FCC TEST REPORT

REPORT NO.: RF900523R01
MODEL NO.: WUSB11
RECEIVED: May 23, 2001
TESTED: May 23 ~ May 30, 2001

APPLICANT: GLOBAL SUN COMMUNICATIONS, INC.

ADDRESS: No.13, Tung Yuan Road, Jung Li Industrial Park,
Jung Li City, Tao Yuan Hsien,
Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

This test report consists of 49 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, NVLAP or any government agencies. The test results in the report only apply to the tested sample.

0528

Lab Code: 200102-0

Table of Contents

1 CERTIFICATION 4
2 SUMMARY OF TEST RESULTS 5
3 GENERAL INFORMATION 6
3.1 GENERAL DESCRIPTION OF EUT 6
3.2 DESCRIPTION OF TEST MODES 7
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS 7
3.4 DESCRIPTION OF SUPPORT UNITS 8
4 TEST TYPES AND RESULTS 9
4.1 CONDUCTED EMISSION MEASUREMENT 9
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 9
4.1.2 TEST INSTRUMENTS 9
4.1.3 TEST PROCEDURES 10
4.1.4 TEST SETUP 10
4.1.5 EUT OPERATING CONDITIONS 11
4.1.6 TEST RESULTS 12
4.2 RADIATED EMISSION MEASUREMENT 18
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 18
4.2.2 TEST INSTRUMENTS 19
4.2.3 TEST PROCEDURES 20
4.2.4 TEST SETUP 21
4.2.5 EUT OPERATING CONDITIONS 21
4.2.6 TEST RESULTS 22
4.3 6DB BANDWIDTH MEASUREMENT 27
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 27
4.3.2 TEST INSTRUMENTS 27
4.3.3 TEST PROCEDURE 28
4.3.4 TEST SETUP 28
4.3.5 EUT OPERATING CONDITIONS 28
4.3.6 TEST RESULTS 29
4.4 MAXIMUM PEAK OUTPUT POWER 33
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 33
4.4.2 TEST INSTRUMENTS 33
4.4.3 TEST PROCEDURES 34
4.4.4 TEST SETUP 34
4.4.5 EUT OPERATING CONDITIONS 34

4.4.6 TEST RESULTS 35
4.5 POWER SPECTRAL DENSITY MEASUREMENT 36
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 36
4.5.2 TEST INSTRUMENTS 36
4.5.3 TEST PROCEDURE 37
4.5.4 TEST SETUP 37
4.5.5 EUT OPERATING CONDITIONS 37
4.5.6 TEST RESULTS 38
4.6 BAND EDGES MEASUREMENT 42
4.6.1 LIMITS OF BAND EDGES MEASUREMENT 42
4.6.2 TEST INSTRUMENTS 42
4.6.3 TEST PROCEDURE 42
4.6.4 EUT OPERATING CONDITION 43
4.6.5 TEST RESULTS 43
4.7 ANTENNA REQUIREMENT 46
4.7.1 STANDARD APPLICABLE 46
4.7.2 ANTENNA CONNECTED CONSTRUCTION 46
5 PHOTOGRAPHS OF THE TEST CONFIGURATION 47
6 INFORMATION ON THE TESTING LABORATORIES 49

1 CERTIFICATION

PRODUCT :	Wireless USB Adapter
BRAND NAME :	Linksys
MODEL NO. :	WUSB11
APPLICANT :	GLOBAL SUN COMMUNITCATIONS, INC.
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 May 23, 2001 to May 30, 2001, 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.

TESTED BY: Gary Chang, **DATE:** June 8, 2001
Gary Chang

CHECKED BY: Demi Chen, **DATE:** June 8, 2001
Demi Chen

APPROVED BY: , **DATE:** June 8, 2001
Harris W. Lai,
Senior V.P.

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**
15.107	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –15.18dBuV at 3.09300MHz
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)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –6.1dBuV at 176.22 MHz
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	Wireless USB Adapter
MODEL NO.	WUSB11
POWER SUPPLY	5VDC from computer
MODULATION TYPE	CCK, BPSK, QPSK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	18 dBm
ANTENNA TYPE	Monopole antenna
DATA CABLE	1.5m (Nonshielded)
I/O PORTS	USB
ASSOCIATED DEVICES	NA

NOTE :

1. This report is prepared for FCC class II permissive change. The difference compared with the original design is PCB re-layout and outer appearance change. So the test is necessary.
2. The WUSB11 with original design has been approved by FCC under FCC ID:O7JGL2411USB.
3. For a more detailed features description, please refer to the manufacturer's specifications or 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 a Wireless USB 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	Inspiron 5000e	TW-012JXN-12961-0B9-2912	FCC DoC Approved
2	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
3	MODEM	ACEEX	1414	980020510	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 (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

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	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
EMCO-L.I.S.N. (for support units)	3825/2	9204-1964	July 9, 2001
Software	Cond-V2e	NA	NA
RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 9, 2001
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	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 equipments are used for the final measurement.

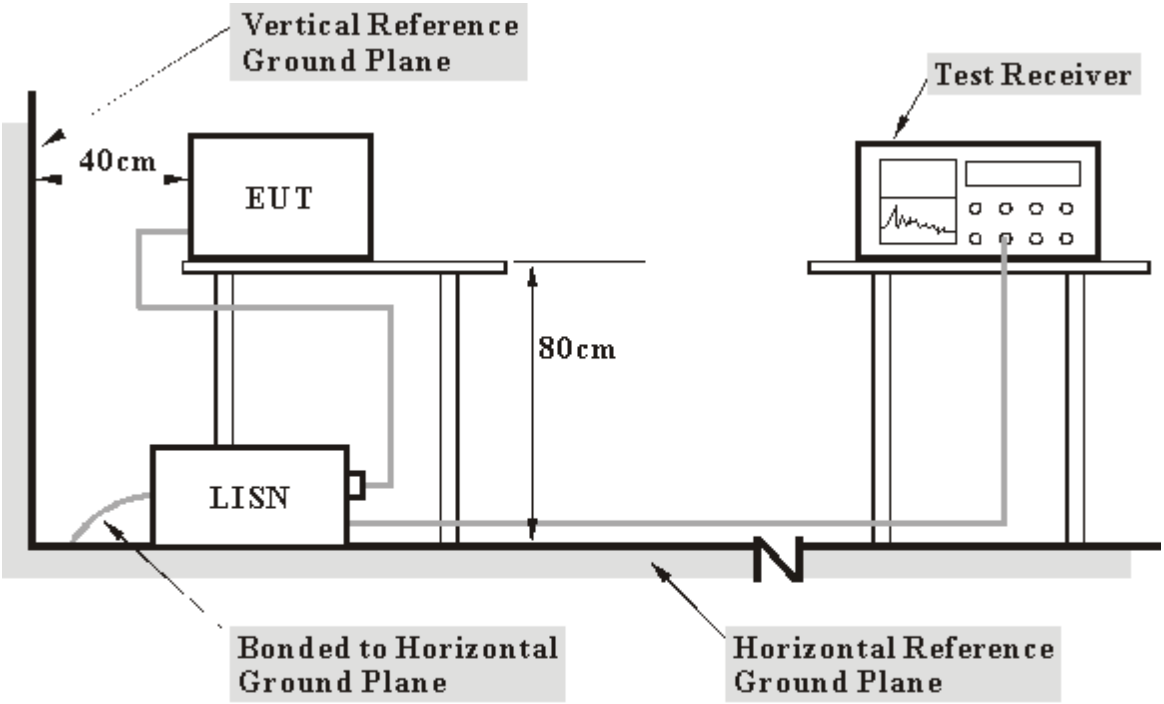
4.1.3 TEST PROCEDURES

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.

