Renesas Flash Programmer V3

Release Note

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Rev.15.00
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Introduction

Thank you for using the Renesas Flash Programmer (RFP).

This document covers release information on the RFP V3 products. For points for caution, also see the user's manual for the RFP. For the target devices supported by the latest version, refer to "List of MCUs supported by Renesas Flash Programmer V3" on the Renesas Web site.

See the following documents for restrictions applying to particular target devices.

- User's manuals of the target devices
- Documents in which restrictions applying to particular target devices are listed

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1. Environment

1.1 OSs supported

- Windows 10 (32-bit and 64-bit)
- Windows 11
- Linux (Ubuntu 20.04 LTS, x64/ARM32/ARM64)
- Linux (Ubuntu 22.04 LTS, x64/ARM32/ARM64)
- Linux (Ubuntu 24.04 LTS, x64/ARM64)
- macOS 13 Ventura (only supported on machines with Apple silicon)
- macOS 14 Sonoma (only supported on machines with Apple silicon)

Remarks:
1. We recommend having the latest version of Windows installed.
2. A point for caution applies with regard to the security function of Windows. For details, refer to item (4) in section 4.2, Problems during Operation, in the latest version of the user's manual for this product.
3. The GUI (RFPV3.exe) does not run under Linux and macOS.
4. ARM32 is not supported by Ubuntu 24.04 LTS and later versions.

1.2 Required software

- Linux and macOS: Refer to the guide "rfp-cli.md", which is separately provided. Note that this is a markdown-format English file.

1.3 Restrictions

- Linux does not support the E1 emulator, E20 emulator, and USB Direct connection.
- macOS does not support the E1 emulator, E20 emulator, and USB Direct connection. It also does not support connection through USB boot mode for RA devices.
  The UART connection via the serial port under macOS supports baud rates of up to 230400 bps.

2. Release Information on RFP V3.17.00

2.1 Additional target devices

Group	Part Number
RH850/U2B-FCC	R7F702Z23, R7F702Z28
RA8E1	R7FA8E1AF
RA8E2	R7FA8E2AF

2.2 Improvement through changes to a feature

- Changes to the order of programming areas via an SWD interface

Applies to: RA0E1, RA2A1, RA2A2, RA2E1, RA2E2, RA2E3, RA2L1, RA4E1, RA4M1, RA4M2, RA4M3, RA4W1, RA6E1, RA6M1, RA6M2, RA6M3, RA6M4, RA6M5, RA6T1, RA6T2

The order of programming areas via an SWD interface has now been changed as follows.

Before the change: Code Flash -> Config Area -> Data Flash

After the change: Code Flash -> Data Flash -> Config Area

3. Release Information on the Previous RFP V3 Products

3.1 Release Information on RFP V3.16.00

3.1.1 Additional target devices

Group	Part Number
RX260	R5F52606, R5F52607, R5F52608
RX261	R5F52616, R5F52617, R5F52618
RH850/U2B10	R7F70254x
RH850/U2B-FCC	R7F702Z21, R7F702Z26
DA1453x	DA14531, DA14535

3.1.2 Improvements through changes to features

- Support for firmware included in the SDK

The software has been updated to use the firmware included in the SDK for flash memory operations on DA devices. Accordingly, the supported external flash memory has been changed.

- External flash memory supported for DA devices

Group	External Flash Memory
DA1469x*1	MX25U3235F, GD25LE32, P25Q32SL
DA1470x*1	MX25U6432, W25Q64JWIM
DA1459x*1	MX25U3235F, W25Q32JWIM, W25Q32JWIQ
DA1453x*2	AT25XE021A, AT25DF021A, P25Q11U, MX25R2035F, W25X10CL, W25X20CL, AT25DF011, AT25DN011, AT25XE011, AT25EU0021A, AT25XE041B, GD25WD20

Notes: 1. DA devices that the external flash memory to be supported has been changed.
2. Write a program to a DA1453x device with a size no greater than that of the RAM in each device. Operation in the case of writing a program with a larger size is not guaranteed.
1., 2. If the program does not operate after it has been written, apply a reset.

- Erasure of the external flash memory in DA devices by rfp-cli

Previously, when the rfp-cli command-line software was used to specify the address range for erasing external flash memory, only erasing a specified range was possible. However, rfp-cli is now usable to erase all areas of external flash memory.

- Writing to RA or DA devices by using rfp-cli

When rfp-cli is used to specify the address range for writing to RA or DA devices via the SWD interface but the specified range violates the requirement for alignment, an address error is now generated.

- Support for Ubuntu 24.04 LTS

Ubuntu 24.04 LTS was added as a supported OS.

- SWD interface signal

The stability of communications of the SWD signal has now been improved for the combination of the E2 emulator and an RA device.

- Reduced startup time for rfp-cli

Startup time for the rfp-cli command-line software has been reduced.

3.2 Release Information on RFP V3.15.00

3.2.1 Additional target devices

Group	Part Number
RL78/G15	R5F12007, R5F12008
DA1470x*	DA14701, DA14705, DA14706, DA14708

Note: Although RFP V3.14.00 did not support some of these devices, this version now supports all devices.

3.2.2 Improvements through changes to features

- Changing the number for the OEM root public key

The number for the OEM root public key flash option has been changed from 1 to 0. This will change the GUI display of the [Flash Options] tabbed page and the following option of the rfp-cli command-line software.

Before the change: -fo oemrootkey1

After the change: -fo oemrootkey0

- Merging files

Simultaneous programming of user key files and all other files has now been possible in RA-family devices.

- End of support for Ubuntu 18.04 LTS

Ubuntu 18.04 LTS has been removed from the set of supported operating systems.

- Support for macOS 14

macOS 14* was added as a supported OS. Note that the GUI (RFPV3.exe) does not run under macOS 14.

