


EMC TEST REPORT



UCS Co., Ltd.

#702, Megavalley, 799 Kwanyang-dong, Dongan-gu, Anyang-city, Kyunggi-do, 431-767, Korea
Tel : 82-31-420-5680/Fax :82-31-420-5685, Open Site : 82-31-355-2666

EMC Test Report

Report Number	UCSFC-1206-038			
Applicant	Company Name	WIZNET Co., LTD.		
	Address	4F Humax Village, 11-4, Sunae-dong, Bundang-gu, Seongnam, South Korea		
Product	Product Name	WiFi Module JIG		
	Model No.	WIZ630wi-EVB	Manufacturer	WIZNET Co., LTD.
	Serial No.	None	Country of origin	Korea
Other	Receipt Date	2012.03.19	Receipt Number	UCS-R-2012-138
	Issued Date	2012-06-18	Tested Date	2012.06.15 ~ 2012.06.15
Test Result	Pass			
Standard	FCC Part 15 Subpart B 107/109			
Tested by	S. M. Yang 			
Approved by	K. T. Kim 			
<h2 style="margin: 0;">UCS Co., Ltd.</h2> <p style="margin: 0; font-size: small;"> #702, Megavalley, 799 Kwanyang-dong, Dongan-gu, Anyang-city, Kyunggi-do, 431-767, Korea Tel : 82-31-420-5680/Fax :82-31-420-5685, Open Site : 82-31-355-2666 </p>				
<p>o This is certified that the above mentioned products have been tested for the sample provided by client.</p> <p>o No part of this document may not be duplicated or reproduced by any means without the express written permission of UCS Co., Ltd.</p>				

Contents

1. Applicant Information	Page 4
2. EUT Information	Page 4
3. Laboratory Information	Page 4
4. Test Configuration and condition	Page 5
5. Summary of Test Results and Measurement Procedures	Page 7
6. Test Results	Page 9
7. Appendix-A : Test Setup Photographs	Page 14
8. Appendix-B : External Photographs of EUT	Page 16
9. Appendix-C : Internal Photographs of EUT	Page 17

1. Applicant Information

Applicant Name : WIZNET Co., LTD.
Address : 4F Humax Village, 11-4, Sunae-dong, Bundang-gu, Seongnam, South Korea
Manufacturer : WIZNET Co., LTD.
Country of Origin : Korea

2. EUT Information

Product Name : WiFi Module JIG
Model : WIZ630wi-EVB

2.2 Electrical specification

Input Rating : 5 Vdc / 2 A

3. Laboratory Information

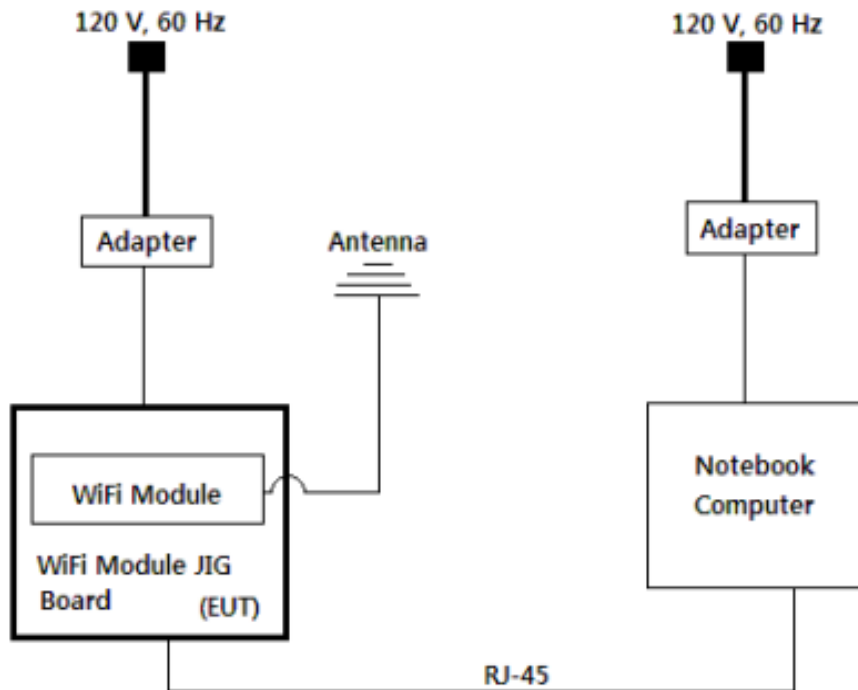
Laboratory Name : UCS Co., Ltd.
Location : 476-4, Hwalcho-dong, Hwaseong-si, Kyunggi-do, Korea 445-150

