FCC TEST REPORT

REPORT NO.: RF930518H05
MODEL NO.: BEFW11S4 V4
RECEIVED: May 18, 2004
TESTED: May 20 to 31, 2004

APPLICANT: Cisco-Linksys, LLC

ADDRESS: 121 Theory Drive Irvine, CA 92612 (USA)

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

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1 CERTIFICATION

PRODUCT :	Wireless-B Broadband Router
BRAND NAME :	Linksys
MODEL NO. :	BEFW11S4 V4
TESTED:	May 20 to 31, 2004
TEST ITEM:	ENGINEERING SAMPLE
APPLICANT :	Cisco-Linksys, LLC
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

The above equipment (Model: BEFW11S4 V4) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY: Amanda Chu , **DATE:** Jan. 02, 2004

(Amanda Chu)

APPROVED BY: _____ , **DATE:** Jan. 02, 2004

(Eric Lin, 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 –11.14 dBuV at 0.470 MHz
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 –2.1 dBuV at 660.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless-B Broadband Router
MODEL NO.	BEFW11S4 V4
POWER SUPPLY	12VDC from AC Adapter
MODULATION TYPE	DBPSK for 1Mbps DQPSK for 2Mbps CCK for 5.5/11Mbps
RADIO TECHNOLOGY	DSSS, CCK
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	15.13dBm
ANTENNA TYPE	High-Gain Omni Antenna
DATA CABLE	NA
I/O PORTS	10/100 RJ45 Internet Port x1 10/100 RJ45 Switched LAN Port x4
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT must be supplied with a power adapter and following two different brands could be chosen:

Adapter 1:	
Brand:	Linksys
Model No.:	D12-1A
Input power :	AC120V, 60Hz, 23W
Output power :	DC12V, 1A, DC Cable:1.8m, unshielded
Adapter 2:	
Brand:	Linksys
Model No.:	AM-1201000D41
Input power :	AC120V, 60Hz, 23W
Output power :	DC12V, 1A, DC Cable:1.8m, unshielded

2. There is one antenna provided to this EUT,:

No.	Antenna Type	Gain (dBi)	Cable Loss (dB)
1	High-Gain Omni	7 (without cable loss)	3.7

3. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

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

NOTE:

1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.
3. Two test results were presented in the following sections: The test result A is for antenna with the remote antenna-stand, and the test result B is for antenna without the remote antenna-stand.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless-B Broadband Router . According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of 47 CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

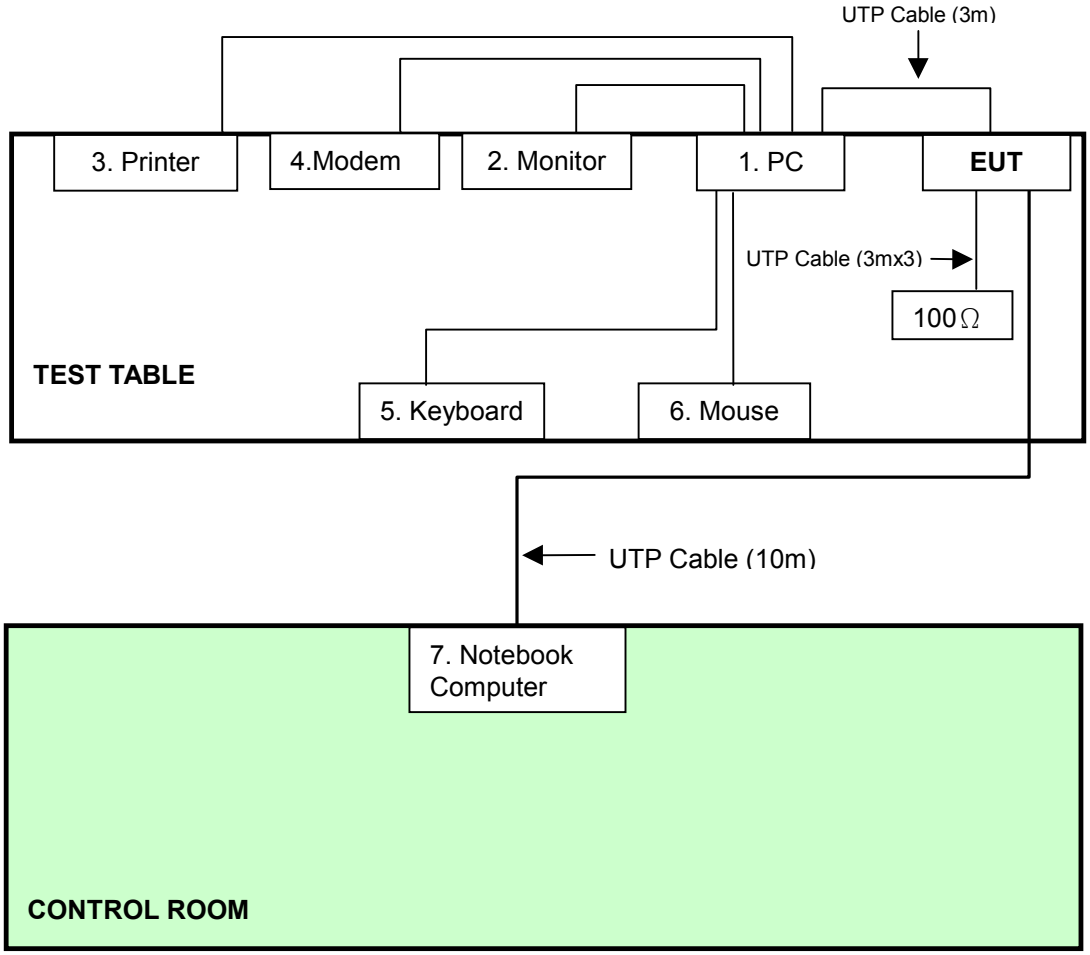
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Personal Computer	HP	DTPC 27	SG21103567	FCC DoC
2	Color monitor	ADI	CM100	026058T10200628 A	DoC
3	Printer	HP	C2642A	MY79F1C3MZ	B94C2642X
4	Modem	ACEEX	1414	0206026776	IFAXDM1414
5	Keyboard	BTC	KB-5200T	N23305028	E5XKB5122WTH0110
6	Mouse	BTC	M851	G00347024432	NA
7	Notebook Computer	Dell	PP01L	TW-0791UH-12800-0CK-3735	FCC DoC

No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
3	1.8 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core.
4	1.0 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core
5	1.8 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core.
6	1.8 m foil shielded wire, terminal by frame, PS2 Connector, w/o Core.
7	NA

Note: 1. All power cords of the above support units are unshielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: 1. Support unit 7 was kept in the control room during the test.
2. Please refer to the photos of test configuration in Item 5 also.

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Dec. 04, 2004
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 04, 2004
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 27, 2004
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2004
Terminator(for KYORITSU)	50	3	May 10, 2005
Software	Cond-V2e	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

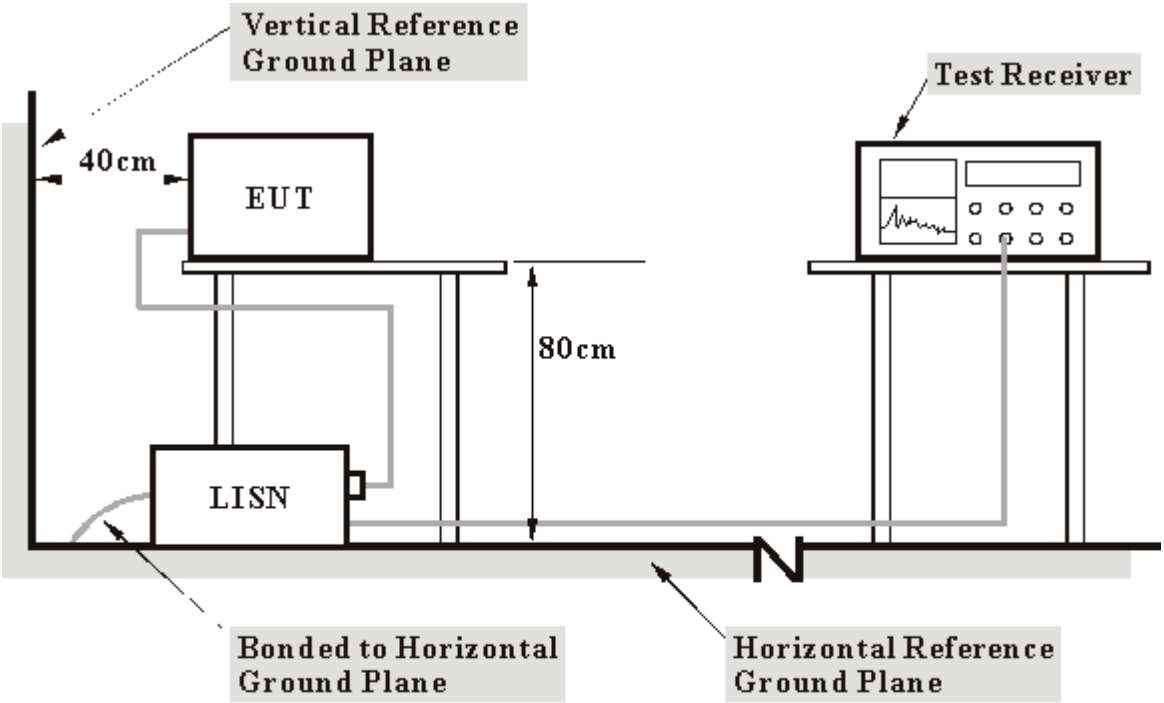
3. TEST PROCEDURES

a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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/HOST 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

4.1.3 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.