*: macOS 14 Sonoma (only supported on machines with Apple silicon)

3.2.3 Removing a restriction

- Installing USB drivers for 32-bit versions of the Windows OS

3.3 Release Information on RFP V3.14.00

3.3.1 Additional target devices

Group	Part Number
RA8T1	R7FA8T1AF, R7FA8T1AH
RA2A2	R7FA2A2AD, R7FA2A2BD
RA0E1	R7FA0E105, R7FA0E107
RH850/U2B6	R7F70255x
RH850/U2B-FCC	R7F702Z22
RH850/F1KM	R7F701A64, R7F701A65, R7F701A66, R7F701A67, R7F701A68, R7F701A69, R7F701A70, R7F701A71, R7F701A72, R7F701A73, R7F701A74, R7F701A75, R7F701A76, R7F701A77, R7F701A78, R7F701A79, R7F701A80, R7F701A81, R7F701A82, R7F701A83, R7F701A84
RISC-V MCU G021	R9A02G021
DA1459x	DA14592
DA1470x*3	DA14701, DA14705, DA14706, DA14708

Notes: 1. DA1459x, DA1470x, and DA1469x devices support the following external flash memory chips.
MX25U3235F, GD25LE32, P25Q32SL, MX25U6432, and W25Q64JWIM
2. Before enabling the “Create and write product/image headers” feature to write a program file to a DA1469x or DA1470x device, set the Quad Enable bit for enabling (= 1) in the status register of the external flash memory.
3. Some devices are still unsupported, and in this case the E3000106 error occurs.
All DA1470x devices will be supported in V3.15.00. (Scheduled to be released on April 22, 2024)

3.3.2 New feature

- Support for macOS

macOS* was added as a supported OS. Note that the GUI (RFPV3.exe) does not run under macOS.

*: macOS 13 Ventura (only supported on machines with Apple silicon)

3.3.3 Improvements through changes to features

- Reduced startup time for rfp-cli and rpe

Startup time for the rfp-cli command-line software and rpe encryption utility program has been reduced.

- Increasing the speed of programming DA devices

Applies to: DA1469x

The speed of programming DA devices has now greatly been improved.

- Changing the names of microcontroller to be displayed in the [Create New Project] dialog box

Applies to: RISC-V MCU

The list name of RISC-V MCUs that are selectable in the [Create New Project] dialog box has been changed.

3.4 Release Information on RFP V3.13.00

3.4.1 Additional target devices

Group	Part Number
RA8M1	R7FA8M1AF, R7FA8M1AH
RA8D1	R7FA8D1AF, R7FA8D1AH, R7FA8D1BF, R7FA8D1BH
RA2E3	R7FA2E305, R7FA2E307
DA1469x*	DA14691, DA14695, DA14697, DA14699

Note: DA1469x devices support the following external flash memory chips.
MX25U3235F, GD25LE32, and W25Q64JWIM

3.4.2 New features

- Reading of HEX files with a specified address offset

A feature for adding an additive offset to the address when reading a HEX file has been added to the [Operation] tabbed page of the GUI.

- Added types of program file

Binary and sfp files have been added to the types of supported program files.

3.4.3 Improvements through changes to a feature

- Merging of features for selecting program files and user key files

The [User Keys] tabbed page of the GUI has been discontinued since user key files can now be selected on the [Operation] tabbed page. This simplifies the addition and removal of user key files and program files.

- Updating the J-Link firmware

A feature for updating the firmware of the J-Link debug probe from SEGGER has been added if the version of the firmware is earlier than that included with this product during connection of the RFP through the J-Link debug probe.

3.5 Release Information on RFP V3.12.00

3.5.1 Additional target device

Group	Part Number
RX26T	R5F526T8, R5F526TA

3.5.2 Improvements through changes to a feature

- Increasing the speed of programming via an SWD interface

Applies to: RA2A1, RA2E1, RA2E2, RA2L1, RA4E1, RA4M1, RA4M2, RA4M3, RA4W1, RA6E1, RA6M1, RA6M2, RA6M3, RA6M4, RA6M5, RA6T1, RA6T2

The speed of programming via an SWD interface has now greatly been improved.

- Merging files

Simultaneous programming of an image file (RPI file) created by the RFP or an encrypted program file (RPE file) and a user key file has now been possible.

- -write-rpi command for the rfp-cli

The result of output by the -write-rpi command for the rfp-cli command-line software has been changed. From this version of the RFP, specification of the address range and the unit for writing to flash memory are applied to the generated RPI files. However, no change has been made to the RPI files generated by the -output-file command.

3.6 Release Information on RFP V3.11.02

3.6.1 Additional target devices

Group	Part Number
RA6T3	R7FA6T3BB
RL78/G16	R5F1211A, R5F1211C, R5F1214A, R5F1214C, R5F1216A, R5F1216C, R5F1217A, R5F1217C, R5F121BA, R5F121BC
RL78/G24	R7F101G6E, R7F101G6G, R7F101G7E, R7F101G7G, R7F101G8E, R7F101G8G, R7F101GAE, R7F101GAG, R7F101GBE, R7F101GBG, R7F101GEE, R7F101GEG, R7F101GFE, R7F101GFG, R7F101GGE, R7F101GGG, R7F101GJE, R7F101GJG, R7F101GLE, R7F101GLG
RX23E-B	R5F523E5B, R5F523E5J, R5F523E5K, R5F523E5L, R5F523E5M, R5F523E5N, R5F523E6B, R5F523E6J, R5F523E6K, R5F523E6L, R5F523E6M, R5F523E6N
RX26T	R5F526T9, R5F526TB, R5F526TF

3.6.2 New features

- -file-offset command for the rfp-cli

A command for appending an offset value for addition during reading of a HEX file has been added to the rfp-cli command-line software.

- -checksum-type command for the rfp-cli

A command for specifying the checksum type has been added to the rfp-cli command-line software.

3.6.3 Improvements through changes to a feature

- Checksum type

Applies to: RL78, except for RL78/G10, G1M, G1N, G15, and G16 devices

A 16-bit additive method has been added as a type of checksum calculation for RL78 devices.

- Increasing the speed of reading via an SWD interface

The speed of reading via an SWD interface through the J-Link debug probe from SEGGER has now greatly been improved. This improves the speed of reading and verifying memory.

- Cancelling the erase command

The problem of an inability to cancel an erase command being executed via an SWD interface in some devices has been fixed.

- -pv command for the rfp-cli

A -pv command which combines the program (-p) and verify (-v) commands has been added to the rfp-cli command-line software.

- End of support for Windows 7 and Windows 8.1

Windows 7 and Windows 8.1 have been removed from the set of supported operating systems.

