



# PIC16C717/770/771

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

The PIC16C717/770/771 parts you have received conform functionally to the Device Data Sheet (DS41120B), 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

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.

#### Work around

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.

### CODE EXAMPLE :

```
*****
; 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
    bcf    T1CON,NOT_T1SYNC ; set for synchronous mode
    bcf    T1CON,TMR1ON     ; stop timer
    bsf    T1CON,NOT_T1SYNC ; restore asynchronous mode
    return                 ; return to calling routine
```

# PIC16C717/770/771

## 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 |
|-----------|------|----------------|------------------|----------------------|-----|------|--------------------------|-----|------|-------|
|           |      |                |                  | Min                  | Typ | Max  | Min                      | Typ | 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 |
|-----------|------|----------------|-----------------|----------------------|-----|------|--------------------------|-----|------|-------|
|           |      |                |                 | Min                  | Typ | Max  | Min                      | Typ | 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 (DS41120B), the following clarifications and corrections should be noted.

### 1. Module: DC Characteristics

Figure 15-1: TPIC16C717/770/771 VOLTAGE-FREQUENCY GRAPH,  $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ ;

Figure title changes from  $+85^{\circ}\text{C}$  to  **$+125^{\circ}\text{C}$** .

### 2. Module: DC Characteristics

Figure 15-3: PIC16LC717/770/771 VOLTAGE-FREQUENCY GRAPH,  $-40^{\circ}\text{C} \leq T_A \leq 0^{\circ}\text{C}$ ,  $+70^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ ;

Figure title changes from  $+85^{\circ}\text{C}$  to  **$+125^{\circ}\text{C}$** .

## 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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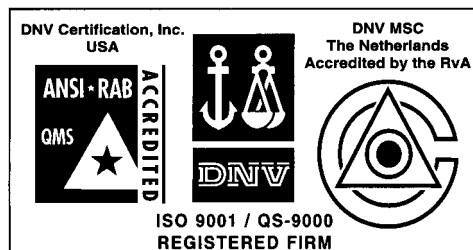
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