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Chapter 1. Target Devices

Below is a list of devices supported by the Code Generator for RX111 V1.05.01.02	
PIN	Device name
36pin	R5F5111JAxLM, R5F51111AxLM, R5F51113AxLM
40pin	R5F5111JAxNF, R5F51111AxNF, R5F51113AxNF
48pin	R5F5111JAxFL, R5F5111JAxNE, R5F51111AxFL, R5F51111AxNE R5F51113AxFL, R5F51113AxNE, R5F51114AxFL, R5F51114AxNE R5F51115AxFL, R5F51115AxNE, R5F51116AxFL, R5F51116AxNE R5F51117AxFL, R5F51117AxNE, R5F51118AxFL, R5F51118AxNE
64pin	R5F5111JAxFK, R5F5111JAxFM, R5F5111JAxLF R5F51111AxFK, R5F51111AxFM, R5F51111AxLF R5F51113AxFK, R5F51113AxFM, R5F51113AxLF R5F51114AxFK, R5F51114AxFM, R5F51114AxLF R5F51115AxFK, R5F51115AxFM, R5F51115AxLF R5F51116AxFK, R5F51116AxFM, R5F51116AxLF R5F51117AxFK, R5F51117AxFM, R5F51117AxLF R5F51118AxFK, R5F51118AxFM, R5F51118AxLF
The Code Generator for RX111 is based on the following documents.	
Manual Name	Document Number
RX111 Group User's Manual: Hardware	R01UH0365JJ0110
	R01UH0365EJ0110

Below is a list of devices supported by the Code Generator for RX110 V1.05.01.02	
PIN	Device name
36pin	R5F5110HAxLM, R5F5110JAxLM, R5F51101AxLM, R5F51103AxLM
40pin	R5F5110HAxNF, R5F5110JAxNF, R5F51101AxNF, R5F51103AxNF
48pin	R5F5110JAxFL, R5F5110JAxNE, R5F51101AxFL, R5F51101AxNE R5F51103AxFL, R5F51103AxNE, R5F51104AxFL, R5F51104AxNE R5F51105AxFL, R5F51105AxNE
64pin	R5F5110JAxFK, R5F5110JAxFM, R5F5110JAxLF R5F51101AxFK, R5F51101AxFM, R5F51101AxLF R5F51103AxFK, R5F51103AxFM, R5F51103AxLF R5F51104AxFK, R5F51104AxFM, R5F51104AxLF R5F51105AxFK, R5F51105AxFM, R5F51105AxLF
The Code Generator for RX110 is based on the following documents.	
Manual Name	Document Number
RX110 Group User's Manual: Hardware	R01UH0421JJ0100
	R01UH0421EJ0100

Below is a list of devices supported by the Code Generator for RX64M V1.02.01.02	
PIN	Device name
100pin	R5F56MFCxFP, R5F56MFCxLJ, R5F56MFDxFP, R5F56MFDxLJ R5F56MGCxFP, R5F56MGCxLJ, R5F56MGDxFP, R5F56MGDxLJ R5F56MJCxFP, R5F56MJCxLJ, R5F56MJDxFP, R5F56MJDxLJ R5F56MLCxFP, R5F56MLCxLJ, R5F56MLDxFP, R5F56MLDxLJ
144/145pin	R5F56MFCxFB, R5F56MFCxLK, R5F56MFDxFB, R5F56MFDxLK R5F56MGCxFB, R5F56MGCxLK, R5F56MGDxFB, R5F56MGDxLK R5F56MJCxFB, R5F56MJCxLK, R5F56MJDxFB, R5F56MJDxLK R5F56MLCxFB, R5F56MLCxLK, R5F56MLDxFB, R5F56MLDxLK
176/177pin	R5F56MFDxFC, R5F56MFDxBG, R5F56MFDxLC, R5F56MFCxFC R5F56MFCxBG, R5F56MFCxLC, R5F56MGDxFC, R5F56MGDxBG R5F56MGDxLC, R5F56MGCxFC, R5F56MGCxBG, R5F56MGCxLC R5F56MJDxFC, R5F56MJDxBG, R5F56MJDxLC, R5F56MJCxFC R5F56MJCxBG, R5F56MJCxLC, R5F56MLDxFC, R5F56MLDxBG R5F56MLDxLC, R5F56MLCxFC, R5F56MLCxBG, R5F56MLCxLC
The Code Generator for RX64M is based on the following documents.	
Manual Name	Document Number
RX64M Group User's Manual: Hardware	R01UH0377JJ0090
	R01UH0377EJ0090

