# Міскоснір РІС16С717/770/771

# PIC16C717/770/771 Rev. C Silicon/Data Sheet Errata

The PIC16C717/770/771 parts you have received conform functionally to the Device Data Sheet (DS41120**B**), except for the anomalies described below.

All problems listed here will be addressed in future revisions of the PIC16C717/770/771 silicon.

#### 1. Module: A/D Converter

Exception to Table 15-12, Parameter A04.

PIC16C770/771 (12-bit A/D): No missing codes to 11-bits of resolution, up to 4 non-consecutive missing codes may occur when used to 12-bits of resolution.

## Work around

None.

## 2. Module: Timer1

When Timer1 is configured to operate as an asynchronous counter, care must be taken that there is no incoming pulse while the module is being

#### CODE EXAMPLE :

turned off. If an incoming pulse arrives while Timer1 is being turned off (i.e., TMR1ON transitions from 1 to 0), the value of registers TMR1L and TMR1H will be unpredictable.

# <u>Work around</u>

This solution involves changing Timer1 from Asynchronous to Synchronous mode before turning off Timer1. No additional resources are required for this solution.

Timer1 synchronization will start, effectively stopping Timer1, one Q period after the Synchronous mode is enabled, or one Q period later than would have been realized by simply clearing the TMR1ON bit. One additional count, in excess of the counts accrued during this extra Q period, may be accumulated before the TMR1ON bit is eventually cleared in the next instruction. The occurrence of this additional count is dependent on the phase relationship between OSC1, or the internal system clock, and T1CKI.

```
;
   Call this routine to stop Timer1 asynchronous counting
;
   Timer1 is stopped after the timer is changed to synchronous mode
;
   The captured timer value resides in TMR1H and TMR1L at the completion of this
;
   routine.
TMR1Capture
                        ; entry point
         T1CON,NOT_T1SYNC ; set for synchronous mode
  bcf
   bcf
         T1CON, TMR1ON
                        ; stop timer
   bsf
         T1CON,NOT_T1SYNC
                        ; restore asynchronous mode
   return
                        ; return to calling routine
```

## 3. Module: ECCP (Compare Mode)

The CCP1 output latch, observed on RB3/CCP1/ P1A, can change unexpectedly when the ECCP module is changed from a set output on match (CCP1CON<3:0> = "1000") to clear output on match (CCP1CON<3:0> = "1001") or vice versa. This condition will occur, following an ECCP Reset, at the third iteration of the following sequence:

- 1. CCPR1<3:0> is changed from "1001" to "1000" or vice versa.
- 2. The TMR1H:TMR1L register pair matches the CCP1R1H:CCPR1L register pair.

Step 1 of the third iteration will cause the CCP1 output latch to immediately, and erroneously, change to the inverse of the CCPR1<0> bit. This gives the appearance of an inverted ECCP response to the third, and subsequent, compare match events.

The apparent inverted response will persist until the CCP1CON<3> bit is cleared (exiting Compare mode). Interrupts always occur correctly on the match condition. The error is only in the state of the CCP1 output latch.

# Work around

# Option 1

Use the ECCP toggle output on compare match mode (CCP1CON<3:0> = "0010").

## Option 2

Do not selectively change the CCP1CON<0> bit. Instead, perform the following:

- Set the RB3 data latch to the same state as the CCP1 output latch (movf PORTB, f) to avoid an output glitch when the CCP1CON register is cleared.
- Next, clear the CCP1CON register (clrf CCP1CON).
- Finally, set the CCP1CON<3:0> bits to the next desired output on Compare Match mode.

# TABLE 1: DC SPECIFICATION DEVIATIONS FROM DATA SHEET

Param No.	Sym.	Characteristic		Tested Specification			Data Sheet Specification			Units
NO.				Min	Тур	Max	Min	Тур	Max	
D005	VBOR	BOR Voltage	BORV<1:0> = 0100	2.35		2.80	2.5		2.66	V
			BORV<1:0> = 0101	2.55		3.02	2.7		2.86	V
			BORV<1:0> = 0110	3.95		4.71	4.2		4.46	V
			BORV<1:0> = 0111	4.23		5.05	4.5		4.78	V

