FCC TEST REPORT

REPORT NO.: RF910716R04
MODEL NO.: USB-300
RECEIVED: July 16, 2002
TESTED: July 18 ~ July 24, 2002

APPLICANT: Wistron NeWeb Corp.

ADDRESS: No. 10-1, Li-hsin Road I, Science-based Industrial Park, Hsinchu 300, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.

0528
ILAC MRA

Lab Code: 200102-0

Table of Contents

1 CERTIFICATION

PRODUCT :	IEEE 802.11b WLAN MiniUSB Adapter
BRAND NAME :	Wistron NeWeb
MODEL NO. :	USB-300
APPLICANT :	Wistron NeWeb Corp.
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from July 18, 2002 to July 24, 2002. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

CHECKED BY : Emily Lu , DATE : July 29, 2002
Emily Lu

APPROVED BY : Hsi Wu for , DATE : July 29, 2002
Dr. Alan Lane, Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –16.32dBuV at 0.173MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –2.10dBuV at 84.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	IEEE 802.11b WLAN MiniUSB Adapter
MODEL NO.	USB-300
POWER SUPPLY	5.0VDC from Notebook
MODULATION TYPE	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	15.24dBm
ANTENNA TYPE	Inverted F Antenna
DATA CABLE	1.2m (Shielded) with ferrite core
I/O PORTS	mini USB port
ASSOCIATED DEVICES	NA

NOTE:

For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
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		

NOTE: 1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an IEEE 802.11b WLAN MiniUSB Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)
ANSI C63.4 : 1992

All tests have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP01L	TW-09C748-12800-19O-B220	FCC DoC APPROVED
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED
3	MODEM	ACEEX	1414	980020503	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	845552/004	Jun. 19, 2003
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	July 23, 2003
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 25, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	90031627	July 23, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C05.01	July 23, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 2003
Shielded Room	Site 5	ADT-C05	NA
VCCI Site Registration No.	Site 5	C-1093	NA

NOTE: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. "*": These equipment are used for conducted telecom port test only (if tested).

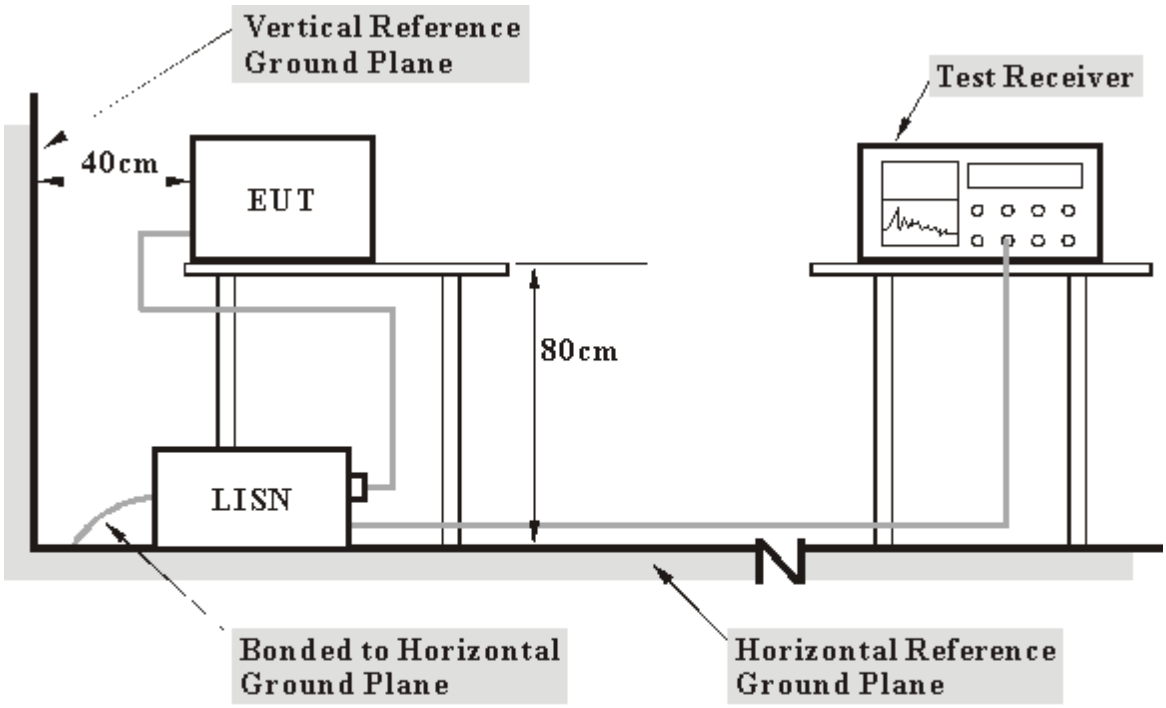
4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported.

