

FCC TEST REPORT

REPORT NO.: RF920129R03

MODEL NO.: 802MABB

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TESTED: Feb. 7 ~ Feb. 11, 2003

APPLICANT: Actiontec Electronics (Taiwan) Inc.

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0528
ILAC MRA



Lab Code: 200102-0

Table of Contents

1.	CERTIFICATION	5
2.	SUMMARY OF TEST RESULTS.....	6
3.	GENERAL INFORMATION	8
3.1	GENERAL DESCRIPTION OF EUT.....	8
3.2	DESCRIPTION OF TEST MODES.....	10
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS.....	11
3.4	DESCRIPTION OF SUPPORT UNITS.....	12
4.	TEST TYPES AND RESULTS (FOR PART 802.11b).....	13
4.1	CONDUCTED EMISSION MEASUREMENT	13
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	13
4.1.2	TEST INSTRUMENTS	13
4.1.3	TEST PROCEDURES	14
4.1.4	DEVIATION FROM TEST STANDARD	14
4.1.5	TEST SETUP	15
4.1.6	EUT OPERATING CONDITIONS.....	15
4.1.7	TEST RESULTS	16
4.2	RADIATED EMISSION MEASUREMENT	22
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	22
4.2.2	TEST INSTRUMENTS	23
4.2.3	TEST PROCEDURES	24
4.2.4	DEVIATION FROM TEST STANDARD	24
4.2.5	TEST SETUP	25
4.2.6	EUT OPERATING CONDITIONS.....	25
4.2.7	TEST RESULTS	26
4.3	6dB BANDWIDTH MEASUREMENT	31
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	31
4.3.2	TEST INSTRUMENTS	31
4.3.3	TEST PROCEDURE	32
4.3.4	DEVIATION FROM TEST STANDARD	32
4.3.5	TEST SETUP	32
4.3.6	EUT OPERATING CONDITIONS.....	32
4.3.7	TEST RESULTS	33
4.4	MAXIMUM PEAK OUTPUT POWER	37
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	37
4.4.2	INSTRUMENTS.....	37
4.4.3	TEST PROCEDURES	38
4.4.4	DEVIATION FROM TEST STANDARD	38
4.4.5	TEST SETUP	38
4.4.6	EUT OPERATING CONDITIONS.....	38



4.4.7	TEST RESULTS	39
4.5	POWER SPECTRAL DENSITY MEASUREMENT	40
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	40
4.5.2	TEST INSTRUMENTS	40
4.5.3	TEST PROCEDURE	41
4.5.4	DEVIATION FROM TEST STANDARD	41
4.5.5	TEST SETUP	41
4.5.6	EUT OPERATING CONDITION	41
4.5.7	TEST RESULTS	42
4.6	BAND EDGES MEASUREMENT	46
4.6.1	LIMITS OF BAND EDGES MEASUREMENT	46
4.6.2	TEST INSTRUMENTS	46
4.6.3	TEST PROCEDURE	46
4.6.4	DEVIATION FROM TEST STANDARD	46
4.6.5	EUT OPERATING CONDITION	47
4.6.6	TEST RESULTS	47
4.7	ANTENNA REQUIREMENT	50
4.7.1	STANDARD APPLICABLE	50
4.7.2	ANTENNA CONNECTED CONSTRUCTION	50
5.	TEST TYPES AND RESULTS (FOR PART 802.11a).....	51
5.1	CONDUCTED EMISSION MEASUREMENT	51
5.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	51
5.1.2	TEST INSTRUMENTS	51
5.1.3	TEST PROCEDURES	52
5.1.4	DEVIATION FROM TEST STANDARD	52
5.1.5	TEST SETUP	53
5.1.6	EUT OPERATING CONDITIONS.....	53
5.1.7	TEST RESULTS	54
5.2	RADIATED EMISSION MEASUREMENT	56
5.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	56
5.2.2	LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	57
5.2.3	TEST INSTRUMENTS	58
5.2.4	TEST PROCEDURES	59
5.2.5	DEVIATION FROM TEST STANDARD	59
5.2.6	TEST SETUP	60
5.2.7	EUT OPERATING CONDITIONS.....	60
5.2.8	TEST RESULTS	61
5.3	PEAK TRANSMIT POWER MEASUREMENT	74
5.3.1	LIMITS OF PEAK TRANSMIT POWER MEASUREMENT	74
5.3.2	TEST INSTRUMENTS	74
5.3.3	TEST PROCEDURE	75
5.3.4	DEVIATION FROM TEST STANDARD	75
5.3.5	TEST SETUP	75



5.3.6	EUT OPERATING CONDITIONS.....	75
5.3.7	TEST RESULTS	76
5.4	PEAK POWER EXCURSION MEASUREMENT	100
5.4.1	LIMITS OF PEAK POWER EXCURSION MEASUREMENT	100
5.4.2	TEST INSTRUMENTS	100
5.4.3	TEST PROCEDURE	101
5.4.4	DEVIATION FROM TEST STANDARD	101
5.4.5	TEST SETUP	101
5.4.6	EUT OPERATING CONDITIONS.....	101
5.4.7	TEST RESULTS	102
5.5	PEAK POWER SPECTRAL DENSITY MEASUREMENT.....	115
5.5.1	LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	115
5.5.2	TEST INSTRUMENTS	115
5.5.3	TEST PROCEDURES	116
5.5.4	DEVIATION FROM TEST STANDARD	116
5.5.5	TEST SETUP	116
5.5.6	EUT OPERATING CONDITIONS.....	116
5.5.7	TEST RESULTS	117
5.6	FREQUENCY STABILITY	130
5.6.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	130
5.6.2	TEST INSTRUMENTS	130
5.6.3	TEST PROCEDURE	130
5.6.4	DEVIATION FROM TEST STANDARD	131
5.6.5	TEST SETUP	131
5.6.6	EUT OPERATING CONDITION	131
5.6.7	TEST RESULTS	132
5.7	BAND EDGES MEASUREMENT	133
5.7.1	TEST INSTRUMENTS	133
5.7.2	TEST PROCEDURE	133
5.7.3	EUT OPERATING CONDITION	133
5.7.4	TEST RESULTS	134
5.8	ANTENNA REQUIREMENT	143
5.8.1	STANDARD APPLICABLE	143
5.8.2	ANTENNA CONNECTED CONSTRUCTION	143
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION	144
7.	INFORMATION ON THE TESTING LABORATORIES.....	146



1. CERTIFICATION

PRODUCT : Wireless LAN 802.11a/b Dual Band Mini PCI Adapter
BRAND NAME : Actiontec
MODEL NO. : 802MABB
APPLICANT : Actiontec Electronics (Taiwan) Inc.
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247),
Subpart E (Section 15.407), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Feb. 7 ~ Feb. 11, 2003. The test record data evaluation and Equipment under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

CHECKED BY: Rennie Wang, **DATE:** February 21, 2003
Rennie Wang
APPROVED BY: Dr. Alan Lane, **DATE:** February 21, 2003
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 -15.76dBuV at 0.416MHz
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)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -1.90dBuV at 504.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit



APPLIED STANDARD: 47 CFR Part 15, Subpart E			
Standard Section	Test Type	Result	REMARK
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -14.74dBuV at 0.416MHz
15.407(b/1/2/3)(b)(5)	Electric Field Strength Spurious Emissions, 30 MHz – 40000 MHz	PASS	Meet the requirement of limit Minimum passing margin is -1.90dBuV at 504.00MHz
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter
MODEL NO.	802MABB
POWER SUPPLY	3.3VDC from host equipment
MODULATION	802.11b: DSSS 802.11a: OFDM
TRANSFER RATE	802.11b: 1 / 2 / 5.5 / 11Mbps 802.11a: 6 to 54Mbps *(Turbo mode : up to 108Mbps)
FREQUENCY RANGE	802.11b: 2412MHz ~ 2462MHz 802.11a: 5.15GHz ~ 5.35GHz, 5.725GHz ~ 5.825GHz
NUMBER OF CHANNEL	802.11b: 11 802.11a: 12 for Normal mode / 5 for Turbo mode
CHANNEL SPACING	802.11b: 5MHz 802.11a: 20MHz for Normal mode / 40MHz for Turbo mode
OUTPUT POWER	802.11b: 16.91dBm 802.11a: 18.82dBm
DATA CABLE	NA
ANTENNA TYPE	Inverted F antenna
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The Wireless LAN 802.11a/b Dual Band Mini PCI Adapter is specified to laptop PC which brand is Quanta, and the model name is EU3.

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. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b technology.

4. This EUT is capable of providing data rates up to 108Mbps in turbo mode.

5. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3.2 DESCRIPTION OF TEST MODES

For 802.11b: Eleven channels are provided to this EUT.

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

NOTE:

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

For 802.11a: Eight channels are provided to this EUT for Normal mode.

Channel	Frequency	Channel	Frequency
1	5180 MHz	7	5300 MHz
2	5200 MHz	8	5320 MHz
3	5220 MHz	9	5745MHz
4	5240 MHz	10	5765MHz
5	5260 MHz	11	5785MHz
6	5280 MHz	12	5805MHz

Five channels are provided to this EUT for Turbo Mode.

Channel	Frequency	Channel	Frequency
1	5210 MHz	4	5760MHz
2	5250 MHz	5	5800MHz
3	5290 MHz		

NOTE:

1. The EUT was transmitting at full power on the specified channel with a duty cycle of 99% (maximum allowed). The EUT was tested in both normal mode (channel bandwidth of approximately 30MHz) and turbo mode (channel bandwidth of approximately 60MHz).
2. "Normal Mode" allows data rates of up to 54Mbps. The device was, therefore, tested in Normal mode at the data rate that produced the highest output power for normal mode (6Mbps).
3. "Turbo Mode" allows data rates of up to 108Mbps. At data rates higher than 12Mbps the PA gain is reduced to improve signal fidelity. The device was, therefore, tested in turbo mode at the data rate that produced the highest output power for turbo mode (12Mbps).
4. Channel 1, 4, 5, 8, 9 and 12 are the closest frequencies to the band edge, were chosen for final test of Normal Mode.
5. Channel 1 ~ 5 were chosen for final test of turbo mode.



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC 47CFR Part 15, Subpart C. (15.247),
Subpart E (15.407). 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

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

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

4. TEST TYPES AND RESULTS (FOR PART 802.11b)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. 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	847793/022	Mar. 12, 2003
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	July 23, 2003
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 30, 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 peripheral)	3825/2	90031627	July 23, 2003
Software	Cond-V2M1	NA	NA
RF cable (JYBAO)	5D-FB	Cable-C05.01	July 19, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 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.
 2. “*”: These equipment are used for conducted telecom port test only (if tested).
 3. The test was performed in ADT Shielded Room No. 5.
 4. The VCCI Site Registration No. is C-1093.



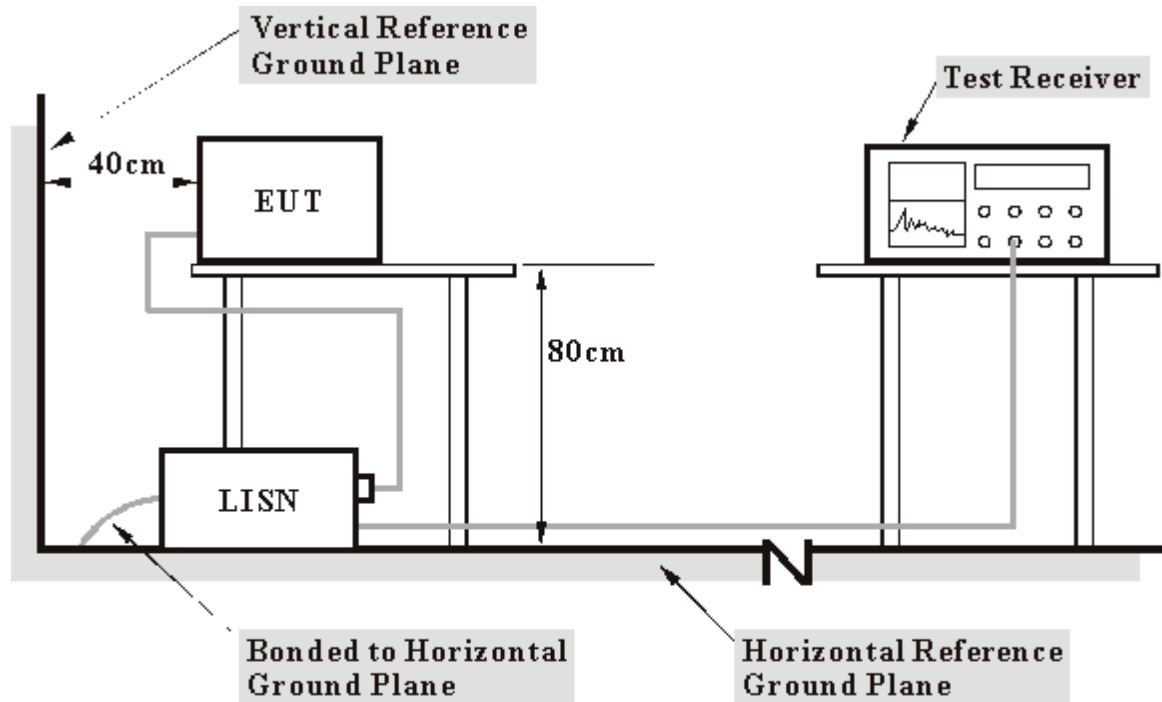
4.1.3 TEST PROCEDURES

- 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. Plug the EUT into the PCMCIA to Mini PCI extender which connected to a computer system placed on a testing table.
- b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The computer system sent "H" messages to its screen.
- d. The computer system sent "H" messages to printer, and the printer prints them on paper.

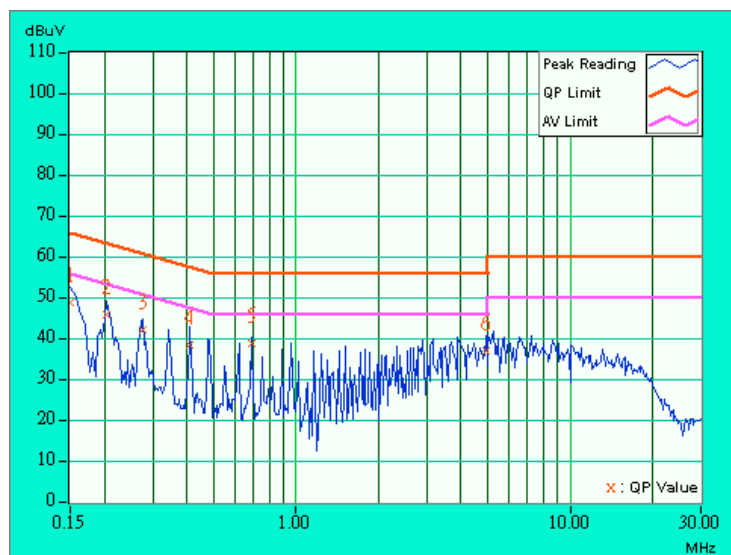
4.1.7 TEST RESULTS

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%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)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.150	0.10	48.32	-	48.42	-	66.00	56.00	-17.58	-
2	0.205	0.10	45.46	-	45.56	-	63.42	53.42	-17.86	-
3	0.275	0.10	41.83	-	41.93	-	60.97	50.97	-19.04	-
4	0.408	0.10	37.97	-	38.07	-	57.69	47.69	-19.62	-
5	0.685	0.15	38.37	-	38.52	-	56.00	46.00	-17.48	-
6	4.930	0.43	36.60	-	37.03	-	56.00	46.00	-18.97	-

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.

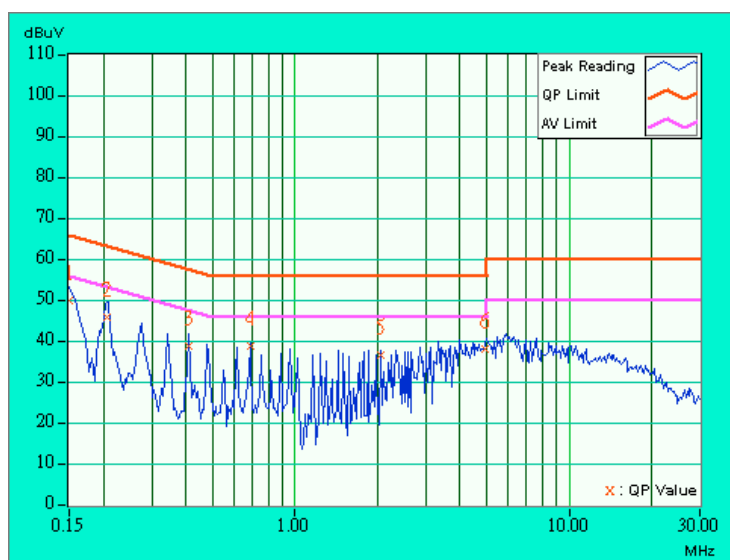


EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1005 hPa	TESTED BY: Cody Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.150	0.10	49.77	-	49.87	-	66.00	56.00	-16.13	-
2	0.206	0.10	45.79	-	45.89	-	63.36	53.36	-17.47	-
3	0.408	0.10	38.53	-	38.63	-	57.69	47.69	-19.06	-
4	0.685	0.15	38.53	-	38.68	-	56.00	46.00	-17.32	-
5	2.051	0.20	36.18	-	36.38	-	56.00	46.00	-19.62	-
6	4.926	0.32	37.98	-	38.30	-	56.00	46.00	-17.70	-

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.

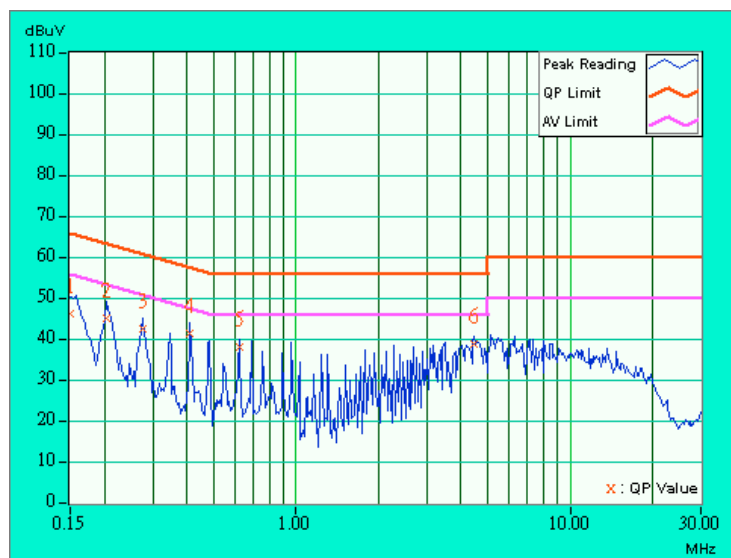


EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1005 hPa	TESTED BY: Cody Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.150	0.10	45.98	-	46.08	-	66.00	56.00	-19.92	-
2	0.205	0.10	44.76	-	44.86	-	63.42	53.42	-18.56	-
3	0.275	0.10	42.09	-	42.19	-	60.97	50.97	-18.78	-
4	0.412	0.10	41.15	-	41.25	-	57.62	47.62	-16.36	-
5	0.620	0.14	37.66	-	37.80	-	56.00	46.00	-18.20	-
6	4.469	0.42	38.40	-	38.82	-	56.00	46.00	-17.18	-

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.

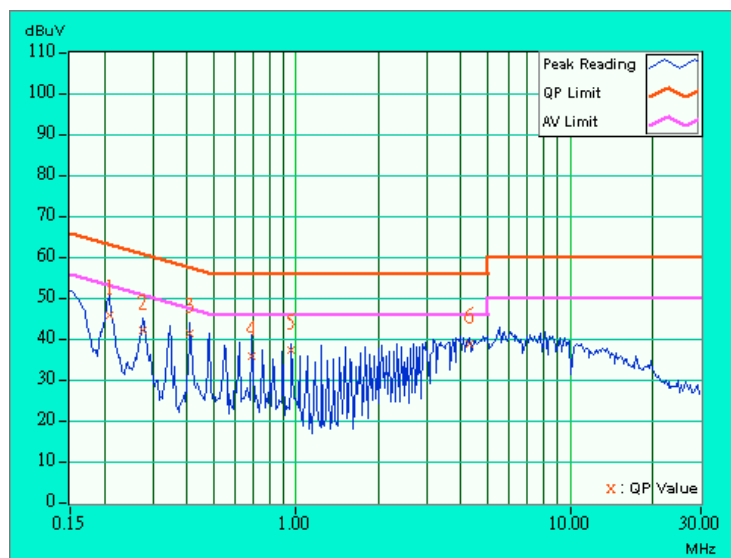


EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1005 hPa	TESTED BY: Cody Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.209	0.10	45.45	-	45.55	-	63.26	53.26	-17.71	-
2	0.275	0.10	41.82	-	41.92	-	60.97	50.97	-19.05	-
3	0.412	0.10	41.05	-	41.15	-	57.62	47.62	-16.46	-
4	0.685	0.15	35.67	-	35.82	-	56.00	46.00	-20.18	-
5	0.964	0.19	37.11	-	37.30	-	56.00	46.00	-18.70	-
6	4.270	0.30	38.64	-	38.94	-	56.00	46.00	-17.06	-

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.

