RS9110-N-11-02 Evaluation Board

User Guide

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Table of Contents

Table of Figures

1: Introduction

The RS9110-N-11-02 evaluation board provides a complete IEEE 802.11bgn Wireless LAN evaluation platform. This basically has the RS9110-N-02 802.11bgn WLAN module mounted on it along with few other supporting components such as 40 Mhz reference oscillator and few other passives. The RS9110-N-11-02 is a high-performance, low-power WLAN module.

The board connects to a host processor through SDIO or SPI interfaces. It also provides the connectivity for the WLAN module to the Vector Signal Generator (VSG) and Vector Signal Analyzer (VSA) through a microwave coaxial connector switch.

The RS9110-N-11-02 evaluation board facilitates you in carrying out following tests.

- Evaluation of the end–to-end throughput performance.
- Evaluation of the Transmit and Receive performance of the radio.

Figure 1 shows the block diagram of this evaluation board.

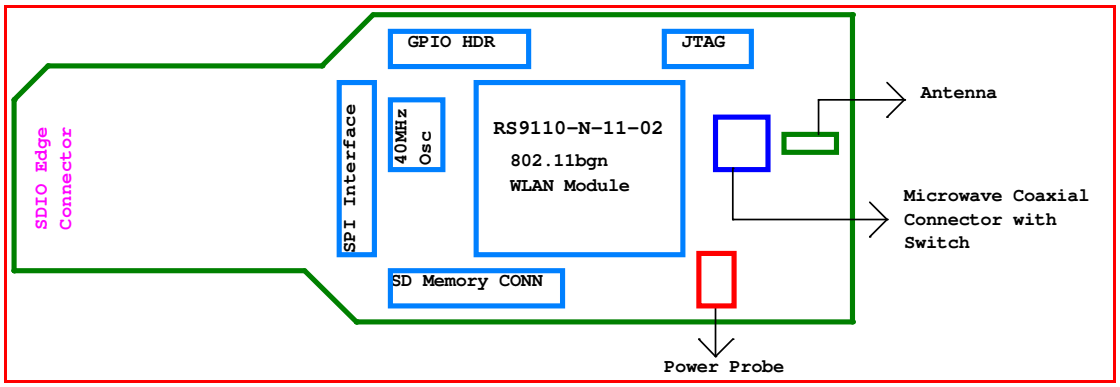

Figure 1: RS9110-N-11-02 Evaluation Board Block Diagram

The following picture illustrates various connectors on the RS9110-N-11-02 evaluation board

