

## iW-RainboW-G21D Quick Start Guide

R4.0

## Disclaimer

iWave Systems reserves the right to change details in this publication including but not limited to any Product specification without notice.

No warranty of accuracy is given concerning the contents of the information contained in this publication. To the extent permitted by law no liability (including liability to any person by reason of negligence) will be accepted by iWave Systems, its subsidiaries or employees for any direct or indirect loss or damage caused by omissions from or inaccuracies in this document.

## Trademarks

All registered trademarks, product names mentioned in this publication are the property of their respective owners and used for identification purposes only.

## Certification

iWave Systems Technologies Pvt. Ltd. is an ISO 9001:2015 Certified Company.



## Warranty & RMA

Warranty support for Hardware: 1 Year from iWave or iWave's EMS partner.

For warranty terms, go through the below web link,  
<http://www.iwavesystems.com/support/warranty.html>

For Return Merchandise Authorization (RMA), go through the below web link,  
<http://www.iwavesystems.com/support/rma.html>

## Technical Support

iWave Systems technical support team is committed to provide the best possible support for our customers so that our Hardware and Software can be easily migrated and used.

For assistance, contact our Technical Support team at,

<b>Email</b>	<b>: <a href="mailto:support.ip@iwavesystems.com">support.ip@iwavesystems.com</a></b>
<b>Website</b>	<b>: <a href="http://www.iwavesystems.com">www.iwavesystems.com</a></b>
<b>Address</b>	<b>: iWave Systems Technologies Pvt. Ltd. # 7/B, 29<sup>th</sup> Main, BTM Layout 2<sup>nd</sup> Stage, Bangalore-560076, India.</b>

## INTRODUCTION

### About this Guide

This document is intended as the guide for unpacking iWave's iW-RainboW-G21D - RZ/G1H Qseven Development Platform 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 platform.

### Development Platform Overview

The iW-RainboW-G21D Development Platform incorporates RZ/G1H Qseven SOM which is based on Renesas high performance RZ/G1H (Octa Core - Quad ARM Cortex A15 and Quad A7 MPUs) and Qseven Compatible Carrier Board. This platform 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/G1H 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 Development Platform 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 Development Platform.
- Avoid using board in extreme dust, humidity and temperature conditions. Do not place the Development Platform in wet area.
- Before using the Development Platform, 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.
- Don't try to remove the Qseven SOM module from the Development platform unless really required.
- Before connecting or removing Qseven SOM module from the Development platform, ensure that power cable is unplugged and ESD antistatic guidelines are followed.



**Check the local regulations for disposal of electronic products.**

## Unpacking Guidelines

Please follow the below guidelines while unpacking the RZ/G1H Qseven Development Platform.

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










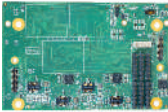

- Make sure that packing box is facing upwards while opening.
- Make sure that the entire packing list items mentioned in Package Checklist are present.



**Static electricity can destroy electronics in the platform. Make sure to follow the ESD precautions to prevent damage to the platform and injury to the user.**

## Package Checklist

The RZ/G1H Qseven Development Platform will be shipped with the following items:

Sl. No.	Package Item	Qty	Image
1	iW-RainboW-G21D RZ/G1H Qseven Development Platform	1	  <p>All components used in this platform is Lead free and ROHS compliant</p>
2	12V,2A Power Adaptor with universal plugs	1	
3	USB OTG Cable	1	
4	DVD (Please refer DVD Content section)	1	
5	Quick Start Guide Hard copy	1	
6	SPI Programmer Board	Optional	
7	Camera Add On Module (With Screw Bag)	Optional	 



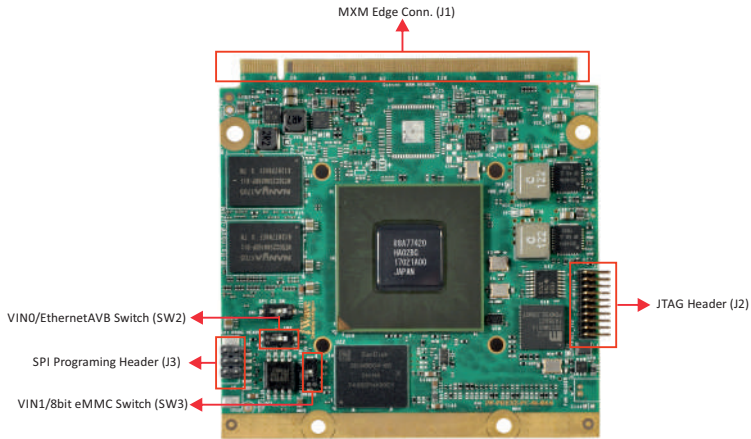
**Do not proceed with installation, if any of the items listed in the above checklist is missing or damaged. Contact iWave support team.**

