Testing Laboratory
1190

FCC / IC TEST REPORT

According to

47 CFR Part 15 Subpart B and IC RSS-210

Equipment	:	**802.11g USB Wireless Adapter**
Trade Name	:	**2WIRE**
Model No.	:	**US-G-AT-02**
FCC ID	:	**IXMUSGAT02**
IC ID	:	**4110A-USGAT02**
Filing Type	:	**Declaration of Conformity**
Applicant	:	**Universal Scientific Industrial Co., Ltd.**
		141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

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- Report Version: Rev. 01

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Report Issue Date: Jul. 20, 2007

Report No.	Description

Certificate No. : FD770310

CERTIFICATE OF COMPLIANCE

according to

47 CFR Part 15 Subpart B and IC RSS-210

Equipment	:	**802.11g USB Wireless Adapter**
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Filing Type	:	**Declaration of Conformity**
Applicant	:	**Universal Scientific Industrial Co., Ltd.** 141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and the energy emitted by this equipment was *passed* FCC Part 15 B and IC RSS-210 in both radiated and conducted emission class B limits. Testing was carried out on Jul. 17, 2007 at SPORTON International Inc. LAB.

Roy Wu
Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1 Applicant

Universal Scientific Industrial Co., Ltd.
141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

1.2 Manufacturer

Universal Scientific Industrial Co., Ltd.
141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen, Nan-Tou, Taiwan

1.3 Basic Description of Equipment under Test

Equipment	:	802.11g USB Wireless Adapter
Trade Name	:	2WIRE
Model No.	:	US-G-AT-02
FCC ID	:	IXMUSGAT02
IC ID	:	4110A-USGAT02

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. DUT Type	802.11g USB Wireless Adapter			
2. Trade Name	2WIRE			
3. Model Name	US-G-AT-02			
4. FCC ID	IXMUSGAT02			
5. IC ID	4110A-USGAT02			
6. Modulation Type/Data Rate	DSSS / OFDM			
7. Frequency Range.	2400 MHz ~ 2483.5 MHz			
8. Number of Channels	11			
9. Carrier Frequency of each channel	2412+(n-1)*5 MHz; n=1~11			
10. Maximum Output Power to Antenna (Normal condition)	802.11b : 17.61 dBm (for Antenna 1) 17.78 dBm (for Antenna 2 & 3) 802.11g : 20.41 dBm (for Antenna 1) 22.43 dBm (for Antenna 2 & 3)			
11. Type of Antenna Connector	Antenna 1: N/A Antenna 2: H.U.FL Antenna 3: H.U.FL			
12. Antenna Type	Antenna 1: Printed Antenna (Internal) Antenna 2: Printed Antenna (External) Antenna 3: Printed Antenna (External)			
13. Antenna Gain	Antenna 1: 2.4 dBi Antenna 2: 2.69 dBi Antenna 3: 2.05 dBi			
14. Function Type	Transmitter		Transceiver	V

