



# FCC TEST REPORT

**REPORT NO.:** RF931004L01

**MODEL NO.:** WL-2203

**RECEIVED:** Oct. 4, 2004

**TESTED:** Oct. 18 ~ Oct. 19, 2004

**APPLICANT:** CC&C Technologies, Inc.

**ADDRESS:** 8F, 150, Jian Yi Road, Chung Ho City, Taipei County, Taiwan 235, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2<sup>nd</sup> Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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No. 2177-01



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ILAC MRA



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## 1 CERTIFICATION

**PRODUCT :** WLAN 11g USB Adapter  
**BRAND NAME :** CC&C  
**MODEL NO. :** WL-2203  
**APPLICANT :** CC&C Technologies, Inc.  
**TESTED :** Oct. 18 ~ Oct. 19, 2004  
**TEST SAMPLE :** ENGINEERING SAMPLE  
**STANDARDS :** FCC Part 15, Subpart C (Section 15.247),  
ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** Windy Chou , **DATE:** Oct. 21, 2004  
( Windy Chou )

**TECHNICAL ACCEPTANCE :** Gary Chang , **DATE:** Oct. 21, 2004  
Responsible for RF ( Gary Chang )

**APPROVED BY :** Cody Chang , **DATE:** Oct. 21, 2004  
( Cody Chang, Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: FCC Part 15, Subpart C</b>			
<b>Standard Section</b>	<b>Test Type and Limit</b>	<b>Result</b>	<b>REMARK</b>
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.49dB at 0.213MHz
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 -1.89dB at 9648.00MHz
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.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

<b>Measurement</b>	<b>Frequency</b>	<b>Uncertainty</b>
Conducted emissions	9k~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.55 dB
	200MHz ~1000MHz	3.58 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	WLAN 11g USB Adapter
<b>MODEL NO.</b>	WL-2203
<b>POWER SUPPLY</b>	5.0Vdc from host equipment
<b>MODULATION TYPE</b>	BPSK, QPSK, CCK, 16QAM, 64QAM
<b>RADIO TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
<b>FREQUENCY RANGE</b>	2412MHz ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11
<b>MAXIMUM OUTPUT POWER</b>	11.169mW
<b>ANTENNA TYPE</b>	Chip antenna with 1.98dBi gain
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	USB
<b>ASSOCIATED DEVICES</b>	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 standards and backwards compatible with IEEE 802.11b products.
3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



### 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

**NOTE:**

1. Below 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, the worst case, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.
3. From our experience and technical viewpoint, we have chosen data rates 11Mbps for CCK technique and 6Mbps for OFDM technique, as the worst cases for the test among other data rates.
4. Two test results were presented in the following sections. The test result A was for CCK technique and the test result B was for OFDM technique.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a WLAN 11g USB 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 C63.4-2003**

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

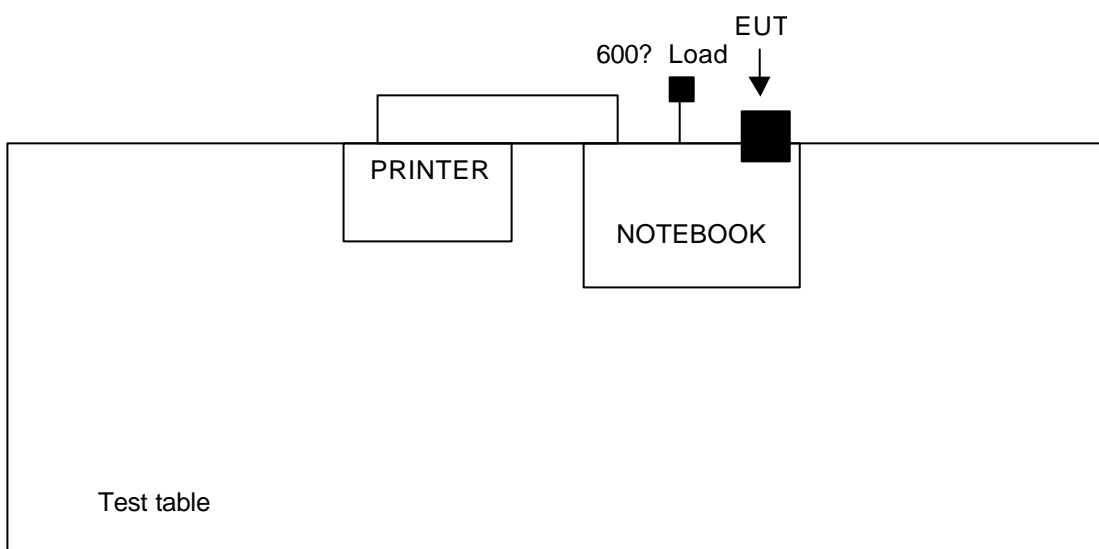
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	Compaq	N800C	470048-515	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved
3	600? Load	NA	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m shielded cable without core
3	NA

**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 $\mu$ 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
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Dec. 11, 2004
RF signal cable Woken	5D-FB	Cable-HyC02-01	Mar. 07, 2005
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Mar. 10, 2005
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Mar. 04, 2005
Software ADT	ADT_Cond_V3	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 HwaYa Shielded Room 2.
  3. The VCCI Site Registration No. is C-2047.



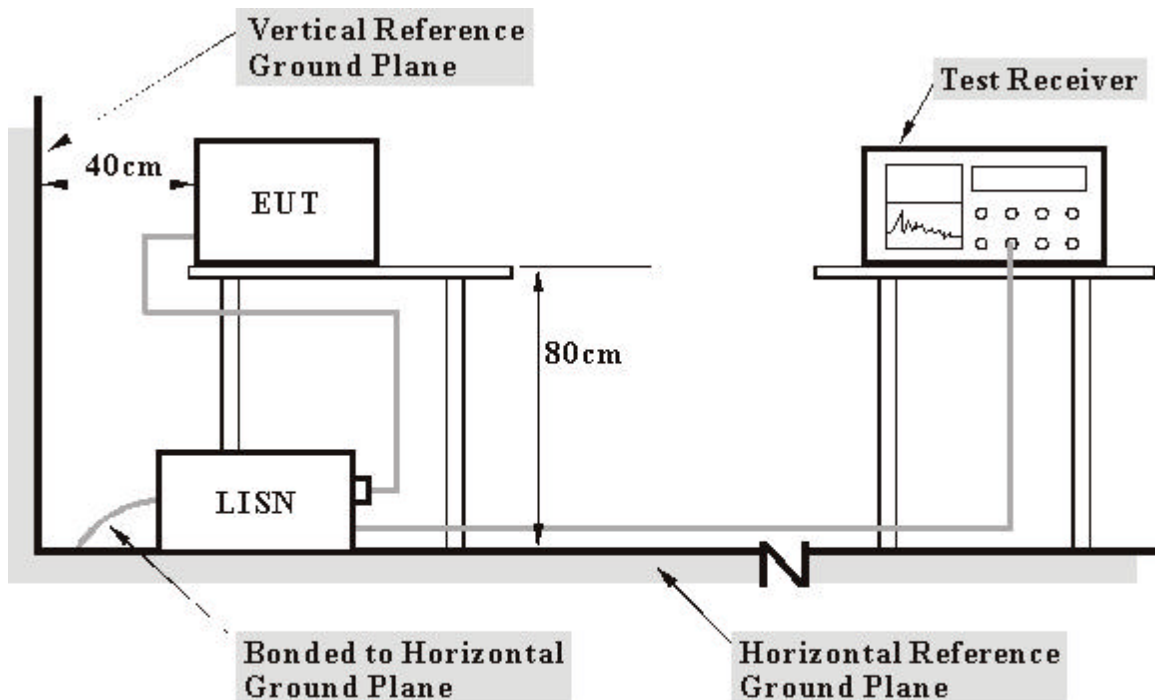
#### 4.1.3 TEST PROCEDURES

- 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 Limit - 20dB was not recorded.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



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

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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Connected the EUT to a Notebook system placed on a testing table.
- b. The Notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The Notebook system sent "H" messages to its screen.
- d. The Notebook system sent "H" messages to printer, and the printer printed them on paper.
- e. Steps c ~ d were repeated.

