FCC TEST REPORT

REPORT NO.: RF920529H01
MODEL NO.: MN-730
RECEIVED: May 29, 2003
TESTED: May 29 to Jun. 24, 2003

APPLICANT: Microsoft Corporation

ADDRESS: One Microsoft Way, Redmond WA 98052-6399, U.S.A

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

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Lab Code: 200376-0

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1 CERTIFICATION

PRODUCT : Microsoft Broadband Networking Wireless PCI Adapter
BRAND NAME : Microsoft
MODEL NO. : MN-730
APPLICANT : Microsoft Corporation
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 29 to Jun. 24, 2003. 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.

PREPARED BY: Amanda Chu , **DATE:** *Jun. 25, 2003*
(Amanda Chu)

APPROVED BY: _____ , **DATE:** *Jun. 25, 2003*
(Eric Lin, 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 –14.71 dBuV at 13.145 MHz
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 –2.1 dBuV at 2390.00MHz
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	Microsoft Broadband Networking Wireless PCI Adapter
MODEL NO.	MN-730
POWER SUPPLY	5VDC from host equipment
MODULATION TYPE	CCK, OFDM, DBPSK, DQPSK
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	1/2/5.5/6/9/11/12/18/24/36/48/54Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	19.38dBm
ANTENNA TYPE	Dipole Antenna
DATA CABLE	NA
I/O PORTS	PCI
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
2. The EUT complies with IEEE 802.11g draft standards, and backwards compatible with IEEE 802.11b products.
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. Transfer rate, 11Mbps with CCK technique and 54Mbps with OFDM technique, the worst case, were chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Microsoft Broadband Networking Wireless PCI Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR 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 47CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

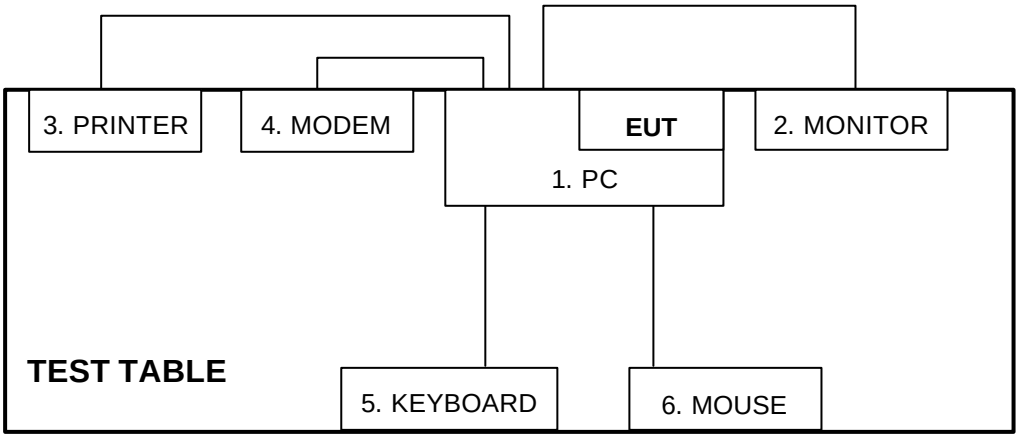
3.4 DESCRIPTION OF SUPPORT UNITS

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	PERSONAL COMPUTER	HEWLETT PACK	HP Vectra XE310	SG14902704	FCC DoC
2	MONITOR	ADI	CM100	026058T10200531	FCC DoC
3	PRINTER	EPSON	LQ-300+	DCGY017082	FCC DoC
4	MODEM	ACEEX	1414	0206026775	IFAXDM1414
5	KEYBOARD	FORWARD	FDA-104GA	FDKB 8110056	F4ZFDA-104G
6	MOUSE	DEXIN	A2P800A	80102116	NA

No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
3	1.8m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
4	1.3m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.4 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core.
6	1.4 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core.

Note: 1. All power cords of the above support units are unshielded (1.8m).



NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration in Item 5 also.

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTES: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

(3) All emanations from a class A/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.	CALIBRATION DATE
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Nov. 17, 2003
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 13, 2003
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 23, 2003
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2003
Terminator(for KYORITSU)	50	#1	Apr. 11, 2004
Software	Cond-V2e	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

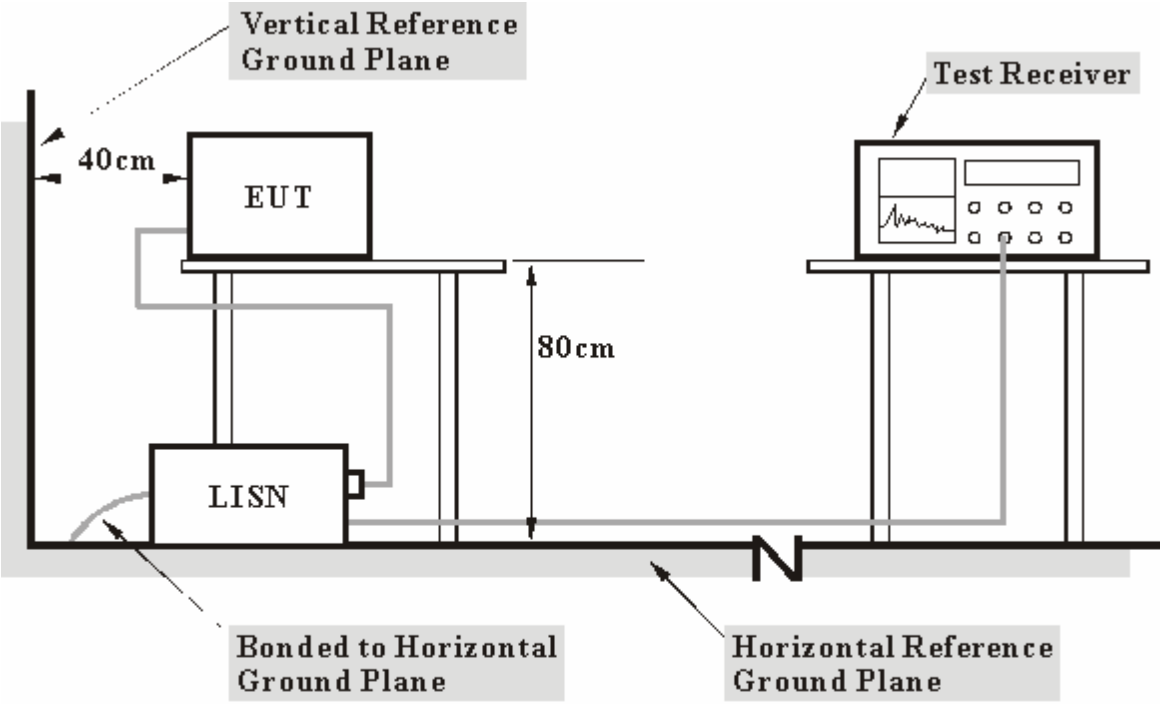
3. TEST PROCEDURES

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

4.1.3 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.

4.1.4 EUT OPERATING CONDITIONS

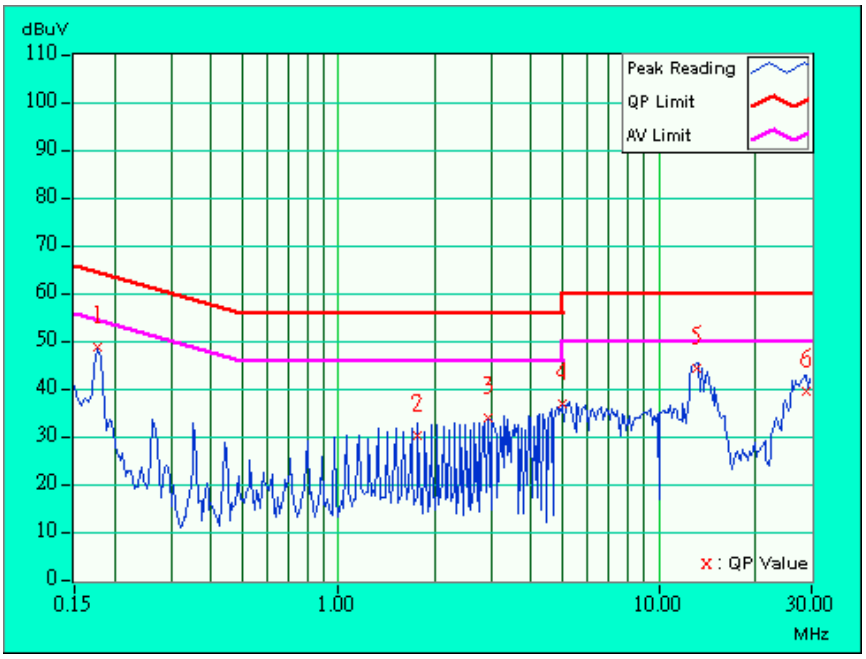
a. Plug the EUT into the support unit 1 (Personal computer) which placed on a testing table.
b. The support unit 1 (Personal computer) ran a test program "MFGTEST.EXE" to enable EUT under transmission condition continuously at specific channel frequency.

4.1.5 TEST RESULTS

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 964 hPa	**TESTED BY**	Tony Chen

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	47.82	-	47.92	-	64.61	54.61	-16.69	-
2	1.775	0.10	29.13	-	29.23	-	56.00	46.00	-26.77	-
3	2.931	0.15	33.01	-	33.16	-	56.00	46.00	-22.84	-
4	4.976	0.33	35.78	-	36.11	-	56.00	46.00	-19.89	-
5	13.152	0.73	43.25	-	43.98	-	60.00	50.00	-16.02	-
6	28.879	1.20	38.60	-	39.80	-	60.00	50.00	-20.20	-

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 964 hPa	**TESTED BY**	Tony Chen

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	46.94	-	47.04	-	64.61	54.61	-17.57	-
2	0.357	0.10	35.47	-	35.57	-	58.80	48.80	-23.23	-
3	0.447	0.10	35.20	-	35.30	-	56.93	46.93	-21.63	-
4	0.623	0.10	33.51	-	33.61	-	56.00	46.00	-22.39	-
5	13.949	0.58	41.83	-	42.41	-	60.00	50.00	-17.59	-
6	26.918	0.90	40.43	-	41.33	-	60.00	50.00	-18.67	-

NOTES: (1) "*": Undetectable
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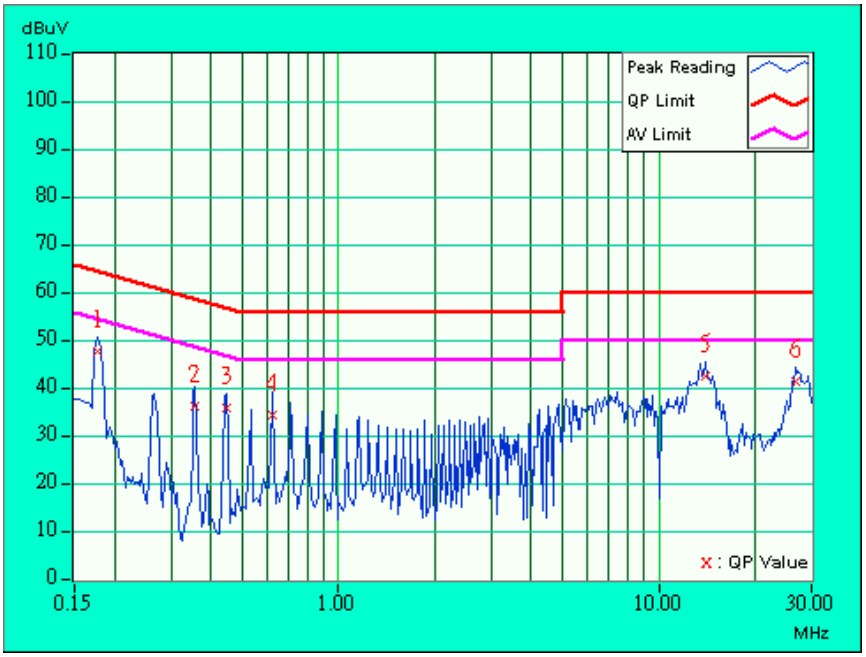
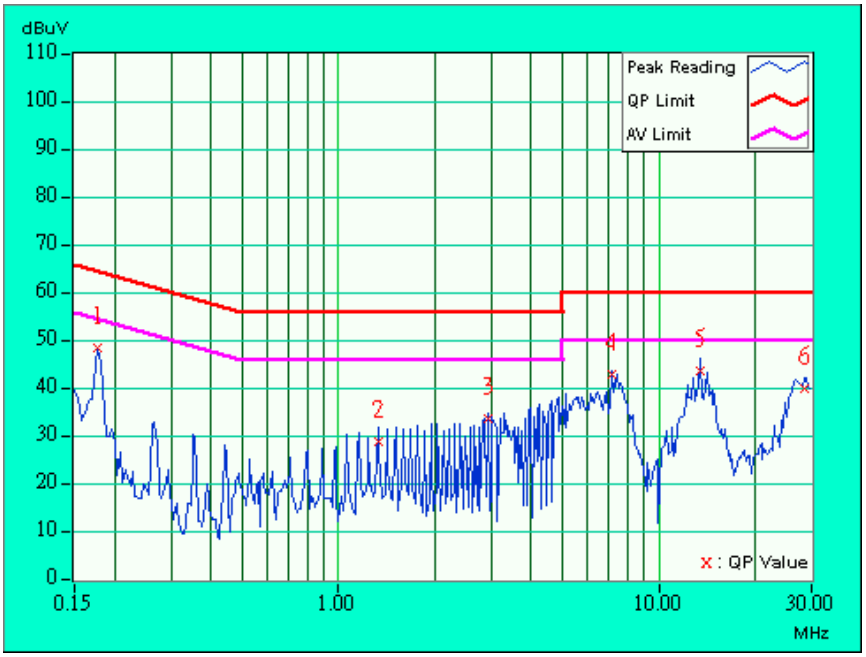
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 964 hPa	**TESTED BY**	Tony Chen

