

Date: 22 Nov 2011

Product Category: 8-bit Microcontrollers

Device Family:  

Notification subject: ERRATA - dsPIC33EPXXXMU8XX and PIC24EPXXXGU81X Errata & Data Sheet Clarification Errata Document Revision

Notification text: SYST-22FSWP478

Microchip has released a new DeviceDoc for the dsPIC33EPXXXMU8XX and PIC24EPXXXGU81X Errata & Data Sheet Clarification of devices. If you are using one of these devices please read the document located at [dsPIC33EPXXXMU8XX and PIC24EPXXXGU81X Errata & Data Sheet Clarification](#).

Notification Status: Final

Description of Change: Updated issues 2 (CPU), 7 (PWM), 8 (PWM), 12 (ECAN™), and 14(USB). Added issues 20 (ADC), 21 (PMP), 22 (Flash Memory), 23 (Flash Memory), 24 (Power System), 25 (PWM), 26 (QEI), 27 (QEI), 28 (CPU), and 29 (PWM).

Pre Change: N/A

Post Change: N/A

Impacts to Data Sheet: None

Reason for Change: To Improve Productivity

Change Implementation Status: Complete

Date Document Changes Effective: 22 Nov 2011

NOTE: Please be advised that this is a change to the document only the product has not been changed..

Markings to Distinguish Revised from Unrevised Devices:N/A

Attachment(s): [dsPIC33EPXXXMU8XX and PIC24EPXXXGU81X Errata & Data Sheet Clarification](#)

Please contact your local [Microchip sales office](#) with questions or concerns regarding this notification.

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Product Change Notification - SYST-22FSWP478

Parts Affected

PIC24EP512GU814
dsPIC33EP256MU814
PIC24EP256GU814
dsPIC33EP512MU814
dsPIC33EP512MU810
dsPIC33EP256MU810
PIC24EP512GU810
PIC24EP256GU810
dsPIC33EP256MU806



dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814

dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814 Family Silicon Errata and Data Sheet Clarification

The dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814 family devices that you have received conform functionally to the current Device Data Sheet (DS70616F), except for the anomalies described in this document.

The silicon issues discussed in the following pages are for silicon revisions with the Device and Revision IDs listed in [Table 1](#). The silicon issues are summarized in [Table 2](#).

The errata described in this document will be addressed in future revisions of the dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814 silicon.

Note: This document summarizes all silicon errata issues from all revisions of silicon, previous as well as current. Only the issues indicated in the last column of [Table 2](#) apply to the current silicon revision (**B1**).

Data Sheet clarifications and corrections start on [page 13](#), following the discussion of silicon issues.

The silicon revision level can be identified using the current version of MPLAB® IDE and Microchip's programmers, debuggers and emulation tools, which are available at the Microchip corporate web site (www.microchip.com).

For example, to identify the silicon revision level using MPLAB IDE in conjunction with MPLAB ICD 3 or PICKit™ 3:

1. Using the appropriate interface, connect the device to the MPLAB ICD 3 programmer/debugger or PICKit 3.
2. From the main menu in MPLAB IDE, select *Configure>Select Device*, and then select the target part number in the dialog box.
3. Select the MPLAB hardware tool (*Debugger>Select Tool*).
4. Perform a "Connect" operation to the device (*Debugger>Connect*). Depending on the development tool used, the part number *and* Device Revision ID value appear in the **Output** window.

Note: If you are unable to extract the silicon revision level, please contact your local Microchip sales office for assistance.

The Device and Revision ID values for the various dsPIC33EPXXX(GP/MC/MU)806/810/814 and PIC24EPXXX(GP/GU)810/814 silicon revisions are shown in [Table 1](#).

TABLE 1: SILICON DEVREV VALUES

Part Number	Device ID ⁽¹⁾	Revision ID for Silicon Revision ⁽²⁾
		B1
dsPIC33EP256MU806	0x1861	0x4002
dsPIC33EP256MU810	0x1862	
dsPIC33EP256MU814	0x1863	
PIC24EP256GU810	0x1826	
PIC24EP256GU814	0x1827	
dsPIC33EP512MU810	0x1872	
dsPIC33EP512MU814	0x1873	
dsPIC33EP512GP806	0x187D	
dsPIC33EP512MC806	0x1879	

- Note 1:** The Device and Revision IDs (DEVID and DEVREV) are located at the last two implemented addresses in program memory.
- 2:** Refer to the "dsPIC33E/PIC24E Flash Programming Specification" (DS70619) for detailed information on Device and Revision IDs for your specific device.

