

FCC TEST REPORT

REPORT NO.: RF930109R01

MODEL NO.: MN-710

RECEIVED: January 8, 2004

TESTED: January 8 ~ January 10, 2004

APPLICANT: Microsoft Corporation

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

ISSUED BY: Advance Data Technology Corporation

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

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1 CERTIFICATION

PRODUCT : Microsoft® Broadband Networking Wireless USB 2.0 Adapter

MODEL NO.: MN-710

BRAND: Microsoft®

APPLICANT : Microsoft Corporation

TEST ITEM: ENGINEERING SAMPLE

STANDARDS : FCC 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 January 8, 2004 to January 10, 2004. 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: Stacy Hsueh , **DATE:** January 13, 2004
Stacy Hsueh

APPROVED BY: Ellis Wu , **DATE:** January 13, 2004
Ellis Wu / Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -17.15dB at 0.177MHz
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 -3.89dB at 65.98MHz
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

NOTE: The information of measurement uncertainty is available upon the customer's request.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter
MODEL NO.	MN-710
BRAND NAME	Microsoft®
POWER SUPPLY	5.0Vdc from host equipment
MODULATION TYPE	BPSK, QPSK, CCK, 16QAM, 64QAM
MODULATION 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	19.20dBm
ANTENNA TYPE	Dipole antenna with 2.5dBi gain
DATA CABLE	NA
I/O PORTS	USB
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 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 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.
3. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst cases, were chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Microsoft® Broadband Networking Wireless USB 2.0 Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

All test items 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

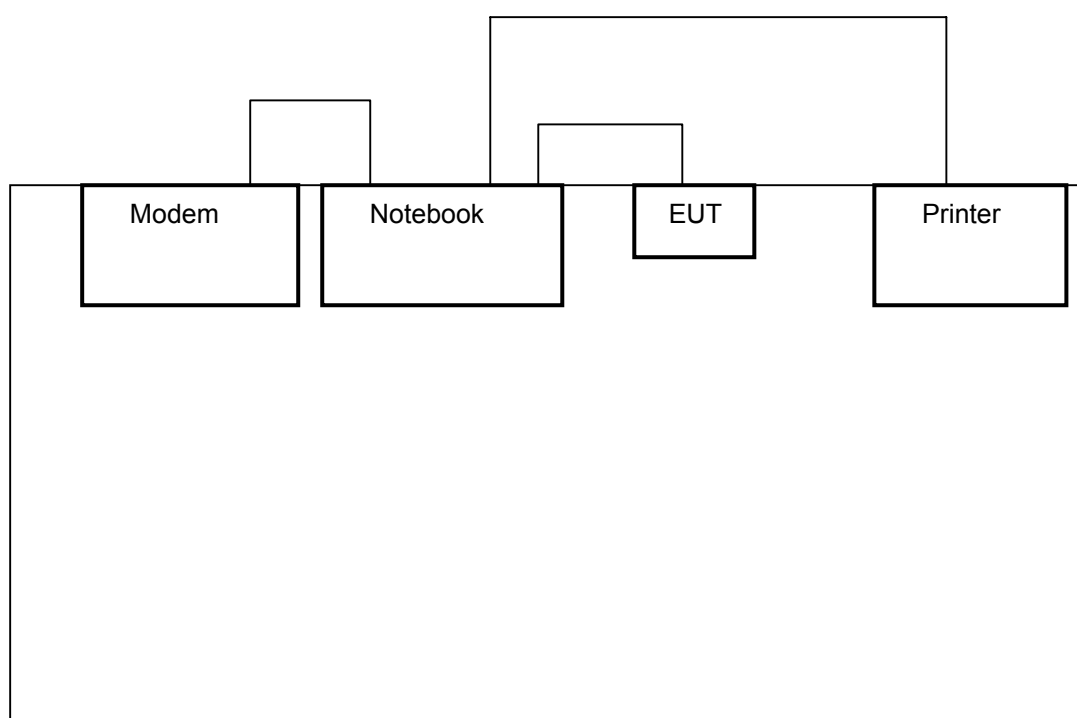
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP01L	TW-0791UH-12800-123-5423	FCC DoC Approved
2	MODEM	ACEEX	1414	980020526	IFAXDM1414
3	PRINTER	EPSON	LQ-300+	DCGY017058	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).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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. 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.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS 30	828765/002	July 15, 2004
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	835239/001	Apr. 28, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	835239/002	Apr. 28, 2004
*ROHDE & SCHWARZ 4-wire ISN	ENY41	935154/007	Apr. 30, 2004
*ROHDE & SCHWARZ 2-wire ISN	ENY22	833823/026	Apr. 30, 2004
Software	Cond-V2M3	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C09.01	May 23, 2004
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	Jun. 04, 2004

- 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. “*”: These equipment are used for conducted telecom port test only (if tested).
 3. The test was performed in ADT Shielded Room No. 9.
 4. The VCCI Site Registration No. is C-1312.

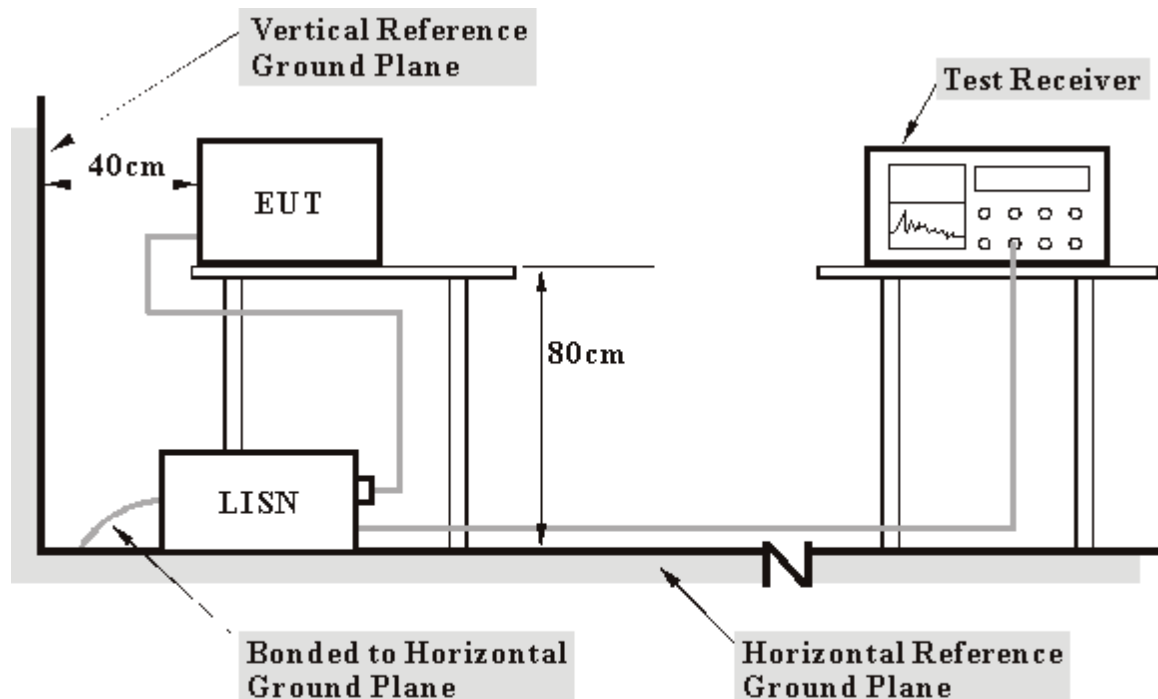
4.1.3 TEST PROCEDURES

- 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 150kHz to 30MHz was searched. Emission levels under 20dB 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

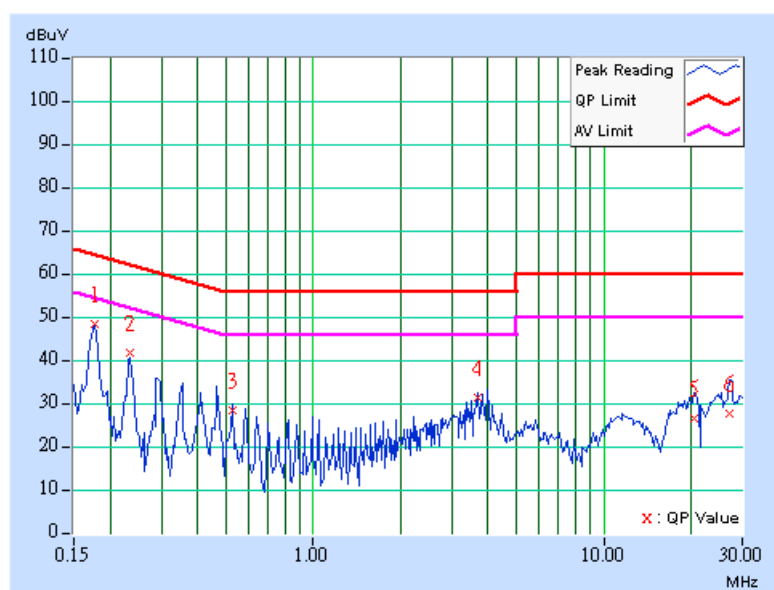
- Plug the EUT a notebook system placed on a testing table.
- The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- The computer system sent "H" messages to its screen.
- The computer system sent "H" messages to its modem.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

4.1.7 TEST RESULTS

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 1	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	TESTED BY: Jun Wu	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	47.23	-	47.33	-	64.63	54.63	-17.30	-
2	0.234	0.12	40.47	-	40.59	-	62.31	52.31	-21.72	-
3	0.525	0.20	27.33	-	27.53	-	56.00	46.00	-28.47	-
4	3.676	0.28	30.17	-	30.45	-	56.00	46.00	-25.55	-
5	20.453	1.12	25.24	-	26.36	-	60.00	50.00	-33.64	-
6	27.137	1.34	26.59	-	27.93	-	60.00	50.00	-32.07	-

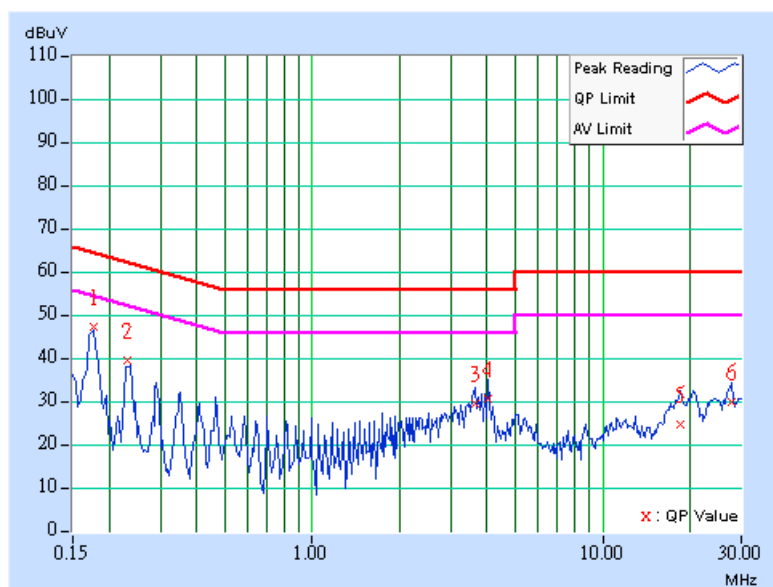
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 1	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	TESTED BY: Jun Wu	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	46.29	-	46.39	-	64.63	54.63	-18.24	-
2	0.232	0.12	38.61	-	38.73	-	62.39	52.39	-23.67	-
3	3.619	0.20	28.68	-	28.88	-	56.00	46.00	-27.12	-
4	4.024	0.20	29.70	-	29.90	-	56.00	46.00	-26.10	-
5	18.398	0.87	23.94	-	24.81	-	60.00	50.00	-35.19	-
6	27.629	1.05	28.77	-	29.82	-	60.00	50.00	-30.18	-

