RZ MPU Qt6 (v6.8.3) Package V4.0.0.2 for RZ MPU Verified Linux Package V4.0.1

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Qt6 (v6.8.3) Start-up Guide

Introduction

This release note describes the contents, building procedures for Qt6 (v6.8.3), and important points of the RZ MPU Qt6 (v6.8.3) Package V4.0.0.2 for RZ MPU Verified Linux Package Version 4.0.1 (hereinafter referred to as “VLP”).

As “Qt6.8.3” includes components licensed under LGPLv3, please consider the commercial version if necessary, depending on your intended use.

If you need information to build Linux VLP without Qt6 (v6.8.3), please refer to “RZ MPU Verified Linux Package Version 4.0.1 Release Note” (r01us0797ej0102-rz(Release Note).pdf).

Contents

1. Release Items

- **Name and version**
  RZ MPU Qt6 (v6.8.3) Package V4.0.0.2 for RZ MPU Verified Linux Package Version 4.0.1 (hereinafter referred to as “Qt6 (v6.8.3) Package v4.0.0.2” and “VLP v4.0.1”).

- **Distribution method**
  Visit one of the sites below and create an account to download the basic packages of VLP v4.0.1 listed in Table 2.

  RZ Family (including RZ/G series):
  https://www.renesas.com/products/microcontrollers-microprocessors/rz-arm-based-high-end-32-64-bit-mpus

  RZ MPU Verified Linux Package [6.1-CIP]:
  https://www.renesas.com/en/software-tool/rz-mpu-verified-linux-package-61-cip

- **Target board for Qt6 (v6.8.3)**
  The target boards for this VLP are as shown in the table below.

Table 1. Target board list

Device	Evaluation Board
RZ/G2L	RZ/G2L Evaluation Board Kit (P/N: RTK9744L23S01000BE)
RZ/G2LC	RZ/G2LC Evaluation Board Kit (P/N: RTK9744C22S01000BE)

- **Build Environment**
  Linux Host PC:
  - OS: Ubuntu 22.04 LTS (64-bit).
  - 255 GB of free disk space.

  Note) VLP cannot be built on Ubuntu 24.04 LTS.

- **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 (*)	Verified Linux Package. This file includes the **Yocto recipe packages** and the necessary documents.
rz_vlp_v4.0.1.tar.gz	**Yocto recipe packages**.
r01us0797ej0102-rz(Release Note).pdf	This document describes the contents and important points of VLP.
r01us0798ej0101-rz(Linux Start-up Guide RZG2L,LC,UL).pdf	This document describes booting method and the required settings of bootloader for **RZ/G2L and RZ/G2LC**.

Basic files of Qt6 (v6.8.3) Package v4.0.0.2

File	Description
RTK0EF0224Z00002ZJ_v4.0.0.2.zip (*)	Qt6 (v6.8.3) Package. This file includes the **Yocto recipe packages** for Qt6 and the necessary documents.
rzg_bsp_qt6.8.3_v4.0.0.2.tar.gz	**Yocto recipe packages**.
r01us0806ej0102-rz(Qt6 Start-up Guide).pdf	This document.
oss_pkg_qt6.8.3_v4.0.0.2.7z (*)	Open-source software packages. See the Note below before you download.

(*) 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 and using this large OSS package file (oss_pkg_qtXXX_xxx.7z) is not mandatory if your Linux Host PC is connected to the Internet and can directly download the individual source code packages listed in the Yocto recipes. However, if your Host 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, you may 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 the Linux Start-up Guide.

Optional packages (*)

	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**.

2. Build Instructions

2.1 Build VLP without Qt6 (v6.8.3)

Please follow the documents below and build the VLP first. You can check the release items in the Release Note, and then follow chapters 1 and 2 of the Linux Start-up Guide.

Table 3. Documents of VLP v4.0.1

r01us0797ej0102-rz(Release Note).pdf	This document describes the contents and important points of VLP.
r01us0798ej0101-rz(Linux Start-up Guide RZG2L,LC,UL).pdf	This document describes booting methods and the required settings of bootloader for **RZ/G2L and RZ/G2LC**. Please refer to chapters 1 and 2 for building VLP.

VLP includes additional packages and options, allowing users to select their own combination.
Please note that Qt6 (v6.8.3) package is tested with the combination below.

Example: RZ/G2L is tested using both the graphics and codec libraries, but it is not tested using Security, Multi-OS, or Docker.

Table 4. Combinations of Qt6 (v6.8.3)

		Packages and Options				
		Graphics	Codec	Security	Multi-OS	Docker
Devices	RZ/G2L	O		-	-	-
	RZ/G2LC	O	-	-	-	-

(*) "-" means that the packages and the options are not tested with Qt6 (v6.8.3).

