



FCC TEST REPORT

REPORT NO.: RF930305R01

MODEL NO.: WMP-G04

RECEIVED: Mar. 5, 2004

TESTED: Mar. 8 ~ Mar. 10, 2004

APPLICANT: Alpha Networks Inc.

ADDRESS: No. 8, Li-shing 7th Rd, Science-based
Industrial Park, Hsinchu, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

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1 CERTIFICATION

PRODUCT : High-Speed 2.4GHz WLAN Mini PCI Card
MODEL NO.: WMP-G04
BRAND: Alpha Networks Inc.
APPLICANT : Alpha Networks Inc.
TEST ITEM: Engineering Sample
STANDARDS : FCC 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 Mar. 8 to Mar. 10, 2004. 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.

PREPARED BY: Windy Chou., **DATE:** Mar. 12, 2004

Windy Chou

APPROVED BY: Ellis Wu, **DATE:** Mar. 12, 2004
Ellis Wu, Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC 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 -11.73dB at 0.169MHz
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 -2.48dB at 133.41MHz
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

NOTE: The information of measurement uncertainty is available upon the customer's request.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	High-Speed 2.4GHz WLAN Mini PCI Card
MODEL NO.	WMP-G04
POWER SUPPLY	3.3Vdc from host equipment
MODULATION TYPE	BPSK, QPSK, CCK, 16QAM, 64QAM
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	17.5dBm
ANTENNA TYPE	External: Swivel Dipole antenna with 2dBi antenna gain Internal: PIFA antenna with 0dBi antenna gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. There are two antenna types provided to this EUT. One is Swivel Dipole antenna with 2dBi gain, and another is PIFA antenna with 0dBi gain.
2. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
3. The EUT complies with IEEE 802.11g draft standards, and backwards compatible with IEEE 802.11b products.
4. 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 to this EUT.

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

NOTE:

1. Below 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.
3. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst cases, were chosen for final test.
4. Two test modes were presented in the following sections, the test mode A was for CCK technique and the test mode B was for OFDM technique.
5. In the test report, both PIFA and Dipole antennas were chosen for all tests.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a High-Speed 2.4GHz WLAN Mini PCI Card. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)

ANSI C63.4 : 1992

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

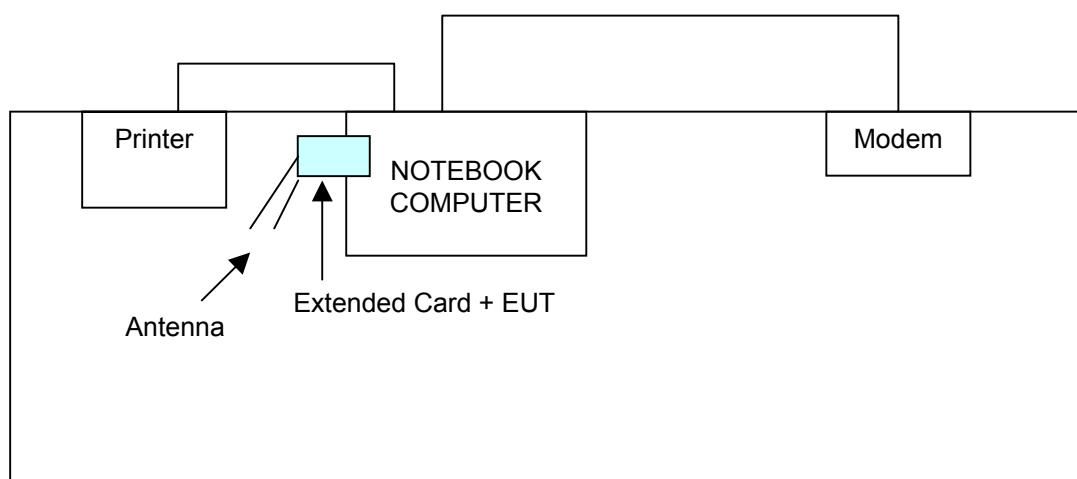
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	Dell	LX4100D	07427	HFSBLX
2	PRINTER	EPSON	LQ-300+	DCGY017058	FCC DoC Approved
3	MODEM	ACEEX	1414	980020516	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).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Jan. 04, 2005
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Dec. 09, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Dec. 09, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100220	Dec. 09, 2004
*ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 19, 2004
*ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Nov. 19, 2004
Software	Cond-V2M3	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	May 01, 2004
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010770	Mar. 24, 2004
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Apr. 06, 2004

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. “*”: These equipment are used for conducted telecom port test only (if tested).
 3. The test was performed in ADT Shielded Room No. 10.
 4. The VCCI Site Registration No. is C-1312.



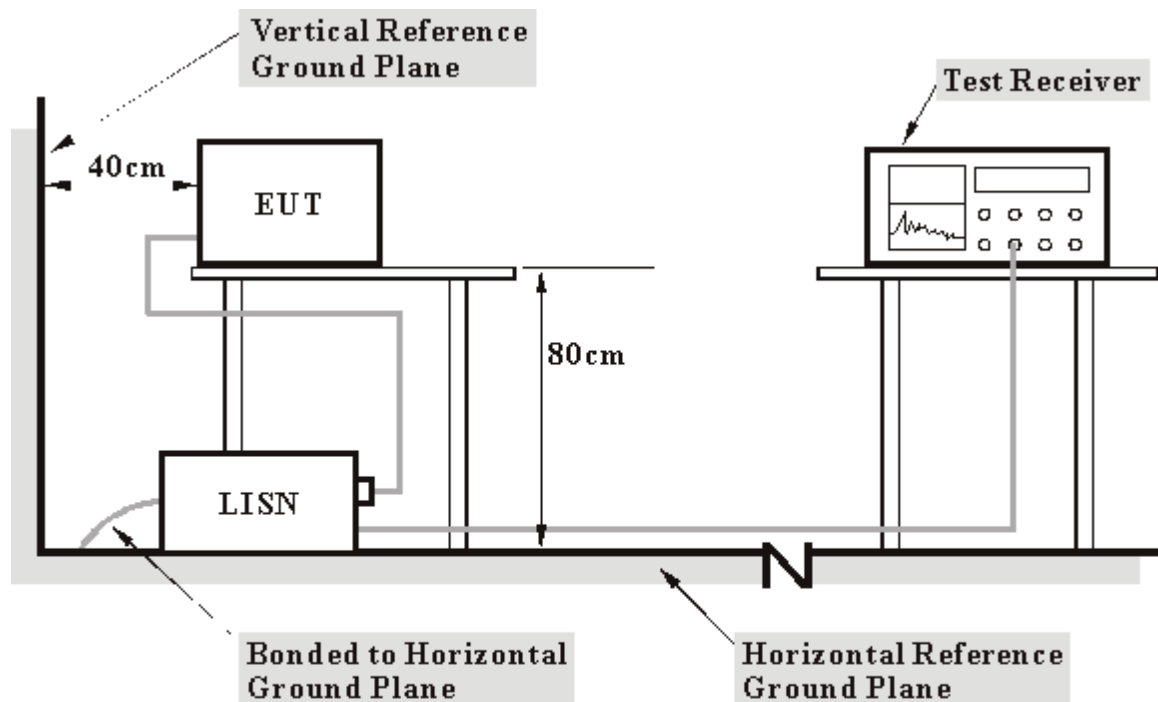
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under Limit - 20dB was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