4.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITIONS

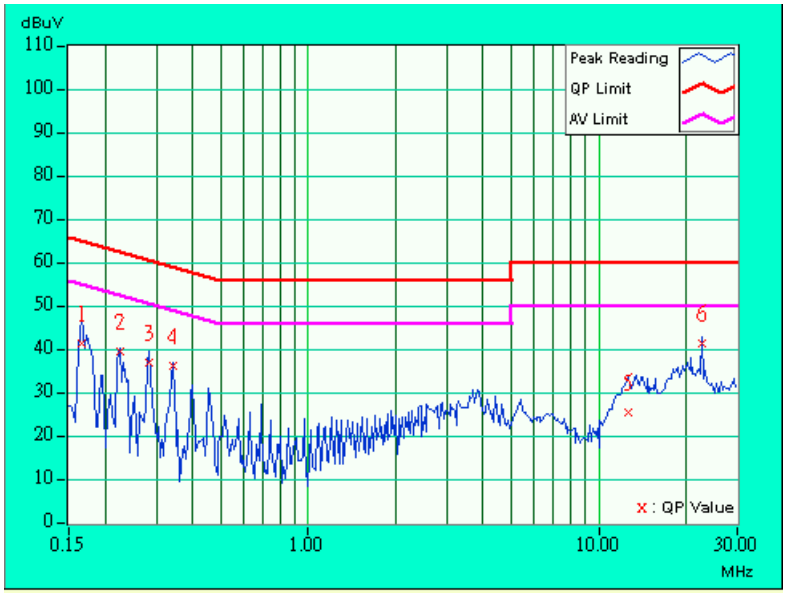
a. Connected the EUT to a computer system placed on a testing table.
b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The computer system sent "H" messages to its screen.
d. The computer system sent “H” messages to modem.
e. The computer system sent "H" messages to printer, and the printer prints them on paper.

4.1.6 TEST RESULTS

EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 65 %RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.10	40.53	-	40.63	-	65.18	55.18	-24.55	-
2	0.224	0.10	38.69	-	38.79	-	62.66	52.66	-23.87	-
3	0.283	0.10	35.86	-	35.96	-	60.73	50.73	-24.77	-
4	0.341	0.10	35.36	-	35.46	-	59.17	49.17	-23.71	-
5	12.602	0.65	24.42	-	25.07	-	60.00	50.00	-34.93	-
6	22.570	1.10	40.44	-	41.54	-	60.00	50.00	-18.46	-

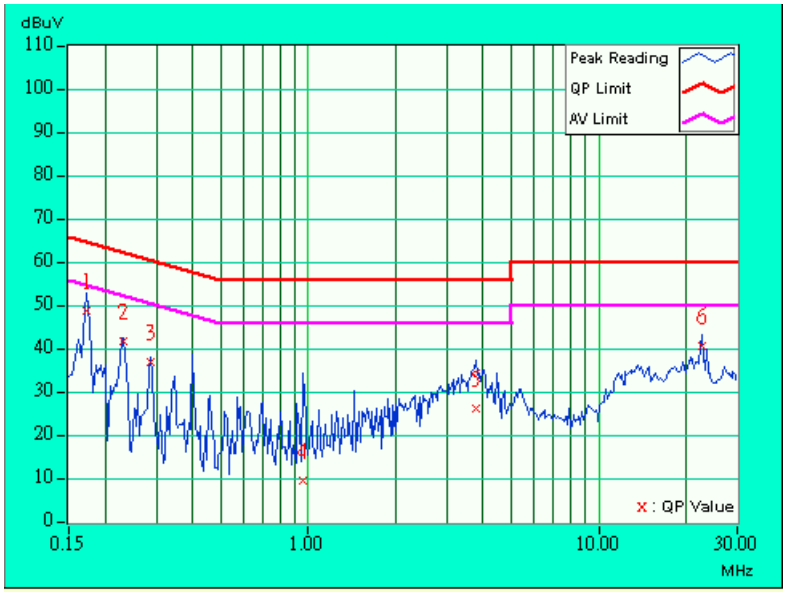
REMARKS : 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 65 %RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	48.25	-	48.35	-	64.79	54.79	-16.44	-
2	0.232	0.10	41.24	-	41.34	-	62.38	52.38	-21.04	-
3	0.287	0.10	36.44	-	36.54	-	60.62	50.62	-24.08	-
4	0.963	0.19	8.96	-8.72	9.15	-8.53	56.00	46.00	-46.85	-54.53
5	3.793	0.29	25.38	-	25.67	-	56.00	46.00	-30.33	-
6	22.570	0.75	39.91	-	40.66	-	60.00	50.00	-19.34	-

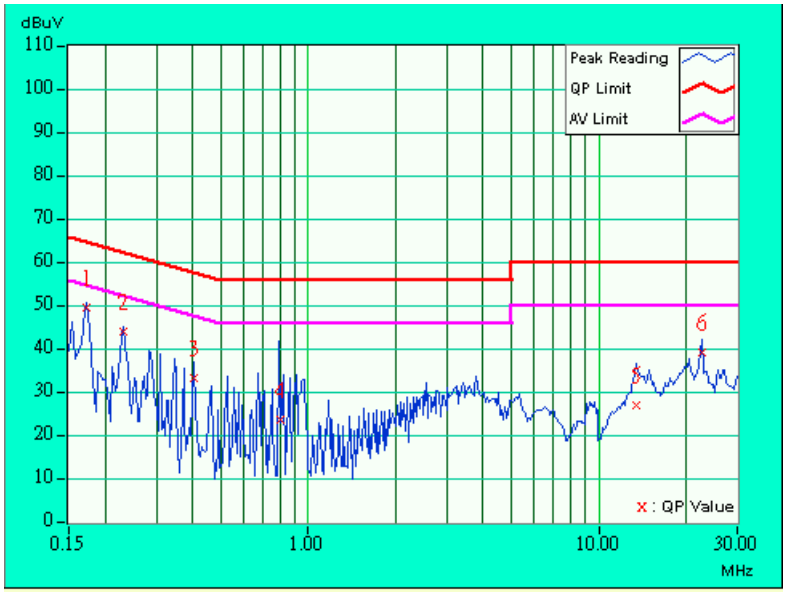
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 65 %RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	48.37	-	48.47	-	64.79	54.79	-16.32	-
2	0.232	0.10	42.83	-	42.93	-	62.38	52.38	-19.45	-
3	0.404	0.10	32.31	-	32.41	-	57.77	47.77	-25.36	-
4	0.805	0.17	22.52	-	22.69	-	56.00	46.00	-33.31	-
5	13.438	0.67	25.99	-	26.66	-	60.00	50.00	-33.34	-
6	22.570	1.10	38.27	-	39.37	-	60.00	50.00	-20.63	-