4. Test Configuration and condition

4.1 EUT Operating Condition

- The EUT was in the following operation mode during all testing
- After installing the EUT on the Evaluation Board, tested with checking the operation status into "Ping Test"
(However, this unit are provided three types of antennas and connecting the most useful Monopole antenna (WSL 025) at the test, report is written to results of test
- Tested Input Rating : 120 Vac, 60 Hz

4.2 EUT Test Configuration Diagram



4.3 Peripheral equipments list for test

Equipment Name	Model	Serial Number	Manufacturer
WiFi Module JIG	WIZ630wi-EVB	-	WIZNET Co., LTD.
Adapter	DP-05020DG	-	-
WiFi Module	WIZ630wi	-	WIZNET
Monopole Antenna	WSL025	-	WANSHIH ELECTRONIC CO., LTD.

4.4 Cable Connections

Start		End		Cable	
Name	I/O Port	Name	I/O Port	Length	Spec.
EUT	RJ-45	Notebook Computer	RJ-45	1.0	Unshielded
WiFi Module	SMA	Antenna	SMA	0.1	Unshielded
Evaluation Board	DC In	Adapter	-	1.4	Unshielded
Notebook Computer	Power	Adapter	-	1.6	Unshielded

5. Summary of Test Results and Measurement Procedures

5.1 Summary of test results

Standard	Test Item	Results
FCC Part 15 Subpart B	Conducted Emission	Complied
FCC Part 15 Subpart B	Radiated Emission	Complied

5.2 Preliminary Testing

It is often valuable to performing preliminary radiated measurements at a closer distance than specified for compliance to determine the emission characteristics of the EUT. At close-in distance, it is easier to determine the spectrum signature of EUT, and if applicable, the EUT configuration that emanate the maximum level of emissions. The data may not be precisely correlatable results.

5.3 Shielded Enclosure

To search the Radiated frequency outline of an EUT a shielded screen room may be used. If the shielded room is used for radiated data, the data page will state that the EUT was in a shielded enclosure. All data collected in a screen room for emission data, radiated emissions is for frequency outline only. If an EUT is placed in screen room for AC Powerline Conducted the data page will show that a screen room was used and data frequencies and levels will be correct and used for test data.

5.4 Data Reporting Format

The measurement results expressed in accordance with C63.4 and specified limits where applicable are presented in tabular or graphical form, or alternatively as recorder charts or photographs of a spectrum analyzer display, showing the level vs. frequency.

5.5 AC Powerline Conducted Emission Test

The EUT is set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-2003. The highest emissions were also analyzed in detail by operating the spectrum analyzer in fixed tuned mode to determine the precise amplitude of the emissions. On the other hand, the interconnecting cables were moved around the table to maximize the emissions, and the position of the peripheral devices were interchanged to check whether there is any changes in emissions.

NOTE : The resolution bandwidth and video bandwidth of test receiver is 9 kHz for Quasi-peak detection (QP) at frequency below 30 MHz. Q.P value A.V limit when do over by A.V mode conversion after measure .

5.6 Radiated Emission Test

The EUT and support equipment are set up on the turntable in an open field site. Desktop EUTs are set up on a wooden stand (test-table), 80 cm above the ground plane. All items on the table were placed at least 10 cm apart each other. Interconnecting cables which hang closer than 40 cm to the ground plane are folded back and forth to form a 30 cm by 40 cm long bundle, hanging approximately between the ground plane and table. The highest emissions were also analyzed, in detail, with the tuned aerial to search the precise amplitude of the emissions. On the other hand, the interconnecting cables were moved around the table and if the highest amplitudes is observed, the EUT is rotated in the horizontal plane while changing the antenna polarization to the vertical plane to maximize the field strength. Once the maximum field strength is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. The position of the peripheral devices are interchanged to check for any changes in emissions. In rare instances, the maximum field strength may occur with the antenna polarized between vertical and horizontal.

NOTE : The resolution bandwidth and video bandwidth of test receiver is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.

6. Test Results

6.1 Conducted Emission

Test Standard	FCC Part 15 Subpart B		
Test Configuration	Tested with program provided by customer		
Tested Date	2012.06.15		
Input Ratings	120 Vac, 60 Hz		
Temperature(°C)	25.1 °C	Humidity(% R.H.)	52.5 %
Note	Complied		

6.1.1 Limit of Conducted Emission

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	79	66	66 ~ 56*	56 ~ 46*
0.5 ~ 5	73	60	56	46
5 ~ 30	73	60	60	50

* : The limit decreases linearly with the logarithm of frequency.

