PIC16C505 → PIC16F505 Migration

DEVICE MIGRATIONS

This document is intended to describe the functional differences that are present when migrating from the PIC16C505 to the PIC16F505.

Note 1:	This device has been designed to perform to the parameters of its data sheet. It has been tested to an electrical specification designed to determine its conformance with these parameters. Due to process differences in the manufacture of this device, this device may have different performance characteristics than its earlier version. These differences may cause this device to perform differently in your application than the earlier version of this device.
2:	The user should verify that the device oscillator starts and performs as expected. Adjusting the loading capacitor values and/or the Oscillator mode may be required.

Table 1 shows the considerations that must be taken into account when migrating from the PIC16C505 to the PIC16F505.

TABLE 1: PIC16C505 → PIC16F505 MIGRATION DIFFERENCES

Functional Differences				
No.	**Difference**	**H/W**	**S/W**	**Prog.**
1	Programming algorithm change, PIC16F505 uses a new programming algorithm	—	—	✔
2	Program memory code protection, bits 11-6 now unimplemented	—	✔	—
3	Operating regions	✔	—	—
4	OSCCAL, one extra OSCCAL calibration bit has been added	—	✔	—

Legend: H/W – Issues may exist with regard to the application circuit.
S/W – Issues may exist with regard to the user program.
Programming – Issues may exist with regard to programming the device.

TABLE 2: PIC16C505 → PIC16F505 NEW FEATURES

No.	**Feature**
1	PIC16F505 has 1024 words of Flash program memory
2	EC Mode Oscillator

Legend: H/W – Issues may exist with regard to the application circuit.
S/W – Issues may exist with regard to the user program.
Programming – Issues may exist with regard to programming the device.

DEVICE MIGRATIONS

The PIC16F505 is mainly a technology process change from the PIC16C505 14-pin parts. There are some changes that may affect older designs looking to use the new parts. The changes are grouped into two categories: those that affect hardware and those that affect software. In most cases, an older design will have little or no problems migrating to these new parts.

HARDWARE CHANGES

Oscillator

EC Oscillator mode has been added to the device. This saves the cost of a dedicated clock source when a system-wide clock source is available.

Operating Region

The commercial temperature operating region has been incorporated into the industrial temperature region. Please see the voltage frequency graphs in the data sheet for more information.

The “LF” operating region has been incorporated into the “F” parts. Please see the voltage frequency graphs in the data sheet for more information.

Process Differences

Because the PIC16F505 uses a newer process technology, there will be subtle behavior differences between the PIC16C505 and the PIC16F505. Before starting on a design migration, check the data sheets and verify that the electrical specifications for the new part are appropriate for your application.

SOFTWARE CHANGES

Flash Program Memory Code Protection

The Code Protect bits for the program memory have changed from the PIC16C505 to the PIC16F505. Configuration bits <11:6> ($\overline{CP}$) are now unimplemented. They have been replaced with one Configuration bit <3> ($\overline{CP}$).

OSCCAL

An extra bit has been implemented in the 4 MHz INTOSC enhancing the calibrated frequency of the INTOSC.

The factory calibration value stored at location 03FFh has also been increased by one bit and is loaded in the same manner as the PIC16C505 with a `MOVLW, OSCCAL` instruction.

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.

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ISO/TS 16949:2002

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