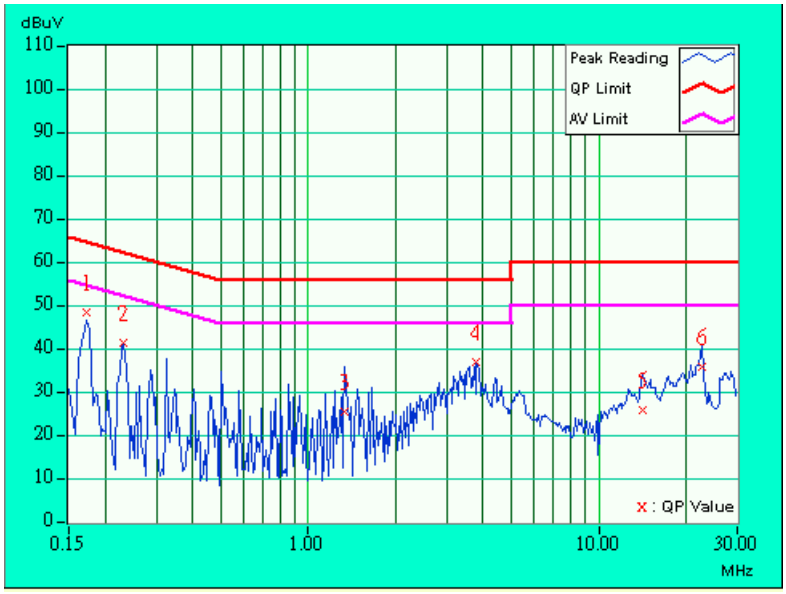
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 65 %RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	47.84	-	47.94	-	64.79	54.79	-16.85	-
2	0.232	0.10	40.87	-	40.97	-	62.38	52.38	-21.41	-
3	1.328	0.20	24.67	-	24.87	-	56.00	46.00	-31.13	-
4	3.805	0.29	36.11	-	36.40	-	56.00	46.00	-19.60	-
5	14.121	0.48	25.05	-	25.53	-	60.00	50.00	-34.47	-
6	22.566	0.75	35.21	-	35.96	-	60.00	50.00	-24.04	-

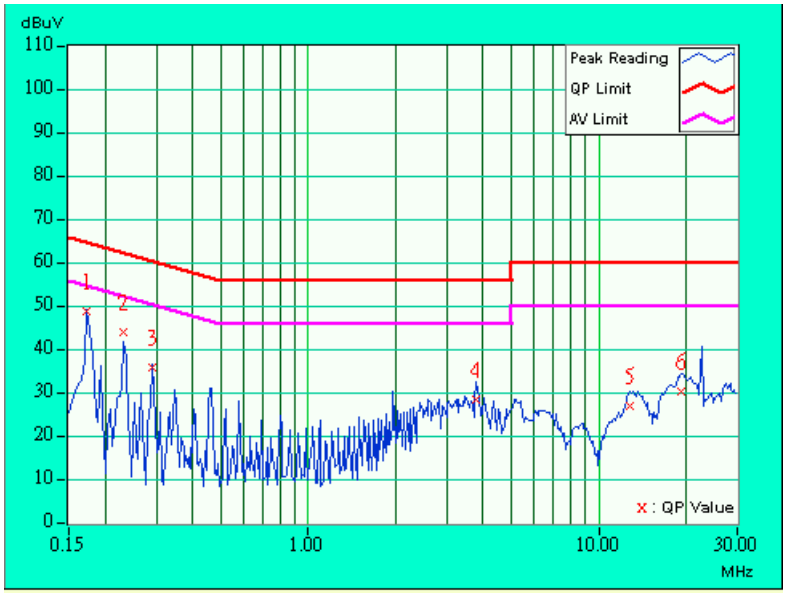
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 65 %RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	48.00	-	48.10	-	64.79	54.79	-16.69	-
2	0.232	0.10	42.96	-	43.06	-	62.38	52.38	-19.32	-
3	0.291	0.10	34.86	-	34.96	-	60.51	50.51	-25.55	-
4	3.805	0.38	27.50	-	27.88	-	56.00	46.00	-28.12	-
5	12.750	0.66	26.24	-	26.90	-	60.00	50.00	-33.10	-
6	19.230	0.95	29.25	-	30.20	-	60.00	50.00	-29.80	-

