



FCC TEST REPORT

REPORT NO.: RF911016R02

MODEL NO.: 802MI3B

RECEIVED: Oct. 16, 2002

TESTED: Dec. 2 ~ Dec. 4, 2002

APPLICANT: Actiontec Electronics (Taiwan) Inc.

ADDRESS: 3F, No. 170, Ming Chuan E. Rd., Sec. 3, Taipei,
Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

This test report consists of 48 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, NVLAP or any government agencies. The test results in the report only apply to the tested sample.



0528
ILAC MRA



Lab Code: 200102-0

Table of Contents

1	CERTIFICATION	4
2	SUMMARY OF TEST RESULTS	5
3	GENERAL INFORMATION	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	7
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	7
3.4	DESCRIPTION OF SUPPORT UNITS	8
4	TEST TYPES AND RESULTS	9
4.1	CONDUCTED EMISSION MEASUREMENT	9
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	9
4.1.2	TEST INSTRUMENTS	9
4.1.3	TEST PROCEDURES	10
4.1.4	DEVIATION FROM TEST STANDARD	10
4.1.5	TEST SETUP	11
4.1.6	EUT OPERATING CONDITIONS	11
4.1.7	TEST RESULTS	12
4.2	RADIATED EMISSION MEASUREMENT	18
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	18
4.2.2	TEST INSTRUMENTS	19
4.2.3	TEST PROCEDURES	20
4.2.4	DEVIATION FROM TEST STANDARD	20
4.2.5	TEST SETUP	21
4.2.6	EUT OPERATING CONDITIONS	21
4.2.7	TEST RESULTS	22
4.3	6dB BANDWIDTH MEASUREMENT	26
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	26
4.3.2	TEST INSTRUMENTS	26
4.3.3	TEST PROCEDURE	27
4.3.4	DEVIATION FROM TEST STANDARD	27
4.3.5	TEST SETUP	27
4.3.6	EUT OPERATING CONDITIONS	27
4.3.7	TEST RESULTS	28
4.4	MAXIMUM PEAK OUTPUT POWER	32
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	32
4.4.2	TEST INSTRUMENTS	32

4.4.3. TEST PROCEDURES.....	33
4.4.4. DEVIATION FROM TEST STANDARD	33
4.4.5. TEST SETUP	33
4.4.6. EUT OPERATING CONDITIONS.....	33
4.4.7. TEST RESULTS.....	34
4.5. POWER SPECTRAL DENSITY MEASUREMENT.....	35
4.5.1. LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	35
4.5.2. TEST INSTRUMENTS	35
4.5.3. TEST PROCEDURE	36
4.5.4. DEVIATION FROM TEST STANDARD	36
4.5.5. TEST SETUP	36
4.5.6. EUT OPERATING CONDITIONS.....	36
4.5.7. TEST RESULTS.....	37
4.6. BAND EDGES MEASUREMENT.....	41
4.6.1. LIMITS OF BAND EDGES MEASUREMENT	41
4.6.2. TEST INSTRUMENTS	41
4.6.3. TEST PROCEDURE	41
4.6.4. EUT OPERATING CONDITION	42
4.6.5. TEST RESULTS.....	42
4.7. ANTENNA REQUIREMENT.....	45
4.7.1. STANDARD APPLICABLE	45
4.7.2. ANTENNA CONNECTED CONSTRUCTION.....	45
5 PHOTOGRAHPS OF THE TEST CONFIGURATION.....	46
6 INFORMATION ON THE TESTING LABORATORIES	48



1 CERTIFICATION

PRODUCT : 802.11b Wireless LAN Mini-PCI Adapter

BRAND NAME : Actiontec

MODEL NO. : 802MI3B

APPLICANT : Actiontec Electronics (Taiwan) Inc.

STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247),
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Dec. 2 ~ Dec. 4, 2002, The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

CHECKED BY: Rennie Wang : **DATE:** December 16, 2002
Rennie Wang

APPROVED BY: Dr. Alan Lane : **DATE:** December 16, 2002
Dr. Alan Lane
Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -18.39dBuV at 0.15MHz
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 -4.20dBuV at 9647.00MHz
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	802.11b Wireless LAN Mini-PCI Adapter
MODEL NO.	802MI3B
POWER SUPPLY	3.3VDC from notebook
MODULATION TYPE	CCK, BPSK, QPSK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	8.84dBm
ANTENNA TYPE	Inverted F antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The 802.11b Wireless LAN Mini-PCI Adapter is specified to laptop PC which brand is Asus, and the model number is L3000.
2. The notebook is powered by the following adapter:

BRAND :	Delta
MODEL :	ADP-90FB Rev.F
INPUT :	100-240V 1.5A 50-60Hz
OUTPUT :	19V 4.74A

3. 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 in this EUT.

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

NOTE:

1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a 802.11b Wireless LAN Mini-PCI Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)
ANSI C63.4 : 1992

All tests have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED
2	MODEM	ACEEX	1414	980020569	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY 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	ESCS30	834115/016	Mar. 3, 2003
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH3-Z5	847265/023	Jan. 10, 2003
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Nov. 29, 2003
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Nov. 29, 2003
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	July 10, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C03.01	July 11, 2003
Terminator (For EMCO LISN)	NA	E1-01-300	Feb. 20, 2003
Terminator (For EMCO LISN)	NA	E1-01-301	Feb. 20, 2003
Shielded Room	Site 3	ADT-C03	NA
VCCI Site Registration No.	Site 3	C-274	NA

NOTE:

1. The 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 Open Site No. 3.

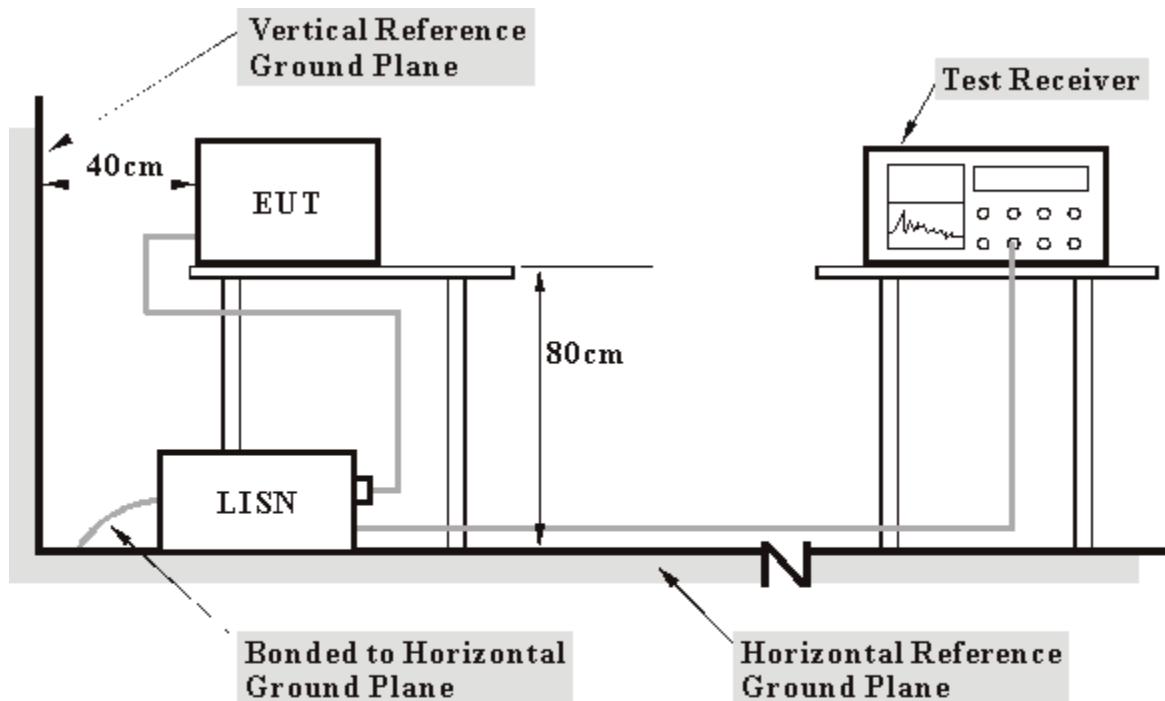
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note:

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

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

4.1.6 EUT OPERATING CONDITIONS

- a. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- b. The computer system sent "H" messages to its screen.