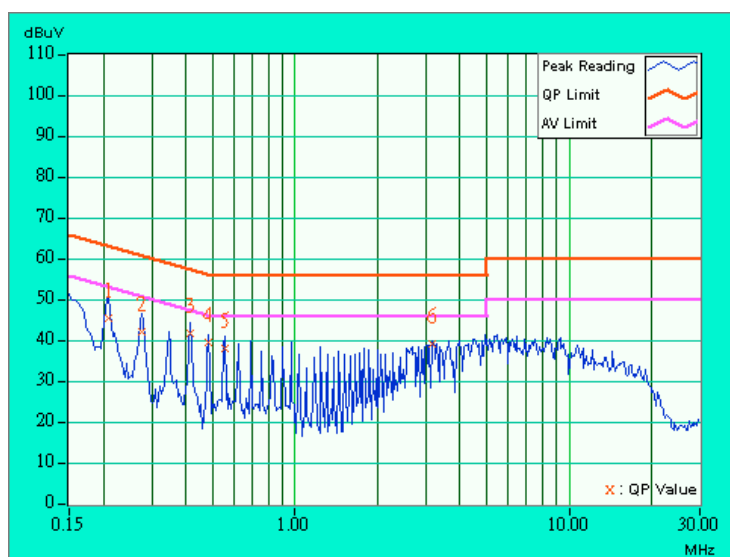


EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.209	0.10	45.35	-	45.45	-	63.26	53.26	-17.81	-
2	0.275	0.10	41.78	-	41.88	-	60.97	50.97	-19.09	-
3	0.416	0.10	41.67	-	41.77	-	57.54	47.54	-15.76	-
4	0.482	0.11	39.35	-	39.46	-	56.30	46.30	-16.84	-
5	0.552	0.13	37.90	-	38.03	-	56.00	46.00	-17.97	-
6	3.176	0.32	39.01	-	39.33	-	56.00	46.00	-16.67	-

Remarks:

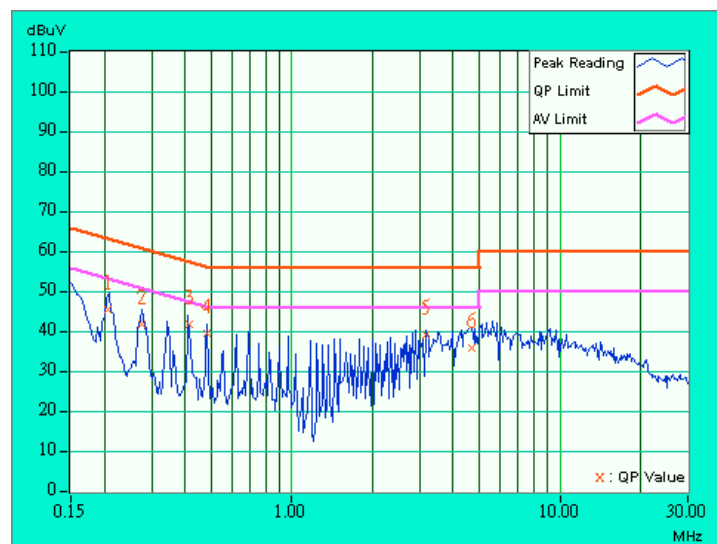
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level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



EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 62%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.206	0.10	45.31	-	45.41	-	63.36	53.36	-17.95	-
2	0.275	0.10	41.68	-	41.78	-	60.97	50.97	-19.19	-
3	0.413	0.10	41.61	-	41.71	-	57.59	47.59	-15.88	-
4	0.482	0.11	39.37	-	39.48	-	56.30	46.30	-16.82	-
5	3.172	0.26	39.09	-	39.35	-	56.00	46.00	-16.65	-
6	4.684	0.31	35.59	-	35.90	-	56.00	46.00	-20.10	-

- Remarks:
1. "-": Undetectable
 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 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
* 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
* Spectrum Analyzer	8593E	3926A04191	Mar. 28, 2003
* Test Receiver	ESI7	838496/016	Feb. 21, 2003
SCHAFFNER Tunable Dipole Antenna	VHBA 9123	459	Nov. 22, 2003
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 02, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 03, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 09, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	ADT_Radiated _V5.09	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jul. 11. 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 11. 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.

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.
5. The VCCI Site Registration No. is R-1039.



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 the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

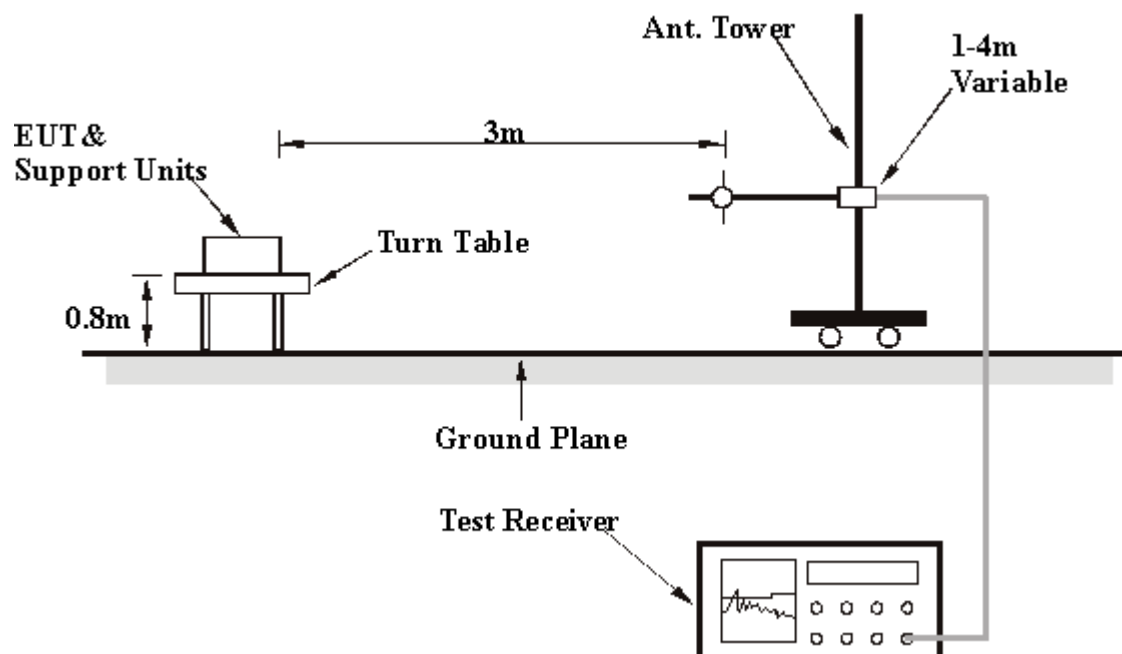
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 11	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

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	150.73	32.8 QP	43.50	-10.70	1.31 H	66	21.40	11.40
2	174.49	32.7 QP	43.50	-10.80	1.64 H	358	22.00	10.60
3	266.00	43.6 QP	46.00	-2.40	1.23 H	102	27.00	16.60
4	279.75	30.9 QP	46.00	-15.10	1.40 H	51	14.40	16.50
5	325.76	36.3 QP	46.00	-9.70	1.27 H	358	19.10	17.30
6	331.91	36.4 QP	46.00	-9.60	1.50 H	31	19.00	17.40
7	364.70	31.6 QP	46.00	-14.40	1.24 H	357	13.50	18.10
8	399.53	34.7 QP	46.00	-11.30	1.19 H	122	15.60	19.10
9	427.68	32.8 QP	46.00	-13.20	1.42 H	3	13.30	19.50
10	451.77	42.6 QP	46.00	-3.40	1.02 H	295	22.80	19.80
11	592.88	37.4 QP	46.00	-8.60	1.40 H	1	15.00	22.50
12	615.68	39.1 QP	46.00	-6.90	1.71 H	133	16.40	22.70
13	630.03	39.0 QP	46.00	-7.00	1.57 H	4	16.20	22.80
14	651.42	36.7 QP	46.00	-9.30	1.67 H	26	13.90	22.80
15	732.91	35.1 QP	46.00	-10.90	1.88 H	357	11.30	23.80
16	797.91	33.6 QP	46.00	-12.40	1.57 H	23	8.80	24.80
17	846.90	32.4 QP	46.00	-13.60	1.18 H	343	7.30	25.10

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	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 11	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

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	59.21	31.7 QP	40.00	-8.30	1.63 V	254	24.20	7.60
2	139.46	34.1 QP	43.50	-9.40	1.25 V	29	21.90	12.20
3	174.07	32.4 QP	43.50	-11.10	1.06 V	316	21.70	10.70
4	232.66	31.1 QP	46.00	-14.90	1.72 V	3	17.20	14.00
5	258.16	39.1 QP	46.00	-6.90	1.83 V	62	22.50	16.60
6	265.96	42.5 QP	46.00	-3.50	1.68 V	215	25.90	16.60
7	333.19	34.3 QP	46.00	-11.70	1.59 V	3	16.90	17.40
8	398.75	35.0 QP	46.00	-11.00	1.25 V	21	15.90	19.10
9	452.00	40.4 QP	46.00	-5.60	1.46 V	319	20.60	19.80
10	504.00	44.1 QP	46.00	-1.90	1.53 V	61	22.90	21.20
11	515.97	40.2 QP	46.00	-5.80	1.32 V	51	19.00	21.20
12	531.75	38.5 QP	46.00	-7.50	1.36 V	3	17.40	21.10
13	581.02	32.1 QP	46.00	-13.90	1.10 V	7	10.00	22.10
14	600.74	37.3 QP	46.00	-8.70	1.23 V	329	14.60	22.70
15	644.93	35.0 QP	46.00	-11.00	1.85 V	142	12.30	22.80
16	676.18	36.9 QP	46.00	-9.10	1.05 V	1	14.00	22.90
17	730.25	37.1 QP	46.00	-8.90	1.02 V	24	13.40	23.70
18	796.55	35.3 QP	46.00	-10.70	1.81 V	336	10.50	24.80

REMARKS:

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

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 1	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

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	*2412.00	108.9 PK			1.03 H	72	79.40	32.80
1	*2412.00	102.0 AV			1.03 H	72	72.40	32.80
2	3168.00	45.1 PK	74.00	-28.90	1.70 H	358	11.30	33.80
3	4824.00	56.4 PK	74.00	-17.60	1.50 H	350	19.40	36.90
3	4824.00	45.2 AV	54.00	-8.80	1.50 H	350	8.20	33.80
4	6336.00	60.4 PK	88.90	-28.50	1.43 H	25	21.30	39.10
4	6336.00	59.2 AV	82.0	-22.80	1.43 H	25	20.10	36.90
5	7235.00	51.4 PK	74.00	-22.60	1.51 H	104	9.90	41.40
5	7235.00	43.4 AV	54.00	-10.60	1.51 H	104	1.90	39.10
6	9648.00	53.8 PK	74.00	-20.20	1.42 H	325	10.40	43.40
6	9648.00	47.0 AV	54.00	-7.00	1.42 H	325	3.60	41.40

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	*2412.00	105.5 PK			1.70 V	103	76.00	32.80
1	*2412.00	100.0 AV			1.70 V	103	70.50	32.80
2	3168.00	45.7 PK	74.00	-28.30	1.18 V	101	11.90	33.80
3	4824.00	60.6 PK	74.00	-13.40	1.64 V	299	23.70	36.90
3	4824.00	48.5 AV	54.00	-5.50	1.64 V	299	11.50	33.80
4	6336.00	65.9 PK	85.50	-19.60	1.27 V	221	26.80	39.10
4	6336.00	65.2 AV	80.00	-14.80	1.27 V	221	26.10	36.90
5	7236.00	55.9 PK	74.00	-18.10	1.48 V	218	14.40	41.40
5	7236.00	46.9 AV	54.00	-7.10	1.48 V	218	5.40	39.10
6	9648.00	56.0 PK	74.00	-18.00	1.09 V	141	12.60	43.40
6	9648.00	49.0 AV	54.00	-5.00	1.09 V	141	5.60	41.40

REMARKS:

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

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 6	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

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	110.7 PK			1.11 H	72	77.90	32.80
1	*2437.00	104.2 AV			1.11 H	72	71.40	32.80
2	3168.00	44.9 PK	74.00	-29.10	1.00 H	41	11.10	33.80
3	4874.00	58.1 PK	74.00	-15.90	1.68 H	333	20.90	37.10
3	4874.00	46.8 AV	54.00	-7.20	1.68 H	333	9.60	33.80
4	6336.00	60.3 PK	90.70	-30.40	1.38 H	141	21.20	39.10
4	6336.00	58.7 AV	84.20	-25.50	1.38 H	141	19.60	37.10
5	7310.00	50.5 PK	74.00	-23.50	1.15 H	24	8.90	41.50
5	7310.00	42.5 AV	54.00	-11.50	1.15 H	24	0.90	39.10
6	9748.00	51.9 PK	74.00	-22.10	1.45 H	35	8.60	43.30
6	9748.00	44.9 AV	54.00	-9.10	1.45 H	35	1.60	41.50

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	*2437.00	107.7 PK			1.30 V	112	74.90	32.80
1	*2437.00	102.7 AV			1.30 V	112	69.90	32.80
2	3168.00	45.7 PK	74.00	-28.30	1.09 V	7	11.90	33.80
3	4874.00	62.4 PK	74.00	-11.60	2.05 V	276	25.20	37.10
3	4874.00	50.1 AV	54.00	-3.90	2.05 V	276	12.90	33.80
4	6336.00	63.3 PK	87.70	-24.40	1.57 V	292	24.20	39.10
4	6336.00	62.4 AV	82.70	-20.30	1.57 V	292	23.30	37.10
5	7309.00	52.5 PK	74.00	-21.50	1.21 V	162	10.90	41.50
5	7309.00	45.6 AV	54.00	-8.40	1.21 V	162	4.00	39.10
6	9747.00	50.9 PK	74.00	-23.10	1.33 V	352	7.60	43.30
6	9747.00	43.9 AV	54.00	-10.10	1.33 V	352	0.60	41.50

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. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * ” : Fundamental frequency

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

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	*2463.00	107.1 PK			1.52 H	137	74.30	32.90
1	*2463.00	101.5 AV			1.52 H	137	68.70	32.90
2	3168.00	45.2 PK	74.00	-28.80	1.32 H	54	11.40	33.80
3	4924.00	57.5 PK	74.00	-16.50	1.00 H	213	20.10	37.30
3	4924.00	45.3 AV	54.00	-8.70	1.00 H	213	8.00	33.80
4	6336.00	58.7 PK	87.10	-28.40	1.73 H	244	19.60	39.10
4	6336.00	57.2 AV	81.50	-24.30	1.73 H	244	18.10	37.30
5	7386.00	49.5 PK	74.00	-24.50	1.51 H	241	7.90	41.70
6	9850.00	51.3 PK	74.00	-22.70	1.13 H	244	8.10	43.20
6	9850.00	43.8 AV	54.00	-10.20	1.13 H	244	0.60	39.10

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	*2463.00	108.7 PK			1.26 V	123	75.80	32.90
1	*2463.00	102.4 AV			1.26 V	123	69.50	32.90
2	3168.00	46.7 PK	74.00	-27.30	1.03 V	55	12.90	33.80
3	4924.00	60.1 PK	74.00	-13.90	1.03 V	175	22.70	37.30
3	4924.00	47.6 AV	54.00	-6.40	1.03 V	175	10.20	33.80
4	6336.00	63.5 PK	88.70	-25.20	1.53 V	102	24.40	39.10
4	6336.00	62.2 AV	82.40	-20.20	1.53 V	102	23.10	37.30
5	7384.00	49.5 PK	74.00	-24.50	1.03 V	47	7.90	41.70
6	9648.00	50.0 PK	74.00	-24.00	1.34 V	45	6.60	43.40
6	9648.00	44.0 AV	54.00	-10.00	1.34 V	45	0.60	39.10

REMARKS:

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

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

NOTE:

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

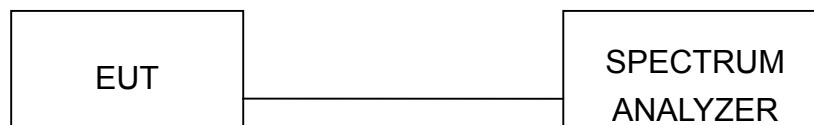
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB 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

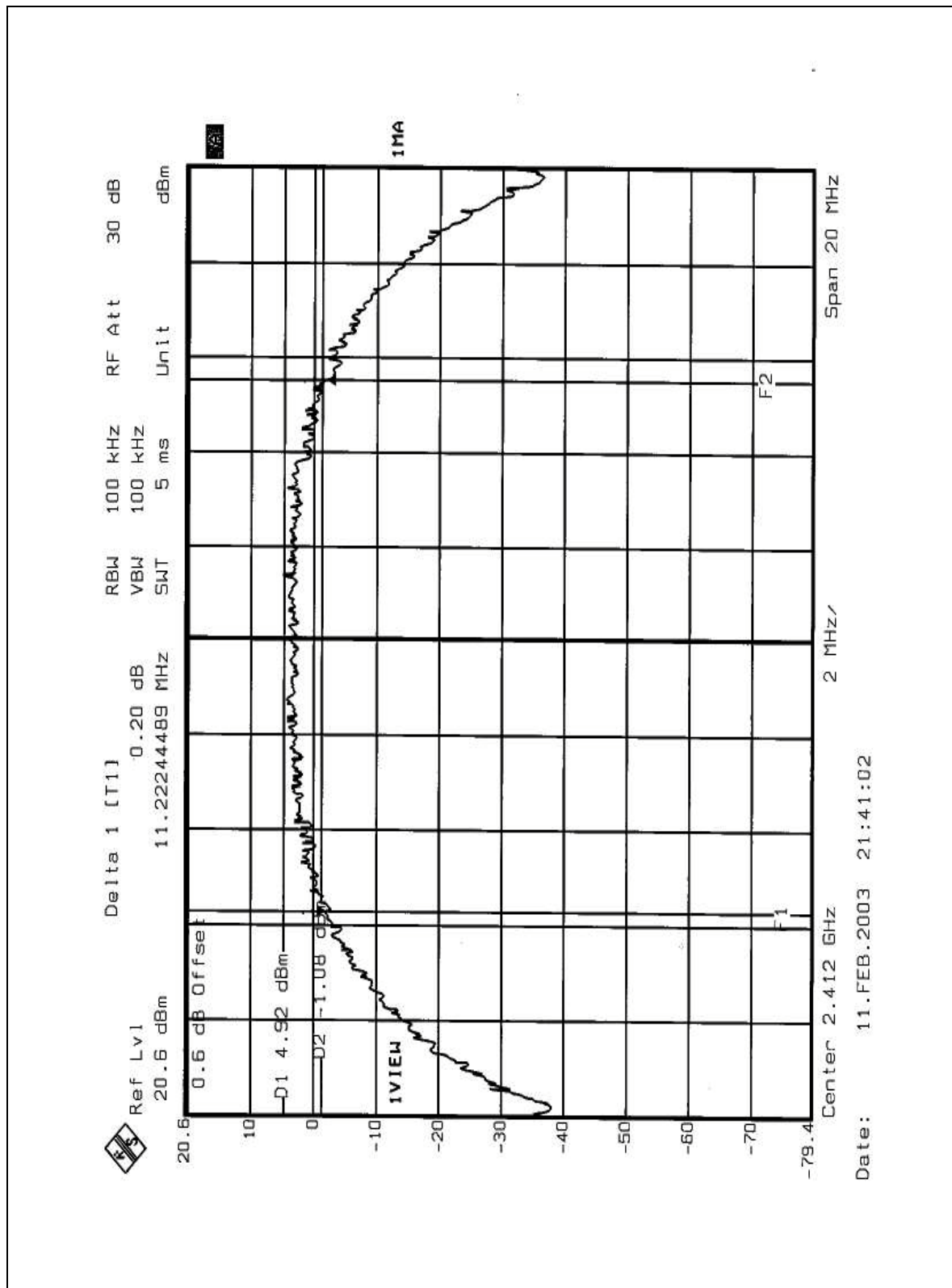
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

