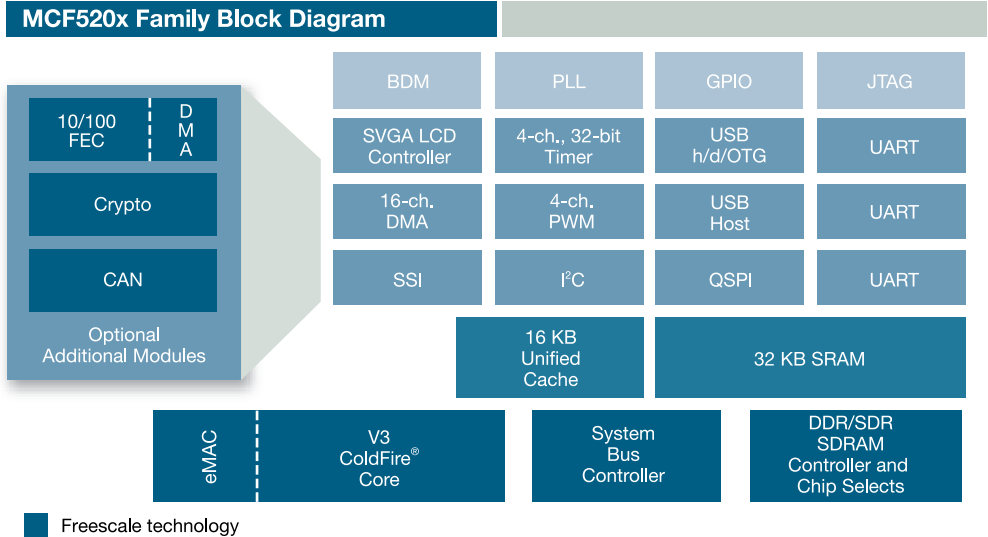# MCF532x Family
Fact sheet

Control Efficiency

The MCF532x family takes industrial control efficiency to the next level with an integrated super video graphics adapter (SVGA) LCD controller that helps reduce overall system cost by supporting a variety of LCD panels from one single embedded controller chip. Building on the competitive high-performance legacy of the 68K ColdFire® family, these devices offer up to 211 (Dhrystone 2.1) MIPS at 240 MHz, placing them among the highest performing processors in their class. Advanced features include an enhanced multiply-accumulate (eMAC) unit, which handles DSP-like instructions, and an integrated SDRAM controller that supports either double data rate (DDR) or single data rate (SDR) memory.

Connectivity

For applications requiring enhanced human-machine interfaces, the MCF532x family enables higher performance and increased flexibility for virtually any combination of system-to-system, in-system or networked communication. MCF532x embedded controllers offer both an integrated universal serial bus (USB) host and an integrated USB On-The-Go (OTG) module, as well as three on-chip universal asynchronous receiver/transmitters (UARTs) for direct communication between computers, terminals and other devices. The MCF532x family also features an integrated queued serial peripheral interface (QSPI) and an inter-integrated circuit (I2C) for in-system communication and supports networked communication via the integrated Fast Ethernet controller (FEC) and controller area network (CAN) modules.

MCF520x Family Block Diagram

- 10/100 FEC
- DMA
- Crypto
- CAN
- Optional Additional Modules
- BDM
- PLL
- GPIO
- JTAG
- SVGA LCD Controller
- 4-ch., 32-bit Timer
- USB h/d/OTG
- UART
- 16-ch. DMA
- 4-ch. PWM
- USB Host
- UART
- SSI
- I2C
- QSPI
- UART
- 16 KB Unified Cache
- 32 KB SRAM
- eMAC
- V3 ColdFire® Core
- System Bus Controller
- DDR/SDR SDRAM Controller and Chip Selects

■ Freescale technology

Security

Data protection is a critical requirement for connected embedded applications. The MCF532x family offers an optional on-chip hardware encryption module that is designed to support a variety of encryption algorithms and protocols while maintaining high overall system performance.

