

RZ MPU Verified Linux Package

Version 4.0.1

R01US0797EJ0103

Rev. 1.03

Release Note

Mar 20, 2026

Introduction

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

Please also refer to the following documents that describe the instructions to build VLP and boot the evaluation boards.

- r01us0798ej0101-rz(Linux Start-up Guide RZG2L,LC,UL).pdf
- r01us0816ej0100-rz(Linux Start-up Guide RZG3S).pdf

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1. Release Items

- **Name and version**

RZ MPU Verified Linux Package

Version 4.0.1 (hereinafter referred to as “VLP v4.0.1”)

- **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/G series. Basic packages of VLP v4.0.1 which are listed in Table 2 can be downloaded.

RZ Family:

<https://www.renesas.com/products/microcontrollers-microprocessors/rz-arm-based-high-end-32-64-bit-mpus>

You can also download the basic packages of VLP v4.0.1 which are listed in Table 2 from the site below.

RZ MPU Verified Linux Package [6.1-CIP]:

<https://www.renesas.com/en/software-tool/rz-mpu-verified-linux-package-61-cip>

- **Target boards**

The target boards of this VLP are as below table.

Table 1. Target boards list

Device	Evaluation Board
RZ/G2L	RZ/G2L Evaluation Board Kit (P/N: RTK9744L23S01000BE)
RZ/G2LC	RZ/G2LC Evaluation Board Kit (P/N: RTK9744C22S01000BE)
RZ/G2UL	RZ/G2UL Evaluation Board Kit (P/N: RTK9743U11S01000BE)
RZ/G3S	RZ/G3S Evaluation Board Kit (P/N: RTK9845S33C01000BE)

- **Build Environment**

Linux Host PC

OS: Ubuntu 22.0.4 LTS (64-bit OS must be used.)

200GB free space on HDD or SSD is necessary. (*)

(*) The necessary free space

Note) Please note that the building of VLP fails when Ubuntu 24.04 is used.

- **Verified functions**

Linux VLP

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

- **File contents**

VLP is delivered by the files listed in Table 2.

Table 2. RZ MPU Verified Linux Package

Basic files of VLP v4.0.1

File	Description
RTK0EF0045Z0035AZJ-v4.0.1.zip (*1)	Verified Linux Package. This file includes the Yocto recipe packages and the necessary documents.
rz_vlp_v4.0.1.tar.gz	Yocto recipe packages
r01us0797ej0103-rz(Release Note).pdf	This document
r01us0798ej0101-rz(Linux Start-up Guide RZG2L,LC,UL).pdf	Documents describing booting methods and the required settings of bootloader for RZ/G2L, RZ/G2LC and RZ/G2UL .
r01us0816ej0100-rz(Linux Start-up Guide RZG3S).pdf	Documents describing booting methods and the required settings of bootloader for RZ/G3S .
oss_pkg_rz_v4.0.1.7z (*1)	Open-source software packages See the Note below before you download.

(*1) These 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) The open source software (OSS) packages contain all the relevant source code files. These are the same versions of OSS that was used when VLP was verified. Downloading a using this large OSS package file (oss_pkg_rz_XXX.7z) is not mandatory if your build PC is connected to the Internet and can directly download the individual source code packages listed in the Yocto recipes. However, if your build PC is not connected to the Internet, this OSS package file contains all the source packages required by the Yocto build.

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 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. Most bootable images that VLP supports can be built on an “offline” environment. Please refer to the documents of “Linux_StartUp_Guide”.

Optional packages (*1)

	File (“XX” is replaced by “EN” or “JP”.)	Description
RZ MPU Graphics Library	RTK0EF0045Z14001ZJ-4.1.2.6_XX.zip	For RZ/G2L and RZ/G2LC . This provides graphics function compliant with the OpenGL ES standard.
RZ MPU Video Codec Library	RTK0EF0045Z16001ZJ-v4.1.3.1_XX.zip	RZ MPU Video Codec Library for RZ/G2L .

Additional packages

File	Description
RTK0EF0045Z9006AZJ-v4.0.3.zip	BSP Manual Set for RZ/G2L, RZ/G2LC, RZ/G2UL, and RZ/G3S.

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".

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. The manifest file is created to the following path after building the images:

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

Note: <board> is refer to Linux Start-up Guide of each device.
<image-name> is minimal, bsp, or Weston.