## Get to Know the RZ/G1H Development Platform

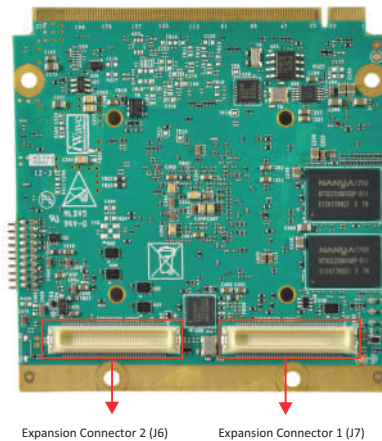
The RZ/G1H Qseven Development platform consists of 70mmx70mm RZ/G1H Qseven SOM and 120mmx120mm Nano-ITX form factor Qseven Carrier Board. The RZ/G1H Qseven Development platform supports the following features.

RZ/G1H Qseven SOM Features	
CPU	Renesas RZ/G1H MPU Quad ARM Cortex®-A15 MPCore® @ 1.4GHz Quad ARM Cortex®-A7 MPCore® @ 780MHz
Memory	2GB DDR3 (Expandable ) 4GB eMMC Flash (Expandable ) 2MB SPI NOR Flash (Expandable)
Real Time Clock	RTC Controller
Headers	JTAG Header x 1 SPI Programming Header x 1
RZ/G1H Qseven Carrier Board Features	
Serial Interface	Debug UART through USB Micro AB Connector Data UART (SCIIFB2) x 1 Port through Header
High Speed Interface	USB3.0 Host x 1 Port through Dual stack USB3.0 Type A Connector PCIe x 1 Port SATA x 1 Port (Optional)
Communication Interface	100/1000Mbps Ethernet through RJ45 MagJack USB2.0 Host x 1 Port through Dual stack USB3.0 Type A Connector USB 2.0 Host x 1 Port through USB Type A MagJack Combo Connector USB2.0 OTG x 1 Port through Micro AB Connector CAN x 1 Port through Header SDHI (4bit) x 1 Port
Audio/Video Interface	I2S Audio Codec with 3.5mm Audio IN and OUT jack 7" RGB LCD Connector with CapacitiveTouch HDMI Output through HDMI Transmitter x 1 Port
On Board Switches	Power ON/OFF Switch Reset Switch Board Configuration Switch
Additional Features	SPI Flash (MSIOF0) RTC Coin Cell holder Fan Header 80pin Expansion Connector x 3 (To connect Add-On-Module)
General Specification	Power Supply : 12V,2A Power Input Jack Form Factor : 120mm X 120mm Nano ITX

The RZ/G1H Qseven SOM major components location are shown in the below figure.



