[Notification]

Introduction of Useful Functions for Debugging

on IECUBE Full-Spec Emulator for the RL78 Family

Outline

We would like to introduce useful functions for debugging on the IECUBE full-spec emulator for the RL78 family.

1. Useful Functions of IECUBE for the RL78 family of MCUs

The full-spec emulator achieves in-circuit connection with the MCU foot pattern on the user system through the IC socket and performs debugging by using the MCU (evaluation chip) dedicated to the emulator. Advanced debug functions such as the real-time trace function, and measurement functions such as the C0 are useful for problem analysis and system evaluation.

Useful functions for debugging on IECUBE for the RL78 family of MCUs are introduced as follows.

Refer to the URL below for details about the functions or system configuration.
https://www.renesas.com/iecube

➢ Trace Function

This function allows a program execution history (traces) to be recorded by instruction. A time stamp is added to each trace, allowing confirmation of instruction execution time. Trace analysis allows invalid interruption sources to be determined and potential bugs to be found effectively.


Time stamp is displayed.

*Note that the above figure is a screen shot from the Japanese version. The followings are in the same manner.

➢ Real-time RAM Monitoring Function

This function can refresh the RAM value in real-time during program execution, and facilitate dynamic verification of program capability. When a break occurs, part which has changed from the data before program was executed is displayed in color so that it can be easily recognized.

Breaks and changes to RAM values because of data writes are highlighted in color.
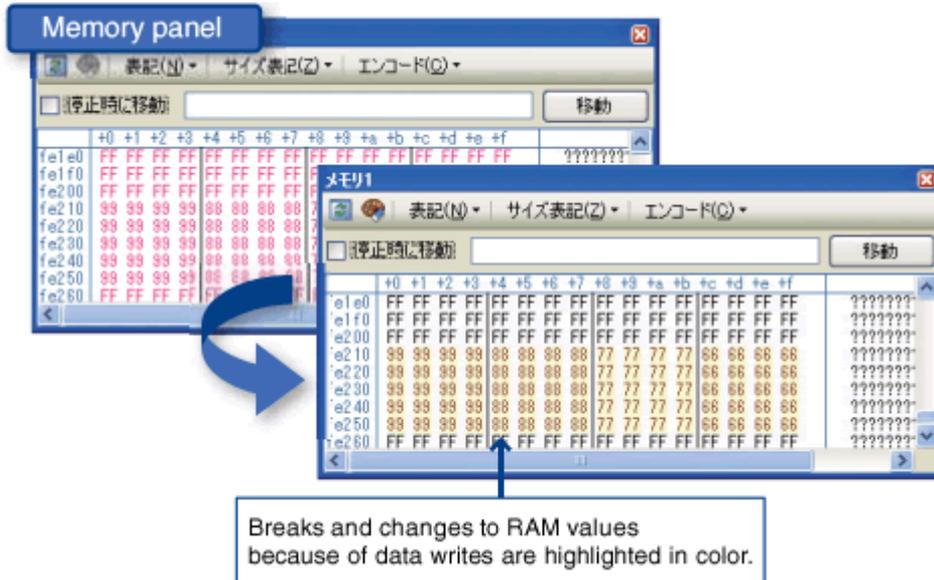
➢ Coverage Measurement Function

This function measures the ratio of executed codes in each function or section, and then displays the result in a way that can be confirmed at a glance.

Function list panel:

Displays the coverage ratio of executed codes in each function or section by color as well as its specific percentage.

Editor panel:

Displays executed program source lines in color.

The coverage ratio (%) is displayed for individual functions and actions.

Executed lines are highlighted in color.
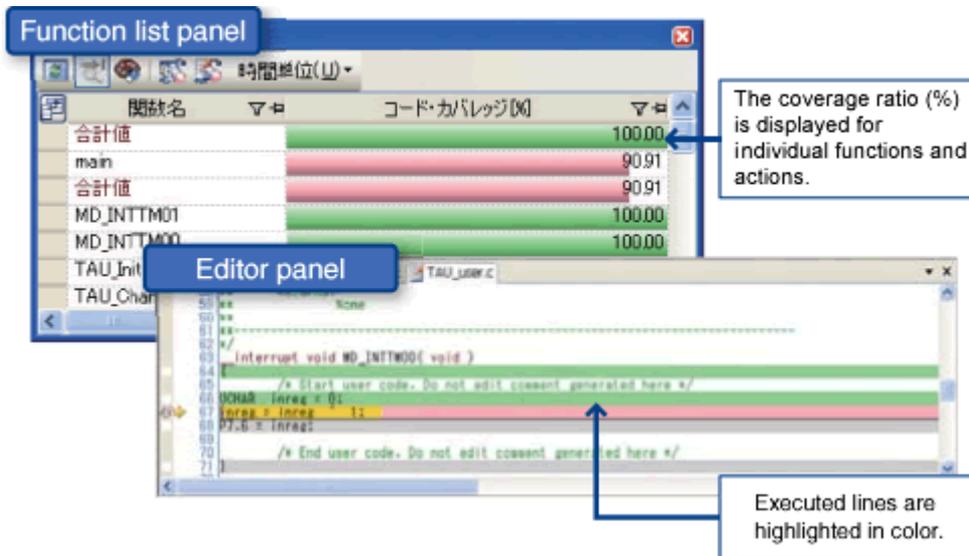
➢ Performance Measurement Function