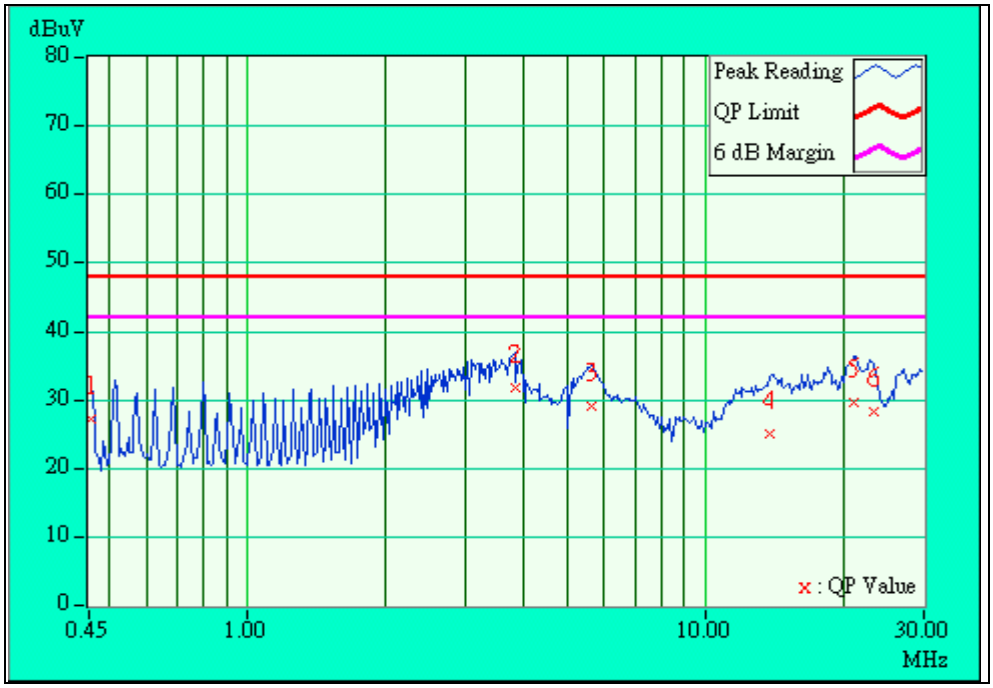
4.1.6 TEST RESULTS

EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.45300	0.20	27.14	-	27.34	-	48.00	-	-20.66	-
2	3.82800	0.38	31.73	-	32.11	-	48.00	-	-15.89	-
3	5.65400	0.48	29.01	-	29.49	-	48.00	-	-18.51	-
4	13.88163	0.93	25.06	-	25.99	-	48.00	-	-22.01	-
5	21.03800	1.16	29.66	-	30.82	-	48.00	-	-17.18	-
6	23.23700	1.29	28.30	-	29.59	-	48.00	-	-18.41	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

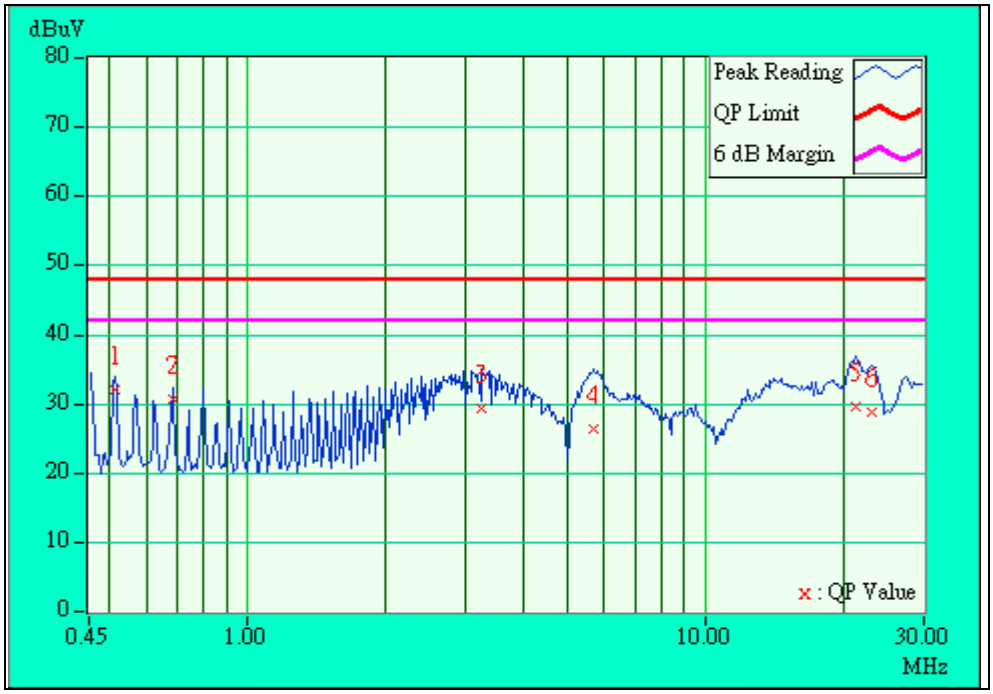


EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.51300	0.20	32.13	-	32.33	-	48.00	-	-15.67	-
2	0.68400	0.20	30.59	-	30.79	-	48.00	-	-17.21	-
3	3.24900	0.32	29.41	-	29.73	-	48.00	-	-18.27	-
4	5.69600	0.46	26.46	-	26.92	-	48.00	-	-21.08	-
5	21.40100	1.08	29.54	-	30.62	-	48.00	-	-17.38	-
6	23.08613	1.19	28.85	-	30.04	-	48.00	-	-17.96	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

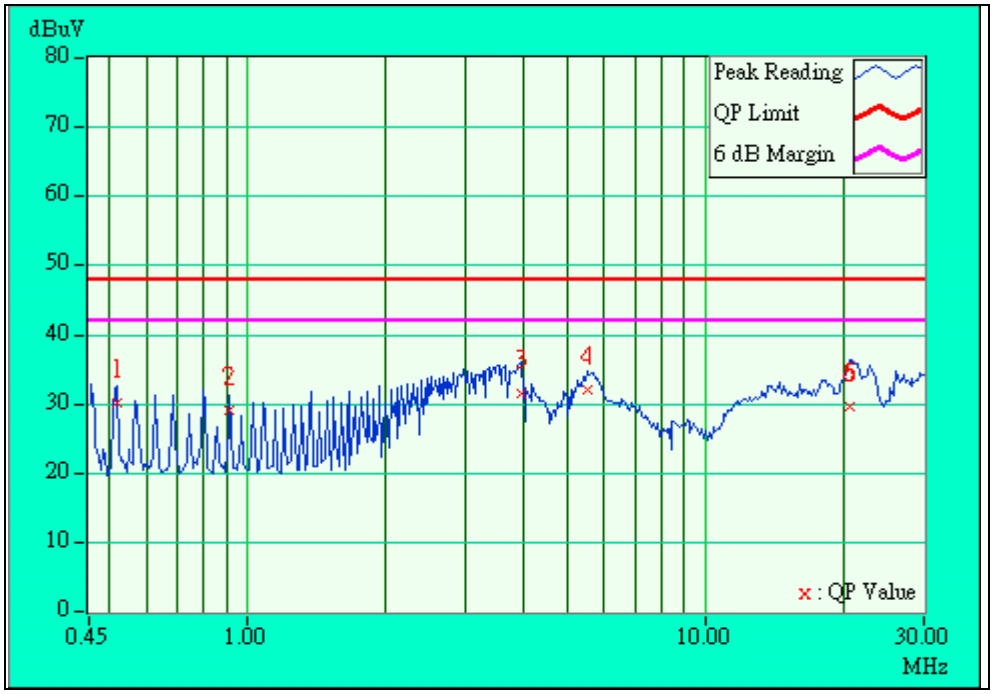


EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.51601	0.20	30.16	-	30.36	-	48.00	-	-17.64	-
2	0.91500	0.20	29.07	-	29.27	-	48.00	-	-18.73	-
3	3.94500	0.39	31.52	-	31.91	-	48.00	-	-16.09	-
4	5.54900	0.48	31.94	-	32.42	-	48.00	-	-15.58	-
5	20.70800	1.14	29.64	-	30.78	-	48.00	-	-17.22	-
6	20.70800	1.14	29.62	-	30.76	-	48.00	-	-17.24	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