2. Test Configuration of Equipment under Test

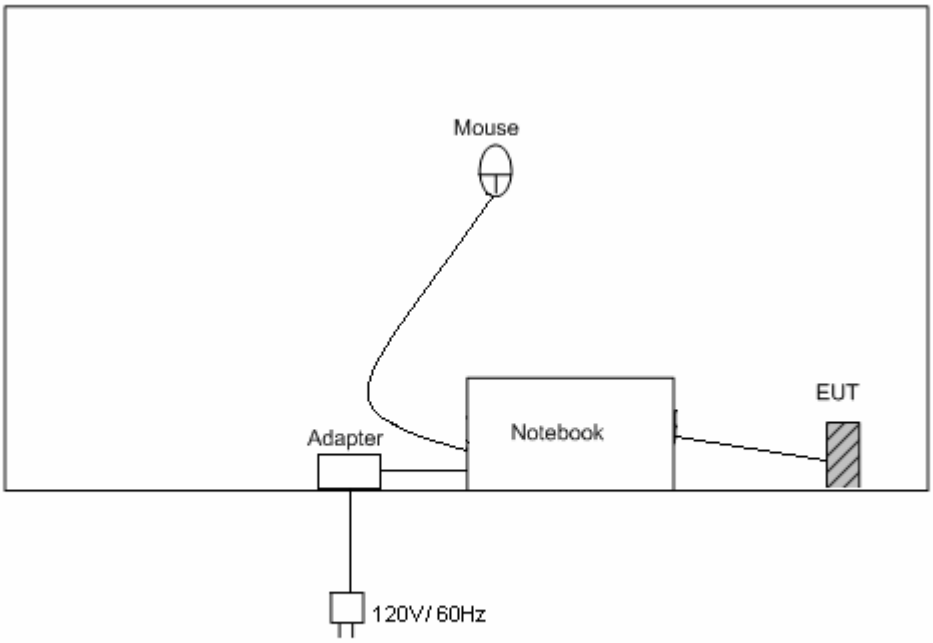
2.1 Test Manner

a. The EUT has been setup pursuant to ANSI C63.4-2003 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
b. The complete test system refers to 2.2 for EMI test.
c. The following test modes were tested for conducted emission test:
Mode 1: WLAN Idle Mode + USB Charging
d. The following test modes were tested for radiated emission test:
Mode 1: WLAN Idle Mode + USB Charging
e. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 13 GHz.

2.2 Description of Test System

Item	Equipment	Trade Name	Model Name	FCC ID
1.	USB Mouse	Microsoft	B75-000093	DoC
2.	Notebook	IBM	2662-GT3	DoC

2.3 Connection Diagram of Test System



3. Test Software

The executive program, EMCTest.exe, under WINXP installed in notebook which generates a complete line continuously repeating “H” pattern were used as the test software.

The programs were executed as follows:

a. Turn on the power of all equipments.
b. The Notebook reads the test program from its hard disk drive and runs it.
c. The Notebook sends “H” messages to the Notebook panel, and the Notebook panel displays “H” patterns on the screen.
d. The Notebook sends “H” messages to its internal hard disk, and the hard disk reads and writes the message.
e. Repeat the steps from b to d.

4. General Information of Test

4.1 Test Facility

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
TEL : 886-3-327-3456
FAX : 886-3-318-0055
Test Site No. : CO01-HY, 03CH04-HY

4.2 Test Voltage

AC 120V / 60Hz

4.3 Standard for Methods of Measurement

ANSI C63.4-2003

4.4 Test in Compliance with

FCC Part 15 Subpart B and RSS-210 Issued 6

4.5 Frequency Range Investigated

a. Conduction: from 150 kHz to 30 MHz
b. Radiation: from 30 MHz to 13000MHz

4.6 Test Distance

The test distance of radiated emission from antenna to EUT is 3m.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

