



FCC TEST REPORT

REPORT NO.: RF910808R02

MODEL NO.: WAP51AB

RECEIVED: July 29, 2002

TESTED: July 30 ~ Sep. 9, 2002

APPLICANT: The Linksys Group, Inc.

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ISSUED BY: Advance Data Technology Corporation

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0528
ILAC MRA



Lab Code: 200102-0



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1 CERTIFICATION

PRODUCT : Dual-Band Wireless Access Point
BRAND NAME : Linksys
MODEL NO. : WAP51AB
APPLICANT : The Linksys Group, Inc.
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247),
Subpart E (Section 15.407) and Subpart B,
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from July 30 ~ Sep. 9, 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 : Sep. 12, 2002
Emily Lu

APPROVED BY : Alan Lane for , DATE : Sep. 12, 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 -11.14dBuV at 0.226MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -3.4dBuV at 811.20MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit



APPLIED STANDARD: 47 CFR Part 15, Subpart E and Subpart B

Standard Section	Test Type	Result	REMARK
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -11.69dBuV at 0.244MHz
15.407(b)(5)	Electric Field Strength Spurious Emissions, 30 MHz – 40000 MHz (Transmitting)	PASS	Meet the requirement of limit Minimum passing margin is -2.4dBuV at 10520.0MHz
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit
15.407(b1/2/3)	Effective Isotropic Radiated Power Spurious Emissions, 1 GHz – 40 GHz	PASS	Meet the requirement of limit Minimum passing margin is -2.2dBm at 5149.80MHz
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Dual-Band Wireless Access Point
MODEL NO.	WAP51AB
POWER SUPPLY	5.0VDC from AC adapter
MODULATION TYPE	802.11b: DSSS 802.11a: OFDM
TRANSFER RATE	802.11b: 1 / 2 / 5.5 / 11Mbps 802.11a: 6 to 54Mbps
FREQUENCY RANGE	802.11b: 2412MHz ~ 2462MHz 802.11a: 5.15GHz ~ 5.35GHz
NUMBER OF CHANNEL	802.11b: 11 802.11a: 8
CHANNEL SPACING	802.11b: 5MHz 802.11a: 20MHz
OUTPUT POWER	802.11b: 10.53dBm 802.11a: 14.63dBm
DATA CABLE	NA
ANTENNA TYPE	Dipole
I/O PORTS	RJ45
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT was powered by the following AC adapter:

BRAND :	LINKSYS
MODEL :	MS15-050250-A1D
INPUT :	AC100-240V 50/60Hz 0.5A
OUTPUT :	DC5.0V 2.5A

2. The EUT operates in both the 5GHz and 2.4GHz Bands and Wi-Fi compatibility with 802.11a and 802.11b technology.
3. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3.2 DESCRIPTION OF TEST MODES

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

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

NOTE:

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

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

Channel	Frequency	Channel	Frequency
1	5180 MHz	5	5260 MHz
2	5200 MHz	6	5280 MHz
3	5220 MHz	7	5300 MHz
4	5240 MHz	8	5320 MHz

NOTE:

1. The EUT was transmitting at full power on the specified channel with a duty cycle of 99% (maximum allowed). The EUT was tested in normal mode (channel bandwidth of approximately 30MHz).
2. "Normal Mode" allows data rates of up to 54Mbps. The device was, therefore, tested in Normal mode at the data rate that produced the highest output power for normal mode (6Mbps).
3. Channel 1, 4, 5 and 8 are the closest frequencies to the band edge, were chosen for final test of Normal Mode.



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Dual-Band Wireless Access Point. 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),
Subpart E (15.407) and Subpart B.
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	DELL	PP01L	TW-09C748-12800-19O-B220	FCC DoC APPROVED
2	FAST ETHERNET PC CARD	D-Link	DFE-680TXD	RE1A044413	MQ4FE2K5MX

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

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



4 TEST TYPES AND RESULTS (FOR PART 802.11b)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	847793/022	Mar. 12, 2003
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	Jul. 23, 2003
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 25, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	90031627	Jul. 23, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C05.01	Jul. 23, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 2003
Shielded Room	Site 5	ADT-C05	NA
VCCI Site Registration No.	Site 5	C-1093	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. The test was performed in ADT Open Site No. 5.



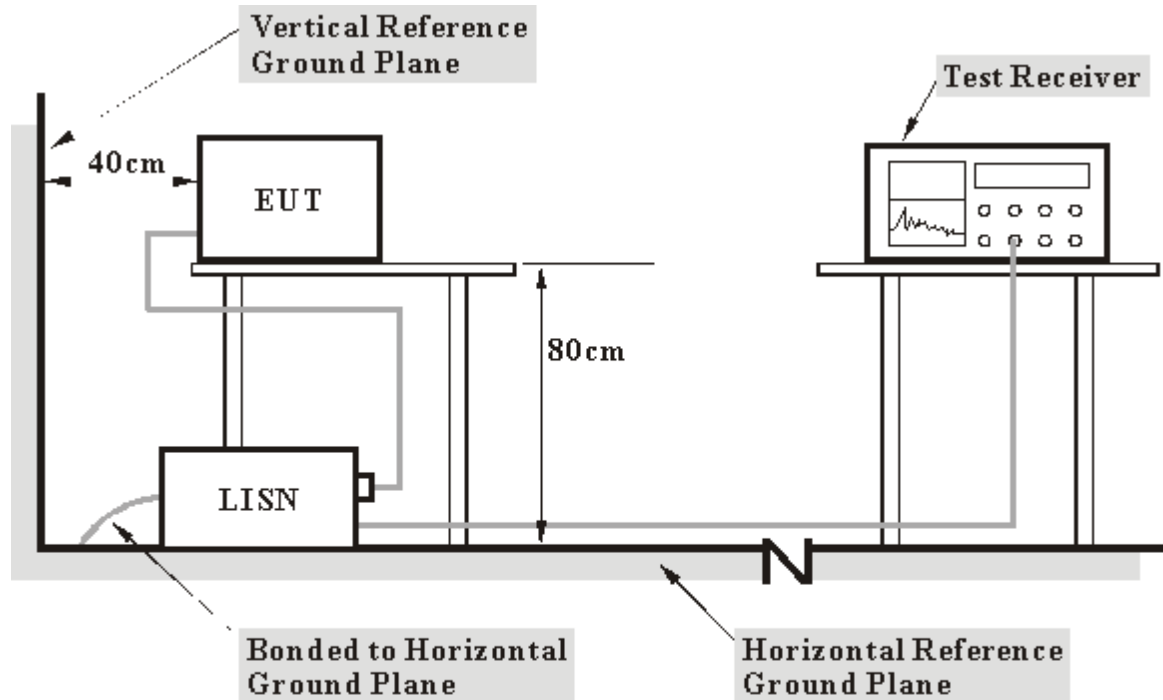
4.1.3 TEST PROCEDURES

- 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. Placed the EUT on the testing table.
- b. Prepared another computer system to act as a communication partner and placed it outside of testing area.
- c. The communication partner run a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency via an RJ 45 cable.
- d. The communication partner sent data to EUT by command "PIN".

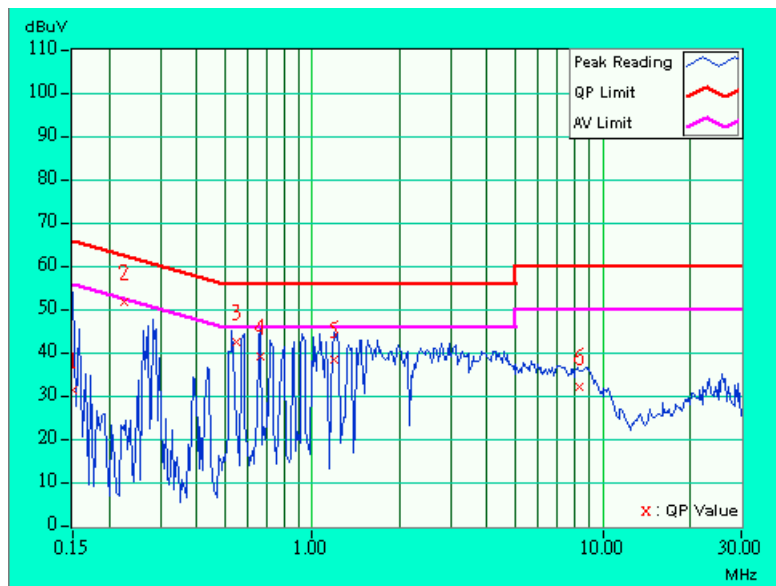


4.1.7 TEST RESULTS

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50 %RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.150	0.10	31.06	-	31.16	-	66.00	56.00	-34.84	-
2	0.226	0.10	51.37	-	51.47	-	62.61	52.61	-11.14	-
3	0.551	0.13	41.95	-	42.08	-	56.00	46.00	-13.92	-
4	0.666	0.14	38.65	-	38.79	-	56.00	46.00	-17.21	-
5	1.195	0.20	38.00	-	38.20	-	56.00	46.00	-17.80	-
6	8.340	0.54	31.65	-	32.19	-	60.00	50.00	-27.81	-

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

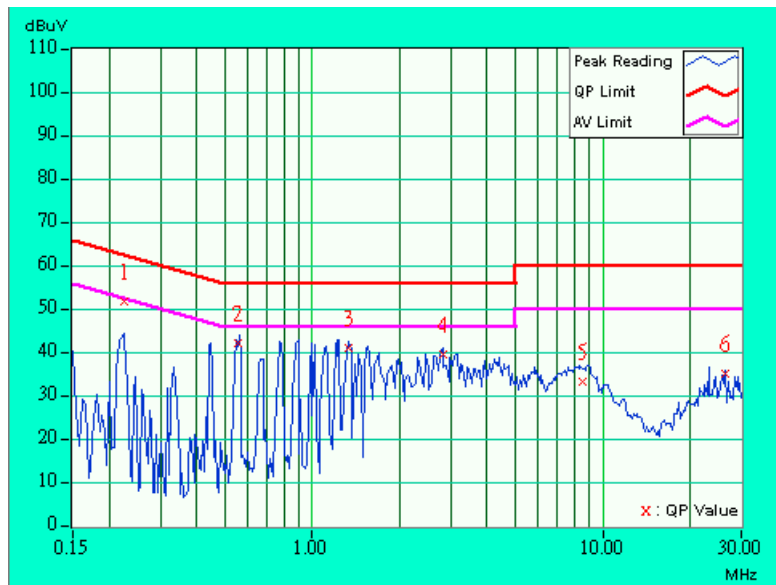




EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50 %RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.224	0.10	50.94	-	51.04	-	62.66	52.66	-11.62	-
2	0.552	0.13	41.57	-	41.70	-	56.00	46.00	-14.30	-
3	1.328	0.20	40.33	-	40.53	-	56.00	46.00	-15.47	-
4	2.809	0.24	38.82	-	39.06	-	56.00	46.00	-16.94	-
5	8.504	0.38	32.56	-	32.94	-	60.00	50.00	-27.06	-
6	26.547	0.73	34.59	-	35.32	-	60.00	50.00	-24.68	-

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

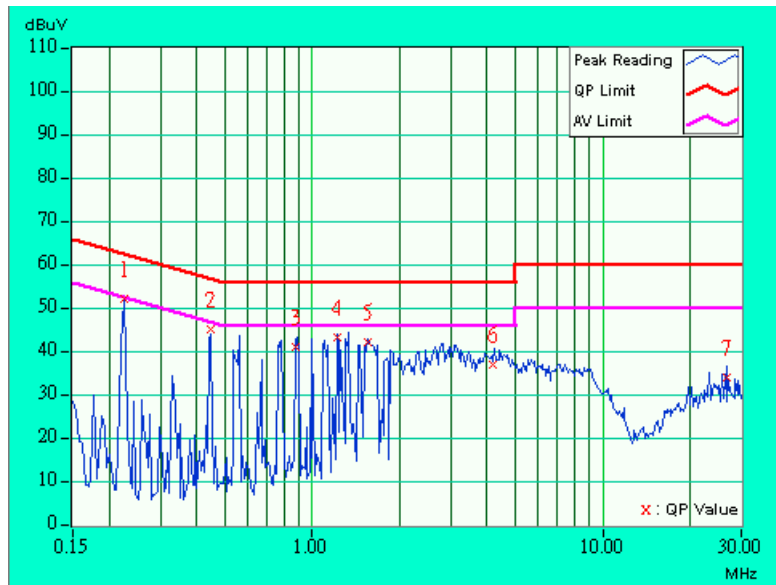




EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50 %RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.224	0.10	50.90	-	51.00	-	62.66	52.66	-11.66	-
2	0.447	0.11	43.92	-	44.03	-	56.93	46.93	-12.91	-
3	0.873	0.18	39.98	-	40.16	-	56.00	46.00	-15.84	-
4	1.215	0.20	41.95	-	42.15	-	56.00	46.00	-13.85	-
5	1.551	0.20	40.89	-	41.09	-	56.00	46.00	-14.91	-
6	4.195	0.41	35.62	-	36.03	-	56.00	46.00	-19.97	-
7	26.605	1.23	32.82	-	34.05	-	60.00	50.00	-25.95	-

