C Compiler Package for RL78 Family V1.10.00 Release Note

R20UT4876EJ0100
Rev.1.00
Dec 01,2020

Thank you for using our product.

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

Contents

Chapter 1. User's Manuals

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

Name	Document Number
CC-RL Compiler User's Manual	R20UT3123EJ0110
CS+ Integrated Development Environment User's Manual: CC-RL Build Tool Operation	R20UT3284EJ0109

Chapter 2. Changes

This section describes changes to CC-RL from V1.09.00 to V1.10.00.

2.1 Addition of the -stuff option

The -stuff option has been added to allocate variables in separate sections according to their alignment values.

By specifying this option, it is possible to reduce the ROM or RAM size.

2.2 Addition of the -Obranch_chaining option

The -Obranch_chaining option has been added for optimization to reduce the code size of branch instructions.

When this option is specified, a branch instruction may not directly branch to the final destination; but branch to another branch instruction with the same destination by using a smaller branch instruction. This slows down the execution speed, but reduces the code size.

2.3 Addition of the -Oalign option

The -Oalign option has been added for optimization which changes to the alignment conditions of variables.

For example, when accessing contiguous fields of a structure-type variable, the number of instructions that are generated can be reduced by changing the alignment condition of the variable and merging two or more accesses into a single access. This reduces the code size and improves the execution speed.

2.4 Addition of the -VERBOSE option

The -VERBOSE option has been added to display detailed information at link time.

By specifying crc as a parameter, the results of CRC calculations and the output position addresses are displayed.

2.5 Enhanced of the -Osame_code option

The ability to aggregate common sequences of instructions has been enhanced.

The following source code shows how this reduces the code size and improves the execution speed.

<Example of source code>

```
int mac0(int src, int lhs, int rhs){
    return (src + lhs * rhs);
}

int mac1(int src, int lhs, int rhs){
    return (src + lhs * rhs);
}
```

<Code output by CC-RL V1.09.00 (-cpu=S2 -Osame_code)>

```
_mac0:
                .STACK _mac0 = 6
                push ax
                call $!__CommonCode@0
                pop hl
                ret
_mac1:
                .STACK _mac1 = 6
                push ax
                call $!__CommonCode@0
                pop hl
                ret
__CommonCode@0:
                .STACK __CommonCode@0 = 4
                movw ax, de
                call !!__COM_imul
                movw bc, ax
                movw ax, [sp+0x04]
                xchw ax, bc
                addw ax, bc
                ret
```

```
< Code output by CC-RL V1.10.00 (-cpu=S2 -Osame_code)>
    _mac0:
            .STACK _mac0 = 4
            br $__CommonCode@0
    __CommonCode@0:
            .STACK __CommonCode@0 = 6
            push ax
            movw ax, de
            call !!__COM_imul
            movw bc, ax
            movw ax, [sp+0x00]
            addw ax, bc
            pop hl
            ret
    _mac1:
            .STACK _mac1 = 4
            br $__CommonCode@0
```

2.6 Improved precision of alias analysis

The precision of alias analysis has been improved to make it easier to apply optimizations such as moving memory access instructions across intrinsic function calls or aggregate copies.

The following source code shows how this reduces the code size and improves the execution speed.

```
<Example of source code>

unsigned GlobalVariable;

typedef struct{
   unsigned char _array[128];
} MyStruct;

MyStruct Source;

MyStruct Destination;

void test(void){
   GlobalVariable = 0;
   Destination = Source;
   while(GlobalVariable != 0){}
}
```

```
< Code output by CC-RL V1.09.00 (-cpu=S2)>
    _test:
            .STACK _test = 4
            clrw ax
            movw !LOWW(_GlobalVariable), ax
            movw de, #0x0080
            movw bc, #LOWW(_Source)
            movw ax, #LOWW(_Destination)
            call !!_memcpy
    .BB@LABEL@1_1:
            movw ax, !LOWW(_GlobalVariable)
            or a, x
            bnz $.BB@LABEL@1_1
    .BB@LABEL@1_2:
            ret
```

```
< Code output by CC-RL V1.10.00 (-cpu=S2)>
    _test:
            .STACK _test = 4
            clrw ax
            movw !LOWW(_GlobalVariable), ax
            movw de, #0x0080
            movw bc, #LOWW(_Source)
            movw ax, #LOWW(_Destination)
            call !!_memcpy
            ret
```

2.7 Rectified point for caution

The following point for caution no longer applies. For details, refer to Tool News.

- Using the -Ointermodule option (CCRL#026)

Chapter 3. Points for Caution

3.1 Note on specifying path names

Absolute paths that include drive letters or relative paths can be used as the path names for specifying input/output files or folders.

3.2 Other points for caution

Please refer to the user's manual for other points for caution regarding V1.09.00 of the CC-RL compiler.

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(Rev.5.0-1 October 2020)

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