Please refer to the instructions in Linux Start-up Guide of each device.

Table 3. Versions of commonly used components

Components	VLP v4.0.0	VLP v4.0.1
Linux kernel	6.1.107-cip28	6.1.141-cip43
gcc	13.3.0	13.4.0
glibc	2.39	2.39
busybox	1.36.1	1.36.1
openssl	3.2.4	3.2.4
gstreamer1.0	1.22.12	1.22.12
wayland	1.22.0	1.22.0
weston	13.0.1	13.0.1
python3	3.12.9	3.12.11
docker	25.0.3	25.0.3

Please note that VLPv4 includes packages licensed under the GPLv3 by default. If you wish to exclude these packages, please refer to the Linux Start-up Guide for instructions.

3. Changes

Renesas has released the RZ/G Verified Linux Package Version 3.0.x. This chapter describes the changes from VLPv3 to VLPv4.0.0 and later versions of VLP v4.

Table 4. Change points from VLPv3 to VLPv4.0.0

Features	Description
Package	Some building instructions have been changed; please refer to the Linux Start-up Guide for instructions.
Yocto recipes	<ul style="list-style-type: none"> - Upgrade Yocto version to 5.0 (Scarthgap). - Remove Qt recipes from meta-renesas. Qt recipes will be released in another package. - GPLv3-licensed packages are installed as default.
Kernel	<ul style="list-style-type: none"> - Upgrade the kernel version from 5.10 to 6.1. - ECC is not supported in kernel v6.1.
RZ MPU Graphics Library (RZ/G2L, LC)	New Graphics libraries for VLPv4 are released.
RZ MPU Graphics Video Codec Library (RZ/G2L)	New Video Codec libraries for VLPv4 are released.
ECC	ECC is not supported in kernel v6.1.

Table 5. Change points from VLPv4.0.0 to VLPv4.0.1

Features	Description
Package	<ul style="list-style-type: none"> - Newly supported RZ/G2UL, RZ/V2L, and RZ/G3S. - Changed some building instructions. Please refer to the Linux Start-up Guide for details.
Yocto recipes	- Updated Yocto version to 5.0.11 (Scarthgap).
Bootloaders	<ul style="list-style-type: none"> - Updated Trusted Firmware-A to v2.10 - Updated U-boot version to v2024.07. - Updated Flash writer version to v1.08.
Kernel	<ul style="list-style-type: none"> - Updated the kernel to v6.1.141-cip43 - Supported ECC. - Supported suspend to Idle. - Fixed an SSI issue where errors could occur when continuing recording during full-duplex communication.
RZ MPU Graphics Library (RZ/G2L, LC)	Updated the version to v4.1.2.6.
RZ MPU Graphics Video Codec Library (RZ/G2L)	Updated the version to v4.1.3.1.

4. Restrictions

4.1 Crypto feature

From VLP v4.0.0, the TUNE_FEATURES setting for Yocto Scarthgap is set:

```
TUNE_FEATURES = "aarch64 crypto cortexa55"
```

Since crypto is included, the GCC/G++ options become:

```
-mcpu=cortex-a55+crypto
```

This enables the use of crypto-related instructions.

Some OSS software assumes that crypto instructions are available when this option is enabled and therefore uses them in its code. As a result, crashes have occurred on the **Non-Secure** variant, where these instructions are not supported such as QT application.

So, to avoid this issue in **Non-Secure** Board Kit, remove crypto feature by adding below setting to local.conf:

```
TUNE_FEATURES:remove = "crypto"
```

5. Notes

5.1 Memory Map

5.1.1 RZ/G2L Series

Following Figures show memory map of RZ/G2L Series in this Linux BSP package.

- The volume of SDRAM is total:
 - 2GB (RZ/G2L Evaluation Board Kit PMIC version)
 - 1GB (RZ/G2LC Evaluation Board Kit)
 - 1GB (RZ/G2UL Evaluation Board Kit)
- The following region is used as a secure region. It doesn't allow U-Boot and kernel to access those regions.
 - 128MB from 0x00_4000_0000 to 0x00_47FF_FFFF in SDRAM

Note) To use the system SRAM on RZ MPUs, please consult the hardware manual for detailed usage guidelines.