Below is a list of devices supported by the Code Generator for RX113 V1.02.01.02	
PIN	Device name
64pin	R5F51135AxLJ, R5F51136AxLJ, R5F51137AxLJ, R5F51138AxLJ
100pin	R5F51135AxFP, R5F51136AxFP, R5F51137AxFP, R5F51138AxFP R5F51135AxFM, R5F51136AxFM, R5F51137AxFM, R5F51138AxFM
The Code Generator for RX113 is based on the following documents.	
Manual Name	Document Number
RX113 Group User's Manual: Hardware	R01UH0448JJ0100
	R01UH0448EJ0100

Below is a list of devices supported by the Code Generator for RX71M V1.00.02.02	
PIN	Device name
100pin	R5F571MFDxFP, R5F571MFCxLJ, R5F571MFDxFP, R5F571MFDxLJ R5F571MGDxFP, R5F571MGDxLJ, R5F571MGCxFP, R5F571MGCxLJ R5F571MJDxFP, R5F571MJDxLJ, R5F571MJCxFP, R5F571MJCxLJ R5F571MLDxFP, R5F571MLDxLJ, R5F571MLCxFP, R5F571MLCxLJ
144/145pin	R5F571MFCxFB, R5F571MFCxLK, R5F571MFDxFB, R5F571MFDxLK R5F571MGCxFB, R5F571MGCxLK, R5F571MGDxFB, R5F571MGDxLK R5F571MJCxFB, R5F571MJCxLK, R5F571MJDxFB, R5F571MJDxLK R5F571MLCxFB, R5F571MLCxLK, R5F571MLDxFB, R5F571MLDxLK
176/177/178pin	R5F571MFDxFC, R5F571MFDxBG, R5F571MFDxLC, R5F571MFCxFC, R5F571MFCxBG, R5F571MFCxLC, R5F571MGDxFC, R5F571MGDxBG, R5F571MGDxLC, R5F571MGCxFC, R5F571MGCxBG, R5F571MGCxLC, R5F571MJDxFC, R5F571MJDxBG, R5F571MJDxLC, R5F571MJCxFC, R5F571MJCxBG, R5F571MJCxLC, R5F571MLDxFC, R5F571MLDxBG, R5F571MLDxLC, R5F571MLCxFC, R5F571MLCxBG, R5F571MLCxLC
The Code Generator for RX71M is based on the following documents.	
Manual Name	Document Number
RX71M Group User's Manual: Hardware	R01UH0493JJ0100
	R01UH0493EJ0100

Below is a list of devices supported by the Code Generator for RX23T V1.00.00.03	
PIN	Device name
48pin	R5F523T3AxFL, R5F523T5AxFL
52pin	R5F523T3AxFD, R5F523T5AxFD
64pin	R5F523T3AxFM, R5F523T5AxFM
The Code Generator for RX23T is based on the following documents.	
Manual Name	Document Number
RX23T Group User's Manual: Hardware	R01UH0520JJ0100
	R01UH0520EJ0100

Chapter 2. User's Manuals

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

Manual Name	Document Number
CS+ Code Generator Tool Integrated Development Environment User's Manual: RX API Reference[CS+ for CC]	R20UT3103EJ0100
CS+ Code Generator Tool Integrated Development Environment User's Manual: Peripheral Function Operation[CS+ for CC][CS+ for CA,CX]	R20UT3104EJ0100
CS+ Code Generator Tool Integrated Development Environment User's Manual: Pin View[CS+ for CC][CS+ for CA,CX]	R20UT3105EJ0100
CS+ V3.01.00 Integrated Development Environment User's Manual: Message[CS+ for CC]	R20UT3286EJ0100

Chapter 3. Key Points for Selecting Uninstallation Method

There are two ways to uninstall this product.

