ADT CORP.

FCC TEST REPORT

REPORT NO.: RF910409R02
MODEL NO.: WM300
RECEIVED: April 9, 2002
TESTED: April 15 ~ April 26 , 2002

APPLICANT: BROMAX COMMUNICATIONS, INC.

ADDRESS: No.20, Kuang Fu Road, Hsin Chu Industrial Park, Hu Kou,Hsin Chu 303, 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 60 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.

CNLA
0528
ILAC MRA

NVLAP®
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 TEST SETUP 10
4.1.5 EUT OPERATING CONDITIONS 11
4.1.6 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 TEST SETUP 21
4.2.5 EUT OPERATING CONDITIONS 21
4.2.6 TEST RESULTS (A) 22
4.2.7 TEST RESULTS (B) 27
4.2.8 TEST RESULTS (C) 32
4.3 6dB BANDWIDTH MEASUREMENT 37
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 37
4.3.2 TEST INSTRUMENTS 37
4.3.3 TEST PROCEDURE 38
4.3.4 TEST SETUP 38
4.3.5 EUT OPERATING CONDITIONS 38
4.3.6 TEST RESULTS 39
4.4 MAXIMUM PEAK OUTPUT POWER 43
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 43
4.4.2 TEST INSTRUMENTS 43
4.4.3 TEST PROCEDURES 44

4.4.4 TEST SETUP 44
4.4.5 EUT OPERATING CONDITIONS 44
4.4.6 TEST RESULTS 45
4.5 POWER SPECTRAL DENSITY MEASUREMENT 46
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 46
4.5.2 TEST INSTRUMENTS 46
4.5.3 TEST PROCEDURE 47
4.5.4 TEST SETUP 47
4.5.5 EUT OPERATING CONDITIONS 47
4.5.6 TEST RESULTS 48
4.6 BAND EDGES MEASUREMENT 52
4.6.1 LIMITS OF BAND EDGES MEASUREMENT 52
4.6.2 TEST INSTRUMENTS 52
4.6.3 TEST PROCEDURE 52
4.6.4 EUT OPERATING CONDITION 53
4.6.5 TEST RESULTS 53
4.7 ANTENNA REQUIREMENT 56
4.7.1 STANDARD APPLICABLE 56
4.7.2 ANTENNA CONNECTED CONSTRUCTION 56
5 PHOTOGRAPHS OF THE TEST CONFIGURATION 57
6 INFORMATION ON THE TESTING LABORATORIES 60

1 CERTIFICATION

PRODUCT : 11Mbps Wireless LAN Module

MODEL NO. : WM300

BRAND : BroMax

APPLICANT : BROMAX COMMUNICATIONS, INC.

STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992, Canada RSS 210, New Zealand RFS 29

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from April 15 to April 26, 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.

TESTED BY: Gary Chang , DATE: April 30, 2002
Gary Chang

CHECKED BY: Emily Lu , DATE: April 30, 2002
Emily Lu

APPROVED BY: Alan Lane DATE: April 30, 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 Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –13.85dBuV at 21.332MHz
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 –9.0dBuV at 220.00MHz
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	11Mbps Wireless LAN Module
MODEL NO.	WM300
POWER SUPPLY	5.0VDC from host equipment
MODULATION TYPE	BPSK, QPSK, CCK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	14.71dBm
ANTENNA TYPE	Dipole and Printed antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. There are four sets of antenna and two outer appearances provided to this EUT.

2. The details about four antennas:

	ANTENNA TYPE	ANTENNA GAIN
1	Dipole antenna	5dBi
2	Dipole antenna	2.5dBi
3	Dipole antenna	1dBi
4	Printed antenna	-2dBi

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

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

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

NOTE:

1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.
3. Antenna 1, 3 and 4 mentioned on section 3.1 were chosen for test and test results have been presented in the following.
4. For radiated emission test, test result (A) is for antenna 1, test result (B) is for antenna 3 and test result (C) is for antenna 4.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 11Mbps Wireless LAN Module. 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, Canada RSS 210, New Zealand RFS 29

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	NOTEBOOK	DELL	PP01L	TW-09C748-12800-19O-B220	FCC DoC APPROVED
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED
3	MODEM	ACEEX	1414	980020510	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
3	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 (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class 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	ESHS30	828109/007	July 4, 2002
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 3, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 3, 2002
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C02.01	July 5, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2003
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2003
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

NOTE: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

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

3. "*": These equipment are used for conducted telecom port test only (if tested).

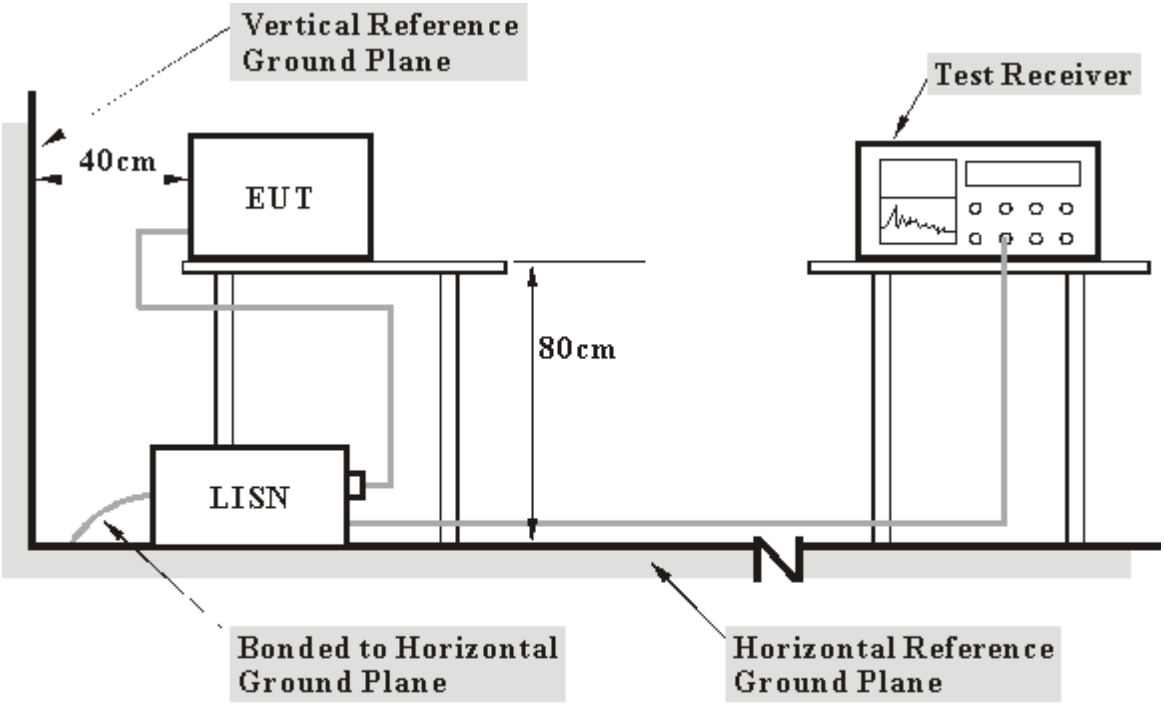
4.1.3 TEST PROCEDURES

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 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 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.

4.1.5 EUT OPERATING CONDITIONS

a. Connected the EUT 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 modem.
e. The computer system sent "H" messages to printer and the printer prints them on paper.

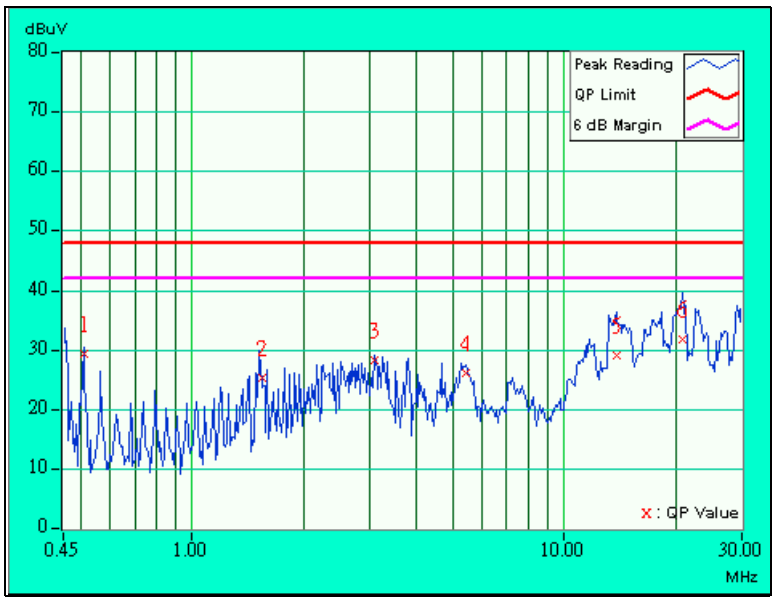
4.1.6 TEST RESULTS

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%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)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.510	0.10	28.45	-	28.55	-	48.00	-	-19.45	-
2	1.537	0.10	24.34	-	24.44	-	48.00	-	-23.56	-
3	3.078	0.21	27.22	-	27.43	-	48.00	-	-20.57	-
4	5.414	0.35	25.19	-	25.54	-	48.00	-	-22.46	-
5	13.793	0.73	28.15	-	28.88	-	48.00	-	-19.12	-
6	20.714	1.01	30.78	-	31.79	-	48.00	-	-16.21	-

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.

