

PIC18F2585/2680/4585/4680
Data Sheet

28/40/44-Pin, High-Temperature, High-Performance Microcontrollers with ECAN™, 10-Bit A/D and nanoWatt Technology

© 2009 Microchip Technology Inc.

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE**.** Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

Trademarks

The Microchip name and logo, the Microchip logo, dsPIC, KEELOQ, KEELOQ logo, MPLAB, PIC, PICmicro, PICSTART, rfPIC and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

FilterLab, Hampshire, HI-TECH C, Linear Active Thermistor, MXDEV, MXLAB, SEEVAL and The Embedded Control Solutions Company are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Application Maestro, CodeGuard, dsPICDEM, dsPICDEM.net, dsPICworks, dsSPEAK, ECAN, ECONOMONITOR, FanSense, HI-TIDE, In-Circuit Serial Programming, ICSP, Mindi, MiWi, MPASM, MPLAB Certified logo, MPLIB, MPLINK, mTouch, Octopus, Omniscient Code Generation, PICC, PICC-18, PICDEM, PICDEM.net, PICkit, PICtail, PIC^{32} logo, REAL ICE, rfLAB, Select Mode, Total Endurance, TSHARC, UniWinDriver, WiperLock and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

All other trademarks mentioned herein are property of their respective companies.

© 2009, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

Printed on recycled paper.

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO/TS 16949:2002

Microchip received ISO/TS-16949:2002 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

© 2009 Microchip Technology Inc.

PIC18F2585/2680/4585/4680

28/40/44-Pin, High-Temperature, High-Performance MCUs with ECAN™, 10-Bit A/D and nanoWatt Technology

High-Temperature Features:
- Ambient Temperature Range of -40°C to 150°C

ECAN Module Features:
- Message Bit Rates, up to 1 Mbps
- Conforms to CAN 2.0B ACTIVE Specification
- Fully Backward Compatible with PIC18XXX8 CAN modules
- Three Modes of Operation:
  - Legacy, Enhanced Legacy, FIFO
- Three Dedicated Transmit Buffers with Prioritization
- Two Dedicated Receive Buffers
- Six Programmable Receive/Transmit Buffers
- Three Full 29-Bit Acceptance Masks
- 16 Full 29-Bit Acceptance Filters w/ Dynamic Association
- DeviceNet™ Data Byte Filter Support
- Automatic Remote Frame Handling
- Advanced Error Management Features

Power-Managed Modes:
- Run: CPU on, Peripherals on
- Idle: CPU off, Peripherals on
- Sleep: CPU off, Peripherals off
- Two-Speed Oscillator Start-up

Flexible Oscillator Structure:
- Four Crystal modes, up to 40 MHz
- 4x Phase Lock Loop (PLL) – Available for Crystal and Internal Oscillators
- Two External RC modes, up to 4 MHz
- Two External Clock modes, up to 40 MHz
- Internal Oscillator Block:
  - 8 user-selectable frequencies, from 31 kHz to 8 MHz
  - Provides a complete range of clock speeds, from 31 kHz to 32 MHz when used with PLL
  - User-tunable to compensate for frequency drift
- Secondary Oscillator using Timer1 @ 32 kHz
- Fail-Safe Clock Monitor
  - Allows for safe shutdown if peripheral clock stops

Special Microcontroller Features:
- C Compiler Optimized Architecture with Optional Extended Instruction Set
- Priority Levels for Interrupts
- 8 x 8 Single-Cycle Hardware Multiplier
- Extended Watchdog Timer (WDT):
  - Programmable period from 41 ms to 131s
- Single-Supply 5V In-Circuit Serial Programming™ (ICSP™) via Two Pins
- In-Circuit Debug (ICD) via Two Pins

Peripheral Highlights:
- High-Current Sink/Source 25 mA/25 mA
- Three External Interrupts
- One Capture/Compare/PWM (CCP1) module
- Enhanced Capture/Compare/PWM (ECCP1) module (40/44-pin devices only):
  - One, two or four PWM outputs
  - Selectable polarity
  - Programmable dead time
  - Auto-shutdown and auto-restart
- Master Synchronous Serial Port (MSSP) module Supporting 3-Wire SPI (all 4 modes) and I^2C™ Master and Slave modes
- Enhanced Addressable USART module:
  - Supports RS-485, RS-232 and LIN/J2602 support
  - RS-232 operation using internal oscillator block (no external crystal required)
  - Auto-wake-up on Start bit
  - Auto-Baud Detect (ABD)
- 10-bit, up to 11-Channel Analog-to-Digital Converter module (A/D), up to 100 ksps
  - Auto-acquisition capability
  - Conversion available during Sleep
- Dual Analog Comparators with Input Multiplexing

Note: This document is supplemented by the *"PIC18F2585/2680/4585/4680 Data Sheet"* (DS39625). See **Section 1.0 "Device Overview"**.

