R20UT3408EJ0100
Rev.1.00
Mar 23, 2015

AP4 for RX V1.05.00

Release Note

Use AP4 for RX (The name was changed from Application Leading Tool for RX. It's made Applilet for RX in the following by these whole sentences.), and thank you very much truly.

The restriction items for using this product, and notices, etc. are mentioned by these attached documents. Before using, I would like to ask you to read certainly.

Contents

Chapter 1. Introduction

AP4 for RX(Applilet for RX) is a software tool to generate device driver code for on-chip peripherals. It generates device driver codes using user settings through GUI. Initialize code and API functions are provided.

Chapter 2. Target Devices

Below is a list of devices supported by the AP4 for RX V1.05.00

RX111 group	
PIN	Device name
36pin	R5F5111JAxLM, R5F51111AxLM, R5F51113AxLM
40pin	R5F5111JAxNF, R5F51111AxNF, R5F51113AxNF
48pin	R5F5111JAxFL, R5F5111JAxNE, R5F51111AxFL, R5F51111AxNE R5F51113AxFL, R5F51113AxNE, R5F51114AxFL ,R5F51114AxNE R5F51115AxFL ,R5F511145xNE
64pin	R5F5111JAxFK, R5F5111JAxFM, R5F5111JAxLF R5F51111AxFK, R5F51111AxFM, R5F51111AxLF R5F51113AxFK, R5F51113AxFM, R5F51113AxLF R5F51114AxFK, R5F51114AxFM, R5F51114AxLF R5F51115AxFK, R5F51115AxFM, R5F51115AxLF
Following documents.	
Manual Name	Document Number
RX111 Group User's Manual: Hardware	R01UH0365JJ0110
	R01UH0365EJ0110

RX110 group	
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
Following documents.	
Manual Name	Document Number
RX110 Group User's Manual: Hardware	R01UH0421JJ0100
	R01UH0421EJ0100

RX64M group	
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
Following documents.	
Manual Name	Document Number
RX64M Group User's Manual: Hardware	R01UH0377JJ0090
	R01UH0377EJ0090

RX113 Group	
Nickname	Device name
64pin	R5F51135AxLJ, R5F51136AxLJ, R5F51137AxLJ, R5F51138AxLJ
100pin	R5F51135AxFP, R5F51136AxFP, R5F51137AxFP, R5F51138AxFP R5F51135AxFM, R5F51136AxFM, R5F51137AxFM, R5F51138AxFM
Following documents.	
Manual Name	Document Number
RX113 Group User's Manual: Hardware	R01UH0448JJ0100
	R01UH0448EJ0100

RX71M Group	
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

Following documents.	
Manual Name	Document Number
RX71M Group User's Manual: Hardware	R01UH0493JJ0050
	R01UH0493EJ0050

Chapter 3. Operating Environment

- Host machine
  - IBM PC/AT compatibles (Windows® 8, Windows® 7, Windows Vista®)
  - Processor: 1 GHz or higher (must support hyper-threading, multi-core CPUs)
  - Memory capacity: 2 GB or more recommended. Minimum requirement is 1 GB or more (64-bit Windows requires 2 G or more)
  - Hard disk capacity: 200 MB or more spare capacity
  - Display: 1024 x 768 or higher resolution, 65,536 or more colors
  - Interface: USB 2.0
  - All other necessary software environments in addition to WindowsOS
    - .NET Framework version4.5
    - Microsoft Visual C++ 2010 SP1 runtime library

- Development Environments

Product Name	Version
IAR Embedded Workbench for Renesas RX	V2.60 or later
GNURX	V14.02 or later
Renesas electronics Compiler for RX [CC-RX]	V2.03 or later

Chapter 4. Changes

This chapter describes change from AP for RX V1.04.00 to V1.05.00

No.	Description	version				
		RX113 V1.01.00.02	RX111 V1.04.00.02	RX110 V1.04.00.02	RX64M V1.01.00.02	RX71M V1.00.01.01
1	Change of Data handled by polling	/	-	-	/	/
2	Change of Clock Generator Setting	/	-	-	/	/
3	Addition of PinView	/	-	-	-	-
4	Addition of API	-	/	/	/	/
5	Changes of TRGC and TRGD register setting	/	○	/	○	-
6	Changes of SCKCR2 register setting	/	/	/	○	/
7	Changes of BUS setting	/	/	/	○	/
8	Changes of SCI setting	○	○	○	○	○

