



SPORTON International Inc.

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FCC RADIO TEST REPORT

Applicant's company	AboCom Systems, Inc.
Applicant Address	No. 77, Youyi Rd., Jhunan Township, Miaoli County 350, Taiwan, R.O.C.
FCC ID	MQ4WAP257
Manufacturer's company	AboCom Systems, Inc.
Manufacturer Address	No. 77, Youyi Rd., Jhunan Township, Miaoli County 350, Taiwan, R.O.C.

Product Name	Wireless 802.11b/g High Power PoE Access Point
Brand Name	AboCom
Model Name	WAP257
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Receive Date	Jun. 22, 2006
Final Test Date	Dec. 29, 2006
Submission Type	Class II Change



Statement

Test result included is only for the 802.11b/g part of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

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1. CERTIFICATE OF COMPLIANCE

Product Name : Wireless 802.11b/g High Power PoE Access Point
Brand Name : AboCom
Model Name : WAP257
Applicant : AboCom Systems, Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jun. 22, 2006 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

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2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	3.95 dB
-	15.247(b)(3)	Maximum Peak Conducted Output Power	-	-
-	15.247(e)	Power Spectral Density	-	-
-	15.247(a)(2)	6dB Spectrum Bandwidth	-	-
4.2	15.247(d)	Radiated Emissions	Complies	2.03 dB
-	15.247(d)	Band Edge Emissions	-	-
-	15.203	Antenna Requirements	-	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	$\pm 2.26\text{dB}$	Confidence levels of 95%
Maximum Peak Conducted Output Power	$\pm 0.5\text{dB}$	Confidence levels of 95%
Power Spectral Density	$\pm 0.71\text{dB}$	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 6.25 \times 10^{-7}$	Confidence levels of 95%
Radiated Emissions/ Band Edge Emissions	$\pm 3.72\text{dB}$	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Power Type	POE & Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

Power	Brand	Model	Rating
Adapter	LEADER	MT12-4120100-A1	Input:120VAC, 60Hz, 0.3A Output:12VDC, 1.0A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Cortec	AN2400-0101RS	Dipole Antenna	Reversed-SMA	2.00

3.4. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz		

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	11 Mbps	6	1
Radiated Emissions 9kHz~1GHz	11g/BPSK	6 Mbps	6	1

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4088	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Class II Change

This product is an extension of original one reported under Sporton project number: FR662216

Below is the table for the change of the product with respect to the original one.

Modifications	Description	Performance Checking
Add 1 power adapter	Brand: LEADER Model: MT12-4120100-A1 Rating: Input:120VAC, 60Hz, 0.3A Output:12VDC, 1.0A	AC Conducted Emissions Radiated Emissions

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D505	DoC
Printer	EPSON	LQ-680	DoC
Modem	ACEEX	DM-1414	IFAXDM1414
Notebook	DELL	D400	DoC

3.9. Test Software Setting

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating " H " pattern was used as the test software.

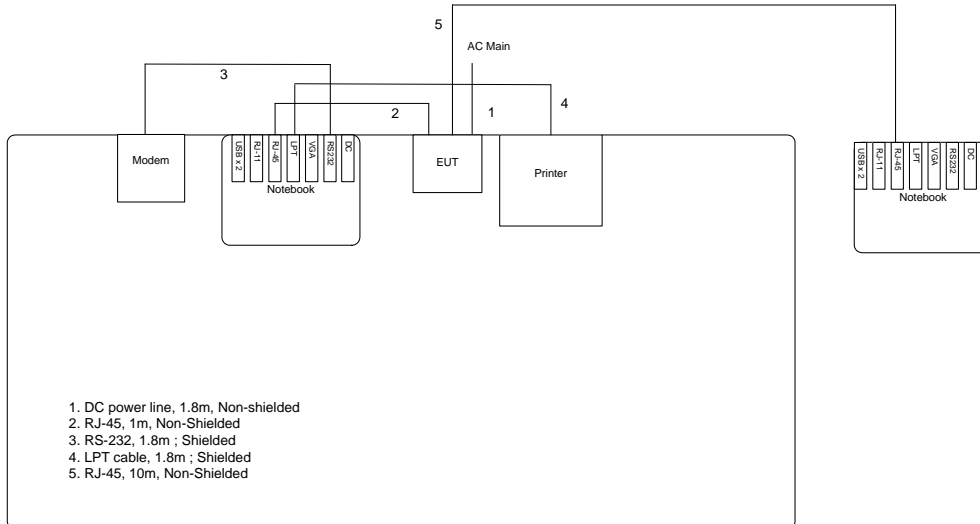
The program was executed as follows :

- a. Turn on the power of all equipment.
- b. The NB sends " H " messages to the panel, and the panel displays " H " patterns on the screen.
- c. The NB sends " H " messages to the printer, then the printer prints them on the paper.
- d. The NB sends " H " messages to the modem.
- e. Repeat the steps from b to d.

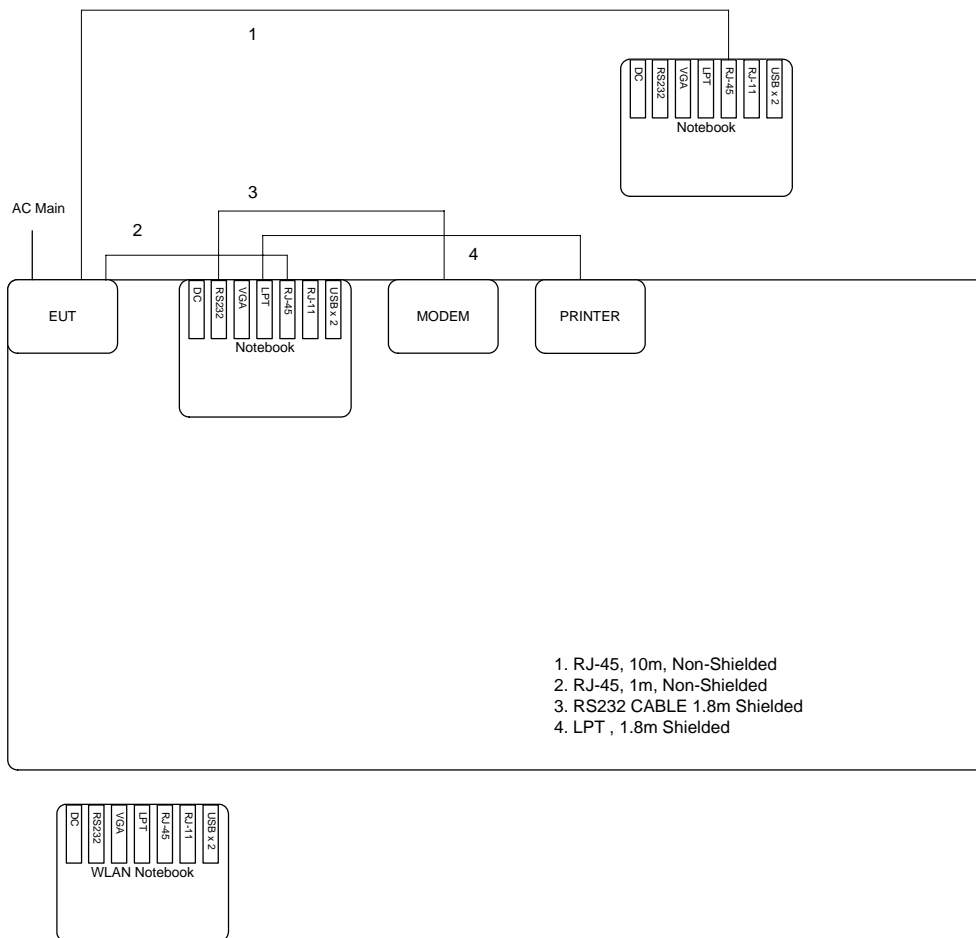
At the same time, "ping.exe" was executed to link with the remote workstation to receive and transmit single by LAN and WLAN.

