FCC TEST REPORT

REPORT NO.: RF910814R04B
MODEL NO.: NWP11B
RECEIVED: October 15, 2002
TESTED: July 16 ~ August 24, 2002

APPLICANT: The Linksys Group, INC.

ADDRESS: 17401 Armstrong Ave. Irvine, CA 92614

ISSUED BY: Advance Data Technology Corporation

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

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0528
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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 DEVIATION FROM TEST STANDARD 10
4.1.5 TEST SETUP 11
4.1.6 EUT OPERATING CONDITIONS 12
4.1.7 TEST RESULTS 13
4.2 RADIATED EMISSION MEASUREMENT 19
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 19
4.2.2 TEST INSTRUMENTS 20
4.2.3 TEST PROCEDURES 21
4.2.4 DEVIATION FROM TEST STANDARD 21
4.2.5 TEST SETUP 22
4.2.6 EUT OPERATING CONDITIONS 22
4.2.7 TEST RESULTS 23
4.3 6dB BANDWIDTH MEASUREMENT 28
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 28
4.3.2 TEST INSTRUMENTS 28
4.3.3 TEST PROCEDURE 29
4.3.4 DEVIATION FROM TEST STANDARD 29
4.3.5 TEST SETUP 29
4.3.6 EUT OPERATING CONDITIONS 29
4.3.7 TEST RESULTS 30
4.4 MAXIMUM PEAK OUTPUT POWER 34
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 34
4.4.2 TEST INSTRUMENTS 34

4.4.3 TEST PROCEDURES 35
4.4.4 DEVIATION FROM TEST STANDARD 35
4.4.5 TEST SETUP 35
4.4.6 EUT OPERATING CONDITIONS 35
4.4.7 TEST RESULTS.....36
4.5 POWER SPECTRAL DENSITY MEASUREMENT 37
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT.....37
4.5.2 TEST INSTRUMENTS 37
4.5.3 TEST PROCEDURE 38
4.5.4 DEVIATION FROM TEST STANDARD 38
4.5.5 TEST SETUP 38
4.5.6 EUT OPERATING CONDITIONS 38
4.5.7 TEST RESULTS.....39
4.6 BAND EDGES MEASUREMENT.....43
4.6.1 LIMITS OF BAND EDGES MEASUREMENT.....43
4.6.2 TEST INSTRUMENTS 43
4.6.3 TEST PROCEDURE 43
4.6.4 DEVIATION FROM TEST STANDARD 43
4.6.5 EUT OPERATING CONDITION.....44
4.6.6 TEST RESULTS.....44
4.7 ANTENNA REQUIREMENT.....47
4.7.1 STANDARD APPLICABLE.....47
4.7.2 ANTENNA CONNECTED CONSTRUCTION 47
5 PHOTOGRAPHS OF THE TEST CONFIGURATION.....48
6 INFORMATION ON THE TESTING LABORATORIES.....50

1 CERTIFICATION

PRODUCT : Wireless Notebook Adapter

MODEL NO. : NWP11B

BRAND : Linksys

APPLICANT : The Linksys Group, 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 July 16 ~ August 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: Rennie Wang, **DATE:** October 18, 2002

Rennie Wang

APPROVED BY: Alan Lane, **DATE:** October 18, 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 –13.50dBuV at 0.17MHz
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 –10.10dBuV at 460.00MHz
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	Wireless Notebook Adapter
MODEL NO.	NWP11B
POWER SUPPLY	5.0VDC from host equipment
MODULATION TYPE	BPSK, QPSK, CCK, PBCC
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11/22Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	17.99dBm
ANTENNA TYPE	Chip Antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. This report is issued as a supplementary report to the original report with no. RF910814R04.

2. For 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 to 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. Transfer rate, 22Mbps, which is the worst case, was chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless Notebook 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	MODEM	ACEEX	1414	980020503	IFAXDM1414
3	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	1.2m braid shielded wire, terminated with DB25 and Centronics 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	834115/016	Mar. 03, 2003
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH3-Z5	847265/023	Jan. 10, 2003
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 10, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 10, 2002
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	July 10, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C03.01	July 11, 2003
Terminator (For EMCO LISN)	NA	E1-01-300	Feb. 20, 2003
Terminator (For EMCO LISN)	NA	E1-01-301	Feb. 20, 2003
Shielded Room	Site 3	ADT-C03	NA
VCCI Site Registration No.	Site 3	C-274	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. The test was performed in ADT Open Site No. 3.

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.

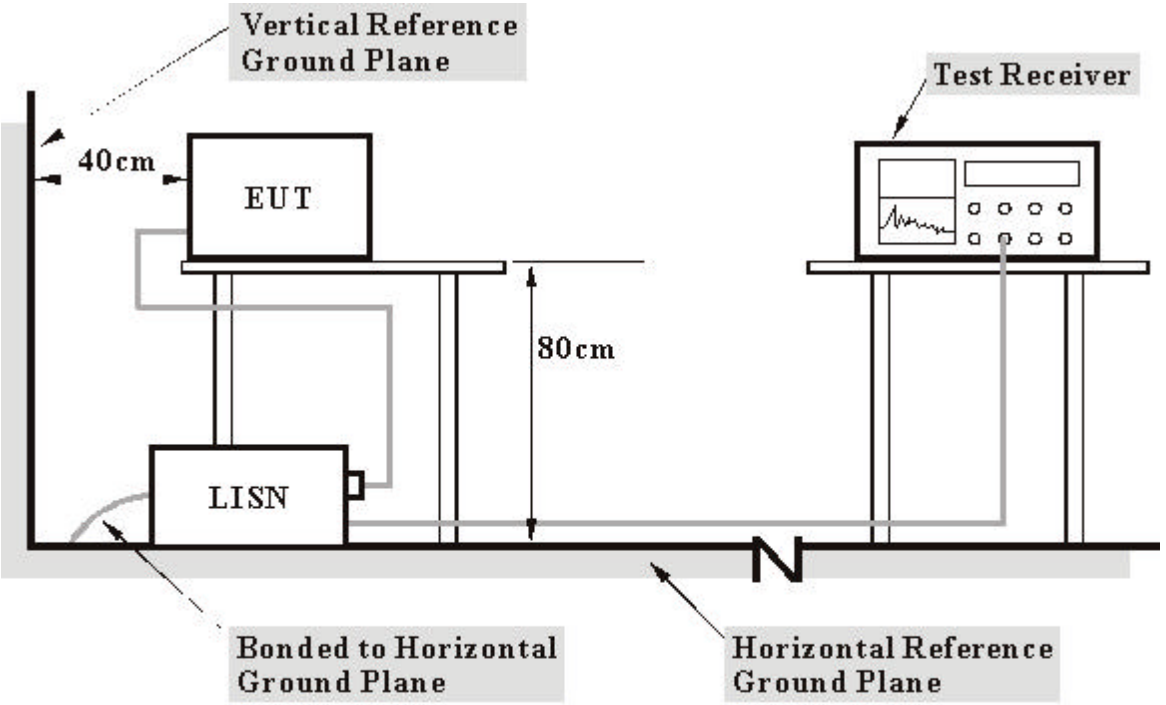
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 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.