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

4.1 Details of Changes

4.1.1 Change 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 V1.01.00

4.1.2 Change of Clock Generator Setting

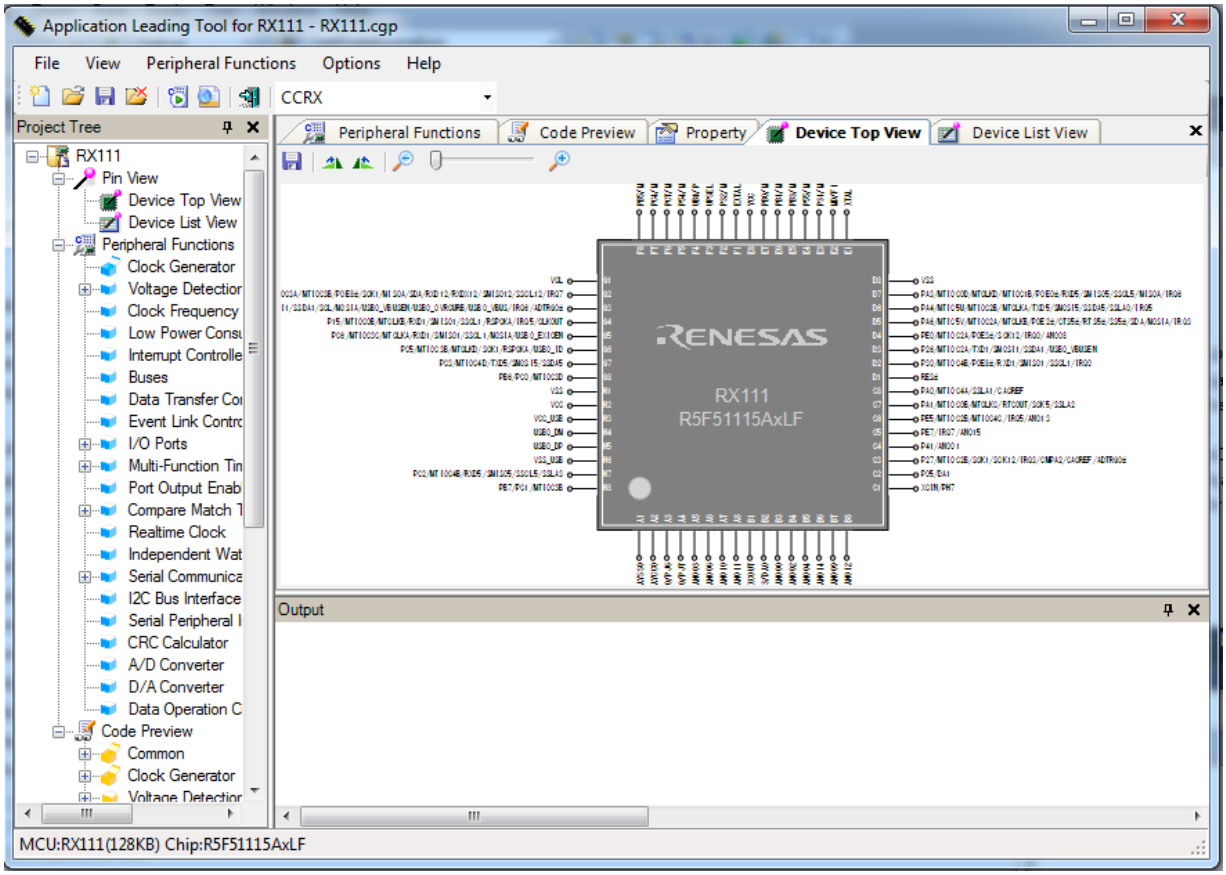
In the clock generator setting, it corrected so that the value exceeding restriction of a device could not be set up.

This issue has been corrected in V1.01.00

4.1.3 Addition of PinView

PinView displays current pin settings by CodeGenerator. There are Device Top View and Device List View.