- Selecting a tool during connection of multiple J-Link debug probes

The facility has been improved to allow the selection of a tool during connection of multiple J-Link debug probes from SEGGER.

3.7 Release Information on RFP V3.11.01

3.7.1 Additional target devices

Group	Part Number
RH850/U2A6	R7F702302
RH850/U2A8	R7F702301B
RH850/U2A16	R7F702300B
RISC-V/VC	R9A06G150
RA4E2	R7FA4E2B9
RA4T1	R7FA4T1B9, R7FA4T1BB
RA6E2	R7FA6E2B9, R7FA6E2BB
RL78/F23	R7F123FBG, R7F123FGG, R7F123FLG, R7F123FMG
RL78/G22	R7F102G4C, R7F102G4E, R7F102G6C, R7F102G6E, R7F102G7C, R7F102G7E, R7F102G8C, R7F102G8E, R7F102GAC, R7F102GAE, R7F102GBC, R7F102GBE, R7F102GCC, R7F102GCE, R7F102GEC, R7F102GEE, R7F102GFC, R7F102GFE, R7F102GGC, R7F102GGE
RX65W-A	R5F565WE

3.7.2 New feature

- Support for Ubuntu 22.04 LTS

Ubuntu 22.04 LTS has been added as a supported OS.

3.7.3 Improvements through changes to a feature

- Increasing the speed of programming via an SWD interface

The speed of programming via an SWD interface through the J-Link debug probe from SEGGER has now greatly been improved.

- Support for programming via an SWD interface

Applies to: RA4E1, RA4M2, RA4M3, RA6E1, RA6M4, RA6M5, RA6T2

The above target devices have now been added to those with support for programming via an SWD interface through the J-Link debug probe from SEGGER, the E2 emulator, or the E2 emulator Lite. Note that those target devices also have facilities which do not allow for programming via an SWD interface. For details, refer to “SWD interface connection”.

- Discontinuation of the Renesas Flash Programmer utility program

The Renesas Flash Programmer utility program, rfp-util.exe, which had been bundled with this product, has been discontinued. Use the Security Key Management Tool as the successor software.

3.8 Release Information on RFP V3.11.00

3.8.1 Additional target devices

Group	Part Number
RL78/G15	R5F12017, R5F12018, R5F12047, R5F12048, R5F12067, R5F12068
Battery Management	RAJ240055, RAJ240057
RISC-V/MC	R9A02G020

3.8.2 New feature

- Giving feedback

A feature for giving feedback has been added to the [Help] menu on the menu bar. You can select this item and then submit your opinions or impressions by using the [Give Feedback] form.

3.8.3 Improvements through changes to a feature

- [Block Settings] tabbed page

The settings for blocks to be erased ([Erase] column) and programmed and verified ([P.V] column) have been integrated into a [Select] column.

- Output for the types of checksum calculation to a log

The log format of the types of calculation used for the output of calculated checksums has been modified.

3.8.4 Removing restrictions

- Writing to the code flash memory of an RL78/F24 for secure boot
- Operation after connection through the SWD interface

3.8.5 Errata for User's Manual

The following OS described in the RFP V3.11.00 User's Manual is not supported. The following OS will be supported from the next version.

“Linux (Ubuntu 22.04 LTS, x64/ARM32/ARM64)”

3.9 Release Information on RFP V3.10.00

3.9.1 Additional target devices

Group	Part Number
RX660	R5F56604, R5F56609

3.9.2 New feature

- Support for programming via an SWD interface

Applies to: RA

The RFP now supports programming by an SWD interface via the J-Link debug probe from SEGGER, the E2 emulator, or the E2 emulator Lite. For the target devices, refer to “List of MCUs supported by Renesas Flash Programmer V3”.

3.9.3 Improvement through changes to a feature

- Connection via a serial interface by J-Link

Applies to: RA

The problem that the RFP did not operate with the J-Link debug probe from SEGGER via a serial interface has been corrected. However, note that the RFP does not operate with some versions of the J-Link hardware and firmware. For more information, refer to the following Web page.
https://www.renesas.com/rfp#system

3.10 Release Information on RFP V3.09.02

3.10.1 Additional target devices

Group	Part Number
RH850/F1KM	R7F701A55, R7F701A56, R7F701A57, R7F701A58, R7F701A59, R7F701A60
RX140	R5F51405, R5F51406

3.10.2 Improvements through changes to a feature

- Change to the default state of the [Skip blank areas] option

The default setting of the [Skip blank areas] option has been changed to enabled in the [Read Memory] dialog box.

- Support for Windows 11

Windows 11 has been added as a supported OS.

3.11 Release Information on RFP V3.09.01

3.11.1 Additional target devices

Group	Part Number
RL78/F24	R7F124FBJ, R7F124FGJ, R7F124FLJ, R7F124FMJ, R7F124FPJ
RL78/G23	R7F100GAH, R7F100GBH, R7F100GCH, R7F100GEH, R7F100GFH, R7F100GGH, R7F100GJH, R7F100GLH, R7F100GMH, R7F100GPH
RH850/F1KM	R7F701760, R7F701762, R7F701764
RH850/U2A8	R7F702301, R7F702301A
RH850/U2A16	R7F702300A
RH850/U2A-EVA	R7F702Z19B
Battery Management	RAJ240310
C30	R9A02G0151

3.11.2 New features

- -key-password and -mac-password commands for the rfp-cli

Applies to: RL78/F2x

Commands for specifying the key and MAC passwords which are required for writing to security data of an RL78/F2x have been added to the rfp-cli command-line software.

- -output-file command for the rfp-cli

A command for merging the specified program data to be output as a file without connecting the target device has been added to the rfp-cli command-line software.

Output file formats:

- HEX files in Motorola S format
- HEX files in Intel HEX format
- RPI files

3.11.3 Improvements through changes to a feature

- Microcontroller types to be displayed during the creation of a new project

Applies to: RL78

The name of the list of RL78 microcontrollers for selection when a new project is created has been changed.

- COM connection of RL78/G10, RL78/G1M and RL78/G1N

Applies to: RL78/G10, RL78/G1M, RL78/G1N

We have changed processing of connection to the COM port.