4.1.6 EUT OPERATING CONDITIONS

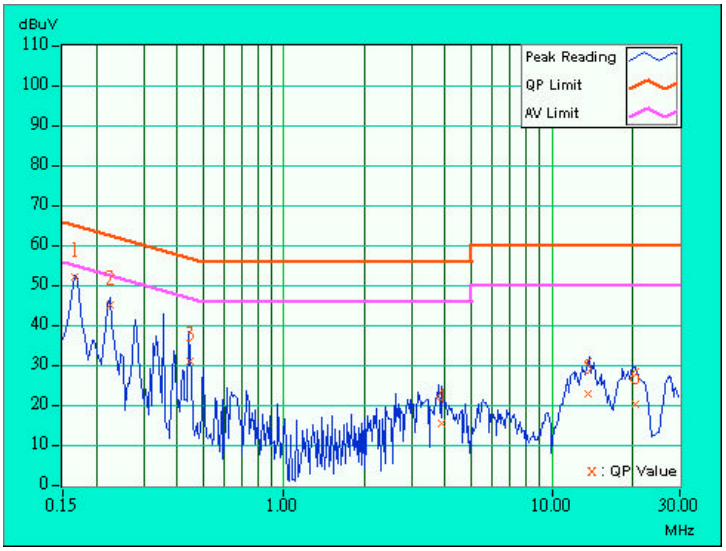
a. Connected the EUT to a computer system placed on a testing table.
b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The computer system sent "H" messages to its screen.
d. The computer system sent “H” messages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

4.1.7 TEST RESULTS

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

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	0.166	0.10	51.58	-	51.68	-	65.18	55.18	-13.50	-
2	0.224	0.10	44.55	-	44.65	-	62.66	52.66	-18.01	-
3	0.449	0.11	30.12	-	30.23	-	56.89	46.89	-26.66	-
4	3.898	0.39	14.83	-	15.22	-	56.00	46.00	-40.78	-
5	13.668	0.65	22.11	-	22.76	-	60.00	50.00	-37.24	-
6	20.570	0.81	19.43	-	20.24	-	60.00	50.00	-39.76	-

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.

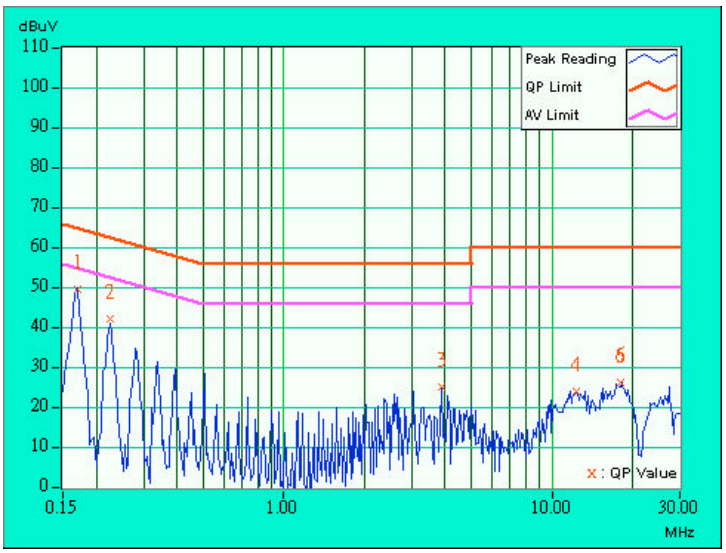


EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

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	0.170	0.10	49.07	-	49.17	-	64.98	54.98	-15.81	-
2	0.224	0.10	41.55	-	41.65	-	62.66	52.66	-21.01	-
3	3.875	0.29	24.60	-	24.89	-	56.00	46.00	-31.11	-
4	12.313	0.45	23.60	-	24.05	-	60.00	50.00	-35.95	-
5	17.945	0.56	25.75	-	26.31	-	60.00	50.00	-33.69	-
6	17.945	0.56	25.87	-	26.43	-	60.00	50.00	-33.57	-

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.

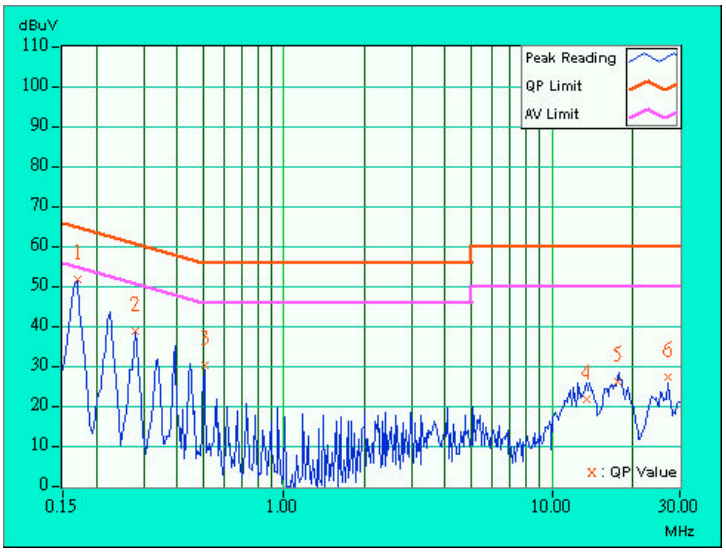


EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

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	0.170	0.10	50.85	-	50.95	-	64.98	54.98	-14.03	-
2	0.279	0.10	37.85	-	37.95	-	60.85	50.85	-22.90	-
3	0.505	0.12	29.49	-	29.61	-	56.00	46.00	-26.39	-
4	13.418	0.64	21.02	-	21.66	-	60.00	50.00	-38.34	-
5	17.547	0.75	25.47	-	26.22	-	60.00	50.00	-33.78	-
6	27.203	0.94	26.56	-	27.50	-	60.00	50.00	-32.50	-

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.

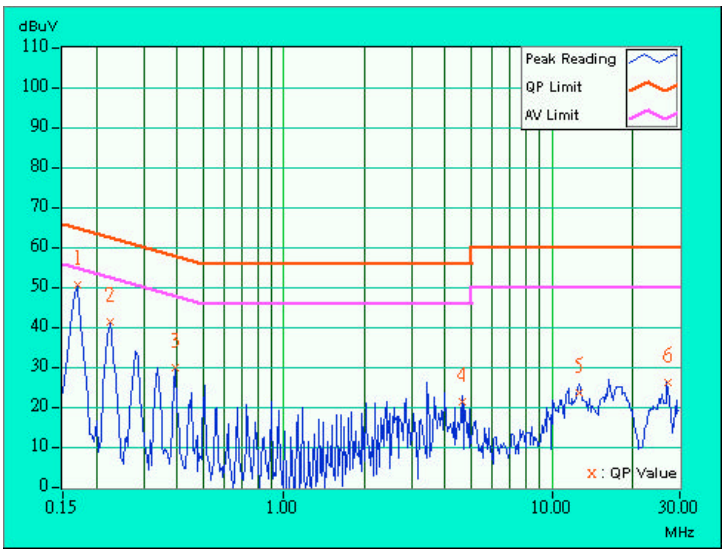


EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

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	0.170	0.10	49.99	-	50.09	-	64.98	54.98	-14.89	-
2	0.224	0.10	41.00	-	41.10	-	62.66	52.66	-21.56	-
3	0.392	0.10	29.52	-	29.62	-	58.02	48.02	-28.40	-
4	4.605	0.31	20.75	-	21.06	-	56.00	46.00	-34.94	-
5	12.586	0.45	22.99	-	23.44	-	60.00	50.00	-36.56	-
6	27.141	0.64	25.58	-	26.22	-	60.00	50.00	-33.78	-

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.

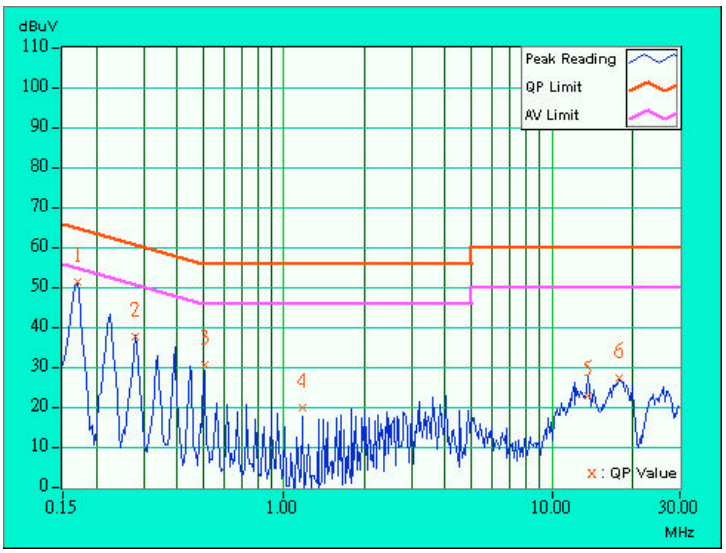


EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

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	0.170	0.10	50.67	-	50.77	-	64.98	54.98	-14.21	-
2	0.279	0.10	37.12	-	37.22	-	60.85	50.85	-23.63	-
3	0.505	0.12	29.87	-	29.99	-	56.00	46.00	-26.01	-
4	1.176	0.20	19.25	-	19.45	-	56.00	46.00	-36.55	-
5	13.629	0.65	22.32	-	22.97	-	60.00	50.00	-37.03	-
6	17.801	0.76	26.47	-	27.23	-	60.00	50.00	-32.77	-

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.