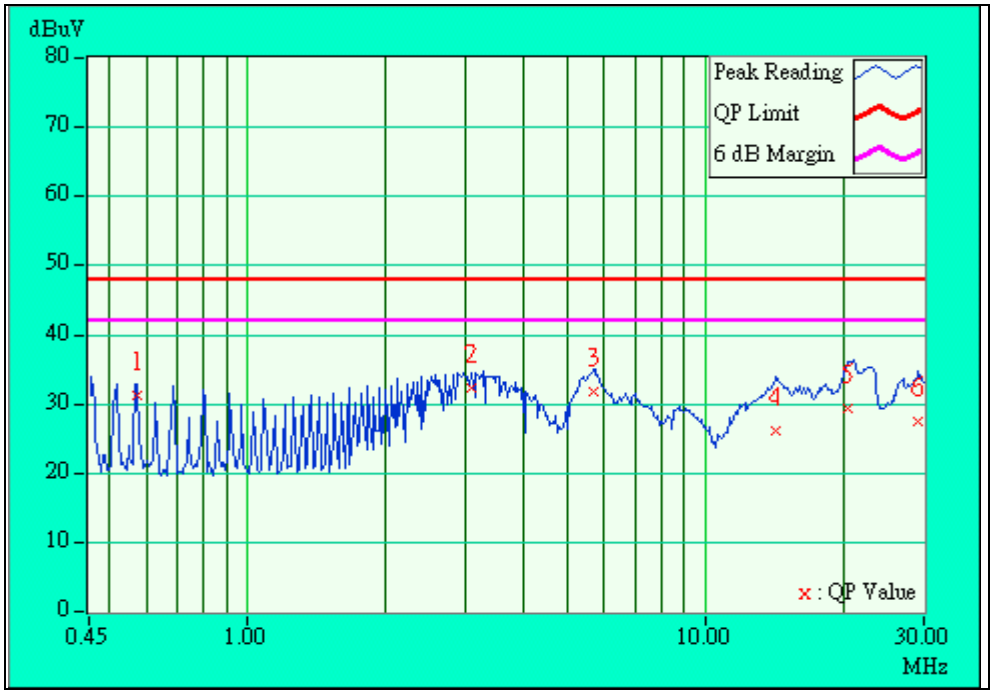


EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.57300	0.20	31.37	-	31.57	-	48.00	-	-16.43	-
2	3.09000	0.31	32.25	-	32.56	-	48.00	-	-15.44	-
3	5.66600	0.46	31.72	-	32.18	-	48.00	-	-15.82	-
4	14.25200	0.86	26.16	-	27.02	-	48.00	-	-20.98	-
5	20.54600	1.03	29.48	-	30.51	-	48.00	-	-17.49	-
6	29.15000	1.38	27.45	-	28.83	-	48.00	-	-19.17	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

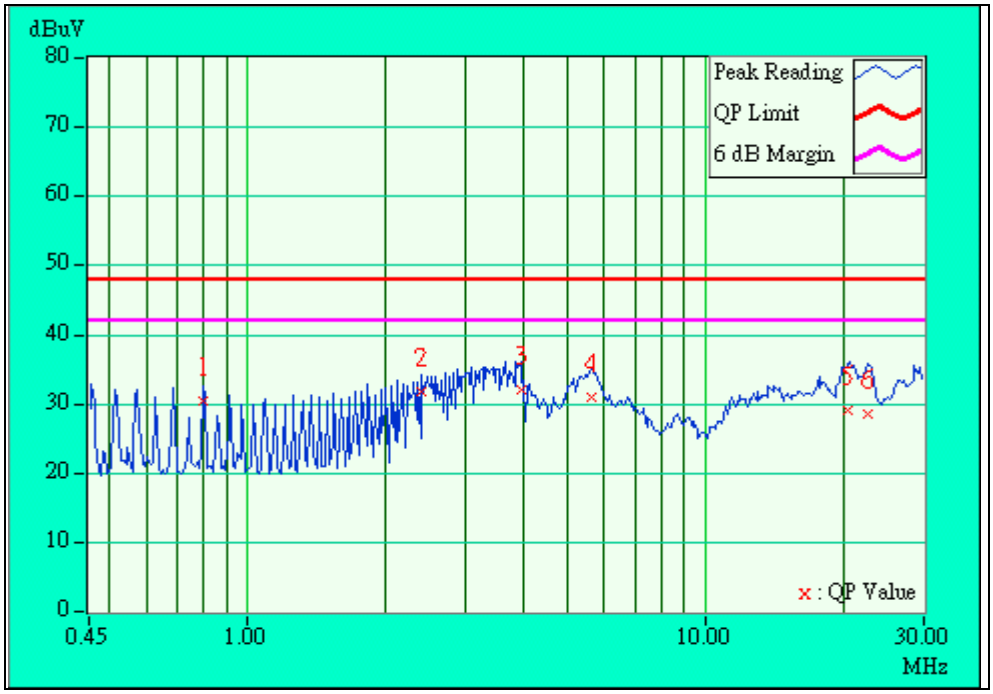


EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.80100	0.20	30.46	-	30.66	-	48.00	-	-17.34	-
2	2.40600	0.24	31.88	-	32.12	-	48.00	-	-15.88	-
3	3.95400	0.40	32.10	-	32.50	-	48.00	-	-15.50	-
4	5.61500	0.48	30.98	-	31.46	-	48.00	-	-16.54	-
5	20.45300	1.13	29.07	-	30.20	-	48.00	-	-17.80	-
6	22.61900	1.26	28.52	-	29.78	-	48.00	-	-18.22	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

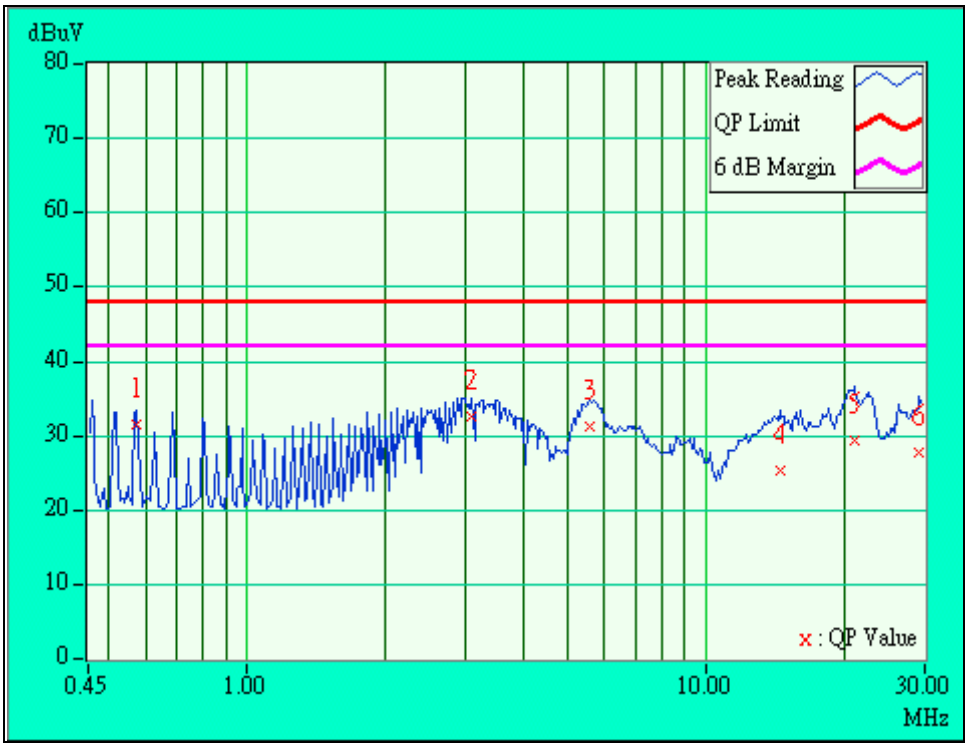


EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER	110Vac, 60 Hz	**PHASE**	Netural (N)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.57300	0.20	31.61	-	31.81	-	48.00	-	-16.19	-
2	3.09300	0.31	32.51	-	32.82	-	48.00	-	-15.18	-
3	5.55500	0.45	31.24	-	31.69	-	48.00	-	-16.31	-
4	14.48000	0.87	25.22	-	26.09	-	48.00	-	-21.91	-
5	21.07100	1.06	29.26	-	30.32	-	48.00	-	-17.68	-
6	29.17100	1.38	27.81	-	29.19	-	48.00	-	-18.81	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



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 7, 2002
*HP Preamplifier	8447D	2944A08485	Nov. 4, 2001
* HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 4, 2001
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 4, 2001
* Antenna (Horn)	BBHA9120-D	D130	July 10, 2001
Open Field Test Site	Site 5	ADT-R05	July 28, 2001
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI : R-1039		

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 equipments are used for the final measurement.