3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration



3.10.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the 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 below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

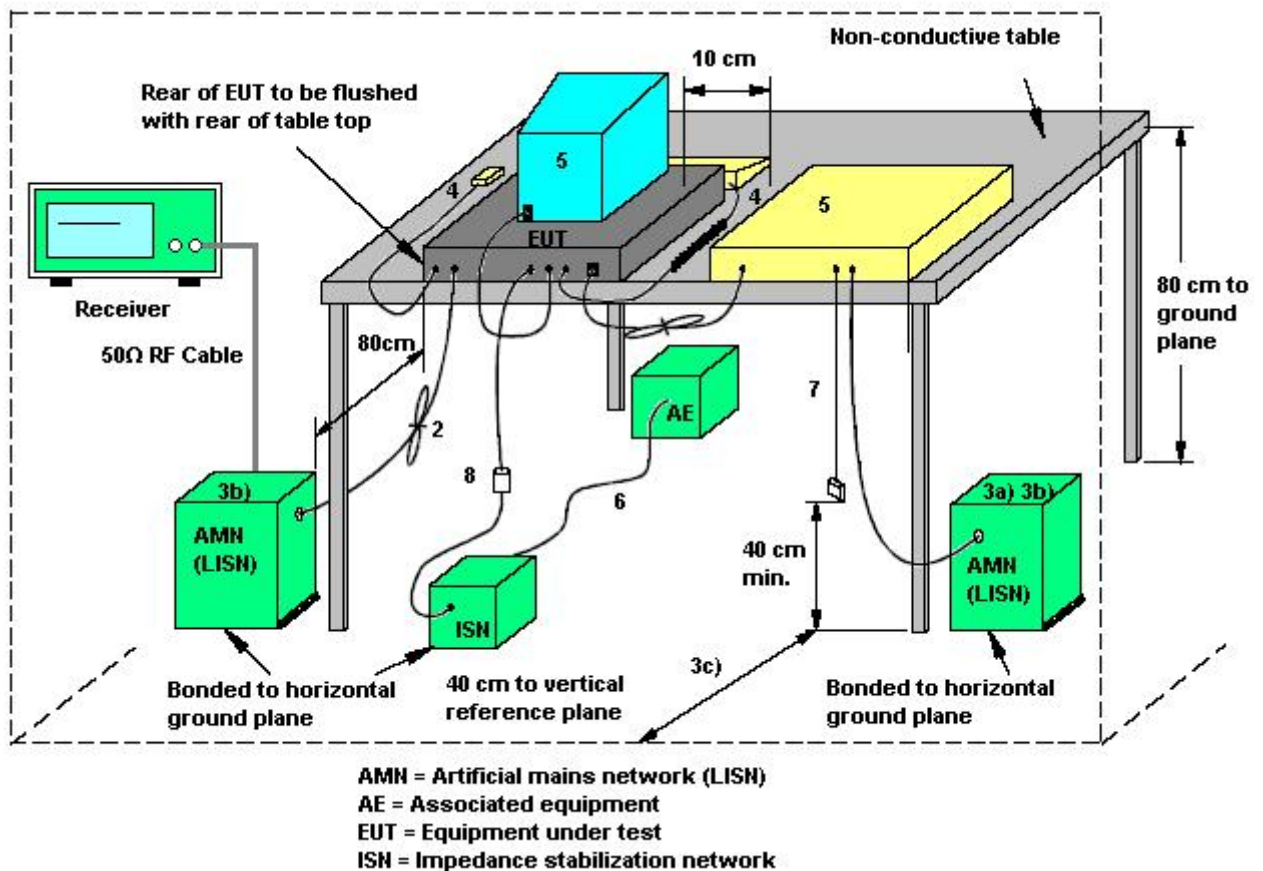
Please refer to section 5 in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



1. If cables, which hang closer than 40 cm to the horizontal metal groundplane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
2. Excess mains cord shall be bundled in the centre or shortened to appropriate length.
3. EUT is connected to one artificial mains network (AMN). All AMNs and ISNs may alternatively be connected to a vertical reference plane or metal wall.
4. All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
5. AMN and ISN are 80 cm from the EUT and at least 80 cm from other units and other metal planes.
6. Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
7. Cables of hand operated devices, such as keyboards, mice, etc. shall be placed as for normal usage.
8. Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
9. I/O signal cable intended for external connection.
10. The end of the I/O signal cables which are not connected to an AE may be terminated, if required, using correct terminating impedance.
11. If used, the current probe shall be placed at 0,1 m from the ISN.

