RainboW-G8D
i.MX51 Qseven Development Platform
Quick Start Guide

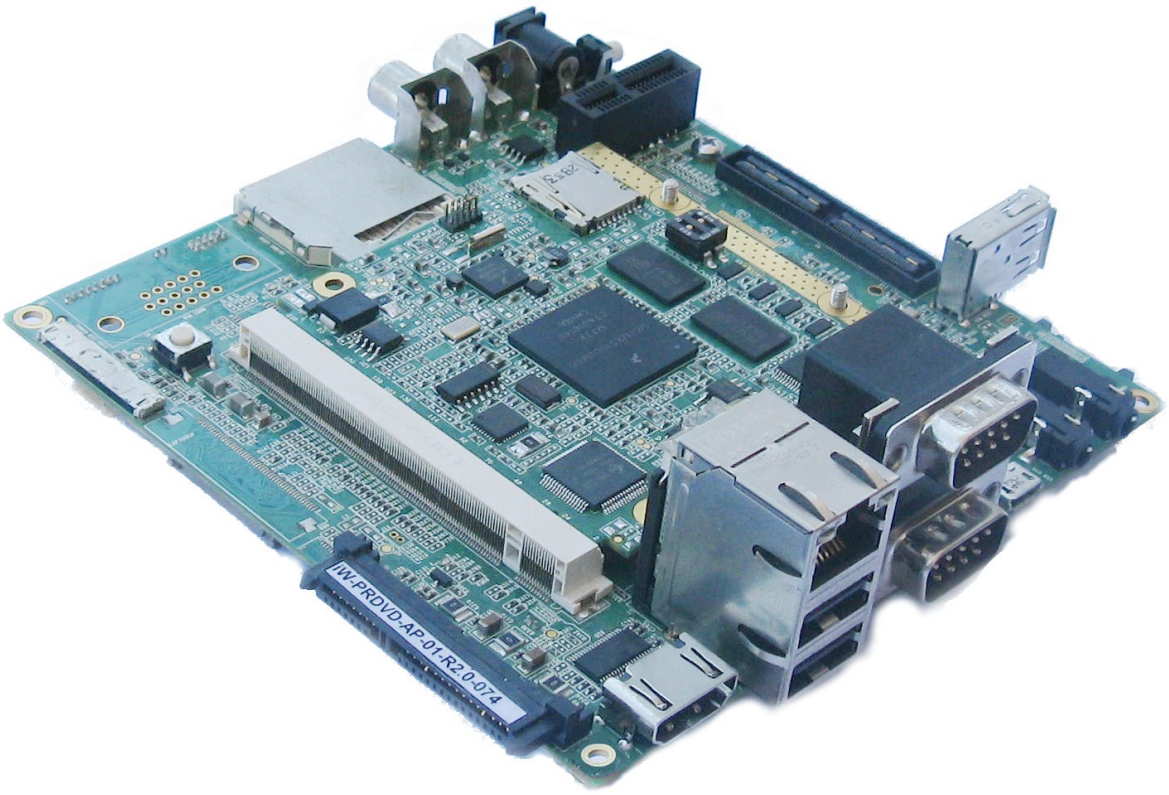

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Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

1.1 About this Guide

This document is intended as the guide for unpacking iWave's RainboW-G8D - i.MX51 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 installing the platform.

1.2 Development Platform Overview

The RainboW-G8 Development Platform incorporates **Qseven compatible i.MX51 SOM** which is based on Freescale's i.MX51 Series application processor and **Generic Qseven compatible Development Board.** This platform can be used for quick prototyping of any high end applications in verticals like Industrial, Medical & Green Energy Controller. The board is highly packed with all necessary on-board connectors to validate complete i.MX51 CPU features.

