[Notification]

Jump Start Your System Development of an RL78/G23 MCU!

Development Environment That Simplifies System Development of a Low-End MCU

Overview

This Tool News introduces a development environment for the RL78/G23 microcontrollers.

Efficient system development can be realized by using software that improves quality and reduces development time, Smart Configurator for more efficient system design, and advanced but easy-to-use tools.

1. The RL78/G23 MCUs, a new addition to the RL78 family

The RL78/G23 MCUs - a lineup newly added to the RL78 family - are fully compatible with our previous products (thereby allowing for smooth transition). These new MCUs provide enhanced memory and functionality while employing the same CPU core and peripheral functions, along with pin-to-pin compatibility.

New functions such as SNOOZE Mode Sequencer and Logic & Event Link Controller as well as large current port and the capacitive touch sensor are added, and security functions are also enhanced. These MCUs combine high performance/intelligence with low power consumption - perfectly suited to the IoT era.

2. Development Environment that helps you start system development of an RL78/G23 MCU right away

Renesas RL78 family development tools support the entire development process for the RL78 applications with development tools such as integrated development environments (IDEs), real-time OSes, middleware, and programming tools that dramatically enhance the development process. Furthermore, Renesas integrated development environments enable you to accomplish coding, building, and debugging tasks quickly and easily, helping to reduce system development time.
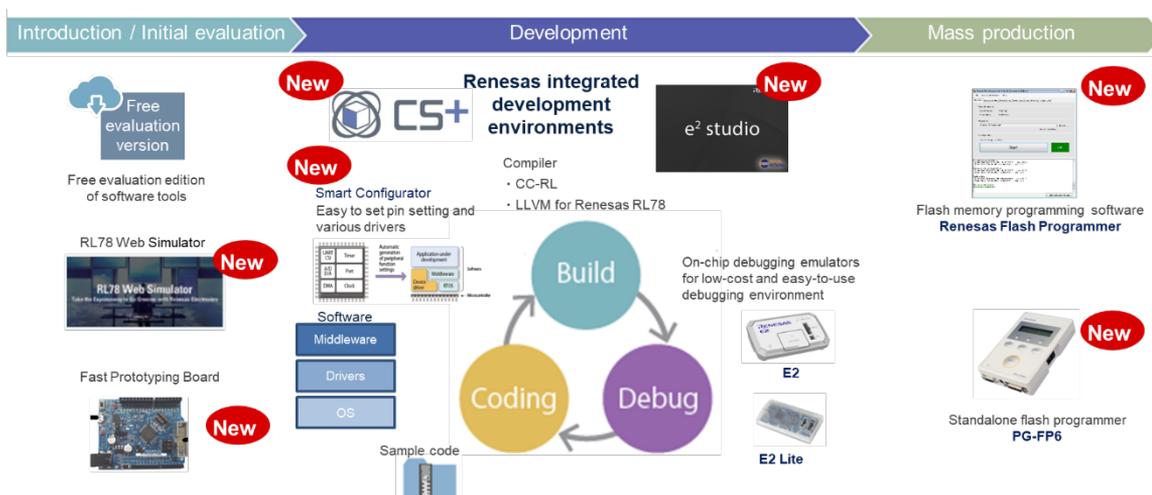

Figure 1 RL78 Development Environment

Users of the RL78 MCU can develop an embedded system with an RL78/G23 MCU in the familiar RL78 family development environment. "New" in the figure above indicates a new or upgraded product for the RL78/ G23 group.

2.1 Web Simulator

These revolutionary cloud-based tools take care of the setting up of an evaluation environment and the calculation of MCU power supply current, which are necessary for initial evaluation. This web simulator offers two tools: MCU Simulator Online and Current Consumption Calculator.