**Top View of SOM**

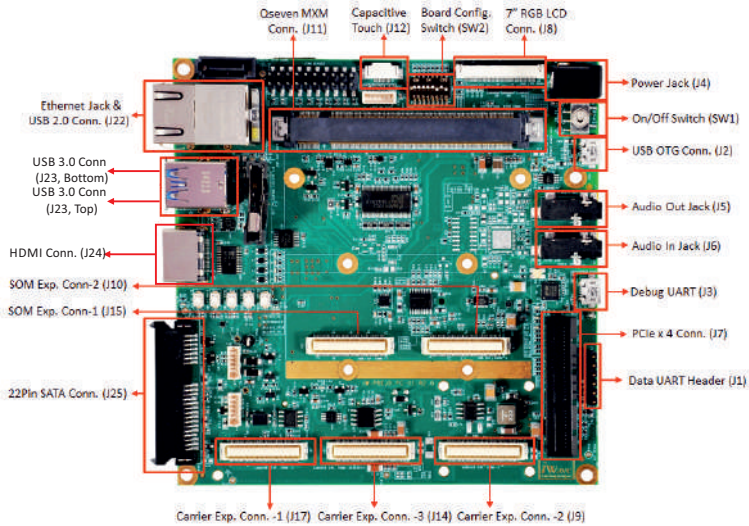


**Bottom View of SOM**

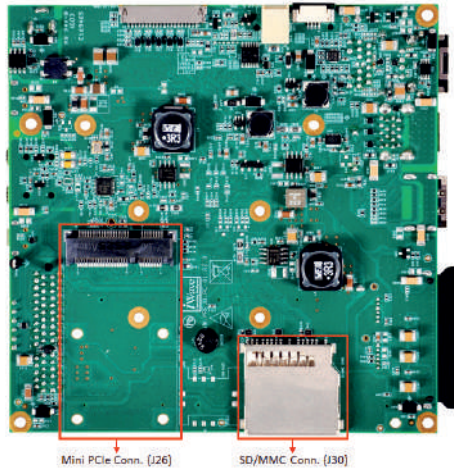


**Refer SOM Hardware User Guide for more details.**

The RZ/G1H Qseven Carrier Board major components location are shown in the below figure.



**Top View of Qseven Carrier Board**



**Bottom View of Qseven Carrier Board**

**Note**

Refer Development Platform 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/G1H Qseven Development Platform.

- Read the Development Platform Documents
- Setting Board Configuration Switch
- Setting up the Debug port
- Power ON the Development platform

### Read the Documents

Before setting up the test environment, one must read all the documents of the RZ/G1H Qseven Development platform to know about its features and get familiar with it. These documents are available in the DVD which comes along with the RZ/G1H Qseven Development platform Package.

Below mentioned documents are available in the DVD,

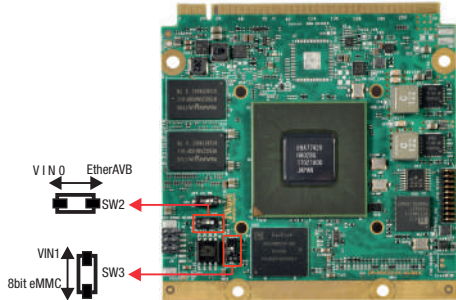
- RZ/G1H Qseven DevKit Quick start Guide (This Guide)
- RZ/G1H Qseven SOM Hardware User Guide
- RZ/G1H Qseven DevKit Hardware User Guide
- RZ/G1H Qseven SOM Software User Guide
- RZ/G1H Qseven SOM Release Notes for Software



Refer DVD contents section to know about the DVD content structure and platform related document's path.

## Configuration Switch Setting - RZ/G1H Qseven SOM

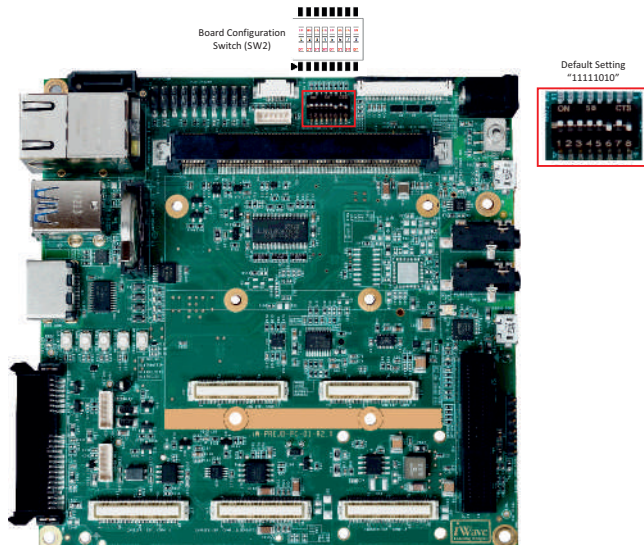
The RZ/G1H Qseven SOM has two single bit DIP switch SW1 and SW2 for configuration setting. This switch can be used to select one interface over other as given in the below table.



SWITCH	ON (HIGH)	OFF (LOW)
SW1	VIN0	Ethernet AVB
SW2	VIN1 and eMMC in 4bit mode	eMMC in 8bit mode

