# iWave
### Embedding Intelligence



# iW-RainboW-G23S
# Quick Start Guide

R1.0

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For assistance, contact our Technical Support team at,

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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 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 Single Board Computer.

## Single Board Computer (SBC) Overview

The RZ/G1C Single Board Computer is an extension of RZ/G1C CPU, which is based on Renesas high performance RZ/G1C (Dual/Solo Core - ARM Cortex A7 MPUs). This 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 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 SBC.

- Avoid using board in extreme dust, humidity and temperature conditions. Do not place the SBC in wet area.

- Before using the 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 Single Board Computer.

- Wear the anti-static wristband while unpacking and handling the SBC to prevent electrostatic discharge.

- Use anti-static pad/mat with proper grounding to place the SBC.

- Don't touch the inside surface of the 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 SBC. Make sure to follow the ESD precautions to prevent damage to the SBC and injury to the user.**

## Package Checklist

The RZ/G1C Single Board Computer will be shipped with the following items:

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

**Note** **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 Single Board Computer

The RZ/G1C Single Board Computer consists of 85mmx56mm RZ/G1C Single Board Computer. The RZ/G1C SBC supports the following features.

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

The RZ/G1C Single Board Computer major components location are shown in the below figure.

40 Pin Exp. Conn1.(J1)   40 Pin Exp. Conn2.(J3)   SPI Prog. Header(J6)

Analog Video IN RCA Jack (J4)

20 Pin Exp. Conn.(J7)

Dual USB Connector (J8)

Power Jack (J9)

Gigabit Ethernet Connector (J10)

Reset Switch(SW1)

USB Micro B Conn (J12)

HDMI Connector (J12)   JTAG Header (J13)
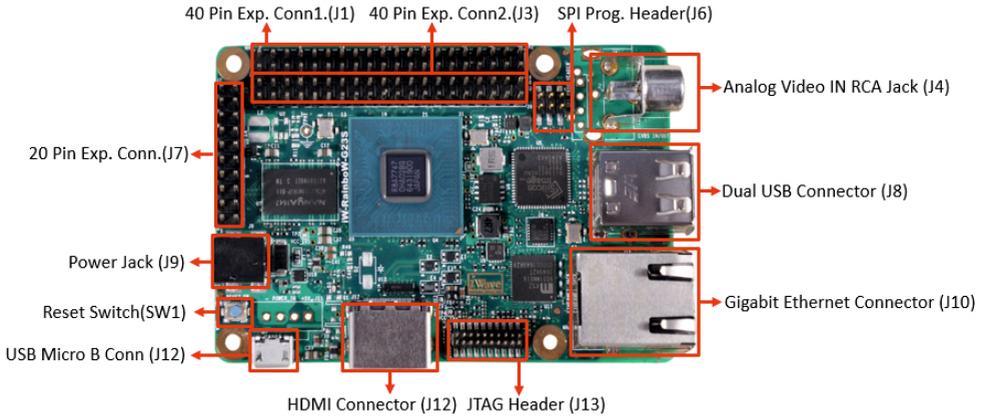
**Top View of Single Board Computer**

Micro SD Conn. (J15)
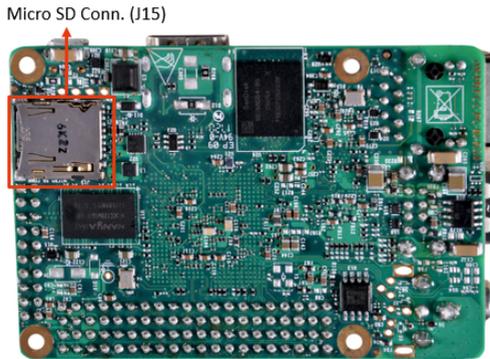
**Bottom View of Single Board Computer**

**Refer Single Board Computer 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 Single Board Computer.

- Read the Single Board Computer Documents
- Setting up the Debug  port
- Power ON the Single Board Computer

## Read the Documents

Before setting up the test environment, one must read all the documents of the RZ/G1C Single Board Computer to know about its features and get familiar with it. These documents are available in the DVD which comes along with the RZ/G1C  Single Board Computer 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 SBC related document's path.**

## Debug Port Setting

Please follow the below procedure to setup the Debug Micro USB port of RZ/G1C Single Board Computer.

- Connect TypeA end of TTL-R232R-RPI cable to PC and 3pin (100mil) Berghosue end of TTL-R232R-RPI cable to Single Board Computer'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

- Open the HyperTerminal on PC/Laptop with the following setting.
  Baud rate : 115200 bps
  Data bits : 8
  Parity : None
  Stop bits : 1
  Flow control : None

## Powering ON the Single Board Computer

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

■ Connect the 5V power supply plug to the power connector (J9) of the Single Board Computer as shown below and Power ON the power supply.



