

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

Send any inquiries to <http://www.renesas.com/inquiry>.

RENESAS TECHNICAL UPD

Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
RenesasTechnology Corp.

Product Category	User Development Environment	Document No.	TN-CSX-A087A/E	Rev.	1.0
Title	Release Information of Renesas C/C++ Compiler Package for SuperH RISC engine family V.9.00 Release 00		Information Category	Technical Notification	
Applicable Product	R0C40700XSW09R	Lot No.	Reference Document	SuperH RISC engine C/C++ Compiler Assembler Optimizing Linkage Editor User's Manual (REJ10B0152-0100H Rev.1.00)	
	R0C40700XSS09R	All			
R0C40700XSH09R					

Renesas C/C++ Compiler Package for SuperH RISC engine family is updated in V.9.00 Release 00.

1. Descriptions of Upgrade

1.1 Functions Introduced and Improved

A. In Compiler

(1) The new-come CPUs SH-2A and SH2A-FPU supported. In addition, the functions of utilizing the TBR register in these CPUs introduced (option tbr and directive #pragma tbr).

(2) The following items interpreted in conformance with ANSI:

(a) Indexing in arrays

Example:

```
-----
int iarray[10], i=3;
i[iarray] = 0; /* Interpreted as iarray[i] = 0; */
-----
```

(b) Specifying bit fields in unions

Example:

```
-----
union u {
    int a:3;
};
-----
```

(c) Operations between constants

Example:

```
-----
static int i=1||2/0; /* A zero division issues a warning */
-----
```

(d) Library function strtoul and macro FOPEN_MAX in conformance with ANSI introduced.

- (3) The following options introduced:
 - (a) `strict_ansi`: Allows the compiler to interpret the following items in conformance with ANSI:
 - * Operations between an unsigned int type and a long one
 - * The associative law in floating-point operationsConsequently, the results of operations may differ from those obtained in Ver.8.00 and earlier.
 - (b) `enable_register`: Assigns variables specified by the register storage-class specifier to registers, with the highest priority.
 - (c) `smap`: Performs access optimization for the external variables defined within files to be compiled. However, re-compilation is not needed as in the "map" option.
- (4) The following instructions specific to the SH-2A and SH2A-FPU CPUs introduced as built-in functions:
Saturation operation, TBR setting, and TBR reference
- (5) The following instructions that cannot be written in C language introduced as built-in functions:
T bit reference, T bit setting, Midsection extract from combined registers, Add with carry, Subtract with borrow, negation, 1-bit division, Rotation, and Sift
- (6) How to allocate memory to the following options and pragma directives specified:
 - (a) Options `abs20`, `abs28`, and `abs32`
 - (b) Directives `#pragma abs20`, `#pragma abs28`, and `#pragma abs32`
- (7) Directive `#pragma address` introduced, which places a variable at an absolute address.
- (8) The maximum values of seven items enlarged as follows:
 - (a) The nesting level in the combination of the iteration statements (`while`, `do`, and `if`) and the selection statements(`if` and `switch`): from 32 to 4096
 - (b) The number of `goto` labels usable in a function: from 511 to 2147483646
 - (c) The nesting level in a `switch` statement: from 16 to 2048
 - (d) The number of case labels usable in a `switch` statement: from 511 to 2147483646
 - (e) The number of arguments in function definitions and function calls: from 63 to 2147483646
 - (f) The number of bytes in a section name: from 31 to 8192
 - (g) The number of sections that can be specified in a file by the `#pragma section` directive: from 64 to 2045
- (9) Improved the precision of operations when libraries of the mathematical functions used.

B. In Assembler

- (1) The new-come CPUs SH-2A and SH2A-FPU supported.
- (2) Controlling assembler directive command `".STACK"` introduced:
This command, when put in an assembler source file to declare a stack size, allows the stack-analyzing tool to reads the size automatically.
- (3) The maximum value of the characters in the define option and the `.DEFINE` assembler directive command, hitherto limited to 32, raised unlimited.

C. In Optimizing Linkage Editor

- (1) Boundary-adjusting numbers can be set for the sections selected by the binary option.
- (2) The `xreference` parameter (`show=xreference`) introduced to the `show` option:
By using this parameter, cross-reference information that informs from where variables and functions are referred to can be output to a linkage list.

- (3) Option msg_unused introduced: This option is used to send an error message if any externally defined symbols that have not yet been referred to exist.

D. In Simulator Debugger (Windows Version Only)

Supported by the following simulator debuggers:

- (1) The Cycle Base simulator for the SH-4A
- (2) The Cycle Base simulator for the SH4AL-DSP
- (3) The functional simulator for the SH2A-FPU
- (4) The Cycle Base simulator for the SH2A-FPU

1.2 Problems Fixed

The following problems have been fixed:

A. High-performance Embedded Workshop (Windows Version Only)

- (1) If the last label in ASCII order is searched for using the search function in the Label window, the error message "LABEL NOT FOUND" appears.
- (2) If multiple-step execution is discontinued and then the program is executed in the usual way, the STOP button on the toolbar for manually stopping the program stays not illuminated, which may disable the manual stopping of the program.

At the same time, such operations of the HEW may not be managed as closing the workspace by selecting the File -> Close Workspace command or ending the application by selecting the File -> Exit command.
- (3) Using the Open Workspace command in the interface of the HEW's server function may cause an application error to arise.
- (4) If load modules written in the ELF/DWARF2 format are downloaded and the source file containing them is displayed in the Source window, the addresses of the source lines in which no program statements are written may incorrectly be provided.
- (5) Context-sensitive helps may be unavailable when the following tabs are selected in their respective dialog boxes:
 - (a) The Build and Editor tabs in the Options dialog box
 - (b) The Tool Bar, Place Holder, Debuggers, Logs, and Help tabs in the Customize dialog box
 - (c) The Options tab in the Debug Settings dialog box