This issue has been corrected in 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 

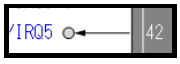
Device Top View supports zoom function. The zoom slider controls the zoom level.

Drag and Move

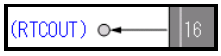
Device Top View supports mouse drags action. Hold down mouse left button on the graph and move will drag the graph around.

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 CodeGenerator.

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 PinView Color in Property Window

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

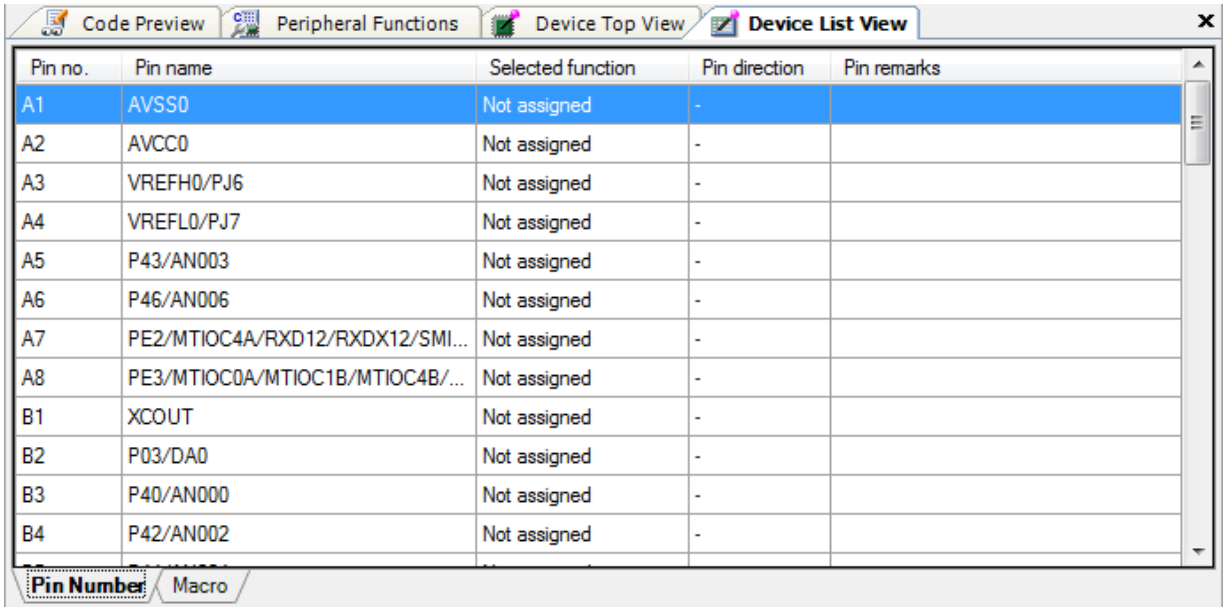
Right click on the Device Top View on project tree, the property window will pop up a right click menu.

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.