# TABLE 2: DC SPECIFICATION DEVIATIONS FROM DATA SHEET

Param No.	Sym.	Characteristic		Tested Specification			Data Sheet Specification			Units
NO.				Min	Тур	Max	Min	Тур	Max	
D420	Vlvd	LVD Voltage	LVV<3:0> = 0100	2.35	_	2.80	2.5	_	2.66	V
			LVV<3:0> = 0101	2.55	_	3.02	2.7	—	2.86	V
			LVV<3:0> = 0110	2.64		3.14	2.8	_	2.98	V
			LVV<3:0> = 0111	2.83		3.37	3.0	_	3.2	V
			LVV<3:0> = 1000	3.11	_	3.71	3.3	—	3.52	V
			LVV<3:0> = 1001	3.29		3.93	3.5	_	3.72	V
			LVV<3:0> = 1010	3.39		4.04	3.6	_	3.84	V
			LVV<3:0> = 1011	3.58	_	4.26	3.8	—	4.04	V
			LVV<3:0> = 1100	3.77		4.49	4.0	_	4.26	V
			LVV<3:0> = 1101	3.95		4.71	4.2	_	4.46	V
			LVV<3:0> = 1110	4.23	_	5.05	4.5	_	4.78	V

# **Clarifications/Corrections to the Data Sheet:**

In the Device Data Sheet (DS41120**B**), the following clarifications and corrections should be noted.

1. Module: DC Characteristics

Figure 15-1: TPIC16C717/770/771 VOLTAGE-FREQUENCY GRAPH, -40°C  $\leq$  TA  $\leq$  +85°C;

Figure title changes from +85°C to **+125°C**.

# 2. Module: DC Characteristics

Figure 15-3: PIC16LC717/770/771 VOLTAGE-FREQUENCY GRAPH, -40°C  $\leq$  TA  $\leq$  0°C, +70°C  $\leq$  TA  $\leq$  +85°C;

Figure title changes from +85°C to **+125°C**.

# **REVISION HISTORY**

Rev A Document (2/01)

Original errata document.

Issues 1 (A/D Converter) and 2 (Timer1 Module) were added (page 1).

Item 1, Table 5-12 concerning Parameter A04, was added (page 2).

Rev B Document (9/01)

Issue 3 (ECCP Compare Mode), Table 1 and 2 were added (page 2).

Under the Clarifications/Corrections Section, Item 1, Table 15-12 was updated with additional information (page 3).

Under the Clarifications/Corrections Section, the following Items were added:

Item 2, Table 15-15 concerning DC Characteristics for PIC16C717 and PIC16LC717 was updated (page 4).

Item 3, Section 15.1 and Section 15.2 concerning DC Characteristics for PIC16C717/770/771 and PIC16LC717/770/771, respectively were replaced with a new Section, which contains updated information in a new format (page 5).

Item 4, Table 15-11 concerning DC Characteristics for VREF was replaced with updated information (page 8).

Rev C Document (8/02)

Under the Data Sheet Clarifications/Corrections Section, Items 1 through 4 were incorporated into DS41120B. New Items 1 and 2 were added for clarification.

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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: 86-28-86766200 Fax: 86-28-86766599 China - Fuzhou

Microchip Technology Consulting (Shanghai) Co., Ltd., Fuzhou Liaison Office Unit 28F, World Trade Plaza No. 71 Wusi Road Fuzhou 350001, China Tel: 86-591-7503506 Fax: 86-591-7503521 **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: 86-755-82350361 Fax: 86-755-82366086

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Microchip Technology Inc. India Liaison Office Divyasree Chambers 1 Floor, Wing A (A3/A4) No. 11, O'Shaugnessey 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

Samsung-Dong, Kangnam-Ku Seoul, Korea 135-882 Tel: 82-2-554-7200 Fax: 82-2-558-5934

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

Singapore, 188980 Tel: 65-6334-8870 Fax: 65-6334-8850

# Taiwan

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

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Austria

Microchip Technology Austria GmbH Durisolstrasse 2 A-4600 Wels Austria Tel: 43-7242-2244-399 Fax: 43-7242-2244-393 Denmark Microchip Technology Nordic ApS Regus Business Centre Lautrup hoj 1-3 Ballerup DK-2750 Denmark Tel: 45 4420 9895 Fax: 45 4420 9910 France Microchip Technology SARL Parc d'Activite du Moulin de Massy 43 Rue du Saule Trapu Batiment A - ler Etage 91300 Massy, France Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79 Germany Microchip Technology GmbH Steinheilstrasse 10 D-85737 Ismaning, Germany Tel: 49-89-627-144 0 Fax: 49-89-627-144-44 Italy 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** Microchip Ltd. 505 Eskdale Road Winnersh Triangle Wokingham Berkshire, England RG41 5TU

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

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