

C Compiler Package for RL78 Family V1.15.00

Release Note

Thank you for using our product.

This document describes the restrictions and points for caution. Read this document before using the product.

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1. User's Manuals

Please read the following user's manuals along with this document.

Name	Document Number
CC-RL Compiler User's Manual	R20UT3123EJ0114
CS+ Integrated Development Environment User's Manual: CC-RL Build Tool Operation	R20UT3284EJ0113

2. Changes

This section describes the changes resulting from the following version upgrades.

For Windows: CC-RL V1.14.00 to V1.15.00

For Linux: CC-RL V1.13.02 to V1.15.00

2.1 Addition of the -STRIDE_SELF_AREA option

The -STRIDE_SELF_AREA option, which allocates sections in divided areas that exclude the self-RAM area, was added.

2.2 Addition of the -STRIDE_OCDTR_AREA option

The -STRIDE_OCDTR_AREA option, which allocates sections in divided areas that exclude the trance-RAM area, was added.

2.3 Addition of the -STRIDE_OCDHPI_AREA option

The -STRIDE_OCDHPI_AREA option, which allocates sections in divided areas that exclude the hot plug-in RAM area, was added.

2.4 Addition of the -AVOID_SADDR_STACK option

The -AVOID_SADDR_STACK option, which sets a stack area that excludes the SADDR area, was added.

2.5 Modification of the specifications of the -DEBUG_MONITOR option

For an RL78/G15 or RL78/G16 device specified with the -device option, when the OCD monitoring start and end addresses are omitted by specifying the -DEBUG_MONITOR option, the specifications were modified so that OCD monitoring areas are not allocated.

2.6 Improvement to optimization by the -switch option

Optimization in cases where specification of the -switch option is omitted was improved so that the compiler automatically selects an optimized output format.

Example of source code (test.c)

```
unsigned char func(unsigned char key){  
    switch(key & 0x3){  
        default:  
        case 0:  
            return (2);  
        case 1:  
            return (3);  
        case 2:  
            return (1);  
        case 3:
```

```

    return (4);
}
}

```

Code output (ccrl -cpu=S1 -Ospeed -S test.c)

<pre> <CC-RL V1.14.00> .SECTION .text,TEXT .TYPE _func,function,.LFE1-_func _func: .STACK _func = 4 and a, #0x03 dec a bz \$.BB@LABEL@1_4 .BB@LABEL@1_1: ; entry dec a bz \$.BB@LABEL@1_5 .BB@LABEL@1_2: ; entry dec a bz \$.BB@LABEL@1_6 .BB@LABEL@1_3: ; bb10 mov a, #0x02 ret .BB@LABEL@1_4: ; switch_clause_bb4 mov a, #0x03 ret .BB@LABEL@1_5: ; switch_clause_bb6 oneb a ret .BB@LABEL@1_6: ; switch_clause_bb8 mov a, #0x04 ret .LFE1: </pre>	<pre> <CC-RL V1.15.00> .SECTION .text,TEXT .TYPE _func,function,.LFE1-_func _func: .STACK _func = 4 and a, #0x03 mov b, a mov a, SMRLW(_@STI_0)[b] ret .LFE1: .SECTION .const,CONST .TYPE _@STI_0,object,4 _@STI_0: .DB 0x02,0x03,0x01,0x04 </pre>
--	--

2.7 Modification of the specifications of conditions for the output of bit-manipulation instructions

When a value is read for a variable qualified as volatile, the specifications were modified so that the compiler outputs bit-manipulation instructions in response to optimization by the compiler.

2.8 Other changes and improvements

Other changes and improvements are described below.

- Correction of internal errors

Internal errors sometimes occurred in the build process in previous revisions. These errors have been corrected.

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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Dec.01.24		Newly created.

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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