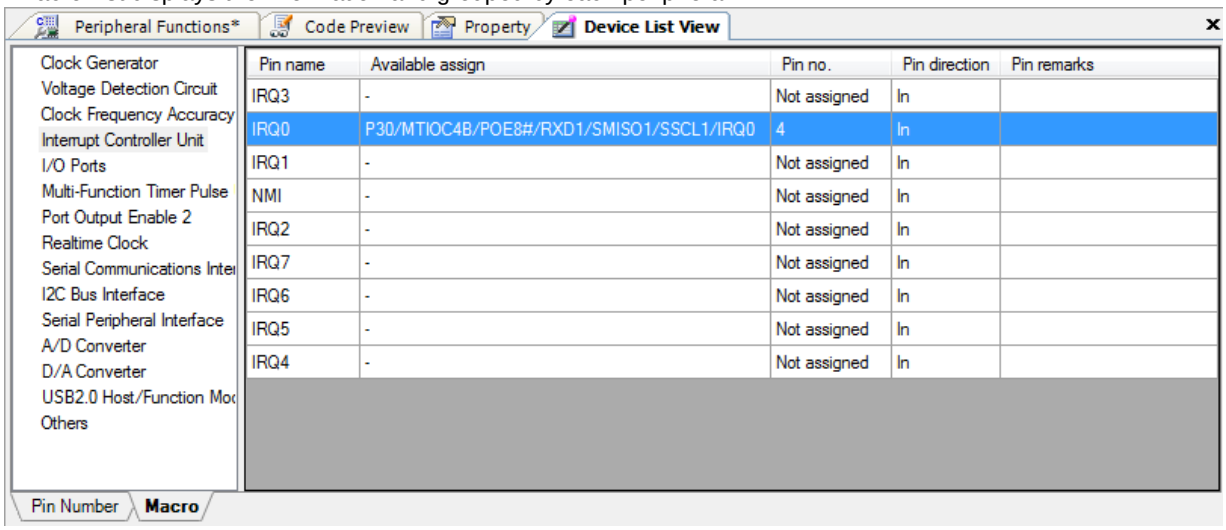
Pin Number List Window

Pin Number list displays current pins configuration pin number.



Macro List Window

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



4.1.4 Addition of API

API was added to RX113. Please refer to the end of a book of a release note for API specification.

This issue has been corrected in V1.04.00

4.1.5 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 AP4 for V1.05.00

4.1.6 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 AP4 for V1.05.00

4.1.7 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 AP4 for V1.05.00

4.1.8 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 AP4 for V1.05.00

Chapter 5. Cautions

This section describes cautions for using AP4 for RX.

5.1 Cautions List

No	Description	version				
		RX113 V1.02.00.01	RX111 V1.05.00.01	RX110 V1.05.00.01	RX64M V1.02.00.01	RX71M V1.00.01.01
1	Cautions of USB.	/	○	/	○	○
2	Cautions of online Help	○	○	○	○	○
3	Cautions of the IAR Embedded Workbench for Renesas RX V2.42.1	○	○	○	/	/
4	Cautions of Serial Communications Interface Asynchronous Mode	○	○	○	○	○
5	Cautions of Low Power Consumption	○	○	○	○	○
6	Cautions of User boot mode	/	/	/	○	○

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

5.2 Cautions Details

5.2.1 Cautions of USB

Applilet for RX is not supporting the USB.
[Workaround] There is no workaround.

5.2.2 About online Help

Applilet for RX is not supporting online help.
[Workaround] There is no workaround.

5.2.3 About the IAR Embedded Workbench

In case of IAR Embedded Workbench for Renesas RX V2.42.1, the following functions cause build error.

- Setting of High-speed On-chip Oscillator
- Setting of I/O port (PortH and PortJ)

[Workaround]
Setting of High-speed On-chip Oscillator
Comment out generated line `SYSTEM.HOCOWTCR.BYTE = xxxx;` in a function `void R_CGC_Create(void)`

Example

```
void R_CGC_Create(void)
{


    /* Set HOCO wait time */
    SYSTEM.HOCOWTCR.BYTE = _06_CGC_HOCO_WAIT_CYCLE_266;    // This line

}
```

Setting of I/O port (PortH and PortJ)
There is no workaround.
Please use the IAR Embedded Workbench for Renesas RX V2.42.2 or later.

5.2.4 Cautions of Serial Communications Interface Asynchronous Mode

Applilet is Asynchronization Mode of SCI and is not supporting the MTU clock input .
[Workaround] There is no workaround.

5.2.5 Cautions of Low Power Consumption

Applilet for RX is not supporting Low Power Consumption.
[Workaround] There is no workaround.

5.2.6 Cautions of User boot mode

Applilet for RX is not supporting User boot mode.
[Workaround] There is no workaround.

Chapter 6. About API added and changed by this version

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_R12DA_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_cmpb*n*_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_CMPBn_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_CMPBn_Stop ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.
   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc.
   Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.
6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

RENESAS

SALES OFFICES Renesas Electronics Corporation http://www.renesas.com

Refer to "http://www.renesas.com/" for the latest and detailed information.

Renesas Electronics America Inc.
2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics India Pvt. Ltd.
No.777C, 100 Feet Road, HALII Stage, Indiranagar, Bangalore, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.
12F., 234 Teheran-ro, Gangnam-Gu, Seoul, 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141

Colophon 5.0