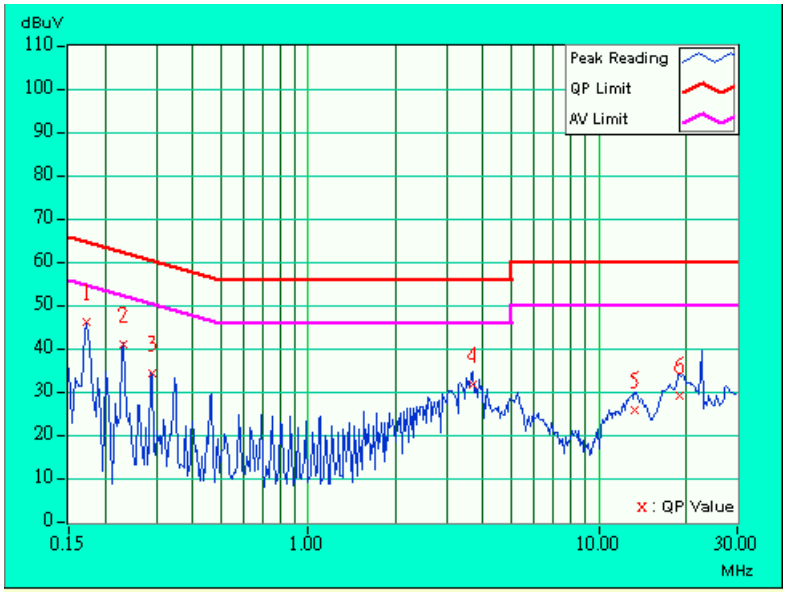
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 65 %RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	45.62	-	45.72	-	64.79	54.79	-19.07	-
2	0.232	0.10	40.30	-	40.40	-	62.38	52.38	-21.98	-
3	0.291	0.10	33.59	-	33.69	-	60.51	50.51	-26.82	-
4	3.691	0.28	31.10	-	31.38	-	56.00	46.00	-24.62	-
5	13.387	0.47	25.07	-	25.54	-	60.00	50.00	-34.46	-
6	19.094	0.75	28.44	-	29.19	-	60.00	50.00	-30.81	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 3, 2003
* EMCO Horn Antenna	3115	9312-4192	April 9, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA

NOTE: 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

3. "*" = These equipment are used for the final measurement.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

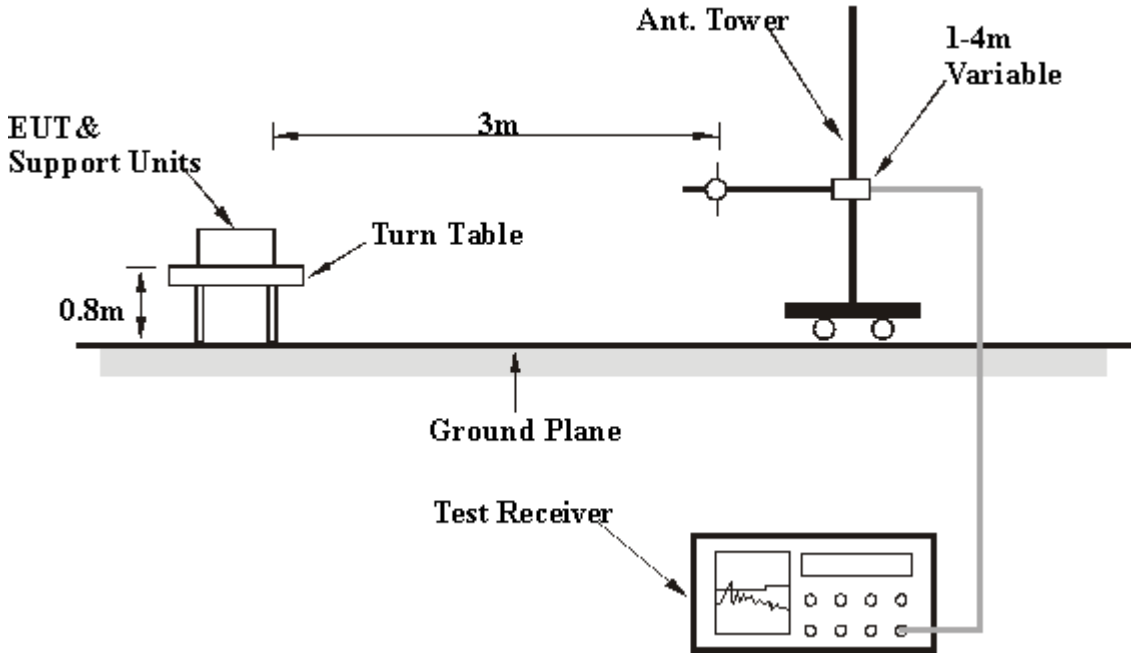
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.6 TEST RESULTS

EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 75%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	84.00	37.9 QP	40.00	-2.10	2.02H	54	28.60	7.63	1.71	0.00	-9.35
2	176.00	31.6 QP	43.50	-11.90	1.00H	200	19.24	9.08	3.28	0.00	-12.36
3	180.00	28.7 QP	43.50	-14.80	1.63H	41	16.37	8.91	3.42	0.00	-12.34
4	240.00	27.6 QP	46.00	-18.40	1.02H	10	12.03	11.41	4.16	0.00	-15.57
5	300.00	27.3 QP	46.00	-18.70	1.50H	228	9.18	13.18	4.94	0.00	-18.12
6	315.00	28.0 QP	46.00	-18.00	1.11H	109	9.30	13.53	5.18	0.00	-18.70
7	336.00	28.9 QP	46.00	-17.10	1.16H	102	9.53	13.92	5.45	0.00	-19.37
8	391.00	30.0 QP	46.00	-16.00	1.25H	3	8.08	15.77	6.15	0.00	-21.92
9	455.00	34.9 QP	46.00	-11.10	1.11H	237	11.39	16.45	7.07	0.00	-23.51
10	455.00	28.9 QP	46.00	-17.10	1.33H	309	5.39	16.45	7.07	0.00	-23.51
11	547.20	32.7 QP	46.00	-13.30	1.00H	117	6.73	17.89	8.07	0.00	-25.97
12	590.00	34.0 QP	46.00	-12.00	1.29H	3	7.10	18.48	8.42	0.00	-26.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	176.00	31.6 QP	43.50	-11.90	1.00V	200	19.24	9.08	3.28	0.00	-12.36
2	240.00	27.6 QP	46.00	-18.40	1.02V	10	12.03	11.41	4.16	0.00	-15.57
3	315.00	28.0 QP	46.00	-18.00	1.11V	109	9.30	13.53	5.18	0.00	-18.70
4	336.00	28.9 QP	46.00	-17.10	1.16V	102	9.53	13.92	5.45	0.00	-19.37
5	391.00	30.0 QP	46.00	-16.00	1.25V	3	8.08	15.77	6.15	0.00	-21.92
6	455.00	34.9 QP	46.00	-11.10	1.11V	237	11.39	16.45	7.07	0.00	-23.51
7	547.20	32.7 QP	46.00	-13.30	1.00V	117	6.73	17.89	8.07	0.00	-25.97

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.

EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 75%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2375.00	43.6 AV	54.00	-10.40	1.00H	209	46.67	26.90	4.98	34.90	3.02
2	2375.00	52.4 PK	74.00	-21.60	1.00H	209	55.40	26.90	4.98	34.90	3.02
3	*2412.00	107.0 PK			1.24H	94	74.83	27.11	5.10	0.00	-32.21
4	*2412.00	99.4 AV			1.24H	94	67.17	27.11	5.10	0.00	-32.21
5	4824.00	35.7 AV	54.00	-18.30	1.11H	47	31.67	31.43	7.23	34.63	-4.02
6	4824.00	45.8 PK	74.00	-28.20	1.11H	47	41.80	31.43	7.23	34.63	-4.02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2375.00	38.6 AV	54.00	-15.40	1.00V	112	41.67	26.90	4.98	34.90	3.02
2	2375.00	48.1 PK	74.00	-25.90	1.00V	112	51.10	26.90	4.98	34.90	3.02
3	*2412.00	102.2 PK			1.03V	152	70.00	27.11	5.10	0.00	-32.21
4	*2412.00	95.0 AV			1.03V	152	62.83	27.11	5.10	0.00	-32.21
5	4824.00	38.0 AV	54.00	-16.00	1.02V	101	34.00	31.43	7.23	34.63	-4.02
6	4824.00	48.2 PK	74.00	-25.80	1.02V	101	44.20	31.43	7.23	34.63	-4.02

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.
6. " * " = Fundamental frequency

EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 75%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2341.00	36.0 AV	54.00	-18.00	1.14H	278	39.00	26.90	4.98	34.90	3.02
2	2341.00	45.6 PK	74.00	-28.40	1.14H	278	48.60	26.90	4.98	34.90	3.02
3	*2437.00	102.2 PK			1.14H	254	69.80	27.33	5.08	0.00	-32.40
4	*2437.00	93.9 AV			1.14H	254	61.48	27.33	5.08	0.00	-32.40
5	4874.00	34.8 AV	54.00	-19.20	1.03H	293	30.74	31.47	7.21	34.63	-4.05
6	4874.00	45.7 PK	74.00	-28.30	1.03H	293	41.69	31.47	7.21	34.63	-4.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2341.00	33.0 AV	54.00	-21.00	1.04V	232	36.00	26.90	4.98	34.90	3.02
2	2341.00	43.5 PK	74.00	-30.50	1.04V	232	46.50	26.90	4.98	34.90	3.02
3	*2437.00	103.7 PK			1.04V	232	71.30	27.33	5.08	0.00	-32.40
4	*2437.00	96.2 AV			1.04V	232	63.80	27.33	5.08	0.00	-32.40
5	4874.00	38.2 AV	54.00	-15.80	1.06V	199	34.10	31.47	7.21	34.63	-4.05
6	4874.00	48.1 PK	74.00	-25.90	1.06V	199	44.00	31.47	7.21	34.63	-4.05

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.
6. " * " = Fundamental frequency

EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 75%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2462.00	100.4 AV			1.11H	280	68.00	27.33	5.08	0.00	-32.40
2	*2462.00	107.8 PK			1.11H	280	75.35	27.33	5.08	0.00	-32.40
3	2500.00	46.5 AV	54.00	-7.50	1.12H	281	48.80	27.54	5.06	34.90	2.31
4	2500.00	55.6 PK	74.00	-18.40	1.12H	281	57.90	27.54	5.06	34.90	2.31.
5	4924.00	35.1 AV	54.00	-18.90	1.39H	128	31.00	31.51	7.21	34.62	-4.10
6	4924.00	46.5 PK	74.00	-27.50	1.39H	128	42.39	31.51	7.21	34.62	-4.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2462.00	103.4 PK			1.06V	162	71.00	27.33	5.08	0.00	-32.40
2	*2462.00	95.6 AV			1.06V	162	63.17	27.33	5.08	0.00	-32.40
3	2500.00	52.4 PK	74.00	-21.60	1.09V	162	54.67	27.54	5.06	34.90	2.31
4	2500.00	43.7 AV	54.00	-10.30	1.09V	162	46.00	27.54	5.06	34.90	2.31
5	4924.00	38.4 AV	54.00	-15.60	1.00V	173	34.33	31.51	7.21	34.62	-4.10
6	4924.00	52.0 PK	74.00	-22.00	1.00V	173	47.89	31.51	7.21	34.62	-4.10

