FCC TEST REPORT

REPORT NO.: RF911118R02
MODEL NO.: WMA1
RECEIVED: Nov. 12, 2002
TESTED: Nov. 14 ~ Nov. 28, 2002

APPLICANT: QUANTA COMPUTER INC.

ADDRESS: 7F, No. 116, Hou Kang St., Shih Lin, Taipei, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

0528
ILAC MRA

Lab Code: 200102-0

Table of Contents

1 CERTIFICATION

PRODUCT :	Wireless PCMCIA Card
BRAND NAME :	Quanta
MODEL NO. :	WMA1
APPLICANT :	QUANTA COMPUTER INC.
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Nov. 14, 2002 to Nov. 28, 2002, The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

CHECKED BY : Emily Lu , DATE : Dec. 3, 2002

Emily Lu

APPROVED BY : for , DATE : Dec. 3, 2002

Dr. Alan Lane, Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is –15.61dBuV at 0.173MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –3.6dBuV at 7236.00MHz
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	Wireless PCMCIA Card
MODEL NO.	WMA1
POWER SUPPLY	3.3VDC from host equipment
MODULATION TYPE	CCK, BPSK, QPSK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	13.65dBm
ANTENNA TYPE	Dipole antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE: 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.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless PCMCIA Card. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	IBM	TYPE 1161-41T	AA-G0R37 00/10	NA
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED
3	MODEM	ACEEX	1414	980020569	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 OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	834115/016	Mar. 3, 2003
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH3-Z5	847265/023	Jan. 10, 2003
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 10, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 10, 2002
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	July 10, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C03.01	July 11, 2003
Terminator (For EMCO LISN)	NA	E1-01-300	Feb. 20, 2003
Terminator (For EMCO LISN)	NA	E1-01-301	Feb. 20, 2003
Shielded Room	Site 3	ADT-C03	NA
VCCI Site Registration No.	Site 3	C-274	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. "*": These equipment are used for conducted telecom port test only (if tested).
3. The test was performed in ADT Open Site No. 3.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

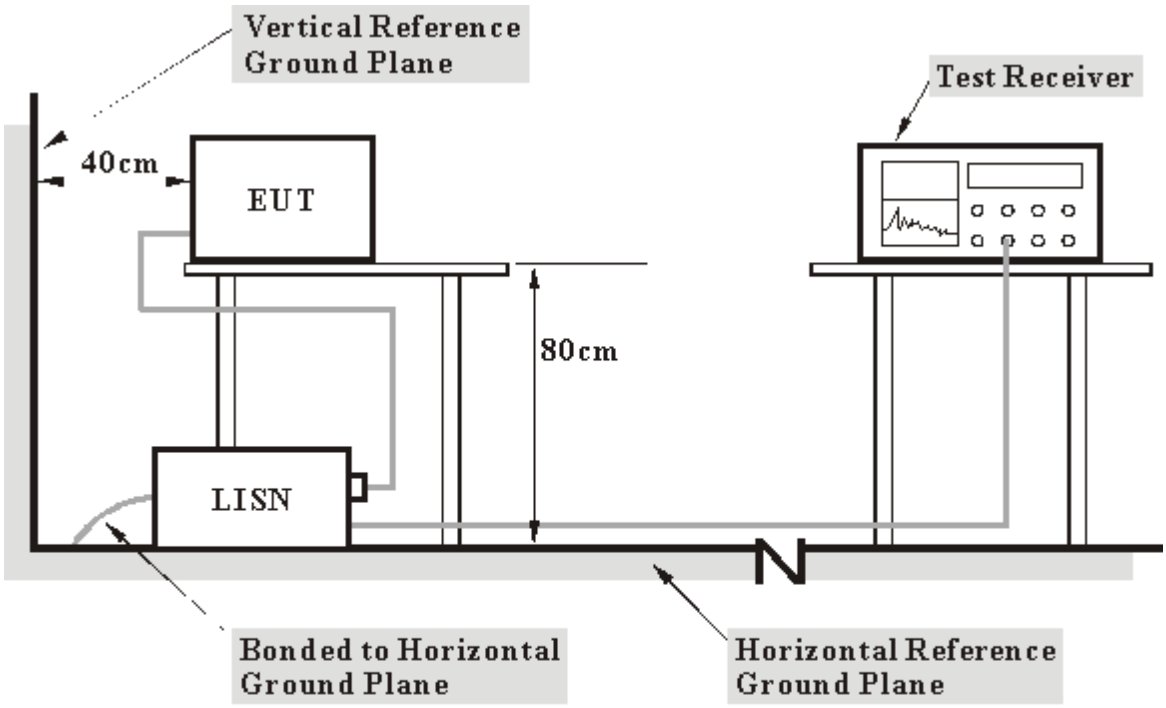
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

a. Plug the EUT into the PCMCIA extender which connected to a notebook 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.

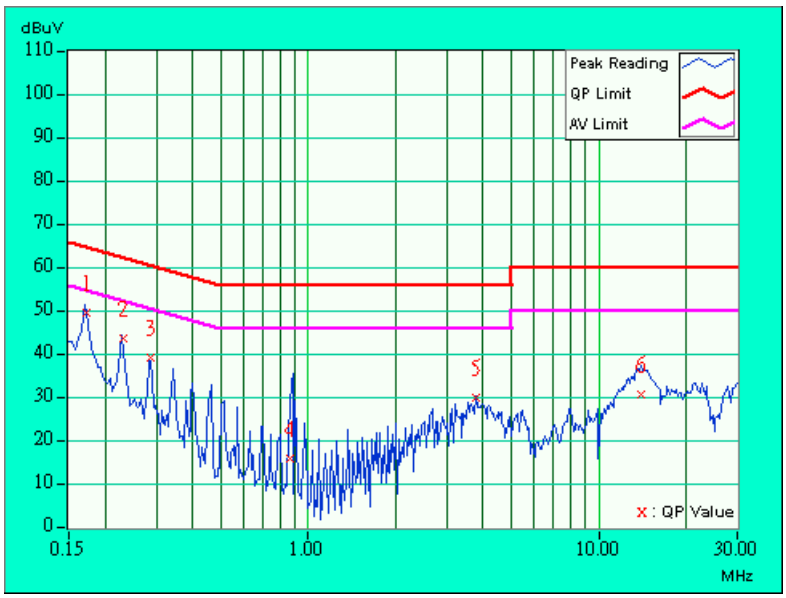
4.1.7 TEST RESULTS

EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%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	0.173	0.10	49.08	-	49.18	-	64.79	54.79	-15.61	-
2	0.230	0.10	42.91	-	43.01	-	62.45	52.45	-19.44	-
3	0.287	0.10	38.73	-	38.83	-	60.62	50.62	-21.79	-
4	0.863	0.18	15.40	-	15.58	-	56.00	46.00	-40.42	-
5	3.773	0.48	29.32	-	29.80	-	56.00	46.00	-26.20	-
6	13.949	0.66	30.16	-	30.82	-	60.00	50.00	-29.18	-

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.

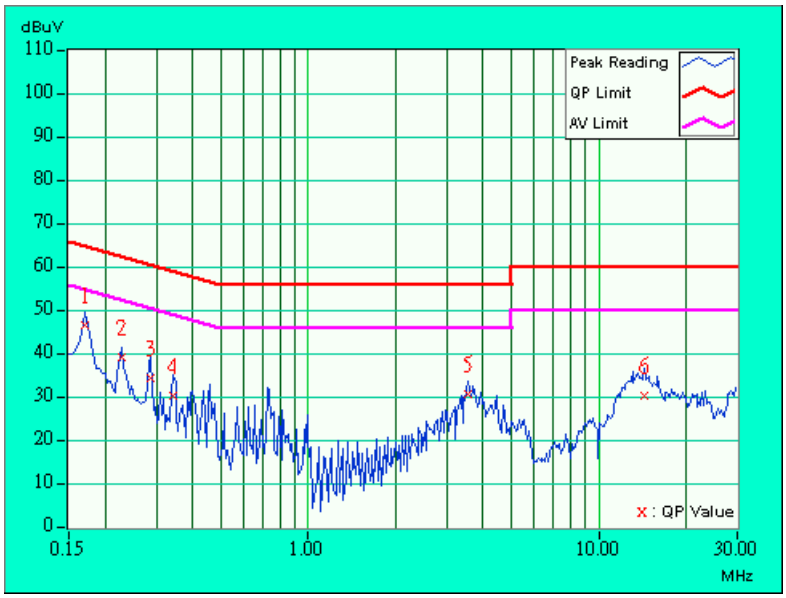


EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

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	0.170	0.10	46.09	-	46.19	-	64.98	54.98	-18.79	-
2	0.228	0.10	38.92	-	39.02	-	62.52	52.52	-23.50	-
3	0.287	0.10	33.90	-	34.00	-	60.61	50.61	-26.61	-
4	0.341	0.10	30.04	-	30.14	-	59.17	49.17	-29.03	-
5	3.542	0.38	30.30	-	30.68	-	56.00	46.00	-25.32	-
6	14.397	0.49	29.72	-	30.21	-	60.00	50.00	-29.79	-

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.