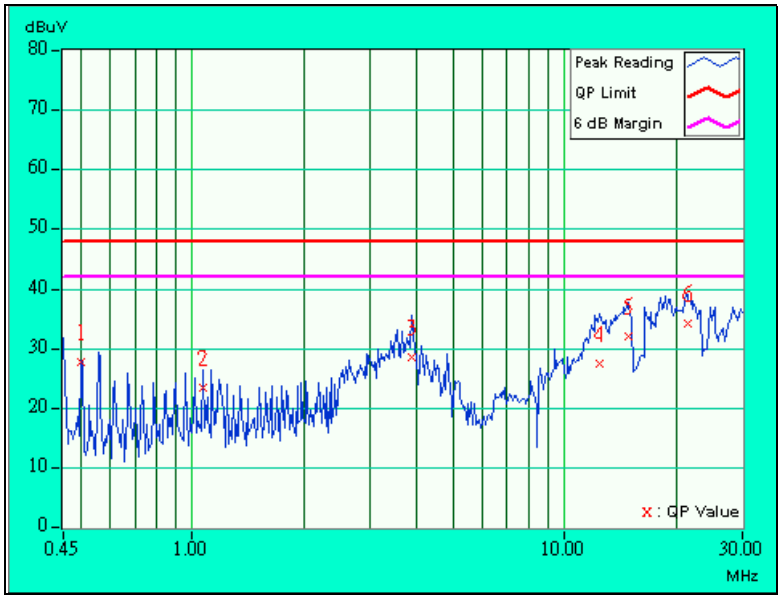


EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.504	0.10	26.79	-	26.89	-	48.00	-	-21.11	-
2	1.068	0.10	22.53	-	22.63	-	48.00	-	-25.37	-
3	3.885	0.29	27.68	-	27.97	-	48.00	-	-20.03	-
4	12.449	0.50	26.71	-	27.21	-	48.00	-	-20.79	-
5	14.810	0.59	31.23	-	31.82	-	48.00	-	-16.18	-
6	21.332	0.83	33.32	-	34.15	-	48.00	-	-13.85	-

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.

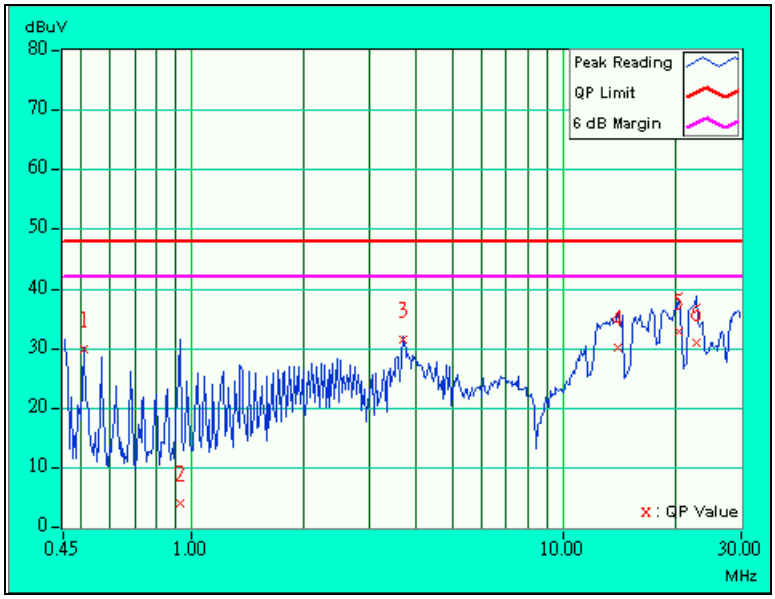


EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.510	0.10	28.90	-	29.00	-	48.00	-	-19.00	-
2	0.927	0.10	2.95	-	3.05	-	48.00	-	-44.95	-
3	3.699	0.27	30.59	-	30.86	-	48.00	-	-17.14	-
4	13.946	0.74	28.98	-	29.72	-	48.00	-	-18.28	-
5	20.417	1.01	31.85	-	32.86	-	48.00	-	-15.14	-
6	22.781	1.06	29.95	-	31.01	-	48.00	-	-16.99	-

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.

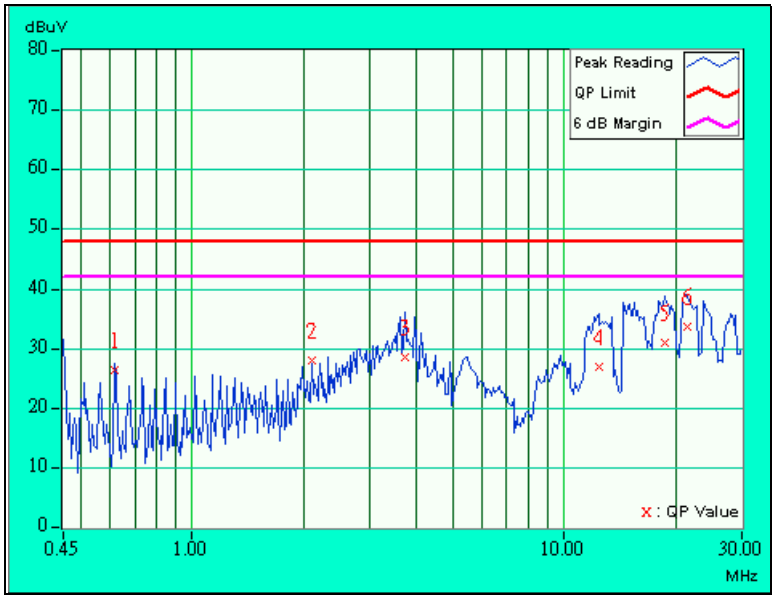


EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (Uv)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.621	0.10	25.62	-	25.72	-	48.00	-	-22.28	-
2	2.094	0.11	27.16	-	27.27	-	48.00	-	-20.73	-
3	3.732	0.27	27.62	-	27.89	-	48.00	-	-20.11	-
4	12.386	0.50	26.10	-	26.60	-	48.00	-	-21.40	-
5	18.557	0.74	30.13	-	30.87	-	48.00	-	-17.13	-
6	21.374	0.83	32.73	-	33.56	-	48.00	-	-14.44	-

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.

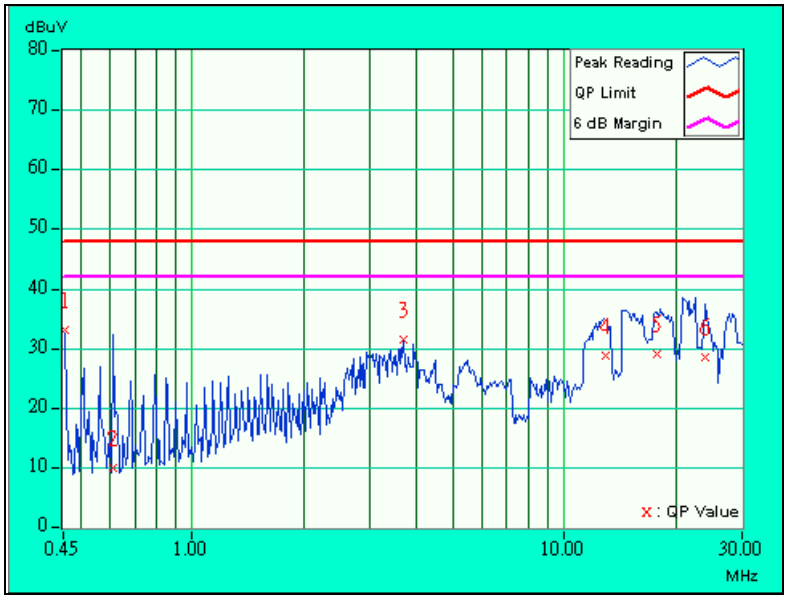


EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.453	0.10	32.13	-	32.23	-	48.00	-	-15.77	-
2	0.615	0.10	8.88	-	8.98	-	48.00	-	-39.02	-
3	3.693	0.27	30.40	-	30.67	-	48.00	-	-17.33	-
4	12.899	0.67	27.67	-	28.34	-	48.00	-	-19.66	-
5	17.723	0.91	28.02	-	28.93	-	48.00	-	-19.07	-
6	23.795	1.08	27.36	-	28.44	-	48.00	-	-19.56	-

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.

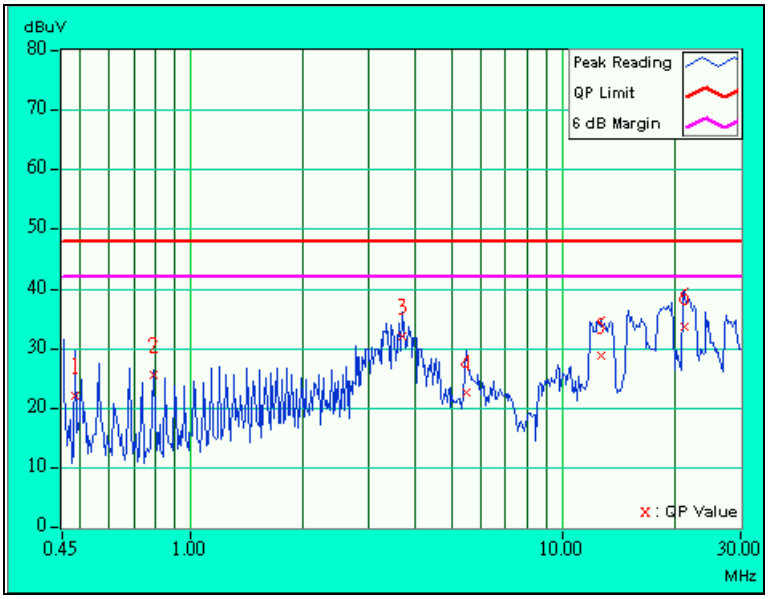


EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.486	0.10	21.20	-	21.30	-	48.00	-	-26.70	-
2	0.792	0.10	24.76	-	24.86	-	48.00	-	-23.14	-
3	3.684	0.27	31.32	-	31.59	-	48.00	-	-16.41	-
4	5.498	0.32	21.92	-	22.24	-	48.00	-	-25.76	-
5	12.647	0.51	27.98	-	28.49	-	48.00	-	-19.51	-
6	21.122	0.82	32.85	-	33.67	-	48.00	-	-14.33	-

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

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

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 7, 2002
* HP Preamplifier	8447D	2944A08485	May 7, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
* EMCO Horn Antenna	3115	9312-4192	April 8, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI : R-1039		

NOTE: 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.