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	47.23	-	47.33	-	64.61	54.61	-17.28	-
2	1.330	0.10	27.57	-	27.67	-	56.00	46.00	-28.33	-
3	2.931	0.15	32.48	-	32.63	-	56.00	46.00	-23.37	-
4	7.105	0.46	41.68	-	42.14	-	60.00	50.00	-17.86	-
5	13.414	0.74	42.33	-	43.07	-	60.00	50.00	-16.93	-
6	28.688	1.20	38.98	-	40.18	-	60.00	50.00	-19.82	-

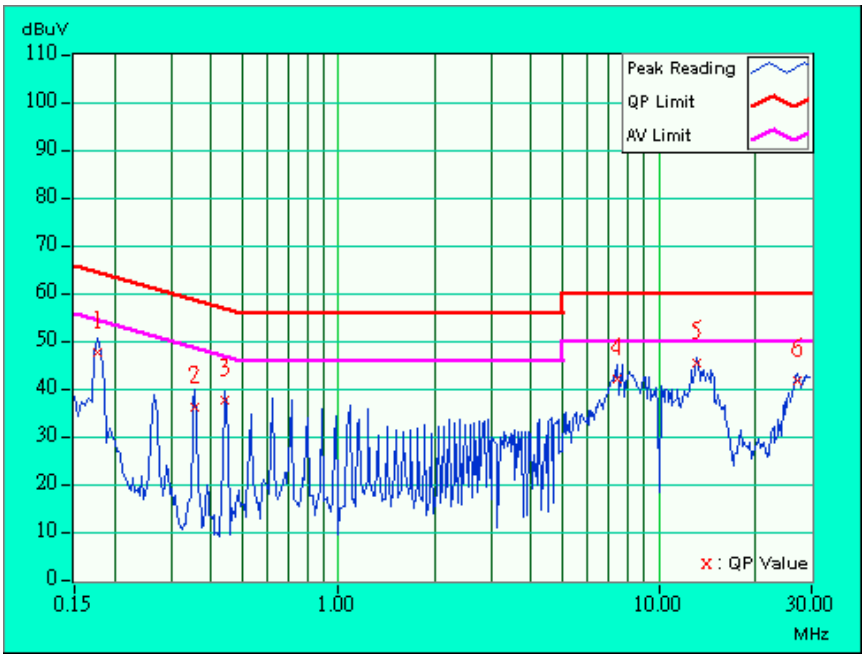
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 964 hPa	**TESTED BY**	Tony Chen

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	46.97	-	47.07	-	64.61	54.61	-17.54	-
2	0.357	0.10	35.40	-	35.50	-	58.80	48.80	-23.30	-
3	0.443	0.10	36.75	-	36.85	-	57.01	47.01	-20.16	-
4	7.461	0.43	41.22	-	41.65	-	60.00	50.00	-18.35	-
5	**13.145**	**0.56**	**44.73**	**-**	**45.29**	**-**	**60.00**	**50.00**	**-14.71**	**-**
6	27.176	0.90	41.02	-	41.92	-	60.00	50.00	-18.08	-

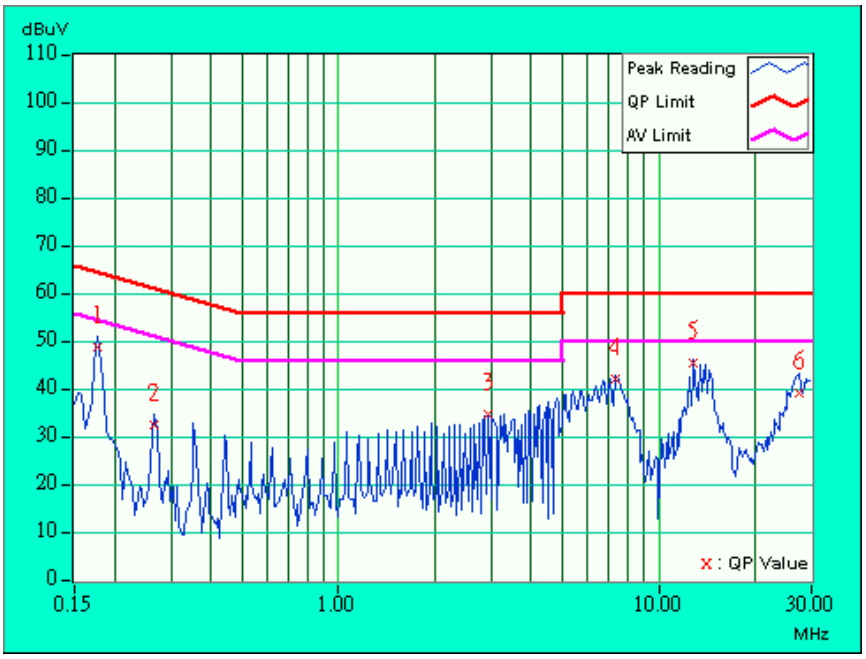
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 964 hPa	**TESTED BY**	Tony Chen

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	47.66	-	47.76	-	64.61	54.61	-16.85	-
2	0.267	0.10	31.48	-	31.58	-	61.20	51.20	-29.62	-
3	2.931	0.15	33.62	-	33.77	-	56.00	46.00	-22.23	-
4	7.285	0.47	40.88	-	41.35	-	60.00	50.00	-18.65	-
5	12.879	0.72	44.19	-	44.91	-	60.00	50.00	-15.09	-
6	27.449	1.20	38.19	-	39.39	-	60.00	50.00	-20.61	-

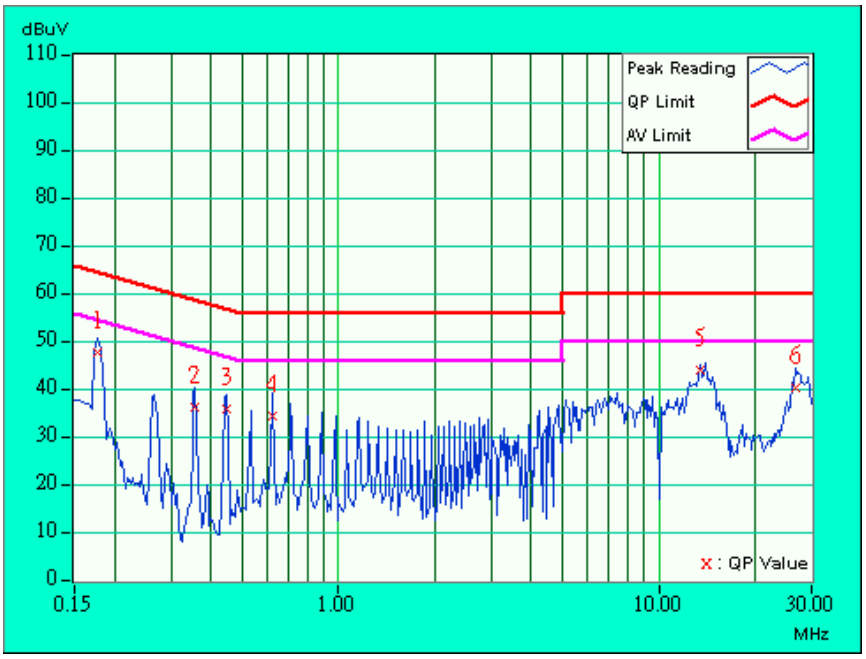
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 964 hPa	**TESTED BY**	Tony Chen

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	46.93	-	47.03	-	64.61	54.61	-17.58	-
2	0.357	0.10	35.54	-	35.64	-	58.80	48.80	-23.16	-
3	0.447	0.10	35.21	-	35.31	-	56.93	46.93	-21.62	-
4	0.623	0.10	33.46	-	33.56	-	56.00	46.00	-22.44	-
5	13.504	0.57	43.22	-	43.79	-	60.00	50.00	-16.21	-
6	26.918	0.90	39.30	-	40.20	-	60.00	50.00	-19.80	-

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit 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 (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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	8594ER	3829U04676	Jul. 14, 2003
ADVANTEST Spectrum Analyzer	R3271A	85060311	May 21, 2004
CHASE RF Pre_Amplifier	CPA9232	1057	Apr. 24, 2004
HP Pre_Amplifier	8449B	3008A01281	June 27, 2004
ROHDE & SCHWARZ Test Receiver	ESVS 10	849231 /019	Nov. 03, 2003
CHASE Broadband Antenna	CBL6111c	2730	Jul 17, 2003
Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Jul. 31, 2003
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
RF Switches (ARNITSU)	CS-201	1565157	Jul. 29, 2003
RF CABLE (Chaintek) 1GHz-20GHz	Ak 9515-D	001	Aug, 20.2003
RF Cable(RICHTEC)	9913-30M	STCCAB-30M-1GHz-021	Nov. 5, 2003
Software	AS60P8	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. C.
5. The FCC Site Registration No. is 656396.
6. The VCCI Site Registration No. is R-1626.

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.

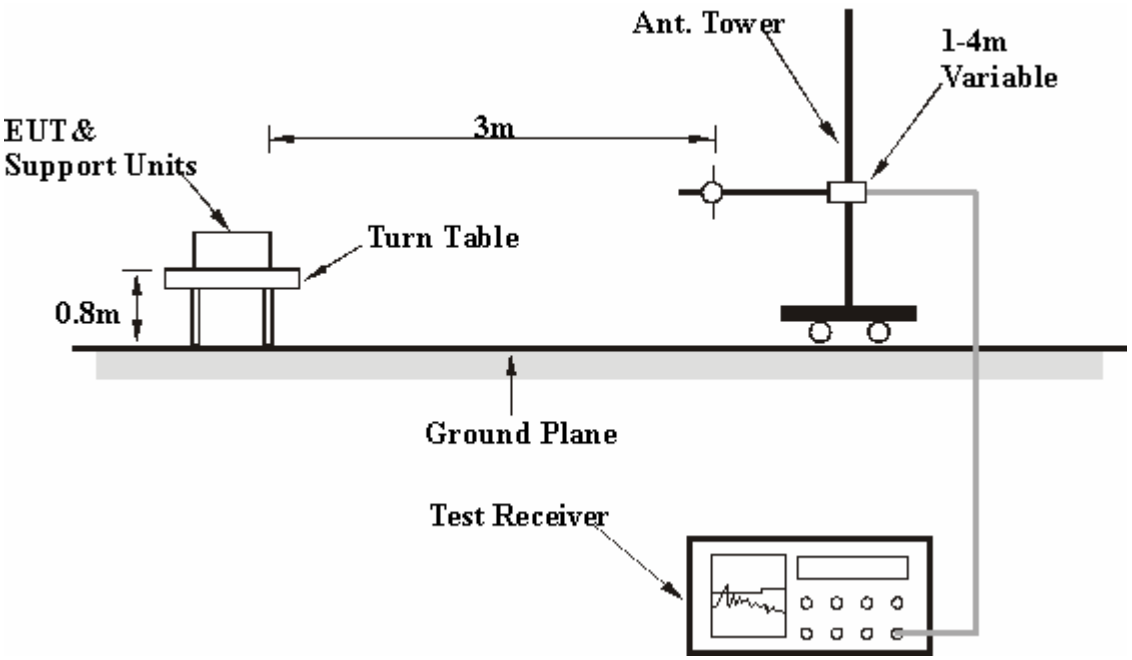
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21 deg. C, 57 % RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	35.25	30.2 QP	40.00	-9.80	1.26 H	170	13.70	16.60
2	64.00	25.9 QP	40.00	-14.10	1.67 H	273	20.60	5.20
3	120.47	21.4 QP	43.50	-22.10	1.23 H	58	9.70	11.70
4	258.05	23.4 QP	46.00	-22.60	1.52 H	168	9.20	14.20
5	263.80	20.6 QP	46.00	-25.40	1.27 H	1	6.50	14.10
6	288.05	22.1 QP	46.00	-23.90	1.25 H	319	8.30	13.80
7	399.75	27.1 QP	46.00	-18.90	1.67 H	0	10.10	17.00
8	433.88	31.1 QP	46.00	-14.90	1.49 H	7	13.20	18.00
9	499.89	31.3 QP	46.00	-14.70	1.23 H	0	12.00	19.30
10	598.87	31.8 QP	46.00	-14.20	1.44 H	73	10.90	20.90

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)	Correction Factor (dB/m)
1	37.13	28.4 QP	40.00	-11.60	1.38 V	322	12.90	15.60
2	64.00	21.8 QP	40.00	-18.20	1.29 V	350	16.60	5.20
3	121.94	21.6 QP	43.50	-21.90	1.02 V	86	9.80	11.80
4	127.62	22.7 QP	43.50	-20.80	1.34 V	72	10.70	12.00
5	250.39	22.4 QP	46.00	-23.60	1.30 V	97	9.10	13.30
6	263.94	22.9 QP	46.00	-23.10	1.25 V	0	8.80	14.10
7	320.36	21.4 QP	46.00	-24.60	1.14 V	59	6.90	14.60
8	402.56	26.8 QP	46.00	-19.20	1.38 V	9	9.70	17.10
9	486.80	28.3 QP	46.00	-17.70	1.52 V	309	9.30	19.00
10	525.40	29.1 QP	46.00	-16.90	1.37 V	211	9.40	19.60

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247

4.2.7 TEST RESULTS - DSSS

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average(AV)
ENVIRONMENTAL CONDITIONS	21 deg. C, 58%RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	2390.00	55.6 PK	74.00	-18.40	1.20 H	7	25.80	29.80
1	2390.00	44.5 AV	54.00	-9.50	1.20 H	7	14.70	29.80
2	*2412.00	102.3 PK			1.16 H	2	72.40	29.90
2	*2412.00	91.8 AV			1.16 H	2	61.90	29.90
3	4824.00	41.1 PK	74.00	-32.90	1.20 H	101	4.80	36.20
4	7236.00	47.0 PK	74.00	-27.00	1.30 H	2	5.30	41.70

