RZ/V2L ISP Support Package Release Note Version 1.30

Release Note

Introduction

This release note describes the contents of the ISP Support Package Release Note and how to construct its operating environments.

Note: This package should be installed only when using Simple ISP.

Contents

1. Release Items

The release items in the ISP Support Package Release Note are as following.

- **Name and Version**

  ISP Support Package Release Note Version.1.30

- **Target Evaluation Board**

  RZ/V2L SMARC Board

  Note: For the settings of RZ/V2L Evaluation Board, please refer to the SMARC EVK of RZ/V2L Linux Start-up Guide (R01US0617). Refer to “4 Reference Board Setting” for necessary equipment other than the RZ/V2L Evaluation Board.

  The CMOS sensor (OV5645) in the Coral camera is no longer available and should not be used for mass production. Any software support provided is for evaluation purposes only.

- **File Contents**

  Table 1-1 shows the list of contents in r11an0561ej0130-rzv2l-isp-sp.zip. shows the list of contents in rzv2l_meta-isp_ver1.30.tar.gz.

Table 1-1 File Contents

Folder / Filename	Explanation
r11an0561ej0130-rzv2l-isp-sp.zip	ISP support package
r11an0561ej0130-rzv2l-isp-sp.pdf	This document.
rzv2l_isp-sample-application_ver1.30.tar.gz	Sample source codes of RZ/V2L Simple ISP Sample Application.
meta-rz-simple-isp.tar.gz	Recipe to add ISP support to Linux Package.
r11an0563ej0130-rzv2l-simple-isp.pdf	RZ/V2L Simple ISP Sample Application.
r11uz0105ej0130-rzv2l-simple-isp.pdf	RZ/V2L Simple ISP User's manual.
r70zz0221ej0102-rzv2l-isp-sp-note-of-caution.pdf	RZ/V2L ISP Support Package note of caution.
rzv2l_isp-adjustment-tool_ver1.30.tar.gz	Adjustment tool of RZ/V2L Simple ISP*

Note: Please refer readme.txt included rzv2l_isp_adjustment-tool ver1.30.tar.gz.

- **Features**

  Major updates:

  None

- **Related Packages**

  1. RZ/V Verified Linux Package V3.0.4
  2. RZ/V2L DRP-AI Support Package Version.7.40

- **Related Documents**
  1. RZ/V Verified Linux Package Version 3.0.4 Release Note (R01US0565)
  2. SMARC EVK of RZ/V2L Linux Start-up Guide (R01US0617)
  3. RZ/V2L DRP-AI Support Package Release Note (R11AN0549)
  4. RZ/V2L DRP-AI Sample Application Note (R11AN0573)
  5. RZ/V2L ISP Support Package note of caution(R70ZZ221)

- **Restrictions**

  None.

2. Build

This chapter will explain how to build the RZ/V2L ISP Support Package. The following packages are required to build this package.

1. RZ/V2L Linux Package
2. RZ/V2L DRP-AI Support Package

Note: In order to run the sample application and adjustment tool, please build with Mali Graphic Library. Please refer to RZ/V Verified Linux Package Version 3.0.4 Release Note (R01US0565) for more information.

Note: Before executing bitbake commands, apply all recipes in above packages.

2.1 Preparation

Refer to the “RZ/V2L DRP-AI Support Package Release Note” and follow the steps described in the “3. Build” chapter.

2.2 Add the Environmental Variable

As in the “RZ/V2L DRP-AI Support Package Release Note”, set the working directory as the environmental variable.

```
$ export WORK=/home/user/user_work
```

Note: Specify the working directory in red above according to your machine. The example above uses “user/user_work”.

2.3 Unzip the ISP Support Package Recipe

Place the r11an0561ej0130-rzv2l-isp-sp.zip to the working directory and run the following command.

```
$ cd $WORK
$ unzip ./r11an0561ej0130-rzv2l-isp-sp.zip
$ tar zxvf ./r11an0561ej0130-rzv2l-isp-sp/meta-rz-simple-isp.tar.gz
```

After executed the command, ‘meta-rz-simple-isp’ directory is created under ‘meta-rz-features’ directory.

This figure shows an example of the folder directory structure after executed this command.

```
WORK
    build
    meta-gplv2
    meta-openembedded
    meta-qt5
    meta-renesas
    meta-rz-features
        meta-guis
        meta-rz-bootloaders
        meta-rz-drpai
        meta-rz-graphics
        meta-rz-simple-isp
    meta-virtualization
    poky
    r11an0561ej0130-rzv2l-isp-sp
    rzv2l_drpai-driver
```

2.4 Set the build environment variables

Run the following command to set the environment variable for the build.