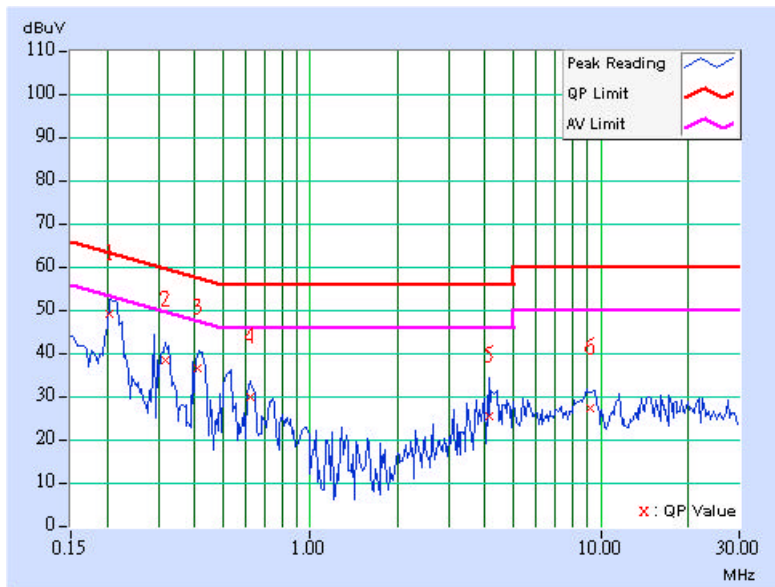


4.1.7 TEST RESULTS

<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	1	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64% RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

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	0.205	0.10	48.65	-	48.75	-	63.42	53.42	-14.67	-
2	0.318	0.11	38.19	-	38.30	-	59.76	49.76	-21.46	-
3	0.408	0.12	36.34	-	36.46	-	57.69	47.69	-21.24	-
4	0.619	0.16	29.34	-	29.50	-	56.00	46.00	-26.50	-
5	4.113	0.32	25.03	-	25.35	-	56.00	46.00	-30.65	-
6	9.223	0.51	26.85	-	27.36	-	60.00	50.00	-32.64	-

- 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.

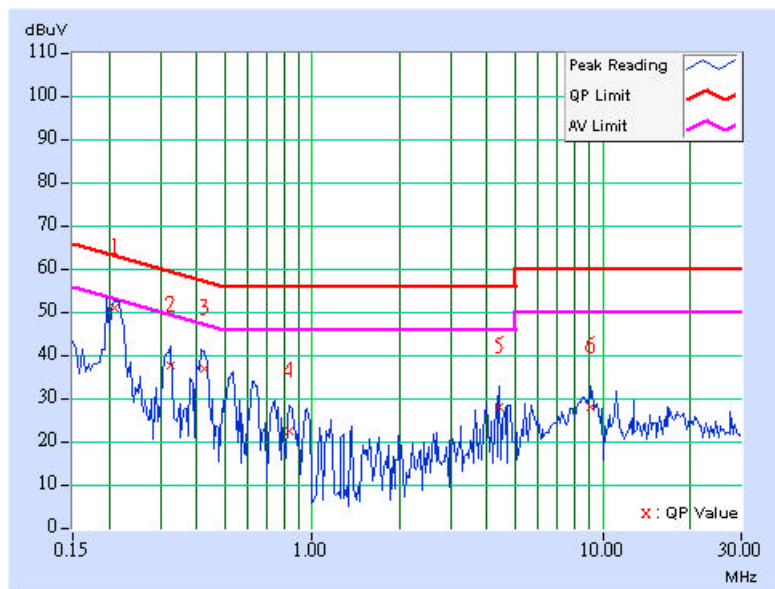




<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	1	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64% RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

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	0.209	0.10	50.60	-	50.70	-	63.26	53.26	-12.56	-
2	0.326	0.11	37.47	-	37.58	-	59.56	49.56	-21.98	-
3	0.423	0.12	36.49	-	36.61	-	57.38	47.38	-20.77	-
4	0.834	0.20	21.96	-	22.16	-	56.00	46.00	-33.84	-
5	4.430	0.32	27.67	-	27.99	-	56.00	46.00	-28.01	-
6	9.141	0.47	27.79	-	28.26	-	60.00	50.00	-31.74	-

- 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.

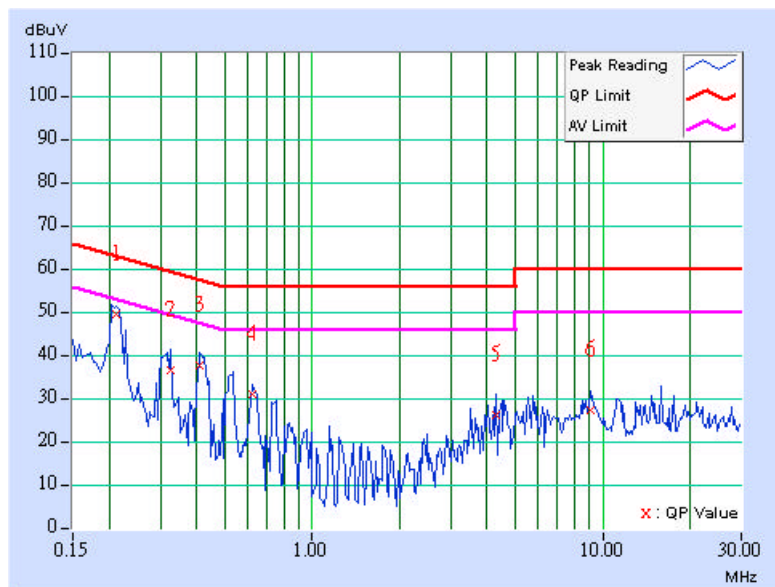




<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	6	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64% RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

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	0.213	0.10	49.20	-	49.30	-	63.11	53.11	-13.81	-
2	0.326	0.11	36.30	-	36.41	-	59.56	49.56	-23.15	-
3	0.412	0.12	37.22	-	37.34	-	57.61	47.61	-20.28	-
4	0.619	0.16	30.79	-	30.95	-	56.00	46.00	-25.05	-
5	4.316	0.33	25.68	-	26.01	-	56.00	46.00	-29.99	-
6	9.113	0.50	27.03	-	27.53	-	60.00	50.00	-32.47	-

- 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.

