[Notification]

Get Started with Developing a System

Incorporating the RXv3 Core-Based RX660 Group!

Introducing Development Software and Tools Designed to Maximize RXv3 Core Features

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Outline

This tool news gives an overview of the development environment for the RXv3 core architecture of the RX Family and the support of the RX660 group.

We offer high-quality software that helps accelerate development, boards and kits to improve system designing efficiency, and advanced tools that are also easy-to-use to deliver efficient system development to our users.

For details about the 32-bit RX660 microcontrollers (providing excellent noise tolerance and supporting 5 V power supply), see the following:

https://www.renesas.com/rx660

1. Features

1.1 RX Family Software and Tools to Support Efficient RXv3 Core-based System Development

The innovative RXv3 core boosts the proven Renesas RX CPU core architecture with up to 6.0 CoreMark®/MHz, as measured by EEMBC® Benchmarks, to deliver industry-leading performance, power efficiency, and responsiveness.

Renesas RX development environment offers tools such as integrated development environment, real-time OS, middleware and programming tools, supporting the end-to-end development processes for RX applications enabling efficient system development. Furthermore, our IDEs facilitate each process in development cycle from code generation, building to debugging to help accelerate your development.

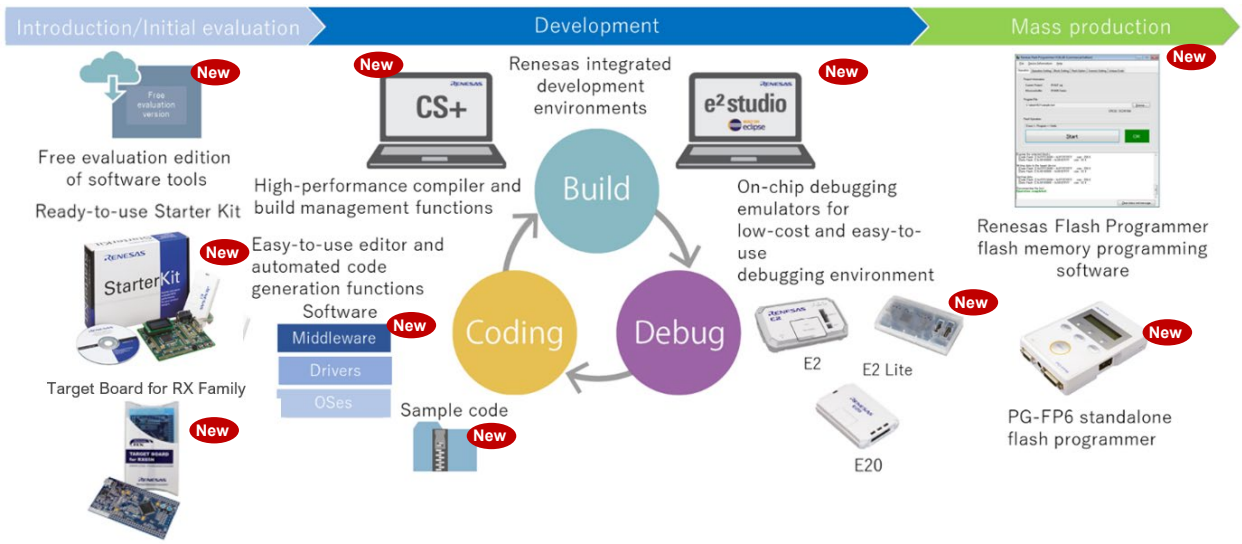

Figure 1-1 RX Family Development Environment

Existing RXv1 or RXv2 core users can start working with the RXv3 core-based MCU by using familiar RX software and tools. “New” in figure 1-1 above indicates new or upgraded products for the RXv3 group.

Using the same CPU core instruction sets, the RXv3 core is compatible with the RXv2 and RXv1 cores of the RX family. Binary compatibility ensures that applications written for the previous-generation RXv2 and RXv1 cores can carry forward to the RXv3-based MCUs. Developers can also take advantage of design assets and focus on developing new features.