RainboW-G8D i.MX51 Q7 Development Platform Features					
SL. No	Feature support	Interface	Hardware populate	Linux 2.6.35 *iW-G8D-Q7LXC*	Remarks
i.MX51 Qseven SOM					
1	i.MX51 CPU		✓	✓	Single core in sampling stage
2	128MB DDR2	DDR2	✓	✓	Expandable on need basis
3	Micro SD	SD2	✓	✓	
4	NAND Flash	NAND	✓	✓	
5	JTAG	JTAG	✓		Only supported in development kits
6	Boot Media selection switch		✓		Only supported in development kits
Generic Qseven Carrier Board					
7	RS232 Serial (Debug)	UART1	✓	✓	
8	2nd UART port	UART3	✓		
9	Standard SD	SD1	✓	✓	Either SD1 or WIFI can be used
10	USB 2.0 Host – 3 Ports	USB1	✓	✓	4 port USB Hub available on iMx51 Q7 SOM
11	USB 2.0 device	USB OTG	✓	✓	
12	10/100 Ethernet	MDI	✓	✓	
13	Audio IN/OUT – ALC5610 Codec	AUD4-AC97			Available only binary on request
14	SATA3.0 – 1 Port	PATA	✓		SATA boot option available
15	LVDS0 10.4" LCD display	LVDS0	✓	✓	
16	Touch controller - MAX11801	I2C 2	✓	✓	Resistive 7" touch screen
17	PWM backlight control	PWM1,2	✓	✓	
18	CAN – 1 port	eCSPI2	✓	✓	
19	RTC support	RTC	✓	✓	
20	Wi-Fi module - WYSAAVDX7	eSDHC1	✓	✓	Either SD1 or Wi-Fi can be used
21	BT module	USBH1	✓		Through USB Host Port
22	Open GL/VG Accelerators		✓	✓	Binary support only
23	HW Codecs - Decode		✓	✓	

Figure 1: RainboW-G8 Features

1.3 Important Symbols Used

: Important Note

: Warning

: Use ESD Protection

: ROHS complaint

: Check the local regulations for disposal of electronic products

2. UNPACKING

2.1 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 platform in extreme dust, humidity, and temperature conditions. Do not place the Development platform in wet area.
- Before using the platform, make sure that all cables are correctly connected and the power adopter 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 before disposal of this electronic product

2.2 Unpacking Guidelines

Please follow the below guidelines while unpacking the RainboW-G8 Development platform.

- Make sure to follow the below antistatic guidelines before unpacking.
  - 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 Table 1 is present.

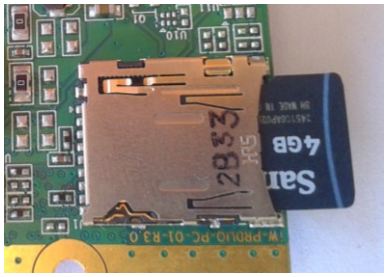
Static electricity can destroy electronics in the platform. Make sure to follow the ESD precautions to prevent damage to the platform and injury to the user

2.3 RainboW-G8 Packing List

The RainboW-G8 Qseven Development Platform will be shipped with the following items:

Table 1: Package Checklist

Sl.No	Package Item	Quantity	Image
1	iW-RainboW-G8 i.MX51 Qseven Development Platform	1	 RoHS ***All components used in this platform is Lead free and ROHS complaint***
2	12V,2A Power Adaptor with universal plugs	1	

3	4GB Micro SD card (Attached with the i.MX51 Qseven SOM)	1	
4	Debug UART Cable	1	
5	Stylus	1	
6	DVD (Please see APPENDIX for content details)	1	

Do not proceed with installation, if any of the items listed in the above checklist is missing or damaged. Please contact iWave support team at support.ip@iwavesystems.com

3. SETTING UP THE TEST ENVIRONMENT

3.1 Getting Start

This section describes the step by step procedure to setup the test environment for RainboW-G8 Development System.

- Read the Development Platform Documents
- Check Boot Mode Switch setting
- Check Boot Media Switch setting
- Setting up the Debug UART port
- Power ON the Development platform

3.1.1 Read the Documents

Before setting up the test environment, one must read all the documents of the RainboW-G8 Development platform to know about the Platform, its features and to get familiar with it. These documents are available in the DVD which comes along with the RainboW-G8 Package.

Below mentioned documents are available in the DVD,

- RainboW-G8 Quick start Guide (This Guide)
- i.MX51 Qseven SOM Hardware User Guide
- Generic Qseven Carrier Board Hardware User Guide
- Software User Manual
- Release Notes for Software

Please see

APPENDIX ***section to know about the DVD content structure and platform related document's path in DVD***

3.1.2 Boot Mode Setting

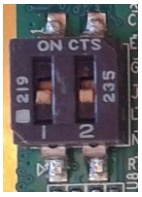
Rainbow-G8 platform supports two boot mode options for booting.

- Internal Boot Mode (Default):
  This mode is used for normal booting form NAND flash and difficultly set while shipping.

