

A Note on Using C Compiler M3T-NC30WA

--On an OR Operation Between a Variable and a Constant--

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

- On an OR operation between a variable and a constant
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1. Versions Concerned

M3T-NC30WA V.2.00 Release 1 through V.5.20 Release 1

2. Description

Performing an OR operation between a variable of type unsigned or signed long and a constant of powers of 2 may generate incorrect code.

3. Conditions

This problem occurs if the following four conditions are satisfied:

- (1) An OR operation between variable A and a constant of powers of 2 is performed.
- (2) The type of variable A is unsigned or signed long.
- (3) Variable A is declared with the volatile qualifier.
- (4) The result of the operation (1) is assigned to variable B, which satisfies the following conditions:
 - a. It is an auto variable.
 - b. It is declared without the volatile qualifier.
 - c. Its address is either of the following:
 - * the address of register FB - 17 or earlier
 - * the address of register FB + 16 or later

4. Example

```
-----  
volatile long gl;          /* Conditions (2) and (3) */  
void func(void)  
{  
    long bl[6];          /* Condition (4) */  
  
    bl[0] = gl | 0x000001L; /* Conditions (1) and (4) */  
    ...  
}
```

5. Workaround

This problem can be circumvented by going through the following steps:

- (1) Define temporary variable C of type signed or unsigned long.
- (2) Assign to the variable in (1) the constant of powers of 2 between which and variable A an OR operation would be done.
- (3) Perform the OR operation between variables A and C.

```
-----  
volatile long gl;  
void func(void)  
{  
    long bl[6];  
    long tmp;          /* Constant C */  
  
    tmp = 0x000001L;  
    bl[0] = gl | tmp;  
    ...  
}
```

6. Schedule of Fixing the Problem

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

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