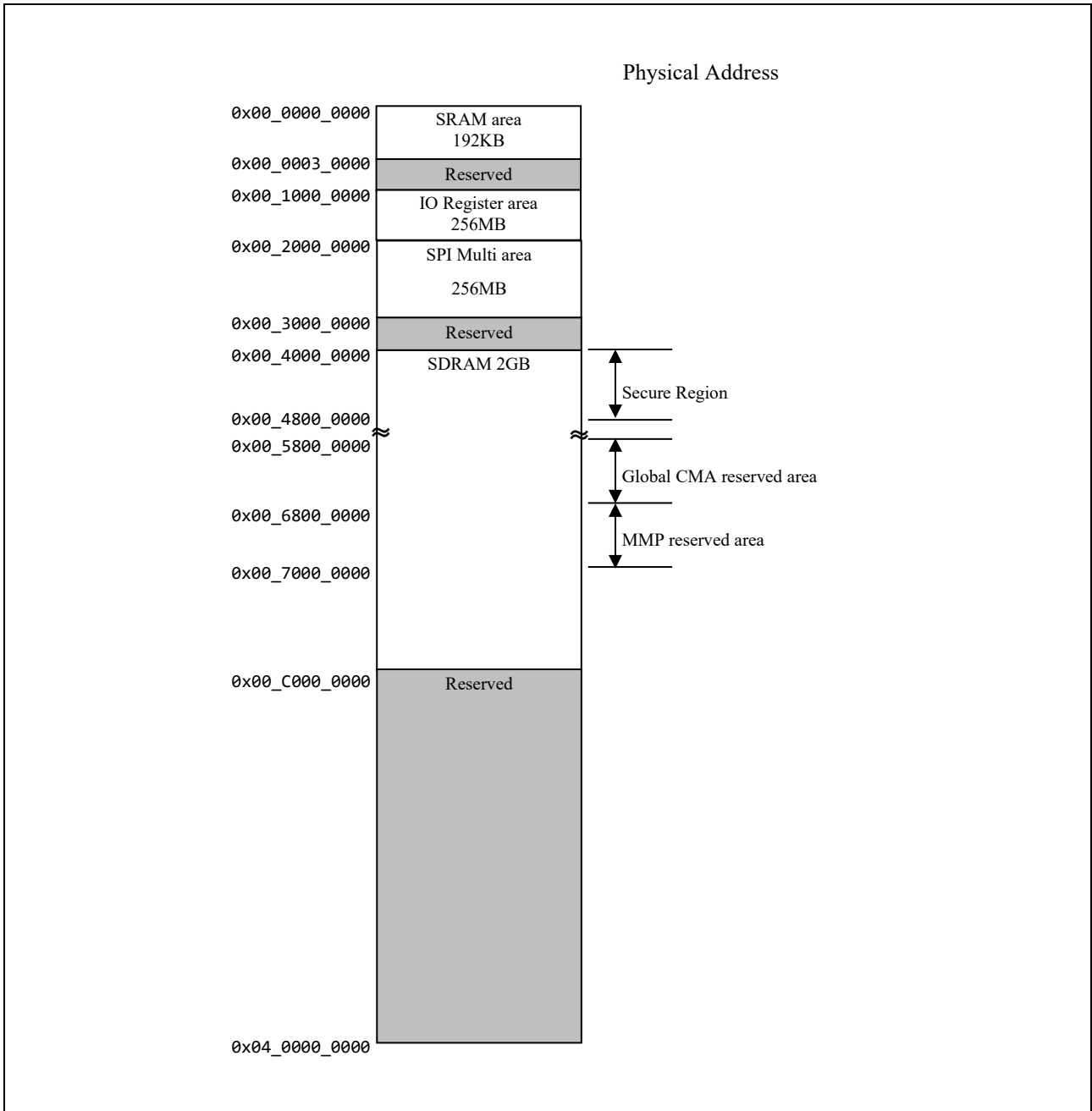


Figure 1. RZ/G2L Evaluation Board Kit PMIC version memory map (Boot)