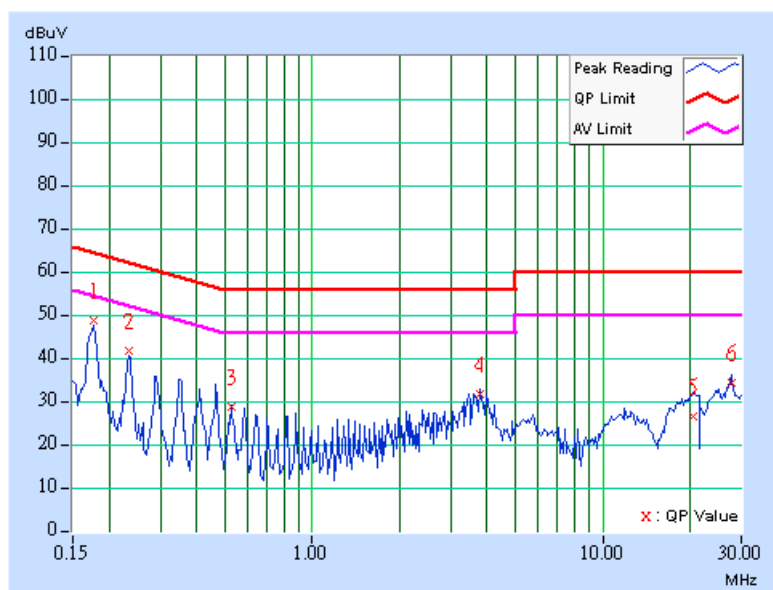
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 6	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	TESTED BY: Jun Wu	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	47.38	-	47.48	-	64.63	54.63	-17.15	-
2	0.234	0.12	40.61	-	40.73	-	62.31	52.31	-21.58	-
3	0.525	0.20	27.61	-	27.81	-	56.00	46.00	-28.19	-
4	3.793	0.29	30.59	-	30.88	-	56.00	46.00	-25.12	-
5	20.606	1.12	25.14	-	26.26	-	60.00	50.00	-33.74	-
6	27.629	1.35	33.14	-	34.49	-	60.00	50.00	-25.51	-

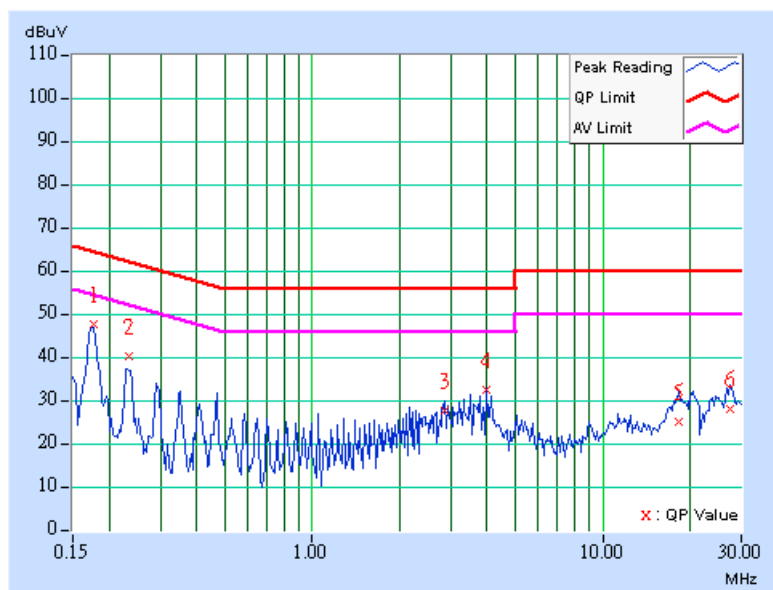
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 6	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	TESTED BY: Jun Wu	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	46.67	-	46.77	-	64.63	54.63	-17.86	-
2	0.234	0.12	39.35	-	39.47	-	62.31	52.31	-22.84	-
3	2.860	0.20	26.72	-	26.92	-	56.00	46.00	-29.08	-
4	3.973	0.20	31.58	-	31.78	-	56.00	46.00	-24.22	-
5	18.176	0.86	24.02	-	24.88	-	60.00	50.00	-35.12	-
6	27.527	1.05	26.99	-	28.04	-	60.00	50.00	-31.96	-

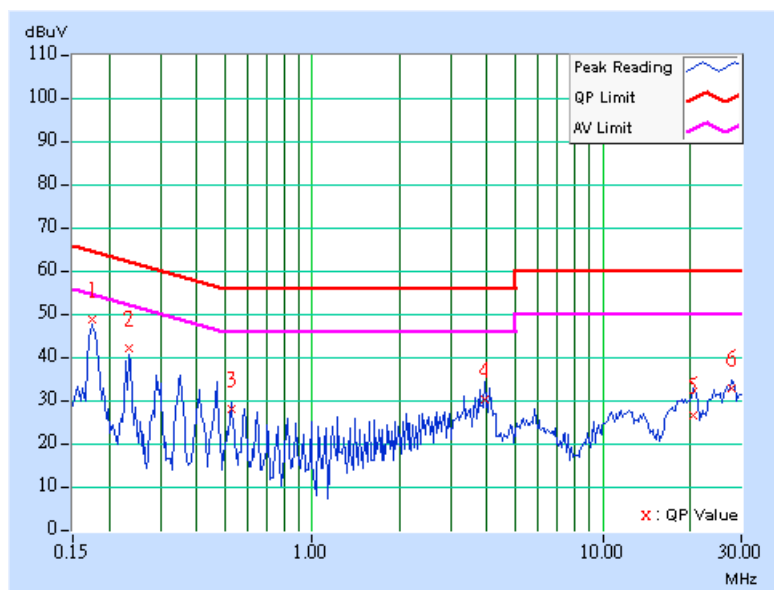
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 11	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	TESTED BY: Jun Wu	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.174	0.10	47.42	-	47.52	-	64.77	54.77	-17.25	-
2	0.234	0.12	40.75	-	40.87	-	62.31	52.31	-21.44	-
3	0.525	0.20	26.83	-	27.03	-	56.00	46.00	-28.97	-
4	3.913	0.30	28.93	-	29.23	-	56.00	46.00	-26.77	-
5	20.579	1.12	25.28	-	26.40	-	60.00	50.00	-33.60	-
6	27.722	1.35	31.74	-	33.09	-	60.00	50.00	-26.91	-

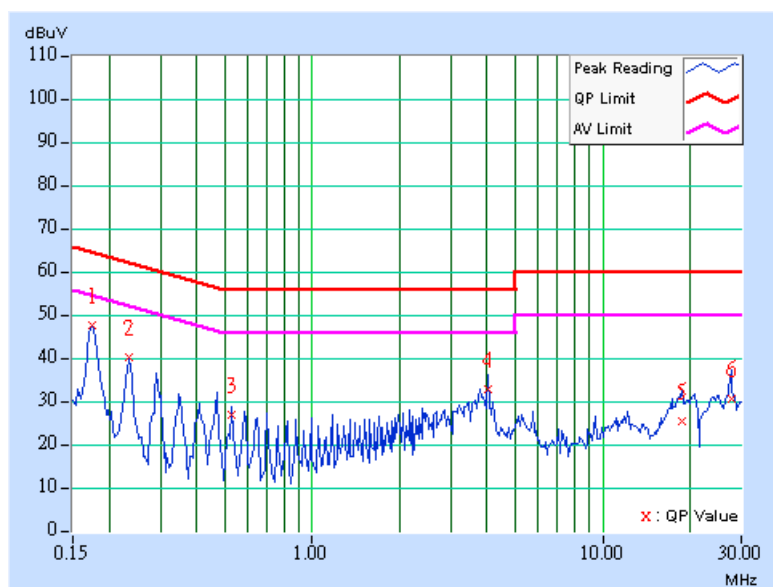
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 11	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	TESTED BY: Jun Wu	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.174	0.10	46.73	-	46.83	-	64.77	54.77	-17.94	-
2	0.234	0.12	39.35	-	39.47	-	62.31	52.31	-22.84	-
3	0.525	0.20	25.89	-	26.09	-	56.00	46.00	-29.91	-
4	4.033	0.20	31.97	-	32.17	-	56.00	46.00	-23.83	-
5	18.815	0.88	24.39	-	25.27	-	60.00	50.00	-34.73	-
6	27.674	1.05	29.53	-	30.58	-	60.00	50.00	-29.42	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	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	8593E	3911A07465	Jul. 07, 2004
*HP Preamplifier	8447D	2944A10386	Aug. 12, 2004
*HP Preamplifier	8449B	3008A01201	Nov. 11, 2004
SCHAFFNER Tunable Dipole Antenna	VHBA 9123	459	Jun. 26, 2004
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
*SCHAFFNER TEST RECEIVER	SCR 3501	409	Jan. 26, 2004
* SCHAFFNER BILOG Antenna	CBL6111C	2727	Jul. 15, 2004
SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jun 30, 2004
ADT. Turn Table	TT100	0201	NA
* ADT. Tower	AT100	0201	NA
* Software	ADT_Radiated_V5.14	NA	NA
* ANRITSU RF Switches	MP59B	6100237246	Oct. 17, 2004
* TIMES RF cable	LMR-600	CABLE-ST10-01	Oct. 17, 2004

- 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. "*" = 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. 10.
 5. The VCCI Site Registration No. is R-1625.

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.

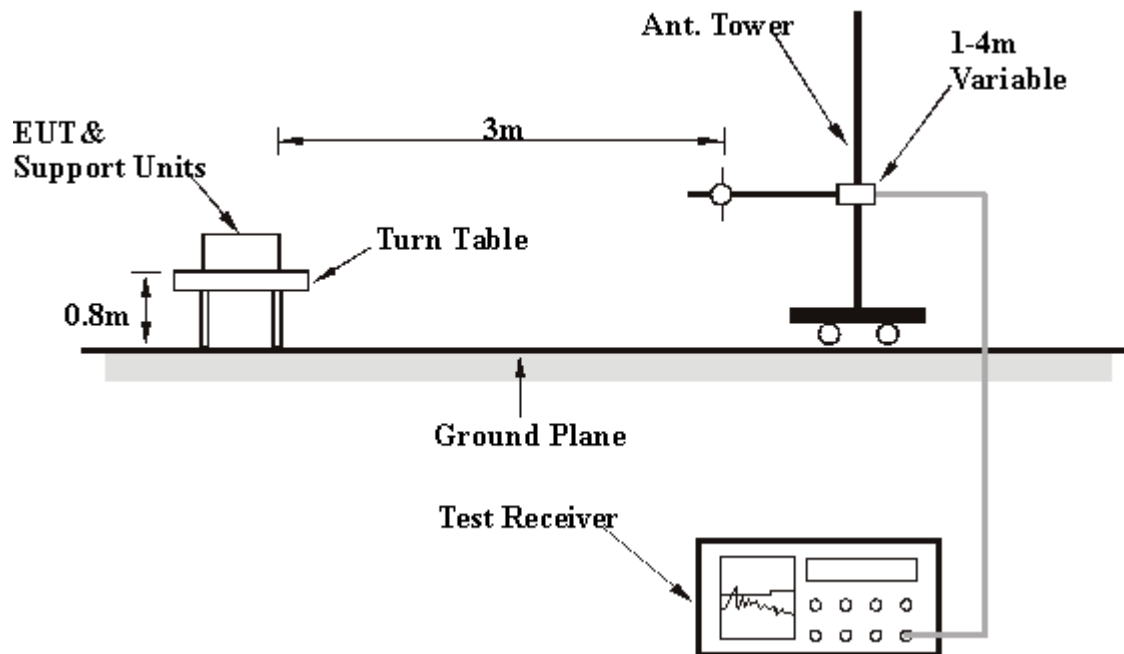
NOTE:

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 10Hz 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	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23 deg. C, 70 % RH, 991hPa	TESTED BY: Jun Wu	

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	120.00	25.18 QP	43.50	-18.32	2.12 H	43	12.73	12.45
2	144.03	23.48 QP	43.50	-20.02	2.46 H	307	11.32	12.16
3	160.00	26.21 QP	43.50	-17.29	2.21 H	223	15.45	10.76
4	179.84	25.23 QP	43.50	-18.27	2.03 H	91	15.14	10.09
5	186.87	28.04 QP	43.50	-15.46	2.02 H	115	17.83	10.21
6	200.47	39.52 QP	43.50	-3.98	1.92 H	339	29.02	10.50
7	221.10	33.92 QP	46.00	-12.08	2.08 H	85	21.99	11.93
8	239.98	33.16 QP	46.00	-12.84	1.56 H	333	19.93	13.23
9	381.00	34.62 QP	46.00	-11.38	1.00 H	112	16.02	18.60
10	401.00	36.90 QP	46.00	-9.10	1.00 H	36	17.46	19.44
11	560.00	33.47 QP	46.00	-12.53	1.00 H	72	9.91	23.56
12	750.30	31.71 QP	46.00	-14.29	1.00 H	288	4.30	27.41

- 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.