4.1.4 EUT OPERATING CONDITIONS

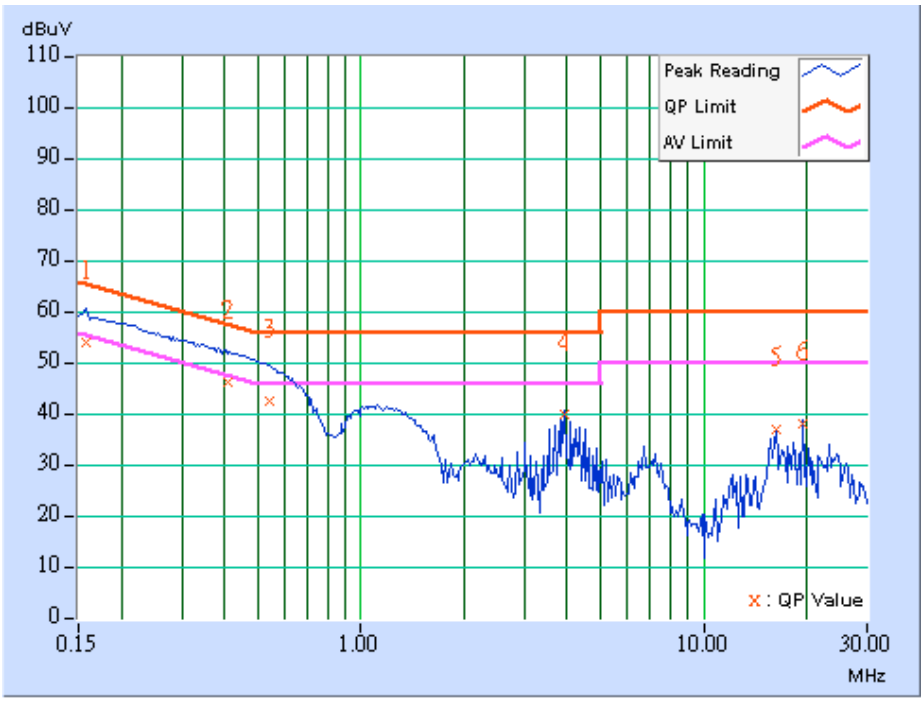
a. Placed the EUT on the testing table.
b. The support units (1-6) act as a Server PC system to communicate with EUT via UTP cable.
c. Prepared other computer systems (support unit 7) to act as a communication partner and placed them outside of testing area.
d. The communication partner run the test program "Ping.exe" to enable EUT under transmission/receiving condition continuously via one TEL line and wireless transmission.
e. PC sends "H" messages to modem.
f. PC sends "H" messages to printer, and the printer prints them on paper.

4.1.5 TEST RESULTS

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 1, Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 970 hPa	**TESTED BY**	Rex Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.22	52.62	-	52.84	-	65.58	55.58	-12.74	-
2	0.407	0.20	45.00	-	45.20	-	57.71	47.71	-12.50	-
3	0.544	0.22	41.04	-	41.26	-	56.00	46.00	-14.74	-
4	3.949	0.40	38.51	-	38.91	-	56.00	46.00	-17.09	-
5	16.230	1.25	35.48	-	36.73	-	60.00	50.00	-23.27	-
6	19.480	1.38	36.79	-	38.17	-	60.00	50.00	-21.83	-

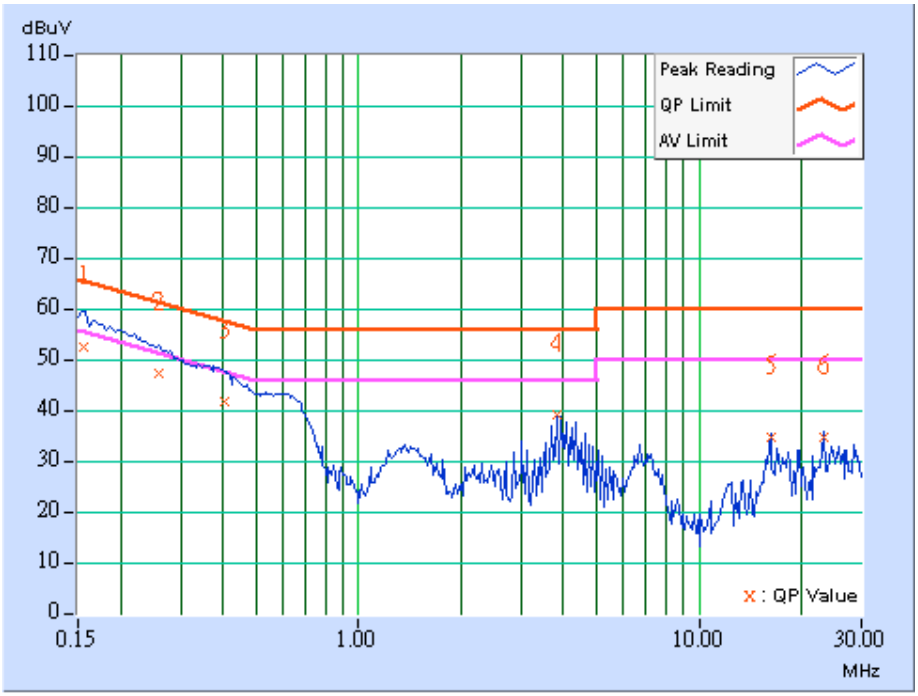
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 1, Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 970 hPa	**TESTED BY**	Rex Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.157	0.21	51.48	-	51.69	-	65.65	55.65	-13.95	-
2	0.259	0.27	46.09	-	46.36	-	61.45	51.45	-15.09	-
3	0.406	0.20	40.79	-	40.99	-	57.73	47.73	-16.74	-
4	3.813	0.39	38.23	-	38.62	-	56.00	46.00	-17.38	-
5	16.230	1.12	33.62	-	34.74	-	60.00	50.00	-25.26	-
6	23.129	1.20	33.74	-	34.94	-	60.00	50.00	-25.06	-

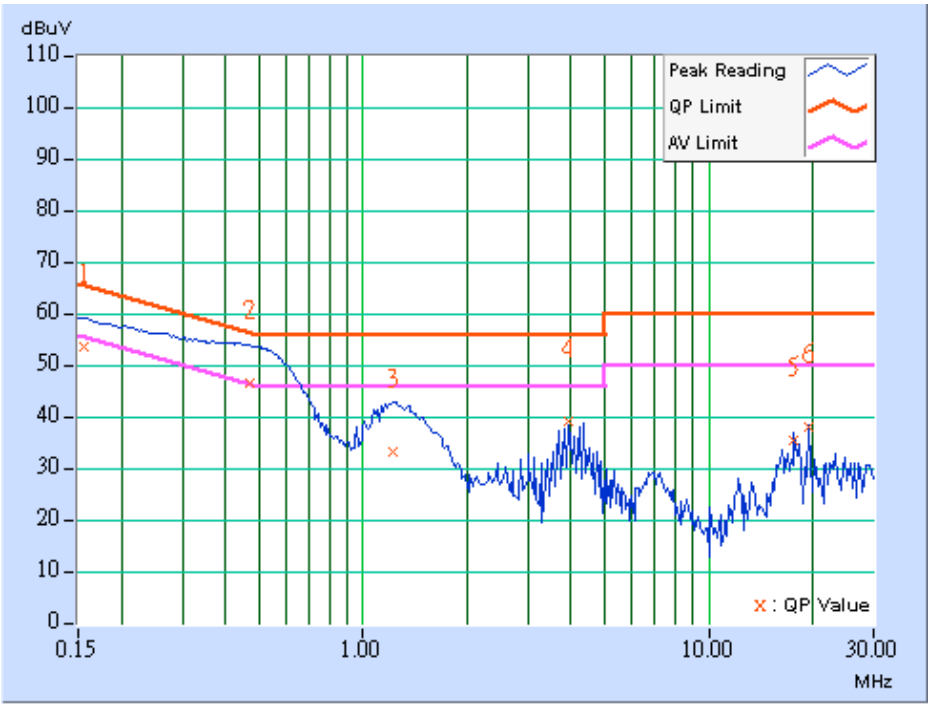
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 2, Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 970 hPa	**TESTED BY**	Rex Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.156	0.21	52.38	-	52.59	-	65.66	55.66	-13.06	-
2	**0.470**	**0.21**	**45.16**	**-**	**45.37**	**-**	**56.51**	**46.51**	**-11.14**	**-**
3	1.228	0.30	31.96	-	32.26	-	56.00	46.00	-23.74	-
4	3.953	0.40	37.84	-	38.24	-	56.00	46.00	-17.76	-
5	17.695	1.31	34.24	-	35.55	-	60.00	50.00	-24.45	-
6	19.480	1.38	36.67	-	38.05	-	60.00	50.00	-21.95	-

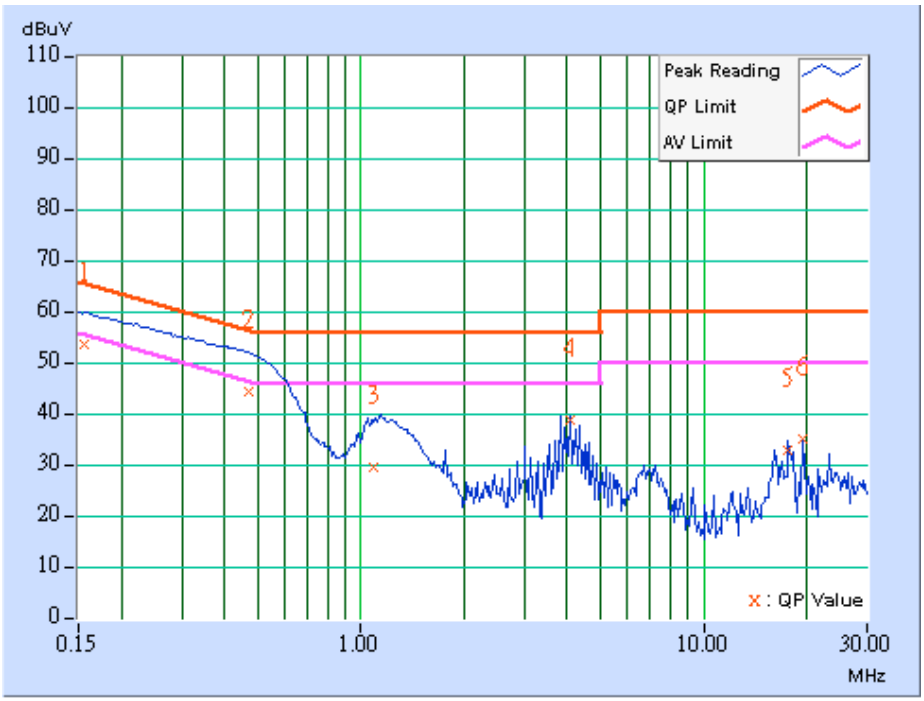
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 2, Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 970 hPa	**TESTED BY**	Rex Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.156	0.21	52.52	-	52.73	-	65.66	55.66	-12.92	-
2	0.469	0.21	43.44	-	43.65	-	56.54	46.54	-12.89	-
3	1.090	0.30	28.49	-	28.79	-	56.00	46.00	-27.21	-
4	4.086	0.40	37.54	-	37.94	-	56.00	46.00	-18.06	-
5	17.695	1.15	31.84	-	32.99	-	60.00	50.00	-27.01	-
6	19.480	1.19	34.13	-	35.32	-	60.00	50.00	-24.68	-

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit 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 (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	8594ER	3829U04676	Aug. 30, 2004
ADVANTEST Spectrum Analyzer	R3271A	85060311	Jun. 16, 2004
CHASE RF Pre_Amplifier	CPA9232	1057	May. 10, 2005
HP Pre_Amplifier	8449B	3008A01922	Oct. 13, 2004
ROHDE & SCHWARZ Test Receiver	ESVS 10	849231 /019	Sep. 30, 2004
CHASE Broadband Antenna	CBL6111c	2730	Jul 30, 2004
Schwarzbeck Horn_Antenna	3115	5619	Jul. 17, 2004
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170192	Feb. 16, 2005
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
RF Switches (ARNITSU)	CS-201	1565157	Dec. 01, 2004
RF CABLE (Chaintek) 1GHz-20GHz	SF102	22054-2	Feb. 10. 2005
RF Cable(RICHTEC)	9913-30M	STCCAB-30M-1GHz-021	Dec. 01, 2004
Software	AS60P8	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna)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. C.
5. The FCC Site Registration No. is 656396.
6. The VCCI Site Registration No. is R-1626.
7. The CANADA Site Registration No. is IC 4824-3.