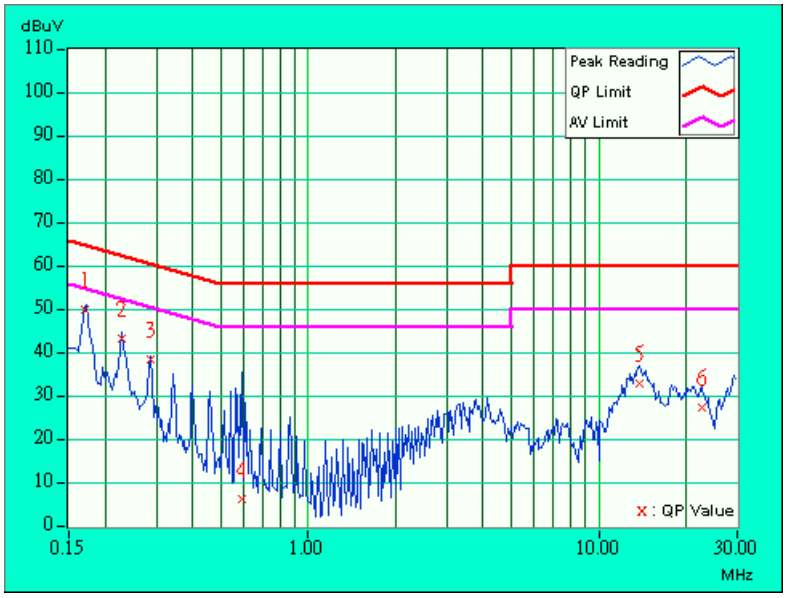


EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

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	0.170	0.10	49.16	-	49.26	-	64.98	54.98	-15.72	-
2	0.228	0.10	42.49	-	42.59	-	62.52	52.52	-19.93	-
3	0.287	0.10	37.72	-	37.82	-	60.62	50.62	-22.80	-
4	0.591	0.13	5.47	-7.23	5.60	-7.10	56.00	46.00	-50.40	-53.10
5	13.734	0.65	31.93	-	32.58	-	60.00	50.00	-27.42	-
6	22.668	0.91	26.32	-	27.23	-	60.00	50.00	-32.77	-

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.

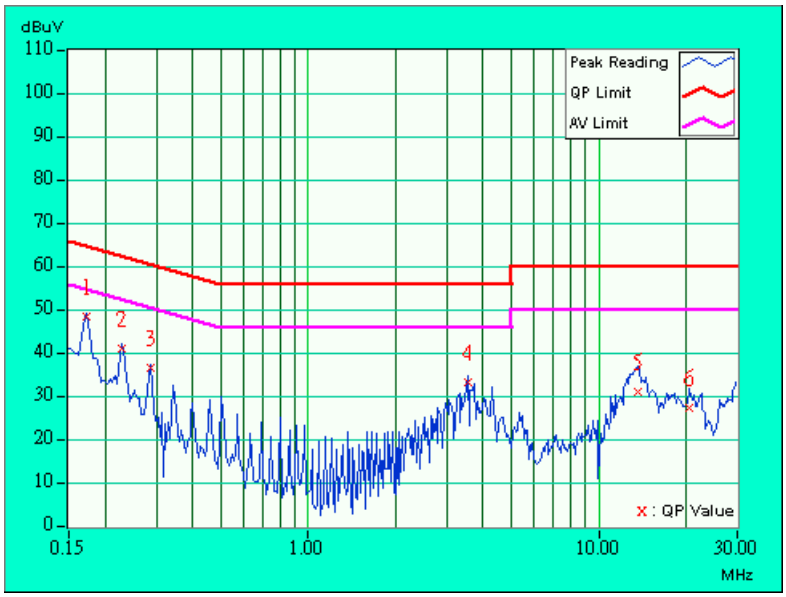


EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

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	0.173	0.10	47.87	-	47.97	-	64.79	54.79	-16.82	-
2	0.228	0.10	40.44	-	40.54	-	62.52	52.52	-21.98	-
3	0.287	0.10	36.05	-	36.15	-	60.62	50.62	-24.47	-
4	3.551	0.38	32.59	-	32.97	-	56.00	46.00	-23.03	-
5	13.684	0.47	30.46	-	30.93	-	60.00	50.00	-29.07	-
6	20.371	0.61	26.88	-	27.49	-	60.00	50.00	-32.51	-

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.

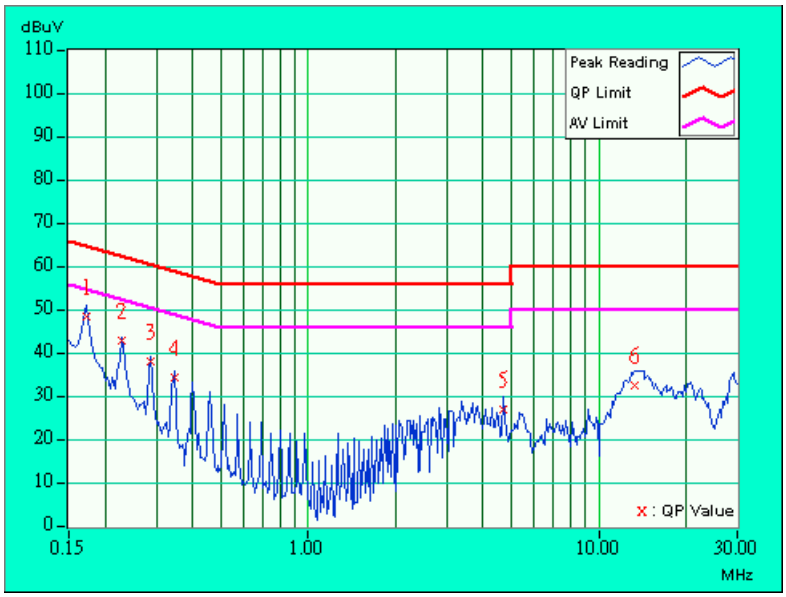


EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

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	0.173	0.10	47.93	-	48.03	-	64.79	54.79	-16.76	-
2	0.228	0.10	42.39	-	42.49	-	62.52	52.52	-20.03	-
3	0.287	0.10	37.64	-	37.74	-	60.62	50.62	-22.88	-
4	0.345	0.10	33.92	-	34.02	-	59.07	49.07	-25.05	-
5	4.703	0.50	26.24	-	26.74	-	56.00	46.00	-29.26	-
6	13.246	0.63	31.83	-	32.46	-	60.00	50.00	-27.54	-

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.

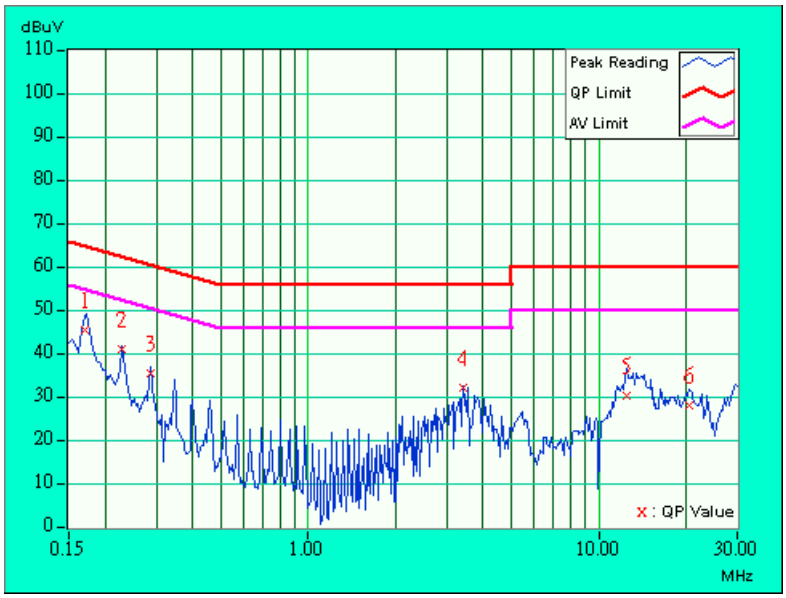


EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

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	0.170	0.10	45.06	-	45.16	-	64.98	54.98	-19.82	-
2	0.228	0.10	40.64	-	40.74	-	62.52	52.52	-21.78	-
3	0.287	0.10	35.00	-	35.10	-	60.62	50.62	-25.52	-
4	3.438	0.37	31.57	-	31.94	-	56.00	46.00	-24.06	-
5	12.547	0.45	29.64	-	30.09	-	60.00	50.00	-29.91	-
6	20.523	0.61	27.46	-	28.07	-	60.00	50.00	-31.93	-