Device	Program Memory		Data Memory		I/O	10-Bit A/D (ch)	CCP1/ ECCP1 (PWM)	MSSP		EUSART	Comp.	Timers 8/16-Bit
	Flash (bytes)	# Single-Word Instructions	SRAM (bytes)	EEPROM (bytes)				SPI	Master I^2C™			
PIC18F2585	48K	24576	3328	1024	28	8	1/0	Y	Y	1	0	1/3
PIC18F2680	64K	32768	3328	1024	28	8	1/0	Y	Y	1	0	1/3
PIC18F4585	48K	24576	3328	1024	44	11	1/1	Y	Y	1	2	1/3
PIC18F4680	64K	32768	3328	1024	40/44	11	1/1	Y	Y	1	2	1/3

Table of Contents

1.0 Device Overview 7
2.0 Special Features of the CPU 9
3.0 Electrical Characteristics 11
Appendix A: Revision History 13
The Microchip Web Site 15
Customer Change Notification Service 15
Customer Support 15
Reader Response 16
Product Identification System 17

© 2009 Microchip Technology Inc.

TO OUR VALUED CUSTOMERS

It is our intention to provide our valued customers with the best documentation possible to ensure successful use of your Microchip products. To this end, we will continue to improve our publications to better suit your needs. Our publications will be refined and enhanced as new volumes and updates are introduced.

If you have any questions or comments regarding this publication, please contact the Marketing Communications Department via E-mail at **docerrors@microchip.com** or fax the **Reader Response Form** in the back of this data sheet to (480) 792-4150. We welcome your feedback.

Most Current Data Sheet

To obtain the most up-to-date version of this data sheet, please register at our Worldwide Web site at:

http://www.microchip.com

You can determine the version of a data sheet by examining its literature number found on the bottom outside corner of any page. The last character of the literature number is the version number, (e.g., DS30000A is version A of document DS30000).

Errata

An errata sheet, describing minor operational differences from the data sheet and recommended workarounds, may exist for current devices. As device/documentation issues become known to us, we will publish an errata sheet. The errata will specify the revision of silicon and revision of document to which it applies.

To determine if an errata sheet exists for a particular device, please check with one of the following:

- Microchip's Worldwide Web site; http://www.microchip.com
- Your local Microchip sales office (see last page)

When contacting a sales office, please specify which device, revision of silicon and data sheet (include literature number) you are using.

Customer Notification System

Register on our web site at **www.microchip.com** to receive the most current information on all of our products.

© 2009 Microchip Technology Inc.

NOTES:

© 2009 Microchip Technology Inc.

1.0 DEVICE OVERVIEW

This document contains device-specific information for the following devices, operating in an ambient temperature range between -40°C and 150°C:

- PIC18F2585
- PIC18F2680
- PIC18F4585
- PIC18F4680

Note: This data sheet documents only the devices' features and specifications that are in addition to the features and specifications of the non-specialty PIC18F2585/2680/4585/4680 devices. For information on the features and specifications shared by this document's High-Temperature devices and the non-specialty devices, see the *"PIC18F2585/2680/4585/4680 Data Sheet"* (DS39625).

This family of devices offers the advantages of all PIC18 microcontrollers – namely, high computational performance at an economical price. In addition to these features, the PIC18F2585/2680/4585/4680 family introduces design enhancements that make these microcontrollers a logical choice for many high-performance, power-sensitive applications.

The primary differentiating features and specifications of the High-Temperature PIC18F2585/2680/4585/4680 family devices are:

- Above 125°C, writes are not allowed for Flash program memory
- All AC timing specifications are increased by 30%

  This de-rating factor includes parameters, such as TPWRT
- Maximum HS frequency of operation is 20 MHz

Note: The test duration for AEC-Q100 reliability testing for devices operating at 150°C is 1,000 hours. Any design operating at 125°C to 150°C for longer than that period is not warranted without prior written approval from Microchip Technology Inc.

© 2009 Microchip Technology Inc.

NOTES:

© 2009 Microchip Technology Inc.

