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INTRODUCTION

About this Guide

This document is intended as the guide for unpacking iWave's iW-RainboW-G23S-RZ/G1C Single Board Computer (RZ/G1C SBC) package and setting up the test environment for it. It also gives details about safety information and important cautions which should adhere while using the RZ/G1C SBC.

RZ/G1C Single Board Computer (RZ/G1C SBC) Overview

The RZ/G1C SBC is an extension of RZ/G1C CPU, which is based on Renesas high performance RZ/G1C (Dual Core - ARM Cortex A7 MPUs). This RZ/G1C SBC can be used for quick prototyping of any high end applications in verticals like Automotive, Industrial & Medical. The board is highly packed with all necessary on-board connectors to validate almost complete RZ/G1C CPU features.

Important Symbols Used



Important Note



Warning



Use ESD Protection



ROHS complaint



Check the local regulations for disposal of electronic products

UNPACKING

Safety Information

- Before unpacking and installing the RZ/G1C SBC or adding devices on it, carefully read all the manuals that came with the package.
- Place the product on a stable surface. To avoid short circuits in electronics, keep all conducting material away from the RZ/G1C SBC.
- Avoid using board in extreme dust, humidity and temperature conditions. Do not place the RZ/G1C SBC in wet area.
- Before using the RZ/G1C SBC, make sure that all cables are correctly connected and the power adapter is correctly selected.
- Make sure that Electrical outlet where you connected the power adapter is not damaged and working fine.
- If the power adapter is broken, do not try to fix it by yourself. To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before displacing the system.



Check the local regulations for disposal of electronic products.

Unpacking Guidelines

Please follow the below guidelines while unpacking the RZ/G1C SBC.

- Wear the anti-static wristband while unpacking and handling the RZ/G1C SBC to prevent electrostatic discharge.
- Use anti-static pad/mat with proper grounding to place the RZ/G1C SBC.
- Don't touch the inside surface of the RZ/G1C SBC circuit board.
- Self-grounding: Touch a grounded conductor every few minutes to discharge any excess static build-up.









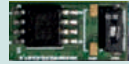
- Make sure that packing box is facing upwards while opening.
- Make sure that the entire packing list items mentioned in Package Checklist are present.



Static electricity can destroy electronics in the RZ/G1C SBC. Make sure to follow the ESD precautions to prevent damage to the RZ/G1C SBC and injury to the user.

Package Checklist

The RZ/G1C SBC will be shipped with the following items:

Sl. No.	Package Item	Qty	Image
1	iW-RainboW-G23S RZ/G1C Single Board Computer	1	  <p>All components used in this RZ/G1C SBC is Lead free and ROHS compliant</p>
2	5V,2.5A Power Adaptor with universal plugs	1	
3	Quick Start Guide	1	
4	DVD (Please refer DVD Content section)	1	
5	Custom JTAG Cable	1 (Optional)	
6	SPI Programmer Board	1 (Optional)	



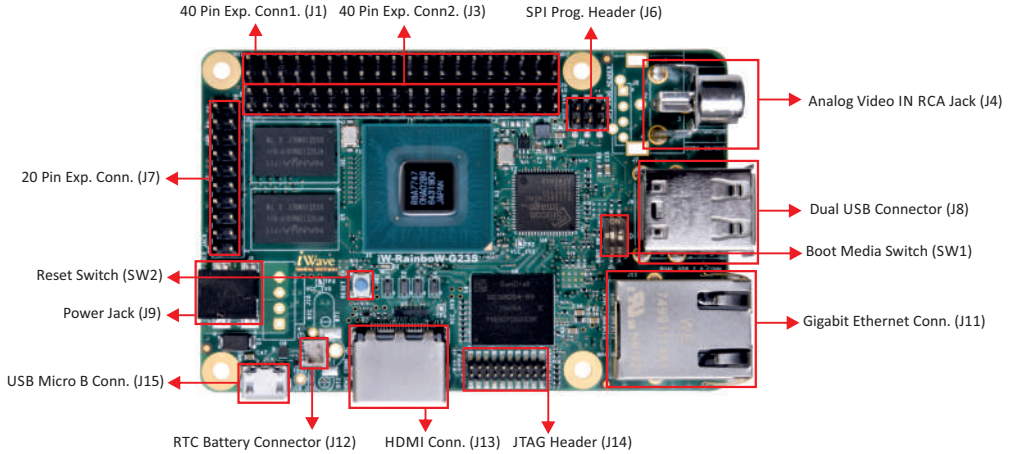
Do not proceed with installation, if any of the items listed in the above checklist is missing or damaged. Contact iWave support team.

