RZ/A2M Group

RZ/A2M Software Core Package V2.00 Release Note

R01AN4583EJ0200
Rev.2.00
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Introduction

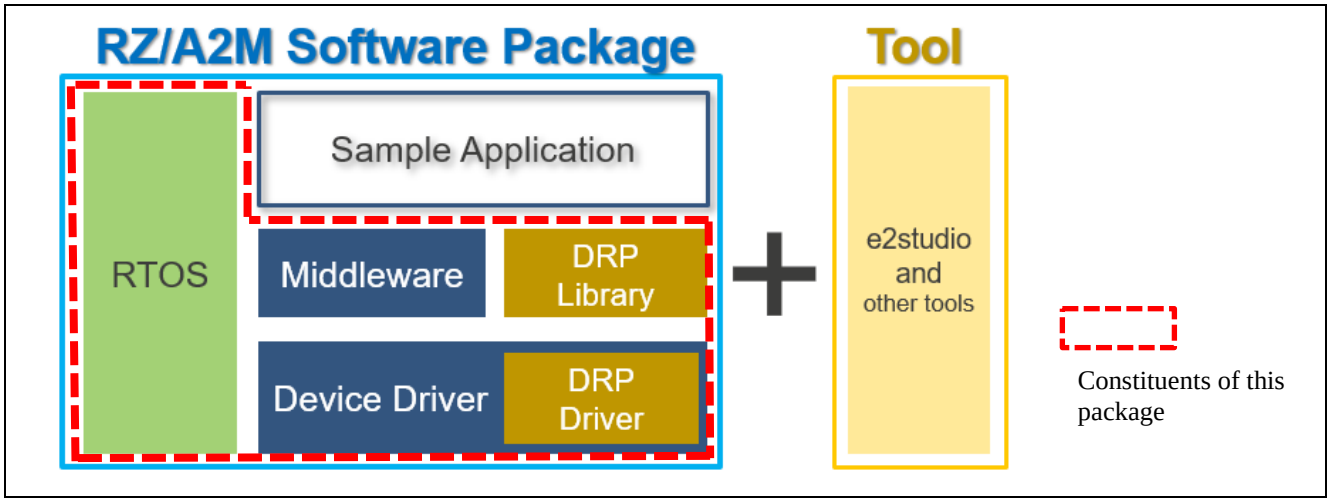
This software package for RZ/A2M is one of RZ/A2M Software Package and consists of Renesas provided drivers, middleware, and RTOS. You can add new functions to your product of RZ/A2M using this package easily.

The executable sample program which is made based on this package is published on Renesas web site as RZ/A2M Group RZ/A2M Simple Applications Package (R01AN4494), RZ/A2M Group 2D Barcode Package (R01AN4487), and RZ/A2M Group IRIS Package(R01AN4584).

- RZ/A2M FreeRTOS Software Package site:
  https://www.renesas.com/products/software-tools/software-os-middleware-driver/software-package/rza2-software-development-kit-free-rtos.html

RZ/A2M Group RZ/A2M Simple Applications Package (R01AN4494), RZ/A2M Group 2D Barcode Package (R01AN4487), and RZ/A2M Group IRIS Package(R01AN4584) includes only required functions (drivers / middleware / RTOS) by each sample program, from this package's constituent.

User can add each function (drivers / middleware / RTOS) of this package to sample program. Please refer to section 3 for more detail.



Position of RZ/A2M Software Core Package

Target Device

RZ/A2M

Contents

1. Overview

Table 1.1 lists software bundled in this package.

"RZ/A2M Group RZ/A2M Simple Application Package" (R01AN4494), "RZ/A2M Group 2D Barcode Package" (R01AN4487), and "RZ/A2M Group IRIS Package" (R01AN4584) include sample programs using these pieces of software. Note that this package includes no application and no project.

Table 1.1 Software bundled in this package

Directory	Peripheral device	Description
generate\drivers\r_cache	L1 / L2 cache	L1 and L2 cache
generate\drivers\r_cpg	Clock Pulse Generator	Clock settings for LSI
generate\drivers\r_gpio	GPIO	GPIO driver
generate\drivers\r_intc	Interrupt Controller	Driver for controlling interrupt
generate\drivers\r_mmu	Memory Management Unit	Driver to control memory attribute
generate\drivers\r_stb	Power-Down Modes	Driver to control stand-by mode
generate\os_abstraction	-	OS abstraction wrapper
generate\os_abstraction_freertos	-	OS abstraction wrapper(FreeRTOS)
generate\sc_drivers\r_cbuffer	-	Ring buffer
generate\sc_drivers\r_ceu	Capture Engine Unit	Driver to capture the image from camera via parallel interface
generate\sc_drivers\r_dmac	Direct Memory Access Controller	Driver to control DMAC
generate\sc_drivers\r_drp	Dynamic Reconfigurable Processor	DRP driver
generate\sc_drivers\r_ether	Ethernet Contoroller	Driver to communicate with other board via LAN
generate\sc_drivers\r_jcu	JPEG Codec Unit	Driver to control JPEG
generate\sc_drivers\r_mipi	MIPI CSI-2 Interface Video Input Module	Driver to capture the image from camera via MIPI CSI-2 interface
generate\sc_drivers\r_ostm	OS Timer	OS Timer driver
generate\sc_drivers\r_riic	I2C Bus Interface	Driver to control other devices via I2C bus.
generate\sc_drivers\r_rvapi	-	Video Application Interface
generate\sc_drivers\r_scifa	Serial Communications Interface with FIFO	Driver to control both asynchronous and clock synchronous serial communication.
generate\sc_drivers\r_vdc	Video Display Controller 6	Driver to capture the image from camera via parallel interface, and driver to display.
generate\system	-	Common files for the system
src\freertos	-	FreeRTOS v10.0.0