3.11.4 Removing a restriction

- SVR settings for the RH850/U2A16 group

3.12 Release Information on RFP V3.09.00

3.12.1 Additional target devices

Group	Part Number
RA2E2	R7FA2E2A3, R7FA2E2A5, R7FA2E2A7
RL78/G23	R7F100GFK, R7F100GFL, R7F100GGK, R7F100GGL, R7F100GJK, R7F100GJL, R7F100GLK, R7F100GLL, R7F100GMK, R7F100GML, R7F100GPK, R7F100GPL, R7F100GSK, R7F100GSL
RA6T2	R7FA6T2AB, R7FA6T2AD, R7FA6T2BB, R7FA6T2BD

3.12.2 New features

- Indication by error messages

Applies to: All devices

Description: When an error that is relatively frequent occurs, the log shows the URL for a page that describes the details and the actions to be taken.

- Reading of e^2 studio Renesas Partition Data Files

Applies to: RA

Description: To make the settings of flash option data on boundaries, the RFP now supports the reading of Renesas Partition Data Files output by the e^2 studio.

3.12.3 Improvements through changes to a feature

- Display of recently used projects

Applies to: All devices

Description: The number of recently used project files that are displayed has been increased from four to eight.

- Removal of the function for displaying licenses

Applies to: All devices

Description: Since providing the products on CD-ROM was discontinued, the function for displaying licenses has been removed.

- Connection via the USB serial-conversion IC from FTDI

Applies to: RL78/G10, RL78/G1M, RL78/G1N

Description: The stability of the connection when the USB serial-conversion IC from FTDI is in use has been improved.

- Change of the displayed name of the extended data area

Applies to: RH850 with an extended data area

Description: The displayed name of the extended data area has been changed to Data Flash 2.

- Change to the specifications of the calcresponse command of rfp-util

Applies to: All devices

Description: An algorithm name parameter has been added for the calcresponse command of the rfp-cli command-line software.

- Loading of the J-Link library

Applies to: RA

Description: The problem of frequent failures in loading of the J-Link library during connection of the tool when J-Link software is not installed under Linux has been corrected.

3.13 Release Information on RFP V3.08.03

3.13.1 Additional target devices

Group	Part Number
RA4E1	R7FA4E10B, R7FA4E10D
RA6E1	R7FA6E10D, R7FA6E10F
RL78/G23	R7F100GAJ, R7F100GBJ, R7F100GCJ, R7F100GEJ, R7F100GFJ, R7F100GGJ, R7F100GJJ, R7F100GLJ, R7F100GMJ, R7F100GPJ, R7F100GSJ
RX140	R5F51403
RX671	R5F56719, R5F5671C, R5F5671E

3.14 Release Information on RFP V3.08.02

3.14.1 Additional target devices

Group	Part Number
RL78/G23	R7F100GAF, R7F100GAG, R7F100GBF, R7F100GBG, R7F100GCF, R7F100GCG, R7F100GEF, R7F100GEG, R7F100GFF, R7F100GFG, R7F100GFN, R7F100GGF, R7F100GGG, R7F100GGN, R7F100GJF, R7F100GJG, R7F100GJN, R7F100GLF, R7F100GLG, R7F100GLN, R7F100GMG, R7F100GMN, R7F100GPG, R7F100GPN, R7F100GSN

3.14.2 New feature

- Support for ARM32 and ARM64 Linux

Applies to: All devices

Description: ARM32 and ARM64 have been added to the architectures for which Linux is supported.

3.14.3 Improvement through changes to a feature

- Improvement of error messages when the RFP is connected to a target device

3.15 Release information on RFP V3.08.01

3.15.1 Additional target devices

Group	Part Number
RA2E1	R7FA2E1A5, R7FA2E1A7, R7FA2E1A9
RA4M2	R7FA4M2AB, R7FA4M2AC, R7FA4M2AD
RA4M3	R7FA4M3AD
RA6M5	R7FA6M5AG, R7FA6M5AH, R7FA6M5BF, R7FA6M5BG, R7FA6M5BH
RL78/I1C	R5F10NML, R5F10NPL
RH850/U2A16	R7F702300
RH850/U2A-EVA	R7F702Z19A
RE01B	R7F0E01BD

3.15.2 Removing a restriction

- RPI file

3.16 Release information on RFP V3.08.00

3.16.1 Additional target devices

Group	Part Number
RA2L1	R7FA2L1A8, R7FA2L1A9
RA4M3	R7FA4M3AE, R7FA4M3AF
RA6M4	R7FA6M4AD, R7FA6M4AE, R7FA6M4AF
RA6T1	R7FA6T1AB, R7FA6T1AD
RX23E-A	R5F523E5S, R5F523E6S

3.16.2 New features

- Support for Linux

Applies to: All devices

Description: New rfp-cli software has been added for the RFP command line which supports Ubuntu*. This allows operation from the command line alone and does not require settings by the GUI. Command-line operation is also available under Windows. However, these types of command line operation are not compatible with the simple command line operations of the RFP GUI.

*: 18.04 LTS Desktop, 64-bit and 20.04 LTS Desktop, 64-bit

- Support for the J-Link debug probe from SEGGER

Applies to: RA

Description: The RFP now supports programming by the J-Link debug probe from SEGGER via a serial interface.

- Addition of the support for the security functions of the RA family

Applies to: RA

Description: The RFP now supports the TrustZone and device life-cycle management (DLM) security functions of the RA family.

3.16.3 Change to a feature

- Parameter files for the RA family

Applies to: RA

Description: The format of the parameter files which are automatically generated by the RFP has been changed. If a project file for an RA family device which has been created with a previous version of the product (V3.06.03 or an earlier version) is read with the RFP V3.08.00 or a later version, the following error messages will appear; create a new project.

Error (E3000008): This file is corrupt and cannot be opened (path to the parameter file; line: X).

Error (E0000015): The parameter file is not correct.

