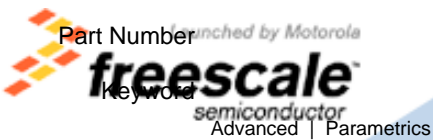


[Register](#)[Login](#)[Basket](#)
[Products](#) [Applications](#) [Technologies](#) [Support](#) [Where to Buy](#) [About Freescale](#)
[MK/ColdFire](#) > [ColdFire MCF5XXX](#) > MCF5281

MCF5281 : Integrated ColdFire Version 2 Microcontroller

[BE](#)

The MCF5281 is a 32-bit microcontroller based on the ColdFire core and integrated with Ethernet, Flash and CAN. This device offers advanced communications features, a rich peripheral set and a variety of supporting software and development tools. The MCF5281 offers flexibility in the embedded memory options provided in the 32-bit microcontroller product portfolio.

Similar to its part device, the MCF5282, the MCF5281 is designed to simplify embedded Ethernet-networked microcontroller applications. With its integrated 10/100 Mbps Ethernet MAC and network-ready applications software, the MCF5281 can bring standards-based networking to a variety of traditional MCU applications including food service equipment, security systems, vending machines, exercise equipment and industrial controllers. Applications in all of these areas will benefit from networking functions such as Web-based user interfaces, network time synchronization, and router/gateway functionality for legacy serial protocols.

Rate this Page

-- - 0 + ++

[Care to Comment?](#)

▶ [Block Diagram](#)

MCF5281 Features

- V2 ColdFire core delivering 76 (Dhrystone 2.1) MIPS at 80 MHz running from Cache/RAM (max running from internal flash 66 MIPS)
- 256KB embedded flash memory
- Enhanced Multiply-Accumulate Unit (eMAC) for DSP functionality
- 64 Kbytes of static RAM
- 10/100 Ethernet MAC
- Cache for external access support
- Address decode and chip selects
- CAN 2.0B controller area network interface with 16 message buffers
- Three UARTs with DMA capability
- Queued serial peripheral interface (QSPI) with four peripheral chip selects
- 8-channel 10-bit queued analog-to-digital converter (QADC)
- Four 32-bit timers with capture, compare and DMA capability
- Eight 16-bit timer channels for capture, compare, and pulse width modulation
- Four periodic interrupt timers (PITs)
- I2C bus controller
- JTAG for board testing
- BDM for debug, including real-time trace
- 17 mm x 17 mm x 1.6 mm 256-ball MAPBGA package

- Operation at 66 and 80 MHz from -40C to +85C
- Available software package including real-time operating system and network protocol stack with support for IP, UDP, TCP, ARP, DHCP, ICMP, SNMP, HTTP, and TFTP protocols
- Metrowerks CodeWarrior support
- Extensive third party tools and software support
- Available at 66MHz delivering 63 (Dhrystone 2.1) MIPS running from Cache/ RAM (max running from internal flash 54 MIPS)

[▲ Return to Top](#)

CPU Performance (Max) (MIPS)	Operating Frequency (Max) (MHz)	Power Dissipation (Typ) (W)	Core Operating Voltage (Spec) (V)	I/O Operating Voltage (Max) (V)	Ambient Temp (Min) (oC)	Ambient Temp (Max) (oC)	Integrated Memory Controller
63, 76	66, 80	0.72	3.3	5	-40	85	SDRAM



L1 Cache Instructional (Max) (kByte)	L1 Cache Data (Max) (kByte)	Internal RAM (KByte)	A/D Converter-Y/N	A/D Converter		GPIO Pins	Bus Interface
				Channels	Bits (bit)		
2	2	64	Yes	8	10	150	32-bit

External Bus Speed (Max) (MHz)	Serial Interface	Chip Selects	Timers	Other Peripherals	Package Description	Availability
	Type		Channels			
66, 80	FlexCAN, I2C, MAC (FEC) 10/100 Ethernet, QSPI, UART	7	4	256KB Flash, DMA Controller, EMAC, Interrupt Controller, JTAG, PLL, Watchdog Timer	MAPBGA 256 17*17*0.8P1.0	Production Now

[▲ Return to Top](#)

MCF5281 Parametrics

MCF5281 Documentation**Documentation****Application Note**

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
<u>AN2394_D</u> Migrating from the MCF5272 to the MCF5282	FREESCALE	pdf	549	1	10/17/2003	-
<u>AN2393</u> Migrating from the MMC2114 to the MCF5282	FREESCALE	pdf	400	0	11/22/2002	
<u>AN1766</u> Using the SDRAM Controller on the MCF5307 ColdFire Integrated Processor Application Note	FREESCALE	pdf	312	2.0	3/12/1999	
<u>AN2168</u> ColdFire Microprocessor DMA Controller Application Note	FREESCALE	pdf	422	n/a	-	-



