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## Chapter 1. Target Devices

The target devices supported by the CA78K0 are listed on the Website.

Please see this URL.

CubeSuite+ Product Page:

<http://www.renesas.com/cubesuite+>

## Chapter 2. User's Manuals

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

Manual Name	Document Number
CubeSuite+ V1.03.00 78K0 Coding Edition	R20UT2141EJ0100
CubeSuite+ V1.01.00 78K0 Build Edition	R20UT0783EJ0100
CubeSuite+ V1.03.00 Message	R20UT2147EJ0100

## Chapter 3. Key Word for Uninstallation

There are two ways to uninstall this product.

- Use the integrated uninstaller (uninstalls CubeSuite+)
- Use separate uninstaller (uninstalls this product only)

To use the separate uninstaller, select the following from the Control Panel:

- Add/Remove Programs (Windows XP)
- Programs and Features (Windows Vista, Windows 7)

Then select "CubeSuite+ CA78K0 V1.30".

## Chapter 4. Changes

This chapter describes change of CA78K0.

There is a possibility that the code is changed by the following.

### 4.1 Changes of CA78K0

This section describes changes of CA78K0 from V1.21 to V1.30.

#### 4.1.1 Improved Translation Limit

- Number of "case" labels for one "switch" statement. 257 → 1024
- Number of characters in one logical source line. 2048 → 32767
- Number of macro identifiers simultaneously defined in one translation unit. 32767 → 60000
- Number of members of a single structure or single union. 256 → 1024
- Macro nesting. 200 → 10000
- Number of nesting levels of an expression enclosed by parentheses in a complete expression. 32 → 1024

#### 4.1.2 Improved *#asm* statements

improved about the following *#asm* statements

- (1) Make an external definition / an external reference declaration of the symbol besides CC78K0 management by "#asm" with C source,
- (2) When the symbol name length who did the external definition / the external reference is 9 or more characters, generate OMF of unjust symbol information and it becomes an error.

#### 4.1.3 Removal of restriction

##### No.77 [Restriction for a conditional operator](#)

Description: The code will be incorrect if the result of a conditional operator is a Boolean-type value.

(Example)

```
__boolean b1;
unsigned char uc1;
void func()
{
    b1 = (uc1 & 0x80) ? (__boolean)1 : (__boolean)0;
}
```

## Chapter 5. Cautions

This section describes cautions for using CA78K0 V1.30.

### 5.1 Caution for the Memory bank relocation support tool

#### [Caution for the Memory bank relocation support tool](#)

Description: In the re-link function, it may become an error if a memory bank relocation support tool is started to a flash area.

## Chapter 6. Restrictions

This section describes the restrictions for the CA78K0.

### 6.1 Restrictions for the CA78K0

Below is a list of restrictions for the CA78K0 V 1.30

#### 6.1.1 List of restrictions for the CA78K0

##### (1) List of restrictions for Assembler

No.	Description
1	An error occurs if a control statement is crossed in a structured assembly language description.(Only PM+ version)
5	The assembler performs illegal processing if the label receiving the effect of optimization is described in the <i>saddr</i> part when an EQU definition is performed for a bit symbol with the value <i>saddr.bit</i> .

##### (2) List of restrictions for Compiler

No.	Description
16	Bit fields with type <i>signed</i> are handled as unsigned bit fields.
43	Output conversion on I/O functions in the standard libraries causes illegal behavior.
44	The size of the minimum value (-32768) of types <i>int/short</i> is 4.
47	If the parameter type and the type of the identifier in a function definition do not match, an error is output.
48	In an identifier list in a function definition, a parameter that is not declared is not handled as type <i>int</i> , and an error results.
49	The # operator cannot be expanded correctly.

### 6.1.2 Restriction Details for the CA78K0

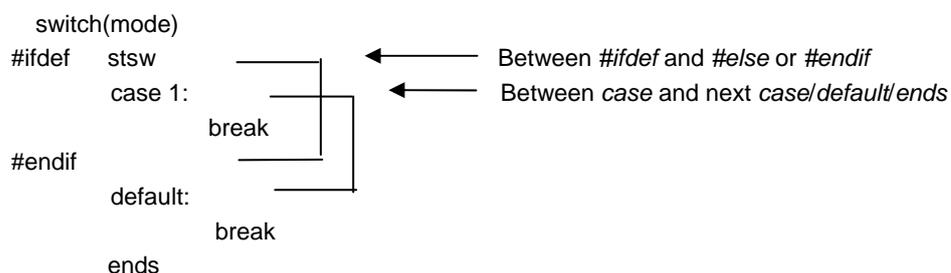
Below are details for the limitations for CA78K0 V1.30.