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
MODE	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23 deg. C, 70 % RH, 991hPa	TESTED BY: Jun Wu	

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	65.98	36.11 QP	40.00	-3.89	1.00 V	196	30.04	6.07
2	71.72	30.59 QP	40.00	-9.41	1.00 V	238	24.04	6.55
3	120.00	33.04 QP	43.50	-10.46	1.00 V	315	20.59	12.45
4	144.00	28.53 QP	43.50	-14.97	1.00 V	336	16.37	12.16
5	156.03	29.11 QP	43.50	-14.39	1.00 V	75	18.00	11.11
6	160.05	36.03 QP	43.50	-7.47	1.00 V	188	25.27	10.76
7	168.03	30.19 QP	43.50	-13.31	1.00 V	253	19.70	10.49
8	180.03	31.48 QP	43.50	-12.02	1.00 V	118	21.40	10.08
9	200.10	32.10 QP	43.50	-11.40	1.00 V	358	21.62	10.48
10	219.15	28.02 QP	46.00	-17.98	1.00 V	116	16.23	11.79
11	239.98	30.89 QP	46.00	-15.11	1.00 V	317	17.66	13.23
12	400.00	31.69 QP	46.00	-14.31	1.00 V	137	12.27	19.42
13	560.00	33.25 QP	46.00	-12.75	1.00 V	94	9.69	23.56

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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.

4.2.8 TEST RESULTS (FOR CCK)

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz		
ENVIRONMENTAL CONDITIONS	23deg. C, 70 % RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Jun Wu		

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	46.47 PK	74.00	-27.53	1.10 H	214	16.68	29.79
1	2390.00	37.60 AV	54.00	-16.40	1.10 H	214	7.81	29.79
2	*2412.00	98.66 PK			1.10 H	214	68.91	29.75
2	*2412.00	89.79 AV			1.10 H	214	60.04	29.75
3	4824.00	48.85 PK	74.00	-25.15	1.51 H	188	13.53	35.32
4	9648.00	54.80 PK	78.66	-23.86	1.10 H	186	9.99	44.81
4	9648.00	47.21 AV	69.79	-22.58	1.10 H	186	2.40	44.81

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	57.57 PK	74.00	-16.43	1.16 V	162	27.78	29.79
1	2390.00	49.16 AV	54.00	-4.84	1.16 V	162	19.37	29.79
2	*2412.00	109.76 PK			1.16 V	162	80.01	29.75
2	*2412.00	101.35 AV			1.16 V	162	71.60	29.75
3	4824.00	48.62 PK	74.00	-25.38	1.37 V	238	13.66	34.96
4	9648.00	56.65 PK	79.76	-23.11	1.30 V	198	11.84	44.81
4	9648.00	48.83 AV	81.35	-32.52	1.30 V	198	4.02	44.81

- 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. “ * ” : Fundamental frequency.

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz		
ENVIRONMENTAL CONDITIONS	23deg. C, 70 % RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Jun Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

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	*2437.00	103.23 PK			1.42 H	190	73.39	29.84
1	*2437.00	95.03 AV			1.42 H	190	65.19	29.84
2	4874.00	49.57 PK	74.00	-24.43	1.15 H	200	14.43	35.14
3	9748.00	54.69 PK	83.23	-28.54	1.14 H	184	9.91	44.78
3	9748.00	46.11 AV	75.03	-28.92	1.14 H	184	1.33	44.78

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

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	*2437.00	113.05 PK			1.17 V	169	83.21	29.84
1	*2437.00	104.79 AV			1.17 V	169	74.95	29.84
2	4874.00	51.82 PK	74.00	-22.18	1.41 V	215	16.68	35.14
2	4874.00	44.07 AV	54.00	-9.93	1.41 V	215	8.93	35.14
3	9748.00	57.23 PK	93.05	-35.82	1.18 V	207	12.45	44.78
3	9748.00	47.80 AV	84.79	-36.99	1.18 V	207	3.02	44.78

- 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. “ * ” : Fundamental frequency.

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz		
ENVIRONMENTAL CONDITIONS	23deg. C, 70 % RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Jun Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M								
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	102.09 PK			1.39 H	188	72.16	29.93
1	*2462.00	93.27 AV			1.39 H	188	63.34	29.93
2	2483.50	50.03 PK	74.00	-23.97	1.39 H	188	20.02	30.01
2	2483.50	41.21 AV	54.00	-12.79	1.39 H	188	11.20	30.01
3	4924.00	48.62 PK	74.00	-25.38	1.08 H	186	13.30	35.32
4	9848.00	55.67 PK	82.09	-26.42	1.12 H	214	10.91	44.76
4	9848.00	46.70 AV	73.27	-26.57	1.12 H	214	1.94	44.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M								
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	110.57 PK			1.10 V	191	80.64	29.93
1	*2462.00	101.95 AV			1.10 V	191	72.02	29.93
2	2483.50	58.51 PK	74.00	-15.49	1.10 V	191	28.50	30.01
2	2483.50	49.89 AV	54.00	-4.11	1.10 V	191	19.88	30.01
3	4924.00	51.40 PK	74.00	-22.60	1.26 V	191	16.08	35.32
3	4924.00	43.47 AV	54.00	-10.53	1.26 V	191	8.15	35.32
4	9848.00	58.05 PK	90.57	-32.52	1.37 V	159	13.29	44.76
4	9848.00	49.51 AV	81.95	-32.44	1.37 V	159	4.75	44.76

- 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. “ * ” : Fundamental frequency.

4.2.9 TEST RESULTS (FOR OFDM)

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz		
ENVIRONMENTAL CONDITIONS	23deg. C, 70 % RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Jun Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

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	50.49 PK	74.00	-23.51	1.24 H	150	20.70	29.79
1	2390.00	40.57 AV	54.00	-13.43	1.24 H	150	10.78	29.79
2	*2412.00	98.65 PK			1.24 H	150	68.90	29.75
2	*2412.00	88.73 AV			1.24 H	150	58.98	29.75
3	4824.00	47.52 PK	74.00	-26.48	1.37 H	215	12.56	34.96
4	9648.00	54.60 PK	78.65	-24.05	1.14 H	215	9.79	44.81
4	9648.00	43.97 AV	68.73	-24.76	1.14 H	215	-0.84	44.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

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	53.50 PK	74.00	-20.50	1.00 V	138	23.71	29.79
1	2390.00	45.47 AV	54.00	-8.53	1.00 V	138	15.68	29.79
2	*2412.00	106.41 PK			1.07 V	168	76.48	29.93
2	*2412.00	96.33 AV			1.07 V	168	66.40	29.93
3	4824.00	49.06 PK	74.00	-24.94	1.00 V	185	14.10	34.96
4	9648.00	56.62 PK	86.41	-29.79	1.37 V	318	11.81	44.81
4	9648.00	48.15 AV	76.33	-28.18	1.37 V	318	3.34	44.81

- 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. “ * ” : Fundamental frequency.

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz		
ENVIRONMENTAL CONDITIONS	23deg. C, 70 % RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Jun Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

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	*2437.00	101.15 PK			1.42 H	189	71.31	29.84
1	*2437.00	91.22 AV			1.42 H	189	61.38	29.84
2	4874.00	47.99 PK	74.00	-26.01	1.16 H	231	12.85	35.14
3	9748.00	55.32 PK	81.15	-25.83	1.15 H	178	10.54	44.78
3	9748.00	47.12 AV	71.22	-24.10	1.15 H	178	2.34	44.78

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

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	*2437.00	111.05 PK			1.14 V	168	81.21	29.84
1	*2437.00	101.17 AV			1.14 V	168	71.33	29.84
2	4874.00	51.09 PK	74.00	-22.91	1.29 V	218	15.95	35.14
2	4874.00	43.09 AV	54.00	-10.91	1.29 V	218	7.95	35.14
3	9748.00	56.54 PK	91.05	-34.51	1.36 V	189	11.76	44.78
3	9748.00	47.68 AV	81.17	-33.49	1.36 V	189	2.90	44.78

- 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. “ * ” : Fundamental frequency.

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710		
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz		
ENVIRONMENTAL CONDITIONS	23deg. C, 70 % RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Jun Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M								
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	96.87 PK			1.40 H	189	66.94	29.93
1	*2462.00	87.37 AV			1.40 H	189	57.44	29.93
2	2483.50	47.68 PK	74.00	-26.32	1.40 H	189	17.67	30.01
2	2483.50	38.18 AV	54.00	-15.82	1.40 H	189	8.17	30.01
3	4924.00	54.17 PK	74.00	-19.83	1.18 H	203	9.41	44.76
3	4924.00	46.20 AV	54.00	-7.80	1.18 H	203	1.44	44.76
4	9848.00	58.02 PK	76.87	-18.85	1.44 H	195	13.26	44.76
4	9848.00	52.18 AV	67.37	-15.19	1.44 H	195	7.42	44.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M								
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	106.41 PK			1.07 V	168	76.48	29.93
1	*2462.00	96.33 AV			1.07 V	168	66.40	29.93
2	2483.50	57.22 PK	74.00	-16.78	1.07 V	168	27.21	30.01
2	2483.50	47.14 AV	54.00	-6.86	1.07 V	168	17.13	30.01
3	4924.00	47.61 PK	74.00	-26.39	1.14 V	221	12.29	35.32
4	9848.00	56.37 PK	86.41	-30.04	1.68 V	360	11.61	44.76
4	9848.00	47.60 AV	76.33	-28.73	1.68 V	360	2.84	44.76

- 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. “ * ” : 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
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004

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

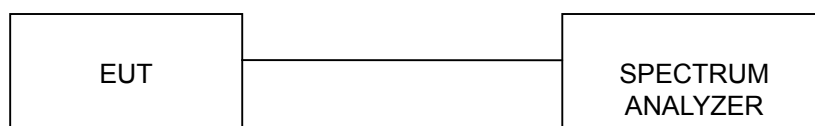
4.3.3 TEST PROCEDURE

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 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

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

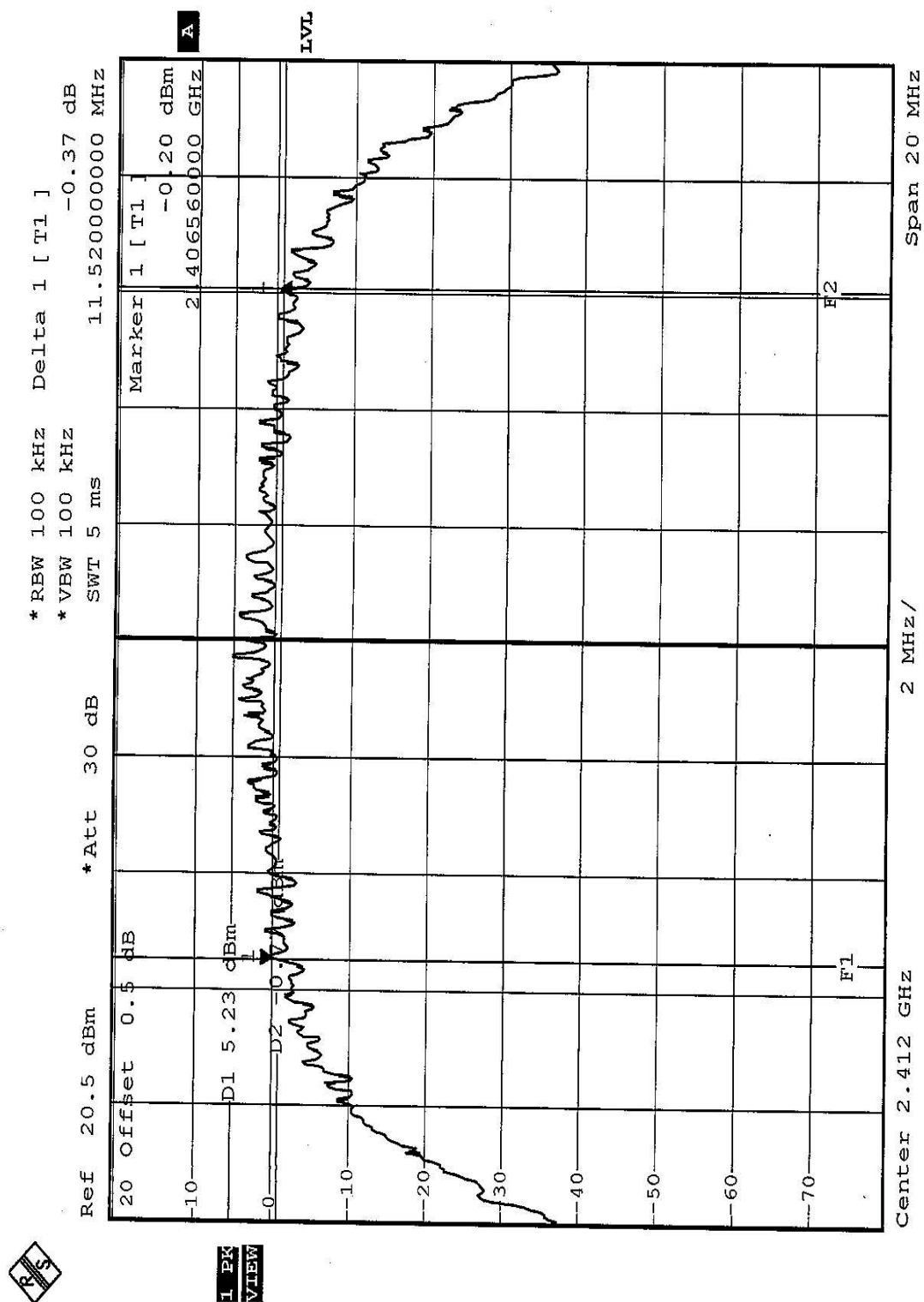
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