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.

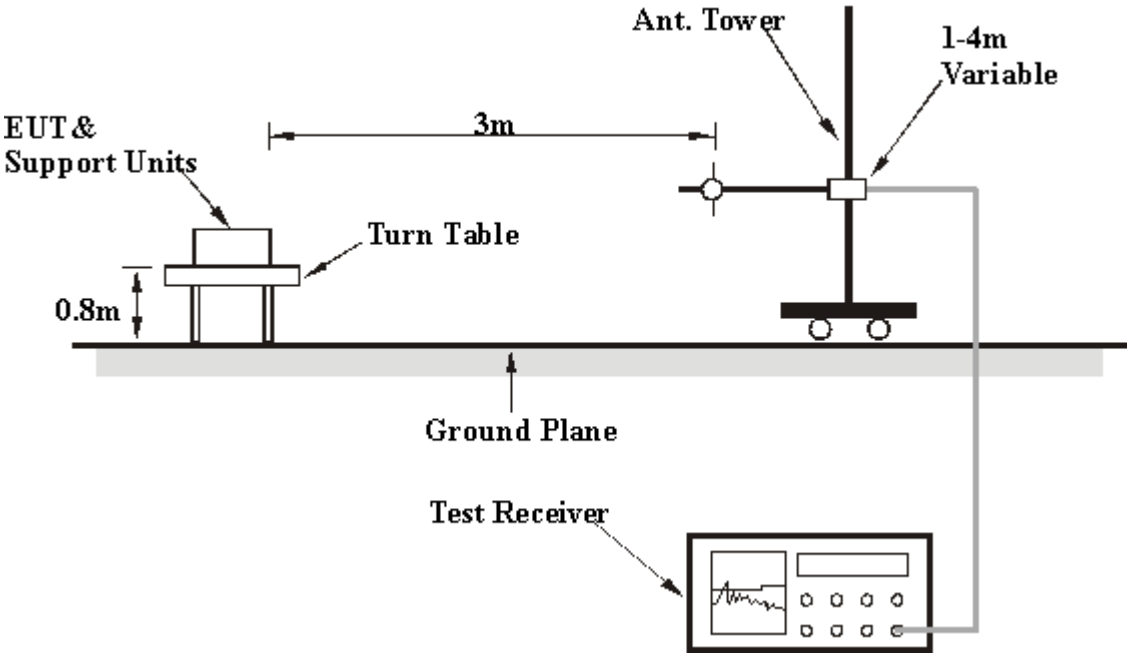
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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 peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection 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	Wireless USB Adapter	**MODEL**	WUSB11
MODE	11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	144.32	30.8 QP	43.50	-12.70	1.00H	259	17.80	10.43	2.58	0.00	-13.00
2	176.53	33.0 QP	43.50	-10.50	1.00H	321	21.60	8.73	2.65	0.00	-11.38
3	180.53	36.9 QP	43.50	-6.60	1.00H	82	25.60	8.62	2.66	0.00	-11.28
4	252.36	36.1 QP	46.00	-9.90	1.00H	211	21.60	11.61	2.91	0.00	-14.52
5	288.01	35.8 QP	46.00	-10.20	1.00H	329	20.40	12.35	3.04	0.00	-15.38
6	440.25	37.5 QP	46.00	-8.50	1.00H	118	18.30	15.93	3.27	0.00	-19.21
7	480.53	36.3 QP	46.00	-9.70	1.08H	303	16.20	16.63	3.51	0.00	-20.14
8	504.72	36.9 QP	46.00	-9.10	1.00H	189	16.20	16.97	3.68	0.00	-20.66
9	660.25	33.0 QP	46.00	-13.00	1.10H	102	11.40	17.77	3.84	0.00	-21.61
10	748.23	35.5 QP	46.00	-10.50	1.80H	254	12.50	18.80	4.21	0.00	-23.02

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	132.00	28.5 QP	43.50	-15.00	1.00V	310	15.00	10.97	2.52	0.00	-13.49
2	144.25	30.9 QP	43.50	-12.60	1.00V	56	17.90	10.43	2.58	0.00	-13.01
3	176.22	37.4 QP	43.50	-6.10	1.00V	75	26.00	8.73	2.65	0.00	-11.38
4	220.12	30.4 QP	46.00	-15.60	1.00V	107	18.00	9.58	2.82	0.00	-12.42
5	324.56	34.9 QP	46.00	-11.10	1.03V	45	18.50	13.14	3.23	0.00	-16.37
6	479.56	38.4 QP	46.00	-7.60	1.03V	238	18.30	16.58	3.48	0.00	-20.08
7	748.50	35.6 QP	46.00	-10.40	1.65V	249	12.60	18.80	4.21	0.00	-23.02
8	880.12	36.7 QP	46.00	-9.30	1.70V	14	12.50	19.63	4.54	0.00	-24.17

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2037.80	48.5 pk	74.00	-25.50	1.00H	146	18.86	26.31	3.29	0.00	-29.60
2	*2412.70	108.1 pk	NA	NA	1.06H	229	77.00	27.45	3.62	0.00	-31.08
3	*2412.70	98.4 Av	NA	NA	1.06H	229	67.30	27.45	3.62	0.00	-31.08
4	4076.00	53.0 pk	74.00	-21.00	1.00H	274	18.25	30.03	4.77	0.00	-34.80
5	4823.60	54.6 pk	74.00	-19.40	1.02H	332	18.04	31.35	5.21	0.00	-36.56.
6	4823.60	47.2 Av	54.00	-6.80	1.02H	332	10.65	31.35	5.21	0.00	-36.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2037.90	47.4 pk	74.00	-26.60	1.00V	6	17.80	26.31	3.29	0.00	-29.60
2	*2412.40	102.9 pk	NA	NA	1.07V	86	71.86	27.45	3.62	0.00	-31.07
3	*2412.40	93.9 Av	NA	NA	1.07V	86	62.85	27.45	3.62	0.00	-31.07
4	4076.50	54.6 pk	74.00	-19.40	1.01V	4	19.85	30.03	4.77	0.00	-34.80
5	4076.50	46.1 Av	54.00	-7.90	1.01V	4	11.32	30.03	4.77	0.00	-34.80
6	4824.10	57.2 pk	74.00	-26.80	1.07V	64	20.59	31.35	5.21	0.00	-36.57
7	4824.10	41.3 Av	54.00	-12.70	1.07V	64	4.69	31.35	5.21	0.00	-36.56