TABLE 1: SILICON DEVREV VALUES (CONTINUED)

Part Number	Device ID ⁽¹⁾	Revision ID for Silicon Revision ⁽²⁾
		B1
PIC24EP512GU810	0x1836	0x4002
PIC24EP512GU814	0x1837	
PIC24EP512GP806	0x183D	

Note 1: The Device and Revision IDs (DEVID and DEVREV) are located at the last two implemented addresses in program memory.

2: Refer to the “*dsPIC33E/PIC24E Flash Programming Specification*” (DS70619) for detailed information on Device and Revision IDs for your specific device.

TABLE 2: SILICON ISSUE SUMMARY

Module	Feature	Item Number	Issue Summary	Affected Revisions ⁽¹⁾
				B1
I/O Multiplexer	Open Drain Feature	1.	The open drain control signal from GPIO, PORTA bit 3, is inadvertently controlling the data output of bit 15 of PORTC.	X
CPU	DSP DO Instruction	2.	The assembly language DO instruction does not function correctly with nested loops when the inner loop count is zero (one iteration).	X
CPU	div.sd Instruction	3.	When using the div.sd instruction, the overflow bit is not getting set when an overflow occurs.	X
PPS	Virtual Remap	4.	Virtual pin remapping does not work correctly.	X
SPI	Frame Sync Pulse	5.	Frame sync pulse not generated in Master mode when FRMPOL = 0.	X
SPI	Frame Sync Pulse	6.	When in SPI Slave mode, with the frame sync pulse set as an input, FRMDLY must be set to '0'.	X
PWM	Dead Time Compensation	7.	The duty cycle is not correct when using dead time and the programmed duty cycle is close to 0% or 100%.	X
PWM	Dead Time Compensation	8.	Dead Time Compensation is not enabled for Center Aligned PWM Mode.	X
Power System	BOR	9.	BOR must always be enabled.	X
Reserved	—	10.	—	—
ECAN™	CANCKS	11.	The function of the CANCKS bit is reversed.	X
ECAN	ERRIF	12.	The ERRIF status bit does not get set when a CAN error condition occurs.	X
USB	LS through Hub	13.	The USB bus might not be returned to the J-state following an acknowledgement packet when running low-speed through a hub.	X
USB	UIDLE Interrupt	14.	UIDLE interrupts cease if the UIDLE interrupt flag is cleared.	X
DMA	CAN	15.	Possible loss of interrupts when DMA is used with CAN.	X
UART	TX Interrupt	16.	A TX Interrupt may occur before the data transmission is complete.	X
UART	UTXBRK	17.	When a Read-Modify-Write operation is performed to set or clear any bit(s) in the UxSTA register while hardware is clearing the UTXBRK bit, the UTXBRK bit may remain set.	X
UART	UARTEN	18.	The transmitter write pointer does not get cleared when the UART is disabled (UARTEN = 0), it requires TXEN to be set in order to clear the write pointer.	X
I ² C™	I2CxCON	19.	When a Read-Modify-Write operation is performed to set or clear any bit(s) in the I2CxCON register while hardware is clearing the ACKEN bit, the ACKEN bit may remain set.	X
ADC	DONE bit	20.	The ADC Conversion Status bit, DONE (ADxCON1<0>), does not indicate completion of conversion when External Interrupt is selected as the ADC trigger source (ADxCON1<SSRC> = 1).	X
PMP	—	21.	On the dsPIC33EPXXXGU814 or PIC2EPXXXMU814 devices, the PMCS1/PMA14 and PMCS2/PMA15 pin functionality is duplicated on the RJ14/15 pins in addition to the expected RK11/RK12 pins.	X

Note 1: Only those issues indicated in the last column apply to the current silicon revision.