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

3. "*" = These equipment are used for the final measurement.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

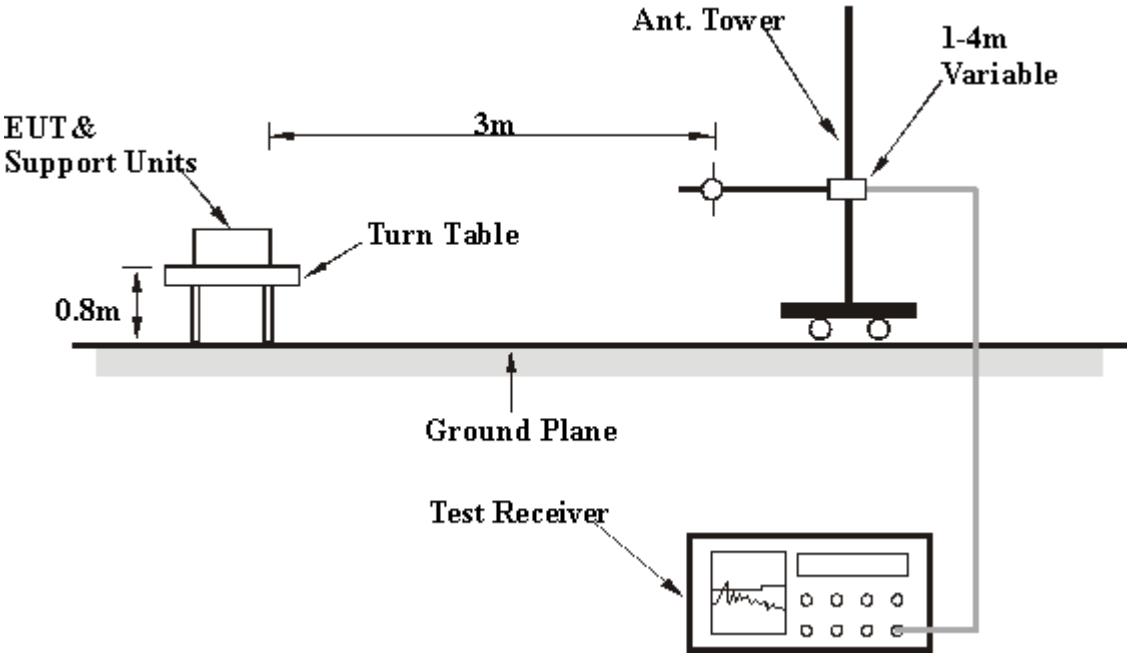
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

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

4.2.4 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.6 TEST RESULTS (A)

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	32.0 QP	43.50	-11.50	1.29H	178	19.71	11.16	1.13	0.00	-12.29
2	176.00	31.0 QP	43.50	-12.50	1.26H	216	20.59	9.08	1.33	0.00	-10.42
3	220.00	32.0 QP	46.00	-14.00	1.19H	317	20.37	10.12	1.51	0.00	-11.63
4	308.00	31.0 QP	46.00	-15.00	1.15H	273	15.71	13.38	1.91	0.00	-15.29
5	352.00	33.0 QP	46.00	-13.00	1.12H	210	16.64	14.31	2.05	0.00	-16.36
6	616.00	30.0 QP	46.00	-16.00	1.09H	142	8.29	18.82	2.89	0.00	-21.72
7	660.00	33.0 QP	46.00	-13.00	1.13H	53	10.71	19.25	3.05	0.00	-22.30
8	704.00	31.0 QP	46.00	-15.00	1.11H	2	8.46	19.38	3.16	0.00	-22.54
9	836.00	29.0 QP	46.00	-17.00	1.14H	65	5.01	20.54	3.45	0.00	-24.00

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	32.0 QP	43.50	-11.50	1.14V	65	19.71	11.16	1.13	0.00	-12.29
2	176.00	29.0 QP	43.50	-14.50	1.08V	109	18.59	9.08	1.33	0.00	-10.41
3	352.00	32.0 QP	46.00	-14.00	1.12V	153	15.64	14.31	2.05	0.00	-16.36
4	396.00	33.0 QP	46.00	-13.00	1.10V	229	14.82	15.96	2.22	0.00	-18.18
5	440.00	28.0 QP	46.00	-18.00	1.03V	216	9.31	16.32	2.38	0.00	-18.70
6	528.00	27.0 QP	46.00	-19.00	1.08V	180	6.78	17.62	2.60	0.00	-20.23
7	616.00	30.0 QP	46.00	-16.00	1.05V	138	8.29	18.82	2.89	0.00	-21.72
8	660.00	29.0 QP	46.00	-17.00	1.22V	78	6.71	19.25	3.05	0.00	-22.29
9	748.00	27.0 QP	46.00	-19.00	1.23V	73	3.60	20.14	3.26	0.00	-23.40
10	792.00	28.0 QP	46.00	-18.00	1.21V	124	4.09	20.60	3.31	0.00	-23.92
11	880.00	27.5 QP	46.00	-18.50	1.18V	172	3.27	20.68	3.55	0.00	-24.24

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2412.00	106.2 PK	-	-	1.43H	103	74.00	27.11	5.10	0.00	-32.21
2	*2412.00	100.2 AV	-	-	1.43H	103	68.00	27.11	5.10	0.00	-32.21
3	4824.00	49.0 PK	74.00	-25.00	1.39H	68	45.00	31.43	7.23	34.63	-4.02

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2412.00	109.2 PK	-	-	1.36V	88	77.00	27.11	5.10	0.00	-32.21
2	*2412.00	103.2 AV	-	-	1.36V	88	71.00	27.11	5.10	0.00	-32.21
3	4824.00	47.8 PK	74.00	-26.20	1.29V	176	43.80	31.43	7.23	34.63	-4.02

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2437.00	103.9 PK	-	-	1.37H	279	71.50	27.33	5.08	0.00	-32.40
2	*2437.00	97.4 AV	-	-	1.37H	279	65.00	27.33	5.08	0.00	-32.40
3	4874.00	47.1 PK	74.00	-26.90	1.37H	75	43.00	31.47	7.21	34.63	-4.05

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2437.00	110.4 PK	-	-	1.53V	182	78.00	27.33	5.08	0.00	-32.40
2	*2437.00	102.4 AV	-	-	1.53V	182	70.00	27.33	5.08	0.00	-32.40
3	4874.00	47.3 PK	74.00	-26.70	1.49V	169	43.20	31.47	7.21	34.63	-4.05

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss.
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2463.00	102.9 PK	-	-	1.30H	24	70.53	27.33	5.08	0.00	-32.40
2	*2463.00	96.4 AV	-	-	1.30H	24	64.00	27.33	5.08	0.00	-32.40
3	2492.00	44.5 PK	74.00	-29.50	1.26H	157	46.80	27.54	5.06	34.90	2.31
4	4924.00	48.6 PK	74.00	-25.40	1.26H	87	44.50	31.51	7.21	34.62	-4.10

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2463.00	111.7 PK	-	-	1.57V	210	79.30	27.33	5.08	0.00	-32.40
2	*2463.00	104.8 AV	-	-	1.57V	210	72.40	27.33	5.08	0.00	-32.40
3	2491.00	44.8 PK	74.00	-29.20	1.61V	75	47.10	27.54	5.06	34.90	2.31
4	4924.00	48.1 PK	74.00	-25.90	1.57V	122	44.00	31.51	7.21	34.62	-4.10

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

4.2.7 TEST RESULTS (B)

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	29.5 QP	43.50	-14.00	1.02H	317	17.21	11.16	1.13	0.00	-12.29
2	176.00	30.0 QP	43.50	-13.50	1.06H	269	19.59	9.08	1.33	0.00	-10.42
3	220.00	33.0 QP	46.00	-13.00	1.19H	219	21.37	10.12	1.51	0.00	-11.63
4	264.00	31.0 QP	46.00	-15.00	1.25H	158	16.42	12.89	1.70	0.00	-14.58
5	308.00	32.0 QP	46.00	-14.00	1.22H	107	16.71	13.38	1.91	0.00	-15.29
6	352.00	31.2 QP	46.00	-14.80	1.17H	61	14.84	14.31	2.05	0.00	-16.37
7	440.00	30.4 QP	46.00	-15.60	1.20H	11	11.71	16.32	2.38	0.00	-18.70
8	484.00	31.4 QP	46.00	-14.60	1.25H	55	11.97	16.96	2.47	0.00	-19.44
9	528.00	32.2 QP	46.00	-13.80	1.22H	97	11.98	17.62	2.60	0.00	-20.23
10	572.00	31.7 QP	46.00	-14.30	1.19H	142	10.70	18.25	2.75	0.00	-21.00
11	616.00	30.7 QP	46.00	-15.30	1.19H	209	8.99	18.82	2.89	0.00	-21.71
12	660.00	33.5 QP	46.00	-12.50	1.13H	266	11.21	19.25	3.05	0.00	-22.29

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	29.0 QP	43.50	-14.50	1.12V	228	16.71	11.16	1.13	0.00	-12.29
2	176.00	28.0 QP	43.50	-15.50	1.08V	176	17.59	9.08	1.33	0.00	-10.42
3	220.00	27.0 QP	46.00	-19.00	1.12V	125	15.37	10.12	1.51	0.00	-11.63
4	264.00	29.0 QP	46.00	-17.00	1.15V	73	14.42	12.89	1.70	0.00	-14.58
5	308.00	30.0 QP	46.00	-16.00	1.22V	78	14.71	13.38	1.91	0.00	-15.29
6	308.00	31.0 QP	46.00	-15.00	1.24V	159	15.71	13.38	1.91	0.00	-15.29
7	572.00	28.4 QP	46.00	-17.60	1.18V	205	7.40	18.25	2.75	0.00	-21.01
8	616.00	31.0 QP	46.00	-15.00	1.22V	255	9.29	18.82	2.89	0.00	-21.72
9	748.00	32.0 QP	46.00	-14.00	1.19V	300	8.60	20.14	3.26	0.00	-23.41

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2412.00	99.2 PK	-	-	1.73H	342	67.00	27.11	5.10	0.00	-32.21
2	*2412.00	93.2 AV	-	-	1.73H	342	61.00	27.11	5.10	0.00	-32.21
3	4824.00	47.0 PK	74.00	-27.00	1.73H	144	43.00	31.43	7.23	34.63	-4.02