NOTE:

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Apr. 29, 2003
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 07, 2003
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2003
ANTENNA (Large Biconical)	VHBA9123	449	Dec. 10, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 02, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 03, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 09, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 25, 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 12, 2003
Open Field Test Site	Site 5	ADT-R05	Jul. 19, 2003
VCCI Site Registration No.	Site 5	R-1039	NA

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

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

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

4. The test was performed in ADT Open Site No. 5.

4.2.3 TEST PROCEDURES

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

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

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

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

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

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

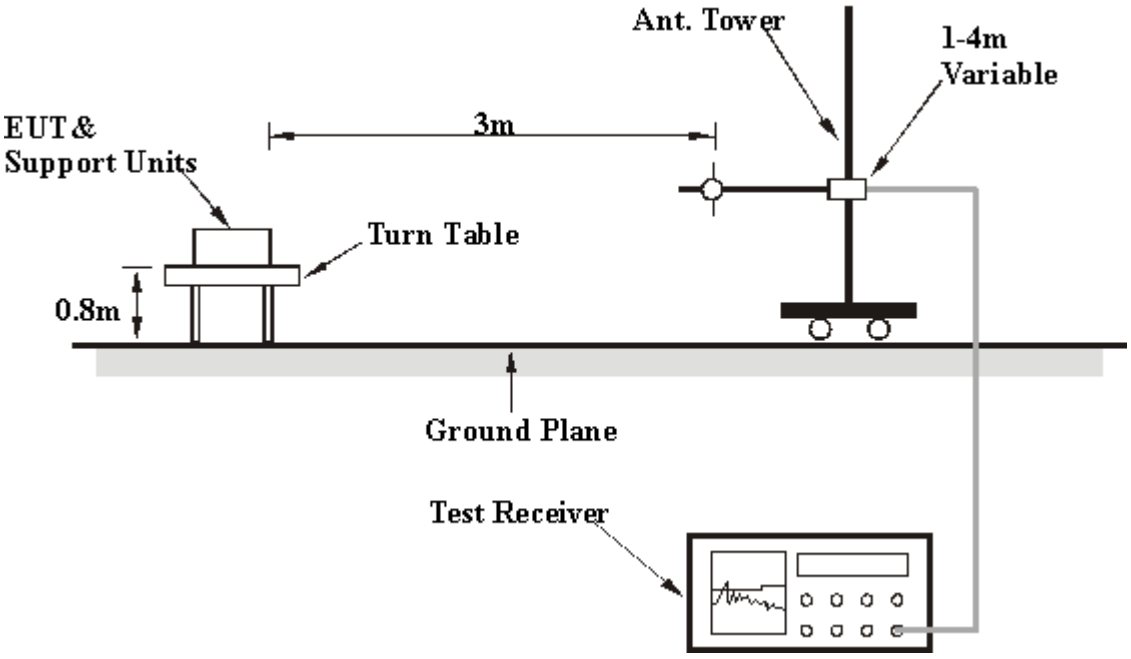
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

EUT	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % 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	176.00	31.2 QP	43.50	-12.30	1.34H	3	18.32	9.08	3.80	0.00	-12.88
2	220.00	33.4 QP	46.00	-12.60	1.81H	92	18.94	10.12	4.30	0.00	-14.42
3	264.00	29.5 QP	46.00	-16.50	1.43H	153	11.71	12.89	4.91	0.00	-17.79
4	308.00	26.0 QP	46.00	-20.00	1.64H	330	7.43	13.38	5.19	0.00	-18.58
5	352.00	27.0 QP	46.00	-19.00	1.70H	167	6.96	14.31	5.73	0.00	-20.05
6	396.00	28.5 QP	46.00	-17.50	1.31H	34	6.41	15.96	6.13	0.00	-22.09
7	572.00	28.0 QP	46.00	-18.00	1.34H	294	2.10	18.25	7.65	0.00	-25.91
8	748.00	30.9 QP	46.00	-15.10	1.90H	288	2.06	20.14	8.75	0.00	-28.90

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	176.00	24.9 QP	43.50	-18.60	1.97V	165	12.02	9.08	3.80	0.00	-12.88
2	220.00	25.6 QP	46.00	-20.40	1.53V	291	11.18	10.12	4.30	0.00	-14.42
3	264.00	23.3 QP	46.00	-22.70	1.33V	110	5.50	12.89	4.91	0.00	-17.79
4	308.00	23.5 QP	46.00	-22.50	1.38V	232	4.93	13.38	5.19	0.00	-18.57
5	484.00	26.0 QP	46.00	-20.00	1.27V	171	2.53	16.96	6.51	0.00	-23.47
6	528.00	24.0 QP	46.00	-22.00	1.27V	109	-0.63	17.62	7.00	0.00	-24.63
7	748.00	30.8 QP	46.00	-15.20	1.34V	107	1.91	20.14	8.75	0.00	-28.89

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	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % 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	2386.00	36.5 AV	54.00	-17.50	1.51H	118	43.00	27.67	2.53	36.72	6.52
2	2386.00	45.7 PK	74.00	-28.30	1.51H	118	52.21	27.67	2.53	36.72	6.52
3	*2412.00	91.0 AV			1.77H	226	97.50	27.67	2.53	36.72	6.53
4	*2412.00	97.3 PK			1.77H	226	103.80	27.67	2.53	36.72	6.52
5	4824.00	37.7 AV	54.00	-16.30	1.58H	179	38.90	31.52	4.01	36.70	1.18
6	4824.00	46.3 PK	74.00	-27.70	1.58H	179	47.50	31.52	4.01	36.70	1.19
7	7236.00	41.8 AV	54.00	-12.20	1.27H	236	37.00	36.20	5.58	37.00	-4.78
8	7236.00	51.1 PK	74.00	-22.90	1.27H	236	46.30	36.20	5.58	37.00	-4.79

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	2386.00	45.7 AV	54.00	-8.30	1.02V	231	52.20	27.67	2.53	36.72	6.52
2	2386.00	52.4 PK	74.00	-21.60	1.02V	185	58.90	27.67	2.53	36.72	6.52
3	*2412.00	106.8 PK			1.15V	254	113.30	27.67	2.53	36.72	6.52
4	*2412.00	99.3 AV			1.15V	254	105.83	27.67	2.53	36.72	6.52
5	4824.00	42.7 AV	54.00	-11.30	1.32V	214	43.89	31.52	4.01	36.70	1.18
6	4824.00	47.3 PK	74.00	-26.70	1.32V	214	48.50	31.52	4.01	36.70	1.19
7	7236.00	61.0 PK	74.00	-13.00	1.17V	207	56.20	36.20	5.58	37.00	-4.78
8	7236.00	50.4 AV	54.00	-3.60	1.17V	207	45.60	36.20	5.58	37.00	-4.78

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	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % 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	95.9 AV			1.78H	225	102.10	27.81	2.66	36.71	6.24
2	*2437.00	90.3 AV			1.78H	225	96.50	27.81	2.66	36.71	6.24
3	4874.00	35.8 AV	54.00	-18.20	1.35H	134	36.90	31.59	4.03	36.70	1.08
4	4874.00	44.9 PK	74.00	-29.10	1.35H	134	46.00	31.59	4.03	36.70	1.09
5	7311.00	50.9 PK	74.00	-23.10	1.71H	235	46.00	36.26	5.65	37.02	-4.90
6	7311.00	42.4 AV	54.00	-11.60	1.71H	235	37.50	36.26	5.65	37.02	-4.90

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	101.0 AV			1.12V	256	107.27	27.81	2.66	36.71	6.24
2	*2437.00	107.6 PK			1.12V	256	113.86	27.81	2.66	36.71	6.24
3	4874.00	40.9 AV	54.00	-13.10	1.10V	190	42.00	31.59	4.03	36.70	1.08
4	4874.00	46.0 PK	74.00	-28.00	1.10V	190	47.10	31.59	4.03	36.70	1.09
5	7311.00	48.1 AV	54.00	-5.90	1.48V	46	43.20	36.26	5.65	37.02	-4.91
6	7311.00	56.9 PK	74.00	-17.10	1.48V	46	52.00	36.26	5.65	37.02	-4.90.

