

PIC16C62X/PIC16CE62X → PIC16F62X Migration

DEVICE MIGRATIONS

This document is intended to describe the functional differences and the electrical specification 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.

Table 1 shows the considerations that must be taken into account when migrating from the PIC16C62X/PIC16CE62X to the PIC16F62X.

TABLE 1: PIC16C62X/PIC16CE62X → PIC16F62X MIGRATION DIFFERENCES

Functional Differences				
No.	Difference	H/W	S/W	Prog.
1	RC mode is now ER mode	✓	✓	—
2	EEPROM is not I ² C™	—	✓	—

TABLE 2: PIC16C62X/PIC16CE62X → PIC16F62X NEW FEATURES

No.	Feature
1	Program memory is FLASH
2	Internal 4 MHz and 37 kHz RC
3	Hardware USART
4	16-bit Timer1
5	8-bit auto reload Timer2
6	Capture, Compare, PWM Module
7	Internal MCLR

DEVICE MIGRATIONS

The PIC16F627 and PIC16F628 are the latest additions to the PIC16C62X/PIC16CE62X family of 18-pin parts with comparators. These new parts greatly increase the available features with the addition of many new peripherals. Some of these changes 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 FLASH parts.

HARDWARE CHANGES

FLASH Memory

This change will not affect many applications, but it does provide some simple opportunities for improvements. With very little effort, a design can be made in-circuit reprogrammable.

RC MODE IS NOW ER MODE

The biggest difference between the PIC16C62X/PIC16CE62X and the PIC16F62X would be the removal of the RC Oscillator mode. This has been changed to an External Resistor (ER) mode. In most cases, a design can switch from RC to ER, simply by removing the 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 RC modes can be used.

INTRC IS A NEW MODE

This part has two internal RC Oscillator modes. The first mode, enabled by a CONFIG bit, is the 4 MHz mode (INTRC). The second is a 37 kHz mode that is software selectable when the part is in ER or INTRC. This allows designs to switch between a High Speed, High Power mode and a Low Speed, Low Power mode, as desired. The 37 kHz oscillator is not available when the configuration register is set for HS, XT or LP modes.

Internal MCLR

The $\overline{\text{MCLR}}$ pin can now be disabled. This removes the possibility of externally resetting the CPU, but it can provide an additional I/O pin. If you do not use the pin, it is still recommended that you tie the pin high or low with a resistor. When MCLR is disabled, RA5 becomes available as a Schmitt trigger input.

New I/O Pins

The addition of the INTRC modes frees up two more pins. OSC1 and OSC2 can be configured as RA6 and RA7 for general purpose I/O. Additionally, RA6 can be used to bring the INTRC clock external. Consult the PIC16F62X Data Sheet (DS40300) for details.

Process Differences

Because the PIC16F62X family is made on a FLASH process, there will be subtle behavior differences between the PIC16F62X and the PIC16C62X parts. The most visible difference will be in power consumption. Before starting on a design migration, check the data sheets and verify that the power consumption of the new parts is appropriate for your application.

ICSP™ Programming

The PIC16F62X family includes provisions for ICSP. The ICSP algorithms are very similar to the algorithms in the PIC16C62X/PIC16CE62X devices. The primary difference is the ability to program the EEPROM and to erase the memory. This eliminates the requirement of special code to initialize the EEPROM memory at run time. It also allows test code to be programmed and then replaced with product code, due to the rewriteable nature of the FLASH memory. The PIC16F62X also includes a Low Voltage Programming mode (LVP) that allows the device to be programmed from a 5V power supply. Using LVP places restrictions on pin RB4. Consult the data sheet for details.

SOFTWARE CHANGES

EEPROM is No Longer Accessed With I²C™

The PIC16CE62X family provides a valuable EEPROM resource that is important for many applications. This EEPROM was implemented by placing a second DIE alongside the PICmicro® DIE. The communications were handled with firmware that provided I²C communications.

The FLASH process used in the PIC16F62X family allows the EEPROM cells to be integrated on the same DIE as the PICmicro DIE. This integration includes circuitry to perform the EEPROM read and write cycles. Consult the data sheets for the new routines for accessing the EEPROM.

NEW FEATURES

The PIC16F62X has new hardware features that some applications may be able to move from software. These features include:

1. Hardware USART.
2. 16-bit Timer 1 with LP oscillator driver.
3. 8-bit auto-reload Timer 2.
4. Capture, Compare PWM (CCP) module.
5. 10-bit PWM output.
6. Internal RC oscillator at 4 MHz and 37 kHz.

CONCLUSION

The PIC16F62X family is a valuable addition to the 18-pin comparator family of parts. With the addition of a UART, new timers, CCP, PWM and internal RC, a wider range of applications becomes possible. With only minimal hardware/software changes, many existing PIC16C62X designs can be migrated to take advantage of FLASH memory and a newer process.

NOTES:

Note the following details of the code protection feature on PICmicro® MCUs.

- The PICmicro family meets the specifications contained in the Microchip Data Sheet.
- Microchip believes that its family of PICmicro microcontrollers is one of the most secure products 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 PICmicro microcontroller in a manner outside the operating specifications contained in the data sheet. The person doing so may be 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 product.