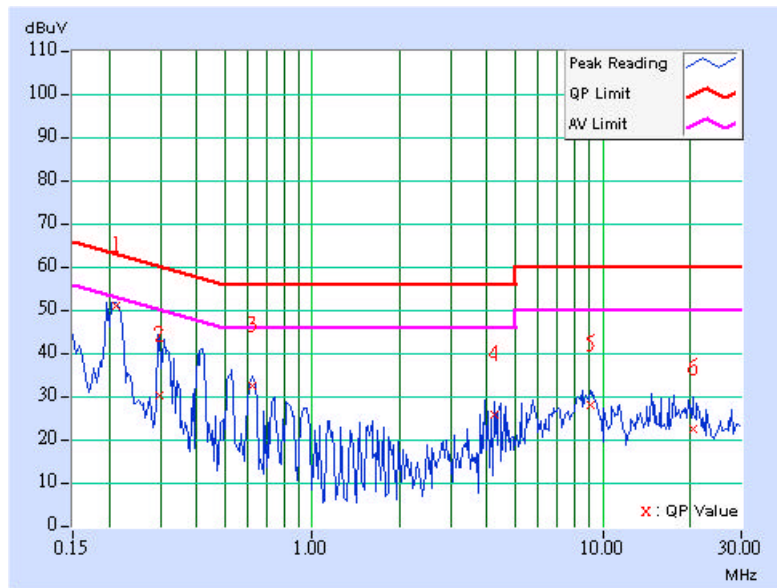




<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	6	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64% RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.10	50.52	-	50.62	-	63.11	53.11	-12.49	-
2	0.298	0.11	29.71	-	29.82	-	60.29	50.29	-30.47	-
3	0.619	0.16	32.00	-	32.16	-	56.00	46.00	-23.84	-
4	4.234	0.31	25.10	-	25.41	-	56.00	46.00	-30.59	-
5	9.078	0.47	27.44	-	27.91	-	60.00	50.00	-32.09	-
6	20.367	0.65	22.07	-	22.72	-	60.00	50.00	-37.28	-

- 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.

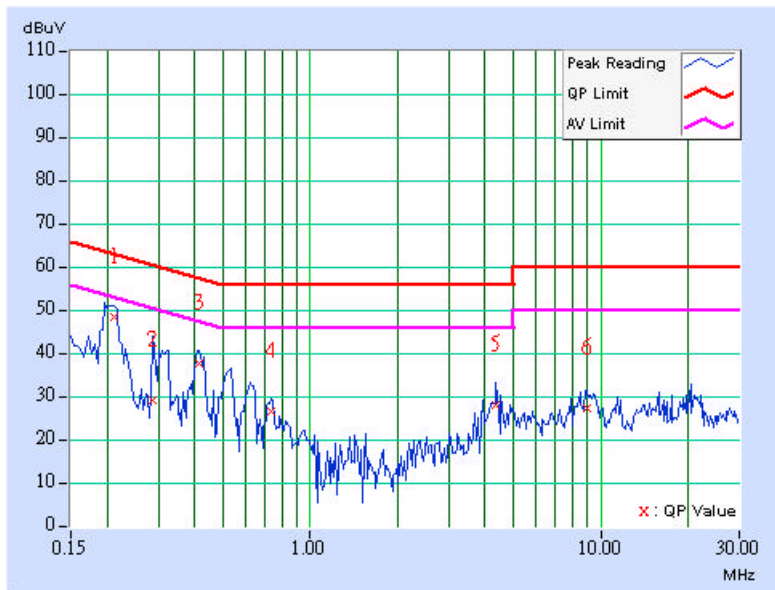




<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	11	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64% RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.10	48.20	-	48.30	-	63.11	53.11	-14.81	-
2	0.287	0.11	28.74	-	28.85	-	60.62	50.62	-31.77	-
3	0.416	0.12	37.14	-	37.26	-	57.54	47.54	-20.28	-
4	0.736	0.19	26.06	-	26.25	-	56.00	46.00	-29.75	-
5	4.371	0.33	27.63	-	27.96	-	56.00	46.00	-28.04	-
6	8.957	0.50	26.94	-	27.44	-	60.00	50.00	-32.56	-

- 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.



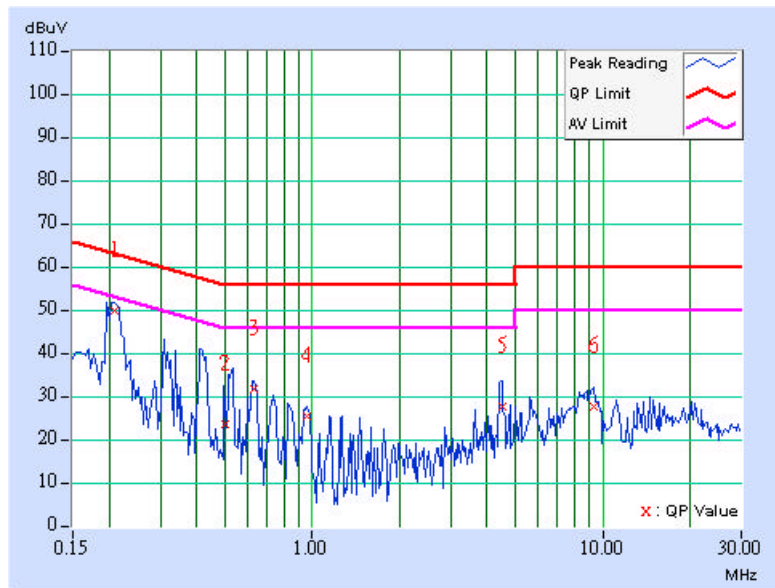




<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	11	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Netural (N)
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64% RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.10	49.51	-	49.61	-	63.26	53.26	-13.65	-
2	0.500	0.14	23.40	-	23.54	-	56.00	46.00	-32.46	-
3	0.630	0.16	31.23	-	31.39	-	56.00	46.00	-24.61	-
4	0.963	0.23	25.14	-	25.37	-	56.00	46.00	-30.63	-
5	4.508	0.33	27.33	-	27.66	-	56.00	46.00	-28.34	-
6	9.266	0.47	27.45	-	27.92	-	60.00	50.00	-32.08	-

- 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(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
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jun, 08, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-153	Feb. 03, 2005
HORN Antenna SCHWARZBECK	9120D	9120D-408	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170243	Feb. 23, 2005
Preamplifier Agilent	8447D	2944A10633	Jan. 15, 2005
Preamplifier Agilent	8449B	3008A01964	Jan. 27, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218183/4	Mar. 05, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218195/4	Mar. 05, 2005
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 HwaYa Chamber 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-3.



#### 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 3 meter semi-anechoic chamber. 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.