6.1.2 Test set-up and procedure

The mains terminal disturbance voltage was measured with the equipment under test(EUT) in a shield room.

The EUT was connected to an artificial mains network(LISN) placed on the floor.

The EUT was placed on non-metallic table 0.8m above the metallic, grounded floor.

The distance to other metallic surface was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

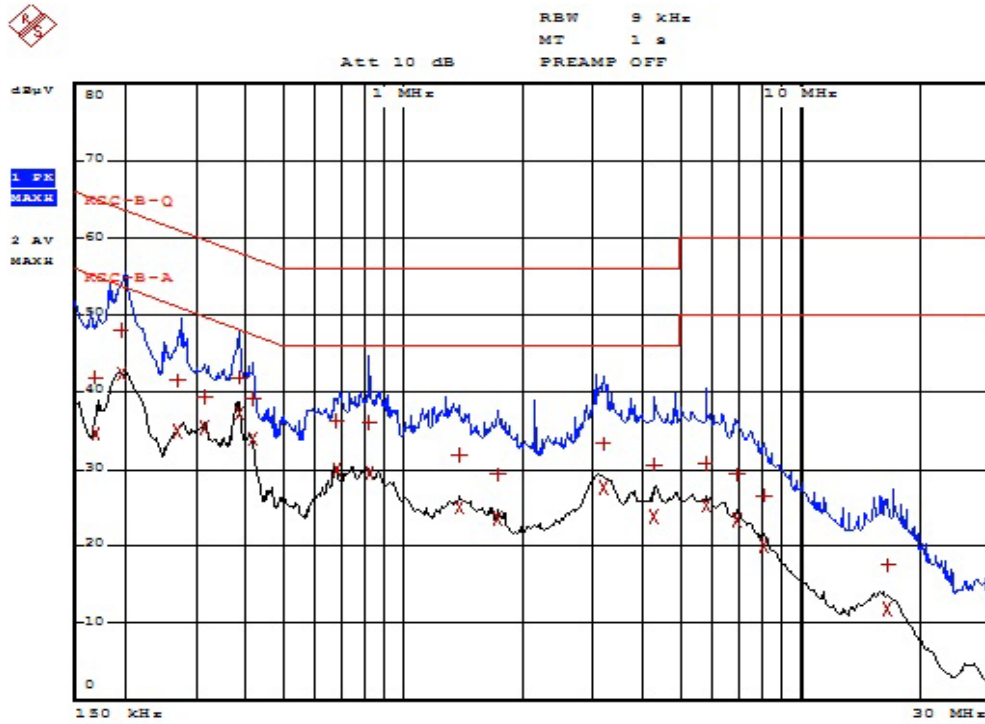
6.1.3 Used test equipments

Equipment	Model	Serial No.	Vendor	Next Cal. Date	Used
Test Receiver	ESPI3	101171	R&S	2012.08.12	■
LISN	NSLK 8127	8127518	SCHWARZBECK	2012.10.04	■
LISN	L2-16A	1100X90603	PMM	2012.10.04	■

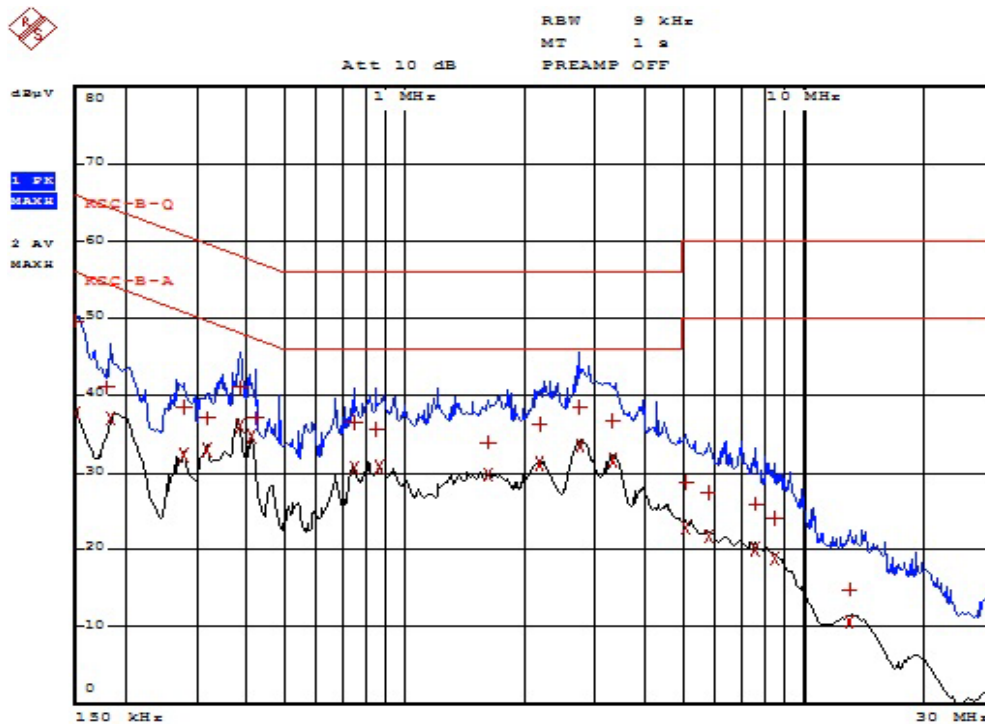
6.1.4 Conducted emission measurement results

