



## Section 40. Introduction (Part IV)

### **HIGHLIGHTS**

This section of the manual contains the following major topics:

40.1	Introduction	40-2
40.2	Revision History	40-3

Note:

This family reference manual section is meant to serve as a complement to device data sheets. Depending on the device variant, this manual section may not apply to all dsPIC33F/PIC24H devices.

Please consult the Product Families table in the current device data sheet to check whether this document supports the device you are using.

Device data sheets and family reference manual sections are available for download from the Microchip Worldwide Web site at: http://www.microchip.com

#### 40.1 INTRODUCTION

Part IV sections of the dsPIC33F/PIC24H Family Reference Manual provide information on modules specific to the dsPIC33F Switch Mode Power Supply (SMPS) Digital Signal Controllers (DSCs). These devices include peripherals that are ideally suited for power control applications.

dsPIC33F SMPS devices feature many advanced peripherals, such as a high resolution PWM, a High-Speed (up to 4 Msps) 10-bit Analog-to-Digital Converter (ADC), and a High-Speed Analog Comparator module. In addition, these devices feature Peripheral Pin Select (PPS) functionality, which provides flexibility of mapping any digital peripheral functionality to any desired digital pin.

Part IV sections apply to the following dsPIC33F devices:

dsPIC33FJ06GS001

dsPIC33FJ06GS202

• dsPIC33FJ06GS101

dsPIC33FJ06GS202A

dsPIC33FJ06GS101A

dsPIC33FJ09GS302

• dsPIC33FJ06GS102

dsPIC33FJ16GS502

• dsPIC33FJ06GS102A

dsPIC33FJ16GS504

Table 40-1 provides a guide to specific information about these devices.

Table 40-1: Family Reference Manual Information Guide

For Information About:	See This Section:	DS Number
CPU	Part I, Section 2	DS70204
Data Memory	Part I, Section 3	DS70202
Program Memory	Part I, Section 4	DS70203
Flash Programming	Part I, Section 5	DS70191
Reset	Part I, Section 8	DS70192
Watchdog Timer and Power-Saving Modes	Part I, Section 9	DS70196
Timers	Part I, Section 11	DS70205
Input Capture	Part I, Section 12	DS70198
Output Compare	Part I, Section 13	DS70209
UART	Part I, Section 17	DS70188
Serial Peripheral Interface (SPI)	Part I, Section 18	DS70206
Inter-Integrated Circuit <sup>™</sup> (I <sup>2</sup> C <sup>™</sup> )	Part I, Section 19	DS70195
CodeGuard <sup>™</sup> Security	Part I, Section 23	DS70199
Programming and Diagnostics	Part I, Section 24	DS70207
Device Configuration	Part I, Section 25	DS70194
Development Tool Support	Part I, Section 26	DS70200
I/O Ports with Peripheral Pin Select	Part II, Section 30	DS70190
Interrupts	Part IV, Section 41	DS70300
Oscillator	Part IV, Section 42	DS70307
High-Speed PWM	Part IV, Section 43	DS70323
High-Speed 10-bit Analog-to-Digital Converter (ADC)	Part IV, Section 44	DS70321
High-Speed Analog Comparator	Part IV, Section 45	DS70296

#### 40.2 REVISION HISTORY

#### Revision A (July 2007)

This is the initial released version of the document.

#### **Revision B (July 2012)**

This revision was updated to include the following devices:

- dsPIC33FJ06GS001
- dsPIC33FJ06GS101A
- dsPIC33FJ06GS102A
- dsPIC33Fj06GS202A
- dsPIC33FJ09GS302

In addition, minor updates to text and formatting changes were incorporated throughout the document.

# dsPIC33F/PIC24H Family Reference Manual NOTES:

#### 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, PIC<sup>32</sup> logo, 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, chipKIT, chipKIT logo, 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, Omniscient Code Generation, PICC, PICC-18, PICDEM, PICDEM.net, PICkit, PICtail, 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.

 $\ensuremath{\mathsf{SQTP}}$  is a service mark of Microchip Technology Incorporated in the U.S.A.

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

© 2007-2012, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

Rrinted on recycled paper.

ISBN: 978-1-62076-407-7

## QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO/TS 16949=

Microchip received ISO/TS-16949:2009 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.



## 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://www.microchip.com/

support 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

Indianapolis Noblesville, IN Tel: 317-773-8323 Fax: 317-773-5453

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

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

**China - Beijing** Tel: 86-10-8569-7000 Fax: 86-10-8528-2104

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

**China - Chongqing**Tel: 86-23-8980-9588
Fax: 86-23-8980-9500

**China - Hangzhou** Tel: 86-571-2819-3187 Fax: 86-571-2819-3189

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

**China - Nanjing** Tel: 86-25-8473-2460

Fax: 852-2401-3431

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

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

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

#### ASIA/PACIFIC

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

Fax: 91-80-3090-4123 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 - Osaka** Tel: 81-66-152-7160 Fax: 81-66-152-9310

**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: 886-3-5778-366 Fax: 886-3-5770-955

**Taiwan - Kaohsiung** Tel: 886-7-536-4818

Fax: 886-7-330-9305 **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

11/29/11