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	Wireless PCMCIA Card	**MODEL**	WMA1
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % 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	*2462.00	90.3 AV			1.79H	225	96.50	27.81	2.66	36.71	6.24
2	*2462.00	96.7 PK			1.79H	225	102.90	27.81	2.66	36.71	6.24
3	2500.00	32.6 AV	54.00	-21.40	1.05H	51	38.60	27.96	2.78	36.70	5.96
4	2500.00	43.0 PK	74.00	-31.00	1.05H	51	49.00	27.96	2.78	36.70	5.96
5	4924.00	36.8 AV	54.00	-17.20	1.13H	159	37.80	31.66	4.06	36.70	0.99
6	4924.00	47.0 PK	74.00	-27.00	1.13H	159	48.00	31.66	4.06	36.70	1.00
7	7386.00	42.9 AV	54.00	-11.10	1.51H	281	37.80	36.40	5.79	37.05	-5.14
8	7386.00	51.9 PK	74.00	-22.10	1.51H	281	46.80	36.40	5.79	37.05	-5.14

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	*2462.00	100.8 AV			1.31V	160	107.00	27.81	2.66	36.71	6.24
2	*2462.00	106.6 PK			1.31V	160	112.80	27.81	2.66	36.71	6.24
3	2500.00	45.2 PK	74.00	-28.80	1.39V	194	51.20	27.96	2.78	36.70	5.96
4	2500.00	37.9 AV	54.00	-16.10	1.39V	194	43.90	27.96	2.78	36.70	5.96
5	4924.00	38.5 AV	54.00	-15.50	1.53V	119	39.50	31.66	4.06	36.70	0.99
6	4924.00	47.5 PK	74.00	-26.50	1.53V	119	48.50	31.66	4.06	36.70	1.00
7	7386.00	50.3 AV	54.00	-3.70	1.65V	38	45.20	36.40	5.79	37.05	-5.15
8	7386.00	59.9 PK	74.00	-14.10	1.65V	38	54.80	36.40	5.79	37.05	-5.14.

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
R&S 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.

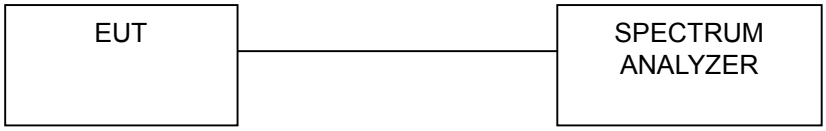
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

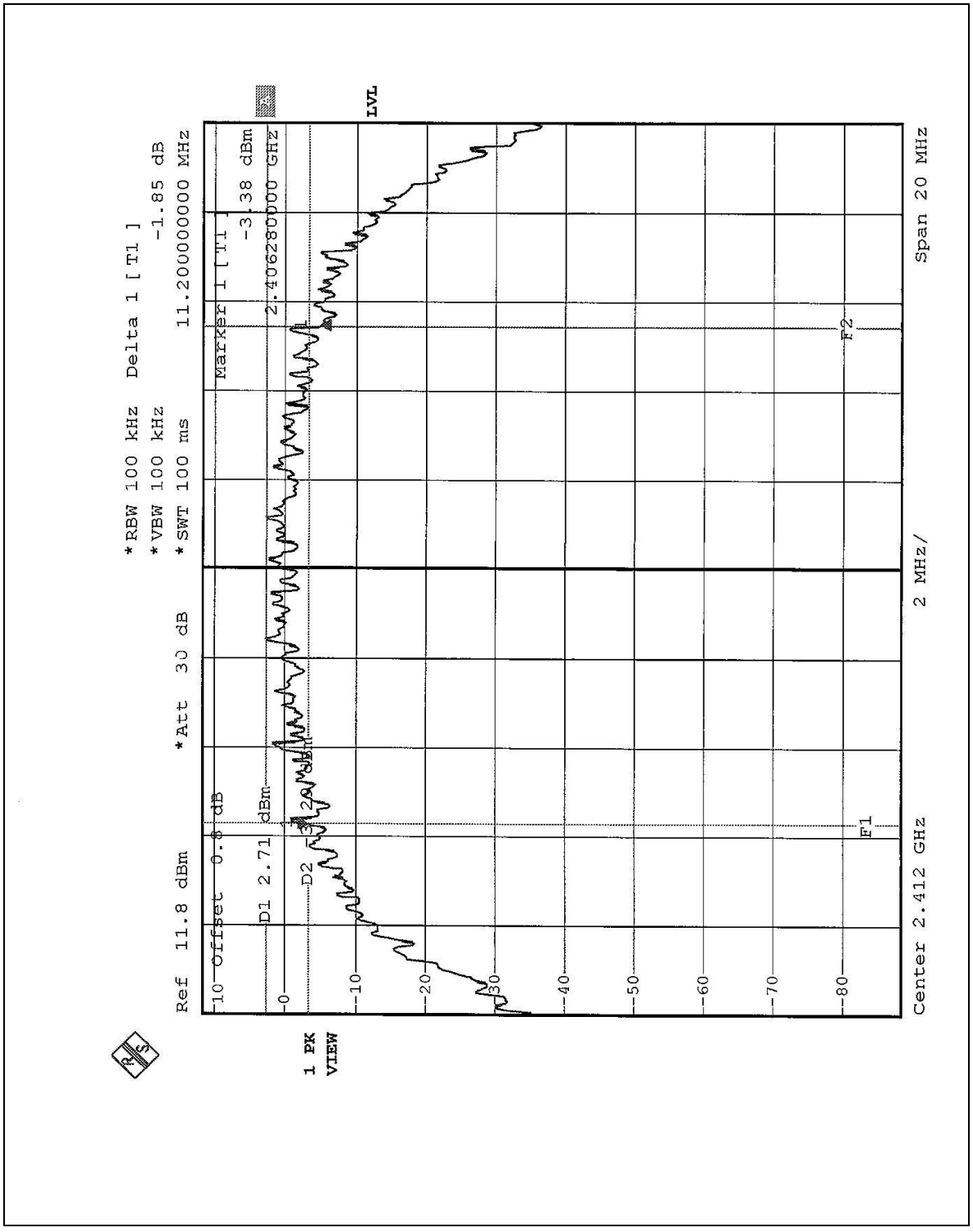
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

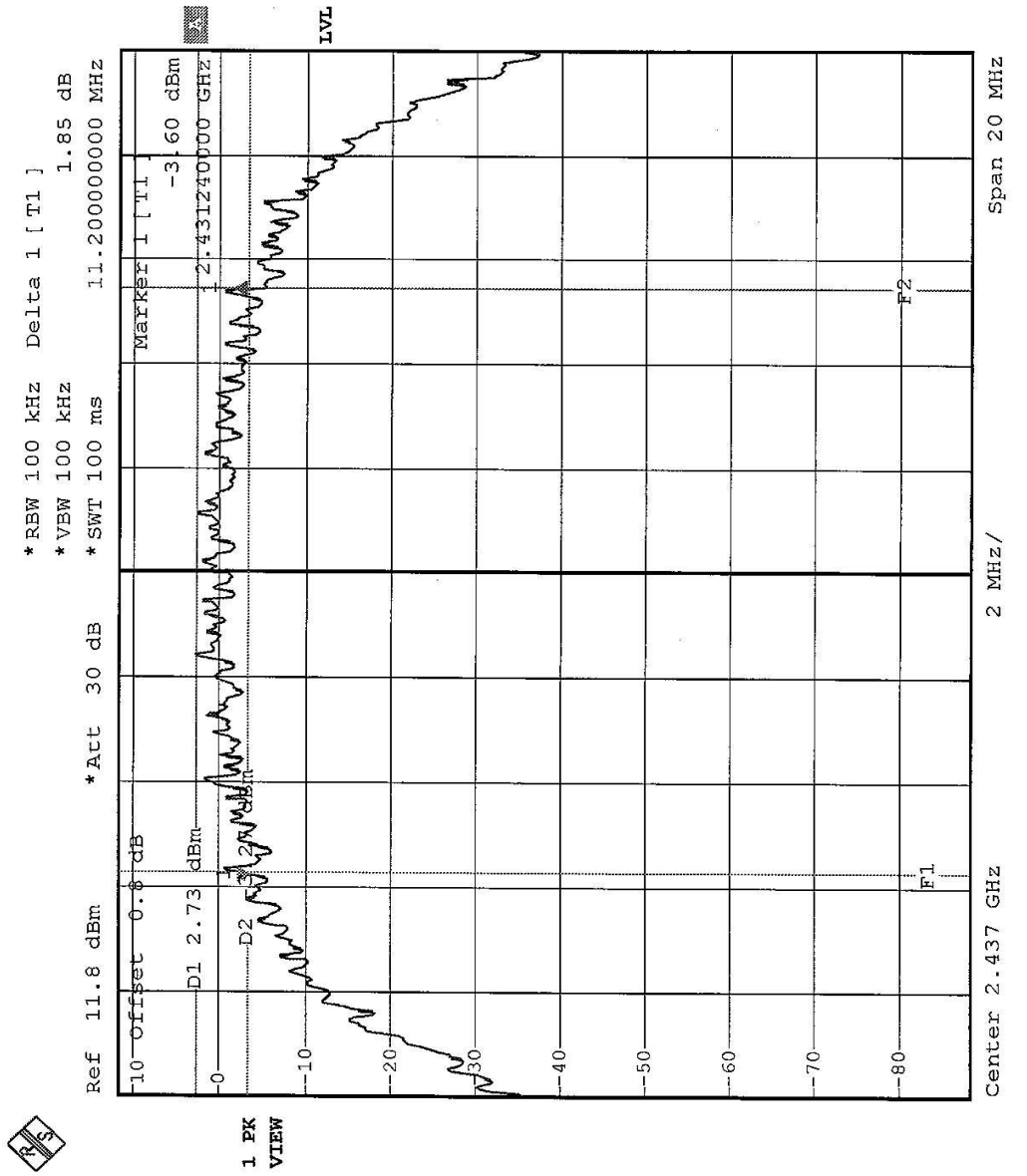
EUT	Wireless PCMCIA Card	**MODEL**	WMA1
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg. C, 62%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.20	0.5	PASS
6	2437	11.20	0.5	PASS
11	2462	11.64	0.5	PASS