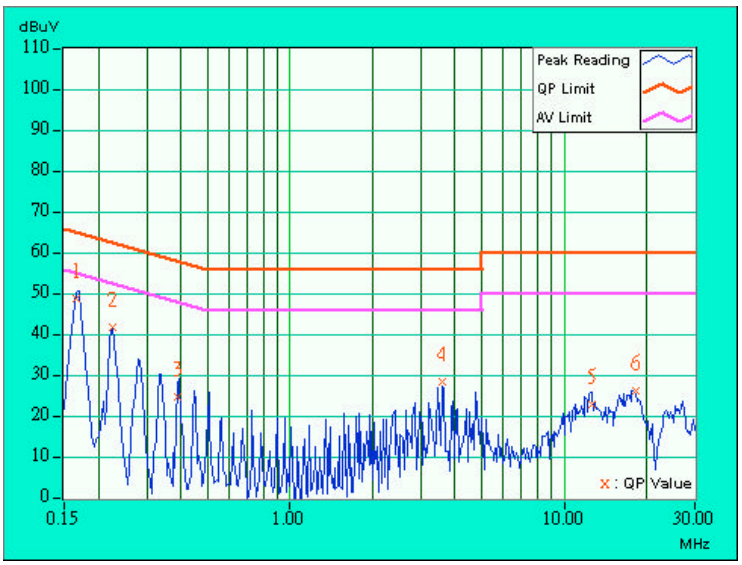


EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

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	0.166	0.10	48.18	-	48.28	-	65.18	55.18	-16.90	-
2	0.224	0.10	41.18	-	41.28	-	62.66	52.66	-21.38	-
3	0.388	0.10	24.18	-	24.28	-	58.10	48.10	-33.82	-
4	3.594	0.28	27.95	-	28.23	-	56.00	46.00	-27.77	-
5	12.578	0.45	22.38	-	22.83	-	60.00	50.00	-37.17	-
6	18.207	0.56	25.63	-	26.19	-	60.00	50.00	-33.81	-

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 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 07, 2003
* 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. 02, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 03, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 09, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 25, 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 12, 2003
Open Field Test Site	Site 5	ADT-R05	Jul. 19, 2003
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.
5. The test was performed in ADT Open Site No. 5.

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.

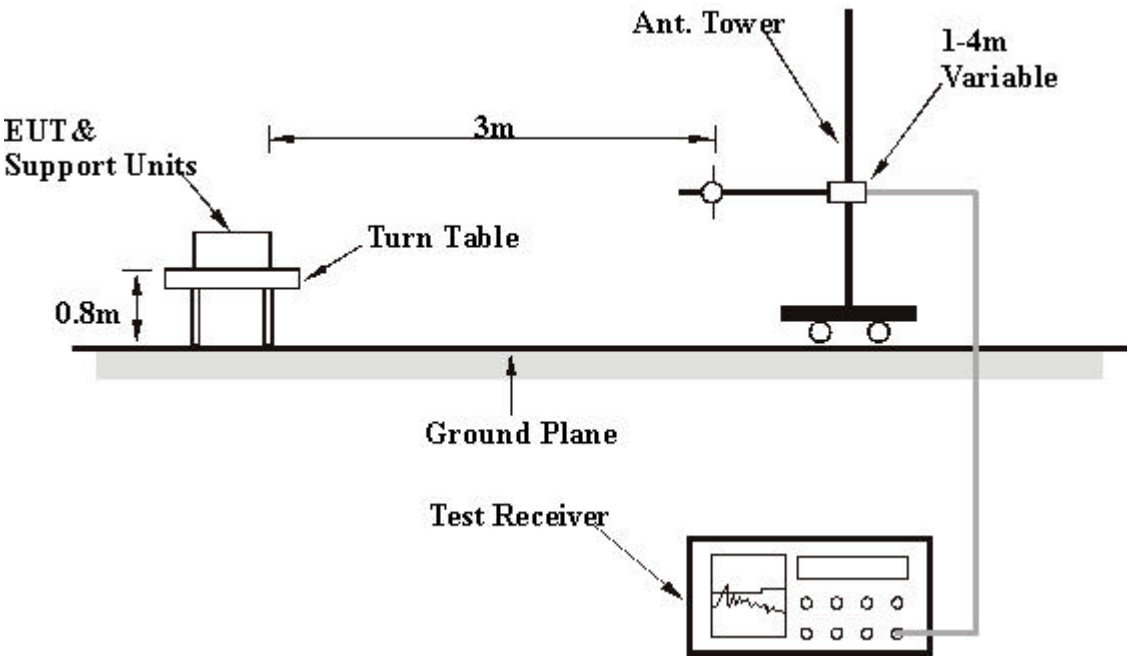
NOTE:

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 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30 deg. C, 50 % RH, 1050 hPa	**TESTED BY**: Bunny Yao	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	176.00	25.3 QP	43.50	-18.20	1.41H	97	12.94	9.08	3.28	0.00	-12.36
2	308.00	22.2 QP	46.00	-23.80	1.17H	79	3.75	13.38	5.07	0.00	-18.45
3	352.00	31.0 QP	46.00	-15.00	1.05H	246	11.01	14.31	5.68	0.00	-19.99
4	396.00	30.2 QP	46.00	-15.80	1.01H	274	8.04	15.96	6.20	0.00	-22.17
5	440.00	30.3 QP	46.00	-15.70	1.00H	252	7.09	16.32	6.87	0.00	-23.20
6	460.00	33.5 QP	46.00	-12.50	1.48H	65	9.86	16.53	7.11	0.00	-23.65
7	484.00	26.5 QP	46.00	-19.50	1.07H	131	2.25	16.96	7.32	0.00	-24.29
8	572.00	30.1 QP	46.00	-15.90	1.01H	225	3.60	18.25	8.29	0.00	-26.55
9	590.00	29.6 QP	46.00	-16.40	1.65H	64	2.70	18.48	8.42	0.00	-26.90
10	748.00	32.4 QP	46.00	-13.60	1.22H	338	2.09	20.14	10.17	0.00	-30.31

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. The other emission levels were very low against the limit.

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30 deg. C, 50 % RH, 1050 hPa	**TESTED BY**: Bunny Yao	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	264.00	24.0 QP	46.00	-22.0	0.99V	3	6.68	12.89	4.44	0.00	-17.32
2	352.00	28.3 QP	46.00	-17.7	1.50V	318	8.31	14.31	5.68	0.00	-19.99
3	390.00	30.2 QP	46.00	-15.8	0.99V	102	8.40	15.68	6.12	0.00	-21.80
4	396.00	26.4 QP	46.00	-19.6	1.31V	242	4.19	15.96	6.20	0.00	-22.16
5	460.00	35.9 QP	46.00	-10.1	1.10V	119	12.26	16.53	7.11	0.00	-23.64
6	484.00	25.1 QP	46.00	-20.9	1.19V	87	0.82	16.96	7.32	0.00	-24.28
7	528.00	27.9 QP	46.00	-18.1	1.02V	164	2.45	17.62	7.82	0.00	-25.44
8	590.00	32.4 QP	46.00	-13.6	1.03V	214	5.50	18.48	8.42	0.00	-26.90
9	748.00	32.2 QP	46.00	-13.8	1.49V	99	1.89	20.14	10.17	0.00	-30.31

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. The other emission levels were very low against the limit.