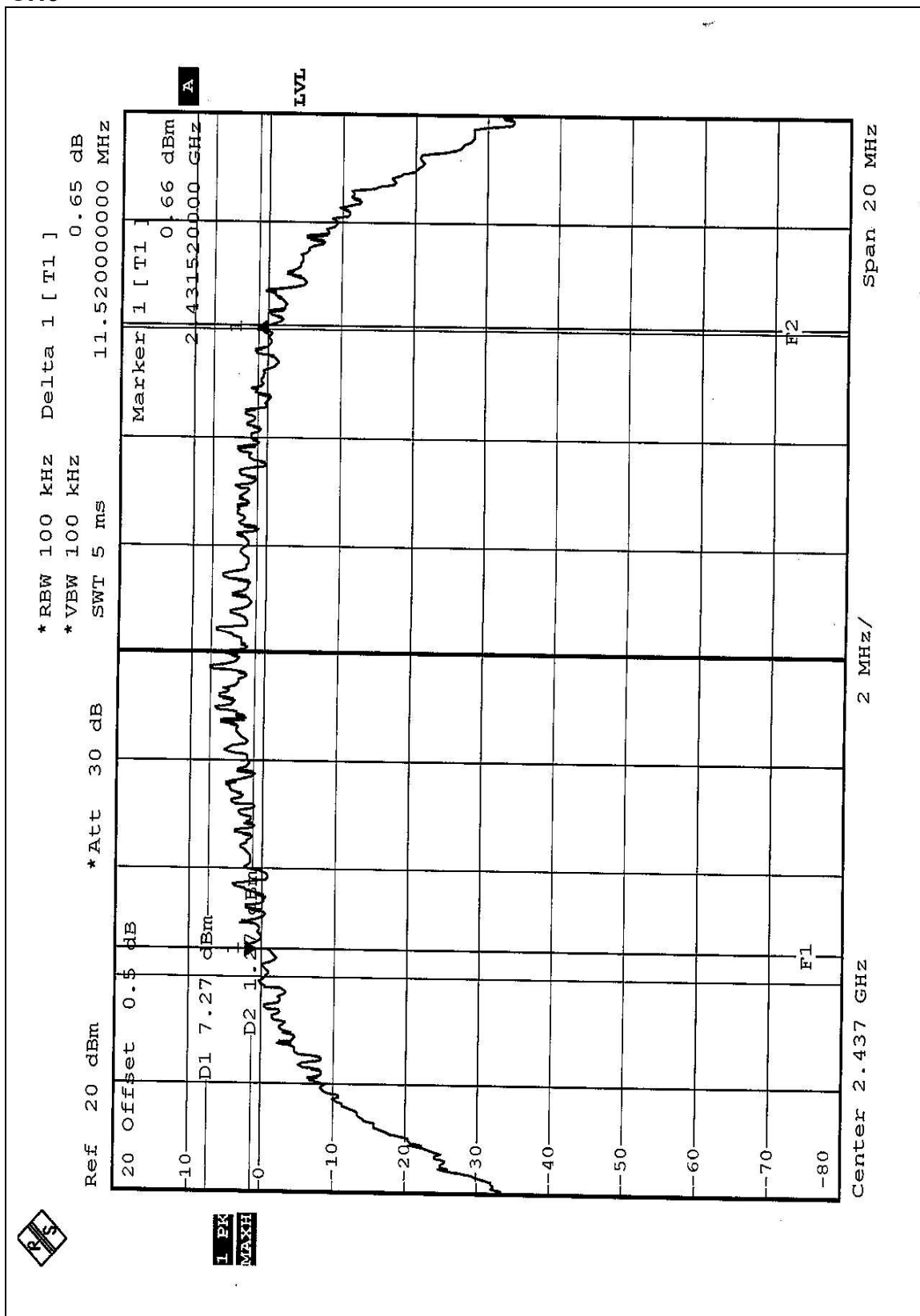
EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710	MODE	CCK
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.52	0.5	PASS
6	2437	11.52	0.5	PASS
11	2462	11.48	0.5	PASS