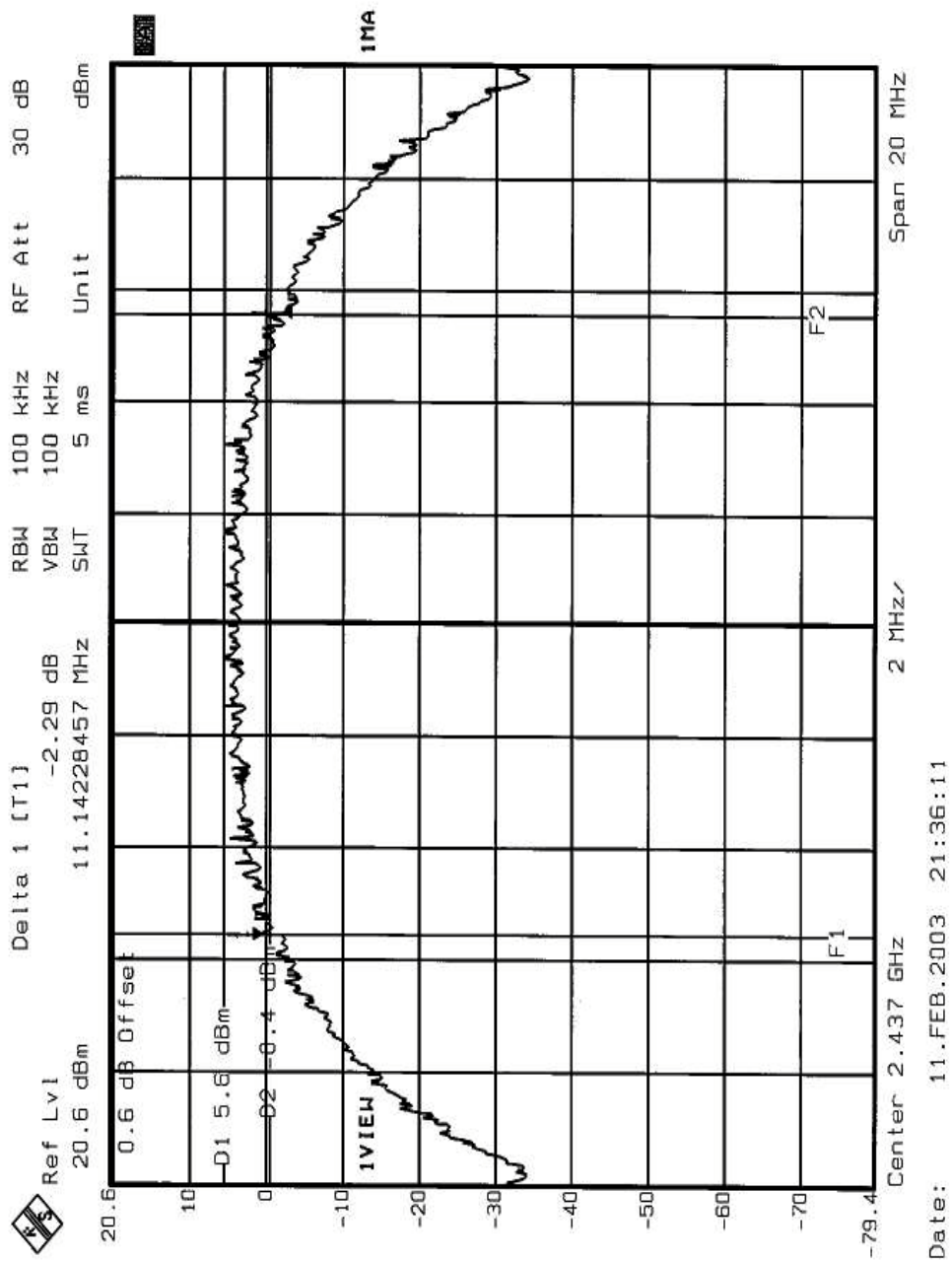
EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	21deg. C, 68RH, 1005 hPa
TESTED BY: Ansen Lei			

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.22	0.5	PASS
6	2437	11.14	0.5	PASS
11	2462	11.22	0.5	PASS

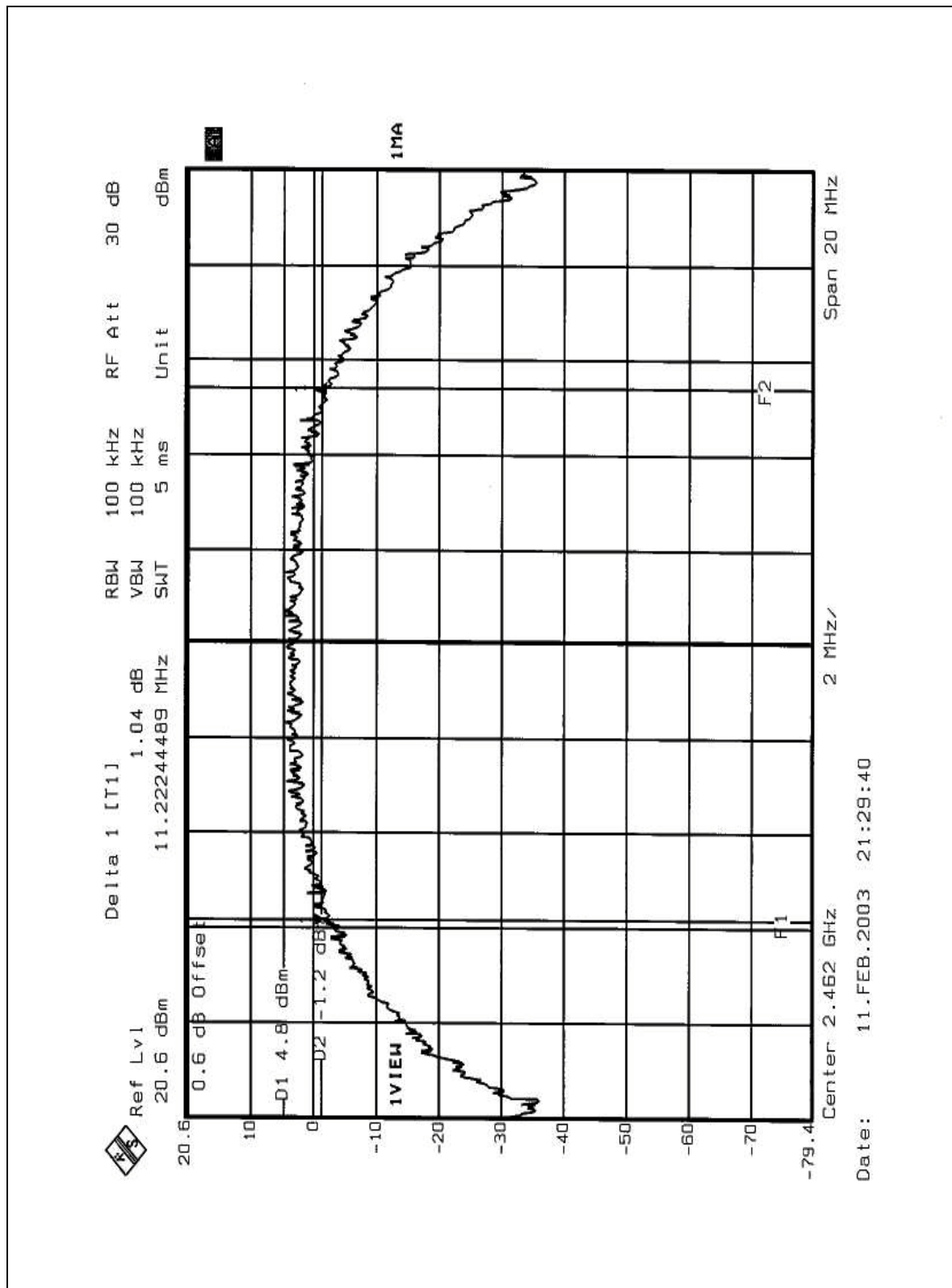
CH1



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 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
POWER METER	E4416A	GB41291118	Jul. 30, 2003
PEAK POWER SENSOR	E9327A	US40440722	Jul. 30, 2003

NOTE:

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

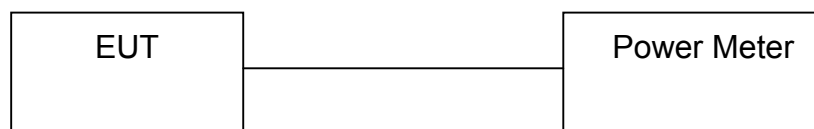
4.4.3 TEST PROCEDURES

The transmitter output was connected to the peak power meter.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	21deg.C, 68RH, 1005 hPa
TESTED BY: Ansen Lei			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.42	30	PASS
6	2437	16.91	30	PASS
11	2462	16.84	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:

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

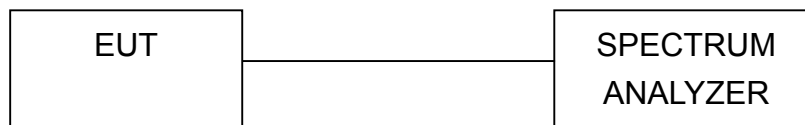
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz 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 CONDITION

Same as Item 4.3.6

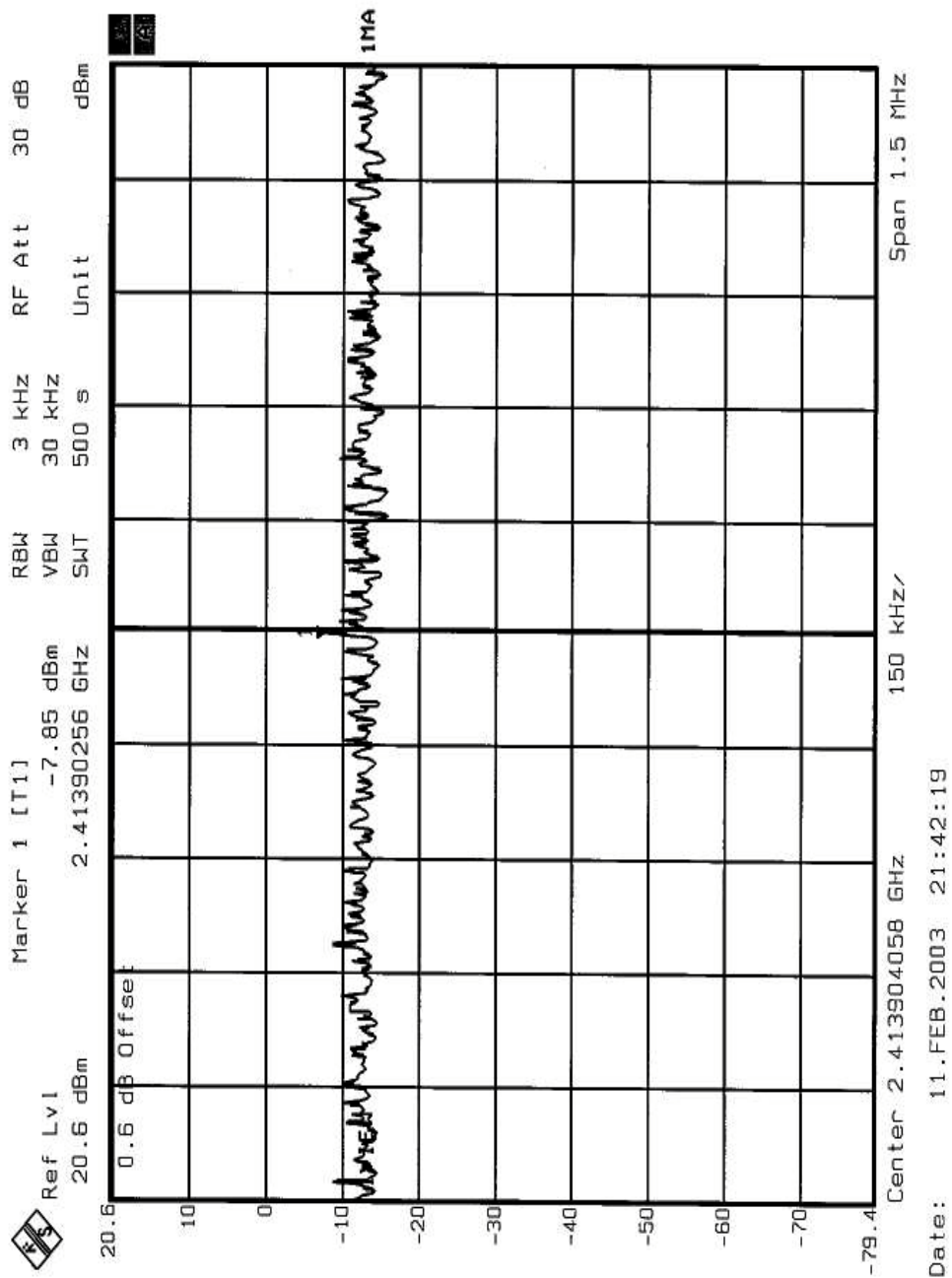


4.5.7 TEST RESULTS

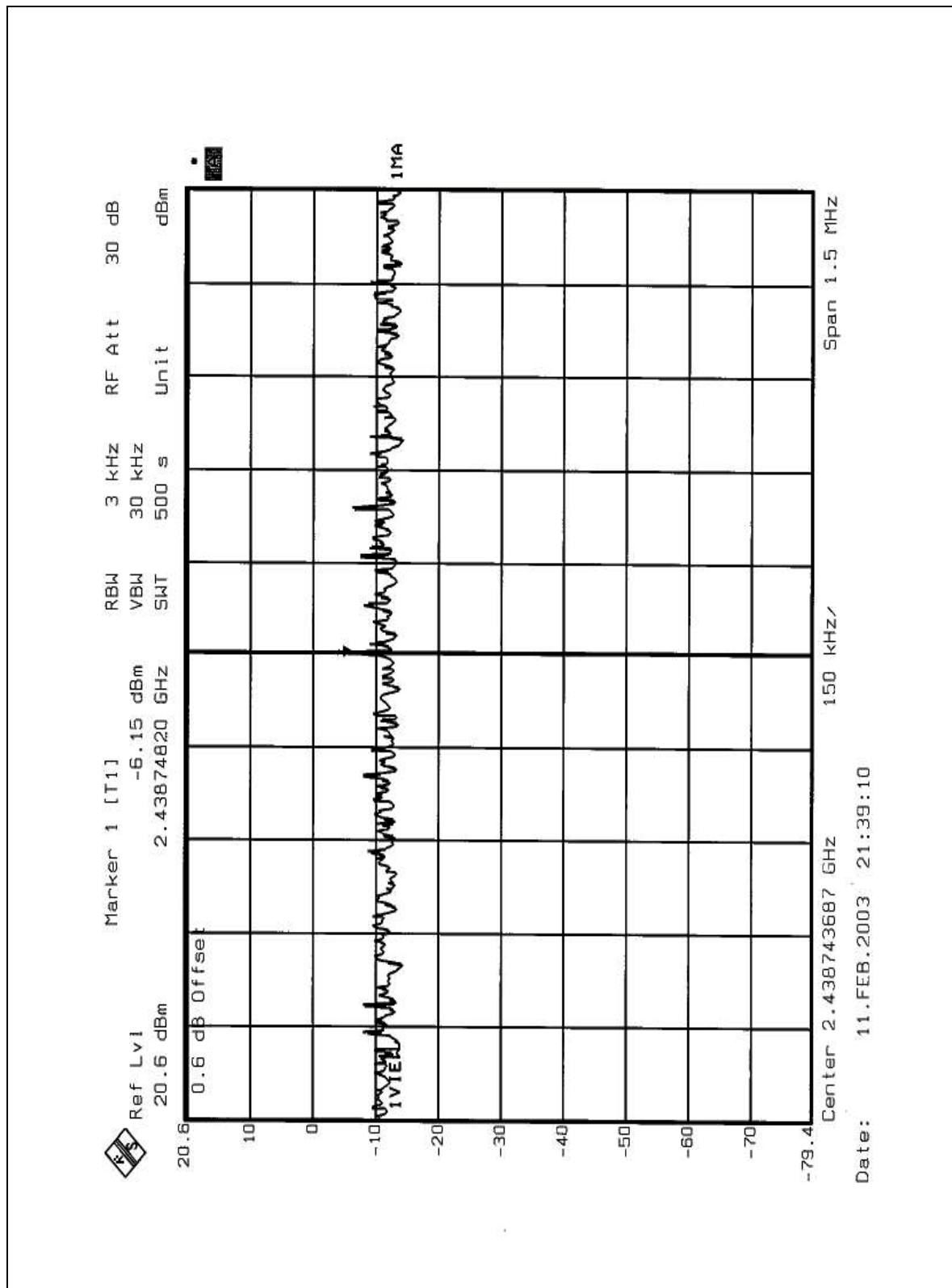
EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	21deg. C, 68RH, 1005 hPa
TESTED BY: Ansen Lei			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-7.85	8	PASS
6	2437	-6.15	8	PASS
11	2462	-7.68	8	PASS

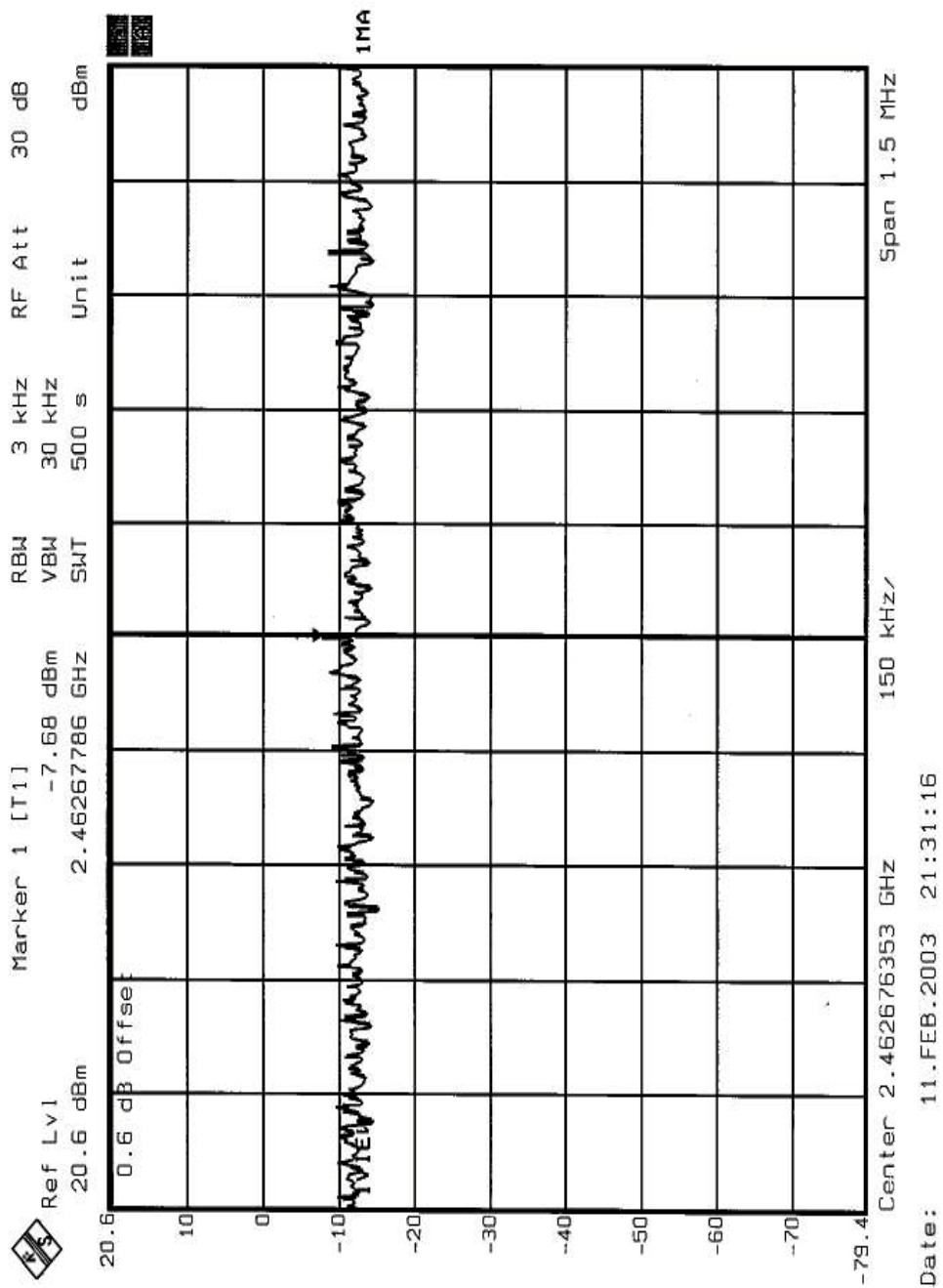
CH1



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:

