

RZ/G2 Reference Boards

R01TU0279EJ0101

Rev.1.01

Start-up Guide

May 16, 2019

Introduction

This document provides a guide to prepare RZ/G2 reference boards to boot up with the Verified Linux Package for 64bit kernel. Especially, procedures to write bootloader to each board are explained.

Bootloaders are written to the Flash ROM on the board using the FlashWriter or the MiniMonitor provided by Renesas. This document explains the way to write these files using the MiniMonitor.

Note) The FlashWriter and the MiniMonitor will be provided via the RZ/G Marketplace, but the page which provides them may under construction. Please ask using the “Contact Us” page at the Marketplace to get them for a while.

RZ/G Marketplace:

America: <https://mp.renesas.com/en-us/rzg/>

Europe: <https://mp.renesas.com/en-eu/rzg/>

Asia: <https://mp.renesas.com/en-sg/rzg/>

Japan: <https://mp.renesas.com/ja-jp/rzg/>

Target

RZ/G2 Group reference boards

- Hoperun Technology HiHope RZ/G2M platform (hihope-rzg2m)
- Silicon Linux RZ/G2E evaluation kit (EK874)

Verified Linux Package for 64bit kernel version 1.0.x

Contents

1. Hoperun Technology HiHope RZ/G2M platform (hihope-rzg2m)	3
1.1 Preparation	3
1.1.1 Building files to write	3
1.1.2 Settings	3
1.2 Booting MiniMonitor	3
1.3 Writing Bootloader	5
1.4 Setting U-boot	6
2. Silicon Linux RZ/G2E evaluation kit (EK874)	8
2.1 Preparation	8
2.1.1 Building files to write	8
2.1.2 Settings	8
2.2 Booting MiniMonitor	8
2.3 Writing Bootloader	9

2.4	Setting U-boot.....	9
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1. Hoperun Technology HiHope RZ/G2M platform (hihope-rzg2m)

1.1 Preparation

1.1.1 Building files to write

This board uses the files below as a bootloader. Please build them according to the Release Note and copy these files to the PC which runs a serial terminal software.

- bootparam_sa0.srec
- bl2-hihope-rzg2m.srec
- cert_header_sa6.srec
- bl31-hihope-rzg2m.srec
- u-boot-elf-hihope-rzg2m.srec

1.1.2 Settings

Connect between the board and a control PC by USB serial cable according to the Release Note.

Set the settings about serial communication protocol on a terminal software as below:

- Speed: 115200 bps
- Data: 8bit
- Parity: None
- Stop bit: 1bit
- Flow control: None

To set the board to SCIF Download mode, set the SW1002 as below:



SW1002

8	7	6	5	4	3	2	1
OFF	OFF	OFF	OFF	ON	ON	ON	ON

Note) Be careful not to change the SW1001 and SW1003

1.2 Booting MiniMonitor

Turn on the power of the board by changing the SW2402. Messages below are shown on the terminal.

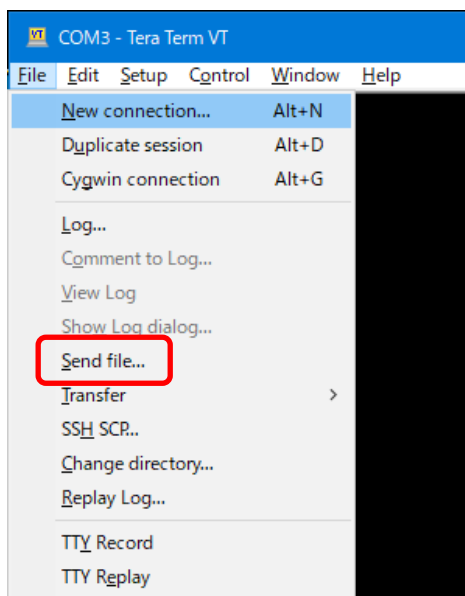
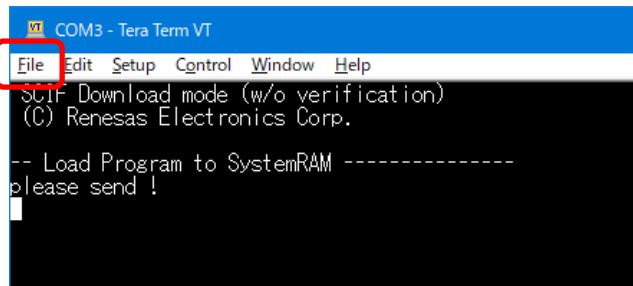
```
SCIF Download mode (w/o verification)
(C) Renesas Electronics Corp.

-- Load Program to SystemRAM -----
please send !
```