2.0 SPECIAL FEATURES OF THE CPU

Note: For additional details on the Configuration bits, refer to **Section 24.1 "Configuration Bits"** in the *"PIC18F2585/2680/4585/4680 Data Sheet"* (DS39625). Device ID information presented in this section is for the High-Temperature PIC18F2585/2680/4585/4680 family only.

2.1 Device ID Registers

The Device ID registers are read-only registers. They identify the device type and revision for device programmers and can be read by firmware using table reads.

TABLE 2-1: DEVICE IDs

File Name		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Default/ Unprogrammed Value
3FFFFEh	DEVID1	DEV2	DEV1	DEV0	REV4	REV3	REV2	REV1	REV0	xxxx xxxx(1)
3FFFFFh	DEVID2	DEV10	DEV9	DEV8	DEV7	DEV6	DEV5	DEV4	DEV3	000 1100

Legend: x = unknown, u = unchanged, — = unimplemented. Shaded cells are unimplemented, read as '0'.

Note 1: See Register 2-1 for DEVID1 values. DEVID registers are read-only and cannot be programmed by the user.

REGISTER 2-1: DEVID1: DEVICE ID REGISTER 1

R	R	R	R	R	R	R	R
DEV2	DEV1	DEV0	REV4	REV3	REV2	REV1	REV0
bit 7							bit 0

Legend:			
R = Readable bit	W = Writable bit	U = Unimplemented bit, read as '0'	
-n = Value at POR	'1' = Bit is set	'0' = Bit is cleared	x = Bit is unknown

bit 7-5 **DEV<2:0>:** Device ID bits
111 = PIC18F2585
110 = PIC18F2680
101 = PIC18F4585
100 = PIC18F4680

bit 4-0 **REV<4:0>:** Revision ID bits
These bits are used to indicate the device revision.

© 2009 Microchip Technology Inc.

REGISTER 2-2: DEVID2: DEVICE ID REGISTER 2

R	R	R	R	R	R	R	R
DEV10	DEV9	DEV8	REV7	REV6	REV5	REV4	REV3
bit 7							bit 0

Legend:			
R = Readable bit	W = Writable bit	U = Unimplemented bit, read as ‘0’	
-n = Value at POR	‘1’ = Bit is set	‘0’ = Bit is cleared	x = Bit is unknown

bit 7-0 **DEV<10:3>:** Device ID bits

These bits are used with the DEV<2:0> bits in the Device ID Register 1 to identify the part number.

0000 1110 = PIC18F2585/2680/4585/4680 family devices

Note: These values for DEV<10:3> may be shared with other devices. The specific device is always identified by using the entire DEV<10:0> bit sequence.

© 2009 Microchip Technology Inc.

3.0 ELECTRICAL CHARACTERISTICS

Note: Other than some basic data, this section documents only the High-Temperature PIC18F2585/2680/4585/4680 family devices' specifications that differ from those of the non-specialty PIC18F2585/2680/4585/4680 devices. For detailed information on the electrical specifications shared by the High-Temperature and non-specialty devices, see the *"PIC18F2585/2680/4585/4680 Data Sheet"* (DS39625).

Unless otherwise noted, this section's parameters assume a minimum voltage of 4.2V.