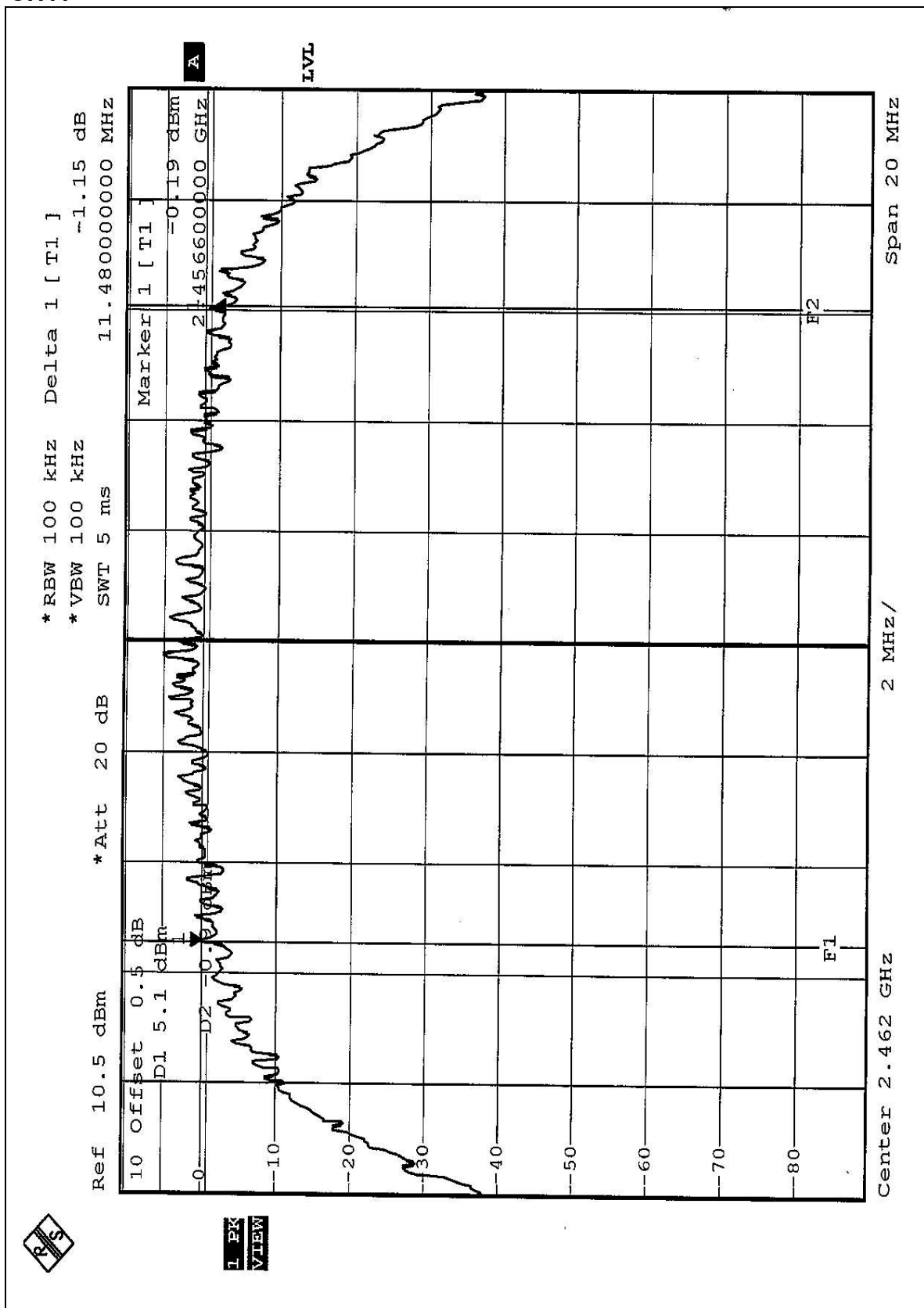
CH1



CH6



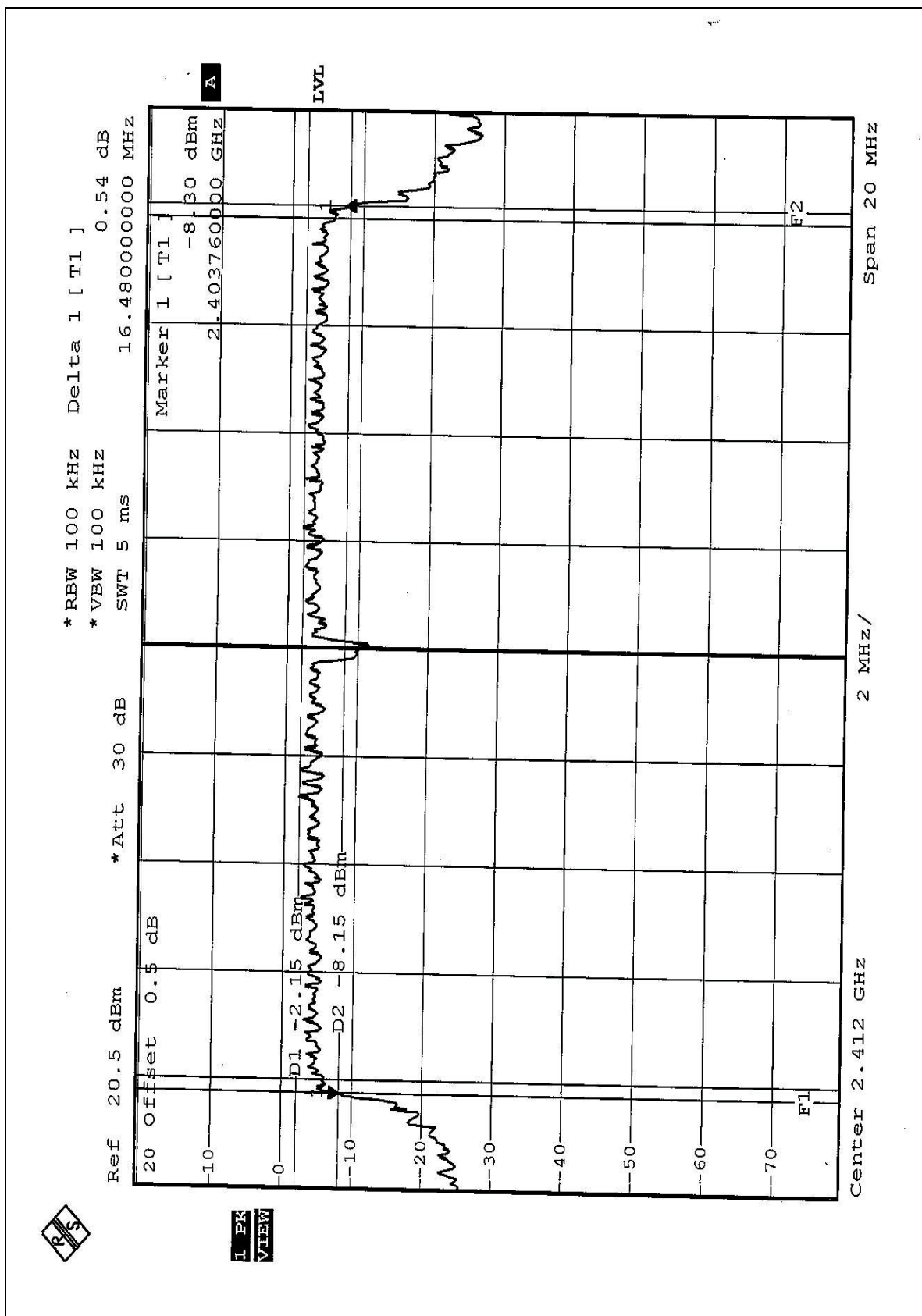
CH11



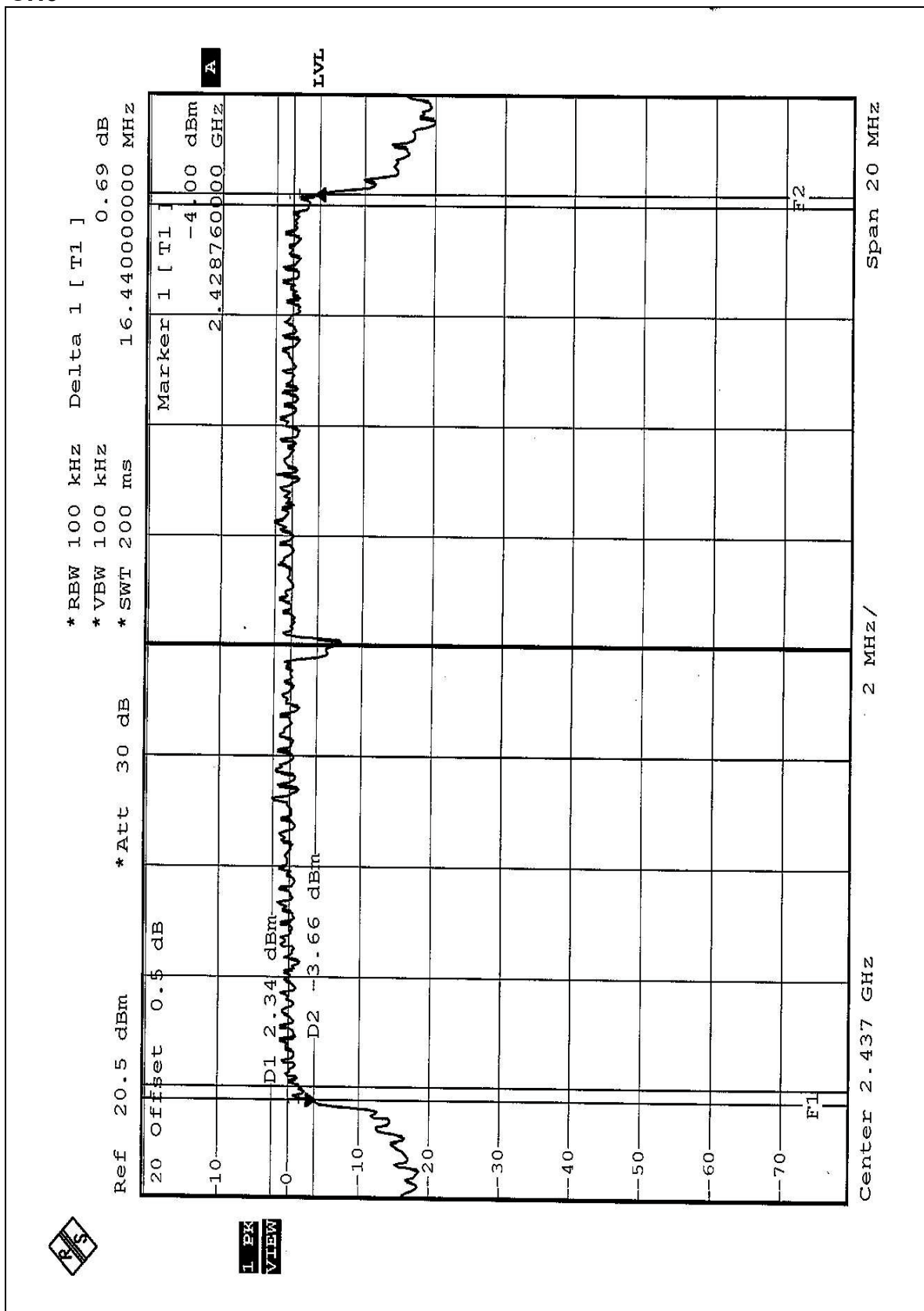
EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710	MODE	OFDM
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.48	0.5	PASS
6	2437	16.44	0.5	PASS
11	2462	16.52	0.5	PASS

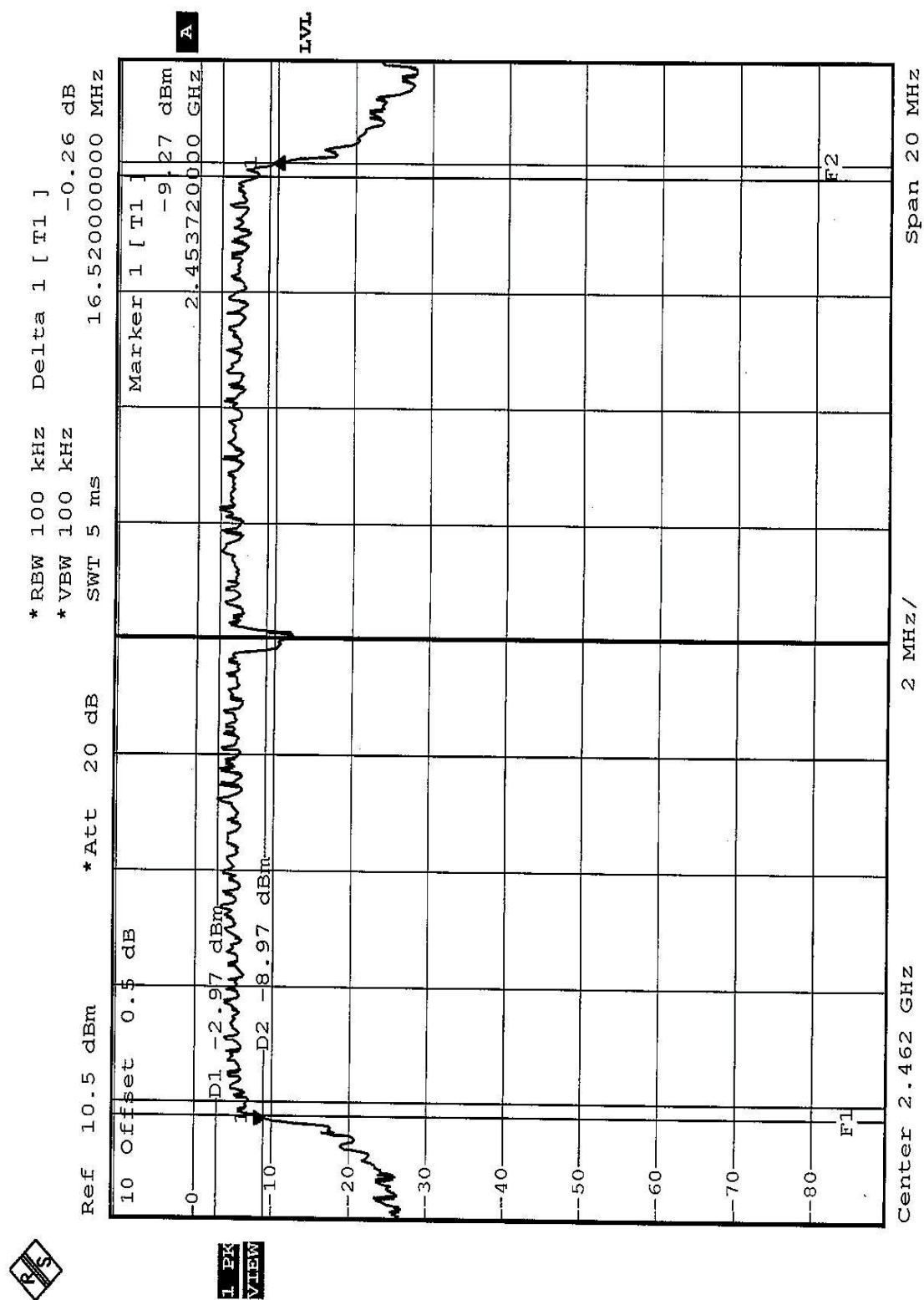
CH1



CH6



CH11



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
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004
R&S SIGNAL GENERATOR	SMP04	100011	May 28, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	B048470	Mar. 05, 2004
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

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 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	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710	MODE	CCK
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	16.20	30	PASS
6	2437	18.10	30	PASS
11	2462	16.40	30	PASS

EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710	MODE	OFDM
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	14.50	30	PASS
6	2437	19.20	30	PASS
11	2462	14.50	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	Aug. 12, 2004

NOTE: 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 3kHz RBW and 30kHz 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