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

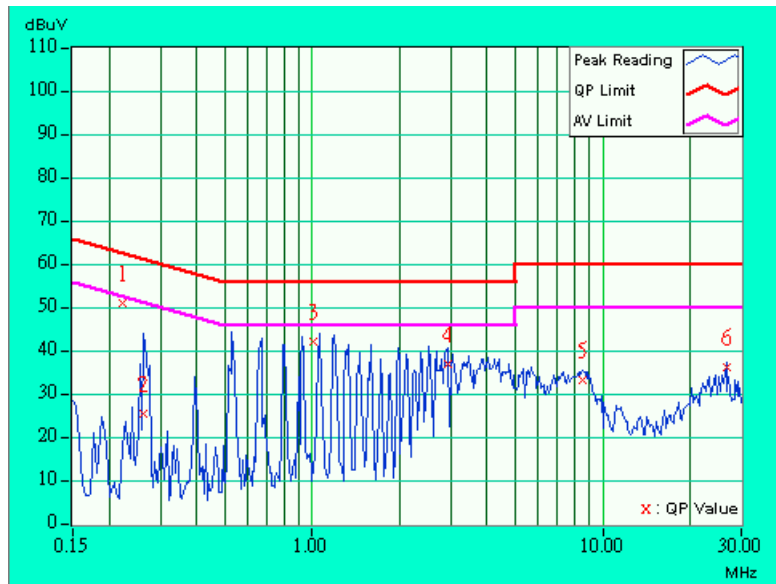




EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50 %RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.222	0.10	50.52	-	50.62	-	62.73	52.73	-12.11	-
2	0.263	0.10	24.97	-	25.07	-	61.33	51.33	-36.26	-
3	1.006	0.20	41.60	-	41.80	-	56.00	46.00	-14.20	-
4	2.926	0.25	36.47	-	36.72	-	56.00	46.00	-19.28	-
5	8.500	0.38	32.53	-	32.91	-	60.00	50.00	-27.09	-
6	26.609	0.73	35.68	-	36.41	-	60.00	50.00	-23.59	-

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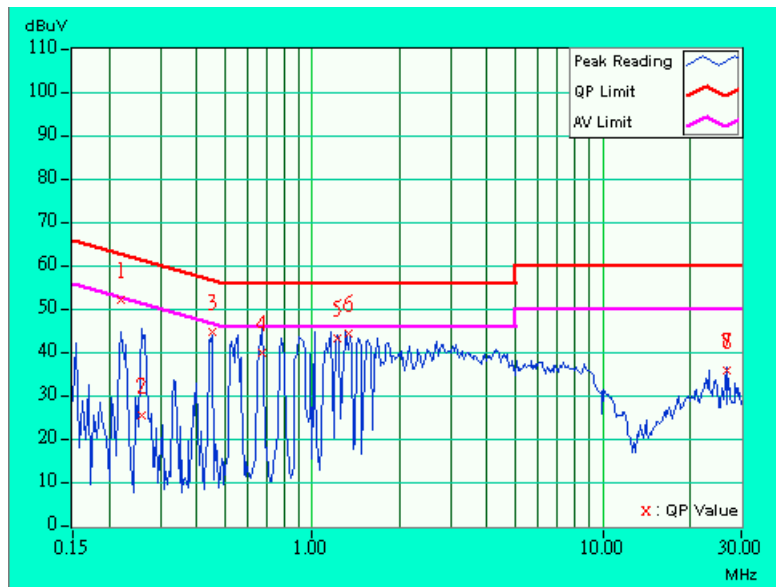




EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50 %RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.220	0.10	50.86	-	50.96	-	62.81	52.81	-11.85	-
2	0.259	0.10	24.28	-	24.38	-	61.45	51.45	-37.07	-
3	0.451	0.11	43.49	-	43.60	-	56.86	46.86	-13.26	-
4	0.670	0.14	38.77	-	38.91	-	56.00	46.00	-17.09	-
5	1.219	0.20	41.92	-	42.12	-	56.00	46.00	-13.88	-
6	1.338	0.20	43.20	-	43.40	-	56.00	46.00	-12.60	-
7	26.609	1.23	34.63	-	35.86	-	60.00	50.00	-24.14	-
8	26.609	1.23	34.53	-	35.76	-	60.00	50.00	-24.24	-

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

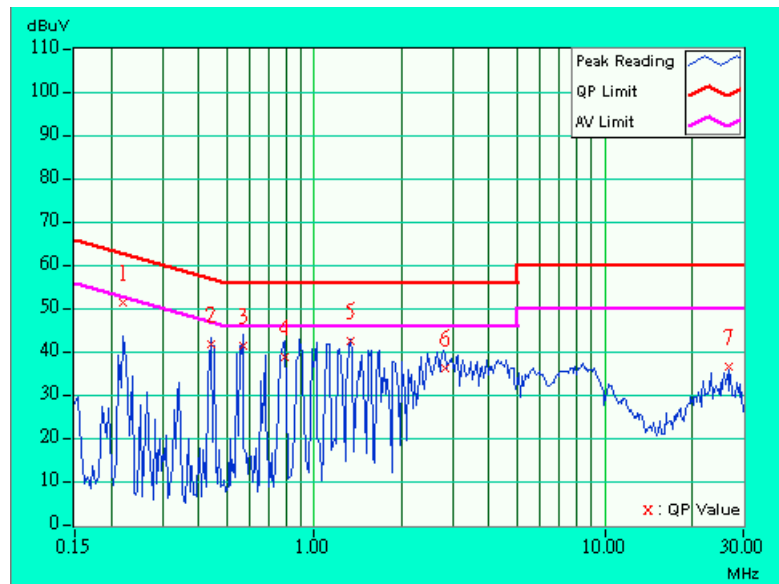




EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50 %RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]		QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.220	0.10	50.76	-	50.86	-	62.81	52.81	-11.95	-
2	0.439	0.11	41.22	-	41.33	-	57.08	47.08	-15.75	-
3	0.568	0.13	40.67	-	40.80	-	56.00	46.00	-15.20	-
4	0.795	0.17	38.25	-	38.42	-	56.00	46.00	-17.58	-
5	1.340	0.20	41.91	-	42.11	-	56.00	46.00	-13.89	-
6	2.832	0.24	35.47	-	35.71	-	56.00	46.00	-20.29	-
7	26.609	0.73	35.99	-	36.72	-	60.00	50.00	-23.28	-

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





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 7, 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, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 3, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 9, 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 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 if tested.
 5. 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 the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

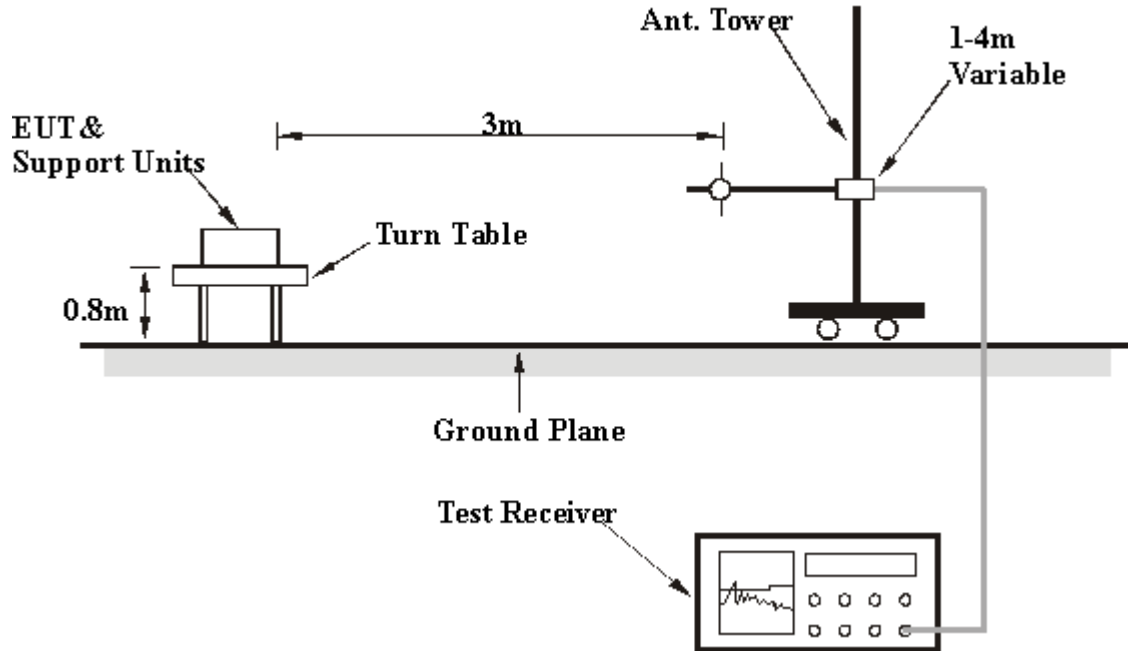
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	137.50	24.5 QP	43.50	-19.00	1.58H	2	11.06	10.95	2.49	0.00	-13.44
2	156.00	23.4 QP	43.50	-20.10	1.64H	227	10.73	9.88	2.77	0.00	-12.65
3	218.40	32.9 QP	46.00	-13.10	1.24H	191	18.90	10.12	3.85	0.00	-13.96
4	231.50	30.4 QP	46.00	-15.60	1.36H	136	15.59	10.84	4.02	0.00	-14.86
5	250.00	38.2 QP	46.00	-7.80	1.49H	223	21.85	12.02	4.29	0.00	-16.33
6	325.00	25.3 QP	46.00	-20.70	1.33H	67	6.27	13.72	5.31	0.00	-19.03
7	343.20	30.6 QP	46.00	-15.40	1.09H	97	10.95	14.07	5.55	0.00	-19.62
8	375.00	32.3 QP	46.00	-13.70	1.10H	319	11.23	15.13	5.94	0.00	-21.07
9	500.00	34.9 QP	46.00	-11.10	1.19H	96	10.21	17.26	7.47	0.00	-24.73
10	526.00	32.0 QP	46.00	-14.00	1.61H	62	6.56	17.62	7.82	0.00	-25.44
11	561.60	35.8 QP	46.00	-10.20	1.82H	130	9.53	18.09	8.20	0.00	-26.30
12	625.00	39.7 QP	46.00	-6.30	1.49H	115	11.95	18.91	8.80	0.00	-27.72
13	686.42	39.5 QP	46.00	-6.50	1.45H	125	10.64	19.29	9.55	0.00	-28.85
14	750.00	41.4 QP	46.00	-4.60	1.41H	317	11.02	20.18	10.19	0.00	-30.37
15	800.00	35.1 QP	46.00	-10.90	1.03H	196	4.60	20.69	9.82	0.00	-30.51
16	811.20	42.6 QP	46.00	-3.40	1.11H	235	11.88	20.64	10.04	0.00	-30.69
17	875.00	40.3 QP	46.00	-5.70	1.02H	139	8.40	20.63	11.25	0.00	-31.89

- NOTE:**
- 1 Emission level = Raw Value - Correction Factor
 - 2 Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 - 3 The other emission levels were very low against the limit.
 - 4 Margin value = Emission level - Limit value



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

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/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	240.00	28.3 QP	46.00	-17.70	1.07V	235	12.73	11.41	4.16	0.00	-15.57
2	250.00	35.0 QP	46.00	-11.00	1.07V	344	18.67	12.02	4.29	0.00	-16.32
3	288.00	20.5 QP	46.00	-25.50	1.28V	166	2.80	12.88	4.81	0.00	-17.70
4	375.00	31.2 QP	46.00	-14.80	1.68V	174	10.13	15.13	5.94	0.00	-21.07
5	384.00	24.2 QP	46.00	-21.80	1.25V	355	2.64	15.50	6.06	0.00	-21.57
6	436.83	33.7 QP	46.00	-12.30	2.02V	261	10.56	16.30	6.83	0.00	-23.14
7	469.00	34.3 QP	46.00	-11.70	1.31V	133	10.43	16.70	7.19	0.00	-23.90
8	500.00	35.0 QP	46.00	-11.00	1.56V	119	10.28	17.26	7.47	0.00	-24.72
9	562.00	34.0 QP	46.00	-12.00	1.61V	313	7.67	18.09	8.20	0.00	-26.29
10	624.96	39.5 QP	46.00	-6.50	1.00V	280	11.79	18.91	8.80	0.00	-27.71
11	749.97	38.0 QP	46.00	-8.00	1.34V	271	7.58	20.18	10.19	0.00	-30.37
12	811.21	39.3 QP	46.00	-6.70	1.51V	129	8.58	20.64	10.04	0.00	-30.69
13	864.00	33.7 QP	46.00	-12.30	1.68V	275	2.00	20.57	11.13	0.00	-31.70
14	960.00	35.9 QP	46.00	-10.10	1.94V	77	2.62	21.24	11.99	0.00	-33.23
15	992.00	34.5 QP	54.00	-19.50	1.76V	127	0.77	21.34	12.35	0.00	-33.69

- NOTE:**
- 1 Emission level = Raw Value - Correction Factor
 - 2 Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 - 3 The other emission levels were very low against the limit.
 - 4 Margin value = Emission level - Limit value



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 1	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2412.00	88.7 PK			1.62H	84	55.89	27.67	5.10	0.00	-32.77
2	*2412.00	84.5 AV			1.62H	84	51.70	27.67	5.10	0.00	-32.77
3	4824.00	37.0 AV	54.00	-17.00	1.51H	315	32.91	31.52	7.23	34.63	-4.12
4	4824.00	47.6 PK	74.00	-26.40	1.51H	315	43.50	31.52	7.23	34.63	-4.12

