RZ/A1H Group, RZ/A1LU Group

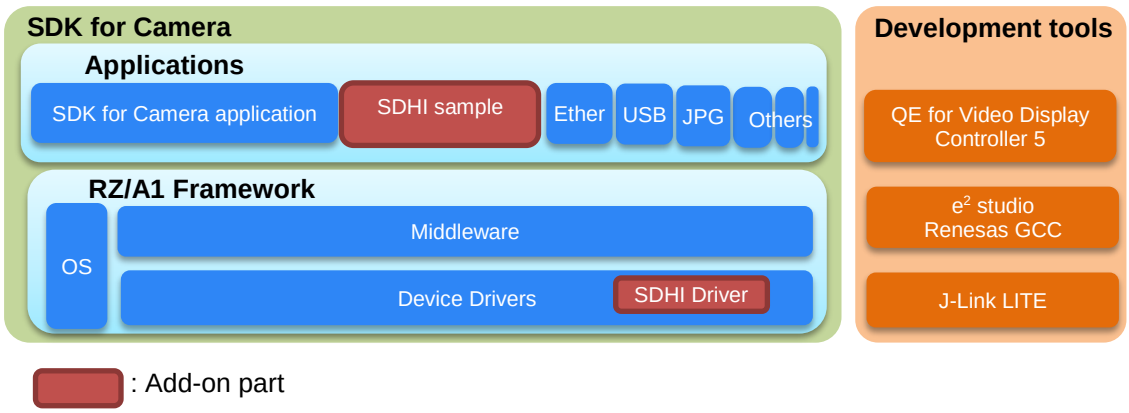
SDHI Add-on Release Note

R01AN3895EJ0201
Rev.2.01
Oct 10, 2018

Introduction

This document explains package contents and the way to add SDHI(SD Host Interface) function to "SDK for Camera", Human Machine Interface (hereinafter referred to HMI) software development kit for RZ/A1.

Sample programs for SDHI driver and SDHI driver are included in this package. SDHI driver provides access to SD memory card and MMC card. It can also be linked with FAT filesystem.



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Target Board

Renesas Starter Kit+ for RZ/A1H

Stream it! RZ V2.0

Table of Contents

1. Package Contents

1.1 Software

This package contains the following software.

Table 1-1 Software of this package

No	Name	Folder	Explanation
1	RZ/A1H Group, RZ/A1LU Group SDHI Add-on	Software	A set of SDHI sample program and SDHI driver those operate with RZ/A1 Framework.

1.2 Sample program

This package contains the following sample program.

Table 1-2 Sample program of this package

No	Name	Folder	Explanation
1	SDHI Filesystem Sample program (SDHI_smp1)	Software\Specifications\App \driver_sample\sdhi\sample1	This program uses file system when doing read and write access to SD card
2	SDHI Sample program (SDHI_smp2)	Software\Specifications\App \driver_sample\sdhi\sample2	A console program that executes access to the SD card by a command via a terminal software

1.3 Documents

This package contains the following documents.

Table 1-3 Documents of this package

No	Type	Title	Rev	File Name Path
1	Release Note	RZ/A1H Group, RZ/A1LU Group SDHI Add-on Release Note	2.01	(Japanese) r01an3895jj0201-rza1.pdf (English) r01an3895ej0201-rza1.pdf (This document) Document\ReleaseNote
2	Application Note	RZ/A1H Group, RZ/A1LU Group SDHI Sample Program Application Note	1.00	(Japanese) r01an3898jj0100-rza1.pdf (English) r01an3898ej0100-rza1.pdf Document\Specifications\App\driver_sample\sdhi
3	Application Note	RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework SDHI Driver Application Note	1.00	(Japanese) r01an3863jj0100-rza1.pdf (English) r01an3863ej0100-rza1.pdf Document\Specifications\Drv\sdhi
4	Application Note	RZ/A1 SD Memory Card Driver Software Library User's Manual	1.00	(Japanese) r01uw0119jj_rza1sd.pdf (English) r01uw0119ej0100_rza1sd.pdf Document\Specifications\Drv\sdhi