2. Operation Confirmation Conditions

Table 2.1 Peripheral device used(1/2)

Peripheral device	Usage
MCU used	RZ/A2M
Operating frequency[MHz] (Note)	CPU Clock (Iφ) : 528MHz Image processing clock (Gφ) : 264MHz Internal Bus Clock (Bφ) : 132MHz Peripheral Clock 1 (P1φ) : 66MHz Peripheral Clock 0 (P0φ) : 33MHz QSPI0_SPCLK : 66MHz CKIO : 132MHz
Operating voltage	Power supply voltage (I/O): 3.3 V Power supply voltage (either 1.8V or 3.3V I/O (PVcc SPI)) : 3.3V Power supply voltage (internal): 1.2 V
Integrated development environment	e2 studio V7.3.0
C compiler	"GNU Arm Embedded Tool chain 6-2017-q2-update" compiler options(except directory path) Release: -mcpu=cortex-a9 -march=armv7-a -marm -mthumb-interwork -mlittle-endian -mfloat-abi=hard -mfpu=neon -mno-unaligned-access -Os -ffunction-sections -fdata-sections -Wunused -Wuninitialized -Wall -Wextra -Wmissing-declarations -Wconversion -Wpointer-arith -Wpadded -Wshadow -Wlogical-op -Waggregate-return -Wfloat-equal -Wnull-dereference -Wmaybe-uninitialized -Wstack-usage=100 -fabi-version=0 Hardware Debug: -mcpu=cortex-a9 -march=armv7-a -marm -mthumb-interwork -mlittle-endian -mfloat-abi=hard -mfpu=neon -mno-unaligned-access -Og -ffunction-sections -fdata-sections -Wunused -Wuninitialized -Wall -Wextra -Wmissing-declarations -Wconversion -Wpointer-arith -Wpadded -Wshadow -Wlogical-op -Waggregate-return -Wfloat-equal -Wnull-dereference -Wmaybe-uninitialized -g3 -Wstack-usage=100 -fabi-version=0

Note: The operating frequency used in clock mode 1 (Clock input of 24MHz from EXTAL pin)

Table 2.2 Peripheral device used(2/2)

Operation mode	Boot mode 3 (Serial Flash boot 3.3V)
Terminal software communication settings	Communication speed: 115200bps Data length: 8 bits Parity: None Stop bits: 1 bit Flow control: None
Board to be used	RZ/A2M CPU board RTX921053C00000BE RZ/A2M SUB board RTK79210XXB00000BE
Device (functionality to be used on the board)	Serial flash memory allocated to SPI multi-I/O bus space (channel 0) Manufacturer : Macronix Inc. Model Name : MX25L51245GXD RL78/G1C (This device communications the host PC by convert USB Communication and Serial Communication.) LED1 EEPROM R1EX24128ASAS0A(Renesas) Ethernet PHY RTL8201FL-VB-CG(Realtek)

3. How to Use This Package

Drivers bundled in this package can be add/remove/configure using Smart Configurator, a function of e2 studio v7.3.

For detail, refer to “RZ/A2M Group RZ/A2M Software Package Quick Start Guide”(R01QS0027), bundled in each application packages.

4. Reference Application Notes

Following application notes are related in this package.

- Application Packages (needed downloading)
  - RZ/A2M Group RZ/A2M Simple Application Package(R01AN4494)
    includes simple executable projects using software bundled in this package.
  - RZ/A2M Group 2D Barcode Package(R01AN4487)
    includes 2D barcode sample projects using software bundled in this package.
  - RZ/A2M Group IRIS Package(R01AN4487)
    includes iris detection sample projects using software bundled in this package.

- Documents for components (bundled in this package)
  - RZ/A2M Group GPIO Driver Application Note (R01AN4395)
    includes driver software for GPIO use.
  - RZ/A2M Group DMAC Driver Application Note (R01AN4467)
    includes driver software for DMAC use.
  - RZ/A2M Group STB Driver Application Note (R01AN4496)
    includes driver software for STB use.
  - RZ/A2M Group OSTM Driver Application Note (R01AN4497)
    includes driver software for OSTM use.
  - RZ/A2M Group MMU Driver Application Note (R01AN4498)
    includes driver software for MMU use.
  - RZ/A2M Group CPG Driver Application Note (R01AN4499)
    includes driver software for CPG use.
  - RZ/A2M Group INTC Driver Application Note (R01AN4500)
    includes driver software for INTC use.
  - RZ/A2M Group Cache Driver Application Note (R01AN4501)
    includes driver software for Cache use.
  - RZ/A2M Group SCIFA Driver Application Note (R11AN0307)
    includes driver software for SCIFA use.
  - RZ/A2M Group CEU Driver Application Note (R01AN4474)
    includes driver software for CEU use.
  - RZ/A2M Group DRP Driver User's Manual (R01US0355)
    includes driver software for DRP use.
  - RZ/A2M Group DRP Library User's Manual (R01US0367)
    includes libraries for DRP.

