

# RZ/G Verified Linux Package

## Version 3.0.5

R01US0553EJ0108  
Rev. 1.08  
Oct. 31, 2023

### Release Note

#### Introduction

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

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

- r01us0555ej0102-rz-g(Linux Start-up Guide RZG2H,M,N,E).pdf
- r01us0616ej0100-rz-g(Linux Start-up Guide RZG2L,LC,UL).pdf
- r01us0618ej0100-rz-g(Linux Start-up Guide RZG1H,M,N,E,C).pdf

#### Contents

<b>1. Release Items .....</b>	<b>2</b>
<b>2. Components .....</b>	<b>5</b>
<b>3. Changes .....</b>	<b>6</b>
<b>4. Restrictions .....</b>	<b>7</b>
<b>5. Notes .....</b>	<b>8</b>
<b>6. Revision History .....</b>	<b>9</b>

## 1. Release Items

- **Name and version**

RZ/G Verified Linux Package

Version 3.0.5 (hereinafter referred to as “VLP/G v3.0.5”)

- **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/G v3.0.5 which are listed in Table 1 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/G v3.0.5 which are listed in Table 1 from the site below.

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

<https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rz-mpus/rzg-linux-platform/rzg-marketplace/verified-linux-package/rzg-verified-linux-package>

- **Target board**

Hoperun Technology HiHope RZ/G2H platform (hihope-rzg2h) Rev 4.0

Hoperun Technology HiHope RZ/G2M platform (hihope-rzg2m) Rev 4.0 (\*1)

Hoperun Technology HiHope RZ/G2N platform (hihope-rzg2n) Rev 4.0

Silicon Linux RZ/G2E evaluation kit (ek874) Rev E

RZ/G2L Evaluation Board Kit PMIC version (\*2):

- RZ/G2L SMARC Module Board v2.1
- RZ SMARC Series Carrier Board v4.0

RZ/G2LC Evaluation Board Kit (\*3):

- RZ/G2LC SMARC Module Board v1.0
- RZ SMARC Series Carrier Board v4.0

RZ/G2UL Evaluation Board Kit (\*4):

- RZ/G2UL SMARC Module Board v1.0
- RZ SMARC Series Carrier Board v4.0

iWave RZ/G1H-PF Qseven Development Platform R2.1, R4.0

iWave RZ/G1M-PF Qseven Development Platform R2.0, R5.0

iWave RZ/G1N-PF Qseven Development Platform R3.4

iWave RZ/G1E-PF SODIMM Development Platform R3.1, R4.0

- (\*1) There are 2 versions of RZ/G2M LSI devices. There are version 3.0 and 1.3 (hereinafter referred to as “RZ/G2M v3.0” and “RZ/G2M v1.3”).
- (\*2) “RZ/G2L Evaluation Board Kit” and “RZG2L Evaluation Board Kit PMIC version” includes the RZ/G2L SMARC Module Board and the RZ SMARC Series Carrier Board.
- (\*3) “RZG2LC Evaluation Board Kit” includes the RZ/G2LC SMARC Module Board and the RZ SMARC Series Carrier Board.
- (\*4) “RZ/G2UL Evaluation board Kit” includes the RZ/G2UL SMARC Module Board and the RZ SMARC Series Carrier Board.

- **Verified functions**

## Linux VLP

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

## GUI Framework

- Qt (LGPL version)

- **File contents**

VLP/G is delivered by the files listed in the Table 1.

**Table 1. RZ/G Verified Linux Package**

**Basic files of VLP/G v3.0.5**

File	Description
RTK0EF0045Z0021AZJ-v3.0.5.zip (*1)	Verified Linux Package. This file includes the <b>Yocto recipe packages</b> and the necessary documents.
rzg_vlp_v3.0.5.tar.gz	<b>Yocto recipe packages</b>
oss_pkg_rzg_v3.0.5.7z (*1)	Open source software packages  <b>See the Note below before download</b>
r01us0553ej0108-rz-g(Release Note).pdf	This document
r01us0555ej0102-rz-g(Linux_StartUp_Guide_RZG2H,M,N,E).pdf	Documents describing booting method and the required settings of bootloader for <b>RZ/G2H, RZ/G2M, RZ/G2N, and RZ/G2E</b> .
r01us0616ej0100-rz-g(Linux Start-up Guide RZG2L,LC,UL).pdf	Documents describing booting method and the required settings of bootloader for <b>RZ/G2L, RZ/G2LC, and RZ/G2UL</b> .
r01us0648ej0100-rz-g(Linux_StartUp_Guide_RZG1H,M,N,E).pdf	Documents describing booting method and the required settings of bootloader for <b>RZ/G1H, RZ/G1M, RZ/G1N, and RZ/G1E</b> .