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)	Correction Factor (dB/m)
1	2390.00	56.8 PK	74.00	-17.20	1.43 V	46	27.00	29.80
1	2390.00	47.4 AV	54.00	-6.60	1.43 V	46	17.60	29.80
2	*2412.00	110.4 PK			1.38 V	30	80.50	29.90
2	*2412.00	102.7 AV			1.38 V	30	72.80	29.90
3	4824.00	44.3 PK	74.00	-29.70	1.44 V	12	8.10	36.20
4	7236.00	49.8 PK	74.00	-24.20	1.39 V	70	8.10	41.70

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21 deg. C, 58%RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	2390.00	51.1 PK	74.00	-22.90	1.02 H	1	21.30	29.80
1	2390.00	41.8 AV	54.00	-12.20	1.02 H	1	12.00	29.80
2	*2437.00	99.9 PK			1.21 H	34	69.90	30.00
2	*2437.00	89.7 AV			1.21 H	34	59.70	30.00
3	2484.00	51.7 PK	74.00	-22.30	1.34 H	347	21.60	30.10
3	2484.00	41.3 AV	54.00	-12.70	1.34 H	347	11.20	30.10
4	4874.00	40.5 PK	74.00	-33.50	1.11 H	24	4.10	36.50
5	7311.00	46.9 PK	74.00	-27.10	1.10 H	47	5.10	41.80

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)	Correction Factor (dB/m)
1	2390.00	54.1 PK	74.00	-19.90	1.18 V	2	24.30	29.80
1	2390.00	44.0 AV	54.00	-10.00	1.18 V	2	14.20	29.80
2	*2437.00	109.6 PK			1.57 V	29	79.60	30.00
2	*2437.00	99.4 AV			1.57 V	29	69.40	30.00
3	2484.00	54.4 PK	74.00	-19.60	1.40 V	20	24.30	30.10
3	2484.00	44.4 AV	54.00	-9.60	1.40 V	20	14.20	30.10
4	4874.00	42.5 PK	74.00	-31.50	1.02 V	32	6.00	36.50
5	7311.00	48.4 PK	74.00	-25.60	1.20 V	4	6.70	41.80

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21 deg. C, 58%RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	*2462.00	99.1 PK			1.21 H	59	69.00	30.10
1	*2462.00	89.8 AV			1.21 H	59	59.70	30.10
2	2484.00	54.7 PK	74.00	-19.30	1.28 H	357	24.60	30.10
2	2484.00	44.8 AV	54.00	-9.20	1.28 H	357	14.70	30.10
3	4924.00	41.2 PK	74.00	-32.80	1.01 H	38	4.50	36.70
4	7386.00	47.3 PK	74.00	-26.70	1.11 H	3	5.50	41.80

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)	Correction Factor (dB/m)
1	*2462.00	109.4 PK			1.22 V	26	79.30	30.10
1	*2462.00	100.0 AV			1.22 V	26	69.90	30.10
2	2484.00	57.4 PK	74.00	-16.60	1.21 V	5	27.30	30.10
2	2484.00	48.8 AV	54.00	-5.20	1.21 V	5	18.70	30.10
3	4924.00	43.8 PK	74.00	-30.20	1.42 V	15	7.10	36.70
4	7386.00	49.8 PK	74.00	-24.20	1.38 V	59	8.00	41.80

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

4.2.8 TEST RESULTS -OFDM

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average(AV)
ENVIRONMENTAL CONDITIONS	21 deg. C, 57%RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	2390.00	59.4 PK	74.00	-14.60	1.23 H	260	29.60	29.80
1	2390.00	48.1 AV	54.00	-5.90	1.23 H	260	18.30	29.80
2	*2412.00	98.1 PK			1.20 H	324	68.20	29.90
2	*2412.00	89.5 AV			1.20 H	324	59.60	29.90
3	4824.00	50.2 PK	74.00	-23.80	1.02 H	32	14.00	36.20
4	7236.00	47.2 PK	74.00	-26.80	1.25 H	360	5.50	41.70

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)	Correction Factor (dB/m)
1	2390.00	64.7 PK	74.00	-9.30	1.06 V	358	34.90	29.80
1	**2390.00**	**51.9 AV**	**54.00**	**-2.10**	**1.06 V**	**358**	**22.10**	**29.80**
2	*2412.00	105.2 PK			1.31 V	260	75.30	29.90
2	*2412.00	96.7 AV			1.31 V	260	66.80	29.90
3	4824.00	52.3 PK	74.00	-21.70	1.25 V	47	16.10	36.20
3	4824.00	42.9 AV	54.00	-11.10	1.25 V	47	6.70	36.20
4	7236.00	44.0 PK	74.00	-30.00	1.00 V	6	2.30	41.70

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21 deg. C, 58%RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	2390.00	51.2 PK	74.00	-22.80	1.21 H	360	21.40	29.80
1	2390.00	41.0 AV	54.00	-13.00	1.21 H	360	11.20	29.80
2	*2437.00	102.0 PK			1.03 H	45	72.00	30.00
2	*2437.00	91.0 AV			1.03 H	45	61.00	30.00
3	2484.00	51.1 PK	74.00	-22.90	1.02 H	30	21.00	30.10
3	2484.00	41.3 AV	54.00	-12.70	1.02 H	30	11.20	30.10
4	4874.00	43.0 PK	74.00	-31.00	1.35 H	2	6.60	36.50
5	7311.00	48.2 PK	74.00	-25.80	1.02 H	32	6.40	41.80

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)	Correction Factor (dB/m)
1	2390.00	53.1 PK	74.00	-20.90	1.25 V	37	23.30	29.80
1	2390.00	44.0 AV	54.00	-10.00	1.25 V	37	14.20	29.80
2	*2437.00	109.2 PK			1.02 V	47	79.30	30.00
2	*2437.00	99.9 AV			1.02 V	47	69.90	30.00
3	2484.00	53.3 PK	74.00	-20.70	1.33 V	360	23.20	30.10
3	2484.00	44.2 AV	54.00	-9.80	1.33 V	360	14.00	30.10
4	4874.00	45.3 PK	74.00	-28.70	1.00 V	2	8.90	36.50
5	7311.00	48.6 PK	74.00	-25.40	1.03 V	250	6.80	41.80

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21 deg. C, 58%RH, 964 hPa	**TESTED BY**	Eric Lee

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)	Correction Factor (dB/m)
1	*2462.00	102.3 PK			1.03 H	43	72.20	30.10
1	*2462.00	92.0 AV			1.03 H	43	61.90	30.10
2	2484.00	58.8 PK	74.00	-15.20	1.38 H	10	28.70	30.10
2	2484.00	46.9 AV	54.00	-7.10	1.38 H	10	16.70	30.10
3	4924.00	42.7 PK	74.00	-31.30	1.00 H	3	6.00	36.70
4	7386.00	47.3 PK	74.00	-26.70	1.09 H	18	5.50	41.80

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)	Correction Factor (dB/m)
1	*2462.00	110.5 PK			1.24 V	18	80.40	30.10
1	*2462.00	100.2 AV			1.24 V	18	70.10	30.10
2	2484.00	60.3 PK	74.00	-13.70	1.20 V	344	30.10	30.10
2	2484.00	50.6 AV	54.00	-3.40	1.20 V	344	20.40	30.10
3	4924.00	46.1 PK	74.00	-27.90	1.31 V	1	9.40	36.70
4	7386.00	48.9 PK	74.00	-25.10	1.00 V	240	7.10	41.80

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
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	FSP	1093.4495.30	Dec. 19, 2003

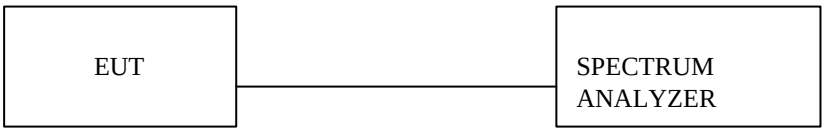
NOTE:

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 TEST SETUP



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

4.3.5 EUT OPERATING CONDITIONS

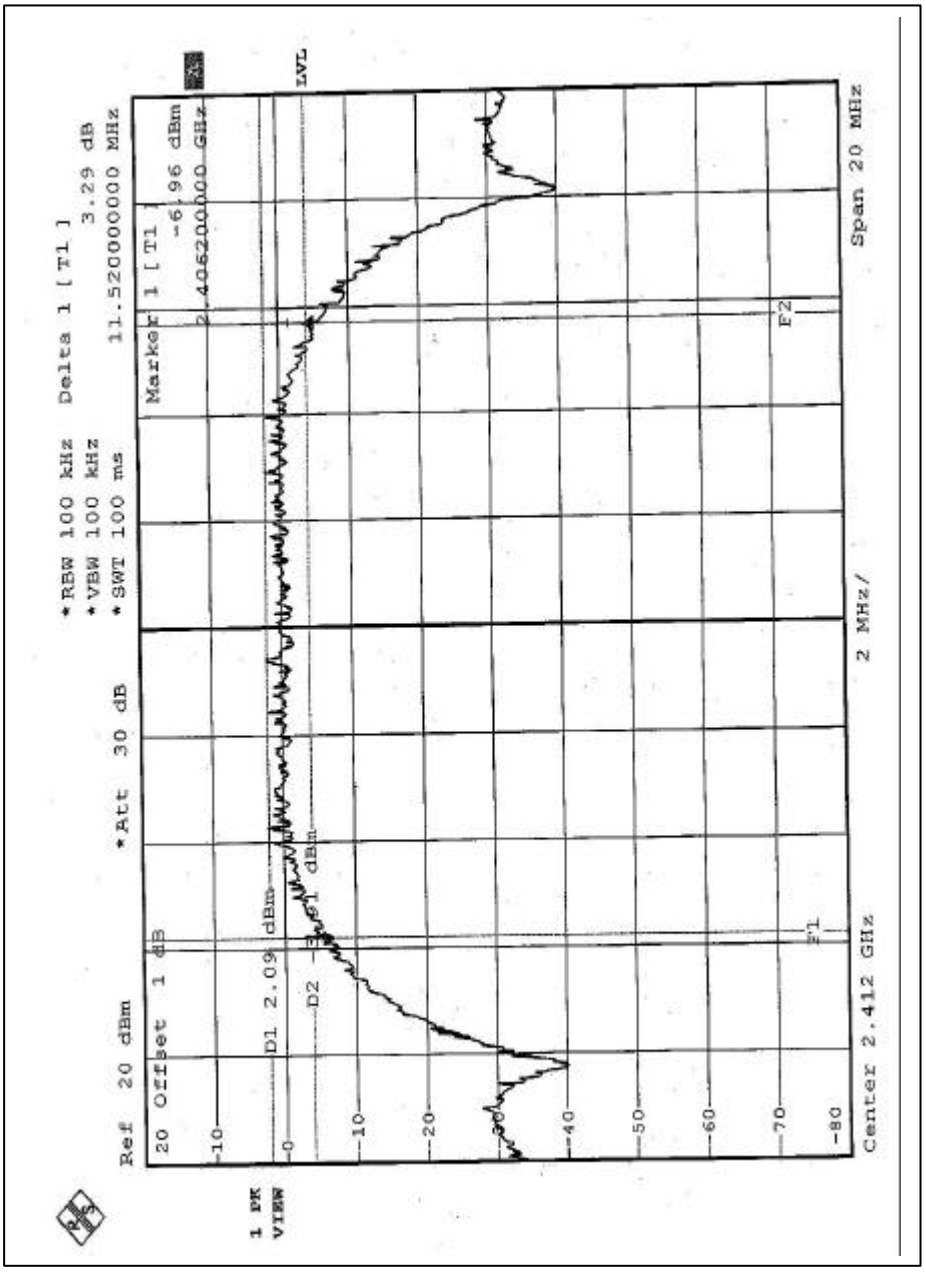
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS-DSSS