3.17 Release information on RFP V3.06.02

3.17.1 Additional target devices

Group	Part Number
RL78/G1M	R5F11W67, R5F11W68
RL78/G1N	R5F11Y67, R5F11Y68
RH850/E2H	R7F702011
RH850/E2UH	R7F702012A
RH850	R7F702Z11A, R7F702Z12
RE01_256KB	R7F0E0108, R7F0E0118

3.18 Release information on RFP V3.06.01

3.18.1 Additional target devices

Group	Part Number
RH850/E2M	R7F702002A
RH850	R7F702Z02C, R7F702Z04C
RL78/F1E	R5F11KLE, R5F11KLF, R5F11KLG, R5F11LLE, R5F11LLF, R5F11LLG
RA2A1	R7FA2A1AB
RA4M1	R7FA4M1AB
RA6M1	R7FA6M1AD
RA6M2	R7FA6M2AD, R7FA6M2AF
RA6M3	R7FA6M3AF, R7FA6M3AH
RL78/G13A	R5F140FK, R5F140FL, R5F140GK, R5F140GL, R5F140LK, R5F140LL, R5F140PK, R5F140PL
RL78/G1P	R5F11Z7A, R5F11ZBA
RL78/I1C	R5F11TLE, R5F11TLG
RA4W1	R7FA4W1AD
RE01_1500KB	R7F0E014D, R7F0E015D, R7F0E016D, R7F0E017D
RX66N	R5F566ND, R5F566NN
RX72N	R5F572ND, R5F572NN
RL78	R5F11VBG, R5F11VLG
RX13T	R5F513T3, R5F513T5

3.19 Release information on RFP V3.06.00

3.19.1 Additional target devices

Group	Part Number
RX23E-A	R5F523E5A, R5F523E6A
RX72M	R5F572MD, R5F572MN
RX23W	R5F523W7, R5F523W8

3.19.2 New features

- Addition of the feature for encrypting program files

Applies to: All devices

Description: A feature for encrypting program files has been added. Executing the encryption utility program from the command line allows the encryption with a password of program files.

- Expansion of command-line options

Applies to: All devices

Description: New commands (bin, read32, write32 and writebit) have been added to those specifiable as command-line options.

- Addition of the feature for standard output from the command line

Applies to: All devices

Description: A feature for displaying a log and the state of progress in standard output from the command line when commands are executed has been added.

3.19.3 Removing a restriction

- Settings of lock bits or OTP of the RH850/C1M-A2 group

3.20 Release information on RFP V3.05.03

3.20.1 Additional target devices

Group	Part Number
RH850/F1KH	R7F701708, R7F701709, R7F701710, R7F701711, R7F701714, R7F701715
RH850/F1KM	R7F701652, R7F701653
RH850	R7F701417, R7F701437
RX66T	R5F566TFA, R5F566TFB, R5F566TFC, R5F566TFE, R5F566TFF, R5F566TFG, R5F566TKA, R5F566TKB, R5F566TKC, R5F566TKE, R5F566TKF, R5F566TKG
RX72T	R5F572TFA, R5F572TFB, R5F572TFC, R5F572TFE, R5F572TFF, R5F572TFG, R5F572TKA, R5F572TKB, R5F572TKC, R5F572TKE, R5F572TKF, R5F572TKG

3.20.2 Removing a restriction

- Enabling of the intelligent cryptographic unit slave E (ICUSE) of the RH850/C1M-A, RH850/F1K, RH850/F1KM-S1, RH850/P1L-C, and RH850/P1M-E groups

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3.21 Release information on RFP V3.05.01

3.21.1 Additional target devices

Group	Part Number
RX66T	R5F566TA, R5F566TE
RH850	R7F701Z05A, R7F701Z06A, R7F701Z07A, R7F701Z11, R7F701Z12, R7F701Z12A
S5D3	R7FS5D37A
Battery Management	RAJ240047, RAJ240071, RAJ240075
C30	R9J02G012

3.22 Release information on RFP V3.05.00

3.22.1 Additional target devices

Group	Part Number
RX130	R5F51305B, R5F51306B

3.22.2 New features

- Expansion of command-line options

Applies to: All devices

Description: New commands have been added to those specifiable as command-line options. In addition to the existing specification of program files, the command can be executed with the specification of a tool or commands, by which the settings can be replaced with those in the project file.

- Support of relative paths for files

Applies to: All devices

Description: The specification has been changed so that the following files are saved with relative paths when they are placed under the project directory.

• Program file

• Unique code file

- Addition of the feature for displaying projects that have recently been used

Applies to: All devices

Description: A feature for displaying the names of project files that have most recently been used (up to four names) has been added to the [File] menu. A filename can be selected to open the given project.

3.22.3 Improvement through changes to a feature

- Change to the feature for generating RPI files

Applies to: All devices

Description: The specification has been changed so that the following settings are reflected in [Save Image File] from the [File] menu.

• [P.V] on the [Block Setting] tabbed page

• [Fill with 0xFF] on the [Operation Setting] tabbed page

Note: Due to this change, RPI files may not perfectly match those that have been output by V3.04.00 and earlier versions.

3.22.4 Removing a restriction

- Setting lock bits in RX MCUs

3.23 Release information on RFP V3.04.00

3.23.1 Additional target devices

Group	Part Number
RH850/C1M-A	R7F701275
RH850/D1M	R7F701441, R7F701442, R7F701461, R7F701462
RH850/F1H	R7F701511, R7F701512, R7F701526, R7F701528
RH850/F1KM	R7F701644, R7F701645, R7F701646, R7F701647, R7F701648, R7F701649, R7F701650, R7F701651, R7F701652, R7F701653, R7F701684, R7F701685, R7F701686, R7F701687, R7F701688, R7F701689, R7F701690, R7F701691, R7F701692, R7F701693, R7F701694, R7F701695
RL78/G11	R5F1051A, R5F1054A
RL78/H1D	R5F11NGF, R5F11NGG, R5F11NLF, R5F11NLG, R5F11NME, R5F11NMF, R5F11NMG, R5F11RMG
S3A1	R7FS3A17C
S5D5	R7FS5D57C

3.23.2 New features

- Support for the E2 emulator with RX MCUs

Applies to: RX

Description: The RFP now supports programming of flash memory of RX MCUs via the E2 emulator.

- Display of the checksums of files in particular areas of flash memory

Applies to: RH850, RL78, RX

Description: A [File Checksum] feature has been added under the [File] menu. The checksums of program files in particular areas are displayed in the [Log output] panel. For the RL78, the checksums can be calculated within block-selection ranges.

- Release from license authentication

Applies to: All devices

Description: A feature for release from license authentication has been added.