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/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2412.00	95.1 AV			1.70V	213	62.37	27.67	5.10	0.00	-32.77
2	*2412.00	98.0 PK			1.70V	213	65.21	27.67	5.10	0.00	-32.77
3	4824.00	38.1 AV	54.00	-15.90	1.38V	357	34.00	31.52	7.23	34.63	-4.12
4	4824.00	48.4 PK	74.00	-25.60	1.38V	357	44.30	31.52	7.23	34.63	-4.12

- NOTE:**
1. Emission level = Raw Value - Correction Factor
 2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. The limit value is defined as per 15.247
 6. “ * ” : Fundamental frequency



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 6	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2437.00	86.3 AV			1.97H	182	53.40	27.81	5.08	0.00	-32.89
2	*2437.00	89.5 PK			1.97H	182	56.58	27.81	5.08	0.00	-32.89
3	4874.00	46.9 PK	74.00	-27.10	1.37H	34	42.75	31.59	7.21	34.63	-4.17
4	4874.00	37.4 AV	54.00	-16.60	1.37H	34	33.25	31.59	7.21	34.63	-4.17

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/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2437.00	94.0 AV			2.07V	320	61.15	27.81	5.08	0.00	-32.89
2	*2437.00	97.2 PK			2.07V	320	64.30	27.81	5.08	0.00	-32.89
3	4874.00	37.1 AV	54.00	-16.90	1.60V	318	32.94	31.59	7.21	34.63	-4.17
4	4874.00	46.6 PK	74.00	-27.40	1.60V	318	42.39	31.59	7.21	34.63	-4.18

- NOTE:**
1. Emission level = Raw Value - Correction Factor
 2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. The limit value is defined as per 15.247
 6. “ * ” : Fundamental frequency



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2462.00	84.2 AV			1.79H	214	51.35	27.81	5.08	0.00	-32.89
2	*2462.00	90.0 PK			1.79H	214	57.09	27.81	5.08	0.00	-32.89
3	4924.00	36.2 AV	54.00	-17.80	1.15H	229	31.95	31.66	7.21	34.62	-4.25
4	4924.00	47.8 PK	74.00	-26.20	1.15H	229	43.56	31.66	7.21	34.62	-4.25

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/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2462.00	94.0 AV			1.60V	196	61.15	27.81	5.08	0.00	-32.89
2	*2462.00	98.6 PK			1.60V	196	65.69	27.81	5.08	0.00	-32.89
3	4924.00	47.5 PK	74.00	-26.50	1.47V	11	43.30	31.66	7.21	34.62	-4.25
4	4924.00	37.5 AV	54.00	-16.50	1.47V	11	33.20	31.66	7.21	34.62	-4.25

- NOTE:**
1. Emission level= Raw Value - Correction Factor
 2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. The limit value is defined as per 15.247
 6. “ * ” : Fundamental frequency



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

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

NOTE:

- 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.

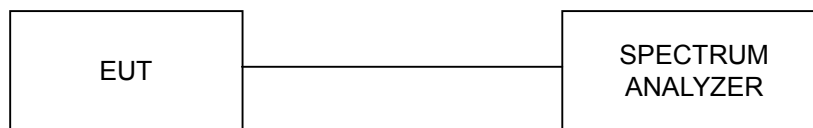
4.3.3 TEST PROCEDURE

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 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.



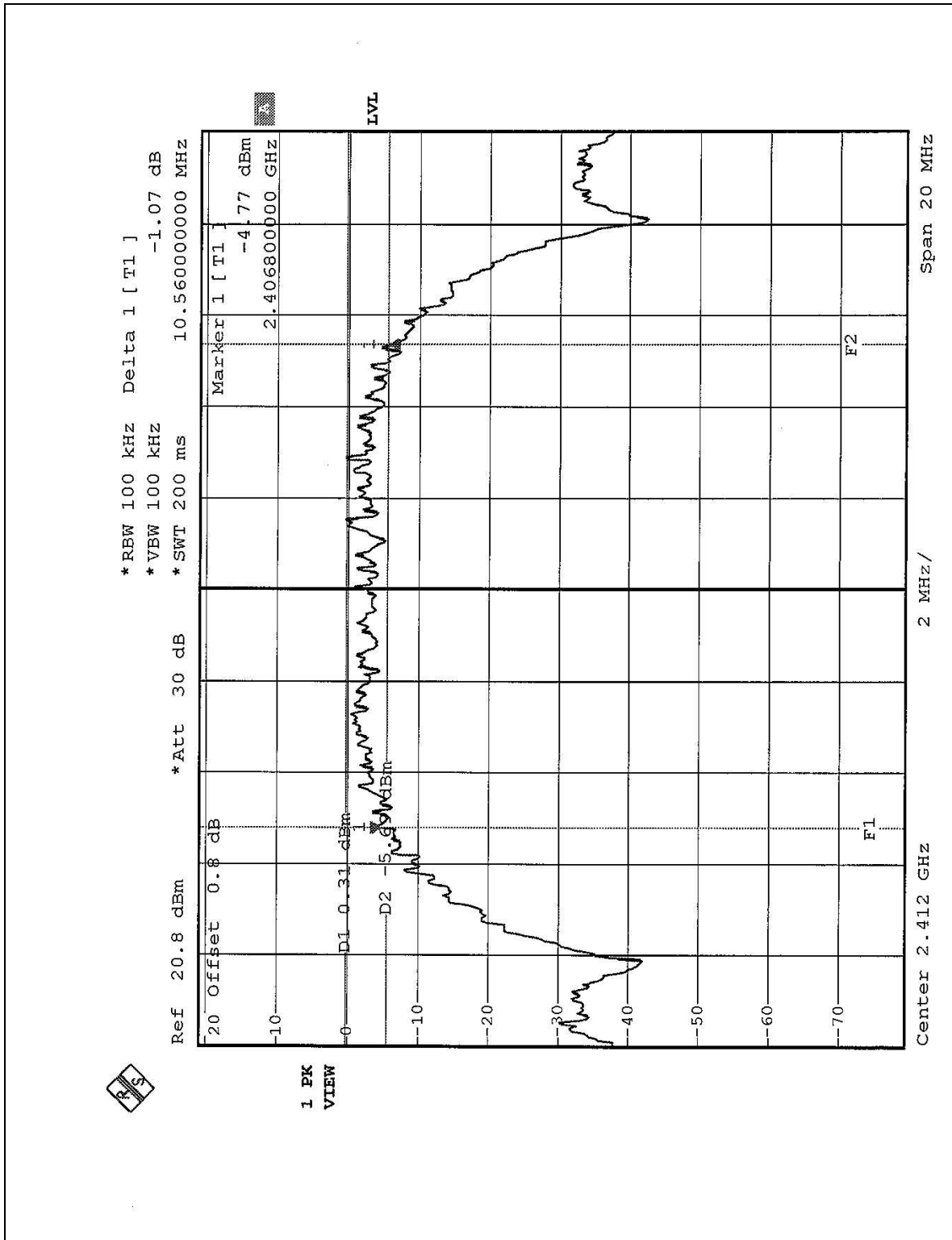
4.3.7 TEST RESULTS

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	30deg. C, 55%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.56	0.5	PASS
6	2437	10.52	0.5	PASS
11	2462	10.56	0.5	PASS

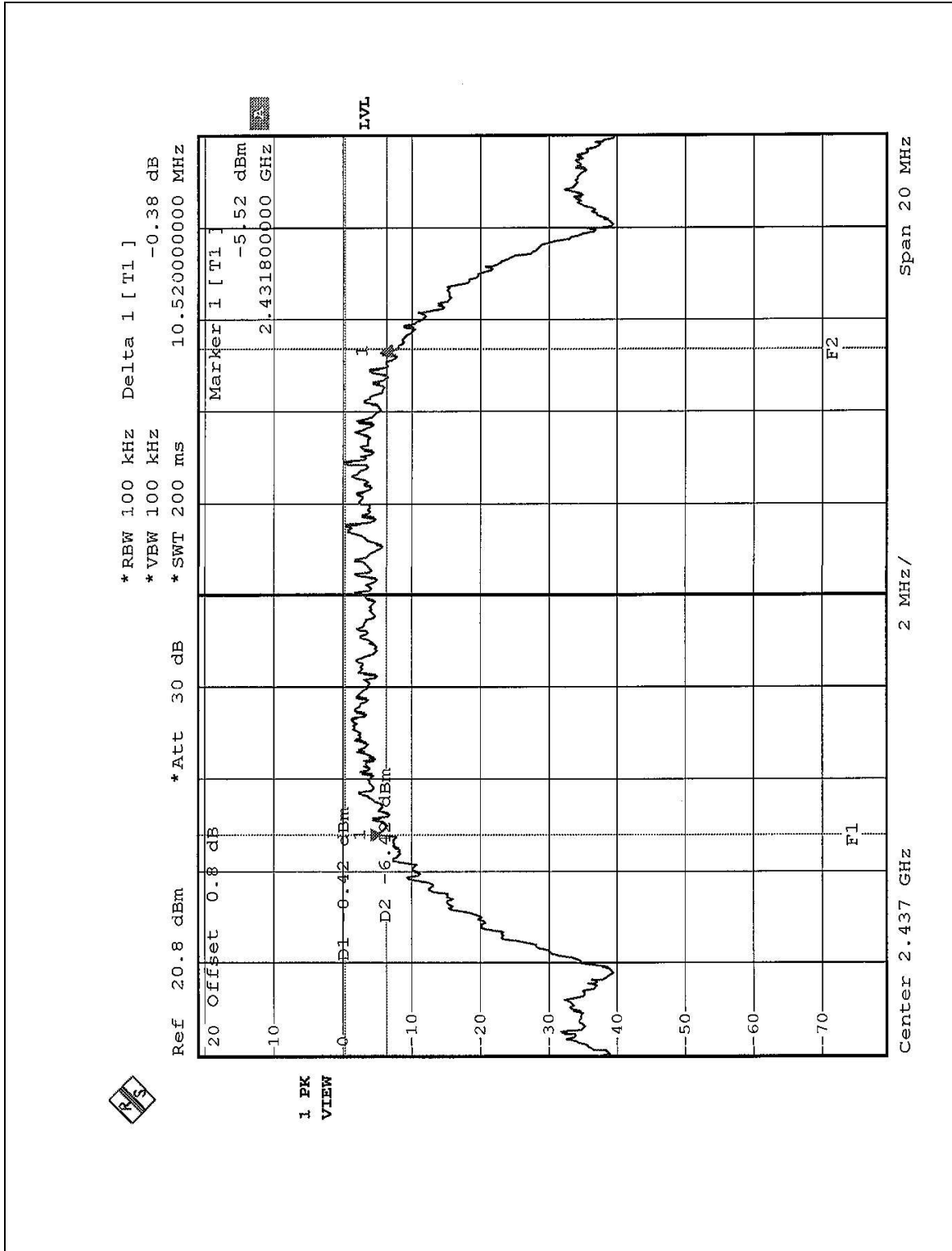


CH1



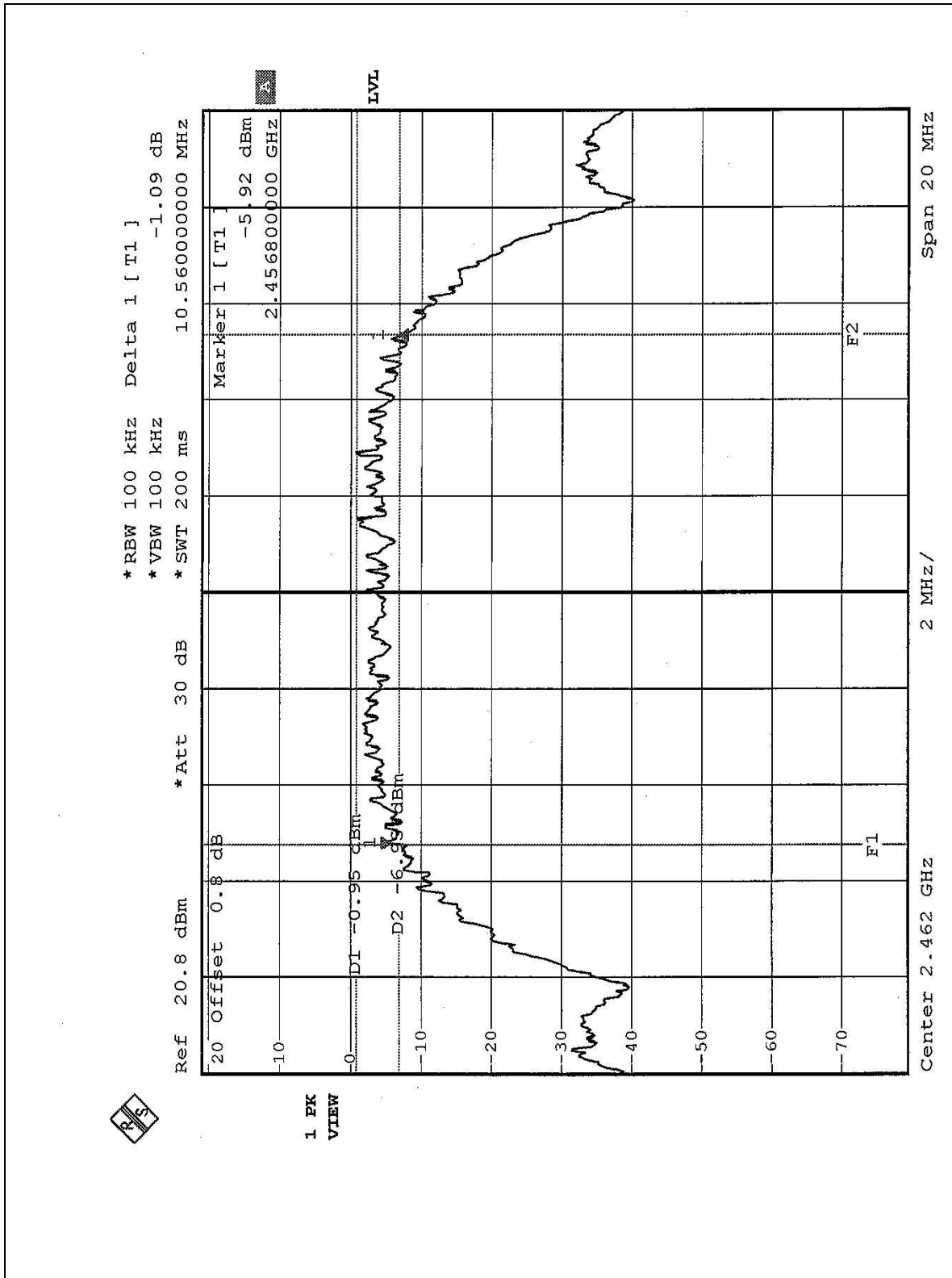


CH6





CH11





4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SINGLE CHANNEL POWER METER	NRVS	100026	Feb. 23, 2003
PEAK POWER SENSOR	NRV-Z32	100013	Feb. 23, 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.