After completing the build, please move to 2.2 in this document to enable Qt6 (v6.8.3).

2.2 Build VLP with Qt6 (v6.8.3)

This section describes the instructions to build VLP with Qt6 (v6.8.3).

Copy all files obtained from Renesas into your Linux Host PC prior to the steps below. The directory which you put the files in is described as <package download directory> in the build instructions.

(1) Move to the working directory and decompress Yocto recipe packages

Run the commands below. The name and the place of the working directory can be changed as necessary.

```
$ cd ~/rz_vlp_v${PACKAGE_VERSION}
$ cp ../<package download directory>/*.zip .
$ unzip ./RTK0EF0224Z00002ZJ_v4.0.0.2.zip
$ tar zxvf ./RTK0EF0224Z00002ZJ_v4.0.0.2/rzg_bsp_qt6.8.3_v4.0.0.2.tar.gz
```

Note) Ensure your Host PC has at least 255 GB of free disk space.
If you are using a virtual machine, please verify the allocated storage.

(2) Set up a build environment

Initialize a build using the “oe-init-build-env” script in Poky and point TEMPLATECONF to platform conf path.

```
$ TEMPLATECONF=$PWD/meta-renesas/meta-rz-distro/conf/templates/rz-conf/ \
source poky/oe-init-build-env build
```

(3) Add layers

Run the commands below to add these layers to bblayers.conf.

```
$ bitbake-layers add-layer ../meta-qt6
$ bitbake-layers add-layer ../meta-rz-qt6
$ bitbake-layers add-layer ../meta-rz-features/meta-rz-codecs
$ bitbake-layers add-layer ../meta-rz-features/meta-rz-graphics
```

(4) Decompress OSS files to “build” directory (optional)

Use the 7z command to decompress the OSS packages into "~/rz_vlp_v${PACKAGE_VERSION}/build/" (or any path you prefer). Skip this step if the “offline” build is not needed.

```
$ cp ../../<package download directory>/oss_pkg_qt6.8.3_v4.0.0.2.7z .
$ 7z x oss_pkg_qt6.8.3_v4.0.0.2.7z
```

Note) If you skip this step, the bitbake command will download all source codes from the repositories of each OSS over the internet. Please be aware that if you are not in an "offline" environment, the building might fail due to unexpected changes in the OSS repositories. Open-source software packages include all the source codes of the OSS components. These are the exact versions of the OSS used during the verification of VLP. If you are simply evaluating VLP and the RZ/G2L group, using these open-source software packages is not necessary. Generally, all the software can be built without these files if your Linux Host PC has an internet connection. Open-source software packages are necessary for an "offline" environment. An "offline" environment is defined as an isolated environment without any network connection. VLP can consistently build images in this "offline" environment using these packages, unaffected by any modifications in the original OSS repositories. Furthermore, this "offline" environment always produces the same images that Renesas verified. Keep in mind that building without these open-source software packages could lead to the use of different source codes than those used by Renesas, due to potential unexpected changes in the OSS repositories.

Please select "**A**" if you see the messages below.

```
Would you like to replace the existing file:
Path: ./own-mirror/git2_git.eclipse.org.r.tcf.org.eclipse.tcf.agent.git.tar.gz.done
Size: 0 bytes
Modified: 2025-06-24 14:59:12
with the file from archive:
Path: own-mirror/git2_git.eclipse.org.r.tcf.org.eclipse.tcf.agent.git.tar.gz.done
Size: 0 bytes
Modified: 2025-06-24 14:59:12
? (Y)es / (N)o / (A)lways / (S)kip all / A(u)to rename all / (Q)uit? A
```

After completing the above steps, the "offline" environment is ready. To use the OSS packages and prevent network access, add these lines to "~/rz_vlp_v${PACKAGE_VERSION}/build/conf/local.conf":

```
BB_GENERATE_MIRROR_TARBALLS = "1"
BB_GENERATE_SHALLOW_TARBALLS = "1"
BB_GIT_SHALLOW = "1"
BB_GIT_SHALLOW_DEPTH = "1"

BB_NO_NETWORK = "1"

INHERIT += "own-mirrors"
SOURCE_MIRROR_URL = "file://<build directory>/own-mirror"
```

Other build environments can then reference the same "<build directory>/own-mirror" instead of decompressing the OSS packages individually.

(5) Start a build

Note) Before continuing the steps below, you can add optional packages (e.g., Qt examples or WebEngine features) to the root filesystem by referring to 2.3.

Run the command below to start a build. It may take several hours depending on your Host PC's performance.

```
$ MACHINE=<board> bitbake core-image-qt
```

<board> can be selected from the Table 5.