3.24 Release information on RFP V3.03.01

3.24.1 Additional target device

Group	Part Number
Motor control IC	RAJ306000

3.24.2 Removing restrictions

- An error occurring during installation of the USB Driver for USB Boot MCU Type B
- A connection error occurring with the E2 emulator (revision B)

3.25 Release information on RFP V3.03.00

3.25.1 Additional target devices

Group	Part Number
S3A6	R7FS3A677, R7FS3A678
RH850/F1H	R7F701534
RH850/F1K	R7F701542, R7F701543, R7F701546, R7F701547, R7F701557, R7F701560, R7F701561, R7F701562, R7F701563, R7F701566, R7F701567, R7F701577, R7F701580, R7F701582, R7F701586, R7F701597, R7F701602, R7F701603, R7F701610, R7F701611, R7F701612, R7F701613, R7F701620, R7F701621, R7F701622, R7F701623
RH850/P1L-C	R7F701388, R7F701389, R7F701390, R7F701391
RH850/P1M-E	R7F701375, R7F701376, R7F701377, R7F701378, R7F701379, R7F701380, R7F701381, R7F701382, R7F701383, R7F701384, R7F701385, R7F701386
Battery Management	RAJ240045, RAJ240080, RAJ240090, RAJ240100, RAJ240500
RX130	R5F51305, R5F51306, R5F51307, R5F51308
RX651	R5F5651C, R5F5651E
RX65N	R5F565NC, R5F565NE

3.25.2 New features

- Support for the E2 emulator with RL78 MCUs

Applies to: RL78

Description: The RFP now supports programming of flash memory of RL78 MCUs via the E2 emulator.

- Addition to handling of out-of-range errors for the memory of the MCU

Applies to: All devices

Description: Previously, when an attempt at access to data out of the range of memory in the MCU was detected, the RFP output a warning message and continued processing. However, in such cases now, the RFP can be set to generate an error and stop processing with an optional function from V3.03.00.

3.25.3 Improvement through changes to a feature

- Change to filling with 0xFF

Applies to: All devices

Description: For [Fill with 0xFF] in the [Operation Setting] tabbed page, the specification has been changed so that the target area can be selected but the configuration area is not selectable as a target. Since information on the setting for [Fill with 0xFF] is not carried over if a project that was created in V3.02.01 or an earlier version is read, change the setting as required.

3.26 Release information on RFP V3.02.01

3.26.1 Additional target devices

Group	Part Number
S128	R7FS12877, R7FS12878
S3A3	R7FS3A37A
S5D9	R7FS5D96C, R7FS5D96E, R7FS5D97C, R7FS5D97E
RH850/F1H	R7F701530
RH850/P1H-C	R7F701372A
RH850/P1M	R7F701305, R7F701323
RH850/P1M-C	R7F701373A, R7F701374A
RX24T	R5F524TB, R5F524TC, R5F524TE
RX24U	R5F524UB, R5F524UC, R5F524UE

3.26.2 New feature

- Support for the E2 emulator with RH850 MCUs

Applies to: RH850

Description: The RFP now supports programming of flash memory of RH850 MCUs via the E2 emulator.

3.27 Release information on RFP V3.02.00

3.27.1 Additional target devices

Group	Part Number
S124	R7FS12476, R7FS12477
S3A7	R7FS3A77C
S7G2	R7FS7G27G, R7FS7G27H
RH850/E1M-S2	R7F701215, R7F701216
RH850/F1H	R7F701506, R7F701507, R7F701522, R7F701524, R7F701525, R7F701527, R7F701529, R7F701531
RH850/F1K	R7F701581, R7F701583, R7F701587
RH850/F1M	R7F701544, R7F701545, R7F701552, R7F701564, R7F701572
RH850/P1H-C	R7F701371, R7F701372
RH850/P1M-C	R7F701373, R7F701374
RL78/F15	R5F113GK, R5F113LK, R5F113MK, R5F113PG, R5F113PH, R5F113PJ, R5F113PK
RL78/G11	R5F1056A, R5F1057A, R5F1058A
RL78/I1C	R5F10NLE, R5F10NME, R5F10NMJ, R5F10NPG
RL78/L1A	R5F11MMD, R5F11MME, R5F11MMF, R5F11MPE, R5F11MPF, R5F11MPG
RX651	R5F56514, R5F56517, R5F56519
RX65N	R5F565N4, R5F565N7, R5F565N9

3.27.2 New feature

- Support for Renesas Synergy™ microcontrollers

Applies to: Renesas Synergy™

Description: The RFP now supports Renesas Synergy™ microcontrollers. Note that the supported versions may differ according to the microcontroller. For details, refer to "List of MCUs supported by Renesas Flash Programmer V3" on the Renesas Web site.

3.28 Release information on RFP V3.01.00

3.28.1 Additional target devices

Group	Part Number
RH850/C1H	R7F701270
RH850/C1M	R7F701271
RH850/D1L	R7F701402, R7F701403, R7F701422, R7F701423
RH850/D1M	R7F701404, R7F701405, R7F701406, R7F701407, R7F701408, R7F701410, R7F701411, R7F701412, R7F701428, R7F701430, R7F701431, R7F701432
RH850/F1M	R7F701549
RH850/P1M	R7F701304, R7F701313, R7F701315, R7F701320, R7F701321, R7F701322
RX24T	R5F524T8, R5F524TA
RL78/F15	R5F113GL, R5F113LL, R5F113ML, R5F113PL, R5F113TG, R5F113TH, R5F113TJ, R5F113TK, R5F113TL
RL78/G1H	R5F11FLJ, R5F11FLK, R5F11FLL
RL78/I1C	R5F10NLG, R5F10NMG, R5F10NPJ
RL78/L1A	R5F11MMD, R5F11MME, R5F11MMF, R5F11MPE, R5F11MPF, R5F11MPG

3.28.2 New features

- Display of the checksums of files

Applies to: All devices

Description: When a file is selected in the [Program File] area on the [Operation] tabbed page, the checksum of the file as a whole is displayed within the [Program File] area and output in the log output panel.

- Loading multiple program files

Applies to: All devices

Description: The RFP is now capable of loading multiple program files. All of the files selected by the user are combined before being programmed in the flash memory.

- Importing license files

Applies to: All devices

Description: The RFP is now capable of importing license files.

- Programming of unique codes

Applies to: All devices

Description: The RFP now supports programming of a unique code in a designated area of flash memory.

