

RZ/V Verified Linux Package

Version 3.0.6

R01US0565EJ0107
Rev. 1.07
Jun. 28, 2024

Release Note

Introduction

This release note describes the contents, building procedures and important points of the RZ/V Verified Linux Package (hereinafter referred to as “VLP/V”).

Please refer to the following documents for build instructions specific to each target device:

- r01us0617ej0103-rz-v(Linux Start-up Guide RZV2L).pdf
- r01us0527ej0150-rz-v(StartUp_Guide_V2M).pdf
- r01us0578ej0130-rz-v(StartUp_Guide_V2MA).pdf

Contents

1. Release Items	2
2. Components	5
3. Changes	6
3.1 RZ/V2L, RZ/V2M and RZ/V2MA	6
4. Restrictions	7
5. Notes	8
5.1 Notes	8
5.2 Memory Map	9
5.2.1 RZ/V2L	9
5.2.2 RZ/V2M	10
5.2.3 RZ/V2MA	12
6. Appendix.....	13
7. Revision History	14

1. Release Items

- **Name and version**

RZ/V Verified Linux Package

Version 3.0.6 (hereinafter referred to as “VLP/V v3.0.6”)

- **Distribution method**

Please visit the site below and create an account to download the packages. This site is for the entire RZ Family which includes the RZ/V series. Basic packages of VLP/V v3.0.6 which are listed in 0 can be downloaded.

RZ/V2L product page:

<http://www.renesas.com/RZV2L>

RZ/V2M product page:

<http://www.renesas.com/RZV2M>

RZ/V2MA product page:

<http://www.renesas.com/RZV2MA>

RZ/V Verified Linux Package [5.10-CIP]:

<https://www.renesas.com/us/en/software-tool/rzv-verified-linux-package-510-cip>

- **Target board**

RZ/V2L Evaluation Board Kit PMIC version (*):

- RZ/V2L SMARC Module Board
- RZ SMARC Series Carrier Board

RZ/V2M Evaluation Board Kit:

- RZ/V2M EVK
- RZ SMARC Series Carrier Board

RZ/V2MA Evaluation Board Kit:

- SBEV-RZ/V2MA-KIT

(*) “RZ/V2L Evaluation Board Kit PMIC version” include the RZV2L SMARC Module Board and the RZ SMARC Series Carrier 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.

- **Build Environment**

Linux Host PC

OS: Ubuntu 20.04 LTS (64 bit OS must be used.)

20.04 inside a docker container also OK.

200GB free space on HDD or SSD is necessary.

- **Verified functions**

Linux BSP

- Linux Kernel
- Linux Drivers
- Graphics Libraries
- Codec Libraries

GUI Framework

- Qt (LGPL version)

- **File contents**

VLP/V is delivered by the files listed in .

Table 1 RZ/V Verified Linux Package

Basic packages

File	Description
RTK0EF0045Z0024AZJ-v3.0.6.zip (*1)	Verified Linux Package. This file includes the Yocto recipe packages and the necessary documents.
rzv_vlp_v3.0.6.tar.gz (*1)	Yocto recipe packages
0001-rz-common-recipes-debian-buster-glibc-update-to-v2.2.patch	Patch file to update. See the “5. Note” section. This file is optional.
r01us0565ej0107-rz-v(Release Note).pdf	This document
r01us0617ej0103-rz-v(Linux Start-up Guide RZV2L).pdf	Documents describing booting method and the required settings of bootloader for RZ/V2L .
r01us0527ej0150-rz-v(StartUp_Guide_V2M).pdf	Documents describing booting method and the required settings of bootloader for RZ/V2M .
r01us0578ej0130-rz-v(StartUp_Guide_V2MA).pdf	Documents describing booting method and the required settings of bootloader for RZ/V2MA .
oss_pkg_rzv_v3.0.6.7z (3.1GB) (1*)	Open source software packages See the Note below before download

(*1) Yocto recipe and Open source software packages are provided “AS IS” with no warranty and the license which is described in the source code. Please check the contents of the license, then consider the applicability to the product carefully.

Note) Open source software packages contain all source codes of OSSs except for Linux kernel. These are the same versions of OSSs used when VLP/V was verified.
If you are just evaluating VLP/V and RZ/V series, open source software packages are not mandatory to use.
 Usually, all the software can be built without using these files if your build machine is connected to the Internet.