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

4.6.3 TEST PROCEDURE

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation



4.6.5 EUT OPERATING CONDITION

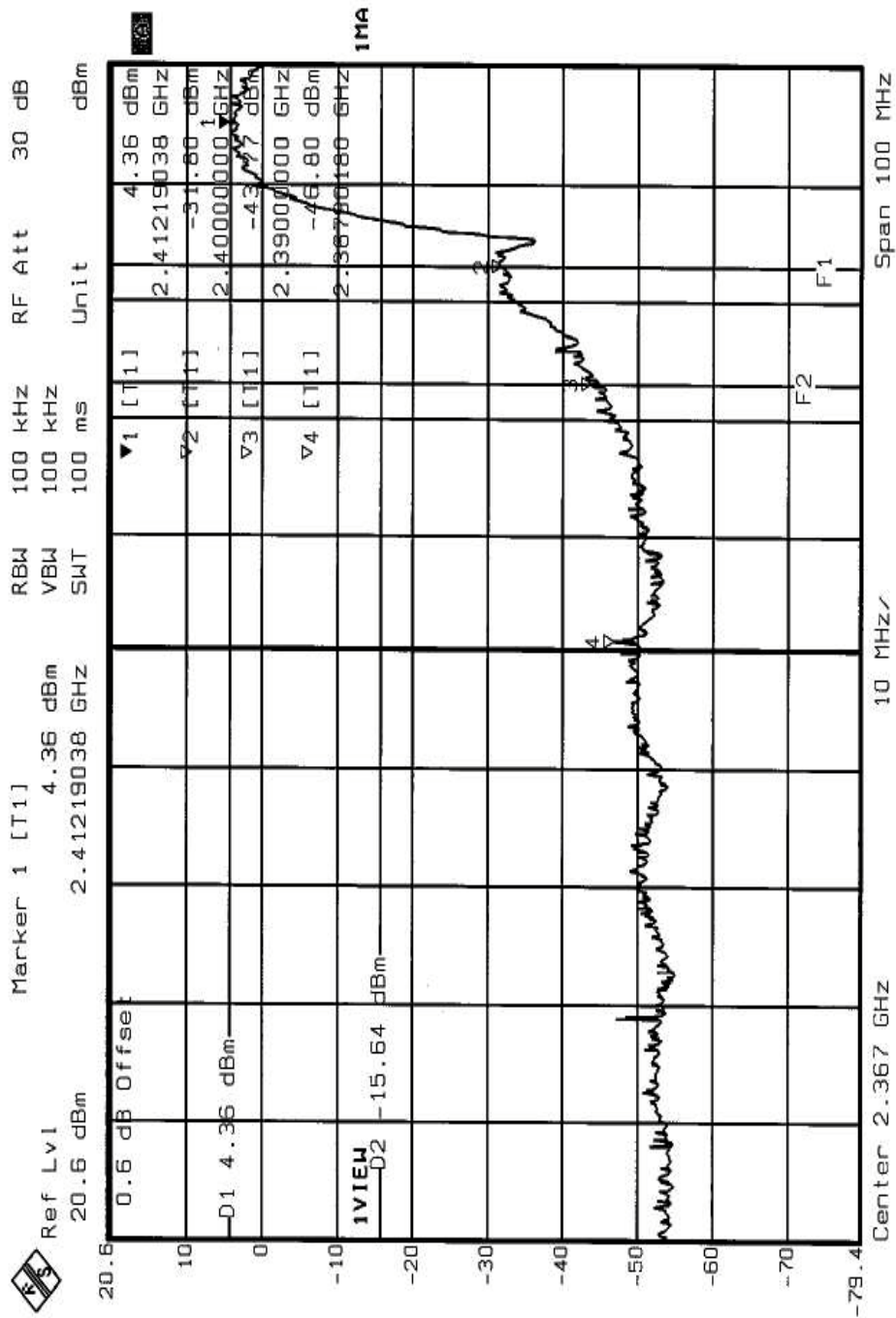
Same as Item 4.3.6

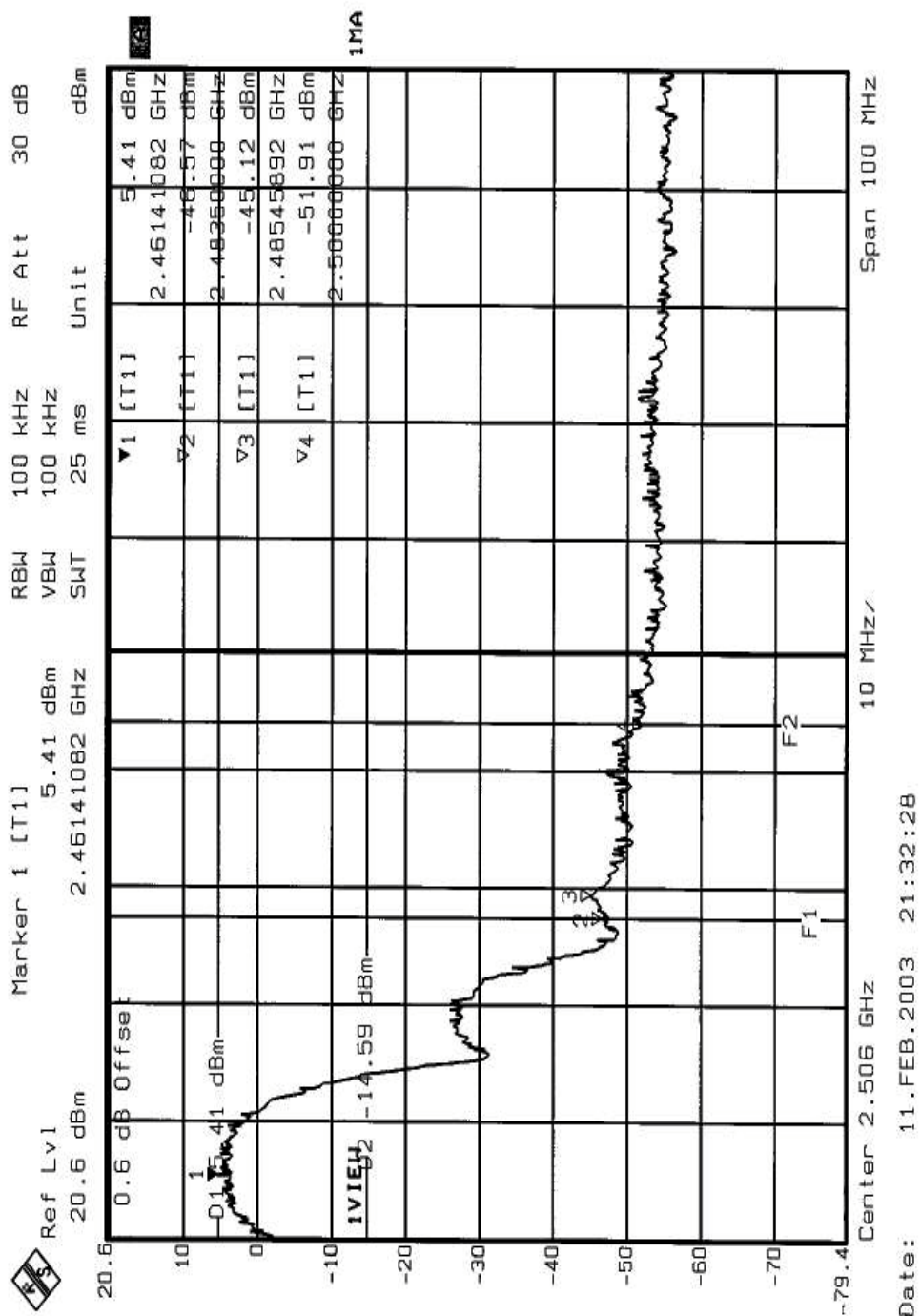
4.6.6 TEST RESULTS

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

NOTE:

The band edge emission plot on the following pages shows 48.13dB / 50.53dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz / 2.4854GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 (page 29) is 102.4dBuV/m, so the maximum field strength in restrict band is $102.4 - 50.53 = 51.87$ dBuV/m which is under 54dBuV/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 Inverted F Antenna with UFL connector. The maximum Gain of the antenna is 1.94dBi

5. TEST TYPES AND RESULTS (FOR PART 802.11a)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 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.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	847793/022	Mar. 12, 2003
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	July 23, 2003
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 30, 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 peripheral)	3825/2	90031627	July 23, 2003
Software	Cond-V2M1	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C05.01	July 19, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 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.
 2. “*”: These equipment are used for conducted telecom port test only (if tested).
 3. The test was performed in ADT Shielded Room No. 5.
 4. The VCCI Site Registration No. is C-1093.



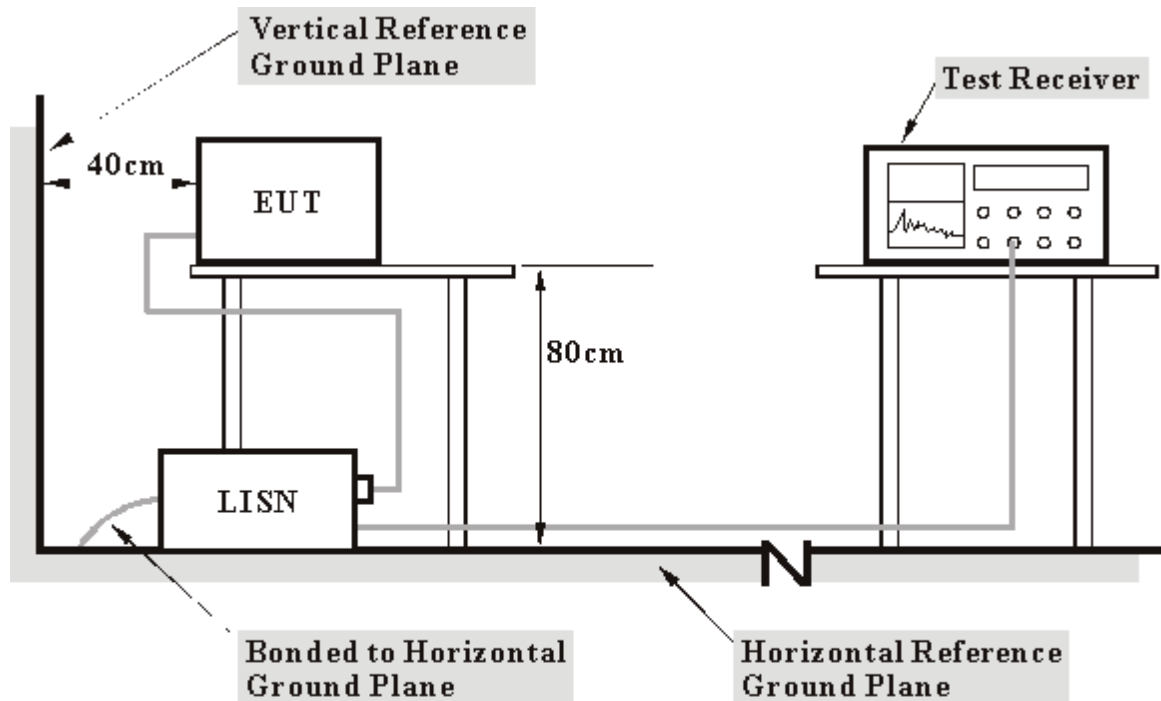
5.1.3 TEST PROCEDURES

- 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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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.

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

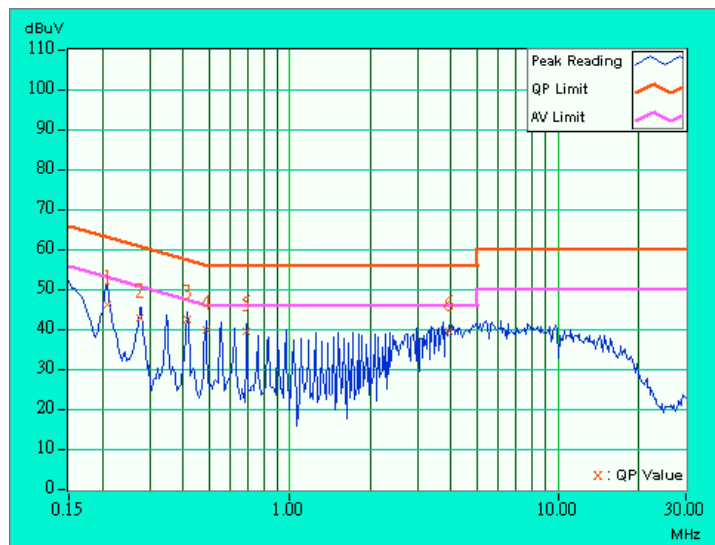
5.1.7 TEST RESULTS

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
		6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60RH, 1005 hPa	TESTED BY: Cody Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.10	45.93	-	46.03	-	63.26	53.26	-17.23	-
2	0.278	0.10	42.58	-	42.68	-	60.89	50.89	-18.21	-
3	0.416	0.10	42.27	-	42.37	-	57.54	47.54	-15.16	-
4	0.486	0.11	39.45	-	39.56	-	56.24	46.24	-16.67	-
5	0.692	0.15	39.37	-	39.52	-	56.00	46.00	-16.48	-
6	3.945	0.39	39.20	-	39.59	-	56.00	46.00	-16.41	-

NOTE:

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.

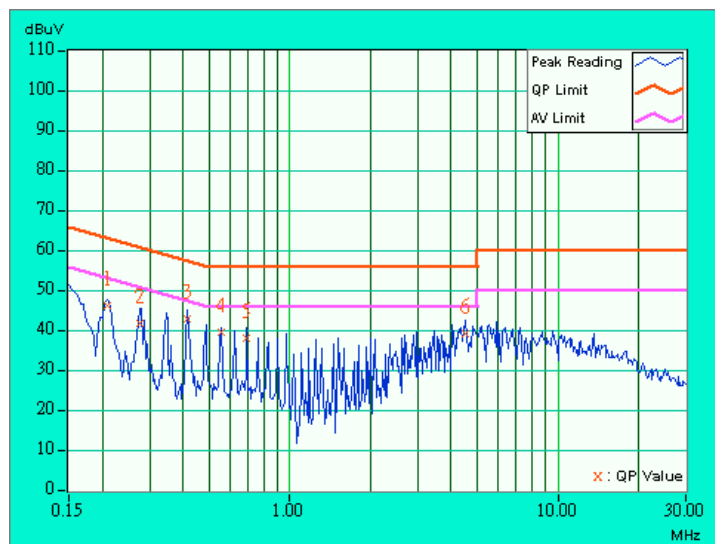


EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
		6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60RH, 1005 hPa	TESTED BY: Cody Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.10	46.15	-	46.25	-	63.26	53.26	-17.01	-
2	0.275	0.10	41.52	-	41.62	-	60.97	50.97	-19.35	-
3	0.416	0.10	42.69	-	42.79	-	57.54	47.54	-14.74	-
4	0.552	0.13	39.33	-	39.46	-	56.00	46.00	-16.54	-
5	0.690	0.15	37.98	-	38.13	-	56.00	46.00	-17.87	-
6	4.500	0.31	39.05	-	39.36	-	56.00	46.00	-16.64	-

NOTE:

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.





5.2 RADIATED EMISSION MEASUREMENT

5.2.1 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.



5.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBμV/m) *note 3
5150~5250	-27	68.3
5250~5350	-27	68.3
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m}, \quad \text{where } P \text{ is the eirp (Watts)}$$



5.2.3 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
* Spectrum Analyzer	8593E	3926A04191	Mar. 28, 2003
* Test Receiver	ESI7	838496/016	Feb. 21, 2003
SCHAFFNER Tunable Dipole Antenna	VHBA 9123	459	Nov. 22, 2003
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 02, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 03, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 09, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	ADT_Radiated _V5.09	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jul. 11. 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 11. 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.

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.
5. The VCCI Site Registration No. is R-1039.



5.2.4 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 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

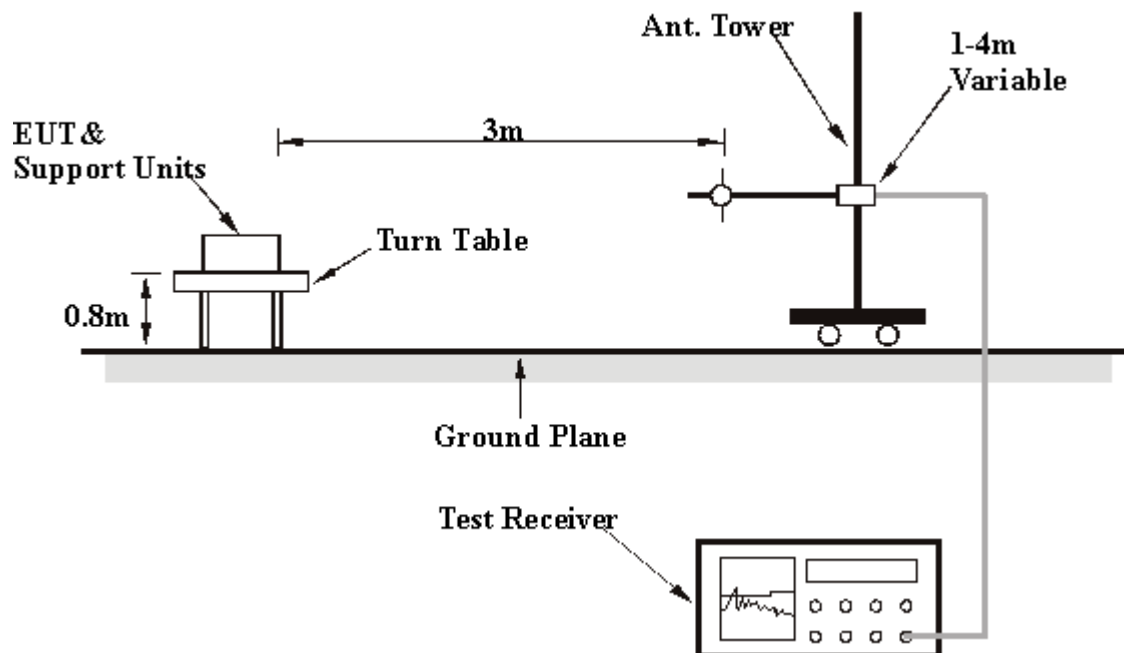
NOTE:

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.

5.2.5 DEVIATION FROM TEST STANDARD

No deviation

5.2.6 TEST SETUP



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

5.2.7 EUT OPERATING CONDITIONS

Same as 4.1.6

5.2.8 TEST RESULTS

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
FREQUENCY RANGE	Below 1000MHz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	150.73	32.8 QP	43.50	-10.70	1.31 H	66	21.40	11.40
2	174.49	32.7 QP	43.50	-10.80	1.64 H	358	22.00	10.60
3	266.00	43.6 QP	46.00	-2.40	1.23 H	102	27.00	16.60
4	279.75	30.9 QP	46.00	-15.10	1.40 H	51	14.40	16.50
5	325.76	36.3 QP	46.00	-9.70	1.27 H	358	19.10	17.30
6	331.91	36.4 QP	46.00	-9.60	1.50 H	31	19.00	17.40
7	364.70	31.6 QP	46.00	-14.40	1.24 H	357	13.50	18.10
8	399.53	34.7 QP	46.00	-11.30	1.19 H	122	15.60	19.10
9	427.68	32.8 QP	46.00	-13.20	1.42 H	3	13.30	19.50
10	451.77	42.6 QP	46.00	-3.40	1.02 H	295	22.80	19.80
11	592.88	37.4 QP	46.00	-8.60	1.40 H	1	15.00	22.50
12	615.68	39.1 QP	46.00	-6.90	1.71 H	133	16.40	22.70
13	630.03	39.0 QP	46.00	-7.00	1.57 H	4	16.20	22.80
14	651.42	36.7 QP	46.00	-9.30	1.67 H	26	13.90	22.80
15	732.91	35.1 QP	46.00	-10.90	1.88 H	357	11.30	23.80
16	797.91	33.6 QP	46.00	-12.40	1.57 H	23	8.80	24.80
17	846.90	32.4 QP	46.00	-13.60	1.18 H	343	7.30	25.10

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	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
FREQUENCY RANGE	Below 1000MHz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	59.21	31.7 QP	40.00	-8.30	1.63 V	254	24.20	7.60
2	139.46	34.1 QP	43.50	-9.40	1.25 V	29	21.90	12.20
3	174.07	32.4 QP	43.50	-11.10	1.06 V	316	21.70	10.70
4	232.66	31.1 QP	46.00	-14.90	1.72 V	3	17.20	14.00
5	258.16	39.1 QP	46.00	-6.90	1.83 V	62	22.50	16.60
6	265.96	42.5 QP	46.00	-3.50	1.68 V	215	25.90	16.60
7	333.19	34.3 QP	46.00	-11.70	1.59 V	3	16.90	17.40
8	398.75	35.0 QP	46.00	-11.00	1.25 V	21	15.90	19.10
9	452.00	40.4 QP	46.00	-5.60	1.46 V	319	20.60	19.80
10	504.00	44.1 QP	46.00	-1.90	1.53 V	61	22.90	21.20
11	515.97	40.2 QP	46.00	-5.80	1.32 V	51	19.00	21.20
12	531.75	38.5 QP	46.00	-7.50	1.36 V	3	17.40	21.10
13	581.02	32.1 QP	46.00	-13.90	1.10 V	7	10.00	22.10
14	600.74	37.3 QP	46.00	-8.70	1.23 V	329	14.60	22.70
15	644.93	35.0 QP	46.00	-11.00	1.85 V	142	12.30	22.80
16	676.18	36.9 QP	46.00	-9.10	1.05 V	1	14.00	22.90
17	730.25	37.1 QP	46.00	-8.90	1.02 V	24	13.40	23.70
18	796.55	35.3 QP	46.00	-10.70	1.81 V	336	10.50	24.80

REMARKS:

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

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal Mode	CHANNEL	1
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	#5150.00	64.0 PK	74.00	-10.00	1.42 H	189	26.30	37.70
1	#5150.00	51.2 AV	54.00	-2.80	1.42 H	189	13.50	37.70
2	*5180.00	102.1 PK			1.42 H	189	64.40	37.70
2	*5180.00	93.9 AV			1.42 H	189	56.20	37.70
3	10360.00	58.3 PK	68.30	-10.00	1.25 H	78	13.80	44.50

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	#5150.00	59.7 PK	74.00	-14.30	1.15 V	88	22.00	37.70
1	#5150.00	51.0 AV	54.00	-3.00	1.15 V	88	13.30	37.70
2	*5180.00	97.9 PK			1.15 V	88	60.20	37.70
2	*5180.00	90.4 AV			1.15 V	88	52.70	37.70
3	10360.00	57.3 PK	68.30	-11.00	1.32 V	45	12.80	44.50

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. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*” : Fundamental frequency
6. “#” : The radiated frequency falling in the restricted band.