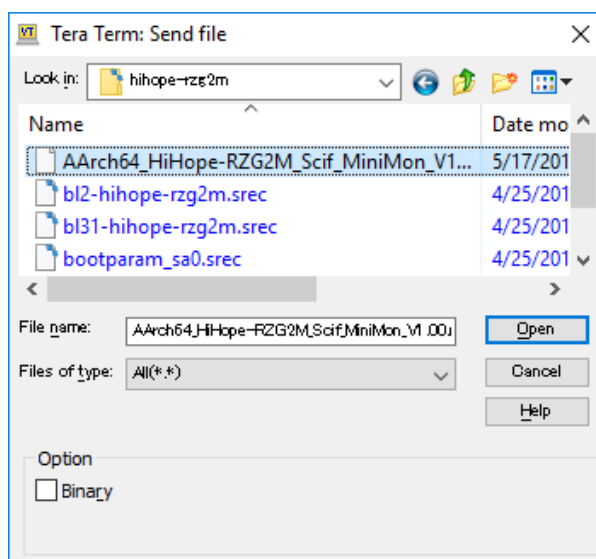
Send an image of the MiniMonitor (AArch64_HiHope-RZG2M_Scif_MiniMon_V1.00.mot) from terminal software after the message “please send !” is shown.

Below is a sample procedure using Tera Term.

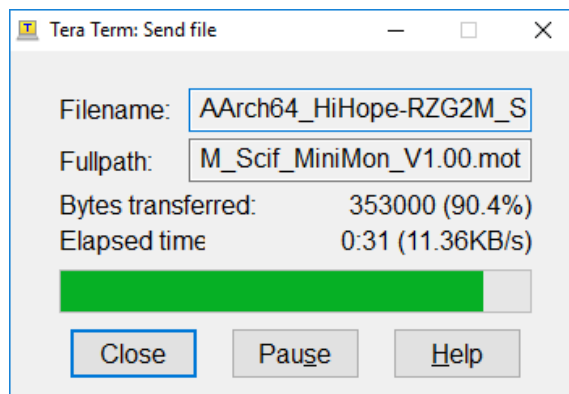
Open a “Send file” dialog by selecting “File” → “Sendfile” menu.



Then, select the image to be send and click “Open” button.



The image will be sent to the board via serial connection.



After successfully download the binary, the MiniMonitor is automatically started and messages like below are shown on the terminal.

```
RZ/G2 Scif Download MiniMonitor V1.00 2019.04.12
Work Memory      : SystemRAM
Board Judge      : Used Board-ID
Board Name       : HiHope RZ/G2M
Product Code     : RZ/G2M ES1.1
```

1.3 Writing Bootloader

“xls2” command of the MiniMonitor is used to write binary files. This command receives binary data from the serial port and write the data to specified address of the Flash ROM with information where the data should be loaded on the address of the main memory.

This is an example of writing “bootparam_sa0.srec” which should be placed to E6320000h of the main memory to 000000h of the Flash ROM.

```
>xls2
===== Qspi/HyperFlash writing of Gen3 Board Command =====
Load Program to Spiflash
Writes to any of SPI address.
Winbond : W25M512JW
Program Top Address & Qspi/HyperFlash Save Address
===== Please Input Program Top Address =====
Please Input : H'E6320000

===== Please Input Qspi/HyperFlash Save Address ===
Please Input : H'000000
Work RAM(H'50000000-H'53FFFFFF) Clear....
please send ! (',' & CR stop load)
```

Send the data of “bootparam_sa0.srec” from terminal software after the message “please send !” is shown.

