RZ/V Verified Linux Package
Version 3.0.7

Release Note

R01US0565EJ0109
Rev. 1.09
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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 building instructions specific to each target device:

- r01us0617ej0105-rz-v(Linux Start-up Guide RZV2L).pdf
- r01us0527ej0142-rzv2m(StartUp-Guide-V2M).pdf
- r01us0578ej0122-rzv2ma(StartUp-Guide-V2MA).pdf

Contents

1. Release Items

- **Name and version**
  RZ/V Verified Linux Package
  Version 3.0.7 (hereinafter referred to as “VLP/V v3.0.7”)

- **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 v3.0.7 which are listed in Table 2. RZ/V Verified Linux Package 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/en/software-tool/rzv-verified-linux-package

Table 1. Target board

Device	Evaluation Board
RZ/V2L	RZ/V2L Evaluation Board Kit (P/N: RTK9754L23S01000BE) 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.
RZ/V2M	RZ/V2M Evaluation Board Kit. (Released by CSM SOLUTION CO.,LTD.)
RZ/V2MA	RZ/V2MA Evaluation Board Kit. (Released by SHIMAFUJI ELECTRIC INCORPORATED)

- **Build Environment**
  Linux Host PC
  OS: Ubuntu 22.0.4 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
  - Bootloader

  GUI Framework
  - Qt (LGPL version)

- **File contents**
  VLP/V is delivered by the files listed in the below table.

Table 2. RZ/V Verified Linux Package

Basic packages

File	Description
RTK0EF0045Z0024AZJ-v3.0.7.zip (*1)	Verified Linux Package. This file includes the **Yocto recipe packages** and the necessary documents.
rzv_vlp_v3.0.7.tar.gz (*1)	**Yocto recipe packages**
r01us0565ej0109-rz-v(Release Note).pdf	This document
r01us0617ej0105-rz-v(Linux Start-up Guide RZV2L).pdf	Documents describing booting method and the required settings of bootloader for **RZ/V2L**.
r01us0527ej0142-rzv2m(StartUp-Guide-V2M).pdf	Documents describing booting method and the required settings of bootloader for **RZ/V2M**.
r01us0578ej0122-rzv2ma(StartUp-Guide-V2MA).pdf	Documents describing booting method and the required settings of bootloader for **RZ/V2MA**.
vlp_v_v3.0.7_patches.zip	Patch files to update some bugs. See the “5. Notes” section. This file is optional.
oss_pkg_rzv_v3.0.7.7z (3.09GB) (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. 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

File ("XX" is replaced by "EN" or "JP".)	**Description**
RTK0EF0045Z14001ZJ-v3.1.2.3_rzv_XX.zip	RZ MPU Graphics Library for RZ/V2L. This provides graphics function compliant with the OpenGL ES standard.
RTK0EF0045Z16001ZJ-v3.1.3.0_rzv_XX.zip	RZ MPU Video Codec Library for RZ/V2L.
RTK0EF0131F02000SJ-v1.0.zip	RZ MPU Video Codec Library for RZ/V2MA.
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.

Additional packages

File	**Description**
RTK0EF0045Z9006AZJ-v4.0.1.zip	BSP Manual Set for RZ/V2L.
RTK0EF0112Z9000AZJ-v1.4.1.zip	BSP Manual Set for RZ/V2M and RZ/V2MA.