TABLE 2: SILICON ISSUE SUMMARY (CONTINUED)

Module	Feature	Item Number	Issue Summary	Affected Revisions ⁽¹⁾
				B1
Flash Memory	ICSP™	22.	If either the General or Auxiliary Segment is protected, neither segment can be read.	X
Flash Memory	Programming	23.	Stall mechanism may not function properly when erasing or programming Flash memory while executing code from the same Flash segment.	X
Power System	Flash Regulator	24.	The RCON<VREGSF> bit always reads as '0'.	X
PWM	Dead Time	25.	When operating in Edge-Aligned Complimentary mode the dead time could become zero.	X
QEI	Index Counter	26.	The QEI Index Counter does not count correctly in Quadrature Detector mode.	X
QEI	Modulo Mode	27.	Modulo mode functionality is incorrect when the Count Polarity bit is set.	X
CPU	DO Loop	28.	PSV access, including table reads or writes, in the last instruction of a DO loop are not allowed.	X
PWM	Master Time Base Mode	29.	In Master Time Base mode, writing to the period register and any other timing parameter of the PWM module will cause the update of the other timing parameter to take effect one PWM cycle after the period update is effective.	X

Note 1: Only those issues indicated in the last column apply to the current silicon revision.

Silicon Errata Issues

Note: This document summarizes all silicon errata issues from all revisions of silicon, previous as well as current. Only the issues indicated by the shaded column in the following tables apply to the current silicon revision (**B1**).

1. Module: I/O Multiplexer

The open drain control signal from GPIO PORTA, bit 3, is inadvertently controlling the data output of bit 15 of PORTC.

Work around

There is no work around. If bit 15 of PORTC is being used as an output (FOSC<OSCIOFNC> = 0 and TRISC<15> = 0), the open drain capability for bit 3 of PORTA cannot be enabled and used as an open drain output (ODCA<3> ≠ 1).

This issue only applies when the OSC2 pin function is set for general purpose digital I/O (FOSC<ISCIOFNC> = 0) and the device is using the FRC or EC Primary Oscillator modes.

Affected Silicon Revisions

B1								
X								

2. Module: CPU

Note: This silicon issue applies only to the dsPIC33EPXXXGP/MC/MU806/810/814 devices.

The assembly language DO instruction does not function correctly with nested loops when the inner loop count is zero (one iteration).

Work around

With nested DO loops where an inner loop can have a single iteration (DCOUNT = 0), one of the following precautions must be taken for proper operation:

1. Insert a NOP immediately after the DO instruction, which can contain a loop count of zero, and insert two NOP instructions immediately following the DO instruction of the next outer loop, as shown in [Example 1](#).
2. Alternatively, the code can test for a count of zero and branch over the DO instruction for all nested loops. In this case, insertion of NOP instructions is not required.

This issue does not apply if there are no nesting of DO loops or if all of the inner loop counts are always greater than zero. When a nested DO loop has a count of zero, only the immediate next outer loop will be affected.

Affected Silicon Revisions

B1								
X								

EXAMPLE 1:

```

do      w0, out_lp      ; w0 contains the count for the outer loop
  nop                    ; 2 NOPs are added for the work around
  nop                    ;
  ...                    ; user code
  do      w1, in_lp     ; w1 contains count for the inner loop
  nop                    ; A Single NOP is the required work around for the inner loop
  ...                    ; user code
in_lp:                                     ; end of inside loop
...
out_lp:                                     ; end of outside loop
    
```


3. Module: CPU

When using the Signed 32-by-16-bit Division instruction, `div.sd`, the overflow bit does not always get set when an overflow occurs.

Work around

Test for and handle overflow conditions outside of the `div.sd` instruction.

Affected Silicon Revisions

B1							
X							

4. Module: PPS

Virtual pin remapping does not work.

Work around

Virtual remapping applies to comparator outputs and the QEI Home and Index functions:

1. Comparator outputs can be connected to a peripheral input by mapping both the comparator output and the peripheral input to an unused physical pin using the peripheral pin select feature.

The following example assumes that there is no connection to the RP127/RG15 pin on the device. The following statements connect Comparator Output 1 to Input Capture IC1 using RP127.

```
RPINR7bits.IC1R = 127;
/*assign Input Capture 1 to RP127*/
RPOR15bits.RP127R = 0b011000;
/*assign RP127 to Comparator Output 1*/
```

2. The FCLCONx register can be used to map comparator outputs to PWM fault inputs without the use of virtual remapping.

The following statement will connect Comparator 1 output to Fault Control Signal Source for PWM 1.

```
FCLCON1bits.FLTSRC = 8;
/* value of 0b01000 selects Comp. 1 */
```

3. FHOME_x and FINDX_x are not accessible, making the digital filter in the QEI module unusable for any other peripheral besides the QEI. There is no work around.

