

To our customers,

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## Old Company Name in Catalogs and Other Documents

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On April 1<sup>st</sup>, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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# RENESAS TECHNICAL UPDATE

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RenesasTechnology Corp.

Product Category	MPU&MCU		Document No.	TN-16C-128A/EA	Rev.	1.00
Title	M16C Family Precaution on entering wait mode		Information Category	Usage Limitation		
Applicable Product	M16C/62P Group, M16C/6S Group, M16C/6K9 Group, M16C/6KA Group, M16C/6N4, M16C/6N5, M16C/6NK, M16C/6NL, M16C/6NM, M16C/6NN, M16C/6H Group(except M306H2), M16C/26 Group, M16C/26A Group, M16C/28 Group, M16C/29 Group, M16C/1N Group, R8C/10 Group, R8C/11 Group, R8C/12 Group, R8C/13 Group, R8C/ 14Group, R8C/15 Group, R8C/16 Group, R8C/17 Group	Lot No.	Reference Document			
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## 1. Precaution

The value in the internal RAM area may be rewritten when exiting wait mode if writing to the internal RAM area before executing the wait instruction and entering wait mode. When accessing any area other than the internal RAM area (except 03FDh to 03FFh<sup>(1)</sup>) between the writing instruction to the internal RAM area and execution of the wait instruction, this problem will not occur.

(NOTE1) Nothing is assigned from 03FDh to 03FFh for the following products. Do not access from 03FDh to 03FFh.

M16C/1N Group, R8C/10 Group, R8C/11 Group, R8C/12 Group, R8C/13 Group, R8C/ 14Group, R8C/15 Group, R8C/16 Group, R8C/17 Group

The area for a maximum of 3 bytes is rewritten from the following address of the internal RAM in which the writing is performed before the wait instruction. The rewritten value is the same value as the one which was written before the wait instruction

(Figure 1). When the writing to the internal RAM area by the DMAC, this problem will also occur.

### [Program Operation Image]

(Example when entering wait mode after writing 055h to 0601h)

```

mov.b #055h,0601h      ; Write to internal RAM area
wait                   ; Enter wait mode
nop
nop
nop
nop
.
.
.

```

The value of 0602h to 0604h  
may be rewritten to #055h

mov.b #055h,601h      Wait mode      Interrupt program for exit

Interrupt request is generated

Figure 1. Example of Instruction Execution

2. Countermeasure

Insert the jmp.b instruction between the writing instruction to the internal RAM area and wait instruction as shown in Figure 2 “Example of Countermeasure Program” if precaution of 1 causes a problem. Also when the DMA transfer may occur between executing the jmp.b instruction and wait instruction, set the DMAE bit (DMA enable bit) to “0” (disable) before executing the wait instruction.

	bclr	dmae_dm0con	;	When the DMA transfer may occur between executing
			;	the jmp.b instruction and wait instruction, disable the DMA.
	bclr	dmae_dm1con	;	When the DMA transfer may occur between executing
			;	the jmp.b instruction and wait instruction, disable the DMA.
	.			
	mov.b	#055h,0601h	;	Write to internal RAM area
	.			
Countermeasure Program	jmp.b	_LABEL_001		
	[_LABEL_001:			
	fset	I	;	Enable interrupt
	wait		;	Enter wait mode
	nop			
	nop			
	nop			
	.			
	.			
	.			

Figure 2 Example of Countermeasure Program