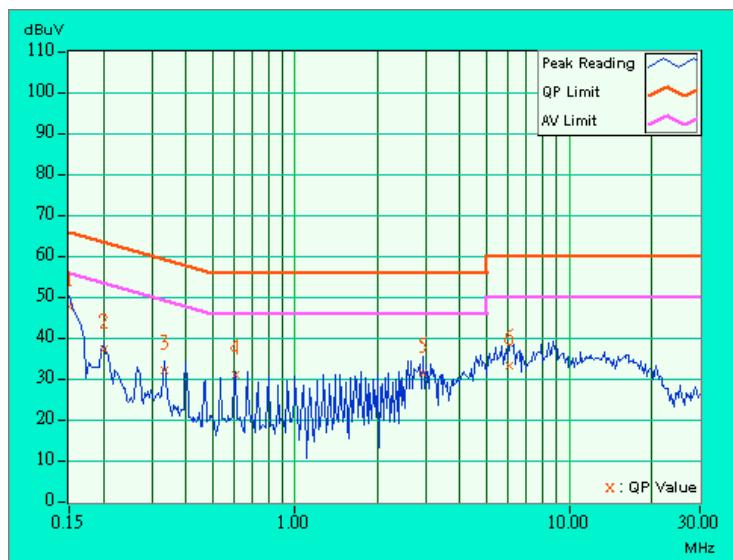
4.1.7 TEST RESULTS

EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	24 deg. C, 64%RH, 1005 hPa	TESTED BY:	Cody Chang

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	0.150	0.10	47.23	-	47.33	-	66.00	56.00	-18.67	-
2	0.201	0.10	36.82	-	36.92	-	63.58	53.58	-26.66	-
3	0.334	0.10	31.65	-	31.75	-	59.36	49.36	-27.61	-
4	0.603	0.13	30.52	-	30.65	-	56.00	46.00	-25.35	-
5	2.940	0.39	31.16	-	31.55	-	56.00	46.00	-24.45	-
6	6.080	0.50	32.65	-	33.15	-	60.00	50.00	-26.85	-

NOTE:

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

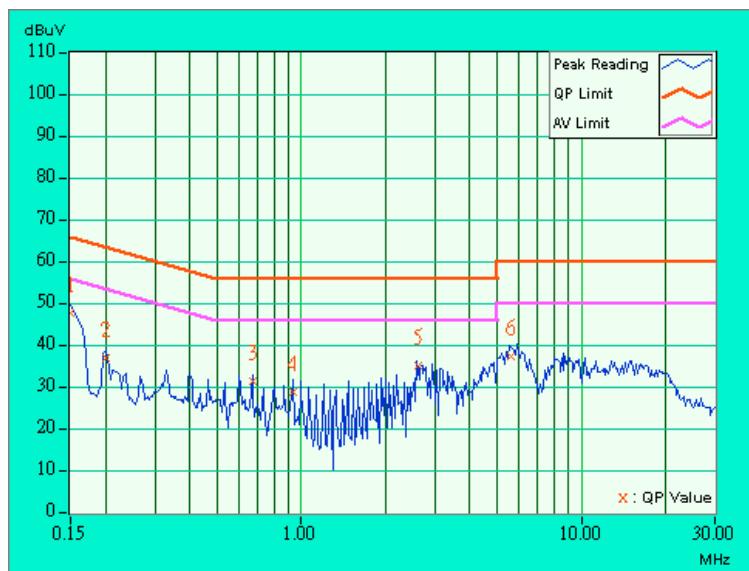


EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	TESTED BY: Cody Chang		

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	47.51	-	47.61	-	66.00	56.00	-18.39	-
2	0.201	0.10	36.68	-	36.78	-	63.58	53.58	-26.80	-
3	0.670	0.14	30.97	-	31.11	-	56.00	46.00	-24.89	-
4	0.931	0.19	28.65	-	28.84	-	56.00	46.00	-27.16	-
5	2.600	0.33	34.88	-	35.21	-	56.00	46.00	-20.79	-
6	5.602	0.40	37.07	-	37.47	-	60.00	50.00	-22.53	-

NOTE:

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

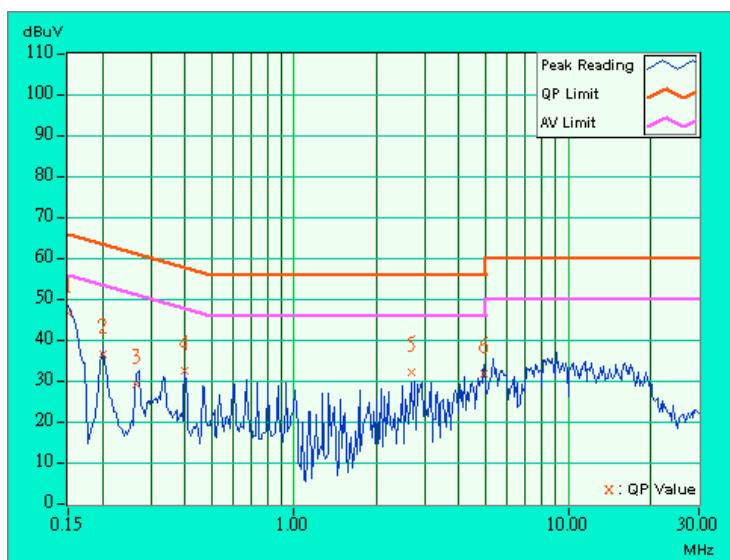


EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	24 deg. C, 64%RH, 1005 hPa		TESTED BY: Cody Chang

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	0.150	0.10	46.12	-	46.22	-	66.00	56.00	-19.78	-
2	0.201	0.10	36.06	-	36.16	-	63.58	53.58	-27.42	-
3	0.267	0.10	28.79	-	28.89	-	61.20	51.20	-32.31	-
4	0.400	0.10	32.12	-	32.22	-	57.85	47.85	-25.63	-
5	2.680	0.37	31.90	-	32.27	-	56.00	46.00	-23.73	-
6	4.961	0.50	31.39	-	31.89	-	56.00	46.00	-24.11	-

NOTE:

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

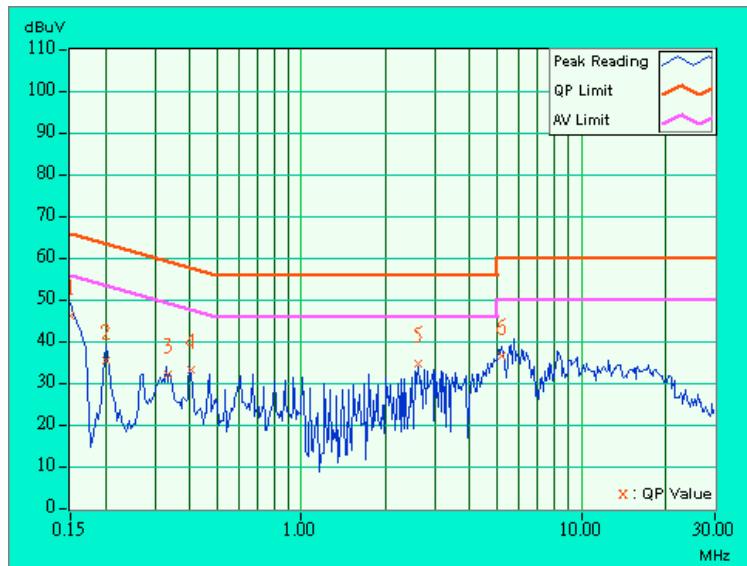


EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	24 deg. C, 64%RH, 1005 hPa		TESTED BY: Cody Chang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	45.90	-	46.00	-	66.00	56.00	-20.00	-
2	0.201	0.10	35.32	-	35.42	-	63.58	53.58	-28.16	-
3	0.335	0.10	31.83	-	31.93	-	59.33	49.33	-27.40	-
4	0.403	0.10	32.78	-	32.88	-	57.80	47.80	-24.92	-
5	2.617	0.33	34.23	-	34.56	-	56.00	46.00	-21.44	-
6	5.168	0.40	36.17	-	36.57	-	60.00	50.00	-23.43	-