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/V2L

https://www.renesas.com/en/document/mas/bsp-manual-set-rzg2l-rzfive-rzv2l-and-rzv2n-group-rtk0ef0045z9006azj-v401zip

For RZ/V2M and RZ/V2MA

https://www.renesas.com/en/document/mas/rzv2m-and-rzv2ma-linux-bsp-manual-set

2. Components

The components which are commonly used in this release are listed in Table 3. 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 3 Versions of commonly used components

Components	VLP/V v3.0.6	VLP/V v3.0.7
Linux kernel	5.10.201-cip41	5.10.229-cip54
GCC	8.3.0 (Arm GCC 8.3-2019.03)	8.3.0 (Arm GCC 8.3-2019.03)
Glibc	2.28	2.28
Busybox	1.30.1	1.30.1
openssl	1.1.1n	1.1.1n
gstreamer1.0	1.16.3	1.16.3
wayland	1.18.0	1.18.0
weston	8.0.0	8.0.0
Python3	3.8.18	3.8.18
Qt (LGPL version)	5.6.3	5.6.3
Docker	19.03.8-ce	19.03.8-ce

3. Changes

This section describes the changes in this release from VLP/V v3.0.7, including new features and defect fixes.

Table 4. Basic Changes from VLP/Vv3.0.6 to VLP/Vv3.0.7

Features	Description
Yocto recipes	Poky: update to dunfell v23.0.33 (previous version is v23.0.31). meta-openembedded: update to the latest commit.
Kernel	Update the kernel version to v5.10.229-cip54 and v5.10.229-cip54-rt23.
U-boot	Update vmmc and vqmmc settings for eSD mode. Configure U-Boot to set a random MAC address.
MTU3 Driver	Enable output pins for channel 4 and 7; add Suspend to RAM support (RZ/V2L only).
RIIC Driver	Add support for slave mode and implement bus recovery (RZ/V2L only).
SSI Driver	Terminate DMA descriptor if the stream isn't running; this is a workaround for full duplex TX/RX alignment (RZ/V2L only).
Versa3-clock	Add support for 5L35023 variant (RZ/V2L only).
PICE Driver	Add support for device and vendor ID configuration (RZ/V2[M/MA] only).
LCDC Driver	(RZ/V2L only) Support for panels connected directly to DPAD output. Implement host transfer API for MIPI DSI.
RZ MPU Graphics Library (RZ/V2L)	This release includes some specification updates.
RZ MPU Video Codec Library (RZ/V2L)	This release includes some bug fixes.
RZ MPU Video Codec Library (RZ/V2MA)	Adding support for multi-threading. Adding APIs for semaphore lock checking and semaphore initialization.
CVE-2025-4802	This release includes the patch for the glibc vulnerability.
glib-2.0	Updated to glib2.0_2.58.3-2+deb10u8.

4. Restrictions

Due to recent changes in Debian's official security update repositories (which function as OSS mirrors), certain OSS packages have already been removed. As a result, fetch errors will occur during the build process

To avoid this issue, please use the pre-prepared OSS package (named "oss_pkg_rzv_v3.0.7.7z") provided in our release web page by running the following commands before starting the build:

```
$ cd ~/rzv_vlp_${PACKAGE_VERSION}/build
$ cp <package download directory>/*.7z .
$ 7z x oss_pkg_rzv_${PACKAGE_VERSION}.7z
```

This step is mandatory to ensure a successful and consistent build environment for this version.

5. Notes

5.1 Notes

Check the following patches, select, and apply to your build environment if needed. After that, 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.

```
$ cd ~/rzv_vlp_${PACKAGE_VERSION}       #(e.g., PACKAGE_VERSION=v3.0.7)
$ unzip RTK0EF0045Z0024AZJ-v3.0.7.zip \
"RTK0EF0045Z0024AZJ-v3.0.7/vlp_v_v3.0.7_patches.zip"
$ unzip RTK0EF0045Z0024AZJ-v3.0.7/vlp_v_v3.0.7_patches.zip -d extra
```

The following files and directories will be extracted into the *~/rzv_vlp_${PACKAGE_VERSION}/extra* folder:

```
├── 0001-meta-rz-common-glib2.0-update-to-2.58.3-2-deb10u8.patch
├── 0001-meta-rz-common-recipes-core-debian-glibc-fix-CVE-2025-4802.patch
├── linux-renesas
│   └── 0001-driver-i2c-busses-i2c-riic-Fix-issue-can-t-set-value.patch
└── u-boot
    ├── 0001-configs-smarc-rz-g2l-g2lc-g2ul-v2l-change-CONFIG_ENV.patch
    └── 0002-configs-Enable-CONFIG_NET_RANDOM_ETHADDR-as-default.patch
```