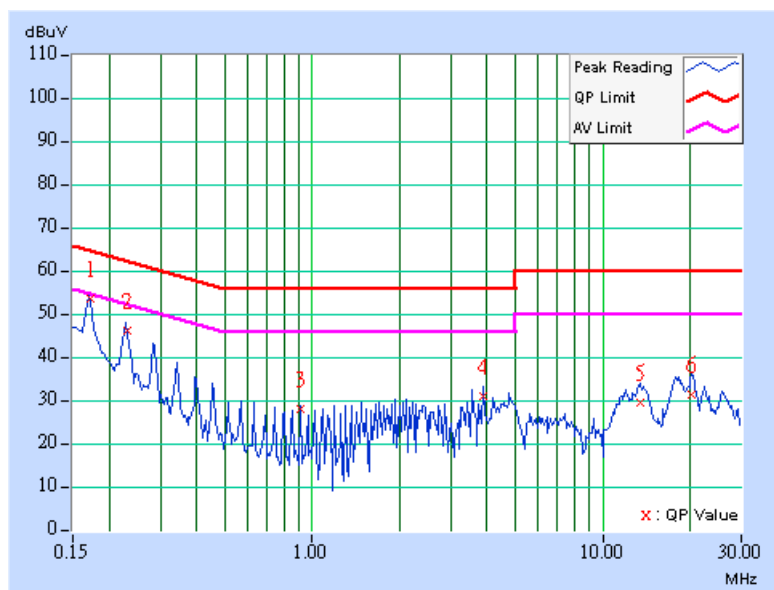
- a. Plug the EUT a notebook system placed on a testing table.
- b. The notebook system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook system sent "H" messages to its screen.
- d. The notebook system sent "H" messages to modem.
- e. The notebook system sent "H" messages to printer, and the printer prints them on paper.
- f. Steps c-e are repeated.

4.1.7 TEST RESULTS

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
MODE	Channel 1	6dB BANDWIDTH	9kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	22deg. C, 63%RH, 991 hPa	TESTED BY: Martin Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.172	0.10	52.95	-	53.05	-	64.86	54.86	-11.81	-
2	0.230	0.10	45.46	-	45.56	-	62.45	52.45	-16.89	-
3	0.910	0.18	27.15	-	27.33	-	56.00	46.00	-28.67	-
4	3.873	0.29	30.02	-	30.31	-	56.00	46.00	-25.69	-
5	13.488	0.74	28.87	-	29.61	-	60.00	50.00	-30.39	-
6	20.320	0.92	30.40	-	31.32	-	60.00	50.00	-28.68	-

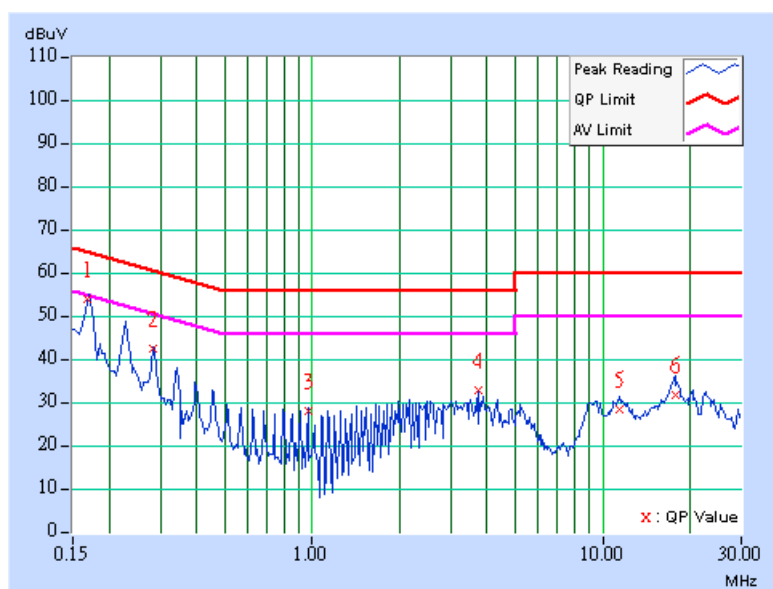
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	22deg. C, 63%RH, 991 hPa	TESTED BY: Martin Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.169	0.10	53.20	-	53.30	-	65.03	55.03	-11.73	-
2	0.284	0.10	41.91	-	42.01	-	60.69	50.69	-18.68	-
3	0.966	0.19	27.23	-	27.42	-	56.00	46.00	-28.58	-
4	3.754	0.29	32.18	-	32.47	-	56.00	46.00	-23.53	-
5	11.379	0.56	27.75	-	28.31	-	60.00	50.00	-31.69	-
6	17.797	0.76	31.24	-	32.00	-	60.00	50.00	-28.00	-

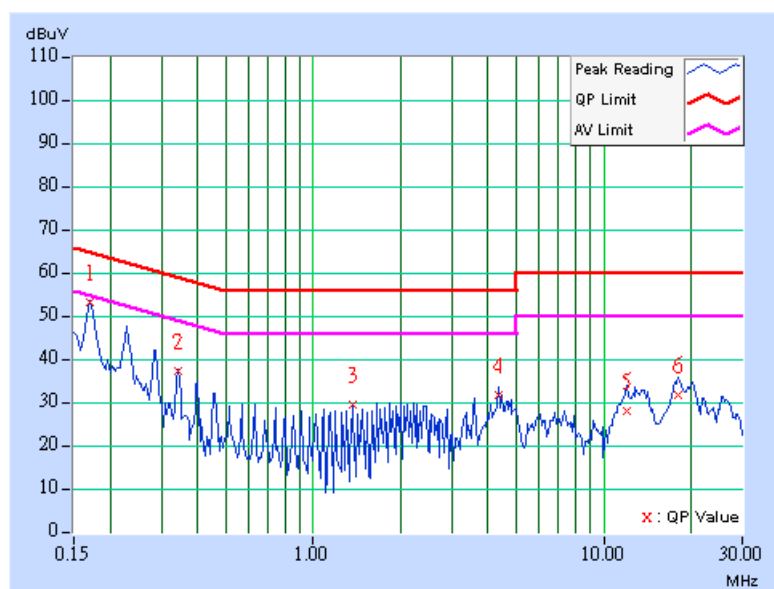
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
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



EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH, 991 hPa	TESTED BY: Martin Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.10	52.61	-	52.71	-	64.98	54.98	-12.27	-
2	0.341	0.10	36.57	-	36.67	-	59.17	49.17	-22.50	-
3	1.367	0.20	28.67	-	28.87	-	56.00	46.00	-27.13	-
4	4.333	0.32	30.81	-	31.13	-	56.00	46.00	-24.87	-
5	12.024	0.68	27.42	-	28.10	-	60.00	50.00	-31.90	-
6	18.066	0.86	30.93	-	31.79	-	60.00	50.00	-28.21	-