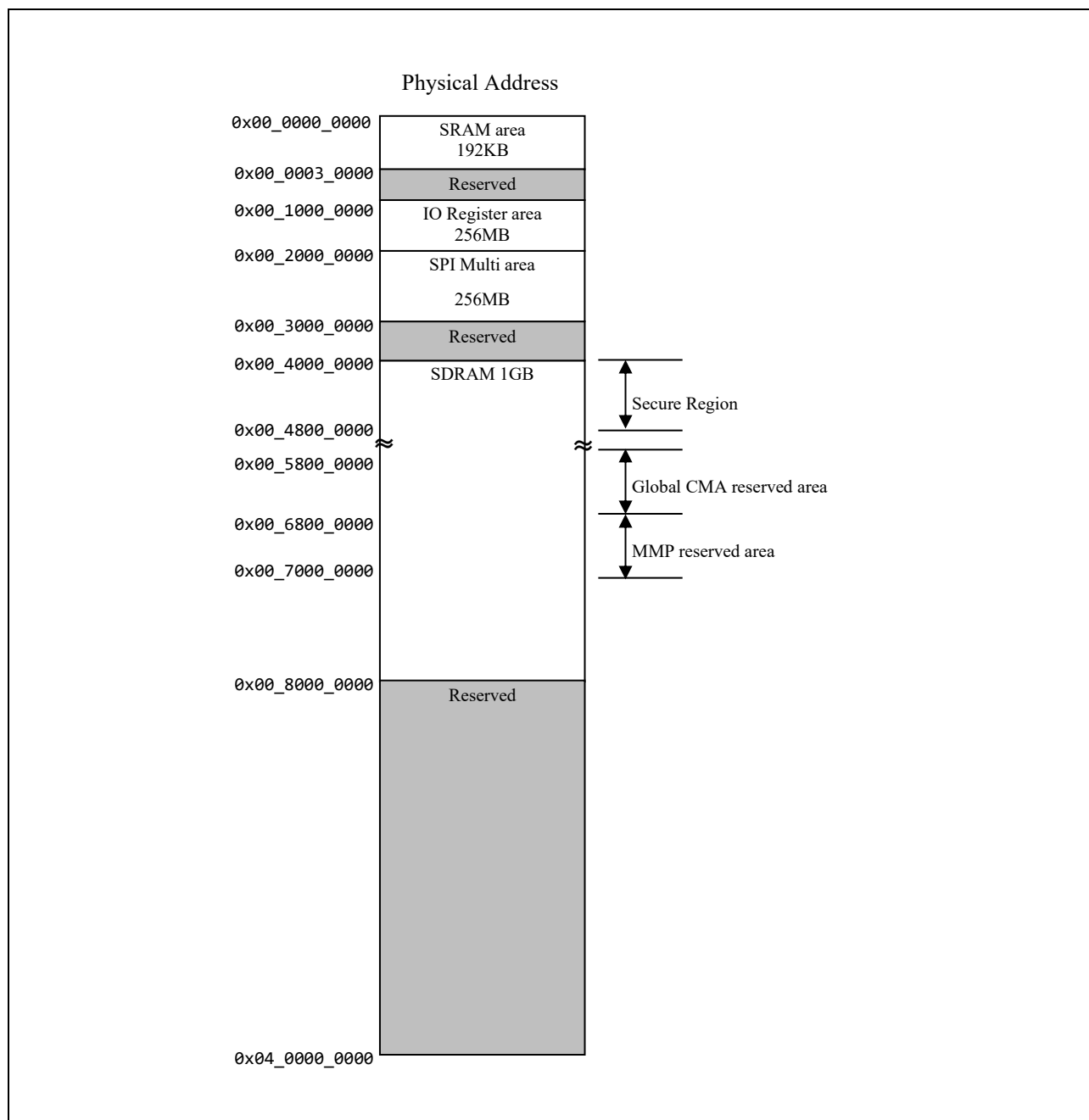


Figure 2. RZ/G2LC Evaluation Board Kit version memory map (Boot)