Refer to the following Tool News for details.

https://www.renesas.com/search?keywords=r20ts0688

[Upgrade to revision] Web Simulator MCU Simulator Online V1.13.00, Current Consumption Calculator V2.08.00

2.2 Evaluation Board Specialized for Prototype Development for Applications

The RL78/G23-64p Fast Prototyping Board (FPB) comes equipped with an RL78/G23 microcontroller and is an evaluation board specialized for prototype development for a variety of applications. By simply connecting the USB cable, you can write/debug programs and start your evaluation without additional tools. It is also possible to use the conventional E2 emulator and E2 emulator Lite for advanced debugging. With Arduino Uno and grove interfaces included as standard and ability to access all pins of the microcontroller, and so on, it has high expandability.

For details about RL78/G23-64p Fast Prototyping Board, refer to the following:
https://www.renesas.com/rl78g23-64p_fpb

2.3 Easy-to-use Customizable Integrated Development Environment

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

e^2 studio is an integrated development environment tool for the Renesas MCU families, based on the "Eclipse" open-source integrated development environment. You can select multiple compilers and debug tools provided by Renesas as well as our partner vendors. Combined with the multi-functional editor and project management tools, e^2 studio has various extended functions from Renesas.

e^2 studio 2021-04 supports project generation, build, and debugging in an RL78/G23 group project.

For details about e^2 studio 2021-04, refer to the following Tool News:

https://www.renesas.com/search?keywords=r20ts0685

[Upgrade to version] e² studio Integrated Development Environment 2021-04

For details about e^2 studio and downloads, refer to the following:

https://www.renesas.com/e2studio

➢ CS+ IDE -Integrated development environment originally designed by Renesas-

The CS+ integrated development environment provides simplicity, security, and ease of use in developing software through interactive cycles of editing, building, and debugging. You can use the basic software tools for developing software for Renesas MCUs immediately after the initial installation. CS+ is also compatible with Renesas hardware tools including the E2 emulator (E2) and E2 emulator Lite (E2 Lite) on-chip debugging emulators (sold separately), which facilitates advanced debugging. Abundant extensions and functions for user support ensure a dependable environment for all users.

Combined with RL78 Device Information V8.05.01, CS+ V8.05.00 supports project generation, build, and debugging in an RL78/G23 group project. For details about CS+ V8.05.00 and device information, refer to the following:

For details about CS+ V8.05.00, refer to the following Tool News:

https://www.renesas.com/search?keywords=r20ts0648

[Upgrade to revision] Integrated Development Environment CS+ V8.05.00

Device Information

RL78 Device Information V8.05.01 supports the following devices:

RL78/G23 group:

R7F100GLG, R7F100GLF

For downloads, refer to the following:

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

・SMS Assembler

SMS assembler is the assembler for SMS (SNOOZE Mode Sequencer), which runs only the various peripheral functions. Support of the SMS assembler makes it easy to write a code compatible with SMS, thereby helping you to develop a low power system.

・RL78 COM Port

RL78 COM Port has been added to the debug tool. You can debug a program at low cost by using a USB serial conversion adapter.
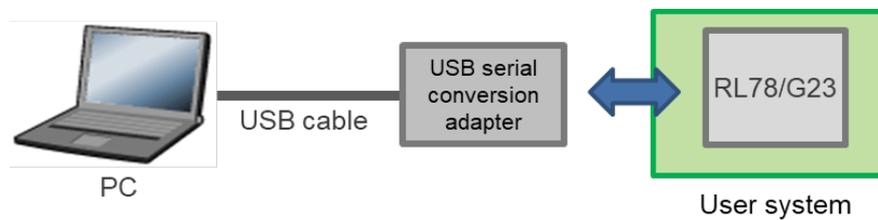

Figure 2 RL78 COM Port

・ Simulator for RL78/G23

This simulator enables source-level debugging of applications even before the target system becomes available, thus achieving efficient debugging of the programs developed for the RL78/G23 MCUs.

Furthermore, the virtual board panel that allows you to build a virtual system makes your debugging environment highly user friendly.