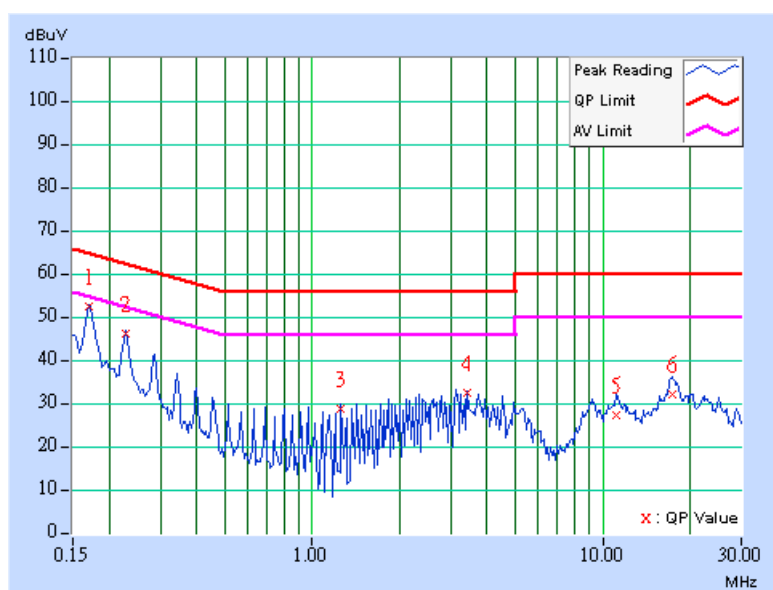
- REMARKS:**
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level -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



EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH, 991 hPa	TESTED BY: Martin Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.10	51.84	-	51.94	-	64.98	54.98	-13.04	-
2	0.228	0.10	45.38	-	45.48	-	62.52	52.52	-17.04	-
3	1.254	0.20	28.07	-	28.27	-	56.00	46.00	-27.73	-
4	3.422	0.27	31.74	-	32.01	-	56.00	46.00	-23.99	-
5	11.120	0.54	26.63	-	27.17	-	60.00	50.00	-32.83	-
6	17.406	0.75	31.59	-	32.34	-	60.00	50.00	-27.66	-

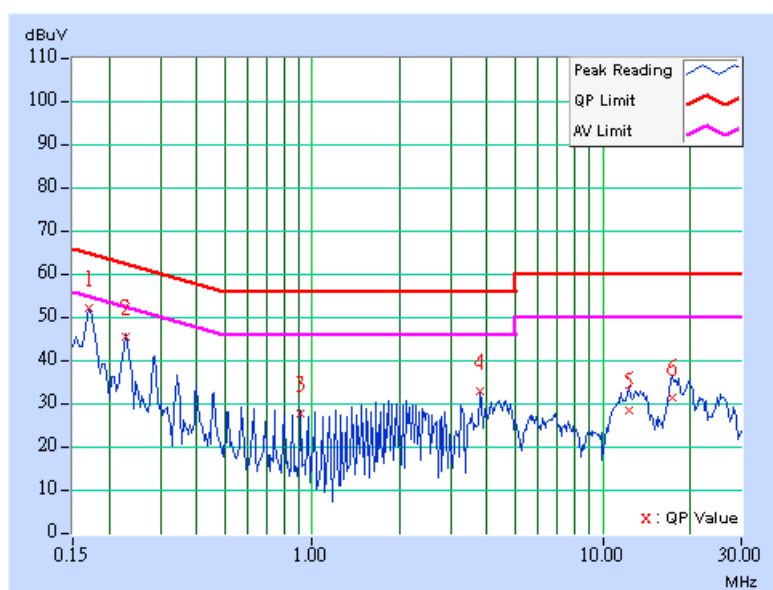
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH, 991 hPa	TESTED BY: Martin Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.171	0.10	51.44	-	51.54	-	64.92	54.92	-13.38	-
2	0.228	0.10	44.57	-	44.67	-	62.52	52.52	-17.85	-
3	0.914	0.19	27.05	-	27.24	-	56.00	46.00	-28.76	-
4	3.772	0.29	32.01	-	32.30	-	56.00	46.00	-23.70	-
5	12.336	0.69	27.85	-	28.54	-	60.00	50.00	-31.46	-
6	17.383	0.85	30.72	-	31.57	-	60.00	50.00	-28.43	-

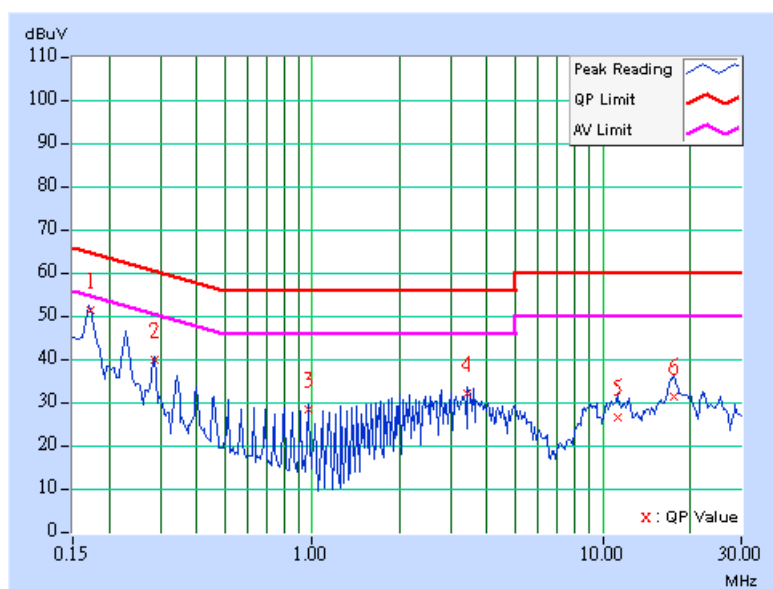
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH, 991 hPa	TESTED BY: Martin Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	50.78	-	50.88	-	64.80	54.80	-13.92	-
2	0.287	0.10	39.28	-	39.38	-	60.62	50.62	-21.24	-
3	0.970	0.20	27.67	-	27.87	-	56.00	46.00	-28.13	-
4	3.426	0.27	31.64	-	31.91	-	56.00	46.00	-24.09	-
5	11.238	0.55	26.04	-	26.59	-	60.00	50.00	-33.41	-
6	17.602	0.75	30.87	-	31.62	-	60.00	50.00	-28.38	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*HP Spectrum Analyzer	8593E	3911A07465	Jul. 07, 2004
*HP Preamplifier	8447D	2944A10386	Aug. 12, 2004
* HP Preamplifier	8449B	3008A01292	Aug. 11, 2004
SCHAFFNER Tunable Dipole Antenna	VHBA 9123	459	Jun. 26, 2004
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
*SCHAFFNER TEST RECEIVER	SCR 3501	409	Nov. 06, 2004
* SCHAFFNER BILOG Antenna	CBL6111C	2727	Jul. 15, 2004
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jun 30, 2004
* ADT. Turn Table	TT100	0201	NA
* ADT. Tower	AT100	0201	NA
* Software	ADT_Radiated_V5.14	NA	NA
* ANRITSU RF Switches	MP59B	6100237246	Oct. 17, 2004
* TIMES RF cable	LMR-600	CABLE-ST10-01	Oct. 17, 2004

- 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. 10.
 5. The VCCI Site Registration No. is R-1625.



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.