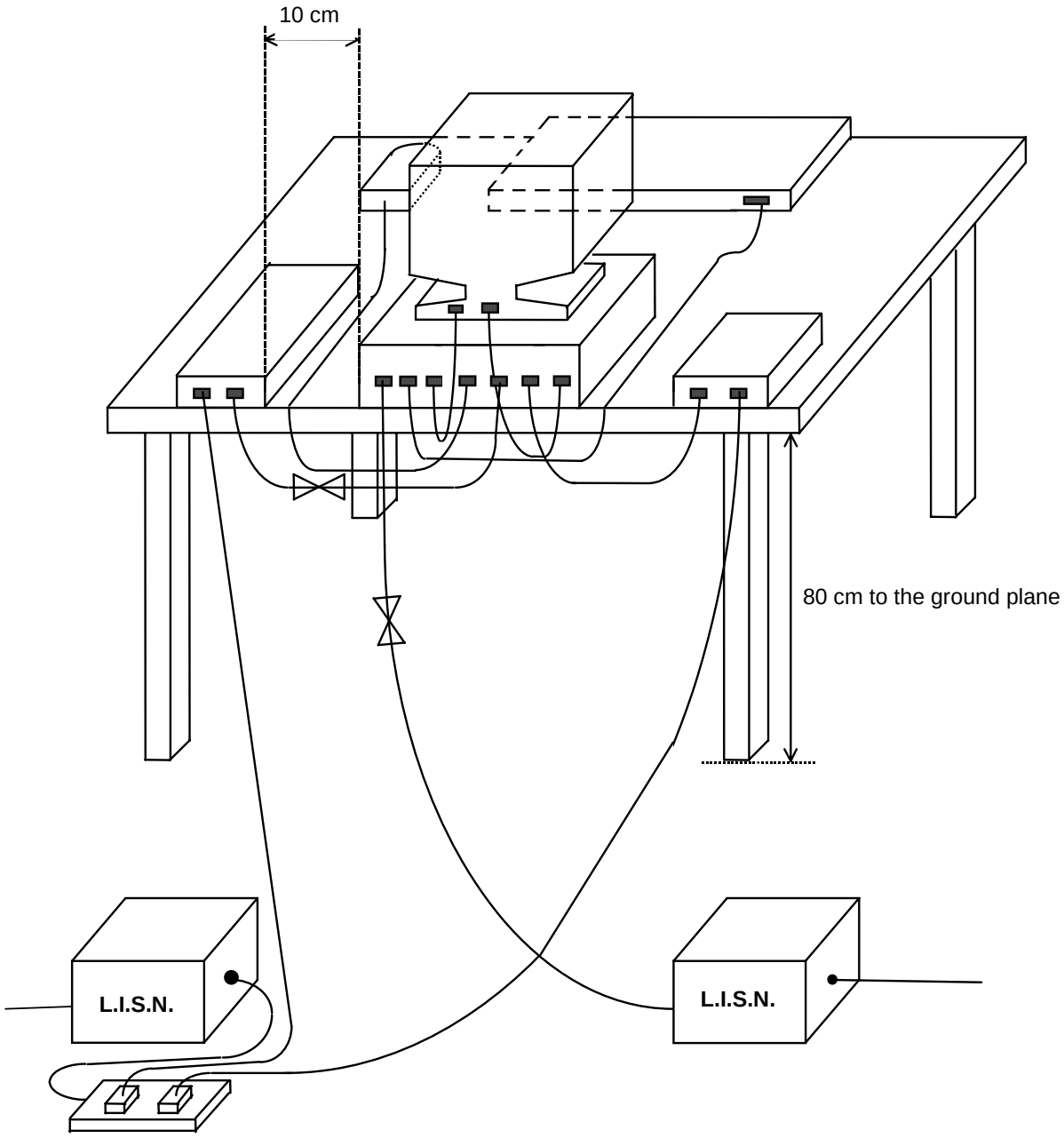
5.1 Major Measuring Instruments

As described in Chapter 7.

5.2 Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.3 Typical Test Setup Layout of Conducted Powerline