- Serial Downloader Mode:
  This mode is used when user wants to program NAND Flash using ATK Tool. For more details, please refer Software user Manual.

Boot modes can be selected by user using boot mode switch (SW1) settings on i.MX51 SOM as mentioned in Error! Reference source not found..

Table 2: Boot Mode Settings Truth Table

Boot Mode Setting On i.MX51 SOM	SW1 (2 Position Switch)		
	POS1	POS2	Image
Internal Boot Mode (**Default**)	OFF	OFF	
Serial Downloader Mode	ON	ON	
ON – High OFF - Low			

Use ESD Protection while changing the switch setting

1. ***For more Boot Media options and settings, please refer i.MX51 Qseven SOM Hardware User Guide***
2. ***Procedure to load binaries in boot media, please refer Software User Manual.***

3.1.3 Debug UART Setting

RainboW-G8 platform comes with Debug UART cable for easy debugging and testing. Please follow the below procedure to setup the Debug UART of Development platform.

- Connect the one end of the Debug UART Cable to Host PC/Laptop's serial port and another end of the cable to RainboW-G8 platform's debug UART connector (J27 – Dual port DB9 connector's bottom port) as shown below.

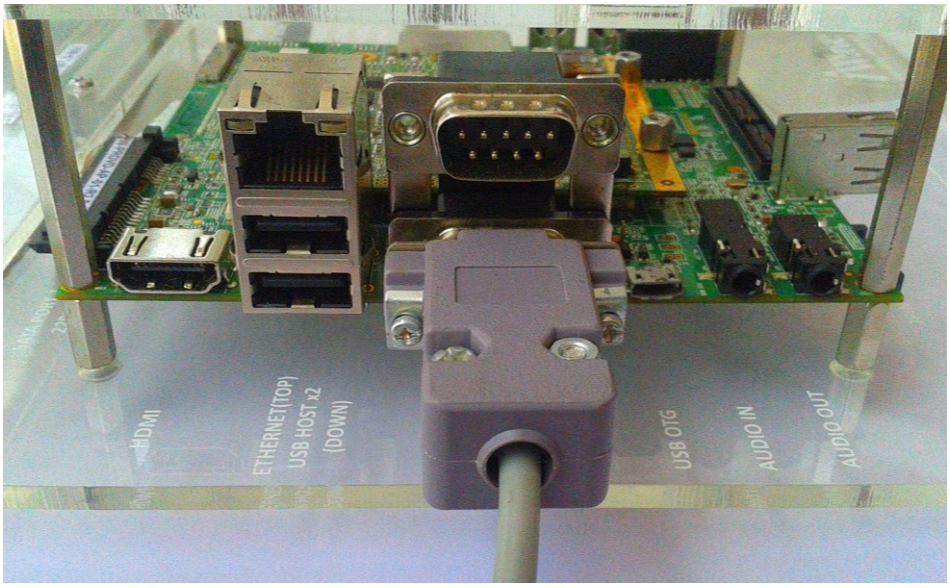


Figure 2: Debug UART connection

- 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

3.1.4 Powering ON RainboW-G8

RainboW-G8 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 (J3) of the RainboW-G8 platform as shown below and switch ON the power supply