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2062.90	51.6 pk	74.00	-22.40	1.00H	157	20.69	27.61	3.31	0.00	-30.92
2	*2436.80	107.8 pk	NA	NA	1.00H	160	75.80	28.38	3.64	0.00	-32.03
3	*2436.80	98.1 Av	NA	NA	1.00H	160	66.13	28.38	3.64	0.00	-32.03
4	4126.40	46.4 Av	54.00	-7.60	1.19H	163	9.21	32.40	4.79	0.00	-37.19
5	4874.60	57.9 pk	74.00	-16.10	1.00H	164	19.57	33.07	5.25	0.00	-38.31.
6	4874.60	43.6 Av	54.00	-10.40	1.00H	164	5.28	33.07	5.25	0.00	-38.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2062.40	50.8 pk	74.00	-23.20	1.23V	196	19.85	27.61	3.31	0.00	-30.92
2	*2436.90	104.9 pk	NA	NA	1.17V	193	72.90	28.38	3.64	0.00	-32.03
3	*2436.90	94.2 Av	NA	NA	1.17V	193	62.14	28.38	3.64	0.00	-32.03
4	4125.60	57.7 pk	74.00	-16.30	1.18V	144	20.56	32.40	4.79	0.00	-37.19
5	4125.60	47.9 Av	54.00	-6.10	1.18V	144	10.68	32.40	4.79	0.00	-37.19
6	4874.70	57.8 pk	74.00	-16.20	1.12V	251	19.45	33.07	5.25	0.00	-38.31
7	4874.70	43.4 Av	54.00	-10.60	1.12V	251	5.05	33.07	5.25	0.00	-38.31

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless USB Adapter	**MODEL**	WUSB11
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2088.00	51.4 pk	74.00	-2.60	1.00H	153	20.38	27.66	3.33	0.00	-30.99
2	*2461.80	105.7 pk	NA	NA	1.00H	171	73.64	28.42	3.66	0.00	-32.09
3	*2461.80	97.0 Av	NA	NA	1.00H	171	64.90	28.42	3.66	0.00	-32.09
4	2483.50	53.3 pk	74.00	-20.70	1.00H	354	21.20	28.47	3.68	0.00	-32.15
5	4175.90	55.7 pk	74.00	-18.30	1.00H	170	18.45	32.40	4.81	0.00	-37.21.
6	4175.90	47.8 Av	54.00	-6.20	1.00H	74	10.56	32.40	4.81	0.00	-37.22
7	4924.10	58.4 pk	74.00	-15.60	1.00H	345	19.98	33.15	5.28	0.00	-38.43
8	4924.10	44.8 Av	54.00	-9.20	1.00H	345	6.34	33.15	5.28	0.00	-38.44

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2088.80	50.7 pk	74.00	-3.30	1.08V	230	19.67	27.66	3.33	0.00	-30.99
2	*2461.80	94.9 Av	NA	NA	1.12V	359	62.77	28.42	3.66	0.00	-32.09
3	*2461.80	104.0 pk	NA	NA	1.12V	359	71.94	28.42	3.66	0.00	-32.09
4	2489.30	51.1 pk	74.00	-22.90	1.00V	46	18.96	28.47	3.68	0.00	-32.16
5	4176.80	57.6 pk	74.00	-16.40	1.16V	163	20.41	32.40	4.81	0.00	-37.21
6	4176.80	50.1 Av	54.00	-3.90	1.16V	163	12.94	32.40	4.81	0.00	-37.21
7	4924.10	58.4 pk	74.00	-15.60	1.08V	171	20.00	33.15	5.28	0.00	-38.43
8	4924.10	44.9 Av	54.00	-9.10	1.08V	171	6.49	33.15	5.28	0.00	-38.43

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

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
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

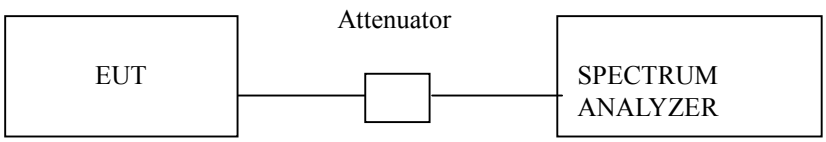
NOTE:

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.

4.3.3 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



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

4.3.5 EUT OPERATING CONDITIONS

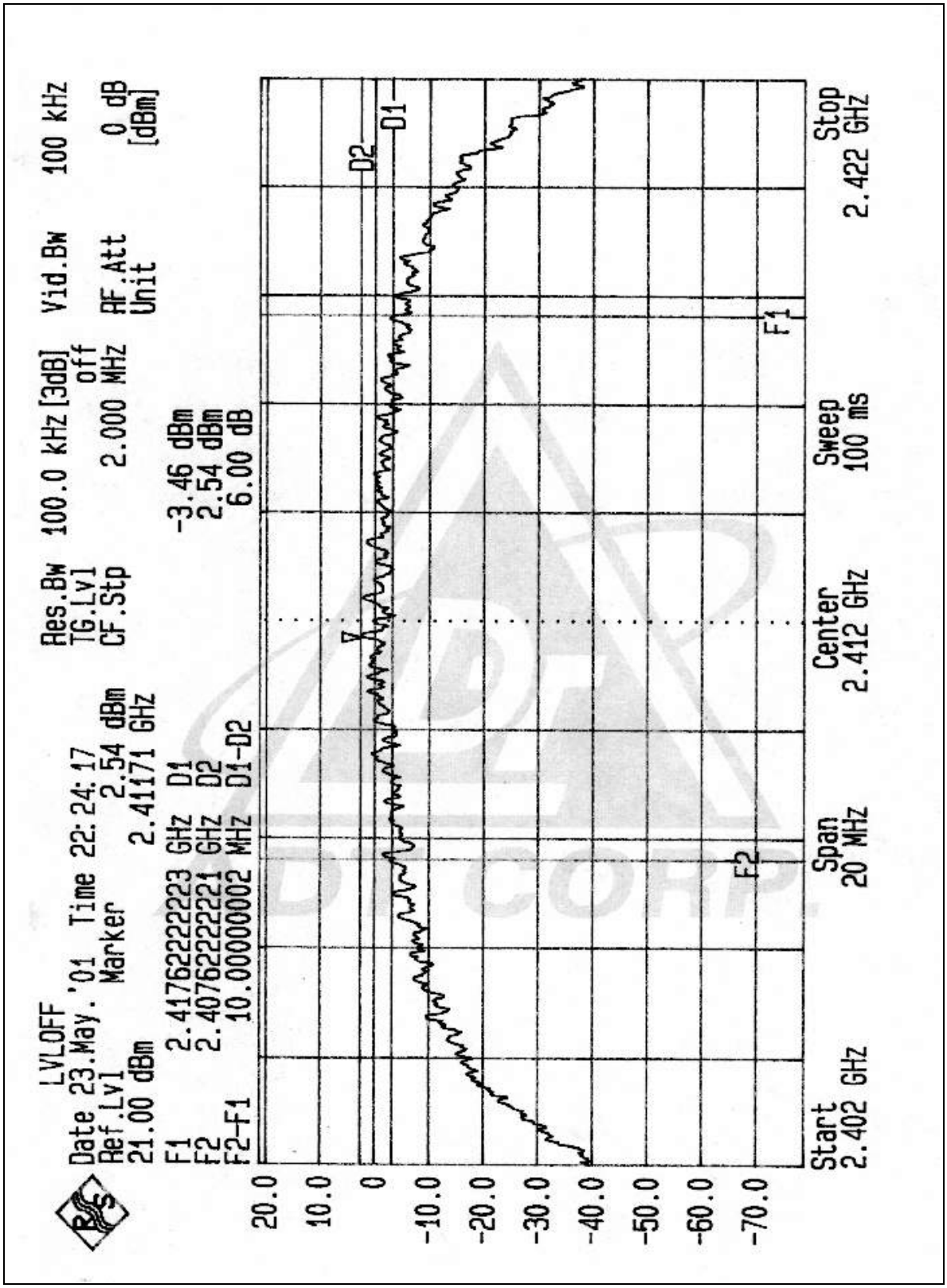
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