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 50 % RH, 1050 hPa	**TESTED BY**: Bunny Yao	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2374.00	42.4 AV	54.00	-11.60	1.38H	125	45.42	26.90	4.98	34.90	3.02
2	2374.00	53.5 PK	74.00	-20.50	1.38H	125	56.50	26.90	4.98	34.90	3.02
3	*2412.00	102.7 AV	-	-	1.09H	126	70.50	27.11	5.10	0.00	-32.21
4	*2412.00	110.1 PK	-	-	1.09H	126	77.86	27.11	5.10	0.00	-32.21
5	4824.00	35.0 AV	54.00	-19.00	1.20H	207	31.00	31.43	7.23	34.63	-4.02
6	4824.00	46.2 PK	74.00	-27.80	1.20H	207	42.20	31.43	7.23	34.63	-4.02

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2385.00	34.5 AV	54.00	-19.50	1.31V	70	37.16	27.11	5.10	34.90	2.69
2	2385.00	46.2 PK	74.00	-27.80	1.31V	70	48.93	27.11	5.10	34.90	2.70
3	*2412.00	92.2 AV	-	-	1.30V	66	60.00	27.11	5.10	0.00	-32.22
4	*2412.00	99.2 PK	-	-	1.30V	66	66.95	27.11	5.10	0.00	-32.22
5	4824.00	35.6 AV	54.00	-18.40	1.25V	211	31.55	31.43	7.23	34.63	-4.02
6	4824.00	45.8 PK	74.00	-28.20	1.25V	211	41.80	31.43	7.23	34.63	-4.02

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. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 50 % RH, 1050 hPa	**TESTED BY**: Bunny Yao	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2379.00	39.9 AV	54.00	-14.10	1.11H	130	42.97	26.90	4.98	34.90	3.02
2	2379.00	51.6 PK	74.00	-22.40	1.11H	130	54.58	26.90	4.98	34.90	3.02
3	*2437.00	109.5 PK	-	-	1.09H	126	77.13	27.33	5.08	0.00	-32.40
4	*2437.00	102.4 AV	-	-	1.09H	126	69.96	27.33	5.08	0.00	-32.40
5	4874.00	34.9 AV	54.00	-19.10	1.11H	32	30.80	31.47	7.21	34.63	-4.05
6	4874.00	46.2 PK	74.00	-27.80	1.11H	32	42.10	31.47	7.21	34.63	-4.05

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2383.00	43.8 PK	74.00	-30.20	1.04V	113	46.44	27.11	5.10	34.90	2.69
2	2383.00	31.8 AV	54.00	-22.20	1.04V	113	34.51	27.11	5.10	34.90	2.69
3	*2437.00	92.6 AV	-	-	1.01V	116	60.19	27.33	5.08	0.00	-32.41
4	*2437.00	99.9 PK	-	-	1.01V	116	67.48	27.33	5.08	0.00	-32.41
5	4874.00	34.9 AV	54.00	-19.10	1.18V	122	30.80	31.47	7.21	34.63	-4.05
6	4874.00	45.9 PK	74.00	-28.10	1.18V	122	41.89	31.47	7.21	34.63	-4.05

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 Notebook Adapter	**MODEL**	NWP11B
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 50 % RH, 1050 hPa	**TESTED BY**: Bunny Yao	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2462.00	100.6 AV	-	-	1.00H	138	68.19	27.33	5.08	0.00	-32.40
2	*2462.00	107.5 PK	-	-	1.00H	138	75.10	27.33	5.08	0.00	-32.40
3	2500.00	40.6 AV	54.00	-13.40	1.00H	138	42.90	27.54	5.06	34.90	2.31
4	2500.00	52.2 PK	74.00	-21.80	1.00H	138	54.50	27.54	5.06	34.90	2.31
5	4924.00	34.8 AV	54.00	-19.20	1.40H	124	30.70	31.51	7.21	34.62	-4.10
6	4924.00	45.7 PK	74.00	-28.30	1.40H	124	41.56	31.51	7.21	34.62	-4.10

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2462.00	92.6 AV	-	-	1.00V	123	60.19	27.33	5.08	0.00	-32.40
2	*2462.00	99.4 PK	-	-	1.00V	123	66.97	27.33	5.08	0.00	-32.40
3	2500.00	45.9 PK	74.00	-28.10	1.00V	123	48.23	27.54	5.06	34.90	2.31
4	2500.00	35.2 AV	54.00	-18.80	1.00V	123	37.51	27.54	5.06	34.90	2.31
5	4924.00	34.7 AV	54.00	-19.30	1.42V	43	30.56	31.51	7.21	34.62	-4.10
6	4924.00	45.5 PK	74.00	-28.50	1.42V	43	41.38	31.51	7.21	34.62	-4.10

NOTE:

Emission level = Raw value - Correction Factor

3. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
1. Margin value = Emission level - Limit value
2. " * " : Fundamental frequency
3. 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
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.

4.3.3 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 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

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

4.3.6 EUT OPERATING CONDITIONS

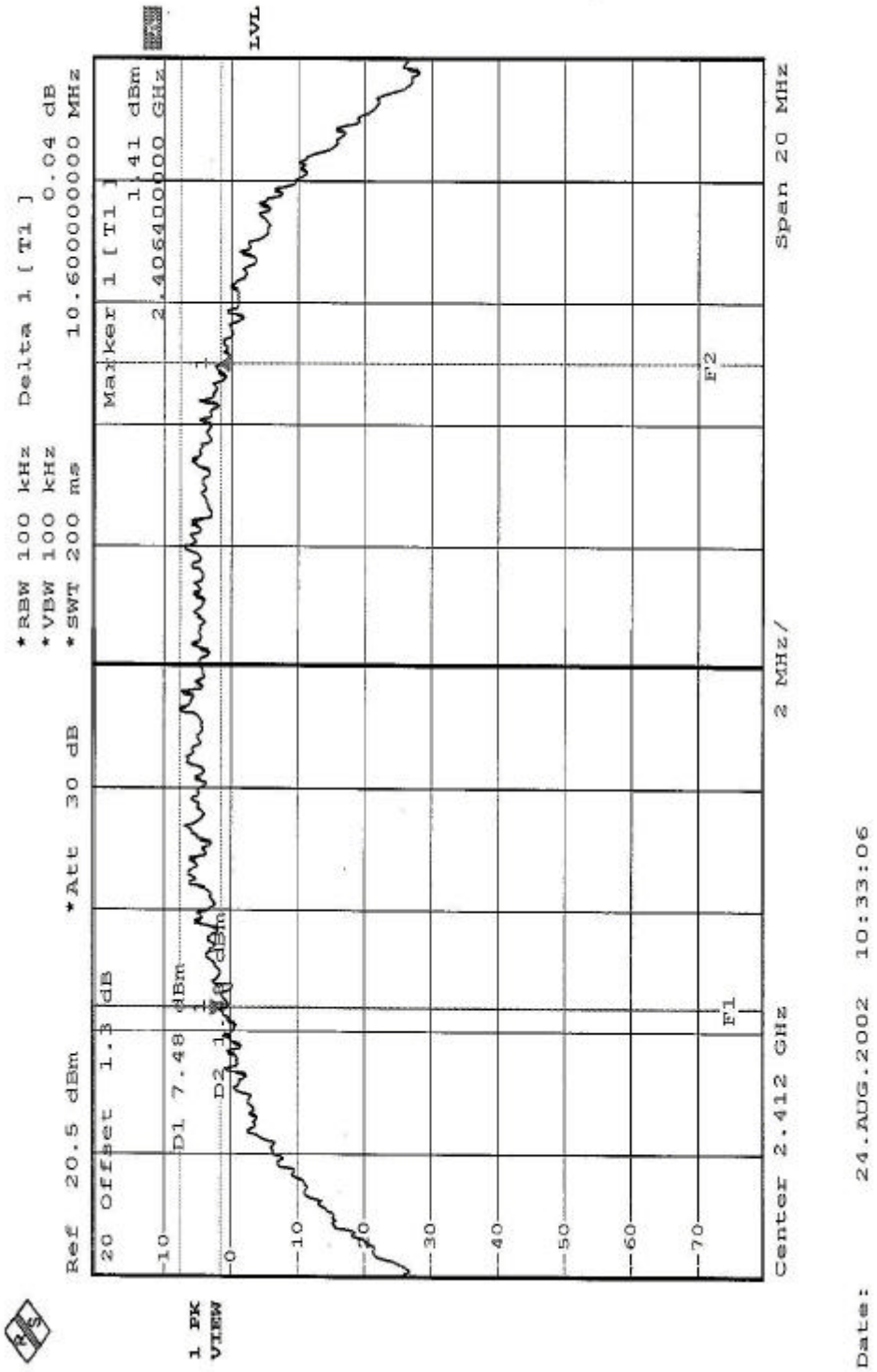
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	32 deg. C, 52%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.60	0.5	PASS
6	2437	11.04	0.5	PASS
11	2462	11.08	0.5	PASS