This function measures the total execution time of a program, pass count (number of passes), and the average/maximum/minimum execution time, and allows sections that cause degradation of program performance to be accurately found. This function can display the ratio of execution time of functions based on the trace data.
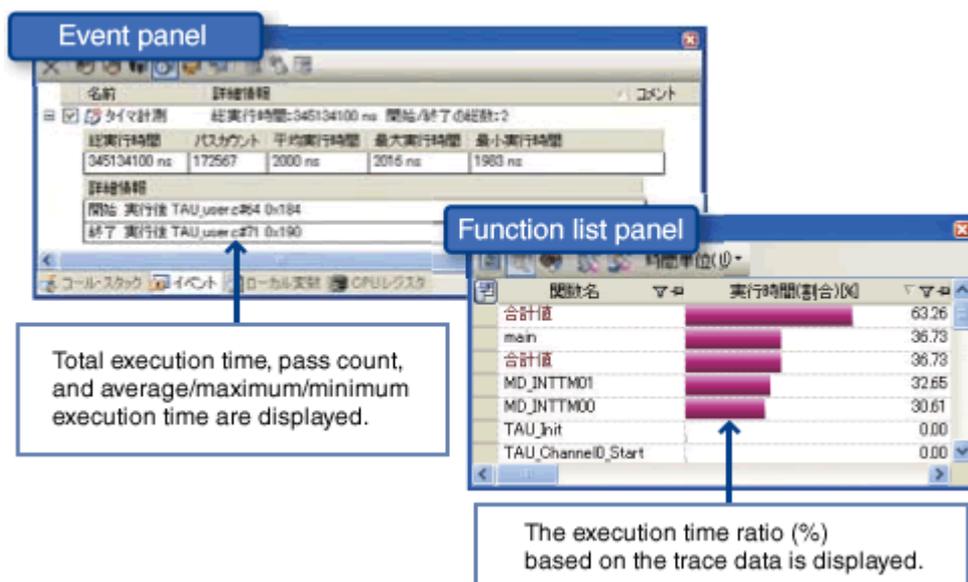
Total execution time, pass count, and average/maximum/minimum execution time are displayed.

The execution time ratio (%) based on the trace data is displayed.

Additionally, this function is equipped with a fail-safe break function to stop execution when an invalid access to the memory occurs during program execution.

This function is also equipped with a self-diagnosis function to provide a safe debug environment.

➢ Optional Product

Signal waveforms between IECUBE and a target system can be observed by connecting a check pin adapter (optional product, sold separately) to IECUBE.

For details, refer to the URL below.
https://www.renesas.com/iecube/checkpin_adapter
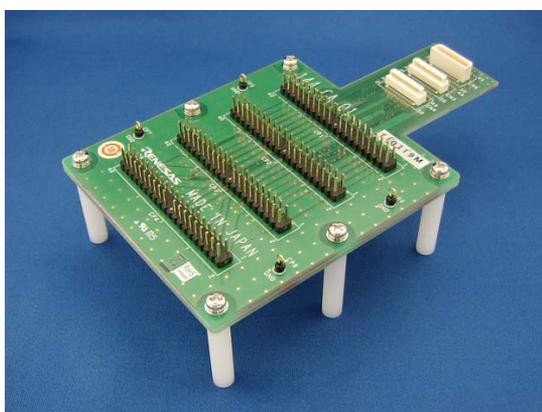
2. Supported MCUs

MCUs which support IECUBE for the RL78 family of MCUs are as follows:

- RL78/G12, RL78/G13, RL78/G14, RL78/G1A, RL78/G1C, RL78/G1E, RL78/G1F groups
- RL78/L12, RL78/L13, RL78/L1C groups
- RL78/I1A, RL78/I1B groups
- RL78/F12, RL78/F13, RL78/F14, RL78/F15, RL78/F1A groups
- RL78/D1A group (only for vehicle installation)

3. How to Purchase the Product

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

For the model name of the IECUBE product corresponding to each supported MCU, refer to the URL below:
https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ut3776

Revision History

Rev.	Date	Description	
		Page	**Summary**
1.00	Dec. 01, 2016	-	First edition issued

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