Open source software packages are required for an “offline” environment. The word “offline” means an isolated environment which does not connect to any network. VLP/V can always build images in this “offline” environment by using these packages without affected from changes of original repositories of OSSs. Also, this “offline” environment always reproduces the same images as the images which were verified by Renesas. Note that if you build without using open source software packages, there are possibilities to use different source codes than Renesas used due to the implicit changes of the repositories of OSSs.

Optional packages (*1)

File ("XX" is replaced by "EN" or "JP".)	Description
RTK0EF0045Z13001ZJ-v1.2.2_XX.zip (Evaluation version) RTK0EF0045Z14001ZJ-v1.2.2_rzv_XX.zip (Unrestricted version)	RZ MPU Graphics Library for RZ/G2L, RZ/G2LC and RZ/V2L . This provides graphics function compliant with the OpenGL ES standard. These libraries are tested with VLP/V v3.0.6.
RTK0EF0045Z15001ZJ-v1.2.2_XX.zip (Evaluation version) RTK0EF0045Z16001ZJ-v1.2.2_rzv_XX.zip (Unrestricted version)	RZ MPU Video Codec Library for RZ/G2L, RZ/V2L . These libraries are tested with VLP/V v3.0.6.
RTK0EF0045Z89001ZJ-v1.0.1.zip	RZ/V2M Bootloader Packages. This package provides the required recipes for RZ/V2M boot loaders.
RTK0EF0045Z90001ZJ-v1.0.1.zip	RZ/V2MA Bootloader Packages. This package provides the required recipes for RZ/V2MA boot loaders.

(*1) Evaluation vs Unrestricted Version

There are two release versions: Evaluation and Unrestricted. Please note that both of these packages have the same exact functionality. The only difference is that when you execute an application that uses the evaluation version of the libraries, operation will automatically be stopped after a few hours. The unrestricted version does not have this time limitation. To acquire the unrestricted version, please contact Renesas to start the formal process of acquiring those releases.

Additional packages

File	Description
RTK0EF0045Z9006AZJ-v3.0.6.zip	BSP Manual Set for RZ/G2L, RZ/G2LC, RZ/G2UL, RZ/Five and RZ/V2L.
RTK0EF0112Z9000AZJ-v1.4.0.zip	BSP Manual Set for RZV2M.
RTK0EF0133Z9000AZJ-v1.2.0.zip	BSP Manual Set for RZV2MA.

Note) Detailed information regarding the configuration (Device tree) and usage of the device drivers contained in this VLP can be downloaded from Renesas.com. Please download the "BSP Manual Set".

For RZ/G2L and RZ/V2L

<https://www.renesas.com/document/oth/rzg2l-group-and-rzv2l-group-bsp-manual-set>

For RZ/V2M

<https://www.renesas.com/document/mah/rzv2m-linux-bsp-manual-set>

For RZ/V2MA

<https://www.renesas.com/document/oth/rzv2ma-linux-bsp-manual-set>

2. Components

The components which are commonly used in this release are listed in Table 2. Please also refer to the manifest file for details.

Please refer to:

```
$WORK/build/tmp/deploy/images/smarc-rzv2l/core-image-<image-name>-smarc-rzv2l.manifest
```

Note: [<image-name>](#)

```
RZ/V2L      :minimal, bsp, weston, qt
RZ/V2M,MA  :minimal, bsp
```

Table 2 Versions of commonly used components

Components	VLP/V v3.0.5	VLP/V v3.0.5-update3	VLP/V v3.0.6
Linux kernel	5.10.184-cip36	5.10.184-cip36	5.10.201-cip41
GCC	8.3.0 (Arm GCC 8.3-2019.03)	8.3.0 (Arm GCC 8.3-2019.03)	8.3.0 (Arm GCC 8.3-2019.03)
Glibc	2.28	2.28	2.28
Busybox	1.30.1	1.30.1	1.30.1
openssl	1.1.1n	1.1.1n	1.1.1n
gstreamer1.0	1.16.3	1.16.3	1.16.3
wayland	1.18.0	1.18.0	1.18.0
weston	8.0.0	8.0.0	8.0.0
Python3	3.8.13	3.8.13	3.8.18
Qt (LGPL version)	5.6.3	5.6.3	5.6.3
Docker	19.03.8-ce	19.03.8-ce	19.03.8-ce

3. Changes

This section describes the changes in this release from VLP/V v3.0.6, including new features and defect fixes.