Get to Know the RZ/G1C SBC

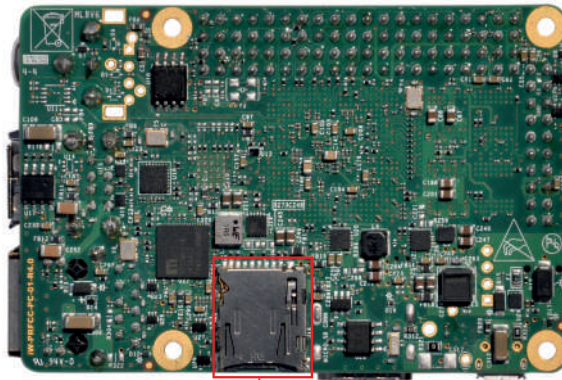
The RZ/G1C SBC supports the following features.

RZ/G1C SBC Features	
CPU	Renesas RZ/G1C MPU Dual ARM Cortex®-A7 MPCore® @ 1GHz
Memory	512MB DDR3 (Expandable) 8GB eMMC Flash (Expandable) 16MB SPI NOR Flash (Expandable) Micro SD Slot
Communication Features	100/1000Mbps Ethernet through RJ45MagJack x 1 USB2.0 Host x 2 Port through Dual stack Type A Connector USB2.0 OTG as a Device x 1 Port through Micro B Connector
Video Features	HDMI x 1 Port through HDMI connector CVBS Video Input through RCA Jack CVBS Video Output through RCA Jack/Header (Optional)
Other Features	JTAG Header x 1 SPI Flash Programming Header x 1 RTC Controller with Battery Connector x 1 Boot Media Switch x 1 Reset Switch x 1
Expansion Features	40pin Expansion Connector x 2 (To Connect Add-On-Module) 20pin Expansion Connector x 1 (To Connect Add-On-Module)
General Specification	Power Supply : 5V,2.5A Power Input Jack Form Factor : 85mm X 56mm

The RZ/G1C SBC major components location are shown in the below figure.



Top View of RZ/G1C SBC



Bottom View of RZ/G1C SBC



Refer RZ/G1C SBC Hardware User Guide for more details.

SETTING UP THE TEST ENVIRONMENT

Getting Start

This section describes the step by step procedure to setup the test environment for RZ/G1C SBC.

- Read the RZ/G1C SBC Documents
- Boot Media Setting
- Setting up the Debug port
- Power ON the RZ/G1C SBC

Read the Documents

Before setting up the test environment, one must read all the documents of the RZ/G1C SBC to know about its features and get familiar with it. These documents are available in the DVD which comes along with the RZ/G1C SBC Package.