Affected Silicon Revisions

B1							
X							

5. Module: SPI

When using the frame sync pulse output feature (SPIxCON2<FRMEN> = 1) in Master Mode (SPIxCON2<SPIFSD> = 0), the frame sync pulse is not being generated with an active low pulse (SPIxCON2<FRMPOL> = 0).

Work around

The SS pin is used as the frame sync pulse when the frame sync pulse output feature is used. Mapping the SSx input function and output function to the same pad using the PPS feature resolves this issue.

The following code example assigns SPI1 SS input and SPI1 SS output to RP118.

```
RPINR21bits.SS1R = 118;
/* assign the SPI1 Slave Select Input to RP118 */
RPOR13bits.RP118R = 0b000111;
/* assign peripheral output function SPI1 to RP118 */
```

Affected Silicon Revisions

B1							
X							

6. Module: SPI

When in SPI Slave mode (SPIxCON1<MSTEN> = 0) and using the frame sync pulse output feature (SPIxCON2<FRMEN> = 1) in Slave Mode (SPIxCON2<SPIFSD> = 0), the Frame Sync Pulse Edge Select bit must be set to '0' (SPIxCON2 <FRMDLY> = 0)

Work around

There is no work around. The Frame Sync Pulse Edge Select bit cannot be set to produce a Frame sync pulse that coincides with the first bit clock.

Affected Silicon Revisions

B1							
X							

7. Module: PWM

When dead time compensation is enabled (PWMCONx<DTC> = 11) in Edge-Aligned mode (PWMCONx<CAM> = 0), the setting of the DTCP<1:0> bits (PWMCONx<7:6>) and the external signal DTCMPx, determine whether the DTRx register is added to or subtracted from the duty cycle specified by the PDCx or MDC registers.

When DTR is being subtracted from the duty cycle, the resulting duty cycle will be 0% if the programmed duty cycle, minus two times the DTR value, is less than '0'.

$$\text{Duty Cycle} = 0\% \text{ when } (\text{PDCx} - 2 \text{ DTR}) < 0 \text{ if MDCS} = 0 \text{ (PWMCONx<8>)}$$

or

$$(\text{MDC} - 2 \text{ DTR}) < 0 \text{ if MDCS} = 1 \text{ (PWMCONx<8>)}$$

When DTR is being added to the duty cycle, the resulting duty cycle will be 100% if the programmed duty cycle, plus two times the DTR register, is greater than the period.

$$\text{Duty Cycle} = 100\% \text{ when } (\text{PDCx} + 2 \text{ DTR}) \geq \text{Period if MDCS} = 0 \text{ (PWMCONx<8>)}$$

or

$$(\text{MDC} + 2 \text{ DTR}) \geq \text{Period if MDCS} = 1 \text{ (PWMCONx<8>)}$$

The period is specified by the PTPER, STPER or PHASEx registers, depending on the ITB (PWMCON<9>) and MTBS (PWMCONx<3>) bit settings.

Note: The dead time values, as specified in the ALTDTRx register, are not part of the equations shown above, and are still applied when the duty cycle is not forced to 0% or 100%.

Work around

If using dead time compensation, do not use duty cycle values that are less than two times the DTR value or that are greater than or equal to the period less two times the DTR value.

Affected Silicon Revisions

B1							
X							

8. Module: PWM

When dead time compensation is enabled (PWMCONx<DTC> = 11) in Center-Aligned mode (PWMCONx<CAM> = 1), the dead time, as specified in the ALTDTRx register, is not being applied to the PWMxH output. The leading and trailing edges of the PWMxL output are extended by one-half the value of the ALTDTRx register, but the PWMxH leading and trailing edges are unaffected.

Work around

Using the values from **Section 14. "High-Speed PWM"** (DS70645), adjust the PWM parameters as follows:

- Subtract one-half of the ALTDTR dead time from PDCx
- Use twice the value for ALTDTR. For example:
 - Frequency of 60 kHz, duty cycle of 50%
 - Desired dead time of 833 ns and dead time compensation of 833 ns

Using the specified values from **Section 14. "High-Speed PWM"** (DS70645):

- PHASEx = 1000
- PDCx = 500
- ALTDTR = 833 ns/8.33 ns = 100
- DTR = (833 ns/8.33 ns)/2 = 50

Applying the work around:

- ALTDTR = 2 * 100 = 200
- PDCx = PDCx - 25 = 475

Affected Silicon Revisions

B1							
X							

9. Module: Power System

For this version of silicon, the Brown-out Reset (BOR) must always be enabled.

