

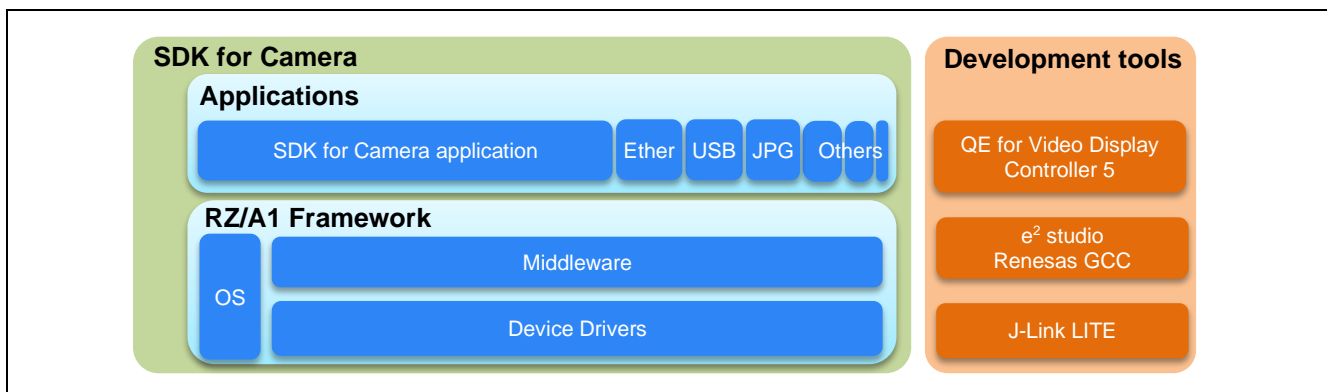
RZ/A1H Group, RZ/A1M Group, RZ/A1LU Group, RZ/A1L Group, RZ/A1LC Group

RZ/A1 Framework V2.13 Release Note

Introduction

This software package is Human Machine Interface (hereinafter referred to as HMI) software development kit for RZ/A1 call as SDK for Camera, and supports camera input, LCD output, and image adjustment. Sample programs, middleware, and device drivers for RZ/A1H, RZ/A1M, RZ/A1L, RZ/A1LU and RZ/A1LC are packed as one package.

Figure below shows the software diagram of “SDK for Camera”.



Block	Description								
SDK for Camera	A software development kit which is characterized by supporting the image sensing input and the LCD output, and includes software to control peripheral IPs of RZ/A1.								
Applications	Structured by an application software of “SDK for Camera” for the camera and the display applied products, and sample applications for each driver.								
RZ/A1 Framework	<p>RZ/A1 Framework consists device drivers for RZ/A1, middleware, and OS.</p> <table border="1"> <tr> <td>Middleware</td> <td>FileSystem (FATFS), TCP/IP Stack(lwIP), RGA</td> </tr> <tr> <td>Device Drivers</td> <td>ADC, DMA, RIIC, RSPI, SCIF, SCUX, SSIF, Ethernet, USBF-CDC, USBH-MSC, CEU, JCU, VDC5, SDHI, IMR, PFV, VDEC, DRC</td> </tr> <tr> <td>OS</td> <td>CMSIS-RTOS RTX</td> </tr> </table> <p>Red: for RZ/A1H only (RZ/A1LU does not have the hardware IP) To use SDHI or DRC, NDA is required. To use FileSystem (FATFS), downloading is required.</p>	Middleware	FileSystem (FATFS), TCP/IP Stack(lwIP), RG A	Device Drivers	ADC, DMA, RIIC, RSPI, SCIF, SCUX, SSIF, Ethernet, USBF-CDC, USBH-MSC, CEU, JCU, VDC5, SDHI, IMR, PFV, VDEC, DRC	OS	CMSIS-RTOS RTX		
Middleware	FileSystem (FATFS), TCP/IP Stack(lwIP), RG A								
Device Drivers	ADC, DMA, RIIC, RSPI, SCIF, SCUX, SSIF, Ethernet, USBF-CDC, USBH-MSC, CEU, JCU, VDC5, SDHI, IMR, PFV, VDEC, DRC								
OS	CMSIS-RTOS RTX								
Development tools	<p>The development environment and tools used in “SDK for Camera”.</p> <table border="1"> <tr> <td>QE for Display (Former name: QE for Video Display Controller 5)</td> <td>This is a development support tool, easy to handle the adjustment of the initial screen (for timing). (Free download)</td> </tr> <tr> <td>QE for Camera</td> <td>This is a development support tool, easy to handle the adjustment of the settings of camera.(Free download)</td> </tr> <tr> <td>e² studio, Renesas GCC</td> <td>IDE and compiler. (Free download)</td> </tr> <tr> <td>J-Link LITE</td> <td>Emulator made by SEGGER.(Bundled in the Target Board)</td> </tr> </table>	QE for Display (Former name: QE for Video Display Controller 5)	This is a development support tool, easy to handle the adjustment of the initial screen (for timing). (Free download)	QE for Camera	This is a development support tool, easy to handle the adjustment of the settings of camera.(Free download)	e ² studio, Renesas GCC	IDE and compiler. (Free download)	J-Link LITE	Emulator made by SEGGER.(Bundled in the Target Board)
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e ² studio, Renesas GCC	IDE and compiler. (Free download)								
J-Link LITE	Emulator made by SEGGER.(Bundled in the Target Board)								