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB) = Pre-Amplifier Factor (dB) - Antenna Factor (dB) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.
6. " * " = Fundamental frequency

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

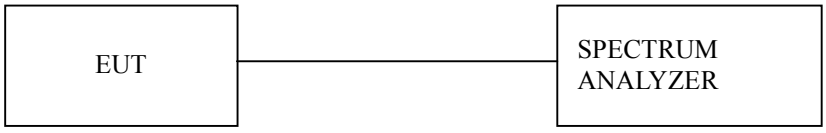
Notes:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4 TEST SETUP



4.3.5 EUT OPERATING CONDITIONS

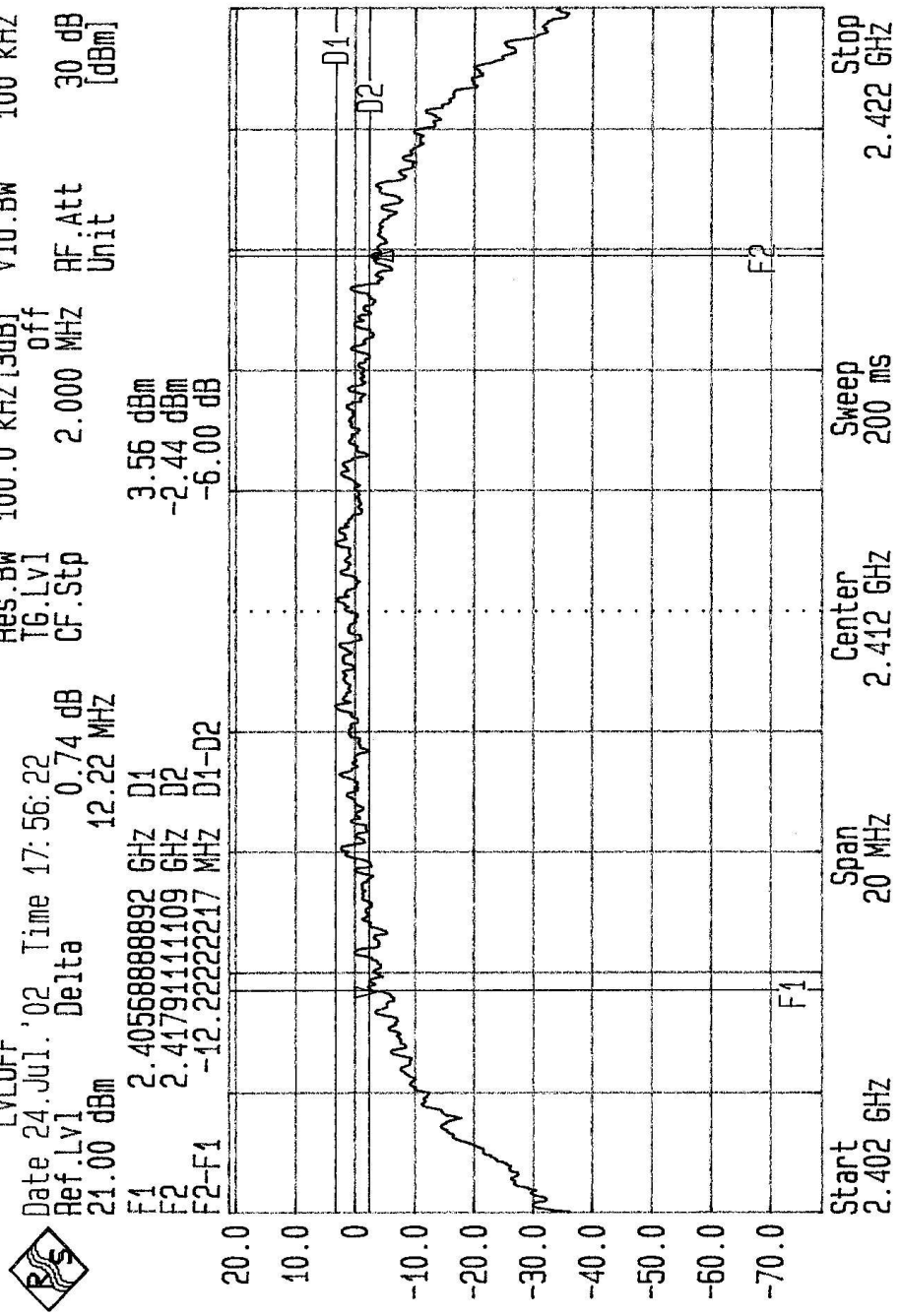
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