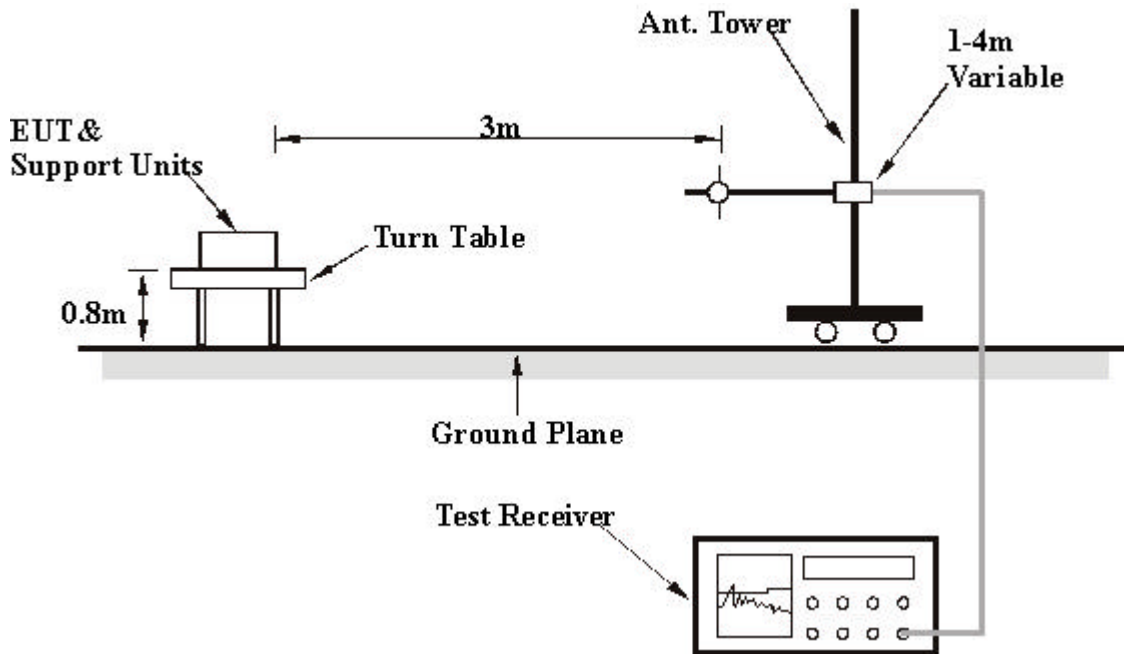
**NOTE:**

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 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



## 4.2.7 TEST RESULTS

<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	11	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

**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	127.19	26.78 QP	43.50	-16.72	2.00 H	343	13.47	13.31
2	239.94	28.22 QP	46.00	-17.78	1.00 H	343	14.97	13.25
3	399.34	30.14 QP	46.00	-15.86	1.00 H	199	13.20	16.95
4	529.58	30.63 QP	46.00	-15.37	2.00 H	94	11.27	19.36
5	584.01	28.35 QP	46.00	-17.65	3.00 H	40	7.56	20.79
6	702.59	32.91 QP	46.00	-13.09	1.00 H	229	10.34	22.57
7	797.84	28.87 QP	46.00	-17.13	1.00 H	28	5.11	23.77
8	840.60	33.46 QP	46.00	-12.54	1.00 H	304	9.30	24.16

- 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.



<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	11	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

**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	66.93	33.86 QP	40.00	-6.14	1.00 V	37	20.59	13.27
2	109.70	29.79 QP	43.50	-13.71	1.00 V	280	17.82	11.97
3	362.40	32.90 QP	46.00	-13.10	3.00 V	172	16.77	16.13
4	529.58	32.72 QP	46.00	-13.28	1.00 V	328	13.36	19.36
5	584.01	33.51 QP	46.00	-12.49	1.00 V	169	12.72	20.79
6	702.59	33.93 QP	46.00	-12.07	1.00 V	184	11.36	22.57

- 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 (A)

<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	1	<b>FREQUENCY RANGE</b>	1~25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak (PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

**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	1052.00	48.95 PK	74.00	-25.05	1.14 H	211	21.21	27.74
2	1080.00	46.28 PK	74.00	-27.72	1.48 H	107	18.43	27.85
3	2390.00	45.44 PK	74.00	-28.56	1.16 H	190	13.83	31.61
4	*2412.00	106.35 PK			1.16 H	190	74.65	31.70
4	*2412.00	98.88 AV			1.16 H	190	67.18	31.70
5	4824.00	54.85 PK	74.00	-19.15	1.23 H	30	17.27	37.58
5	4824.00	43.02 AV	54.00	-10.98	1.23 H	30	5.44	37.58
6	9648.00	62.89 PK	74.00	-11.11	1.10 H	306	14.52	48.37
6	<b>9648.00</b>	<b>52.11 AV</b>	<b>54.00</b>	<b>-1.89</b>	<b>1.10 H</b>	<b>306</b>	<b>3.74</b>	<b>48.37</b>

**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	1052.00	43.99 PK	74.00	-30.01	1.17 V	354	16.25	27.74
2	1080.00	42.39 PK	74.00	-31.61	1.40 V	307	14.54	27.85
3	2390.00	44.40 PK	74.00	-29.60	1.43 V	81	12.79	31.61
4	*2412.00	105.31 PK			1.43 V	81	73.61	31.70
4	*2412.00	97.97 AV			1.43 V	81	66.27	31.70
5	4824.00	52.91 PK	74.00	-21.09	1.37 V	5	15.33	37.58
5	4824.00	40.03 AV	54.00	-13.97	1.37 V	5	2.45	37.58
6	9648.00	58.96 PK	74.00	-15.04	1.65 V	358	10.59	48.37
6	9648.00	50.77 AV	54.00	-3.23	1.65 V	358	2.40	48.37

- 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.





<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	6	<b>FREQUENCY RANGE</b>	1~25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

#### 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	1052.00	46.85 PK	74.00	-27.15	1.33 H	139	19.11	27.74
2	1080.00	46.24 PK	74.00	-27.76	1.14 H	247	18.39	27.85
3	*2437.00	105.25 PK			1.16 H	183	73.40	31.85
3	*2437.00	97.29 AV			1.16 H	183	65.44	31.85
4	4874.00	52.68 PK	74.00	-21.32	1.08 H	19	15.02	37.66
4	4874.00	40.82 AV	54.00	-13.18	1.08 H	19	3.16	37.66

#### 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	1052.00	43.77 PK	74.00	-30.23	1.04 V	307	16.03	27.74
2	1080.00	41.58 PK	74.00	-32.42	1.17 V	348	13.73	27.85
3	*2437.00	103.73 PK			1.45 V	92	71.88	31.85
3	*2437.00	95.98 AV			1.45 V	92	64.13	31.85
4	4874.00	50.33 PK	74.00	-23.67	1.03 V	1	12.67	37.66

- 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.