— RZ/A2M Group Ethernet Driver Application Note (R01AN4642)
includes driver software for Ethernet use.

— RZ/A2M Group JCU Driver Application Note (R01AN4456)
includes driver software for JCU use.

— RZ/A2M Group MIPI Driver Application Note (R01AN4481)
includes driver software for MIPI use.

— RZ/A2M Group Video Utility Application Note (R01AN4476)
includes driver software for Video use.

— RZ/A2M Group Video Display Controller and Sprite Engine Sample Driver Application Note (R01AN4475)
includes driver software for VDC use and SPE use.

- The Other Documents (needed downloading)

— RZ/A2M Group RZ/A2M Software Package Quick Start Guide (R01QS0027)
A guide for using RZ/A2M Software Package. This file is bundled in Application Packages.

— RZ/A2M Group Video Register Definition file iodefine.h (R01AN4585)
Describes I/O registers of RZ/A2M and how to use them.

5. Restrictions

The Restrictions of this package are shown as follow.

Table 5-1 Restrictions

No.	Type	Description
1	Driver (DMAC)	The DMAC driver supports only memory-to-memory transfers.
2	Driver (DRP)	In the case that DRP driver is added to the project using Smart Configurator, include path will not be added to assembly options. It is necessary to added assembly options as follows. example) In case of using **Bayer2Grayscale** library. "${ProjDirPath}/generate/sc_drivers/r_drp\drp_lib/**r_drp_bayer2grayscale**" The pass of bold face depends on the library you want to use.
3	Driver (RIIC)	Slave mode is not supported.
4	Driver (RIIC)	SMBus format is not supported.
5	Driver (RIIC)	When you add the component configuration with SmartConfigurator, do not register settings where different configurations refer to the same channel number.
6	Driver (SCIFA)	When you add the component configuration with SmartConfigurator, do not register settings where different configurations refer to the same channel number.

6. Precautions

The Precautions of this package are shown as follow.

Table 6-1 Precautions

No.	Type	Description
1	All	This package is incompatible with RZ/A2M Simple Application Package **V1.00** or RZ/A2M 2D Barcode Package **V1.00**. Please use RZ/A2M Simple Application Package **V2.00** or RZ/A2M 2D Barcode Package **V2.00** because of including the similar project.

7. Reference Documents

User's Manual: Hardware

RZ/A2M Group User's Manual: Hardware
The latest version can be downloaded from the Renesas Electronics website.

RTX921053C00000BE (RZ/A2M CPU board) User's Manual
The latest version can be downloaded from the Renesas Electronics website.

RTK79210XXB00000BE (RZ/A2M SUB board) User's Manual
The latest version can be downloaded from the Renesas Electronics website.

ARM Architecture Reference Manual ARMv7-A and ARMv7-R edition Issue C
The latest version can be downloaded from the ARM website.

ARM Cortex™-A9 (Revision: r4p1) Technical Reference Manual
The latest version can be downloaded from the ARM website.

ARM Generic Interrupt Controller Architecture Specification - Architecture version 2.0
The latest version can be downloaded from the ARM website.

ARM CoreLink™ Level 2 Cache Controller L2C-310 (Revision: r3p3) Technical Reference Manual
The latest version can be downloaded from the ARM website.

Technical Update/Technical News

The latest information can be downloaded from the Renesas Electronics website.

User's Manual: Development Tools

Integrated development environment e2studio User’s Manual can be downloaded from the Renesas Electronics website.
The latest version can be downloaded from the Renesas Electronics website.

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Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	Sep. 14, 2018	-	First Edition Issued
2.00	Dec. 28, 2018	3	Added following drivers: • r_drp, r_ether, r_riic
		3	Moved following drivers to “generate\sc_drivers”: • r_ceu, r_jcu, r_mipi, r_rvapi, r_vdc
		4,6	Changed supporting version of e2studio to v7.3
		5	Added EEPROM and Ethernet PHY to “device”.
		6	Supported Smart Configurator function of e2 studio.
		7	Added following documents to “Reference Documents”: • RZ/A2M Group IRIS Package • RZ/A2M Group CEU Driver Application Note • RZ/A2M Group DRP Driver User’s Manual • RZ/A2M Group DRP Library User’s Manual • RZ/A2M Group Ethernet Driver Application Note • RZ/A2M Group JCU Driver Application Note • RZ/A2M Group MIPI Driver Application Note • RZ/A2M Group Video Utility Application Note • RZ/A2M Group RZ/A2M Software Package Quick Start Guide • RZ/A2M Group Video Register Definition file iodefine.h
		9	Added the assembler include path issue to the restriction.

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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