4.1.5. Test Deviation

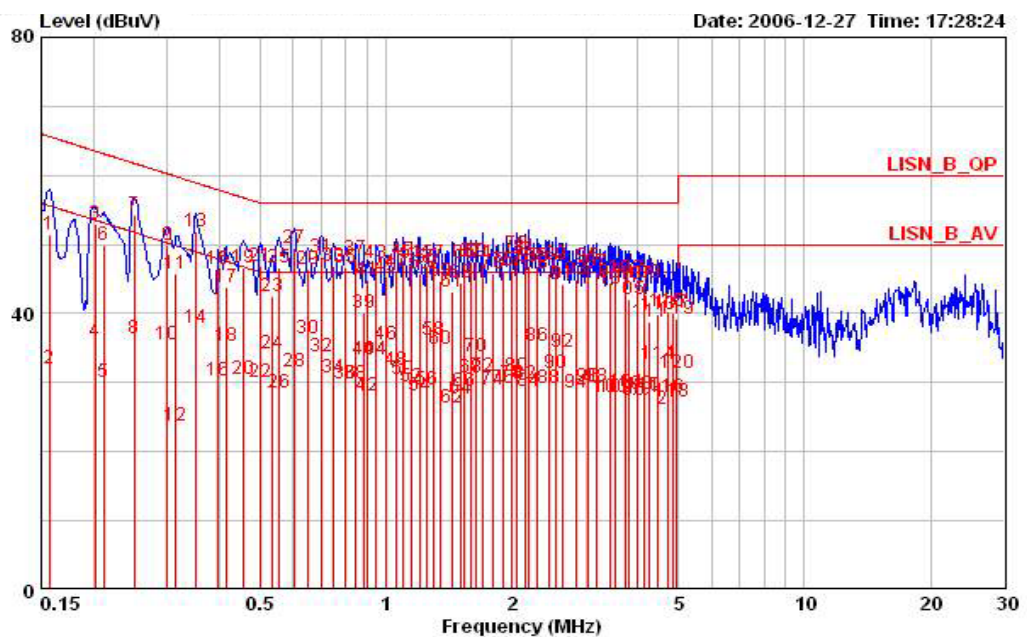
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	26°C	Humidity	60%
Test Engineer	Johnson Chang	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark	Po1/Phase
	MHz	dBuV	Limit	Line	Level	Factor	Loss		
			dB	dBuV	dBuV	dB	dB		
1	0.15650	51.55	-14.10	65.65	51.16	0.19	0.20	QP	NEUTRAL
2	0.15650	32.10	-23.55	55.65	31.71	0.19	0.20	AVERAGE	NEUTRAL
3	0.20181	52.92	-10.62	63.54	52.62	0.10	0.20	QP	NEUTRAL
4	0.20181	36.00	-17.54	53.54	35.70	0.10	0.20	AVERAGE	NEUTRAL
5	0.21167	30.04	-23.10	53.14	29.75	0.09	0.20	AVERAGE	NEUTRAL
6	0.21167	49.96	-13.18	63.14	49.67	0.09	0.20	QP	NEUTRAL
7	0.25078	54.32	-7.41	61.73	54.05	0.07	0.20	QP	NEUTRAL
8	0.25078	36.40	-15.33	51.73	36.13	0.07	0.20	AVERAGE	NEUTRAL
9	0.30028	49.98	-10.25	60.24	49.74	0.04	0.20	QP	NEUTRAL
10	0.30028	35.46	-14.77	50.24	35.22	0.04	0.20	AVERAGE	NEUTRAL
11	0.31495	45.72	-14.11	59.84	45.49	0.03	0.20	QP	NEUTRAL
12	0.31495	23.85	-25.98	49.84	23.62	0.03	0.20	AVERAGE	NEUTRAL
13	0.35015	51.96	-7.00	58.96	51.74	0.02	0.20	QP	NEUTRAL
14	0.35015	37.93	-11.03	48.96	37.71	0.02	0.20	AVERAGE	NEUTRAL
15	0.39763	46.44	-11.46	57.90	46.24	0.00	0.20	QP	NEUTRAL
16	0.39763	30.19	-17.71	47.90	29.99	0.00	0.20	AVERAGE	NEUTRAL
17	0.41485	43.82	-13.73	57.55	43.62	0.00	0.20	QP	NEUTRAL
18	0.41485	35.29	-12.26	47.55	35.09	0.00	0.20	AVERAGE	NEUTRAL
19	0.45395	46.74	-10.06	56.80	46.54	0.00	0.20	QP	NEUTRAL
20	0.45395	30.51	-16.29	46.80	30.31	0.00	0.20	AVERAGE	NEUTRAL
21	0.50203	46.88	-9.12	56.00	46.68	0.00	0.20	QP	NEUTRAL
22	0.50203	30.12	-15.88	46.00	29.92	0.00	0.20	AVERAGE	NEUTRAL