Refer to the following release note for details.

https://www.renesas.com/search?keywords=r20ut4963

Simulator for RL78/G23 V1.00.01 Release Note

For details about the simulator, refer to the following:

https://www.renesas.com/software-tool/simulator-cs-rl78-family-78k0r-and-78k0

2.4 CC-RL V1.10.00 that maximizes the performance of the RL78 family

CC-RL is a compiler package that incorporates optimization technology developed by Renesas for its compilers and linkers for the RX family and RH850 family, enabling it to generate highly efficient code that extracts the full performance potential of the RL78 family. The latest version available is CC-RL V1.10.00.

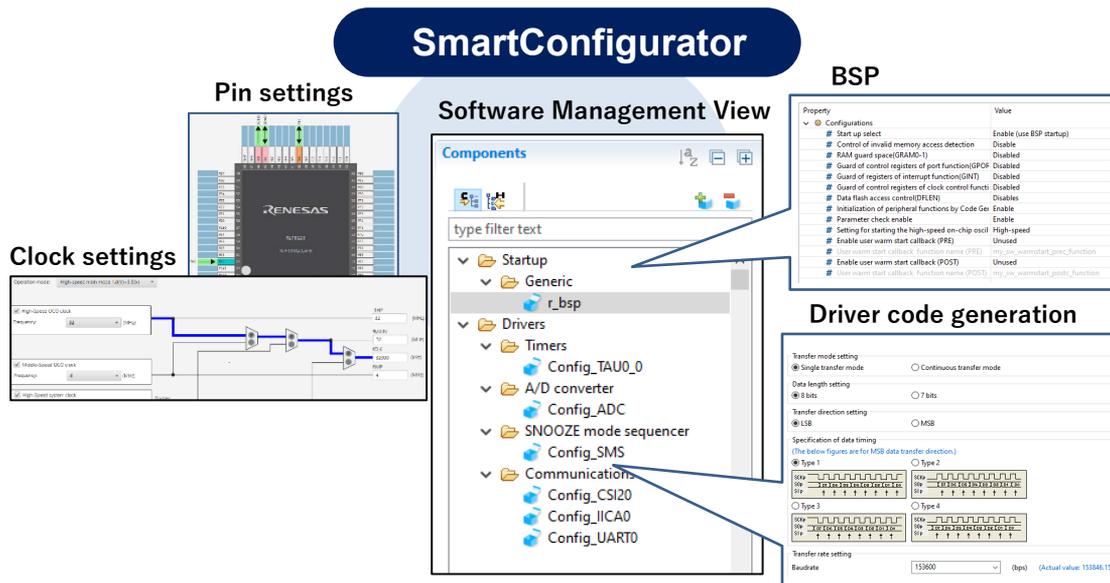For details about CC-RL V1.10.00, refer to the following Tool News:

https://www.renesas.com/search?keywords=r20ts0647

[Upgrade to revision] C Compiler Package for RL78 Family CC-RL V1.10.00

2.5 Reducing the Program Design Time with Smart Configurator

Smart Configurators are utilities for combining software in ways that meet your needs. They shorten your system development time through support for capacitive touch sensor drivers, automatic generation of driver code that handles the settings of MCU peripheral modules, and pin configuration.

2.8 QE for Capacitive Touch can also be easily configured in Smart Configurator.

For details about RL78 Smart Configurator V1.0.1, refer to the following Tool News:

https://www.renesas.com/search?keywords=r20ts0684

[Released on the web] e² studio RL78 Smart Configurator Plug-in V1.0.0, RL78 Smart Configurator V1.0.1

Smart Configurator User's Guide is also available. Refer to the following for details.

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

*The RL78/G23 group is supported in RL78 Smart Configurator V1.0.1.

2.6 Renesas Flash Driver RL78 Type01

Renesas Flash Driver RL78 Type01 (RFD RL78 Type01) is flash driver software designed for self programming to allow field reprogramming or rewriting of required data after shipment.

RFD RL78 Type01 is integrated into a user program, allowing a user to reprogram a user program area or data flash area.