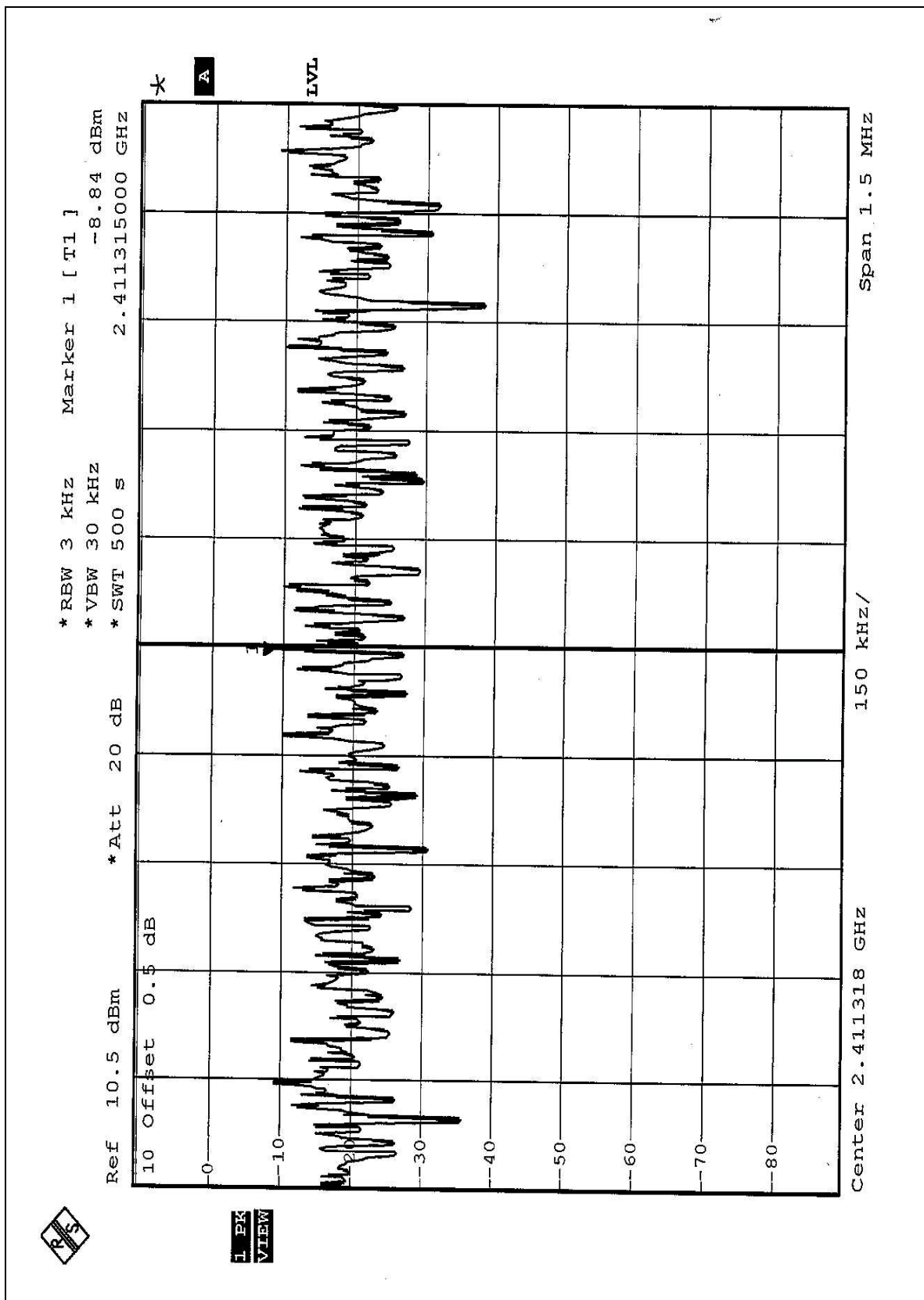
Same as 4.3.6

4.5.7 TEST RESULTS

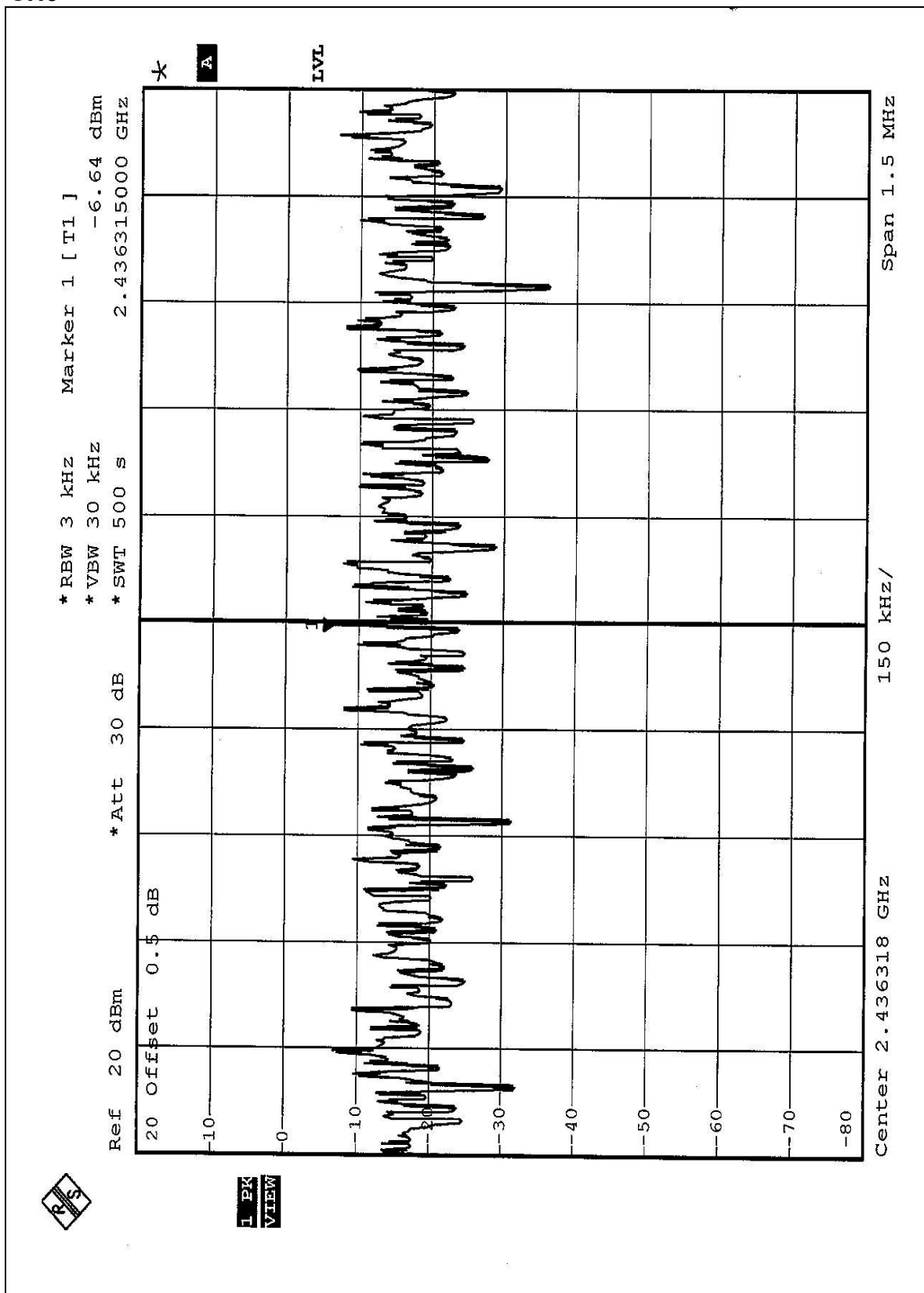
EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710	MODE	CCK
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-8.84	8	PASS
6	2437	-6.64	8	PASS
11	2462	-8.75	8	PASS

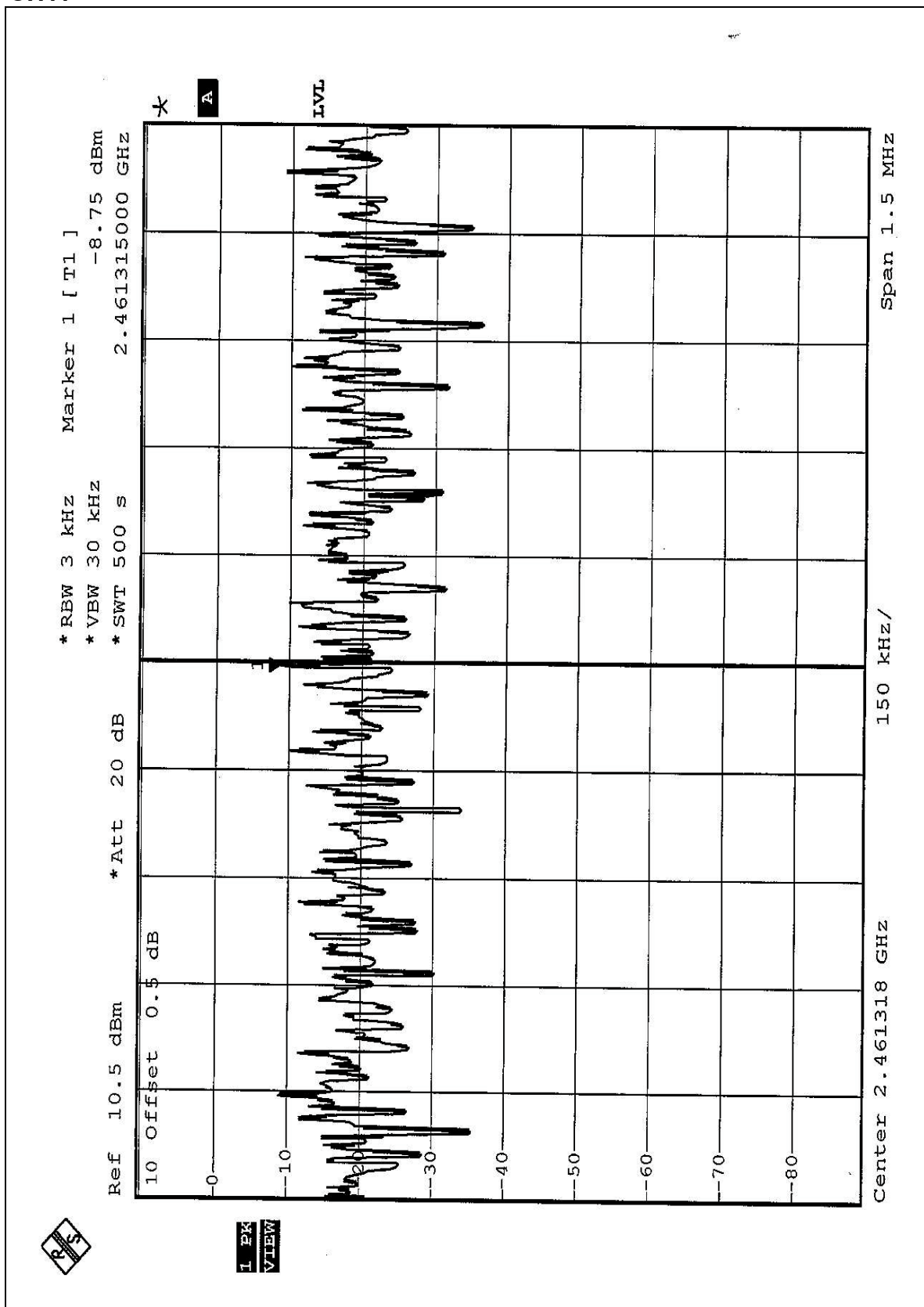
CH1



CH6



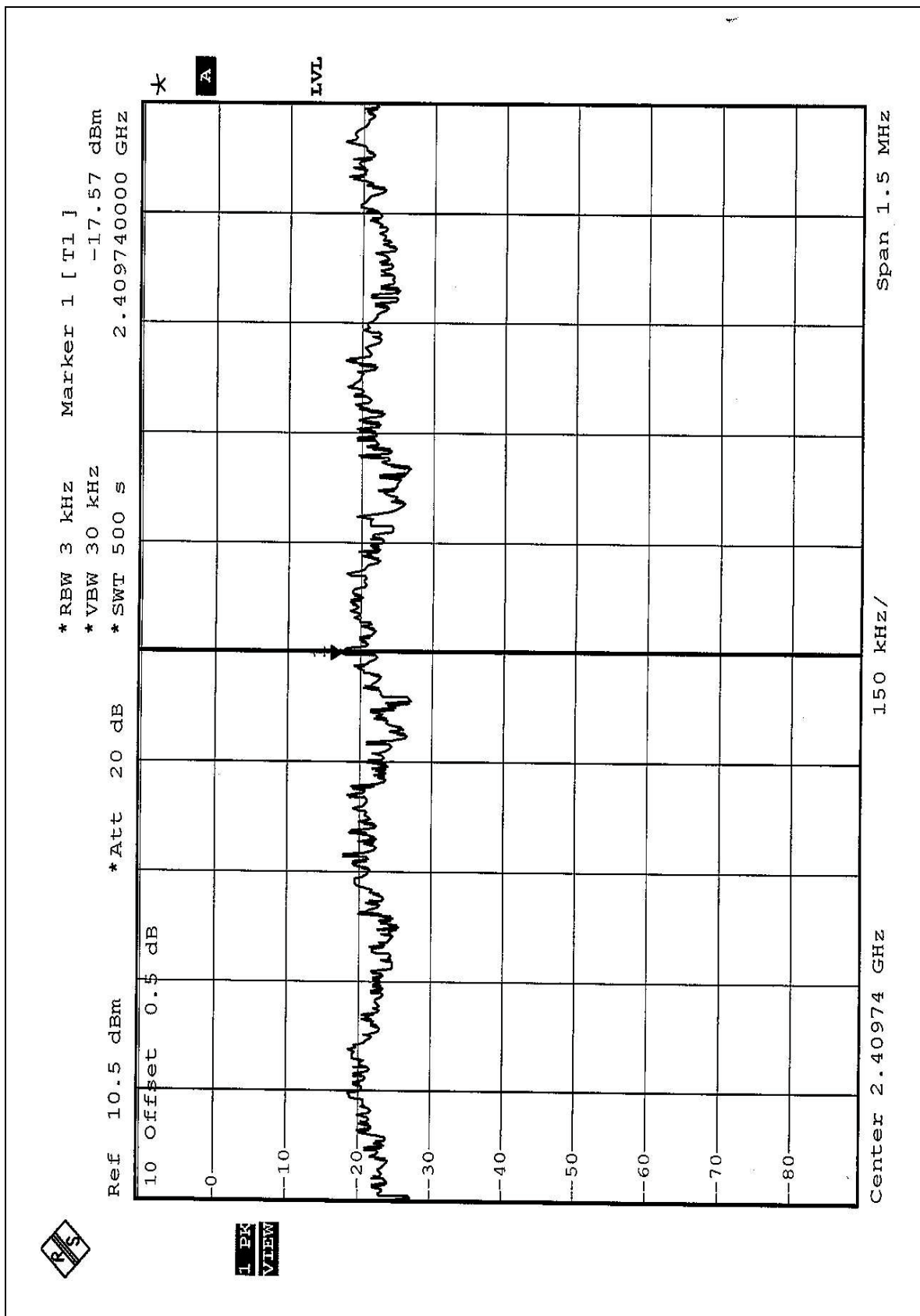
CH11



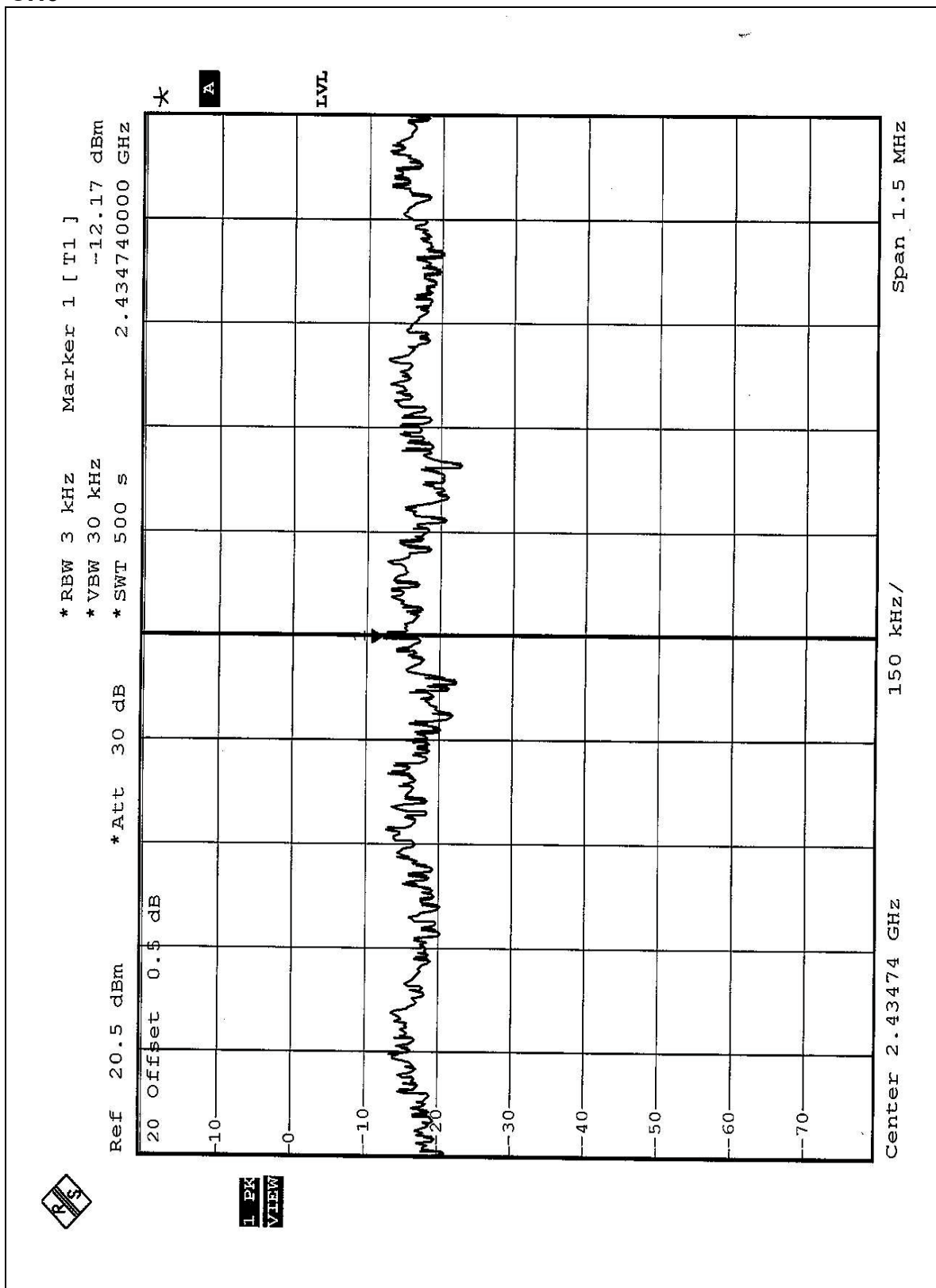
EUT	Microsoft® Broadband Networking Wireless USB 2.0 Adapter		
MODEL	MN-710	MODE	OFDM
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-17.57	8	PASS
6	2437	-12.17	8	PASS
11	2462	-17.58	8	PASS