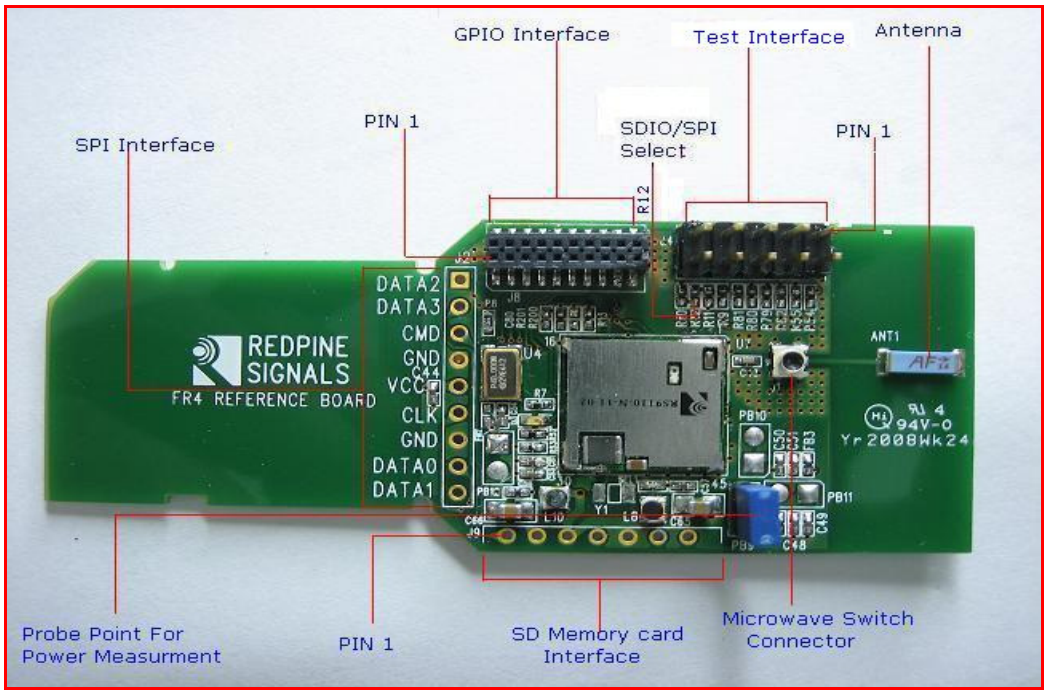

Figure 2: RS9110-N-11-02 Evaluation Board and Connectors

A probe point (Jumper PB9) is provided in order to measure the total power consumed by the RS9110-N-11-02 WLAN Module during transmit, receive, and standby modes.

On board resistors are provided for the Mode Select, which helps the user to switch from the SDIO host interface to SPI host interface.

A SMD-based Microwave switch connector is provided to detach the onboard antenna, and attach external RF input/output of any signal generator/signal analyzer through a Microwave Cable Adapter (Murata Part Number::MXHS83QH3000).

The following diagram illustrates how the user can connect an adapter with Microwave coaxial cable to the switch connector.

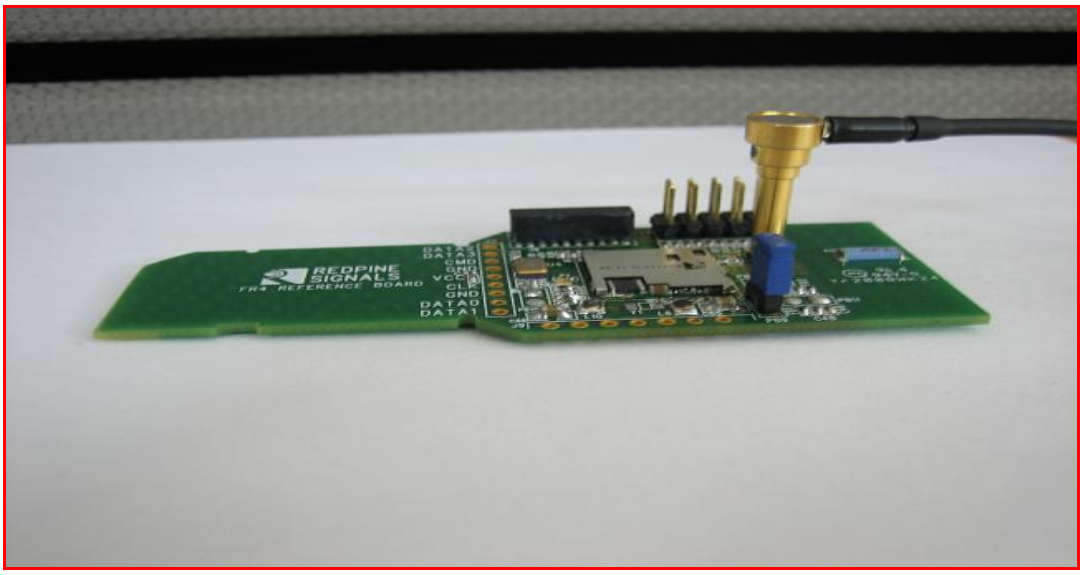

Figure 3: RF Cable Connected to the RS9110-N-11-02 Evaluation Board

1.1: LED Functionality

The LED on the EVB provides a visual indication of association and on air traffic to the user. If a user connects an external power amplifier in the rsi_config_vals structure in the driver, the LED will not function as described in this section.

1) LED will remain off while driver is loaded and active
2) LED will blink to indicate any Tx/Rx traffic activity on air
3) The LED blinking/toggle timing is set to within 40ms. This enables for the naked eye to recognize LED blinking.

2: Wi-Fi Data Transfer Tests

The evaluation kit allows you to carry out WLAN data transfer tests, where in RS9110-N-11-02 EVB can be connected to any 802.11bgn Access Points and user can run any network applications to verify the WLAN connection. You can also evaluate the application level throughputs using this EVB.

In order to perform these tests, a Windows XP, or Linux, or Window CE based WLAN driver is provided along with the evaluation kit.