## Configuration Switch Setting - RZ/G1H Qseven Carrier Board

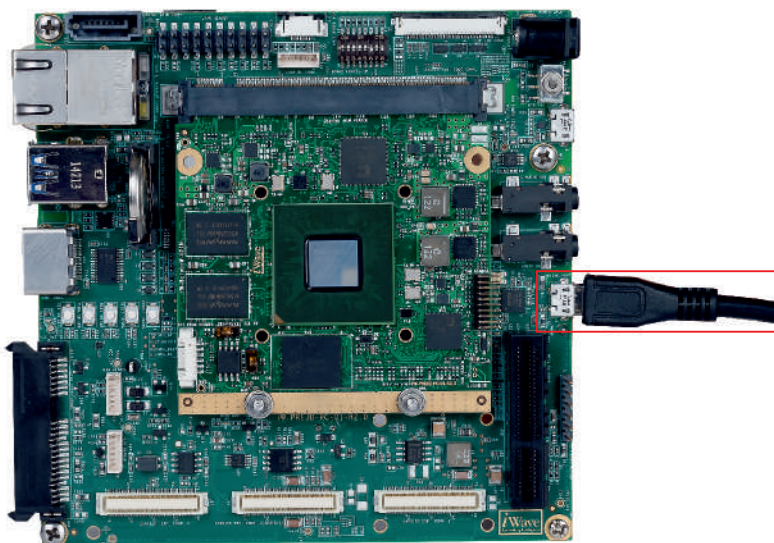
The RZ/G1H Qseven Development platform has one 8bit Board configuration switch (SW2) to configure the carrier board specific feature setting. Each bit of this switch is used to select the different features or modes. Default setting of Board configuration switch is “11111010” as shown in the figure.



## Debug Port Setting

Please follow the below procedure to setup the Debug Micro USB port of RZ/G1H Qseven Development Platform.

- Connect TypeA end of USB cable to PC and MicroB end of USB cable to Development platform's debug Micro USB connector(J3) 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>

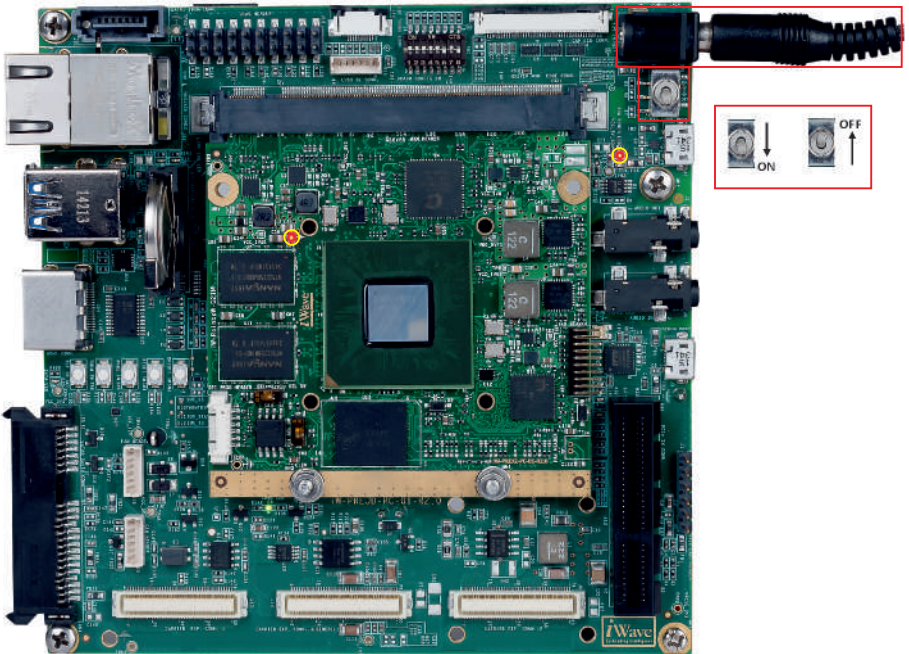
- Open the HyperTerminal on PC/Laptop with the following setting.

Baud rate	: 115200 bps
Data bits	: 8
Parity	: None
Stop bits	: 1
Flow control	: None

## Powering ON the Development Platform

The RZ/G1H Qseven Development platform comes with 12V, 2A power supply with universal plugs. Please follow the below procedure to power ON the Development platform.

- Connect the 12V power supply plug to the power connector (J4) of the Development platform as shown below and switch ON the power supply.



**Power Supply Connection**

- Once Power is applied to the Development platform, the Red Power LEDs in the RZ/G1H Qseven SOM and carrier board 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 any of the Power Status LEDs are blinking or not glowing. Contact iWave support team.**

## Done with Test Environment

Once power is applied to the RZ/G1H Qseven Development Platform as explained in the previous section, the HyperTerminal of the PC/Laptop which is connected to the Development platform will immediately show the boot messages of the boot loader.

iWave supports below mentioned Operating System Releases for RZ/G1H Qseven Development Platform.