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

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

- Programs and Features (Windows Vista, Windows 7, Windows 8, Windows 8.1)

Then select "CS+ Code Generator for RX".

Chapter 4. Changes

This chapter describes change from V1.06.00 to V1.07.00

4.1 Changes List

No	Description	Corresponds of code generation					
		RX110	RX111	RX113	RX23T	RX64M	RX71M
		V1.05.01.02	V1.05.01.02	V1.02.01.02	V1.00.00.03	V1.02.01.02	V1.00.02.02
1	Eliminate of Data handled by polling	-	-	/	/	/	/
2	Changes of Clock Generator Setting	-	-	/	/	/	/
3	Addition of Pin View	-	-	/	/	-	/
4	Addition of API	/	/	-	o	/	/
5	Changes of TRGC and TRGD register setting	/	-	/	/	-	-
6	Changes of SCKCR2 register setting	/	/	/	/	-	/
7	Changes of BUS setting	/	/	/	/	-	/
8	Changes of SCI setting	-	-	-	/	-	-
9	Changes of MTIOC3D pin setting for MTU3 normal mode	/	/	/	/	o	/
10	Output code changes of Simple I2C bus (SCI)	/	o	o	-	o	o
11	Changes of Clock Generator Setting (PLL Circuit Operation)	/	o	o	-	/	/
12	Changes of an error is generated in the address output pins for the bus	/	/	/	o	/	/
13	Changes of a selection error is generated for the pin settings of TPU	/	/	/	o	/	/

o: Correspondence, -: Not correspondence (finish of correction), /: Outside of function

4.2 Details of Changes

4.2.1 Eliminate of Data handled by polling

The selection "Data handled by polling" was eliminated.

- Data processing settings for the serial communication interface (SCI)
- Data processing settings for the serial peripheral interface

This issue has been corrected in Code Generator for RX V1.01.00.