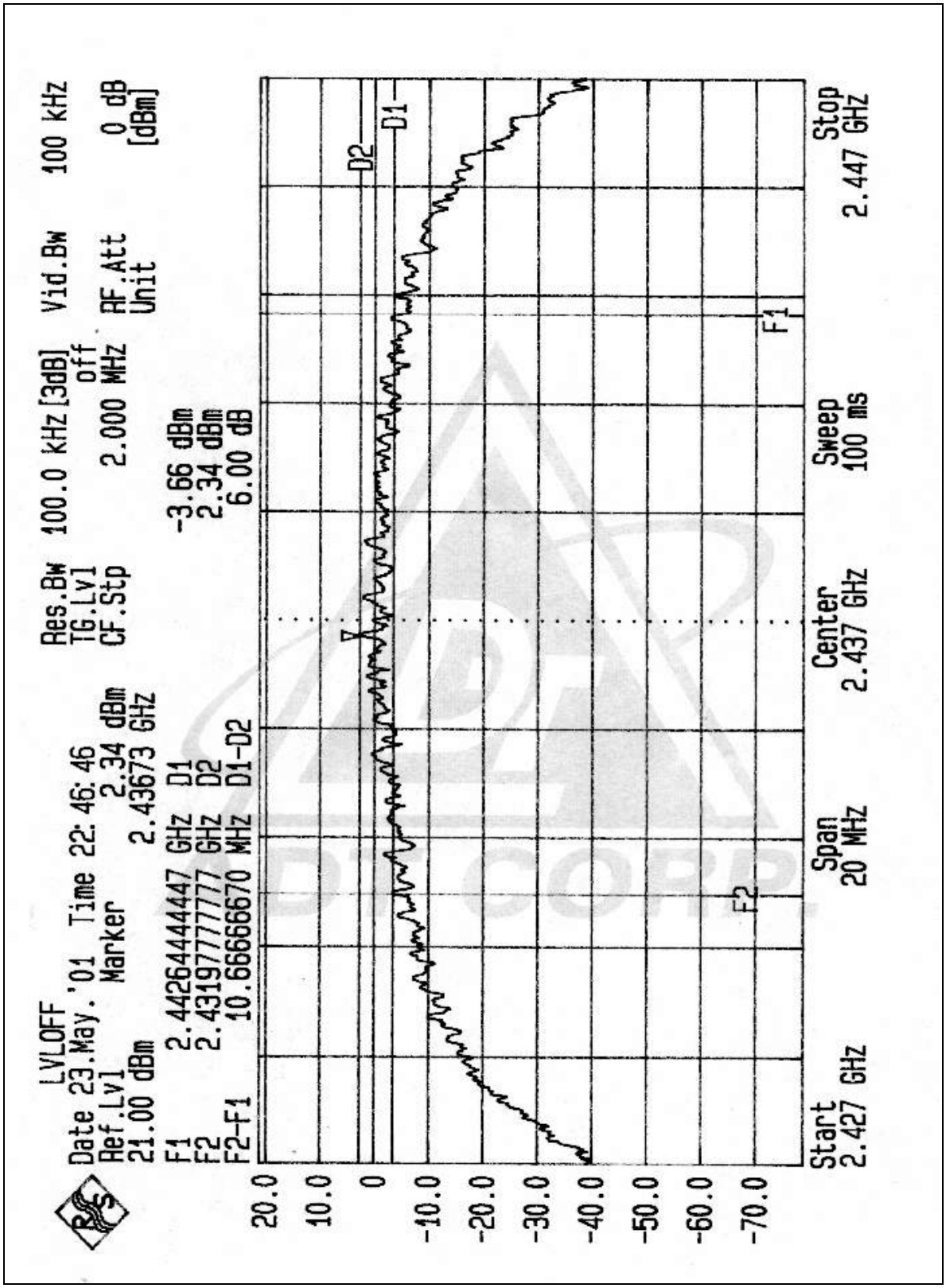
EUT	Wireless USB Adapter	**MODEL**	WUSB11
INPUT POWER (SYSTEM)	110Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	28 deg. C, 60%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.00	0.5	PASS
6	2437	10.67	0.5	PASS
11	2462	11.04	0.5	PASS

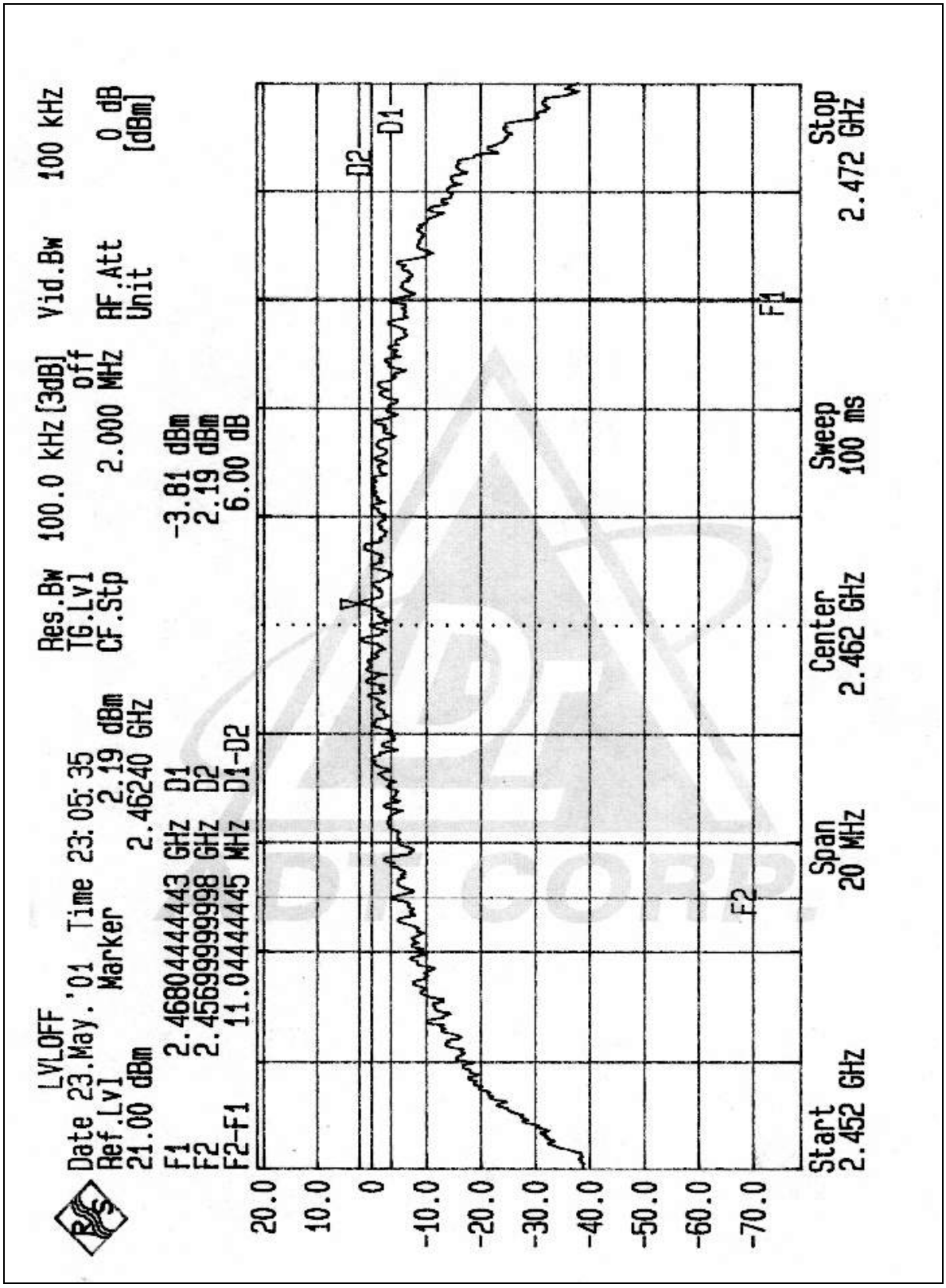
CH1


LVLOFF
Date 23.May.'01 Time 22:24:17
Ref.Lvl
21.00 dBm
Marker
2.54 dBm
2.41171 GHz
F1 2.41762222223 GHz D1
F2 2.40762222221 GHz D2
F2-F1 10.00000002 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-3.46 dBm
2.54 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D2
D1
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 100 ms
Stop 2.422 GHz