Target Device / Target Board

Target Device: RZ/A1H, RZ/A1M, RZ/A1L, RZ/A1LU, RZ/A1LC

Target Board: Renesas Starter Kit+ for RZ/A1H (YR0K77210S011BE)

Stream it! RZ V2.0 (YSTREAM-IT-RZ-V2)

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1. Package Contents

1.1 Software

This package contains the following software.

Table 1-1 Software of this package

No	Name	Folder
1	RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework V2.13	Software

1.2 Documents

This package contains the following documents.

Table 1-2 Documents of this package

No	Type	Title	Rev	File Name
				Path
1	Release Note	RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework V2.13 Release Note	2.13	(Japanese) r01an3638jj0213-rza1-fwp.pdf
				(English) r01an3638ej0213-rza1-fwp.pdf (This document)
				Document\ReleaseNote
2	Quick Start Guide	RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Quick Start Guide	1.03	(Japanese) r01an3639jj0103-rza1.pdf
				(English) r01an3639ej0103-rza1.pdf
				Document\Specifications
3	Porting Guide	RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Porting Guide	1.00	(Japanese) r01an4137jj0100-rza1.pdf
				(English) r01an4137ej0100-rza1.pdf
				Document\Specifications

This package contains various documents besides the above. Regarding those documents, refer to document No.2 “RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Quick Start Guide”.

2. Folder Structure

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

Table 2-1 Folder Structure

TOP	: top folder
license.txt	: software license
Document	: documents
ReleaseNote	: Release Note (refer to section 1.2)
Specifications	: other documents (refer to section 1.2)
Software	: programs
App	: sample programs
CMSIS_RTOS_RTX	: base OS and driver for peripheral IP
MW	: Middleware
Tool	: Bootloader for Serial Flash
Util	: Utility for arbitration between applications and drivers

For details, refer to “RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Quick Start Guide (R01AN3639)”. (refer to Table 1-2).

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/A1L Group, RZ/A1LU Group, RZ/A1LU Group User's Manual: Hardware (R01UH0437)
This document describes the hardware specifications for RZ/A1LU.
- Renesas Starter Kit+ User's Manual For e2studio (R20UT3007)
This document describes the connection of potentiometer for Renesas Starter Kit+ for RZ/A1H.
- RZ stream it! Kit User's Manual For e2studio (R20UT3823)
This document describes the connection of potentiometer for Stream it! RZ V2.0.