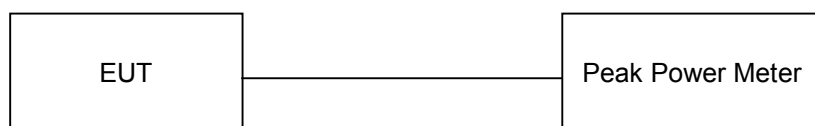
4.4.3 TEST PROCEDURES

The transmitter output was connected to the peak power meter.

4.4.4 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	Dual-Band Wireless Access Point	MODEL	WAP51AB
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	30deg.C, 55%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	10.53	30	PASS
6	2437	9.89	30	PASS
11	2462	9.56	30	PASS



4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

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

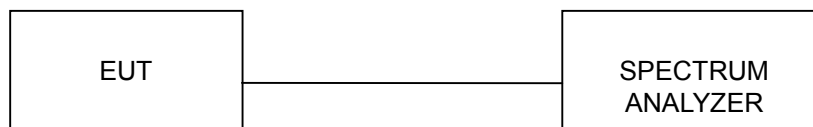
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



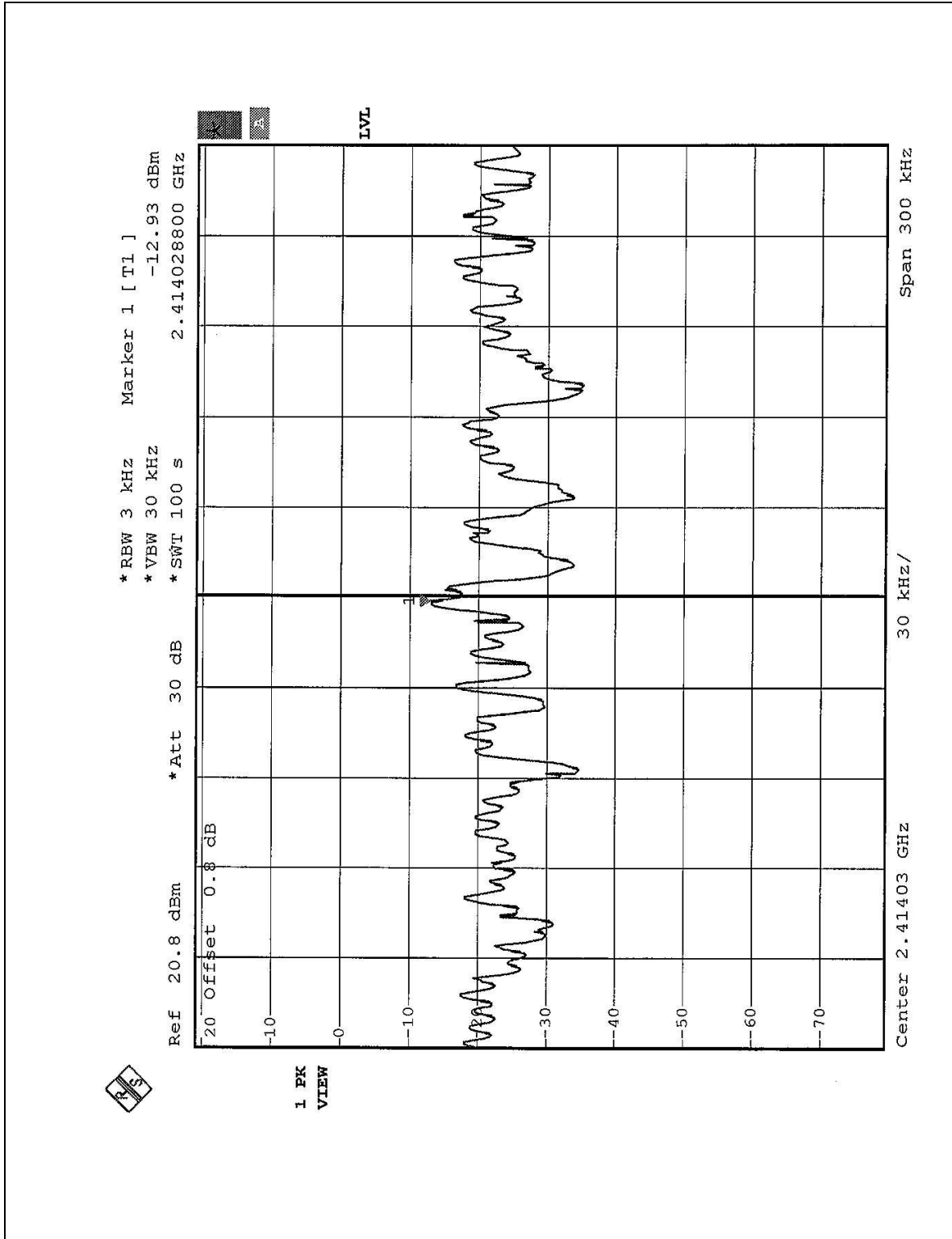
4.5.7 TEST RESULTS

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	30deg. C, 55%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	-12.93	8	PASS
6	2437	-13.99	8	PASS
11	2462	-15.29	8	PASS

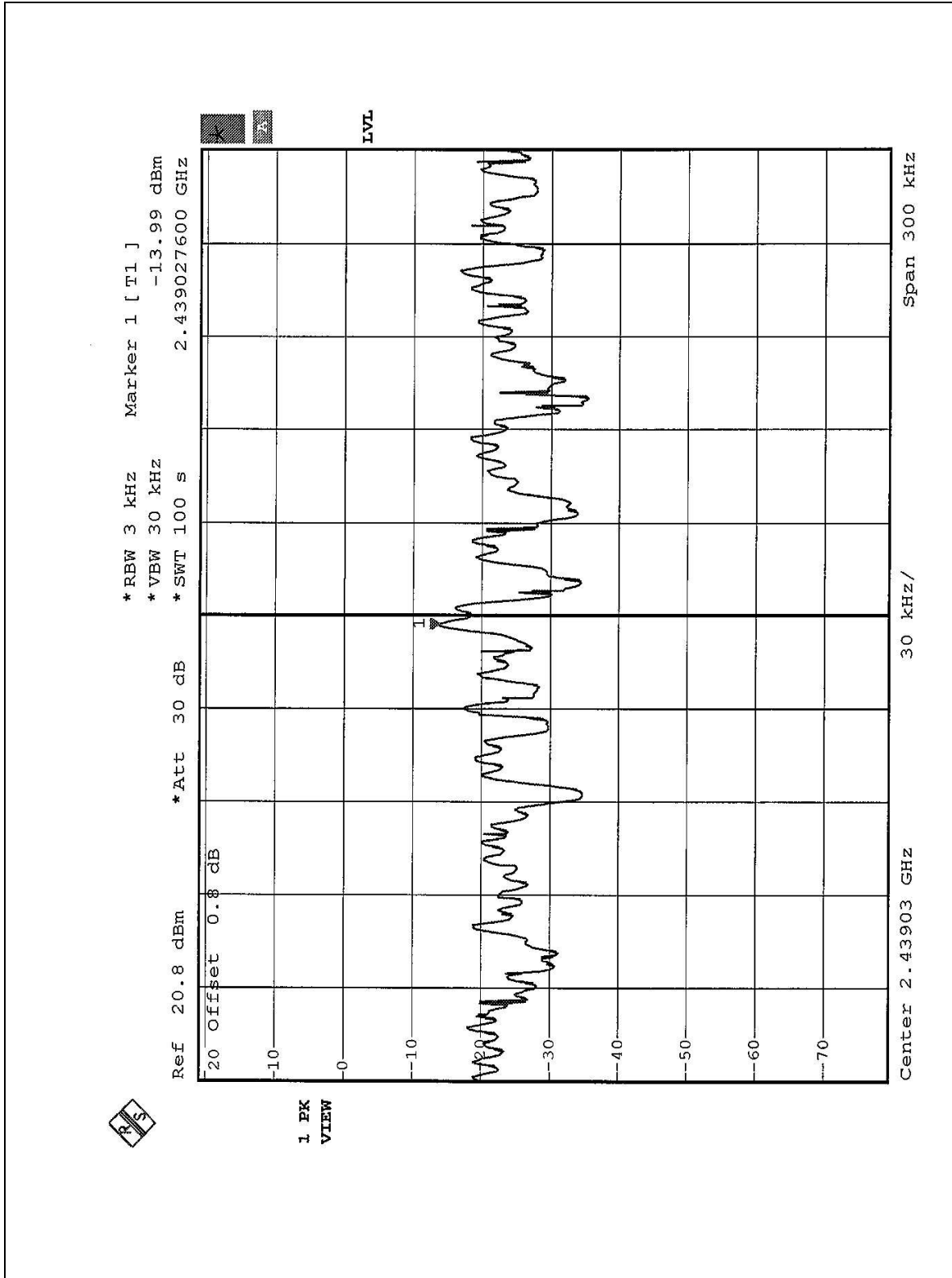


CH1



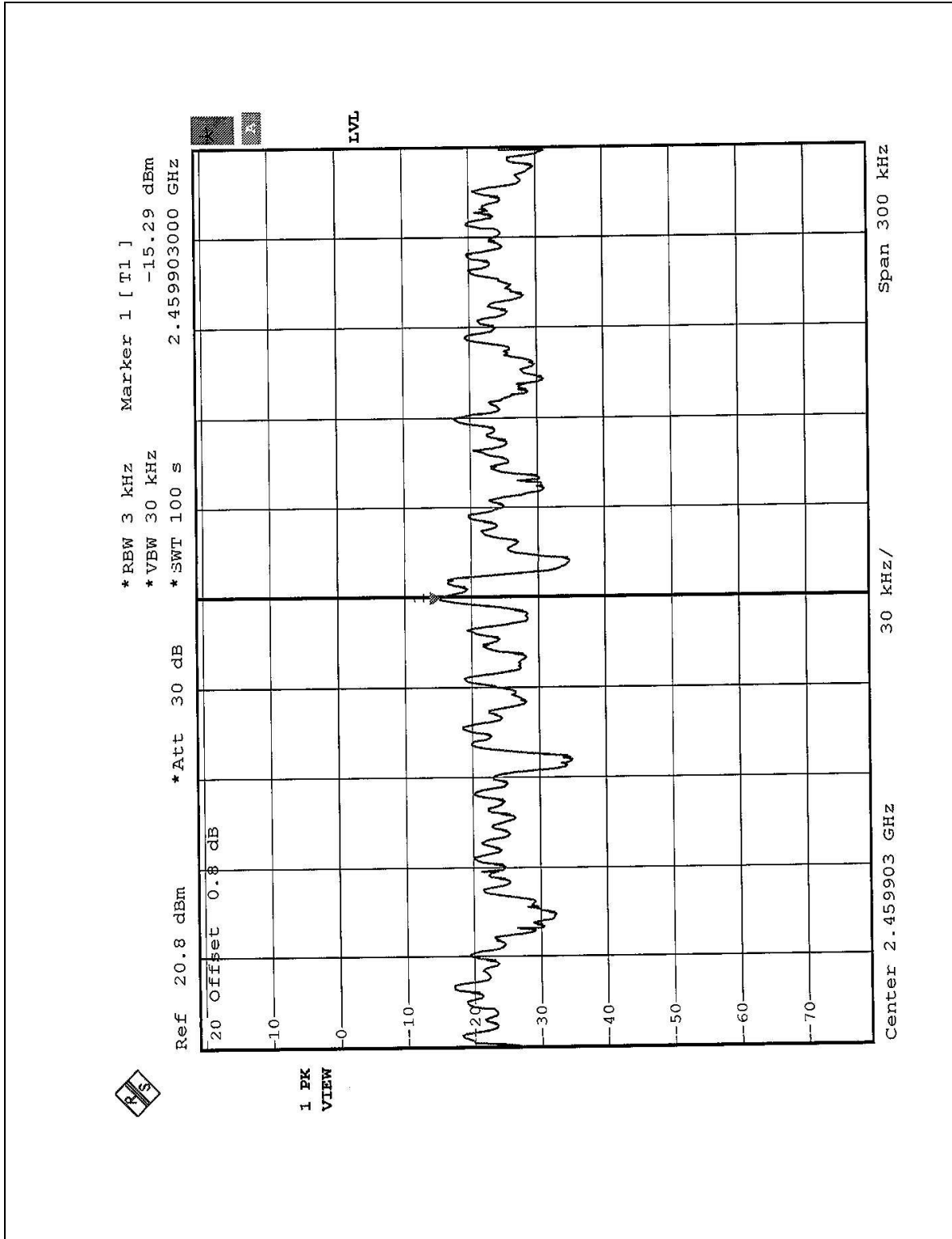


CH6





CH11





4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

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

NOTE:

1. The measurement uncertainty is less than $\pm 2.6\text{dB}$, 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 DEVIATION FROM TEST STANDARD

No deviation



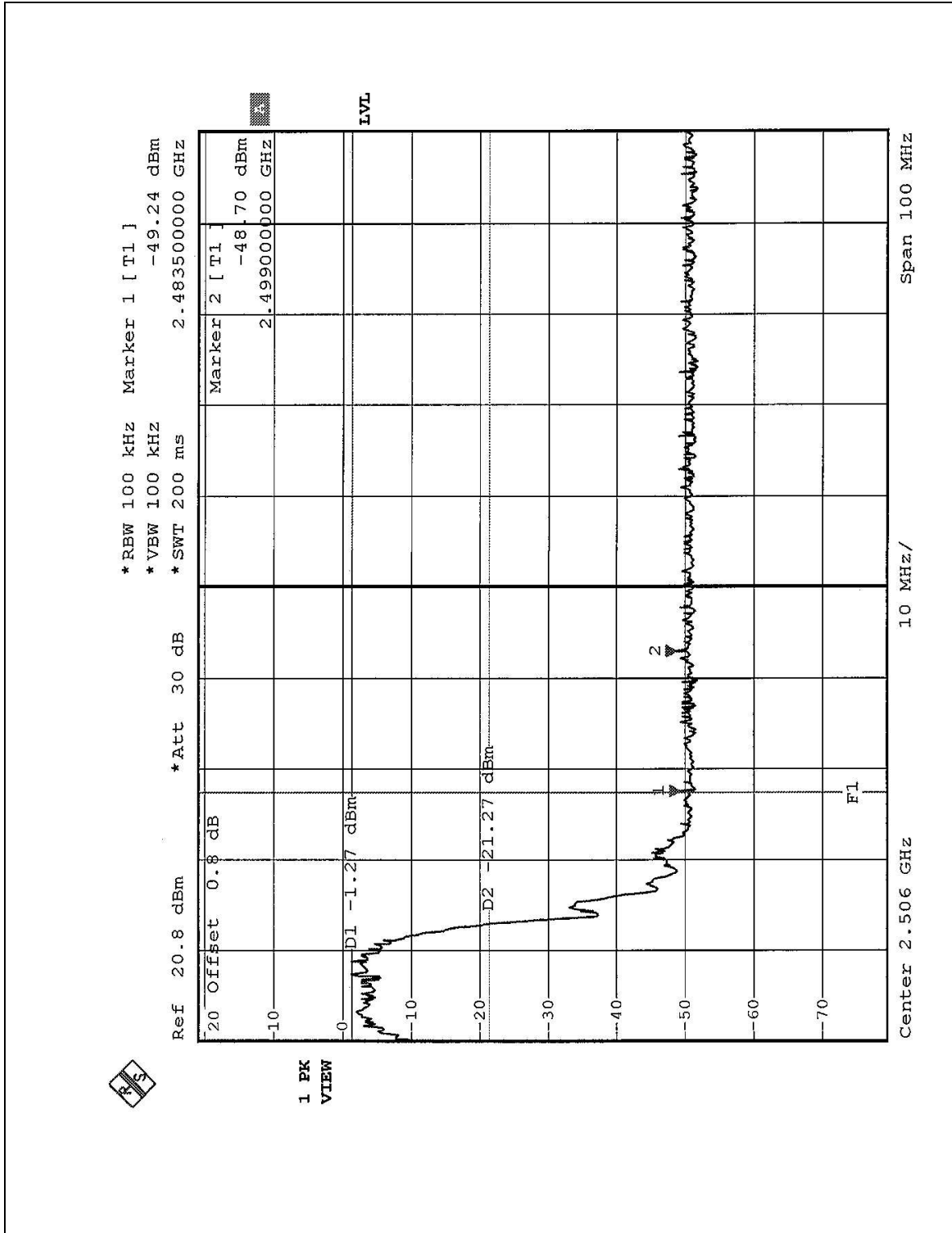
4.6.5 EUT OPERATING CONDITION

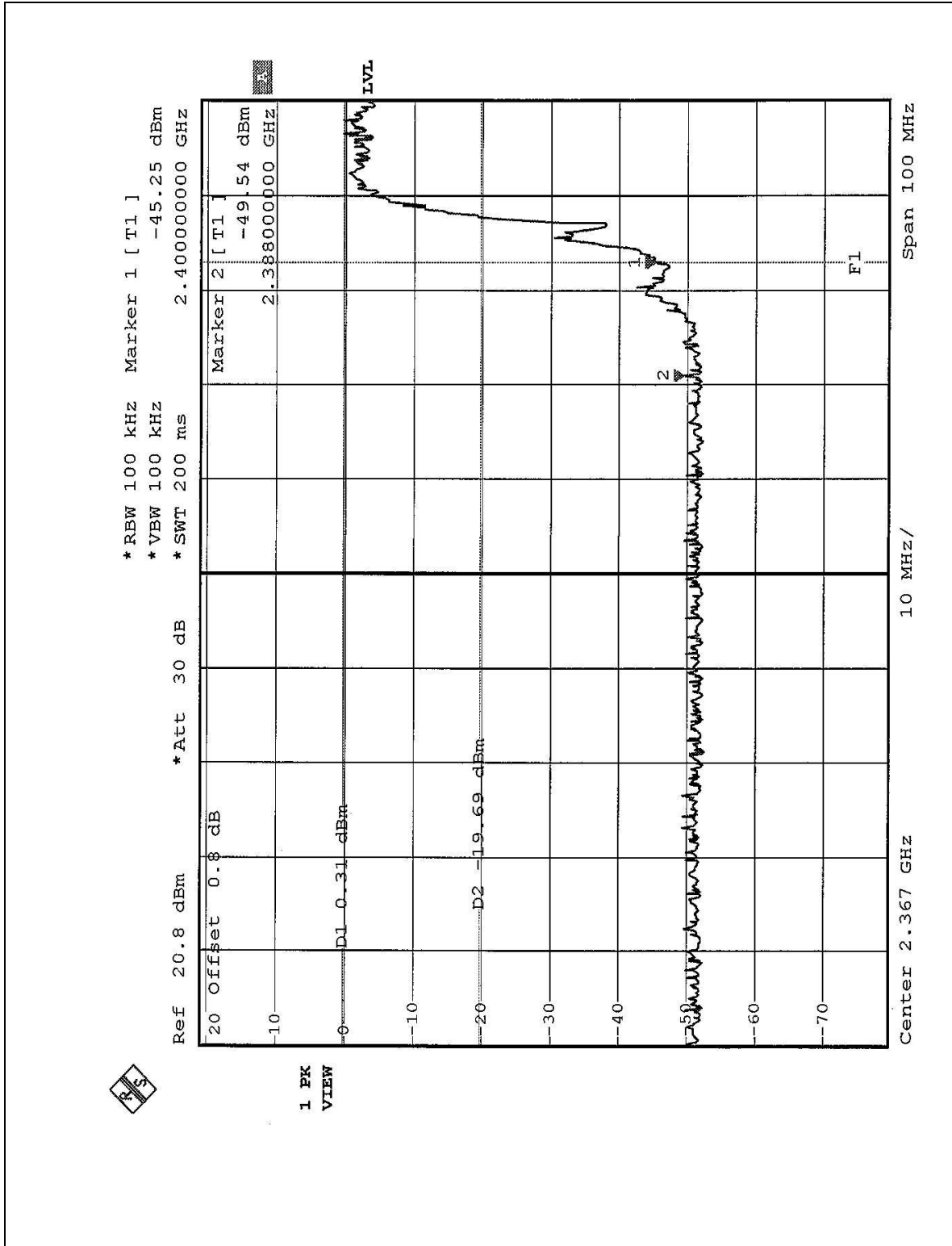
Same as Item 4.3.6

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 47.97dB / 45.56dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz / 2.4000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 (Page 26) is 95.1dBuV/m, so the maximum field strength in restrict band is $95.1 - 45.56 = 49.54$ dBuV/m which is under 54 dBuV/m limit.







4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole Antenna without antenna connector. The maximum Gain of the antenna is 1dBi only.



5 TEST TYPES AND RESULTS (FOR PART 802.11a)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. 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.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	847793/022	Mar. 12, 2003
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	Jul. 23, 2003
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 25, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	90031627	Jul. 23, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C05.01	Jul. 23, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 2003
Shielded Room	Site 5	ADT-C05	NA
VCCI Site Registration No.	Site 5	C-1093	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. The test was performed in ADT Open Site No. 5.



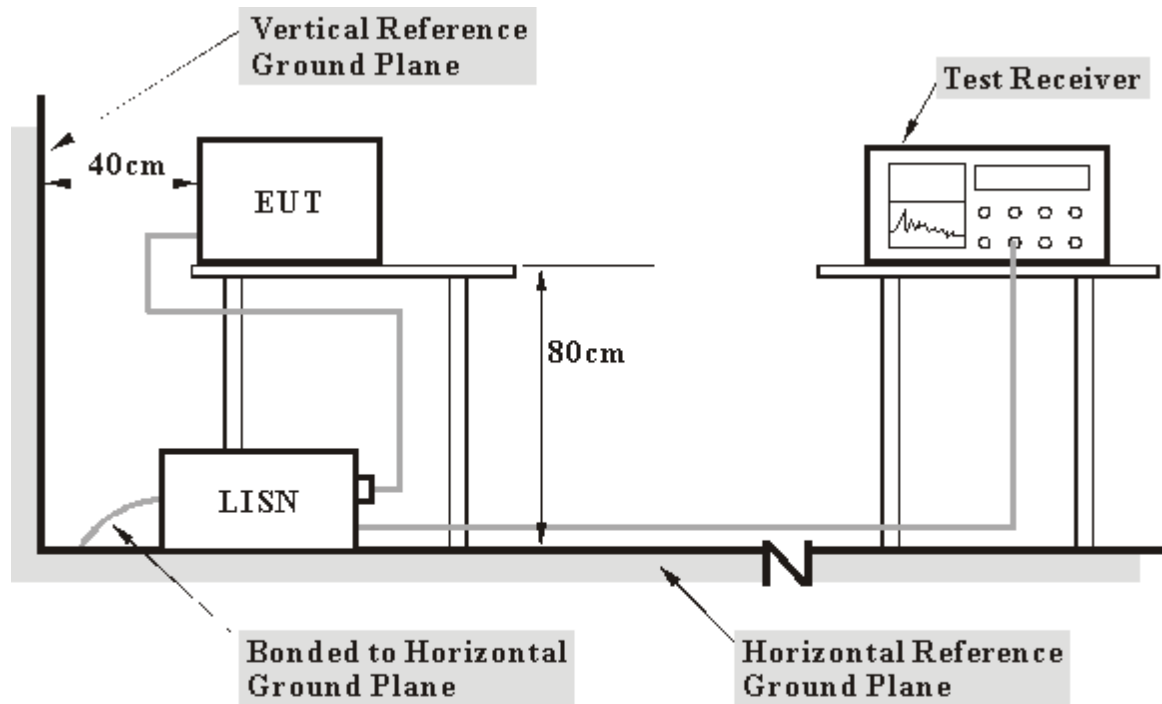
5.1.3 TEST PROCEDURES

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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



5.1.6 EUT OPERATING CONDITIONS

- 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.



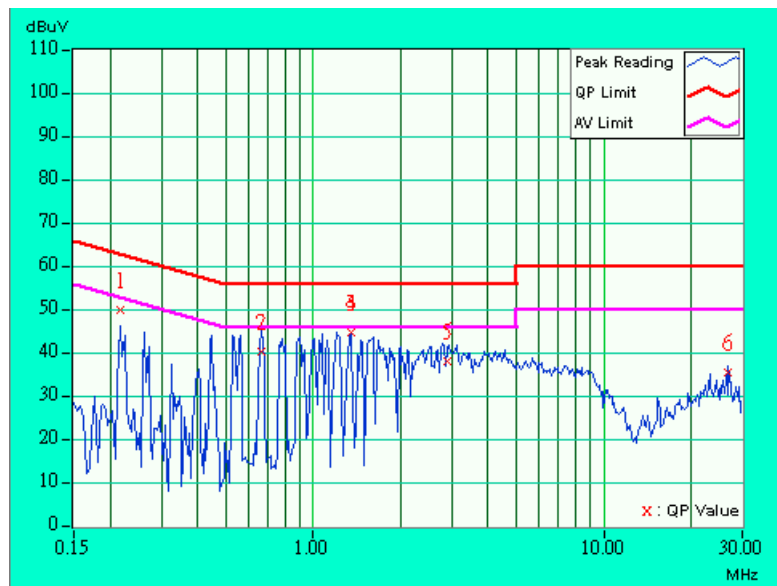
5.1.7 TEST RESULTS (TRANSMITTING)

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
		6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.216	0.10	48.75	-	48.85	-	62.96	52.96	-14.11	-
2	0.666	0.14	39.16	-	39.30	-	56.00	46.00	-16.70	-
3	1.344	0.20	43.52	-	43.72	-	56.00	46.00	-12.28	-
4	1.344	0.20	43.48	-	43.68	-	56.00	46.00	-12.32	-
5	2.902	0.29	36.89	-	37.18	-	56.00	46.00	-18.82	-
6	26.609	1.23	34.28	-	35.51	-	60.00	50.00	-24.49	-

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.



