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Specification For Approval

WiFi Module WL0217E(IEEE 802.11b/g/n)

WL0217

Approved

Reference

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Chapter 1 revision

1.1 Version History

Version	Amendments	Revision Date	Revised
V1.0	Preliminary document	2011-08-11	Jiemy
V1.1	Add FCC IC Label and Lable Location	2011-9-11	Jiemy

Chapter 2 Introduction

2.1 Introduction

WL0217 is a single band wireless 802.11n USB module for Blu-ray players and other multi-media devices. It enables multi-media devices to connect onto 802.11n WLAN network and attain data communication speeds up to 300 megabits-per-second (Mbps). It is also backward compatible to the existing 802.11b/g network.

2.2 Product Features

Product Features

- ◆ High speed for wireless LAN connection, Up to 300 Mbps data rate.
- ◆ Backward compatible to the existing IEEE 802.11/b/g WLAN network.
- ◆ On-board high gain antenna
- ◆ Support USB v2.0

2.2 Applications

- ◆ Home networking for device
- ◆ Wireless multimedia.

Chapter 3 Hardware

3.1 General Overview

- ◆ USB 2.0 Interface and 802.11 n chipset-on-board design.

3.2 Hardware Architecture

- ◆ Broadcom 43235 single chip USB2.0

3.3 Main Chipset Information

- ◆ BCM43235: MIMO MAC + Baseband processor and RF with integrated 2.4GHz PA

3.4 PCB dimension:

- ◆ PCB Dimensions: 54mm x 20mm x 1mm (L x W x H)

3.5 Host Interface

- ◆ USB 2.0. interface (4-pin connector)