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal Mode	CHANNEL	4
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5240.00	101.9 PK			1.42 H	54	64.20	37.70
1	*5240.00	93.5 AV			1.42 H	54	55.80	37.70
2	10480.00	56.8 PK	68.30	-11.50	1.12 H	87	11.80	45.00

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	*5240.00	100.1 PK			1.58 V	280	62.40	37.70
1	*5240.00	92.5 AV			1.58 V	280	54.90	37.70
2	10480.00	56.4 PK	68.30	-11.90	1.14 V	39	11.40	45.00

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	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal Mode	CHANNEL	5
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5260.00	102.7 PK			1.07 H	176	65.00	37.70
1	*5260.00	95.2 AV			1.07 H	176	57.50	37.70
2	10520.00	59.2 PK	68.30	-9.10	1.24 H	87	14.10	45.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5260.00	101.1 PK			1.03 V	267	63.50	37.70
1	*5260.00	92.6 AV			1.03 V	267	54.90	37.70
2	10520.00	57.0 PK	68.3	-11.30	1.15 V	45	11.90	45.10

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	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal Mode	CHANNEL	8
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5320.00	101.7 PK			1.30 H	7	64.00	37.70
1	*5320.00	94.1 AV			1.30 H	7	56.50	37.70
2	#5350.00	60.9 PK	74.00	-13.10	1.30 H	7	23.20	37.70
2	#5350.00	50.0 AV	54.00	-4.00	1.30 H	7	12.30	37.70
3	#10640.00	53.2 PK	74.00	-20.80	1.31 H	23	7.90	45.20
3	#10640.00	43.2 AV	54.00	-10.80	1.31 H	23	-2.10	45.20

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	*5320.00	99.0 PK			1.15 V	270	61.30	37.70
1	*5320.00	91.4 AV			1.15 V	270	53.70	37.70
2	#5350.00	57.9 PK	74.00	-16.10	1.15 V	270	20.20	37.70
2	#5350.00	42.9 AV	54.00	-11.10	1.15 V	270	5.20	37.70
3	#10640.00	55.6 PK	74.00	-18.40	1.43 V	134	10.40	45.20
3	#10640.00	45.7 AV	54.00	-8.30	1.43 V	134	0.40	45.20

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
6. "# " : The radiated frequency falling in the restricted band.

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal Mode	CHANNEL	9
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	5715.00	66.0 PK	68.30	-2.30	1.71 H	358	28.10	37.90
2	5725.00	72.9 PK	78.30	-5.40	1.71 H	358	35.00	37.90
3	*5745.00	103.8 PK			1.71 H	358	65.80	37.90
3	*5745.00	64.9 AV			1.71 H	358	26.90	37.90
4	#11491.00	55.5 PK	74.00	-18.50	1.32 H	351	10.00	45.50
4	#11491.00	44.5 AV	54.00	-9.50	1.32 H	351	-1.00	45.50

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	5715.00	65.9 PK	68.30	-2.40	1.48 V	302	28.00	37.90
2	5725.00	73.9 PK	78.30	-4.40	1.48 V	302	36.00	37.90
3	*5745.00	101.8 PK			1.48 V	302	63.90	37.90
3	*5745.00	94.3 AV			1.48 V	302	56.40	37.90
4	#11491.00	54.3 PK	74.00	-19.70	1.42 V	50	8.80	45.50
4	#11491.00	43.5 AV	54.00	-10.50	1.42 V	50	-2.00	45.50

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. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*” : Fundamental frequency
6. “#” : The radiated frequency falling in the restricted band.



EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal Mode	CHANNEL	12
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5805.00	104.0 PK			1.71 H	3	66.00	38.00
1	*5805.00	95.8 AV			1.71 H	3	57.90	38.00
2	5825.00	71.4 PK	78.30	-6.90	1.71 H	3	33.30	38.00
3	5835.00	65.0 PK	68.30	-3.30	1.71 H	3	27.00	38.00
4	#11613.00	55.2 PK	74.00	-18.80	1.27 H	358	9.60	45.50
4	#11613.00	45.5 AV	54.00	-8.50	1.27 H	358	0.00	45.50

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	*5805.00	101.3 PK			1.67 V	239	63.30	38.00
1	*5805.00	93.6 AV			1.67 V	239	55.60	38.00
2	5825.00	70.7 PK	78.30	-7.60	1.67 V	239	32.70	38.00
3	5835.00	64.0 PK	68.30	-4.30	1.67 V	239	26.00	38.00
4	#11613.00	54.7 PK	74.00	-19.30	1.37 V	78	9.20	45.50
4	#11613.00	44.5 AV	54.00	-9.50	1.37 V	78	-1.00	45.50

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. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. "*" : Fundamental frequency
6. "# " : The radiated frequency falling in the restricted band.

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Turbo Mode	CHANNEL	1
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5210.00	99.6 PK			1.75 H	10	61.90	37.70
1	*5210.00	92.3 AV			1.75 H	10	54.60	37.70
2	10420.00	53.8 PK	68.30	-14.50	1.38 H	352	9.00	44.80

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	*5210.00	95.0 PK			1.43 V	245	57.40	37.70
1	*5210.00	88.0 AV			1.43 V	245	50.40	37.70
2	10420.00	54.6 PK	68.30	-13.70	1.61 V	29	9.80	44.80

REMARKS:

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



EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Turbo Mode	CHANNEL	2
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5250.00	99.6 PK			1.75 H	10	61.90	37.70
1	*5250.00	90.4 AV			1.75 H	10	52.70	37.70
2	10500.00	52.2 PK	68.30	-16.10	1.27 H	353	7.10	45.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5250.00	98.3 PK			1.60 V	286	60.60	37.70
1	*5250.00	89.4 AV			1.60 V	286	51.70	37.70
2	10500.00	55.6 PK	68.30	-12.70	1.27 V	353	10.50	45.10

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	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Turbo Mode	CHANNEL	3
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5290.00	101.6 PK			1.66 H	28	63.90	37.70
1	*5290.00	93.5 AV			1.66 H	28	55.80	37.70
2	10580.00	54.3 PK	68.30	-14.00	1.51 H	352	9.10	45.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5290.00	95.5 PK			1.25 V	48	57.80	37.70
1	*5290.00	87.2 AV			1.25 V	48	49.50	37.70
2	10580.00	55.1 PK	68.30	-13.20	1.70 V	244	9.90	45.10

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	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Turbo Mode	CHANNEL	4
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	5715.00	64.9 PK	68.30	-3.40	1.69 H	354	27.00	37.90
2	5725.00	70.9 PK	78.30	-7.40	1.69 H	354	33.00	37.90
3	*5760.00	100.3 PK			1.69 H	354	62.40	37.90
3	*5760.00	92.5 AV			1.69 H	354	54.60	37.90
4	#11527.00	55.4 PK	74.00	-18.60	1.15 H	18	9.90	45.50
4	#11527.00	45.0 AV	54.00	-9.00	1.15 H	18	-0.50	45.50

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	5715.00	64.3 PK	68.30	-4.00	1.02 V	234	26.40	37.90
2	5725.00	70.7 PK	78.30	-7.60	1.02 V	234	32.80	37.90
3	*5760.00	96.6 PK			1.02 V	234	58.70	37.90
3	*5760.00	89.4 AV			1.02 V	234	51.50	37.90
4	#11527.00	55.5 PK	74.00	-18.50	1.29 V	35	10.00	45.50
4	#11527.00	44.5 AV	54.00	-9.50	1.29 V	35	-1.00	45.50

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. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. "*" : Fundamental frequency
6. "#" : The radiated frequency falling in the restricted band.

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Turbo Mode	CHANNEL	5
FREQUENCY RANGE	Above 1000 MHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Gary Chang		

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	*5800.00	100.3 PK			1.39 H	189	62.40	38.00
1	*5800.00	92.3 AV			1.39 H	189	54.40	38.00
2	5825.00	75.0 PK	78.30	-3.30	1.39 H	189	37.00	38.00
3	5835.00	66.1 PK	68.30	-2.20	1.39 H	189	28.10	38.00
4	#11604.00	55.5 PK	74.00	-18.50	1.21 H	52	10.00	45.50
4	#11604.00	46.3 AV	54.00	-7.70	1.21 H	52	0.80	45.50

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	*5800.00	96.4 PK			1.44 V	258	58.40	38.00
1	*5800.00	90.0 AV			1.44 V	258	52.00	38.00
2	5825.00	74.0 PK	78.30	-4.30	1.44 V	258	36.00	38.00
3	5835.00	66.0 PK	68.30	-2.30	1.44 V	258	28.00	38.00
4	#11604.00	54.5 PK	74.00	-19.50	1.53 V	42	9.00	45.50
4	#11604.00	44.5 AV	54.00	-9.50	1.53 V	42	-1.00	45.50

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. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*” : Fundamental frequency
6. “#” : The radiated frequency falling in the restricted band.



5.3 PEAK TRANSMIT POWER MEASUREMENT

5.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35 GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825 GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

Note: Where B is the 26dB emission bandwidth in MHz.

5.3.2 TEST INSTRUMENTS

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

NOTE:

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

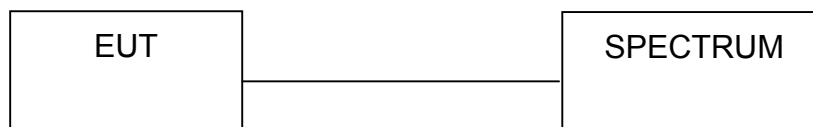
5.3.3 TEST PROCEDURE

2. The transmitter output was connected to the spectrum analyzer.
3. Set span to encompass the entire emission bandwidth of the signal.
4. Set RBW to 1MHz, VBW to 300kHz.
5. Using the spectrum analyzer's channel power measurement function to measure the output power.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

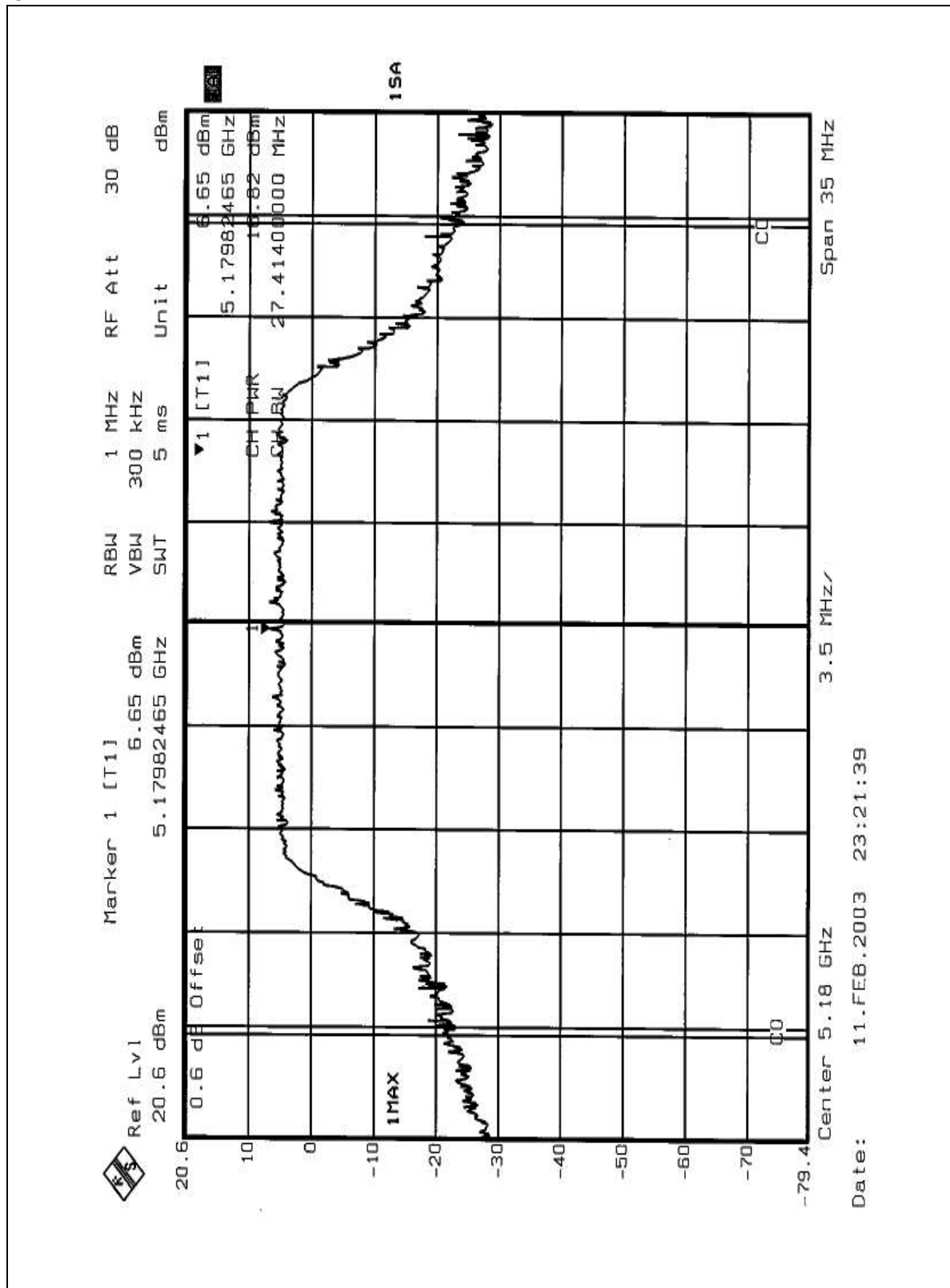
5.3.7 TEST RESULTS

EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21deg. C, 68RH, 1005 hPa	TESTED BY	Ansen Lei

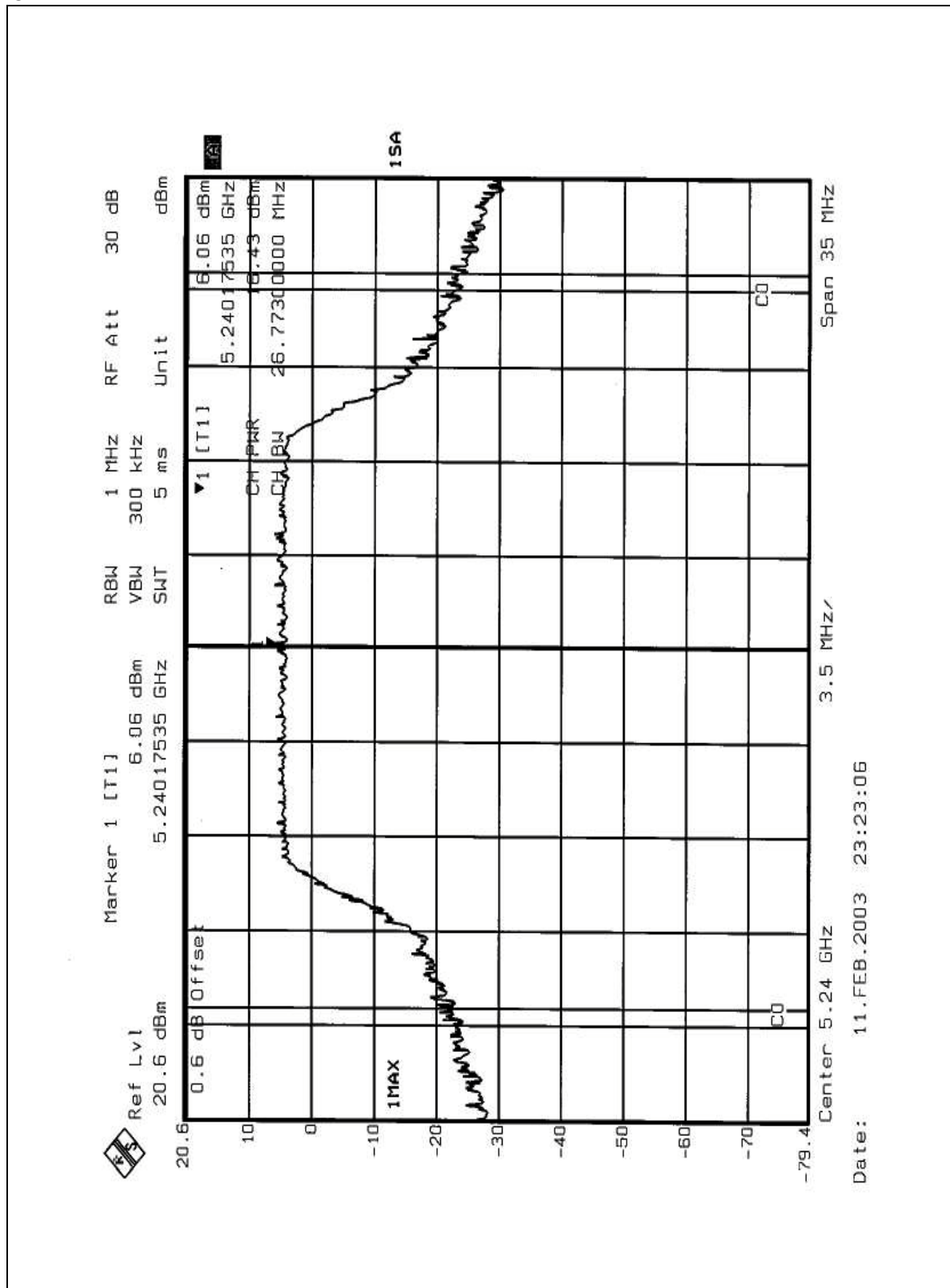
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	16.82	17.00	27.41	PASS
4	5240	16.43	17.00	26.77	PASS
5	5260	16.86	24.00	29.98	PASS
8	5320	16.93	24.00	30.94	PASS
9	5745	16.32	30.00	29.42	PASS
12	5805	18.82	30.00	31.34	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