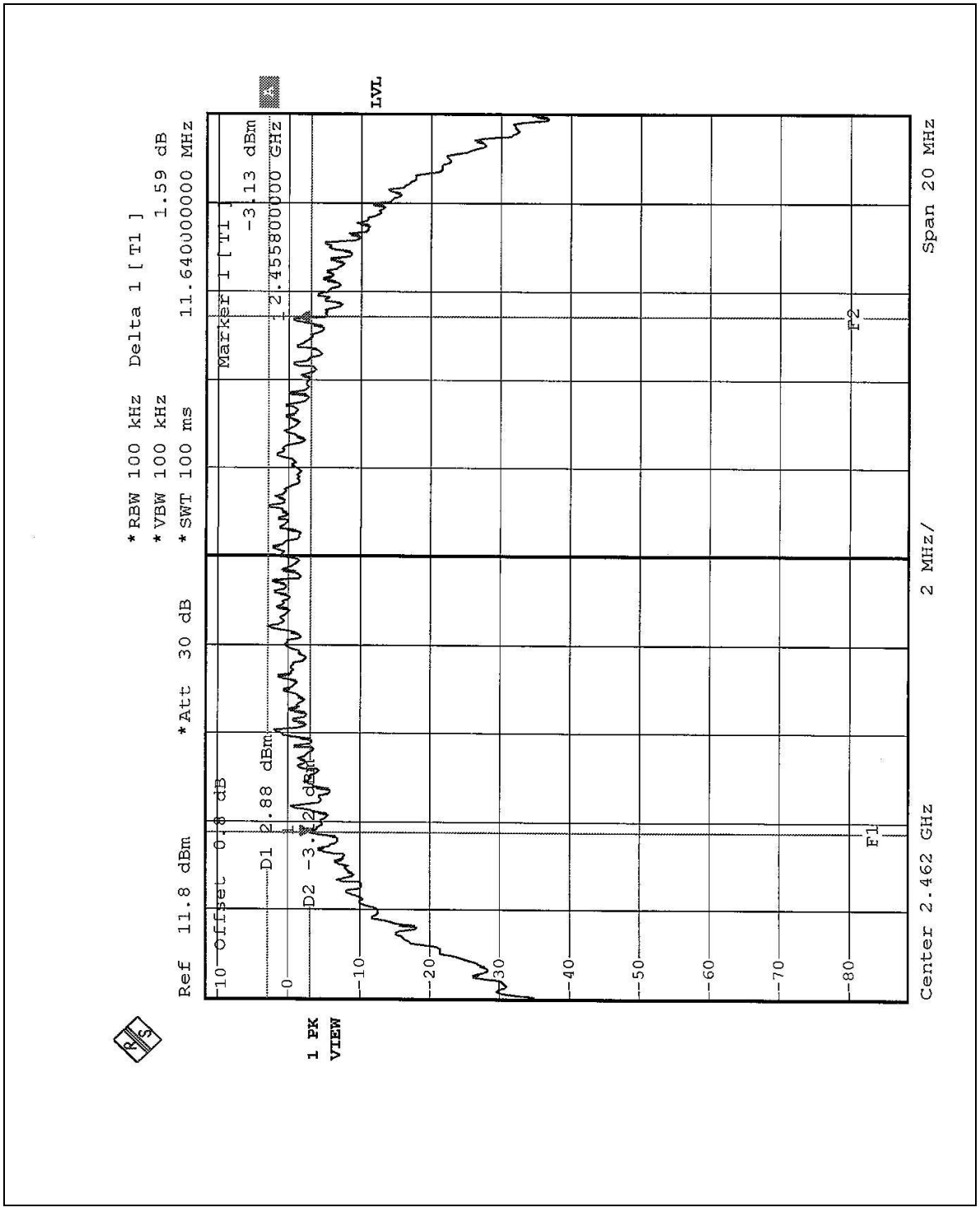
CH1


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Delta 1 [T1]
-1.85 dB
11.200000000 MHz
Marker 1 [T1]
-3.38 dBm
2.406280000 GHz
Ref 11.8 dBm
Offset 0.8 dB
*Att 30 dB
D1 2.71 dBm
LVL
Span 20 MHz
2 MHz/
Center 2.412 GHz
F1
F2
1 PK
VIEW

CH6


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Delta 1 [T1]
1.85 dB
11.200000000 MHz
Marker 1 [T1]
-3.60 dBm
2.431240000 GHz
Ref 11.8 dBm
Offset 0.6 dB
*Att 30 dB
D1 2.73 dBm
D2
LVL
1 PK
VIEW
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11


RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 1 [T1]
1.59 dB
11.640000000 MHz
Marker 1 [T1]
-3.13 dBm
2.455800000 GHz
Ref 11.8 dBm
Offset 0.8 dB
Att 30 dB
D1 2.88 dBm
D2 -3.12 dBm
LVL
1 PK
VIEW
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
PEAK POWER SENSOR	NRV-Z32	100013	Feb. 21, 2003
POWER METER	NRVS	100026	Feb. 20, 2003

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

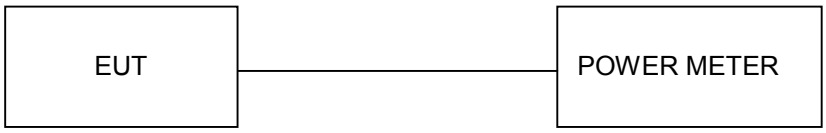
4.4.3 TEST PROCEDURES

The transmitter output was connected to the 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 PCMCIA Card	MODEL	WMA1
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. 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	13.60	30	PASS
6	2437	13.65	30	PASS
11	2462	13.57	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
R&S 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.

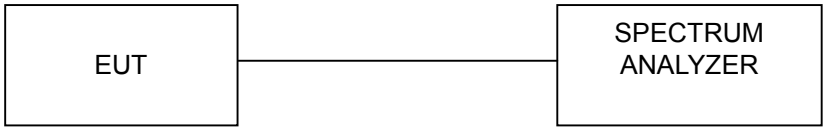
4.5.3 TEST PROCEDURE

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/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