NOTE:

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

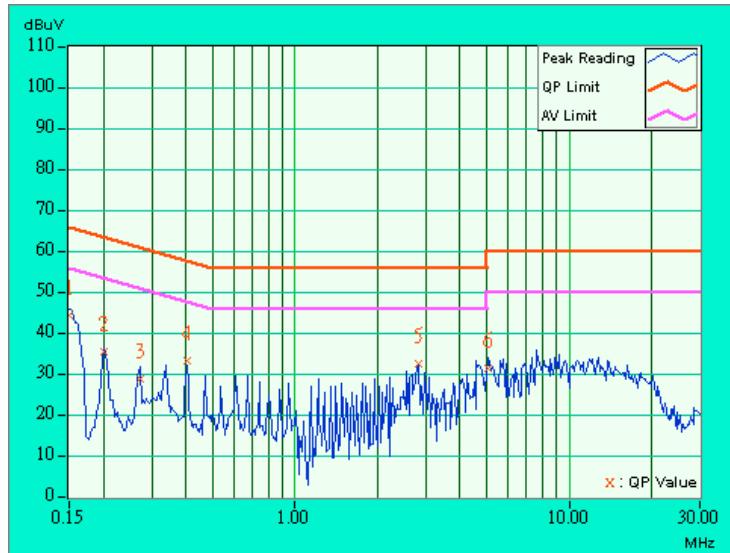


EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	24 deg. C, 64%RH, 1005 hPa		TESTED BY: Cody Chang

No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.
1	0.150	0.10	43.95	-	44.05	-	66.00	56.00	-21.95	-
2	0.201	0.10	35.02	-	35.12	-	63.58	53.58	-28.46	-
3	0.271	0.10	28.36	-	28.46	-	61.08	51.08	-32.62	-
4	0.404	0.10	32.69	-	32.79	-	57.77	47.77	-24.98	-
5	2.832	0.38	32.12	-	32.50	-	56.00	46.00	-23.50	-
6	5.055	0.50	30.82	-	31.32	-	60.00	50.00	-28.68	-

NOTE:

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

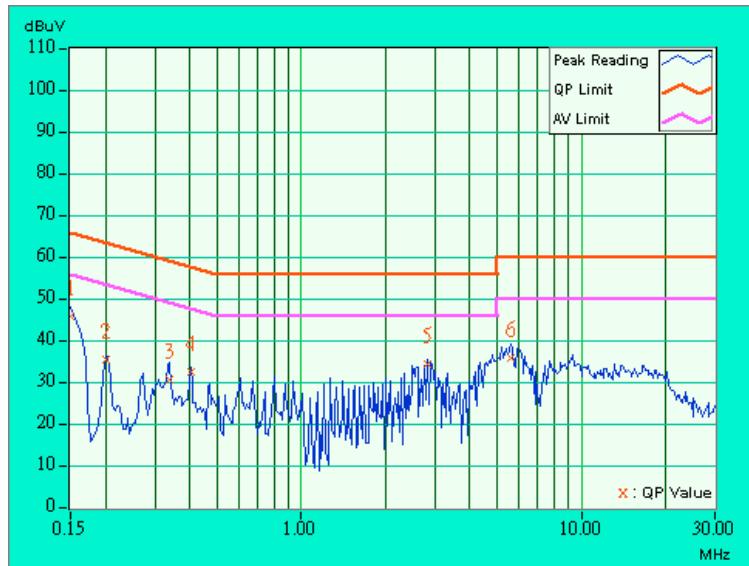


EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	TESTED BY: Cody Chang		

No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.
1	0.150	0.10	45.39	-	45.49	-	66.00	56.00	-20.51	-
2	0.201	0.10	35.00	-	35.10	-	63.58	53.58	-28.48	-
3	0.338	0.10	30.45	-	30.55	-	59.26	49.26	-28.71	-
4	0.404	0.10	32.18	-	32.28	-	57.77	47.77	-25.49	-
5	2.824	0.34	34.11	-	34.45	-	56.00	46.00	-21.55	-
6	5.578	0.40	35.63	-	36.03	-	60.00	50.00	-23.97	-

NOTE:

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Apr. 29, 2003
* HP Preamplifier	8449B	3008A01201	Dec. 01, 2003
* HP Preamplifier	8449B	3008A01292	Aug. 07, 2003
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHAFFNER Tunable Dipole Antenna SCHWARZBECK Tunable Dipole Antenna	VHBA 9123 UHA 9105	459 977	Nov. 22, 2003
ANTENNA (Large Biconical)	VHBA9123	449	Dec. 10, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 02, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 03, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 09, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 25, 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 12, 2003
Open Field Test Site	Site 5	ADT-R05	Jul. 19, 2003
VCCI Site Registration No.	Site 5	R-1039	NA
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI: R-1039		

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. 5.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

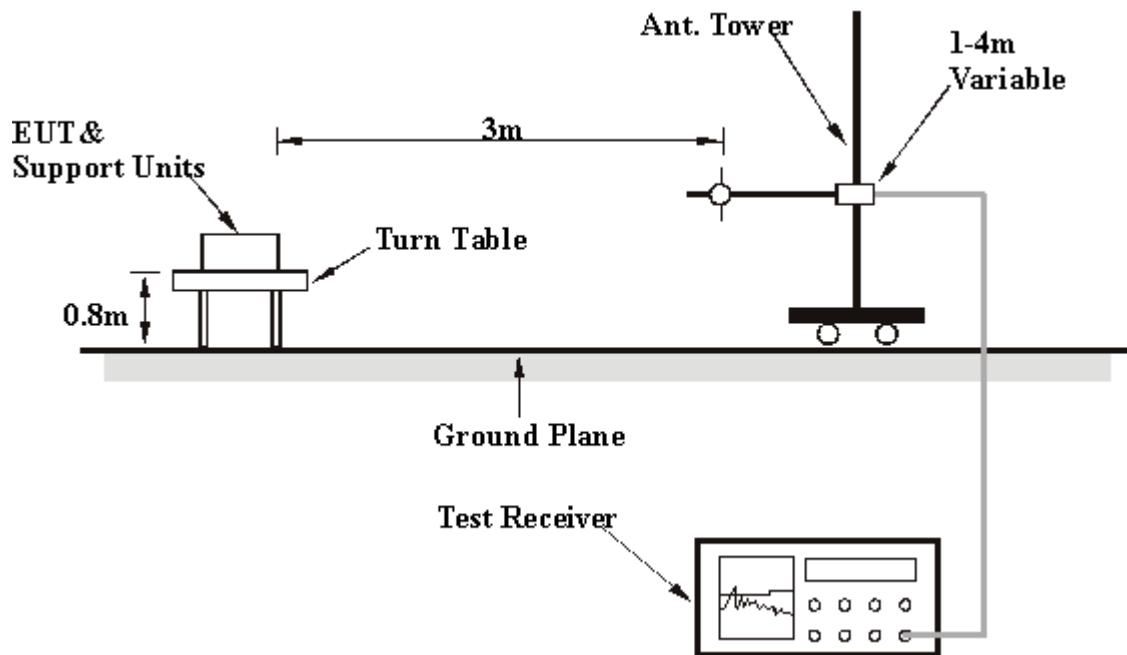
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 11	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	219.97	27.0 QP	46.00	-19.00	1.67 H	214	11.80	15.30
2	307.84	27.0 QP	46.00	-19.00	1.48 H	336	6.80	20.20
3	326.50	33.3 QP	46.00	-12.70	1.22 H	289	12.60	20.70
4	404.50	31.9 QP	46.00	-14.10	1.32 H	148	8.80	23.10
5	487.00	31.4 QP	46.00	-14.60	1.44 H	76	6.60	24.80
6	572.00	29.4 QP	46.00	-16.60	1.21 H	228	3.00	26.50