Brochure

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
<u>CFPITCHPAK</u> 68K ColdFire Product Portfolio	FREESCALE	html	2	0	10/14/2002	-

Errata - [Click here for important errata information](#)

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
<u>MCF5282DE</u> MCF5282 Device Errata	FREESCALE	pdf	463	1.7	9/28/2004	-




Fact Sheets

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
<u>MCF5282FS</u> MCF5282 Fact Sheet	FREESCALE	pdf	1044	0	11/15/2002	
<u>MCF5282PB</u> MCF5282 Integrated Microcontroller Product Brief	FREESCALE	pdf	381	0	8/06/2002	

Product Change Notices

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
<u>PCN9904</u> TSPG-TECD PB-FREE,HALIDE-FREE PKG QUAL	FREESCALE	htm	12	0	6/02/2004	-
<u>PCN9544</u> TSPG-TECD MC QUAL MCF5280/5281/5282	FREESCALE	htm	13	0	2/05/2004	-






Reference Manual

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
CFPRM ColdFire Family Programmer's Reference Manual	FREESCALE	pdf	4199	2	7/26/2001	
MCF5282UM MCF5282 ColdFire Microcontroller User's Manual	FREESCALE	pdf	6846	2.3	11/18/2004	
MCF5282UMAD UPDATED MCF5282 User's Manual Errata	FREESCALE	pdf	126	8	1/18/2004	

Roadmap

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
COLDFIRERD ColdFire Performance Roadmap	FREESCALE	pdf	79	0	10/23/2002	-

Selector Guide

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
SG1000CR Product Selector Guide Index and Cross-Reference	FREESCALE	pdf	172	0	10/04/2004	
SG1001 32-Bit Embedded Processors Selector Guide	FREESCALE	pdf	616	0	1/01/2005	
SG1006 Microcontrollers Selector Guide	FREESCALE	pdf	566	0	1/01/2005	
SG1007 Network and Communications Processors Selector Guide	FREESCALE	pdf	189	0	1/01/2005	
SG1011 Software and Development Tools Selector Guide	FREESCALE	pdf	347	0	1/01/2005	


Supporting Information

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
FLASH PROGRAMMING NEW FlashProgramming_5282.PDF	FREESCALE	pdf	1633	1.0	1/24/2005	-

Training Reference Material

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
MCF5282TR MCF5282 Technical Presentation	FREESCALE	pdf	1305	0	11/15/2002	-

White Paper

ID and Description	Vendor ID	Format	Size K	Rev #	Date Last Modified	Order Availability
MCF5XXXDBWP MCF5XXXDBWP Debug Support on the ColdFire Architecture	FREESCALE	pdf	215	0	1/01/1999	

[Return to Top](#)

MCF5281 Design Tools

Hardware Tools

Emulators/Probes/Wigglers

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>IC30000</u> iC3000 ActiveEmulator The compact iC3000 with its "iCARD" slot can be used as either an affordable hardware debugger, or the interface module for full in-circuit emulators or high-end on-chip trace modules. USB, serial and Ethernet interfaces are supported.	<u>ISYS</u>	-	-	-	-
<u>IC40000</u> iC4000 ActiveEmulator The iC4000 Base unit provides an "iCARD" interface slot so it supports all the same devices as the iC3000, plus can be set up as the Base Unit for the iC2000 emulator modules so it supports all the same devices as the iC2000.	<u>ISYS</u>	-	-	-	-
<u>PROBE</u> Green Hills Probe & Slingshot High speed on-chip download and run control.	<u>GREENHILLS</u>	-	-	-	-

Evaluation/Development Boards and Systems

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>COBRA5282</u> COBRA5282 Credit card-sized embedded processor module based on the ColdFire MCU MCF5282. Provides up to 8MB Flash, 32MB RAM and numerous interface options, including Ethernet. The acronym COBRA stands for ColdFire Board for Rapid Applications.	<u>ELEKTRO</u>	-	-	-	-
<u>M5282EVB</u> M5282EVB Evaluation Board supporting MCF5282/81/80/16/14	FREESCALE	-	-	-	Buy Direct Buy from Distributor
<u>M5282LITE</u> M5282LITE Evaluation Board	FREESCALE	-	-	-	Buy Direct Buy from Distributor
<u>NNDK-MOD5282-KIT</u> NetBurner 5282 Development Kit	<u>NETBURN</u>	-	-	-	-

