

## RZ/A1H Group

### RZ/A1H Software Package V1.20 Release Note

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#### Introduction

This Software Package has the best solution for Human Machine Interface (HMI) application development.

The Software Package shows how easy it is to create a professional, user-friendly and platform-independent user interface for your product. The entire application source code is included in the workspace enabling the Software Package to be ported to the platform of your choice.

The following sample applications are available.

#### GUI sample application:

This is an example for interoperation between RZ/A1H peripherals / 'Renesas Starter Kit+ for RZ/A1H' on-board peripherals using the C++ HMI framework 'Guiliani' by TES Electronics Solutions. 'Guiliani' and the RZ/A1H Software Package facilitate the rapid implementation of smooth, intuitive and high-performance GUIs that can interact with the extensive RZ/A1H peripheral suite free-of-charge.

For details on Guiliani, please refer to:

<https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rz-arm-based-high-end-32-64-bit-mpus/tes-guiliani>

#### SDK for Camera sample application:

Supports camera input, LCD output, and simple image adjustment. If you use the e<sup>2</sup> studio Integrated Development Environment, this sample program can be linked with the development support tool **QE for Display / Camera**. **QE for Display / Camera** is an e<sup>2</sup> studio IDE plugin which can adjust the timing of the LCD panel / camera, image correction, and set up the camera module via a simple GUI.

- Product page

<https://www.renesas.com/qe-display>

<https://www.renesas.com/qe-camera>

#### Touch Panel sample application:

Supports detection of touch events and retrieves the touch coordinates. After touch detection, this sample application will draw a large arrow at the coordinates of the event. Also when the arrow is drawn, JPEG codec processing is done using JPEG Codec Unit (JCU).

This Software Package has a touch abstraction layer which is the Touch Panel Utility. You can implement each touch panel driver easily without modifying the application interface.

#### USB Mass Storage sample application:

This sample demonstrates the access and control of FAT formatted Mass Storage Devices (USB memory stick, hard drive, etc).

#### Web Server sample application:

The Web Engine demonstration provides an example of Ethernet connectivity and a sample web server application that can control peripherals on the target board. C functions may be called from the web server output processor, allowing dynamic data to be displayed on web pages.

**Other sample applications:**

This package includes other sample programs as follows.

Sound / USER Switch / ADC / PMOD (use RSPI) / USBH HID / USBH CDC / USBF HID / USBF CDC / Watchdog timer / RTC

**Target Device / Target Board**

Target Device : RZ/A1H

Target Board : Renesas Starter Kit+ for RZ/A1H (R0K572100S000BE)

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## 1. Package Contents

### 1.1 Software

This package contains the following software.

**Table 1. Software of this package**

No	Name	File
1	RZ/A1H Group RZ/A1H Software Package V1.20 (gcc version)	gcc.zip

### 1.2 Documents

This package contains the following documents.

**Table 2. Documents of this package**

No	Title	Document Number
1	RZ/A1H Group RZ/A1H Software Package Release Note	R01AN5093 (This document)
2	RZ/A1H Group RZ/A1H Software Package Quick Start Guide	R01QS0039
3	RZ/A1H Group SDK for Camera Sample Program Application Note	R01AN5094
4	RZ/A1H Group Video Utility Application Note	R01AN5095
5	RZ/A1H Group Touch Panel Utility Application Note	R01AN5096
6	RZ/A1H Group GUI Sample Program Application Note	R01AN5097
7	Driver documents generated by Doxygen. RZA1_SoftwarePackage\RZ/A1H_Sample\doc\drivers\index.html	-

## 2. Folder Structure

Folder structure of this package and outline of contents are shown as follow.

**Table 3. Folder Structure**

TOP	: top folder
├─gcc.zip	: RZ/A1H Software Package (gcc version)
└─r01an5093ej0120-rza1.pdf	: RZ/A1H Group RZ/A1H (This document)

### 3. Related Documents

Summaries of the related documents are shown as follow.

- RZ/A1H Group, RZ/A1M Group User's Manual: Hardware (R01UH0403)  
This document describes the hardware specifications for RZ/A1H.
- RZ/A1H Group Renesas Starter Kit+ User's Manual For e2studio (R20UT3007)  
This document describes the development kit of Renesas Starter Kit+ for RZ/A1H.

### 4. How to use this package

Regarding how to use, refer to 'RZ/A1H Group RZ/A1H Software Package Quick Start Guide (R01QS0039)'.

### 5. Restrictions

The RSK+ board contains two QSPI devices supporting a total of 128MBytes of flash storage. The Boot loader (r01an2141eg) provided supports directly access to the first 64MB of this flash storage. Accessing the second block cannot be completed while running code from the QSPI devices. If the additional bank needs to be used please ensure that the swap is completed by code running from a different memory area such as RAM. A future sample may be provided to demonstrate accessing the second bank of flash. Please check the web site for updates.

### 6. Known Issues

None.

### 7. Precautions

None.

**Revision History**

Rev.	Date	Revised Contents			
		No	Type	Description	Remark
1.00	Dec. 25, 2019	-	-	First Edition issued	-
1.10	Oct. 11, 2021	1	Driver	Fix bug using lwIP to transfer larger throughput package	-
		2	Sample Program/ Driver	Fix Bug using USB in CDC function mode sending variable data packets larger than 100 bytes	-
		3	Document	Updated i2c documentation.	Doxygen Update
		4	Environment	Fix Bug in ISR handler which can potentially create an invalid memory access.	-
		5	Section 1.1	Updated References	-
		6	Section 2	Updated References	-
		All	Template	New Template Applied	-
1.20	Jul. 20, 2022	-	-	Change library related build options	-

## 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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## Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

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