CH1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D2 1.41 dBm
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F2
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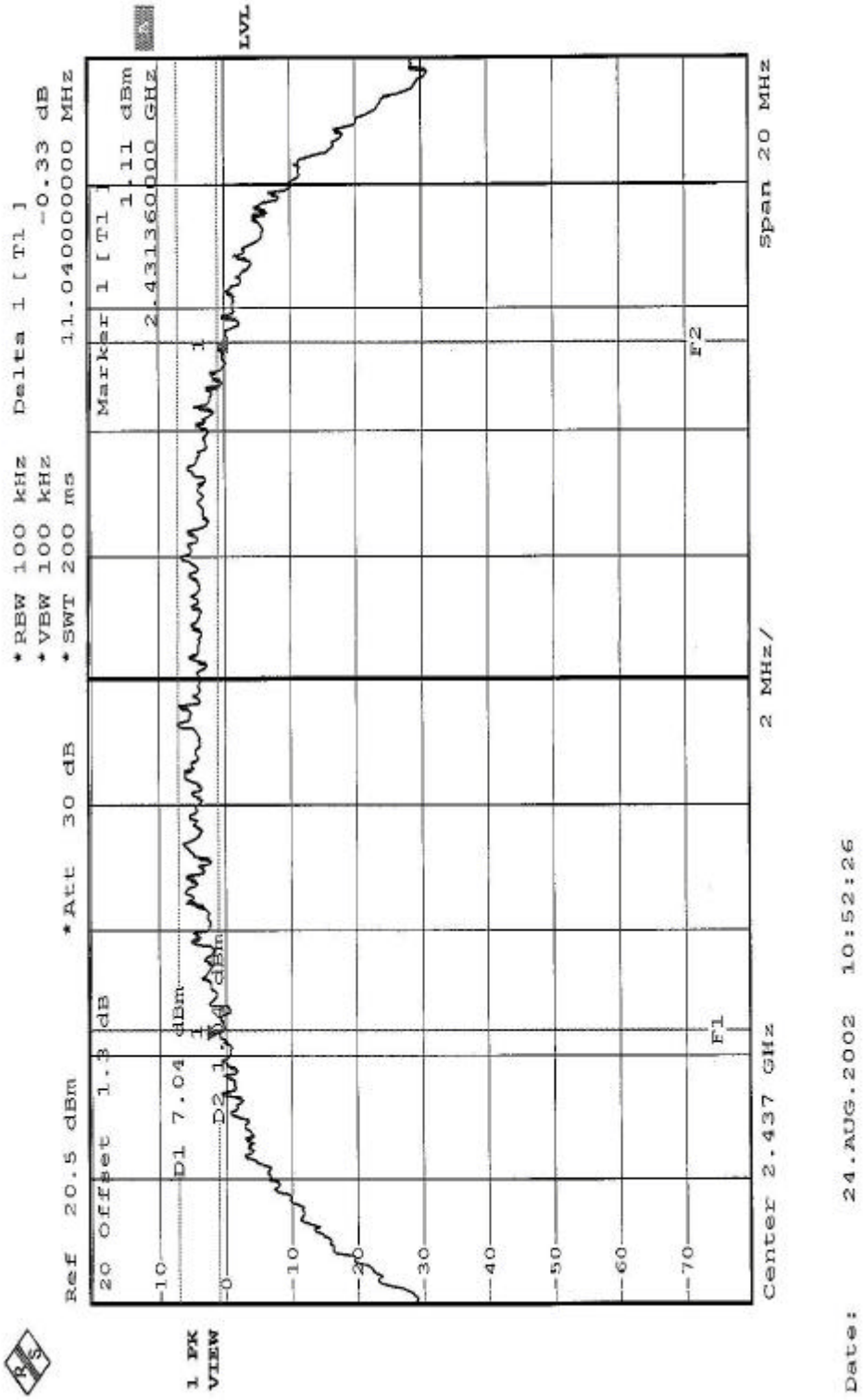
CH6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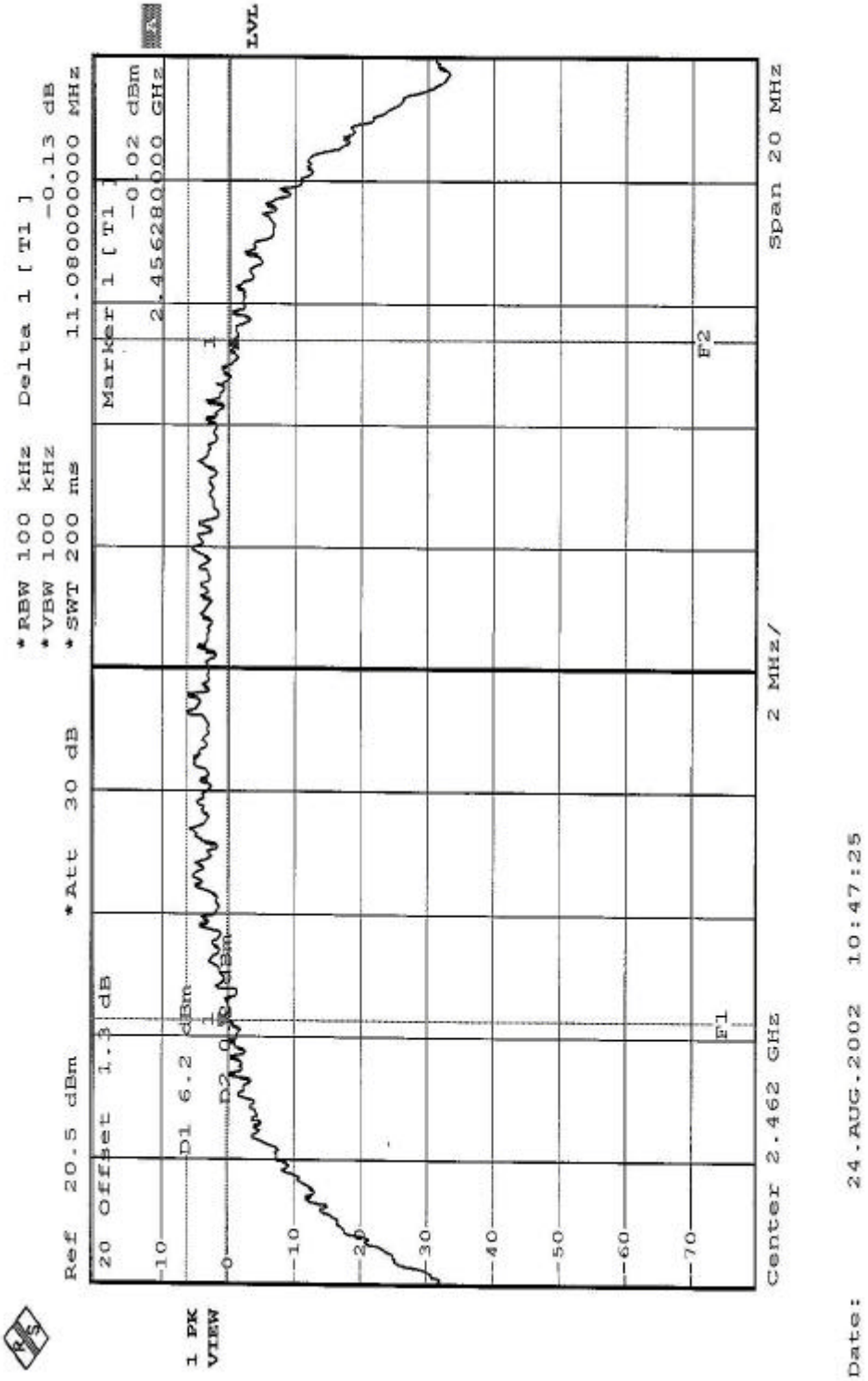
CH11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LVL
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Center 2.462 GHz
2 MHz/
Span 20 MHz
F1
F2
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4.4 MAXIMUM PEAK OUTPUT POWER

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
SINGLE CHANNEL POWER METER	NRVS	100026	Feb. 21, 2003
PEAK POWER SENSOR	NRV-Z32	100013	Feb. 21, 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.