(1) To update glib-2.0 to glib2.0_2.58.3-2+deb10u8 (all products)

This patch upgrades glib-2.0 from glib2.0_2.58.3-2+deb10u5 to glib2.0_2.58.3-2+deb10u8, as the previous version has been removed from the network by its maintainer. Without the Open Source Software packages (oss_pkg_rzv_v3.0.7.7z), the building will fail. To build successfully without them, apply the following patch.

```
$ cd ~/rzv_vlp_${PACKAGE_VERSION}/meta-renesas
$ patch -p1 < ../extra/0001-meta-rz-common-glib2.0-update-to-2.58.3-2-deb10u8.patch
```

(2) To patch CVE-2025-4802 vulnerability

This patch addresses CVE-2025-4802, a vulnerability in glibc (v2.27–2.38) related to untrusted LD_LIBRARY_PATH usage in statically compiled *setuid* binaries that invoke *dlopen*.
→ Full details: https://nvd.nist.gov/vuln/detail/CVE-2025-4802

The patch applies to both recipes-core and recipes-debian:

For recipes-debian:

- buster: 2.28-10+deb10u5
- bullseye: 2.31-13+deb11u13

For recipes-core, the upstream patches have been backported to support Poky.

```
$ cd ~/rzv_vlp_${PACKAGE_VERSION}/meta-renesas
$ patch -p1 < ../extra/0001-meta-rz-common-recipes-core-debian-glibc-fix-CVE-2025\
-4802.patch
```

(3) To update linux-renesas

This vlp_v_v3.0.7_patches.zip package includes a patch to improve *linux-renesas*.

Patch Name	Driver	Machine	Description
0001-driver-i2c-busses-i2c-riic-Fix-issue-can-t-set-value.patch	I2C	smarc-rzv2l	Improves register configuration flow before clock enable.

To apply this patch, follow the instructions below.

```
$ TEMPLATECONF=$PWD/meta-renesas/meta-rzv2l/docs/template/conf/ \
source poky/oe-init-build-env build
$ MACHINE=smarc-rzv2l bitbake linux-renesas -c devshell

# Apply {patch_name} at tmp/work-shared/smarc-rzv2l/kernel-source
$ git am ~/rzv_vlp_${PACKAGE_VERSION}/extra/linux-renesas/{patch_name}
$ exit
$ MACHINE=smarc-rzv2l bitbake linux-renesas -C compile
```

(4) To update u-boot

This vlp_v_v3.0.7_patches.zip package includes some patches to improve *u-boot*.

Patch Name	Driver	Machine	Description
0001-configs-smarc-rz-g2l-g2lc-g2ul-v2l-change-CONFIG_ENV.patch	Environment	smarc-rzv2l	Avoid U-boot environmental conflicts when using the Security Package.
0002-configs-Enable-CONFIG_NET_RANDOM_ETHADDR-as-default.patch	Ethernet	smarc-rzv2l	Set random MAC address in U-Boot.

To apply this patch, follow the instructions below.

```
$ TEMPLATECONF=$PWD/meta-renesas/meta-rzv2l/docs/template/conf/ \
source poky/oe-init-build-env build
$ MACHINE=smarc-rzv2l bitbake u-boot -c devshell

# Apply {patch_name} at
# tmp/work/smarc_rzv2l-poky-linux/u-boot/1_v2021.10+gitAUTOINC+57c087bafa-r0/git
$ git am ~/rzv_vlp_${PACKAGE_VERSION}/extra/u-boot/{patch_name}
$ exit
$ MACHINE=smarc-rzv2l bitbake u-boot -C compile
```