4.2.2 Change of Clock Generator Setting

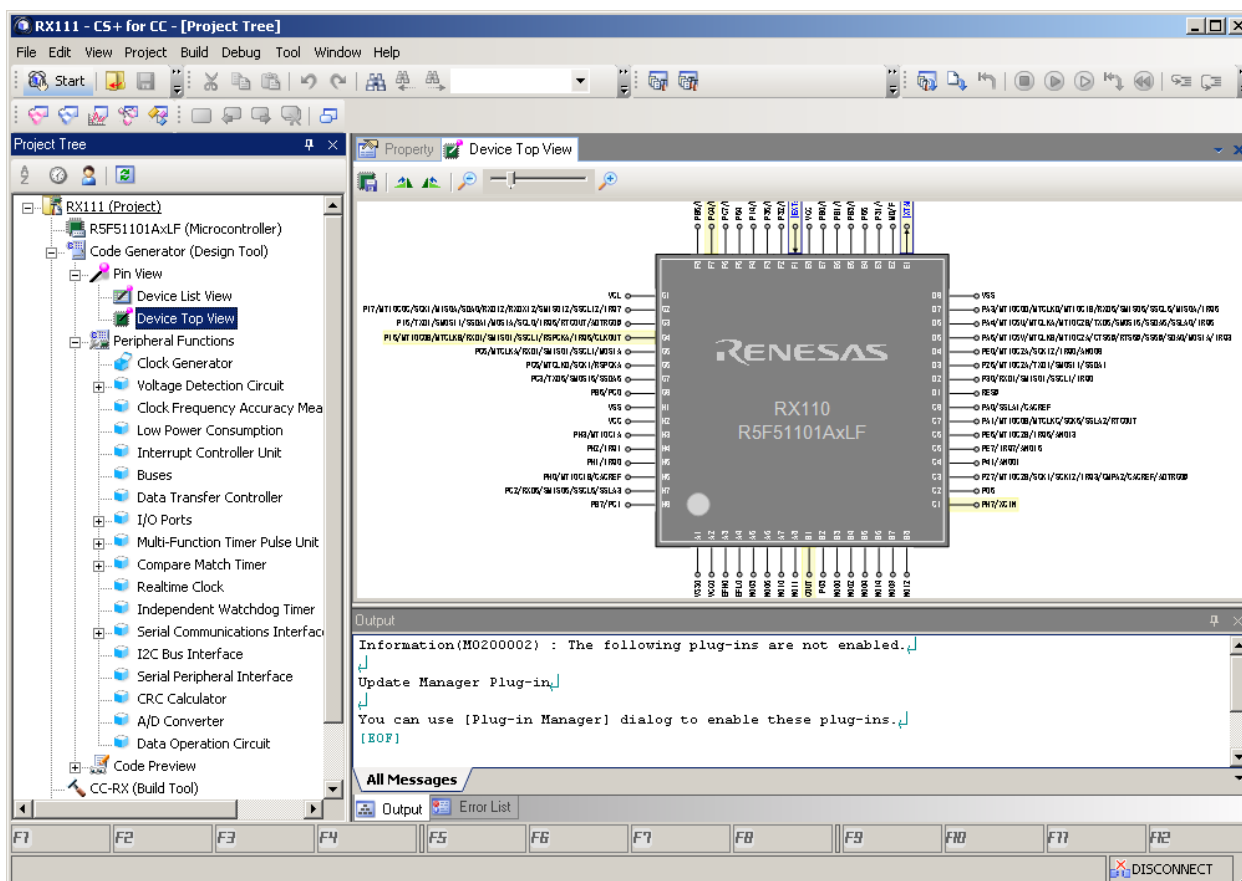
In the clock generator setting, it corrected so that the value exceeding restriction of a device could not be set up.

This issue has been corrected in Code Generator for RX V1.01.00.

4.2.3 Addition of Pin View

Pin View displays current pin settings by Code Generator. There are Device Top View and Device Top View.

This issue has been corrected in Code Generator for RX V1.01.00



Rotate

Device Top View supports rotate function. It allows user to rotate the Device Top View either in clockwise or anti-clockwise direction in steps of 90 degree.

Zoom

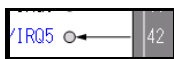
Device Top View supports zoom function. The zoom slider controls the zoom level.

Drag and Move

Device Top View supports mouse drags action. Hold down mouse left button on the graph and move will drag the graph around.

Highlight Pins by Peripheral

Device Top View will highlight the group of pins that belongs to the active CG peripheral (macro).

Input / Output (I/O) Direction Display

Device Top View supports I/O direction of each pin. Input/output direction is indicated by an arrow.

Pin Label Color Highlight

When pin label is displayed in blue color and indicated with parenthesis, it refers to pin function is configured in Code Generator.

Device Top View Output File

Click on the "Save Device Top View" button on Device Top View toolbar, the Device Top View is saved as an image file, in PNG format.

Configure Pin View Color in Property Window

Pin View supports for user to change color, through the property window.

Right click on the Device Top View on project tree, the property window will pop up a right click menu.

Device List View

Device List view displays the pin information in a data grid format. It has two data lists: 'Pin Number' and 'Macro'. Both lists refer to the same pin configuration as shown on the Device Top View.

Pin Number List Window

Pin Number list displays current pins configuration pin number.