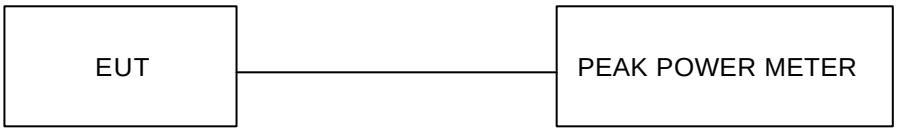
4.4.3 TEST PROCEDURES

The transmitter output was connected to the peak power meter.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	32 deg. C, 52%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.99	30	PASS
6	2437	17.54	30	PASS
11	2462	16.87	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
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.

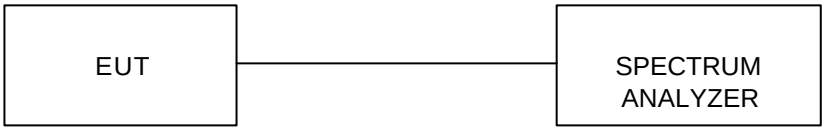
4.5.3 TEST PROCEDURE

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/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 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

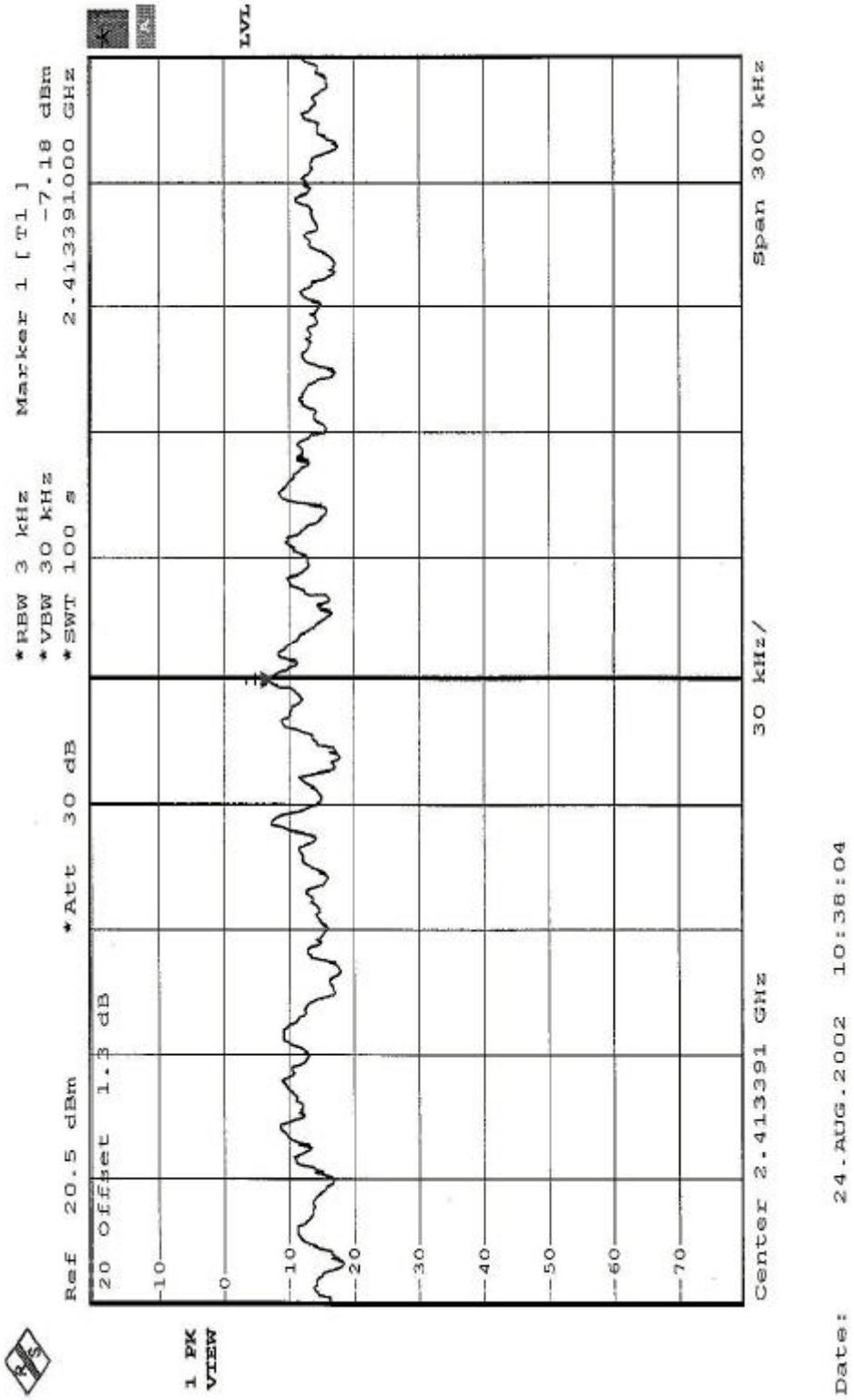
Same as 4.3.6

4.5.7 TEST RESULTS

EUT	Wireless Notebook Adapter	**MODEL**	NWP11B
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	32 deg. C, 52%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-7.18	8	PASS
6	2437	-7.39	8	PASS
11	2462	-8.33	8	PASS