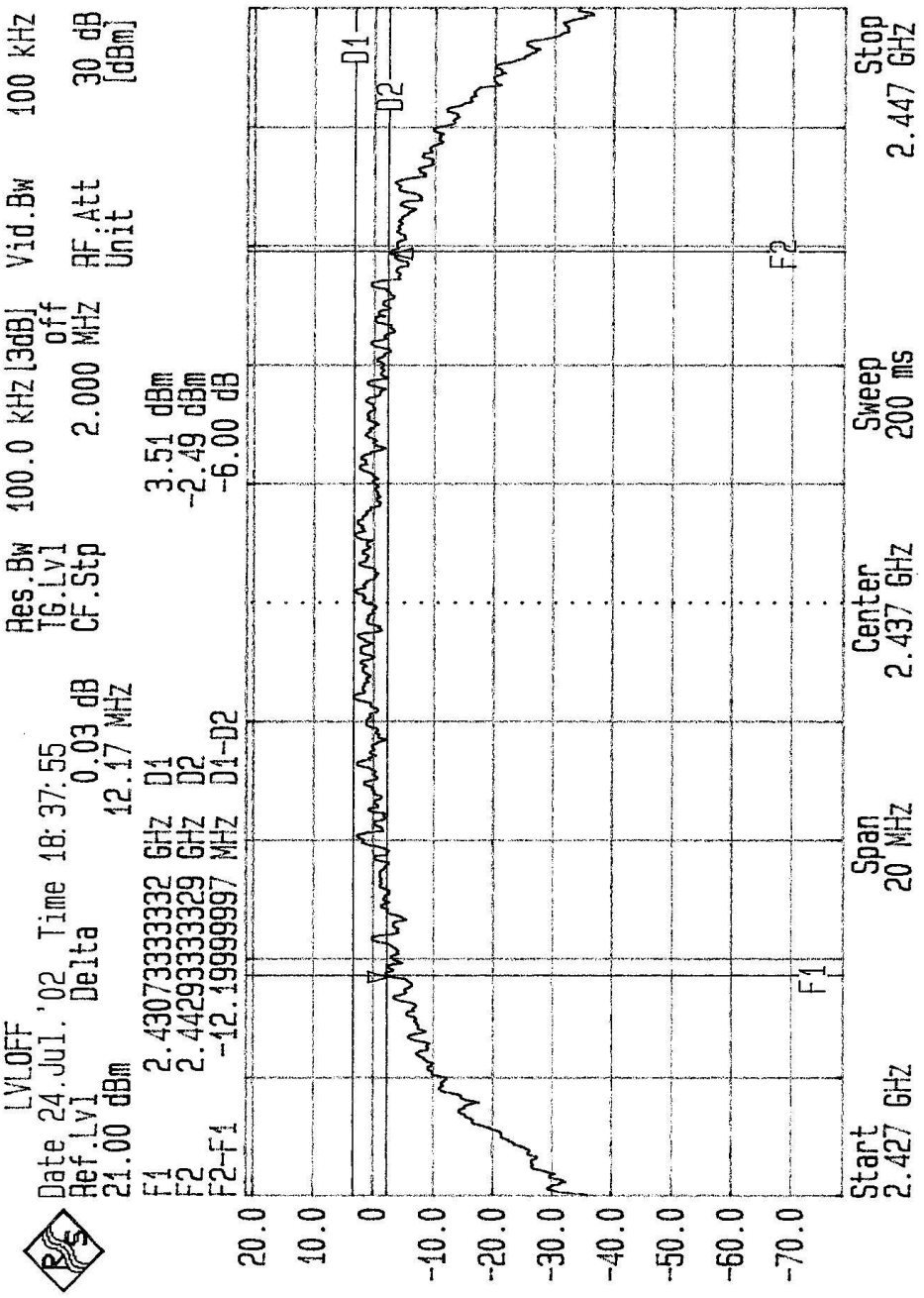
EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	30 deg. C, 51 %RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	12.22	0.5	PASS
6	2437	12.20	0.5	PASS
11	2462	12.16	0.5	PASS