<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	11	<b>FREQUENCY RANGE</b>	1~25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

#### 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	1052.00	47.69 PK	74.00	-26.31	1.17 H	109	19.94	27.74
2	1080.00	45.33 PK	74.00	-28.67	1.36 H	174	17.48	27.85
3	*2462.00	105.10 PK			1.34 H	82	73.10	32.00
3	*2462.00	97.24 AV			1.34 H	82	65.24	32.00
4	2483.50	43.26 PK	74.00	-30.74	1.34 H	82	11.13	32.13
5	4924.00	51.55 PK	74.00	-22.45	1.17 H	19	13.81	37.74
5	4924.00	38.92 AV	54.00	-15.08	1.17 H	19	1.18	37.74

#### 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	1052.00	45.01 PK	74.00	-28.99	1.43 V	349	17.27	27.74
2	1080.00	43.89 PK	74.00	-30.11	1.08 V	144	16.04	27.85
3	*2462.00	103.32 PK			1.14 V	181	71.32	32.00
3	*2462.00	95.48 AV			1.14 V	181	63.48	32.00
4	2483.50	41.48 PK	74.00	-32.52	1.14 V	181	9.35	32.13
5	4924.00	49.35 PK	74.00	-24.65	1.13 V	19	11.61	37.74

- 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 (B)

<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	1	<b>FREQUENCY RANGE</b>	1~25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

**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	1052.00	43.30 PK	74.00	-30.70	1.51 H	251	15.55	27.74
2	1080.00	43.12 PK	74.00	-30.88	1.34 H	251	15.27	27.85
3	2390.00	60.11 PK	74.00	-13.89	1.44 H	89	28.50	31.61
3	2390.00	50.22 AV	54.00	-3.78	1.44 H	89	18.61	31.61
4	*2412.00	102.91 PK			1.44 H	89	71.21	31.70
4	*2412.00	96.02 AV			1.44 H	89	64.32	31.70
5	4824.00	52.53 PK	74.00	-21.47	1.06 H	19	14.95	37.58
5	4824.00	40.36 AV	54.00	-13.64	1.06 H	19	2.78	37.58

**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	1052.00	42.67 PK	74.00	-31.33	1.11 V	139	14.93	27.74
2	1080.00	41.02 PK	74.00	-32.98	1.30 V	142	13.17	27.85
3	2390.00	59.24 PK	74.00	-14.76	1.02 V	241	27.63	31.61
3	2390.00	49.97 AV	54.00	-4.03	1.02 V	241	18.36	31.61
4	*2412.00	104.64 PK			1.02 V	241	72.94	31.70
4	*2412.00	95.37 AV			1.02 V	241	63.67	31.70
5	4824.00	50.02 PK	74.00	-23.98	1.21 V	354	12.44	37.58

- 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.



<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	6	<b>FREQUENCY RANGE</b>	1~25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

#### 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	1052.00	44.22 PK	74.00	-29.78	1.51 H	247	16.48	27.74
2	1080.00	43.55 PK	74.00	-30.45	1.13 H	247	15.70	27.85
3	*2437.00	104.80 PK			1.42 H	84	72.95	31.85
3	*2437.00	95.87 AV			1.42 H	84	64.02	31.85
4	4874.00	58.00 PK	74.00	-16.00	1.05 H	17	20.34	37.66
4	4874.00	45.38 AV	54.00	-8.62	1.05 H	17	7.72	37.66

#### 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	1052.00	42.89 PK	74.00	-31.11	1.19 V	135	15.15	27.74
2	1080.00	41.24 PK	74.00	-32.76	1.16 V	139	13.39	27.85
3	*2437.00	102.68 PK			1.54 V	234	70.83	31.85
3	*2437.00	94.09 AV			1.54 V	234	62.24	31.85
4	4874.00	54.69 PK	74.00	-19.31	1.02 V	141	17.03	37.66
4	4874.00	40.86 AV	54.00	-13.14	1.02 V	141	3.20	37.66

- 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.



<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>CHANNEL</b>	11	<b>FREQUENCY RANGE</b>	1~25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa	<b>TESTED BY</b>	Long Chen

#### 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	1052.00	44.70 PK	74.00	-29.30	1.04 H	138	16.96	27.74
2	1080.00	45.89 PK	74.00	-28.11	1.39 H	227	18.04	27.85
3	*2462.00	104.21 PK			1.32 H	83	72.21	32.00
3	*2462.00	95.14 AV			1.32 H	83	63.14	32.00
4	2483.50	57.03 PK	74.00	-16.97	1.32 H	83	24.90	32.13
4	2483.50	47.96 AV	54.00	-6.04	1.32 H	83	15.83	32.13
5	4924.00	53.14 PK	74.00	-20.86	1.14 H	284	15.40	37.74
5	4924.00	40.69 AV	54.00	-13.31	1.14 H	284	2.95	37.74

#### 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	1052.00	42.39 PK	74.00	-31.61	1.42 V	338	14.65	27.74
2	1080.00	41.62 PK	74.00	-32.38	1.05 V	148	13.77	27.85
3	*2462.00	103.58 PK			1.00 V	242	71.58	32.00
3	*2462.00	93.18 AV			1.00 V	242	61.18	32.00
4	2483.50	56.40 PK	74.00	-17.60	1.00 V	242	24.27	32.13
4	2483.50	47.00 AV	54.00	-7.00	1.00 V	242	14.87	32.13
5	4924.00	50.73 PK	74.00	-23.27	1.12 V	37	12.99	37.74

- 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, 2005

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

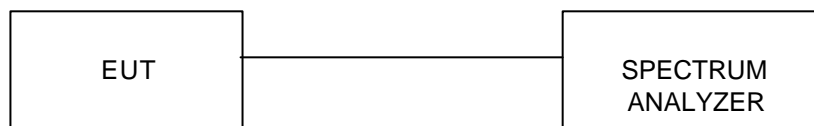
#### 4.3.3 TEST PROCEDURE

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 (A)

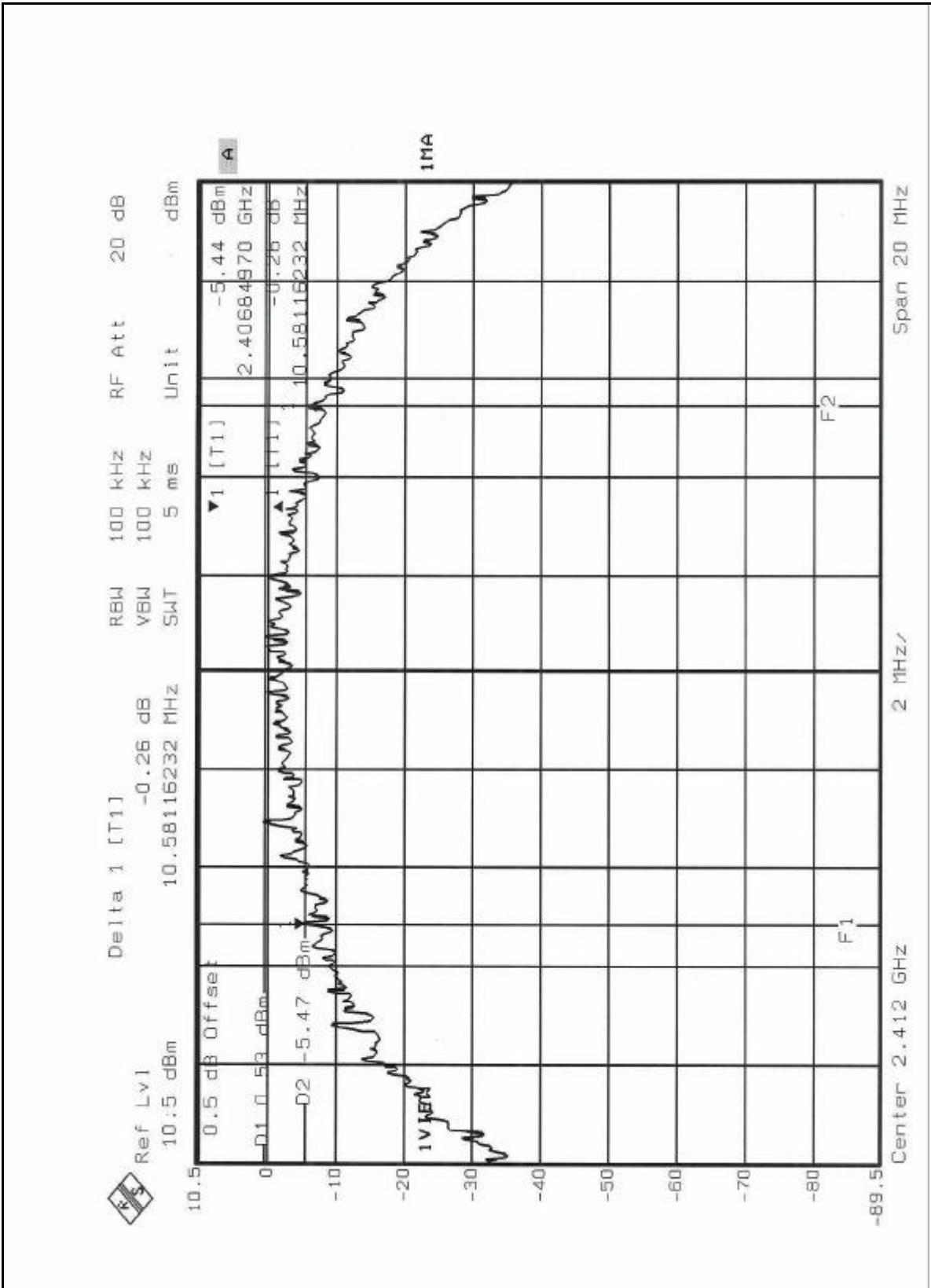
<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa
<b>TESTED BY</b>	Leo Hung		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	10.58	0.5	PASS
6	2437	9.05	0.5	PASS
11	2462	10.02	0.5	PASS