4.2.3 TEST PROCEDURES

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

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

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

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

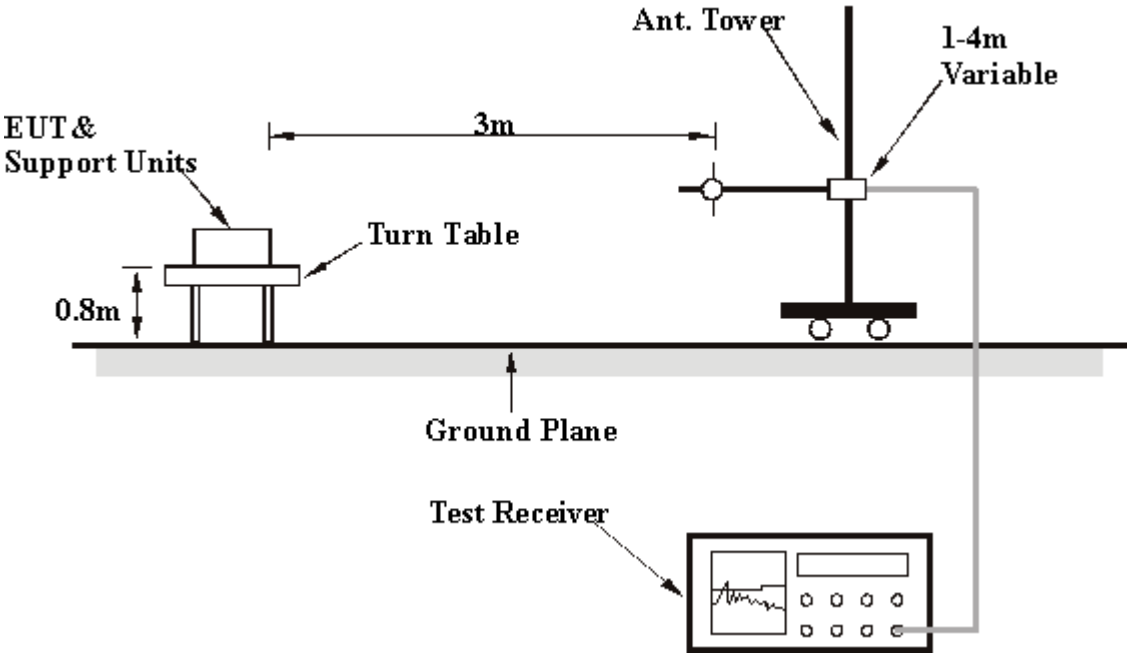
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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

NOTE:

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

4.2.4 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.6 TEST RESULTS (A)

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 1, Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 970 hPa	**TESTED BY**	Tony Chen

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	125.02	26.50 QP	43.50	-17.00	2.33 H	52	11.70	14.80
2	132.00	32.30 QP	43.50	-11.20	2.49 H	57	17.40	14.90
3	250.04	31.90 QP	46.00	-14.10	1.05 H	225	17.60	14.40
4	375.00	35.00 QP	46.00	-11.00	1.12 H	333	17.10	17.90
5	433.73	29.90 QP	46.00	-16.10	1.49 H	29	10.70	19.20
6	467.09	33.20 QP	46.00	-12.80	1.39 H	52	13.10	20.10
7	500.46	34.90 QP	46.00	-11.10	1.48 H	100	13.60	21.30
8	600.00	31.60 QP	46.00	-14.40	1.21 H	37	9.40	22.20
9	660.00	43.40 QP	46.00	-2.60	1.37 H	12	20.40	22.90
10	924.00	27.30 QP	46.00	-18.70	1.41 H	19	2.00	25.30

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	55.25	31.10 QP	40.00	-8.90	1.13 V	36	22.40	8.70
2	74.58	31.90 QP	40.00	-8.10	1.24 V	7	24.70	7.20
3	125.02	30.20 QP	43.50	-13.30	1.35 V	294	15.50	14.80
4	132.00	33.90 QP	43.50	-9.60	1.00 V	101	18.90	14.90
5	250.04	33.50 QP	46.00	-12.50	1.66 V	95	19.20	14.40
6	375.05	28.90 QP	46.00	-17.10	1.72 V	20	11.00	17.90
7	433.73	36.70 QP	46.00	-9.30	1.23 V	159	17.50	19.20
8	467.09	37.50 QP	46.00	-8.50	1.26 V	197	17.40	20.10
9	500.00	32.30 QP	46.00	-13.70	1.32 V	40	11.00	21.30
10	502.48	41.20 QP	46.00	-4.80	1.17 V	159	19.90	21.30
11	600.00	30.60 QP	46.00	-15.40	1.01 V	136	8.30	22.20
12	660.00	36.50 QP	46.00	-9.50	1.06 V	244	13.60	22.90
13	792.00	27.70 QP	46.00	-18.30	1.00 V	118	3.50	24.10
14	924.00	29.30 QP	46.00	-16.70	1.00 V	350	4.00	25.30

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 2, Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 970 hPa	**TESTED BY**	Tony Chen

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	125.02	25.10 QP	43.50	-18.40	1.94 H	45	10.30	14.80
2	132.00	31.60 QP	43.50	-11.90	2.03 H	48	16.70	14.90
3	250.00	35.30 QP	46.00	-10.70	1.37 H	20	20.90	14.40
4	375.00	34.90 QP	46.00	-11.10	1.00 H	335	17.00	17.90
5	433.73	32.10 QP	46.00	-13.90	2.30 H	312	12.90	19.20
6	467.09	34.60 QP	46.00	-11.40	1.50 H	313	14.50	20.10
7	500.45	34.30 QP	46.00	-11.70	1.54 H	298	13.00	21.30
8	600.00	30.10 QP	46.00	-15.90	1.71 H	20	7.90	22.20
9	**660.00**	**43.90 QP**	**46.00**	**-2.10**	**1.31 H**	**0**	**20.90**	**22.90**
10	792.00	28.50 QP	46.00	-17.50	1.34 H	55	4.30	24.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	53.98	29.10 QP	40.00	-10.90	1.60 V	295	20.40	8.70
2	125.02	31.30 QP	43.50	-12.20	1.36 V	272	16.50	14.80
3	132.00	30.30 QP	43.50	-13.20	1.00 V	262	15.30	14.90
4	250.04	32.70 QP	46.00	-13.30	1.00 V	200	18.40	14.40
5	375.00	26.30 QP	46.00	-19.70	2.14 V	26	8.40	17.90
6	433.73	35.30 QP	46.00	-10.70	1.22 V	189	16.10	19.20
7	467.09	37.10 QP	46.00	-8.90	1.51 V	172	17.00	20.10
8	500.45	35.10 QP	46.00	-10.90	1.40 V	207	13.80	21.30
9	660.00	35.50 QP	46.00	-10.50	1.80 V	359	12.60	22.90
10	924.00	31.40 QP	46.00	-14.60	1.76 V	4	6.10	25.30

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	Channel 1	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 970 hPa	**TESTED BY**	Tony Chen

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	2038.00	37.60 PK	74.00	-36.40	1.37 H	330	8.70	28.90
2	2387.00	50.40 PK	74.00	-23.60	1.49 H	138	17.50	32.90
3	2390.00	46.40 PK	74.00	-27.60	1.23 H	214	12.60	33.80
4	*2412.00	90.00 PK			1.00 H	49	60.10	29.90
4	*2412.00	86.10 AV			1.00 H	49	56.20	29.90
5	4824.00	42.10 PK	74.00	-31.90	1.18 H	352	5.80	36.20
6	7236.00	46.00 PK	74.00	-28.00	1.44 H	304	4.30	41.70
7	9648.00	49.10 PK	74.00	-24.90	1.45 H	253	4.20	44.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2038.00	39.60 PK	74.00	-34.40	1.65 V	3	10.70	28.90
2	2387.00	65.10 PK	74.00	-8.90	1.15 V	315	32.20	32.90
2	2387.00	48.40 AV	54.00	-5.60	1.15 V	315	15.50	32.90
3	2390.00	60.30 PK	74.00	-13.70	1.04 V	211	26.50	33.80
3	2390.00	51.10 AV	54.00	-2.90	1.04 V	211	17.30	33.80
4	*2412.00	105.80 PK			1.29 V	240	75.90	29.90
4	*2412.00	102.50 AV			1.29 V	240	72.60	29.90
5	4824.00	44.90 PK	74.00	-29.10	1.03 V	352	8.70	36.20
6	7236.00	46.00 PK	74.00	-28.00	1.16 V	230	4.40	41.70
7	9648.00	46.50 PK	74.00	-27.50	1.21 V	285	1.60	44.90

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	Channel 6	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 970 hPa	**TESTED BY**	Tony Chen

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	2063.00	36.70 PK	74.00	-37.30	1.50 H	248	7.70	29.10
2	2376.00	42.70 PK	74.00	-31.30	1.59 H	244	12.00	30.70
3	*2437.00	90.40 PK			1.00 H	289	60.40	30.00
3	*2437.00	86.00 AV			1.00 H	289	56.10	30.00
4	4874.00	44.30 PK	74.00	-29.70	1.35 H	65	7.90	36.50
5	7311.00	47.70 PK	74.00	-26.30	1.45 H	85	5.90	41.80
6	9748.00	48.00 PK	74.00	-26.00	1.52 H	30	3.40	44.60