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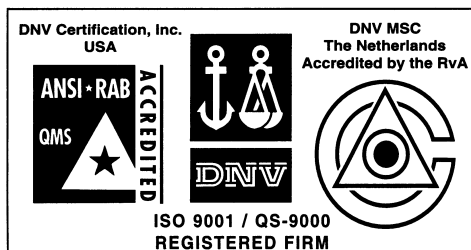
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WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office

2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200 Fax: 480-792-7277
Technical Support: 480-792-7627
Web Address: <http://www.microchip.com>

Rocky Mountain

2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7966 Fax: 480-792-7456

Atlanta

500 Sugar Mill Road, Suite 200B
Atlanta, GA 30350
Tel: 770-640-0034 Fax: 770-640-0307

Boston

2 Lan Drive, Suite 120
Westford, MA 01886
Tel: 978-692-3848 Fax: 978-692-3821

Chicago

333 Pierce Road, Suite 180
Itasca, IL 60143
Tel: 630-285-0071 Fax: 630-285-0075

Dallas

4570 Westgrove Drive, Suite 160
Addison, TX 75001
Tel: 972-818-7423 Fax: 972-818-2924

Detroit

Tri-Atria Office Building
32255 Northwestern Highway, Suite 190
Farmington Hills, MI 48334
Tel: 248-538-2250 Fax: 248-538-2260

Kokomo

2767 S. Albright Road
Kokomo, Indiana 46902
Tel: 765-864-8360 Fax: 765-864-8387

Los Angeles

18201 Von Karman, Suite 1090
Irvine, CA 92612
Tel: 949-263-1888 Fax: 949-263-1338

New York

150 Motor Parkway, Suite 202
Hauppauge, NY 11788
Tel: 631-273-5305 Fax: 631-273-5335

San Jose

Microchip Technology Inc.
2107 North First Street, Suite 590
San Jose, CA 95131
Tel: 408-436-7950 Fax: 408-436-7955

Toronto

6285 Northam Drive, Suite 108
Mississauga, Ontario L4V 1X5, Canada
Tel: 905-673-0699 Fax: 905-673-6509

ASIA/PACIFIC

Australia

Microchip Technology Australia Pty Ltd
Suite 22, 41 Rawson Street
Epping 2121, NSW
Australia
Tel: 61-2-9868-6733 Fax: 61-2-9868-6755

China - Beijing

Microchip Technology Consulting (Shanghai)
Co., Ltd., Beijing Liaison Office
Unit 915
Bei Hai Wan Tai Bldg.
No. 6 Chaoyangmen Beidajie
Beijing, 100027, No. China
Tel: 86-10-85282100 Fax: 86-10-85282104

China - Chengdu

Microchip Technology Consulting (Shanghai)
Co., Ltd., Chengdu Liaison Office
Rm. 2401, 24th Floor,
Ming Xing Financial Tower
No. 88 TIDU Street
Chengdu 610016, China
Tel: 86-28-6766200 Fax: 86-28-6766599

China - Fuzhou

Microchip Technology Consulting (Shanghai)
Co., Ltd., Fuzhou Liaison Office
Unit 28F, World Trade Plaza
No. 71 Wusi Road
Fuzhou 350001, China
Tel: 86-591-7503506 Fax: 86-591-7503521

China - Shanghai

Microchip Technology Consulting (Shanghai)
Co., Ltd.
Room 701, Bldg. B
Far East International Plaza
No. 317 Xian Xia Road
Shanghai, 200051
Tel: 86-21-6275-5700 Fax: 86-21-6275-5060

China - Shenzhen

Microchip Technology Consulting (Shanghai)
Co., Ltd., Shenzhen Liaison Office
Rm. 1315, 13/F, Shenzhen Kerry Centre,
Renminnan Lu
Shenzhen 518001, China
Tel: 86-755-2350361 Fax: 86-755-2366086

Hong Kong

Microchip Technology Hongkong Ltd.
Unit 901-6, Tower 2, Metroplaza
223 Hing Fong Road
Kwai Fong, N.T., Hong Kong
Tel: 852-2401-1200 Fax: 852-2401-3431

India

Microchip Technology Inc.
India Liaison Office
Divyasree Chambers
1 Floor, Wing A (A3/A4)
No. 11, O'Shaugnessey Road
Bangalore, 560 025, India
Tel: 91-80-2290061 Fax: 91-80-2290062

Japan

Microchip Technology Japan K.K.
Benex S-1 6F
3-18-20, Shinyokohama
Kohoku-Ku, Yokohama-shi
Kanagawa, 222-0033, Japan
Tel: 81-45-471-6166 Fax: 81-45-471-6122

Korea

Microchip Technology Korea
168-1, Youngbo Bldg. 3 Floor
Samsung-Dong, Kangnam-Ku
Seoul, Korea 135-882
Tel: 82-2-554-7200 Fax: 82-2-558-5934

Singapore

Microchip Technology Singapore Pte Ltd.
200 Middle Road
#07-02 Prime Centre
Singapore, 188980
Tel: 65-6334-8870 Fax: 65-6334-8850

Taiwan

Microchip Technology Taiwan
11F-3, No. 207
Tung Hua North Road
Taipei, 105, Taiwan
Tel: 886-2-2717-7175 Fax: 886-2-2545-0139

EUROPE

Denmark

Microchip Technology Nordic ApS
Regus Business Centre
Lautrup hof 1-3
Ballerup DK-2750 Denmark
Tel: 45 4420 9895 Fax: 45 4420 9910

France

Microchip Technology SARL
Parc d'Activite du Moulin de Massy
43 Rue du Saule Trapu
Batiment A - 1er Etage
91300 Massy, France
Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79

Germany

Microchip Technology GmbH
Gustav-Heinemann Ring 125
D-81739 Munich, Germany
Tel: 49-89-627-144 0 Fax: 49-89-627-144-44

Italy

Microchip Technology SRL
Centro Direzionale Colleoni
Palazzo Taurus 1 V. Le Colleoni 1
20041 Agrate Brianza
Milan, Italy
Tel: 39-039-65791-1 Fax: 39-039-6899883

United Kingdom

Arizona Microchip Technology Ltd.
505 Eskdale Road
Winnersh Triangle
Wokingham
Berkshire, England RG41 5TU
Tel: 44 118 921 5869 Fax: 44-118 921-5820

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