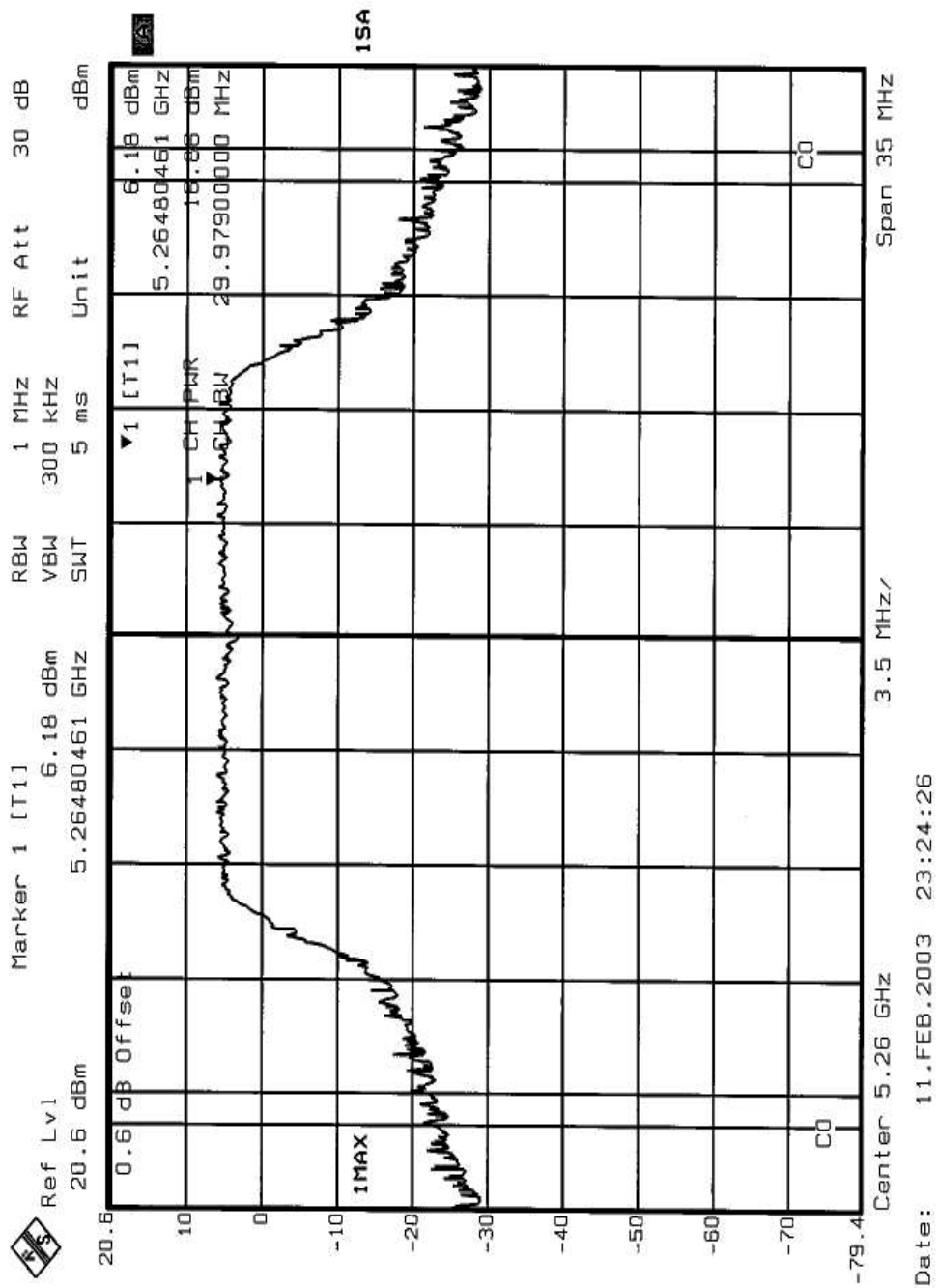
CHANNEL 1



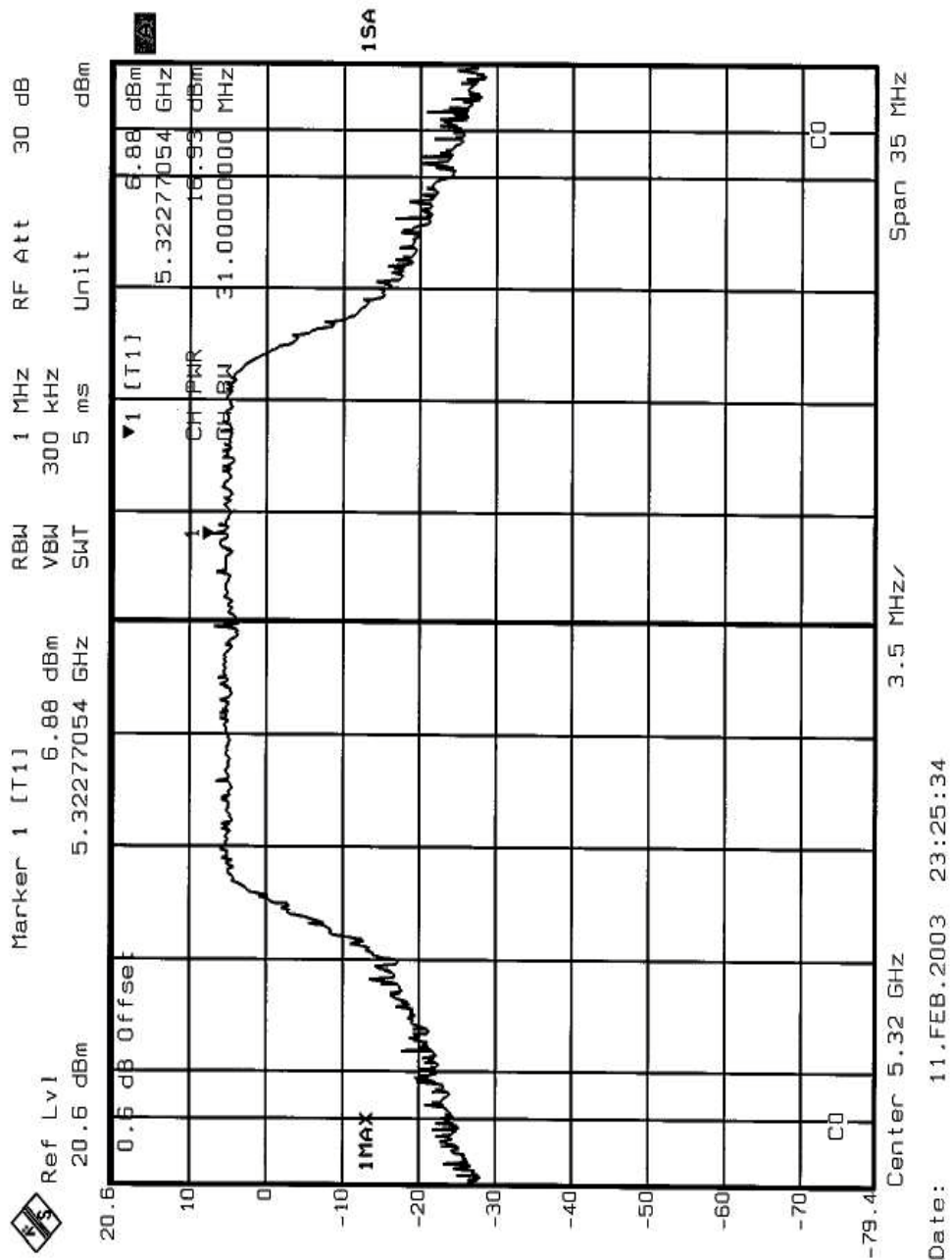
CHANNEL 4



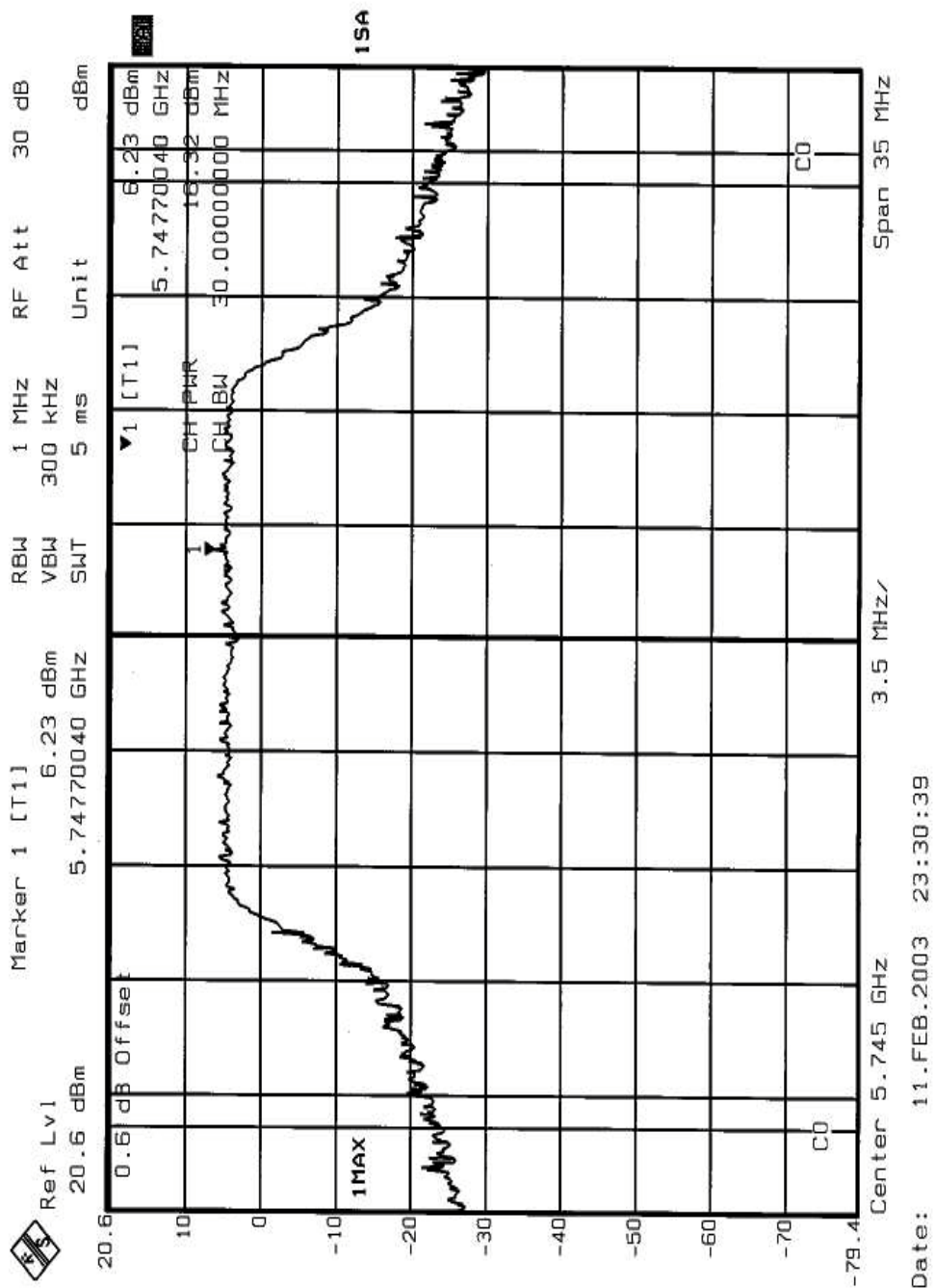
CHANNEL 5



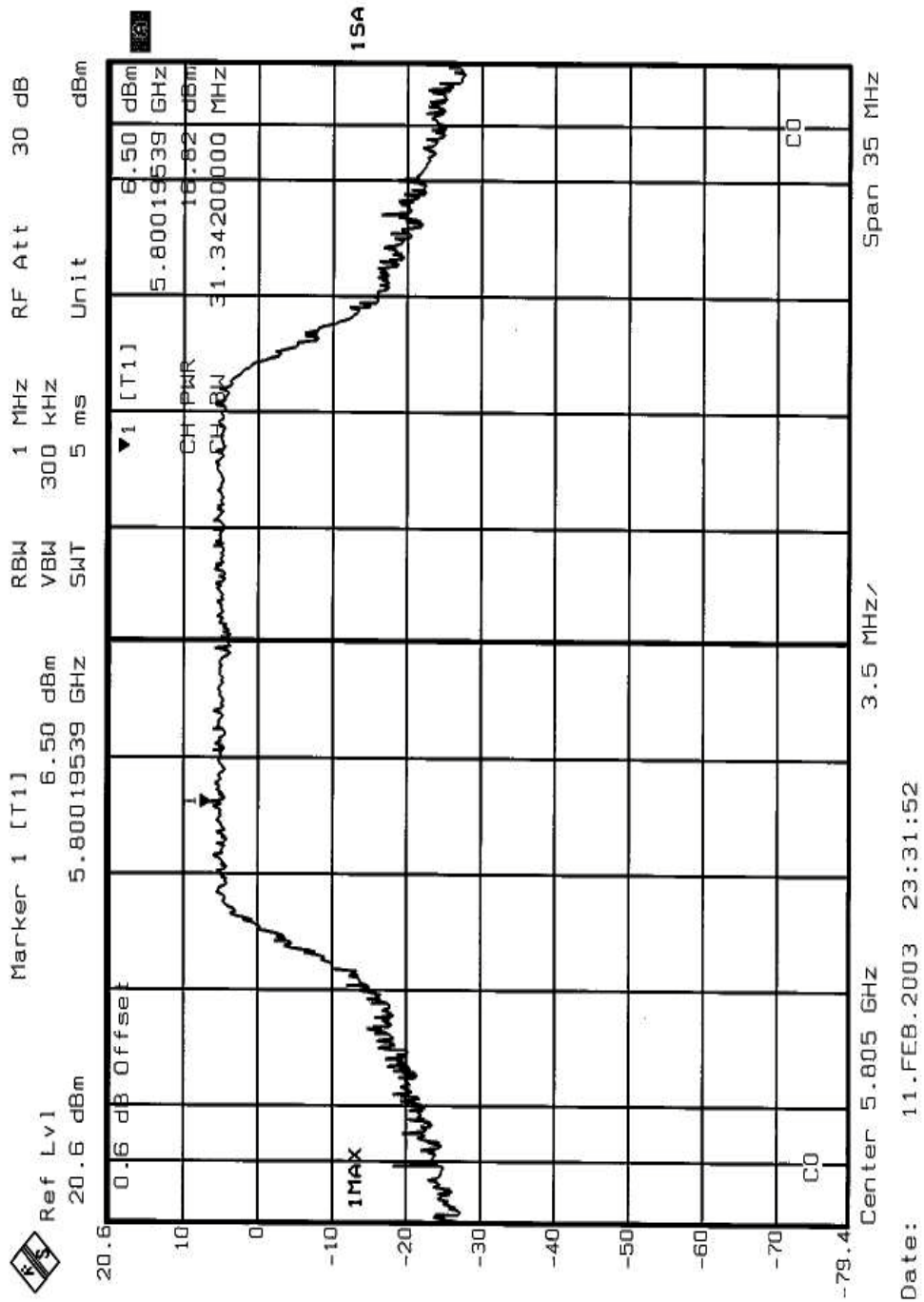
CHANNEL8



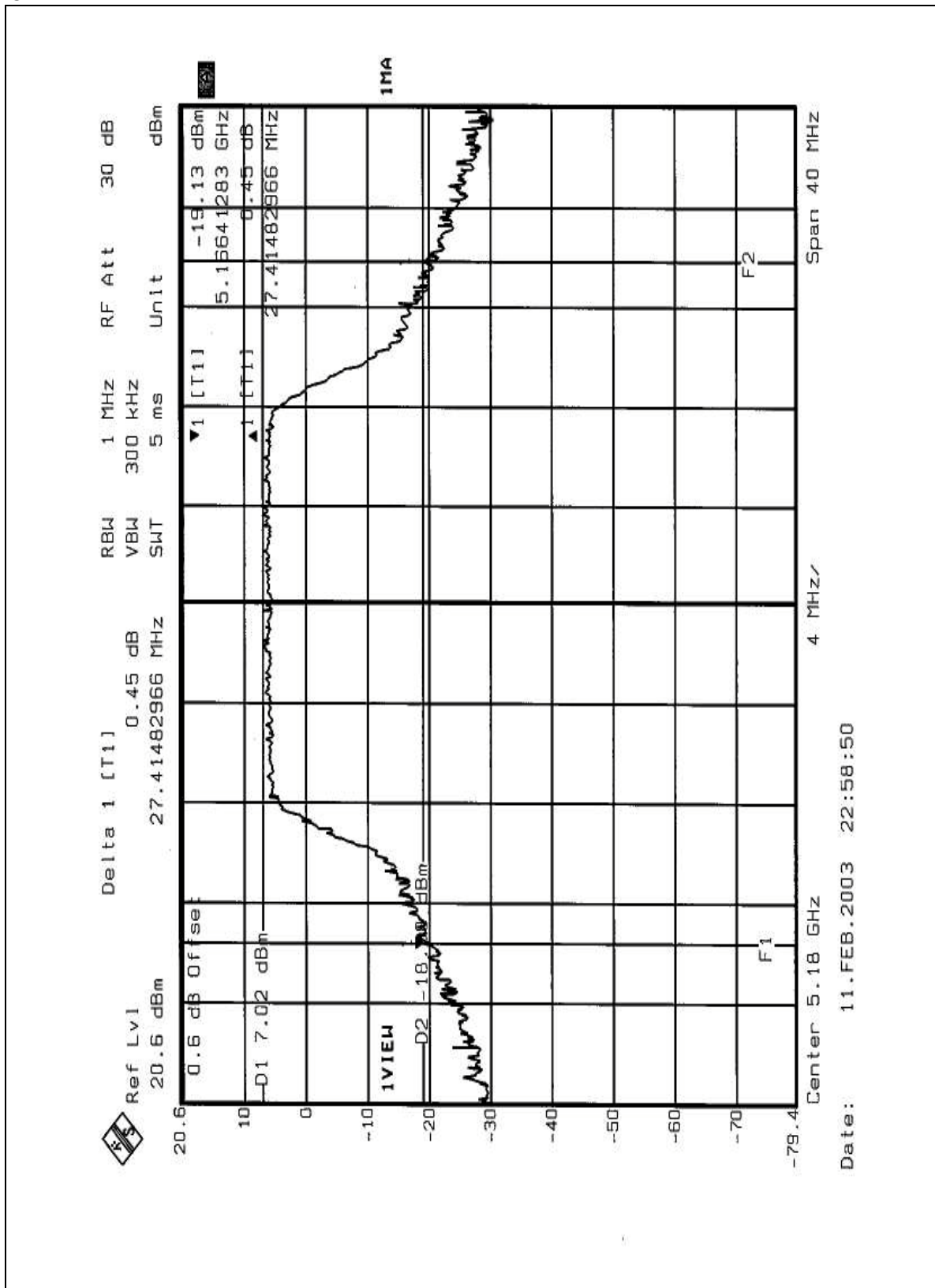
CHANNEL9



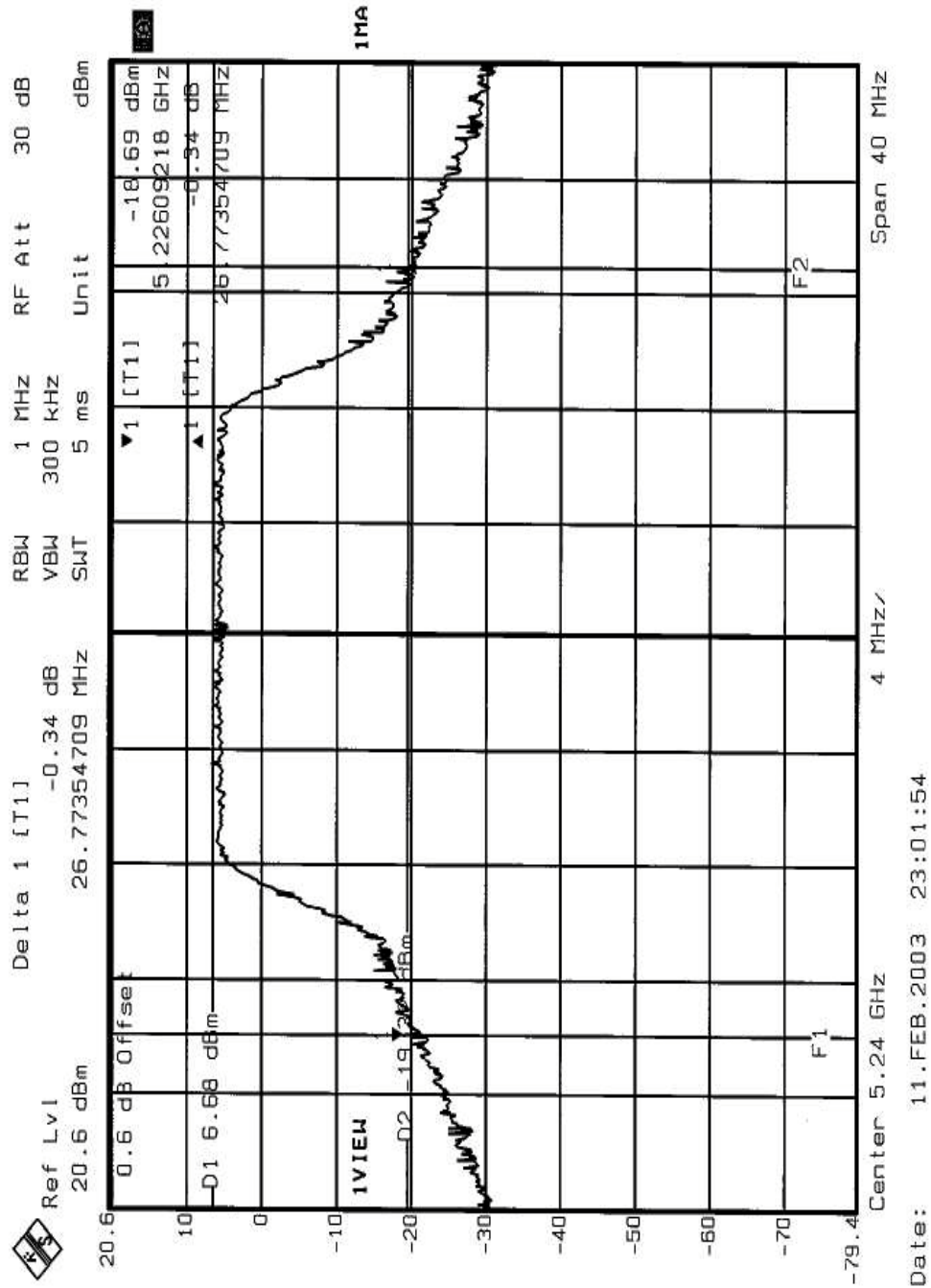
CHANNEL 12



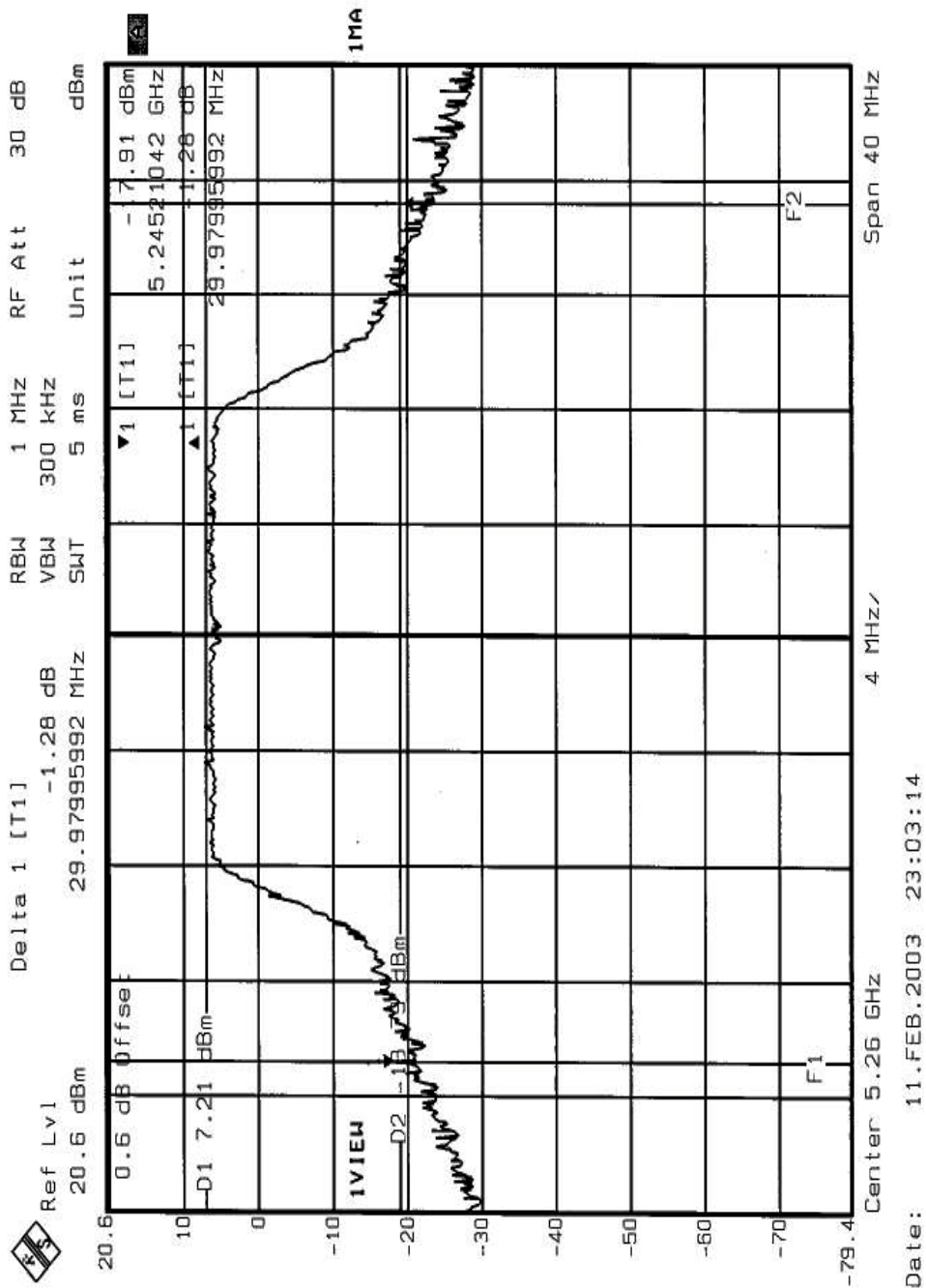
CHANNEL 1



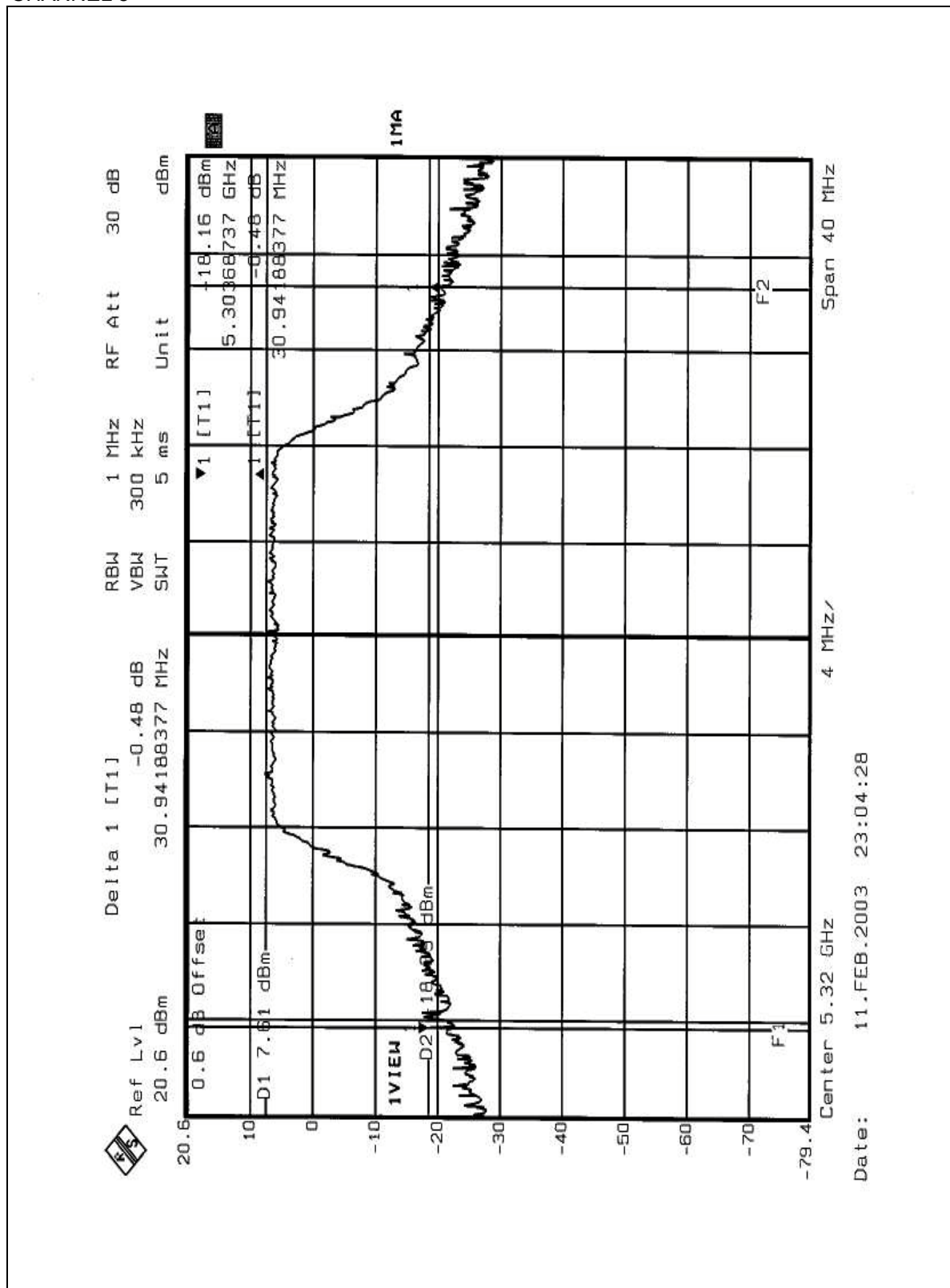
CHANNEL 4



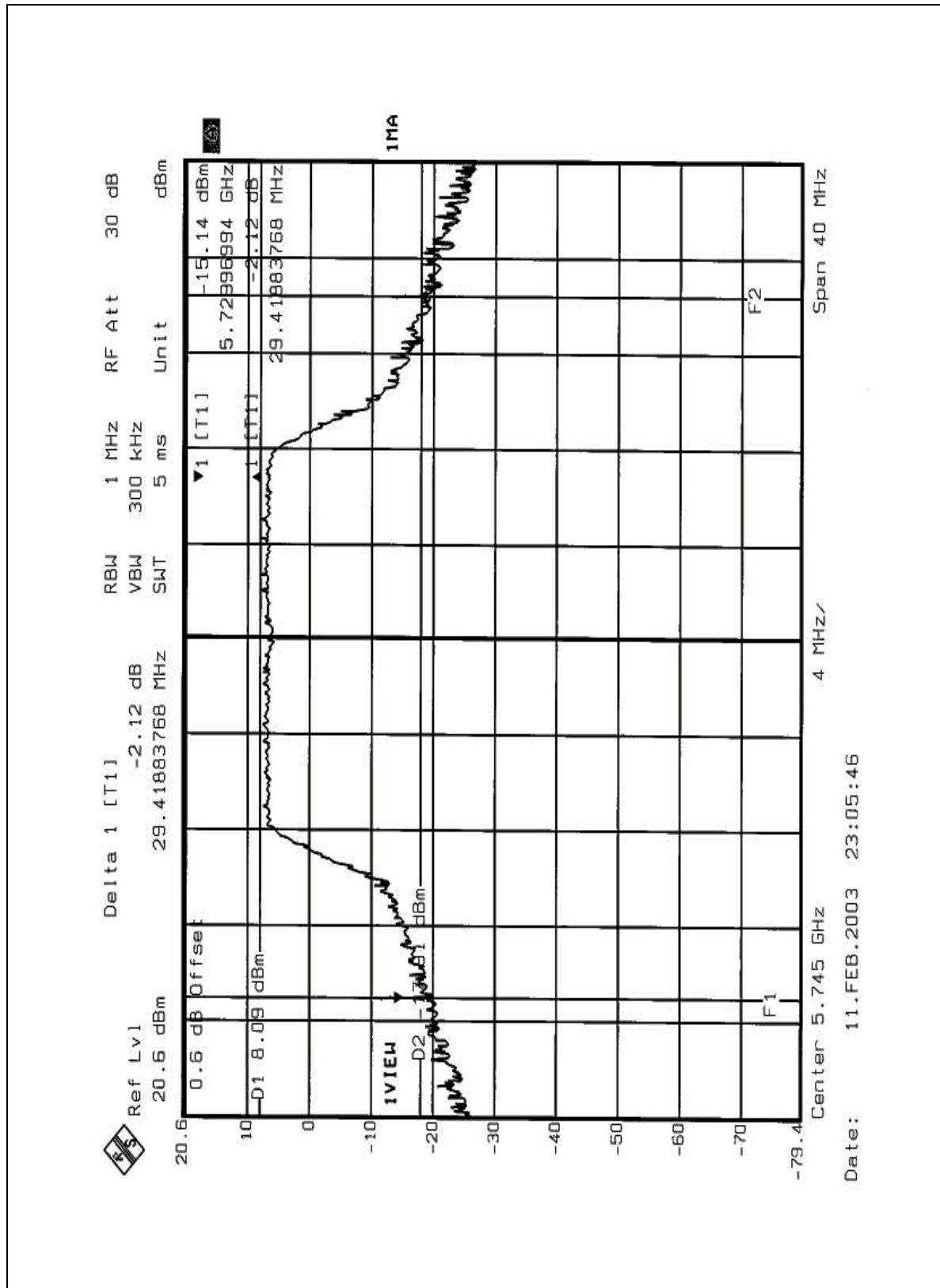
CHANNEL 5



CHANNEL 8



CHANNEL9