Below mentioned documents are available in the DVD,

- RZ/G1C SBC Quick start Guide (This Guide)
- RZ/G1C SBC Hardware User Guide
- RZ/G1C SBC Software User Guide
- RZ/G1C SBC Software Release Note

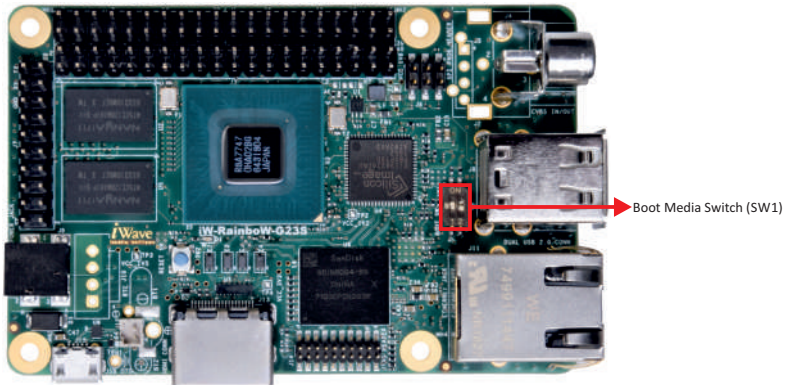


Refer DVD contents section to know about the DVD content structure and RZ/G1C SBC related document's path.



Boot Media Setting

Please follow the below procedure to setup the Boot Media selection of RZ/G1C SBC.

- RZ/G1C SBC supports two positions Boot Media Switch (SW1) which is physically located in the top of the PCB. This switch is used to select the boot media of RZ/G1C CPU. RZ/G1C SBC supports two boot media options for booting RZ/G1C CPU as mentioned in the below table.



Boot Media Setting

Boot Media Setting On RZ/G1C SBC	SW1(2 Position Switch)		
	Position 1	Position 2	Image
QSPI0-SPI Flash (Default)	ON	OFF	
MMC0-8bit eMMC	OFF	ON	

Debug Port Setting

Please follow the below procedure to setup the Debug port of RZ/G1C SBC. To use the Debug UART port, USB to serial UART converter cable (Example: TTL-232R-RPI) is required.

- Connect TypeA end of TTL-232R-RPI cable to PC and 3pin (100mil) Berghosue end of TTL-232R-RPI cable to RZ/G1C SBC's 20pin Expansion connector(J7) as shown below.



Debug Port Connection

- Install the driver for Debug USB Port in Host PC/Laptop using the below link.

Drivers located at: <http://www.ftdichip.com/Products/ICs/FT232R.htm>

- Setup the Debug Terminal parameters.

Baud Rate : 115200

Data bits : 8

Parity : None

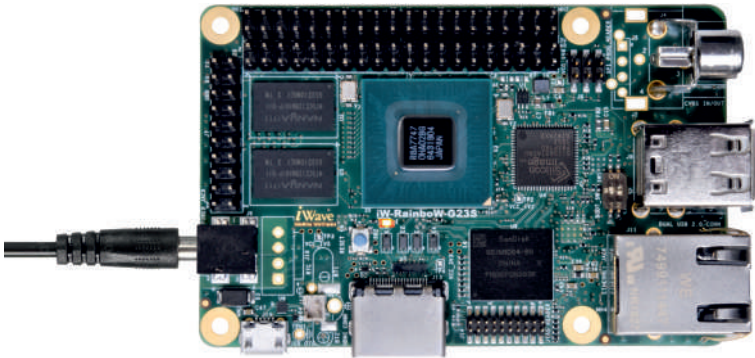
Stop Bits : 1

Flow Control : None

Powering ON the RZ/G1C SBC

The RZ/G1C SBC comes with 5V, 2.5A power supply with universal plugs. Please follow the below procedure to power ON the RZ/G1C SBC.

- Connect the 5V power supply plug to the power connector (J9) of the RZ/G1C SBC as shown below and Power ON the power supply.



Power Supply Connection

- Once Power is applied to the RZ/G1C SBC, the Red Power LEDs in the RZ/G1C SBC will glow as shown in the above image.



Do not use different power adapter other than the supplied one. Do not proceed with installation, if Power Status LED is blinking or not glowing. Contact iWave support team.