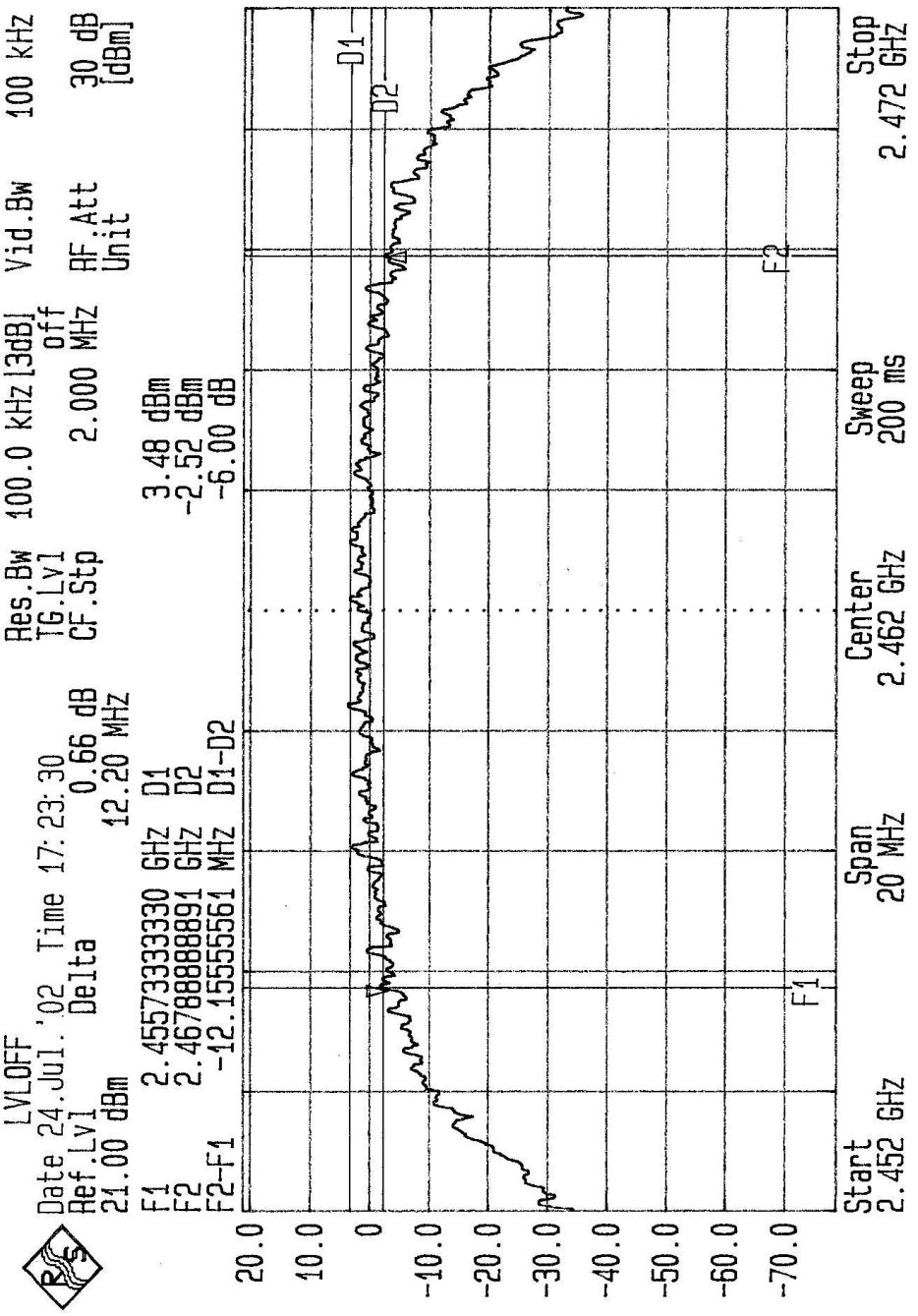
CH1


LVLOFF
Date 24.Jul.'02 Time 17:56:22
Ref.Lvl
21.00 dBm
Delta
0.74 dB
12.22 MHz
F1 2.405688888892 GHz D1 3.56 dBm
F2 2.417911111109 GHz D2 -2.44 dBm
F2-F1 -12.22222217 MHz D1-D2 -6.00 dB
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
Vid.Bw 100 kHz
RF.Att 30 dB
Unit [dBm]
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.402 GHz
Span 20 MHz
Center 2.412 GHz
Sweep 200 ms
Stop 2.422 GHz

CH6


LVLOFF
Date 24.Jul.'02 Time 18:37:55
Ref.Lvl
21.00 dBm
Delta
0.03 dB
12.17 MHz
F1 2.430733333332 GHz D1 3.51 dBm
F2 2.442933333329 GHz D2 -2.49 dBm
F2-F1 -12.19999997 MHz D1-D2 -6.00 dB
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.000 MHz RF.Att 30 dB
Unit [dBm]
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 200 ms
Stop 2.447 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D1
D2
F1
F2

CH11


LVLOFF
Date 24.Jul.'02 Time 17:23:30
Ref.Lvl
21.00 dBm
Delta
0.66 dB
12.20 MHz
F1 2.45573333330 GHz D1
F2 2.46788888891 GHz D2
F2-F1 -12.15555561 MHz D1-D2
Res.Bw 100.0 kHz (3dB) Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.000 MHz
RF.Att 30 dB
Unit [dBm]
3.48 dBm
-2.52 dBm
-6.00 dB
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 200 ms
Stop 2.472 GHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
Peak Power Sensor	NRV-Z32	100013	Feb. 21, 2003
Power Meter	NRVS	100026	Feb. 20, 2003

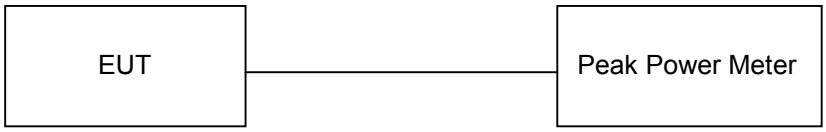
NOTE: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

The transmitter output was connected to the peak power meter.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 3.4.5

4.4.6 TEST RESULTS

EUT	IEEE 802.11b WLAN MiniUSB Adapter	**MODEL**	USB-300
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	30 deg. C, 51 %RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.24	30	PASS
6	2437	15.23	30	PASS
11	2462	15.20	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

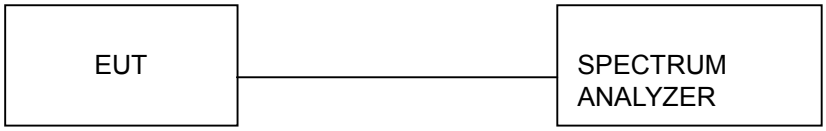
NOTE:1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITION

Same as Item 3.4.5