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2412.00	110.2 PK	-	-	1.01V	252	78.00	27.11	5.10	0.00	-32.21
2	*2412.00	105.2 AV	-	-	1.01V	252	73.00	27.11	5.10	0.00	-32.21
3	4824.00	48.0 PK	74.00	-26.00	1.05V	140	44.00	31.43	7.23	34.63	-4.02

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2437.00	99.4 PK	-	-	1.60H	330	67.00	27.33	5.08	0.00	-32.40
2	*2437.00	94.4 AV	-	-	1.60H	330	62.00	27.33	5.08	0.00	-32.40
3	4874.00	47.8 PK	74.00	-26.20	1.60H	330	43.70	31.47	7.21	34.63	-4.05

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2437.00	109.7 PK	-	-	1.45V	25	77.30	27.33	5.08	0.00	-32.40
2	*2437.00	102.4 AV	-	-	1.45V	25	70.00	27.33	5.08	0.00	-32.40
3	4874.00	48.2 PK	74.00	-25.80	1.45V	47	44.10	31.47	7.21	34.63	-4.05

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss.
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2463.00	98.2 PK	-	-	1.23H	86	65.80	27.33	5.08	0.00	-32.40
2	*2463.00	91.4 AV	-	-	1.23H	86	59.00	27.33	5.08	0.00	-32.40
3	2490.00	45.9 PK	74.00	-28.10	1.23H	226	48.20	27.54	5.06	34.90	2.31
4	4924.00	48.2 PK	74.00	-25.80	1.26H	270	44.10	31.51	7.21	34.62	-4.10

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2463.00	110.4 PK	-	-	1.00V	140	78.00	27.33	5.08	0.00	-32.40
2	*2463.00	104.4 AV	-	-	1.00V	140	72.00	27.33	5.08	0.00	-32.40
3	2491.00	44.7 PK	74.00	-29.30	1.06V	36	47.00	27.54	5.06	34.90	2.31
4	4924.00	47.5 PK	74.00	-26.50	1.05V	83	43.40	31.51	7.21	34.62	-4.10

NOTE:

1 Emission level = Raw value - Correction Factor
2 Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3 Margin value = Emission level - Limit value
4 " * " : Fundamental frequency
5 The other emission levels were very low against the limit.

4.2.8 TEST RESULTS (C)

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	32.0 QP	43.50	-11.50	1.71H	8	19.71	11.16	1.13	0.00	-12.29
2	176.00	30.0 QP	43.50	-13.50	1.36H	359	19.59	9.08	1.33	0.00	-10.41
3	220.00	37.0 QP	46.00	-9.00	1.27H	92	25.37	10.12	1.51	0.00	-11.63
4	264.00	34.0 QP	46.00	-12.00	1.22H	290	19.42	12.89	1.70	0.00	-14.58
5	352.00	31.0 QP	46.00	-15.00	1.03H	10	14.64	14.31	2.05	0.00	-16.37
6	396.00	30.4 QP	46.00	-15.60	1.12H	260	12.22	15.96	2.22	0.00	-18.18
7	616.00	32.0 QP	46.00	-14.00	1.66H	7	10.29	18.82	2.89	0.00	-21.71
8	704.00	29.0 QP	46.00	-17.00	1.00H	9	6.46	19.38	3.16	0.00	-22.54
9	880.00	28.0 QP	46.00	-18.00	1.28H	344	3.77	20.68	3.55	0.00	-24.24

NOTE:

1 Emission level = Raw value - Correction Factor

2 Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)

3 Margin value = Emission level - Limit value

4 The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	264.00	28.0 QP	46.00	-18.00	1.17V	264	13.42	12.89	1.70	0.00	-14.58
2	308.00	31.0 QP	46.00	-15.00	1.37V	83	15.71	13.38	1.91	0.00	-15.30
3	484.00	30.7 QP	46.00	-15.30	1.19V	39	11.27	16.96	2.47	0.00	-19.44
4	528.00	28.0 QP	46.00	-18.00	1.62V	285	7.78	17.62	2.60	0.00	-20.23
5	616.00	29.7 QP	46.00	-16.30	1.71V	199	7.99	18.82	2.89	0.00	-21.72
6	660.00	27.0 QP	46.00	-19.00	1.84V	7	4.71	19.25	3.05	0.00	-22.30
7	880.00	31.0 QP	46.00	-15.00	1.85V	300	6.77	20.68	3.55	0.00	-24.24

NOTE:

1 Emission level = Raw value - Correction Factor

2 Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)

3 Margin value = Emission level - Limit value

4 The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2412.00	110.7 PK	-	-	1.10H	3	78.50	27.11	5.10	0.00	-32.21
2	*2412.00	103.2 AV	-	-	1.10H	3	71.00	27.11	5.10	0.00	-32.21
3	4824.00	47.7 PK	74.00	-26.30	1.45H	32	43.70	31.43	7.23	34.63	-4.02

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2412.00	106.2 PK	-	-	1.15V	50	74.00	27.11	5.10	0.00	-32.21
2	*2412.00	100.7 AV	-	-	1.15V	50	68.50	27.11	5.10	0.00	-32.21
3	4824.00	50.0 PK	74.00	-24.00	1.00V	331	46.00	31.43	7.23	34.63	-4.02

NOTE:

1 Emission level = Raw value - Correction Factor
2 Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3 Margin value = Emission level - Limit value
4 " * " : Fundamental frequency
5 The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2437.00	108.8 PK	-	-	1.40H	259	76.40	27.33	5.08	0.00	-32.40
2	*2437.00	101.4 AV	-	-	1.40H	259	69.00	27.33	5.08	0.00	-32.40
3	4874.00	48.1 PK	74.00	-25.90	1.38H	1	44.00	31.47	7.21	34.63	-4.05

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2437.00	103.4 PK	-	-	1.60V	57	71.00	27.33	5.08	0.00	-32.40
2	*2437.00	97.0 AV	-	-	1.60V	57	64.57	27.33	5.08	0.00	-32.40
3	4874.00	47.6 PK	74.00	-26.40	1.18V	240	43.50	31.47	7.21	34.63	-4.05

NOTE:

1 Emission level = Raw value - Correction Factor
2 Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss.
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3 Margin value = Emission level - Limit value
4 " * " : Fundamental frequency
5 The other emission levels were very low against the limit.

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
MODE	Channel 11	**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**: 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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2463.00	109.4 PK	-	-	1.05H	351	77.00	27.33	5.08	0.00	-32.40
2	*2463.00	102.4 AV	-	-	1.05H	351	70.00	27.33	5.08	0.00	-32.40
3	4924.00	49.1 PK	74.00	-24.90	1.40H	3	45.00	31.51	7.21	34.62	-4.10

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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2463.00	103.3 PK	-	-	1.48V	19	70.90	27.33	5.08	0.00	-32.40
2	*2463.00	96.4 AV	-	-	1.48V	19	64.00	27.33	5.08	0.00	-32.40
3	4924.00	50.1 PK	74.00	-23.90	1.32V	1	46.00	31.51	7.21	34.62	-4.10

NOTE:

1 Emission level = Raw value - Correction Factor
2 Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
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 17, 2002

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

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

4.3.4 TEST SETUP

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

4.3.5 EUT OPERATING CONDITIONS

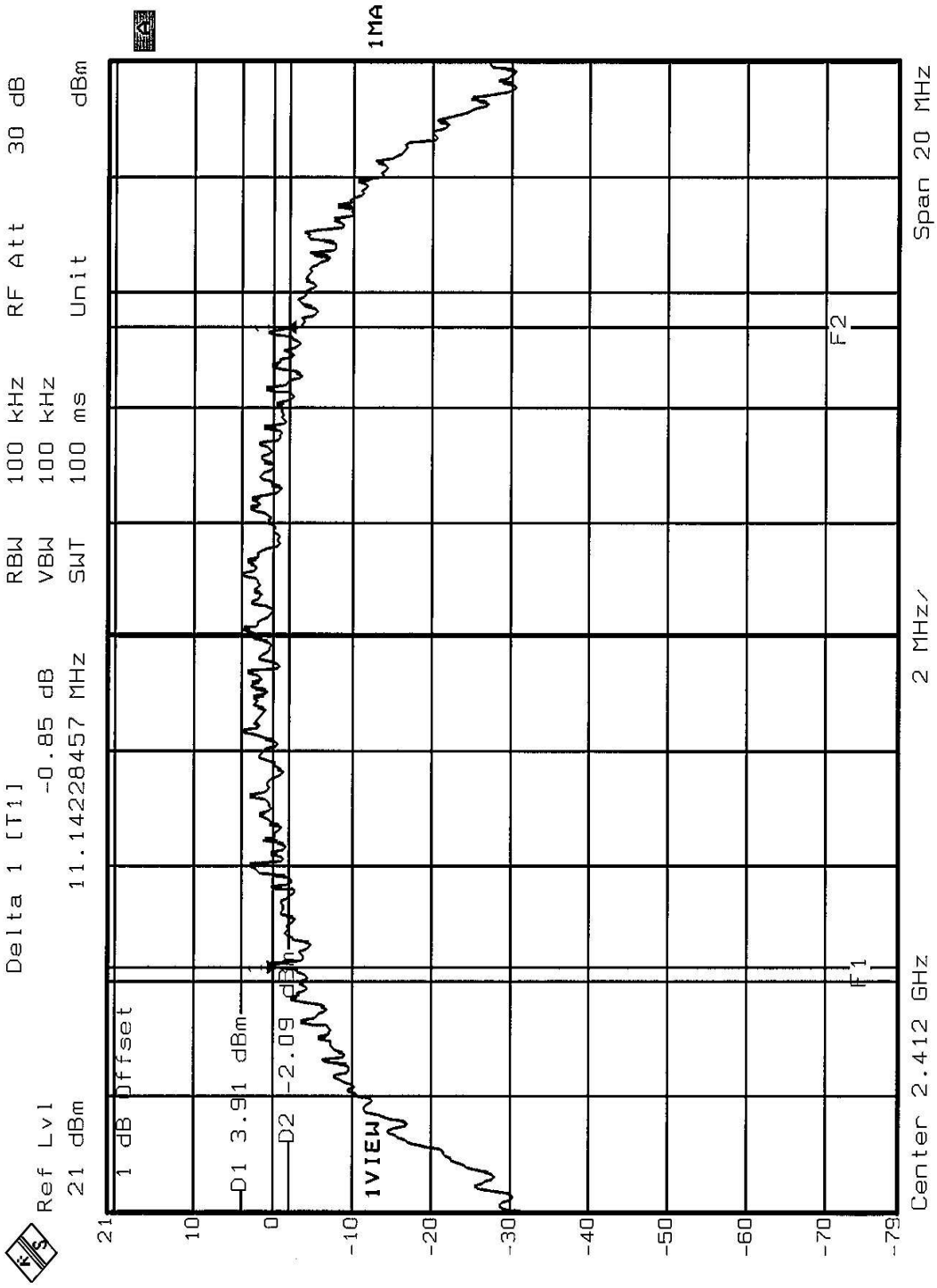
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