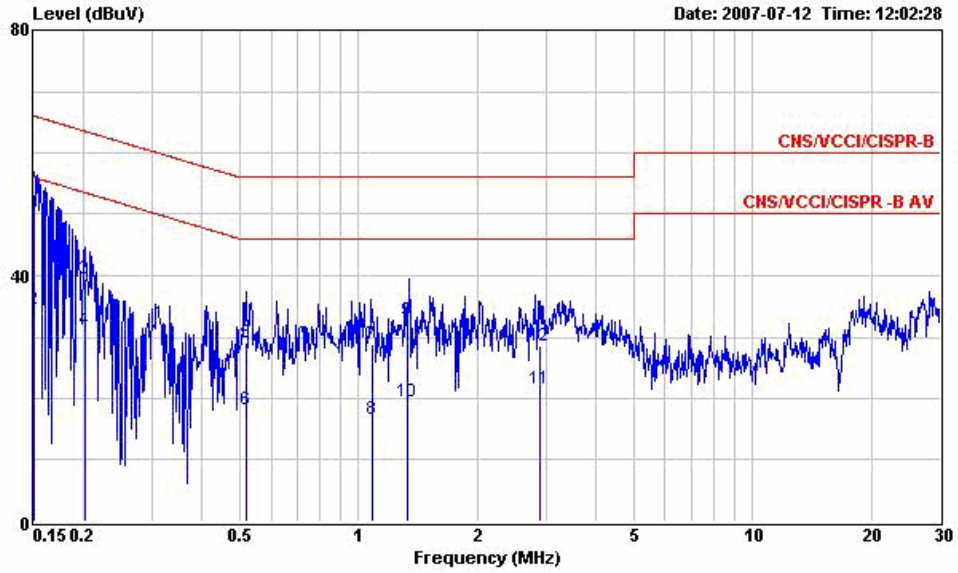


5.4 Test Result of AC Powerline Conducted Emission

5.4.1 Test Mode:

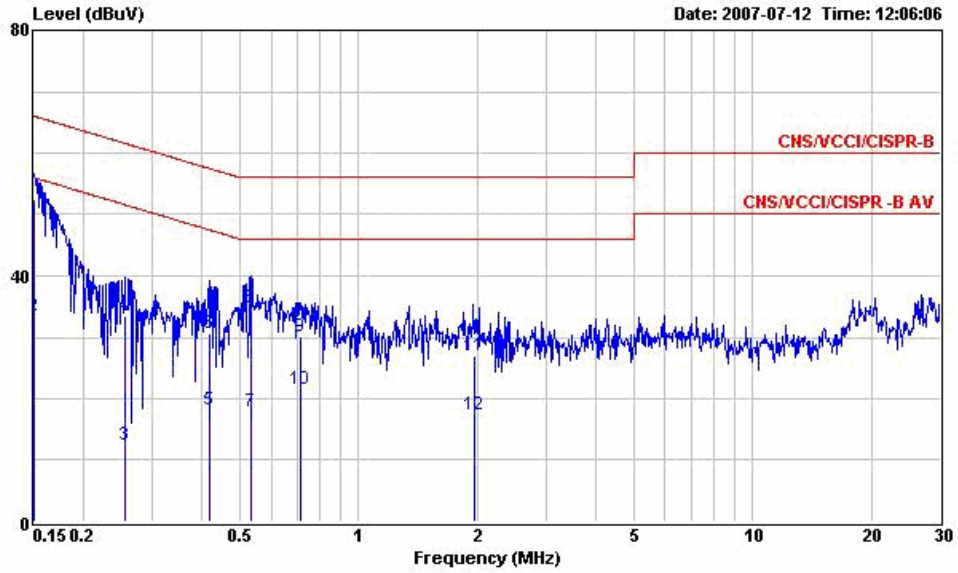
- Temperature: 25~27°C
- Relative Humidity: 58~60%
- Test Engineer: Peter
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ **The test that passed at the minimum margin was marked by a frame in the following data**



Site : CO01-HV
Condition : CNS/VCCI/CISPR-B 2001/004 200604 LINE
EUT : 802.11g USB Wireless adapter
Power : 120V/60Hz
Model :
Memo : WLAN Idle+USB Charging
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	53.13	-12.87	66.00	52.95	0.10	0.08	QP
2	0.150	34.51	-21.49	56.00	34.33	0.10	0.08	Average
3	0.203	39.37	-24.11	63.48	39.17	0.10	0.10	QP
4	0.203	31.28	-22.20	53.48	31.08	0.10	0.10	Average
5	0.521	28.98	-27.02	56.00	28.80	0.10	0.08	QP
6	0.521	18.30	-27.70	46.00	18.12	0.10	0.08	Average
7	1.080	28.77	-27.23	56.00	28.49	0.10	0.18	QP
8	1.080	16.64	-29.36	46.00	16.36	0.10	0.18	Average
9	1.330	32.66	-23.34	56.00	32.36	0.10	0.20	QP
10	1.330	19.45	-26.55	46.00	19.15	0.10	0.20	Average
11	2.881	21.61	-24.39	46.00	21.26	0.15	0.20	Average
12	2.881	28.46	-27.54	56.00	28.11	0.15	0.20	QP



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL
EUT : 802.11g USB Wireless adapter
Power : 120V/60Hz
Model :
Memo : WLAN Idle+USB Charging
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	52.49	-13.51	66.00	52.31	0.10	0.08	QP
2	0.150	33.56	-22.44	56.00	33.38	0.10	0.08	Average
3	0.255	12.43	-39.16	51.59	12.25	0.10	0.08	Average
4	0.255	33.42	-28.17	61.59	33.24	0.10	0.08	QP
5	0.417	18.19	-29.32	47.51	18.04	0.10	0.05	Average
6	0.417	30.70	-26.81	57.51	30.55	0.10	0.05	QP
7	0.535	18.02	-27.98	46.00	17.84	0.10	0.08	Average
8	0.535	34.77	-21.23	56.00	34.59	0.10	0.08	QP
9	0.712	30.24	-25.76	56.00	30.02	0.10	0.12	QP
10	0.712	21.48	-24.52	46.00	21.26	0.10	0.12	Average
11	1.960	27.03	-28.97	56.00	26.69	0.10	0.24	QP
12	1.960	17.35	-28.65	46.00	17.01	0.10	0.24	Average