- Generating RPI files

Applies to: All devices

Description: The RFP is now capable of generating RPI files, which contain data from a designated area of code flash or data flash memory, along with the flash option settings.

- Entering user-specified bit-rates for COM connections

Applies to:	All devices
Description:	While the values of [Speed] were only selectable from the pull-down menu on the [Connect Setting] tabbed page in V3.00.00 and earlier versions, V3.01.00 allows the user to enter a desired bit-rate (but only in the case of a COM connection).

3.28.3 Improvement through changes to a feature

- Using a board that includes the UPD78F0730 microcontroller, which supports serial (COM) connection through a virtual USB driver

Applies to:	All devices
Description:	V3.01.00 of the RFP is also capable of programming by using a board that include a UPD78F0730 microcontroller of the 78K0 family, which supports serial (COM) connection through a virtual USB driver. Programming in this way may lead to the following error if V3.00.00 or an earlier version is in use. E4000003: A timeout error occurred. <Example of an applicable board> EZ-0012 evaluation board for DC/DC LED control by the RL78/I1A* *: For other Renesas evaluation boards equipped with the UPD78F0730, check the corresponding user's manuals.

3.28.4 Removing restrictions

- Errors occurring when commands are executed in the boot mode (USB interface) of MCUs of the RX64M and RX71M groups
- Self-checking of the E1 or E20 emulator leading to errors

3.29 Release history of the RFP

Version	Date of Release
V3.17.00	Oct. 2024
V3.16.00	Jul. 2024
V3.15.00	Apr. 2024
V3.14.00	Jan. 2024
V3.13.00	Oct. 2023
V3.12.00	Jul. 2023
V3.11.02	Apr. 2023
V3.11.01	Jan. 2023
V3.11.00	Oct. 2022
V3.10.00	Jul. 2022
V3.09.02	Apr. 2022
V3.09.01	Jan. 2022
V3.09.00	Oct. 2021
V3.08.03	Jul. 2021
V3.08.02	Apr. 2021
V3.08.01	Jan. 2021
V3.08.00	Oct. 2020
V3.06.02	Jul. 2020
V3.06.01	Oct. 2019
V3.06.00	Aug. 2019
V3.05.03	Apr. 2019
V3.05.01	Nov. 2018
V3.05.00	Jul. 2018
V3.04.00	Jan. 2018
V3.03.01	Nov. 2017
V3.03.00	Jul. 2017
V3.02.01	Jan. 2017
V3.02.00	Oct. 2016
V3.01.00	May 2016
V3.00.00	Dec. 2015

4. Restrictions

4.1 List of restrictions

No.	Restriction	Target	Corresponding Version	Corrected Version
1	Errors occurring when commands are executed in the boot mode (USB interface) of MCUs of the RX64M and RX71M groups	RX64M RX71M	V3.00.00	V3.01.00
2	Self-checking of the E1 or E20 emulator leading to errors	All	V3.00.00	V3.01.00
3	An error occurring during installation of the USB Driver for USB Boot MCU Type B	Renesas Synergy™ RX651 RX65N	V3.02.00 to V3.03.00	V3.03.01
4	A connection error occurring with the E2 emulator (revision B)	RH850 RL78	V3.02.01 to V3.03.00	V3.03.01
5	Setting lock bits in RX MCUs	RX21x, RX22x, RX610, RX62x, RX63x, RX64M, RX71M	V3.00.00 to V3.04.00	V3.05.00
6	Enabling of the intelligent cryptographic unit slave E (ICUSE) of the RH850/C1M-A, RH850/F1K, RH850/F1KM-S1, RH850/P1L-C, and RH850/P1M-E groups	RH850/C1M-A RH850/F1K RH850/F1KM-S1 RH850/P1L-C RH850/P1M-E	V3.00.00 to V3.05.02	V3.05.03
7	Settings of lock bits or OTP of the RH850/C1M-A2 group	RH850/C1M-A2 (R7F701275)	V3.05.00 to V3.05.03	V3.06.00
8	RPI file	RL78 family (excluding RL78/G10, RL78/G1M, and RL78/G1N) Battery Management Renesas USB Power Delivery family (C30 group) Motor Driver/ Actuator Driver ICs (motor control ICs)	V3.08.00	V3.08.01
9	SVR settings for the RH850/U2A16 group	RH850/U2A16	V.3.09.00	V3.09.01
10	Writing to the code flash memory of an RL78/F24 for secure boot	RL78/F24	V3.09.01 to V3.10.00	V3.11.00

11	Operation after connection through the SWD interface	RA2A1, RA2E1, RA2E2, RA2L1, RA4M1, RA4W1, RA6M1, RA6M2, RA6M3, RA6T1	V3.10.00	V3.11.00
12	SWD interface connection	RA4E1, RA4M2, RA4M3, RA6E1, RA6M4, RA6M5, RA6T2	V3.11.01 and later versions	—
13	Installing USB drivers for 32-bit versions of the Windows OS	—	V3.12.00 to V3.14.00	V3.15.00

4.2 Details of restrictions

No. 1 Errors occurring when commands are executed in the boot mode (USB interface) of MCUs of the RX64M and RX71M groups

Applies to: RX64M and RX71M groups

Description: The following error will occur if commands such as for writing are executed while a target device is connected and is in boot mode (for the USB interface).

E100000D: A flow error occurred in the device. (Response 34:C3)

Corrected version: V3.01.00

No. 2 Self-checking of the E1 or E20 emulator leading to errors

Applies to: All devices

Description: Executing the self-checking program for an E1 or E20 emulator that has been connected with V3.00.00 of the Renesas Flash Programmer leads to errors.

The following are the log entries relating to errors in the self-checking program.

[Result of TEST1] FAIL (Error 1103)

[Error Message] The E1/E20 self-check has failed.

[Error Detail] Internal module check has failed.

Facilities other than self-checking (flash programming and debugging) will operate correctly.

Supplementary Note:

Connecting the V3.00.00 Renesas Flash Programmer to an E1 or E20 emulator leads to overwriting of the firmware in the emulator. This leads to errors when the self-checking program for the emulator is executed.

