TEST REPORT

No. 2012EEB00215-EMC

for

Wistron Neweb Corporation.

WIFI module

Model Name: DNUA-93C2

Marketing Name: DNUA-93C2

FCC ID: NKR-DNUA93C2

with

Hardware Version: V1.0

Software Version: /

Issued Date: 2012-07-01

Test Laboratory:
FCC 2.948 Listed: No.733176
IC O.A.T.S listed: No.6629A-1

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

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CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No 52 Hua Yuanbei Road, Haidian District, Beijing, P.R.China
Postal Code:	100191
Telephone:	+86(0)10-62304633-2678
Fax:	+86(0)10-62304633-2504

1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	20-75%

1.3. Project data

Testing End Date:	2012-6-25

1.4. Signature

Du Zhaoxuan
(Prepared this test report)

Zhang Bojun
(Reviewed this test report)

Lu Minniu
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Wistron Neweb Corporation
Address /Post:	20 Park Avenue II Road, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.
City:	Hsinchu
Postal Code:	/
Country:	Taiwan
Telephone:	886-3-666-7799
Fax:	886-3-666-7323

2.2. Manufacturer Information

Company Name:	Wistron Neweb Corporation
Address /Post:	20 Park Avenue II Road, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.
City:	Hsinchu
Postal Code:	/
Country:	Taiwan
Telephone:	886-3-666-7799
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	WIFI module
Model Name	DNUA-93C2
Marketing Name	DNUA-93C2
FCC ID	NKR-DNUA93C2

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	DNUA-93C2	V1.0	/

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

WLAN Antenna

AE ID*	Name	Supplier	GAIN（dBi）
AE1	AG-011333-0296-A0-0000	SHENZHEN B&T TECHNOLOGY Co,.Ltd	2.00
AE2	AG-041333-0428-A0-0000	SHENZHEN B&T TECHNOLOGY Co,.Ltd	1.60
AE3	EZY-W8-2	Wistron NeWeb Corporation	0.78
AE4	EZY-W11-2	Wistron NeWeb Corporation	1.85
AE5	EZY-W11-1	Wistron NeWeb Corporation	5.15
AE6	EZY-W8-1	Wistron NeWeb Corporation	4.53
AE7	EHD-S6	Wistron NeWeb Corporation	<3
AE8	81EAAB15.G02	Wistron NeWeb Corporation	4.35
AE9	81EAAB15.G02	Wistron NeWeb Corporation	3.91

*AE ID: is used to identify the test sample in the lab internally.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE5 + PC	Charging mode

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	10-1-2011 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003
ICES-003	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus	Issue 4

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber (11.20 meters×6.10meters×5.60meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 70 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. =35 %, Max. = 80 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω

Conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. =35 %, Max. = 80 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω

Fully-anechoic chamber (11.20 meters×6.10 meters×6.60 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 70 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω
Voltage Standing Wave Ratio （VSWR）	≤ 6 dB, from 1 to 6 GHz，3 m distance

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Radiated Emission	15.109(a)	A.1	P
2	Conducted Emission	15.107(a)	A.2	P

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1	Test Receiver	ESCI	100701	R&S	2012.12.29
2	Test Receiver	ESCI	100702	R&S	2012.12.29
3	Test Receiver	FSU 26	200679	R&S	2013.01.17
4	BiLog Antenna	VULB9163	9163 330	Schwarzbeck	2014.02.23
5	LISN	ESH2-Z5	100196	R&S	2012.12.30
6	Dual-Ridge Waveguide Horn Antenna	3117	00066585	ETS-Lindgren	2013.04

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§15.109(a))

Reference

FCC: CFR Part 15.109(a)

A.1.1 Method of measurement

The field strength of radiated emissions from the unintentional radiator (USB mode of MS and charging mode of MS) at a distance of 3 meters is tested. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

A.1.2 EUT Operating Mode:

The MS is operating in the USB mode. During the test MS is connected to a PC via a USB cable in the case of USB mode. The model of the PC is Lenovo Thinkcentre R400, and the serial number of the PC is L3-AAE1L08/10. The PC let MS operate normally.