5.5 Photographs of Conducted Powerline Test Configuration

Please refer to Appendix B

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 13 GHz were measured with a bandwidth of 120 kHz and 1MHz according to the methods defines in ANSI C63.4-2003. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

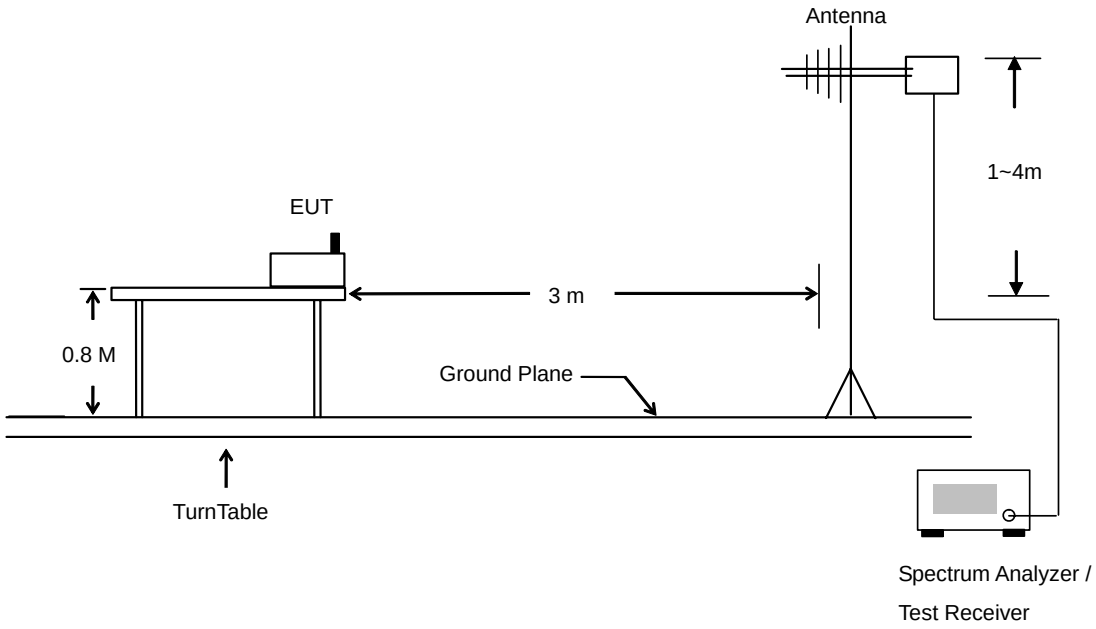
6.1 Major Measuring Instruments

As described in Chapter 7.

6.2 Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a Bi-Log antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both for horizontal polarization and vertical polarization of the antenna.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.

