

RENESAS TOOL NEWS on May 16, 2004: RSO-M3T-NC30WA-040516D

A Note on Using C-Compiler Package M3T-NC30WA --On if Statements Including Bitwise Operations--

Please take note of the following problem in using the M3T-NC30WA C-compiler package (with assembler and integrated development environment) for the M16C/60, M16C/30, M16C/Tiny, M16C/20, M16C/10, and R8C/Tiny series MCUs:

- On if statements including bitwise operations
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1. Versions Concerned

M3T-NC30WA V.1.00 Release 1 through V.5.30 Release 1

2. Description

When the result of the bitwise operation between a variable and an immediate value is contained in the controlling expression of an if statement, the if statement may be evaluated incorrectly.

2.1 Conditions

This problem occurs if the following six conditions are satisfied all:

- (1) One or more optimizing options are selected out of -O1, -O2, -O3, -O4, -O5, -O, -OR, and -OS
- (2) In the program exist an if statement whose controlling expression contains the result of the bitwise operation between a variable and an immediate value.
This controlling expression is either of the following:
 - (a) "a variable & an immediate value"
 - (b) "(a variable & an immediate value) != 0"
- (3) The variable in (2) is 16 bits long.
- (4) The lower 8 bits of the immediate value in (2) are all 0s.

- (5) After compilation the variable in (2) is assigned to register R2, R3, A0, or A1.
- (6) The program statement executed when the evaluation of the if statement is TRUE is only an expression where an immediate value is assigned to a variable.

2.2 Example

```
-----  
unsigned char c;  
void func(void)  
{  
    unsigned int g; /* Condition (3) */  
  
    if(( g & 0xff00 ) != 0) /* Conditions (2) and (4) */  
        data = 1;        /* Condition (6) */  
}  
-----
```

3. Workaround

Place a dummy asm function in front of the program statement when the evaluation of the if statement is TRUE.

```
-----  
unsigned char c;  
void func(void)  
{  
    unsigned int g;  
  
    if(( g & 0xff00 ) != 0){  
        asm(""); /* dummy asm function */  
        data = 1;  
    }  
}  
-----
```

4. Schedule of Fixing the Program

We plan to fix this program in our next release of the product.

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