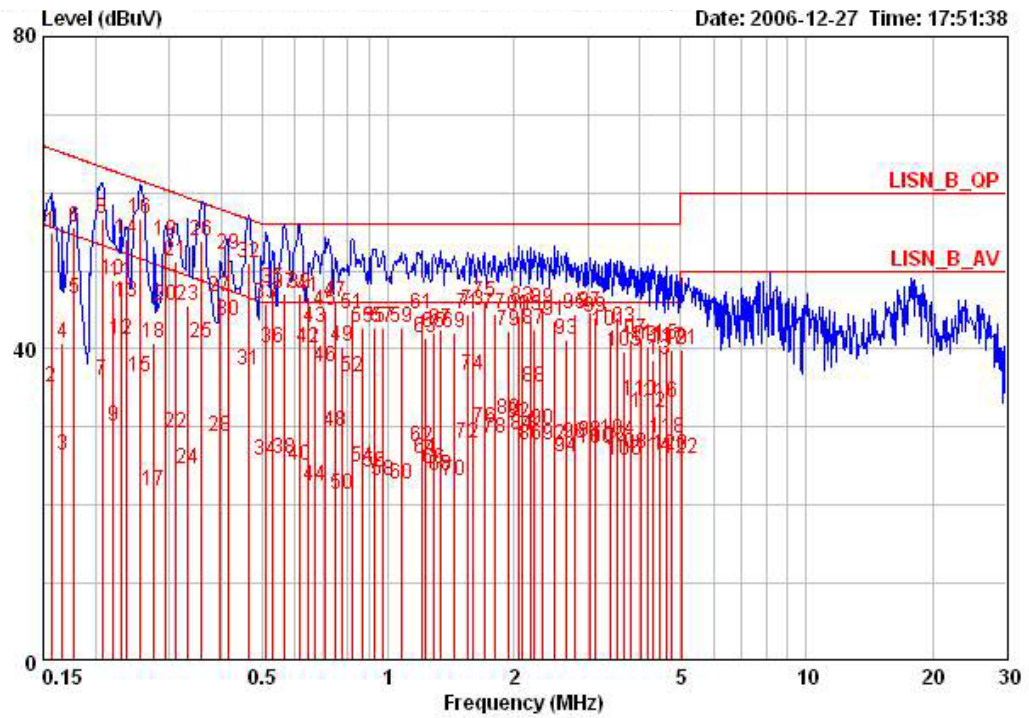
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
23	0.53215	42.61	-13.39	56.00	42.41	0.00	0.20	QP	NEUTRAL
24	0.53215	34.20	-11.80	46.00	34.00	0.00	0.20	AVERAGE	NEUTRAL
25	0.55520	46.64	-9.36	56.00	46.44	0.00	0.20	QP	NEUTRAL
26	0.55520	28.45	-17.55	46.00	28.25	0.00	0.20	AVERAGE	NEUTRAL
27	0.60112	49.39	-6.61	56.00	49.19	0.00	0.20	QP	NEUTRAL
28	0.60112	31.70	-14.30	46.00	31.50	0.00	0.20	AVERAGE	NEUTRAL
29	0.65084	46.48	-9.52	56.00	46.28	0.00	0.20	QP	NEUTRAL
30	0.65084	36.34	-9.66	46.00	36.14	0.00	0.20	AVERAGE	NEUTRAL
31	0.70096	48.24	-7.76	56.00	48.04	0.00	0.20	QP	NEUTRAL
32	0.70096	33.73	-12.27	46.00	33.53	0.00	0.20	AVERAGE	NEUTRAL
33	0.75094	46.95	-9.05	56.00	46.75	0.00	0.20	QP	NEUTRAL
34	0.75094	30.71	-15.29	46.00	30.51	0.00	0.20	AVERAGE	NEUTRAL
35	0.80023	46.67	-9.33	56.00	46.47	0.00	0.20	QP	NEUTRAL
36	0.80023	29.96	-16.04	46.00	29.76	0.00	0.20	AVERAGE	NEUTRAL
37	0.84826	47.92	-8.08	56.00	47.72	0.00	0.20	QP	NEUTRAL
38	0.84826	29.97	-16.03	46.00	29.77	0.00	0.20	AVERAGE	NEUTRAL
39	0.88499	40.08	-15.92	56.00	39.88	0.00	0.20	QP	NEUTRAL
40	0.88499	33.37	-12.63	46.00	33.17	0.00	0.20	AVERAGE	NEUTRAL
41	0.89917	44.90	-11.10	56.00	44.70	0.00	0.20	QP	NEUTRAL
42	0.89917	28.13	-17.87	46.00	27.93	0.00	0.20	AVERAGE	NEUTRAL
43	0.94809	47.25	-8.75	56.00	47.05	0.00	0.20	QP	NEUTRAL
44	0.94809	33.46	-12.54	46.00	33.26	0.00	0.20	AVERAGE	NEUTRAL
45	0.99968	45.30	-10.70	56.00	45.10	0.00	0.20	QP	NEUTRAL
46	0.99968	35.57	-10.43	46.00	35.37	0.00	0.20	AVERAGE	NEUTRAL
47	1.054	46.06	-9.94	56.00	45.87	0.00	0.19	QP	NEUTRAL
48	1.054	31.89	-14.11	46.00	31.70	0.00	0.19	AVERAGE	NEUTRAL
49	1.100	47.72	-8.28	56.00	47.54	0.00	0.18	QP	NEUTRAL
50	1.100	30.43	-15.57	46.00	30.25	0.00	0.18	AVERAGE	NEUTRAL
51	1.147	47.32	-8.68	56.00	47.15	0.00	0.17	QP	NEUTRAL
52	1.147	29.41	-16.59	46.00	29.24	0.00	0.17	AVERAGE	NEUTRAL
53	1.203	45.77	-10.23	56.00	45.62	0.00	0.15	QP	NEUTRAL
54	1.203	28.13	-17.87	46.00	27.98	0.00	0.15	AVERAGE	NEUTRAL
55	1.249	46.58	-9.42	56.00	46.43	0.00	0.15	QP	NEUTRAL
56	1.249	28.97	-17.03	46.00	28.82	0.00	0.15	AVERAGE	NEUTRAL
57	1.296	47.33	-8.67	56.00	47.19	0.00	0.14	QP	NEUTRAL
58	1.296	36.15	-9.85	46.00	36.01	0.00	0.14	AVERAGE	NEUTRAL
59	1.352	44.78	-11.22	56.00	44.65	0.00	0.13	QP	NEUTRAL
60	1.352	34.83	-11.17	46.00	34.70	0.00	0.13	AVERAGE	NEUTRAL
61	1.441	43.14	-12.86	56.00	43.03	0.00	0.11	QP	NEUTRAL
62	1.441	26.39	-19.61	46.00	26.28	0.00	0.11	AVERAGE	NEUTRAL
63	1.503	44.57	-11.43	56.00	44.47	0.00	0.10	QP	NEUTRAL
64	1.503	27.77	-18.23	46.00	27.67	0.00	0.10	AVERAGE	NEUTRAL
65	1.544	47.34	-8.66	56.00	47.23	0.00	0.11	QP	NEUTRAL
66	1.544	28.77	-17.23	46.00	28.66	0.00	0.11	AVERAGE	NEUTRAL
67	1.593	47.45	-8.55	56.00	47.33	0.00	0.12	QP	NEUTRAL
68	1.593	30.66	-15.34	46.00	30.54	0.00	0.12	AVERAGE	NEUTRAL
69	1.645	47.49	-8.51	56.00	47.36	0.00	0.13	QP	NEUTRAL
70	1.645	33.85	-12.15	46.00	33.72	0.00	0.13	AVERAGE	NEUTRAL
71	1.698	47.28	-8.72	56.00	47.14	0.00	0.14	QP	NEUTRAL
72	1.698	30.88	-15.12	46.00	30.74	0.00	0.14	AVERAGE	NEUTRAL
73	1.800	45.86	-10.14	56.00	45.70	0.00	0.16	QP	NEUTRAL
74	1.800	28.88	-17.12	46.00	28.72	0.00	0.16	AVERAGE	NEUTRAL
75	1.898	46.32	-9.68	56.00	46.14	0.00	0.18	QP	NEUTRAL
76	1.898	29.15	-16.85	46.00	28.97	0.00	0.18	AVERAGE	NEUTRAL
77	1.991	46.20	-9.80	56.00	46.00	0.00	0.20	QP	NEUTRAL
78	1.991	29.81	-16.19	46.00	29.61	0.00	0.20	AVERAGE	NEUTRAL
79	2.044	48.63	-7.37	56.00	48.43	0.00	0.20	QP	NEUTRAL
80	2.044	31.01	-14.99	46.00	30.81	0.00	0.20	AVERAGE	NEUTRAL
81	2.144	48.14	-7.86	56.00	47.94	0.00	0.20	QP	NEUTRAL
82	2.144	29.97	-16.03	46.00	29.77	0.00	0.20	AVERAGE	NEUTRAL
83	2.190	46.89	-9.11	56.00	46.69	0.00	0.20	QP	NEUTRAL
84	2.190	28.68	-17.32	46.00	28.48	0.00	0.20	AVERAGE	NEUTRAL