6.3 Typical Test Setup Layout of Radiated Emission

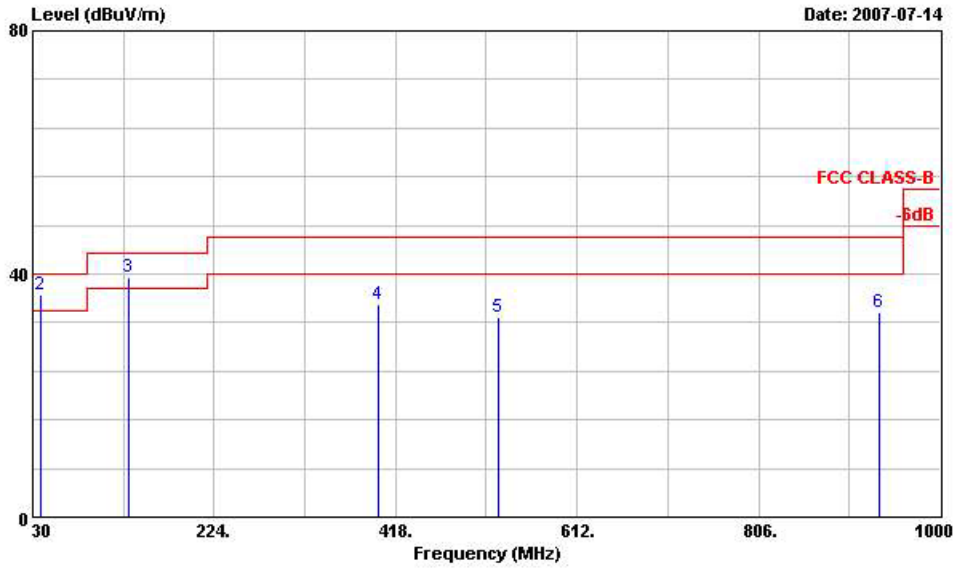


6.4 Test Result of Radiated Emission

6.4.1 Test Mode: 1

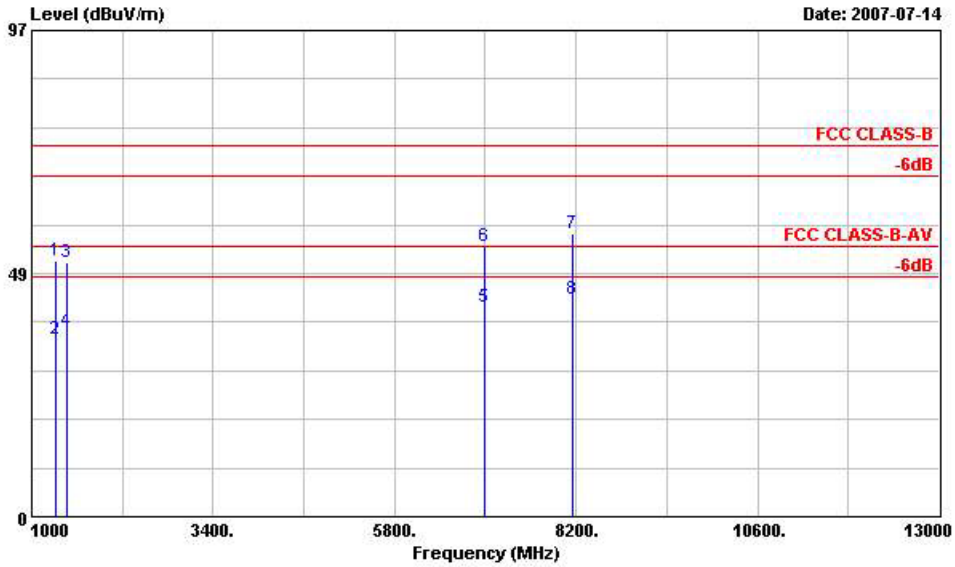
- Test Distance: 3m
- Temperature: 25~27°C
- Relative Humidity: 51~53%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Test Engineer: Anderson
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

The test that passed at the minimum margin was marked by a frame in the following data



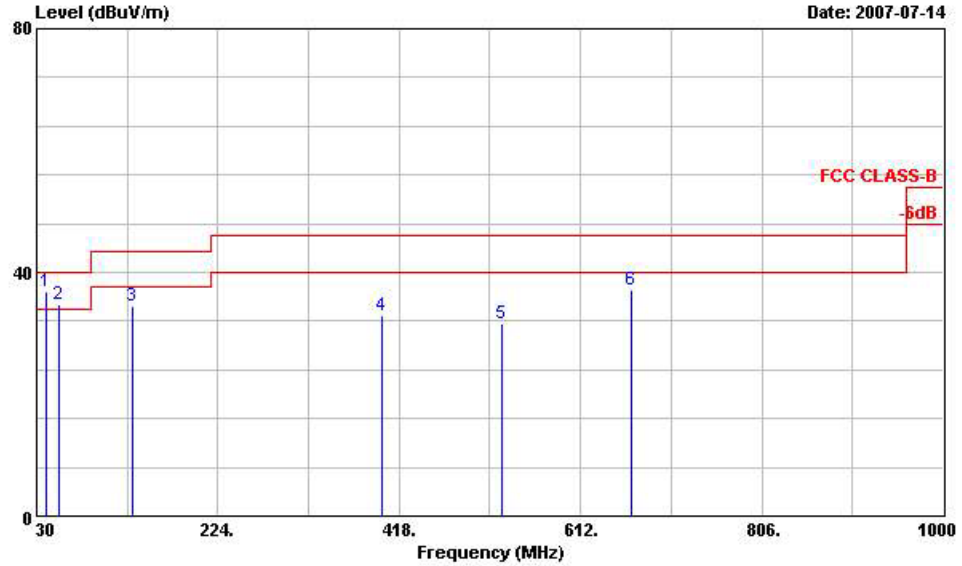
Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 HORIZONTAL
EUT : 802.11g USB Wireless adapter
POWER : From Notebook
MODEL : FD 770310
MODE : WLAN Idle