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	2063.00	42.10 PK	74.00	-31.90	1.33 V	340	13.10	29.10
2	2376.00	55.20 PK	74.00	-18.80	1.08 V	21	24.50	30.70
2	2376.00	39.80 AV	54.00	-14.20	1.08 V	21	9.10	30.70
3	*2437.00	105.70 PK			1.00 V	17	75.70	30.00
3	*2437.00	102.00 AV			1.00 V	17	72.00	30.00
4	4874.00	47.20 PK	74.00	-26.80	1.22 V	346	10.70	36.50
5	7311.00	46.50 PK	74.00	-27.50	1.40 V	207	4.80	41.80
6	9748.00	50.30 PK	74.00	-23.70	1.23 V	140	5.60	44.60

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	Channel 11	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 970 hPa	**TESTED BY**	Tony Chen

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	2088.00	39.00 PK	74.00	-35.00	1.00 H	44	9.80	29.20
2	2375.00	41.40 PK	74.00	-32.60	1.08 H	34	10.70	30.70
3	*2462.00	90.80 PK			1.00 H	3	60.70	30.10
3	*2462.00	87.70 AV			1.00 H	3	57.60	30.10
4	2483.50	41.20 PK	74.00	-32.80	1.02 H	11	11.10	30.10
5	2507.00	37.80 PK	74.00	-36.20	1.11 H	308	7.30	30.50
6	4924.00	39.50 PK	74.00	-34.50	1.18 H	319	2.80	36.70
7	7386.00	46.90 PK	74.00	-27.10	1.23 H	290	5.00	41.80
8	9848.00	48.10 PK	74.00	-25.90	1.02 H	329	3.70	44.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1452.00	38.00 PK	74.00	-36.00	1.23 V	10	10.70	27.30
2	2088.00	43.90 PK	74.00	-30.10	1.64 V	17	14.70	29.20
3	2375.00	50.40 PK	74.00	-23.60	1.00 V	18	19.70	30.70
4	*2462.00	105.60 PK			1.01 V	15	75.50	30.10
4	*2462.00	101.90 AV			1.01 V	15	71.80	30.10
5	2483.50	51.30 PK	74.00	-22.70	1.02 V	21	21.20	30.10
5	2483.50	41.80 AV	54.00	-12.20	1.02 V	21	11.70	30.10
6	2507.00	43.30 PK	74.00	-30.70	1.29 V	1	12.80	30.50
7	4924.00	44.40 PK	74.00	-29.60	1.34 V	247	7.80	36.70
8	7386.00	46.10 PK	74.00	-27.90	1.05 V	333	4.30	41.80
9	9848.00	48.00 PK	74.00	-26.00	1.29 V	102	3.60	44.40

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

4.2.7 TEST RESULTS (B)

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 1, Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 970 hPa	**TESTED BY**	Tony Chen

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	50.00	32.10 QP	40.00	-7.90	1.22 H	255	23.10	9.00
2	125.01	25.00 QP	43.50	-18.50	1.60 H	277	12.30	12.70
3	132.00	24.70 QP	43.50	-18.80	1.61 H	108	11.80	12.80
4	150.02	27.50 QP	43.50	-16.00	1.93 H	238	15.40	12.10
5	250.04	41.80 QP	46.00	-4.20	1.73 H	256	27.60	14.20
6	375.05	29.40 QP	46.00	-16.60	1.40 H	288	11.60	17.80
7	659.99	41.30 QP	46.00	-4.70	1.43 H	353	17.30	24.00
8	923.99	35.60 QP	46.00	-10.40	1.27 H	127	6.50	29.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	50.00	30.90 QP	40.00	-9.10	1.28 V	285	21.90	9.00
2	125.01	35.20 QP	43.50	-8.30	1.13 V	236	22.50	12.70
3	250.03	32.80 QP	46.00	-13.20	1.54 V	237	18.60	14.20
4	375.05	31.20 QP	46.00	-14.80	1.68 V	195	13.40	17.80
5	500.03	28.50 QP	46.00	-17.50	1.11 V	272	6.90	21.60
6	659.99	40.80 QP	46.00	-5.20	1.12 V	141	16.80	24.00
7	791.99	32.20 QP	46.00	-13.80	1.00 V	205	6.10	26.10
8	923.99	35.40 QP	46.00	-10.60	1.13 V	347	6.30	29.10

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	With Adapter 2, Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 970 hPa	**TESTED BY**	Tony Chen

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	125.01	29.40 QP	43.50	-14.10	1.30 H	112	16.70	12.70
2	132.00	25.60 QP	43.50	-17.90	2.03 H	280	12.70	12.80
3	150.02	25.90 QP	43.50	-17.60	1.24 H	68	13.80	12.10
4	250.03	39.70 QP	46.00	-6.30	1.46 H	183	25.50	14.20
5	375.05	27.80 QP	46.00	-18.20	1.41 H	245	10.00	17.80
6	600.08	27.30 QP	46.00	-18.70	1.87 H	196	4.70	22.60
7	659.99	39.90 QP	46.00	-6.10	1.78 H	249	15.90	24.00
8	923.99	36.20 QP	46.00	-9.80	1.72 H	3	7.10	29.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	50.12	31.30 QP	40.00	-8.70	1.59 V	27	22.30	9.00
2	125.01	32.50 QP	43.50	-11.00	1.83 V	34	19.70	12.70
3	250.03	36.20 QP	46.00	-9.80	1.23 V	222	22.00	14.20
4	375.05	32.50 QP	46.00	-13.50	1.73 V	189	14.60	17.80
5	500.03	28.90 QP	46.00	-17.10	1.21 V	166	7.40	21.60
6	659.99	36.70 QP	46.00	-9.30	1.00 V	250	12.60	24.00
7	791.99	31.90 QP	46.00	-14.10	1.00 V	144	5.90	26.10
8	923.99	34.40 QP	46.00	-11.60	1.00 V	270	5.40	29.10

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	Channel 1	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 970 hPa	**TESTED BY**	Tony Chen

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	2038.00	38.70 PK	74.00	-35.30	1.38 H	312	9.80	28.90
2	2387.00	51.90 PK	74.00	-22.10	1.44 H	129	19.00	32.90
2	2387.00	35.70 AV	54.00	-18.30	1.44 H	129	2.80	32.90
3	2390.00	45.70 PK	74.00	-28.30	1.03 H	58	11.90	33.80
4	*2412.00	93.50 PK			1.03 H	58	63.60	29.90
4	*2412.00	89.40 AV			1.03 H	58	59.50	29.90
5	4824.00	43.50 PK	74.00	-30.50	1.19 H	312	7.30	36.20
6	7236.00	49.30 PK	74.00	-24.70	1.52 H	314	7.60	41.70
7	9648.00	53.10 PK	74.00	-20.90	1.19 H	163	8.20	44.90
7	9648.00	43.80 AV	54.00	-10.20	1.19 H	163	-1.10	44.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2038.00	42.50 PK	74.00	-31.50	1.67 V	265	13.60	28.90
2	2387.00	68.20 PK	74.00	-5.80	1.32 V	168	35.30	32.90
2	2387.00	51.30 AV	54.00	-2.70	1.32 V	168	18.40	32.90
3	2390.00	55.30 PK	74.00	-18.70	1.08 V	315	21.50	33.80
3	2390.00	51.10 AV	54.00	-2.90	1.08 V	315	17.30	33.80
4	*2412.00	109.10 PK			1.08 V	315	79.20	29.90
4	*2412.00	105.80 AV			1.08 V	315	75.90	29.90
5	4824.00	45.70 PK	74.00	-28.30	1.34 V	207	9.50	36.20
6	7236.00	49.00 PK	74.00	-25.00	1.29 V	141	7.30	41.70
7	9648.00	49.90 PK	74.00	-24.10	1.11 V	192	5.00	44.90

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	Channel 6	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 970 hPa	**TESTED BY**	Tony Chen

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	2063.00	38.50 PK	74.00	-35.50	1.23 H	206	9.40	29.10
2	2373.00	44.10 PK	74.00	-29.90	1.54 H	311	13.40	30.70
3	*2437.00	93.90 PK			1.09 H	63	63.90	30.00
3	*2437.00	89.30 AV			1.09 H	63	59.30	30.00
4	4874.00	45.10 PK	74.00	-28.90	1.36 H	172	8.60	36.50
5	7311.00	50.80 PK	74.00	-23.20	1.55 H	262	9.00	41.80
6	9748.00	51.70 PK	74.00	-22.30	1.27 H	309	7.10	44.60
6	9748.00	41.90 AV	54.00	-12.10	1.27 H	309	-2.70	44.60

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	2063.00	43.90 PK	74.00	-30.10	1.27 V	318	14.80	29.10
2	2373.00	56.30 PK	74.00	-17.70	1.38 V	296	25.60	30.70
2	2373.00	41.50 AV	54.00	-12.50	1.38 V	296	10.80	30.70
3	*2437.00	107.90 PK			1.19 V	354	77.90	30.00
3	*2437.00	105.20 AV			1.19 V	354	75.20	30.00
4	4874.00	48.30 PK	74.00	-25.70	1.26 V	71	11.80	36.50
5	7311.00	48.30 PK	74.00	-25.70	1.33 V	63	6.50	41.80
6	9748.00	54.10 PK	74.00	-19.90	1.42 V	156	9.50	44.60
6	9748.00	42.80 AV	54.00	-11.20	1.42 V	156	-1.80	44.60

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

EUT	Wireless-B Broadband Router	**MODEL**	BEFW11S4 V4
MODE	Channel 11	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 63%RH, 970 hPa	**TESTED BY**	Tony Chen