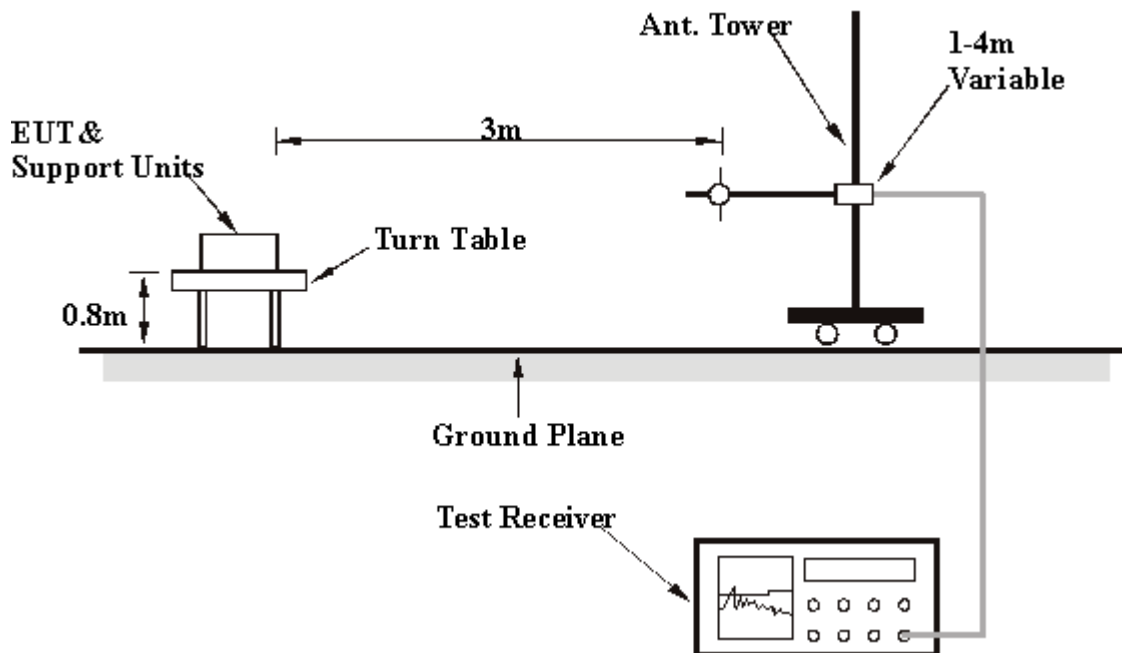
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7. TEST RESULTS

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	66.67	32.58 QP	40.00	-7.42	1.91 H	0	26.47	6.11
2	99.64	39.55 QP	43.50	-3.95	1.78 H	30	29.09	10.46
3	133.41	41.02 QP	43.50	-2.48	1.81 H	20	28.53	12.49
4	160.00	39.15 QP	43.50	-4.35	1.50 H	121	28.39	10.76
5	166.69	35.22 QP	43.50	-8.28	1.15 H	328	24.69	10.53
6	195.79	36.09 QP	43.50	-7.41	1.42 H	175	25.70	10.39
7	200.14	38.62 QP	43.50	-4.88	1.42 H	136	28.14	10.48
8	240.15	35.49 QP	46.00	-10.51	1.20 H	342	22.25	13.24
9	260.98	40.05 QP	46.00	-5.95	1.00 H	280	24.57	15.48
10	401.50	36.44 QP	46.00	-9.56	1.00 H	13	16.99	19.45
11	468.00	37.70 QP	46.00	-8.30	1.00 H	10	16.78	20.92
12	567.80	37.23 QP	46.00	-8.77	1.78 H	68	13.50	23.73
13	721.80	34.63 QP	46.00	-11.37	1.53 H	301	8.05	26.58
14	800.50	35.28 QP	46.00	-10.72	1.44 H	1	8.07	27.21
15	880.00	42.49 QP	46.00	-3.51	1.47 H	213	13.31	29.18

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	132.43	33.93 QP	43.50	-9.57	1.22 V	194	21.44	12.49
2	159.97	31.02 QP	43.50	-12.48	1.46 V	267	20.26	10.76
3	166.68	29.29 QP	43.50	-14.21	1.70 V	250	18.76	10.53
4	200.03	32.69 QP	43.50	-10.81	1.00 V	160	22.22	10.47
5	262.90	32.40 QP	46.00	-13.60	1.15 V	1	16.98	15.42
6	401.50	35.28 QP	46.00	-10.72	1.08 V	106	15.83	19.45
7	459.30	36.00 QP	46.00	-10.00	1.00 V	318	15.35	20.65
8	721.80	33.82 QP	46.00	-12.18	1.46 V	9	7.24	26.58
9	802.20	36.82 QP	46.00	-9.18	2.01 V	214	9.54	27.28
10	881.00	39.81 QP	46.00	-6.19	1.80 V	305	10.64	29.17

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
TEST MODE	A	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	DETECTOR FUNCTION	Peak (PK) Average (AV)
TESTED BY: Martin Lee			

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	42.58 PK	74.00	-31.42	1.12 H	282	12.06	30.52
1	2390.00	32.584AV	54.00	-21.42	1.12 H	282	2.06	30.52
2	*2412.00	101.75 PK			1.12 H	282	71.33	30.42
2	*2412.00	91.75 AV			1.12 H	282	61.33	30.42
3	2790.00	42.42 PK	74.00	-31.58	1.12 H	282	10.58	31.84
3	2790.00	32.42 AV	54.00	-21.58	1.12 H	282	0.58	31.84
4	7233.00	51.07 PK	74.00	-22.93	1.33 H	170	9.66	41.41
4	7233.00	38.74 AV	54.00	-15.26	1.33 H	170	-2.67	41.41

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	52.92 PK	74.00	-21.08	1.00 V	99	22.40	30.52
1	2390.00	42.75 AV	54.00	-11.25	1.00 V	99	12.23	30.52
2	*2412.00	112.09 PK			1.00 V	99	81.67	30.42
2	*2412.00	101.92 AV			1.00 V	99	71.50	30.42
3	2790.00	52.76 PK	74.00	-21.24	1.00 V	99	20.92	31.84
3	2790.00	42.59 AV	54.00	-11.41	1.00 V	99	10.75	31.84
4	7233.00	52.24 PK	74.00	-21.76	1.12 V	263	10.83	41.41
4	7233.00	38.90 AV	54.00	-15.10	1.12 V	263	-2.51	41.41

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
TEST MODE	A	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	DETECTOR FUNCTION	Peak (PK) Average (AV)
TESTED BY: Martin Lee			

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	99.43 PK			1.00 H	147	69.00	30.43
1	*2437.00	89.10 AV			1.00 H	147	58.67	30.43
2	4874.00	45.60 PK	74.00	-28.40	1.14 H	54	8.86	36.74
2	4874.00	33.90 AV	54.00	-20.10	1.14 H	54	-2.84	36.74

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	109.60 PK			1.10 V	299	79.17	30.43
1	*2437.00	98.93 AV			1.10 V	299	68.50	30.43
2	4874.00	45.90 PK	74.00	-28.10	1.06 V	351	9.16	36.74
2	4874.00	34.40 AV	54.00	-19.60	1.06 V	351	-2.34	36.74

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
TEST MODE	A	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	DETECTOR FUNCTION	Peak (PK) Average (AV)
TESTED BY: Martin Lee			

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2310.00	45.95 PK	74.00	-28.05	1.00 H	241	14.55	31.40
1	2310.00	35.79 AV	54.00	-18.21	1.00 H	241	4.39	31.40
2	*2462.00	99.28 PK			1.00 H	241	68.83	30.45
2	*2462.00	89.12 AV			1.00 H	241	58.67	30.45
3	2483.50	41.78 PK	74.00	-32.22	1.00 H	241	11.32	30.46
3	2483.50	31.62 AV	54.00	-22.38	1.00 H	241	1.16	30.46
4	7389.00	52.32 PK	74.00	-21.68	1.25 H	54	10.66	41.66
4	7389.00	39.52 AV	54.00	-14.48	1.25 H	54	-2.14	41.66