3.5 Antenna

- ◆ Print Antenna 2dBi

Chapter 4 Software

4.1 Operating System Supported

- ◆ Windows 2000, XP, Vista
- ◆ Linux Driver

4.2 Wireless Mode Supported

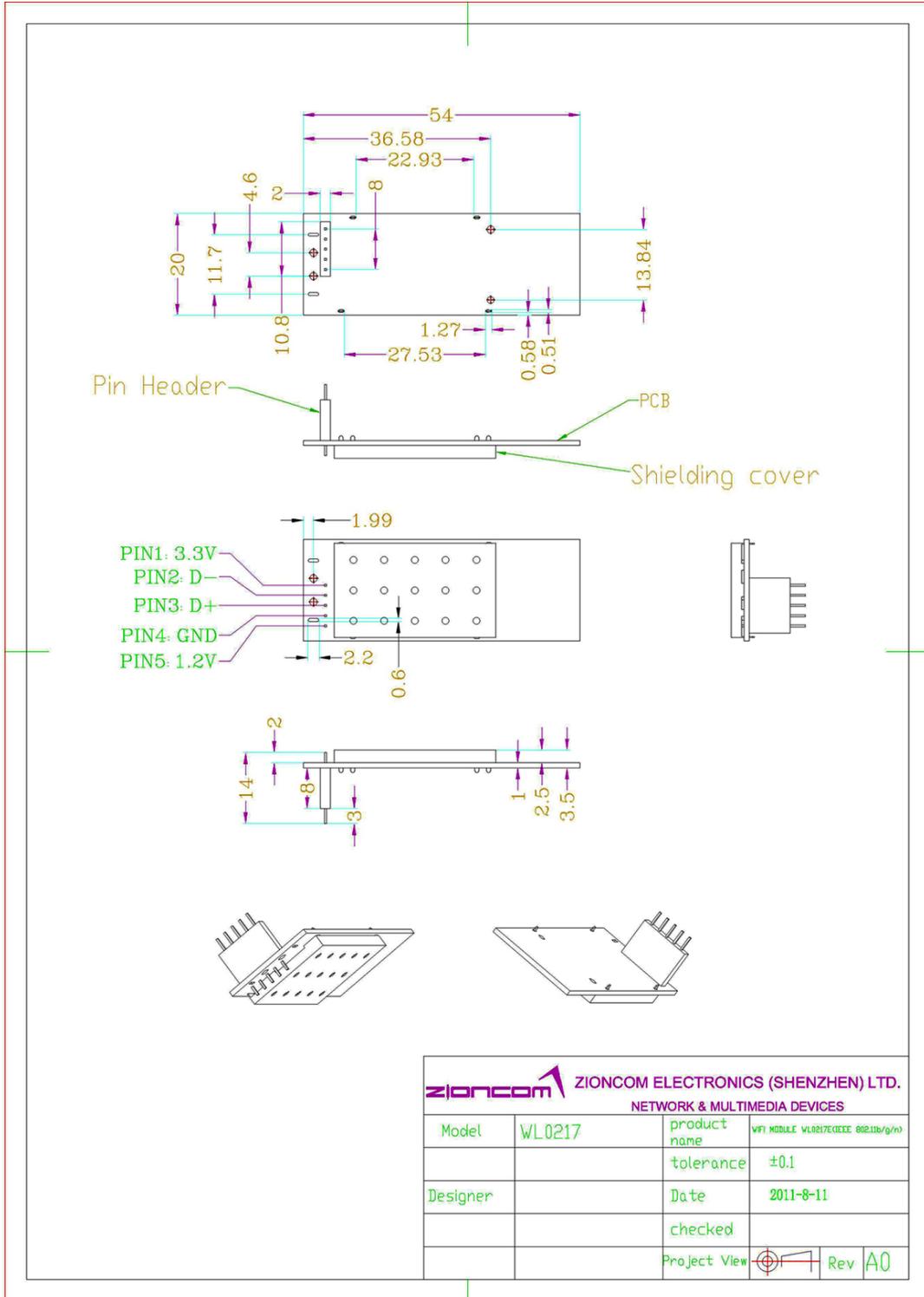
- ◆Infrastructure/Ad-hoc mode

4.3 Security encryption

- ◆ AP (Infrastructure) mode supports
 - ◆ Static WEP that support both 64 and 128 bit keys.
 - ◆ WPA(TKIP) with PSK
- ◆ Ad-hoc mode supports
 - ◆ None (plaintext)
 - ◆ Static WEP that supports both 64 and 128 bit keys.

Chapter 5 Appearance

5.1 Drawings



Chapter 6 Specifications

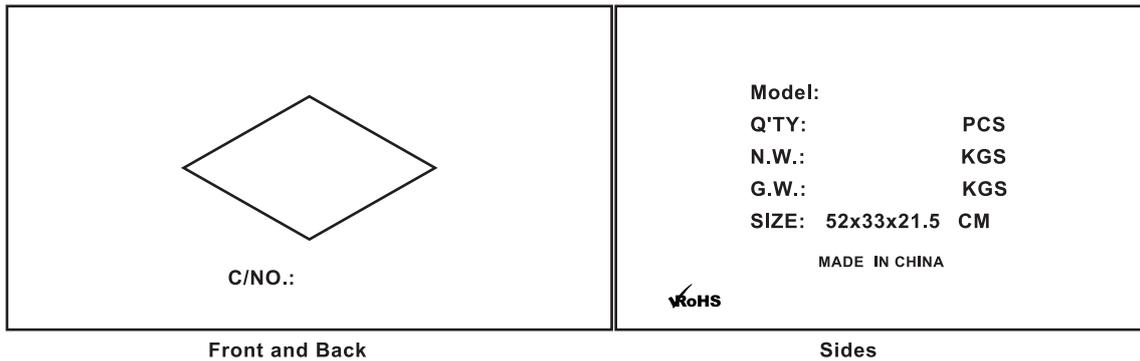
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- ◆ Frequency Band:
 - Draft 802.11n Radio: 2.4 GHz
 - 802.11g Radio: 2.4 GHz
 - 802.11b Radio: 2.4 GHz
 - USA - FCC 2412~2462MHz (Ch1~Ch11)
 - Canada - IC 2412~2462MHz (Ch1~Ch11)
 - Europe - ETSI 2412~2472MHz (Ch1~Ch13)
 - Japan - STD-T66/STD-33 2412~2484MHz (Ch1~Ch14)
 - ◆ Operating Channels:
 - IEEE 802.11b/g/n compliant:
 - 11 channels (US, Canada)
 - 13 channels (ETSI)
 - 14 channels (Japan)
 - ◆ Transmit Power and Sensitivity:
 - TX Output Power: (Typical)
 - 11b 17 +/- 1 dBm@11 Mbps
 - 11g 15 +/- 1 dBm@54 Mbps
 - 11n 14 +/- 1 dBm@64-QAM, 20MHz channel spacing
 - 11n 11 +/- 1 dBm@64-QAM, 40MHz channel spacing
 - Rx Sensitivity : (Typical)
 - 84 dBm @11 Mbps
 - 72 dBm @54 Mbps
 - 64 dBm @64-QAM, 20MHz channel spacing
 - 61 dBm @64-QAM, 40MHz channel spacing
 - ◆ Modulation
 - DBPSK @1Mbps
 - DQPSK@2Mbps
 - CCK@5.5/11Mbps
 - BPSK@6/9 Mbps
 - QPSK@12/18Mbps
 - 16-QAM@24Mbps
 - 64-QAM@48/54Mbps and above
 - ◆ Current consumption (5V DC):
 - TX: TBD Max, @MCS7, 40MHz
 - RX: TBD 310mA Max, @MCS15, 40MHz
 - Power Saving: < TBD
 - Radio OFF mode: < TBD
 - ◆ Operating Temperature: 0 ~ 40 oC ambient
 - ◆ Storage Temperature: -10 ~ 70 oC ambient
 - ◆ Humidity: 5 ~ 90% and must be non-condensing
 - ◆ Regulation and certification compliance available:

References

- IEEE 802.11b Standard Specification
- IEEE 802.11g Standard Specification
- IEEE 802.11n draft Standard Specification

Chapter 7 Packaging

7.1 Packaging



7.2 Fcc IC Label and Lable Location



Chapter 8 Sample test report

8.1 Sample test report

Produce performance parameter table

(1) RF hardware performance (2.4G)

Antenna 0	Power	54M	CH1	12.43dBm	
			CH6	13.91dBm	
			CH11	15.07dBm	
		11N(HT20) MCS7	CH1	11.00dBm	
			CH6	12.00dBm	
			CH11	12.90dBm	
		11N(HT40) MCS7	CH6	12.18dBm	
			54M	CH1	-29.93dB
				CH6	-32.19dB
	CH11	-28.84dB			
	11N(HT20) MCS7	CH1	-30.34dB		
		CH6	-30.33dB		
		CH11	-31.99dB		
	11N(HT40) MCS7	CH6	-31.52dB		
		54M	CH1	-74.0dBm	
CH6			-74.0dBm		
CH11	-74.0dBm				
MAX RX Sensitivity	11N(HT20) MCS7	CH6	-71.0dBm		
		11N(HT40) MCS7	CH6	-67.0dBm	

Antenna 1	Power	54M	CH1	12.75dBm
			CH6	14.05dBm
			CH11	15.07dBm
		11N(HT20) MCS7	CH1	10.53dBm
			CH6	12.28dBm
			CH11	12.25dBm
	11N(HT40) MCS7	CH6	11.98dBm	
EVM		54M	CH1	-29.01dB

			CH6	-32.34dB
			CH11	-29.94dB
		11N(HT20) MCS7	CH1	-30.61dB
			CH6	-32.07dB
		11N(HT40) MCS7	CH11	-31.80dB
			CH6	-31.81dB
	MAX RX Sensitivity	54M	CH1	-74.0dBm
			CH6	-74.0dBm
			CH11	-74.0dBm
		11N(HT20) MCS7	CH6	-72.0dBm
			11N(HT40) MCS7	CH6

(2) Distance throughput performance of wireless

①Dut produce description

Test Object (DUT)	WL0217	PCB Ver	V. C
Chip	BCM43235KMLG		
Test Object (reference produce)	WL0218	PCB Ver	V. D
Chip	BCM43236KMLG		

②Distance environment description(wireless-LAN)