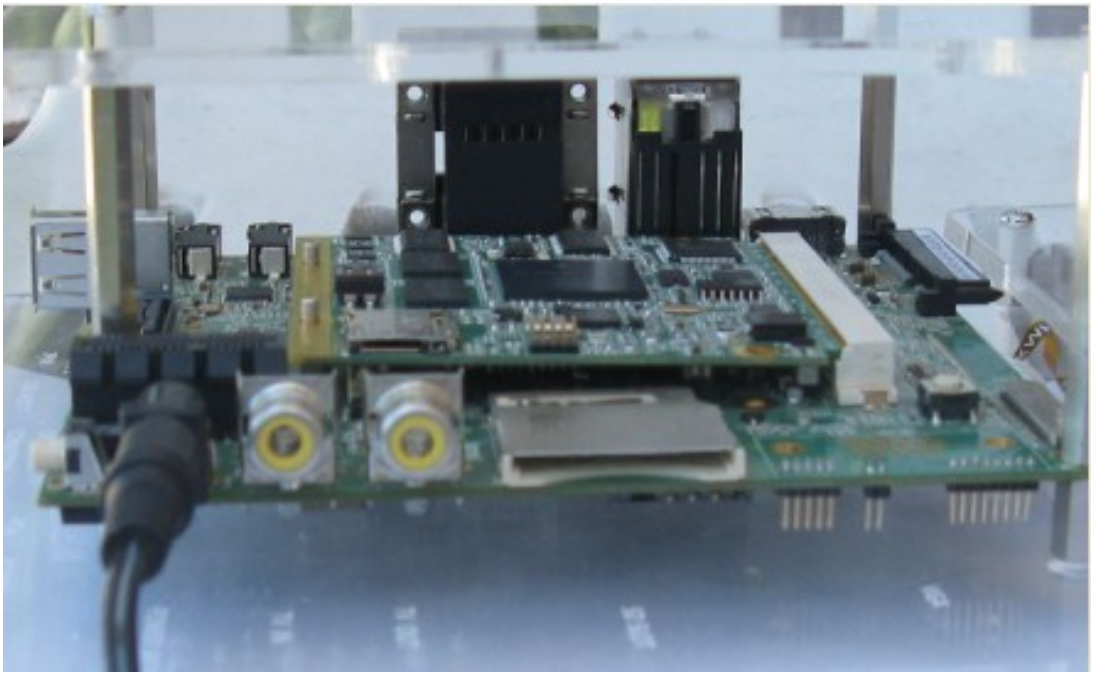


Figure 3: Power Supply Connection

Do not use different power adapter other than the supplied one

- Once Power is applied to RainboW-G8 platform, the Power LEDs in the i.MX51 SOM module and Generic Qseven carrier board will glow as shown below.

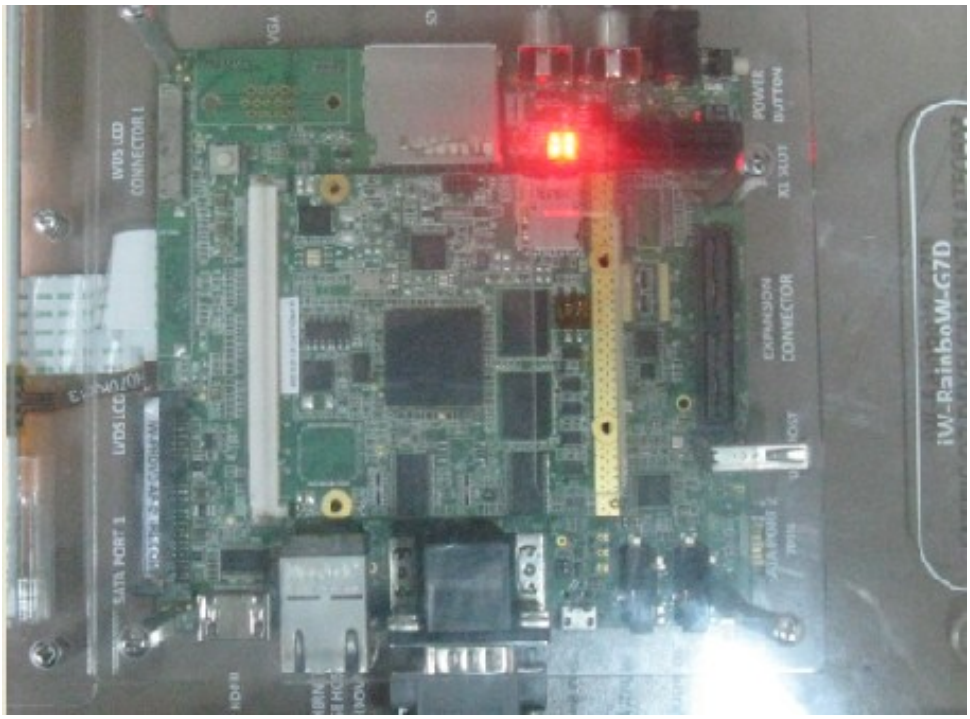


Figure 4: Power ON Indication

Do not proceed with installation, if any of the Power Status LEDs are blinking or not glowing. ***Please contact iWave support team at*** ***support.ip@iwavesystems.com***

3.2 Done with Test Environment

Once power is applied to RainboW-G8D 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 Linux 2.6.35 Operating System for RainboW-G8D Qseven Development platform. For Linux, 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 to connect the Boot media (loaded with boot binary) in the platform before applying power***
3. ***Make sure that all the steps mentioned in Getting Start section is followed***