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2310.00	57.92 PK	74.00	-16.08	1.00 V	258	26.52	31.40
1	2310.00	46.51 AV	54.00	-7.49	1.00 V	258	15.11	31.40
2	*2462.00	110.28 PK			1.28 V	258	79.83	30.45
2	*2462.00	99.45 AV			1.28 V	258	69.00	30.45
3	2483.50	52.78 PK	74.00	-21.22	1.28 V	258	22.32	30.46
3	2483.50	41.95 AV	54.00	-12.05	1.28 V	258	11.49	30.46
4	4924.00	45.81 PK	74.00	-28.19	1.21 V	1	8.89	36.92
4	4924.00	34.68 AV	54.00	-19.32	1.21 V	1	-2.24	36.92
5	7389.00	51.61 PK	74.00	-22.39	1.11 V	263	9.94	41.66
5	7389.00	38.78 AV	54.00	-15.22	1.11 V	263	-2.89	41.66

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
TEST MODE	B	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	DETECTOR FUNCTION	Peak (PK) Average (AV)
TESTED BY: Martin Lee			

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	39.88 PK	74.00	-34.12	1.00 H	114	9.36	30.52
1	2390.00	30.41 AV	54.00	-23.59	1.00 H	114	-0.11	30.52
2	*2412.00	92.72 PK			1.00 H	114	62.30	30.42
2	*2412.00	83.25 AV			1.00 H	114	52.83	30.42
3	4824.00	45.42 PK	74.00	-28.58	1.02 H	98	8.87	36.56
3	4824.00	33.99 AV	54.00	-20.01	1.02 H	98	-2.56	36.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	52.08 PK	74.00	-21.92	1.00 V	147	21.56	30.52
1	2390.00	41.41 AV	54.00	-12.59	1.00 V	147	10.89	30.52
2	*2412.00	104.92 PK			1.00 V	147	74.50	30.42
2	*2412.00	94.25 AV			1.00 V	147	63.83	30.42
3	4824.00	46.42 PK	74.00	-27.58	1.45 V	254	9.87	36.56
3	4824.00	34.32 AV	54.00	-19.68	1.45 V	254	-2.23	36.56

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
TEST MODE	B	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	DETECTOR FUNCTION	Peak (PK) Average (AV)
TESTED BY: Martin Lee			

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	94.10 PK			1.00 H	199	63.67	30.43
1	*2437.00	83.93 AV			1.00 H	199	53.50	30.43
2	4874.00	46.30 PK	74.00	-27.70	1.12 H	146	9.56	36.74
2	4874.00	34.25 AV	54.00	-19.75	1.12 H	146	-2.49	36.74

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	103.03 PK			1.00 V	88	72.60	30.43
1	*2437.00	93.32 AV			1.00 V	88	62.89	30.43
2	4874.00	47.35 PK	74.00	-26.65	1.15 V	98	10.61	36.74
2	4874.00	34.58 AV	54.00	-19.42	1.15 V	98	-2.16	36.74

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

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
TEST MODE	B	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	21 deg. C, 70 % RH, 991 hPa	DETECTOR FUNCTION	Peak (PK) Average (AV)
TESTED BY: Martin Lee			

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2313.00	42.95 PK	74.00	-31.05	1.00 H	309	11.58	31.37
1	2313.00	32.12 AV	54.00	-21.88	1.00 H	309	0.75	31.37
2	*2462.00	93.95 PK			1.00 H	309	63.50	30.45
2	*2462.00	83.12 AV			1.00 H	309	52.67	30.45
3	2483.50	41.45 PK	74.00	-32.55	1.00 H	309	10.99	30.46
3	2483.50	30.62 AV	54.00	-23.38	1.00 H	309	0.16	30.46
4	2612.00	41.95 PK	74.00	-32.05	1.00 H	309	10.89	31.06
4	2612.00	31.12 AV	54.00	-22.88	1.00 H	309	0.06	31.06

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2313.00	52.25 PK	74.00	-21.75	1.00 V	188	20.88	31.37
1	2313.00	41.75 AV	54.00	-12.25	1.00 V	188	10.38	31.37
2	*2462.00	103.25 PK			1.00 V	188	72.80	30.45
2	*2462.00	92.75 AV			1.00 V	188	62.30	30.45
3	2483.50	50.75 PK	74.00	-23.25	1.00 V	188	20.29	30.46
3	2483.50	40.25 AV	54.00	-13.75	1.00 V	188	9.79	30.46
4	2612.00	51.25 PK	74.00	-22.75	1.00 V	188	20.19	31.06
4	2612.00	40.75 AV	54.00	-13.25	1.00 V	188	9.69	31.06
5	4924.00	46.08 PK	74.00	-27.92	1.05 V	87	9.16	36.92
5	4924.00	34.35 AV	54.00	-19.65	1.05 V	87	-2.57	36.92

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004

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

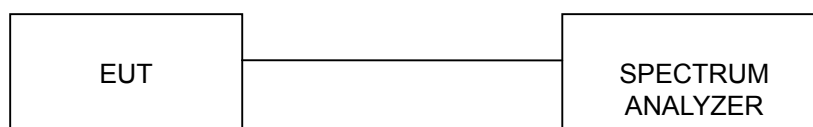
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