Pin no.	Pin name	Selected function	Pin direction	Pin remarks
A1	AVSS0	Not assigned	-	
A2	AVCC0	Not assigned	-	
A3	VREFH0/PJ6	Not assigned	-	
A4	VREFL0/PJ7	Not assigned	-	
A5	P43/AN003	Not assigned	-	
A6	P46/AN006	Not assigned	-	
A7	PE2/MTIOC4A/RXD12/RXDX12/SMI...	Not assigned	-	
A8	PE3/MTIOC0A/MTIOC1B/MTIOC4B/...	Not assigned	-	
B1	XCOUT	Not assigned	-	
B2	P03/DA0	Not assigned	-	
B3	P40/AN000	Not assigned	-	
B4	P42/AN002	Not assigned	-	

Macro List Window

'Macro' list displays the information and grouped by each peripheral.

Peripheral	Pin name	Available assign	Pin no.	Pin direction	Pin remarks
Clock Generator	IRQ3	-	Not assigned	In	
Voltage Detection Circuit	IRQ0	P30/MTIOC4B/POE8#/RXD1/SMISO1/SSCL1/IRQ0	4	In	
Clock Frequency Accuracy	IRQ1	-	Not assigned	In	
Interrupt Controller Unit	NMI	-	Not assigned	In	
I/O Ports	IRQ2	-	Not assigned	In	
Multi-Function Timer Pulse	IRQ7	-	Not assigned	In	
Port Output Enable 2	IRQ6	-	Not assigned	In	
Realtime Clock	IRQ5	-	Not assigned	In	
Serial Communications Inter	IRQ4	-	Not assigned	In	
I2C Bus Interface					
Serial Peripheral Interface					
A/D Converter					
D/A Converter					
USB2.0 Host/Function Mod					
Others					

4.2.4 Addition of API

API was added to RX113. Chapter 6 API which is this note about the API specification, please refer to it.

This issue has been corrected in Code Generator for RX V1.04.00.

API was added to RX23T. Chapter 6 API which is this note about the API specification, please refer to it.

This issue has been corrected in Code Generator for RX V1.07.00.

4.2.5 Changes of TRGC and TRGD register setting

In some cases, required code for setting the TGRC and TGRD registers is not output to the create function that is generated in response to setting up the multi-function timer pulse unit (MTU) or 16-bit timer pulse unit (TPU).

This issue has been corrected in Code Generator for RX V1.06.00.

4.2.6 Change of SCKCR2 register setting

There is an error in the output code of the void R_CGC_Create(void) function, which is in the r_cg_cgc.c source file for clock settings. In writing a value to system clock control register 2 (SCKCR2), bit 0 is erroneously set to "0". The correct setting for bit 0 is "1".

This issue has been corrected in Code Generator for RX V1.06.00.

4.2.7 Change of BUS setting

When setting a separate bus in the interface for bus area settings, the address latch signal (ALE) has to be enabled. The use of a separate bus was originally selectable regardless of the ALE setting.

This issue has been corrected in Code Generator for RX V1.06.00.

4.2.8 Change of SCI setting

The output cord when choosing a simple SPI bus by SCI and carrying out cord generation, isn't right. When the R_SCIn_Stop (void) function is carried out, even if the R_SCIn_Start (void) function is carried out, it can't be received.

This issue has been corrected in Code Generator for RX V1.06.00.

4.2.9 Changes of MTIOC3D pin setting for MTU3 normal mode

When the MTU3 is set with the following conditions, the code generated for port settings is not correct.

- Applicable channel: MTU3
- Function setting: Normal mode
- TGRD3: Output compare register
- Output of MTIOC3D pin: PC4

This issue has been corrected in Code Generator for RX V1.07.00.

4.2.10 Output code changes of Simple I2C bus (SCI)

When the SCI is set with the following conditions, the generated handler code will not be correct. In master reception, the data reception clock is generated for an extra byte. The extra received data are not stored at the designated address.

- Applicable channel: All
- Function setting: Simple I2C bus
- I2C interrupt mode select: Use the reception and transmission interrupts.

This issue has been corrected in Code Generator for RX V1.07.00.

4.2.11 Changes of Clock Generator Setting (PLL Circuit Operation)

When "Operation" is selected under "PLL circuit setting" on the "Clock Generator" page, the generated code has an error.