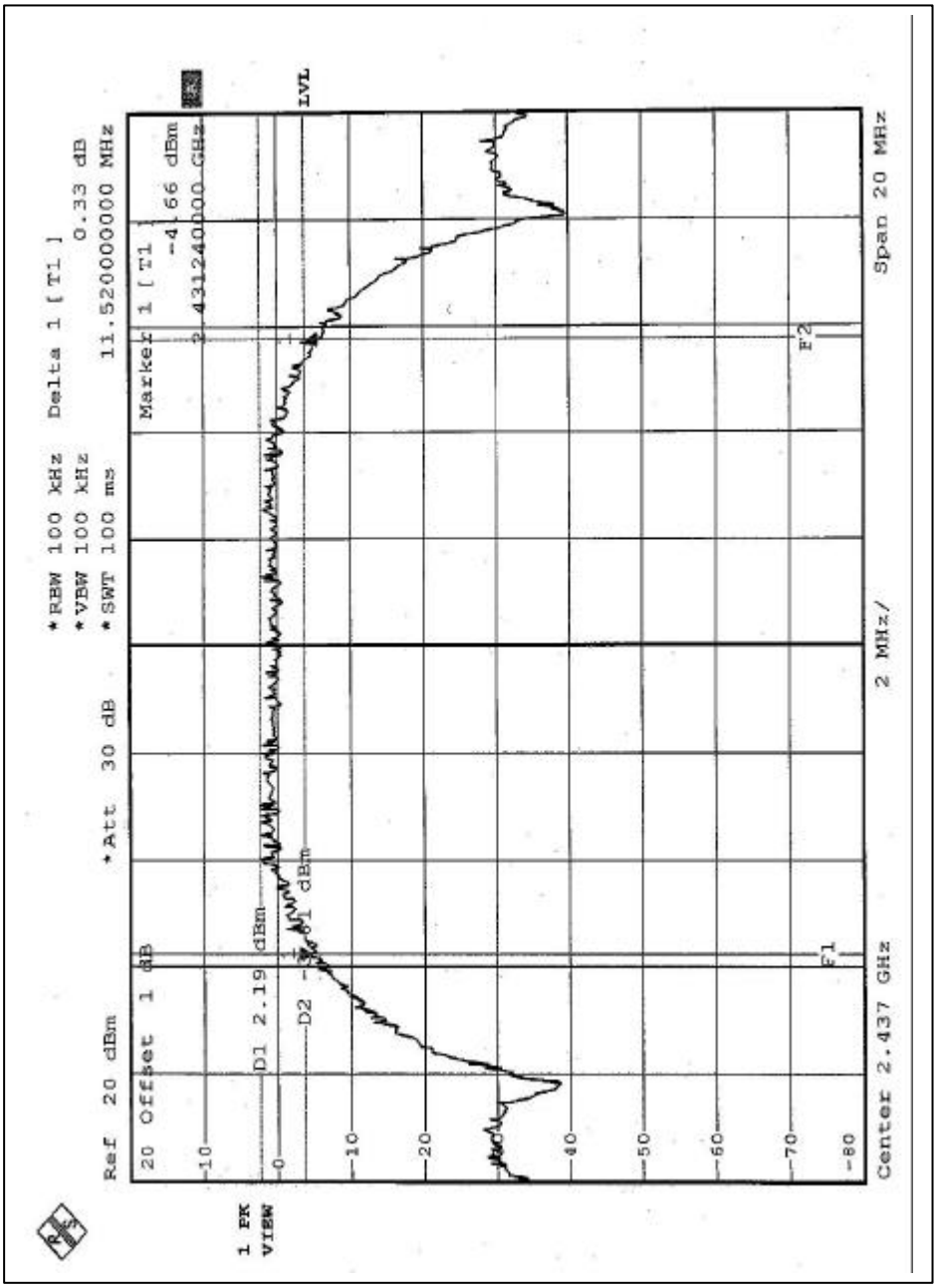
EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 56 %RH, 964 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.52	0.5	PASS
6	2437	11.52	0.5	PASS
11	2462	11.16	0.5	PASS

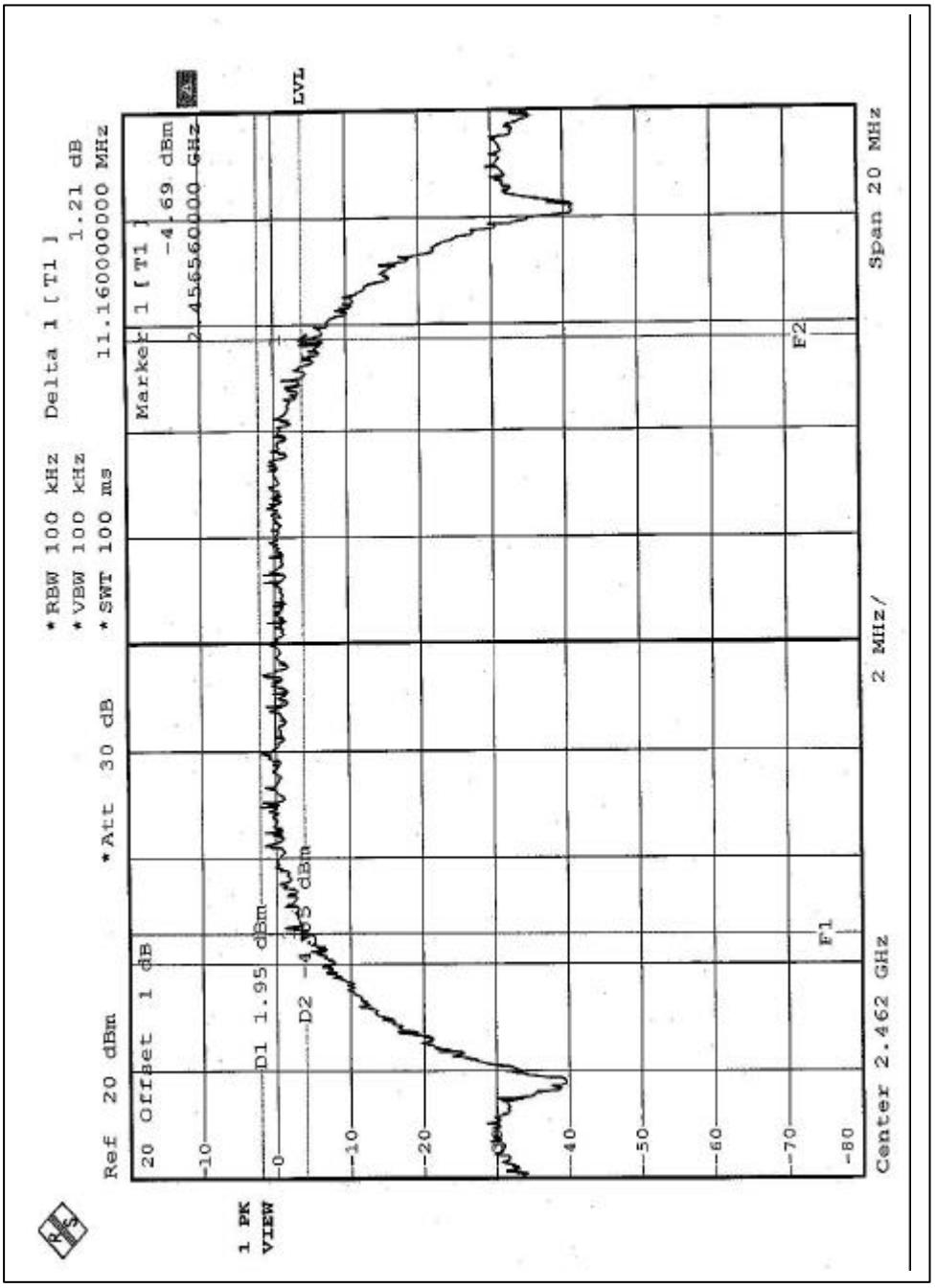
CH1


Ref 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 1 [T1]
3.29 dB
11.52000000 MHz
Marker 1 [T1
-6.96 dBm
2.40620000 GHz
20 Offset 1 dB
D1 2.09 dBm
D2 1 dBm
1 PK
VIEW
LVL
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


Ref 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 1 [T1]
0.33 dB
11.52000000 MHz
Marker 1 [T1]
-4.66 dBm
2.431240000 GHz
20 Offset 1 dB
D1 2.19 dBm
D2 -1.01 dBm
1 PK
VIEW
LVL
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11

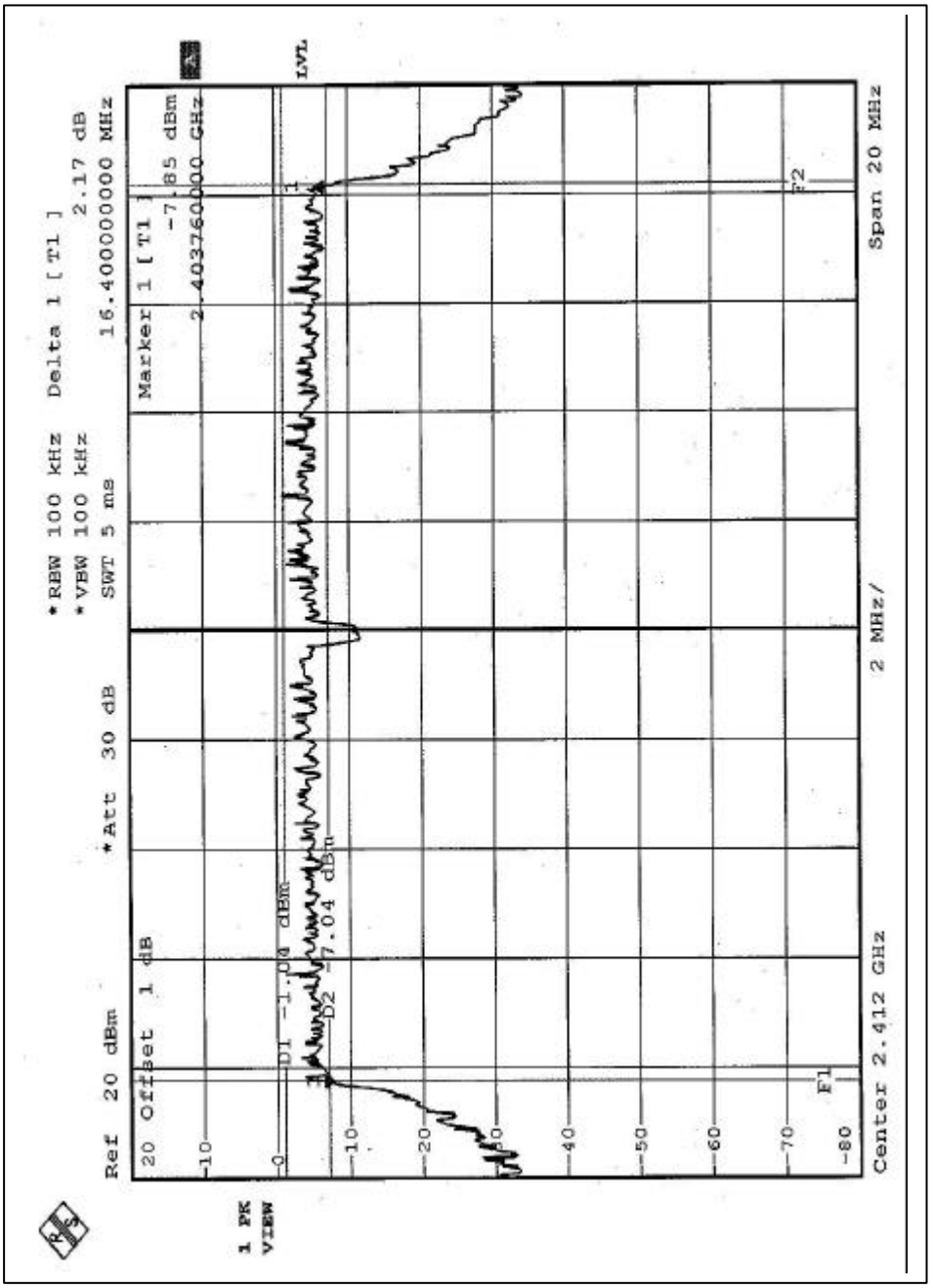

Ref 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 1 [T1]
1.21 dB
11.16000000 MHz
Marker 1 [T1]
-4.69 dBm
2.45560000 GHz
Offset 1 dB
1 PK
VIEW
D1 1.95 dBm
D2 -4.65 dBm
LVL
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

4.3.7 TEST RESULTS-OFDM

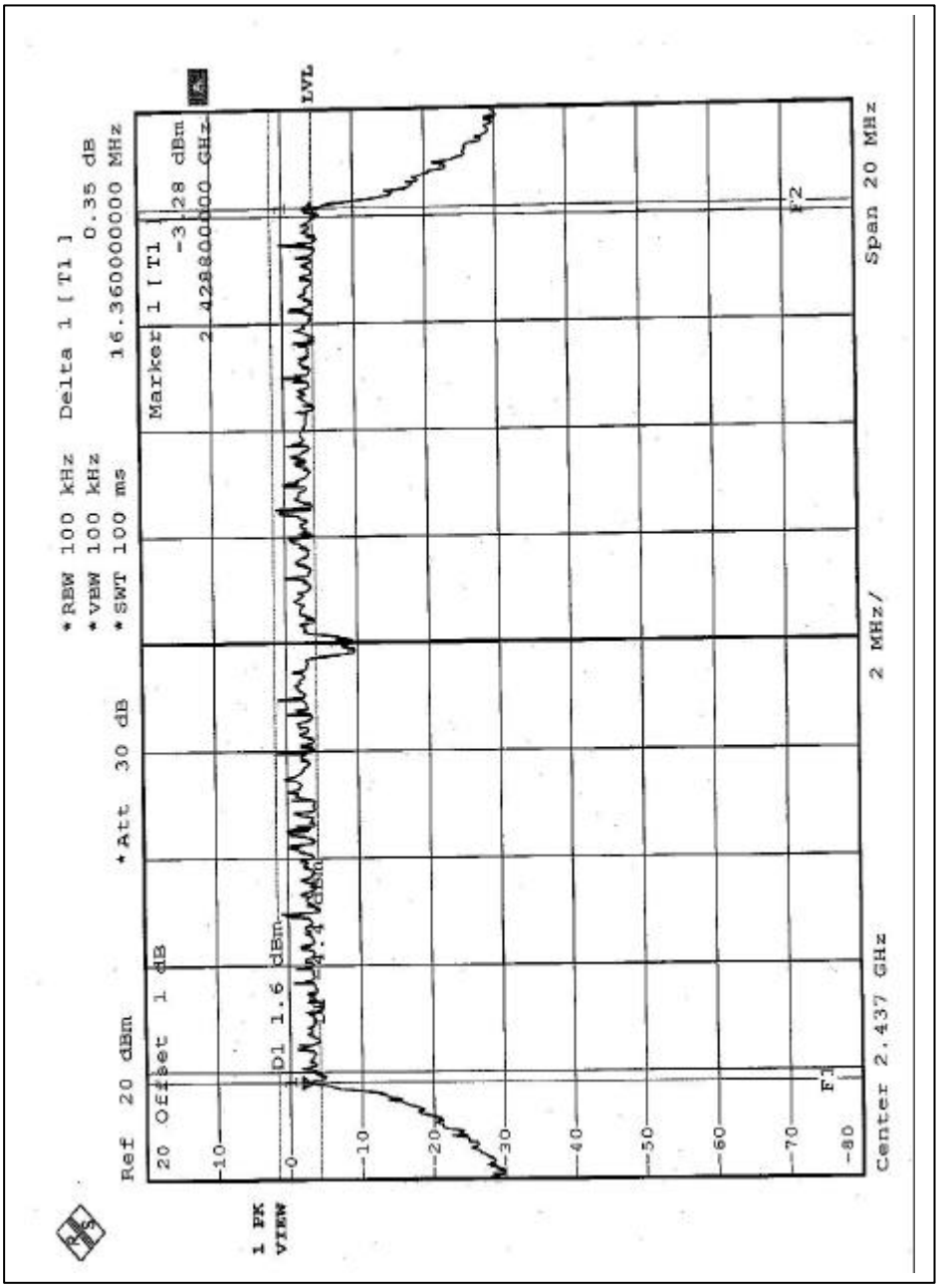
EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 56 %RH, 964 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.40	0.5	PASS
6	2437	16.36	0.5	PASS
11	2462	16.32	0.5	PASS