Models**BSDL**

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>MCF5282BSDL</u> MCF5282 BSDL	FREESCALE	bsdl	24	1.0	-

IBIS

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>MCF5282IBIS</u> MCF5282 IBIS Models	FREESCALE	ibs	277	0	-

Software**Application Software****Code Examples**

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>M5282EVBDEBUG</u> M5282EVB dBUG source files	FREESCALE	zip	606	v3a.1a.1b	-
<u>MCF5282I2C</u> MCF5282 I2C example code	FREESCALE	zip	126	2.0	-
<u>MCF5282SC</u> MCF5282/MCF5280 processor initialization template, header files, and software examples updated revision to include TFTP example and CodeWarrior projects for internal flash	FREESCALE	zip	100	1c	-

Board Support Packages

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>ARC-MOT-MQXBSP</u> MQX Board Support Packages BSPs for Freescale ColdFire, PowerPC, and 68K embedded processors including support for emerging USB and CAN technologies as well as drivers for Ethernet, PCI, HDLC, SPI, I2C, and serial devices.	<u>ARC</u>	-	-	-	-
<u>NNDK-MOD5282-KIT</u> NetBurner 5282 Development Kit	<u>NETBURN</u>	-	-	-	-
<u>PSB01MBSP-WMCF5CW40</u> RTXC Quadros Board Support Complete board support with sample applications	<u>QUADROS</u>	-	-	-	-
<u>TARGETBSP</u> BSP for Motorola Boards Blunk offers a variety of off-the-shelf Board Support Packages for Motorola reference boards.	<u>BLUNK</u>	-	-	-	-

Device Drivers

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
5282FLASH MCF5282 internal Flash program/erase software driver	FREESCALE	zip	1613	3.1.1	-

Libraries

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
TARGETFFS Flash File Systems Embedded flash file systems, TargetFFS-NOR and TargetFFS-NAND, are a rugged alternative to mechanical storage. For either NOR or NAND flash, they implement reliable, re-entrant, powerfail safe file systems with standard APIs.	BLUNK	-	-	-	-

Operating Systems

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
ARC-MOT-MQX MQX Real Time Operating System A robust, high performance, royalty-free kernel designed for deeply embedded applications requiring a small footprint and fast response.	ARC	-	-	-	-
CHRONOS RTOS	INTNICHE	-	-	-	-
CMX-RTX CMX-RTX	CMX	-	-	-	-
NNDK-MOD5282-KIT NetBurner 5282 Development Kit	NETBURN	-	-	-	-
PN512-1 AMX CFire AMX is a full featured RTOS for the ColdFire family including the MCF52xx, MCF53xx and MCF54xx. AMX has been tested on the Cadre III M5206EC3, Arnewsh SBC5307 and Motorola M5272C3, M5249C3 and M5407C3 boards.	KADAK	-	-	-	-
PSB01MPRO-WMCF5CW40 RTXC Quadros for MCF5282 This development-ready solution includes the RTXC Quadros real-time operating system, RTXC Quadnet networking software. The solution is designed to allow for ease of use and fast development by users of all experience levels.	QUADROS	-	-	-	-
PSD10XXXX RTXC Quadros RTOS Innovative RTXC Quadros RTOS has two major modules (Single Stack kernel and Multi-Stack kernel) that are used in combination to uniquely support DSPs, microcontrollers and multiprocessing environments with a common API.	QUADROS	-	-	-	-

<u>SMXCF</u> SMX Modular RTOS for ColdFire smxCF is designed for the ColdFire processor family. It features hard real-time multitasking, networking, file management, user interface, and full support for Metrowerks CodeWarrior.	MICRODIG	-	-	-	-
<u>TARGETOS</u> TargetOS RTOS TargetOS is a full-featured real-time operating system (RTOS) from Blunk Microsystems designed specifically for embedded applications. TargetOS is fast, small, and preemptive.	BLUNK	-	-	-	-
<u>THREADX</u> ThreadX RTOS. Royalty-free real-time operating system (RTOS) for embedded applications. ThreadX is small, fast, and royalty-free making it ideal for high-volume electronic products.	EXPRESSLOG	-	-	-	-

Programmers

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>CFFLASHER</u> CFlasher 2.0 A free flash programming utility for Motorola ColdFire evaluation boards.	FREESCALE	zip	938	2.0	-