After successfully download the binary, messages like below are shown on the terminal.

```
SPI Data Clear(H'FF) Check : OK
SAVE SPI-FLASH..... complete!

===== Qspi/HyperFlash Save Information =====
SpiFlashMemory Stat Address : H'00000000
SpiFlashMemory End Address : H'00000E67
=====
```

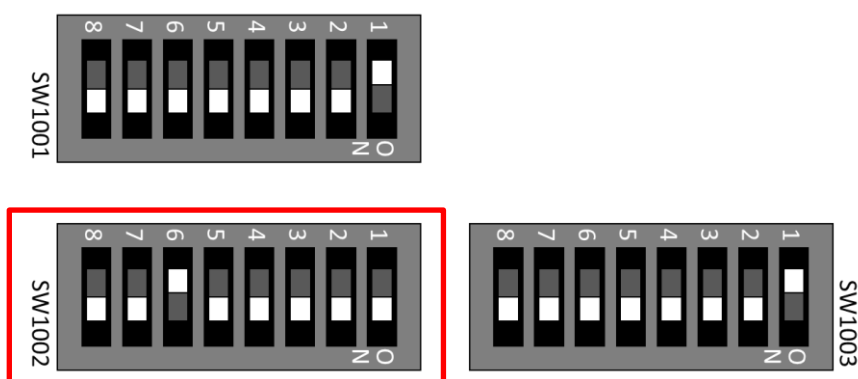
Write all necessary files using the addresses listed at Table 1 and turn off the power of the board by changing the SW2402.

Table 1. Addresses for each file

File name	Address to load to RAM	Address to save to ROM
bootparam_sa0.srec	E6320000	000000
bl2-hihope-rzg2m.srec	E6304000	040000
cert_header_sa6.srec	E6320000	180000
bl31-hihope-rzg2m.srec	44000000	1C0000
u-boot-elf-hihope-rzg2m.srec	50000000	300000

1.4 Setting U-boot

To set the board to SPI Boot mode, set the SW1002 as below:



SW1002

8	7	6	5	4	3	2	1
ON	ON	OFF	ON	ON	ON	ON	ON

Note) Be careful not to change the SW1001 and SW1003

Turn on the power of the board by changing the SW2402.

```

U-Boot 2018.09 (Feb 21 2019 - 09:12:59 +0000)

CPU: Renesas Electronics R8A774A1 rev 1.1/rev 1.2
Model: Hoperun Technology HiHope RZ/G2M platform (hihope-rzg2m)
DRAM:  3.9 GiB
Bank #0: 0x048000000 - 0x0bfffffff, 1.9 GiB
Bank #1: 0x600000000 - 0x67fffffff, 2 GiB

MMC:  sd@ee100000: 0, sd@ee160000: 1
Loading Environment from SPI Flash... SF: Detected w25m512jw with page size 25
6 Bytes, erase size 4 KiB, total 32 MiB
*** Warning - bad CRC, using default environment

```

Following the messages above, many warning messages will be shown. These warnings are eliminated by setting correct environment variables. Please set default value and save them to the Flash ROM.

```
=> env default -a
## Resetting to default environment
=> saveenv
Saving Environment to SPI Flash... SF: Detected w25m512jv with page size 256 B
ytes, erase size 4 KiB, total 32 MiB
Erasing SPI flash...Writing to SPI flash...done
OK
```

In case booting from micro SD card, set environment variables using the commands below:

```
=> setenv bootargs 'root=/dev/mmcblk0p2 rootwait'
=> setenv bootcmd 'fatload mmc 0:1 0x48080000 Image-hihope-rzg2m.bin; fatload
mmc 0:1 0x48000000 Image-r8a774a1-hihope-rzg2m.dtb; booti 0x48080000 - 0x48000
000'
=> saveenv
Saving Environment to SPI Flash... SF: Detected w25m512jv with page size 256 B
ytes, erase size 4 KiB, total 32 MiB
Erasing SPI flash...Writing to SPI flash...done
OK
```

Note) The setting above assumes the SD card has two partitions and stores data as below:

First partition: formatted as FAT, includes Image-hihope-rzg2m.bin and Image-r8a774a1-hihope-rzg2m.dtb

Second partition: formatted as ext4, rootfs image is expanded

Now the board can bootup normally. Please turn off and on the power again to boot up the board.

2. Silicon Linux RZ/G2E evaluation kit (EK874)

2.1 Preparation

2.1.1 Building files to write

This board uses the files below as a bootloader. Please build them according to the Release Note and copy these files to the PC which runs a serial terminal software.

- bootparam_sa0.srec
- bl2-ek874.srec
- cert_header_sa6.srec
- bl31-ek874.srec
- u-boot-elf-ek874.srec

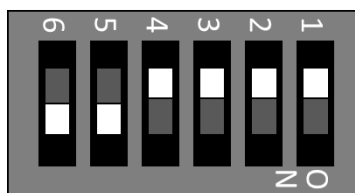
2.1.2 Settings

Connect between the board and a control PC by USB serial cable according to the Release Note.