CH6


LVLOFF
Date 23.May.'01 Time 22:46:46
Ref.Lvl Marker
21.00 dBm 2.34 dBm
2.43673 GHz
F1 2.4426444447 GHz D1
F2 2.4319777777 GHz D2
F2-F1 10.66666670 MHz D1-D2
Res.Bw 100.0 kHz [3dB] off
TG.Lvl 2.000 MHz
CF.Stp
-3.66 dBm
2.34 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F1
F2
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 100 ms
Stop 2.447 GHz

CH11


LVLOFF
Date 23.May.'01 Time 23:05:35
Ref.Lvl
21.00 dBm
Marker
2.19 dBm
2.46240 GHz
F1 2.46804444443 GHz D1
F2 2.45699999998 GHz D2
F2-F1 11.04444445 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-3.81 dBm
2.19 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F1
F2
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 100 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 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE:

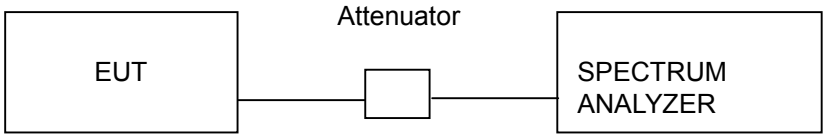
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

a. The transmitter output was connected to the spectrum analyzer through an attenuator.
b. The center frequency of the spectrum analyzer was set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
c. The span of the spectrum analyzer should be larger than 6dB BandWidth plus 10MHz.
d. Used Peak Search to read the peak power after Maximum Hold function was activated.
e. Shifted the marker to +/- 3MHz and +/-6MHz, and recorded the reading.
f. The Maximum Peak Output Power was the linear summation of the 5 readings in (4) and (5).

NOTE: This measurement is the total power of 15MHz bandwidth which is far more wider than 6dB bandwidth.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

4.4.6 TEST RESULTS

EUT	Wireless USB Adapter	**MODEL**	WUSB11
INPUT POWER (SYSTEM)	110Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	28 deg. C, 60%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.74	30	PASS
6	2437	17.89	30	PASS
11	2462	17.74	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
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

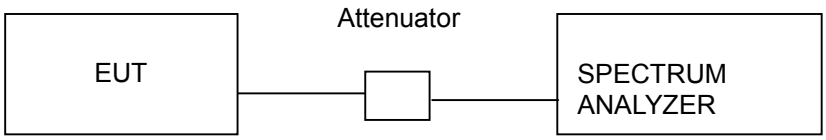
NOTE:

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/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