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

Renesas offers a real-time operating system (real-time OS) that is an implementation of the µITRON specification. Its low resource requirements, outstanding real-time performance, and broad range of service calls make it very suitable for embedded systems requiring true real-time and multi-tasking capabilities.

Refer to the following for details.

➢ RI78V4 V2 real-time OS for RL78 family compliant with µITRON standard

https://www.renesas.com/ri78v4_rl78

2.8   QE for Capacitive Touch

QE for Capacitive Touch is one of the solution toolkits which operate under the e² studio integrated development environment.

For the development of embedded systems that work with capacitive touch sensors, this tool simplifies the initial settings of the touch user interface and the tuning of the sensitivity, thus shortening developing times.

Refer to the following Tool News for details.

https://www.renesas.com/search?keywords=r20ts0681

[Upgrade to revision] Solution Toolkit QE for Capacitive Touch[RA,RL78] V1.3.0: Development Assistance Tool for Capacitive Touch Sensor

For details about the QE for Capacitive Touch, refer to the following.

https://www.renesas.com/qe-capacitive-touch

2.9   On-Chip Debugging Emulator Selectable for Your Usage and Development Scale

Two types of on-chip debugging emulators support the RL78/G23 group.
An advanced E2 developed based on a concept of improvement of development efficiency, and affordably priced E2 Lite. You can select a product that is suitable for your purpose or development scale.

For details about on-chip debugging emulators, refer to the following.

https://www.renesas.com/ocd

2.10   Flash Programming Tool for Each Usage Case

> ➢   Renesas Flash Programmer, on-board programming software -for developing, testing, and writing small-

The Flash Programmer enables you to program via one of Renesas on-chip debugging emulators (E2 and E2 Lite) or using a serial of the RL78 Family. Most suitable for flash programming for testing, developing, or writing small.

Support for the RL78/G23 group was added in Renesas Flash Programmer V3.08.02.

For details about Renesas Flash Programmer V3.08.02, refer to the following Tool News:

https://www.renesas.com/search?keywords=r20ts0682

[Upgrade to revision] Renesas Flash Programmer V3.08.02

For details about the Renesas Flash Programmer, refer to the following URL:

https://www.renesas.com/rfp

> ➢   PG-FP6, Flash Programmer - supports programming without a PC-

A flash programmer that supports standalone programming which can be operated without using a PC, allowing for high-speed programming. Most suitable for programming in large or updating at a field.

Support for the RL78/G23 group was added in Programming GUI for PG-FP6 (FP6 Terminal) V1.05.02.

Refer to the following Tool News for details:

https://www.renesas.com/search?keywords=r20ts0683

[Upgrade to revision] Programming GUI for PG-FP6 Flash Memory Programmer (FP6 Terminal) V1.05.02

For details about PG-FP6, refer to the following.

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

3. Development Environment Prepared by Partners

Development environments provided by different partners also support the RL78/ G23 group. We will continue to expand support with our partners.

■ Integrated Development Environments (IDE)

Company name	IAR Systems	URL	http://www.iar.com/
Product/Service	IAR Embedded Workbench® for RX		
Partner message	IAR Embedded Workbench® for RL78 is the most widely used C/C++ integrated development environment in the world as a high-performance, highly reliable commercial embedded software development tool. Our proprietary compiler generates the industry's fastest and most compact code. All the functionalities are seamlessly integrated to maximize development efficiency.		

■ Flash programmers

Company name	Minato Advanced Technologies Inc.	URL	http://www.minatoat.co.jp/en/
Product/Service	Gang programmers/conversion adapters		
Partner message	Our programmers support RL78/G23, the newly released RL78 series of MCUs (support will be available from June 2021). Depending on your needs, it can be used for any application from simultaneous programming of 4 or 16 MCUs to evaluation/mass production. Supported programmers are MODEL 500 series, MODEL 400 series, and MODEL 308. For mass production, we also suggest you use one of our automatic programmers.		

4.　Obtaining the Product

See the table below for how to download and purchase the free evaluation edition and full version.

To order the product, contact your local Renesas Electronics sales office or distributor with the following information.
For product pricing, make inquiries in the same manner.