- Linux 3.10.31(or higher)

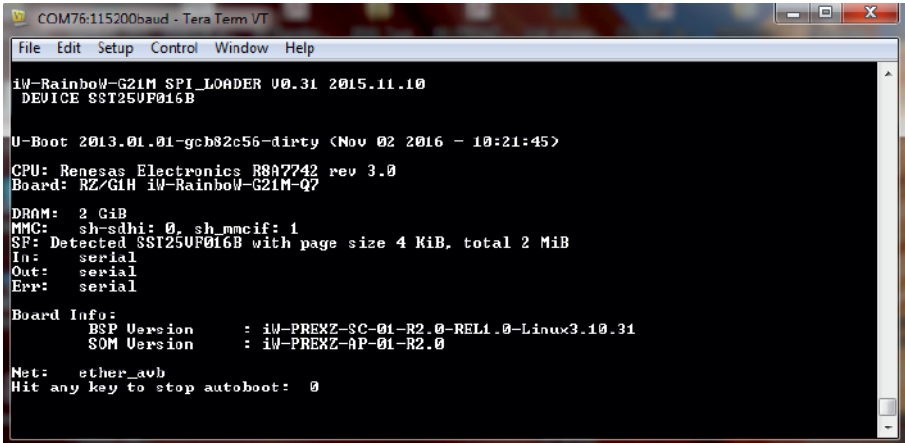
Depending upon the supported Operating system and boot loader on particular delivery, the Hyper Terminal will show the boot messages as described in the following section.



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

## Linux Test Environment

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



```

COM76:115200baud - Tera Term VT
File Edit Setup Control Window Help

iW-Rainbow-G21M SPI_LOADER V0.31 2015.11.10
DEVICE SST25VF016B

U-Boot 2013.01.01-gcb82c56-dirty (Nov 02 2016 - 10:21:45)

CPU: Renesas Electronics R8A7742 rev 3.0
Board: RZ/G1H iW-Rainbow-G21M-Q7

DRAM: 2 GiB
MMC: sh-sdhi: 0, sh_mmcif: 1
SF: Detected SST25VF016B with page size 4 KiB, total 2 MiB
In: serial
Out: serial
Err: serial

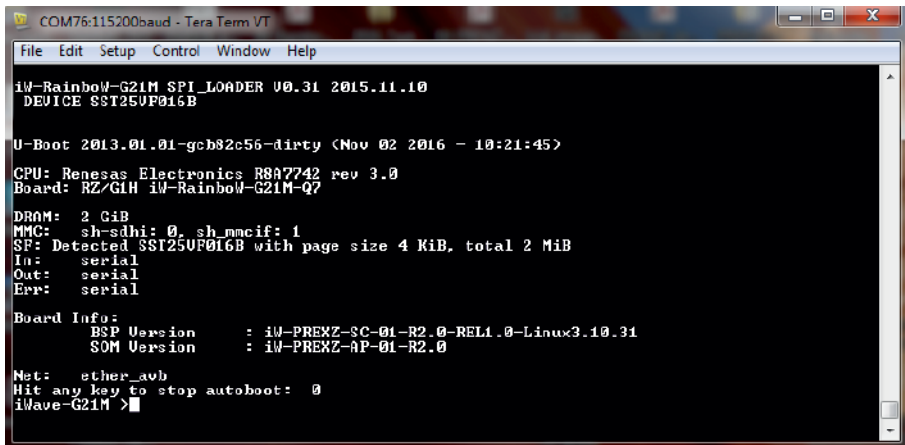
Board Info:
  BSP Version      : iW-PREXZ-SC-01-R2.0-REL1.0-Linux3.10.31
  SOM Version      : iW-PREXZ-AP-01-R2.0

Net: ether_avb
Hit any key to stop autoboot: 0