2.1: Test Setup

If you want to evaluate the system, you need to have following test setup. The EVB is inserted into the Laptop that has SDIO slot, and it is wirelessly connected to an 802.11n Access Point. Data transfer tests can be performed using any other systems in the LAN, which is connected to AP. The test setup is shown in the figure below. The sub-net mask of the wireless interface on the Laptop and AP should be same as that of the LAN, for which AP is connected via Ethernet.

Please note that, in order to evaluate the Lite-Fi™ on a Windows CE or a Windows Mobile platform, you need to replace the Laptop in the following setup, with any of the Windows CE or Windows Mobile based SDIO platform.

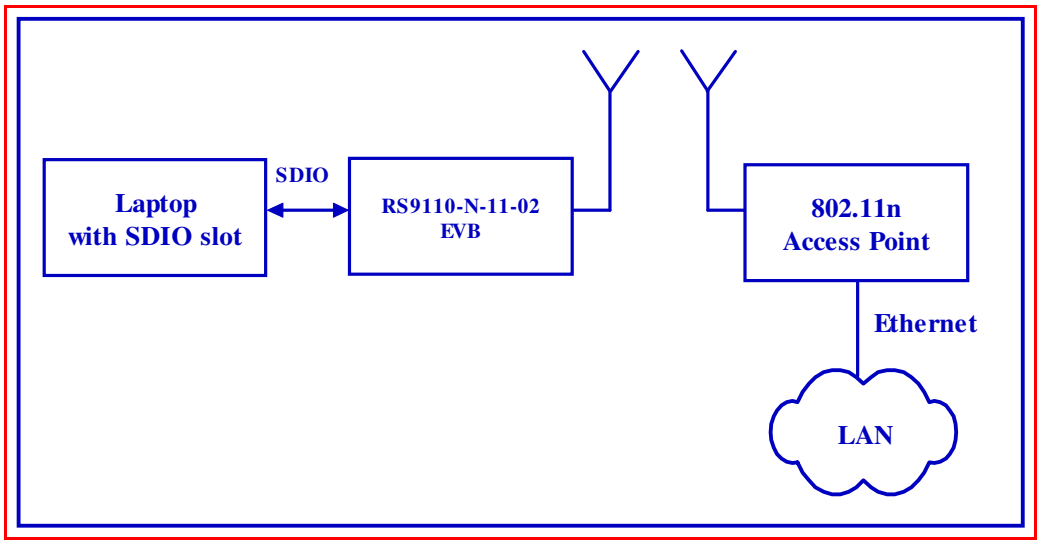

Figure 4: Test Setup for Throughput Measurement

The following is the list of the test setup requirements:

- Laptop with SDIO slot and Windows XP or Linux operating system, or a Windows CE or Windows Mobile based SDIO platform.
- RS9110-N-11-02 EVB
- 802.11n Access Point

2.2: Evaluation Software – Windows XP

The following table provides the description of the software package and installation guides to be used for carrying out the WLAN data transfer tests using an Access Point, on a Windows XP platform.

Deliverable	Description
LiteFi_X_Y_Z.exe	This is an installation setup file based on Windows XP, which will install the Wi-Fi driver files into "C:\Program Files\Lite-Fi". <X_Y_Z> indicates the driver version. For example, LiteFi_2_1_3.exe, means 2.1.3 version of the Windows XP driver.
LiteFi_Driver_Installation_Guide_WindowsXP.pdf	This is a user guide which provides instructions on following topics: • Installation of the setup file • Host requirements to install the Wi-Fi driver • Installation of the Wi-Fi driver
LiteFi_WLAN_Test_Procedure_WindowsXP.pdf	This is a user guide on the usage of the driver and wireless configuration utility to do data transfer tests under following categories: • 11g connection with WPA/WPA2 • 11n connection with WPA2 • 11n connection with Aggregation

2.3: Evaluation Process on Windows XP

You can start the evaluation process as follows:

Step 1: - Follow the instructions mentioned in the *LiteFi_Driver_Installation_Guide_WindowsXP.pdf.*

Step 2: - Follow the instructions mentioned in the

LiteFi_WLAN_Test_Procedure_WindowsXP.pdf.

2.4: Evaluation Software – Linux

The following table provides the description of the software package and installation guides to be used for carrying out the WLAN data transfer tests using an Access Point, on a Linux platform.

