

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 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>

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Renesas Electronics Corporation

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RENESAS TECHNICAL UPDATE

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Renesas Technology Corp.

Product Category	MPU&MCU	Document No.	TN-16C-124A/EA	Rev.	1.00
Title	M16C Family Precaution Concerning Exiting from Stop Mode	Information Category	Usage Limitation		
Applicable Product	M16C Family (M16C/10 Series, M16C/20 Series, M16C/Tiny Series, M16C/30 Series, M16C/60 Series, M16C/70 Series, M16C/80 Series, M32C/80 Series, R8C/Tiny Series)	Lot No.	Reference Document		

1. Precautionary Note

When exiting stop mode using an interrupt, the fifth instruction¹ from the instruction to enter stop mode may be executed before entering the interrupt routine to exit stop mode. (See figure 1.)

Depending on the fifth instruction used, such as the example shown in figure 1, it may not be necessary to take any precautionary measure².

Please evaluate the risk and how executing the fifth instruction prior to the interrupt routine to exit stop mode affects your system, and follow precautionary steps shown in section 2 as necessary.

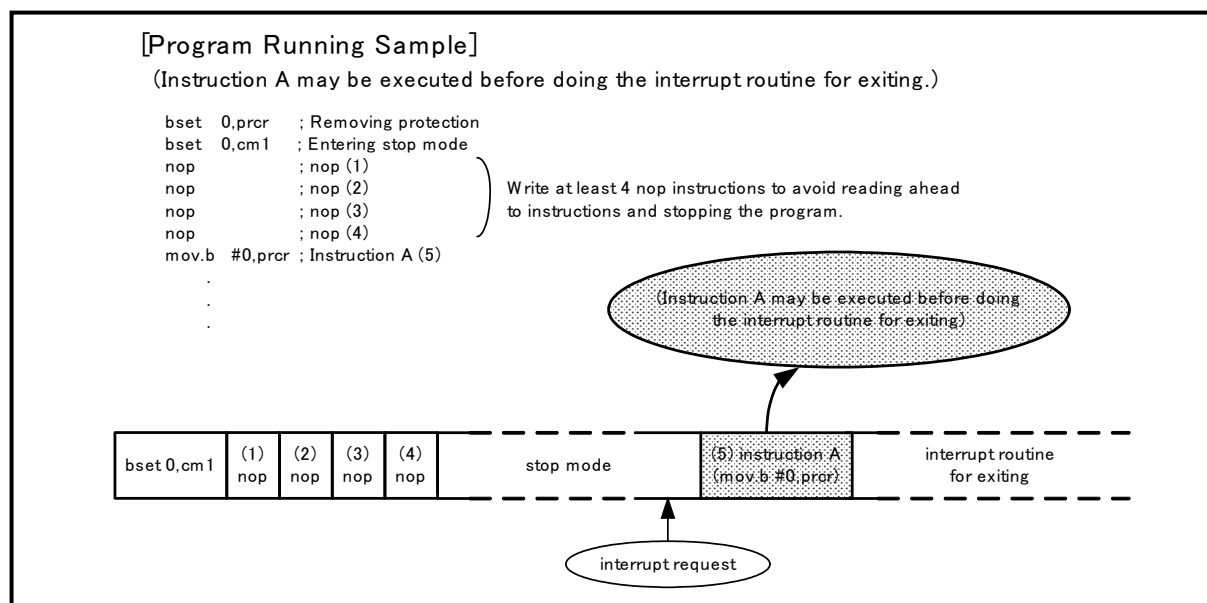


Figure 1. Example of Executing Instructions

NOTES:

- For precautions, at least four nop instructions must be written. (refer to each product's manuals for details.)
- The flash memory versions of the following microcomputers must use countermeasures even if the fifth instruction is any instruction:

**M16C/62N, M3062GF8NFP/GP, M16C/62P, M16C/26, M16C/26A, M16C/28, M16C/29, M16C/10, M16C/70,
M16C/1N, M16C/6N4, M16C/6N5, M16C/6K5, M16C/6K7, M16C/6K9, M16C/6KA, M16C/6S, M16C/6H,
R8C/10, R8C/11, R8C/12, R8C/13, R8C/14, R8C/15, R8C/16, R8C/17**

For flash memory versions of the microcomputer mentioned, countermeasures on section 2 must be taken when entering stop mode. (Refer to Technical News M16C-84-0202 or each product's manuals on details.)

2. Countermeasures

If the event mentioned executing the fifth instruction causes damage in your system, add a jmp.b instruction right after the instruction to enter stop mode as shown in the countermeasure program in figure 2. Figure 3 shows an example program running with the countermeasure.

```

        bset    0,prcr    ; Removing protection
        bset    0,cm1    ; Stopping all clocks (Entering stop mode)
        jmp.b  LABEL_001 ; Executing jmp.b instruction (Jump to the next instruction soon
Counter-      ; with adding no instruction between jmp.b and LABEL.)
measure { LABEL_001:
        nop     ; nop(1)
        nop     ; nop(2)
        nop     ; nop(3)
        nop     ; nop(4)
        mov.b   #0,prcr  ; Setting protection
        .
        .
    
```

Write at least 4 nop instructions to avoid reading ahead to instructions and stopping the program.

Figure2. Countermeasure Program

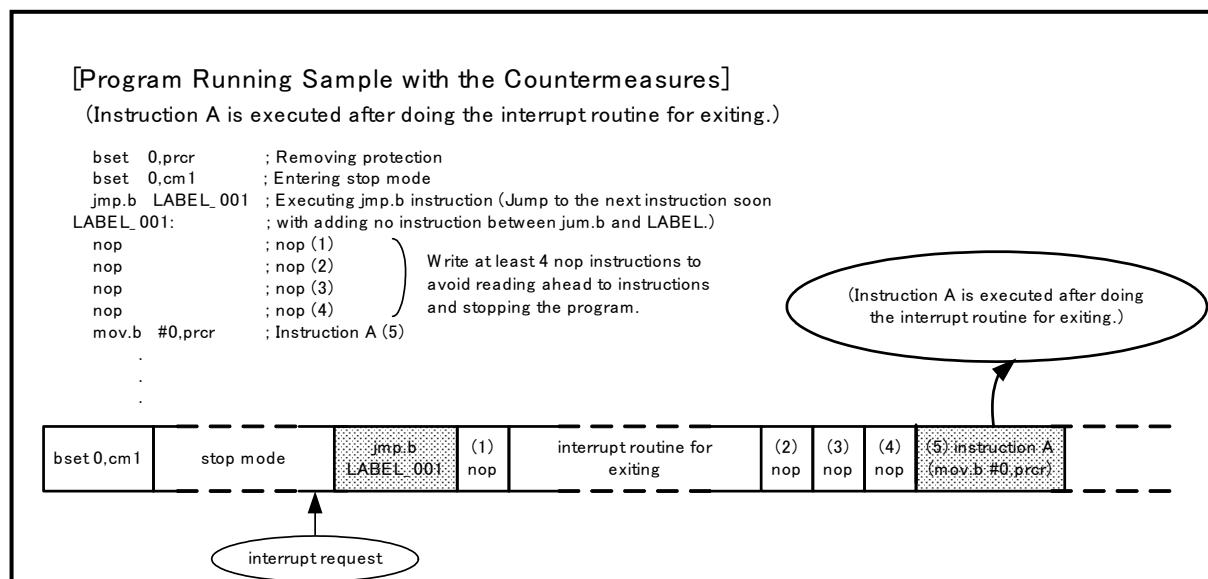


Figure 3. Example of Program Running with the Countermeasures