Done with Test Environment

Once power is applied to the RZ/G1C SBC as explained in the previous section, the HyperTerminal of the PC/Laptop which is connected to the RZ/G1C SBC will immediately show the boot messages of the boot loader.

Linux Test Environment

- In Linux Release, U-boot boot messages will appear in Hyper Terminal as shown below.

```

COMB:115200baud - Tera Term VT
File Edit Setup Control Window Help
iU-Rainbow-U-G23S SPI_LOADER(DDR3) U1.00 2016.03.25
BSP Version : iU-PRFCC-SC-01-R4.0-REL1.0-Linux3.10.31
QSPI 48.75 Mhz 16 KB transfer
SPI Device: IS25LP016D

U-Boot 2013.01.01-gaa28bid-dirty (Feb 01 2018 - 22:55:39)

CPU: Renesas Electronics R8A7747K rev 2.0
Board: R8A7747K iU-Rainbow-U-G23S-F1

Reset Cause: POR
DRAM: 512 MiB
MMC: sh-sdhci: 0, sh-sdhci: 1
SF: Detected IS25LP016D with page size 4 KiB, total 2 MiB
In: serial
Out: serial
Err: serial

Board Info:
  BSP Version : iU-PRFCC-SC-01-R4.0-REL1.0-Linux3.10.31
  SOM Version : iU-PRFCC-AP-01-R4.x

Net: raub
Hit any key to stop autoboot: 1 █

```

- Immediately after power on, press any key in HyperTerminal to go to the U-boot command prompt as shown below. Otherwise Linux will launch automatically.

```

COMB:115200baud - Tera Term VT
File Edit Setup Control Window Help
iU-Rainbow-U-G23S SPI_LOADER(DDR3) U1.00 2016.03.25
BSP Version : iU-PRFCC-SC-01-R4.0-REL1.0-Linux3.10.31
QSPI 48.75 Mhz 16 KB transfer
SPI Device: IS25LP016D

U-Boot 2013.01.01-gaa28bid-dirty (Feb 01 2018 - 22:55:39)

CPU: Renesas Electronics R8A7747K rev 2.0
Board: R8A7747K iU-Rainbow-U-G23S-F1

Reset Cause: POR
DRAM: 512 MiB
MMC: sh-sdhci: 0, sh-sdhci: 1
SF: Detected IS25LP016D with page size 4 KiB, total 2 MiB
In: serial
Out: serial
Err: serial

Board Info:
  BSP Version : iU-PRFCC-SC-01-R4.0-REL1.0-Linux3.10.31
  SOM Version : iU-PRFCC-AP-01-R4.x

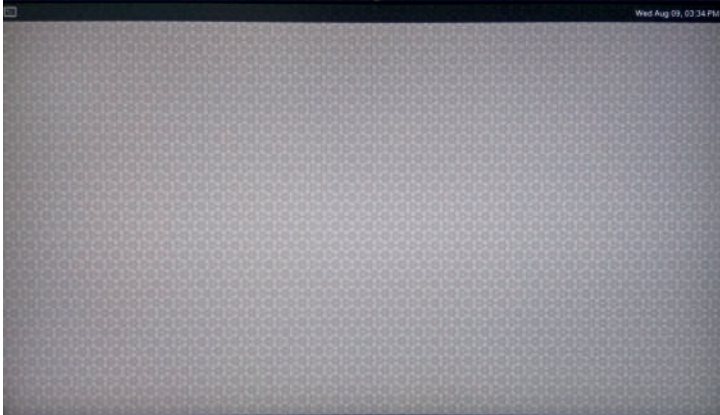
Net: raub
Hit any key to stop autoboot: 0
iU>

```



1. RZ/G1C SBC comes with bootable binary in default boot media.
2. Make sure that all the steps mentioned in Getting Start section is followed.

- Once Linux is launched, the HDMI Monitor will show the Yocto images as shown below and HyperTerminal will show the Linux Login.