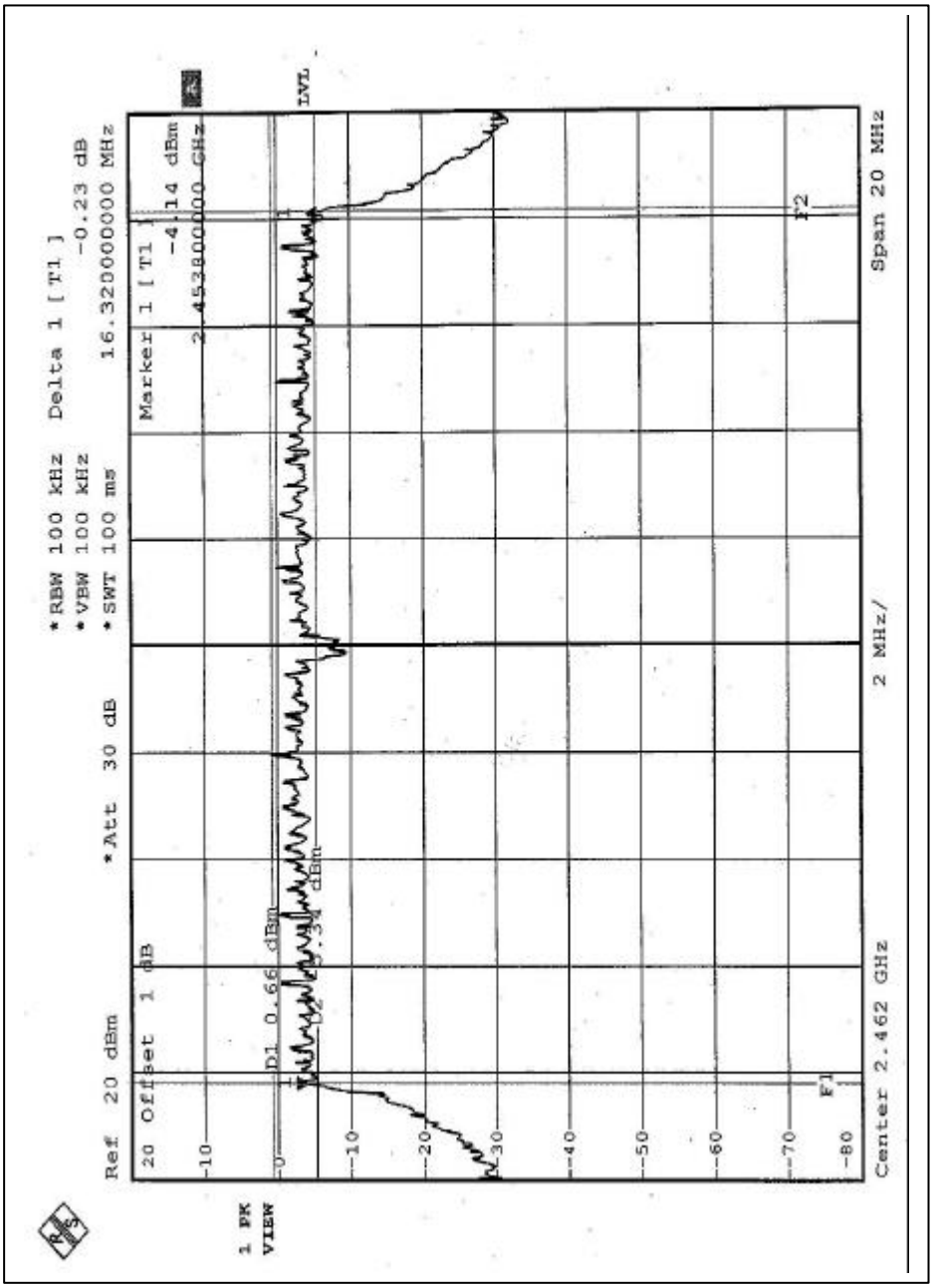
CH1


Ref 20 dBm
Att 30 dB
Offset 1 dB
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
2.17 dB
16.40000000 MHz
Marker 1 [T1]
-7.85 dBm
2.403760000 GHz
1 PK
VIEW
D1 -1.00 dBm
D2 -7.04 dBm
F1
F2
LVL
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


Ref 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 1 [T1]
0.35 dB
16.360000000 MHz
Marker 1 [T1]
-3.28 dBm
2.428000000 GHz
D1 1.6 dBm
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11


Ref 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 1 [T1]
-0.23 dB
16.320000000 MHz
Marker 1 [T1]
-4.14 dBm
2.453800000 GHz
20 Offset 1 dB
D1 0.66 dBm
1 PK
VIEW
Center 2.462 GHz
2 MHz/
Span 20 MHz

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
Two Channdl Digital Oscilloscope	TDS 220	B027241	Jun. 05, 2004
Tektronix	TDS380	B016335	Jun. 06, 2004
NARDA DETECTOR	4503A	FSCM99899	NA
Signal Generator	E8241A	US42110446	Jul.17, 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

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

4.4.4 TEST SETUP

4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

4.4.6 TEST RESULTS-DSSS

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 56 %RH, 964 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.32	30	PASS
6	2437	15.04	30	PASS
11	2462	14.76	30	PASS

4.4.7 TEST RESULTS-OFDM

EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 56 %RH, 964 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.42	30	PASS
6	2437	19.38	30	PASS
11	2462	18.32	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	FSP	1093.4495.30	Dec. 19, 2003

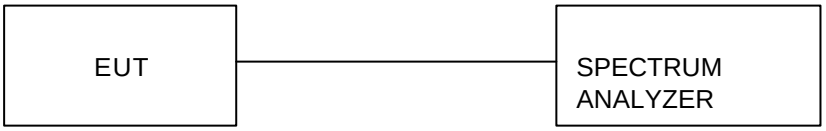
NOTE:

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 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

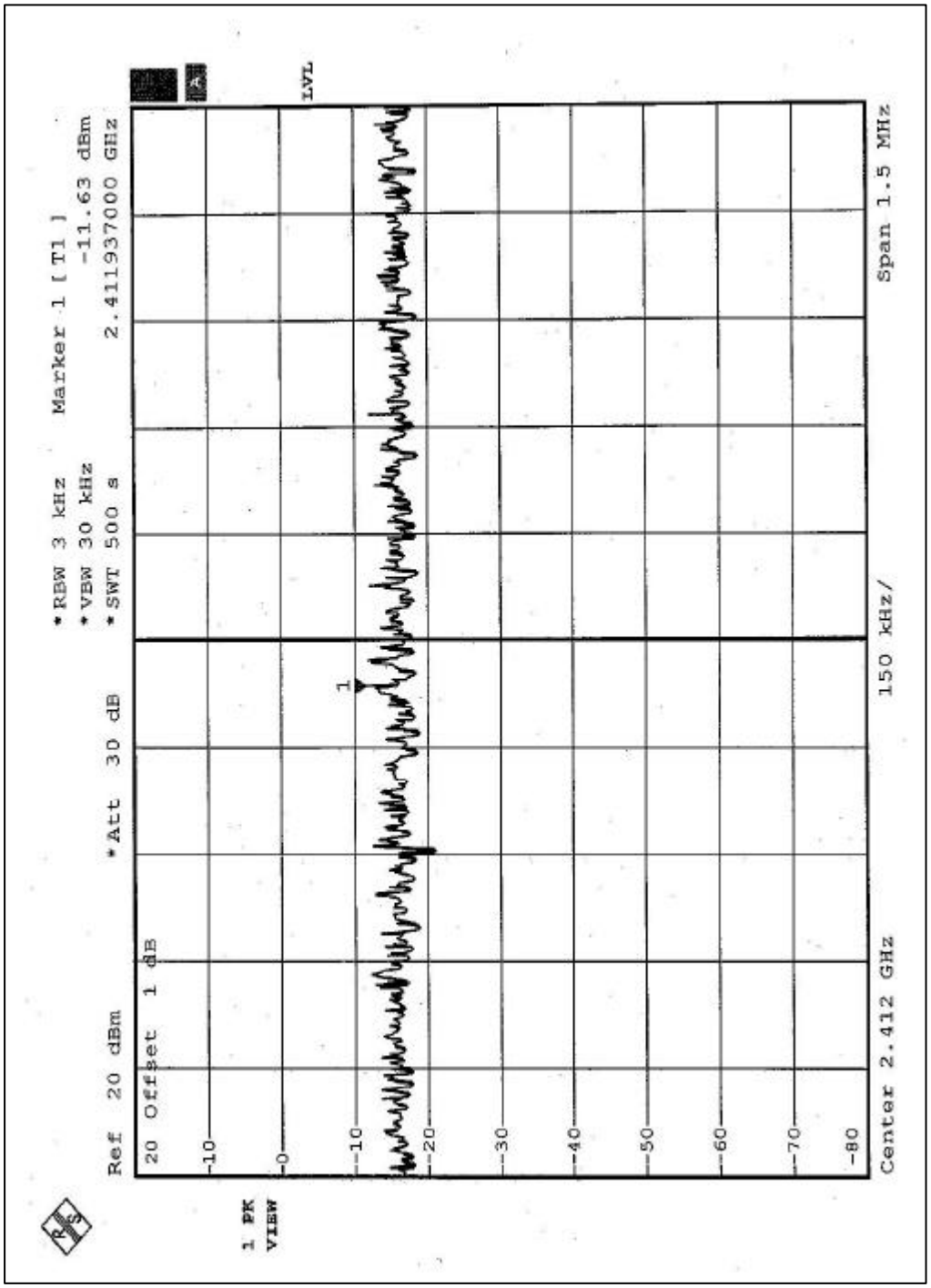
Same as 4.3.5

4.5.6 TEST RESULTS-DSSS

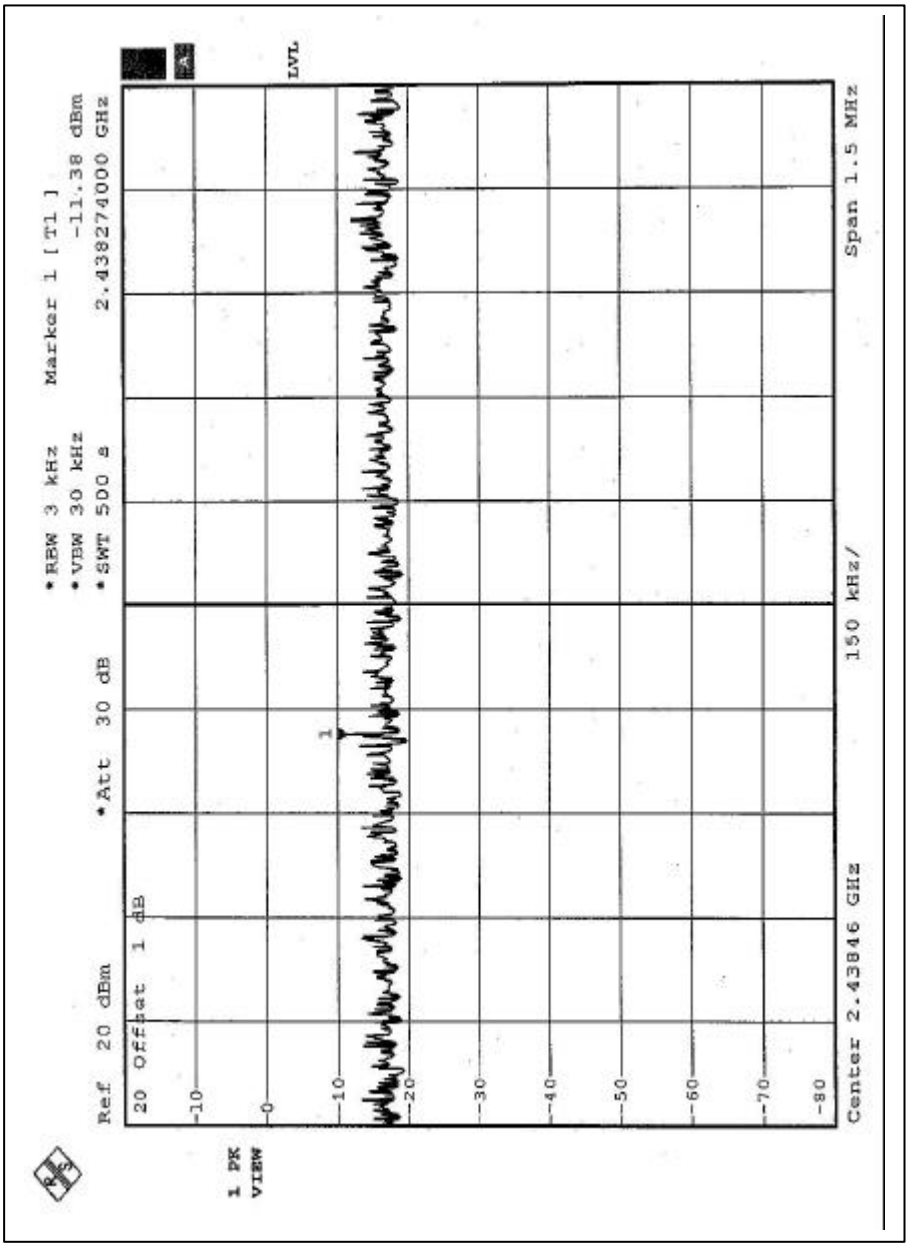
EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 56 %RH, 964 hPa
TESTED BY	Tony Chen		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.63	8	PASS
6	2437	-11.38	8	PASS
11	2462	-13.45	8	PASS