This issue has been corrected in Code Generator for RX V1.07.00.

4.2.12 Changes of an error is generated in the address output pins for the bus

An error is generated in the address output pins "A16-A23" when the following address output pin settings are made for the bus.

- (1) "P71" is selected as the CS1#output pin after checking "Use CS1" with the bus operation setting "Used".
- (2) After selecting "Normal mode" for TPU1 in the 16-bit timer pulse unit settings, "P14" is enabled and set as the TCLKA pin.
- (3) General registers TGRA1 and TGRB1 of TPU1 are set as "Output compare register", after which pins TIOCA1 and TIOCB1 are set to "output disabled".
- (4) The address output pin settings for the bus are made.

This issue has been corrected in Code Generator for RX V1.07.00.

4.2.13 Changes of a selection error is generated for the pin settings of TPU

A selection error is generated for the TIOCA1 pin of TPU1 of the 16-bit timer pulse unit when the following settings for the unit are made.

- (1) TPU1 of the 16-bit timer pulse unit is set to "Phase counting mode 1", a check mark is placed against "TCLKA pin", and "P14" is selected as the TCLKA pin.
- (2) The TIOCA1 and TIOCB1 pins of TPU1 are set to "Input capture at TPU0.TGRn input capture/compare match".
- (3) MTU0 of the Multifunction Timer Pulse Unit 3 is set to "Normal mode" and a check mark is placed against "MTCLKA pin".

This issue has been corrected in Code Generator for RX V1.07.00.

Chapter 5. Cautions

5.1 Cautions List

No.	Description	Corresponds of code generation					
		RX110 V1.05.01.02	RX111 V1.05.01.02	RX113 V1.02.01.02	RX23T V1.00.00.03	RX64M V1.02.01.02	RX71M V1.00.02.02
1	Cautions of USB functions	/	○	○	/	○	○
2	Cautions of Low Power Consumption functions	○	○	○	○	○	○
3	Cautions of SCI (Asynchronous Mode) functions	○	○	○	○	○	○
4	Cautions of User boot mode	/	/	/	/	○	○
5	Cautions of extension code and multi-master of RIIC	/	/	○	○	○	○
6	Cautions of Clock Edge Select of MTU	/	/	/	○	/	/
7	Cautions of triggers to start conversion by the A/D converter of MTU	/	/	/	○	/	/
8	Output code cautions of POE	/	/	/	○	/	/

○: Correspondence, /: Outside of function

5.2 Cautions Details

5.2.1 Cautions of USB functions

The code generator is not supporting the USB functions.

5.2.2 Cautions of Low Power Consumption functions

The code generator is not supporting the Low Power Consumption functions.

5.2.3 Cautions of SCI (Asynchronous Mode) functions

The code generator is not supporting transfer rate clock input from the MTU or TMR.

5.2.4 Cautions of User boot mode

The code generator is not supporting User boot mode.

5.2.5 Cautions of extension code and multi-master of RIIC

The code generator is not supporting the extension code, multi-master function of RIIC.

[Workaround] There is no workaround.

5.2.6 Caution Cautions of Clock Edge Select of MTU

When PCLK is selected of MTU Clock source for counting, Clock Edge Select can't be selected.

[Workaround] Add setting Timer Control Register (TCR) to the generated source programs.

5.2.7 Cautions of triggers to start conversion by the A/D converter of MTU

When the triggers to start conversion by the A/D converter is selected, the source program may not be generated by the error.

[Workaround] There is no workaround.

5.2.8 Output code cautions of POE

When MTIOC0B pin is set to MTIOC0B P93 Pin High-Impedance of POE, the generated code has an error.

[Workaround] Modify the output code in the way shown below.