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	30.540	32.72	-7.28	40.00	48.65	16.36	0.64	32.93	---	---	Peak
2 @	38.370	36.59	-3.41	40.00	56.11	12.71	0.71	32.94	100	283	Peak
3 @	132.330	39.46	-4.04	43.50	59.71	11.28	1.33	32.87	---	---	Peak
4 @	399.400	35.13	-10.87	46.00	49.91	15.75	2.33	32.86	---	---	Peak
5	528.200	32.82	-13.18	46.00	44.82	17.75	2.70	32.45	---	---	Peak
6	934.200	33.63	-12.37	46.00	37.10	24.37	3.58	31.42	---	---	Peak



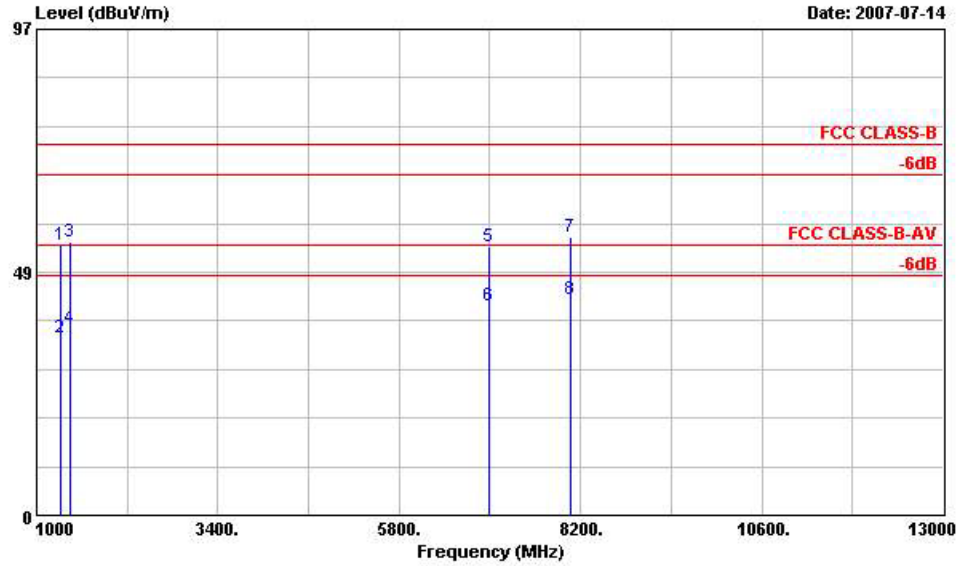
Site :03CH04-HY
Condition:FCC CLASS-B 3m HF-ANT HORIZONTAL
EUT :802.11g USB Wireless adapter
POWER :From Notebook
MODEL :FD 770310
MODE :WLAN Idle

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1324.000	50.92	-23.08	74.00	55.62	26.65	2.60	33.95	100	0	Peak
2	1324.000	35.27	-18.73	54.00	39.97	26.65	2.60	33.95	100	147	Average
3	1460.000	50.65	-23.35	74.00	54.60	27.09	2.73	33.77	100	0	Peak
4	1460.000	36.89	-17.11	54.00	40.84	27.09	2.73	33.77	100	172	Average
5	6998.000	41.73	-12.27	54.00	30.17	37.70	6.36	32.50	100	63	Average
6	6998.000	53.78	-20.22	74.00	42.22	37.70	6.36	32.50	100	0	Peak
7	8164.000	56.36	-17.64	74.00	43.94	39.44	6.83	33.85	100	0	Peak
8 @	8164.000	43.31	-10.69	54.00	30.89	39.44	6.83	33.85	100	137	Average