1.2 C/C++ Compiler Package for RX Family CC-RX V3 to Maximize Performance of RXv3 CPU Core

CC-RX V3 is a compiler that newly supports the RXv3 core-based MCU. It supports the RXv3 core instruction sets, pipeline, and generates optimized codes for execution performance and ROM size.

Measured in combination with RXv3, the CC-RX V3 has achieved industry-leading performance of 6.0 CoreMark/MHz.

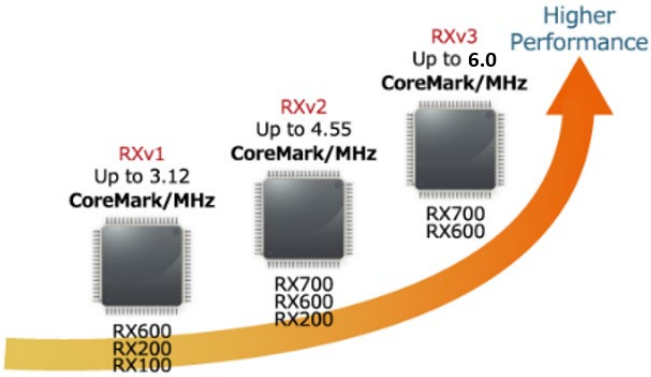

Figure 1-2 Comparison of RXv1 Core, RXv2 Core, and RXv3 Core

CC-RX V3 maintains compatibility with the previous-versions CC-RX V1 and CC-RX V2 to support functions and operations for RXv1/RXv2 core based-MCUs. Furthermore, it has extended features to enable more efficient and effective code generation.

For details about the C/C++ Compiler Package for RX Family CC-RX, see the URL below.

https://www.renesas.com/rx_c

For purchasing CC-RX V3 or upgrading (version) from the CC-RX V2 compiler at a lower price, refer to **Product Lineup** in the above web page.

2. Software and Tools to Quickly Start RXv3 Core-based MCU System Development

2.1 IDEs with Advanced Features Customizable for Your Use

- e^2 studio integrated development environment - Eclipse-based IDE -

e^2 studio is an integrated development environment tool for Renesas MCU family based on the open source IDE “Eclipse” and CDT (C/C++ Development Tooling) plug-in which supports C/C++ project creation. You can select from multiple compilers and debuggers from Renesas as well as GNU and our partners. In addition to the robust editor and project management tool of the Eclipse CDT standard, e^2 studio is also equipped with extension functions of Renesas tools.

e^2 studio 2022-07 allows you to create, build, and debug projects for the RXv3 core-equipped RX660 group MCUs.

For details about e^2 studio 2022-07, refer to the tool news below.

https://www.renesas.com/search?keywords=r20ts0850

For product information and downloading, see the URL below.

https://www.renesas.com/e2studio

- CS+ integrated development environment - Renesas original IDE -

CS+ is an integrated development environment tool designed to deliver “simplicity”, “security”, and “ease of use” to repetitive work of software development from edit, build, and debug. The basic software tools you need for Renesas MCU software development are ready to be used right after installation. CS+ also supports more advanced debugging when used in combination with hardware tools (sold separately) such as on-chip debugging emulator E2 or E2 Lite. Many extension functions and user support functions are also available.

CS+ V8.08.00 allows you to create, build, and debug projects for the RXv3 core-equipped RX660 group MCUs.

For details about CS+ V8.08.00, refer to the tool news below.

https://www.renesas.com/search?keywords=r20ts0858

For product information and downloading, see the URL below.

https://www.renesas.com/cs+

2.2 Easy Start Up with Ready-to-Use Starter Kit

We have released the Renesas Starter Kit for RX660, a perfect starter kit for developers who are new to the RX660 group.