(\*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/G was verified. Downloading a using this large OSS package file (oss\_pkg\_rzg\_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/G 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/G supports can be built on an “offline” environment. Please refer to the documents of “Linux\_StartUp\_Guide”.

**Optional packages (\*1)**

	<b>File</b> ("XX" is replaced by "EN" or "JP".)	<b>Description</b>
RZ MPU Graphics Library	RTK0EF0045Z13001ZJ-v1.1.2_XX.zip (Evaluation version) RTK0EF0045Z14001ZJ-v1.1.2_rzg_XX.zip (Unrestricted version)	For <b>RZ/G2L</b> and <b>RZ/G2LC</b> . This provides graphics function compliant with the OpenGL ES standard.
RZ MPU Video Codec Library	RTK0EF0045Z15001ZJ-v1.1.0_XX.zip (Evaluation version) RTK0EF0045Z16001ZJ-v1.1.0_rzg_XX.zip (Unrestricted version)	RZ MPU Video Codec Library for <b>RZ/G2L</b> .
Multimedia Packages for RZ/G2	RTK0EF0045Z0022AZJ-v1.0.2_XX.zip (Evaluation version) RTK0EF0045Z0023AZJ-v1.0.2_XX.zip (Unrestricted version)	Multimedia Packages for <b>RZ/G2H,M,N,E</b> . This includes the graphics library and the video codec library.

**(\*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 check the optional packages in the renesas web below.

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

<https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rz-mpus/rzg-linux-platform/rzg-marketplace/verified-linux-package/rzg-verified-linux-package>

**Additional packages**

<b>File</b>	<b>Description</b>
RTK0EF0045Z9006AZJ-v3.0.3.zip	BSP Manual Set for RZ/G2L, RZ/G2LC, and RZ/G2UL.
RTK0EF0045Z9002AZJ-v3.0.1.zip	BSP Manual Set for RZ/G2H, RZ/G2M, RZ/G2N, and RZ/G2E.
RTK0EF0045Z9000AZJ-v3.0.0.zip	BSP Manual Set for RZ/G1H, RZ/G1M, RZ/G1N, and RZ/G1E.

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

Download Site:

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

<https://www.renesas.com/us/en/products/microcontrollers-microprocessors/rz-mpus/rzg-linux-platform/rzg-marketplace/verified-linux-package/rzg-verified-linux-package>

## 2. Components

The components which are commonly used in this release are listed in the Table 2. Please also refer to the manifest file for details. The manifest file is created to 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, Weston or qt.

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

**Table 2. Versions of commonly used components**

Components	VLP/G v3.0.3	VLP/G v3.0.5
	For RZ/G2 Series	For RZ/G Series
Linux kernel	5.10.158-cip22	5.10.184-cip36
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	1.31.1	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	3.8.14	3.8.14
Qt (GPL version)*1	5.6.3	5.6.3
Docker	19.03.8-ce	19.03.8-ce

Note) RZ/G2 Group includes RZ/G2H, RZ/G2M, RZ/G2N, RZ/G2E, RZ/G2L, RZ/G2LC, and RZ/G2UL.

\*1) New versions such as Qt6.2.4 are also known to work. Please contact The Qt Company for instructions and support.

### 3. Changes

The following table lists the changes from the previous version.