4. How to use this package

Regarding how to use, refer to “RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Quick Start Guide (R01AN3639)” . (refer to Table 1-2)

5. Confirmation of sample program operation

Regarding the operation of this package, refer to “RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Quick Start Guide (R01AN3639)” . (refer to Table 1-2)

6. Restrictions

The Restrictions of V2.13 are shown as follow.

Table 6-1 Restrictions

No.	Type	Description
1	JCU	Don't set count mode(division process) to JCU driver.

7. Precautions

The Precautions of V2.13 are shown as follow.

Table 7-1 Precautions

No.	Type	Description
1	Standard C library	Functions of Standard C library used in this package is non-correspondence in multi-threading. When execute the library function at the same time from more than one threads, a processing result is unsettled. When using the library function which operates the heap such as malloc, calloc, realloc and etc., please execute in the state of the interrupt disabled to prevent a thread change.
2	Kernel_HW dependence	RZ/A1H use channel 2 of SCIF and RZ/A1LU use channel 3 of SCIF for Serial Debug Port for Kernel (for printf). Therefore, the competition will occur if opening the same channel.
3	SCUX, SSIF	If an SSIF channel is selected as the output destination with the SCUX driver, opening this channel with the SSIF driver results in contention. Thus, use exclusive mode for channel access.
4	The development tool (QE)	From V2.10, this package can cooperate with the development support tool “QE for camera”. In addition, the traditional “QE for Video Display Controller 5(QE for VDC5)” has its name changed to “QE for Display”. In the documents in this package, the word “QE for Video Display Controller 5” or “QE for VDC5” shall read “QE for Display”.

Revision History

Rev.	Date	Description			Remark
		No	Type	Description	
2.13	Dec.16, 2020	1	Sample Program	Updates of CMSIS-RTOS.	Modification points: startup_Renesas_RZ_A1.S in following projects: SDKforCamera_smp1, adc_smp1, blinky_smp1, ether_smp1, imr_smp1, jcu_smp1, pfv_smp1, rga_smp1, rspi_smp1, scif_smp1, scux_smp1, ssif_smp1, touch_panel_smp1, usbf_smp1, usbh_smp1, usbh_smp2, wdt_smp1
		2	Sample Program	Modified redundant processing.	ncg_vg.c of Software\CMSIS_RTOS_RTX\RTOS\RTX\Boards\Renesas\RenesasBSP\drv_src\rga\RGPNCG\src\
2.12	Jul. 19, 2019	1	Document	Added text file to describe software license.	License.txt
		2	Sample Program	Modified some comments in source file.	Modification points: main.c in following projects: SDKforCamera_smp1, imr_smp1, jcu_smp1, rga_smp1

Rev.	Date	Description			
		No	Type	Description	Remark
2.11	Oct 10, 2018	1	Sample Program	Fixed an issue that a section which is should be aligned by 4 bytes was not aligned in link directive file.	Modification points: *.Id of all sample project.
		2	Sample Program	Fixed an issue that the "Number of Wait Cycles between ACTV Command and READ(A)/WRIT(A) Command" of SDRAM (MT48LC16M16A2P-75) which is mounted on Renesas Starter Kit+ for RZ/A1H was wrong.	Modification points: board_Init.c of all sample project.
		3	Driver	Fixed following restriction of RIIC driver. - During IIC communication, "ioif_stop_device()" cannot execute and "ioif_close()" cannot execute for the channel under RIIC transferring. - "aio_cancel()" cannot execute to RIIC driver regardless any status.	Each file of Software\ CMSIS_RTOS_RTX\ RTOS\RTX\Boards\ Renesas\RenesasBSP\ drv_src\riic
		4	Others	Added the section to describe how to use "QE for Camera", into "SDK for Camera sample program Application Note".	Additional points: Document\Specifications\ App\application_sample\ SDKforCamera\ r01an3640*-rza1.pdf

Note: * mark in the "Remark" column is used as wild card.

