RENESAS Tool News

A Note on Using the C Compiler Package for the M16C Series of MCUs
--With Performing Right-Shift Operations--

Please take note of the following problem in using the C compiler package-- M3T-NC30WA--for the M16C series of MCUs:

- With performing right-shift operations

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1. Product and Versions Concerned
The C compiler package--M3T-NC30WA--for the M16C series*
  V.4.00 Release 1 through V.5.44 Release 00

  *The M16C series is the generic name of the M16C/60, /30, /20, /10, /Tiny, and R8C/Tiny series.

2. Description
Under the condition that an optimizing option is selected at compilation, System Error may arise if the result of shifting a 32-bit data piece to the right by the number of bits within a range of 11 to 15 is directly stored in or cast to a variable of 16 bits long.

3. Conditions
This problem may occur if the following conditions are all satisfied:
(1) Any of the following optimizing options is selected to enhance the speed of program execution and minimize ROM consumption: -O, -OR, and -OR_MAX
(2) A data piece of 32 bits long is shifted right by the number of bits within a range of 11 to 15.
(3) The result in (2) above is directly stored in or cast to a variable of 16 bits long.
(4) The compiler specifies the register in which the data piece to be

shifted in (2) and the 16-bit variable in (3) are stored.

Example
```
-------------------------------------------------------------------------
int i;
long l;

    i = (int)( l >> 15 );
-------------------------------------------------------------------------
```

4. Workaround

Do not directly store the result of right-shifting a 32-bit data piece
in or cast it to a 16-bit variable, but assign it to a 32-bit variable
and then store this variable in a 16-bit variable.

Modification of the above example
```
-------------------------------------------------------------------------
int i;
long l, ll;

    ll = l >> 15;  /* Assign the result to a 32-bit variable */
    i = (int)ll;
-------------------------------------------------------------------------
```

5. Schedule of Fixing the Problem

We plan to fix this problem in the next release V.5.45 Release 00 of the product.