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

4.3.6 EUT OPERATING CONDITIONS

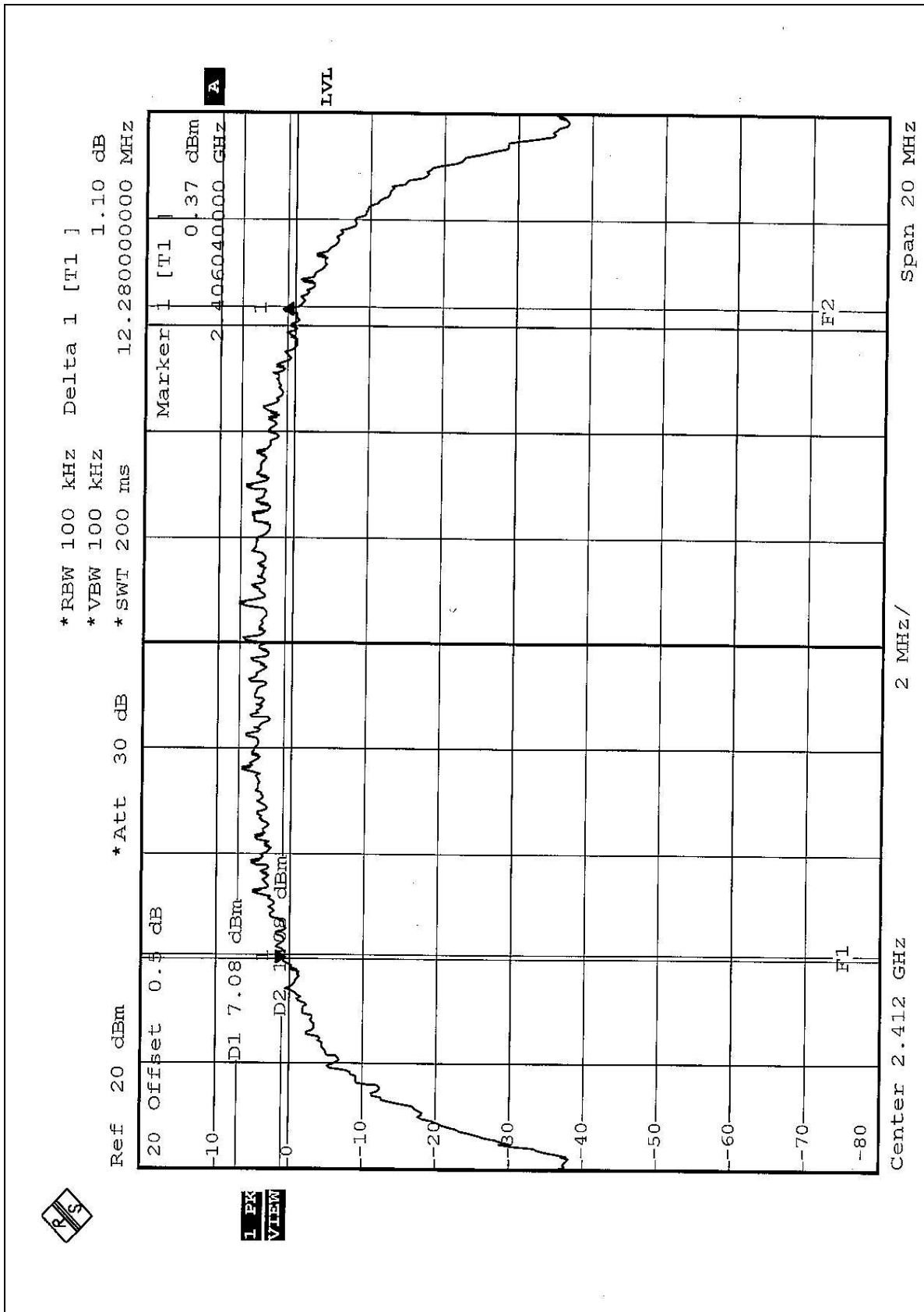
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

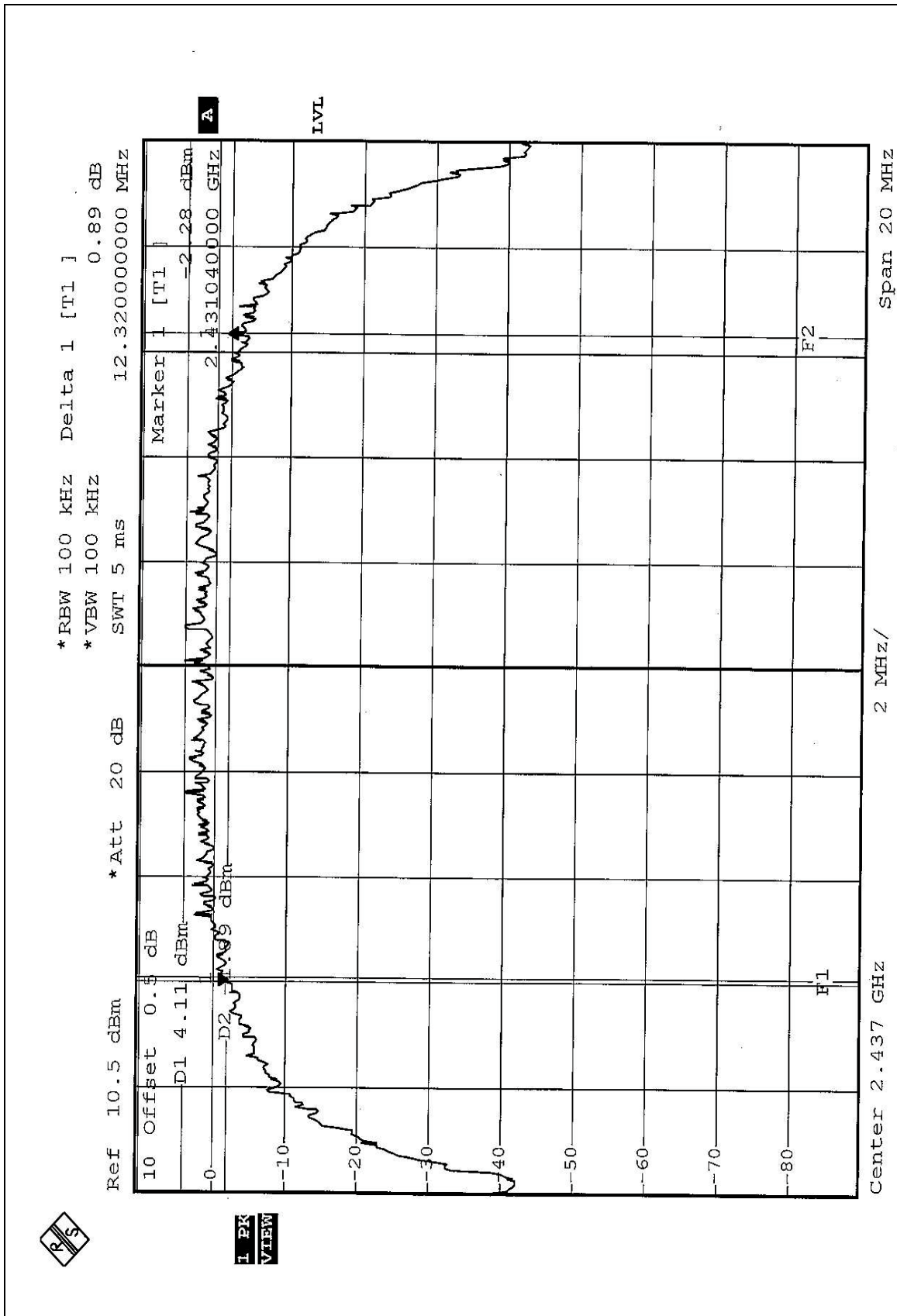
EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH, 991 hPa
MODE	A	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	12.28	0.5	PASS
6	2437	12.32	0.5	PASS
11	2462	12.24	0.5	PASS