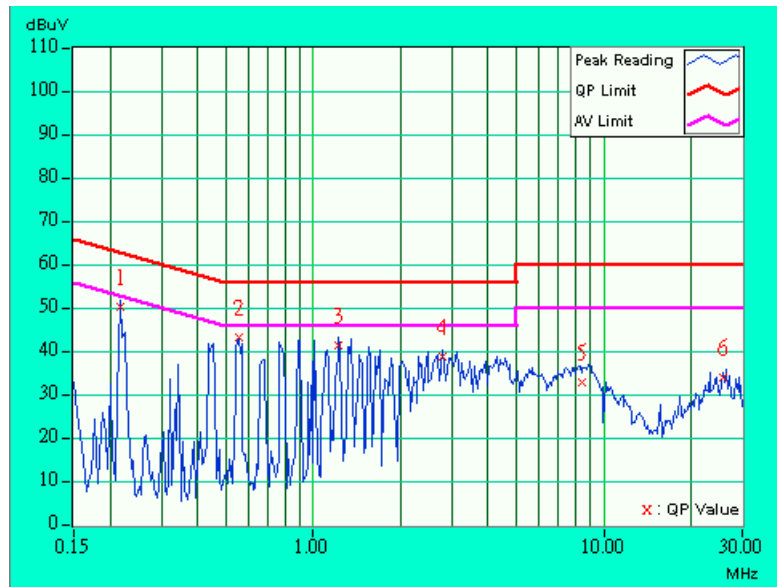


EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
		6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

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	0.216	0.10	49.67	-	49.77	-	62.96	52.96	-13.19	-
2	0.556	0.13	42.66	-	42.79	-	56.00	46.00	-13.21	-
3	1.215	0.20	40.92	-	41.12	-	56.00	46.00	-14.88	-
4	2.785	0.24	38.27	-	38.51	-	56.00	46.00	-17.49	-
5	8.367	0.37	32.24	-	32.61	-	60.00	50.00	-27.39	-
6	25.875	0.72	33.22	-	33.94	-	60.00	50.00	-26.06	-

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.





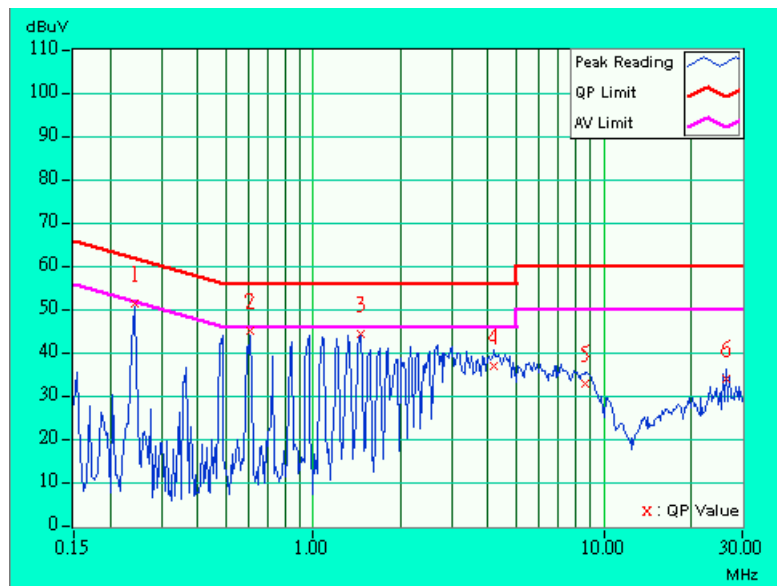
5.1.8 TEST RESULTS (RECEIVING)

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
		6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.244	0.10	50.18	-	50.28	-	61.97	51.97	-11.69	-
2	0.603	0.13	44.02	-	44.15	-	56.00	46.00	-11.85	-
3	1.453	0.20	43.30	-	43.50	-	56.00	46.00	-12.50	-
4	4.168	0.41	35.87	-	36.28	-	56.00	46.00	-19.72	-
5	8.617	0.55	31.71	-	32.26	-	60.00	50.00	-27.74	-
6	26.484	1.23	33.02	-	34.25	-	60.00	50.00	-25.75	-

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.



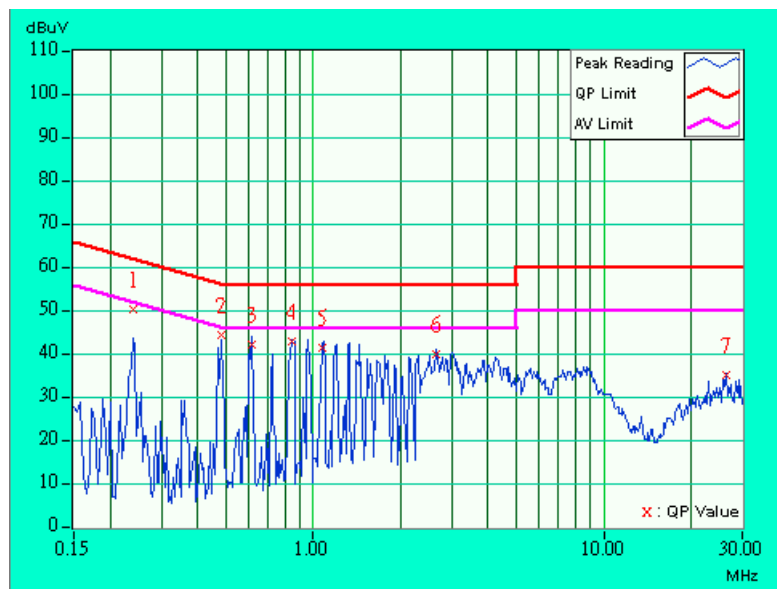


EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
		6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	35 deg. C, 50%RH, 1005 hPa	TESTED BY: Bunny Yao	

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	0.240	0.10	49.62	-	49.72	-	62.10	52.10	-12.38	-
2	0.482	0.11	43.60	-	43.71	-	56.30	46.30	-12.59	-
3	0.611	0.14	41.55	-	41.69	-	56.00	46.00	-14.31	-
4	0.841	0.17	42.34	-	42.51	-	56.00	46.00	-13.49	-
5	1.070	0.20	40.75	-	40.95	-	56.00	46.00	-15.05	-
6	2.656	0.23	39.20	-	39.43	-	56.00	46.00	-16.57	-
7	26.484	0.73	34.38	-	35.11	-	60.00	50.00	-24.89	-

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.





5.2 RADIATED EMISSION MEASUREMENT

5.2.1 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.



5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 7, 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, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 3, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 9, 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 measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
6. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
7. "*" = These equipment are used for the final measurement.
8. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
9. The test was performed in ADT Open Site No. 5.



5.2.3 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.

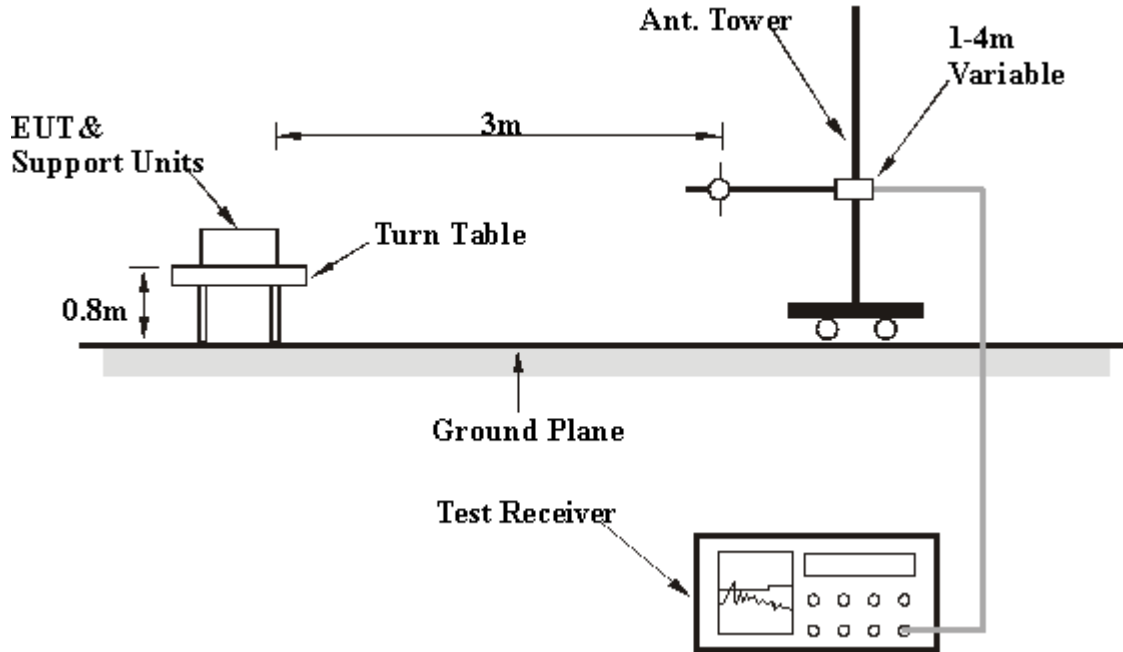
NOTE:

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.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as 5.1.6.



5.2.7 TEST RESULTS (TRANSMITTING)

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bunny Yao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	156.00	22.3 QP	43.50	-21.20	1.62H	47	9.65	9.88	2.77	0.00	-12.65
2	218.50	32.1 QP	46.00	-13.90	1.19H	336	18.14	10.12	3.85	0.00	-13.96
3	250.00	37.8 QP	46.00	-8.20	1.57H	183	21.47	12.02	4.29	0.00	-16.33
4	312.00	27.0 QP	46.00	-19.00	1.31H	125	8.50	13.43	5.11	0.00	-18.55
5	344.00	31.4 QP	46.00	-14.60	1.45H	242	11.79	14.07	5.55	0.00	-19.61
6	375.00	30.8 QP	46.00	-15.20	1.44H	69	9.73	15.13	5.94	0.00	-21.08
7	500.00	36.3 QP	46.00	-9.70	1.53H	106	11.56	17.26	7.47	0.00	-24.72
8	561.61	36.1 QP	46.00	-9.90	2.03H	7	9.78	18.09	8.20	0.00	-26.29
9	624.00	41.5 QP	46.00	-4.50	1.30H	284	13.80	18.91	8.80	0.00	-27.71
10	625.00	40.1 QP	46.00	-5.90	1.45H	106	12.39	18.91	8.80	0.00	-27.71
11	658.00	35.1 QP	46.00	-10.90	1.21H	129	6.64	19.24	9.22	0.00	-28.46
12	750.00	35.4 QP	46.00	-10.60	1.44H	350	5.03	20.18	10.19	0.00	-30.37
13	812.00	37.5 QP	46.00	-8.50	1.35H	251	6.86	20.64	10.04	0.00	-30.70
14	875.50	38.0 QP	46.00	-8.00	1.59H	136	6.07	20.65	11.28	0.00	-31.94
15	998.50	39.3 QP	54.00	-14.70	1.65H	241	5.52	21.35	12.40	0.00	-33.76

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bunny Yao		

NTENNA 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	125.00	31.8 QP	43.50	-11.80	1.33V	260	17.99	11.47	2.29	0.00	-13.76	
2	240.00	30.5 QP	46.00	-15.50	1.45V	205	14.94	11.41	4.16	0.00	-15.57	
3	250.00	30.6 QP	46.00	-15.40	1.63V	312	14.25	12.02	4.29	0.00	-16.32	
4	325.00	27.3 QP	46.00	-18.70	1.09V	285	8.27	13.72	5.31	0.00	-19.03	
5	344.00	27.6 QP	46.00	-18.40	1.58V	151	7.97	14.07	5.55	0.00	-19.61	
6	374.39	30.9 QP	46.00	-15.10	1.73V	150	9.78	15.13	5.94	0.00	-21.07	
7	437.50	34.7 QP	46.00	-11.30	1.39V	20	11.58	16.30	6.83	0.00	-23.14	
8	468.00	36.3 QP	46.00	-9.70	1.09V	55	12.36	16.70	7.19	0.00	-23.90	
9	500.00	35.2 QP	46.00	-10.80	1.53V	324	10.53	17.26	7.47	0.00	-24.72	
10	562.80	31.9 QP	46.00	-14.10	1.66V	207	5.57	18.12	8.22	0.00	-26.34	
11	624.99	40.3 QP	46.00	-5.70	1.00V	255	12.62	18.91	8.80	0.00	-27.71	
12	750.00	37.8 QP	46.00	-8.20	1.37V	38	7.42	20.18	10.19	0.00	-30.37	
13	811.20	40.2 QP	46.00	-5.80	1.49V	155	9.50	20.64	10.04	0.00	-30.69	
14	873.61	41.5 QP	46.00	-4.50	1.43V	19	9.61	20.63	11.25	0.00	-31.89	
15	998.42	47.5 QP	54.00	-6.50	1.19V	3	13.76	21.35	12.40	0.00	-33.76	

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	1	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*5180.00	70.4 AV			1.82H	205	30.55	31.87	8.01	0.00	-39.88
2	*5180.00	84.4 PK			1.82H	205	44.49	31.87	8.01	0.00	-39.88
3	10360.00	50.2 AV	54.00	-3.80	1.12H	8	33.80	39.16	11.92	34.65	-16.42
4	10360.00	61.7 PK	74.00	-12.30	1.12H	8	45.30	39.16	11.92	34.65	-16.42.