3.1 RZ/V2L, RZ/V2M and RZ/V2MA

Table 3 Changes

Features	Description
Yocto	Poky: update to dunfell v23.0.31 (previous version is v23.0.26). meta-openembedded: update to the latest commit. Docker: need to cherry-pick a commit from poky to make it work normally. Correct typo of WIC image for eSD boot. Apply bug fix for kernel-module-mmng: fix user memory access error when flushing cache.
Kernel	Update the kernel version to v5.10.201-cip41(-rt17)
MTU3 Driver	Add support: PWM mode 1 and PWM complementary mode. Counting function. Clock source support
USB Function Driver	Fix 10 pipes for USBF of RZ/G2L Series, RZ/V2L, RZ/Five and RZ/G3S.
Ethernet Driver	Add TX/RX checksum offload support based on Biju's support to improve ethernet performance.
SCIF Driver	Use modulation extended mode for baud-rate higher than 115200 to make the clock more precise.
Optee	Remove all related Optee from meta-renesas. Move all Optee recipes (optee-os, optee-client, optee-test) to meta-rz-security. Add basic setting for RZ/G3S (no security support due no information). Add linux-renesas bbappend in meta-rz-security to enable optee in dts with option build.
RZ MPU Graphics Library (RZ/V2L)	Some bug fixes are included.
RZ MPU Graphics Video Codec Library (RZ/V2L)	Some bug fixes are included.

4. Restrictions

None.

5. Notes

5.1 Notes

Apply the following patch and build in the “online” environment. This step is required before executing the bitbake command. Refer to the section below in the “Linux Start-up Guide” for more information.

2.1 Building images to run on the board:

- “Decompress OSS files to “build” directory (Optional)”
- “Start a build”

(1) For updating glibc to v2.28-10+deb10u4

This patch updates glibc from v2.28-10+deb10u2 to v2.28-10+deb10u4 because v2.28-10+deb10u2 was removed from the network by the developer. **The build fails without this fix.**

```
$ cd ~/rzv_vlp_<package version>/meta-renesas
$ patch -p1 < .. RTK0EF0045Z0024AZJ-<package version>/0001-rz-common-recipes-\
debian-buster-glibc-update-to-v2.2.patch
```

Note) If you build in the “online” environment, all source codes will be downloaded from the repositories of each OSS via the internet when running bitbake command.

5.2 Memory Map

5.2.1 RZ/V2L

RZ/V2L SMARC board memory map is shown in Figure 1.

Physical Address	
0x00_4000_0000	Reserved Area (Size: 128MB)
0x00_47FF_FFFF 0x00_4800_0000	Kernel Area (Size: 256MB)
0x00_57FF_FFFF 0x00_5800_0000	Linux CMA (Size: 256MB)
0x00_67FF_FFFF 0x00_6800_0000	Reserved Area (Size: 128MB)
0x00_6FFF_FFFF 0x00_7000_0000	Kernel Area (Size: 256MB)
0x00_7FFF_FFFF 0x00_8000_0000	DRP-AI (*) (Size: 512MB)
0x00_9FFF_FFFF 0x00_A000_0000	Kernel Area (Size: 256MB)
0x00_AFFF_FFFF 0x00_B000_0000	udmabuf (Size: 64MB)
0x00_B3FF_FFFF 0x00_B400_0000	Simple ISP (Size: 48MB)
0x00_B6FF_FFFF 0x00_B700_0000	Kernel Area (Size: 144MB)
0x00_C000_0000	

Figure 1. Memory Map

Table 1. *: The area to store DRP-AI Object files. This area must be set to an address of 8bytes or less.

5.2.2 RZ/V2M

Note that the memory map for RZ/V2M Linux is set and fixed by U-Boot. Linux should use the area from 0x1_8000_0000h to 0x1F_FFFF_FFFF.