3.1 Absolute Maximum Ratings(†)

Maximum ambient temperature.....150°C

† **NOTICE:** Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

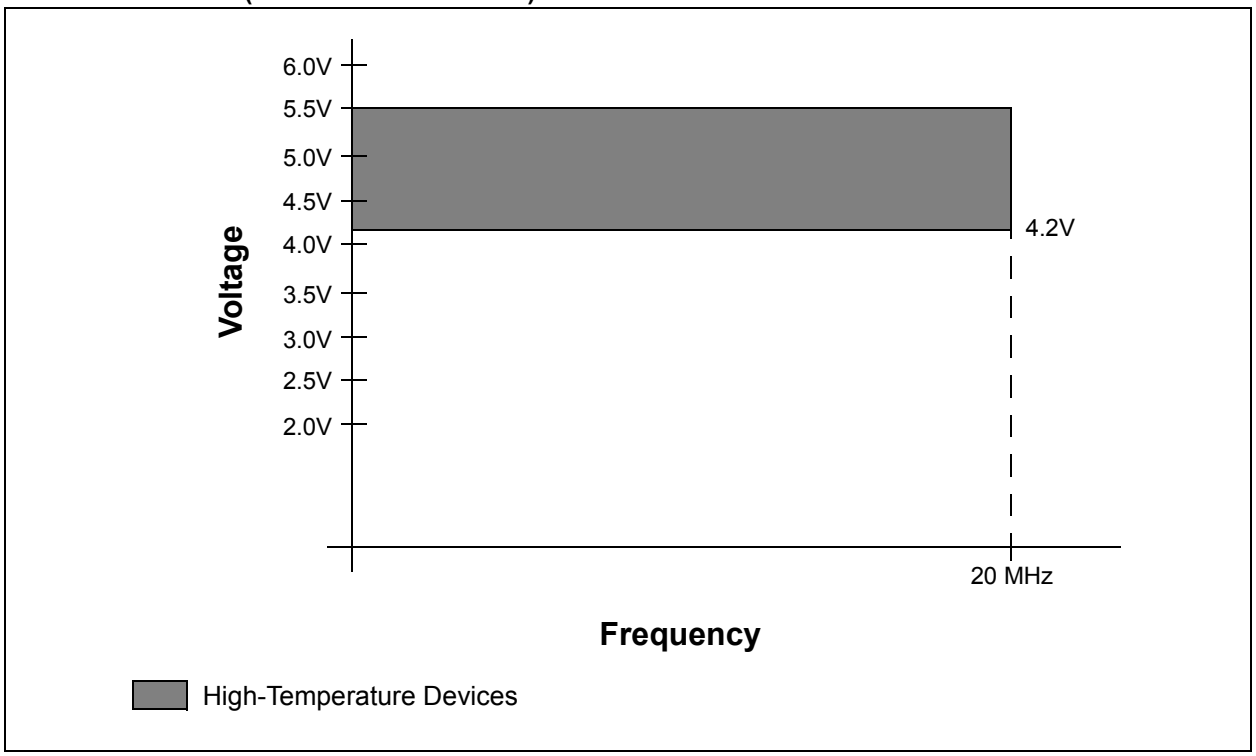
3.2 DC Characteristics

TABLE 3-1: SUPPLY VOLTAGE (HIGH TEMPERATURE)

PIC18F2585/2680/4585/4680 (High Temperature)			**Standard Operating Conditions (unless otherwise stated)** Operating temperature 125°C ≤ TA ≤ 150°C for high temperature					
Param No.	**Symbol**	**Characteristic**	**Min**	**Typ**	**Max**	**Units**	**VDD**	**Conditions**
	IDD	Supply Current	—	—	3.5	mA	5.0	FOSC = 1.5 MHz (PRI_RU mode, EC oscillator)
			—	—	8.5	mA	5.0	FOSC = 4 MHz (PRI_RU mode, EC oscillator)
			—	—	25	mA	5.0	FOSC = 16 MHz (PRI_RU mode, EC oscillator)
			—	—	34	mA	5.0	FOSC = 25 MHz (PRI_RU mode, EC oscillator)
D026	IPD	ΔIA/D	—	2.0	30	mA	5.0	A/D on, not converting
D030	VIL	I/O Ports with TTL Buffer	VSS	—	0.15 VDD	V	<4.5	
D030A	VIL	I/O Ports with TTL Buffer	VSS	—	0.7	V	5.0	4.2V < VDD < 5.5V
D031	VIL	I/O Ports with Schmitt Trigger Buffer	VSS	—	0.25 VDD	V	5.0	
D032	VIL	$\overline{MCLR}$	VSS	—		V	5.0	
D041	VIH	I/O Ports with Schmitt Trigger Buffer	0.85 VDD	—	VDD	V	5.0	
D042	VIH	$\overline{MCLR}$, OSC1 (EC mode)	0.85 VDD	—	VDD	V	5.0	

© 2009 Microchip Technology Inc.

FIGURE 3-1: PIC18F2585/2680/4585/4680 VOLTAGE-FREQUENCY GRAPH (HIGH TEMPERATURE)



3.3 AC Characteristics

TABLE 3-2: OSCILLATOR PARAMETERS

Param No.	Symbol	Characteristics	Freq. Tolerance	Min	Typ	Max	Units	Conditions
OSO8	INTOSC	Internal Calibrated INTOSC Frequency(1)	±20%	6.4	8.0	9.6	MHz	4.2V ≤ VDD ≤ 5.5V, -40°C ≤ TA ≤ 150°C

Note 1: To ensure these oscillator frequency tolerances, VDD and VSS must be capacitively decoupled as close to the device as possible. These values, in parallel, are recommended: 0.1 μF and 0.01 μF.

© 2009 Microchip Technology Inc.