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	220.00	21.1 QP	46.00	-24.90	1.22 V	203	5.80	15.30
2	240.00	24.2 QP	46.00	-21.80	1.43 V	120	6.90	17.40
3	326.00	34.6 QP	46.00	-11.40	1.17 V	39	13.90	20.70
4	396.50	25.3 QP	46.00	-20.70	1.57 V	308	2.40	22.90
5	403.00	31.5 QP	46.00	-14.50	1.25 V	309	8.50	23.10
6	439.00	35.7 QP	46.00	-10.30	1.40 V	223	12.10	23.60
7	572.50	31.1 QP	46.00	-14.90	1.32 V	61	4.60	26.50

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. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 1	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa		TESTED BY: Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2386.00	52.3 PK	74.00	-21.70	1.45 H	26	22.80	29.50
1	2386.00	44.4 AV	54.00	-9.60	1.45 H	26	14.90	29.50
2	*2412.00	93.8 PK			1.47 H	45	64.10	29.70
2	*2412.00	87.1 AV			1.47 H	45	57.40	29.70
3	4824.00	45.8 PK	74.00	-28.20	1.42 H	198	10.40	35.40
4	7236.00	51.8 PK	74.00	-22.20	1.19 H	24	10.10	41.60
4	7236.00	44.5 AV	54.00	-9.50	1.19 H	24	2.80	35.40
5	9647.00	57.4 PK	74.00	-16.60	1.29 H	34	13.50	43.80
5	9647.00	49.8 AV	54.00	-4.20	1.29 H	34	6.00	41.60

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	2386.00	55.7 PK	74.00	-18.30	1.45 V	58	26.20	29.50
1	2386.00	46.9 AV	54.00	-7.10	1.45 V	58	17.40	29.50
2	*2412.00	95.0 PK			1.20 V	45	65.30	29.70
2	*2412.00	88.1 AV			1.20 V	45	58.40	29.70
3	4824.00	49.1 PK	74.00	-24.90	1.18 V	10	13.70	35.40
4	7236.00	56.5 PK	74.00	-17.50	1.08 V	147	14.80	41.60
4	7236.00	47.1 AV	54.00	-6.90	1.08 V	147	5.40	35.40
5	9647.00	56.0 PK	74.00	-18.00	1.08 V	258	12.10	43.80
5	9647.00	49.6 AV	54.00	-4.40	1.08 V	258	5.70	41.60

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. Margin value = Emission level - Limit value
4. “*”: Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 6	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	92.8 PK			1.63 H	14	62.90	29.90
1	*2437.00	87.1 AV			1.63 H	14	57.20	29.90
2	4874.00	51.9 PK	74.00	-22.10	1.26 H	147	16.40	35.50
2	4874.00	42.8 AV	54.00	-11.20	1.26 H	147	7.30	35.50
3	7311.00	52.7 PK	74.00	-21.30	1.39 H	158	10.80	41.90
3	7311.00	43.3 AV	54.00	-10.70	1.39 H	158	1.40	41.90
4	9748.00	52.4 PK	74.00	-21.60	1.70 H	14	8.60	43.80
4	9748.00	44.3 AV	54.00	-9.70	1.70 H	14	0.50	43.80

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	*2437.00	95.0 PK			1.10 V	36	65.10	29.90
1	*2437.00	87.9 AV			1.10 V	36	58.00	29.90
2	4874.00	50.3 PK	74.00	-23.70	1.39 V	48	14.80	35.50
2	4874.00	40.7 AV	54.00	-13.30	1.39 V	48	5.20	35.50
3	7311.00	53.9 PK	74.00	-20.10	1.46 V	58	12.00	41.90
3	7311.00	42.8 AV	54.00	-11.20	1.46 V	58	0.90	41.90
4	9748.00	54.6 PK	74.00	-19.40	1.08 V	189	10.80	43.80
4	9748.00	47.4 AV	54.00	-6.60	1.08 V	189	3.60	43.80

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. Margin value = Emission level - Limit value
4. “*”: Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	TESTED BY: Bunny Yao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	93.8 PK			1.52 H	151	63.70	30.10
1	*2462.00	86.9 AV			1.52 H	151	56.80	30.10
2	2500.00	39.1 PK	74.00	-34.90	1.52 H	156	8.60	30.40
3	4924.00	48.4 PK	74.00	-25.60	1.31 H	68	12.80	35.60
4	7386.00	49.1 PK	74.00	-24.90	1.31 H	68	6.90	42.20
5	9848.00	54.6 PK	74.00	-19.40	1.24 H	345	10.80	43.80
5	9848.00	46.9 AV	54.00	-7.10	1.24 H	345	3.10	30.40

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	95.9 PK			1.26 V	132	65.80	30.10
1	*2462.00	88.8 AV			1.26 V	132	58.70	30.10
2	2500.00	39.0 PK	74.00	-35.00	1.22 V	145	8.50	30.40
3	4924.00	48.4 PK	74.00	-25.60	1.68 V	267	12.80	35.60
4	7386.00	52.8 PK	74.00	-21.20	1.35 V	44	10.60	42.20
4	7386.00	43.7 AV	54.00	-10.30	1.35 V	44	1.50	30.40
5	9647.00	54.7 PK	74.00	-19.30	1.58 V	341	10.90	43.80
5	9647.00	46.6 AV	54.00	-7.40	1.58 V	341	2.70	35.60

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. Margin value = Emission level - Limit value
4. “*”: Fundamental frequency
5. The other emission levels were very low against the limit.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1. LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2. TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

NOTE:

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

4.3.3. TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4. DEVIATION FROM TEST STANDARD

No deviation

4.3.5. TEST SETUP



4.3.6. EUT OPERATING CONDITIONS

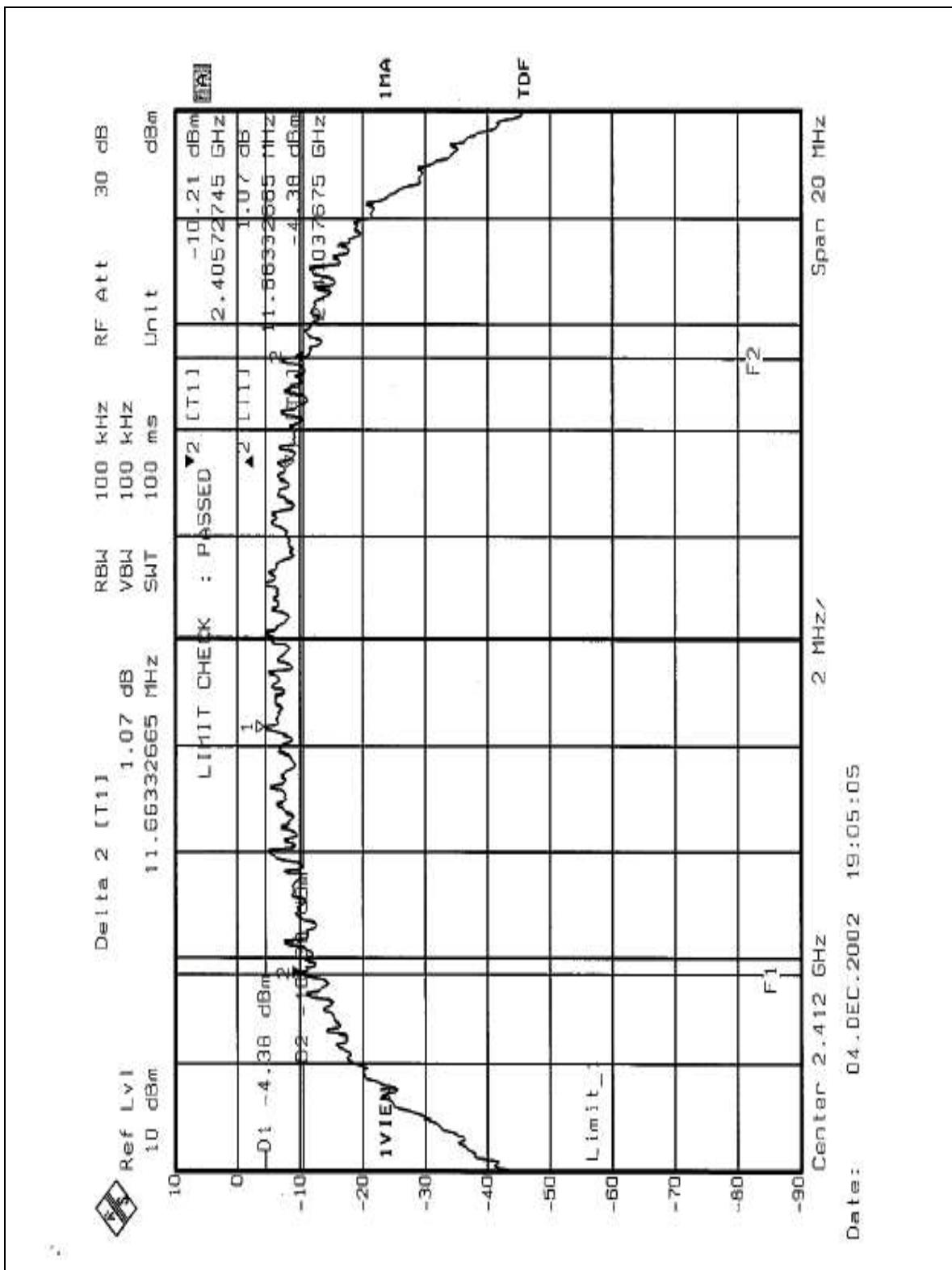
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7. TEST RESULTS

