RENESAS Tool News

The C/C++ Compiler Package for the SuperH RISC engine MCU Family
Revised to V.9.01 Release 00

We have revised the C/C++ compiler package for the SuperH RISC engine MCU family from V.9.00 Release 04A to V.9.01 Release 00.

1. Descriptions of Revision

1.1 Packaged Programs Updated

(1) The High-performance Embedded Workshop has been updated to V.4.02.00.
For details see RENESAS TOOL NEWS Document No. 061216/tn2, published on December 16, 2006.

(2) The simulator debugger has been updated to V.9.06.00.
For details see RENESAS TOOL NEWS Document No. 060701/tn2, published on July 1, 2006.

1.2 Functions Introduced and Modified in the Compiler

(1) The following two options have been introduced:
  (a) Option "optimize=debug_only": Used for always referencing information on local variables
  (b) Option "simple_float_conv": Used for creating code that neglects checking the range of the value before converting an unsigned integer type to a floating-point type and vice versa

(2) The following three preprocessing directives and an intrinsic function have been introduced so that you can describe the processing for effectively using multiple interrupts and register banks in C language when any member of the MCUs whose cores are the SH-3, SH3-DSP, SH-4, SH-4A, and SH4AL-DSP CPUs is used:
  (a) #pragma interrupt (sr_rts): Switches between register banks and uses the RTS instruction.

(b) #pragma interrupt (bank): Declares an interrupt-handling function.

(c) #pragma interrupt (rts): Uses the RTS instruction.

(d) sr_jsr(): Calls a function after accepting multiple interrupt requests.

(3) The following existing functions have been improved and modified:

(a) Options "division=cpu=inline" and "division=cpu=runtime" are selectable when any member of the MCUs whose cores are the SH-2A and SH2A-FPU CPUs is used:

(b) Intrinsic functions ocbi(), ocbp(), and ocbwb() are usable when any member of the MCUs whose core is the SH-4 CPU is used.

(c) A modification has been made to the functions declared with #pragma inline so that they can be expanded inline regardless of whether the "inline" option is selected or not.

(d) A modification made so that the contents of the files selected using the "subcommand" option can be outputted into the compile list when options "subcommand" and "listfile" are both used.

(4) For the CPUs with no floating-point processor unit, such mathematical functions as sinf(), cosf(), tanf(), expf(), logf(), sqrtf(), and atanf(), which are used for single-precision floating-type operations, have been reduced the size, and improved the speed and accuracy of the mathematical operations.

1.3 Functions Introduced and Improved in the Optimizing Linkage Editor

(1) Option "ps_check" has been introduced. This option is used for detecting overlap of object code in the physical address space on the MCUs supporting 32-bit virtual address space.

(2) Option "byte_count" has been introduced. This option is used for altering the maximum number of bytes of the records in the Intel-Hex format file.

(3) Option "space=random" has been introduced. This parameter is used for filling random values into unoccupied areas of the following types of files:

  - S-type files
  - Intel-Hex format files
  - Binary files

(4) Option "memory=low", which reduces memory consumption, can be available used when creating library files.

1.4 Problems Fixed
1.4.1 In the High-performance Embedded Workshop

The following known problems have been fixed:

(1) RENESAS TOOL NEWS Document No. 070316/tn1, published on
March 16, 2007 (available on and after April 5, 2007)

(2) RENESAS TOOL NEWS Document No. RSO-HEW-060416D, published on
April 16, 2006

(3) RENESAS TOOL NEWS Document No. RSO-HEW-051116D, published on
November 16, 2005

(4) RENESAS TOOL NEWS Document No. RSO-HEW_2-051016D, published on
October 16, 2005

(5) RENESAS TOOL NEWS Document No. RSO-HEW-050716D, published on
July 16, 2005

1.4.2 In the Compiler

The following problems have been fixed:

(1) Three problems described in RENESAS TOOL NEWS Document No.
070301/tn3, published on March 1, 2007

(2) Problem where the C4098 and C4099 internal errors arise

1.4.3 In the Optimizing Linkage Editor

The following four problems have been fixed:

(1) Problem that incorrect object code is generated when optimizing
functions are used for optimization with register save/restore.
Conditions:
This problem may occur if the following conditions are all
satisfied:
(a) Either the MCU type SH-2A or SH2A-FPU is used.
(b) Option "goptimize" is selected at compilation.
(c) Optimizing function (in example when using option
"optimize=register"), which is used for saving and restoring
registers, is selected at linking.
(d) Either of the following conditions is met:
(d-1) Option "size" is selected at compilation.
(d-2) A branch instruction to the address of a 4-byte
instruction is generated during compilation.*
*The compile list file (.lst) shows whether the condition
(d-2) is met or not. To create a compile list, use the
"show=object" list option.

(2) Problem that the L3300 error arises and no linking is performed
if a character containing character code 0x7c exists in the name
of the file or folder that is used as the parameter of any of the
following three options:
- Option "input" (for selecting an input object file)

- Option "library"
- Option "binary"

(3) Problem that an internal error may arise or incorrect object
code be generated if the "optimize=symbol_delete" option,
which is used for optimizing the deletion of unreferenced
symbols, is selected.
Conditions:
This problem may occur if the following conditions are all
satisfied:
(a) The version of the linker is V.9.00.00 or later.*
(b) Optimizing option "optimize=1" is selected at compilation.
(c) Option "goptimize" is selected at compilation.
(d) A function of 0 bytes in size appears after compilation.
(e) Option "optimize=symbol_delete" is selected at linking,
which is used for optimizing the deletion of unreferenced
symbols.
(f) By the optimization in (e), the function in (d) is deleted.
The linkage list file (.map) shows the name and size of
the deleted function. To create a linkage list, use the
"show=symbol" list option.

*How to check for the version of your linker is as follows:
(a) In the High-performance Embedded Workshop, open the Tool
menu and select the Administration command.
The Tool Administration dialog box appears, in which you
see the Registered Components list box.
(b) Out of the Toolchains tree in the Registered Components list
select the name of the compiler package you are using; then
click the Properties button. The Properties dialog box opens.
(c) In the Information tab of this dialog box, the version
number of your linker will be shown.
Example: Optimizing Linkage Editor (V.9.02.00)

(4) Problem that a wrong L2330 error arises if the following two
options are both used:
- The "map" option of the compiler
- The "optimize=symbol_delete" option of the linker

At the same time, the following three modifications have been made
to the contents of Intel-Hex format files generated by the linker:
(1) When a record of type 04 is generated, that of type 02 will
not be generated, which would be generated at base address 0

if the modification were not made.

(2) The places of the records designating the starting addresses
   (records of types 03 and 05) have been moved to the front
   of the end record (type 01)

(3) Representation of the starting address in a 03-type record
   has been modified to conform to the Intel-Hex format.*
   *For the contents of files in the Intel-Hex format, see
   Section 18.1.2, "HEX File Format," in "SuperH RISC engine C/C++
   Compiler, Assembler, Optimizing Linkage Editor User's Manual."

2. How to Update Your Product and Purchase the Revised One

2.1 Free-of-Charge Update

Free-of-charge online update is available. Download the upgrade program
from the Web site.
This site will be opened from April 5 on.

2.2 First Ordering

If you place an order for the product, please supply the following
items of information to your local Renesas Technology sales office
or distributor (for the price of the product, also contact them):

Version No.:   V.9.01
Release No.:   Release 00
Host OS: Windows XP or Windows 2000