5.2 Memory Map

5.2.1 RZ/V2L

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

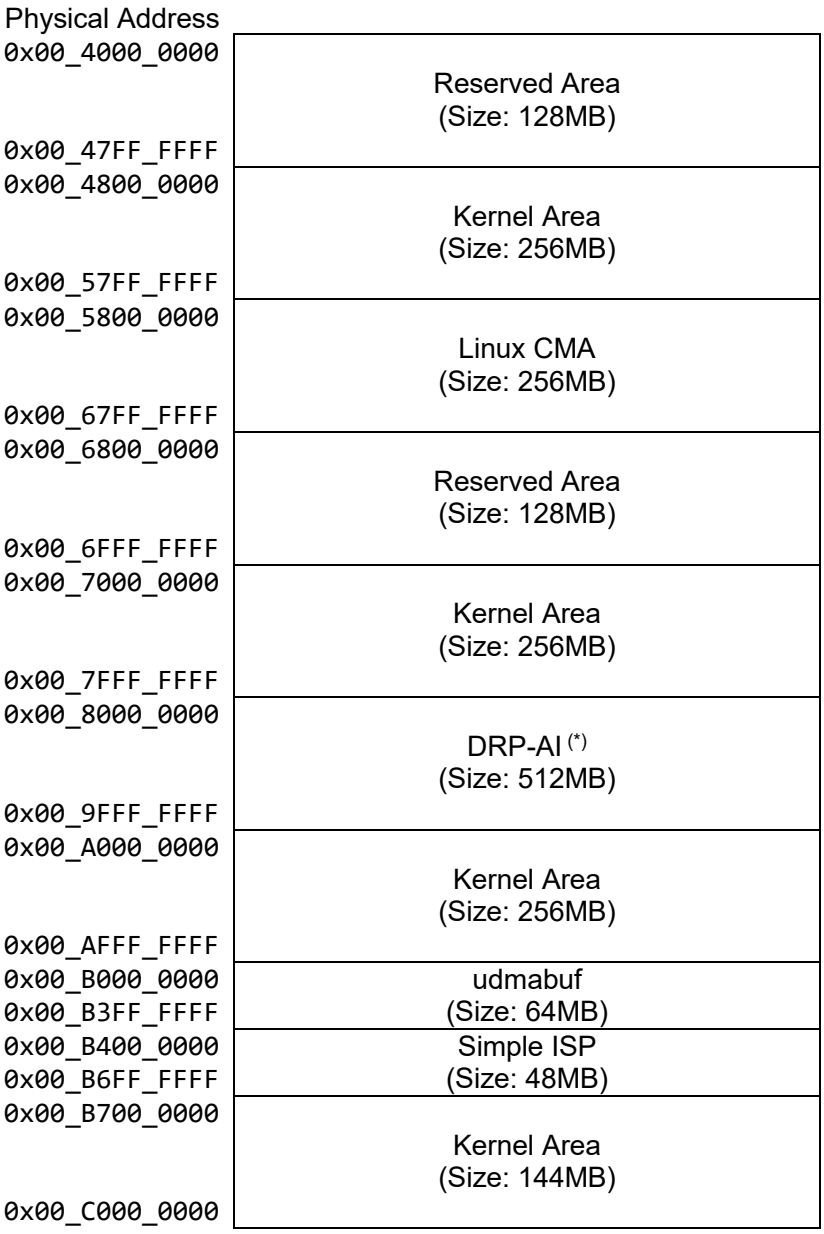

Figure 1. Memory Map

Note (*): 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.