Rev.	Date	Description			Remark
		No	Type	Description	
2.10	June 15, 2018	1	Sample Program	Added some definition reference to application, to cooperate with "QE for Camera".	Software\App\application_sample\ SDKforCamera\sample1\ the following four files in an above folder src\graphics_sample.c src\video_init.c inc\ov7670_omnivision.h inc\ov7740_omnivision.h
		2	Overall	Fixed issues of the setting of "reference project" in each sample project (Missing reference of other required projects)	.project files under Software directory (only the files included the issue)
		3	Sample Program	Fixed an issue that RGA can not draw Immediately from turning on the power. (This issue occurred from RGA V3.00)	Modification points: Software\MW\lib\rga\ libRGAH.a and Software\ CMSIS_RTOS_RTX\ RTOS\RTX\Boards\ Renesas\RenesasBSP\ drv_src\rga\RGPNCG\ src\ncg_state.c Modification documents: Document\Specifications\ MW\rga\ r01an3638*-rza1.pdf and Document\Specifications\ Drv\jcu\ r01an3688*-rza1.pdf
		4	Sample Program	Fixed issue that USBH applications eliminate a media using following partition types: FAT16 (32MB or bigger) FAT32 (LBA system) FAT16 (LBA system)	Modification points: Software\App\ driver_sample\usbh_fs\ \sample1(or sample2) \main.c

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Rev.	Date	Description			
		No	Type	Description	Remark
2.00	Jan 26, 2018	1	Overall	Updated supporting e2 studio to version 6.1.0.	Modification points: .cproject and .project of all sample project.
		2	Overall	Added following items as supporting target device of this software package. RZ/A1M, RZ/A1L, RZ/A1LC	Modification points: Following files of each sample program folder. *.launch, *.jlink, *.ld Added new definition to following header file. Software\ CMSIS_RTOS_RTX\ RTOS\RTX\Boards\ Renesas\INC\ mcu_board_select.h
		3	Sample Program	Added following sample program. RSPi sample program SCIF sample program SCUX sample program Serial Flash boot loader sample program	Additional points: Software\App\ driver_sample\ rspi scif scux Software\Tool\ QSPI_Loader
		4	Others	Added Porting Guide document of this software package.	Additional points: Document\Specifications\ r01an4137*-rza1.pdf
		5	Sample Program	Fixed an issue of “USBHost FileSystem sample program” and “USBHost sample program”, that read/write buffer is not put on uncached RAM area.	Modification points: Software\App\ driver_sample\usbh_fs\ sample1\main.c and, sample2\main.c
		6	Sample Program	Fixed an issue that a typo of section name exists in the link directive file for RAM executing of “Blinky sample program”.	Modification points: Software\App\ driver_sample\blinky\ sample1\ Blinky_smp1_A1*.ld
		7	Sample Program	Fixed an issue that osKernelSysTick function returns wrong time.	Modification points: RTX_Conf_CM.c of each sample program folder.
		8	Others	Duplicate procedure is deleted in build procedure of Quick Start Guide.	Modification points: Document\Specification\ r01an3639*.pdf

Note: * mark in the “Remark” column is used as wild card.