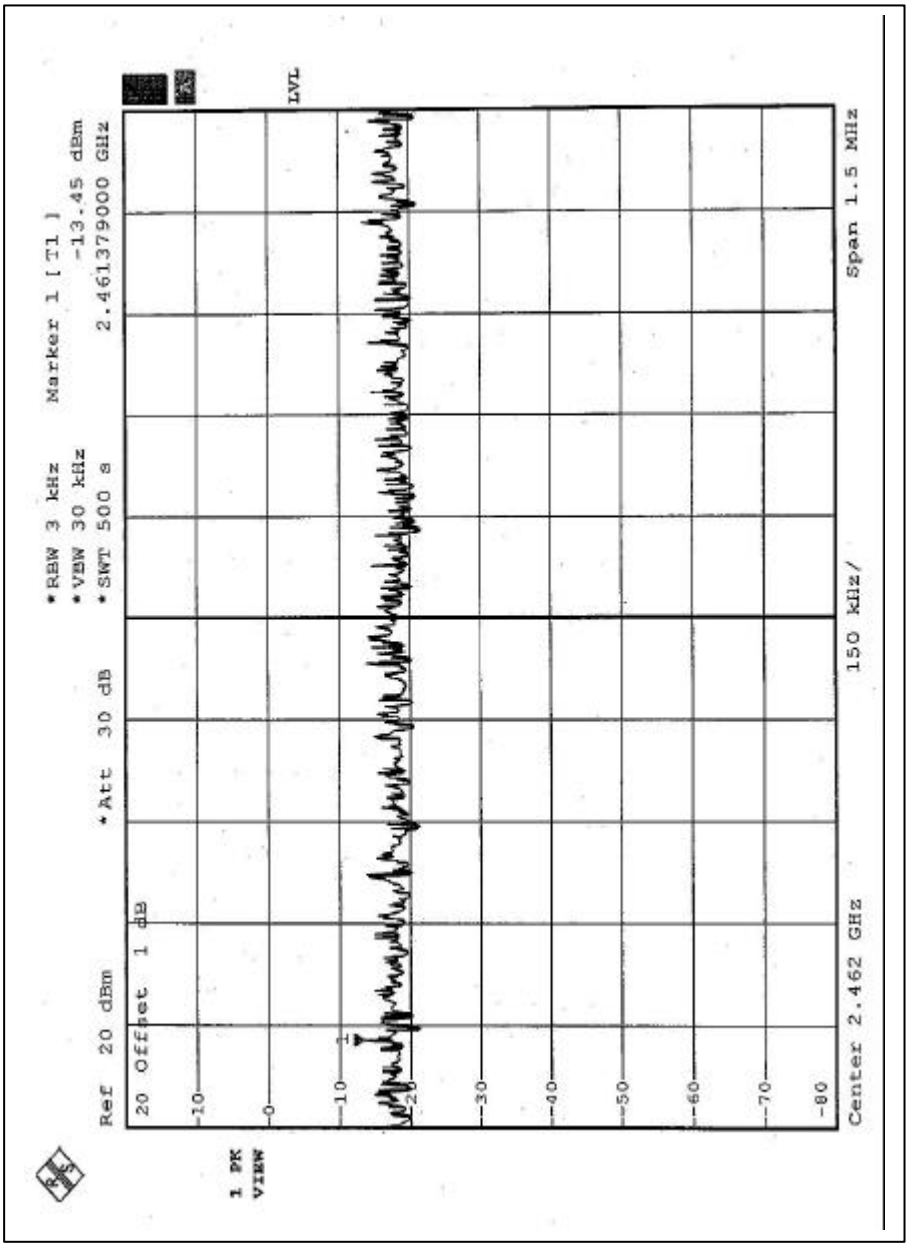
CH1


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-11.63 dBm
2.411937000 GHz
1 PK
VIEW
Center 2.412 GHz
150 kHz/
Span 1.5 MHz

CH6


Ref 20 dBm
Att 30 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-11.38 dBm
2.438274000 GHz
1 PK
VIEW
Center 2.43846 GHz
150 kHz/
Span 1.5 MHz

CH11

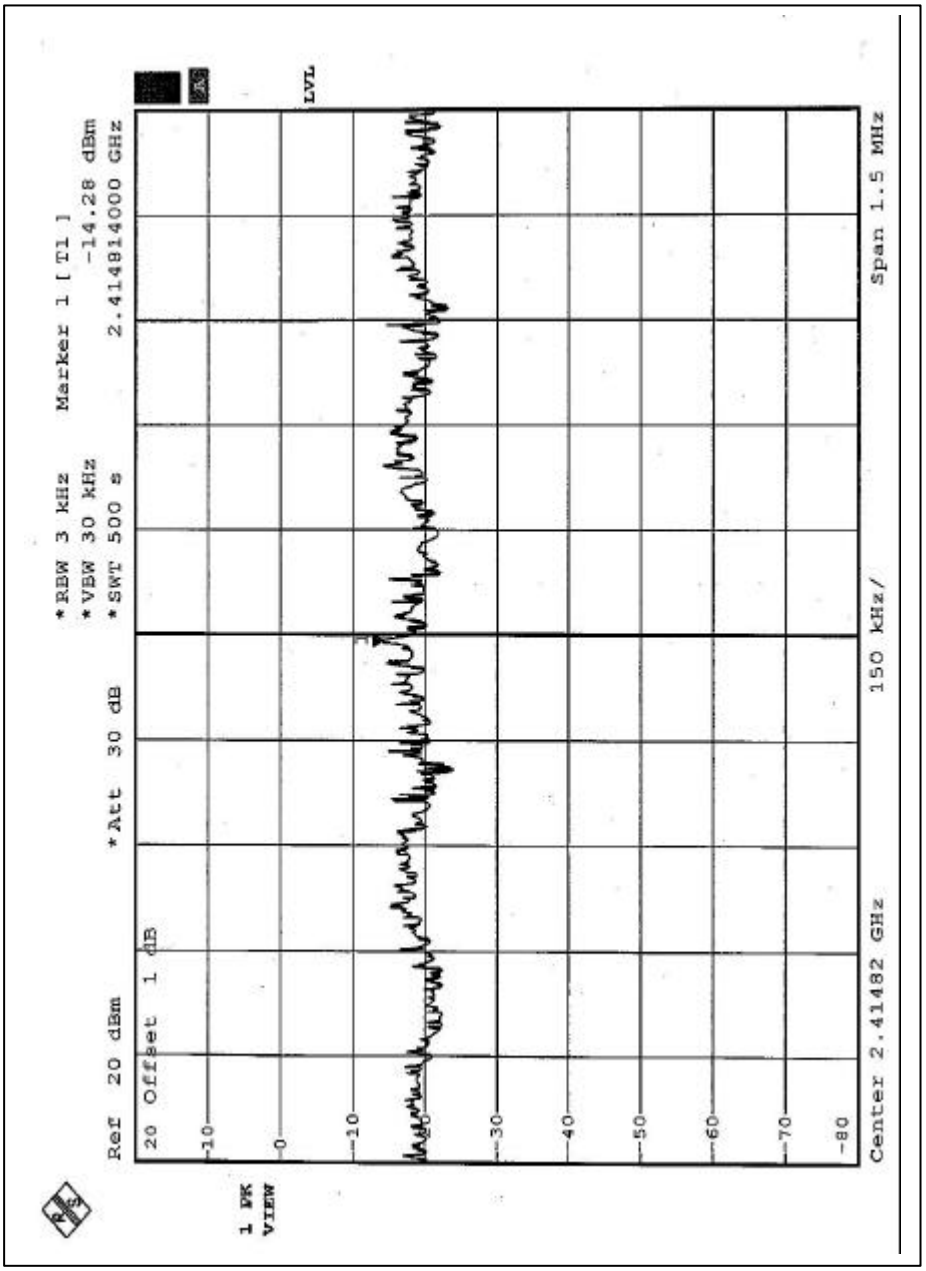

Ref 20 dBm
Att 30 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-13.45 dBm
2.461379000 GHz
20 Offset 1 dB
1 PK
VIEW
LVL
Center 2.462 GHz
150 kHz/
Span 1.5 MHz

4.5.7 TEST RESULTS-OFDM

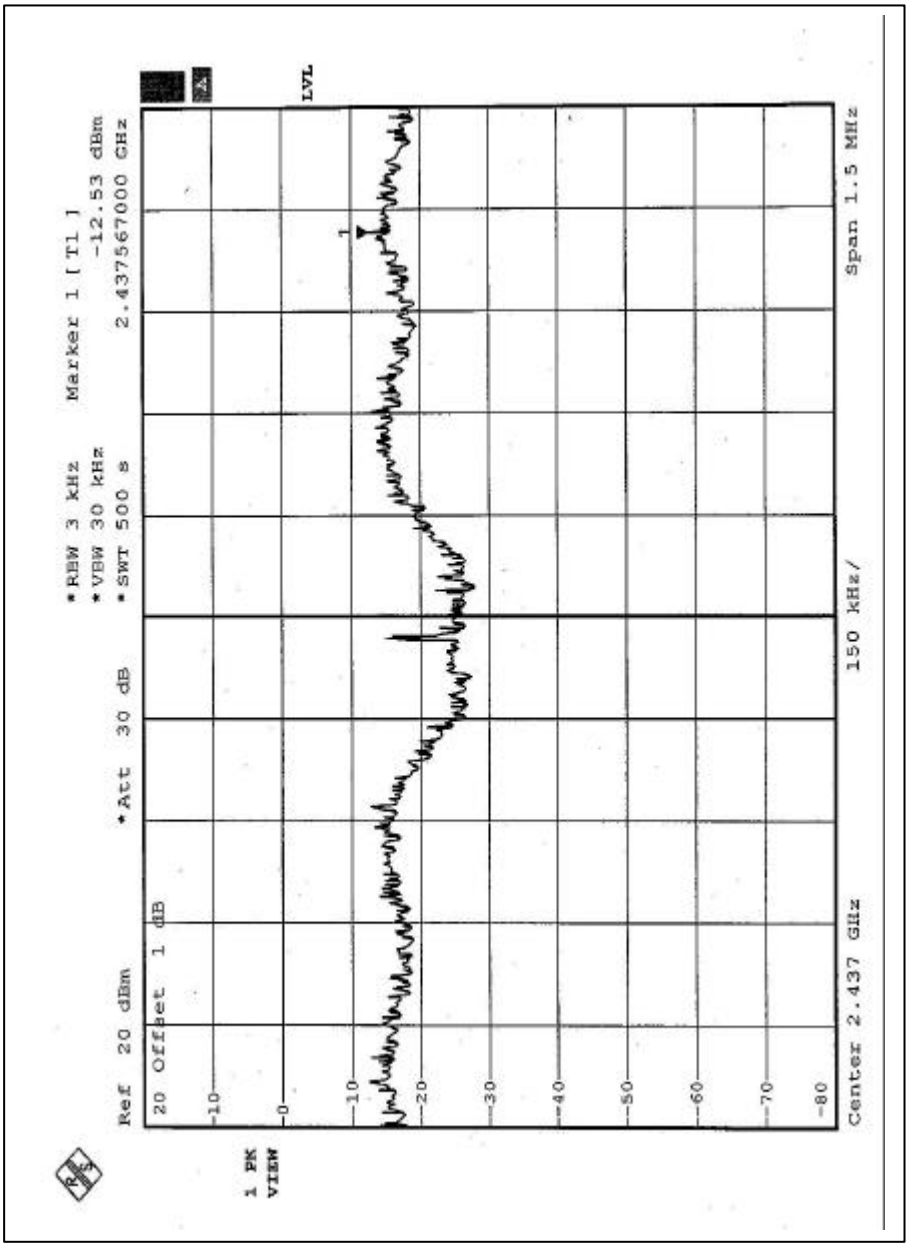
EUT	Microsoft Broadband Networking Wireless PCI Adapter	**MODEL**	MN-730
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 56 %RH, 964 hPa
TESTED BY	Tony Chen		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-14.28	8	PASS
6	2437	-12.53	8	PASS
11	2462	-13.23	8	PASS

