

## PIC16LF1902/1903 Family Silicon Errata and Data Sheet Clarification

The PIC16LF1902/1903 family devices that you have received conform functionally to the current Device Data Sheet (DS41455B), 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 PIC16LF1902/1903 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 (**A5**).

Data Sheet clarifications and corrections start on [page 5](#), 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](http://www.microchip.com)).

For example, to identify the silicon revision level using MPLAB IDE in conjunction with a hardware debugger:

1. Using the appropriate interface, connect the device to the hardware debugger.
2. Open an MPLAB IDE project.
3. Configure the MPLAB IDE project for the appropriate device and hardware debugger.
4. Based on the version of MPLAB IDE you are using, do one of the following:
  - a) For MPLAB IDE 8, select *Programmer > Reconnect*.
  - b) For MPLAB X IDE, select *Window > Dashboard* and click the **Refresh Debug Tool Status** icon (  ).
5. 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 PIC16LF1902/1903 silicon revisions are shown in [Table 1](#).

**TABLE 1: SILICON DEVREV VALUES**

Part Number	DEVICE ID<13:0>			
	DEV<8:0> <sup>(1)</sup>	REV<4:0> Silicon Revision <sup>(2)</sup>		
		A2	A4	A5
PIC16LF1902	01 1100 001	0 0010	0 0100	0 0101
PIC16LF1903	01 1100 000	0 0010	0 0100	0 0101

- Note 1:** The Device ID is located in the configuration memory at address 8006h.
- Note 2:** Refer to the “*PIC16(L)F193X/(L)F194X/LF190X Memory Programming Specification*” (DS41397) for detailed information on Device and Revision IDs for your specific device.

# PIC16LF1902/1903

**TABLE 2: SILICON ISSUE SUMMARY**

Module	Feature	Item Number	Issue Summary	Affected Revisions <sup>(1)</sup>		
				A2	A4	A5
<a href="#">High-Frequency Internal Oscillator (HFINTOSC)</a>	HFINTOSC Operation	<a href="#">1.1</a>	HFINTOSC Max. VDD at -40°C	X		
<a href="#">Oscillator</a>	HFINTOSC Ready/Stable bit	<a href="#">2.1</a>	Bits remained set to '1' after initial trigger	X	X	
<a href="#">Oscillator</a>	Clock Switching	<a href="#">2.2</a>	Clock switching fails	X	X	
<a href="#">Sleep Module</a>	Sleep	<a href="#">3.1</a>	Wake from Sleep	X	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 (A5).

### 1. Module: High-Frequency Internal Oscillator (HFINTOSC)

#### 1.1 HFINTOSC Max. V<sub>DD</sub> at -40°C

The High-Frequency Internal Oscillator may stop working at -40°C when V<sub>DD</sub> is 3.6V.

##### Work around

1. Use the Internal Oscillator (INTOSC) with V<sub>DD</sub> = 3.5V or less.
2. Operate the device with V<sub>DD</sub> = 3.0V then, after the High-Frequency Oscillator (HFINTOSC) is operating at speed, increase V<sub>DD</sub> to 3.6V.

##### Affected Silicon Revisions

A2	A4	A5					
X							

### 2. Module: Oscillator

#### 2.1 OSCSTAT bits: HFIOFR and HFIOFS

When HFINTOSC is selected, HFIOFR and HFIOFS bits will become set when the oscillator becomes ready and stable. Once these bits are set they become “stuck”, indicating that HFINTOSC is always ready and stable. If HFINTOSC is disabled, the bits fail to be cleared.

##### Work around

None.

##### Affected Silicon Revisions

A2	A4	A5					
X	X						

### 2.2 Clock Switching

When switching clock sources between an INTOSC clock source and an external clock source operating at a different power mode, one corrupted instruction may be executed after the switch occurs.

##### Work around

When clock switching from an external oscillator clock source, first switch to 16 MHz HFINTOSC. Once running at 16 MHz HFINTOSC, configure IRCF to run at desired frequency.

When clock switching from an INTOSC to an external oscillator clock source, first switch from desired INTOSC frequency to HFINTOSC High-Power mode (8 MHz or 16 MHz). Once running from HFINTOSC, switch to the external oscillator clock source.

##### Affected Silicon Revisions

A2	A4	A5					
X	X						

# PIC16LF1902/1903

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## 3. Module: Sleep Module

### 3.1 Sleep

Under certain conditions, when the LCD is clocked by LFINTOSC during Sleep mode, the device may not wake-up from Sleep mode.

#### **Work around**

Instead of using Sleep mode, switch the oscillator to LFINTOSC (OSCCON = 0x00) and use a delay loop.

#### **Affected Silicon Revisions**

A2	A4	A5					
X	X	X					

## Data Sheet Clarifications

The following typographic corrections and clarifications are to be noted for the latest version of the device data sheet (DS41455B):

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

### 1. Module: Device ID and Revision ID

Device ID correction for PIC16LF1902 and PIC16LF1903 on page 41 of data sheet DS41455B. In Register 4-3, DEV<8:0> bits should read:

Device	DEVICEID<13:0> Values	
	DEV<8:0>	REV<4:0>
PIC16LF1902	01 1100 <b>001</b>	x xxxx
PIC16LF1903	01 1100 <b>000</b>	x xxxx

# PIC16LF1902/1903

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## APPENDIX A: DOCUMENT REVISION HISTORY

### **Rev A Document (05/2011)**

Initial release of this document.

### **Rev B Document (11/2011)**

Added Silicon Revision A4.

### **Rev C Document (01/2012)**

Added Modules 2.1, 2.2 and 2.3.

### **Rev D Document (01/2013)**

Added MPLAB X IDE; Added Module 3.

### **Rev E Document (10/2013)**

Added Silicon Revision A5; Other minor corrections.

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