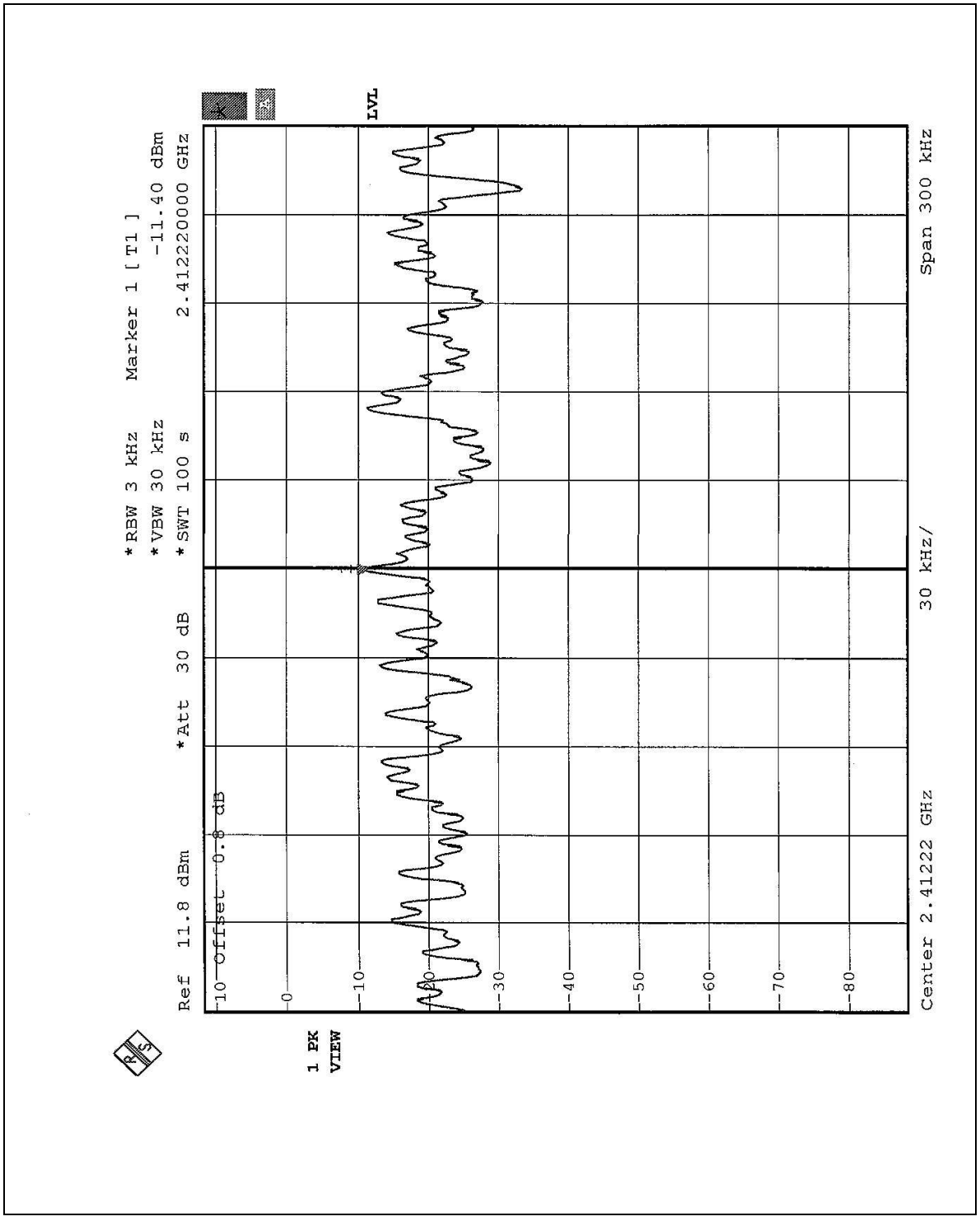
Same as 4.3.6.

4.5.7 TEST RESULTS

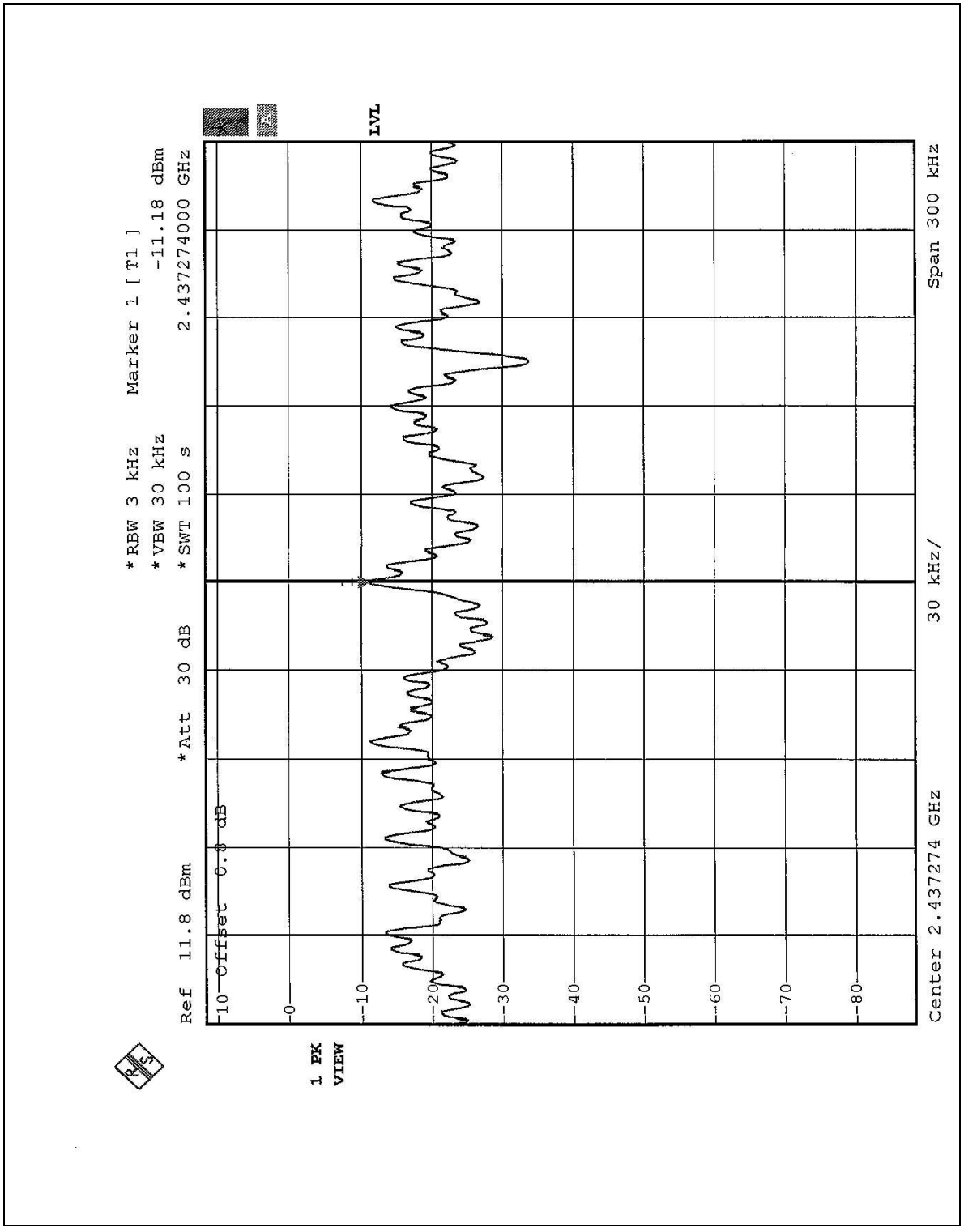
EUT	Wireless PCMCIA Card	MODEL	WMA1
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg. C, 62%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.40	8	PASS
6	2437	-11.18	8	PASS
11	2462	-9.73	8	PASS