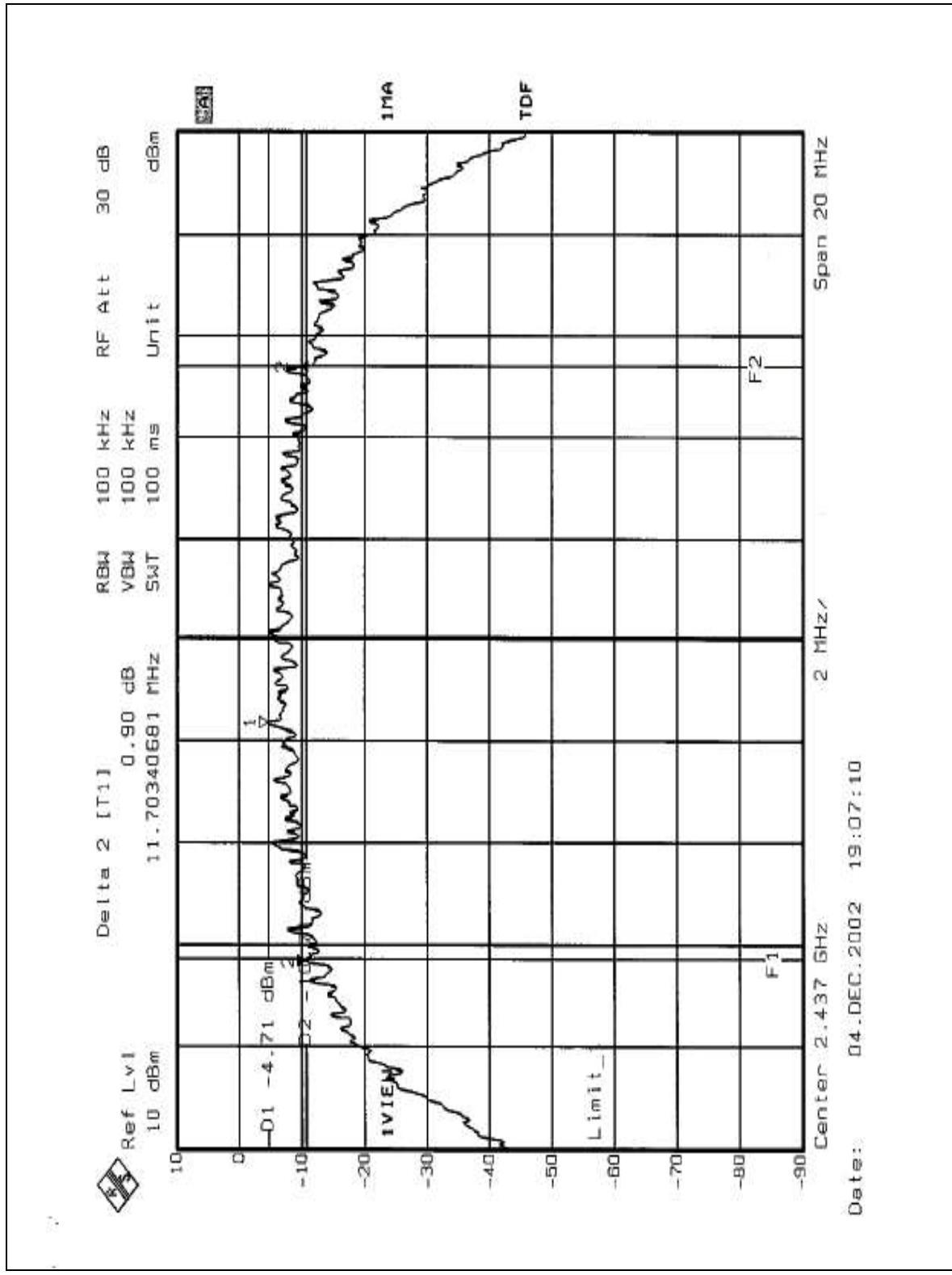
EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH, 1005 hPa
TESTED BY: Bunny Yao			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.66	0.5	PASS
6	2437	11.70	0.5	PASS
11	2462	11.70	0.5	PASS