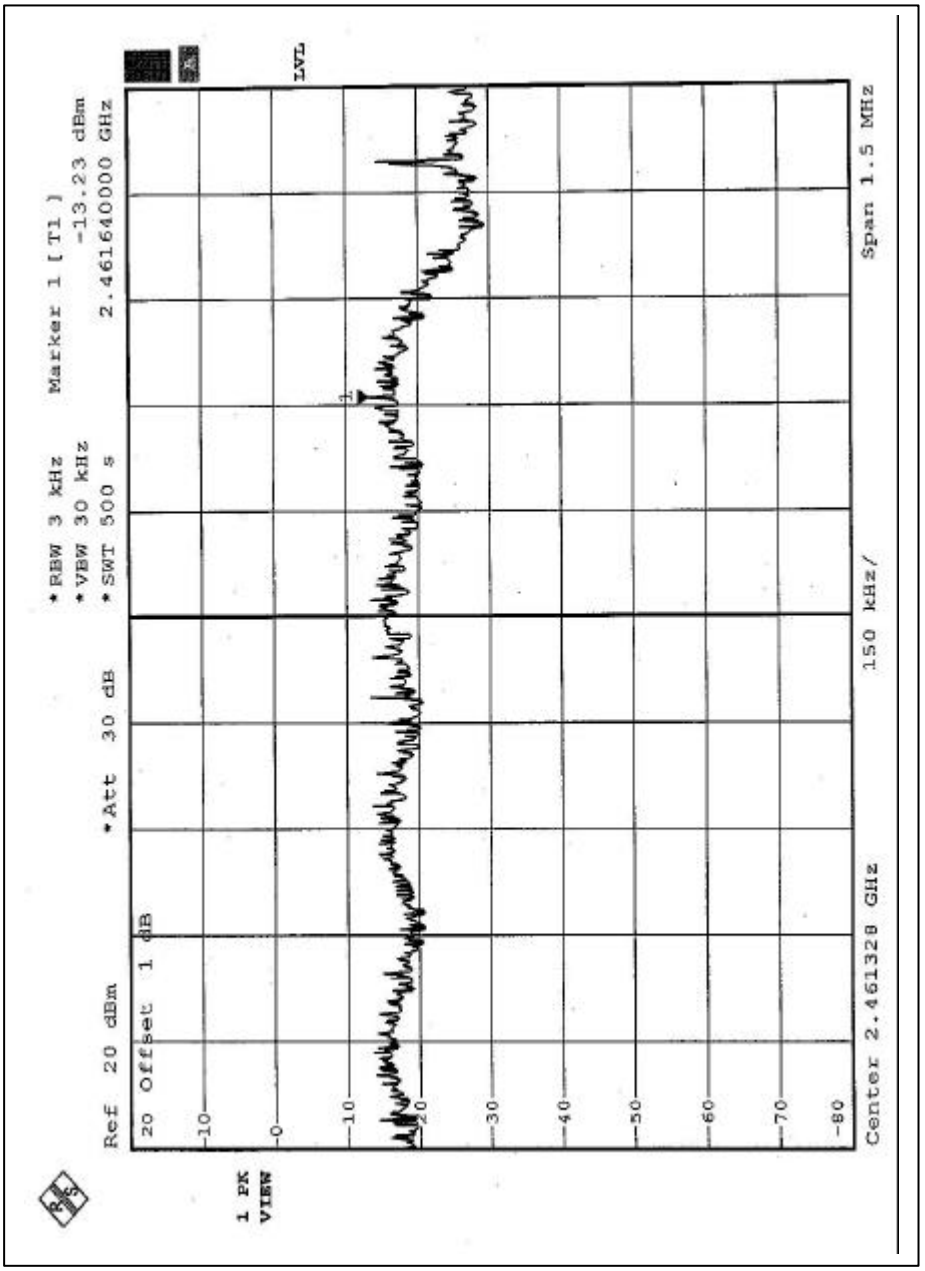
CH1


Ref 20 dBm
Att 30 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-14.28 dBm
2.41481400 0 GHz
20 Offset 1 dB
1 PK
VIEW
LVL
Center 2.41482 GHz
150 kHz/
Span 1.5 MHz

CH6


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-12.53 dBm
2.437567000 GHz
1 PK
VIEW
LVL
Center 2.437 GHz
150 kHz/
Span 1.5 MHz

CH11


Ref 20 dBm
Att 30 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-13.23 dBm
2.461640000 GHz
20 Offset 1 dB
1 PK
VIEW
Center 2.461328 GHz
150 kHz/
Span 1.5 MHz

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
R&S SPECTRUM ANALYZER	FSP	1093.4495.30	Dec. 19, 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 EUT OPERATING CONDITION

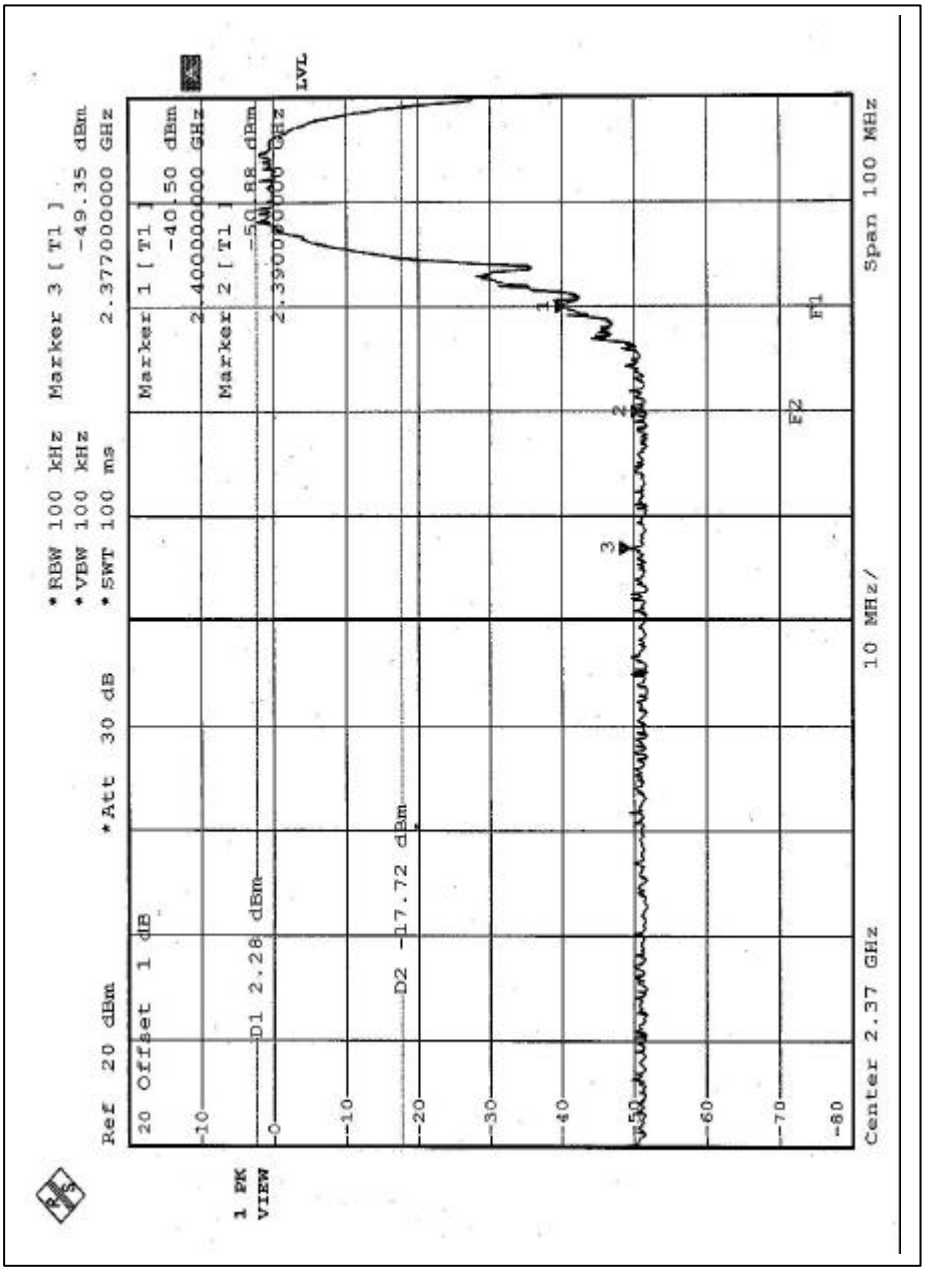
Same as Item 4.3.5

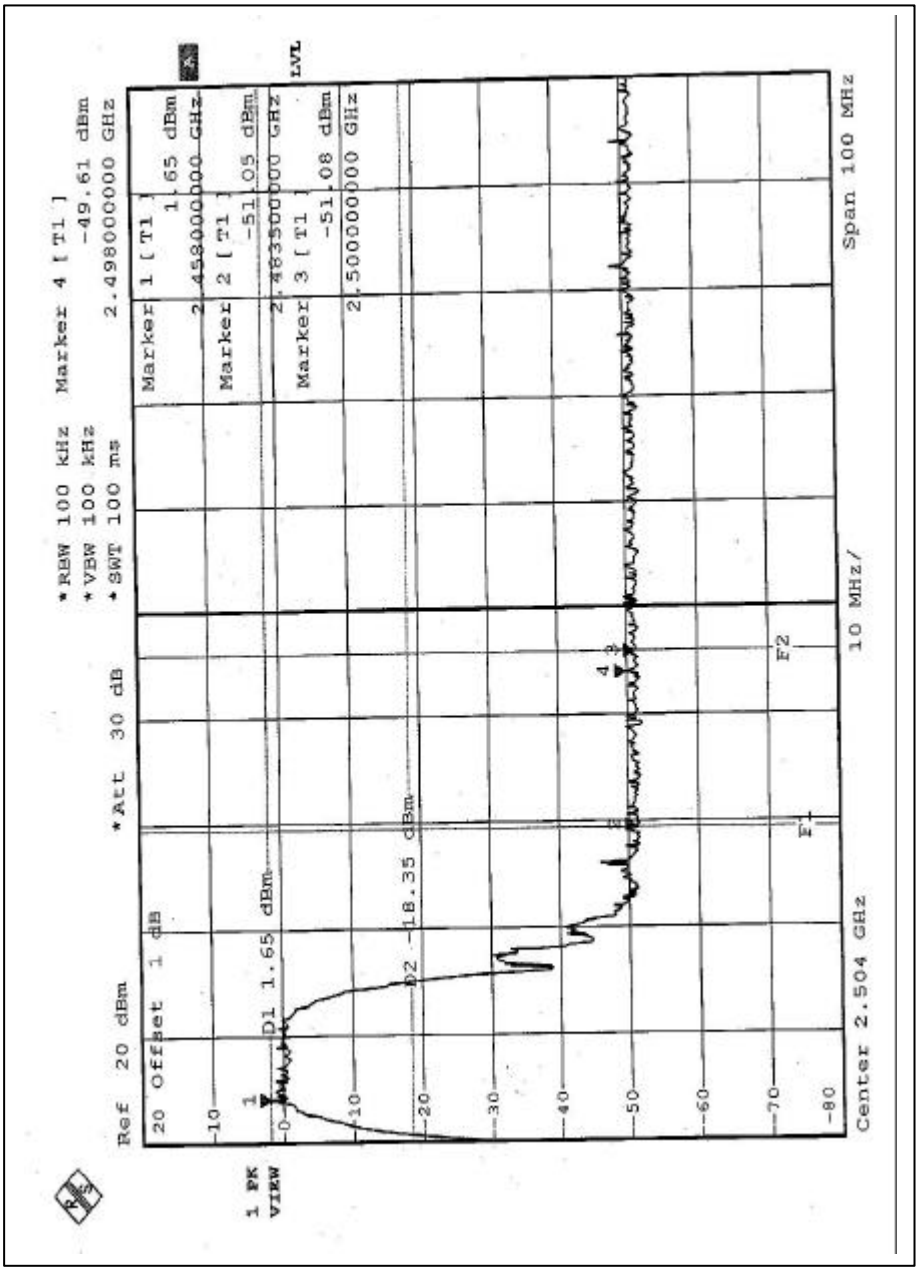
4.6.5 TEST RESULTS - DSSS

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

NOTE (1): The band edge emission plot on the following first page shows 51.63dB delta between carrier maximum power and local maximum emission in restrict band (2.3770GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 102.7dBuV/m, so the maximum field strength in restrict band is 102.7-51.63=51.07dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 51.26 dB delta between carrier maximum power and local maximum emission in restrict band (2.4980GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 100dBuV/m, so the maximum field strength in restrict band is 100-51.26=48.74dBuV/m which is under 54 dBuV/m limit.


Ref 20 dBm
*Att 30 dB
*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 3 [T1]
-49.35 dBm
2.37700000 GHz
20 Offset 1 dB
D1 2.28 dBm
D2 -17.72 dBm
Marker 1 [T1]
-40.50 dBm
2.40000000 GHz
Marker 2 [T1]
-50.88 dBm
2.39000000 GHz
1 PK
VIEW
LVL
Center 2.37 GHz
10 MHz/
Span 100 MHz