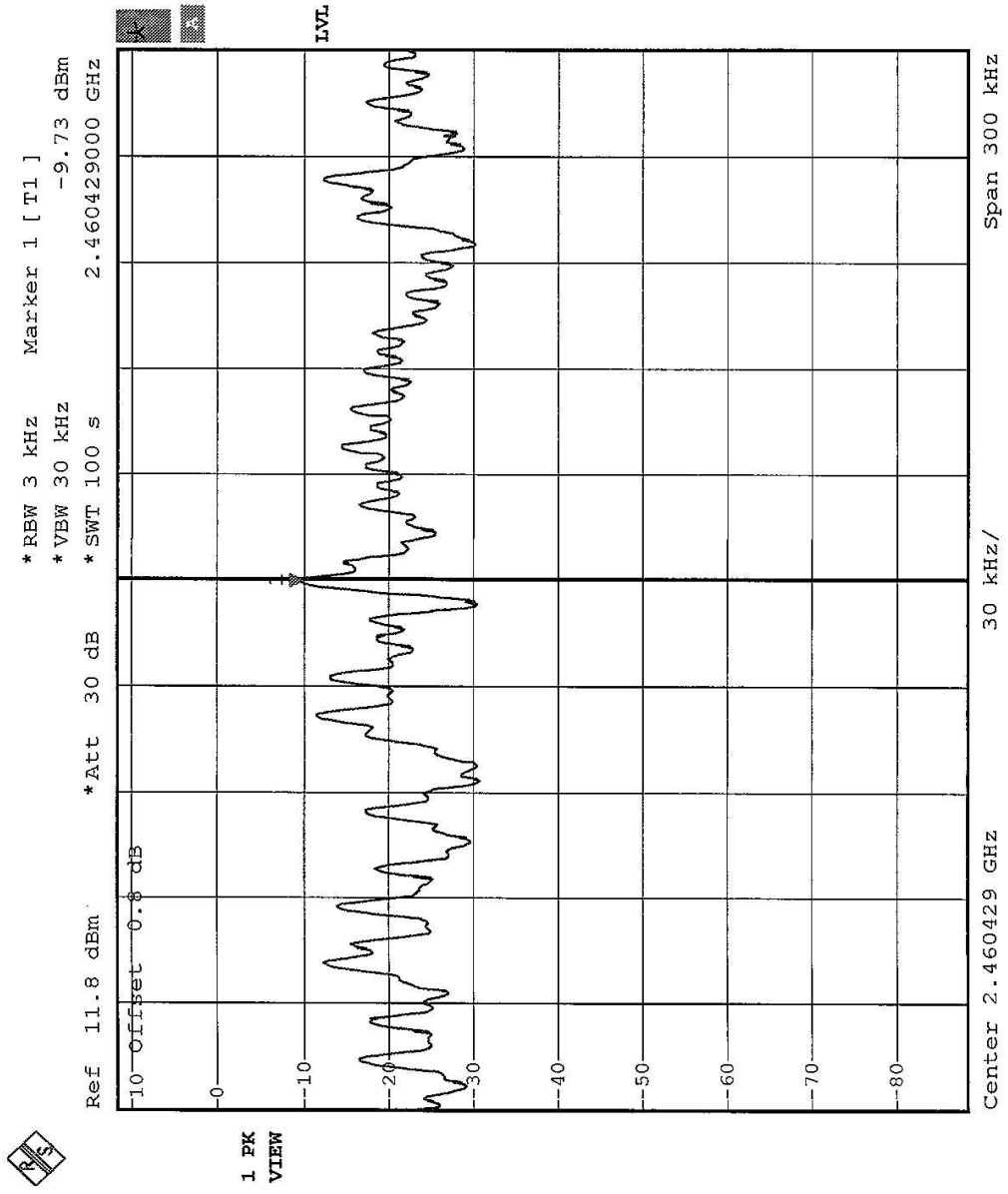
CH1


Ref 11.8 dBm
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 100 s
Marker 1 [T1]
-11.40 dBm
2.41220000 GHz
Offset 0.8 dB
LVL
1 PK
VIEW
Center 2.41222 GHz
30 kHz/
Span 300 kHz

CH6


Ref 11.8 dBm
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 100 s
Marker 1 [T1]
-11.18 dBm
2.437274000 GHz
Offset 0.8 dB
LVL
1 PK
VIEW
Center 2.437274 GHz
30 kHz/
Span 300 kHz

CH11


Ref 11.8 dBm
Offset 0.8 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 100 s
Marker 1 [T1]
-9.73 dBm
2.460429000 GHz
LVL
1 PK
VIEW
Center 2.460429 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
R&S 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