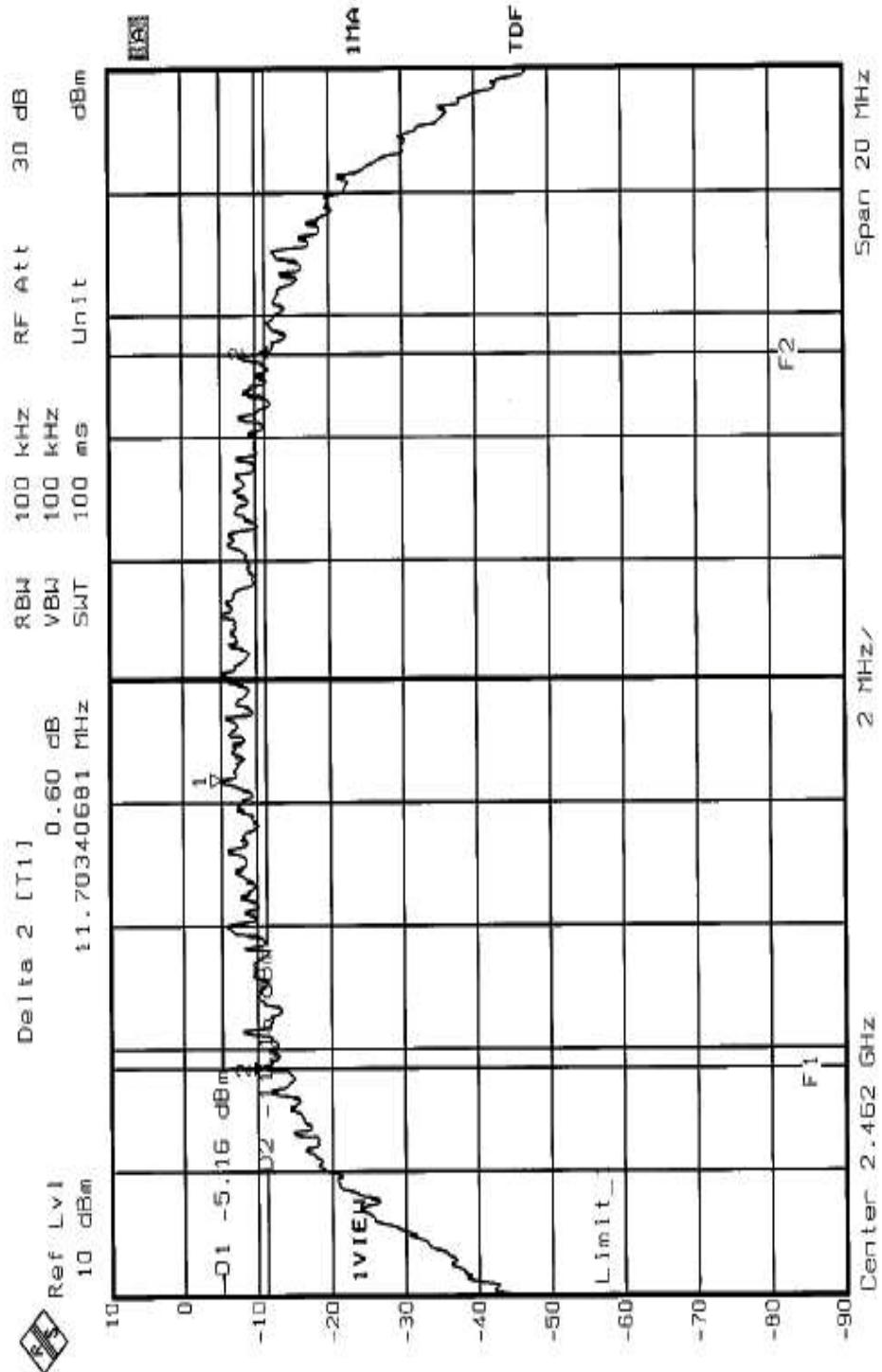
CH1



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

NOTE:

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

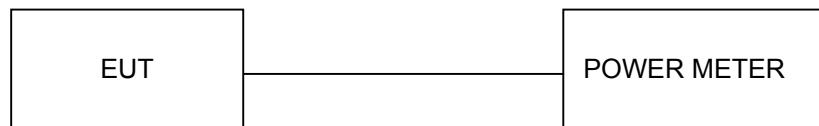
4.4.3. TEST PROCEDURES

The transmitter output was connected to the power meter.

4.4.4. DEVIATION FROM TEST STANDARD

No deviation

4.4.5. TEST SETUP



4.4.6. EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7. TEST RESULTS

EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH, 1005 hPa
TESTED BY: Bunny Yao			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	8.84	30	PASS
6	2437	8.58	30	PASS
11	2462	8.28	30	PASS

4.5. POWER SPECTRAL DENSITY MEASUREMENT

4.5.1. LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2. TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

NOTE:

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

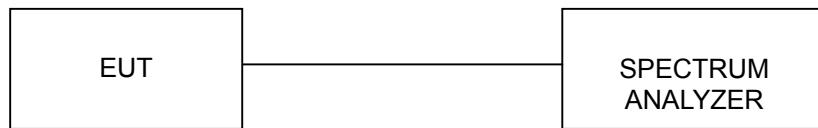
4.5.3. TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