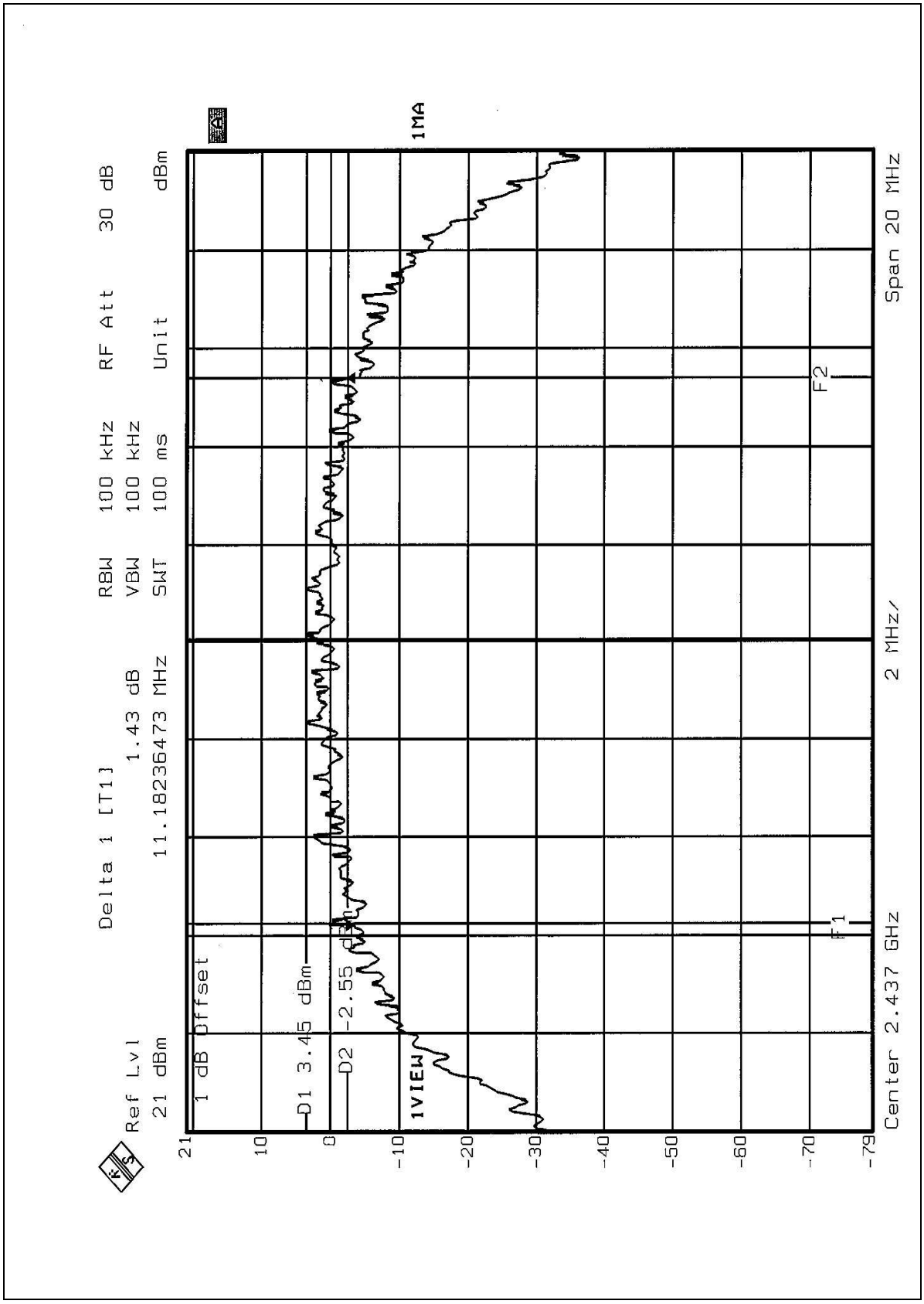
EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 62%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.142	0.5	PASS
6	2437	11.182	0.5	PASS
11	2462	11.182	0.5	PASS

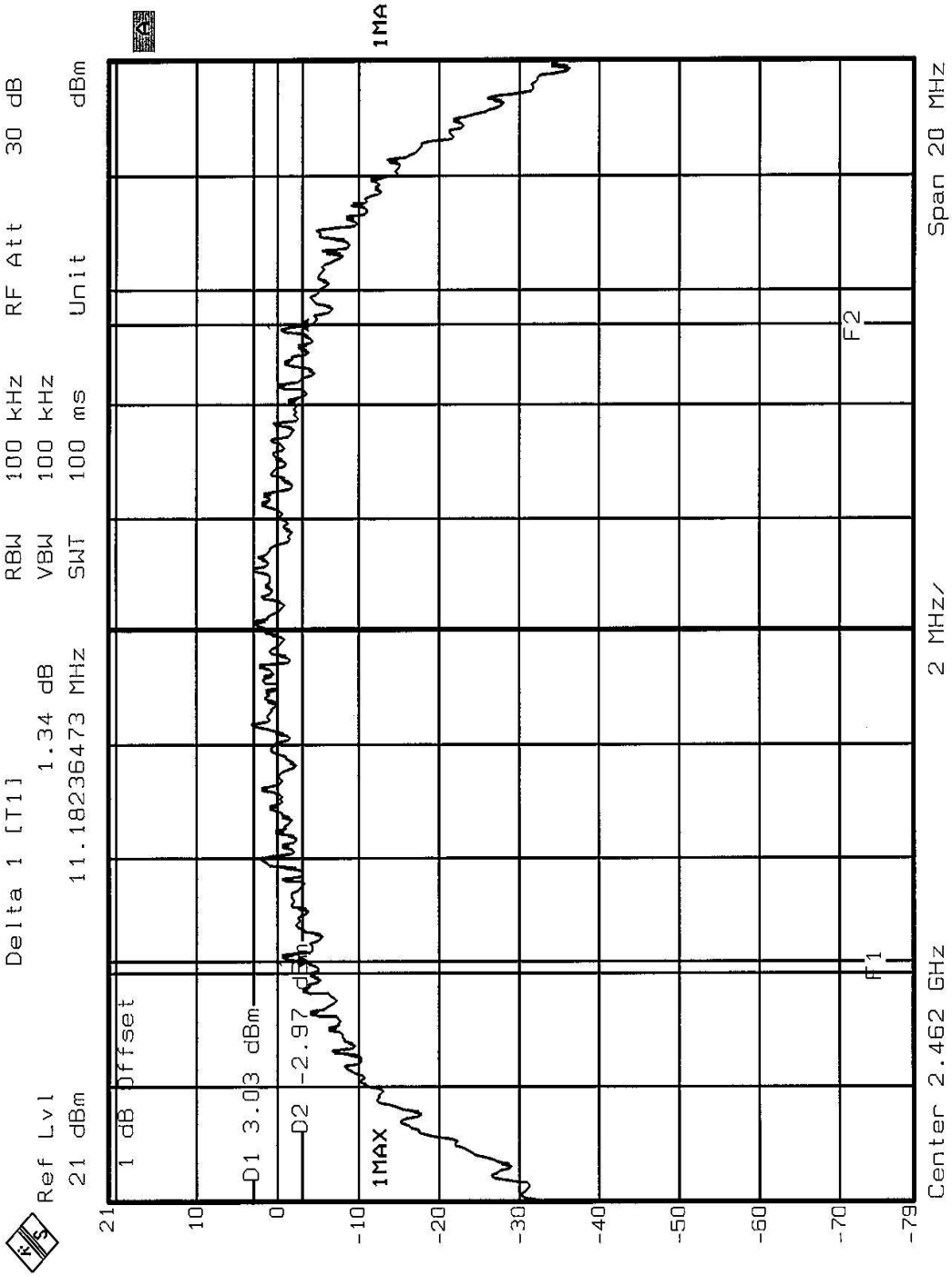
CH1


Ref Lvl
21 dBm
1 dB Offset
Delta 1 [T1]
-0.85 dB
11.14228457 MHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
D1 3.91 dBm
D2 -2.09 dBm
1MA
1VIEW
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79

CH6


Ref Lvl
21 dBm
1 dB Offset
Delta 1 [T1]
1.43 dB
11.18236473 MHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
D1 3.45 dBm
D2 -2.55 dB
1VIEW
1MA
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79

CH11


Ref Lvl
21 dBm
1 dB Offset
Delta 1 [T1]
1.34 dB
11.182364 73 MHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
D1 3.03 dBm
D2 -2.97 dBm
1MAX
1MA
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79

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

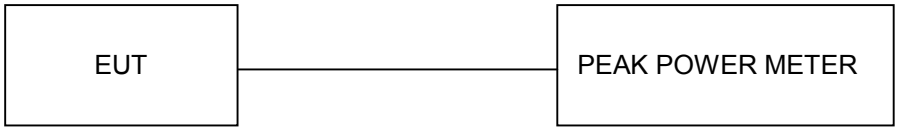
NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

The transmitter output was connected to the peak power meter.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