#### (1) Restriction details for Assemblert

**No. 1** A multidimensional array without the size defined may exhibit incorrect behavior

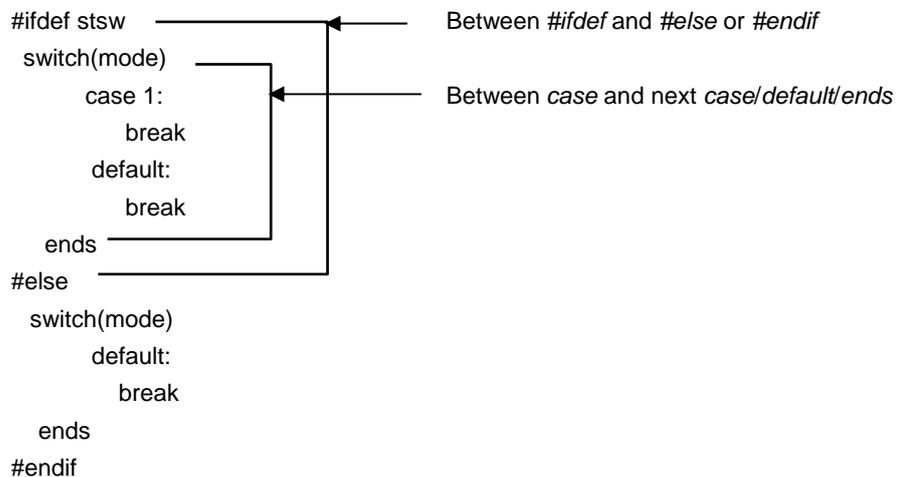
**[Description]** If a control statement is divided or crossed by code between `#ifdef` and `#endif`, an error occurs if `#ifdef` is true.

*Example:*



**[Work-around]** Nesting will not cause an error. Rewrite the source so that the scopes of the control statements do not cross.

*Example:*



- No. 5 The assembler performs illegal processing if the label receiving the effect of optimization is described in the *saddr* part when an EQU definition is performed for a bit symbol with the value *saddr.bit*.

**[Description]** The assembler performs illegal processing if the label receiving the effect of optimization is described in the *saddr* part when an EQU definition is performed for a bit symbol with the value *saddr.bit*.

Illegal processing is performed in the following cases.

- (1) When *saddr.bit* is 0FD20H, path 1 of a label is outside the area, and path 2 is inside the area, an error is output in path 1 for the EQU definition line, but not in path 2. At this time, the object is created but it is incorrect.
  
- (2) When *saddr* is 0FF1FH, path 1 of a label is inside the area, and path 2 is outside the area, no error is output in path 1 for the EQU definition line, while an error is output in path 2. The following assembly error will be output for a label that is defined after this EQU symbol has been referenced.

[F410 Phase error]

When this label is referenced, the object becomes incorrect.

**[Work-around]** None.

## (2) Restriction details for Compiler

No. 16 Bit fields with type *signed* are handled as unsigned bit fields.

**[Description]** Bit fields with type *signed* are handled as unsigned bit fields.

**[Workaround]** None.

No. 43 Output conversion on I/O functions in the standard libraries causes illegal behavior.

**[Description]** When output conversion is performed for the *printf*, *sprintf*, *vprintf*, and *vsprintf* functions, operation will become illegal under the following conditions.

If precision is specified as ".2" for the *d*, *i*, *o*, *u*, *x* or *X* conversion specifier, the 0 flag will not be ignored.

*Example:*

```
#include <stdio.h>

void func()
{
    printf("%04.2d\n", 77);
}
```

**Remark** Illegal operation: "0077"

Correct operation: " 77"

For the *g*, and *G* conversion specifiers, the result is "specified precision + 1".