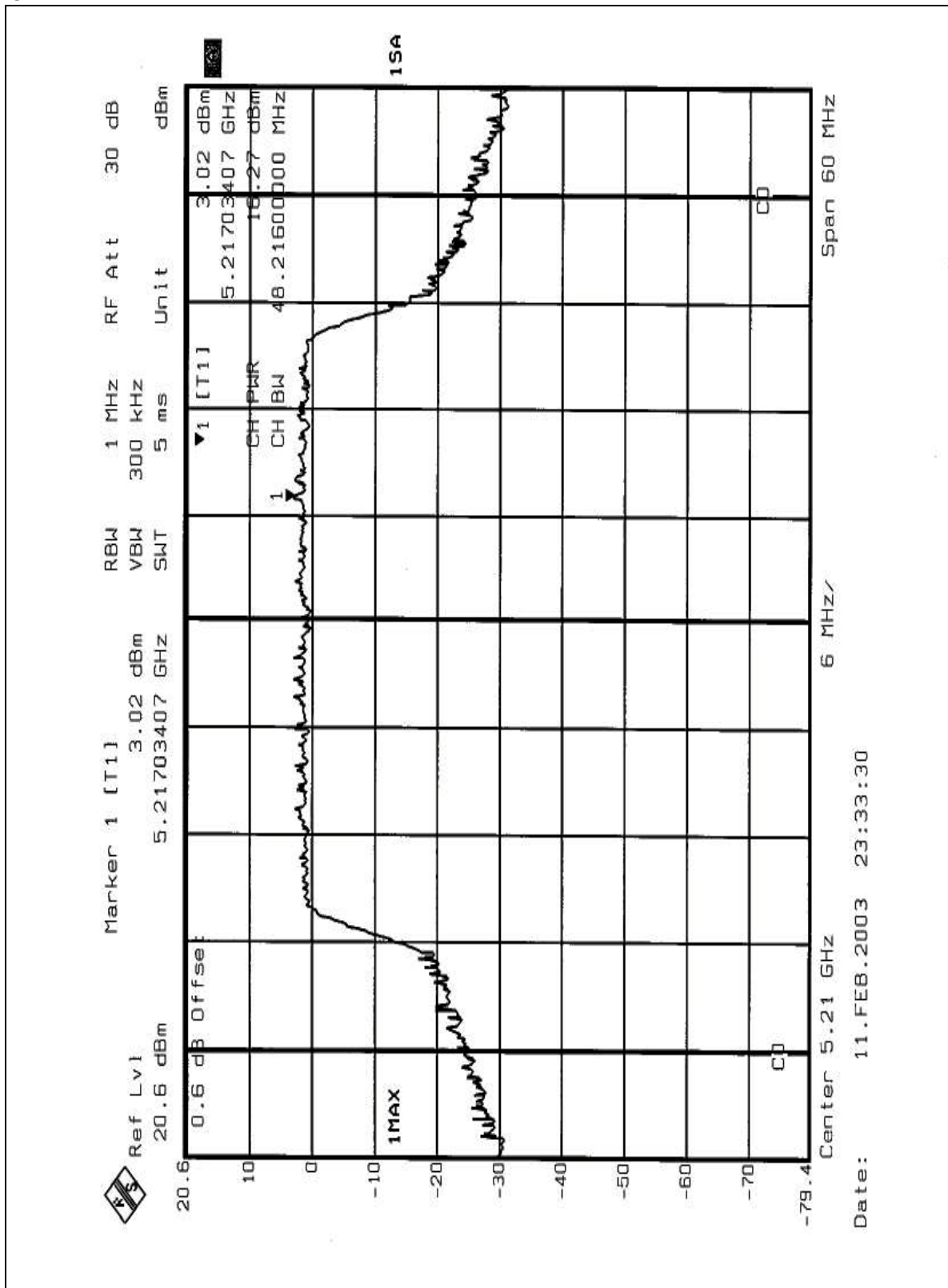


EUT	Wireless LAN 802.11a/b Dual Band Mini PCI Adapter	MODEL	802MABB
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21deg. C, 68RH, 1005 hPa	TESTED BY	Ansen Lei

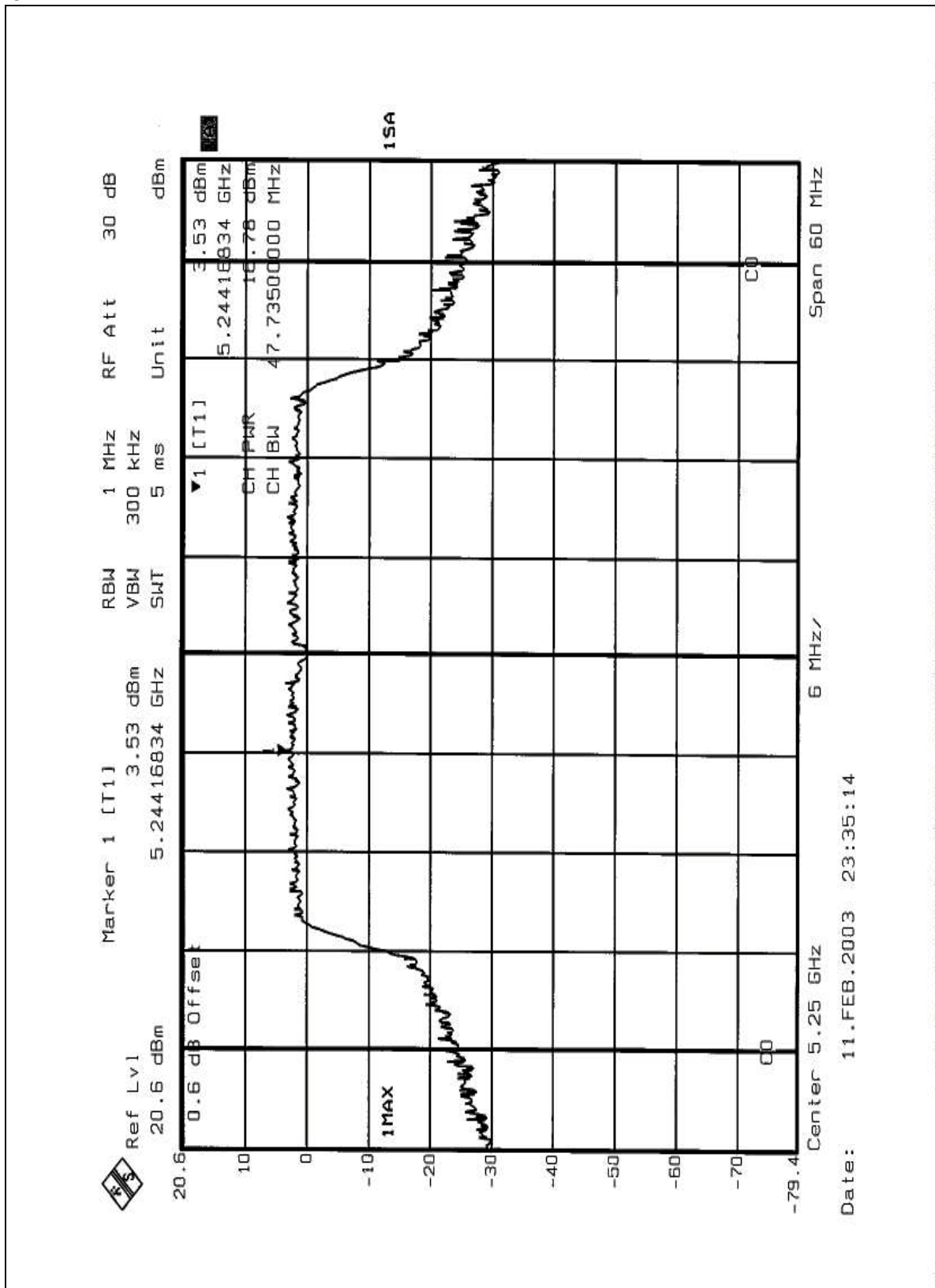
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5210	16.27	17.00	48.22	PASS
2	5250	16.78	17.00	47.74	PASS
3	5290	16.38	24.00	49.30	PASS
4	5760	16.86	30.00	53.39	PASS
5	5800	16.38	30.00	54.71	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