A.1.3 Measurement Limit

Limit from CFR Part 15.109(a)

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

Limit from ICES-003 Section 5.5

Frequency range (MHz)	Field strength limits* (dBμV/m)
30 to 230	40
230 to 1000	47

*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

A.1.4 Test Condition

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
1000-18000	1MHz/1MHz	15

A.1.5 Measurement Results

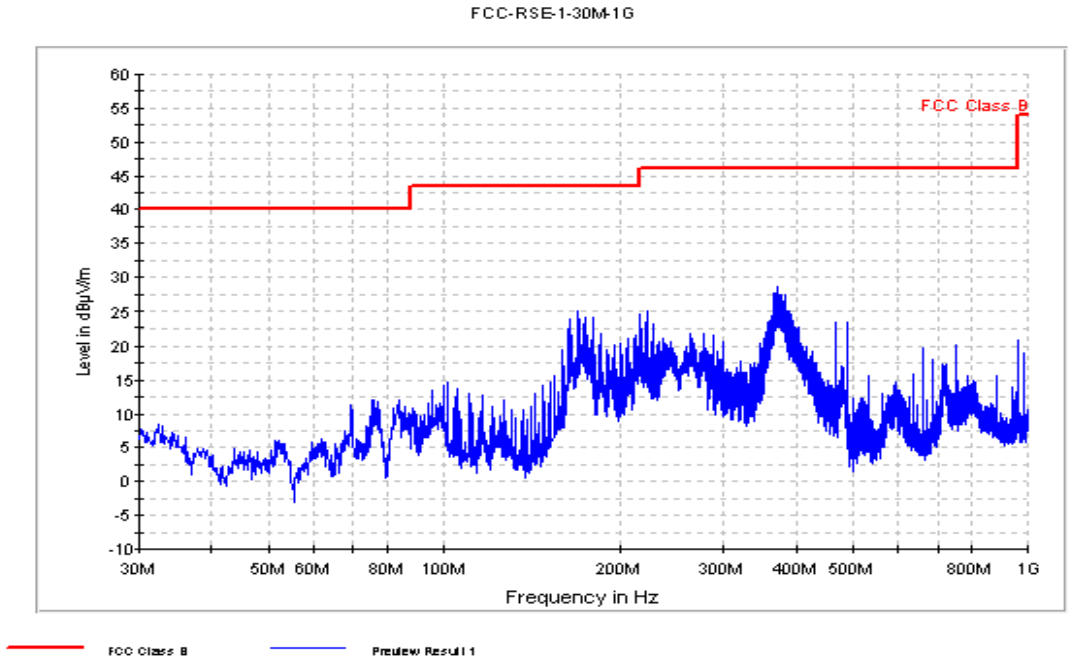

Figure A.1 Radiated Emission from 30MHz to 1GHz (Set.1)

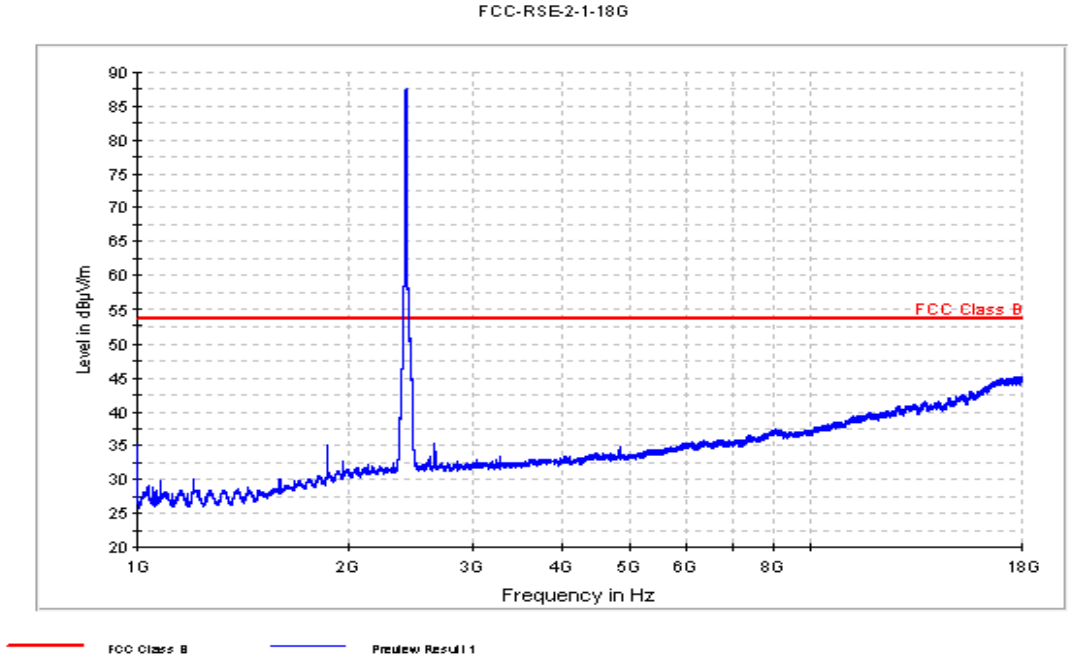

Figure A.2 Radiated Emission from 1GHz to 18GHz (Set.1)