The Renesas Starter Kit for RX660 includes a CPU board with a build-in RX660 MCU, Pmod™ compatible LCD board, and E2 emulator Lite. You can also download the Renesas Starter Kit for RX660 Installer form the website to use the IDE and sample code for code generation and debugging. This enables you to start evaluating the RX660 immediately after purchase.

For details about the Renesas Starter Kit for RX660, see the URL below.

https://www.renesas.com/rskrx660

2.3 CC-RX V3.04.00 to Maximize RX660 Performance

CC-RX V3.01.00 or later supports the RXv3 core-based RX660 group.

For details about the latest V3.04.00, refer to the tool news below.

https://www.renesas.com/search?keywords=r20ts0791

2.4 Smart Configurator to Accelerate Program Designing Process

Smart Configurator is a tool that can combine software as desired. For faster system development, three functions of Smart Configurator are available: import of middleware for MCU peripheral functions (FIT module), automatic driver code generation of peripherals, and pin configuration.

We have released RX Smart Configurator V2.14.0 which supports the RX660 group.

For details, refer to the tool news below.

https://www.renesas.com/search?keywords=r20ts0863

Smart Configurator User's Guide is also available on the web. For details, see the URL below.

https://www.renesas.com/smart-configurator

2.5 RX Driver Package to Reduce System Development Time

RX Driver Package is a software package for using basic functions such as initializing MCU, self-programming of flash memory, timer control, UART communication, and A/D conversion, as well as application functions such as CANFD and remote controller. This software platform can help developers to reduce system development time.

We have released RX Driver Package Ver1.36 which supports the RX660 group.

In RX Driver Package Ver1.36, the CANFD module and the OB1203, HS400x, FS3000, FS1015 sensor control modules have been added.

For details, see the URL below.

https://www.renesas.com/rdp

2.6 High-Speed and Compact µITRON4.0 OS for High-Quality Product Development

We provide a real-time embedded OS that conforms to µITRON4.0 specifications for industry-leading performance. A compact design and excellent real-time functionality and many service calls provide a high-quality real-time multitasking environment for the embedded system.

For details, see the followings.

- RI600V4 µITRON4.0 Real-time OS for RX Family

  https://www.renesas.com/ri600v4

- RI600PX Real-time OS for RX Family

  Developed based on the "RI600V4" with additional memory protection function of the “µITRON4.0 protection extension.”

  https://www.renesas.com/ri600px

2.7 On-chip Debugging Emulators to Fit Your Development Pattern and Scale

There are three types of on-chip debugging emulators supporting the RX660 group: a high-functionality E2 designed for more efficient development, a low-cost E2 Lite, and E20 with a high-volume trace capacity. You can choose the best tool that suits your development pattern and scale.

The RX660 group is now supported by CS+ V8.08 and e^2 studio 2022-07.

For details, see the URL below.

https://www.renesas.com/ocd

2.8 Flash Programming Tools for Different Usage Scenes

- Renesas Flash Programmer on-board programming software - for developing, prototyping and small-scale programming -

Renesas Flash Programmer is on-board programming software which write a program by using the on-chip debugging emulator (E2, E2 Lite, and E20) and a serial or USB interface of the RX family. It is the best flash programming tool for prototyping, developing or for programming in a small-scale.

The RX660 group is now supported by Renesas Flash Programmer V3.10.00.

For details about Renesas Flash Programmer V3.10.00, refer to the tool news below.

https://www.renesas.com/search?keywords=r20ts0860

For details about Renesas Flash Programmer, see the URL below.

https://www.renesas.com/rfp

- PG-FP6 Flash Memory Programmer - Programing without using PC -

The PG-FP6 is a high-speed flash programming tool which supports standalone programming without the need for a PC. It is the perfect programming tool to use for mass production or field updates.

The RX660 group is now supported by Programming GUI for PG-FP6 (FP6 Terminal) V1.06.03.

For details, refer to the tool news below.

https://www.renesas.com/search?keywords=r20ts0859

For details about PG-FP6, see the URL below.

https://www.renesas.com/pg-fp6

3. Obtaining the Product

For downloading the free evaluation edition or commercial edition and for purchasing the product, see the following table.