Note: The environmental variable will be reset if the terminal is closed. Please run the command for each time you open the terminal.

```
$ cd $WORK
$ TEMPLATECONF=$PWD/meta-renesas/meta-rzv2l/docs/template/conf/\
 source poky/oe-init-build-env build
$ bitbake-layers add-layer ../meta-rz-features/meta-rz-simple-isp
```

2.5 Build

Run the bitbake command to build the Linux Package.

```
$ cd $WORK/build
$ MACHINE=smarc-rzv2l bitbake core-image-weston
```

After the Build, the following files will be generated under `$WORK/build/tmp/deploy/images/smarc-rzv2l`.

Table 2-1 Generated Files after Build

Filename	Name
Image-smarc-rzv2l.bin	Linux Kernel Image
Image-r9a07g054l2-smarc.dtb	Linux Device Tree File
core-image-weston-smarc-rzv2l.tar.bz2	A set of root filesystem
bl2_bp-smarc-rzv2l_pmic.srec	S-record files for boot loader
fip-smarc-rzv2l_pmic.srec	

Refer to the “RZ/V2L DRP-AI Support Package Release Note” and follow the steps described in the “6. SDK” chapter.

3. Boot

This chapter will explain how to boot the system applied by RZ/V2L ISP Support Package. There are two ways to boot. One from the network and another boot from the SD Card.

3.1 Preparation

Refer to “4.2 Preparation” or “5.2 Preparation” of “RZ/V2L DRP-AI Support Package Release Note” to prepare for booting. “4.2 Preparation” is the preparation for Network booting and “5.2 Preparation” is the preparation for SD Card booting.

In addition, prepare the sensor “Google Coral Camera*” attached to the RZ/V2L Evaluation board with CS mount lens and video monitor connecting by HDMI (Type D) cable. Table 3-1 lists necessary equipment for network booting and Table 3-2 lists necessary equipment for SD Card booting.

The RZ/V2L Evaluation Board connected sensor and video monitor looks like below.