Deliverable	Description
RS.GENR.LNX.SD.X.Y.Z.tgz	This is an installation setup file based on Linux platform, which will install the Wi-Fi driver files into appropriate user directory. <X.Y.Z> indicates the driver version. For example, RS.GENR.LNX.SD.3.2.8.tgz, means 3.2.8 version of the Linux SDIO driver.
LiteFi_Driver_Installation_Guide_Linux.pdf	This is a user guide which provides instructions on following topics: • Installation of the setup file • Host requirements to install the Wi-Fi driver • Installation and un-installation of the Wi-Fi driver
LiteFi_WLAN_Test_Procedure_Linux.pdf	This is a user guide on the usage of the driver and wireless configuration utility to do data transfer tests under following categories in Linux platform: • 11g connection with WPA/WPA2 • 11n connection with WPA2 • 11n connection with Aggregation

2.5: Evaluation Process on Linux

You can start the evaluation process as follows:

Step 1: - Follow the instructions mentioned in the *LiteFi_Driver_Installation_Guide_Linux_2_6_18.pdf*

Step 2: - Follow the instructions mentioned in the

LiteFi_WLAN_Test_Procedure_Linux.pdf

2.6: Evaluation Software – Windows CE

The following table provides the description of the software package and installation guides to be used for carrying out the WLAN data transfer tests using an Access Point, on a Windows CE platform.

Deliverable	Description
RWLPSDIO_arm_X_Y_Z.cab	This is an installation setup file for a Windows CE or Windows Mobile based ARM platform. <X_Y_Z> indicates the driver version. For example, RWLPSDIO_arm_2_1_3.cab, means 2.1.3 version of the Windows CE driver.
LiteFi_Driver_Installation_Guide_WindowsCE.pdf	This is a user guide which provides instructions on following topics: • Copying the setup file • Host requirements to install the Wi-Fi driver • Installation of the Wi-Fi driver
RS9110_N_11_02_WLAN_Test_Procedure_WindowsCE.pdf	This is a user guide on the usage of the driver and wireless configuration utility to do data transfer tests under following categories in Windows CE platform such as HP-iPAQ PDA: • 11g connection – Open System • 11g connection with WPA • 11n connection with WPA

2.7: Evaluation Process on CE

You can start the evaluation process as follows:

Step 1: - Follow the instructions mentioned in the *LiteFi_Driver_Installation_Guide_WindowsCE.pdf*

Step 2: - Follow the instructions mentioned in the *RS9110_N_11_02_WLAN_Test_Procedure_WindowsCE.pdf*

3: Connector Details

This section covers the connector details of various headers.

3.1: SPI/SDIO connector

The following table provides the interface details for SPI/SDIO connector.

You should not install R12, for operating the evaluation board in SDIO Mode.

Conversely, you need to install R12 to put the board into SPI mode.

S. NO	SDIO Signal Names	SPI Signal Names	Connector Pin No.
1)	Sdio_data2	Spi_Intrerrupt	J2.1
2)	Sdio_data3	--	J2.2
3)	Sdio_cmd	Spi_cs	J2.3
4)	Gnd	Gnd	J2.4 & 7
5)	Supply	Supply	J2.5
6)	Sdio_clk	Spi_clk	J2.6
7)	Sdio_data0	Spi_data in	J2.8
8)	Sdio_data1	Spi_data out	J2.9

3.2: GPIO Interface Header Details

S. No	Signal Names	Connector Pin No.
1)	Supply	J8.1&2
2)	BT-Active	J8.3
3)	Uart_out1	J8.4
4)	BT_Future0	J8.5
5)	Uart_in1	J8.6
6)	WLAN_Active	J8.7
7)	Uart_out2	J8.8
8)	BT_ Priority	J8.9
9)	I2C_SDA	J8.10
10)	BT_ Future1	J8.11
11)	I2C_SCL	J8.12
12)	Uart_rts	J8.13

S. No	Signal Names	Connector Pin No.
13)	RF_LDO_en	J8.14
14)	Uart_cts	J8.15
15)	Xtal_ip_en	J8.16
16)	Power_gate_en	J8.18
17)	Gnd	J8.17,19&20

3.3: SD Memory Interface

S.No.	Signal Names	Connector Pin No.
4)	CS	J9.1
5)	DI	J9.2
6)	Supply	J9.3
7)	SCLK	J9.4
8)	GND	J9.5
9)	DO	J9.6
10)	CD	J9.6