2. Folder Structure

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

Table 2-1 Folder Structure

```
an-r0an3895ej0201-rza1-fwp                  : top folder
  +- readme_j.txt                           : overview of this package (Japanese)
  +- readme_e.txt                           : overview of this package (English)
  +- Document                               : documents folder
  | +- ReleaseNote                          : release Notes(refer to 1.2 section) folder
  | | +- r01an3895jj0201-rza1.pdf
  | | +- r01an3895ej0201-rza1.pdf
  | |
  | +- Specifications                       : each documents(refer to 1.2 section) folder
  |    +- App
  |    | +- driver_sample
  |    |    +- sdhi
  |    |       +- r01an3898jj0100-rza1.pdf  : SDHI sample program application note(Japanese)
  |    |       +- r01an3898ej0100-rza1.pdf  : SDHI sample program application note(English)
  |    |       +- sample1
  |    |       | +- readme.txt              : SDHI Filesystem Sample program Path description file to readme
  |    |       +- sample2
  |    |          +- readme.txt             : SDHI Sample program Path description file to readme
  |    +- Drv
  |       +- sdhi
  |          +- r01an3863jj0100-rza1.pdf    : SDHI driver application note(Japanese)
  |          +- r01an3863ej0100-rza1.pdf    : SDHI driver application note(English)
  |          +- r01uw0119jj_rza1sd.pdf      : RZ/A1 SD Memory Card Driver Software Library User's Manual (Japanese)
  |          +- r01uw0119ej0100_rza1sd.pdf  : RZ/A1 SD Memory Card Driver Software Library User's Manual (English)
  |
  +- Software                               : programs folder
    +- App
    | +- driver_sample
    |    +- sdhi
    |       +- sample1                      : SDHI Filesystem sample program folder
    |       | +- readme_sfboot_j.txt        : SDHI Filesystem Sample program(SDHI_smp1)readme(Japanese)
    |       | +- readme_sfboot_e.txt        : SDHI Filesystem Sample program(SDHI_smp1)readme(English)
    |       +- sample2                      : SDHI sample program folder
    |          +- readme_sfboot_j.txt       : SDHI Sample program(SDHI_smp2)readme(Japanese)
    |          +- readme_sfboot_e.txt       : SDHI Sample program(SDHI_smp2)readme(English)
    +- CMSIS_RTOS_RTX                       : base OS and driver for peripheral IP
      +- RTOS
        +- RTX
          +- Boards
            +- Renesas
              +- RenesasBSP
                +- drv_inc
                | +- sdhi_if.h              : header file of SDHI driver interface
                +- drv_src
                  +- sdhi                   : SDHI source folder
                    +- sdif.h               : header file of SDHI driver
                    +- sdhi_if.c            : source file of SDHI driver interface
                    +- sdhi.c               : source file of SDHI driver
                    +- sdhi_ver.c           : version file of SDHI driver
                    +- lib                  : internal processing folder of SDHI driver
```

3. How to Obtain

This software package is available upon non-disclosure agreement. For details, contact your local sales representatives.

In addition, SD Host/Ancillary Product License Agreement (SD HALA) is required to develop SD host-related products. Refer https://www.sdcard.org/developers/licensing/ for detail.

4. Applying procedure

The procedure for applying this package to the "SDK for Camera", HMI software development kit for RZ/A1 is described below.

1. Download the RZ/A1 Framework(*) and extract it

   (* RZ/A1 Framework URL: https://www.renesas.com/search/keyword-search.html#q=AN_R01AN3638)
2. Extract this package(an-r01an3895ej0201-rza1-fwp.zip)
3. Overwrite the "Document" folder extracted in step 1, by same folder extracted in step 2
4. Overwrite the "Software" folder extracted in step 1, by same folder extracted in step 2

5. Confirmation of sample program operation

Regarding the operation of sample program of this package, please replace "Blinky" with "SDHI" for the contents of chapter 2.4 of the following document (included in RZ/A1 Framework). Please implement Chapter 3 "How to apply this package to RZ/A1 Framework" before actual operation.

- RZ/A1H Group, RZ/A1LU Group RZ/A1 Framework Quick Start Guide (R01AN3639)

6. Restrictions

There are no restrictions on this package.

7. Precautions

The Precautions of this package are shown as follow.

Table 7-1 Documents of this package

No	Type	Description
1	SDHI	There is a difference between the document "RZ/A1 SD memory card driver software library user's manual" and the source code of "SDHI driver" included in this package. The content of the difference is the operation mode specified at card mounting. Please refer to the following difference contents together, when referring to the above document. - Section 3.2 Library Function Table 3.4 Two types related to WP(Write Protect) are added to the operation mode specified by the second argument "mode" of the function sd_mount(). The following macro definitions are added in the file <sdif.h>. 1. Detect of WP# terminal: SD_MODE_WP_ENA(0x0000): Enable SD_WP# terminal detection SD_MODE_WP_DIS(0x0200): Disable SD_WP# terminal detection 2. Polarity specification of WP# terminal *1: SD_MODE_WP_LOW(0x0000): When the level of SD_WP# is Low, judge that it is in a write protect state SD_MODE_WP_HIGH(0x0400): When the level of SD_WP# is High, judge that it is in a write protect state *1: "Detect of WP# terminal" = Valid only when SD_MODE_WP_ENA

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Revision History

Rev.	Date	Revised Contents			
		No	Type	Description	Remark
2.01	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: *.ld 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	Overall	Fixed issues of the setting of "reference project" in each sample project (Missing reference of other required projects)	.project files under Software\App directory
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	Sample Program	Fixed an issue of “SDHI FileSystem sample program”, that read/write buffer is not put on un-cached RAM area. And, modified file open error log message of “SDHI FileSystem sample program” to clarify necessity of File System Library replacement.	Modification points: Software\App\ driver_sample\sdhi\ sample1\main.c
		3	Others	Modified words and terms of readme_sfboot_e.txt of each sample program to accommodate Quick Start Guide.	Modification points: readme_sfboot_e of each sample program folder.
		4	Others	Added about non-disclosure agreement and SD Host/Ancillary Product License Agreement (SD HALA) at Introduction of this document.	Document\ReleaseNote \r01an3895*.pdf
1.00	Jun 16, 2017	-		First Edition issued	-

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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