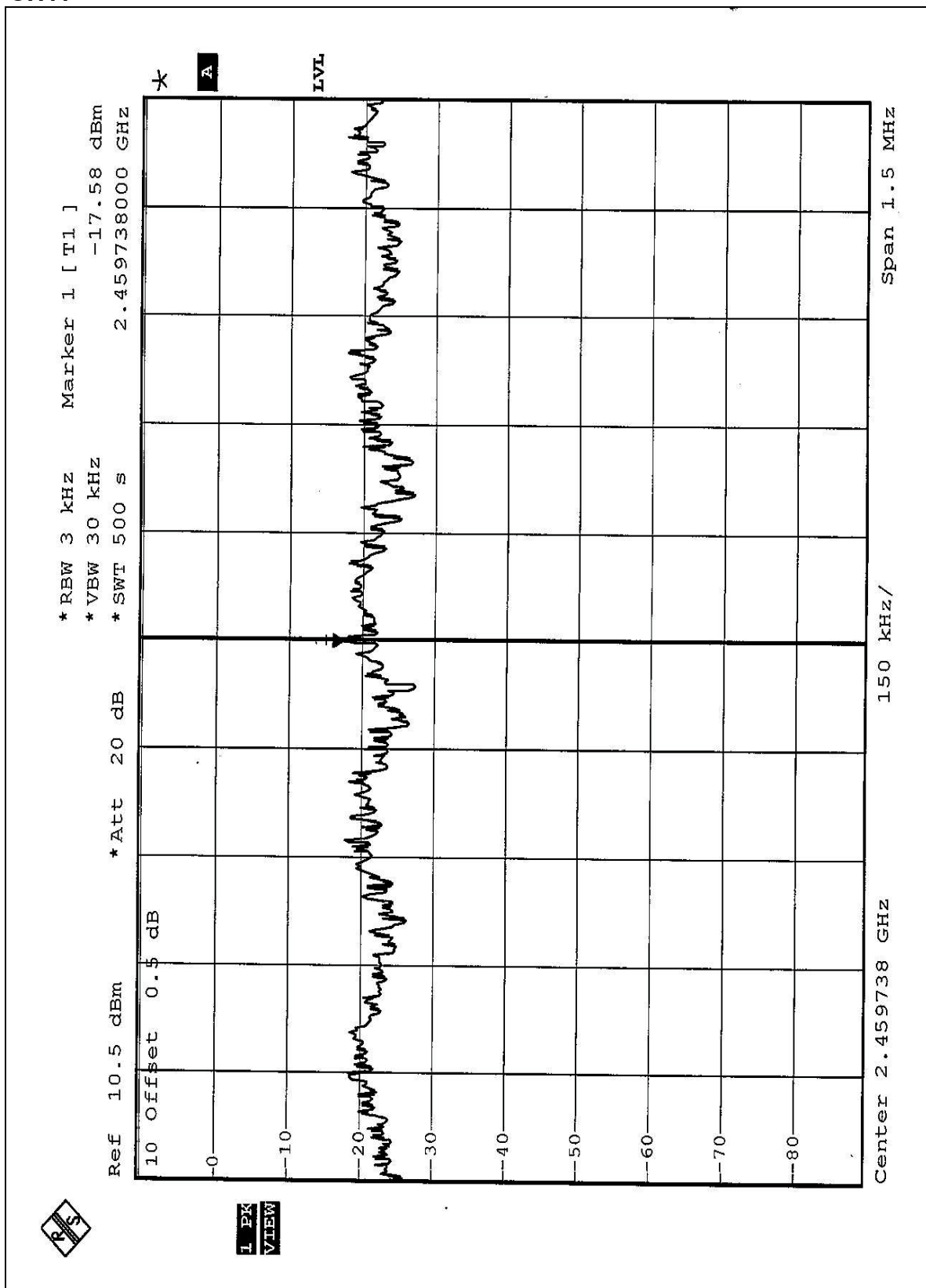
CH1



CH6



CH11



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	Aug. 12, 2004

NOTE: 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 loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges were 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 (FOR CCK)

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).

NOTE 1:

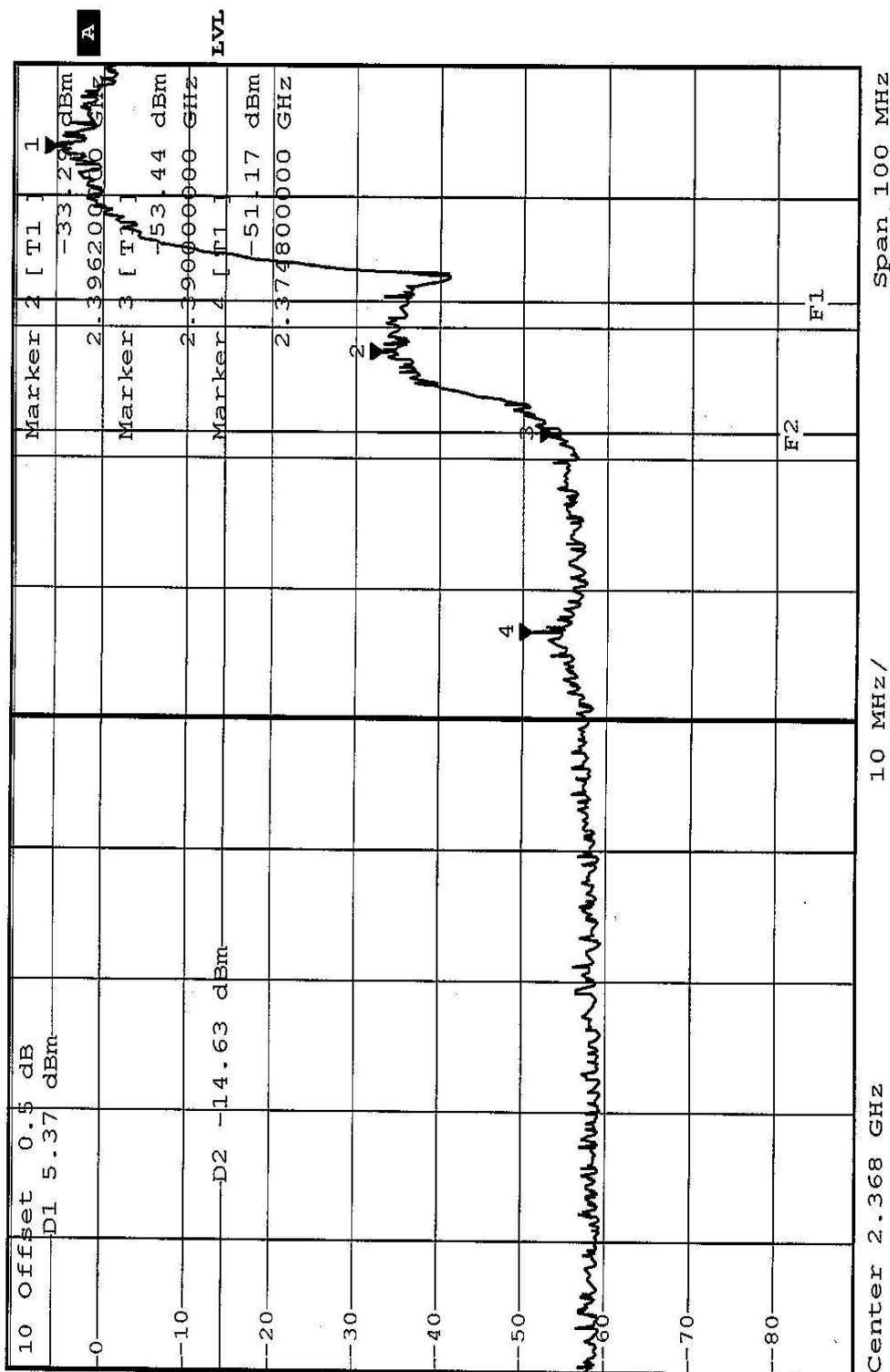
The band edge emission plot on the following first pages shows 56.54dB delta between carrier maximum power and local maximum emission in restrict band (2.3748GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.8 is 101.35dBuV/m, so the maximum field strength in restrict band is $101.35 - 56.54 = 44.81$ dBuV/m which is under 54dBuV/m limit.

NOTE 2:

The band edge emission plot on the following second pages shows 58.37dB 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 4.2.8 is 101.95dBuV/m, so the maximum field strength in restrict band is $101.95 - 58.37 = 43.58$ dBuV/m which is under 54 dBuV/m limit.

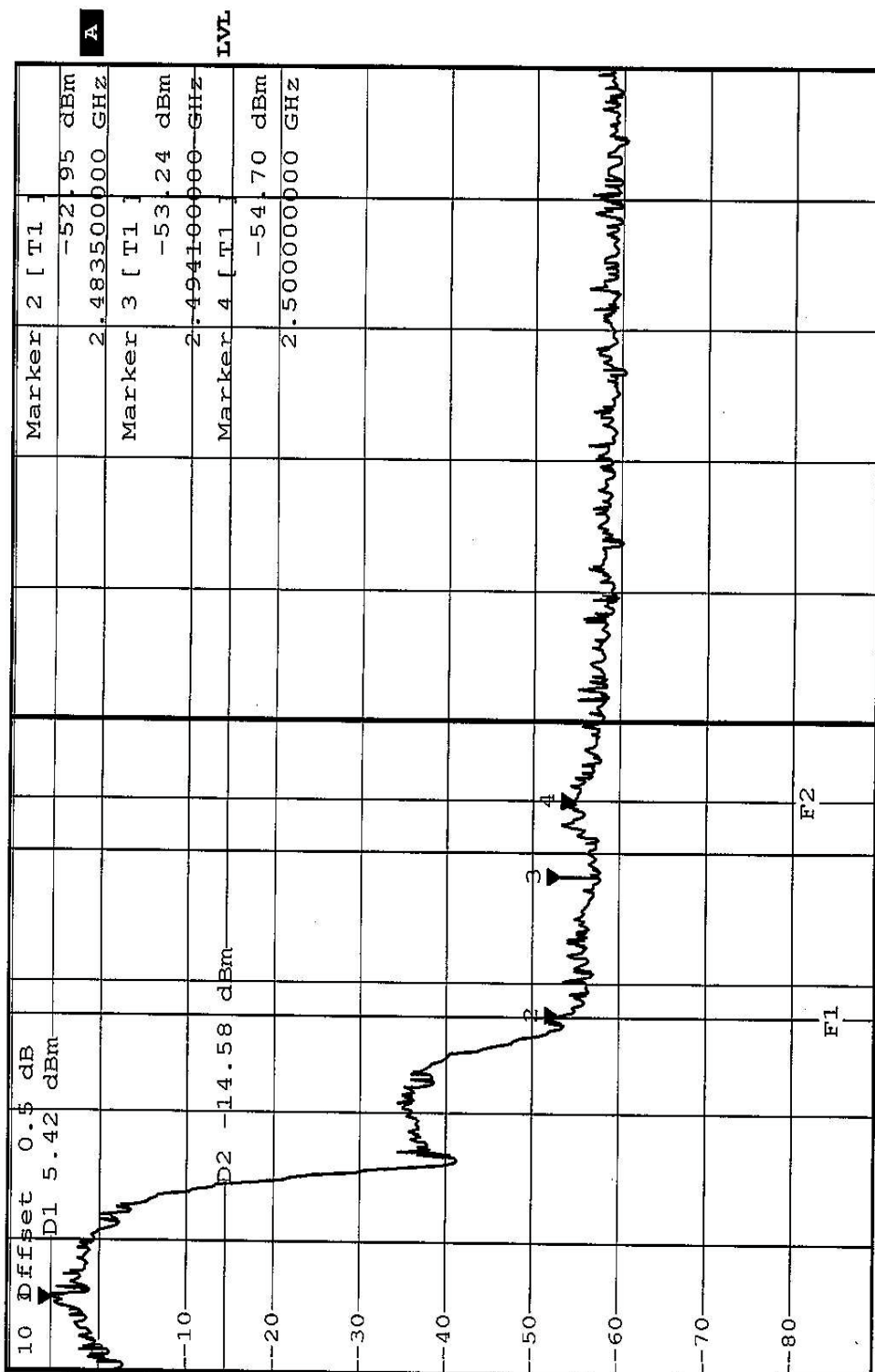


Ref 10.5 dBm *Att 20 dB *RBW 100 kHz Marker 1 [T1] 5.37 dBm
 *VBW 100 kHz SWT 10 ms 2.411800000 GHz