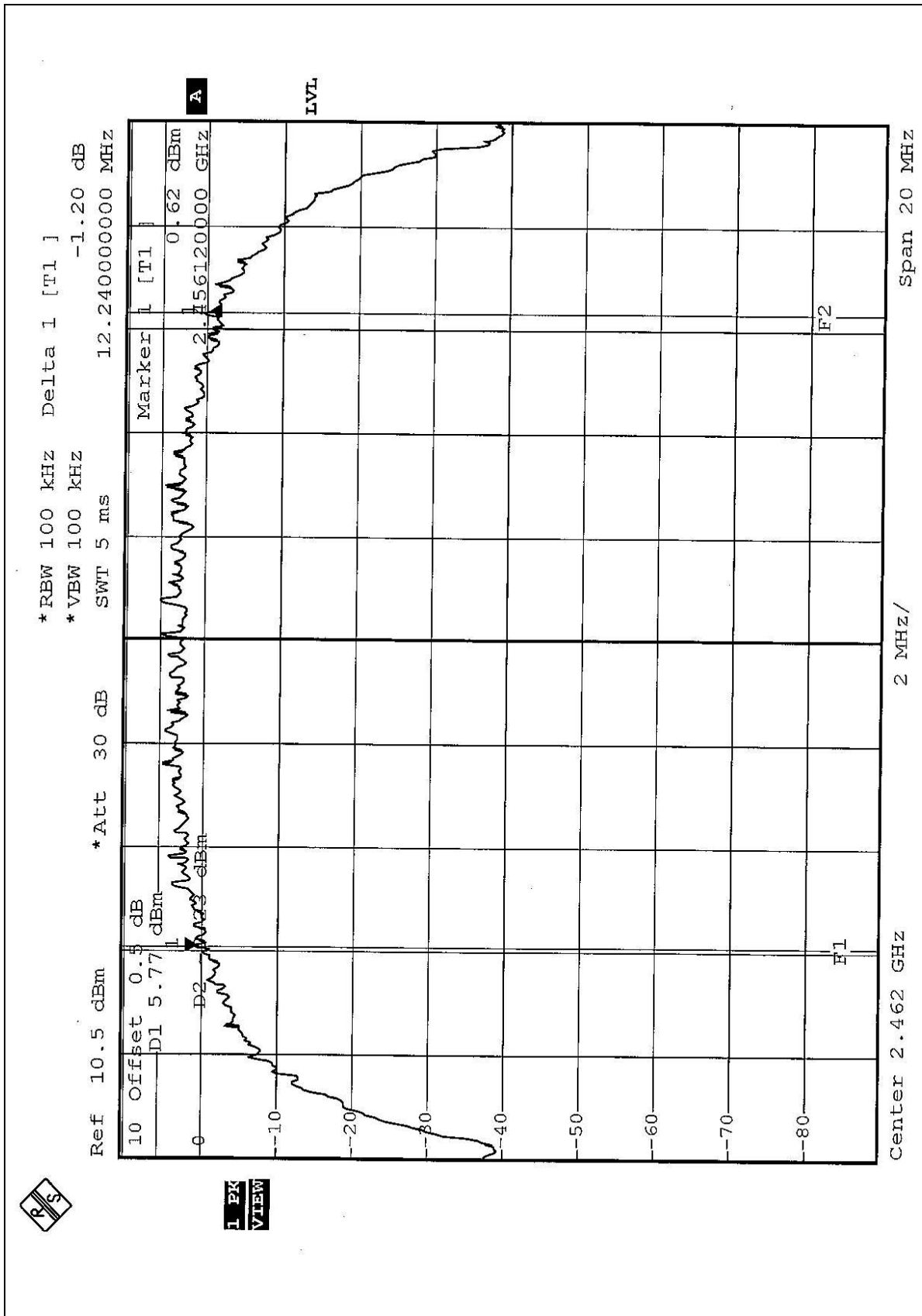
CH1



CH6



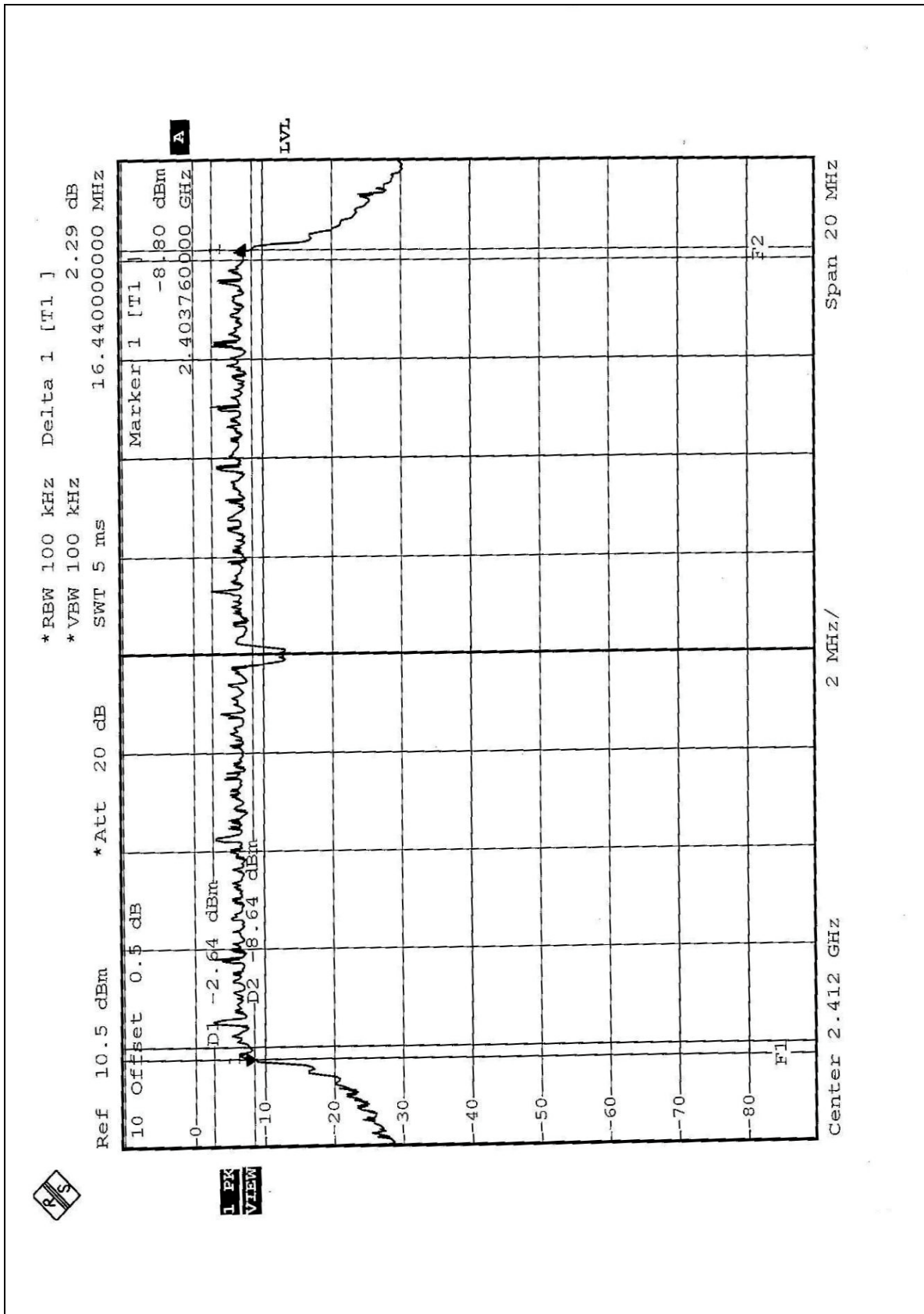
CH11



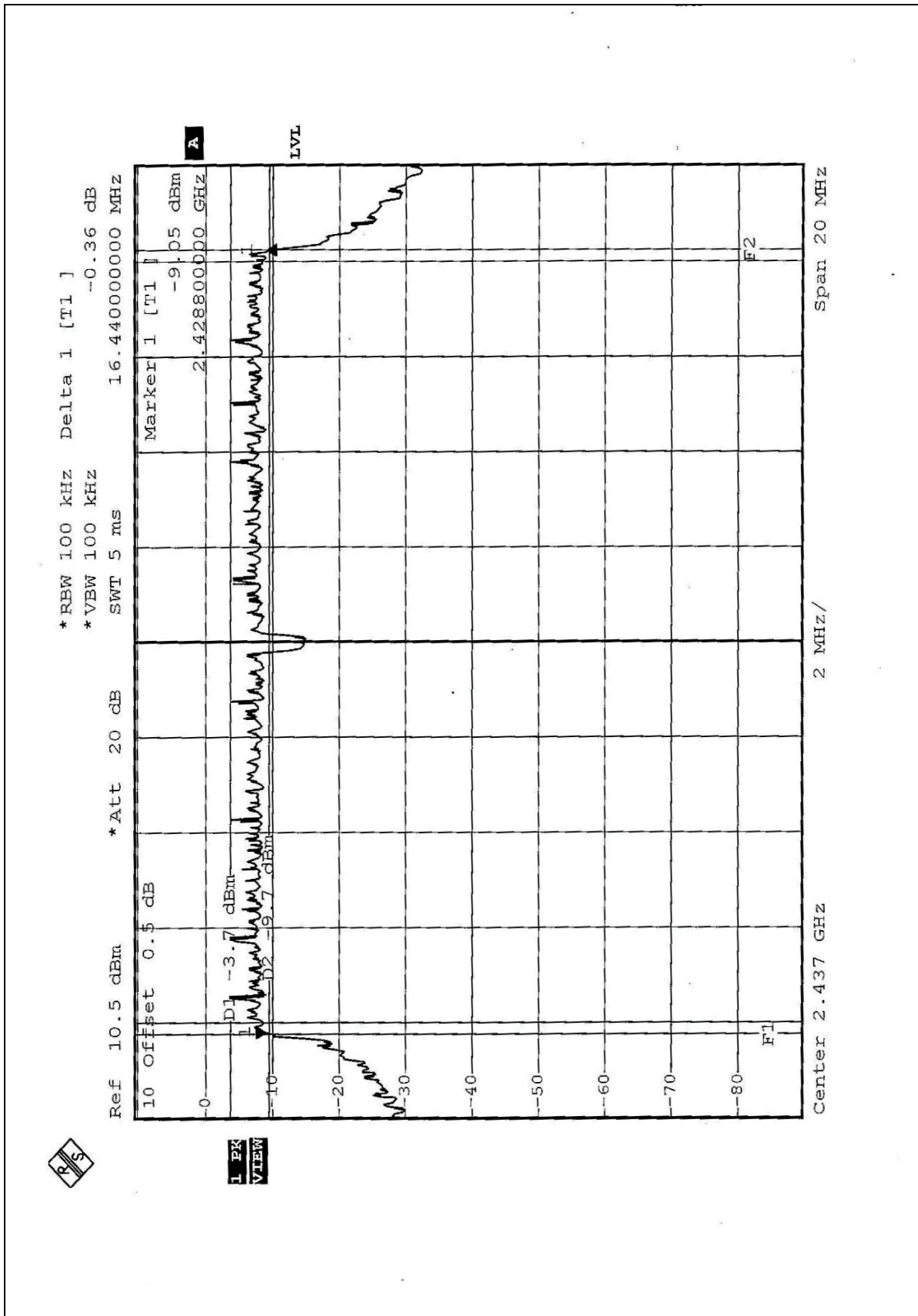
EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH, 991 hPa
TEST MODE	B	TESTED BY	Jamison Chan

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.44	0.5	PASS
6	2437	16.44	0.5	PASS
11	2462	16.40	0.5	PASS

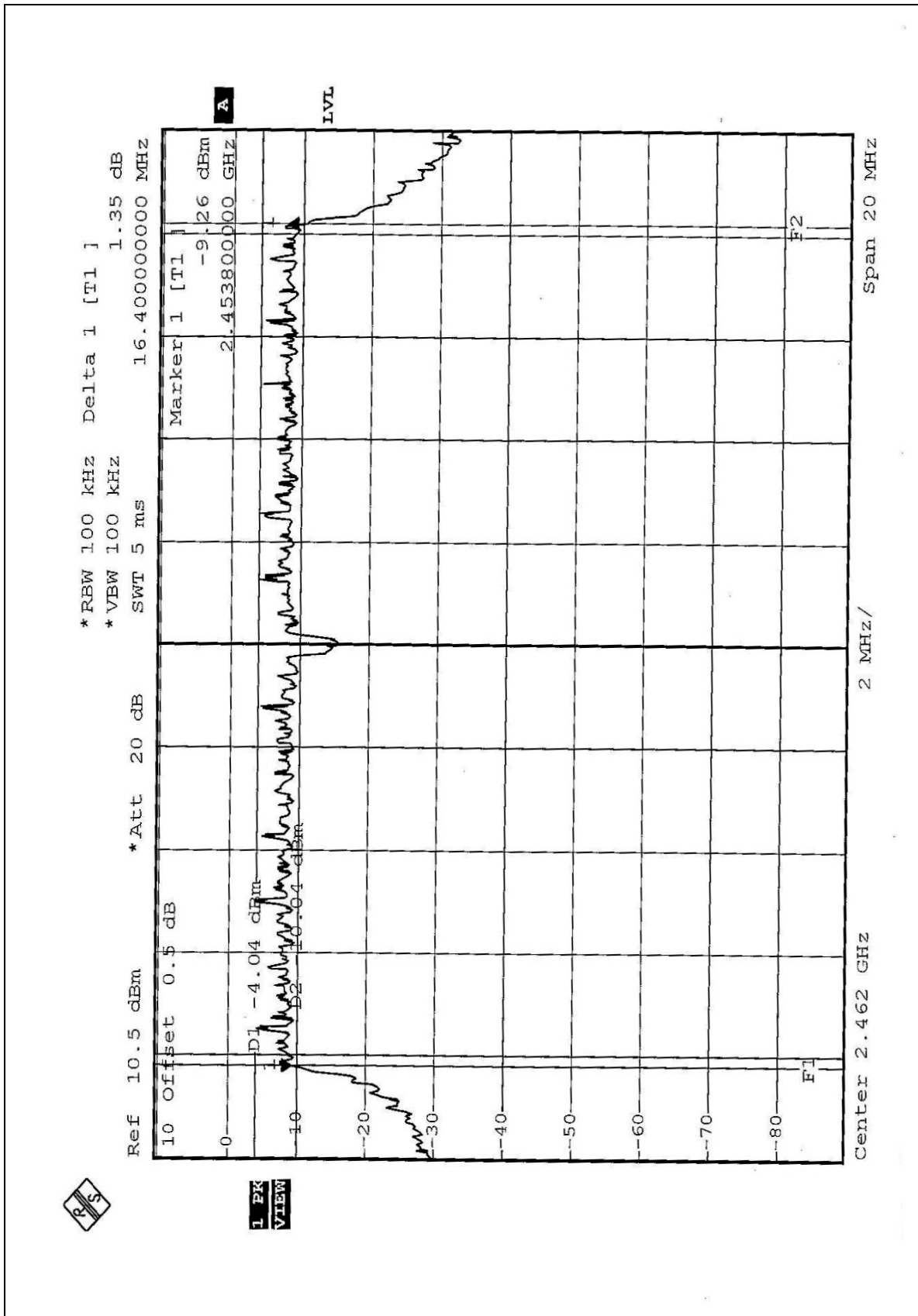
CH1



CH6



CH11



4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004
R&S SIGNAL GENERATOR	SMP04	100011	May 28, 2004
TEKTRONIX OSCILLOSCOPE	TDS 1012	C30657	Mar. 19, 2004
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

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

4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

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