

## A Note on Using the C/C++ Compiler package--M3T-CC32R-- for the M32R MCU Family --With Performing Float-Type Multiplication and Subtraction--

Please take note of the following problem in using the C/C++ compiler package--M3T-CC32R-- for the M32R MCU family:

- With performing float-type multiplication and subtraction

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### 1. Product and Versions Concerned

The C/C++ compiler package--M3T-CC32R--for the M32R MCU family  
V.4.00 Release 1 through V.5.01 Release 00

### 2. Description

If the -m32re5 and -fminst options, which enables using of the FMSUB instruction, and an optimizing option are selected in compilation, an incorrect operand of the FMSUB instruction may be generated for the operations consisting of multiplication and subtraction both of type float.

#### 2.1 Conditions

This problem may occur if the following conditions are all satisfied:

- (1) The -m32re5 and -fminst options are both selected in compilation.
- (2) The optimizing option used in compilation is either of the following:
  - (a) Any of the options -O, -O1, -O3, -O5, and -O7
  - (b) Either -Ospace or -Otime with none of the options -O0, -O2, -O4, and -O6 being selected.
- (3) The following float-type operations are both performed:

- (a) A multiplication whose both terms are of type float
- (b) A subtraction where a value of type float is subtracted from the result of (a)
- (4) The subtraction in (3)-(b) refers to the auto variable to which the result in (3)-(a) is assigned.

## 2.2 Examples

### Source code (sample.c):

```
-----  
float A, B, C;  
float func(void)  
{  
    float var;  
    float answer;  
    .....  
    var = A * B;    /* Condition (3)-(a) */  
    answer = var - C; /* Conditions (3)-(b) and (4) */  
    .....  
}
```

In the above example, the problem may not occur depending on the content of the code written in the omitted lines.

### Command line:

```
-----  
cc32R -c -O7 -m32re5 -fminst sample.c (Conditions (1) and (2))  
-----
```

In the above example of source code, the correct expression for calculating "answer" is  $A * B - C$ . However, in the case when the problem arises, an incorrect instruction "FMSUB A,B,C" is generated, which means  $A - B * C$ .

## 3. Workaround

To avoid generating incorrect FMSUB instructions, compile the source program by using the internal control option -Qa-Xs16.

Example of command line:

```
-----  
cc32R -c -O7 -m32re5 -fminst -Qa-Xs16 sample.c  
-----
```

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