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
85	2.297	46.85	-9.15	56.00	46.65	0.00	0.20	QP	NEUTRAL
86	2.297	35.35	-10.65	46.00	35.15	0.00	0.20	AVERAGE	NEUTRAL
87	2.448	45.87	-10.13	56.00	45.67	0.00	0.20	QP	NEUTRAL
88	2.448	29.28	-16.72	46.00	29.08	0.00	0.20	AVERAGE	NEUTRAL
89	2.540	47.01	-8.99	56.00	46.81	0.00	0.20	QP	NEUTRAL
90	2.540	31.48	-14.52	46.00	31.28	0.00	0.20	AVERAGE	NEUTRAL
91	2.650	44.16	-11.84	56.00	43.96	0.00	0.20	QP	NEUTRAL
92	2.650	34.51	-11.49	46.00	34.31	0.00	0.20	AVERAGE	NEUTRAL
93	2.839	44.80	-11.20	56.00	44.60	0.00	0.20	QP	NEUTRAL
94	2.839	28.55	-17.45	46.00	28.35	0.00	0.20	AVERAGE	NEUTRAL
95	3.041	46.79	-9.21	56.00	46.58	0.00	0.21	QP	NEUTRAL
96	3.041	29.53	-16.47	46.00	29.32	0.00	0.21	AVERAGE	NEUTRAL
97	3.190	46.05	-9.95	56.00	45.81	0.00	0.24	QP	NEUTRAL
98	3.190	29.48	-16.52	46.00	29.24	0.00	0.24	AVERAGE	NEUTRAL
99	3.436	44.49	-11.51	56.00	44.20	0.00	0.29	QP	NEUTRAL
100	3.436	27.98	-18.02	46.00	27.69	0.00	0.29	AVERAGE	NEUTRAL
101	3.547	43.56	-12.44	56.00	43.26	0.00	0.30	QP	NEUTRAL
102	3.547	27.93	-18.07	46.00	27.63	0.00	0.30	AVERAGE	NEUTRAL
103	3.740	45.21	-10.79	56.00	44.91	0.00	0.30	QP	NEUTRAL
104	3.740	28.64	-17.36	46.00	28.34	0.00	0.30	AVERAGE	NEUTRAL
105	3.799	42.12	-13.88	56.00	41.82	0.00	0.30	QP	NEUTRAL
106	3.799	27.52	-18.48	46.00	27.22	0.00	0.30	AVERAGE	NEUTRAL
107	3.985	44.31	-11.69	56.00	44.01	0.00	0.30	QP	NEUTRAL
108	3.985	28.40	-17.60	46.00	28.10	0.00	0.30	AVERAGE	NEUTRAL
109	4.136	44.56	-11.44	56.00	44.26	0.00	0.30	QP	NEUTRAL
110	4.136	28.18	-17.82	46.00	27.88	0.00	0.30	AVERAGE	NEUTRAL
111	4.269	38.88	-17.12	56.00	38.57	0.01	0.30	QP	NEUTRAL
112	4.269	26.10	-19.90	46.00	25.79	0.01	0.30	AVERAGE	NEUTRAL
113	4.478	39.90	-16.10	56.00	39.59	0.01	0.30	QP	NEUTRAL
114	4.478	32.62	-13.38	46.00	32.31	0.01	0.30	AVERAGE	NEUTRAL
115	4.696	40.33	-15.67	56.00	40.01	0.02	0.30	QP	NEUTRAL
116	4.696	27.81	-18.19	46.00	27.49	0.02	0.30	AVERAGE	NEUTRAL
117	4.848	40.11	-15.89	56.00	39.79	0.02	0.30	QP	NEUTRAL
118	4.848	27.32	-18.68	46.00	27.00	0.02	0.30	AVERAGE	NEUTRAL
119	4.952	39.25	-16.75	56.00	38.93	0.02	0.30	QP	NEUTRAL
120	4.952	31.31	-14.69	46.00	30.99	0.02	0.30	AVERAGE	NEUTRAL



