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How to Use This Manual

1. Objective and Target Users

This manual sets out initial procedures for operating the RZ/V2M evaluation board kit. Note that this manual is not intended for use in software development.

This document shows the installation and startup procedure of the first boot loader, second boot loader, and U-Boot on the RZ/V2M evaluation board kit. For details and notes on the RZ/V2M evaluation board kit, refer to the RZ/V2M Evaluation Board Kit Hardware Manual.
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Introduction

This document shows the startup procedure of the first boot loader, second boot loader, and U-Boot on the RZ/V2M evaluation board kit (V2MEVK).

For details on the procedure, refer to the RZ/V2M Linux Package Manual. Descriptions in this document are based on the RZ/V2M Linux Package Rev1.2. When referring to the different package version, follow the descriptions in that document.

Related Documents

The following documents have been prepared for this V2MEVK. Make sure to refer to the latest versions of these documents.

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Document Title</th>
<th>Document No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Startup guide</td>
<td>V2MEVK Startup Guide</td>
<td>This document</td>
<td>Startup procedure of the V2MEVK</td>
</tr>
<tr>
<td>User's manual:</td>
<td>RZ/V2M User's Manual: Hardware</td>
<td>R01UH0940EJ0120</td>
<td>RZ/V2M hardware specifications (pin assignments, memory maps, peripheral specifications, electrical characteristics, and timing charts) and descriptions of operation</td>
</tr>
<tr>
<td>Linux startup</td>
<td>RZ/V2M Linux Package Startup Guide</td>
<td>R01US0527EJ0120</td>
<td>Startup procedure of the RZ/V2M Linux package</td>
</tr>
</tbody>
</table>
1. Operating Environment

Table 2.1-1 lists the recommended environment for V2MEVK operation and Figure 2.1-1 shows the connection method.

Table 2.1-1 Recommended Environment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>RZ/V2M evaluation board kit</td>
<td>Evaluation board kit for RZ/V2M</td>
</tr>
<tr>
<td>Windows PC</td>
<td>For controlling the target board with terminal software</td>
</tr>
<tr>
<td>OS</td>
<td>Windows 10 recommended</td>
</tr>
<tr>
<td>Terminal software</td>
<td>Control serial console of the target board.</td>
</tr>
<tr>
<td></td>
<td>Tera Term is recommended and available at &quot;Tera Term Open Source Project (osdn.jp)&quot;.</td>
</tr>
<tr>
<td>VCP driver</td>
<td>Virtual COM port driver to enable communications between the Windows PC and the target board via USB. This is virtually used as a serial port and available at &quot;CP210x USB to UART Bridge VCP Drivers - Silicon Labs (silabs.com)&quot;. Install &quot;CP210x VCP Windows&quot; at the above web site.</td>
</tr>
<tr>
<td>Serial to micro-USB cable</td>
<td>Serial communications (UART) between the RZ/V2M evaluation board kit and Windows PC</td>
</tr>
<tr>
<td>Micro-SD card</td>
<td>Used to write the flash writer software to the V2MEVK. Use it as SDHC, formatted as FAT32, with one partition.</td>
</tr>
<tr>
<td>AC adapter</td>
<td>12 V, 5 A (Plug: Inner diameter 2.1 mm, outer diameter 5.5 mm)</td>
</tr>
</tbody>
</table>

Figure 2.1-1 Connection Method
2. **Startup Procedure**

This section describes the procedure for writing the first boot loader, second boot loader, and U-Boot required to boot the Linux kernel. This procedure is accomplished by executing the following two functions in order.

1. SD card forced write function
2. Flash writer write function

For details, see section 7, *Flash Writer*, in the *RZ/V2M Linux Package Startup Guide*.

Download the latest version of the following software package from the Renesas Web site.

<table>
<thead>
<tr>
<th>Software Package</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RZ/V2M Linux Package</td>
<td>Linux package for the RZ/V2M</td>
</tr>
</tbody>
</table>

RZ/V2M — AI-only Accelerator (DRP-AI), 4K-compatible Image Signal Processor (ISP), Vision-AI ASSP for Real-time Human and Object Recognition (2022.4)


2.1 **Flash Writer Writing Procedure (using SD Card Forced Write Function)**

2.1.1 **Preparing the SD Card**

Store the files included in the RZ/V2M Linux package on an SD card.

1. SD card format specifications
   - FAT32
   - 1 partition
   - SDHC

2. Store the flash writer software on SD card

   The files to be stored are included in the following directory of the Linux package.

   \`r01an5971ej0<xxx>-rzv2m-linux (<xxx>: Package version)\`
   
   \`|-- option\`
   
   \`|-- flash_writer\`
   
   \`|-- B2_intSW.bin\`
2.1.2 Writing Flash Writer Software (SD Card Forced Write Execution)

Write the prepared file (Flash writer, file name: B2_intSW.bin) to eMMC™ on the board by using the forced write function of RZ/V2M.

1. With the V2MEVK board power turned off, insert the prepared SD card into the V2MEVK’s CN6 connector and set SW2 (see Figure 2.1-1 for the SW2 setting method)
2. Turn on SW501 of V2MEVK
3. The RZ/V2M automatically acquires data from the SD card and writes the data to eMMC. LED2 lights up when writing is successfully completed.