Work around

Do not disable the BOR by setting BOREN = 0 (FPOR<3>) or by setting SBOREN = 0 (RCON<13>).

Affected Silicon Revisions

B1							
X							

10. Module: Reserved

11. Module: ECAN™

The CANCKS (CiCTRL1<11>) function is reversed.

Work around

Set CiCTRL1<CANCKS> = 0 to obtain an FCAN equal to twice FCY or CiCTRL1<CANCKS> = 1 to obtain an FCAN equal to FCY. This bit must be set to '1' for compatibility with the dsPIC33F or PIC24H. At reset it is set to '0'.

Affected Silicon Revisions

B1								
X								

12. Module: ECAN

The ERRIF status flag (CiINTF<5>) does not get set when a CAN error condition occurs, and as a result, an interrupt is not generated even if enabled.

Work around

Use the Invalid Message Interrupt (IVRIF) to inspect the individual error condition status flags TXBO, TXBP, RXBP, TXWAR, RXWAR and EWARN (CiINTF<13:8>) to determine if an error condition has occurred.

Affected Silicon Revisions

B1								
X								

13. Module: USB

While operating in Host mode and attached to a low-speed device through a full-speed USB hub, the host may persistently drive the bus to an SEO state (both D+/D- as '0'), which would be interpreted as a bus Reset condition by the hub; or the host may persistently drive the bus to a J state, which would make the hub detach condition undetectable by the host.

Work around

Connect low-speed devices directly to the Host USB port and not through a USB hub.

Affected Silicon Revisions

B1								
X								

14. Module: USB

In the case where the bus has been idle for > 3 ms, and the UIDLE interrupt flag is set, if software clears the interrupt flag, and the bus remains idle, the UIDLE interrupt flag will not be set again.

Work around

Software can leave the UIDLE bit set until it has received some indication of bus resumption. (Resume, Reset, SOF, or Error).

Note: Resume and Reset are the only interrupts that should occur following UIDLE assertion. If, at any point in time, the UIDLE bit is set, it should be okay to suspend the USB module (as long as this code is protected by the GUARD and/or ACTPEND logic). Note that this will require software to clear the UIDLE interrupt enable bit to exit the USB ISR (if using interrupt driven code).

Affected Silicon Revisions

B1								
X								

15. Module: DMA

When the DMA is set up for CAN receive, interrupts can sometimes be lost if the DMA is held in an “OFF” state by the system arbiter. If a CAN receive interrupt occurs while the DMA is waiting for a grant for the previous CAN transaction, this current interrupt will be dropped.

Work arounds

There are two possible work arounds for this issue:

1. Use Dual Port RAM (If available) for target DMA memory; the DMA cannot be held “OFF” when accessing the back side of DPRAM. Only channels set up for CAN receive would need to use DPRAM; all other peripherals can use any RAM.
2. Elevate the system priority of DMA by writing a 0x20 to the MSTRPR (Master Priority) SFR register (address 0x0058). This will also prevent the DMA from being held “OFF”.

Affected Silicon Revisions

B1							
X							

16. Module: UART

When using UTXISEL = 01 (Interrupt when last character is shifted out of the Transmit Shift Register), and the final character is being shifted out through the Transmit Shift Register, the TX interrupt may occur before the final bit is shifted out.

Work around

If it is critical that the interrupt processing occurs only when all transmit operations are complete, after which the following work around can be implemented:

Hold off the interrupt routine processing by adding a loop at the beginning of the routine that polls the transmit shift register empty bit, as shown in [Example 2](#).

Affected Silicon Revisions

B1							
X							

EXAMPLE 2:

```

// in UART2 initialization code
...
U2STAbits.UTXISEL0 = 1;           // Set to generate TX interrupt when all
U2STAbits.UTXISEL1 = 0;           // transmit operations are complete.
...

U2TXInterrupt(void)
{
    while(U2STAbits.TRMT==0);     // wait for the transmit buffer to be empty
    ...                           // process interrupt
}
    
```

17. Module: UART

When a Read-Modify-Write operation is performed to set or clear any bit(s) in the UxSTA register while hardware is clearing the UTXBRK bit (UxSTA<11>), the UTXBRK bit may remain set. BSET and BCLR are examples of Read-Modify-Write instructions.