4.5.4. DEVIATION FROM TEST STANDARD

No deviation

4.5.5. TEST SETUP



4.5.6. EUT OPERATING CONDITIONS

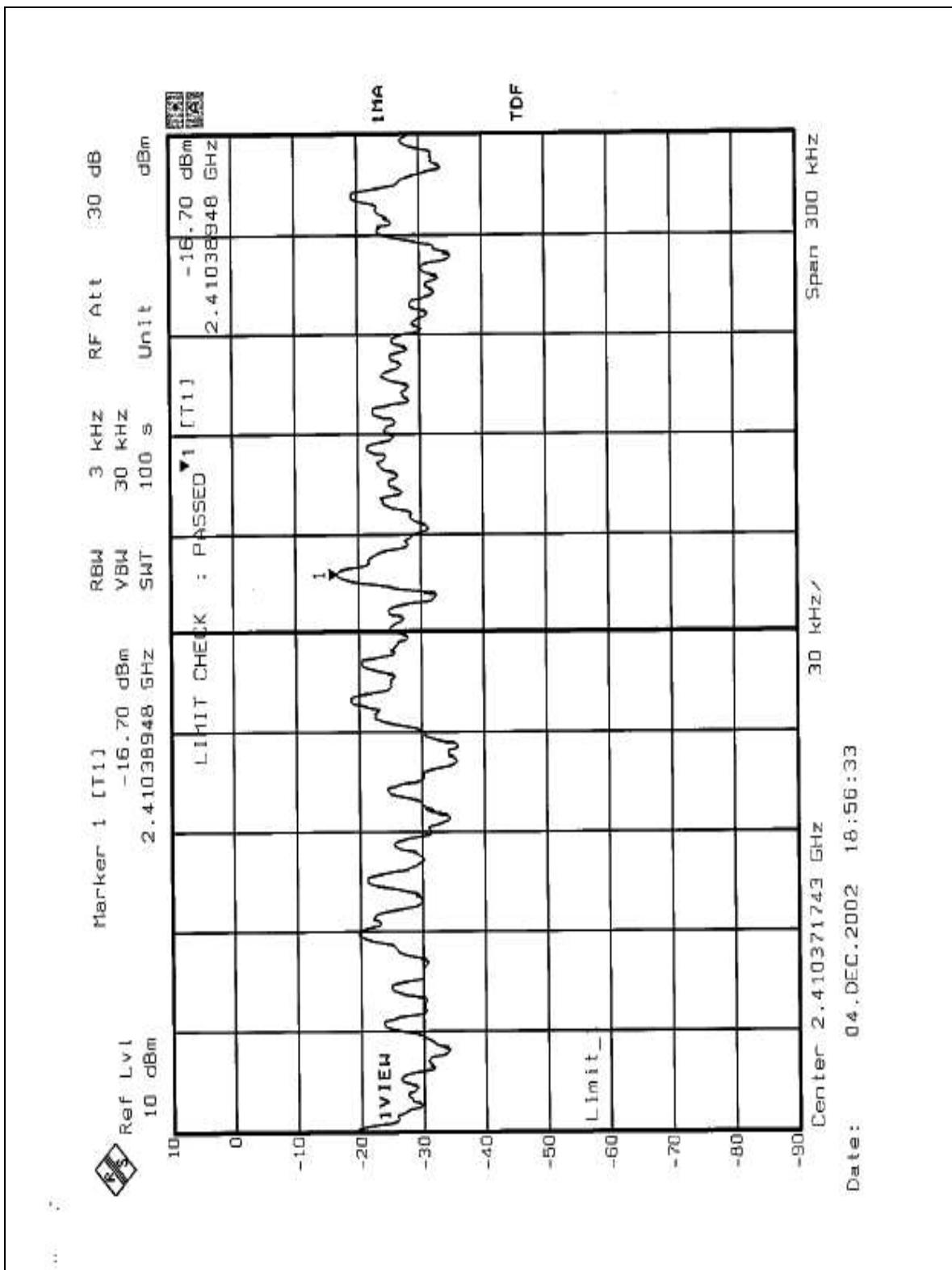
Same as 4.3.6

4.5.7. TEST RESULTS

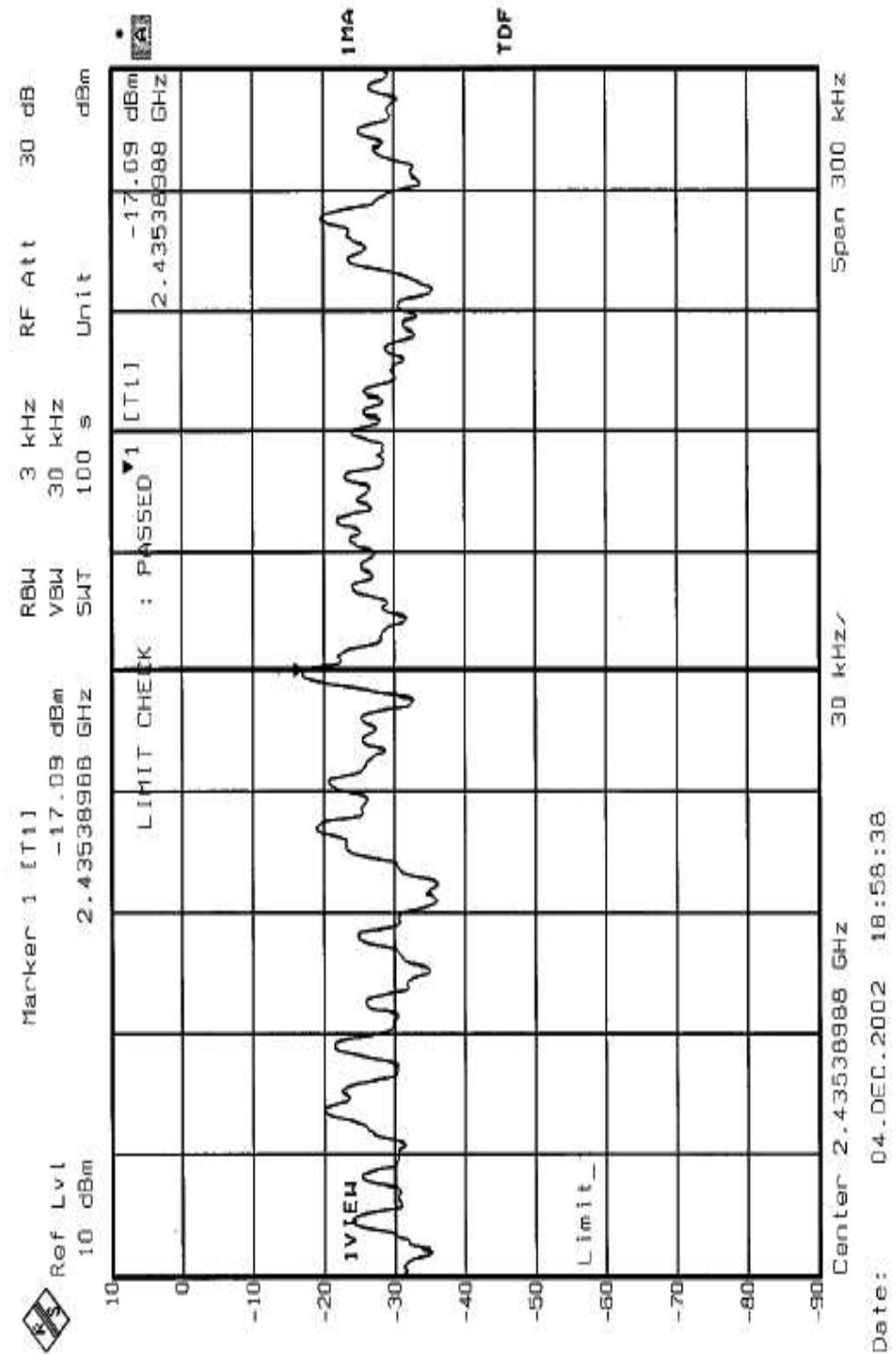
EUT	802.11b Wireless LAN Mini-PCI Adapter	MODEL	802MI3B
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH, 1005 hPa
TESTED BY: Bunny Yao			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-16.70	8	PASS
6	2437	-17.09	8	PASS
11	2462	-17.52	8	PASS

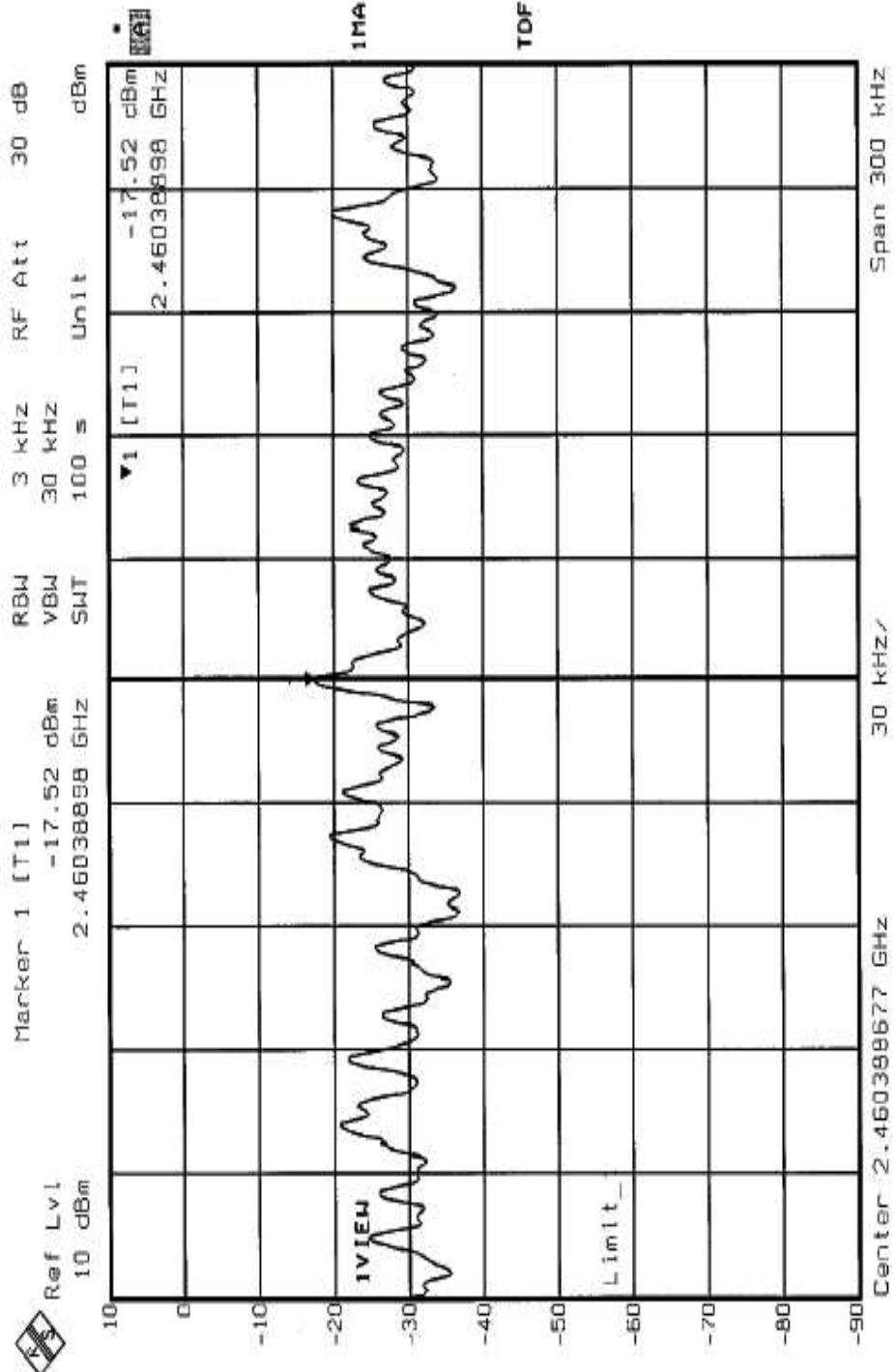
CH1



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	July 24, 2003

NOTE:

1. 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 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

