
M16C/65 and M16C/65C Groups

Differences between M16C/65 and M16C/65C

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Abstract

This document describes differences between M16C/65 100-pin package and M16C/65C 100-pin package.

Products

MCUs: M16C/65 Group and M16C/65C Group

Since the M16C/65C Group is a compatible product with the improved pin assignments and peripheral functions from the M16C/65 Group, replacing the M16C/65 Group with the M16C/65C Group is easy.

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1. Differences

Table 1.1 lists the Differences in Functions.

Table 1.1 Differences in Functions

Item		M16C/65	M16C/65C
Timer/peripheral clock stop function		Not available	Available
Flash memory	Suspend function	Not available	Available

2. Detailed Comparison

2.1 Protection Difference

Table 2.1 lists the Difference in the Protection-Associated SFR.

Table 2.1 Difference in the Protection-Associated SFR

Symbol	Address		Bit	Difference	
	M16C/65	M16C/65C		M16C/65	M16C/65C
PRCR	000Ah	000Ah	0	Protect bit 0 Enable writing to registers CM0, CM1, CM2, PLC0, PCLKR, and FRA0	Protect bit 0 Enable writing to registers CM0, CM1, CM2, PLC0, PCLKR, PCLKSTP1, and FRA0

2.2 Clock Differences

Table 2.2 and Table 2.3 list the Clock Difference and Difference in the Clock-Associated SFR.

Table 2.2 Clock Difference

Item	M16C/65	M16C/65C
Timer/peripheral clock stop function	Not available	Available

Table 2.3 Difference in the Clock-Associated SFR

Symbol	Address		Bit	Difference	
	M16C/65	M16C/65C		M16C/65	M16C/65C
PCLKSTP1	—	0016h	—	—	M16C/65C only

2.3 Timer Differences

Table 2.4 and Table 2.5 list the Timer Difference and Difference in the Timer-Associated SFR, respectively.

Table 2.4 Timer Difference

Item	M16C/65	M16C/65C
Timer clock source select	No (f1 is fixed)	Selectable from f1 and main clock

Table 2.5 Difference in the Timer-Associated SFR

Symbol	Address		Bit	Difference	
	M16C/65	M16C/65C		M16C/65	M16C/65C
PCLKSTP1	—	0016h	—	—	M16C/65C only

2.4 Processor Mode Differences

Table 2.6 and Table 2.7 list the Processor Mode Difference and Difference in the SFR Associated with Processor Mode, respectively.

Table 2.6 Processor Mode Difference

Item	M16C/65	M16C/65C
Usable areas in program ROM 1	When the PM13 bit is 1 and IRON bit is 1, the entire area is usable.	The size of program ROM 1 is limited: When the PM13 bit is 0, addresses D0000h up to FFFFFh are available. When the PM13 bit is 1, addresses 80000h up to FFFFFh are available.

Table 2.7 Difference in the SFR Associated with Processor Mode

Symbol	Address		Bit	Difference	
	M16C/65	M16C/65C		M16C/65	M16C/65C
PRG2C	0010h	0010h	2	Internal area expansion bit 1 Program ROM 1 addresses (40000h to 7FFFFh) 0: Disabled 1: Enabled	Reserved bits Set to 0.

2.5 Flash Memory Differences

Table 2.8 and Table 2.9 list the Flash Memory Difference and Difference in the SFR Associated with the Flash Memory, respectively.

Table 2.8 Flash Memory Difference

Item	M16C/65	M16C/65C
Suspend function	Not available	Available

Table 2.9 Difference in the SFR Associated with the Flash Memory

Symbol	Address		Bit	Difference	
	M16C/65	M16C/65C		M16C/65	M16C/65C
FMR3	—	0223h	—	—	M16C/65C only

2.6 Development Tool Difference

Table 2.8 lists the Development Tool Difference.

Table 2.10 Development Tool Difference

Item	M16C/65	M16C/65C
Renesas Starter Kit	R0K53650ES000BE	—

3. Reference Documents

M16C/65 Group User's Manual: Hardware Rev.2.00

M16C/65C Group User's Manual: Hardware Rev.0.10

The latest versions can be downloaded from the Renesas Electronics website.

Technical Update/Technical News

The latest information can be downloaded from the Renesas Electronics website.

4. Website and Support

Renesas Electronics website

<http://www.renesas.com/>

Inquiries

<http://www.renesas.com/inquiry>

Revision History	M16C/65 and M16C/65C Groups Differences between M16C/65 and M16C/65C
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Rev.	Date	Description	
		Page	Summary
1.00	Jan. 31, 2011	—	First edition issued

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General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this manual, refer to the relevant sections of the manual. If the descriptions under General Precautions in the Handling of MPU/MCU Products and in the body of the manual differ from each other, the description in the body of the manual takes precedence.

1. Handling of Unused Pins

Handle unused pins in accord with the directions given under Handling of Unused Pins in the manual.

- The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

The state of the product is undefined at the moment when power is supplied.

- The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.

In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.

In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

Access to reserved addresses is prohibited.

- The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

- When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

Before changing from one product to another, i.e. to one with a different part number, confirm that the change will not lead to problems.

- The characteristics of MPU/MCU in the same group but having different part numbers may differ because of the differences in internal memory capacity and layout pattern. When changing to products of different part numbers, implement a system-evaluation test for each of the products.

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