HDMI Monitor after Linux Launch

- To Login in Linux, enter “root” in terminal and you will get the Linux command prompt as shown below. Once you get the prompt you are done with Test Environment setup on Linux delivery.

```

COM8:115200baud - Tera Term VT
File Edit Setup Control Window Help
xres x yres <v> = 1920x3240
img pix fmt = 20
num buffers = 3
Loaded PowerUR consumer services.
vsppm (Feb 1 2018 22:03:59) driver installed
Starting Dropbear SSH server: dropbear.
Starting rpchbind daemon...rpchbind: cannot create socket for udp6
rpchbind: cannot create socket for tcp6
done.
creating NFS state directory: done
starting statd: done
Starting advanced power management daemon: No APM support in kernel
<failed.>
Starting Distributed Compiler Daemon: distcc.
NFS daemon support not enabled in kernel
Starting syslogd/klogd: done
* Starting Avahi mDNS/DNS-SD Daemon: avahi-daemon [ ok
]
Starting Telephony daemon
Starting Linux NFC daemon
Stopping Bootlog daemon: bootlogd.
Rootfs Version : iW-PRFCC-SC-01-R4.0-REL1.0-YoctoDaisy
Poky <Yocto Project Reference Distro> 1.6.1 iWave-G23S /dev/ttySC1
iWave-G23S login: root
root@iWave-G23S:~#
    
```

Linux Command Prompt

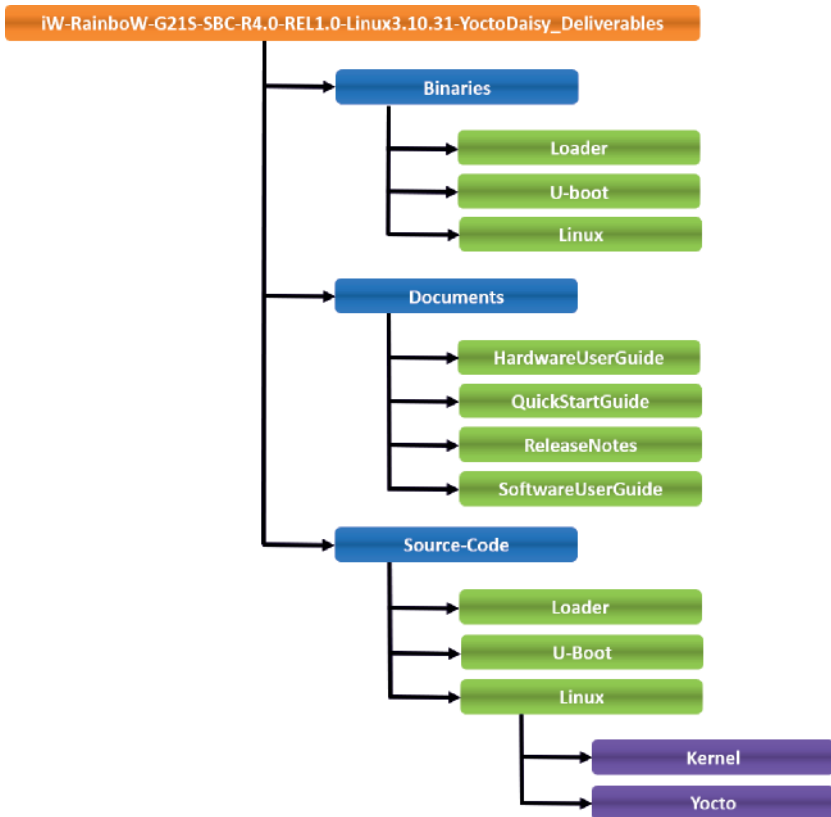


Refer RZ/G1C SBC Linux Software User Guide for further details.

DVD Contents

The following figure shows the DVD content structure for Linux Operating System Release.

Linux Release DVD Contents



Note

iWave continuously improves software releases with latest kernel version. Contact iWave for latest software release detail.

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