* RBW 100 kHz Marker 1 [T1]
 * VBW 100 kHz 5.42 dBm
 Ref 10.5 dBm * Att 20 dB 2.461600000 GHz
 10 Offset 0.5 dB



1 PK
 VIEW

Center 2.506 GHz 10 MHz/ Span 100 MHz

4.6.7 TEST RESULTS (FOR OFDM)

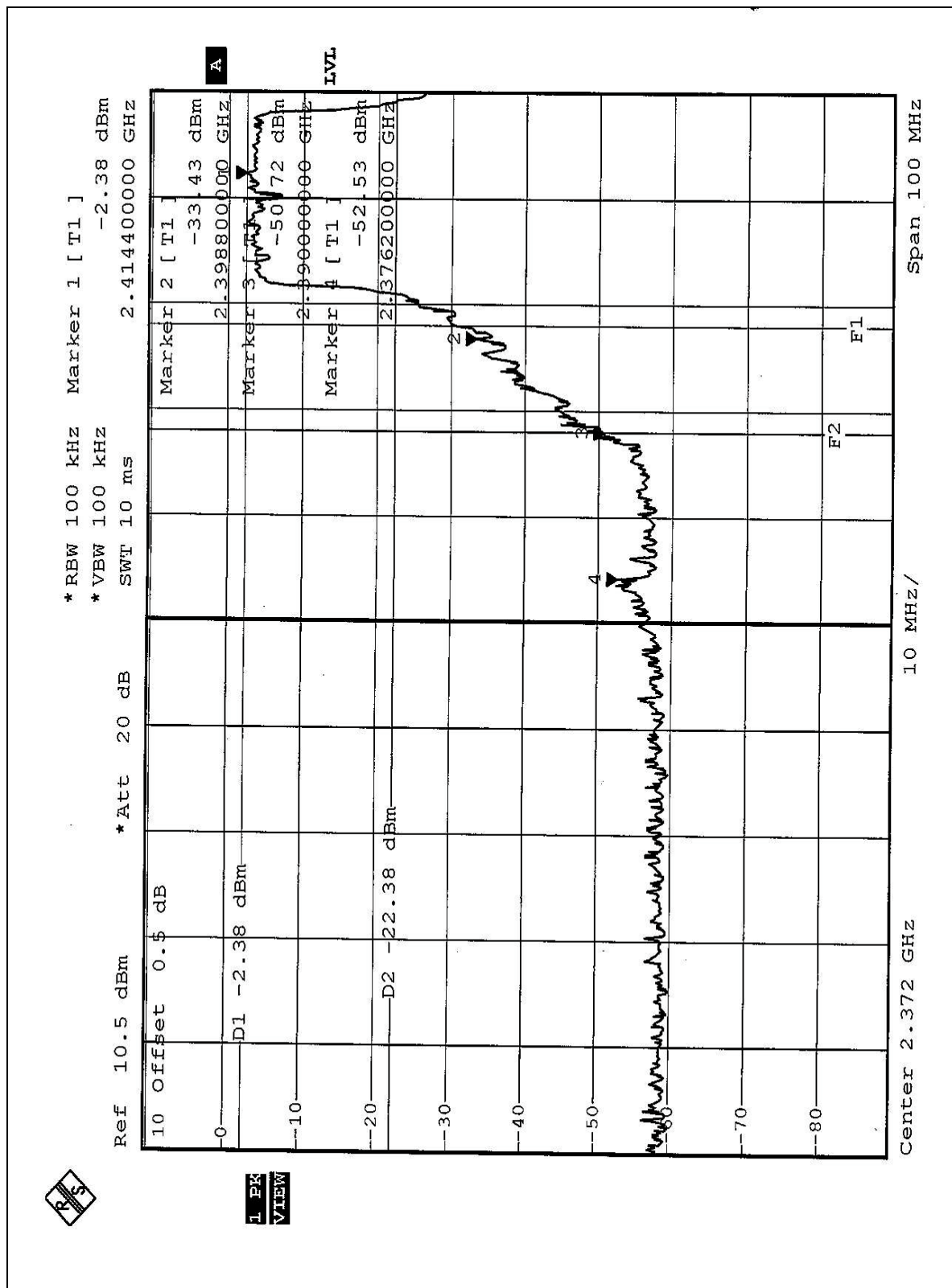
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE 1:

The band edge emission plot on the following first pages shows 48.34dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.9 is 96.33dBuV/m, so the maximum field strength in restrict band is $96.33 - 48.34 = 47.99$ dBuV/m which is under 54dBuV/m limit.

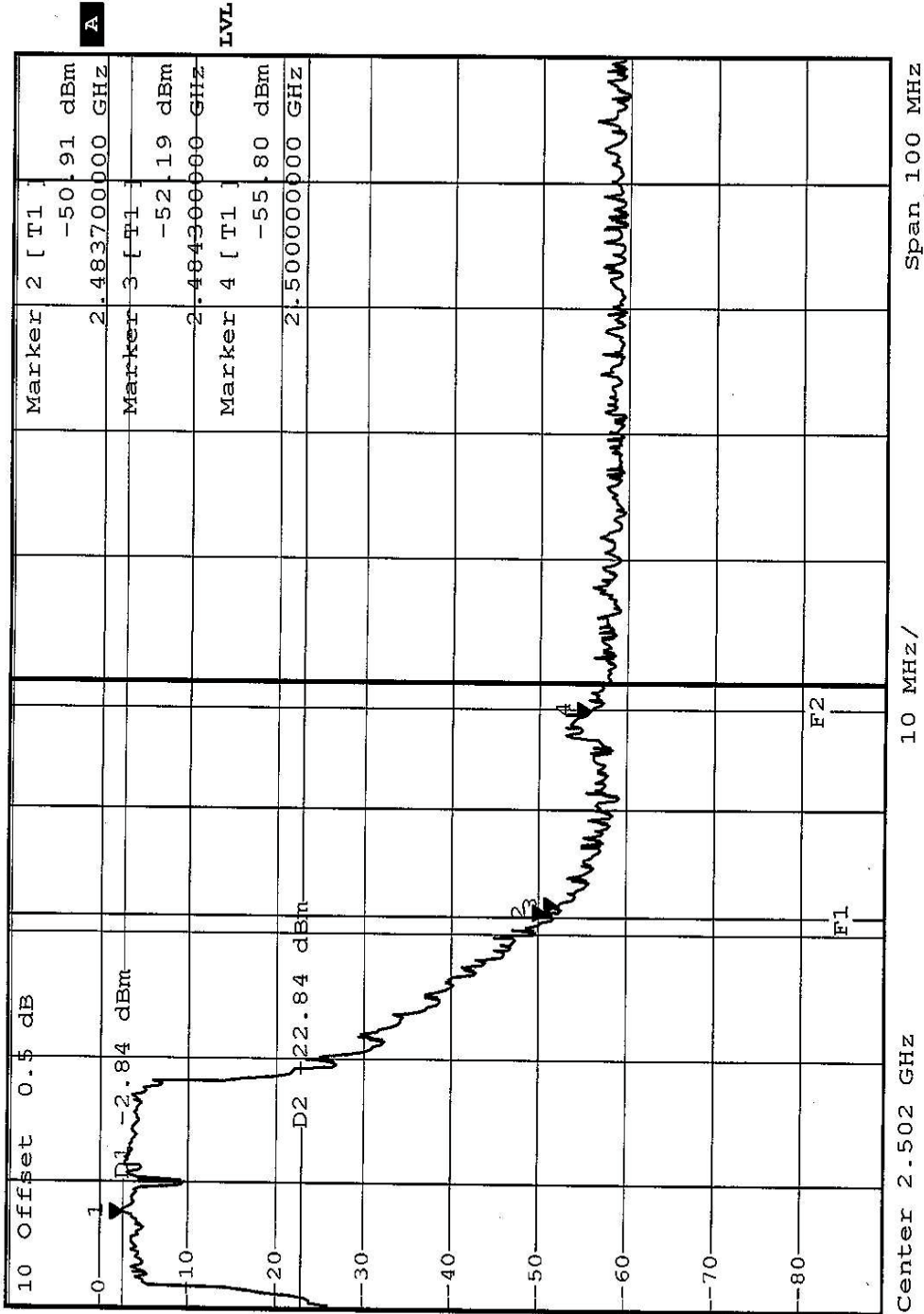
NOTE 2:

The band edge emission plot on the following second pages shows 48.07dB delta between carrier maximum power and local maximum emission in restrict band (2.4837GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.9 is 96.33dBuV/m, so the maximum field strength in restrict band is $96.33 - 48.07 = 48.26$ dBuV/m which is under 54dBuV/m limit.





*RBW 100 kHz Marker 1 [T1]
 *VBW 100 kHz -2.84 dBm
 Ref 10.5 dBm *Att 20 dB SWT 10 ms 2.459600000 GHz



1 PK VIEW

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

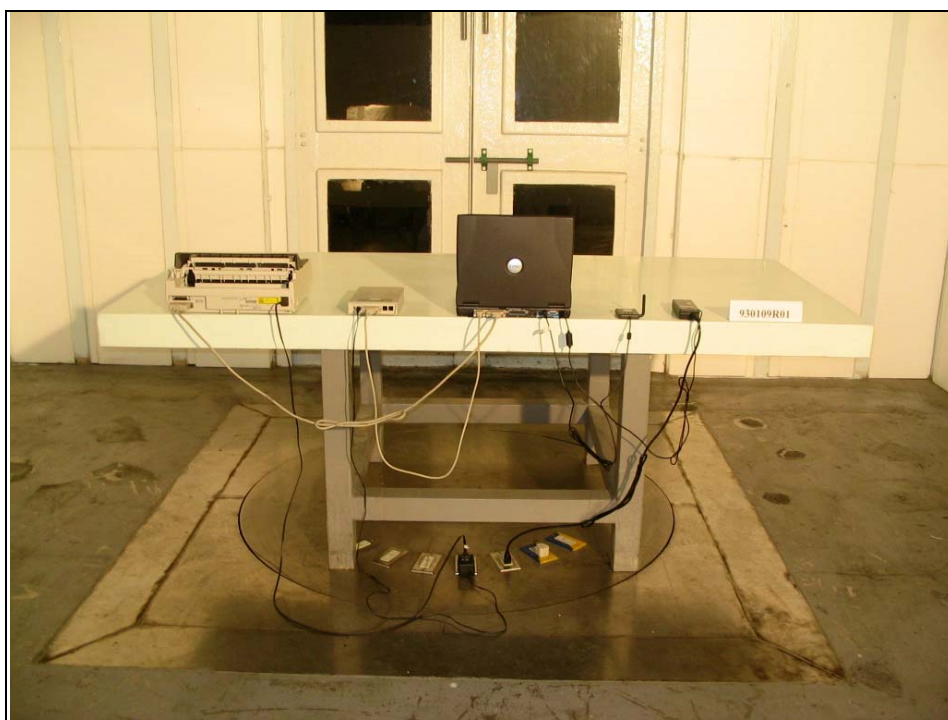
The antenna type used in this product is Dipole Antenna without antenna connector. The maximum Gain of this antenna is only 2.5dBi.

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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Tel: 886-35-935343

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Email: service@mail.adt.com.tw

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