CH1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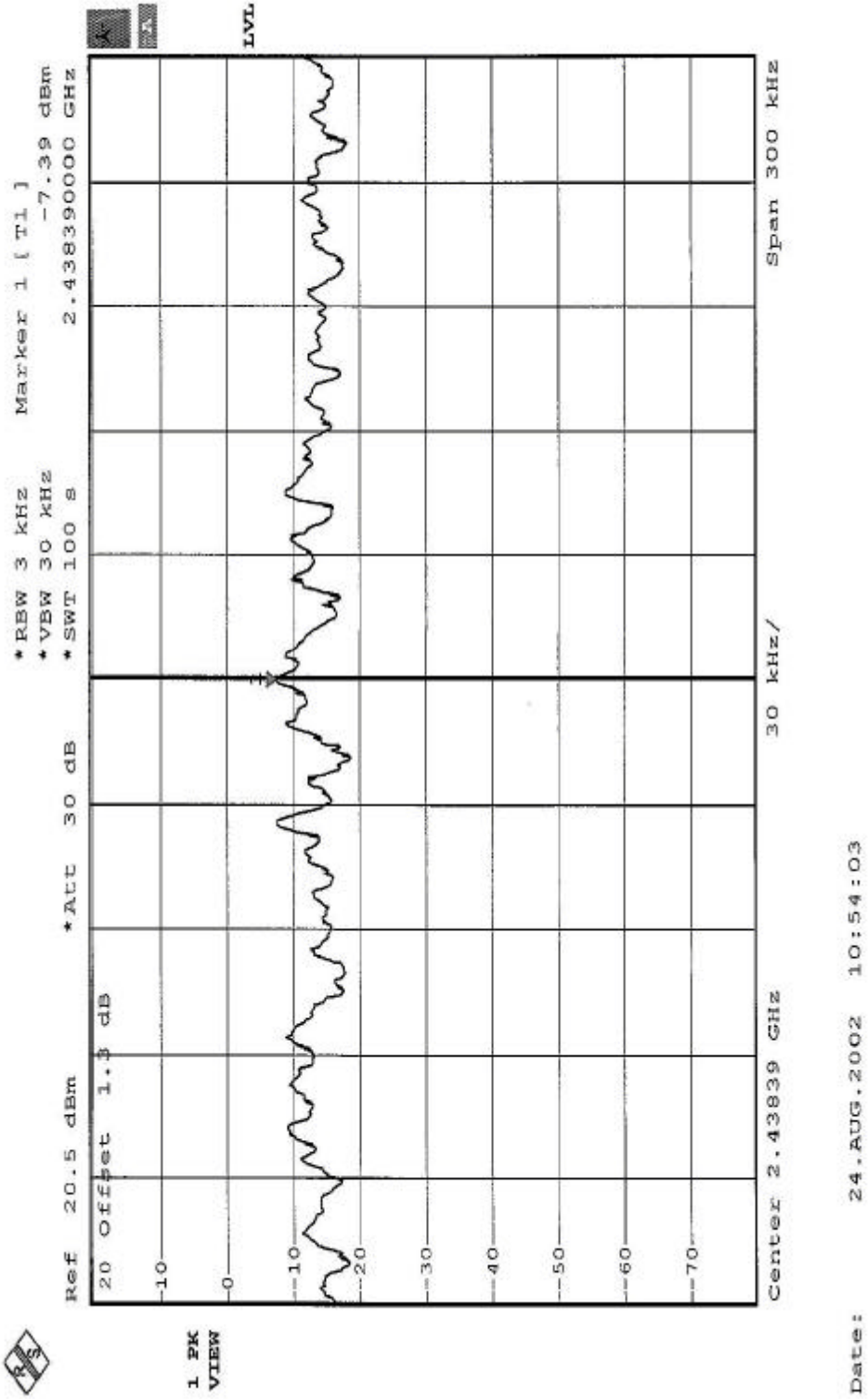
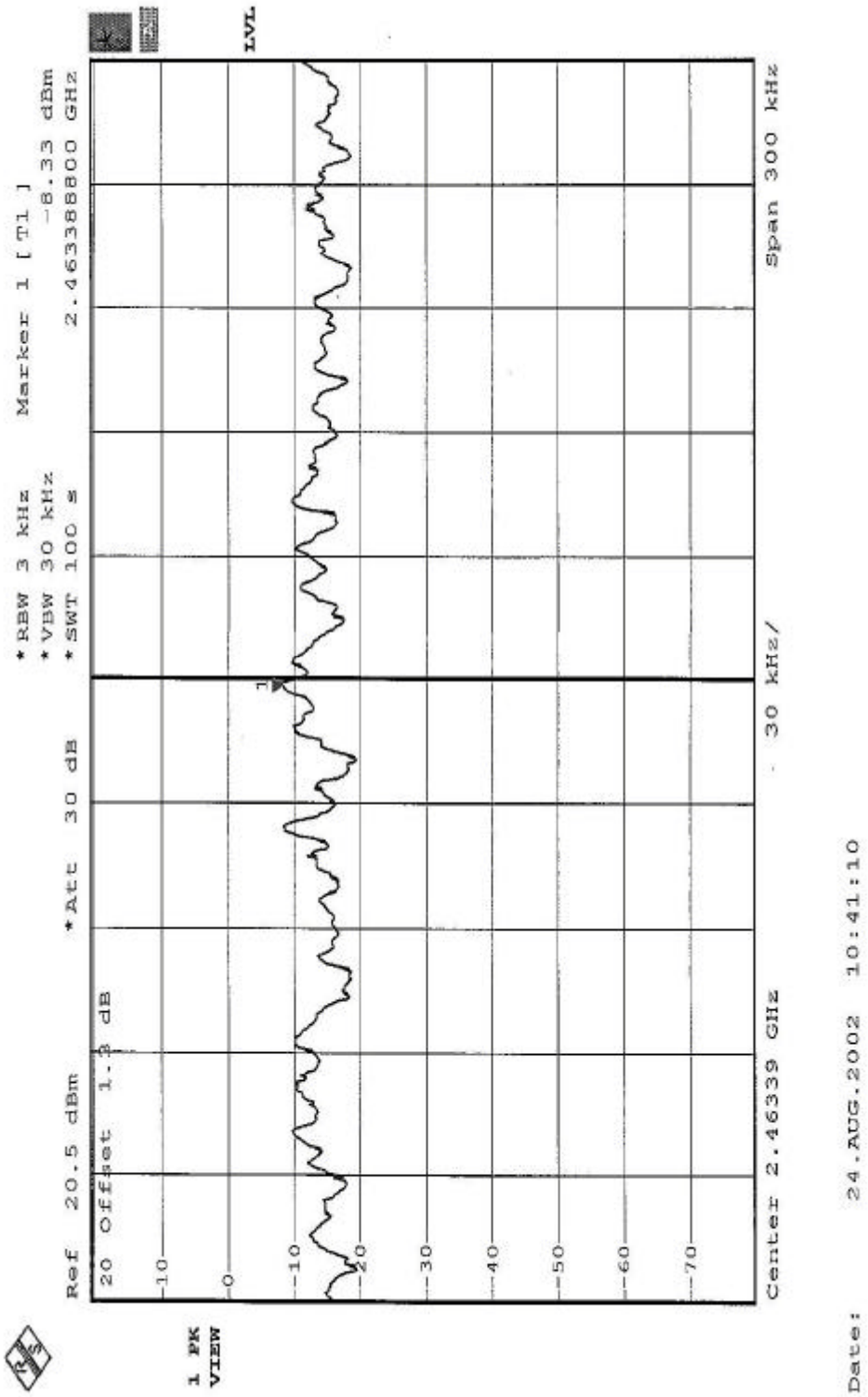
Att 30 dB
RBW 3 kHz
VBW 30 kHz
SWT 100 s
Marker 1 [T1]
-7.18 dBm
2.413391000 GHz
Offset 1.3 dB
LVL
1 PK
VIEW
Center 2.413391 GHz
30 kHz/
Span 300 kHz
Date: 24.AUG.2002 10:38:04

CH6


Ref 20.5 dBm
20 Offset 1.3 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 100 s
Marker 1 [T1]
-7.39 dBm
2.438390000 GHz
LVL
Center 2.43839 GHz
30 kHz/
Span 300 kHz
1 PK
VIEW
Date: 24.AUG.2002 10:54:03

CH11


Ref 20.5 dBm
20 Offset 1.3 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 100 s
Marker 1 [T1]
-8.33 dBm
2.46338800 GHz
LVL
1 PK
VIEW
Center 2.46339 GHz
30 kHz/
Span 300 kHz
Date: 24.AUG.2002 10:41:10