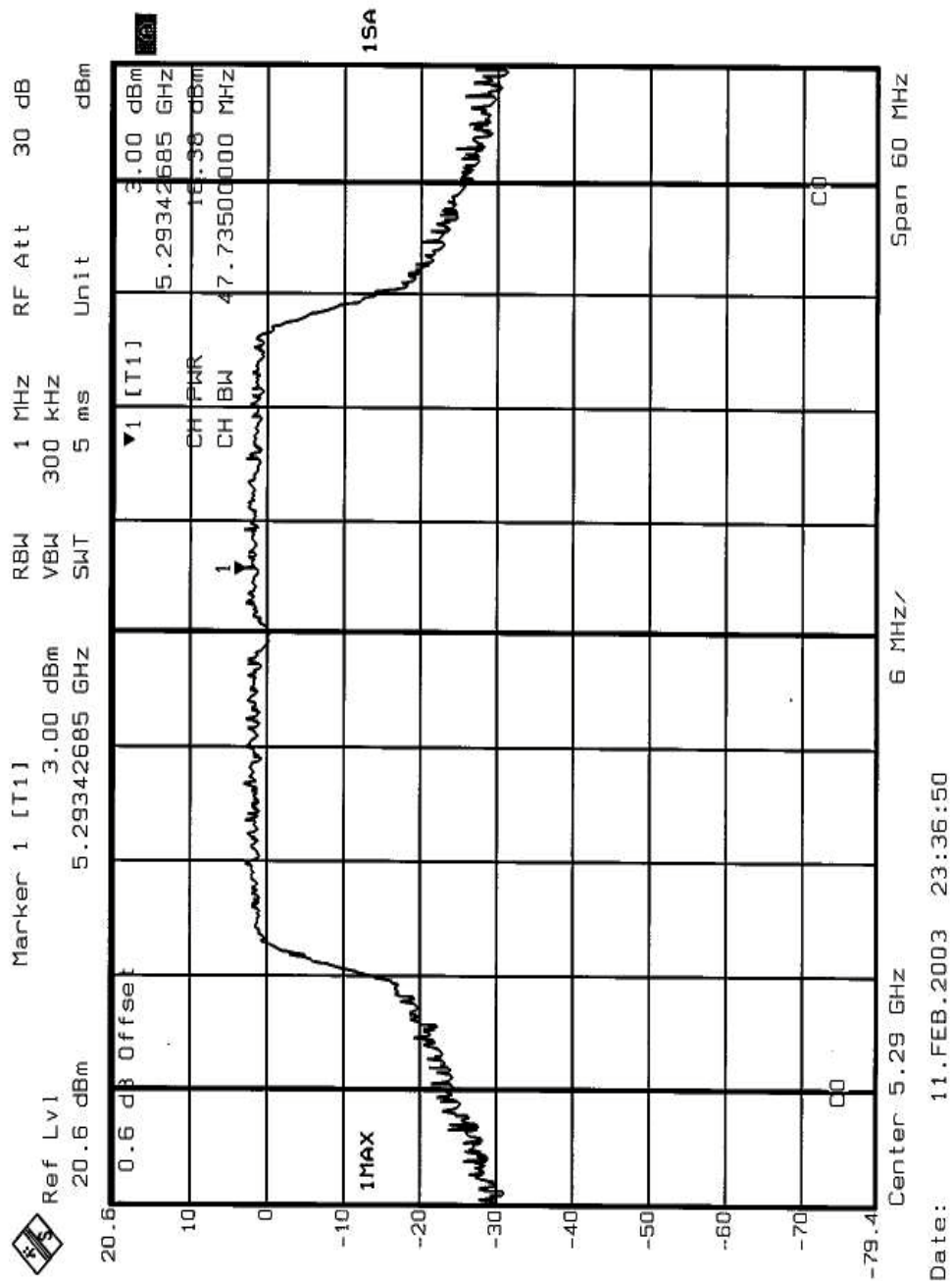
CHANNEL 1



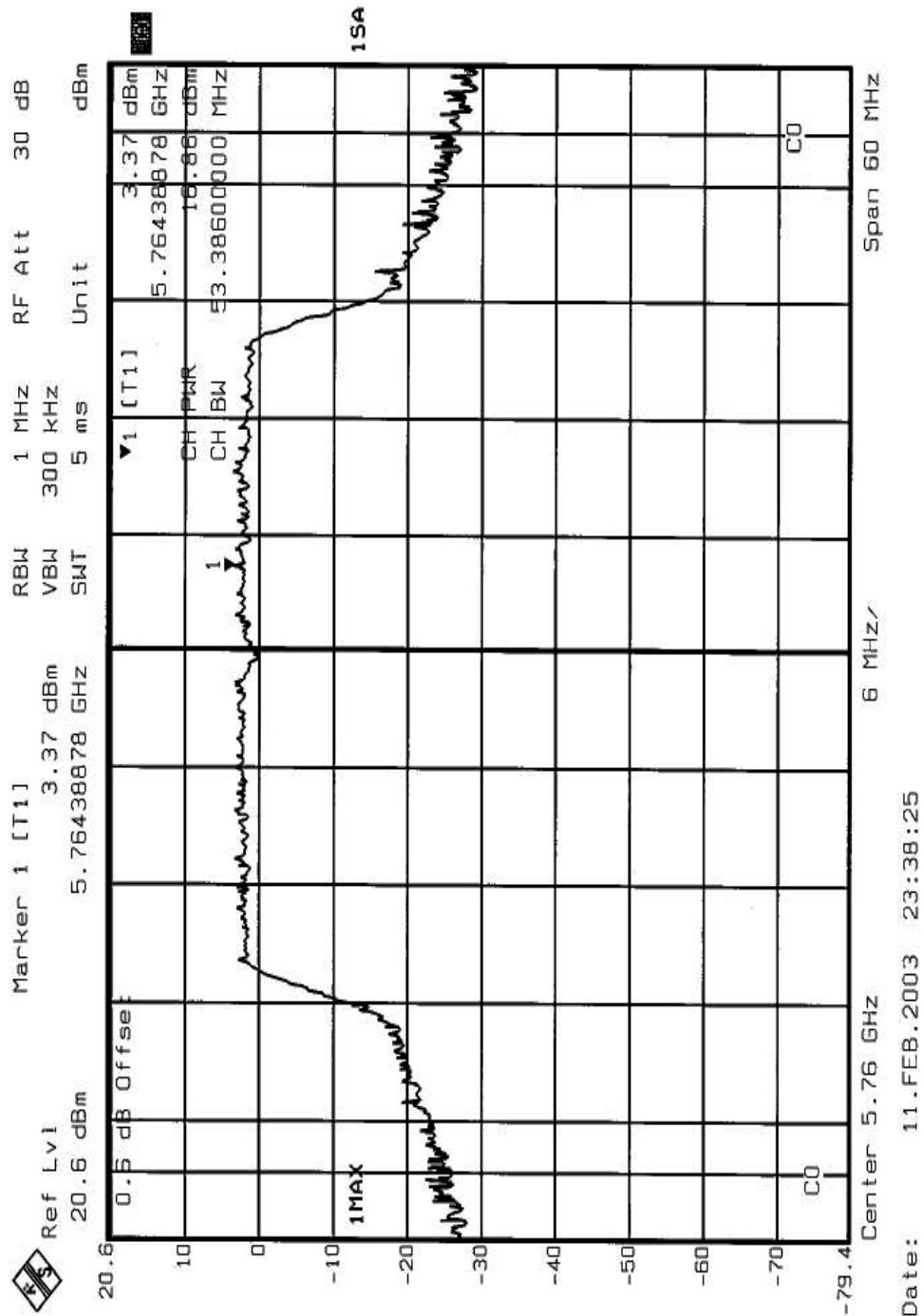
CHANNEL 2



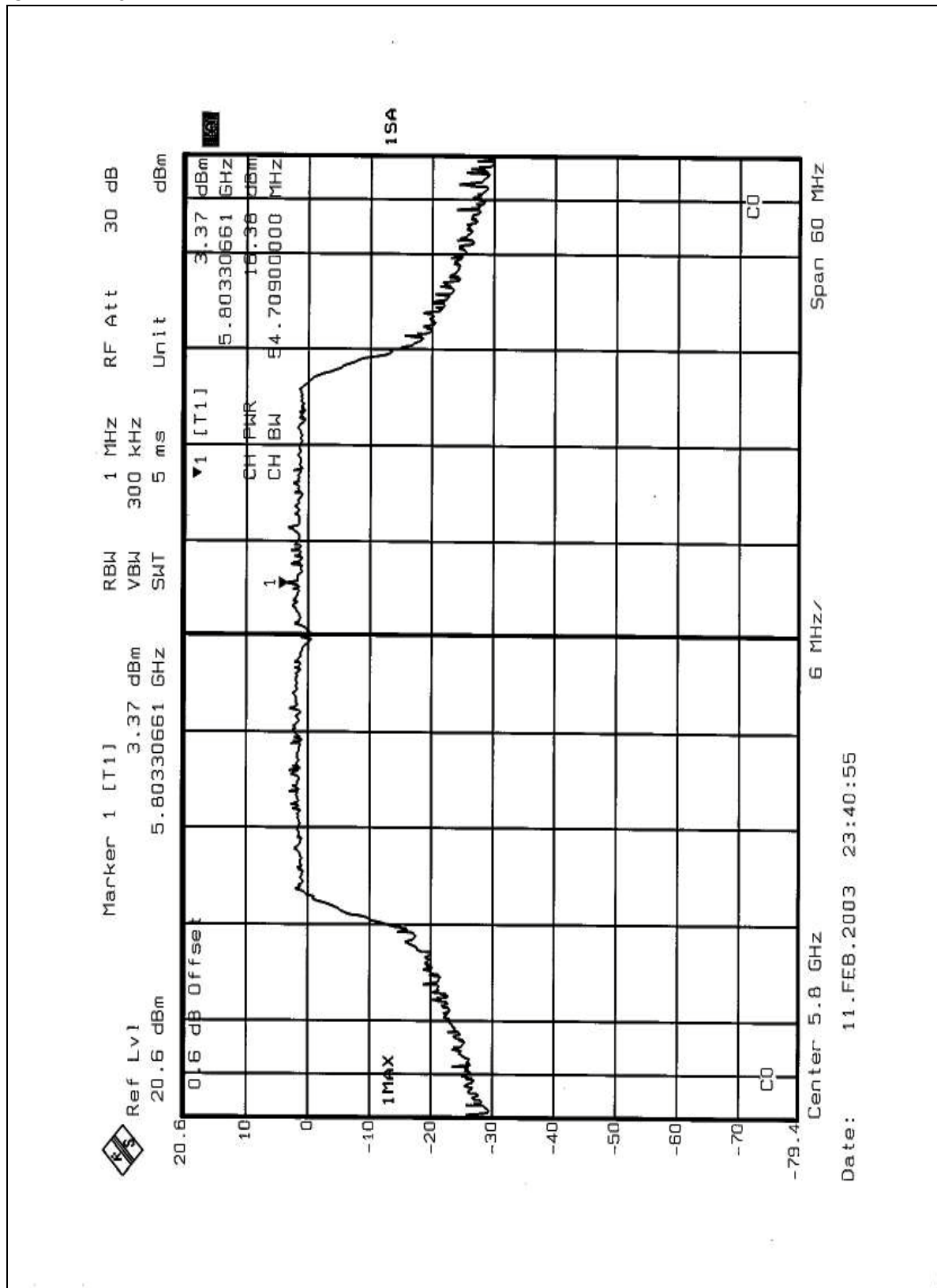
CHANNEL 3



CHANNEL 4



CHANNEL 5

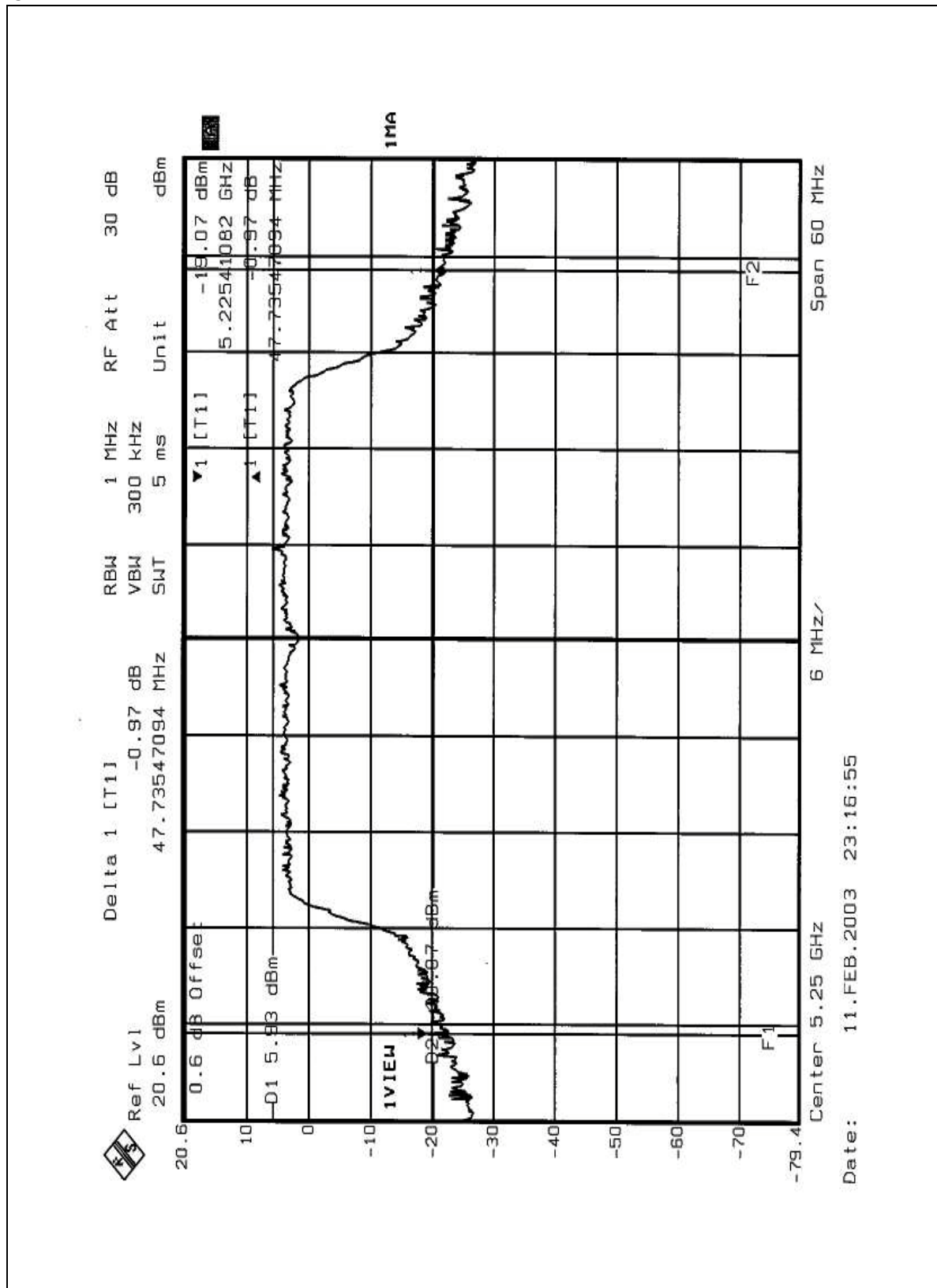


Delta 1 [T1] 0.56 dB 1 MHz RF Att 30 dB
 Ref Lvl 20.6 dBm 300 kHz RBW 0.56 dB
 48.21643287 MHz 5 ms VBW 300 kHz
 Unit dBm

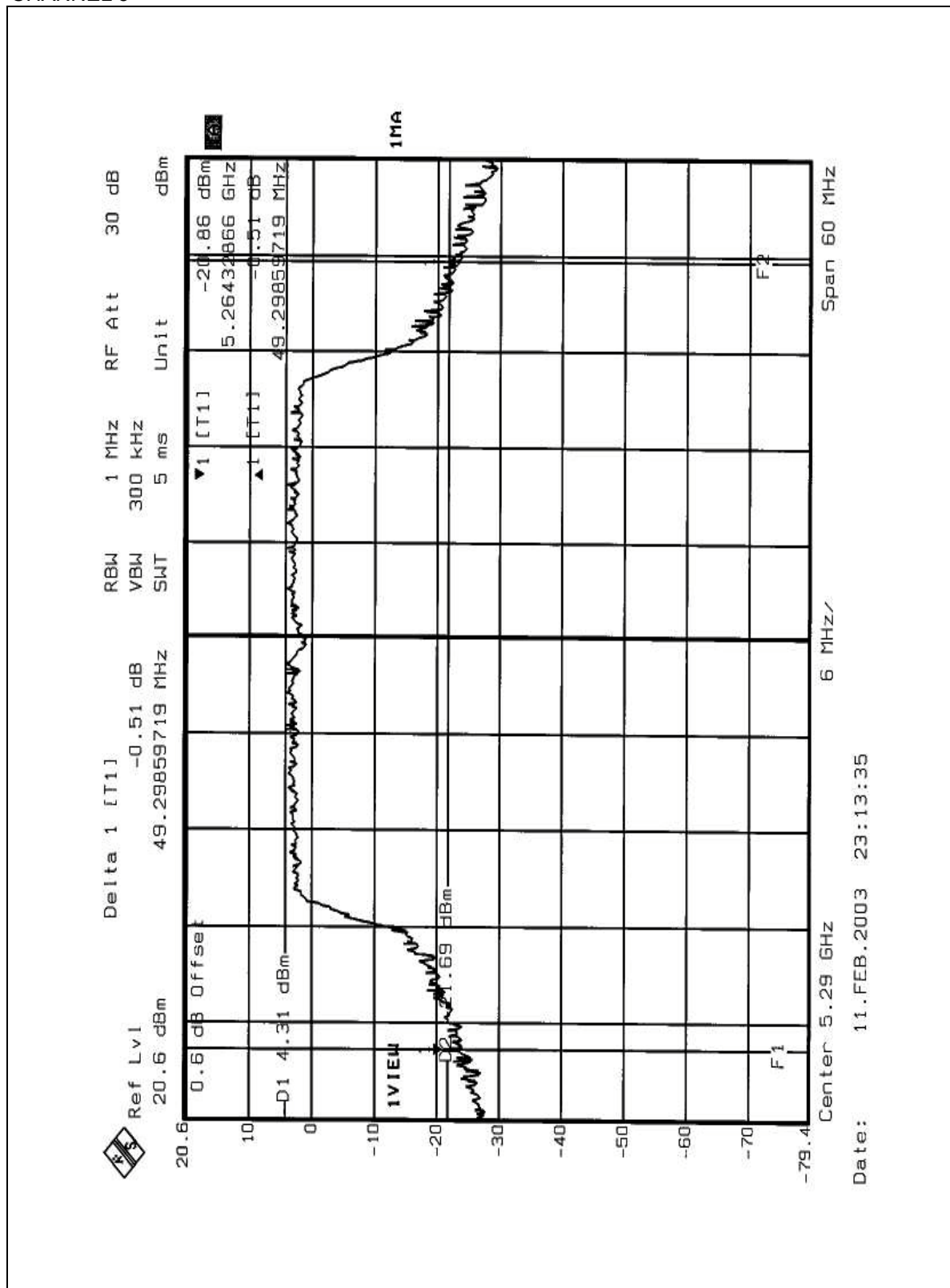
0.6 dB Offset
 D1 4.28 dBm
 1VIEW
 D2 1.72 dBm
 -22.59 dBm
 5.18565130 GHz
 0.56 dB
 48.21643287 MHz
 1MA
 F1
 F2
 Center 5.21 GHz
 Span 60 MHz
 6 MHz/

Date: 11.FEB.2003 23:18:10

CHANNEL 2



CHANNEL 3



Delta 1 [T1] 0.02 dB

Ref Lvl 20.6 dBm

Center 5.8 GHz

1VIEW

D1 4.94 dBm

1MA

1 MHz 300 kHz 5 ms

RBW VBW SWT

0.6 dB Offset

20.6 10 0 -10 -20 -30 -40 -50 -60 -70 -79.4

54.70941884 MHz 54.70941984 MHz

Span 60 MHz

Date: 11.FEB.2003 23:10:21