

ColdFire® Embedded Controllers

MCF5253

Fact Sheet

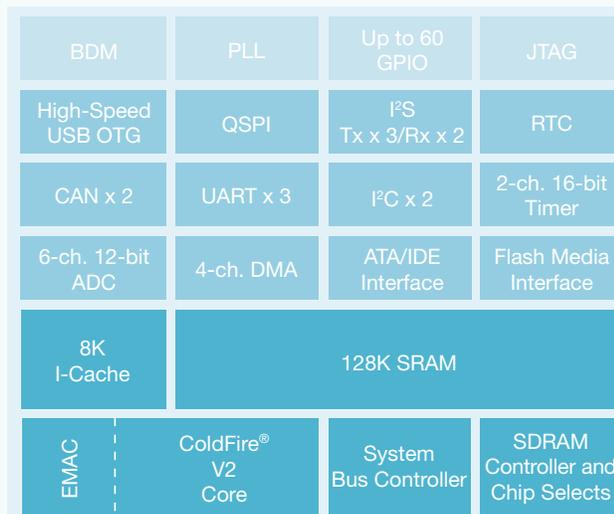
Overview

Anchored by the Version 2 ColdFire® core, the MCF5253 is an excellent general-purpose, cost-effective system controller with over 125 Dhrystone 2.1 MIPS of performance at 140 MHz. The MCF5253 is a unique addition to the ColdFire family because it features two CAN modules, the largest SRAM block in the portfolio at 128K and is the first to offer high-speed USB On-the-Go (OTG) with integrated Physical Layer (PHY). Other features include a dedicated advanced technology attachment (ATA) hard disk interface, real-time clock (RTC) and an enhanced multiply-accumulate (eMAC) unit which provides DSP capabilities. Low-power management features include a flexible phase-lock-loop (PLL) with power-down mode and dynamic clock switching. Freescale's added integration empowers customers to reduce the number of system components that lowers their development costs and facilitates rapid time to market. The MCF5253 is suitable for numerous consumer and industrial applications including point-of-sale, Voice-over IP (VoIP) and medical instrumentation.

Target Applications

- Point-of-sale
 - Card payment terminals
 - Handheld bar code scanners
 - Stationary bar code scanners
 - Bar code printers
 - Automatic teller machines
 - Portable data collection terminals
- Voice-over-Internet Protocol (VoIP)—complete with Inter-IC Sound (I²S) and enhanced multiply-accumulate module (eMAC)

MCF5253 Block Diagram



Features

Benefits

32-Bit V2 ColdFire Central Processing Unit (CPU)

Up to 125 Dhrystone 2.1 MIPS at 140 MHz performance; 1.2V Core; 3.3V I/O

High performance core with low-power management features; optimized for high-level language constructs

Enhanced Multiply and Accumulate Module (eMAC) and Hardware Divide

Provides common set of DSP operations and enhances the integer multiply instructions in the ColdFire architecture

On-Chip Memory

128K SRAM

Provides one-cycle access to critical code and data; supports DMA requests to and from internal SRAM

8K Instruction Cache

Improves system performance by providing cached instructions to the execution unit in a single clock cycle

Synchronous DRAM (SDRAM) Controller

Provides glueless interface for one bank of SDRAM and can address up to 32MB; supports a 16-bit data bus

Power Management Features

Phase Locked Loop (PLL) and System Oscillator

Generates processor clock and allows the use of almost any low frequency external clock (5-35 MHz)

Internal Voltage Regulator

Used to supply the CPU and PLL; reduces the number of external components required; allows operation from a single supply rail

Features cont.	Benefits cont.
Peripherals	
USB 2.0 High Speed Host/Device/OTG controller with integrated PHY	Operates as full and high-speed USB host or full and high-speed USB device; features a USB 2.0 high-speed compatible PHY
Two Control Area Network (CAN) Modules	Full implementation of the Bosch CAN 2.0B protocol specification that supports standard and extended messaging frames
I ² S Interface	Provides the necessary input and output features to receive and transmit digital audio signals over serial interfaces
Three Universal Asynchronous Receiver Transmitters (UART)	Manages asynchronous serial communication; full-duplex operation; features DMA and processor interrupt capabilities
Queued Serial Peripheral Interface (QSPI)	Provides a serial peripheral interface with queued transfer capability
Two I ² C Controllers	Bi-directional serial buses that exchange data between devices
ATA Hard Disk Interface	Advanced technology attachment host interface to IDE hard disk drives and ATAPI optical disc drives
SmartMedia Interface (including IDE and CompactFlash)	Allows connection of an IDE hard disk drive or SmartMedia flash card with minimum external hardware
Flash Media Card Interface	Allows connection to Sony [®] Memory Stick [®] compatible devices; supports secure digital (SD) and other types of flash media
Integration	
Real Time Clock (RTC) Module	Keeps track of the current time even if the clock is turned off
4 channel DMA controller	Four full programmable DMA channels for quick data transfer
6 channel 12-bit Analog-to-Digital Converter (ADC)	Based on the Sigma-Delta concept with 12-bit resolution; both the analog comparator and digital sections are integrated on the MCF5253
2 channel 16-bit timer	Includes two general purpose timers, each of which contains a free-running 16-bit timer; 14.3 ns resolution with CPU clock at 140 MHz
General-Purpose I/O	Up to 57 programmable general-purpose outputs; up to 60 programmable general-purpose inputs
16-bit non-multiplexed data bus with four chip selects	Transfers data between the ColdFire core or DMA and other devices on the external bus
Development Support	
Background Debugger Module (BDM)	Provides system debugging capabilities
Joint Test Action Group (JTAG) Interface	For system diagnostics and manufacturing testing; complies with the IEEE 1149.1A standard for boundary scan testability

Package Options

Part Number	Temp Ranges	Package
MCF5253VM140	0° C to +70° C	225 MAPBGA

Target Applications, cont.

- Medical instrumentation
 - Medical imaging
 - Home health monitoring
 - Patient monitoring
 - Dialysis machines
 - Hearing analysis equipment
 - Powered beds
 - Infusion pumps
 - Electric wheelchairs
 - Laboratory equipment
- HVAC and building control
- Factory automation
- Fire/Security

Cost Effective Development Tools

M5253EVBE US\$680 MSRP

This complete evaluation system comes with everything you need to evaluate the MCF5253 right out of the box, including a complimentary version of CodeWarrior[®] for ColdFire Special Edition.

MCF5253 Hardware and Software Tools

The MCF5253 ColdFire microprocessor is supported by a variety of hardware and software tools to ease the design-in process. The M5253EVBE Evaluation System comes with everything you need to fully evaluate the MCF5253 right out of the box. The M5253EVBE includes, at no extra cost, Freescale's CodeWarrior Development Studio for ColdFire Architectures Special Edition to support development from hardware bring-up through embedded application development. For those interested in open source development, the MCF5253 is also supported by a µCLinux Board Support Package, complete with a USB host and device stacks. A complimentary stand-alone USB stack from CMX systems is also planned for the MCF5253 ColdFire microprocessor. The MCF5253 is well supported by development tool suites offered through leading third party tool developers.

Learn More:

For more information about ColdFire family products, please visit www.freescale.com/coldfire.