Work around

Wait for the UTXBRK bit to get cleared by hardware, before performing a Read-Modify-Write operation on the UxSTA register.

Affected Silicon Revisions

B1							
X							

18. Module: UART

The transmitter write pointer does not get cleared when the UART module is disabled (UARTEN = 0), and it requires the TXEN bit to be set in order to clear the write pointer.

Work around

Do not load data into the TX FIFO (register) before setting the TXEN bit.

Affected Silicon Revisions

B1							
X							

19. Module: I²C™

When a Read-Modify-Write operation is performed to set or clear any bit(s) in the I2CxCON register while hardware is clearing the ACKEN bit (I2CxCON<4>), the ACKEN bit may remain set. BSET and BCLR are examples of Read-Modify-Write instructions.

Work around

Wait for the ACKEN bit to get cleared by hardware before performing a Read-Modify-Write operation on the I2CxCON register.

Affected Silicon Revisions

B1							
X							

20. Module: ADC

The ADC Conversion Status bit, DONE (ADxCON1<0>), does not indicate completion of conversion when External Interrupt is selected as the ADC trigger source (ADxCON1<SSRC> = 1).

Work around

Use ADC interrupt or poll ADxIF (in the IFSx registers) bit to determine the completion of conversion.

Affected Silicon Revisions

B1							
X							

21. Module: PMP

Note: This silicon issue applies only to dsPIC33EPXXXMU814 and PIC24EPXXXMC814 devices.

When PTEN14 = 1 (PMAEN<14>), the PMA<14> or PMCS1 functionality is present on the PMCS1/RK11 (pin 94) and RJ14 (pin 21).

When PTEN15 = 1 (PMAEN<15>), the PMA<15> or PMCS2 functionality is present on the PMCS2/RK12 (pin 93) and RJ15 (pin 22).

Work around

None.

Affected Silicon Revisions

B1							
X							

22. Module: Flash Memory

Note: This silicon issue applies only to In-Circuit Serial Programming™ (ICSP™) mode.

If code or write protection is enabled on either the General Segment or Auxiliary Segment, neither segment can be read by the programmer. Code or write protection is enabled for the General Segment when the GSS (FGS<1>) or GWRP (FGS<0>) bits are '0'. Code or write protection is enabled for the Auxiliary Segment when the APL (FAS<1>) or AWRP (FAS<0>) bits are '0'.

Work around

None.

Affected Silicon Revisions

B1							
X							

23. Module: Flash Memory

The processor stalls while performing Run-Time Self-Programming (RTSP) erase and write operations on the same Flash segment (General or Auxiliary) from which code is being executed. The stall mechanism does not always function properly and can cause unexpected behavior.

Work arounds

Two options are available to avoid this issue:

1. If you are required to execute code, including an Interrupt Service Routine (ISR), from the same segment (either General or Auxiliary) that you are performing RTSP operations on, you must disable interrupts until the erase or programming operation is complete (see [Example 3](#)).
2. If possible, structure your project such that RTSP operations are performed on a segment from which no code is being executed. For example, place all of your executable code in the General Segment and all reprogrammable data in the Auxiliary Segment or vice versa. This solution has the added advantage that no CPU stalls occur since the programming operation is not being performed on the same segment that is executing the code.

EXAMPLE 3:

```

; Load write latches if programming
...
; Setup NVMCON register to erase or program
  as required
...
; Disable interrupts
  PUSH  SR
  MOV   #0x00E0, W0
  IOR   SR
; Write the KEY sequence
  MOV   #0x55, W0
  MOV   W0, NVMKEY
  MOV   #0xAA, W0
  MOV   W0, NVMKEY
; Start the programming sequence
  BSET  NVMCON, #15
; Insert two NOPs after programming
  NOP
  NOP
; Wait for operation to complete
prog_wait:
  BTSC  NVMCON, #15
  BRA   prog_wait
; Re-enable interrupts,
  POP   SR
    
```

Affected Silicon Revisions

B1							
X							

24. Module: Power System

The VREGSF bit functions as documented, but will always read as '0'. Because of the Read-Modify-Write process, any BSET or BCLR instruction of the RCON register will also write a '0' to the VREGSF bit.