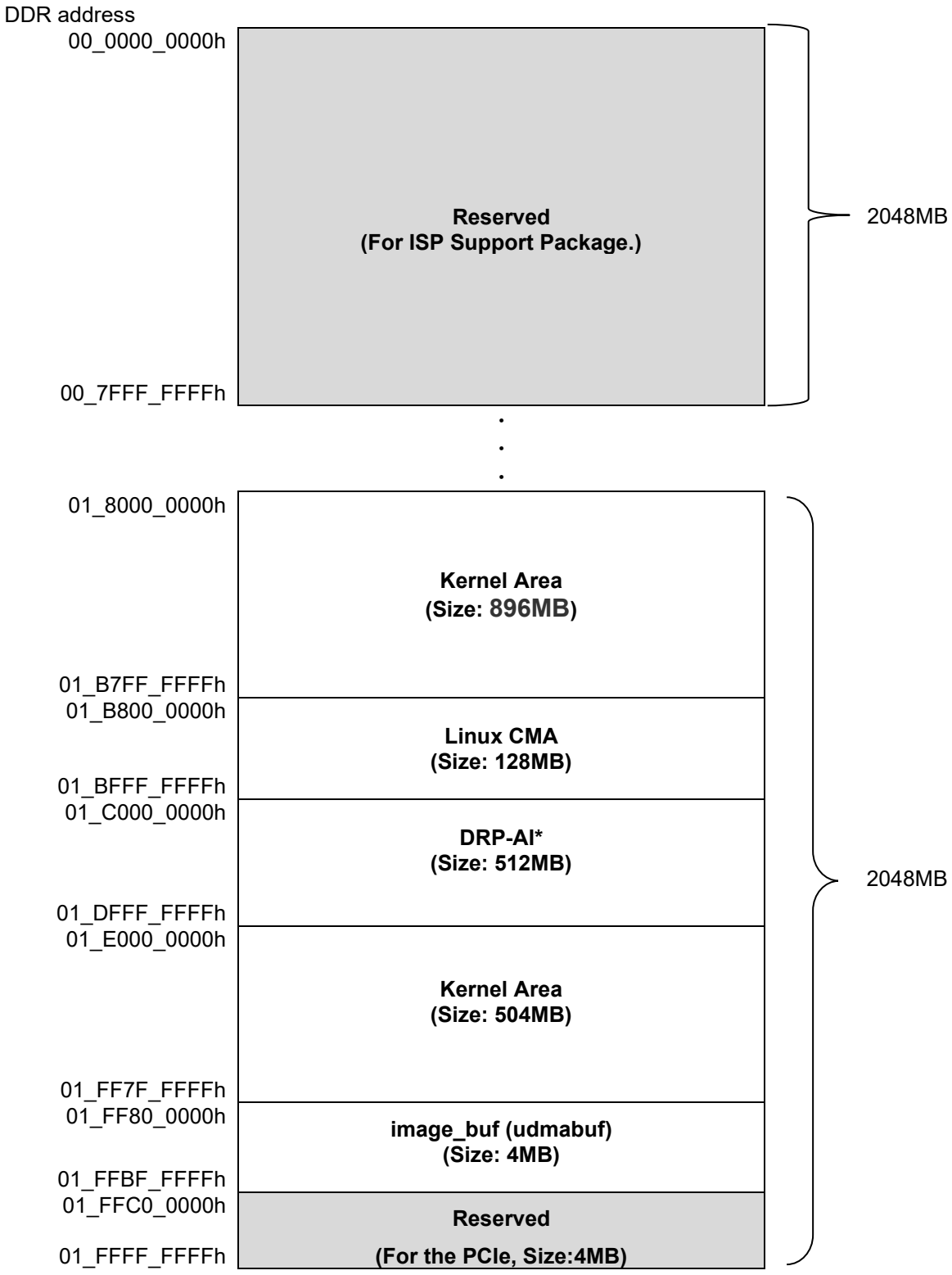

Figure 2. Memory Map

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.