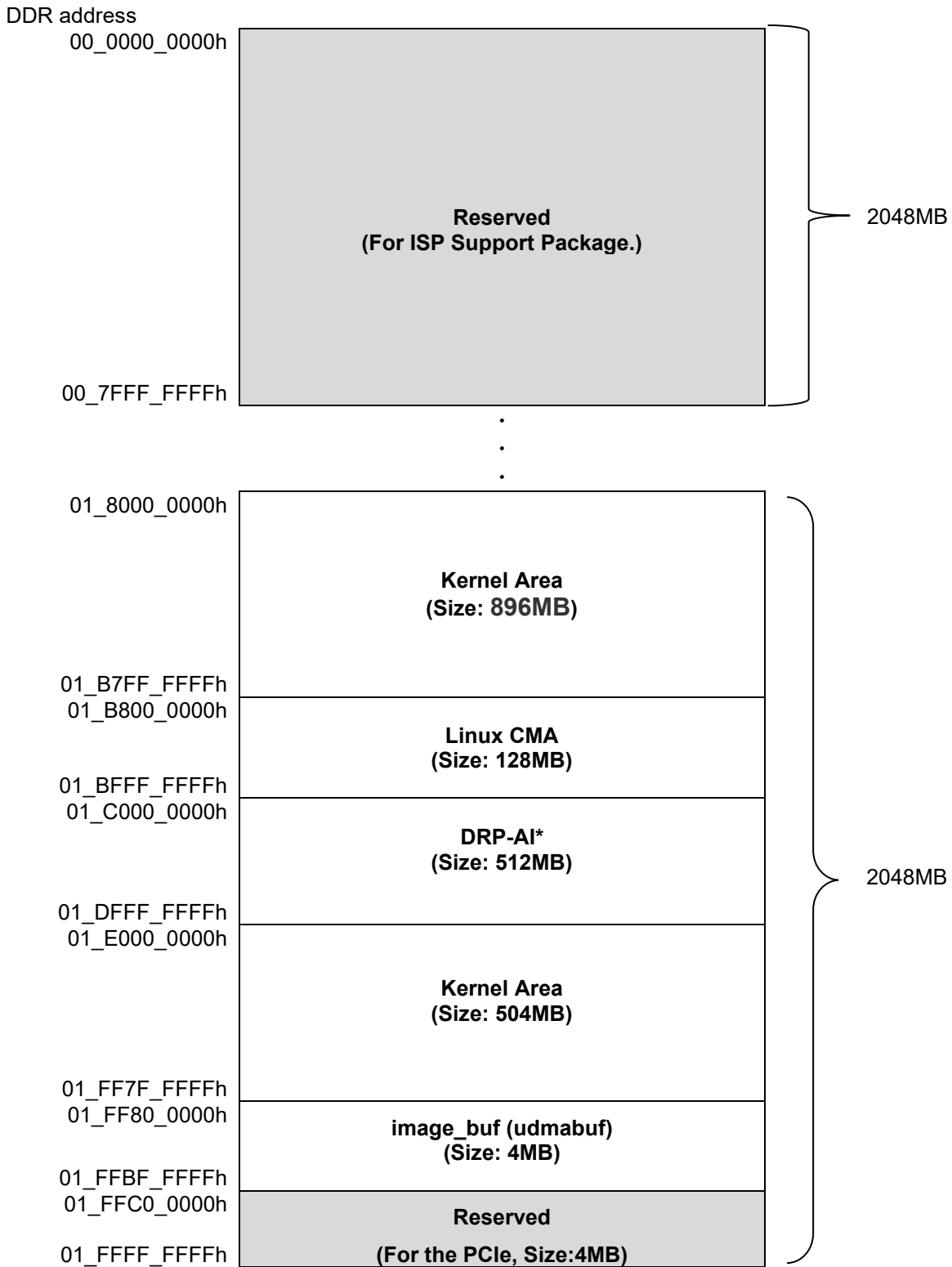


Figure 2. Memory Map

Note

If you use the data (e.g. images) created by RZ/V2M ISP Support Package on a specific IP (*1), you need to copy the data to the Linux area by CPU. If you use DRP-AI, you should copy the data to the appropriate memory area yourself. See the RZ/V2M DRP-AI Sample Application Note for this process. The copy process with IPs other than DRP-AI is performed automatically, so there is no need to do it. Refer to RZ/V2M User Guide: Hardware for details.

*1: DRP-AI, SD, eMMC, Ethernet, USB, PCI Express

5.2.3 RZ/V2MA

The following figure shows the DDR memory map in the RZ/V2MA.