SUPPLEMENTARY EXPLANATION

If LED2 is blinking, the write operation has failed and an error may have occurred on the SD card. Check whether the SD card is inserted and formatted correctly.

---

![Figure 2.1-1 SW2 Settings](image-url)
2.2 Writing Procedure for First Boot Loader, Second Boot Loader, and U-Boot (Using Flash Writer Writing Function)

2.2.1 Starting Flash Writer

Start the flash writer written in section 2.1 Flash Writer Writing Procedure (using SD Card Forced Write Function).

1. Turn off SW501 of V2MEVK
2. Turn off all SW2 switches (SW2-1, SW2-2, SW2-3, and SW2-4) of V2MEVK
3. Connect CN5 of V2MEVK and the Windows PC with a USB cable (standard-A-micro-B) and start Tera Term. See Figure 2.2-1 for Tera Term settings.
4. Turn on SW501 of V2MEVK
   Check that the display is as shown in Figure 2.2-2.

*Note: Figure 2.2-1 shows the configuration for RZ/V2M Linux Package Ver1.2. If you will be using a different version, refer to the RZ/V2M Linux Package Startup Guide for that version.*

![Settings of Tera Term](image)

Figure 2.2-1 Settings of Tera Term
Flash writer for RZ/V2M V1.20 January 14, 2022

Figure 2.2-2 Starting the Flash Writer
2.2.2 Erasing the Area to be Written in eMMC

Erase the area in the eMMC for storing (writing) the first and second boot loaders and U-Boot.

1. Refer to Table 2.2-1 and enter the contents of the input column with Tera Term.

<table>
<thead>
<tr>
<th>Step</th>
<th>Tera Term Display</th>
<th>Input</th>
<th>Supplemental Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;</td>
<td>EM_E</td>
<td>The first and second boot loaders and U-Boot are stored in boot partition 1. For the sector number of boot partition 1 that first and second boot loaders and U-Boot are stored, refer to Figure 2.2-5.</td>
</tr>
<tr>
<td>2</td>
<td>Select area(0-2)&gt;</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>EM_E Complete!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2-1 Procedure of eMMC Initialization

Figure 2.2-3 shows an example of the screen display when the above procedure is successfully executed.

![Figure 2.2-3 EM_E Command](image)

Figure 2.2-3 EM_E Command
2.2.3 Writing the First Boot Loader, Second Boot Loader, and U-Boot

Write first boot loader, second boot loader, and U-Boot, respectively, to eMMC.

1. Storage location of sample first boot loader, second boot loader, and U-Boot
   The files to be written are included in the following directory of the Linux package.
   ```
   r01an5971ej0<xxx>-rzv2m-linux (<xxx>: Package version)
   └─ bin
       └─ loader_1st_128kb.bin
       └─ loader_2nd.bin
       └─ loader_2nd_param.bin
       └─ u-boot.bin
       └─ u-boot_param.bin
   ```

2. Execute writing of first boot loader
   Use the flash writer function for writing.

3. Refer to Table 2.2-2 and enter the contents of the input column with Tera Term.
   The following is an example of the first boot loader (file name to be written: loader_1st_128kb.bin).

<table>
<thead>
<tr>
<th>Step</th>
<th>Tera Term Display</th>
<th>Input</th>
<th>Supplemental Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EM_WB</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Select area(0-2)&gt;</td>
<td>1</td>
<td>See Figure 2.2-5 for details on specifying parameters. (For details, see Table 7-3, Boot loader data stored in the eMMC in the RZ/V2M Linux Package Startup Guide.)</td>
</tr>
<tr>
<td>3</td>
<td>Please Input Start Address in sector:</td>
<td>000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Please Input File size(byte):</td>
<td>20000</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Please send binary file!</td>
<td></td>
<td>This control should be executed by the file transfer function, not by Tera Term command input.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Click “File” and “Send file...”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Select “loader_1st_128kb.bin”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Check “Binary” in “Option”. (see Figure 2.2-4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Click “Open”.</td>
</tr>
<tr>
<td>6</td>
<td>EM_WB Complete!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

![Figure 2.2-4 File Transmission](Check this box.)
4. Execution of writing second boot loader and U-Boot

Writing the second boot loader and U-Boot also requires use of the functions of the flash writer. Change the following from the procedure for the first boot loader (file name to be written: loader_1st_128kb.bin) and write it.

4-1) Change the parameters specified in STEP 2 to 4.

4-2) Change the name of the file to be sent
   Second boot loader: “loader_2nd.bin”, “loader_2nd_param.bin”
   U-Boot: “u-boot.bin”, “u-boot_param.bin”
2.3 Startup with Written Information

Boot V2MEVK with the respective data for the first boot loader, second boot loader, and U-Boot that have been written to eMMC.

1. Turn off SW501 of V2MEVK
2. Turn on SW501 of V2MEVK
3. Restart V2MEVK and if the display is as shown in Figure 2.3-1, startup is complete.

![U-Boot Startup Display](image)

Figure 2.3-1 U-Boot Startup Display
<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>Jun 10, 2022</td>
<td>First edition, issued</td>
</tr>
</tbody>
</table>
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User’s Manual

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