```

### U-boot on Terminal

- 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.



```

COM76:115200baud - Tera Term VT
File Edit Setup Control Window Help

iW-Rainbow-G21M SPI_LOADER V0.31 2015.11.10
DEVICE SST25VF016B

U-Boot 2013.01.01-gcb82c56-dirty (Nov 02 2016 - 10:21:45)

CPU: Renesas Electronics R8A7742 rev 3.0
Board: RZ/G1H iW-Rainbow-G21M-Q7

DRAM: 2 GiB
MMC: sh-sdhi: 0, sh_mmcif: 1
SF: Detected SST25VF016B with page size 4 KiB, total 2 MiB
In: serial
Out: serial
Err: serial

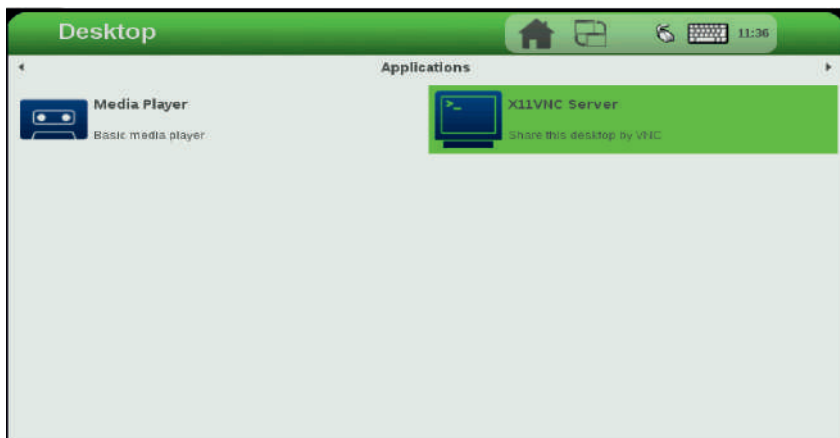
Board Info:
  BSP Version      : iW-PREXZ-SC-01-R2.0-REL1.0-Linux3.10.31
  SOM Version      : iW-PREXZ-AP-01-R2.0

Net: ether_avb
Hit any key to stop autoboot: 0
iWave-G21M >