A.2 Conducted Emission (§15.107(a))

Reference

FCC: CFR Part 15.107(a)

A.2.1 Method of measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 7.2.

A.2.2 EUT Operating Mode:

The MS is operating in the USB mode. During the test MS is connected to a PC via a USB cable in the case of USB mode. The model of the PC is Lenovo Thinkcentre R400, and the serial number of the PC is L3-AAE1L08/10. The PC let MS operate normally.

A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency		

A.2.4 Test Condition in charging mode

Voltage（V）	Frequency（Hz）
120	60

RBW	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

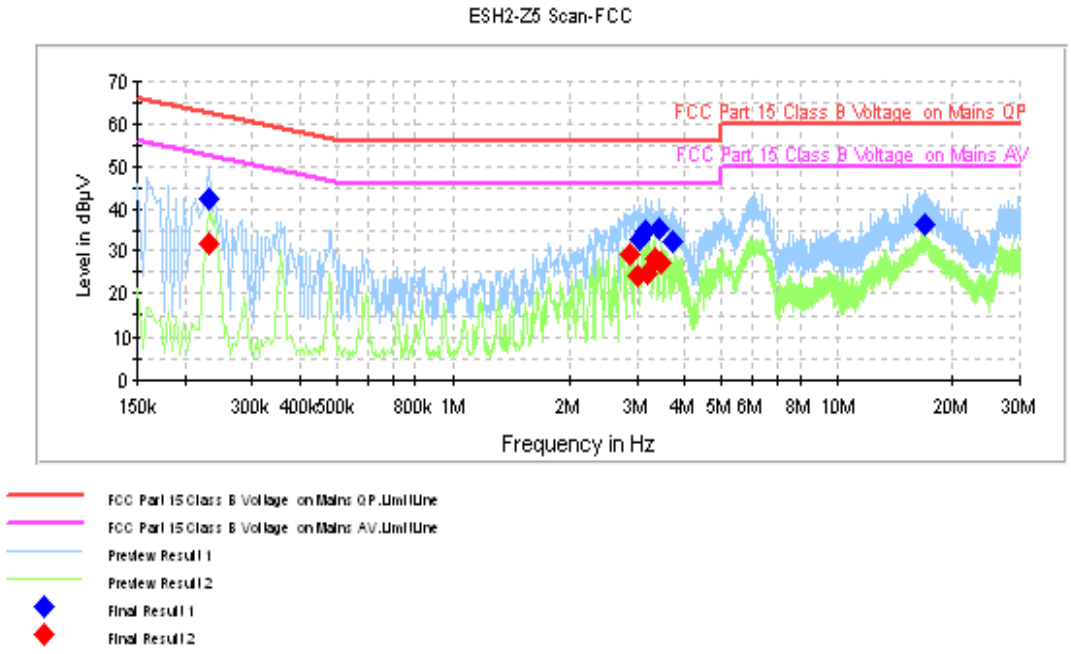

Figure A.3 Conducted Emission (Set.1)

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.231000	42.4	FLO	L1	10.0	20.0	62.4
3.030000	32.8	FLO	N	10.2	23.2	56.0
3.156000	34.9	FLO	L1	10.2	21.1	56.0
3.421500	35.4	FLO	L1	10.2	20.6	56.0
3.723000	32.4	FLO	L1	10.2	23.6	56.0
16.935000	36.2	FLO	N	10.6	23.8	60.0

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.231000	32.0	FLO	L1	10.0	20.4	52.4
2.868000	29.1	FLO	L1	10.1	16.9	46.0
3.012000	24.3	FLO	N	10.2	21.7	46.0
3.178500	24.4	FLO	N	10.2	21.6	46.0
3.345000	28.0	FLO	N	10.2	18.0	46.0
3.471000	27.3	FLO	N	10.2	18.7	46.0

*****END OF REPORT*****