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PIC16F84 → PIC16F84A Migration

DEVICE MIGRATIONS

This document is intended to describe the functional differences and the electrical specification differences that are present when migrating from one device to the next. Table 1-1 shows the considerations that must be taken into account when migrating from the PIC16F84 to the PIC16F84A. Table 2 shows electrical and timing differences.

Note: This device has been designed to perform to the parameters of its data sheet. It has been tested to an electrical specification designed to determine its conformance with these parameters. Due to process differences in the manufacture of this device, this device may have different performance characteristics than its earlier version. These differences may cause this device to perform differently in your application than the earlier version of this device.

Note: The user should verify that the device oscillator starts and performs as expected. Adjusting the loading capacitor values and/or the oscillator mode may be required.

TABLE 1: PIC16F84 → PIC16F84A FUNCTIONAL DIFFERENCES

No.	Module	Differences from PIC16F84	H/W	S/W
1	Oscillator	The PIC16F84 oscillator can run up to 10 MHz. The PIC16F84A oscillator can run up to 20 MHz.	Yes	Yes

Legend: H/W - Issues may exist with regard to the application circuit.
S/W - Issues may exist with regard to the user program.

OSCILLATOR

The PIC16F84A can use crystals up to 20 MHz, resulting in double the execution speed. No changes to the code, other than for timing concerns, are required. No changes to the configuration word are required. The crystal loading capacitors may need to be adjusted for the higher speed crystal, but verifying oscillator operation at the same speed is already recommended for the transition from the PIC16F84 to the PIC16F84A.

TABLE 2: PIC16F84 → PIC16F84A SPECIFICATION DIFFERENCES

Param No.	Symbol	Characteristic		PIC16F84			PIC16F84A			Units
				Min	Typ†	Max	Min	Typ†	Max	
Core										
	FOSC	Eternal CLKIN Frequency (HS mode) Oscillator Frequency (HS mode)		DC 1	— —	10 10	DC 1	— —	20 20	MHz MHz
D001	VDD	Supply Voltage (XT, RC, LP modes)		4.0	—	6.0	4.0	—	5.5	V
D001A	VDD	Supply Voltage (HS mode)		4.5	—	6.0	4.5	—	5.5	V
30	TmCL	MCLR pulse width (low)		1	—	—	2	—	—	μS
D004A	SVDD	VDD rise rate to ensure internal Power-on Reset signal (PWRT disabled)		N/A	N/A	N/A	TBD	—	—	V/mS
D010A	IDD	Supply current during FLASH programming (Fosc = 4.0 MHz, VDD = 5.5V)		—	7.3	10	—	3.0	10	mA
D013	IDD	Supply Current HS mode (VDD = 5.5V)	PIC16F84 (Fosc = 10 MHz)	—	5	10				mA
			PIC16F84A (Fosc = 20 MHz)				—	10	20	mA
D021	IPD	Power-down current (VDD = 4.0V, WDT disabled)	Commercial	—	1.0	14				μA
D021A			Industrial	—	1.0	16	—	1.0	3.0	μA
D022	ΔIWDT	Module Differential Current Watchdog Timer	Commercial	N/A	N/A	N/A	—	6.0	20	μA
			Extended	N/A	N/A	N/A	—	—	25	μA
D040	VIH	Input High Voltage I/O Ports with TTL buffer (4.5V<VDD<5.5V) ⁽¹⁾ (VDD = Entire Range) ⁽¹⁾ with Schmitt Trigger	2.4	—	VDD	2.0	—	VDD	V	
0.48VDD			—	VDD	0.25VDD+0.8	—	VDD	V		
0.45VDD			—	VDD	0.8VDD	—	VDD	V		
D042			MCLR, RA4/T0CKI OSC1 (RC mode)	0.85VDD	—	VDD	0.8VDD	—	VDD	V
D043			OSC1 (XT, HS and LP modes)	0.7VDD	—	VDD	0.7VDD	—	VDD	V
D043A		OSC1 (RC mode)	N/A	N/A	N/A	0.9VDD	—	VDD	V	
D050	VHYS	Hysteresis of Schmitt Trigger inputs		TBD	—	—	—	0.1	—	V
EEPROM Data Memory										
D121	VDRW	VDD for read/write		VMIN	—	6.0	VMIN	—	5.5	V
D122	TDEW	Erase/Write Cycle Time		—	10	20	—	4	8	mS
FLASH Program Memory										
D131	VPR	VDD for read		VMIN	—	6.0	VMIN	—	5.5	V
D133	TDEW	Erase/Write Cycle Time		—	10	—	—	4	8	mS