MCF532x Features

V3 ColdFire Core

- Up to 211 (Dhrystone 2.1) MIPS @ 240 MHz
- Enhanced MAC module and hardware divide

Integration

- Integrated SVGA LCD controller
- 16 KB I/D-Cache
- 32 KB SRAM
- USB 2.0 full-speed host controller
- USB 2.0 full-speed/high-speed* OTG controller
- 10/100 Fast Ethernet Controller (FEC) (MCF5328 and MCF5329 only)
- Hardware accelerated encryption (MCF5329 only)

- Enhanced CAN 2.0B controller (MCF5329 only)
- Three UARTs
- QSPI
- Serial synchronous interface (SSI)
- I2C bus interface
- 4-channel, 32-bit timer with DMA support
- 4-channel PWM timer
- 16-channel DMA controller
- 16-bit DDR/32-bit SDR SDRAM controller
- Up to 94 general purpose I/O
- System integration (PLL, software watchdog)
- 1.5V core, 2.5V DDR, 3.3V I/O voltages

Availability

- Temperature range: -40°C to +85°C
- Package options
  - MCF5329 and MCF5328: 256-ball MAPBGA
  - MCF5327: 196-ball MAPBGA

*High speed using external ULPI PHY

freescale™
semiconductor

ColdFire

ColdFire® Selector Guide

Part Number	Key Features	Package	Speed
MCF5327	LCD controller, USB host, USB-OTG, 3 UARTs, SDR/DDR SDRAM, 4-ch. DMA, 10/100 FEC, CAN encryption (DES/3DES/AES)	256 MAPBGA	Up to 240 MHz
MCF5328	LCD controller, USB host, USB-OTG, 3 UARTs, SDR/DDR SDRAM, 4-ch. DMA, 10/100 FEC	256 MAPBGA	Up to 240 MHz
MCF5329	LCD controller, USB host, USB-OTG, 3 UARTs, SDR/DDR SDRAMC, 4-ch. DMA	196 MAPBGA	Up to 240 MHz

Documentation

Freescale Document Number	Title	Description
MCF5329PB	MCF532x Product Brief	Provides an overview of the MCF532x family, focusing on its highly diverse feature set
MCF5329DS	MCF532x Data Sheet	Describes the functionality of the MCF532x family, including the electrical characteristics, packaging and signal connections
MCF5329RM	MCF5329 Reference Manual	A comprehensive description of the structure and function of the MCF5329 (Also supports the MCF5327 and MCF5328)

The ColdFire portfolio offers unparalleled integration and debugging capabilities across a wide range of performance and price options. Variable-length RISC architecture gives designers greater flexibility and exceptional code density, and efficient use of on-chip memory means designers don't have to sacrifice performance to keep system costs in line. Plus, ColdFire product development tools—compilers, assemblers, linkers, debuggers, code converters, simulators and evaluation kits—accelerate design cycles to help you get your application to market quickly. Whatever your system performance and integration requirements may be, the ColdFire family has a solution to meet your needs.

The Market Challenge

As the demands for integration and connectivity increase, designers are challenged to develop systems that share information in a connected environment while offering a rich set of human interface peripherals. Freescale's MCF532x embedded controller family provides integrated LCD, USB-OTG and Fast Ethernet modules for single-chip solutions that address the growing demand for human interface on machine and industrial control applications while still maintaining a rich level of connectivity and security integration.

68K/ColdFire Hardware and Software Tools Support

Because a number of Freescale and leading third-party development tools support the MCF532x family of embedded controllers supports, developers can easily migrate to other members of the portfolio without extensive new equipment purchases and training expenses. The Freescale M5329EVB evaluation and development system includes a complimentary** CodeWarrior® Special Edition software. Professional tool support is also available through ColdFire third-party tool vendors. Open source software is also available for the M5329EVB, including µCLinux™ and Nano-X, an open source graphical user interface (GUI) development platform.

Development Tools

For more information on development tools, please refer to the Freescale Development Tool Selector Guide (SG1011).

M5329EVB $699*

Evaluation and development system for the MCF532x processor family. Development kit features the MCF5329-based Fire Engine, a plug-in system-on-module containing 32 MB of DDR-SDRAM, 16 MB of NAND flash, 2 MB of boot flash, an audio codec, a touch screen controller and other interfaces. Includes a complimentary Special Edition of CodeWarrior Development Studio for ColdFire Architectures.

*Price indicated is MSRP.
**Subject to license and registration.

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

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