Set the settings about serial communication protocol on a terminal software as below:

- Speed: 115200 bps
- Data: 8bit
- Parity: None
- Stop bit: 1bit
- Flow control: None

To set the board to SCIF Download mode, set the SW12 which is placed near the micro SD card slot as below:



6	5	4	3	2	1
ON	ON	OFF	OFF	OFF	OFF

2.2 Booting MiniMonitor

Turn on the power of the board by changing the SW23. Messages below are shown on the terminal.

```
SCIF Download mode (w/o verification)
(C) Renesas Electronics Corp.

-- Load Program to SystemRAM -----
please send !
```

Send an image of the MiniMonitor (AArch64_EK874_Scif_MiniMon_V1.00.mot) from terminal software after the message “please send !” is shown.

For detail of the procedure, please refer to the section **1.2 Booting MiniMonitor**.

After successfully download the binary, the MiniMonitor is automatically started and messages like below are shown on the terminal.

```
RZ/G2 Scif Download MiniMonitor V1.00 2019.04.12
Work Memory      : SystemRAM
Board Judge      : Used Board-ID
Board Name       : EK874
Product Code     : RZ/G2E ES1.0
```

2.3 Writing Bootloader

“xls2” command of the MiniMonitor is used to write binary files. This command receives binary data from the serial port and write the data to specified address of the Flash ROM with information where the data should be loaded on the address of the main memory.

For detail of the procedure, please refer to the section **1.3 Writing Bootloader**.

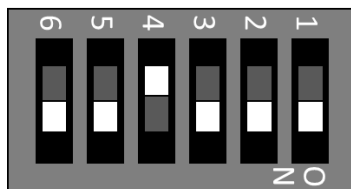
Write all necessary files using the addresses listed at Table 2 and turn off the power of the board by changing the SW23.

Table 2. Addresses for each file

File name	Address to load to RAM	Address to save to ROM
bootparam_sa0.srec	E6320000	000000
bl2-ek874.srec	E6304000	040000
cert_header_sa6.srec	E6320000	180000
bl31-ek874.srec	44000000	1C0000
u-boot-elf-ek874.srec	50000000	300000

2.4 Setting U-boot

To set the board to SPI Boot mode, set the SW12 which is placed near the micro SD card slot as below:



6	5	4	3	2	1
ON	ON	OFF	ON	ON	ON

Turn on the power of the board by changing the SW23.

```
U-Boot 2018.09 (Feb 21 2019 - 09:12:59 +0000)

CPU: Renesas Electronics R8A77990 rev 1.0
Model: Silicon Linux CAT874 RZ/G2E board
DRAM: 896 MiB
Bank #0: 0x048000000 - 0x07ffffff, 896 MiB

MMC: sd@ee100000: 0
Loading Environment from SPI Flash... SF: Detected w25m512jv with page size 25
6 Bytes, erase size 4 KiB, total 32 MiB
*** Warning - bad CRC, using default environment
```

Following the messages above, many warning messages will be shown. These warnings are eliminated by setting correct environment variables. Please set default value and save them to the Flash ROM.

```
=> env default -a
## Resetting to default environment
=> saveenv
Saving Environment to SPI Flash... SF: Detected w25m512jv with page size 256 B
ytes, erase size 4 KiB, total 32 MiB
Erasing SPI flash...Writing to SPI flash...done
OK
```

In case booting from micro SD card, set environment variables using the commands below:

```
=> setenv bootargs 'root=/dev/mmcblk0p2 rootwait'
=> setenv bootcmd 'fatload mmc 0:1 0x48080000 Image-ek874.bin; fatload mmc 0:1
0x48000000 Image-r8a774c0-ek874.dtb; booti 0x48080000 - 0x48000000'
=> saveenv
Saving Environment to SPI Flash... SF: Detected w25m512jv with page size 256 B
ytes, erase size 4 KiB, total 32 MiB
Erasing SPI flash...Writing to SPI flash...done
OK
```

Note) The setting above assumes the SD card has two partitions and stores data as below:

First partition: formatted as FAT, includes Image-ek874.bin and Image-r8a774c0-ek874.dtb

Second partition: formatted as ext4, rootfs image is expanded

Now the board can bootup normally. Please turn off and on the power again to boot up the board.

Website and Support

Renesas Electronics Website

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

Inquiries

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

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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Apr. 25, 2019	–	First edition issued.
1.01	May. 16, 2019	–	Information for RZ/G2M board is added.