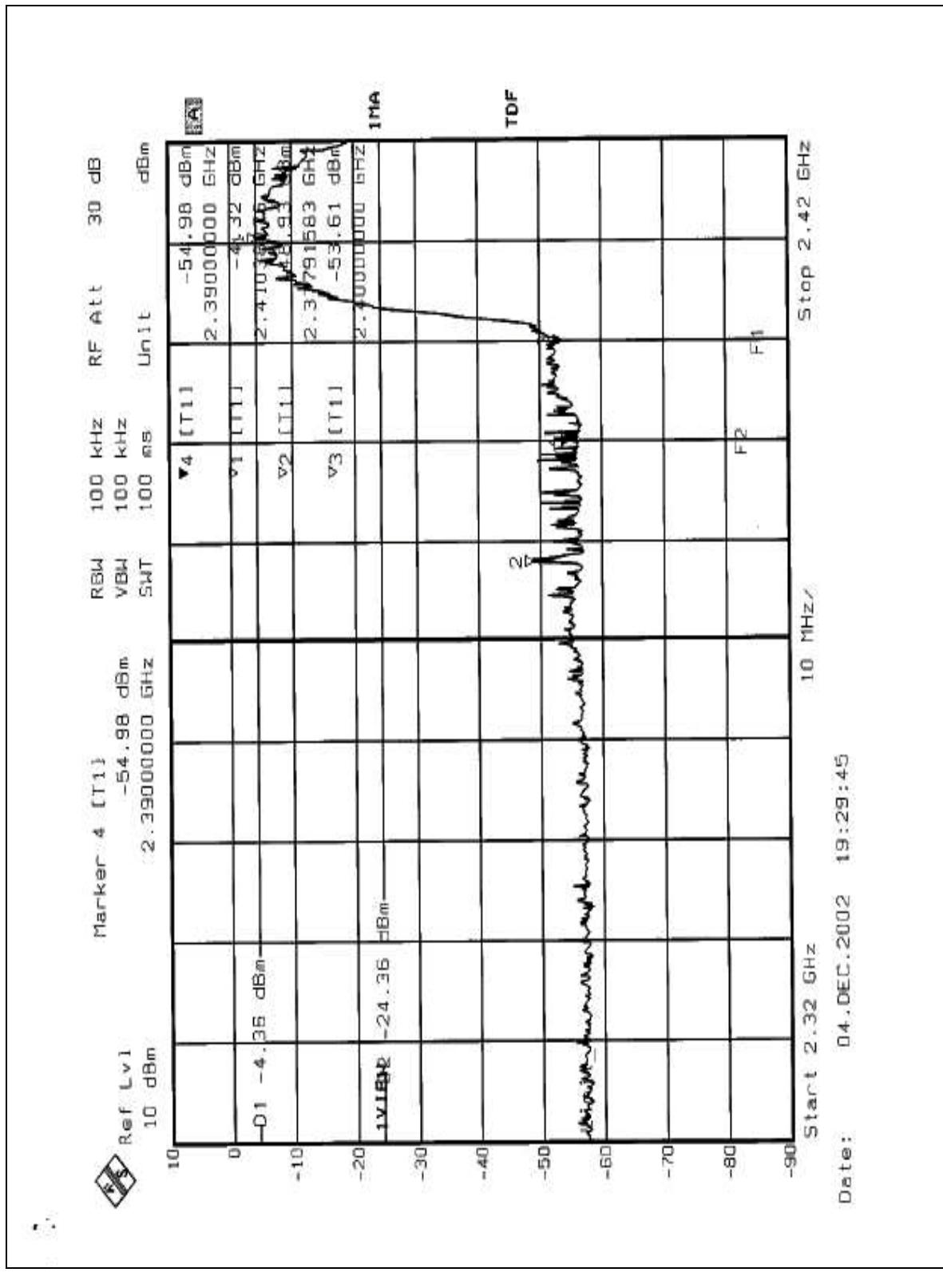
Same as Item 4.3.6

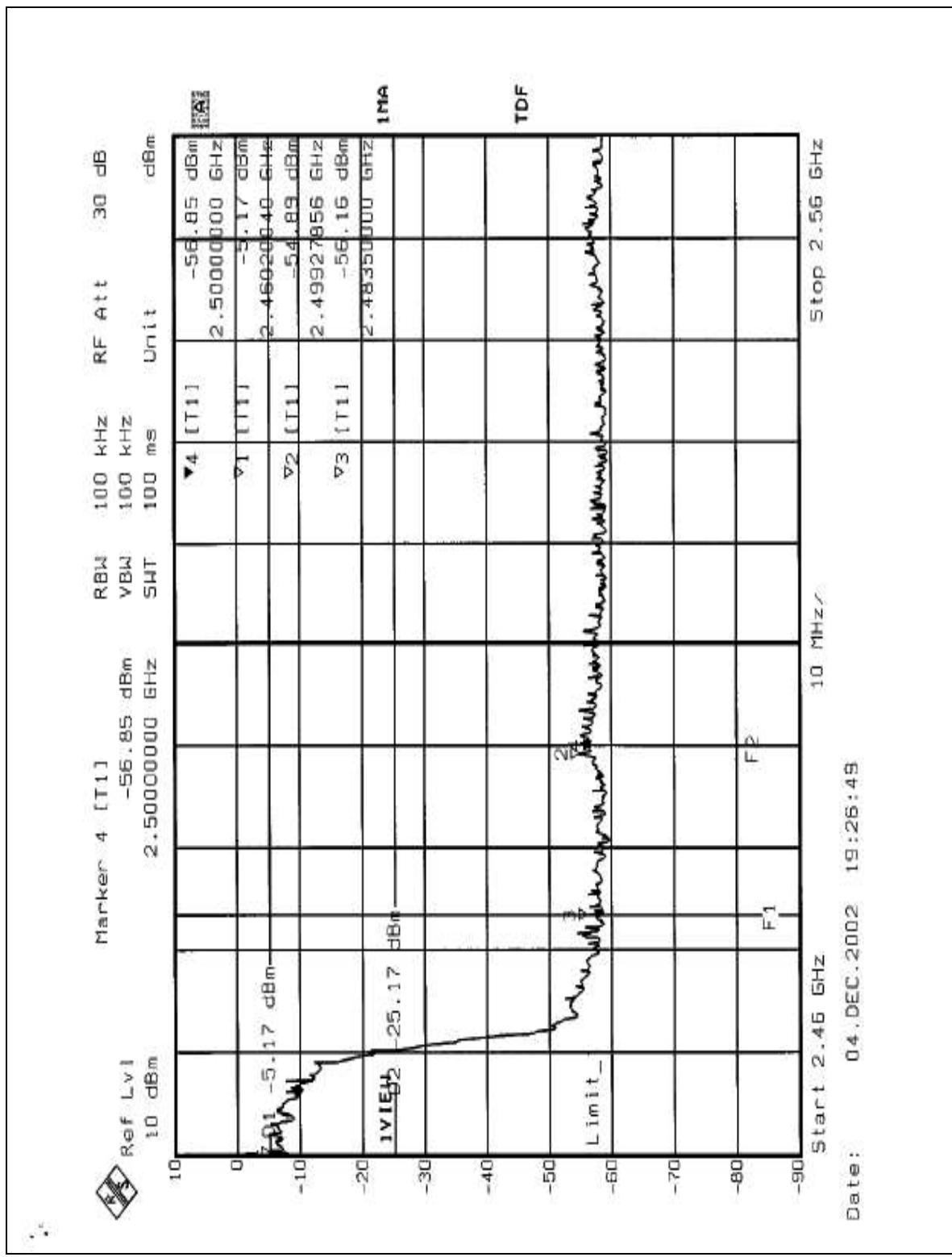
4.6.5. TEST RESULTS

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

NOTE1: The band edge emission plot on the following first page shows 44.57dB delta between carrier maximum power and local maximum emission in restrict band (2.3779GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 (Page 23) is 88.1dB_uV/m, so the maximum field strength in restrict band is $88.1 - 44.57 = 43.53$ dB_uV/m which is under 54dB_uV/m limit.

NOTE2: The band edge emission plot on the following second page shows 49.72dB delta between carrier maximum power and local maximum emission in restrict band (2.4992GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 (Page 25) is 88.8dB_uV/m, so the maximum field strength in restrict band is $88.8 - 49.72 = 39.08$ dB_uV/m which is under 54dB_uV/m limit.





4.7. ANTENNA REQUIREMENT

4.7.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2. ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Printed antenna and the antenna connector type is UFL. The maximum Gain of the antenna is only 3dBi.

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:

Lin Kou EMC Lab:

Tel: 886-2-26052180
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@mail.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.