To order a product, contact your local Renesas Electronics sales office or distributor with a product name and orderable part number. For product pricing, contact the sales office or distributor.

Product/Service	Obtaining the product	Notes Adding support for RX660 to your product/service
Renesas Starter Kit for RX660	Purchase See the URL below for details. https://www.renesas.com/rskrx660#orders	
Target Board for RX660	Purchase See the URL below for details. https://www.renesas.com/tb-rx660#orders	
e^2 studio integrated development environment	Download from the Web. *1 https://www.renesas.com/e2studio#downloads See the tool news below for details. https://www.renesas.com/search?keywords=r20ts0850	Update available See the tool news (left) for details.
CS+ integrated development environment	Download from the Web. See the tool news below for details. https://www.renesas.com/search?keywords=r20ts0858	Update available See the tool news (left) for details.
C/C++ Compiler Package for RX Family (CC-RX V3)	Purchase a compiler license and download from the Web. *2, *3 Refer to “Purchasing the Product” in the tool news. https://www.renesas.com/search?keywords=r20ts0791	If you have CC-RX V2 license, you will need to purchase upgrade (version) license or CC-RX V3 license. See the tool news (left) for details.
RX Smart Configurator	Download from the Web. *1 https://www.renesas.com/smart-configurator#downloads Refer to “Updating the Product” in the tool news. https://www.renesas.com/search?keywords=r20ts0863	Update available See the tool news (left) for details.
RX Family RX Driver Package Ver.1.36	Obtain using Smart Configurator. *1 See the application note below for details. https://www.renesas.com/document/apn/rx-family-rx-driver-package-ver136?r=1169366	Update available See the application note (left) for details.
RI600V4 Real-time OS for RX Family (for CS+)	Purchase (Trial edition available) Refer to “Purchasing the Product” in the tool news. https://www.renesas.com/search?keywords=r20ts0841 Trial edition is available for download at the URL below. https://www.renesas.com/ri600v4#downloads	Update available See the tool news (left) for details.
RI600PX Real-time OS for RX Family	Purchase Refer to “How to Purchase New Software” in the tool news. https://www.renesas.com/search?keywords=r20ts0362	Update available See the tool news (left) for details.

Product/Service	Obtaining the product	Notes Adding support for RX660 to your product/service
E2 emulator	Purchase See the URL below for details. https://www.renesas.com/e2#orders	No update required. For comparison of the emulator features, see the URL below. https://www.renesas.com/software-tool/on-chip-debuggers-rx
E2 emulator Lite	Purchase See the URL below for details. https://www.renesas.com/e2_lite#orders	
E20 emulator	Purchase See the URL below for details. https://www.renesas.com/e20#orders	
Renesas Flash Programmer (Programming GUI)	Purchase (evaluation edition software available) *4 Refer to “Purchasing the Product” in the tool news. https://www.renesas.com/search?keywords=r20ts0860 The evaluation edition software is available for download at the URL below. https://www.renesas.com/rfp#downloads	Update available See the tool news (left) for details.
PG-FP6	Purchase See the URL and tool news below for details. https://www.renesas.com/pg-fp6#orders https://www.renesas.com/search?keywords=r20ts0859	Update for Programming GUI (FP6 Terminal) available. See the tool news (left) for details.

*1: Although the product is available free of charge, it is not the evaluation edition, and can be used as part of a product development process.

*2: The evaluation edition is intended only for testing product performance and functionality. Do not use it for product development. For product development, please consider purchasing the product.

You can also download the evaluation edition from the following URL.

https://www.renesas.com/tool_evaluation

*3: By registering a license key, the product can be used as a commercial edition.

*4: For details about the evaluation edition software, refer to the following URL.

https://www.renesas.com/rfp

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Aug.02.22	-	First edition issued

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The URLs in the Tool News also may be subject to change or become invalid without prior notice.

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