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Renesas Electronics Corporation

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M16C/60, M16C/30, M16C/Tiny Series

The Program Transmission Method to RAM

1. Abstract

This application note describes a procedure for the program transmission to RAM, using in-line assemble. A sample example is followed.

2. Introduction

The explanation of this issue is applied to the following condition:

Applicable MCU: M16C/60 Series (Products with CPU core)
3. Description of the Application Example

This chapter describes the procedures for transmitting the program to RAM using in-line assembler and executing the transmitted program.

3.1 Setup Procedures

The setup procedures for 3. Description of the application example is shown.

(1) Make sure for the program transmission on RAM.

```c
int ram_program_area[1024/2];
```

(2) Set the program transmission source address, the destination address, and the transmission size using in-line assembler.

```c
asm("pushm R0,R1,R2,R3,A0,A1"); ←Save the content of the register.
asm(" mov.b #(_RAM_PRG_START &00000H)>>16,R1H"); ←Set the 4 high-order bits of a transmit source address to R1H register.
asm("mov.w #(_RAM_PRG_START &0FFFFH),A0"); ←Set the 16 low-order bits of a transmit source address the A0 register.
asm("mov.w #_ram_prog_area,A1"); ←Set the transmit destination address to A1 register.
asm("mov.w #(_RAM_PRG_END - _RAM_PRG_START)/2,R3");←Set the transmit count to R3 register.
```

(Note) Define the program area to transmit in advance as shown in the following.

```c
extern RAM_PRG_START;
extern RAM_PRG_END;
... void xxxx_sub(void)
{
    asm(" .glb _RAM_PRG_START ");
    asm("_RAM_PRG_START:"); ←Define in the head of the program to transmit
    ...
    ...
} asm(" .glb _RAM_PRG_END ");
asm("_RAM_PRG_END:"); ←Define at the last of the program to transmit.
... ...
```

(3) Transmit the program to RAM.

Transmit the program using SMOVF instruction written by in-line assembler.

```c
asm(" smovf.w");
asm(" popm R0,R1,R2,R3,A0,A1"); ←Restore the contents of the register saved in (2)
```

(4) Execute the program transmitted to RAM.

```c
asm(" jmp.a _ram_prog_area");
```
4. Reference Program

Please find the reference program from the Renesas Technology Web site.
Click Application Note in the left menu of the M16C/60 Series top page.
The following shows the sample task to execute the program on ROM or on RAM alternately every time a timer counts 256 of TA1 interrupts after the transmission to RAM.

5. Reference Documents

Hardware manual
(Use the most recent version of the document on the Renesas Technology Web site.)

Technical news/Technical update
(Use the most recent version of the document on the Renesas Technology Web site.)

6. Web site and Support

Renesas Technology Web site
http://www.renesas.com/

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Summary

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