Protocol Stacks

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>1.02.0116.TTDDC</u> DeviceNet The DeviceNet Slave protocol software contains all important functions required in order to implement a DeviceNet Slave device in accordance with the current DeviceNet specification of the ODVA.	IXXAT	-	-	-	-
<u>1.02.0121.TTDDC</u> CANopen The CANopen protocol software includes all necessary functions to implement slave or simple master devices according to the CANopen specification DS301, version 4.02 (EN 50325-4).	IXXAT	-	-	-	-
<u>ARC-MOT-IPSHIELD</u> IPShield Security product support for IPSec, IKE, SSL and SSH. Also supports hardware accelerated encryption on processors with an Integrated Security Engine such as MCF5485/5483, MPC870/875, MPC8272/8248, MCF5271, and MCF5275/5275L.	ARC	-	-	-	-
<u>ARC-MOT-RTCS</u> RTCS A real-time, high performance TCP/IP stack designed specifically for embedded networking applications such as IP phones, bridges, routers, pagers, PDAs, cellular phones, and set-top boxes	ARC	-	-	-	-

ARC-MOT-SMTP**SMTP**

Royalty free source code SMTP enables embedded devices to send e-mail to any SMTP server. This allows any embedded device to send asynchronous status reports using email.

ARC

-

-

-

-

CMX TCP/IP

CMX TCP/IP

CMX

-

-

-

-

EPL V2.0

Ethernet Powerlink

The IXXAT EPL protocol stacks are available in a generic version which can easily be ported to ColdFire platforms and various operating systems.

IXXAT

-

-

-

-

ETHERNET/IP MASTER LIBRARY

Ethernet/IP

EtherNet/IP is intended for use in networked real-time control applications. With the integration of Ethernet down to the device level by means of CIP, the user has a number of advantages.

IXXAT

-

-

-

-

INFOLINK-STACKNAME

INFOLink Protocol Software Family

LINK

-

-

-

-

INTERNICHE NAT ROUTER

NAT Firewall

INTNICHE

-

-

-

-

INTERNICHE PPP OPTIONS

PPP, PPPoE, Multi-Link PPP

INTNICHE

-

-

-

-

MOC_SSH_SVR

Mocana Embedded SSH Server

MOCANA SSH SERVER: Supports Freescale chipsets out of the box. Small (50KB), fast (2-3x faster than OpenSSH), trusted. Supports all major cryptos. Royalty free, source code license. FREE EVAL: <http://www.mocana.com/evaluate.html>

MOCANA

-

-

-

-

MOC_SSL_CLIENT

Mocana Embedded SSL/TLS Client

MOCANA SSL/TLS CLIENT: Supports Freescale chipsets out of the box. Small (50KB), fast (2-3x faster than OpenSSL), trusted. Supports all major cryptos. Royalty free, source code license. FREE EVAL: <http://www.mocana.com/evaluate.html>

MOCANA

-

-

-

-

MOC_SSL_SVR

Mocana Embedded SSL/TLS Server

MOCANA SSL/TLS SERVER: Supports Freescale chipsets out of the box. Small (50KB), fast (2-3x faster than OpenSSL), trusted. Supports all major cryptos. Royalty free, source code license. FREE EVAL: <http://www.mocana.com/evaluate.html>

MOCANA

-

-

-

-

NICHESTACK

TCP/IP v4

INTNICHE

-

-

-

-

NICHESTACK SSL LIBRARY

Secure Sockets Layer

INTNICHE

-

-

-

-

NNDK-MOD5282-KIT

NetBurner 5282 Development Kit

NETBURN

-

-



-

-

<u>PSQ40XXXX</u> RTXC Quadnet Networking Protocols Full protocol suite: TCP, UDP, SLIP, ICMP, and ARP with Berkeley Sockets API. Plus DHCP, BOOTP, DNS, IGMP v2, RIP v2, NAT, HTTP, SMTP, POP3, TFTP, FTP, Telnet, SNMP v1,2,3, PPP and more. New security protocols: SSL, IPsec, IKE.	<u>QUADROS</u>	-	-	-	-
<u>TARGETTCP</u> TCP/IP Stack TargetTCP, is a fast, reliable, re-entrant, full-featured TCP/IP protocol stack designed specifically for high-performance embedded networking. The code has a small footprint and is well suited to memory constrained environments.	<u>BLUNK</u>	-	-	-	-
<u>TARGETWEB</u> Web (HTTP) Server TargetWeb is a high-performance embedded web server (HTTP Server) that allows users to monitor and control their embedded applications using any standard browser.	<u>BLUNK</u>	-	-	-	-
<u>WEBPORT HTTP SERVER</u> Embedded web server	<u>INTNICHE</u>	-	-	-	-