Temperature	26°C	Humidity	60%
Test Engineer	Johnson Chang	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15650	55.01	-10.64	65.65	54.62	0.19	0.20	QP	NEUTRAL
2	0.15650	35.15	-20.50	55.65	34.76	0.19	0.20	AVERAGE	NEUTRAL
3	0.16677	26.42	-28.70	55.12	26.06	0.16	0.20	AVERAGE	NEUTRAL
4	0.16677	40.81	-24.31	65.12	40.45	0.16	0.20	QP	NEUTRAL
5	0.17772	46.33	-8.26	54.59	45.99	0.14	0.20	AVERAGE	NEUTRAL
6	0.17772	55.64	-8.95	64.59	55.30	0.14	0.20	QP	NEUTRAL
7	0.20723	35.99	-17.32	53.32	35.70	0.09	0.20	AVERAGE	NEUTRAL
8	0.20723	56.64	-6.67	63.32	56.35	0.09	0.20	QP	NEUTRAL
9	0.22083	30.19	-22.60	52.79	29.90	0.09	0.20	AVERAGE	NEUTRAL
10	0.22083	48.74	-14.05	62.79	48.45	0.09	0.20	QP	NEUTRAL
11	0.23040	48.69	-13.75	62.44	48.41	0.08	0.20	QP	NEUTRAL
12	0.23040	41.27	-11.17	52.44	40.99	0.08	0.20	AVERAGE	NEUTRAL
13	0.23658	46.09	-6.13	52.22	45.81	0.08	0.20	AVERAGE	NEUTRAL
14	0.23658	53.97	-8.25	62.22	53.69	0.08	0.20	QP	NEUTRAL
15	0.25615	36.39	-15.16	51.56	36.13	0.06	0.20	AVERAGE	NEUTRAL
16	0.25615	56.60	-4.95	61.56	56.34	0.06	0.20	QP	NEUTRAL
17	0.27587	21.74	-29.20	50.94	21.49	0.05	0.20	AVERAGE	NEUTRAL
18	0.27587	40.84	-20.10	60.94	40.59	0.05	0.20	QP	NEUTRAL
19	0.29398	53.92	-6.49	60.41	53.68	0.04	0.20	QP	NEUTRAL
20	0.29398	45.58	-4.83	50.41	45.34	0.04	0.20	AVERAGE	NEUTRAL
21	0.31163	51.30	-8.63	59.93	51.06	0.04	0.20	QP	NEUTRAL
22	0.31163	29.12	-20.81	49.93	28.88	0.04	0.20	AVERAGE	NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
23	0.33208	45.51	-13.89	59.40	45.28	0.03	0.20	QP	NEUTRAL
24	0.33208	24.64	-24.76	49.40	24.41	0.03	0.20	AVERAGE	NEUTRAL
25	0.35765	40.73	-8.06	48.78	40.51	0.02	0.20	AVERAGE	NEUTRAL
26	0.35765	53.77	-5.02	58.78	53.55	0.02	0.20	QP	NEUTRAL
27	0.39553	46.62	-11.33	57.95	46.42	0.00	0.20	QP	NEUTRAL
28	0.39553	28.84	-19.11	47.95	28.64	0.00	0.20	AVERAGE	NEUTRAL
29	0.41485	52.09	-5.46	57.55	51.89	0.00	0.20	QP	NEUTRAL
30	0.41485	43.60	-3.95	47.55	43.40	0.00	0.20	AVERAGE	NEUTRAL
31	0.46614	37.17	-9.41	46.58	36.97	0.00	0.20	AVERAGE	NEUTRAL
32	0.46614	51.07	-5.51	56.58	50.87	0.00	0.20	QP	NEUTRAL
33	0.51007	45.87	-10.13	56.00	45.67	0.00	0.20	QP	NEUTRAL
34	0.51007	25.74	-20.26	46.00	25.54	0.00	0.20	AVERAGE	NEUTRAL
35	0.52934	47.70	-8.30	56.00	47.50	0.00	0.20	QP	NEUTRAL
36	0.52934	40.12	-5.88	46.00	39.92	0.00	0.20	AVERAGE	NEUTRAL
37	0.56409	47.10	-8.90	56.00	46.90	0.00	0.20	QP	NEUTRAL
38	0.56409	25.99	-20.01	46.00	25.79	0.00	0.20	AVERAGE	NEUTRAL
39	0.61400	47.14	-8.86	56.00	46.94	0.00	0.20	QP	NEUTRAL
40	0.61400	25.04	-20.96	46.00	24.84	0.00	0.20	AVERAGE	NEUTRAL
41	0.64740	46.62	-9.38	56.00	46.42	0.00	0.20	QP	NEUTRAL
42	0.64740	40.14	-5.86	46.00	39.94	0.00	0.20	AVERAGE	NEUTRAL
43	0.67187	42.76	-13.24	56.00	42.56	0.00	0.20	QP	NEUTRAL
44	0.67187	22.45	-23.55	46.00	22.25	0.00	0.20	AVERAGE	NEUTRAL
45	0.70842	44.85	-11.15	56.00	44.65	0.00	0.20	QP	NEUTRAL
46	0.70842	37.82	-8.18	46.00	37.62	0.00	0.20	AVERAGE	NEUTRAL
47	0.75094	45.92	-10.08	56.00	45.72	0.00	0.20	QP	NEUTRAL
48	0.75094	29.49	-16.51	46.00	29.29	0.00	0.20	AVERAGE	NEUTRAL
49	0.77931	40.35	-15.65	56.00	40.15	0.00	0.20	QP	NEUTRAL
50	0.77931	21.38	-24.62	46.00	21.18	0.00	0.20	AVERAGE	NEUTRAL
51	0.82172	44.48	-11.52	56.00	44.28	0.00	0.20	QP	NEUTRAL
52	0.82172	36.38	-9.62	46.00	36.18	0.00	0.20	AVERAGE	NEUTRAL
53	0.87103	42.74	-13.26	56.00	42.54	0.00	0.20	QP	NEUTRAL
54	0.87103	24.83	-21.17	46.00	24.63	0.00	0.20	AVERAGE	NEUTRAL
55	0.92821	42.75	-13.25	56.00	42.55	0.00	0.20	QP	NEUTRAL
56	0.92821	24.21	-21.79	46.00	24.01	0.00	0.20	AVERAGE	NEUTRAL
57	0.96840	42.74	-13.26	56.00	42.54	0.00	0.20	QP	NEUTRAL
58	0.96840	23.14	-22.86	46.00	22.94	0.00	0.20	AVERAGE	NEUTRAL
59	1.077	42.62	-13.38	56.00	42.44	0.00	0.18	QP	NEUTRAL
60	1.077	22.66	-23.34	46.00	22.48	0.00	0.18	AVERAGE	NEUTRAL
61	1.203	44.49	-11.51	56.00	44.34	0.00	0.15	QP	NEUTRAL
62	1.203	27.41	-18.59	46.00	27.26	0.00	0.15	AVERAGE	NEUTRAL
63	1.229	41.31	-14.69	56.00	41.16	0.00	0.15	QP	NEUTRAL
64	1.229	26.00	-20.00	46.00	25.85	0.00	0.15	AVERAGE	NEUTRAL
65	1.282	42.03	-13.97	56.00	41.89	0.00	0.14	QP	NEUTRAL
66	1.282	24.70	-21.30	46.00	24.56	0.00	0.14	AVERAGE	NEUTRAL
67	1.331	42.57	-13.43	56.00	42.44	0.00	0.13	QP	NEUTRAL
68	1.331	23.68	-22.32	46.00	23.55	0.00	0.13	AVERAGE	NEUTRAL
69	1.433	42.03	-13.97	56.00	41.92	0.00	0.11	QP	NEUTRAL
70	1.433	23.10	-22.90	46.00	22.99	0.00	0.11	AVERAGE	NEUTRAL
71	1.552	44.50	-11.50	56.00	44.39	0.00	0.11	QP	NEUTRAL
72	1.552	27.82	-18.18	46.00	27.71	0.00	0.11	AVERAGE	NEUTRAL
73	1.593	44.95	-11.05	56.00	44.83	0.00	0.12	QP	NEUTRAL
74	1.593	36.65	-9.35	46.00	36.53	0.00	0.12	AVERAGE	NEUTRAL
75	1.698	45.92	-10.08	56.00	45.78	0.00	0.14	QP	NEUTRAL
76	1.698	29.92	-16.08	46.00	29.78	0.00	0.14	AVERAGE	NEUTRAL
77	1.800	44.52	-11.48	56.00	44.36	0.00	0.16	QP	NEUTRAL
78	1.800	28.49	-17.51	46.00	28.33	0.00	0.16	AVERAGE	NEUTRAL
79	1.939	42.19	-13.81	56.00	42.00	0.00	0.19	QP	NEUTRAL
80	1.939	30.96	-15.04	46.00	30.77	0.00	0.19	AVERAGE	NEUTRAL
81	2.055	44.20	-11.80	56.00	44.00	0.00	0.20	QP	NEUTRAL
82	2.055	30.53	-15.47	46.00	30.33	0.00	0.20	AVERAGE	NEUTRAL
83	2.099	45.41	-10.59	56.00	45.21	0.00	0.20	QP	NEUTRAL
84	2.099	29.08	-16.92	46.00	28.88	0.00	0.20	AVERAGE	NEUTRAL