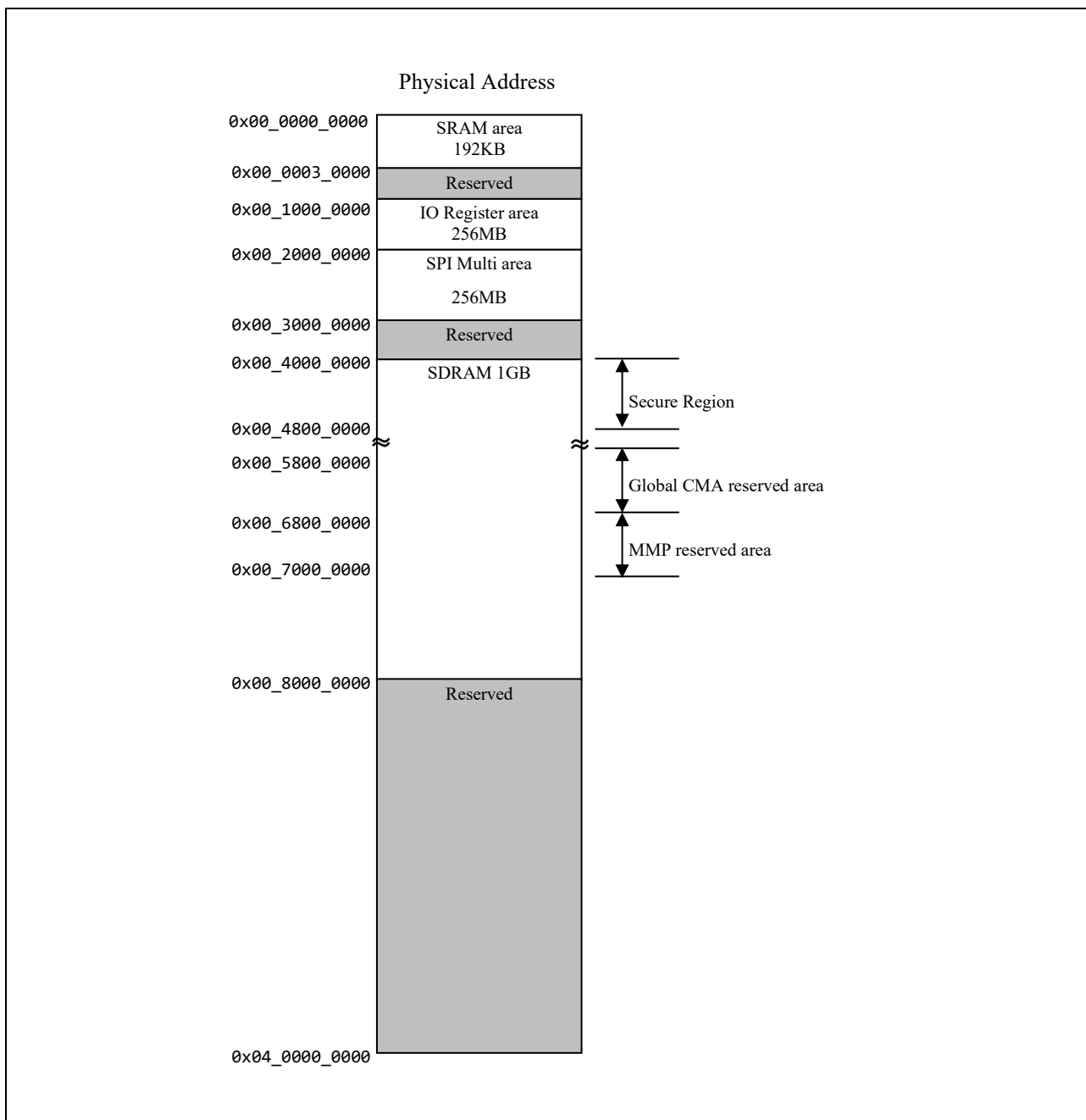


Figure 3. RZ/G2UL Evaluation Board Kit version memory map (Boot)

5.1.2 RZ/G3S

Following Figures show memory map of RZ/G3S in this Linux BSP package.

The volume of SDRAM is 1GB (RZ/G3S Evaluation Board Kit).

The following region is used as a secure region. It doesn't allow U-Boot and kernel to access those regions.

- o 128MB from 0x00_4000_0000 to 0x00_47FF_FFFF in SDRAM

Note) To use the system SRAM on RZ MPUs, please consult the hardware manual for detailed usage guidelines.