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

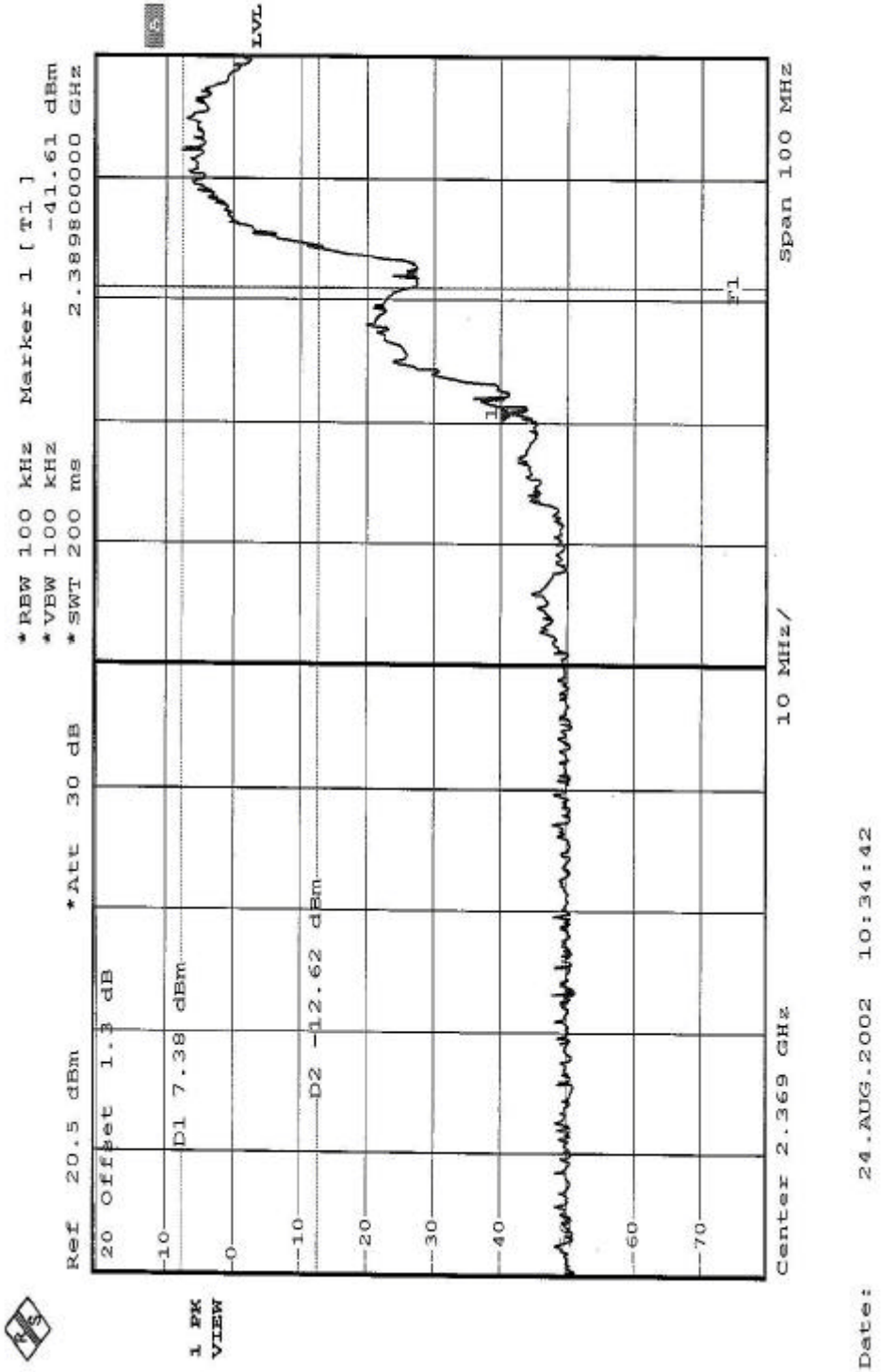
Same as Item 4.3.6

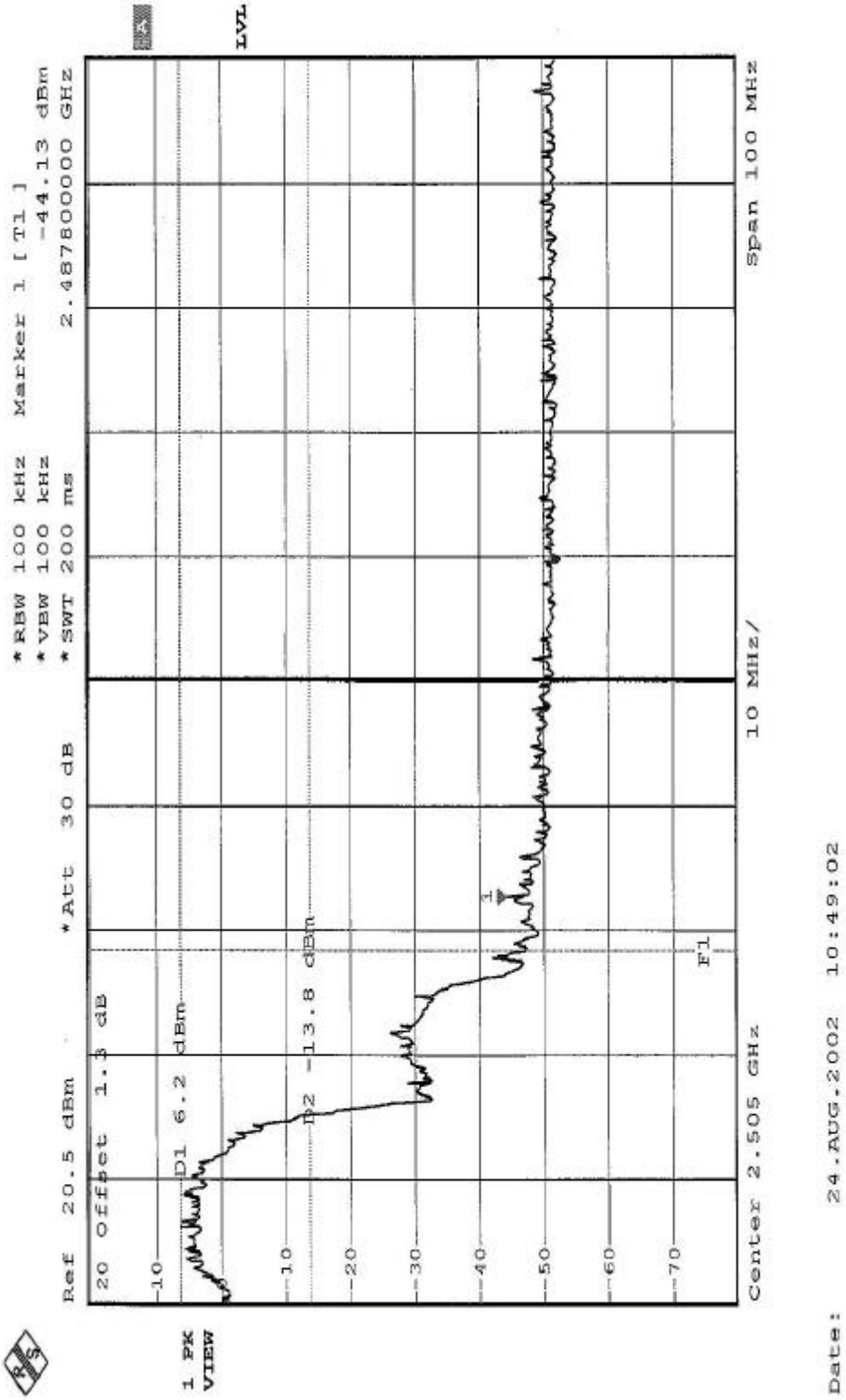
4.6.6 TEST RESULTS

The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE1: The band edge emission plot on the following first page shows 48.99dB delta between carrier maximum power and local maximum emission in restrict band (2.3898GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 102.7dBuV/m, so the maximum field strength in restrict band is 102.7-48.99=53.71 dBuV/m which is under 54 dBuV/m limit.

NOTE2: The band edge emission plot on the following second page shows 50.33dB delta between carrier maximum power and local maximum emission in restrict band (2.4878GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 100.6dBuV/m, so the maximum field strength in restrict band is 100.6-50.33=50.27 dBuV/m which is under 54 dBuV/m limit.


Ref 20.5 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 200 ms
Marker 1 [T1]
-41.61 dBm
2.38980000 GHz
Offset 1.3 dB
D1 7.38 dBm
D2 -12.62 dBm
LVL
T1
1 PK
VIEW
Center 2.369 GHz
10 MHz/
Span 100 MHz
Date: 24.AUG.2002 10:34:42


Ref 20.5 dBm
Offset 1.3 dB
* Att 30 dB
* RBW 100 kHz
* VBW 100 kHz
* SWT 200 ms
Marker 1 [T1]
-44.13 dBm
2.487800000 GHz
1 PK
VIEW
D1 6.2 dBm
D2 -13.8 dBm
F1
Center 2.505 GHz
10 MHz/
Span 100 MHz
Date: 24.AUG.2002 10:49:02

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Chip Antenna. There is no antenna connector. The maximum Gain of this antenna is 1dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST

6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.