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
85	2.201	44.24	-11.76	56.00	44.04	0.00	0.20	QP	NEUTRAL
86	2.201	27.62	-18.38	46.00	27.42	0.00	0.20	AVERAGE	NEUTRAL
87	2.237	42.59	-13.41	56.00	42.39	0.00	0.20	QP	NEUTRAL
88	2.237	35.01	-10.99	46.00	34.81	0.00	0.20	AVERAGE	NEUTRAL
89	2.346	45.16	-10.84	56.00	44.96	0.00	0.20	QP	NEUTRAL
90	2.346	29.66	-16.34	46.00	29.46	0.00	0.20	AVERAGE	NEUTRAL
91	2.500	43.63	-12.37	56.00	43.43	0.00	0.20	QP	NEUTRAL
92	2.500	27.77	-18.23	46.00	27.57	0.00	0.20	AVERAGE	NEUTRAL
93	2.664	41.25	-14.75	56.00	41.05	0.00	0.20	QP	NEUTRAL
94	2.664	26.06	-19.94	46.00	25.86	0.00	0.20	AVERAGE	NEUTRAL
95	2.794	44.55	-11.45	56.00	44.35	0.00	0.20	QP	NEUTRAL
96	2.794	27.98	-18.02	46.00	27.78	0.00	0.20	AVERAGE	NEUTRAL
97	3.041	44.62	-11.38	56.00	44.41	0.00	0.21	QP	NEUTRAL
98	3.041	28.11	-17.89	46.00	27.90	0.00	0.21	AVERAGE	NEUTRAL
99	3.140	44.11	-11.89	56.00	43.88	0.00	0.23	QP	NEUTRAL
100	3.140	27.28	-18.72	46.00	27.05	0.00	0.23	AVERAGE	NEUTRAL
101	3.399	42.18	-13.82	56.00	41.90	0.00	0.28	QP	NEUTRAL
102	3.399	27.37	-18.63	46.00	27.09	0.00	0.28	AVERAGE	NEUTRAL
103	3.547	42.70	-13.30	56.00	42.40	0.00	0.30	QP	NEUTRAL
104	3.547	28.31	-17.69	46.00	28.01	0.00	0.30	AVERAGE	NEUTRAL
105	3.681	39.77	-16.23	56.00	39.47	0.00	0.30	QP	NEUTRAL
106	3.681	25.63	-20.37	46.00	25.33	0.00	0.30	AVERAGE	NEUTRAL
107	3.799	41.11	-14.89	56.00	40.81	0.00	0.30	QP	NEUTRAL
108	3.799	26.61	-19.39	46.00	26.31	0.00	0.30	AVERAGE	NEUTRAL
109	4.006	40.38	-15.62	56.00	40.08	0.00	0.30	QP	NEUTRAL
110	4.006	33.46	-12.54	46.00	33.16	0.00	0.30	AVERAGE	NEUTRAL
111	4.180	40.34	-15.66	56.00	40.04	0.00	0.30	QP	NEUTRAL
112	4.180	31.72	-14.28	46.00	31.42	0.00	0.30	AVERAGE	NEUTRAL
113	4.315	38.55	-17.45	56.00	38.24	0.01	0.30	QP	NEUTRAL
114	4.315	26.07	-19.93	46.00	25.76	0.01	0.30	AVERAGE	NEUTRAL
115	4.478	40.57	-15.43	56.00	40.26	0.01	0.30	QP	NEUTRAL
116	4.478	33.23	-12.77	46.00	32.92	0.01	0.30	AVERAGE	NEUTRAL
117	4.647	40.03	-15.97	56.00	39.71	0.02	0.30	QP	NEUTRAL
118	4.647	28.50	-17.50	46.00	28.18	0.02	0.30	AVERAGE	NEUTRAL
119	4.746	39.94	-16.06	56.00	39.62	0.02	0.30	QP	NEUTRAL
120	4.746	26.40	-19.60	46.00	26.08	0.02	0.30	AVERAGE	NEUTRAL
121	5.031	39.90	-20.10	60.00	39.57	0.03	0.30	QP	NEUTRAL
122	5.031	25.91	-24.09	50.00	25.58	0.03	0.30	AVERAGE	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Radiated Emissions Measurement

4.2.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micovolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.2.2. Measuring Instruments and Setting

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100KHz / 100KHz for peak

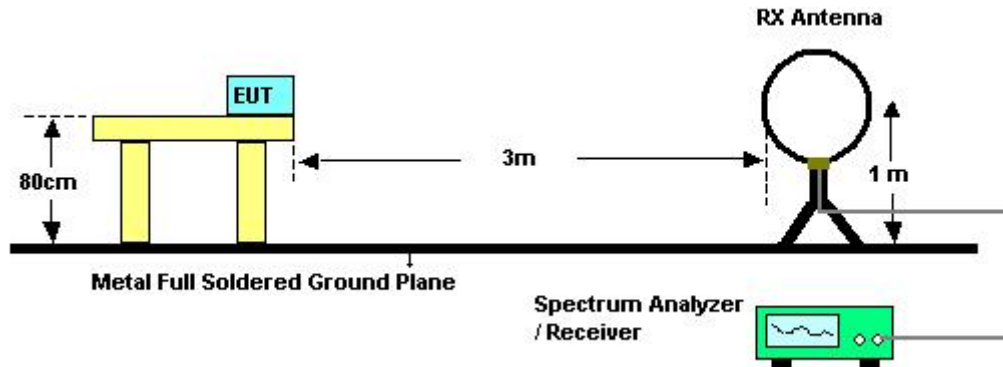
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2.3. Test Procedures

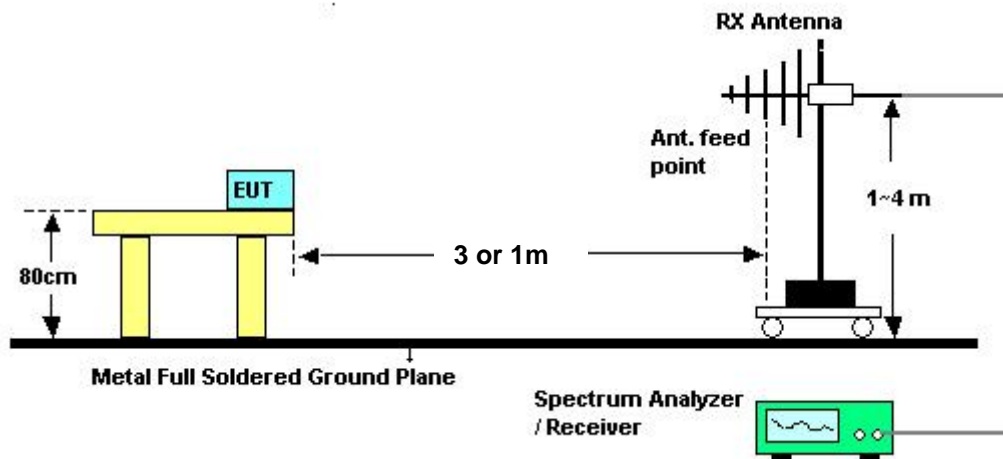
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.2.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	23°C	Humidity	58%
Test Engineer	Leo Hung	Configurations	802.11g CH 6

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

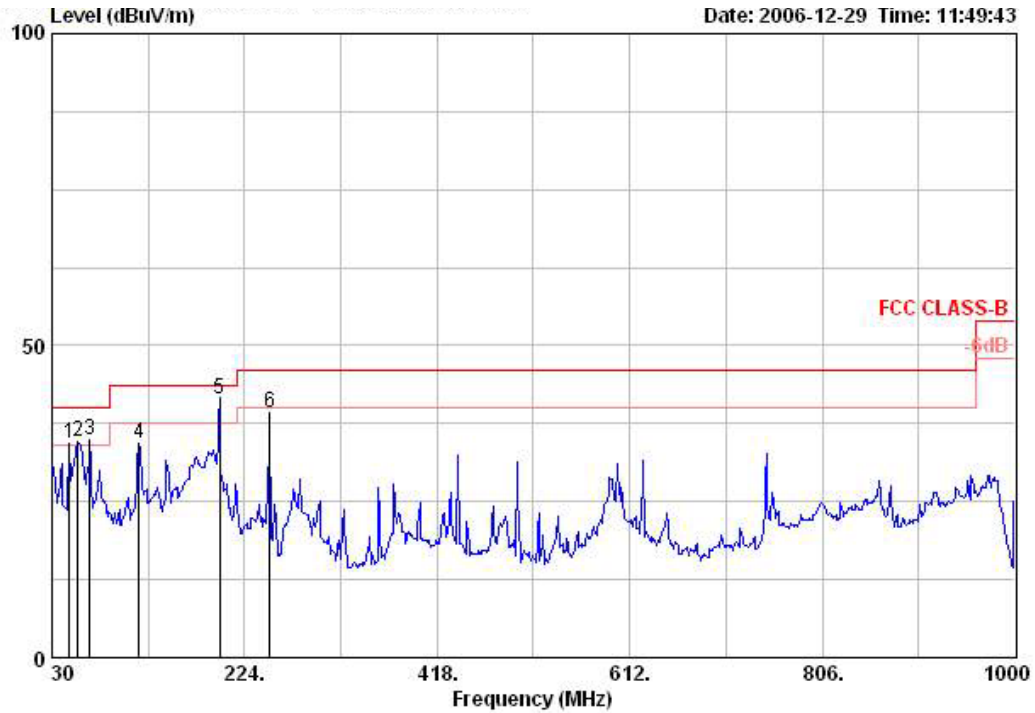
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8. Results of Radiated Emissions (30MHz~1GHz)