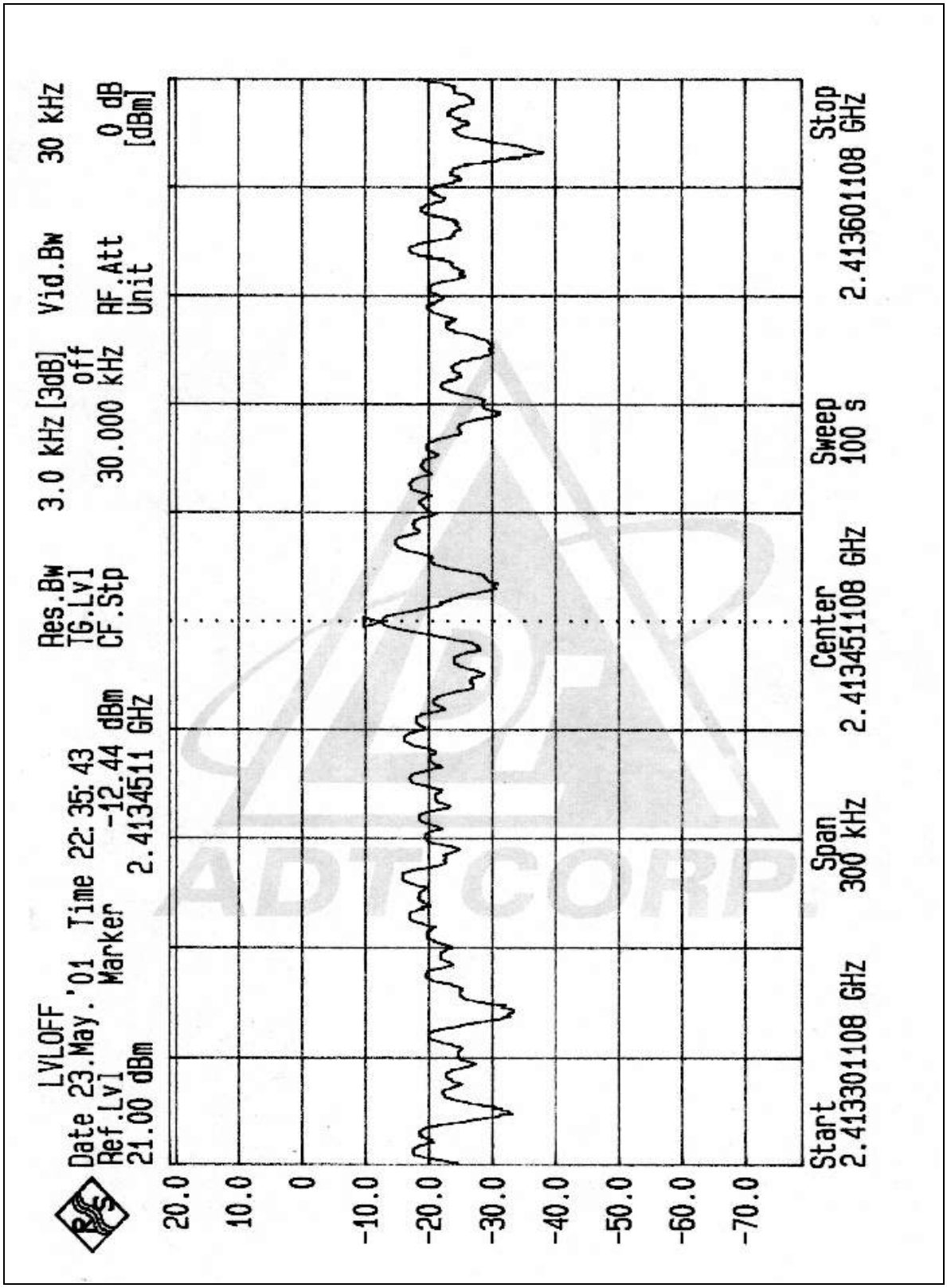
Same as 4.3.5

4.5.6 TEST RESULTS

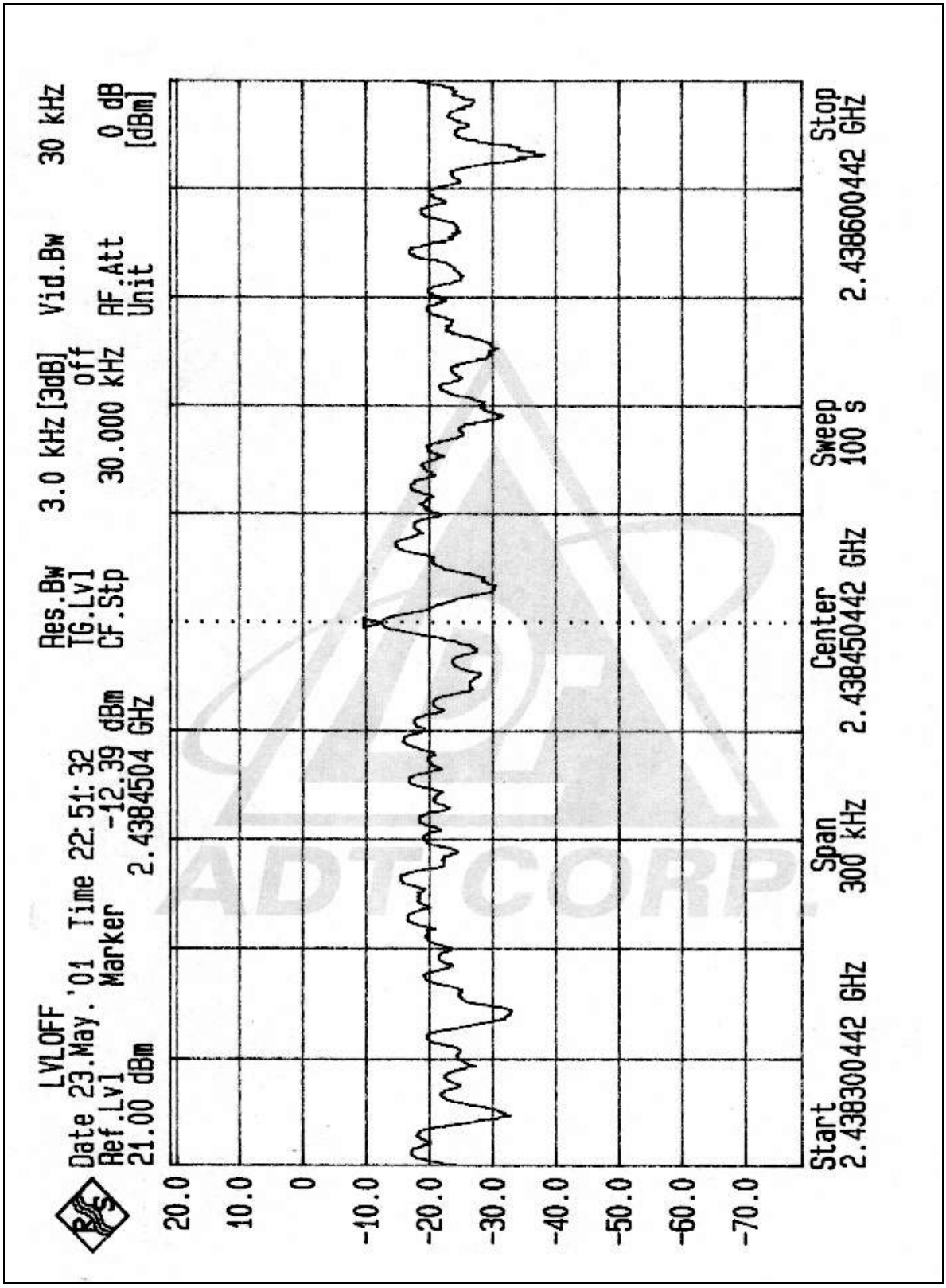
EUT	Wireless USB Adapter	**MODEL**	WUSB11
INPUT POWER (SYSTEM)	110Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	28 deg. C, 60%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-12.44	8	PASS
6	2437	-12.39	8	PASS
11	2462	-12.36	8	PASS

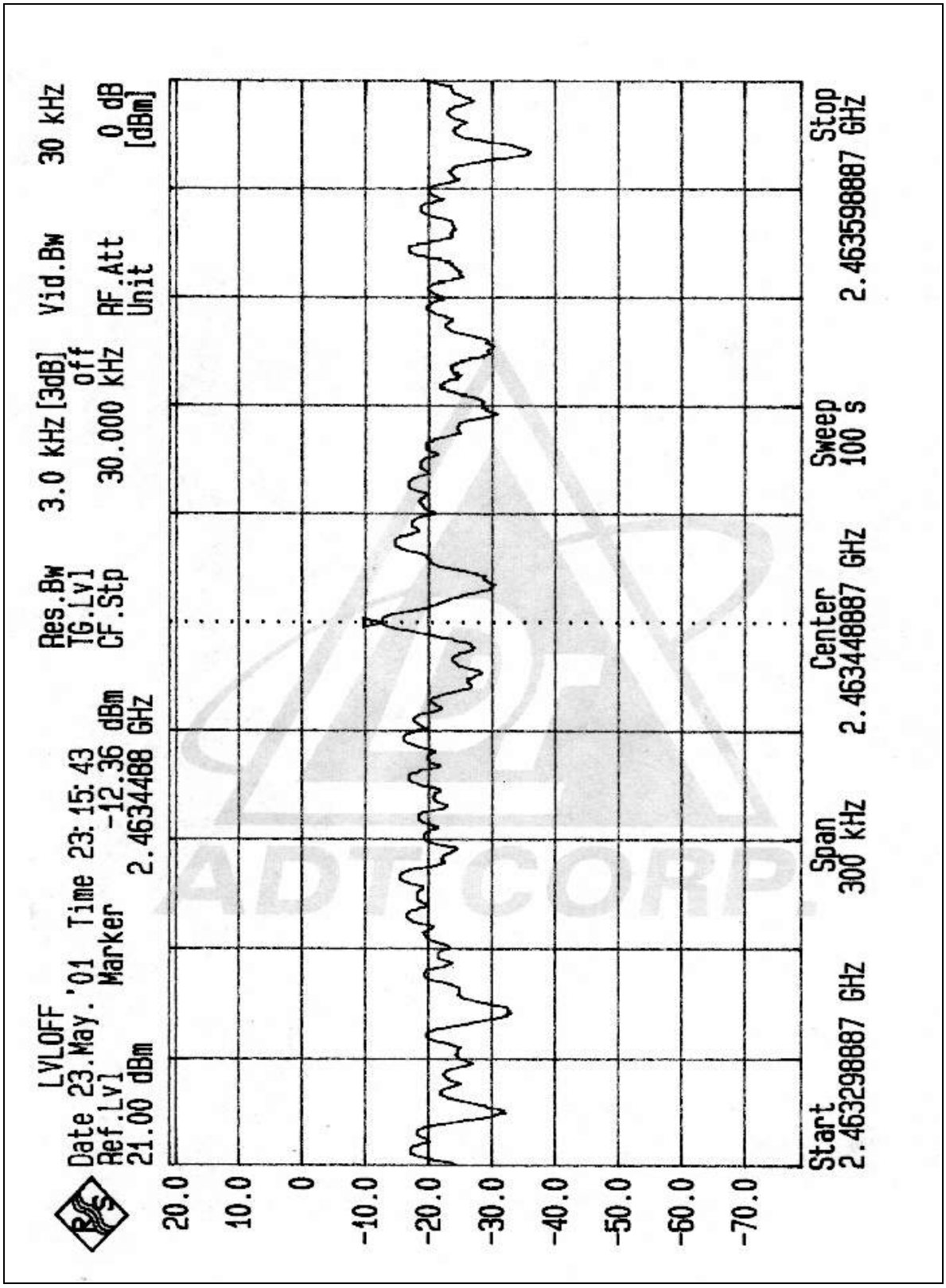
CH1


LVLOFF
Date 23.May.'01 Time 22:35:43
Ref.Lvl
21.00 dBm
Marker
2.4134511 GHz
-12.44 dBm
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.41330110 8 GHz
Span 300 kHz
Center 2.41345110 8 GHz
Sweep 100 s
Stop 2.41360110 8 GHz

CH6


LVLOFF
Date 23.May.'01 Time 22:51:32
Ref.Lvl
21.00 dBm
Marker
-12.39 dBm
2.4384504 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.4383004 42 GHz
Span
300 kHz
Center
2.4384504 42 GHz
Sweep
100 s
Stop
2.4386004 42 GHz

CH11


LVLOFF
Date 23.May.'01 Time 23:15:43
Ref.Lvl
21.00 dBm
Marker
-12.36 dBm
2.463448B8 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.463298887 GHz
Span 300 kHz
Center 2.463448887 GHz
Sweep 100 s
Stop 2.463598887 GHz