Corrected version: V3.01.00

No. 3 An error occurring during installation of the USB Driver for USB Boot MCU Type B

Applies to: Renesas Synergy™, RX651 and RX65N group

Description: When using the applicable products shown in section 3.1 (No. 3), the following error may occur during installation of the USB Driver for USB Boot MCU Type B V1.00.00 (for Renesas Synergy™ microcontrollers and RX651 and RX65N groups in the RX family), and installation may not succeed. If the error does not occur, installation was successful.

E0140021: Some installations have failed. The installations of the specified tools are not completed

Corrected version: V3.03.01

No. 4 A connection error occurring with the E2 emulator (revision B)

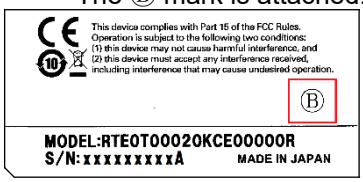
Applies to: RH850, RL78

Description: When using the applicable products shown in section 3.1 (No. 4) and connecting the Renesas Flash Programmer to the MCU via the E2 emulator (revision B), the following error occurs, and connection is not established.

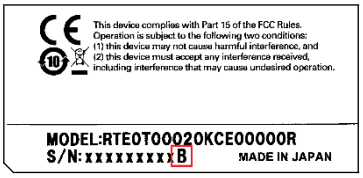
E30002FE: This tool is not supported

Note: E2 emulator revision B can be confirmed by the label on the back of the main unit.

- The Ⓑ mark is attached.



- The end of the serial No. is other than “A”.



Corrected version: V3.03.01

No. 5 Setting lock bits in RX MCUs

Applies to: RX21x, RX22x, RX610, RX62x, RX63x, RX64M, RX71M

Description: For details on this problem, refer to the following Tool News.

https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ts0330

-RENESAS TOOL NEWS, Jul. 16, 2018 Document No. R20TS0330JJ0100

[Notes] Renesas Flash Programmer

Corrected version: V3.05.00

No. 6 Enabling of the intelligent cryptographic unit slave E (ICUSE) of the RH850/C1M-A, RH850/F1K, RH850/F1KM-S1, RH850/P1L-C, and RH850/P1M-E groups

Applies to: RH850/C1M-A, RH850/F1K, RH850/F1KM-S1, RH850/P1L-C, RH850/P1M-E

Description: For details on this problem, refer to the following Tool News.

https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ts0399

-RENESAS TOOL NEWS, Feb. 01, 2019 Document No. R20TS0399EJ0100

[Notes] PG-FP6/PG-FP5 Flash Memory Programmer, Renesas Flash Programmer

Corrected version: V3.05.03

No. 7 Settings of lock bits or OTP of the RH850/C1M-A2 group

Applies to: RH850/C1M-A2 (R7F701275)

Description: For the settings of lock bits or OTP, when blocks 69 and 70 which straddle code flash memory 1 and code flash memory 2 are successively set, the settings for all blocks above block 70 in code flash memory 2 are not reflected (only the settings of all blocks in code flash memory 1, that is, up to block 69 are reflected).

Corrected version: V3.06.00

No. 8 RPI file

Applies to: RL78 family (excluding RL78/G10, RL78/G1M, and RL78/G1N)

Battery Management

Renesas USB Power Delivery family (C30 group)

Motor Driver/Actuator Driver ICs (motor control ICs)

Description: If you execute the [Program] or [Verify Flash Options] command using an RPI file on which no flash option is set, the command does not end normally and returns the following error:

"Error (E3000108): There is no data in the operation range."

Corrected version: V3.08.01

No. 9 SVR settings for the RH850/U2A16 group

Applies to:

Group	Part Number
RH850/U2A16	R7F702300
RH850/U2A-EVA	R7F702Z19A

Description: If both conditions 1 and 2 listed below are satisfied during the creation of a new project, the error listed below the conditions that matches the type of communications in use occurs and prevents creation of the project.

Condition 1: The DC/DC converter is connected to VDD by the SVR function of the target system.

Condition 2: The SVR function is disabled (SVRENABLE = 0) in the SVR option byte (OPBT16) and this becomes the initial state of the device.

Errors:

With CSI communications in use:

“Error (E300010C): Data received from the device are corrupted.”

With 2-wire UART communications in use:

“Error (E4000003): A timeout error occurred. (BFW: 0358)”

Corrected version: V3.09.01

No. 10 Writing to the code flash memory of an RL78/F24 for secure boot

Applies to:

Group	Part Number
RL78/F24	R7F124FBJ, R7F124FGJ, R7F124FLJ, R7F124FMJ, R7F124FPJ

Description: Writing to the code flash memory of an RL78/F2x for secure boot with specification of the key and MAC passwords may not proceed correctly. In such cases, no error will occur but undefined data will be written.

Corrected version: V3.11.00

No. 11 Operation after connection through the SWD interface

Applies to: RA2A1, RA2E1, RA2E2, RA2L1, RA4M1, RA4W1, RA6M1, RA6M2, RA6M3, RA6T1

Description: After the RFP has been connected to the MCU via the SWD interface, if the connected MCU is not turned on again, it will be incapable of operating in single-chip or SCI boot mode. When “2 wire UART” is selected as [Interface] for the RFP, the SCI boot mode of the MCU will be used.

Corrected version: V3.11.00

No. 12 SWD interface connection

Applies to: RA4E1, RA4M2, RA4M3, RA6E1, RA6M4, RA6M5, RA6T2

Description: The following functions cannot be used with an SWD interface connection. If options for these functions are specified with rfp-cli, the option settings will be ignored or an error will occur. This also applies in cases where the options are specified in an RPI file. Use these functions through UART or USB communications.

- Programming, verifying, or reading flash options
- Writing or verifying user keys
- Checksums (including file checksums)
- Settings or acquisition in relation to TrustZone
- Initializing devices
- Connecting the RFP while the target device is in non-secure state

No. 13 Installing USB drivers for 32-bit versions of the Windows OS

Description: The RFP V3.12.00 to V3.14.00 installers for 32-bit versions of the Windows OS do not include the following USB drivers.

- USB driver for the E1 or E20 emulator
- USB driver for USB-boot MCU Type A
  USB driver for the Renesas Flash Programmer for USB-boot MCU Type A, which supports devices of the RX family except those of the RX65x, RX66x, RX67x, and RX72x groups.

Corrected version: V3.15.00

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.
5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.
6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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