Example: MACHINE=smarc-rzg2l

Table 5. List of platforms and the boards

Renesas MPU	<board>
RZ/G2L	smarc-rzg2l
RZ/G2LC	smarc-rzg2lc

After the build completes successfully, you can see similar output and the command prompt will return.

```
NOTE: Tasks Summary: Attempted 13371 tasks of which 16 didn't need to be rerun and a
ll succeeded.
```

All necessary files will be located in the **"build/tmp/deploy/images"** directory.

2.3 Notes

(1) Install Qt examples

Add the line below to "~/rz_vlp_v${PACKAGE_VERSION}/build/conf/local.conf".

```
IMAGE_INSTALL:append = " packagegroup-qt6-examples "
```

(2) Enable WebEngine features

Note) You need additional 25 GB of free disk space to enable the WebEngine features.

Add the line below to "~/rz_vlp_v${PACKAGE_VERSION}/build/conf/local.conf".

```
DISTRO_FEATURES:append = " webengine "
```

(3) Tips to prevent qtwebengine build crashes on low-RAM Host PC

Method 1: Create swap file that is 2 or 4 times larger than the RAM. The steps below create a 32 GB swap file, so please adjust the size as needed for your Host PC. For details, refer to How do I add a swap file?.

```
$ sudo fallocate -l 32G /swapfile
$ sudo chmod 600 /swapfile
$ sudo mkswap /swapfile
$ sudo swapon /swapfile
$ echo "/swapfile swap swap defaults 0 0" | sudo tee -a /etc/fstab
```

Method 2: Limit Ninja parallelism by adding the line below to "~/rz_vlp_v${PACKAGE_VERSION}/meta-rz-qt6/recipes-qt6/qt6/qtwebengine_git.bbappend". Please adjust the number as needed for your Host PC.

```
export NINJAFLAGS = "-j6"
```

(4) Reduce storage usage

Add the line below to "~/rz_vlp_v${PACKAGE_VERSION}/build/conf/local.conf" to remove immediate artifacts.

```
INHERIT += "rm_work"
```

Note) With this method, you only need about 125 GB of free disk space to build VLP with Qt6.

2.4 Verified Qt examples

This section describes how to launch the Qt examples after building VLP with Qt6.

(1) Prepare the SD card and boot the evaluation board

Prepare the SD card and boot the evaluation board by following chapters 3 and 4 of the Linux Start-up Guide below.
After booting the target board, please move to the (2) in this document.

Table 6. Document of VLP v4.0.1

r01us0798ej0101-rz(Linux Start-up Guide RZG2L,LC,UL).pdf	This document describes booting method and the required settings of bootloader for **RZ/G2L and RZ/G2LC**. Please refer to chapters 3 and 4.

(2) Launch the Qt examples on the evaluation board

If you install Qt examples in 2.3(1), they will be located in the **"/usr/shared/examples"** directory.

Please connect a monitor, USB hub, a mouse, and a keyboard to your evaluation board.

The following are **some of the many** Qt examples available in that directory, which you can run using these commands:

- **Qt Multimedia**

```
# /usr/share/examples/multimedia/player/player
# /usr/share/examples/multimedia/videowidget/videowidget
# /usr/share/examples/multimedia/video/mediaplayer/mediaplayerexample
```

- **Qt Graphs**

```
# /usr/share/examples/graphs/2d/hellographs/hellographs
# /usr/share/examples/graphs/3d/widgetgraphgallery/widgetgraphgallery
```

- **Qt OpenGL**

```
# /usr/share/examples/opengl/hellogl2/bin/hellogl2
# /usr/share/examples/opengl/openglwindow/bin/openglwindow
```

- **Qt Quick**

```
# /usr/share/examples/quick/layouts/bin/layoutsexample
# /usr/share/examples/quick/scenegraph/graph/bin/graphapp
```

- **Qt Quick3D**

```
# /usr/share/examples/quick3d/view3d/bin/view3d
# /usr/share/examples/quick3d/hellocube/bin/hellocube
```

- **Qt Quick Controls**

```
# /usr/share/examples/quickcontrols/gallery/bin/galleryexample
# /usr/share/examples/quickcontrols/wearable/bin/wearableexample
```

- **Qt Widgets**

```
# /usr/share/examples/widgets/gallery/bin/gallery
# /usr/share/examples/widgets/graphicsview/chip/bin/chip
```

- **Qt Virtual Keyboard**

```
# /usr/share/examples/virtualkeyboard/basic/basic
```

- **Qt WebEngine**

```
# export QTWEBENGINE_DISABLE_SANDBOX=1
# /usr/share/examples/webenginewidgets/simplebrowser/simplebrowser
# /usr/share/examples/webenginequick/quicknanobrowser/quicknanobrowser
```

3. Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.02	Nov 14, 2025	-	First edition for VLP v4.0.1.

Website and Support

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

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