4.4.6 TEST RESULTS

EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 62%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	14.71	30	PASS
6	2437	14.37	30	PASS
11	2462	14.05	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 17, 2002

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

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

4.5.4 TEST SETUP

4.5.5 EUT OPERATING CONDITIONS

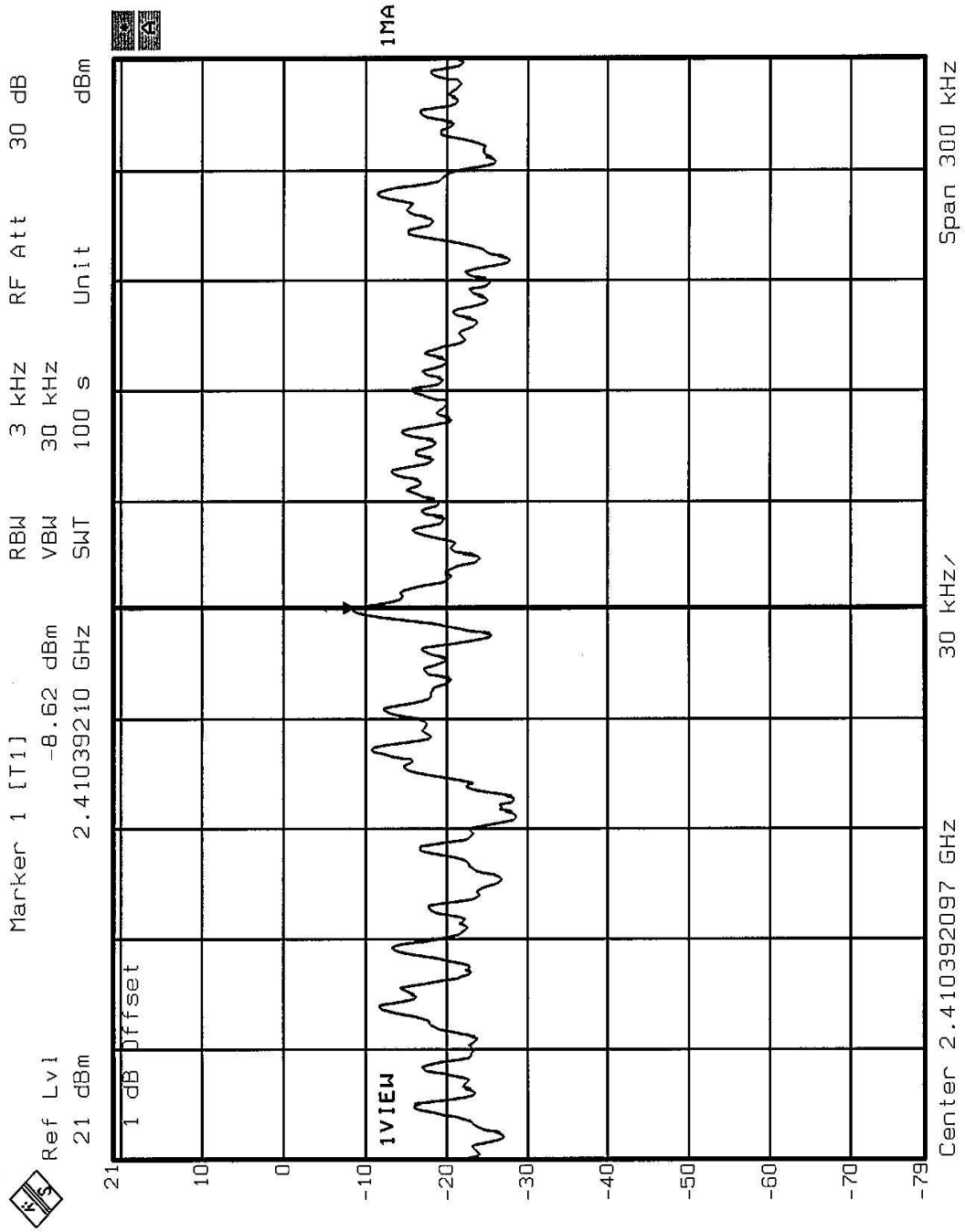
Same as 4.3.5

4.5.6 TEST RESULTS

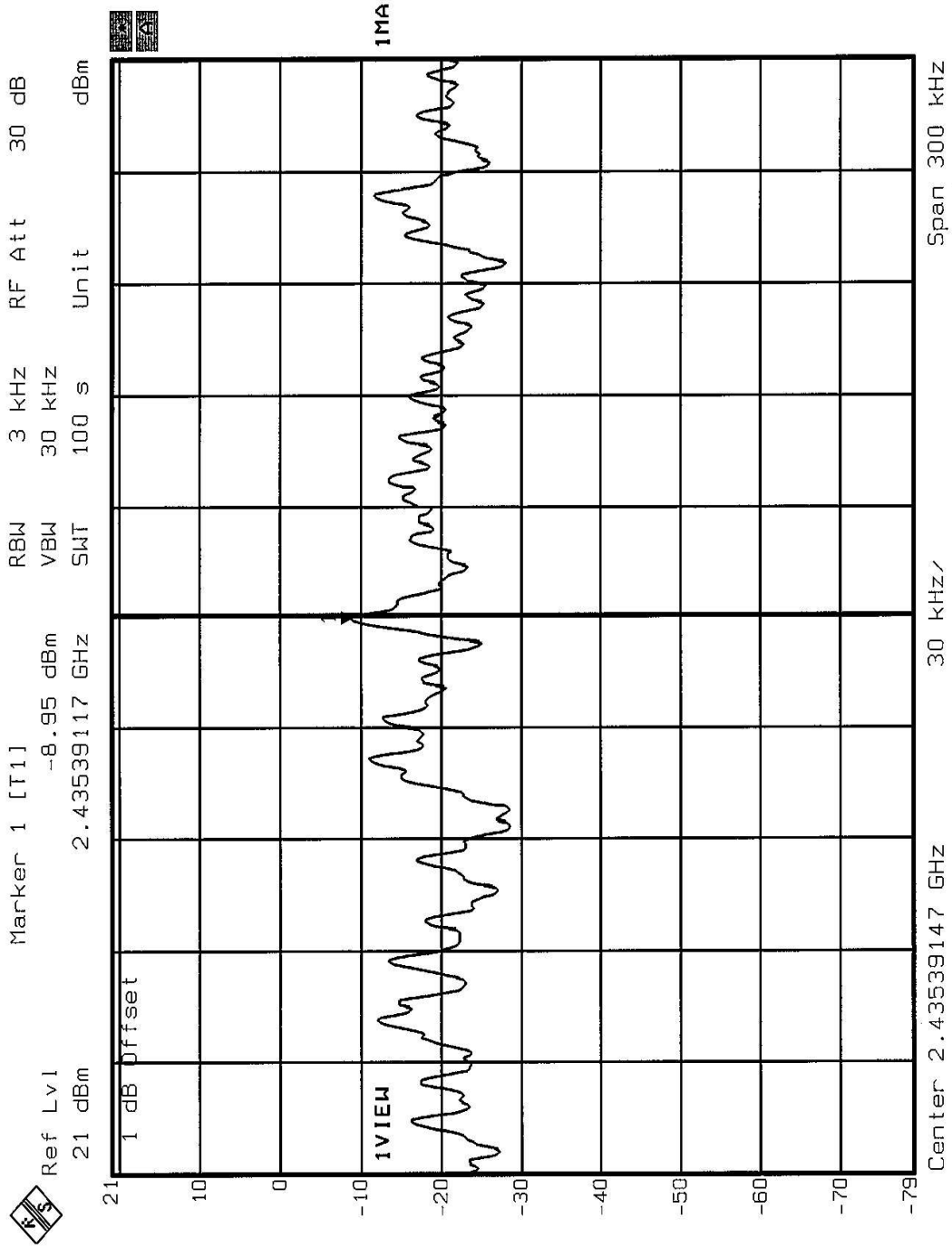
EUT	11Mbps Wireless LAN Module	**MODEL**	WM300
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24 deg. C, 62%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-8.62	8	PASS
6	2437	-8.95	8	PASS
11	2462	-9.50	8	PASS