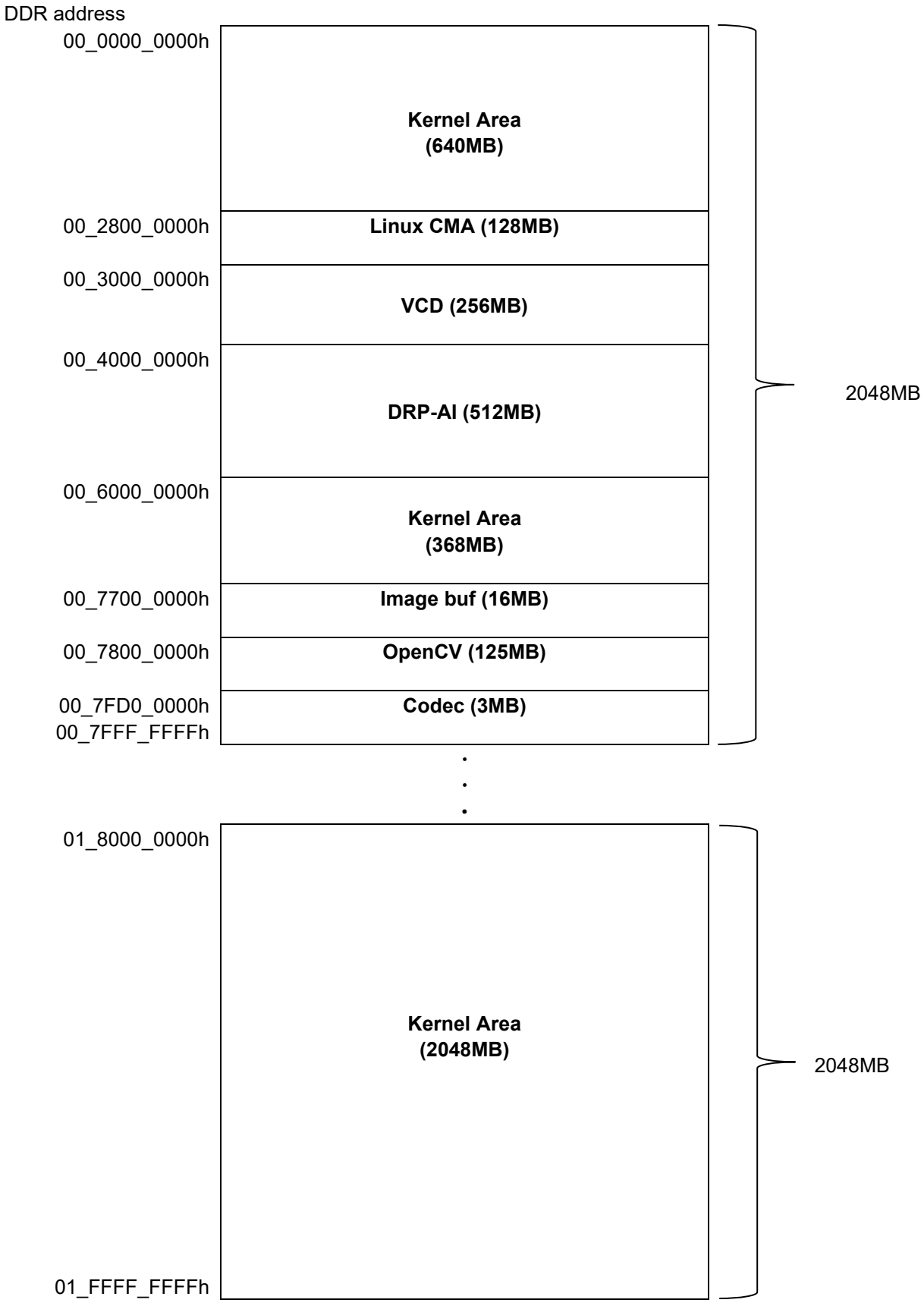

Figure 3. Memory Map

6. Appendix

None.

7. Revision History

		Description	
Rev.	**Date**	**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.
1.08	Dec. 13, 2024	-	Update to v3.0.6-update4.
1.09	Jun. 30, 2025	-	Update to v3.0.7.

Website and Support

Renesas Electronics Website
http://www.renesas.com/

Inquiries
http://www.renesas.com/contact/