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	2088.00	40.50 PK	74.00	-33.50	1.27 H	311	11.30	29.20
2	2375.00	44.30 PK	74.00	-29.70	1.38 H	107	13.60	30.70
3	*2462.00	94.30 PK			1.22 H	119	64.20	30.10
3	*2462.00	90.10 AV			1.22 H	119	60.00	30.10
4	2483.50	30.60 PK	74.00	-43.40	1.22 H	119	0.50	30.10
5	4924.00	45.10 PK	74.00	-28.90	1.36 H	228	8.40	36.70
6	7386.00	49.90 PK	74.00	-24.10	1.41 H	130	8.10	41.80
7	9848.00	52.70 PK	74.00	-21.30	1.41 H	115	8.30	44.40
7	9848.00	42.50 AV	54.00	-11.50	1.41 H	115	-1.90	44.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2088.00	45.70 PK	74.00	-28.30	1.39 V	305	16.50	29.20
2	2375.00	53.10 PK	74.00	-20.90	1.15 V	227	22.40	30.70
2	2375.00	48.30 AV	54.00	-5.70	1.15 V	227	17.60	30.70
3	*2462.00	108.60 PK			1.01 V	10	78.50	30.10
3	*2462.00	104.50 AV			1.01 V	10	74.40	30.10
4	2483.50	44.90 PK	74.00	-29.10	1.01 V	10	14.80	30.10
5	4924.00	46.10 PK	74.00	-27.90	1.38 V	178	9.40	36.70
6	7386.00	49.70 PK	74.00	-24.30	1.26 V	360	7.90	41.80
7	9848.00	52.90 PK	74.00	-21.10	1.19 V	315	8.50	44.40
7	9848.00	42.90 AV	54.00	-11.10	1.19 V	315	-1.50	44.40

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 27, 2004

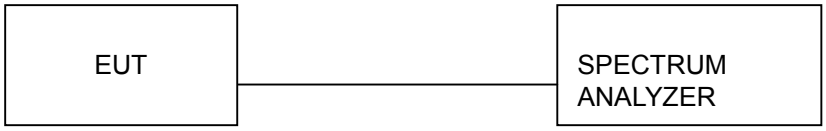
NOTE:

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

4.3.3 TEST PROCEDURE

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

4.3.4 TEST SETUP



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

4.3.5 EUT OPERATING CONDITIONS

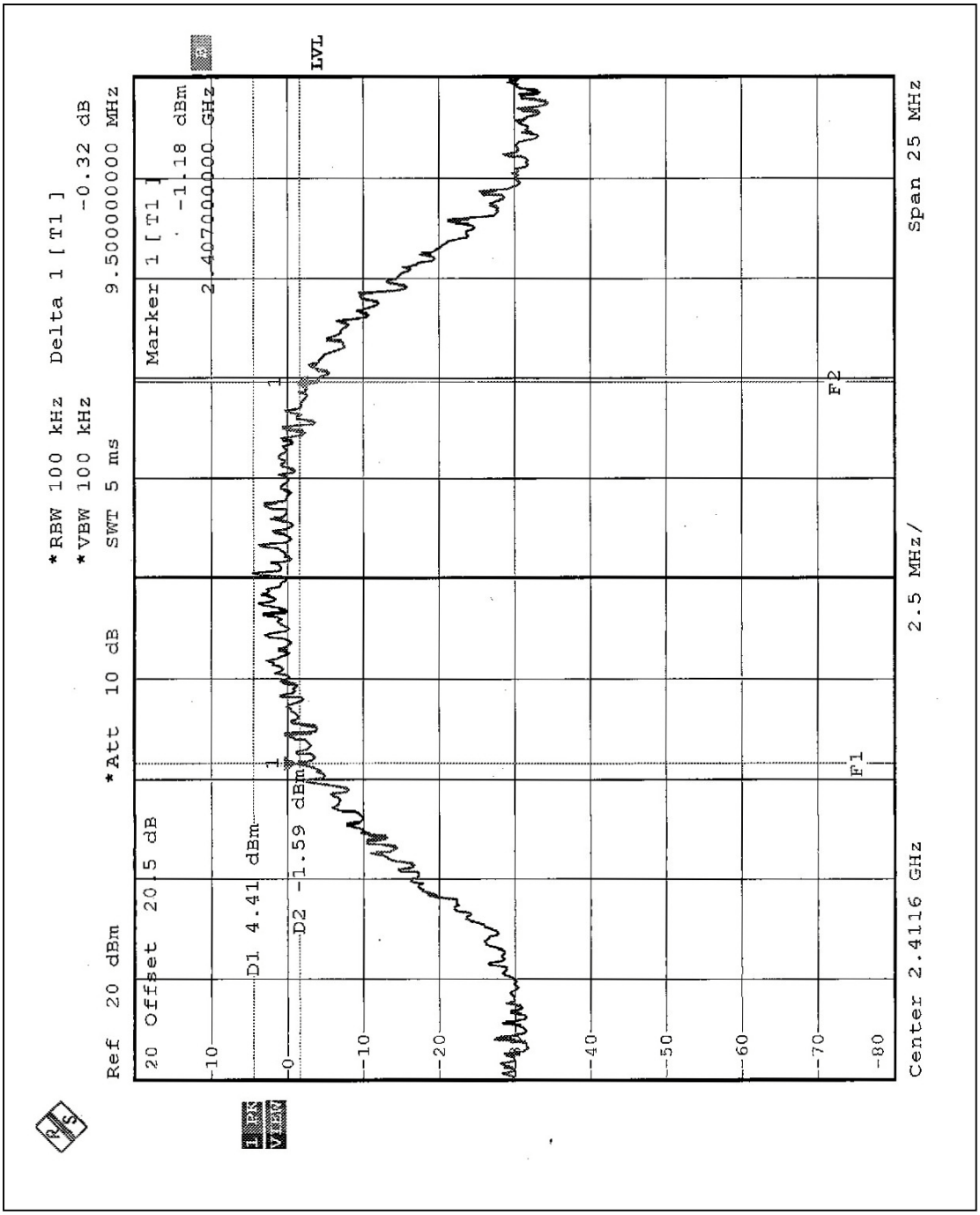
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

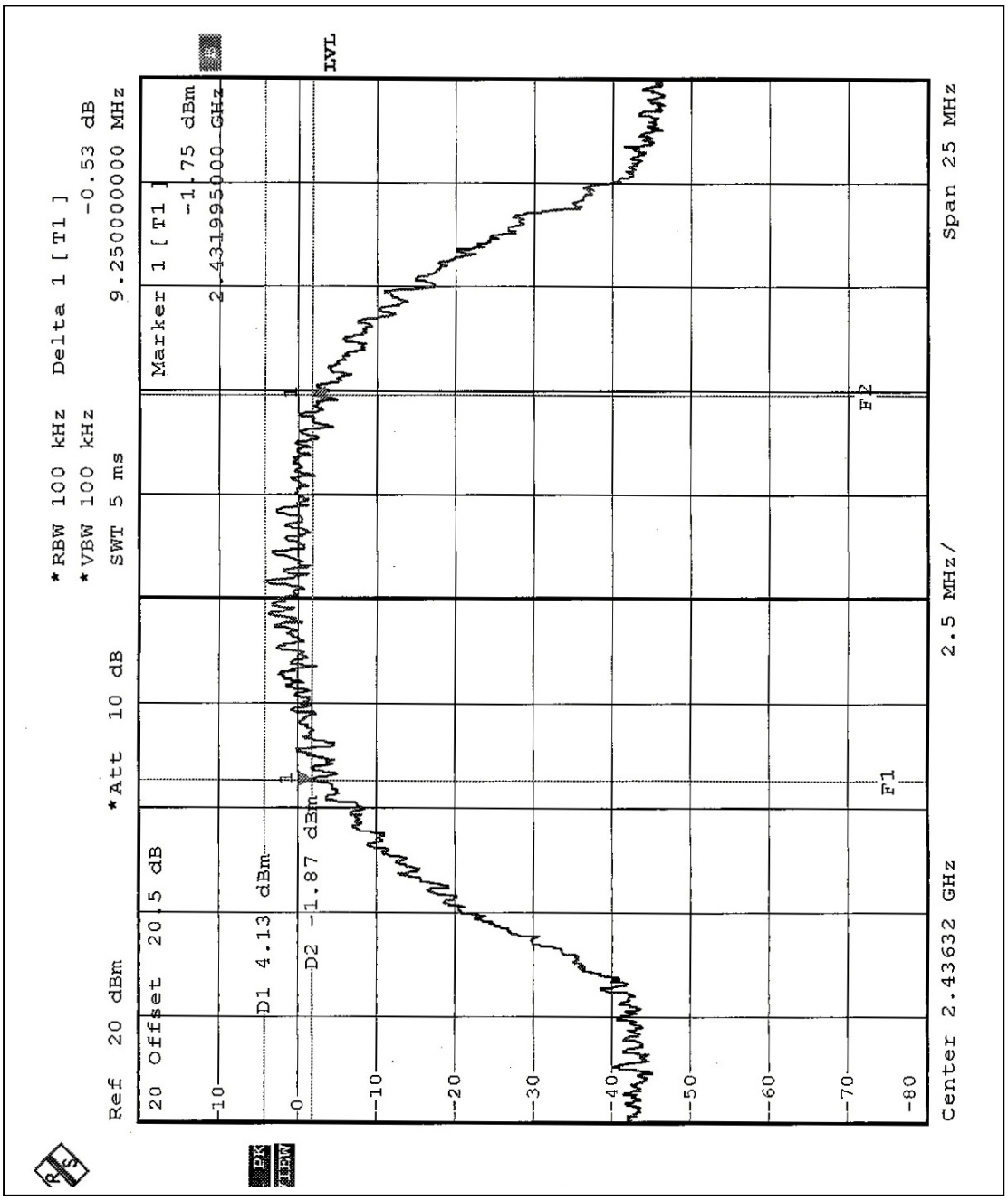
EUT	Wireless-B Broadband Router		
MODEL	BEFW11S4 V4	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 59%RH, 970 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Tony Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	9.5	0.5	PASS
6	2437	9.25	0.5	PASS
11	2462	9.55	0.5	PASS