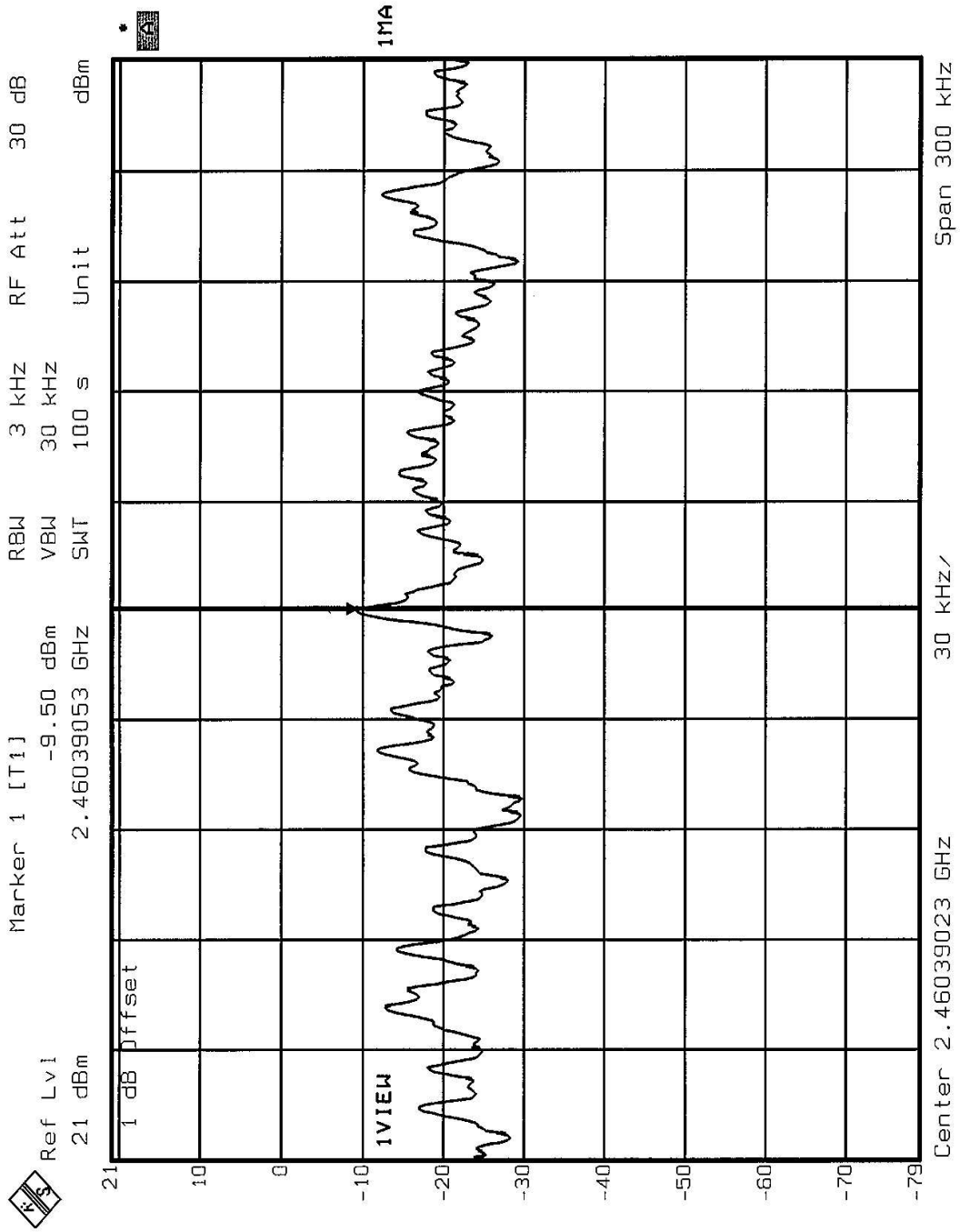
CH1


Ref Lvl
21 dBm
1 dB Offset
Marker 1 [T1]
-8.62 dBm
2.4103921 0 GHz
RBW 3 kHz
VBW 30 kHz
SWT 100 s
RF Att 30 dB
Unit dBm
1MA
1VIEW
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 2.410392097 GHz
30 kHz/
Span 300 kHz

CH6


Ref Lvl
21 dBm
1 dB Offset
Marker 1 [T1]
-8.95 dBm
2.43539117 GHz
RBW 3 kHz
VBW 30 kHz
SWT 100 s
RF Att 30 dB
Unit dBm
1MA
1VIEW
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 2.43539147 GHz
30 kHz/
Span 300 kHz

CH11


Ref Lvl
21 dBm
1 dB Offset
Marker 1 [T1]
-9.50 dBm
2.46039053 GHz
RBW 3 kHz
VBW 30 kHz
SWT 100 s
RF Att 30 dB
Unit dBm
1VIEW
1MA
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 2.46039023 GHz
30 kHz/
Span 300 kHz

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 17, 2002

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST PROCEDURE

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

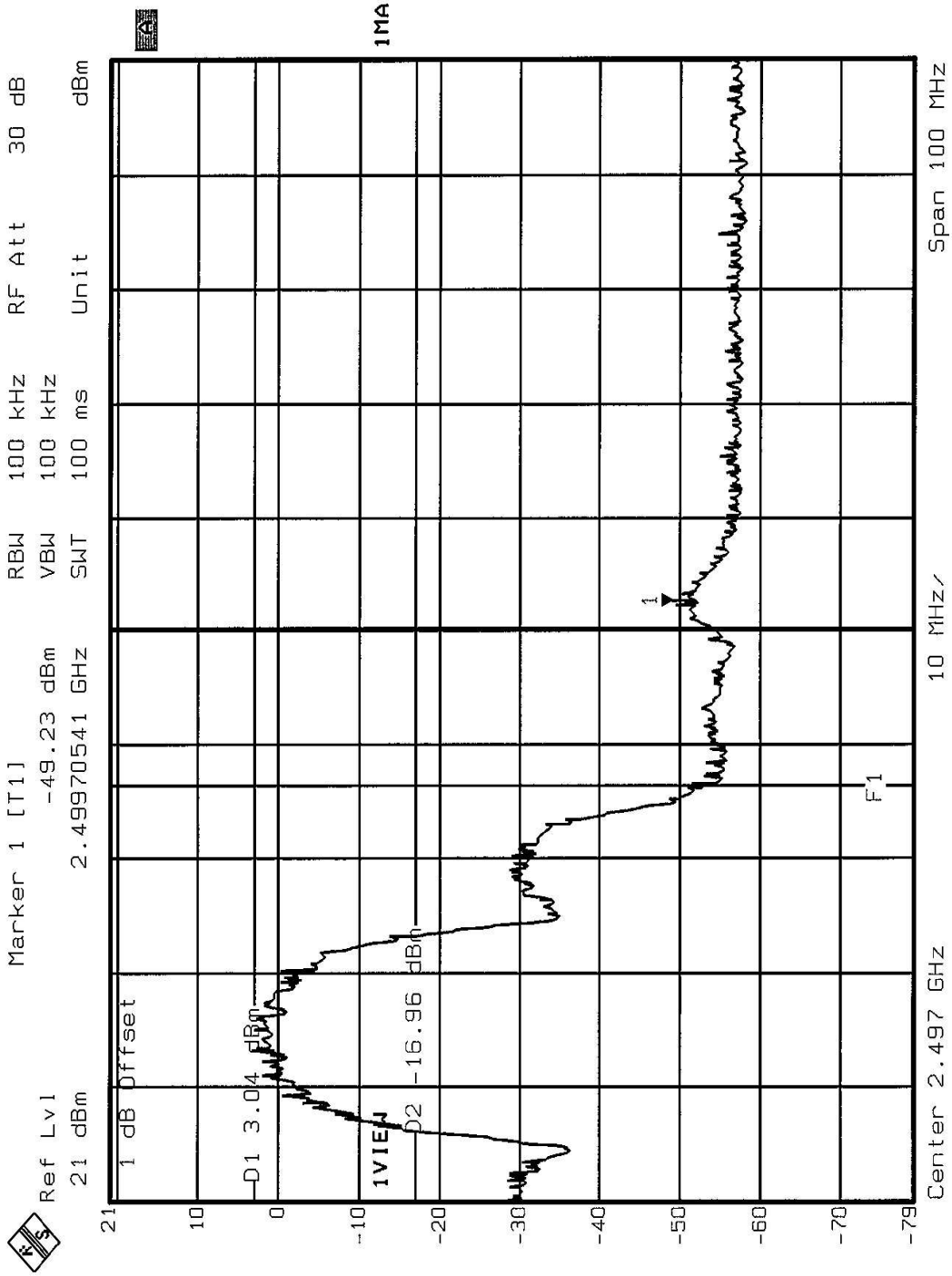
4.6.4 EUT OPERATING CONDITION

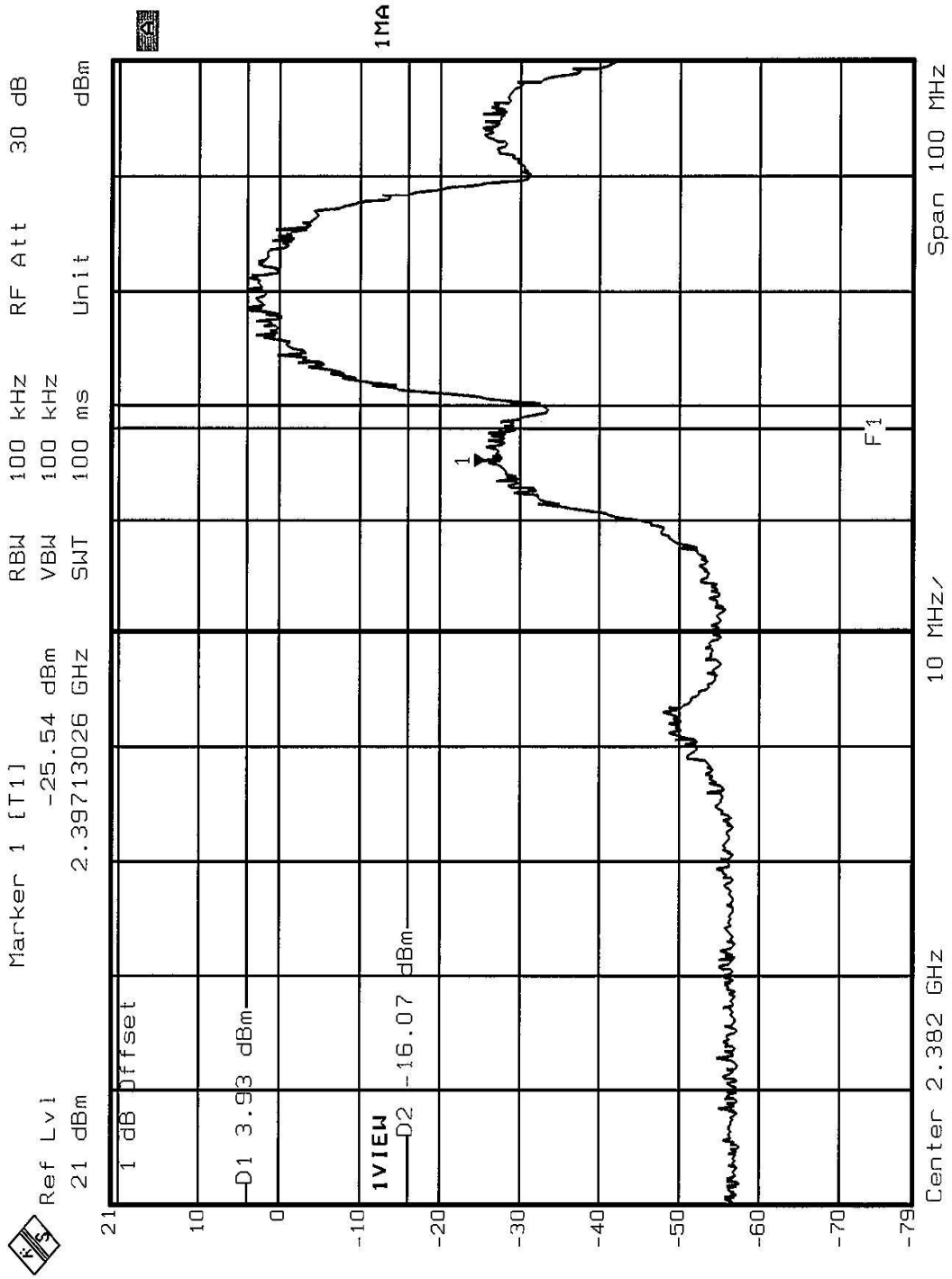
Same as Item 4.3.5

4.6.5 TEST RESULTS

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

NOTE: The band edge emission plot on the following 2 pages shows 52.27dB delta between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 (Page 26) is 104.8dBuV/m, so the maximum field strength in restrict band is 104.8-52.27=52.53 dBuV/m which is under 54 dBuV/m limit.


