RZ/A3UL

Release Note for RZ/A Flexible Software Package

Introduction

This is the release note for RZ/A3UL Flexible Software Package V3.0.0 running on Arm® Cortex®-A55 core of RZ/A3UL.

Target Device

RZ/A3UL

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1. Release Notes

Flexible Software Package (FSP) for Renesas RZ/A3UL MPU version 3.0.0.

You can download the FSP for this release from here.

With respect to the usage of FSP, please refer to the Getting Started with RZ/A Flexible Software Package for setup instructions, hardware details, and related links.

2. Proven Environment

- e^2 studio: e^2 studio 2024-04
- GCC cross-toolchain for A-profile cores: 13.2.rel1-202310 - AArch64 bare-metal target (aarch64-none-elf)

3. Supported RZ/A MPU Kits

The kits supported by the current version are shown below.

RZ/A3UL MPU:

- RZ/A3UL-Evaluation-Board-Kit (QSPI version)
- RZ/A3UL-Evaluation-Board-Kit (Octal-SPI version)

4. Third Party Software

These related software solutions are included alongside RZ/A3UL FSP:

- Amazon FreeRTOS Kernel: 10.6.1
- Amazon FreeRTOS+TCP: 4.0.0
- Amazon FreeRTOS+FAT: 08d0cff4
- Microsoft Azure RTOS FileX: 6.2.1
- Microsoft Azure RTOS GUIX: 6.2.1
- Microsoft Azure RTOS NetX Duo: 6.2.1
- Microsoft Azure RTOS ThreadX: 6.2.1
- Microsoft Azure RTOS USBX: 6.2.1
- SEGGER J-Link: 7.92c

For details on the license of these software, please refer to the repository of each software.

5. Supported Components

Category	Components	Supported Devices
		RZ/A3UL
OS	FreeRTOS	✓
	Azure RTOS	✓
Middleware	FreeRTOS+TCP	✓
	FreeRTOS+FAT	✓
	FileX	✓
	GUIX	✓
	NetX Duo	✓
	USBX	✓
HAL Driver	ADC (r_adc_c)	✓
	CANFD (r_canfd)	✓
	CRU (r_cru)	✓
	LCDC (r_lcdc)	✓
	DMAC (r_dmac)	✓
	Ether (r_gether, r_gether_phy)	✓
	GTM (r_gtm)	✓
	I2C Master (r_riic_master)	✓
	I2C Slave (r_riic_slave)	✓
	INTC_IRQ (r_intc_irq)	✓
	INTC_NMI (r_intc_nmi)	✓
	INTC_TINT (r_intc_tint)	✓
	ISU (r_isu)	✓
	MTU3 (r_mtu3)	✓
	SSI (r_ssi)	✓
	RSPI (r_rspi)	✓
	SCI_uart (r_sci_uart)	✓
	SCIF_uart (r_scif_uart)	✓
	WDT (r_wdt)	✓
	SDHI (r_sdhi)	✓
	USB HHID (r_usb_hhid)	✓
	USB HMSC (r_usb_msc)	✓
	USB PCDC (r_usb_pcdc)	✓
	SPIBSC (r_spibsc)	✓

6. Features Added

- NetX Duo (NAT).

7. Improvement

- Common FSP API support.
- Support FPU feature to ThreadX configuration.
- Support DMAC configuration to I2C Slave driver.
- Support RS-485 feature to SCI Driver.
- Update USBX related description in RZ/A Flexible Software Package Documentation.
- Add USBX PCDC and HUVC Examples to RZ/A Flexible Software Package Documentation.

8. Bug Fixes

- Fixed the issue that pin configuration is not linked to the configuration of some drivers.

9. Limitations

- RZ/A FSP runs under AArch64 mode only and won't run under AArch32 mode.
- USB2.0 Host driver does not support multistage hub connections.
- Up to 2 devices can be connected under the Hub with USB driver.
- When using ISU driver or CRU driver, do not select RZ/A3UL Evaluation Board Kit OCTAL Edition(eXecute-in-place) as Board: in Device Selection.

10. Known Issues

None

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	28.Jul.22	-	-
1.10	30.Sep.22	-	Supports ADC and WDT drivers.
1.20	26.Dec.22	-	Supports CANFD, MTU3a, RIIC(Slave), SCI, SDHI, SPIBSC, USB2.0 Function CDC and USB2.0 Host MSC drivers.
1.21	29.Mar.23	-	Fixed issues with DMA Driver, LDCD Driver, CRU Driver, FreeRTOS.
2.00	30.Jun.23		Supports AzureRTOS middleware and ISU driver.
2.01	22.Sep.23	-	Azure IoT Middleware for Azure RTOS support added.
2.02	29.Feb.24	-	Fixed issues with DMA Driver, RIIC Driver, Ethernet Driver, and UVC middleware.
3.0.0	26.Apr.24	3	Added Supported Components
		2, 3, 4	Updated section 1, 2, 3, 4, 6, 7 and 8 in accordance with the update in RZ/A FSP v3.0.0.

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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