PIC12F629/675

PIC12F629/675 Family
Silicon Errata and Data Sheet Clarification

The PIC12F629/675 family of devices that you have received conform functionally to the current Device Data Sheet (DS41190**F**), 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 PIC12F629/675 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 (**B0**).

Data Sheet clarifications and corrections start on page 4, 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 2 or PICkit™ 3:

1. Using the appropriate interface, connect the device to the MPLAB ICD 2 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 DEVREV values for the various PIC12F629/675 silicon revisions are shown in Table 1.

TABLE 1: SILICON DEVREV VALUES

Part Number	Device ID[1]	Revision ID for Silicon Revision[2]	
		A9	B0
PIC12F629	1111110 xxxxx	0F90h	0F8Bh
PIC12F675	1111100 xxxxx	0FD0h	0FCBh

Note 1: The Device IDs (DEVID and DEVREV) are located at the last two implemented addresses of configuration memory space. They are shown in hexadecimal in the format "DEVID DEVREV".

2: Refer to the *"PIC12F629/675 Flash Programming Specification"* (DS41191) for detailed information on Device and Revision IDs for your specific device.

PIC12F629/675

TABLE 2: **SILICON ISSUE SUMMARY**

Module	Feature	Item Number	Issue Summary	Affected Revisions[1]	
				A9	B0
Data EEPROM Memory	Interrupt Flag	1.	Inadvertently clears.	X	X
Power-on Reset	—	2.	Low V_{DD} Level may fail to release the Reset.	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 (**B0**).

1. Module: Data EEPROM Memory

The EEIF flag may be cleared inadvertently when performing operations on the PIR1 register, simultaneously with the completion of an EEPROM write. This condition occurs when the EEPROM write timer completes at the same moment that the PIR1 register operation is executed. Register operations are those that have the PIR1 register as the destination and include, but are not limited to, BSF, BCF, ANDWF, IORWF and XORWF.

Work around

1. Avoid operations on the PIR1 register when writing to the EEPROM memory.
2. Poll the WR bit (EECON1<1>) to determine when the write is complete.
3. Use a timer interrupt to catch any instances when the EEIF flag is inadvertently cleared. The timer interrupt should be set longer than 8 ms. If EEIF fails, then the timer interrupt occurs as a default time out. The WR and WRERR flags are checked as part of the timer Interrupt Service Routine to verify the EEPROM write success.
4. If periodic interrupts are occurring in addition to the EEIF interrupts, then use a secondary flag to sense write completion. The secondary flag is set whenever EEPROM writes are active. An EEPROM write completion is indicated when the secondary flag is set and the WR flag is clear.

Affected Silicon Revisions

A9	B0						
X	X						

2. Module: Power-on Reset (Rising V$_{DD}$ Detect)

The PIC12F629/675 Power-on Reset (POR) circuitry is sensitive to a low V$_{DD}$ level and may fail to release the Reset if V$_{DD}$ returns to an operational voltage after dropping to a very low level.

The sensitive V$_{DD}$ condition occurs when V$_{DD}$ drops into an out-of-specification voltage region below the Brown-out Detect threshold and then recovers to a normal operating condition. The voltage region that can cause the problem is dependant upon temperature with the region growing as the temperature drops. A typical region is between 0.5 and 0.7V at -25°C. Below the region, the POR operates correctly. Above the region, the POR is inactive per the data sheet. Inside the region, the POR will assert Reset and will not release Reset until power is removed and V$_{DD}$ reaches V$_{SS}$. Because the POR is independent of other Reset circuits (see Figure 9-4 of the data sheet), activating BOR or using the $\overline{\text{MCLR}}$ input will not eliminate the problem.

Work around

To resolve this problem, the application must be designed to assure that V$_{DD}$ reaches V$_{SS}$. This is described as D003 V$_{POR}$ in **Section 12.0 "Electrical Specifications"** of the Device Data Sheet (DS41190**F**).

Affected Silicon Revisions

A9	B0						
X							

Data Sheet Clarification

None.

APPENDIX A: DOCUMENT REVISION HISTORY

Rev. A Document (3/2002)

First revision of this document. Revised Table 12.3

Rev. B Document (9/2002)

Added Module 1: "In-Circuit Serial Programming™", changes made to the Typical In-Circuit Serial Programming Connection, Figure 9-18.

Rev. C Document (04/02/04)

Removed Table 12.3 and Figure 9-18 due to Data Sheet revisions.
Added Module 1: "GPIO Port", changes made to the TRISIO – GPIO Tri-state Register.

Rev. D Document (11/2004)

Added Module 1: "Data EEPROM Memory" for PIC12F629/675 silicon.

Rev. E Document (07/2005)

Data Sheet Clarifications/Corrections Section: Added Module 2: New 4x4 DFN Package added.

Rev. F Document (10/2005)

Data Sheet Clarifications/Corrections Section: Replaced 8-Lead Plastic Dual Flat No Lead Package 4x4 (DFN).

Rev. G Document (8/2006)

Added Module 2: "Power-on Reset (Rising V_{DD} Detect)" for PIC12F629/675 silicon.

Rev. H Document (6/2009)

Updated the document with new format. Deleted Module 1 and 2 from the Data Sheet Clarification section. Updated Table 1 and 2. Other minor edits.

NOTES:

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.

- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.

- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.

- Microchip is willing to work with the customer who is concerned about the integrity of their code.

- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Trademarks

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
═══ ISO/TS 16949:2002 ═══

WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
http://support.microchip.com
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Cleveland
Independence, OH
Tel: 216-447-0464
Fax: 216-447-0643

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Farmington Hills, MI
Tel: 248-538-2250
Fax: 248-538-2260

Kokomo
Kokomo, IN
Tel: 765-864-8360
Fax: 765-864-8387

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608

Santa Clara
Santa Clara, CA
Tel: 408-961-6444
Fax: 408-961-6445

Toronto
Mississauga, Ontario,
Canada
Tel: 905-673-0699
Fax: 905-673-6509

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon
Hong Kong
Tel: 852-2401-1200
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8528-2100
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Hong Kong SAR
Tel: 852-2401-1200
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-5407-5533
Fax: 86-21-5407-5066

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8203-2660
Fax: 86-755-8203-1760

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xiamen
Tel: 86-592-2388138
Fax: 86-592-2388130

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

China - Zhuhai
Tel: 86-756-3210040
Fax: 86-756-3210049

ASIA/PACIFIC

India - Bangalore
Tel: 91-80-3090-4444
Fax: 91-80-3090-4080

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-2566-1512
Fax: 91-20-2566-1513

Japan - Yokohama
Tel: 81-45-471- 6166
Fax: 81-45-471-6122

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

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

Taiwan - Hsin Chu
Tel: 886-3-6578-300
Fax: 886-3-6578-370

Taiwan - Kaohsiung
Tel: 886-7-536-4818
Fax: 886-7-536-4803

Taiwan - Taipei
Tel: 886-2-2500-6610
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

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

03/26/09