APPENDIX A: REVISION HISTORY

Revision A (October 2009)

Original mini data sheet for the high-temperature devices in the PIC18F2585/2680/4585/4680 family.

© 2009 Microchip Technology Inc.

NOTES:

© 2009 Microchip Technology Inc.

THE MICROCHIP WEB SITE

Microchip provides online support via our WWW site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQ), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com, click on Customer Change Notification and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support
- Development Systems Information Line

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: http://support.microchip.com

© 2009 Microchip Technology Inc.

READER RESPONSE

It is our intention to provide you with the best documentation possible to ensure successful use of your Microchip product. If you wish to provide your comments on organization, clarity, subject matter, and ways in which our documentation can better serve you, please FAX your comments to the Technical Publications Manager at (480) 792-4150.

Please list the following information, and use this outline to provide us with your comments about this document.

To: Technical Publications Manager Total Pages Sent _____

RE: Reader Response

From: Name _____

Company _____

Address _____

City / State / ZIP / Country _____

Telephone: (_____) _____ - _____ FAX: (_____) _____ - _____

Application (optional):

Would you like a reply? ___Y ___N

Device: PIC18F2585/2680/4585/4680 Literature Number: DS39963A

Questions:

1. What are the best features of this document?

2. How does this document meet your hardware and software development needs?

3. Do you find the organization of this document easy to follow? If not, why?

4. What additions to the document do you think would enhance the structure and subject?

5. What deletions from the document could be made without affecting the overall usefulness?

6. Is there any incorrect or misleading information (what and where)?

7. How would you improve this document?

© 2009 Microchip Technology Inc.

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

PART NO.	X	/XX	XXX
Device	Temperature Range	Package	Pattern

Device[1,2]	PIC18F2585/2680, PIC18F4585/4680 PIC18F2585/2680T, PIC18F4585/4680T VDD range 4.2V to 5.5V	
Temperature Range	I = -40°C to +85°C	(Industrial)
	E = -40°C to +125°C	(Extended)
	H = -40°C to +150°C	(High Temperature)
Package	PT = TQFP (Thin Quad Flatpack)	
	L = PLCC	
	SO = SOIC	
	SP = Skinny Plastic DIP	
	P = PDIP	
	ML = QFN	
Pattern	QTP, SQTP, Code or Special Requirements (blank otherwise)	

Examples:

a) PIC18F4680T-H/PT = High Temperature, TQFP package in tape and reel configuration

b) PIC18LF258-I/L 301 = Industrial temp., PLCC package, extended VDD limits, QTP pattern #301.

c) PIC18LF458-I/PT = Industrial temp., TQFP package, Extended VDD limits.

d) PIC18F258-E/L = Extended temp., PLCC package, normal VDD limits.

Note 1: F = Standard Voltage Range
LF = Wide Voltage Range

2: T = In tape and reel PLCC and TQFP packages only.

© 2009 Microchip Technology Inc.

WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
http://support.microchip.com
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Cleveland
Independence, OH
Tel: 216-447-0464
Fax: 216-447-0643

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Farmington Hills, MI
Tel: 248-538-2250
Fax: 248-538-2260

Kokomo
Kokomo, IN
Tel: 765-864-8360
Fax: 765-864-8387

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608

Santa Clara
Santa Clara, CA
Tel: 408-961-6444
Fax: 408-961-6445

Toronto
Mississauga, Ontario,
Canada
Tel: 905-673-0699
Fax: 905-673-6509

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon
Hong Kong
Tel: 852-2401-1200
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8528-2100
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Hong Kong SAR
Tel: 852-2401-1200
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-5407-5533
Fax: 86-21-5407-5066

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8203-2660
Fax: 86-755-8203-1760

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xiamen
Tel: 86-592-2388138
Fax: 86-592-2388130

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

China - Zhuhai
Tel: 86-756-3210040
Fax: 86-756-3210049

ASIA/PACIFIC

India - Bangalore
Tel: 91-80-3090-4444
Fax: 91-80-3090-4080

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-2566-1512
Fax: 91-20-2566-1513

Japan - Yokohama
Tel: 81-45-471- 6166
Fax: 81-45-471-6122

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-6578-300
Fax: 886-3-6578-370

Taiwan - Kaohsiung
Tel: 886-7-536-4818
Fax: 886-7-536-4803

Taiwan - Taipei
Tel: 886-2-2500-6610
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

UK - Wokingham
Tel: 44-118-921-5869
Fax: 44-118-921-5820

03/26/09

© 2009 Microchip Technology Inc.