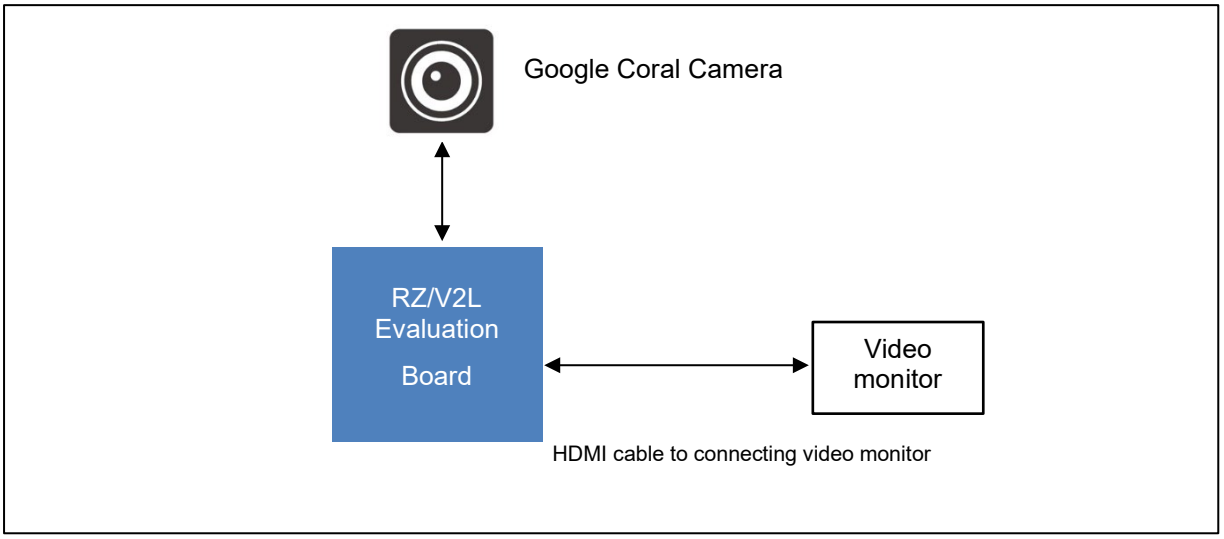

Figure 3-1 Hardware Configuration

Table 3-1 Necessary Equipment for Network Booting

Equipment	Details
RZ/V2L Evaluation Board	RZ/V2L Linux bootloaders and u-boot are written to eMMC*
- Google Coral Camera	Attached to the RZ/V2L Evaluation Board
Linux PC	Used as build/debug environment for RZ/V2L Linux software.
- OS	Ubuntu 20.04 LTS 64-bit OS must be used.
- TFTP server	Used for downloading the Linux kernel to board.
- NFS server	Used for mounting rootfs via NFS.
Serial to Micro USB Cable	Used for serial communication between PC and board.
Ethernet crossover cable	Used for ethernet communication between Linux PC and board.
HDMI (Type D) cable	Used for connecting video monitor.
Video monitor	Used for monitoring sensor images. Requires support for HDMI input and Full HD display.

Note: Please write the u-boot configuration to the eMMC when you boot the board for the first time.

Table 3-2 Necessary Equipment for SD Card Booting

Equipment	Details
RZ/V2L Evaluation Board	RZ/V2L Linux bootloaders and u-boot are written to eMMC*
- Google Coral Camera	Attached to the RZ/V2L Evaluation Board
Linux PC	Used as environment for building/debugging/creating microSD card.
- OS	Ubuntu 20.04 LTS 64-bit OS must be used.
- SD card reader	Used for creating microSD card.
Windows PC	Used for Serial communication display.
- OS	Windows 10
- Terminal software	Used for controlling serial console of the target board. Operation Environment: Tera Term
- Serial port driver	Virtual COM Port driver which enables to communicate Windows PC and the target board via USB which is virtually used as serial port.
Serial to Micro USB Cable	Used for serial communication between PC and board.
microSD card	Used for SD Card Booting. Only SDHC is supported. Operation Environment: Transcend USH-I microSD 300S 16GB
HDMI (Type D) cable	Used for connecting video monitor.
Video monitor	Used for monitoring sensor images. Requires support for HDMI input and Full HD display.

Note: Please write the u-boot configuration to the eMMC when you boot the board for the first time.

3.2 Network Booting

Refer to the “RZ/V2L DRP-AI Support Package Release Note” and follow the steps described in the “4. Network Booting” chapter.

3.3 SD Card Booting

Refer to the “RZ/V2L DRP-AI Support Package Release Note” and follow the steps described in the “5. SD Card Booting” chapter.

Version History

Ver.	Date	Description	
		Page	Summary
0.50	29 Oct, 2021	-	Issued.
1.00	24 Dec 2021	ALL	- Newly created Simple ISP User's Manual - Newly created Simple ISP Sample Application Note - Updated Linux Package v1.00
1.10	28 April 2022	3 ALL	- Added feature - Resolved the restriction of "Set V4L2 Streaming to off in advance when using the Reset function of AI Inference". - Resolved the restriction of "Need to prepare for at least 5 frame buffers for V4L2" by changing the specification. - Removed the restriction of " Network booting is not supported " from this package, because the network boot function has been improved. - Updated Linux Package v1.0.1 - Updated DRP-AI Package v7.0.0 - Extension of ISP information setting command from v1.00 to v1.10 (Refer to sub-section 2.3.2 of Simple ISP User's manual)
1.20	29 July 2022	-	- Added feature - Updated RZ/V2L Verified Linux Package V3.00 - Updated DRP-AI Package v7.10
1.21	31 Jun 2023	-	- Updated RZ/V2L Verified Linux Package V3.02 - Updated DRP-AI Package v7.30
1.30	31 July 2023	4 6,7,8 -	- Related Documents No.5 added. - Build command and directory structure has been changed - Updated RZ/V2L Verified Linux Package V3.04 - Updated DRP-AI Package v7.40

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.

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.
5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
6. Renesas Electronics products are classified according to the following two quality grades: “Standard” and “High Quality”. The intended applications for each Renesas Electronics product depends on the product’s quality grade, as indicated below.
   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.
   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

   Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user’s manual or other Renesas Electronics document.
7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION (“Vulnerability Issues”). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
8. When using Renesas Electronics products, refer to the latest product information (data sheets, user’s manuals, application notes, “General Notes for Handling and Using Semiconductor Devices” in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
14. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note1) “Renesas Electronics” as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.

(Note2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

(Rev.5.0-1 October 2020)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

Contact information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:
www.renesas.com/contact/.