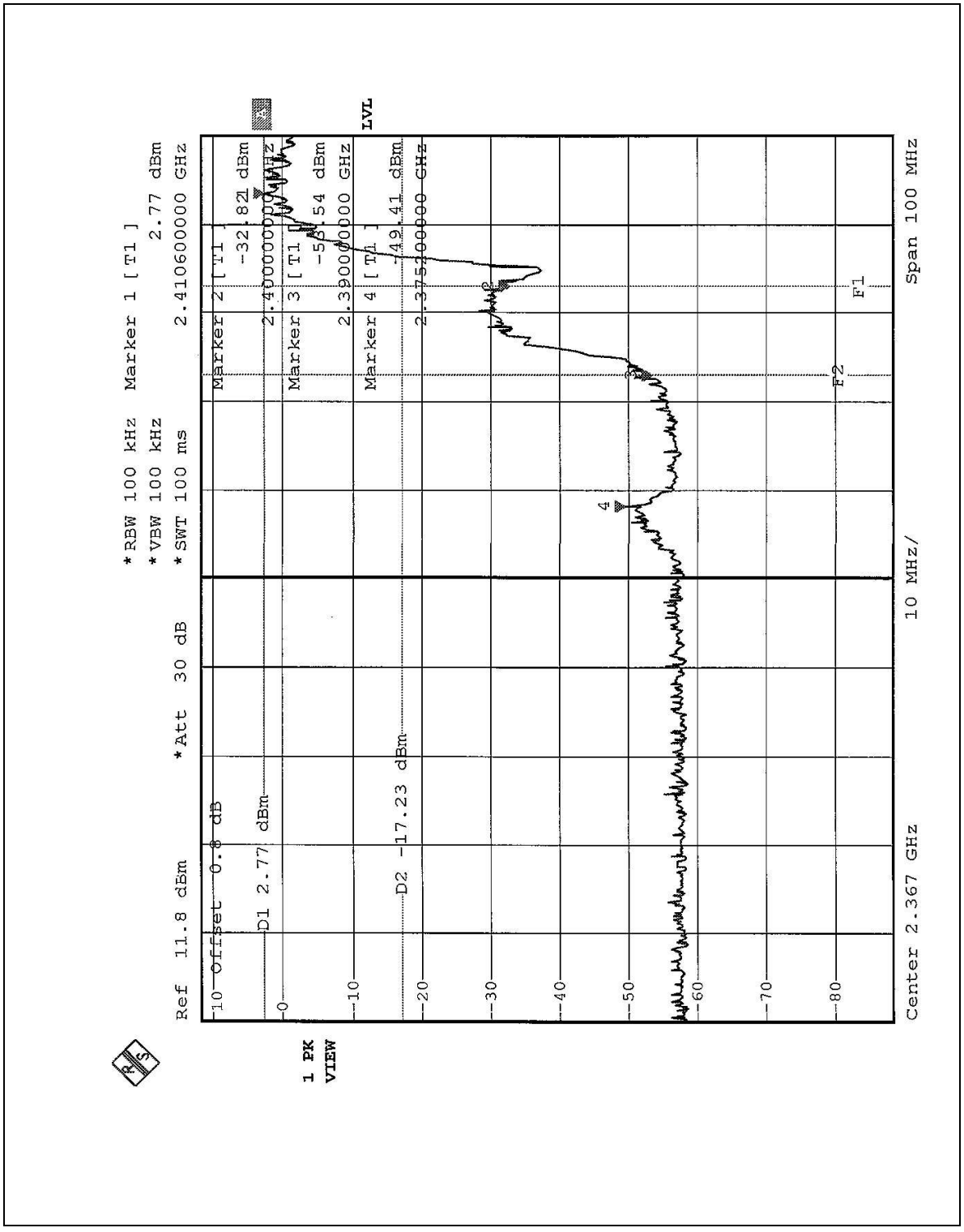
4.6.5 EUT OPERATING CONDITION

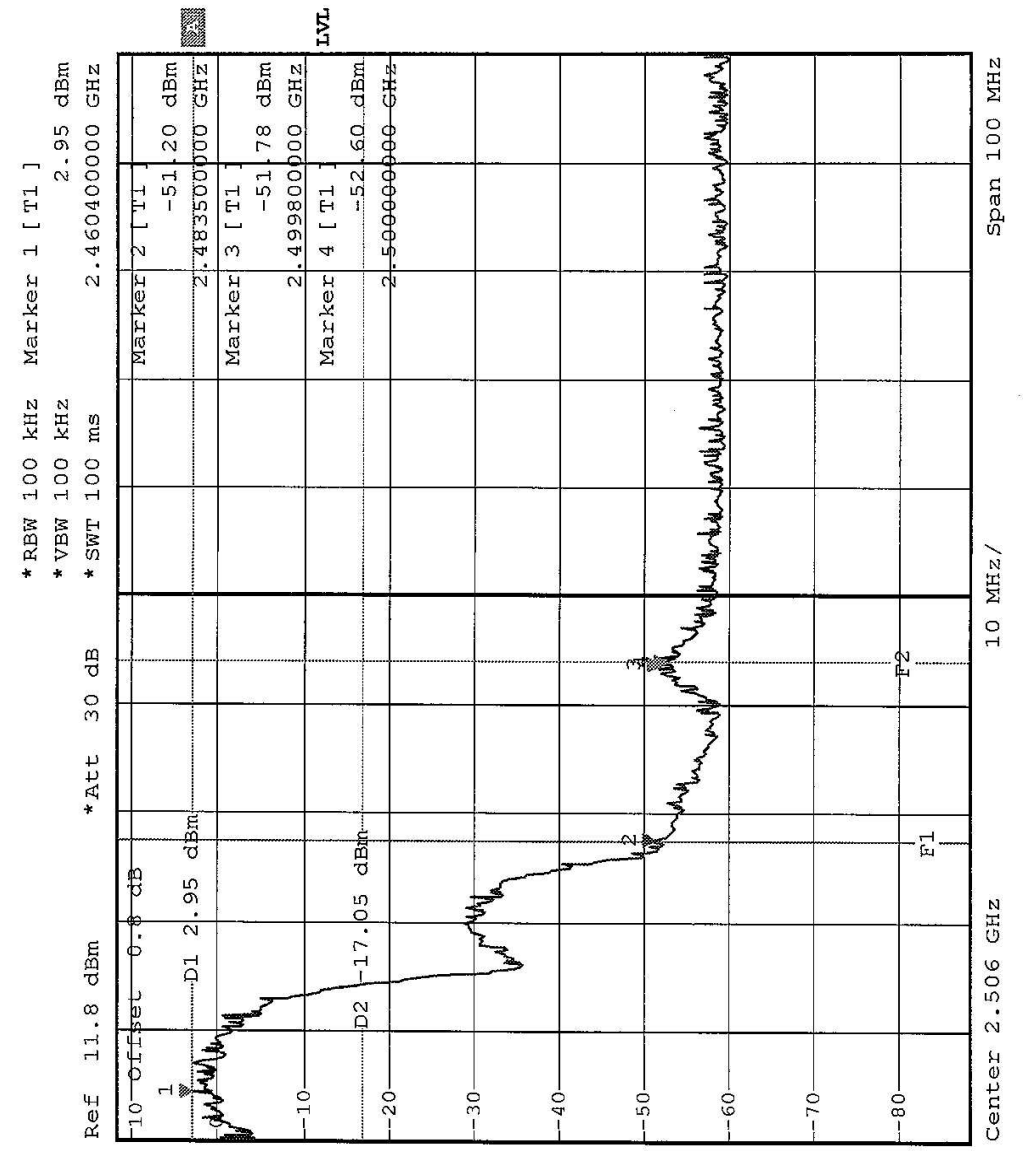
Same as Item 4.3.6.

4.6.6 TEST RESULTS

The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, 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 52.18dB / 54.15dB delta between carrier maximum power and local maximum emission in restrict band (2.3752GHz / 2.4835GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 99.3dBuV/m, so the maximum field strength in restrict band is 99.3-52.18=47.12dBuV/m which is under 54 dBuV/m limit.


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 1 [T1]
2.77 dBm
2.410600000 GHz
*Att 30 dB
Ref 11.8 dBm
Offset 0.8 dB
D1 2.77 dBm
D2 -17.23 dBm
Marker 2 [T1]
-32.82 dBm
2.400000000 GHz
Marker 3 [T1]
-55.54 dBm
2.390000000 GHz
Marker 4 [T1]
-49.41 dBm
2.375100000 GHz
LVL
1 PK
VIEW
F1
F2
Center 2.367 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Marker 1 [T1]
2.95 dBm
2.46040000 GHz
Ref 11.8 dBm
Offset 0.8 dB
Att 30 dB
D1 2.95 dBm
D2 -17.05 dBm
Marker 2 [T1]
-51.20 dBm
2.48350000 GHz
Marker 3 [T1]
-51.78 dBm
2.49980000 GHz
Marker 4 [T1]
-52.60 dBm
2.50000000 GHz
1 PK VIEW
Center 2.506 GHz
10 MHz/
Span 100 MHz

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

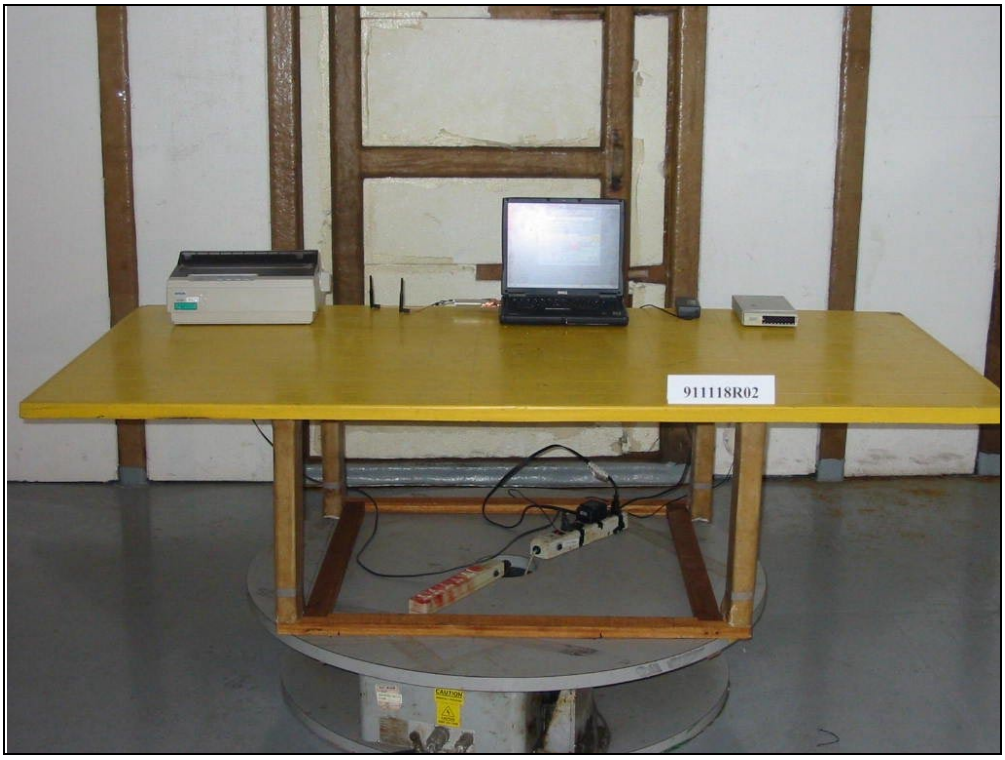
The maximum Gain antenna used in this product is Dipole antenna, and the antenna connector type for the EUT is Reversed MMCX. And the maximum Gain of these antennas is 1.46dBi.

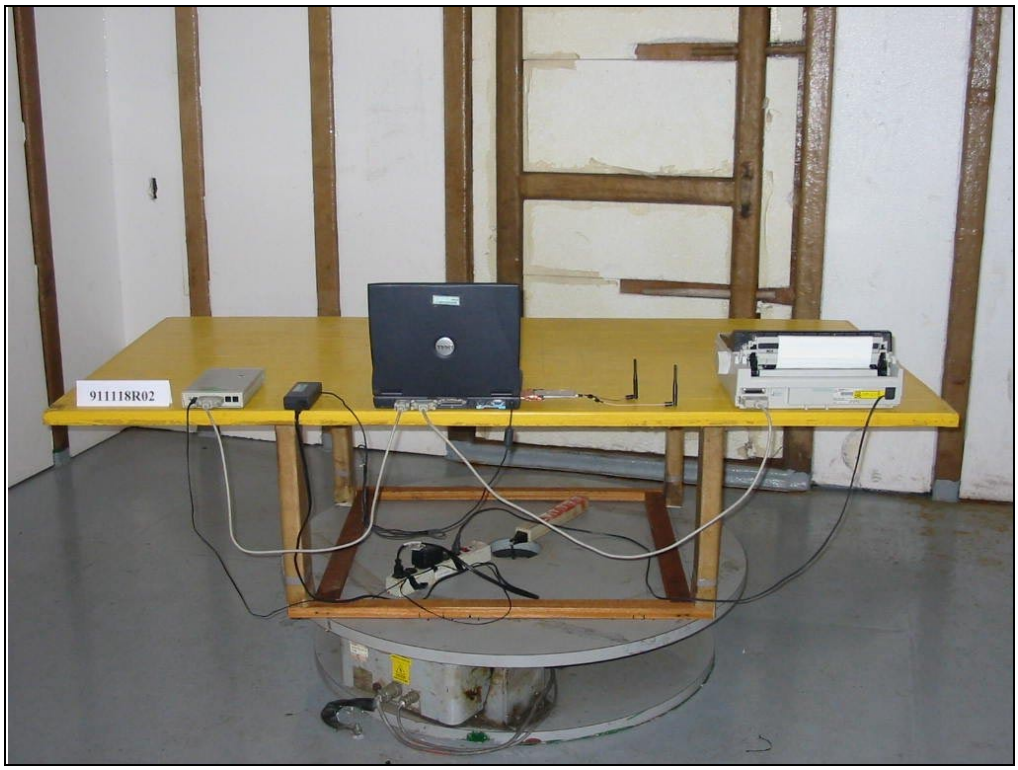
5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST


911118R02

RADIATED EMISSION TEST



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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.

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