**Power Supply Connection**

■ Once Power is applied to the Single Board Computer, the Red Power LEDs in the RZ/G1C Single Board Computer 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

iWave supports below mentioned Operating System Releases for RZ/G1C Single Board Computer.

- Linux 3.10.31(or higher)

Once power is applied to the RZ/G1C Single Board Computer as explained in the previous section, the HyperTerminal of the PC/Laptop which is connected to the Single Board Computer 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.
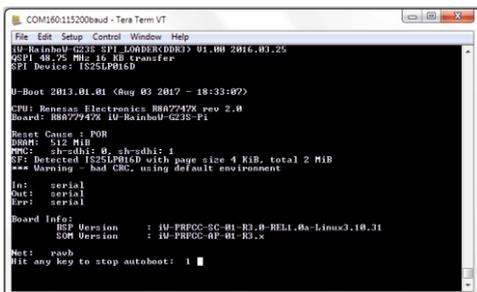


- Immediately after power on, press any key in HyperTerminal to go to the U-boot command prompt as shown below. Otherwise Linux will launch automatically.



**Note**
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.
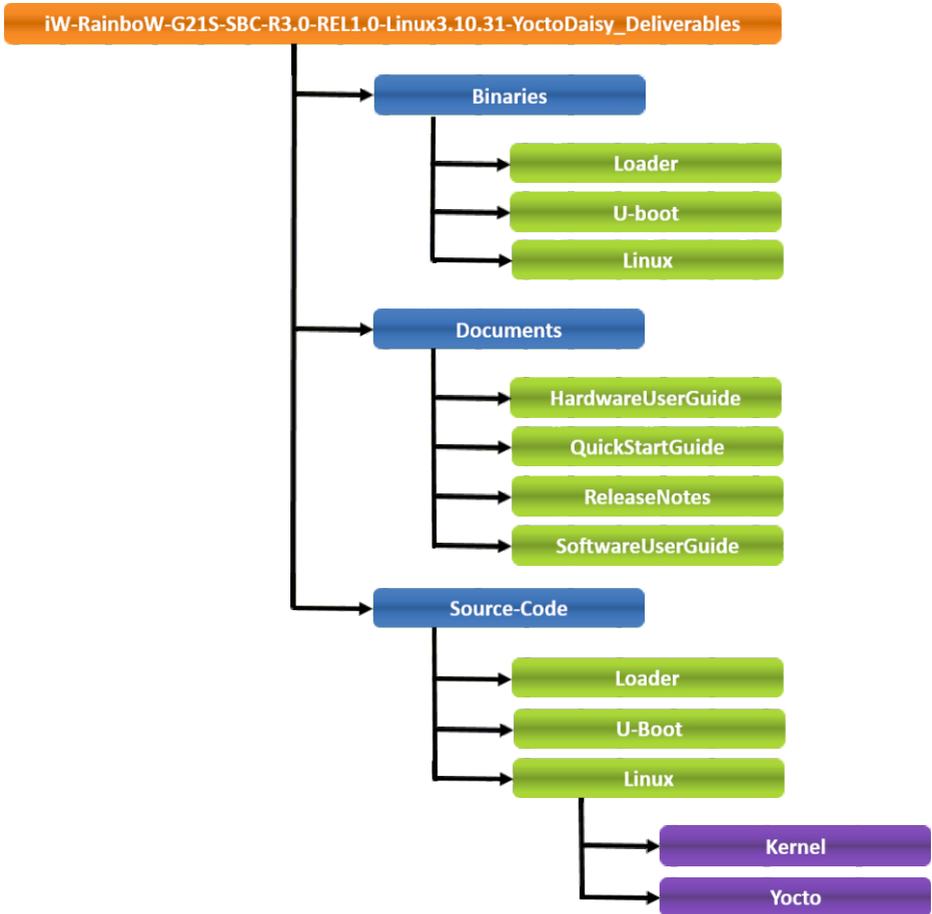


**Linux Command Prompt**

**Refer 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



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

## iWave's other Products

### iW-RainboW-G21M-RZ/G1H Qseven SOM

The RZ/G1H Qseven SOM is based on the Renesas's RZ/G1H processor running at 1.4GHz Quad Core ARM® Cortex®-A15 and 780MHz Quad Core ARM Cortex-A7 MPCores.

### iW-RainboW-G20M-RZ/G1M/G1N Qseven SOM

The RZ/G1M/G1N Qseven SOM is based on the Renesas's RZ/G1M/G1N Dual Core processor running at 1.5GHz ARM® Cortex®-A15 MPCores.

### iW-RainboW-G22M-RZ/G1E SODIMM SOM

The RZ/G1E SODIMM SOM is based on the Renesas's RZ/G1E Dual Core processor running at 1GHz ARM® Cortex®-A7 MPCores.

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