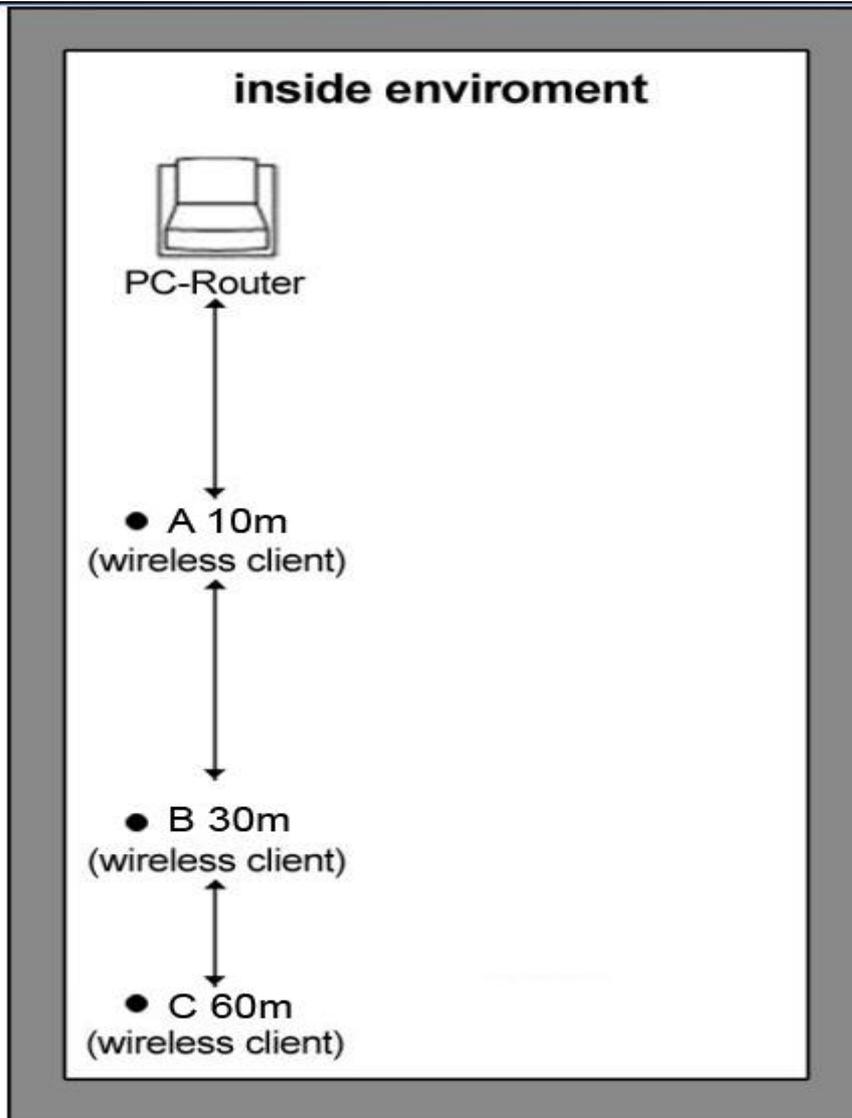
Distance Point	Channel		DUT throughput	Reference produce throughput
SiteA (1M)	Channel 1	Up	81.202Mbps	84.698Mbps
		Down	81.813Mbps	87.733Mbps
	Channel 6	Up	79.754Mbps	84.732Mbps
		Down	82.902Mbps	88.133Mbps
	Channel 11	Up	80.709Mbps	84.656Mbps
		Down	83.300Mbps	87.747Mbps
SiteA (55M)	Channel 1	Up	64.048Mbps	65.302Mbps
		Down	63.552Mbps	54.745Mbps
	Channel 6	Up	54.126Mbps	66.083Mbps
		Down	54.573Mbps	73.120Mbps
	Channel 11	Up	53.708Mbps	65.223Mbps
		Down	55.529Mbps	66.156Mbps
SiteA (70M)	Channel 1	Up	12.648Mbps	17.374Mbps

	Channel 6	Down	6.020Mbps	10.129Mbps
		Up	18.488Mbps	35.994Mbps
		Down	17.046Mbps	19.760Mbps
	Channel 11	Up	22.096Mbps	29.166Mbps
		Down	16.923Mbps	11.531Mbps

Testing Content:

Testing Number	Testing Item	Testing Content
1.	Check wireless adapter case	Check adapter case logo
2.	Led testing	Led working, lightness and aberration of led color
3.	Button Testing	Hardware button of WPS testing
4.	Ping pack testing	wireless adapter ping router gateway testing
5.	Temperature test	Main chipset temperature
6.	Max current testing	Test wireless adapter max electricity in the load
7.	Wireless distance testing	Wireless long distance
8.	Performance aging testing	Chariot aging testing
9.	IQView device testing	IQview testing content

Test environment



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Zioncom reserves the right to make revisions to this document and the product described herein without obligation to notify any person or entity of any such changes.

This device is intended only for OEM integrators under the following conditions:
 The antenna must be installed such that 20 cm is maintained between the antenna and users, and
 The transmitter module may not be co-located with any other transmitter or antenna.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: X7DWL0217"

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
 The end user manual shall include all required regulatory information/warning as show in this manual.

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC Caution:

Operation of this device is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.