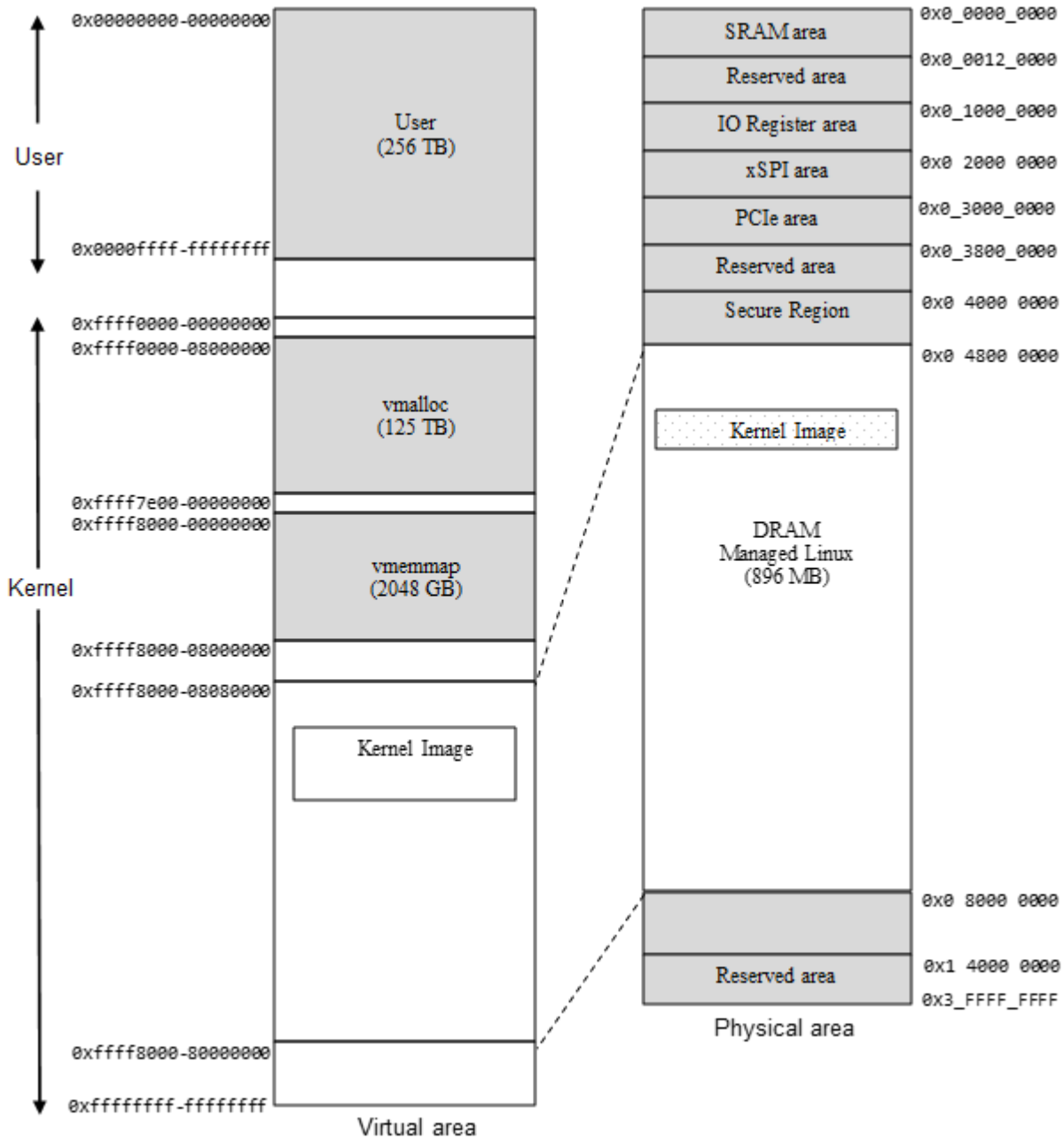


Figure 4. RZ/G3S Evaluation Board Kit version memory map (Boot)

6. Revision History

Rev.	Date	Description	
		Page	Summary
1.00	May 30, 2025	-	First edition for VLP v4.0.0.
1.01	Sep 30, 2025	6	Add restriction about S2Idle support in chapter 4.1.
1.02	Nov 30, 2025	2, 3, 4, 5, 6, 10, 11	<ul style="list-style-type: none">- Update for VLP v4.0.1.- Add RZ/G2UL and RZ/G3S information.- Add changes from VLP v4.0.0 to v4.0.1.- Remove Restrictions about Suspend to Idle in VLP v4.0.1.- Add Restrictions about Crypto Feature.- Add memory map for RZ/G2UL Evaluation Board Kit.- Add memory map for RZ/G3S Evaluation Board Kit.
1.03	Mar 13, 2026	4	- Correct the version of commonly used components in Table3.

Website and Support

Renesas Electronics Website

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

Inquiries

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

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