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 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	— —	**5.5** **5.5**	V V
30	TmcL	$\overline{MCLR}$ 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
	VIH	Input High Voltage I/O Ports								
D040		with TTL buffer (4.5V<VDD<5.5V)**(1)**		2.4	—	VDD	**2.0**	—	VDD	V
D040A		(VDD = Entire Range)**(1)**		0.48VDD	—	VDD	**0.25VDD+0.8**	—	VDD	V
D041		with Schmitt Trigger		0.45VDD	—	VDD	**0.8VDD**	—	VDD	V
D042		$\overline{MCLR}$, 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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