Ref Lvl
21 dBm
1 dB Offset
Marker 1 [T1]
-49.23 dBm
2.49970541 GHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
1MA
D1 3.04 dBm
1VIEW
D2 -16.96 dBm
F1
Center 2.497 GHz
10 MHz/
Span 100 MHz


Ref Lvl
21 dBm
1 dB Offset
D1 3.93 dBm
Marker 1 [T1]
-25.54 dBm
2.39713026 GHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
1VIEW
D2 -16.07 dBm
1MA
Center 2.382 GHz
10 MHz/
Span 100 MHz
F1
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

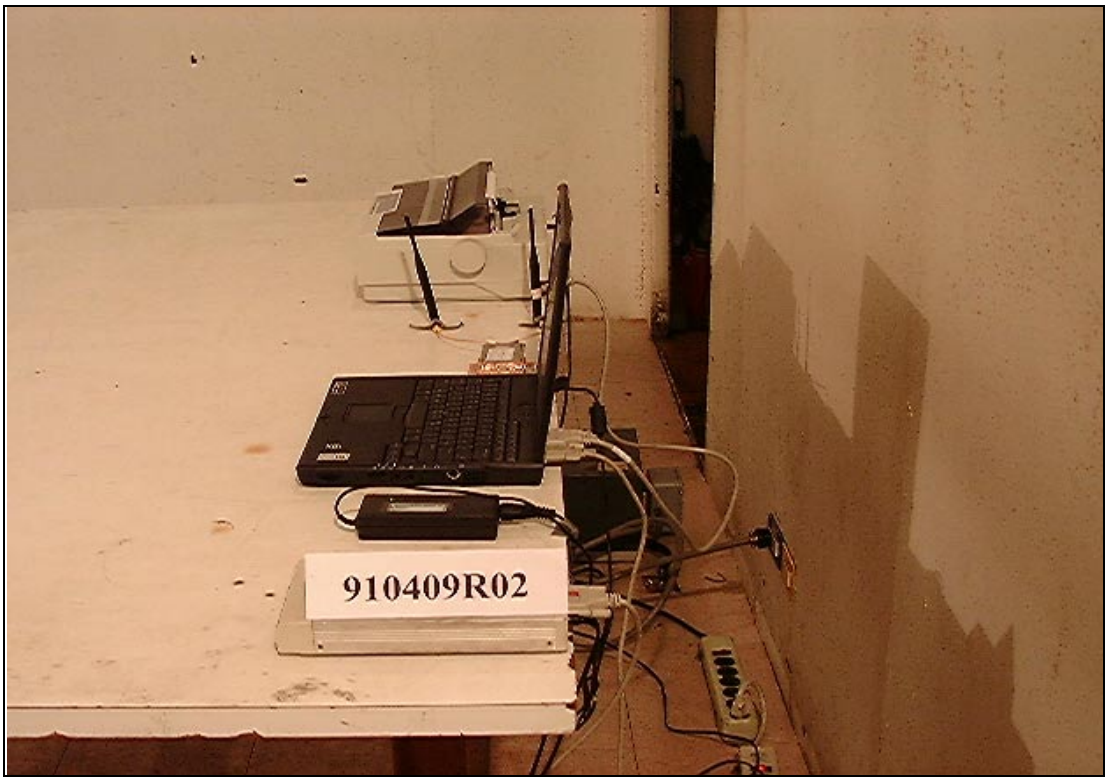
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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

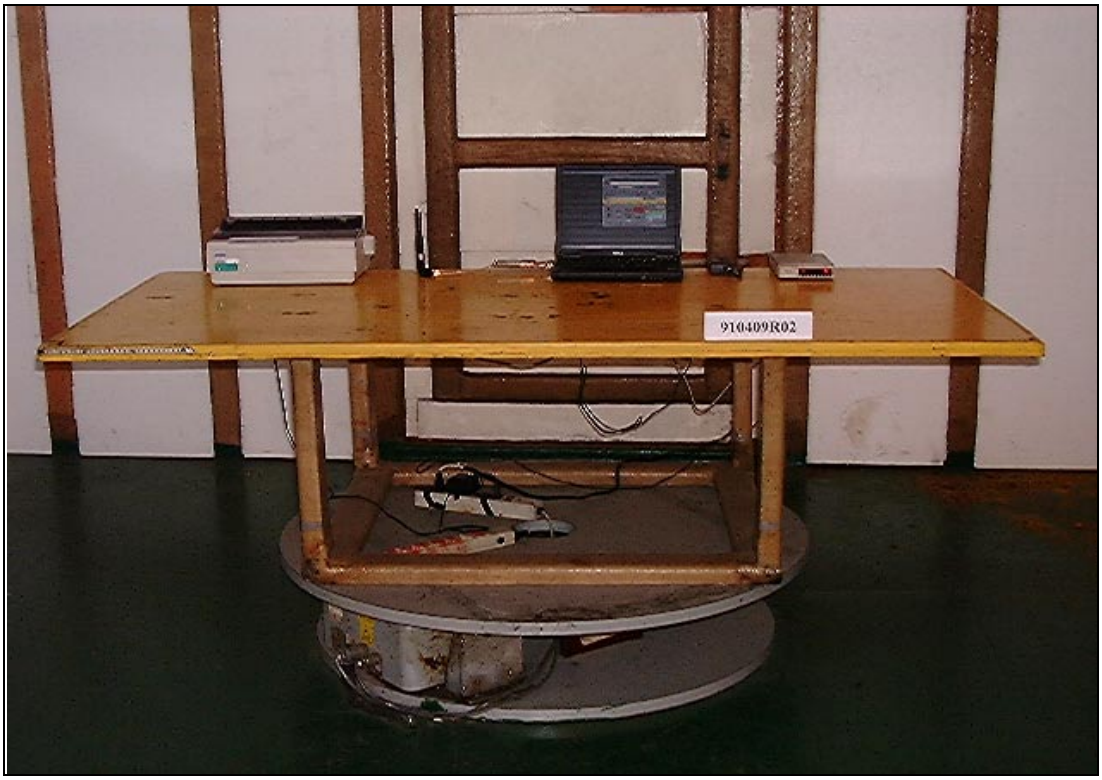
The antenna used in this product are Dipole and Printed Antenna and with MMCX antenna connector. The maximum Gain of this antenna is 5dBi.

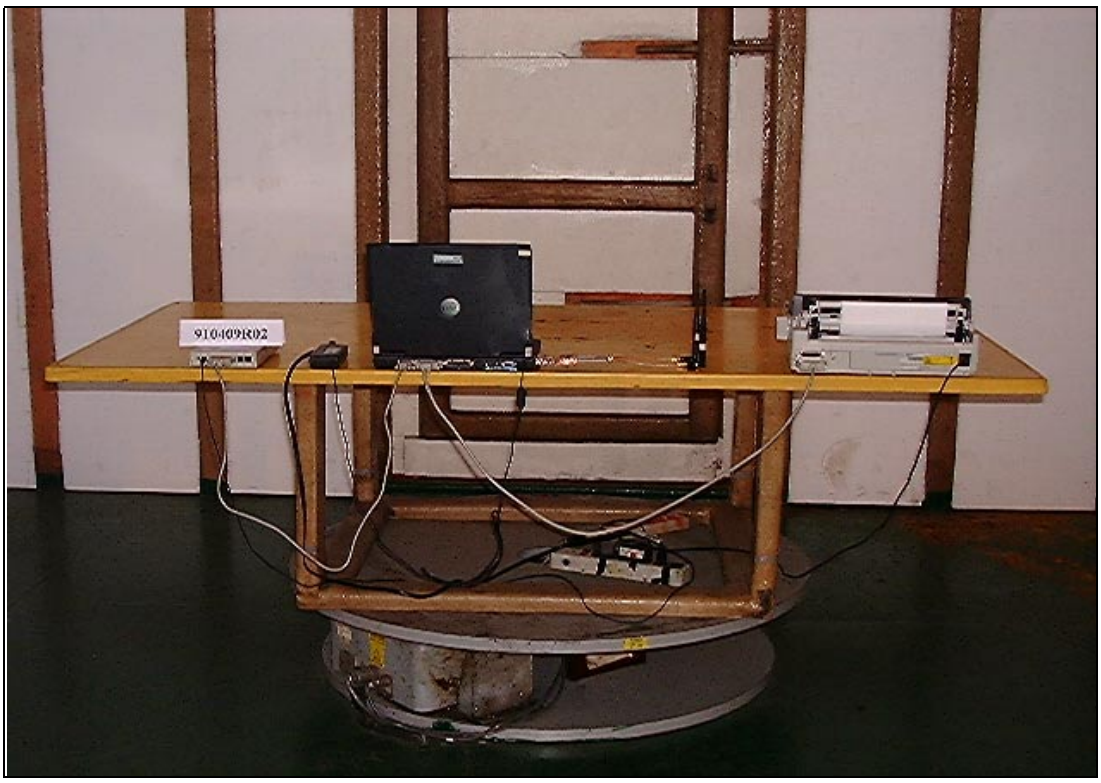
5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





910409R02
TEST-2

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.