3.2.1 Linux Test Environment

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

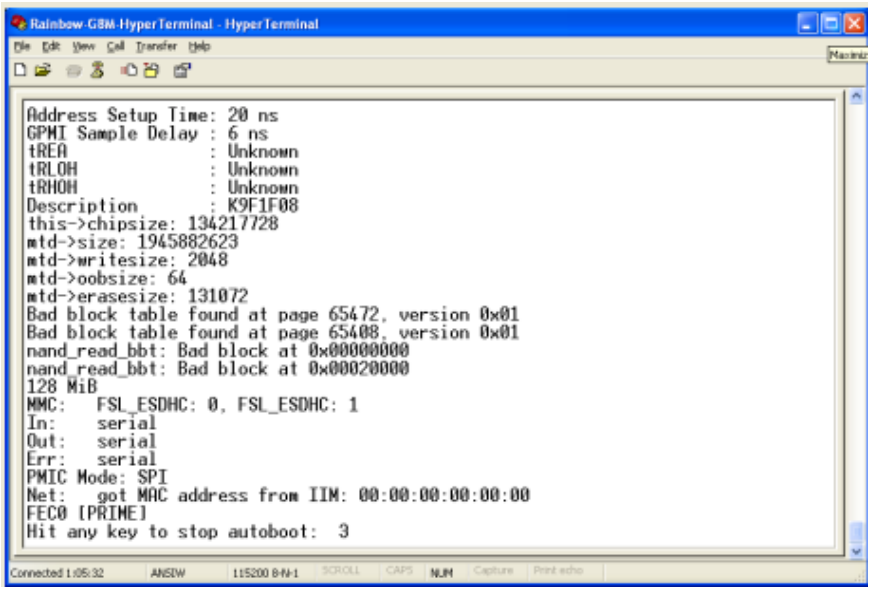


Figure 5: U-boot on Terminal

- 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.

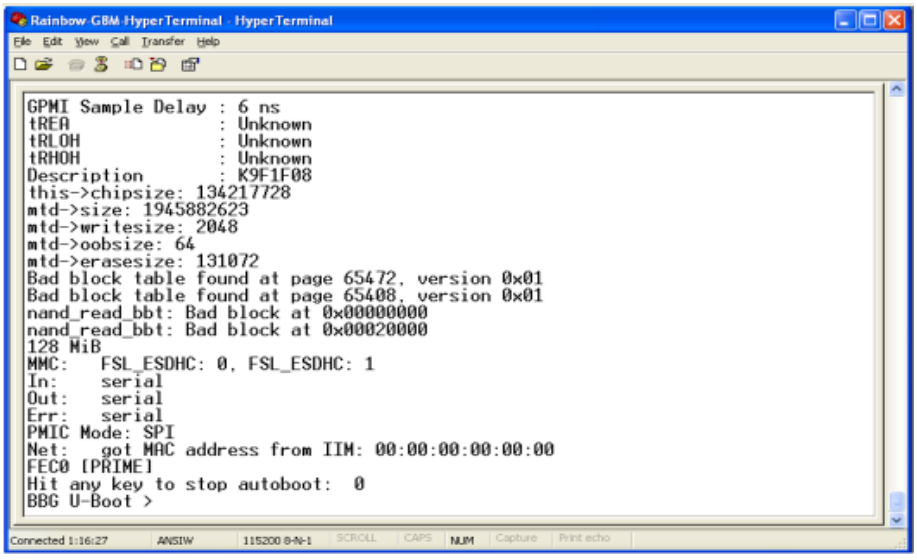


Figure 6: U-boot command Prompt

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

Figure 7: 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.