† Data in "Typ" column is at 5V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: The user may choose the better of the two specifications.

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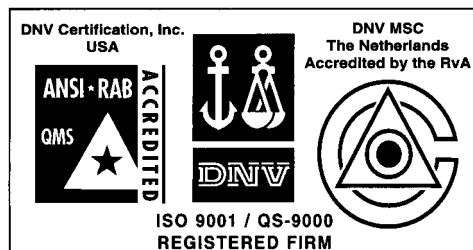
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WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office

2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200 Fax: 480-792-7277
Technical Support: 480-792-7627
Web Address: <http://www.microchip.com>

Rocky Mountain

2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7966 Fax: 480-792-7456

Atlanta

500 Sugar Mill Road, Suite 200B
Atlanta, GA 30350
Tel: 770-640-0034 Fax: 770-640-0307

Austin - Analog

13740 North Highway 183
Building J, Suite 4
Austin, TX 78750
Tel: 512-257-3370 Fax: 512-257-8526

Boston

2 Lan Drive, Suite 120
Westford, MA 01886
Tel: 978-692-3848 Fax: 978-692-3821

Boston - Analog

Unit A-8-1 Millbrook Tarry Condominium
97 Lowell Road
Concord, MA 01742
Tel: 978-371-6400 Fax: 978-371-0050

Chicago

333 Pierce Road, Suite 180
Itasca, IL 60143
Tel: 630-285-0071 Fax: 630-285-0075

Dallas

4570 Westgrove Drive, Suite 160
Addison, TX 75001
Tel: 972-818-7423 Fax: 972-818-2924

Dayton

Two Prestige Place, Suite 130
Miamisburg, OH 45342
Tel: 937-291-1654 Fax: 937-291-9175

Detroit

Tri-Atria Office Building
32255 Northwestern Highway, Suite 190
Farmington Hills, MI 48334
Tel: 248-538-2250 Fax: 248-538-2260

Los Angeles

18201 Von Karman, Suite 1090
Irvine, CA 92612
Tel: 949-263-1888 Fax: 949-263-1338

New York

150 Motor Parkway, Suite 202
Hauppauge, NY 11788
Tel: 631-273-5305 Fax: 631-273-5335

San Jose

Microchip Technology Inc.
2107 North First Street, Suite 590
San Jose, CA 95131
Tel: 408-436-7950 Fax: 408-436-7955

Toronto

6285 Northam Drive, Suite 108
Mississauga, Ontario L4V 1X5, Canada
Tel: 905-673-0699 Fax: 905-673-6509

ASIA/PACIFIC

Australia

Microchip Technology Australia Pty Ltd
Suite 22, 41 Rawson Street
Epping 2121, NSW
Australia
Tel: 61-2-9868-6733 Fax: 61-2-9868-6755

China - Beijing

Microchip Technology Consulting (Shanghai)
Co., Ltd., Beijing Liaison Office
Unit 915
Bei Hai Wan Tai Bldg.
No. 6 Chaoyangmen Beidajie
Beijing, 100027, No. China
Tel: 86-10-85282100 Fax: 86-10-85282104