Frequency (MHz)	Factor		Line	Quasi-Peak(dB μ V)				Average(dB μ V)			
	LISN	Cable		Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
0.17	0.05	0.04	H	64.96	41.83	41.92	23.04	54.96	34.62	34.71	20.25
0.20	0.05	0.04	H	63.61	47.89	47.98	15.63	53.61	42.22	42.31	11.30
0.27	0.05	0.05	H	61.12	41.45	41.54	19.57	51.12	34.92	35.01	16.10
0.31	0.05	0.05	H	59.97	39.41	39.51	20.46	49.97	35.28	35.38	14.59
0.39	0.04	0.06	H	58.06	41.91	42.01	16.05	48.06	37.33	37.43	10.63
0.41	0.04	0.06	H	57.65	39.23	39.33	18.31	47.65	34.00	34.10	13.54
0.75	0.04	0.08	N	56.00	36.41	36.53	19.47	46.00	30.58	30.70	15.30
0.85	0.04	0.09	N	56.00	35.66	35.79	20.21	46.00	30.68	30.81	15.19
1.63	0.05	0.13	N	56.00	33.84	34.02	21.98	46.00	29.65	29.83	16.17
2.19	0.05	0.16	N	56.00	36.14	36.35	19.65	46.00	31.12	31.33	14.67
2.77	0.06	0.19	N	56.00	38.46	38.71	17.29	46.00	33.53	33.78	12.22
3.36	0.07	0.22	N	56.00	36.68	36.97	19.03				
5.10	0.09	0.30	N	60.00	28.70	29.09	30.91	50.00	22.76	23.15	26.85
5.79	0.10	0.33	H	60.00	30.77	31.20	28.80	50.00	25.25	25.68	24.32
5.83	0.10	0.33	N	60.00	27.33	27.76	32.24	50.00	21.74	22.17	27.83
6.95	0.12	0.37	H	60.00	29.33	29.82	30.18				
7.61	0.12	0.38	N	60.00	25.99	26.49	33.51				
8.14	0.14	0.39	H	60.00	26.53	27.05	32.95	50.00	20.01	20.53	29.47

6.1.5 Conducted emission measurement graph



HOT



NEUTRAL

6.2 Radiated Emission

Test Standard	FCC Part 15 Subpart B		
Test Configuration	Tested with program provided by customer		
Tested Date	2012.06.15		
Input Ratings	120 Vac, 60 Hz		
Temperature(°C)	33.3 °C	Humidity(% R.H.)	41.7 %
Note	Complied		

6.2.1 Limit of Radiated Emission

Frequency (MHz)	Class A (dBuV/m) @ 10 m	Class B (dBuV/m) @ 10 m
30 ~ 230	40	30
230 ~ 1000	47	37
Above 1000		

6.2.2 Test set-up and procedure

The final test was done at a 3 m open area test site with a quasi-peak detector.

EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.

Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.

Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.2.3 Used test equipments

Equipment	Model	Serial No.	Vendor	Next Cal. Date	Used
Test Receiver	ESPI3	101171	R&S	2012.08.12	■
Broadband Antenna	VULB9163	398	SCHWARZBECK	2013.10.03	■
Antenna Master	ACT-A400	2009814001	Audix Coporation	-	■
Turn Table	ACT-T200	20090812001	Audix Coporation	-	■
3m OATS	-	-	Semitec	-	■

6.2.4 Radiated emission measurement results

Frequency (MHz)	Reading (dBuV/m)	Polarity	Height (m)	Angle (°)	Factor		Limit (dBuV/m)	Results (dBuV/m)	Margin (dB)
					Antenna	Cable			
126.30	7.69	H	1.0	345	9.46	1.92	43.50	19.07	24.43
321.70	5.38	V	1.0	180	13.49	3.21	46.00	22.08	23.92
533.40	4.76	V	1.0	179	17.45	4.03	46.00	26.24	19.76
747.60	3.59	V	1.0	97	19.83	4.97	46.00	28.39	17.61
852.30	4.34	H	1.0	100	21.20	5.27	46.00	30.81	15.19