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	*5180.00	80.7 AV			1.50V	77	75.37	31.87	8.01	34.53	-5.34
2	*5180.00	90.0 PK			1.50V	77	84.64	31.87	8.01	34.53	-5.34
3	10360.00	49.4 AV	54.00	-4.60	1.33V	39	33.00	39.16	11.92	34.65	-16.42
4	10360.00	61.5 PK	74.00	-12.50	1.33V	39	45.12	39.16	11.92	34.65	-16.42.

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.
5. "*" : Fundamental frequency



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	4	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*5240.00	66.8 AV			1.66H	161	61.20	31.90	8.22	34.50	-5.61
2	*5240.00	74.7 PK			1.66H	161	69.10	31.90	8.22	34.50	-5.61
3	10480.00	49.4 AV	54.00	-4.60	1.49H	135	31.87	39.36	12.73	34.52	-17.57
4	10480.00	60.2 PK	74.00	-13.80	1.49H	135	42.59	39.36	12.73	34.52	-17.57.

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	*5240.00	79.4 AV			1.61V	39	73.82	31.90	8.22	34.50	-5.61
2	*5240.00	88.9 PK			1.61V	39	83.29	31.90	8.22	34.50	-5.61
3	10480.00	49.9 AV	54.00	-4.10	1.11V	352	32.30	39.36	12.73	34.52	-17.57
4	10480.00	61.1 PK	74.00	-12.90	1.11V	352	43.56	39.36	12.73	34.52	-17.57.

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.
5. "*" : Fundamental frequency



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	5	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*5260.00	76.9 AV			1.66H	68	71.33	31.90	8.22	34.50	-5.61
2	*5260.00	86.3 PK			1.66H	68	80.70	31.90	8.22	34.50	-5.61
3	10520.00	49.2 AV	54.00	-4.80	1.51H	79	31.35	39.43	12.92	34.48	-17.86
4	10520.00	61.4 PK	74.00	-12.60	1.51H	79	43.56	39.43	12.92	34.48	-17.86.

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	*5260.00	88.0 AV			1.23V	116	82.40	31.90	8.22	34.50	-5.61
2	*5260.00	96.9 PK			1.23V	116	91.24	31.90	8.22	34.50	-5.61
3	10520.00	51.6 AV	54.00	-2.40	1.42V	3	33.70	39.43	12.92	34.48	-17.86
4	10520.00	63.2 PK	74.00	-10.80	1.42V	3	45.30	39.43	12.92	34.48	-17.86.

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.
5. "*" : Fundamental frequency



EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	8	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*5320.00	68.8 AV			1.53H	311	63.20	31.93	8.16	34.47	-5.63
2	*5320.00	80.1 PK			1.53H	212	74.50	31.93	8.16	34.47	-5.63
3	10640.00	50.2 AV	54.00	-3.80	1.19H	57	32.20	39.61	12.77	34.38	-17.99
4	10640.00	64.1 PK	74.00	-9.90	1.19H	57	46.10	39.61	12.77	34.38	-18.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*5320.00	80.2 AV			1.48V	77	74.58	31.93	8.16	34.47	-5.63
2	*5320.00	89.1 PK			1.48V	77	83.44	31.93	8.16	34.47	-5.63
3	10640.00	50.0 AV	54.00	-4.00	1.22V	150	32.00	39.61	12.77	34.38	-17.99
4	10640.00	61.6 PK	74.00	-12.40	1.22V	150	43.59	39.61	12.77	34.38	-17.99

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.
5. "*" : Fundamental frequency

5.2.8 TEST RESULTS (RECEIVING)

EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bunny Yao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	156.00	22.3 QP	43.50	-21.20	1.62H	47	9.65	9.88	2.77	0.00	-12.65
2	218.50	32.1 QP	46.00	-13.90	1.19H	336	18.14	10.12	3.85	0.00	-13.96
3	250.00	37.8 QP	46.00	-8.20	1.57H	183	21.47	12.02	4.29	0.00	-16.33
4	312.00	27.0 QP	46.00	-19.00	1.31H	125	8.50	13.43	5.11	0.00	-18.55
5	344.00	31.4 QP	46.00	-14.60	1.45H	242	11.79	14.07	5.55	0.00	-19.61
6	375.00	30.8 QP	46.00	-15.20	1.44H	69	9.73	15.13	5.94	0.00	-21.08
7	500.00	36.3 QP	46.00	-9.70	1.53H	106	11.56	17.26	7.47	0.00	-24.72
8	561.61	36.1 QP	46.00	-9.90	2.03H	7	9.78	18.09	8.20	0.00	-26.29
9	624.00	41.5 QP	46.00	-4.50	1.30H	284	13.80	18.91	8.80	0.00	-27.71
10	625.00	40.1 QP	46.00	-5.90	1.45H	106	12.39	18.91	8.80	0.00	-27.71
11	658.00	35.1 QP	46.00	-10.90	1.21H	129	6.64	19.24	9.22	0.00	-28.46
12	750.00	35.4 QP	46.00	-10.60	1.44H	350	5.03	20.18	10.19	0.00	-30.37
13	812.00	37.5 QP	46.00	-8.50	1.35H	251	6.86	20.64	10.04	0.00	-30.70
14	875.50	38.0 QP	46.00	-8.00	1.59H	136	6.07	20.65	11.28	0.00	-31.94
15	998.50	39.3 QP	54.00	-14.70	1.65H	241	5.52	21.35	12.40	0.00	-33.76

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bunny Yao		

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	125.00	31.8 QP	43.50	-11.80	1.33V	260	17.99	11.47	2.29	0.00	-13.76
2	240.00	30.5 QP	46.00	-15.50	1.45V	205	14.94	11.41	4.16	0.00	-15.57
3	250.00	30.6 QP	46.00	-15.40	1.63V	312	14.25	12.02	4.29	0.00	-16.32
4	325.00	27.3 QP	46.00	-18.70	1.09V	285	8.27	13.72	5.31	0.00	-19.03
5	344.00	27.6 QP	46.00	-18.40	1.58V	151	7.97	14.07	5.55	0.00	-19.61
6	374.39	30.9 QP	46.00	-15.10	1.73V	150	9.78	15.13	5.94	0.00	-21.07
7	437.50	34.7 QP	46.00	-11.30	1.39V	20	11.58	16.30	6.83	0.00	-23.14
8	468.00	36.3 QP	46.00	-9.70	1.09V	55	12.36	16.70	7.19	0.00	-23.90
9	500.00	35.2 QP	46.00	-10.80	1.53V	324	10.53	17.26	7.47	0.00	-24.72
10	562.80	31.9 QP	46.00	-14.10	1.66V	207	5.57	18.12	8.22	0.00	-26.34
11	624.99	40.3 QP	46.00	-5.70	1.00V	255	12.62	18.91	8.80	0.00	-27.71
12	750.00	37.8 QP	46.00	-8.20	1.37V	38	7.42	20.18	10.19	0.00	-30.37
13	811.20	40.2 QP	46.00	-5.80	1.49V	155	9.50	20.64	10.04	0.00	-30.69
14	873.61	41.5 QP	46.00	-4.50	1.43V	19	9.61	20.63	11.25	0.00	-31.89
15	998.42	47.5 QP	54.00	-6.50	1.19V	3	13.76	21.35	12.40	0.00	-33.76

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	1	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	5144.00	35.3 AV	54.00	-18.70	1.70H	265	29.95	31.87	8.01	34.53	-5.34
2	5144.00	46.1 PK	74.00	-27.90	1.70H	265	40.76	31.87	8.01	34.53	-5.34

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	5144.00	37.7 AV	54.00	-16.30	1.45V	139	32.40	31.87	8.01	34.53	-5.34
2	5144.00	47.7 PK	74.00	-26.30	1.45V	139	42.36	31.87	8.01	34.53	-5.34

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	4	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	5192.00	37.3 AV	54.00	-16.70	1.49H	115	31.80	31.88	8.15	34.52	-5.52
2	5192.00	48.3 PK	74.00	-25.70	1.49H	115	42.76	31.88	8.15	34.52	-5.52

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	5192.00	37.3 AV	54.00	-16.70	1.61V	58	31.79	31.88	8.15	34.52	-5.52
2	5192.00	47.5 PK	74.00	-26.50	1.61V	58	42.00	31.88	8.15	34.52	-5.52

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	5	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	4208.00	34.4 AV	54.00	-19.60	1.29H	283	31.74	30.56	6.68	34.58	-2.66
2	4208.00	45.1 PK	74.00	-28.90	1.29H	283	42.39	30.56	6.68	34.58	-2.67

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	4208.00	35.0 AV	54.00	-19.00	1.40V	88	32.30	30.56	6.68	34.58	-2.66
2	4208.00	45.9 PK	74.00	-28.10	1.40V	88	43.20	30.56	6.68	34.58	-2.67

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	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	8	DETECTOR FUNCTION	Peak(PK) Average (AV)
FREQUENCY RANGE	Above 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	35 deg. C, 70%RH, 1050 hPa	TESTED BY	Bunny Yao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	4256.00	34.3 AV	54.00	-19.70	1.61H	117	31.43	30.68	6.75	34.61	-2.82
2	4256.00	45.4 PK	74.00	-28.60	1.61H	117	42.56	30.68	6.75	34.61	-2.82

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	4256.00	34.4 AV	54.00	-19.60	1.43V	205	31.56	30.68	6.75	34.61	-2.82
2	4256.00	45.2 PK	74.00	-28.80	1.43V	205	42.39	30.68	6.75	34.61	-2.82

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.



5.3 PEAK TRANSMIT POWER MEASUREMENT

5.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

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

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

5.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE&SCHWARZ SINGLE CHANNEL POWER METER	NRVS	100026	Mar. 21, 2003
ROHDE&SCHWARZ PEAK POWER METER CHANNEL POWER METER	NRV-Z32	100013	Mar. 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.

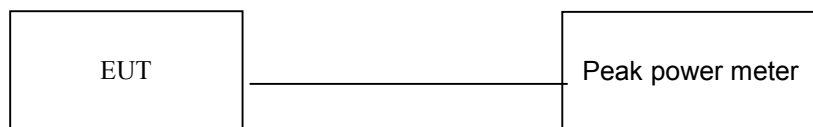
5.3.3 TEST PROCEDURE

The transmitter output was connected to the peak power sensor.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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



5.3.7 TEST RESULTS

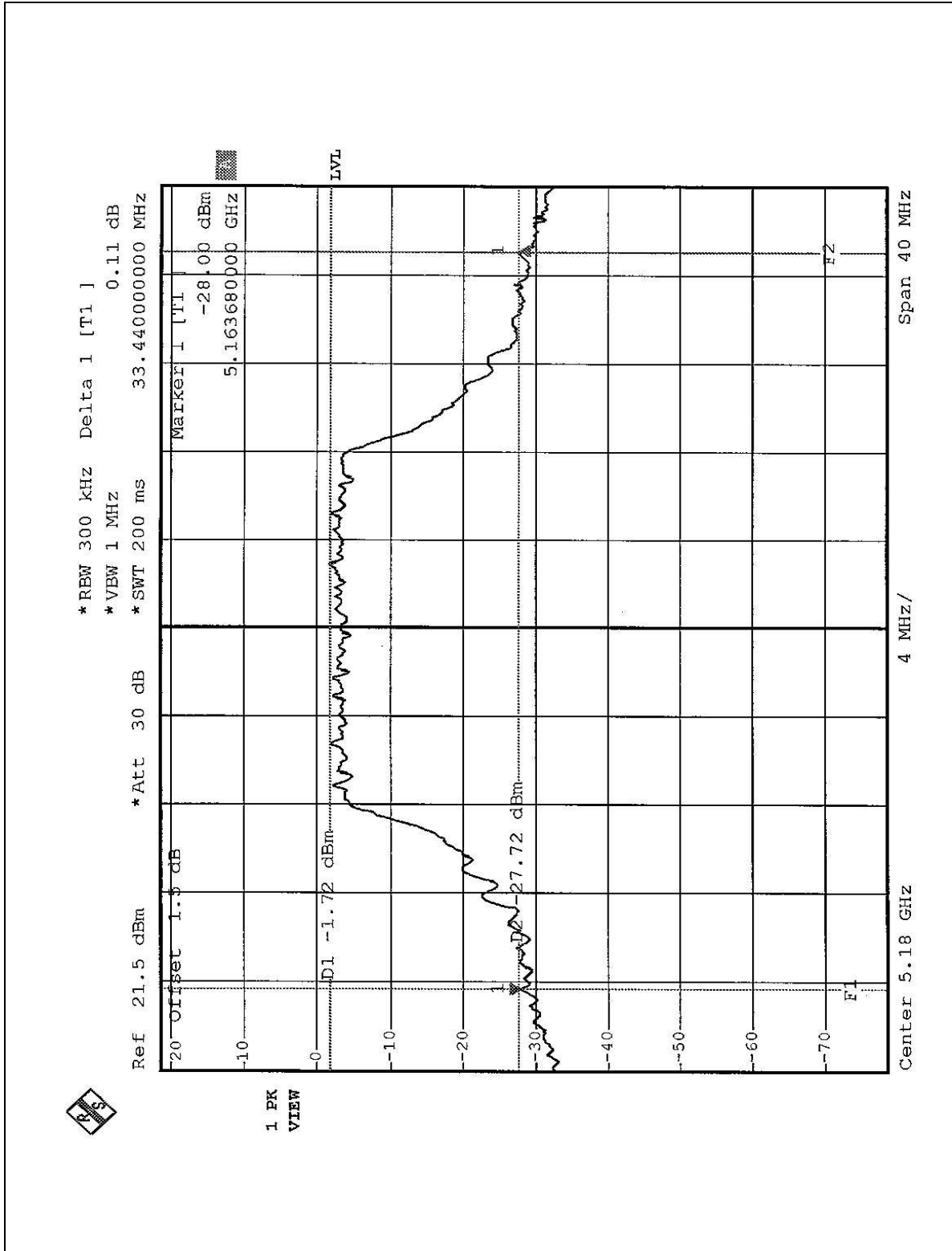
EUT	Dual-Band Wireless Access Point	MODEL	WAP51AB
CHANNEL	1, 4, 5, 8	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	32 deg. C, 50%RH, 1005 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	7.78	17.0	33.44	PASS
4	5240	11.96	17.0	33.28	PASS
5	5260	14.63	24.0	38.07	PASS
8	5320	7.60	24.0	32.04	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to next 6 pages.