Rev.	Date	Description			Remark
		No	Type	Description	
2.00	Jan 26, 2018	9	Others	Fixed a typo of reference document name of SDK for Camera sample program application note.	Modification points: Document\Specification\App\application_sample\SDKforCamera\r01an3640*.pdf
		10	Sample Program	Modified file open error log message of USBHost FileSystem sample program to clarify necessity of File System Library replacement.	Modification points: Software\App\driver_sample\usbh_fs\sample1\main.c
		11	Sample Program	Fixed an issue that the RIIC driver communicates extra 1 byte more than the specify size when the RIIC driver's operation delayed due to high load.	Modification points: Software\CMSIS_RTOS_RTX\RTOS\RTX\Boards\Renesas\RenesasBSP\drv_src\riic.c, riic_int.c, riic_task.c
		12	Sample Program	Fixed an issue that an interrupt handler not related RIIC driver will be unregistered by calling ioif_stop_device() after without calling ioif_open() calling ioif_start_device() .	Modification points: Software\CMSIS_RTOS_RTX\RTOS\RTX\Boards\Renesas\RenesasBSP\drv_src\riic.c, riic_int.c,
		13	Sample Program	Fixed an issue controlling exclusive lock on ioif_close() function toward RIIC driver: <ul style="list-style-type: none"> In the case an error is occurred, exclusive lock is not unlocked In the case no error is occurred, exclusive lock is unlocked more than necessary. 	Modification points: Software\CMSIS_RTOS_RTX\RTOS\RTX\Boards\Renesas\RenesasBSP\drv_src\riic.c, riic_if.c
		14	Others	Add restriction of RIIC driver.	Modification points: "6 Restrictions" of this document
		15	Sample Program	Deleted cancelling operation to RIIC driver.	Modification points: Software\Util\src\riic_devctrl_ch1\riic_ch1_drv.c, Software\Util\src\riic_devctrl_ch3\riic_ch3_drv.c

Note: * mark in the "Remark" column is used as wild card.

Rev.	Date	Description			
		No	Type	Description	Remark
1.03	Aug 30, 2017	1	Others	Added how to use QE for Video Display Controller 5, cooperation with this sample program, and the way to adapting the sample program to user environment, to SDK for Camera Sample Program Application Note.	Modified file is below. Document\Specification\App\application_sample\SDKforCamera\r01an3640*.pdf
		2	Sample Program	Removal of processing for RZ/A1LU in LCD setting header file of IMR, PFV, RGA sample program In the IMR sample program, unnecessary header files are also deleted	Modified files are below. lcd_panel.h included in Software\App\driver_sample\ - imr\sample1\inc - pfv\sample1\inc - rga\sample1\inc Deleted files are below Software\App\driver_sample\ imr\sample1\inc - stream2_tft_ch0.h - stream2_tft_clk.h
		3	Sample Program	Fixed misdescription of filename • stream2_tft_ch0.h ⇒stream2_tft_ch0.h • stream2_tft_clk.h ⇒stream2_tft_clk.h	Modified files are below. Software\App\application_sample\SDKforCamera\ample1\inc - lcd_panel.h - \lcd\stream2_tft_ch0.h - \lcd\stream2_tft_clk.h Software\App\driver_sample\jcu\sample1\inc - lcd_panel.h - \lcd\stream2_tft_ch0.h - \lcd\stream2_tft_clk.h
		4	Sample Program	Fixed an issue that polarity of Vsync was reversed in LCD terminal setting definition for Stream it! RZ V2.0, in SDK for camera and JCU sample program.	Modified files are below. stream2_tft_ch0.h that included in, Software\App\application_sample\SDKforCamera\ample1\inc\lcd ,and Software\App\driver_sample\jcu\sample1\inc\lcd

Note: * mark in the "Remark" column is used as wild card.

RZ/A1H Group, RZ/A1M Group, RZ/A1LU Group, RZ/A1L Group, RZ/A1LC Group RZ/A1 Framework V2.13 Release Note

Rev.	Date	Description			
		No	Type	Description	Remark
1.03	Aug 30, 2017	5	Sample Program	Fixed an issue that the boot program is not registered in debug configuration of IMR sample program.	Modified files are below. Software\App\driver_sample\imr\sample1\IMR_smp1_HardwareDebug.launch
		6	Others	Modified Quick Start Guide to V1.02	Modified file is below. Document\Specification\r01an3639*.pdf
1.02	Jul 14, 2017	1	Overall	Modified project file to avoid build errors in English environment. "rl78.customdebug" character strings in each .cproject file to "rz.debug".	Each .cproject files in Software directory
		2	Others	Modified Quick Start Guide to V1.01	Document\Specification\r01an3639*.pdf
1.01	Jun 23, 2017	1	Others	Modified whole of Introduction of Release Note (this document).	Document\ReleaseNote\r01an3638*.pdf
1.00	May 24, 2017	-		First Edition issued	-

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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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