Before modification:

```
POE.POECR1.BYTE = _40_POE_MTIOC0CPINP93_ENABLE | _0000_POE_POECR1_DEFAULT;
```

After modification:

```
POE.POECR1.BYTE = _40_POE_MTIOC0BPINP93_ENABLE | _0000_POE_POECR1_DEFAULT;
```

Chapter 6. About API added and changed

6.1 About API added for RX113

API Function Name	Function
R_CMPB_Create	Performs initialization necessary to control the Comparator B.
R_CMPB_Create_UserInit	Performs user-defined initialization relating to the Comparator B.
r_cmpb_cmpbn_interrupt	Performs processing in response to the comparator B interrupt.
R_CMPBn_Start	Starts comparison for analog input voltage.
R_CMPBn_Stop	Ends comparison for analog input voltage.

Comparator B (CMPB)

R_CMPB_Create

Performs initialization necessary to control the Comparator B.

[File Name]

r_cg_cmpb.c

[Syntax]

```
void R_CMPB_Create ( void );
```

[Argument(s)]

None.

[Return value]

None.

R_CMPB_Create_UserInit

Performs user-defined initialization relating to the Comparator B.

Remark This API function is called as the R_CMPB_Create callback routine.

[File Name]

r_cg_cmpb_user.c

[Syntax]

```
void R_CMPB_Create_UserInit ( void );
```

[Argument(s)]

None.

[Return value]

None.

r_cmpb_cmpbn_interrupt

Performs processing in response to the comparator B interrupt.

Remark This API function is called to run interrupt processing for the comparator B_n interrupt, which is generated when the comparison result changes at this time.

[File Name]

r_cg_cmpb_user.c

[Syntax]

```
Void r_cmpb_cmpbn_interrupt ( void );
```

Remark n is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPB n _Start

Starts comparison for analog input voltage

Starts D/A conversion.

[File Name]

r_cg_cmpb.c

[Syntax]

```
void R_CMPB $n$ _Start ( void );
```

Remark n is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPB n _Stop

Ends comparison for analog input voltage.

[File Name]

r_cg_cmpb.c

[Syntax]

```
void R_CMPB $n$ _Stop ( void );
```

Remark n is the channel number.

[Argument(s)]

None.

[Return value]

None.

6.2 About API added for RX23T

API Function Name	Function
R_CMPC_Create	Performs initialization necessary to control the Comparator C.
R_CMPC_Create_UserInit	Performs user-defined initialization relating to the Comparator C.
r_cmpc_cmpcn_interrupt	Performs processing in response to the comparator C interrupt.
R_CMPCn_Start	Starts comparison for analog input voltage.
R_CMPCn_Stop	Ends comparison for analog input voltage.

Comparator C (CMPC)**R_CMPC_Create**

Performs initialization necessary to control the Comparator C.

[File Name]

r_cg_cmpc.c

[Syntax]

```
void R_CMPC_Create ( void );
```

[Argument(s)]

None.

[Return value]

None.

R_CMPC_Create_UserInit

Performs user-defined initialization relating to the Comparator C.

Remark This API function is called as the R_CMPC_Create callback routine.

[File Name]

r_cg_cmpc_user.c

[Syntax]

```
void R_CMPC_Create_UserInit ( void );
```

[Argument(s)]

None.

[Return value]

None.

r_cmpc_cmpcn_interrupt

Performs processing in response to the comparator C interrupt.

Remark This API function is called to run interrupt processing for the comparator C_n interrupt, which is generated when the comparison result changes at this time.

[File Name]

r_cg_cmpc_user.c

[Syntax]

```
Void r_cmpc_cmpcn_interrupt ( void );
```

Remark n is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPCn_Start

Starts comparison for analog input voltage

Starts D/A conversion.

[File Name]

r_cg_cmpc.c

[Syntax]

```
void R_CMPCn_Start ( void );
```

Remark n is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPCn_Stop

Ends comparison for analog input voltage.

[File Name]

r_cg_cmpc.c

[Syntax]

```
void R_CMPCn_Stop ( void );
```

Remark n is the channel number.

[Argument(s)]

None.

[Return value]

None.

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