```

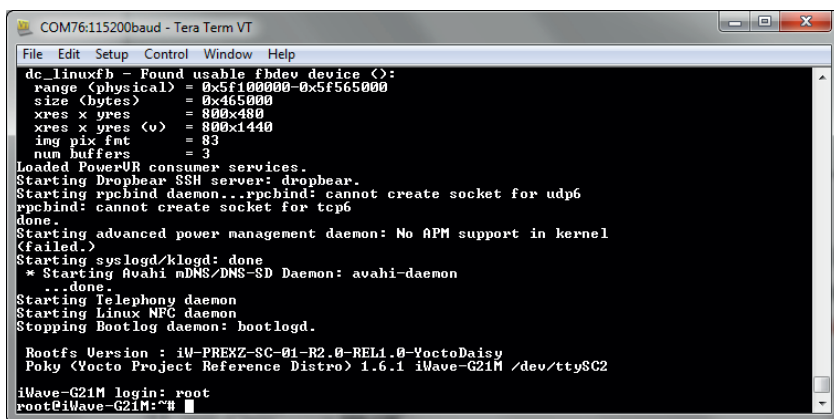
### U-boot Command Prompt

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



**LCD 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**

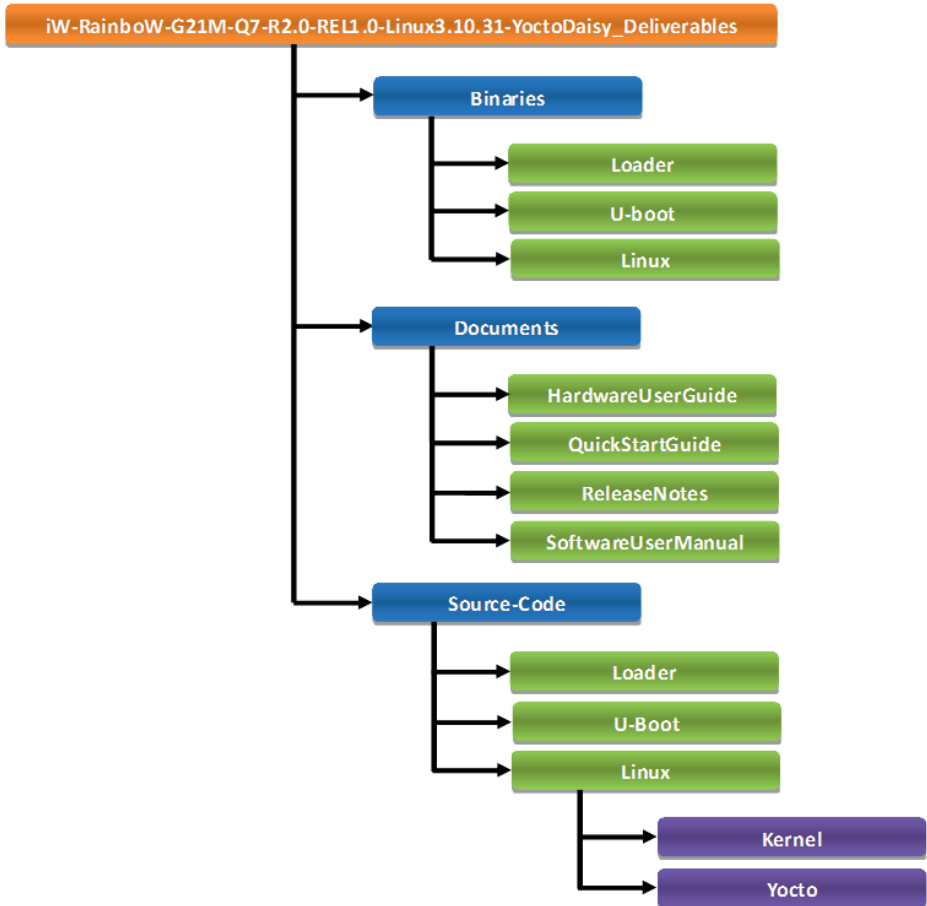


Refer Linux Software User Guide for further details.

## DVD Contents

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

### Linux Release DVD Contents



**Note**

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

## RZ/G1H Camera Add On Module

- iWave supports Camera Add-on Module for RZ/G1H Development platform, which supports following features.

RZ/G1H Camera Add On Module Features	
Video Features	8bit CMOS Camera (VIN0, VIN1, VIN2 and VIN3) x 4 Ports (Or) 16bit CMOS Camera (VIN0 and VIN1) x 2 Ports
Communication Features	CAN1 Header x 1 Port 10/100Mbps EtherMAC through Ethernet Header x 1 Port
Serial Interface Features	Data UART RS232 Header (SCIF0, SCIF1, SCIF2, SCIFB1) x 4 Ports High Speed UART RS232 Header (HSCIF0) x 1 Port
General Specification	Form Factor : 90mm X 60mm



For More details about Camera Add-on Module, contact iWave Sales Team.

## iWave's other Products

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

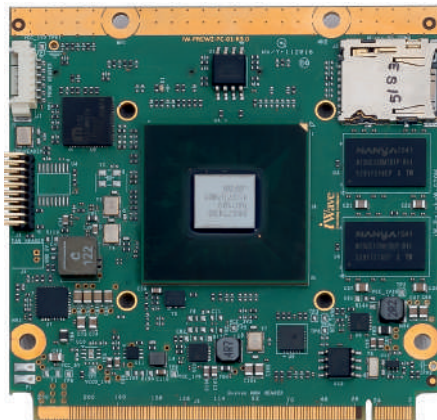
The RZ/G1E SODIMM SOM is industry latest ultra-compact yet highly integrated SOM based on Renesas high performance RZ/G1E Dual ARM Cortex A7 MPU running at 1GHz. A single ruggedized miniature SODIMM connector allows compact carrier board form factors which is ideally suitable for space constraint embedded applications.



### 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 MPCore cores. A single ruggedized Qseven connector provides the carrier board interface to carry all the I/O signals to and from the Qseven SOM. This SOM supports 1GB DDR3L RAM (Expandable) and 4GB eMMC Flash (Expandable) by default.

The MPU is enabled with Three-dimensional graphics engines and has built-in dual channel full HD encode & decode multimedia codecs. The MPU also supports three channels video input and two channels video display output ports. This makes the RZ/G1M/G1N MPU as ideal choice for entertainment, digital signage, HMI applications.



## Headquarters: INDIA

**iWave Systems Tech. Pvt. Ltd.**  
7/B, 29<sup>th</sup> Main, BTM Layout 2<sup>nd</sup> Stage,  
Bangalore-560076, India.  
Ph: +91-80-26683700, 26781643  
Fax: +91 80 26685200  
Email: mktg@iwavesystems.com  
www.iwavesystems.com

## JAPAN

**iWave Japan, Inc.**  
8F-B, Kannai Sumiyoshi Building,  
3-29, Sumiyoshi-cho, Naka-ku, Yokohama,  
Kanagawa, Japan.  
Ph: +81 45 227 7626  
Email: info@iwavejapan.co.jp  
www.iwavejapan.co.jp

## EUROPE

**iWave Europe**  
Postbus 6197  
3130 DD Vlaardingen  
The Netherlands  
Ph: +31 10 2840383  
Email: info@iwavesystems.eu