Software Tools





Compilers

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>COMPILER</u> C/C++ Compiler Optimizing C, C++, EC++ compilers for Freescale PowerPC, ColdFire, StarCore, 68K, MCore and ARM-based MAC architectures.	<u>GREENHILLS</u>	-	-	-	-
<u>CWCF</u> CodeWarrior Development Studio for ColdFire	<u>METROWERKS</u>	-	-	-	 
<u>DIAB</u> Diab C/C++ Compiler	<u>WINDRIV</u>	-	-	-	-
<u>NNDK-MOD5282-KIT</u> NetBurner 5282 Development Kit	<u>NETBURN</u>	-	-	-	-

Debuggers

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
<u>NNDK-MOD5282-KIT</u> NetBurner 5282 Development Kit	<u>NETBURN</u>	-	-	-	-

IDE (Integrated Development Environment)

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
CFDS					
ColdFire Development Suite					
The ColdFire Development Suite includes a C compiler, assembler, linker and library manager and libraries, source level simulator, source level BDM debugger and, for some variants, Code Creation Wizards.					
 CWS-MCF-CX CodeWarrior™ Development Studio for ColdFire Architectures, Windows Hosted	<u>METROWERKS</u>	-	-	-	-
 CWS-MCF-LX CodeWarrior Development Studio for ColdFire Architectures	<u>METROWERKS</u>	-	-	-	 
IC-SW-OPR					
winIDEA					
winIDEA integrates a Project Manager, Source Code Editor, High and Low Level Debugger, and Flash Programmer, all into one easy-to-use Windows application. It is the one user interface for all of our emulators and debuggers.					
MULTI					
MULTI					
MULTI is a complete integrated development environment for embedded applications using C, C++, Embedded C++					
SBCTOOLS-WF					
sbcTools-WF, Eclipse Edition					
Complete software development tools-set, including GCC, GDB, TCPIP stack, serial console and target config services, all accessible seamlessly through Eclipse. Includes WildFire BSP with h/w interface libraries and annotated demo programs.					

Initialization/Boot Code Generation

ID and Description	Vendor ID	Format	Size K	Rev #	Order Availability
COLDFIRE_INIT					
MicroAPL Limited's ColdFire Graphical Configuration Tool					
	<u>MICROAPL</u>	htm	1	n/a	-

 [Return to Top](#)

Orderable Parts Information

Part Number	Package Description	Tape and Reel	Pb-Free Terminations	Application/Qualification Tier	Status	Budgetary Price QTY 1000+ (\$US)	Info	Order
-------------	---------------------	---------------	----------------------	--------------------------------	--------	----------------------------------	------	-------

MCF5281CVF66	<u>MAPBGA 256</u> <u>17*17*0.8P1.0</u>	No	No	COMMERCIAL, INDUSTRIAL	Available	\$17.83	more	Order Sample 	Buy from Distributor 
MCF5281CVF80	<u>MAPBGA 256</u> <u>17*17*0.8P1.0</u>	No	No	COMMERCIAL, INDUSTRIAL	Available	\$21.40	more	Order Sample 	Buy from Distributor 
MCF5281CVM66	<u>MAPBGA 256</u> <u>17*17*0.8P1.0</u>	No	Yes	COMMERCIAL, INDUSTRIAL	Available	\$17.83	more	Order Sample 	Buy from Distributor 
MCF5281CVM80	<u>MAPBGA 256</u> <u>17*17*0.8P1.0</u>	No	Yes	COMMERCIAL, INDUSTRIAL	Available	\$21.40	more	Order Sample 	Buy from Distributor 

NOTE:

- Not all orderable parts are offered through our online sampling program. For further assistance in selecting a similar part from within the program, please submit a [Request for a sample order advice](#).
- Refer to [Samples FAQ](#) for more information.
- Looking for an obsolete part? Check our [distributors' inventory](#)

[▲ Return to Top](#)

Related Products

▶ [MCF5280 : Integrated ColdFire Version 2 Microcontroller](#)

The MCF5280 is the flashless version of the MCF5282 based on Freescale Semiconductor's 32-bit ColdFire core integrated with Ethernet and ...

▶ [MCF5282 : Integrated ColdFire Version 2 Microcontroller](#)

The MCF5282 is the first microcontroller based on Freescale Semiconductor's 32-bit ColdFire core integrated with Ethernet, Flash and CAN. This ...

[▲ Return to Top](#)

Related Links

- ▶ [Industrial Control](#)
- ▶ [Embedded Networks Evaluation CD set](#)
- ▶ [ColdFire® MCF5282 VirtualLab from the Freescale Embedded Learning Center](#)
- ▶ [Quadros Systems, Inc.](#)

[▲ Return to Top](#)

www.freescale.com | [Site Map](#) | [Terms of Use](#) | [Privacy Practices](#) |
© Freescale Semiconductor, Inc. 2004 - 2005. All Rights Reserved