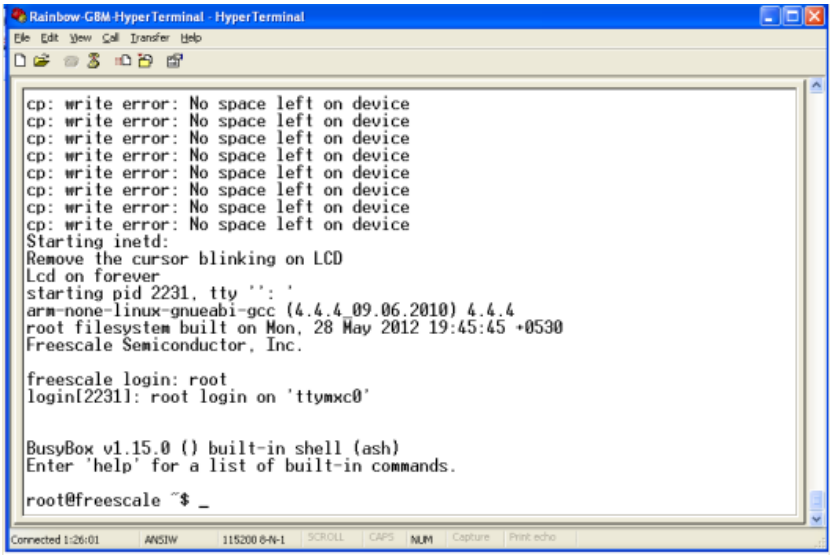


Figure 8: Linux Command Prompt

Please see the Linux Software User Manual for further details

4. APPENDIX

4.1 DVD Contents

iWave supports Linux 2.6.35 Operating System Releases for RainboW-G8D Qseven Development platform. The following Figure shows the DVD content structure of Linux 2.6.35 Operating System Release.

4.1.1 Linux Release DVD Contents

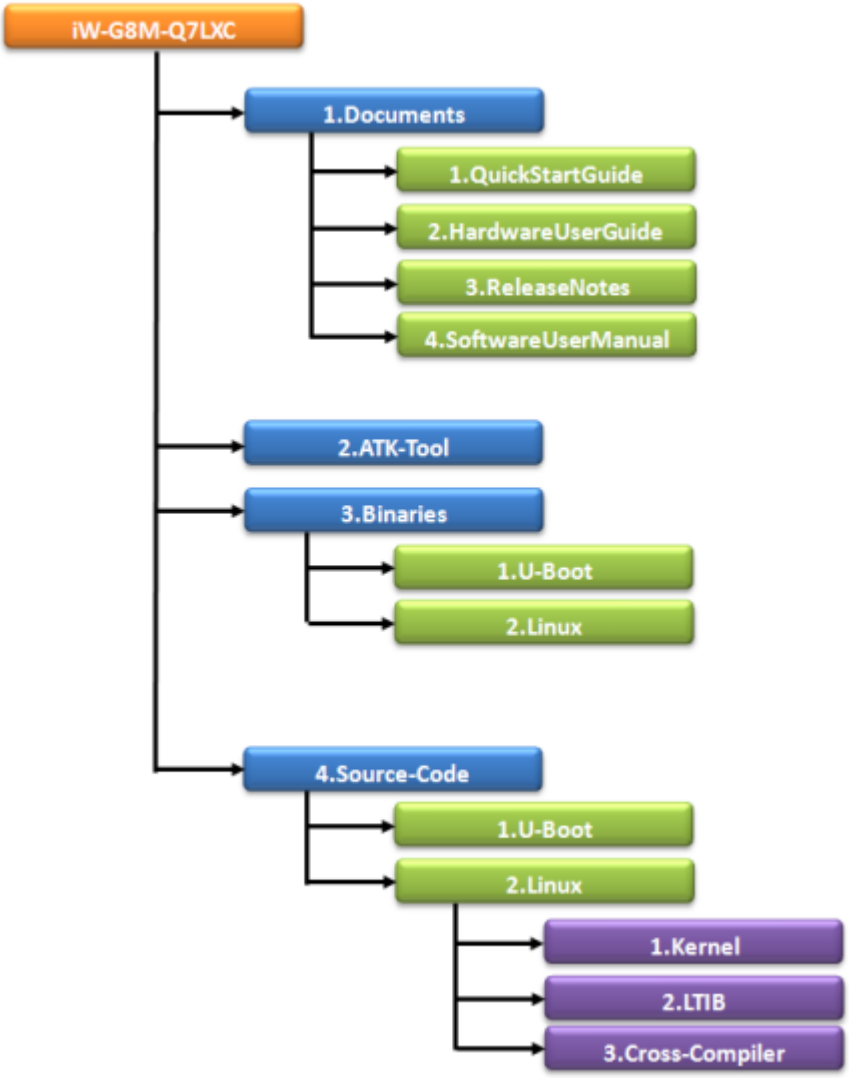


Figure 9: Linux DVD Content