



## PIC16F83 → 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 shows the considerations that must be taken into account when migrating from the PIC16F83 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: PIC16F83 → PIC16F84A FUNCTIONAL DIFFERENCES**

No.	Module	Differences from PIC16F83	H/W	S/W
1	Memory	Program Memory (FLASH): The PIC16F83 has 512 words. The PIC16F84A has 1024 words.	—	Yes
		Data Memory (RAM): The PIC16F83 has 36 bytes. The PIC16F84A has 68 bytes.	—	Yes
2	Oscillator	The PIC16F83 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.

### MEMORY

Program addressing and paging in the PIC16F83 is upwardly compatible with the PIC16F84A. No code changes are required.

All SFR's remain at the same addresses, performing the same functions for both devices. Data space addressing and banking in the PIC16F83 is upwardly compatible with the PIC16F84A. No code changes are required.

### 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 PIC16F83 to the PIC16F84A.

**TABLE 2: PIC16F83 → PIC16F84A SPECIFICATION DIFFERENCES**

Param No.	Symbol	Characteristic	PIC16F83			PIC16F84A			Units	
			Min	Typ†	Max	Min	Typ†	Max		
<b>Core</b>										
	FOSC	Eternal CLKIN Frequency (HS mode) Oscillator Frequency (HS mode)	DC 1	— —	10 10	DC 1	— —	<b>20</b> <b>20</b>	MHz MHz	
D001 D001A	VDD VDD	Supply Voltage (XT, RC, LP modes) Supply Voltage (HS mode)	4.0 4.5	— —	6.0 6.0	4.0 4.5	— —	<b>5.5</b> <b>5.5</b>	V V	
30	TmCL	MCLR pulse width (low)	1	—	—	<b>2</b>	—	—	μS	
<b>D004A</b>	SVDD	VDD rise rate to ensure internal Power-on Reset signal (PWRT disabled)	N/A	N/A	N/A	<b>TBD</b>	—	—	V/mS	
D010A	IDD	Supply current during FLASH programming (FOSC = 4.0 MHz, VDD = 5.5V)	—	7.3	10	—	<b>3.0</b>	10	mA	
D013	IDD	Supply Current HS mode (VDD = 5.5V)	PIC16F83 (FOSC = 10 MHz)	—	5	10				mA
			PIC16F84A (FOSC = 20 MHz)				—	<b>10</b>	<b>20</b>	mA
<b>D021</b> <b>D021A</b>	IPD	Power-down current (VDD = 4.0V, WDT disabled)	Commercial	—	1.0	14				μA
			Industrial	—	1.0	14	—	1.0	<b>3.0</b>	μA
<b>D022</b>	ΔIWDT	Module Differential Current Watchdog Timer	Commercial	N/A	N/A	N/A	—	<b>6.0</b>	<b>20</b>	μA
			Extended	N/A	N/A	N/A	—	—	<b>25</b>	μA
D040 D040A D041	VIH	Input High Voltage I/O Ports with TTL buffer (4.5V < VDD < 5.5V) <sup>(1)</sup> (VDD = Entire Range) <sup>(1)</sup> with Schmitt Trigger	2.4	—	VDD	<b>2.0</b>	—	VDD	V	
			0.48VDD	—	VDD	<b>0.25VDD</b>	—	VDD	V	
			0.45VDD	—	VDD	<b>0.8VDD</b>	—	VDD	V	
			0.85VDD	—	VDD	<b>0.8VDD</b>	—	<b>VDD</b>	V	
D042		MCLR, RA4/T0CKI OSC1 (RC mode)	0.85VDD	—	VDD	<b>0.8VDD</b>	—	<b>VDD</b>	V	
D043 D043A		OSC1 (XT, HS and LP modes) OSC1 (RC mode)	0.7VDD	—	VDD	0.7VDD	—	VDD	V	
			N/A	N/A	N/A	<b>0.9VDD</b>	—	<b>VDD</b>	V	
D050	VHYS	Hysteresis of Schmitt Trigger inputs	TBD	—	—	—	<b>0.1</b>	—	V	
<b>EEPROM Data Memory</b>										
D121	VDRW	VDD for read/write	VMIN	—	6.0	VMIN	—	<b>5.5</b>	V	
D122	TDEW	Erase/Write Cycle Time	—	10	20	—	<b>4</b>	<b>8</b>	mS	
<b>FLASH Program Memory</b>										
D131	VPR	VDD for read	VMIN	—	6.0	VMIN	—	<b>5.5</b>	V	
D133	TDEW	Erase/Write Cycle Time	—	10	20	—	<b>4</b>	<b>8</b>	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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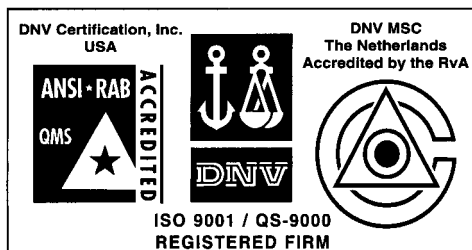
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