 32-bit Timer
CAN	8-ch. QADC	UART	4-ch. PIT

No Flash / 256 KB Flash / 512 KB Flash — Optional Modules

2 KB I-Cache | 64 KB SRAM

eMAC | V2 ColdFire® Core | System Bus Controller | SDRAM Control and Chip Selects

Tools Support for Fast Development
The ColdFire family of microprocessors benefits from extensive support by a world-class development tools suite through leading third-party tools developers. In addition, Freescale, Quadros Systems and Metrowerks have partnered to provide a comprehensive, networked, embedded control solution based on the ColdFire MCF528x Family, OpenTCP stack, RTXC™ Quadros operating system and CodeWarrior™ for ColdFire.

RTXC Quadros for the MCF528x Family includes a real-time operating system (RTOS) supporting both thread- and task-based kernels. It also includes extensive networking support—Ethernet driver; Internet protocols such as IP, UDP, TCP, ICMP, ARP and DHCP; and application-level protocols such as embedded Web server, Trivial FTP server for remote firmware download, SMTP to send e-mail alerts and SNTP to retrieve current-time information from a network NTP server. Three versions of the software are available at a range of prices and functionality.

The Special Edition is free and preloaded into the internal Flash with the purchase of the M5282EVB or available for download for registered users of the Freescale Web site.

The CodeWarrior for ColdFire development tools suite from Metrowerks includes a compiler, assembler, debugger, project manager and build system. Trial versions of the tools are provided with the development kit.

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

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