Work around

If the VREGSF bit is intended to be set to a '1', the user must also write a '1' to the VREGSF bit when setting or clearing any other bit in the RCON register.

Affected Silicon Revisions

B1							
X							

25. Module: PWM

When operating in Edge-Aligned Complimentary mode, if the duty cycle (PDCx) becomes less than the alternate dead time (ALTDTRx), the dead time on the PWMs will become zero.

Work around

Ensure that the duty cycle (PDCx) always meets the following condition: PDCx > (ALTDTRx - 1)

Affected Silicon Revisions

B1							
X							

26. Module: QEI

In Quadrature Encoder mode (QEIxCON<CMM> = 00), the index counter registers (INDXxCNTH and INDXxCNTL) cannot be relied upon to increment when the last known direction was positive and an index pulse occurs. The index register can decrement even if the last known direction was positive. This does not apply to external clock or internal timer QEI modes.

Work around

The Index Event can be used to implement a software counter. The direction could be determined by comparing the current POSxCNT value to that of the previous Index Event.

Affected Silicon Revisions

B1							
X							

27. Module: QEI

When Modulo Count mode (Mode 6) is selected for the position counter (QEIXCON<PIMOD> = 110) and the counter direction is set to negative (QEIXCON<CNTPOL> = 1), the functions of the QEIXLEC and QEIXGEC registers are reversed.

Work around

When using Modulo Count mode in conjunction with a negative count direction (polarity) use the QEIXLEC register as the upper count limit and the QEIXGEC register as the lower count limit.

Affected Silicon Revisions

B1								
X								

28. Module: CPU

Note: This silicon issue applies only to dsPIC33EPXXXGP/MC/MU806/810/814 devices.

Table write (TBLWTL, TBLWTH) instructions cannot be the first or last instruction of a DO loop.

Work around

None.

Affected Silicon Revisions

B1								
X								

29. Module: PWM

The PWM module can operate with variable period, duty cycle, dead-time, and phase values. The master period and other timing parameters can be updated in the same PWM cycle. With immediate updates disabled, the new values should take effect at the start of the next PWM cycle.

As a result of this issue, the updated master period takes effect on the next PWM cycle, while the update of the additional timing parameter is delayed by one PWM cycle. The parameters affected by this erratum are as follows:

Master period registers – update effective on the next PWM cycle:

- PTPER – if PWMCONx<MTBS> = 0
- STPER – if PWMCONx<MTBS> = 1

Additional PWM timing parameters – update effective one PWM cycle after master period update:

- Duty cycle – PDCx, SDCx, and MDC registers
- Phase – PHASEx or SPHASEx registers
- Dead-time – DTRx and ALTDTRx registers and dead-time compensation signals
- Clearing of current-limit and Fault conditions, and application of external period reset signal

Work around

If the application requires the master period and other parameters to be updated at the same time, enable both immediate updates:

- PTCON<EIPU> = 1 – to enable immediate period updates
- PWMCONx<IUE> = 1 – to enable immediate updates of additional parameters listed above

Enabling immediate updates will allow updates to the master period and the other parameters to take effect immediately after writing to the respective registers.

Affected Silicon Revisions

B1								
X								

Data Sheet Clarifications

The following typographic corrections and clarifications are to be noted for the latest version of the device data sheet (DS70616F):

<p>Note: Corrections are shown in bold. Where possible, the original bold text formatting has been removed for clarity.</p>

None to report at this time.

APPENDIX A: REVISION HISTORY

Rev A Document (6/2011)

Initial release of this document; issued for revision B1 silicon.

Includes silicon issues 1 (I/O Multiplexer), 2-3 (CPU), 4 (PPS), 5-6 (SPI), 7-8 (PWM), 9 (Power System), 10 (Reserved), 11-12 (ECAN™), 13-14 (USB), 15 (DMA), 16-18 (UART), and 19 (I²C™).

Rev B Document (11/2011)

Updated issues 2 (CPU), 7 (PWM), 8 (PWM), 12 (ECAN™), and 14(USB).

Added issues 20 (ADC), 21 (PMP), 22 (Flash Memory), 23 (Flash Memory), 24 (Power System), 25 (PWM), 26 (QEI), 27 (QEI), 28 (CPU), and 29 (PWM).

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