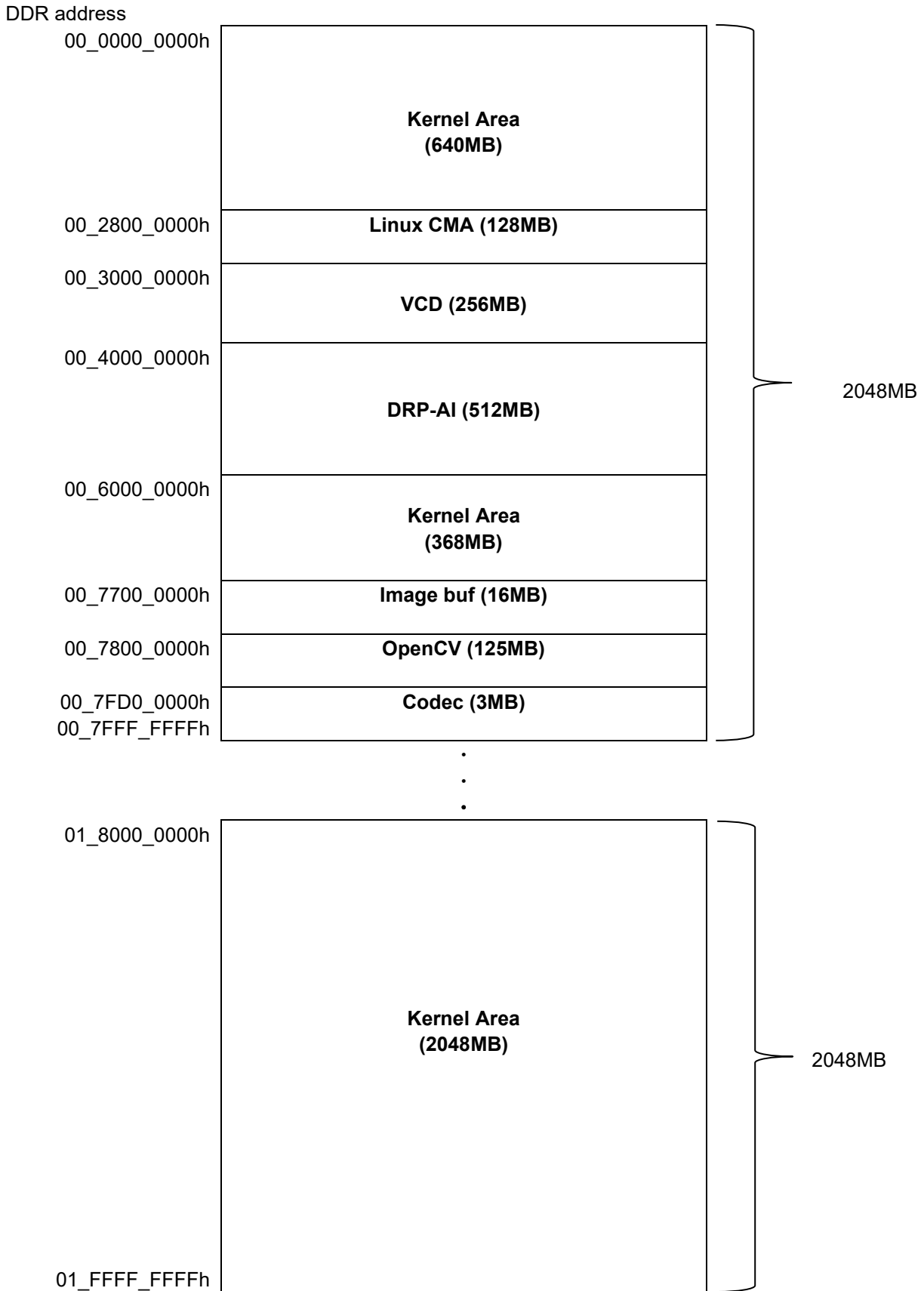


Figure 3. Memory Map

6. Appendix

None.

7. Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jun. 30, 2022	-	First edition issued.
1.01	Jul. 6, 2022	3	Modify Optional packages to describe the information for the latest libraries of the Graphics and the Video Codec.
		6	Modify the step 3.1(2) according to the latest libraries of the Graphics and the Video Codec.
1.02	Aug. 9, 2022	15	Add the update2 information to appendix.
1.03	Dec. 27, 2022	-	Update v3.0.2 released.
		13, 14	Add Bullseye Debian 11 information
1.04	Jul. 31, 2023	-	Support for RZ/V2M, RZ/V2MA Linux as RZ/V VLP. Add the information for RZ/V2M and RZ/V2MA to this document.
		-	Move to "Linux Start-up Guide" that Build Instruction section.
		6-10	Add "Changes" section.
1.05	Dec. 27, 2023	-	Update to VLP/V v3.0.5 for RZ/V2L.
1.06	Feb. 29, 2024	-	Add the patch file of update3. (update1 and update2 do not exist in VLP/V v3.0.5.)
1.07	Jun. 28, 2024	-	Update to v3.0.6.

Website and Support

Renesas Electronics Website

<http://www.renesas.com/>

Inquiries

<http://www.renesas.com/contact/>

All trademarks and registered trademarks are the property of their respective owners.