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APPLICATION NOTE

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

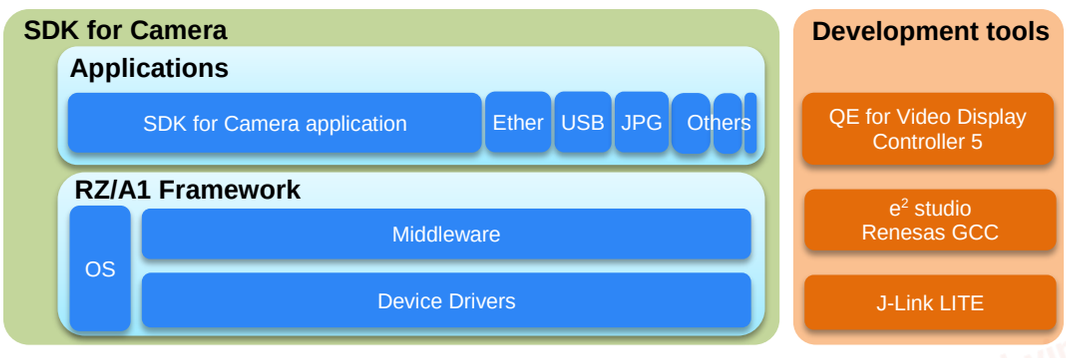
RZ/A1 Framework V2.10 Release Note

R01AN3638EJ0210
Rev.2.10
June 15, 2018

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	RZ/A1 Framework consists device drivers for RZ/A1, middleware, and OS. Middleware: FileSystem (FATFS), TCP/IP Stack(lwIP), RGA 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 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.
Development tools	The development environment and tools used in “SDK for Camera”. 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) e2 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 V2.10	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 V2.10 Release Note	2.10	(Japanese) r01an3638jj0210-rza1.pdf (English) r01an3638ej0210-rza1.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
 |
 ├──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).

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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)

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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 V2.10 are shown as follow.

Table 6-1 Restrictions

No.	Type	Description
1	JCU	Don't set count mode(division process) to JCU driver.
2	RIIC	During IIC communication (it means period from calling ioif_read or ioif_write to returning from the function, or from calling aio_read or aio_write to executing communication completion callback function), don't call following functions toward RIIC driver: • "ioif_stop_device()". • "ioif_close()" with communicating channel. Don't call "aio_cancel()" function toward RIIC driver.

7. Precautions

The Precautions of V2.10 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".

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Revision History

Rev.	Date	Revised Contents			
		No	Type	Description	Remark
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	Revised Contents			
		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 un-cached 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.

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Rev.	Date	Revised Contents			
		No	Type	Description	Remark
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: • 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

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Rev.	Date	Revised Contents			
		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 - streem2_tft_ch0.h - streem2_tft_clk.h
		3	Sample Program	Fixed misdescription of filename ・streem2_tft_ch0.h ⇒stream2_tft_ch0.h ・streem2_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

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Rev.	Date	Revised Contents			
		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. 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 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. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment 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 moment 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 moment 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 moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has 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. Moreover, 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.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the 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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(Rev.4.0-1 November 2017)

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