Site :03CH04-HY
Condition:FCC CLASS-B 3m ANT2724 VERTICAL
EUT :802.11g USB Wireless adapter
POWER :From Notebook
MODEL :FD 770310
MODE :WLAN Idle

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	39.450	36.75	-3.25	40.00	57.12	11.82	0.71	32.90	100	66	Peak
2 @	53.490	34.70	-5.30	40.00	60.84	5.93	0.81	32.88	---	---	Peak
3 @	133.140	34.42	-9.08	43.50	54.75	11.20	1.34	32.87	---	---	Peak
4	399.400	32.83	-13.17	46.00	47.61	15.75	2.33	32.86	---	---	Peak
5	528.200	31.61	-14.39	46.00	43.61	17.75	2.70	32.45	---	---	Peak
6 @	666.100	37.07	-8.93	46.00	45.93	20.06	3.12	32.04	---	---	Peak



Site :03CH04-HY
Condition:FCC CLASS-B 3m HF-ANT VERTICAL
EUT :802.11g USB Wireless adapter
POWER :From Notebook
MODEL :FD 770310
MODE :WLAN Idle

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1324.000	54.00	-20.00	74.00	58.70	26.65	2.60	33.95	100	0	Peak
2	1324.000	35.38	-38.62	74.00	40.08	26.65	2.60	33.95	100	139	Average
3	1454.000	54.45	-19.55	74.00	58.40	27.09	2.73	33.77	100	0	Peak
4	1454.000	37.31	-16.69	54.00	41.26	27.09	2.73	33.77	100	139	Average
5	6998.000	53.62	-20.38	74.00	42.06	37.70	6.36	32.50	100	0	Peak
6	6998.000	41.69	-12.31	54.00	30.13	37.70	6.36	32.50	100	155	Average
7	8068.000	55.62	-18.38	74.00	43.05	39.47	6.78	33.68	100	0	Peak
8 @	8068.000	43.03	-10.97	54.00	30.46	39.47	6.78	33.68	100	155	Average

6.5 Photographs of Radiated Emission Test Configuration

Please refer to Appendix B

7. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz – 2.75GHz	Aug. 30, 2006	Aug. 29, 2007	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/004	9kHz – 30MHz	Mar. 30, 2007	Mar. 29, 2008	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz – 30MHz	Mar. 30, 2007	Mar. 29, 2008	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450Hz	N/A	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 – 60Hz	N/A	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9kHz – 30MHz	Dec. 04, 2006	Dec. 03, 2007	Conduction (CO01-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	N/A	Conduction (CO01-HY)
3m Semi Anechoic	TDK	SAC-3M	03CH04-HY	30 MHz - 1 GHz 3m	Oct. 30, 2006	Oct. 29, 2007	Radiation (03CH04-HY)
Amplifier	Schaffner	CPA9231A	3564	9 kHz - 2 GHz	Aug.31, 2006	Aug.30, 2007	Radiation (03CH04-HY)
Spectrum Analyzer	R&S	FSP7	100641	9 kHz – 7GHz	Sep. 08, 2006	Sep. 07, 2007	Radiation (03CH04-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2724	30 MHz - 1 GHz	Aug. 14, 2006	Aug. 13, 2007	Radiation (03CH04-HY)
RF Cable-R03m	Suhner Switzerland +	RG223/U +RG8/U	CB024	30 MHz - 1 GHz	Sep. 21, 2006	Sep. 20, 2007	Radiation (03CH04-HY)

8. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
combined standard uncertainty Uc(y)	**1.13**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.26**		

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	**1.27**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.54**		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci*u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	**2.36**				
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	**4.72**				

9. Certificate of NVLAP Accreditation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200079-0

Sporton International, Inc. Hwa Ya EMC Laboratory
Tao Yuan Hsien 333
TAIWAN

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).

2007-01-01 through 2007-12-31
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology