

RZ/T2H and RZ/N2H Group

Security Solution Package

Introduction

This is a release note of the Security solution package for RZ/T2H and RZ/N2H.

Target Devices

RZ/T2H and RZ/N2H Group

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1. Package Contents

This package contains the following contents.

No.	Package	Version
1	Security Features User's Manual	1.00
2	Cryptographic Library (Application Note)	2.10
3	Secure Boot Sample Program Package	2.10
4	Secure Firmware Update Sample Program Package	2.10

2. Known Issue

There are two modes for JTAG authentication, plain and hash. In plain authentication mode, if JTAG authentication is succeeded after program run, debugger connection fails even if authentication itself is no problem. For workaround this, ARM instruction "ISB" should be invoked after authentication success. In hash authentication mode, there is no issue.

3. File Structure

The details of the file structure and contents of this package are show below. 'xxxx' rely on version number.

Security Solution Package
├─ 1_Security_Features_Users_Manual
r01uh1144ejxxxx-rzt2h-rzn2h.pdf
├─ 2_Cryptographic_Library
r01an7451ejxxxx-rzt2-n2-security-crypto.pdf
├─ 3_Secure_Boot_Sample_Program_Package
r01an7452ejxxxx-rzt2h-n2h-security-secureboot.zip
├─ 4_Secure_Firmware_Update_Samual_Program_Package
r01an7453ejxxxx-rzt2h-n2h-security-fwupdate.zip

3.1 Folder: 1_Security_Features_Users_Manual

There is document “Security Features User’s Manual: Hardware”.

3.2 Folder: 2_Cryptographic_Library

There is document regarding “Renesas Secure IP driver”.

3.3 Folder: 3_Secure_Boot_Sample_Program_Package

There are software and documents regarding “Secure boot feature”.

3.4 Folder: 4_Secure_Firmware_Update_Sample_Program_Package

There are software and documents regarding “Secure firmware update feature”.

4. Note for Evaluation Board and Security Device

Evaluation board can be purchased on Renesas Web below.

RZ/T2H Evaluation Board Kit: <https://www.renesas.com/rzt2h-evkit>

RZ/N2H Evaluation Board Kit: <https://www.renesas.com/rzn2h-evkit>

The board is equipped with a device that cannot use security function.

If you evaluate with the board, please purchase a device that can use security function and replace.

RZ/T2H: <https://www.renesas.com/rzt2h>

RZ/N2H: <https://www.renesas.com/rzn2h>

Evaluation board	Device Part Number	Package	Security
Evaluation Board Kit for RZ/T2H P/N: RTK9RZT2H0S00000BJ	R9A09G077M44GBG	729-pin FCBGA	Not Available
Evaluation Board Kit for RZ/N2H P/N: RTK9RZN2H0S00000BJ	R9A09G087M44GBG	576-pin FCBGA	Not Available

Device	Part Number	Cortex-A55	Cortex-R52	Package	Security
RZ/T2H	R9A09G077M48GBG	Quad cores	Two CPUs	729-pin FCBGA	Available
RZ/T2H	R9A09G077M28GBG	Dual cores	Two CPUs	729-pin FCBGA	Available
RZ/T2H	R9A09G077M08GBG	Single core	Two CPUs	729-pin FCBGA	Available
RZ/N2H	R9A09G087M48GBG	Quad cores	Two CPUs	576-pin FCBGA	Available
RZ/N2H	R9A09G087M28GBG	Dual cores	Two CPUs	576-pin FCBGA	Available
RZ/N2H	R9A09G087M08GBG	Single core	Two CPUs	576-pin FCBGA	Available

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Nov.22, 2024	-	First edition issued.
1.10	Dec 24, 2024	-	Device support for RZ/N2H

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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