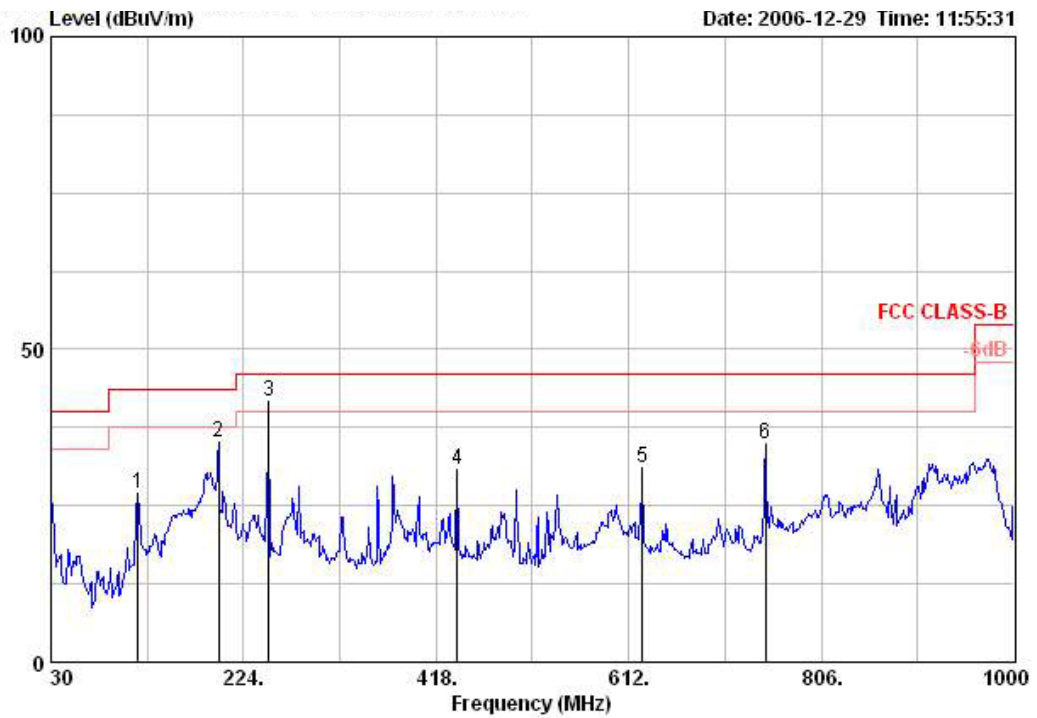
Temperature	23°C	Humidity	58%
Test Engineer	Leo Hung	Configurations	802.11g CH 6

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 !	47.460	34.31	-5.69	40.00	49.95	10.20	0.63	26.48	Peak	400	0
2 !	56.190	34.49	-5.51	40.00	52.51	7.82	0.45	26.28	Peak	400	0
3 !	67.830	34.96	-5.04	40.00	53.90	6.86	0.42	26.22	Peak	400	0
4	117.300	34.42	-9.08	43.50	46.86	12.72	0.81	25.97	Peak	400	0
5 @	198.780	41.47	-2.03	43.50	55.76	10.22	0.95	25.45	QP	0	256
6	249.220	39.34	-6.66	46.00	50.78	12.84	1.15	25.42	Peak	400	0

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	117.300	27.11	-16.39	43.50	39.55	12.72	0.81	25.97	Peak	100	0
2	198.780	35.19	-8.31	43.50	49.48	10.22	0.95	25.45	Peak	100	0
3 @	249.220	41.57	-4.43	46.00	53.00	12.84	1.15	25.42	Peak	100	0
4	439.340	30.69	-15.31	46.00	38.03	17.05	1.46	25.86	Peak	100	0
5	625.580	30.95	-15.05	46.00	35.74	19.31	2.12	26.21	Peak	100	0
6	749.740	34.80	-11.20	46.00	37.27	20.10	2.48	25.05	Peak	100	0

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 15, 2006	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	18667	9 kHz - 2 GHz	Jan. 18, 2006	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	May 29, 2006	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 24, 2006*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004/040	9 kHz - 40 GHz	Sep. 21, 2006	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz - 1 GHz	Jul. 24, 2006	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz - 18GHz	Apr. 27, 2006	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	NCR	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 - 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
EMC Receiver	R&S	ESCS 30	100174	9kHz - 2.75GHz	Feb. 21, 2006	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz - 30MHz	Mar. 28, 2006	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz - 30MHz	Mar. 17, 2006	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz - 30MHz	Apr. 20, 2006	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz - 30MHz	Mar. 27, 2006	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

*Calibration Interval of instruments listed above is two year.

NCR means Non-Calibration required.

6. SPORTON COMPANY PROFILE

SPORTON Lab. was established in 1986 with one shielded room: the first private EMI test facility, offering local manufacturers an alternative EMI test facility apart from ERSO. In 1988, one 3M and 10M/3M open area test site were setup and also obtained official accreditation from FCC, VCCI and NEMKO. In 1993, a Safety laboratory was founded and obtained accreditation from UL of USA, CSA of Canada and TUV (Rhineland & PS) of Germany. In 1995, one EMC lab, including EMI and EMS test facilities was setup. In 1997, SPORTON Group has provided financial expense to relocate the headquarter to Orient Scientific Park in Taipei Hsien to offer more comprehensive, more qualified and better service to local suppliers and manufactures. In 1999, Safety Group and Component Group were setup. In 2001, SPORTON has established 3M/10M chamber in Hwa Ya Technology Park.

6.1. Test Location

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 02-2696-2468 FAX : 02-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 03-327-3456 FAX : 03-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 02-2601-1640 FAX : 02-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 02-2631-4739 FAX : 02-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 02-8227-2020 FAX : 02-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 02-2794-8886 FAX : 02-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C. TEL : 03-656-9065 FAX : 03-656-9085