PIC16F627A/628A/648A

PIC16F62X → PIC16F627A/628A/648A Migration

DEVICE MIGRATIONS

This document is intended to describe the functional differences that are present when migrating from one device to the next.

Note:	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.
Note:	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 PIC16F62X to the PIC16F627A/628A/648A.

TABLE 1:   PIC16F62X → PIC16F627A/628A/648A MIGRATION DIFFERENCES

No.	Difference	H/W	S/W	Prog.
1	ER mode is now RC mode	✓	✓	—
2	Program Memory Code Protection Scheme - All or Nothing	—	—	✓
3	BOR optionally enables the PWRT	✓	—	✓
4	Timer1 Oscillator designed for 32.768 kHz operation.	✓	—	—
5	Dual Speed Oscillator in INTOSC mode only	—	✓	—
6	Comparator Operation per Data Sheet	✓	✓	—

TABLE 2:   PIC16F62X → PIC16F627A/628A/648A NEW FEATURES

No.	Feature
1	PIC16F648A has 4K words of FLASH Program memory
2	PIC16F648A has 256 Bytes of Data EEPROM memory
3	PIC16F648A has 256 Bytes of Data RAM memory
4	Precision Internal 4 MHz oscillator factory calibrated to ±1% (INTOSC)

PIC16F62X

DEVICE MIGRATIONS

The PIC16F627A/628A/648A is mainly a technology process change from the PIC16F62X family of 18-pin parts with comparators. 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

ER Mode is now RC Mode

The biggest difference between the PIC16F62X and the PIC16F627A/628A/648A is the removal of the ER Oscillator mode. This has been changed to an external Resistor/Capacitor (RC) mode. In most cases, a design can switch from ER to RC simply by adding a capacitor and changing the value of the resistor to provide the same clock speed. In cases where 37 kHz or 4 MHz is desired or acceptable, the external RC can be eliminated entirely and the Internal Oscillator modes can be used.

FLASH Program Memory Code Protection

Code Protection for the Program Memory has changed from Code Protect sections of memory to Code Protect of the whole memory. The Configuration bits<12,10> CP0 and bits<13,11> CP1 in the PIC16F62X do not exist in the PIC16F627A/628A/648A. They have been replaced with one configuration bit<13> CP.

New BOR PWRT Relationship

Enabling Brown-out Reset (BOR) does not automatically enable the Power-up Timer (PWRT) the way it did in the PIC16F62X.

Timer1 Oscillator Speed Change

The Timer1 Oscillator is now designed for 32.768 kHz operation. In the PIC16F62X the Timer1 Oscillator was designed to run up to 200 kHz.

Dual Speed Oscillator Mode Change

The Dual Speed Oscillator mode only works within the INTOSC Oscillator mode. In the PIC16F62X, the Dual Speed Oscillator mode works in both the INTRC and ER Oscillator modes.

Comparator Mode

All comparator modes function as described in the data sheet. The issue described in the errata for the PIC16F62X has been rectified and is no longer an issue.

Process Differences

Because the PIC16F627A/628A/648A family uses a newer process technology, there will be subtle behavior differences between the PIC16F62X and the PIC16F627A/628A/648A parts. 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.

TERMINOLOGY CHANGES

1. The "Brown-out Detect (BOD)" terminology has changed to "Brown-out Reset (BOR)" to better represent the function the Brown-out circuitry performs.
2. The "Internal RC Oscillator (INTRC)" terminology has changed to "Internal Oscillator (INTOSC)" to better represent the functioning of the circuitry.

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.

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• 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.

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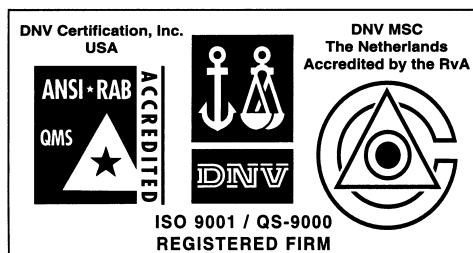
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