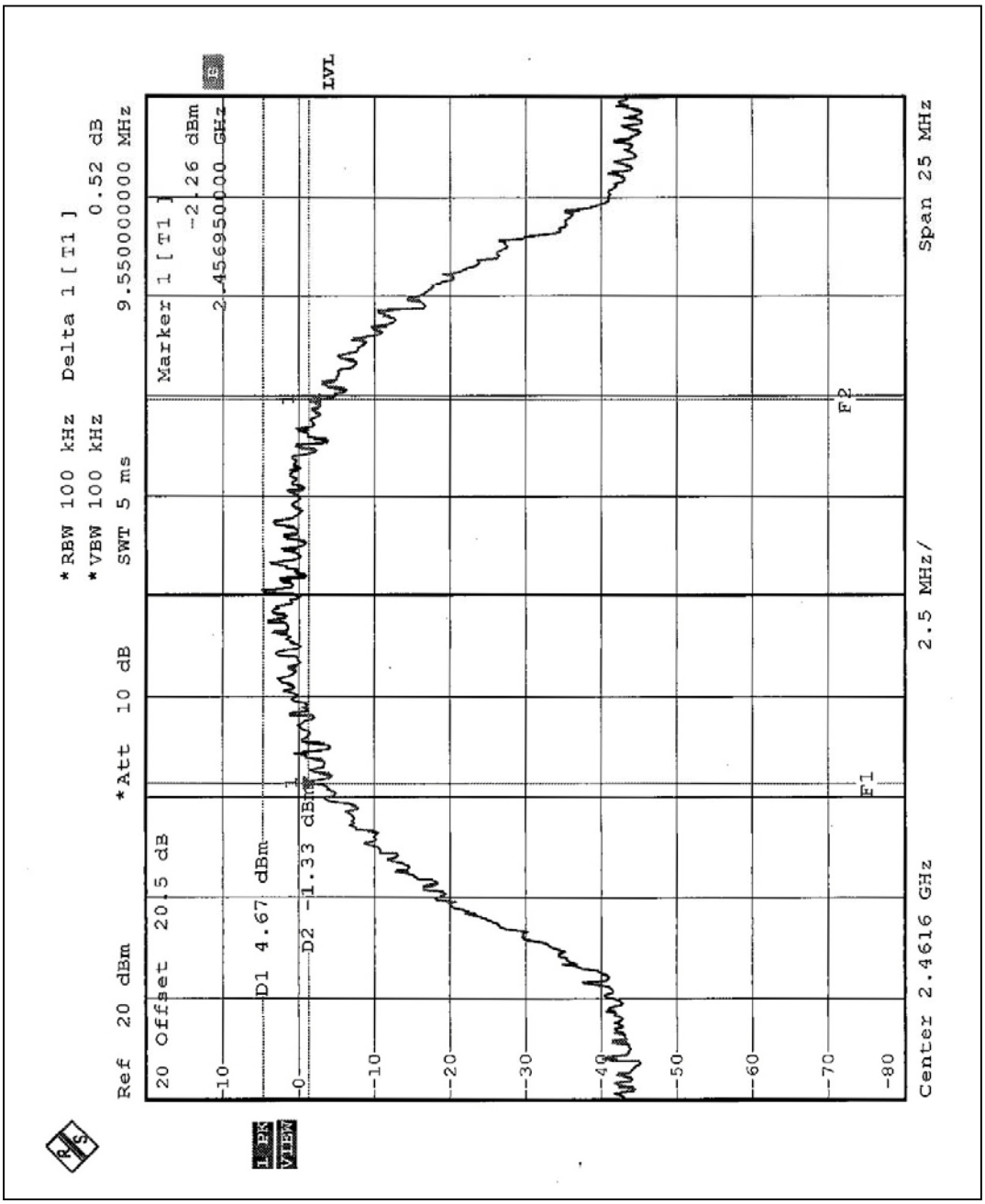
CH1


Ref 20 dBm
20 Offset 20.5 dB
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
-0.32 dB
9.500000000 MHz
Marker 1 [T1]
-1.18 dBm
2.407000000 GHz
D1 4.41 dBm
D2 -1.59 dBm
LVL
F2
F1
Center 2.4116 GHz
2.5 MHz/
Span 25 MHz

CH6


Ref 20 dBm
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
-0.53 dB
9.250000000 MHz
Marker 1 [T1]
-1.75 dBm
2.431995000 GHz
20 Offset 20.5 dB
D1 4.13 dBm
D2 -1.87 dBm
LVL
F1
F2
Center 2.43632 GHz
2.5 MHz/
Span 25 MHz

CH11


Ref 20 dBm
20 Offset 20.5 dB
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
0.52 dB
9.55000000 MHz
Marker 1 [T1]
-2.26 dBm
2.45695000 GHz
D1 4.67 dBm
D2 -1.33 dBm
LVL
1 PK
VBW
Center 2.4616 GHz
2.5 MHz/
Span 25 MHz
F1
F2

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

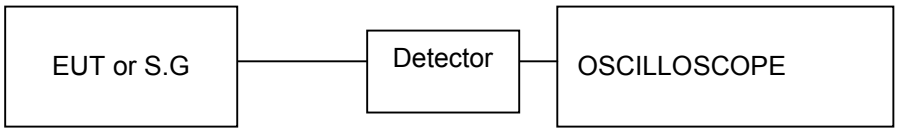
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 27, 2004
R&S SIGNAL GENERATOR	SMP04	100011	May 28, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	B027241	Jun. 29, 2004
NARDA DETECTOR	4503A	FSCM99899	NA

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 peak 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 peak reading on oscilloscope. Record the power level.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

4.4.6 TEST RESULTS (A)

EUT	Wireless-B Broadband Router		
MODEL	BEFW11S4 V4	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 59%RH, 970 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Tony Chen

Antenna Gain 7.0 dBi with Cable loss 3.7 dB:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.1	30	PASS
6	2437	15.13	30	PASS
11	2462	15.09	30	PASS

4.4.7 TEST RESULTS (B)

EUT	Wireless-B Broadband Router		
MODEL	BEFW11S4 V4	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 59%RH, 970 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Tony Chen

Antenna Gain 7.0 dBi (without Cable loss):

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.1	29	PASS
6	2437	15.13	29	PASS
11	2462	15.09	29	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 27, 2004

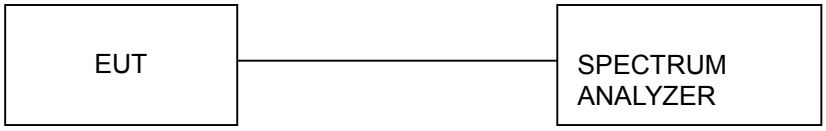
NOTE:

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

4.5.3 TEST PROCEDURE

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

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

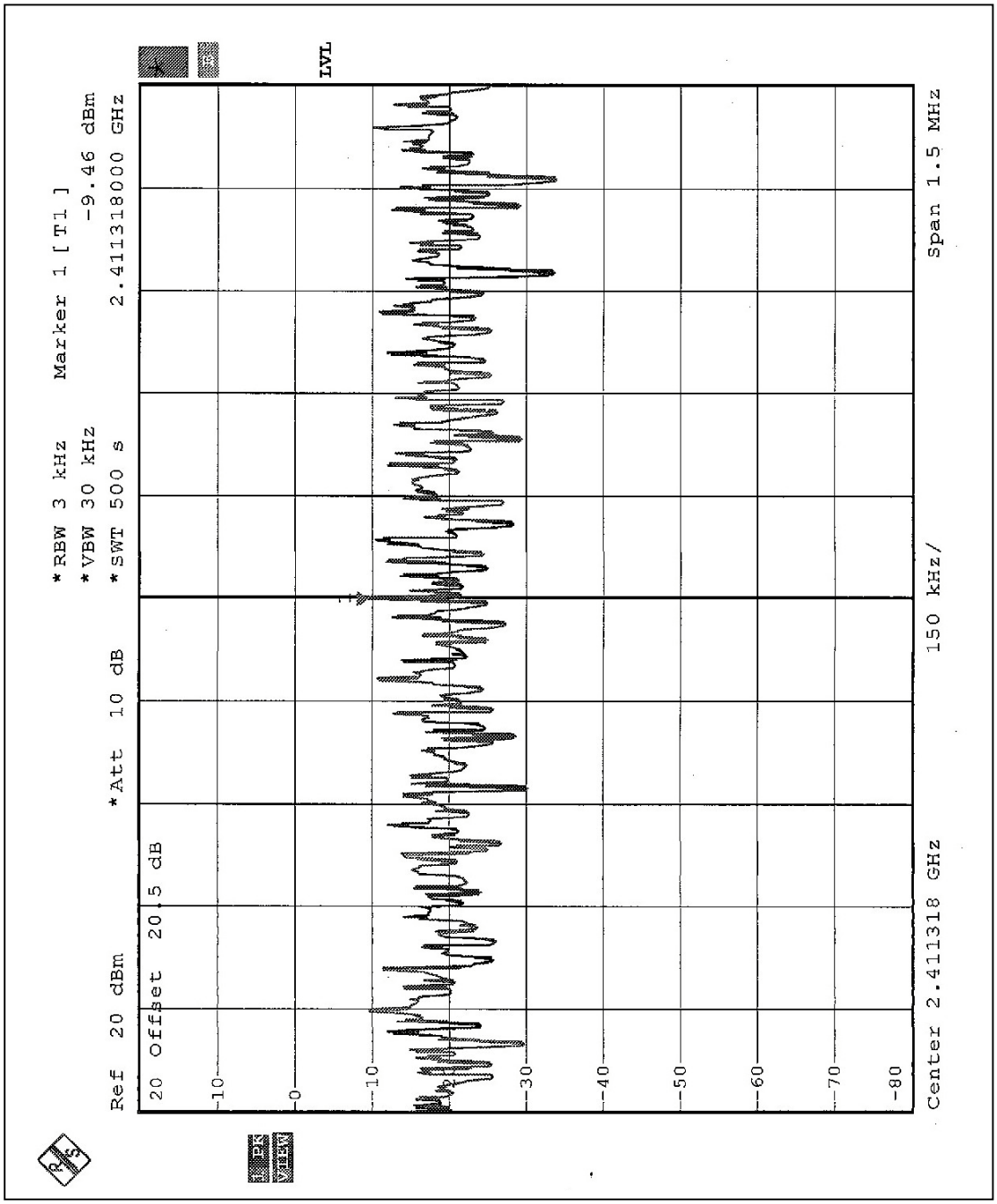
Same as 4.3.5

4.5.6 TEST RESULTS

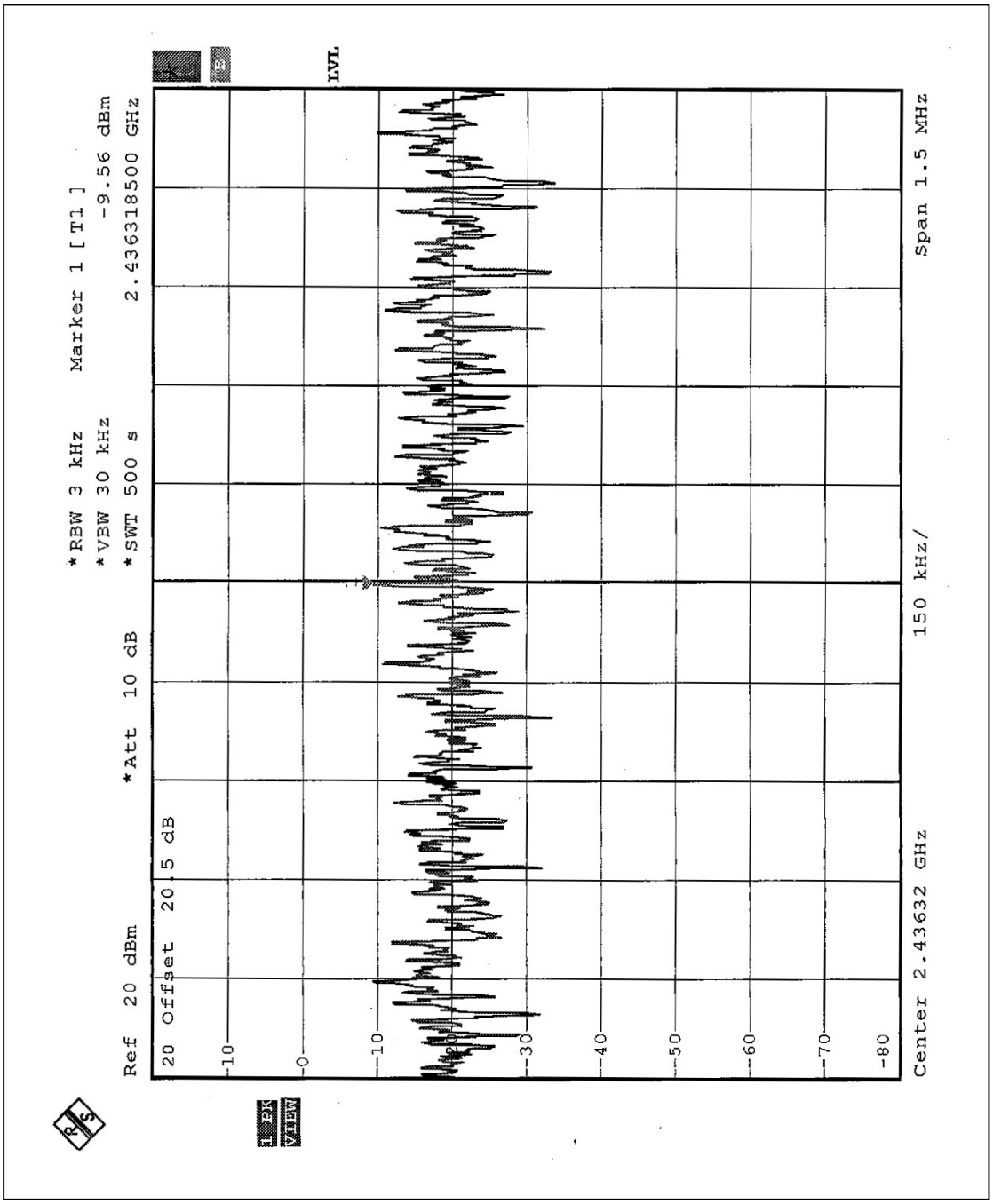
EUT	Wireless-B Broadband Router		
MODEL	BEFW11S4 V4	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 59%RH, 970 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Tony Chen

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.46	8	PASS
6	2437	-9.56	8	PASS
11	2462	-919	8	PASS

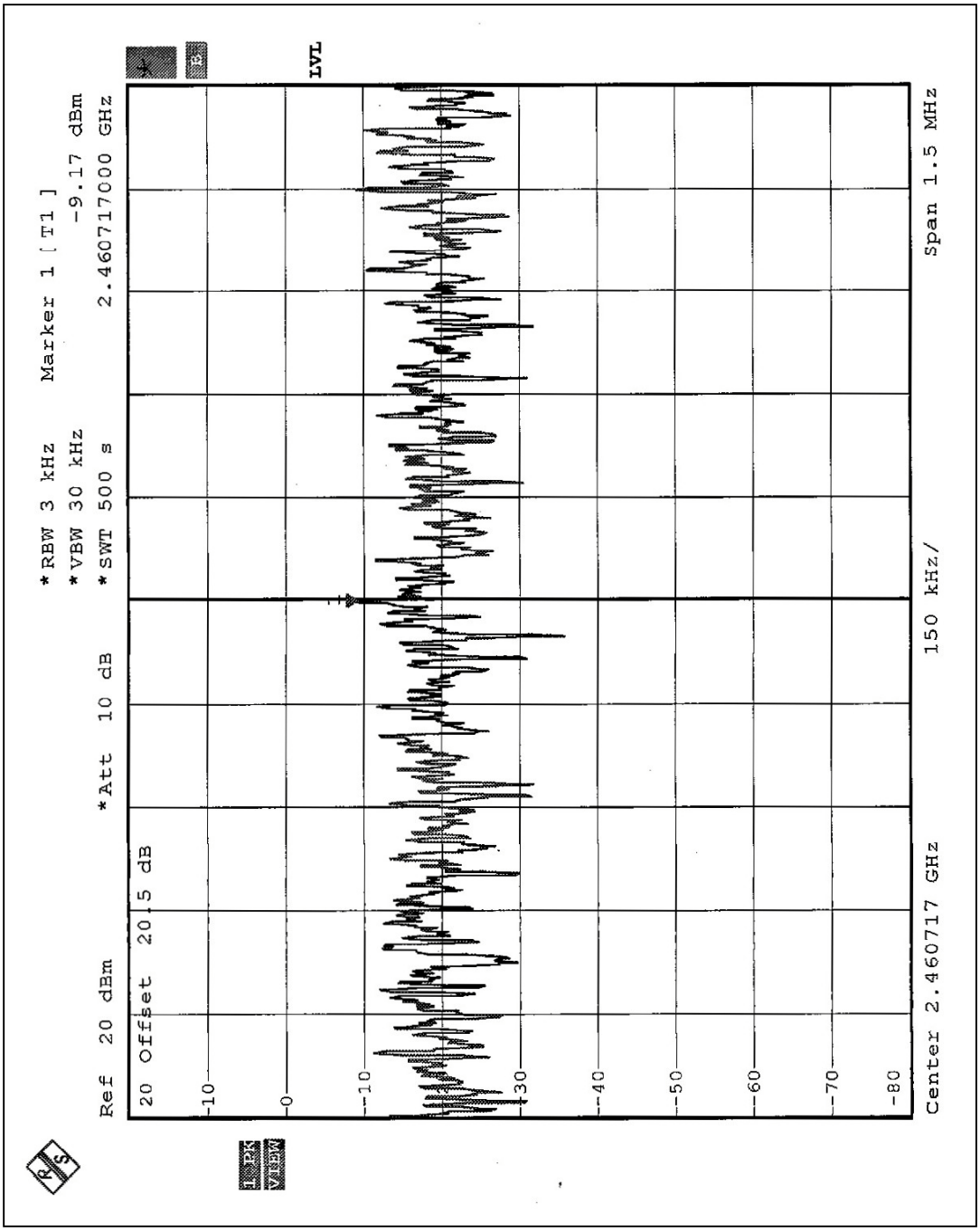
CH1


Ref 20 dBm
20 Offset 20.5 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-9.46 dBm
2.411318000 GHz
LVL
-10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.411318 GHz
150 kHz/
Span 1.5 MHz

CH6


Ref 20 dBm
20 Offset 20.5 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-9.56 dBm
2.436318500 GHz
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.43632 GHz
150 kHz/
Span 1.5 MHz
PK
VIEW

CH11


Ref 20 dBm
20 Offset 20.5 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-9.17 dBm
2.460717000 GHz
LVL
-10
0
-10
-30
-40
-50
-60
-70
-80
Center 2.460717 GHz
150 kHz/
Span 1.5 MHz

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 27, 2004

NOTE:

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

4.6.3 TEST PROCEDURE

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

4.6.4 EUT OPERATING CONDITION

Same as Item 4.3.5

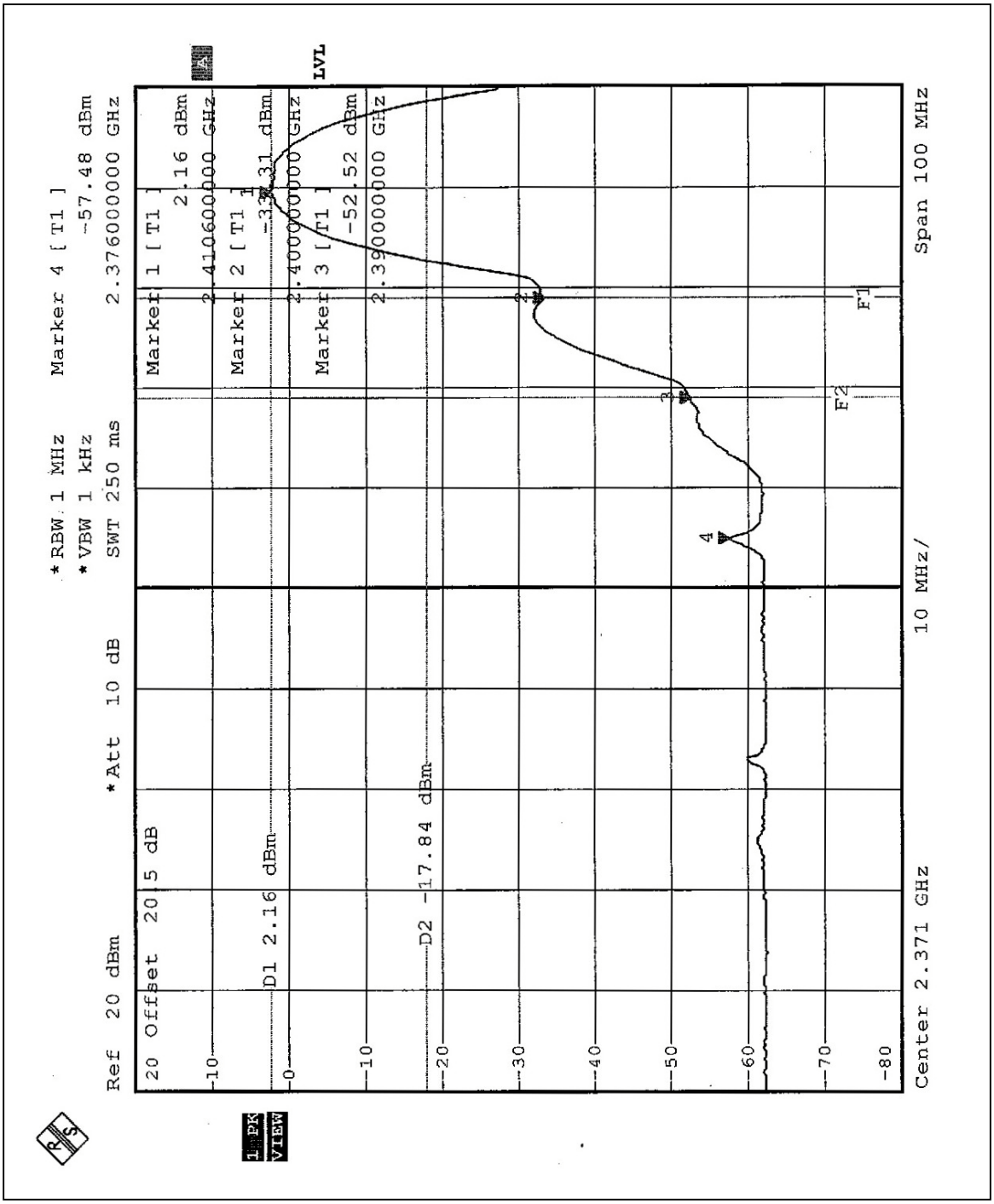
4.6.5 TEST RESULTS (A)