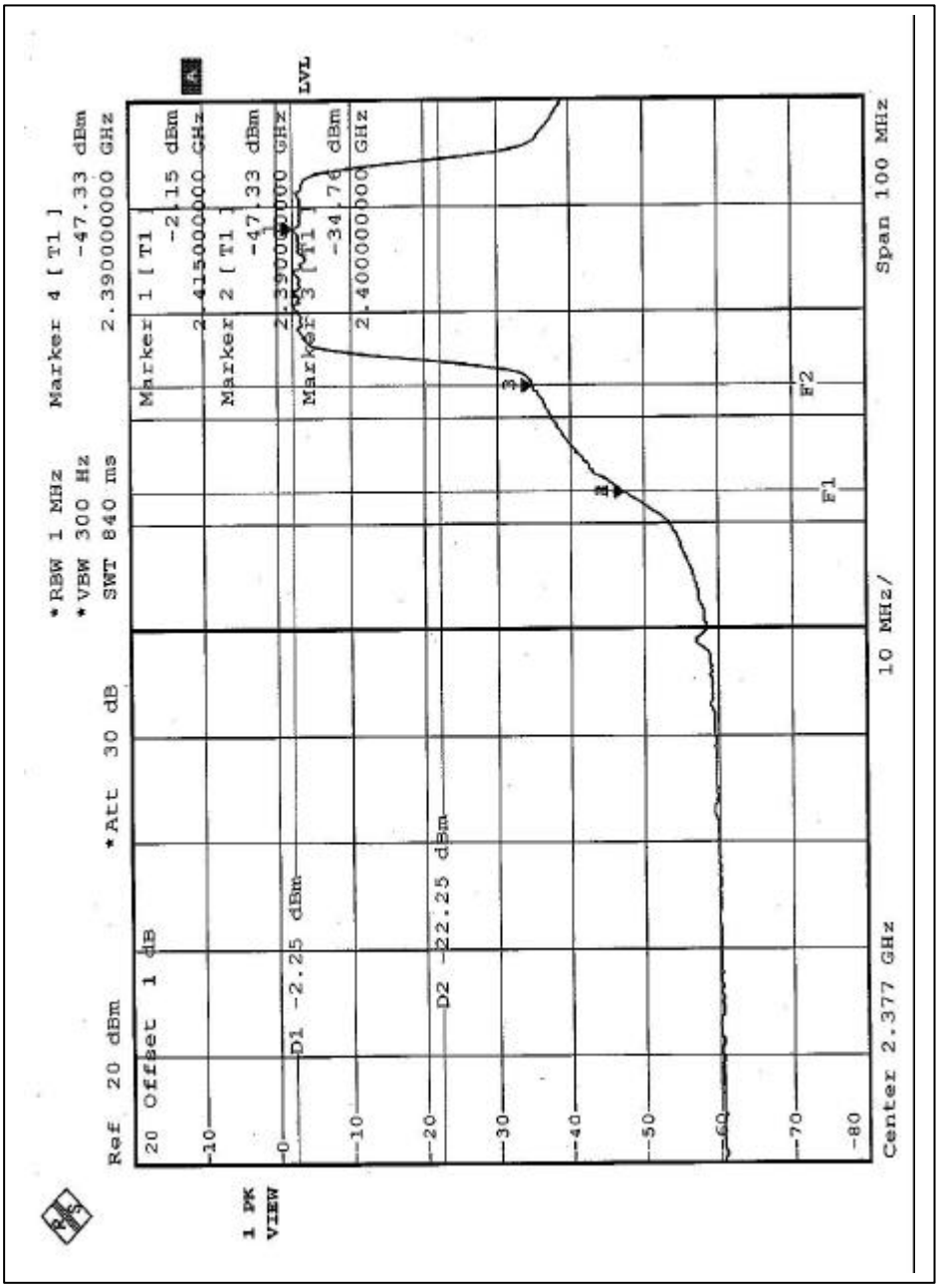

Ref 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Marker 4 [T1]
-49.61 dBm
2.498000000 GHz
20 Offset 1 dB
1 PK
VIEW
D1 1.65 dBm
D2 -18.35 dBm
Marker 1 [T1] 1.65 dBm 2.458000000 GHz
Marker 2 [T1] -51.05 dBm 2.463500000 GHz
Marker 3 [T1] -51.08 dBm 2.500000000 GHz
F1
F2
Center 2.504 GHz
10 MHz/
Span 100 MHz

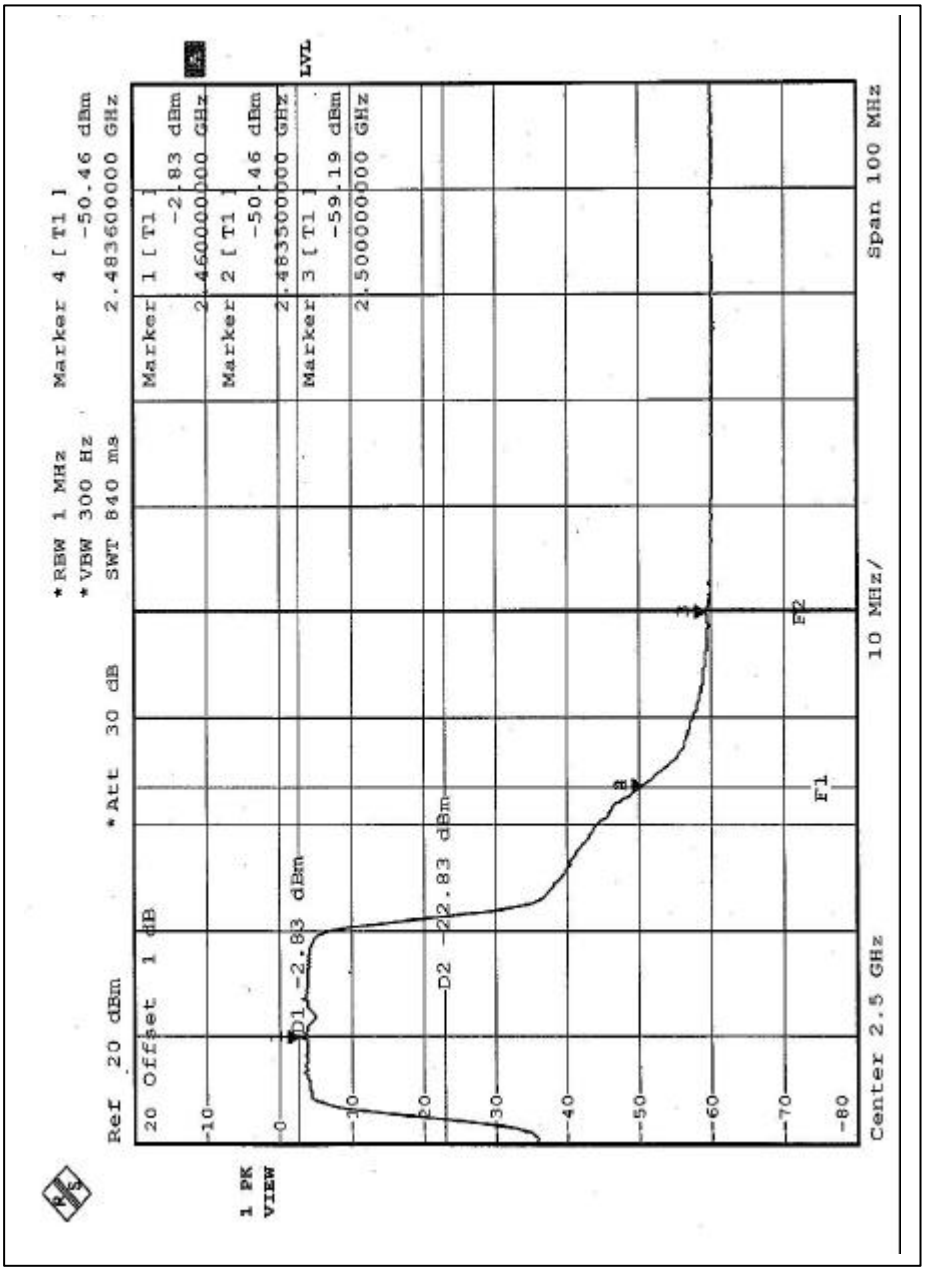
4.6.6 TEST RESULTS-OFDM

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

NOTE (1): The band edge emission plot on the following first page shows 45.08dB delta between carrier maximum power and local maximum emission in restrict band (2.390GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 96.7dBuV/m, so the maximum field strength in restrict band is 96.7-45.08=51.62dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 47.63dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 100.2dBuV/m, so the maximum field strength in restrict band is 100.2-47.63=52.57dBuV/m which is under 54 dBuV/m limit.


Ref 20 dBm
Att 30 dB
RBW 1 MHz
VBW 300 Hz
SWT 840 ms
Marker 4 [T1]
-47.33 dBm
2.39000000 GHz
Marker 1 [T1]
-2.15 dBm
2.41500000 GHz
Marker 2 [T1]
-47.33 dBm
2.39000000 GHz
Marker 3 [T1]
-34.76 dBm
2.40000000 GHz
1 PK
VIEW
D1 -2.25 dBm
D2 -22.25 dBm
F1
F2
Center 2.377 GHz
10 MHz/
Span 100 MHz


Ref 20 dBm
Att 30 dB
RBW 1 MHz
VBW 300 Hz
SWT 840 ms
Marker 4 [T1]
-50.46 dBm
2.483600000 GHz
20 Offset 1 dB
1 PK
VIEW
D1 -2.83 dBm
D2 -22.83 dBm
Marker 1 [T1]
-2.83 dBm
2.460000000 GHz
Marker 2 [T1]
-50.46 dBm
2.483500000 GHz
Marker 3 [T1]
-59.19 dBm
2.500000000 GHz
LVL
Center 2.5 GHz
10 MHz/
Span 100 MHz

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.

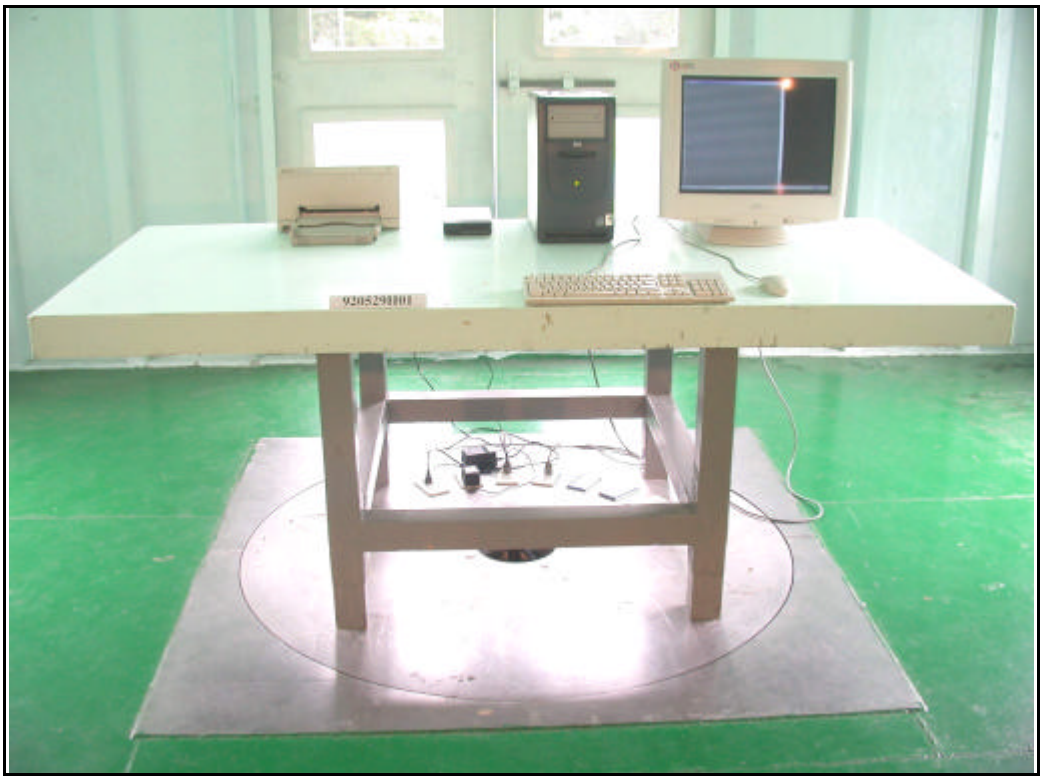
4.7.2 ANTENNA CONNECTED CONSTRUCTION

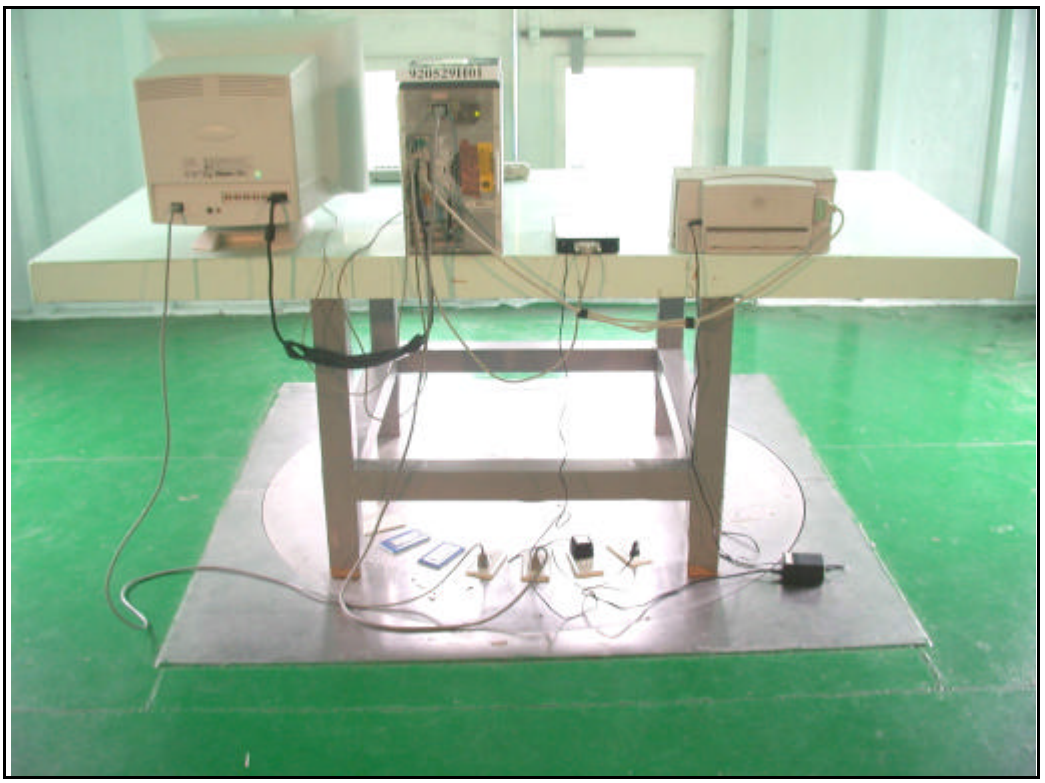
The antenna types used in this product is Dipole antenna without connector. And the maximum Gain of this antenna is only 2dBi.

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, UL
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
Canada	INDUSTRY CANADA
R.O.C.	CNLA, BSMI

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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Fax: 886-2-26052943

Hsin Chu EMC Lab:
Tel: 886-35-935343
Fax: 886-35-935342

Lin Kou Safety Lab:
Tel: 886-2-26093195
Fax: 886-2-26093184

Lin Kou RF&Telecom Lab
Tel: 886-3-3270910
Fax: 886-3-3270892

Email: service@adt.com.tw
Web Site: www.adt.com.tw

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