**Table 3. Changes**

Features	Description
Package	Newly support RZ/G1 series. (RZ/G1H, M, N, E.)
Yocto	3.1.26 (dunfell)
	Add support SBoM SPDX.
	Add support WIC image.
	Update Flash-writer, TF-A, U-boot and Kernel to the latest commit revision.
	Add audio initializing script for RZ/G2L Series.
	Update OpenSSL of Debian Buster to v1.1.1n-0+deb10u6.
Linux Kernel	Update the kernel version to v5.10.184-cip36-rt14.
	Add ECC support for RZ/G2L, LC, UL.
	RTC (RZ/G2L, LC, UL): fix do not advertise update interrupt feature if no interrupt specified.
	MTU3 (RZ/G2L, LC, UL): fix possible case dividing by zero in pwm_config.
	CMT (RZ/G2H, M, N, E): fix hang issue when switching CMT to clocksource after updating to cip36.
	Thermal (RZ/G2H, M, N, E): correct the order of checking THSCP Register.
	Versa3clock (RZ/G2L, LC, UL): add property to enable/disable 32kHz free-running clock.
	Pin control (RZ/G2L, LC, UL): add bias pull up/down pin configuration.
Emergency shutdown (RZ/G2L, LC, UL): add support this feature.	
U-boot	Update default environment variables for all Renesas RZ/G platforms.
	PCIe and USB3.0 Clock generator (RZ/G2E): adjust output amplitude.
Trusted-firmware-a	Update to v2.9.
	Add ECC support for RZ/G2L, LC, UL.
RZ MPU Graphics Library (RZ/G2L, LC)	<p>Update points:</p> <ul style="list-style-type: none"> <li>- [Vulkan] - Support for the following Vulkan extensions: VK_EXT_pipeline_protected_access</li> <li>- [Vulkan] - Support for the Android Baseline 2022 profile</li> <li>- [OpenCL] - Support for CL_DEVICE_SCHEDULING_COMPUTE_UNIT_LIMIT_ARM as part of the cl_arm_scheduling_controls extension v0.6.0 on CSF GPUs</li> </ul> <p>Bug Fix:</p> <ul style="list-style-type: none"> <li>- Cache-invalidate on user-buf unmap could corrupt read-only userbufs (* This issue does not happen on RZ/G platform.)</li> <li>- Userspace can mislead OoM killer in killing innocent Apps or system processes by leaking mali fd to child process.</li> <li>- GPU hang due to incorrect shrinking of an allocation backed by a 2MB page.</li> </ul>

## 4. Restrictions

### (1) USB camera 3.0

RZ/G2E cannot stream with higher resolution than Full HD when you use a camera with USB 3.0.

### (2) CSI40

Disable CSI40 in RZ/G2H, N and G2M v3.0 by default due to SW limitation.

### (3) Wifi and Bluetooth

Low performance while using 2.4GHz Wifi/Bluetooth and USB 3.0 device in HiHope RZ/G2H, M, and N at the same time due to noise. If using USB3.0 device, should connect to 5GHz Wifi network.

Wifi/Bluetooth function on the iWave RZ/G1E rev4.0 board has not been supported.

## 5. Notes

None.

## 6. Revision History

Rev.	Date	Description	
		Page	Summary
1.01	Jul. 13, 2022	-	First edition for VLP/G v3.0.0-update1.
1.02	Jun. 24, 2022	11	Add the "Target devices" column to the Table 4.
		23	Fix the patch file name and the commands.
1.03	Jul. 8, 2022	5	Update the Graphics and Video codec libraries for RZ/G2L and RZ/G2L.
		15	Add the additional information to the table 7.
1.04	Aug. 9, 2022	-	Change some introduction about VLP/G v3.0.0-update1 to VLP/G v3.0.0-update 2.
		4	Update the Release Note and Component List. Add the additional information to OSS files.
		5	Update Optional packages.
		23	Add the update points of VLP/G v3.0.0-update2.
1.05	Sep. 30, 2022	-	First edition for VLP/G v3.0.1.
1.06	Mar. 30, 2023	-	First edition for VLP/G v3.0.3.
1.07	Apr. 21, 2023	4, 8	Update the Multimedia Package revision for RZ/G2H, RZ/G2M, RZ/G2N and RZ/G2E.
1.08	Oct. 31, 2023	-	First edition for VLP/G v3.0.5.
		-	Added support RZ/G1H, RZ/G1M, RZ/G1N, and RZ/G1E.

## Website and Support

Renesas Electronics Website

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

Inquiries

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

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