(1/2)

Product/Service	Obtaining the Product	Note Adding support for RL78/G23 to your product/service
RL78/G23 Fast Prototyping Board	Purchase For details, refer to [Ordering Information] at the following URL: https://www.renesas.com/rl78g23-64p_fpb	
e² studio IDE	Download from the web*1 https://www.renesas.com/e2studio#documents For details, refer to the following Tool News: https://www.renesas.com/search?keywords=r20ts0685	Available through revision. For details, refer to the Tool News on the left.
CS+ IDE	Purchase [Evaluation edition available] Refer to [Purchasing the Product] in the Tool News. https://www.renesas.com/search?keywords=r20ts0648	Available through revision. For details, refer to the Tool News on the left.
C Compiler Package for RL78 Family (CC-RL)	Purchase [Evaluation edition available *2, *3] Refer to [Purchasing the Product] in the Tool News. https://www.renesas.com/search?keywords=r20ts0647	Can be used as is.
Smart Configurator	Download from the web*1 https://www.renesas.com/smart-configurator#documents Refer to [Updating Your Product] in the Tool News. https://www.renesas.com/search?keywords=r20ts0684	For details, refer to the Tool News on the left.
Renesas Flash Driver RL78 Type01	Download from the web*1 To be released on the web page below. (after the end of May 2021) https://www.renesas.com/software-tool/code-flash-libraries-flash-self-programming-libraries Technical support (MyTicket) https://en-support.renesas.com/dashboard	To be released on the web after the end of May 2021. For early access, contact technical support ([My Tickets]).
Real-time OS for RL78 family RI78V4 V2.00.00	Purchase [Trial edition available] Refer to [Purchasing the Product] in the Tool News. https://www.renesas.com/jp/en/document/tnr/launch-ri78v4-v2-real-time-os-rl78-family The Trial edition can be downloaded from the following: https://www.renesas.com/ri78v4_rl78#documents	If you have RI78V4 V1, please purchase RI78V4 V2. If you have RI78V4 V2, it can be used as is. For details, refer to the Tool News on the left.

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Product/Service	Purchasing the new software	Note: Adding support for RL78/G23 to your product/service
QE for Capacitive Touch	Download from the web*1 https://www.renesas.com/qe-capacitive-touch#documents For details, refer to the following Tool News: https://www.renesas.com/search?keywords=r20ts0681	For details, refer to the Tool News on the left.
E2 Emulator	Purchase For details, refer to the following URL: https://www.renesas.com/e2	Can be used as is.
E2 Emulator Lite	Purchase For details, refer to the following URL: https://www.renesas.com/e2_lite	Can be used as is.
Renesas Flash Programmer (Programming GUI)	Purchase [Evaluation edition available] *4 Refer to [How to Purchase the New Software] in the Tool News. https://www.renesas.com/search?keywords=r20ts0682 [Upgrade to revision] Renesas Flash Programmer V3.08.02	Available through revision. For details, refer to the Tool News on the left.
PG-FP6	Purchase For details, refer to the following URL: https://www.renesas.com/pg-fp6	Available through revision of programming GUI, FP6 Terminal. For details, refer to the following Tool News: https://www.renesas.com/search?keywords=r20ts0683 [Upgrade to revision] Programming GUI for PG-FP6 Flash Memory Programmer (FP6 Terminal) V1.05.02

*1: Although it is free of charge, it is not an evaluation edition. Therefore, you can use it in the production process.

*2: The evaluation edition for a product is provided for you to "evaluate functionality and performance of the product". Do not use it in the production process. To use it for production, consider purchasing it.

Evaluation editions are also available from the following URL.
https://www.renesas.com/tool_evaluation

*3: If you register a license key, you can continue to use it as a commercial edition.

*4: The evaluation edition is available from the following URL.
https://www.renesas.com/tool_evaluation

Revision History

		Description	
Rev.	Date	Page	Summary
1.00	Apr.13.21	-	First edition issued