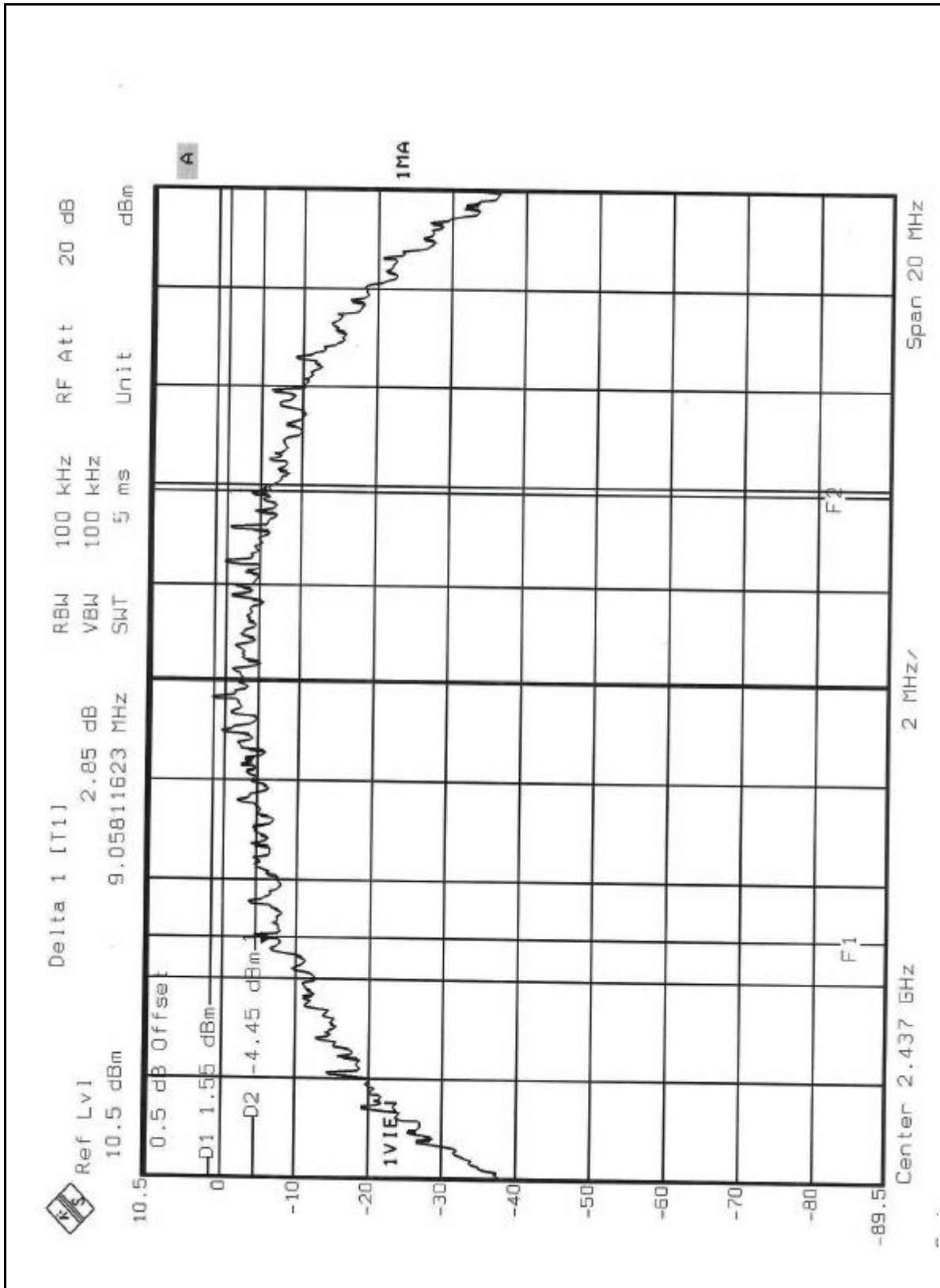




CH1

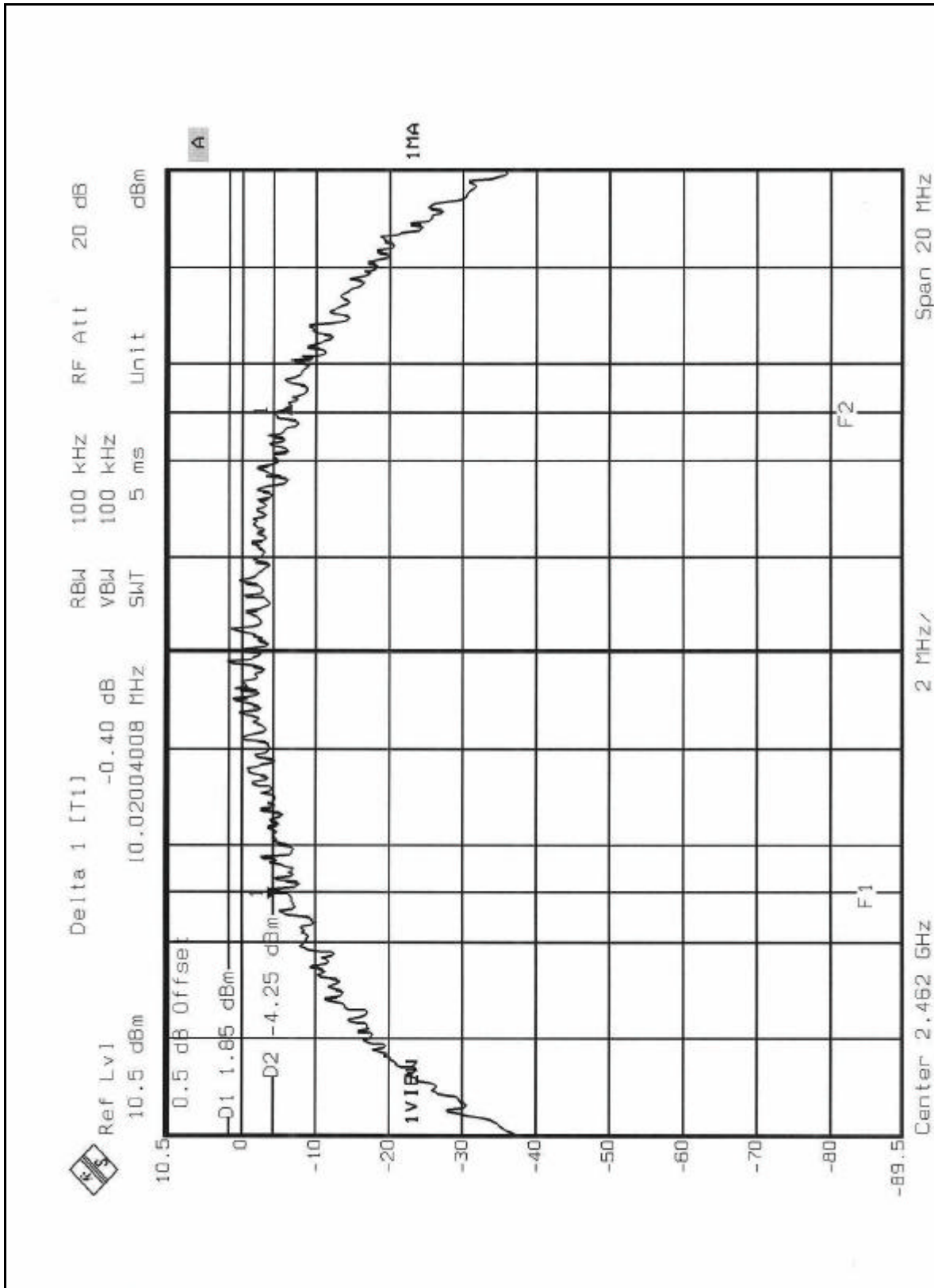


CH6





CH11





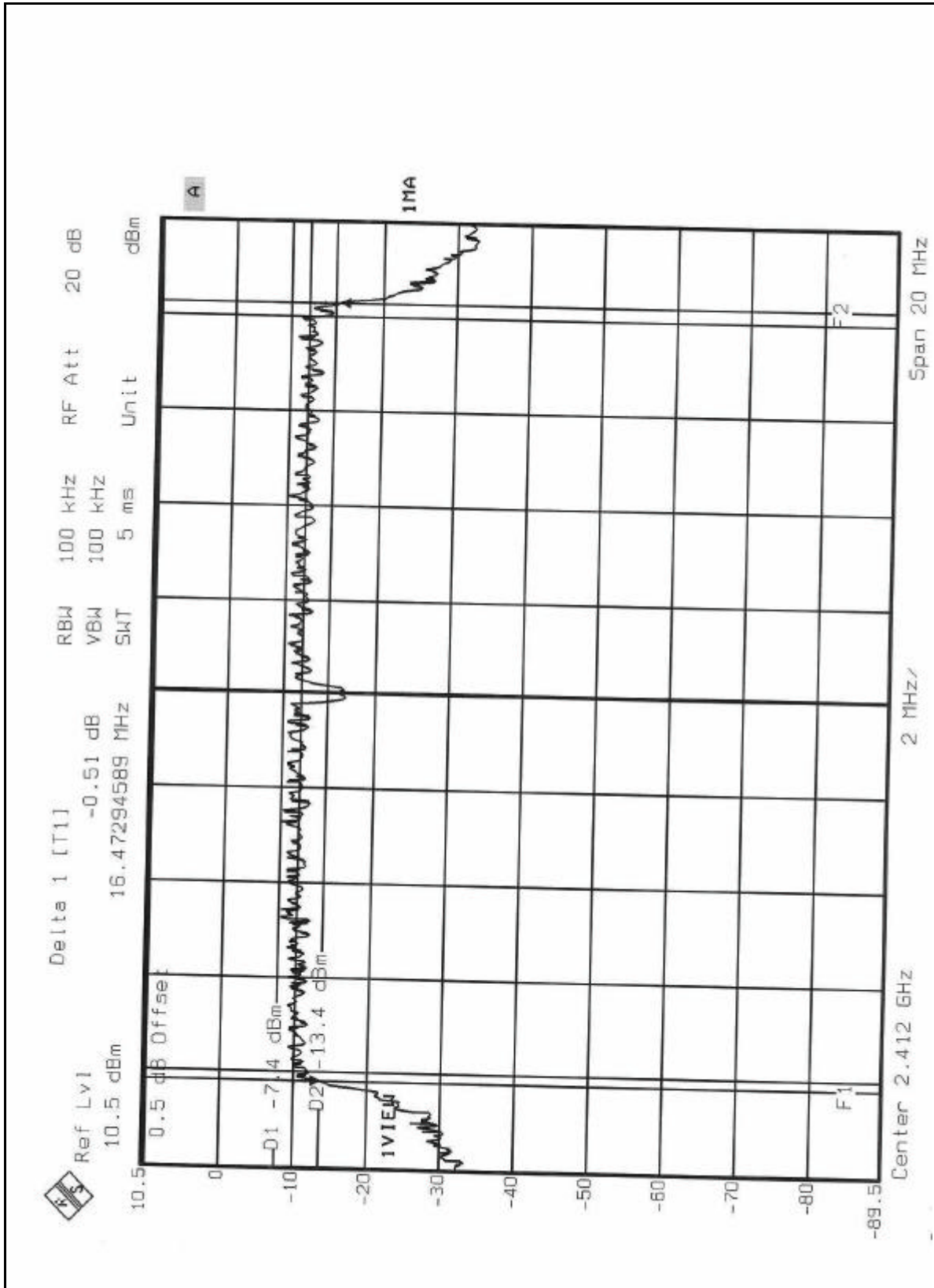
4.3.8 TEST RESULTS (B)

<b>EUT</b>	WLAN 11g USB Adapter	<b>MODEL</b>	WL-2203
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 67% RH, 991 hPa
<b>TESTED BY</b>	Leo Hung		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	16.47	0.5	PASS
6	2437	16.55	0.5	PASS
11	2462	16.55	0.5	PASS