China - Chengdu

Microchip Technology Consulting (Shanghai)
Co., Ltd., Chengdu Liaison Office
Rm. 2401, 24th Floor,
Ming Xing Financial Tower
No. 88 TIDU Street
Chengdu 610016, China
Tel: 86-28-6766200 Fax: 86-28-6766599

China - Fuzhou

Microchip Technology Consulting (Shanghai)
Co., Ltd., Fuzhou Liaison Office
Rm. 531, North Building
Fujian Foreign Trade Center Hotel
73 Wusi Road
Fuzhou 350001, China
Tel: 86-591-7557563 Fax: 86-591-7557572

China - Shanghai

Microchip Technology Consulting (Shanghai)
Co., Ltd.
Room 701, Bldg. B
Far East International Plaza
No. 317 Xian Xia Road
Shanghai, 200051
Tel: 86-21-6275-5700 Fax: 86-21-6275-5060

China - Shenzhen

Microchip Technology Consulting (Shanghai)
Co., Ltd., Shenzhen Liaison Office
Rm. 1315, 13/F, Shenzhen Kerry Centre,
Renminnan Lu
Shenzhen 518001, China
Tel: 86-755-2350361 Fax: 86-755-2366086

Hong Kong

Microchip Technology Hongkong Ltd.
Unit 901-6, Tower 2, Metroplaza
223 Hing Fong Road
Kwai Fong, N.T., Hong Kong
Tel: 852-2401-1200 Fax: 852-2401-3431

India

Microchip Technology Inc.
India Liaison Office
Divyasree Chambers
1 Floor, Wing A (A3/A4)
No. 11, O'Shaughnessey Road
Bangalore, 560 025, India
Tel: 91-80-2290061 Fax: 91-80-2290062

Japan

Microchip Technology Japan K.K.
Benex S-1 6F
3-18-20, Shinyokohama
Kohoku-Ku, Yokohama-shi
Kanagawa, 222-0033, Japan
Tel: 81-45-471- 6166 Fax: 81-45-471-6122

Korea

Microchip Technology Korea
168-1, Youngbo Bldg. 3 Floor
Samsung-Dong, Kangnam-Ku
Seoul, Korea 135-882
Tel: 82-2-554-7200 Fax: 82-2-558-5934

Singapore

Microchip Technology Singapore Pte Ltd.
200 Middle Road
#07-02 Prime Centre
Singapore, 188980
Tel: 65-334-8870 Fax: 65-334-8850

Taiwan

Microchip Technology Taiwan
11F-3, No. 207
Tung Hua North Road
Taipei, 105, Taiwan
Tel: 886-2-2717-7175 Fax: 886-2-2545-0139

EUROPE

Denmark

Microchip Technology Denmark ApS
Regus Business Centre
Lautrup høj 1-3
Ballerup DK-2750 Denmark
Tel: 45 4420 9895 Fax: 45 4420 9910

France

Arizona Microchip Technology SARL
Parc d'Activite du Moulin de Massy
43 Rue du Saule Trapu
Batiment A - 1er Etage
91300 Massy, France
Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79

Germany

Arizona Microchip Technology GmbH
Gustav-Heinemann Ring 125
D-81739 Munich, Germany
Tel: 49-89-627-144-0 Fax: 49-89-627-144-44

Germany - Analog

Lochamer Strasse 13
D-82152 Martinsried, Germany
Tel: 49-89-895650-0 Fax: 49-89-895650-22

Italy

Arizona Microchip Technology SRL
Centro Direzionale Colleoni
Palazzo Taurus 1 V. Le Colleoni 1
20041 Agrate Brianza
Milan, Italy
Tel: 39-039-65791-1 Fax: 39-039-6899883

United Kingdom

Arizona Microchip Technology Ltd.
505 Eskdale Road
Winnersh Triangle
Wokingham
Berkshire, England RG41 5TU
Tel: 44 118 921 5869 Fax: 44-118 921-5820

08/01/01