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Renesas Electronics Corporation

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### SuperH RISC engine C/C++ Compiler Ver.8 bug information

**Attached is the description of the detected bug information in Ver. 8 series of the SuperH RISC engine C/C++ Compiler.**

The bug will affect this package version.

**Attached:** P0700CAS8-040120E

SuperH RISC engine C/C++ Compiler Ver. 8.0.00  The details of the detected bug information

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<tr>
<td><strong>Title</strong></td>
<td>SuperH RISC engine C/C++ Compiler Ver.8 bug information</td>
<td>Information Category</td>
<td>Usage Limitation</td>
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| **Applicable Product** | P0700CAS8-MWR  
  P0700CAS8-SLR  
  P0700CAS8-H7R | Lot No.             | Reference Document |
|                  | Ver.8.0.00                  | SuperH RISC engine C/C++ Compiler  
  Assembler Optimizing Linkage Editor  
  User's Manual  
  REJ10B0047-0100H |
SuperH RISC engine C/C++ Compiler Ver. 8.0.00
The details of the detected bug information

The bug detected in the ver. 8.0.00 of the SuperH RISC engine C/C++ Compiler is shown below.

1. Illegal bit field member comparison

   [Description]
   If compared to a 1-bit bit field member of the volatile-qualified structure referenced via a pointer with a constant, the compared result may be incorrect.

   [Example]
   ```c
   typedef volatile struct { /* The type of the structure is volatile-qualified */
       unsigned int a:19,
       b:1; /* The member is not volatile-qualified */
   } ST;
   
   int f(ST *p) {
       if (p->b) { /* Expression p->b is used for an indirect reference via a pointer */
           return 1;
       }
       return 0;
   }
   ```

   MOV.L @R4,R0
   TST #16,R0 ; Illegal mask value
   MOVT R2
   MOV R2,R0
   RTS
   XOR #1,R0

   [Conditions]
   This problem may occur when all of the following conditions are fulfilled.
   (1) optimize=1 is specified.
   (2) A conditional expression in an if statement includes an expression to compare the bit field to a constant.
   (3) The bit field referred in expression(2) is an indirection reference via a pointer.
   (4) Comparison between a constant 0 and an unsigned-type 1-bit bit field member by "==" or "!=" expression, or comparison between a constant 1 and an unsigned-type 1-bit bit field member by "==" expression.
   (5) The type of the structure is volatile-qualified but the member is not.
   (6) The type of pointer is not volatile-qualified.
   (7) The pointer is a scalar variable.
   (8) The address of the pointer is not referred to.
   (9) The type of the bit field is (unsigned) (short | int | long).

   [Solutions]
   This problem can be prevented by taking any of the following ways.
   (1) volatile-qualify the type of the bit field member.
   (2) Place an expression to refer to the address of the pointer within the same file.
   (3) Use expression (*&p)->b, not p->b, for an indirect reference via a pointer.
   (4) Specify optimize=0.