* Radiated Emission (Above 1GHz) : All radiated results are exist under 20dB below than the limit

7. Appendix-A : Test Setup Photographs

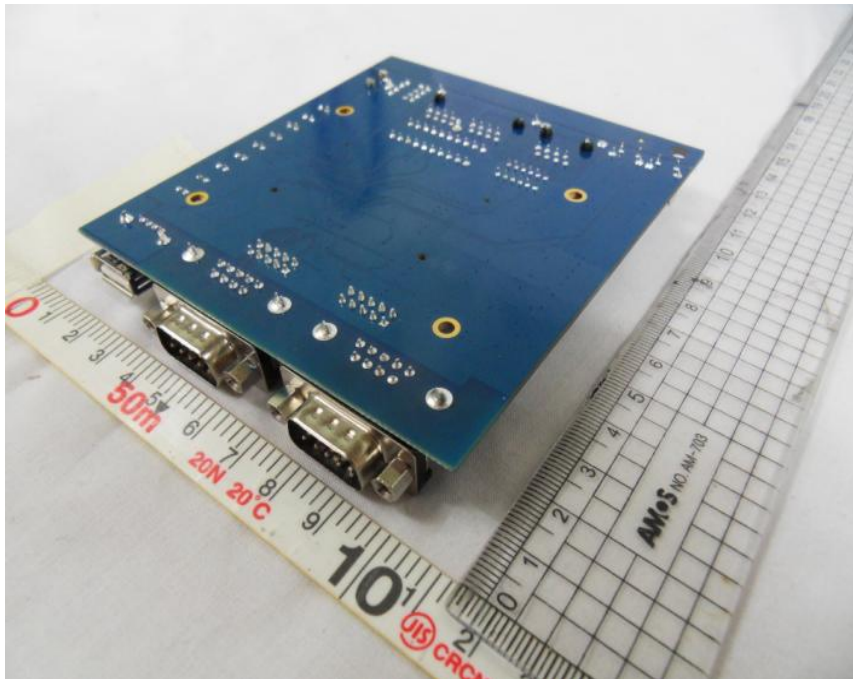
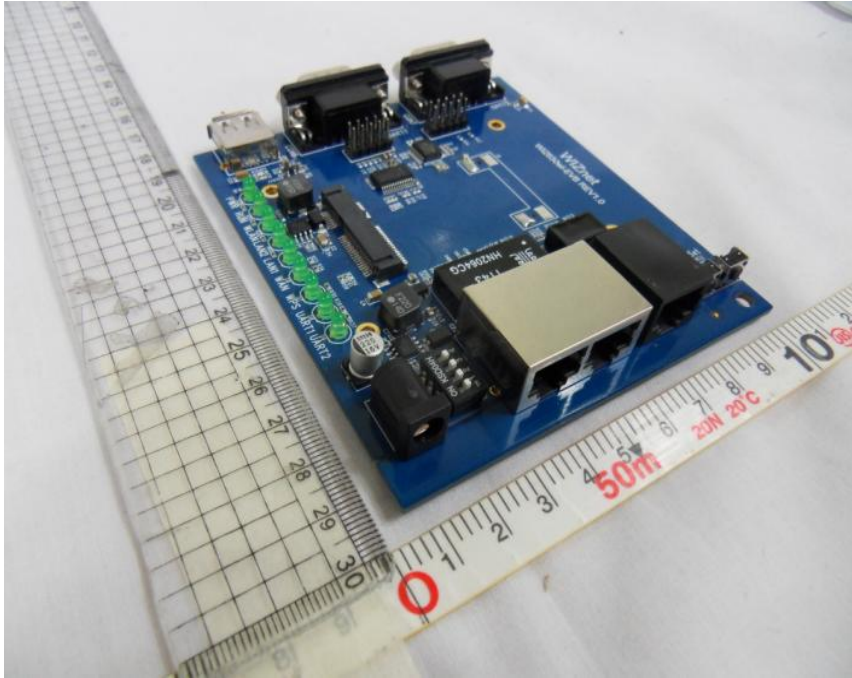
7.1 Conducted Emission Setup Photographs



7.2 Radiated Emission Setup Photographs



8. Appendix-B : External Photographs of EUT



9. Appendix-C : Internal Photographs of EUT