*Example:*

```
#include <stdio.h>

void func()
{
    printf("%.2g", 12.3456789);
}
```

**Remark** Illegal operation: "12.3"

Correct operation: "12"

**[Workaround]** None.

No. 44 The size of the minimum value (-32768) of types *int/short* is 4

**[Description]** The size of the minimum value (-32768) of types *int/short* is 4.

*Example:*

```
int x;
void func()
{
    x = sizeof(-32768);
}
```

**Remark** Illegal operation: The value of x is 4

Correct operation: The value of x is 2

**[Workaround]** Write as (-32767-1).

No. 47 If the parameter type and the type of the identifier in a function definition do not match, an error is output.

**[Description]** Because argument promotion is not performed for the type of an identifier in a function definition, the parameter type and the type of the identifier in the function definition do not match, thus causing the E0747 error.

*Example:*

```
int fn_char(int);
int fn_char(c)
char c;
{
    return 98;
}
```

**[Workaround]** Make sure that the type of the parameter matches that of the identifier in the function definition.

No. 48 In an identifier list in a function definition, a parameter that is not declared is not handled as type *int*, and an error results.

**[Description]** In an identifier list in a function definition, a parameter that is not declared is not handled as type *int*, thus causing the E0706 error.

*Example:*

```
void func(x1, x2, f, x3, lp, fp)
int (*fp)( );
long *lp;
float f;
{
    :
}
```

**[Workaround]** Declare all parameters in a function definition.

## No. 49 The # operator cannot be expanded correctly.

**[Description]** Expansion will not be performed correctly under either of the following conditions.

1. [""] cannot be expanded correctly with the # operator, causing a compile error.

*Example for condition 1:*

```
#include <string.h>
#define str( a) (# a)
int x;
void func()
{
    if (strcmp(str(""), "\\") == 0) x++;
}
```

**Remark:** Illegal operation: Compile error

Correct operation: if (strcmp( "\\", "\\") == 0) x++;

2. Macros that contain a # operator and a nested structure cannot be expanded correctly.

*Example for condition 2:*

```
#define str(a) #a
#define xstr(a) str(a)
#define EXP 1
char *p;
void func()
{
    p = xstr(12EEXP);
}
```

**Remark:** Illegal operation: "p = ("12E1");"

Correct operation: "p = ("12EEXP");"

**[Workaround]** None.

## 6.2 Restrictions for the Memory Bank Relocation Support Tool

Below is a list of restrictions for the Memory Bank Relocation Support Tool.

### 6.2.1 List of restrictions for the Memory Bank Relocation Support Tool

No.	Description
1	Restriction relating to <code>__flashf</code> function
2	Restriction relating to specifying options.
3	Restriction relating to link directives.
4	Restriction relating to <code>callt</code> area.

## 6.2.2 Detail of restrictions for the Memory Bank Relocation Support Tool

See below for details of restrictions for the Memory Bank Relocation Support Tool.

### No. 1 Restriction relating to `__flashf` function

**[Description]** The `__flashf` function must be allocated to the common area, but is relocated to an area other than the common area because the Memory Bank Relocation Support Tool cannot identify the `__flashf` function. Therefore, an error may occur during build.

**[Workaround]** Open the C source file properties for the file that includes the `__flashf` function, and from the [Build Properties] tab, under the [Memory Bank] category, set [Select common/bank Area] to "Common area".

### No. 2 Restriction relating to specifying options.

**[Description]** The Memory Bank Allocation Support Tool does not analyze the options specified in the [Other options] box in the Compiler/Assembler/Linker Options dialog boxes.

**[Workaround]** Do not input options into the [Other options] box if they can be specified in other areas in the option dialog boxes.

### No. 3 Restriction relating to link directives.

**[Description]** The link directive file is not supported. The Memory Bank Allocation Support Tool relocates C source files based on the memory area defined in the device file. (One example of this limitation is that the relocation of `const` data, initialization data, and the like outside of functions is not supported if it is allocated to the bank area.)

**[Workaround]** From the [Memory Bank Options] tab, from the [Margin] category, adjust the free space in each area.

### No. 4 Restriction relating to `callt` area.

**[Description]** If the section name of `@@CALT` is changed as a result of a `#pragma` section specification or quasi directive, the Memory Bank Relocation Support Tool will output an illegal value to the reference information file as the reference count of a function called via a `callt` area.

**[Workaround]** Do not change the section name of `@@CALT`.

## Chapter 7. Changes in User's Manual

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