## Our Partners Across The Globe

### ASIA

**Arrow Electronics**  
2/F, Green 18,  
Hong Kong Science Park,  
Pak Shek Kok, NT, Hong Kong.  
Tel: +85224842484  
E-mail: murphy.chan@arrowasia.com

### KOREA

**J.S Communications**  
#913, Dojung Tower, Anyang-ro 115,  
Manan-gu, Anyang-si, Gyeonggi-do, Korea  
Tel: +82-31-349-9793  
Email: scott.lee@jscoms.co.kr

### GERMANY

**Unitronic GmbH**  
Muendelheimer Weg 9,  
D-40472 Duesseldorf,  
Germany  
Tel: +49 211 9511 - 0  
Email: info@unitronic.de

### UK/IRELAND

**BRAEMAC**  
Braemac House, 1 Mandarin Court,  
Centre Park, Warrington, Cheshire, WA1 1GG.  
Tel: +44 (0)1925 419090  
E-Mail: sales@braemac.co.uk

### TURKEY

**DESIMAL ELEKTRONIK**  
Kalebasi, Sokak No:20,  
Atasehir 34704, Istanbul, Turkey.  
Tel: +90 216 472 07 55  
Email: info@desimal.com.tr  
www.desimal.com.tr

### USA

**Qmax Systems Inc**  
2085 Zanker Road  
San Jose, CA 95131  
USA.  
Tel: +1-408-643-0999  
Email: sales@qmaxsysinc.com

### GLOBAL

**Future Electronics**  
237 Hymus Blvd.,  
Pointe Claire, Quebec,  
Canada H9R 5C7.  
Tel: 514-694-7710  
E-mail: eservices@futureelectronics.com

### USA

**Embedded Technologies, Inc**  
2870 Scott St, Suite 101,  
Vista, CA USA,  
Ph: 1 760 598 2870,  
Email: Info@embeddedtechnologies.com

### SWEDEN

**Acte Solutions AB**  
Box 4115,  
SE-171 04 Solna,  
Sweden.  
Tel: +46 8 445 2800 / 46  
E-mail: peter.olsson@acte.se

### SPAIN

**Novatronics Sistemas**  
C/ Infanta Mercedes, 62  
28020, Madrid.  
Tel: +34 94 439 96 70  
Fax: +34 94 427 51 42  
E-mail: info@novatronicsistemas.com

### CANADA

**Create Control**  
23490 Rawlinson Cr., Langley,  
British Columbia V1M3R6,  
Canada.  
Tel: +1 604 356 3957  
E-mail: robert@createcontrol.ca

### KOREA

**LTC**  
Suite 306B Ssangyong Complex B/D,  
210 Yeongdong-Daero, Kangnam-Gu,  
Seoul, 06286, Korea  
Tel: +82-2-508-4127  
Email: wsh@leadingtechno.com

### NETHERLANDS, BELGIUM

**Adelco Electronics**  
Venkelbaan 82, 2908 KE  
Capelle a/d IJssel, The Netherlands.  
Tel: +31 (0)10 2580580, +32 (0)3 3374499  
Email: info@adelco.nl

### SINGAPORE

**iWave Japan, Inc.**  
30 Marsiling Industrial Estate Road 5,  
#04-05C, Singapore 739211  
Mob: +6591816873  
Email: andrew.chen@iwavejapan.co.jp

### RUSSIA

**Symmetron**  
Business-Park River City,  
Leningradskoe Shosse 69,  
Building 1, Moscow, Russia, 125445.  
Tel: +7(495)961-2020  
E-mail: Mark.Volodarskiy@symmetron.ru

### FRANCE

**EUTESYS SAS**  
13 avenue Morane Saulnier,  
Immeuble Guynemer, CS 60740,  
78457 Vélizy-Villacoublay, France.  
Tel: +33 (0)1 84 73 07 62  
Email: contact@eutesys.com

### ITALY

**AT Embedded Solutions SRL**  
Via Carducci, 35,  
20090 - Trezzano S/N,  
Milano - Italy  
Tel: +39-02-83964364  
Email: francesco.catteneo@ates-group.com

### ISRAEL

**New ARTech Technologies Ltd.**  
4 Hasadna'ot street,  
Herzeliya 4672831, POB 12349, Israel.  
Tel/Fax: +972-9-7674258  
Mob: +972-544-403462  
Email: roniamir@a-r-tech.com