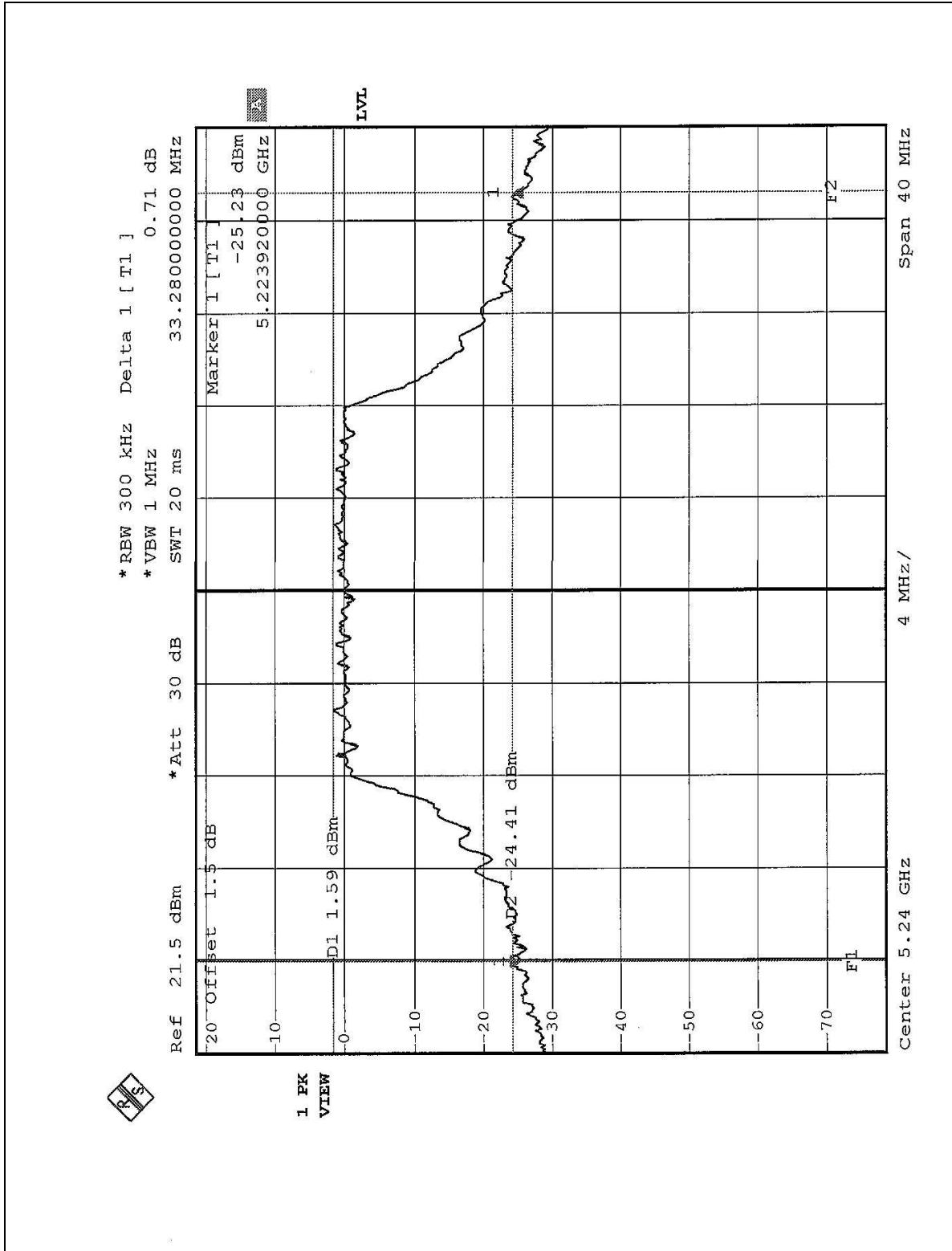


CHANNEL 1



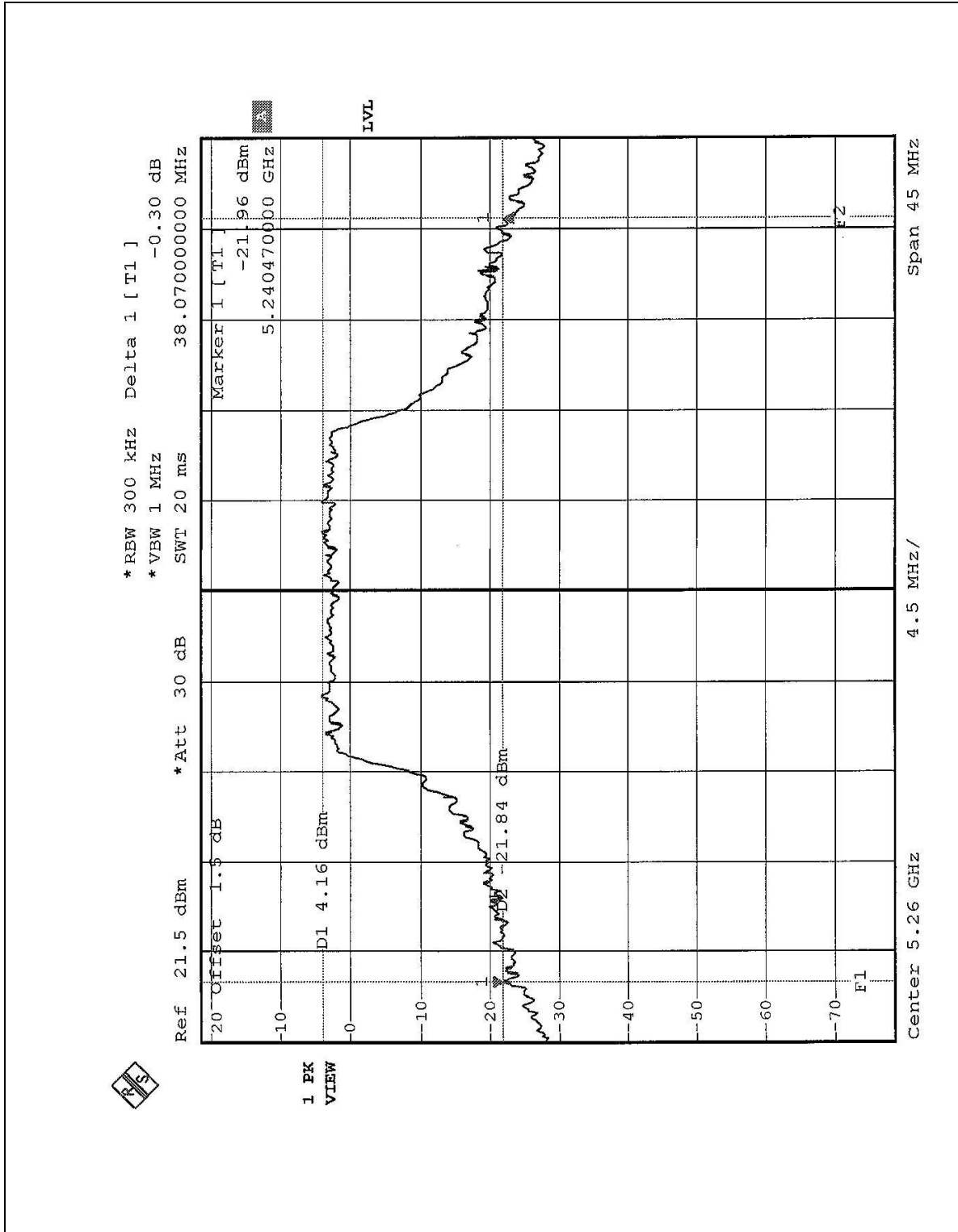


CHANNEL 4





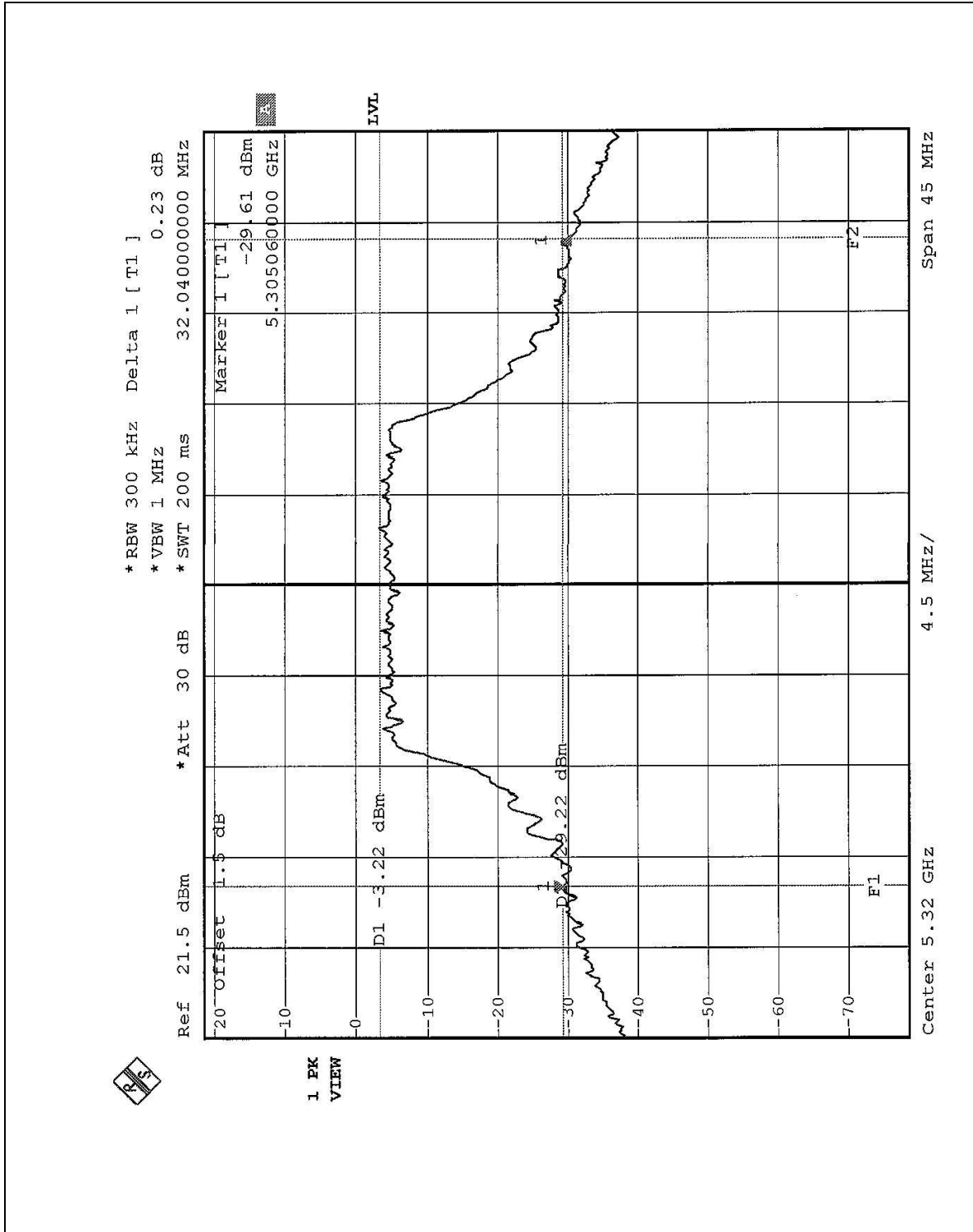
CHANNEL 5



1 PK VIEW



CHANNEL 8



5.4 PEAK POWER EXCURSION MEASUREMENT

5.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	13dB
5.25 – 5.35 GHz	13dB
5.725 – 5.825 GHz	13dB

5.4.2 TEST INSTRUMENTS

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