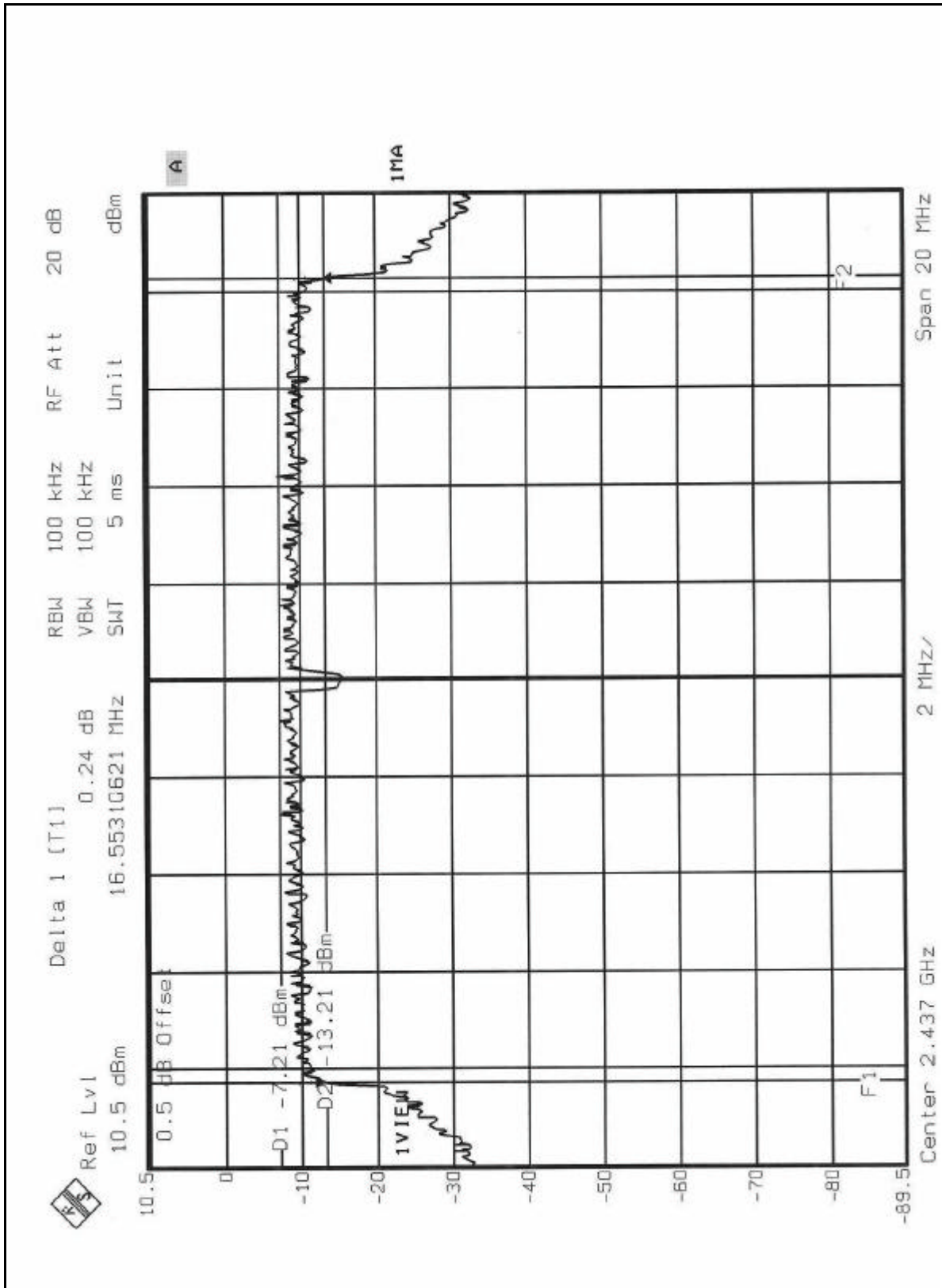


CH1

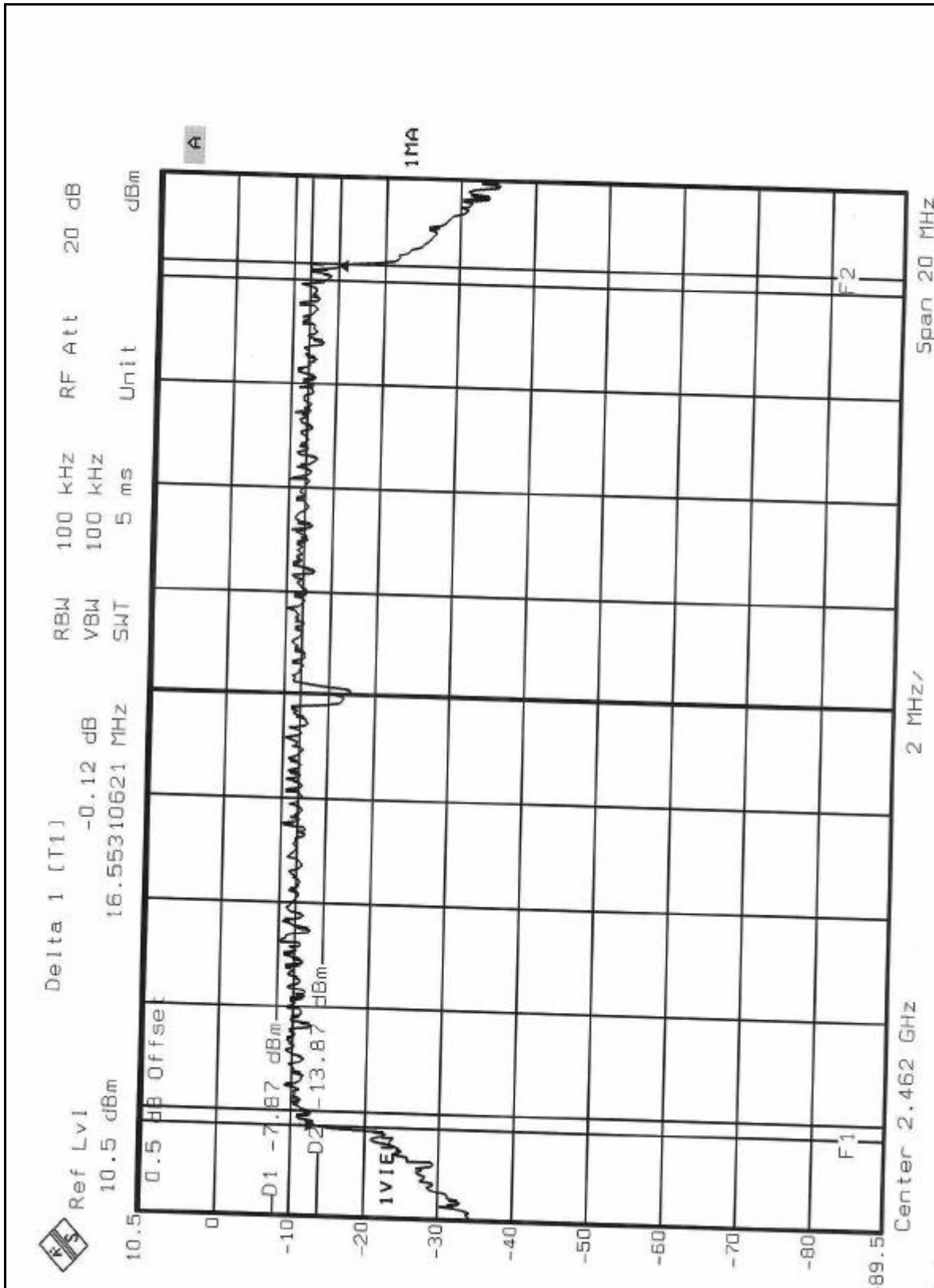




CH6



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, 2005
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	C019167	Feb. 1, 2005
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.