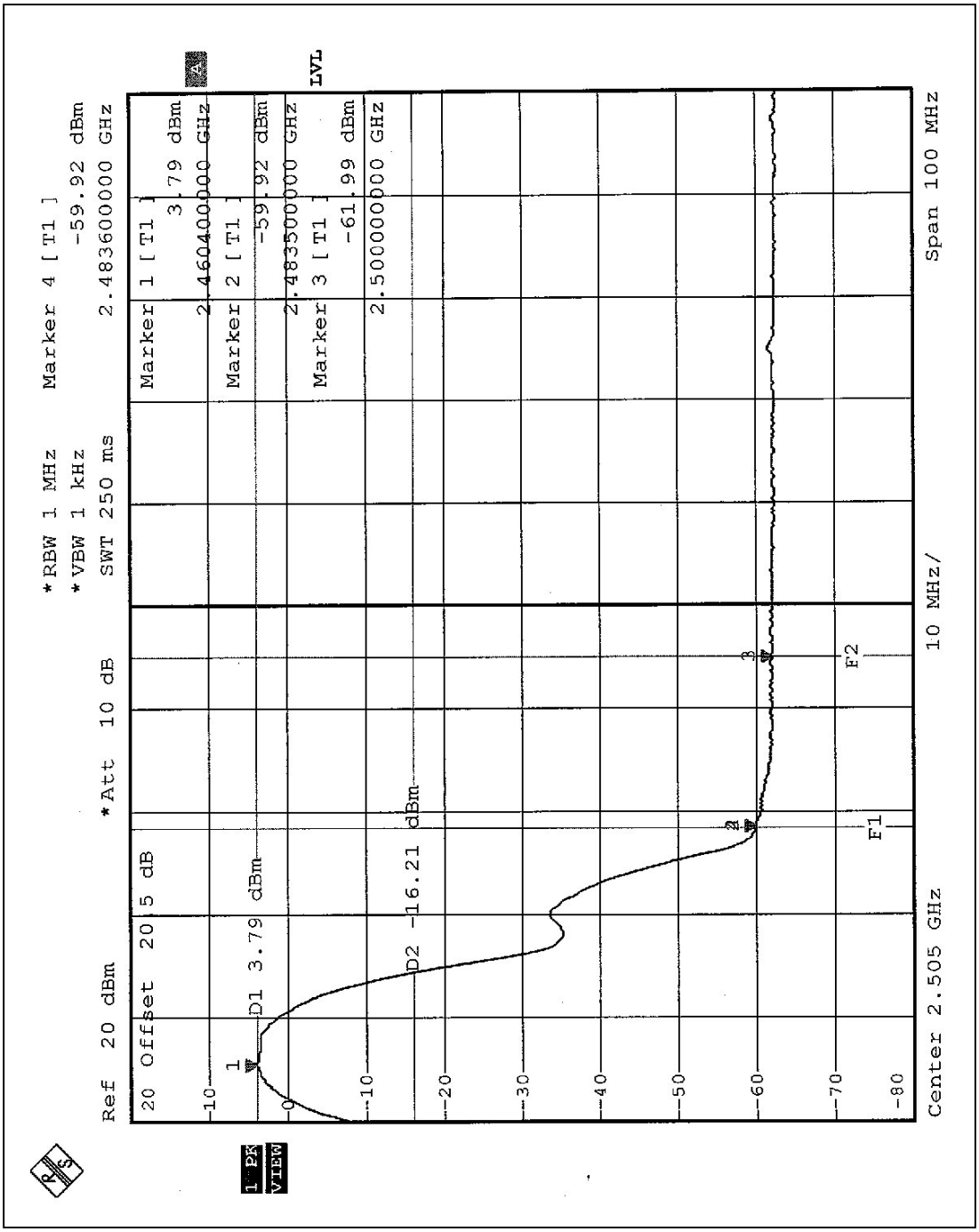
The spectrum plots are attached on the following 2 pages. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

NOTE (1): The band edge emission plot on the following first page shows 54.68dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 102.5dBuV/m, so the maximum field strength in restrict band is 102.5-54.68=47.82dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 63.71dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 101.9dBuV/m, so the maximum field strength in restrict band is 101.9-63.71=38.19dBuV/m which is under 54 dBuV/m limit.


Ref 20 dBm
Offset 20.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 4 [T1]
-57.48 dBm
2.376000000 GHz
Marker 1 [T1]
2.16 dBm
2.410600000 GHz
Marker 2 [T1]
-33.31 dBm
2.400000000 GHz
Marker 3 [T1]
-52.52 dBm
2.390000000 GHz
D1 2.16 dBm
D2 -17.84 dBm
LVL
1 PK VIEW
Center 2.371 GHz
10 MHz/
Span 100 MHz
F1
F2


Ref 20 dBm
20 Offset 20 5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 4 [T1]
-59.92 dBm
2.483600000 GHz
Marker 1 [T1]
3.79 dBm
2.460400000 GHz
Marker 2 [T1]
-59.92 dBm
2.483500000 GHz
Marker 3 [T1]
-61.99 dBm
2.500000000 GHz
D1 3.79 dBm
D2 -16.21 dBm
LVL
1 PK
VIEW
Center 2.505 GHz
10 MHz/
Span 100 MHz
F1
F2

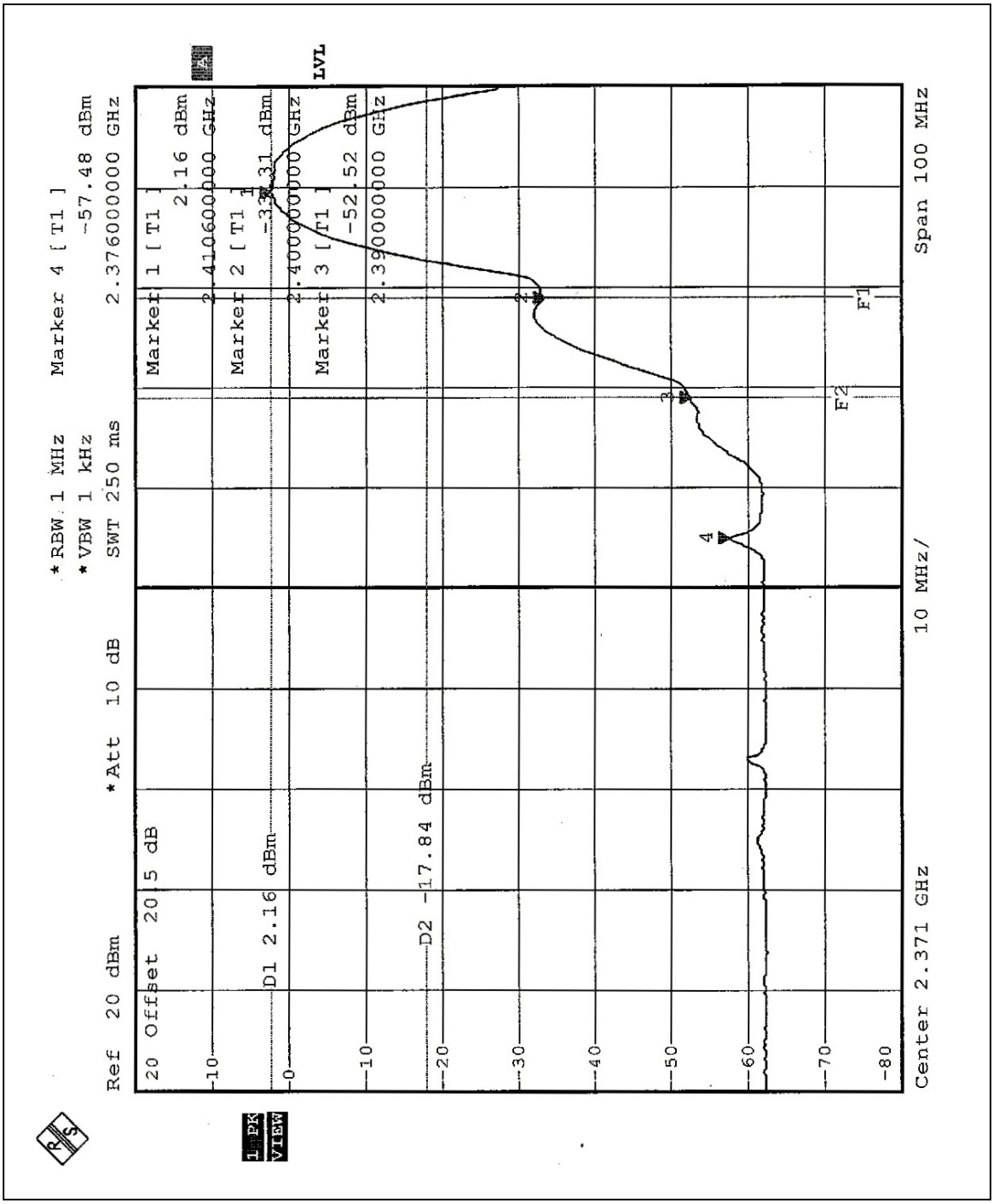
4.6.6 TEST RESULTS (B)

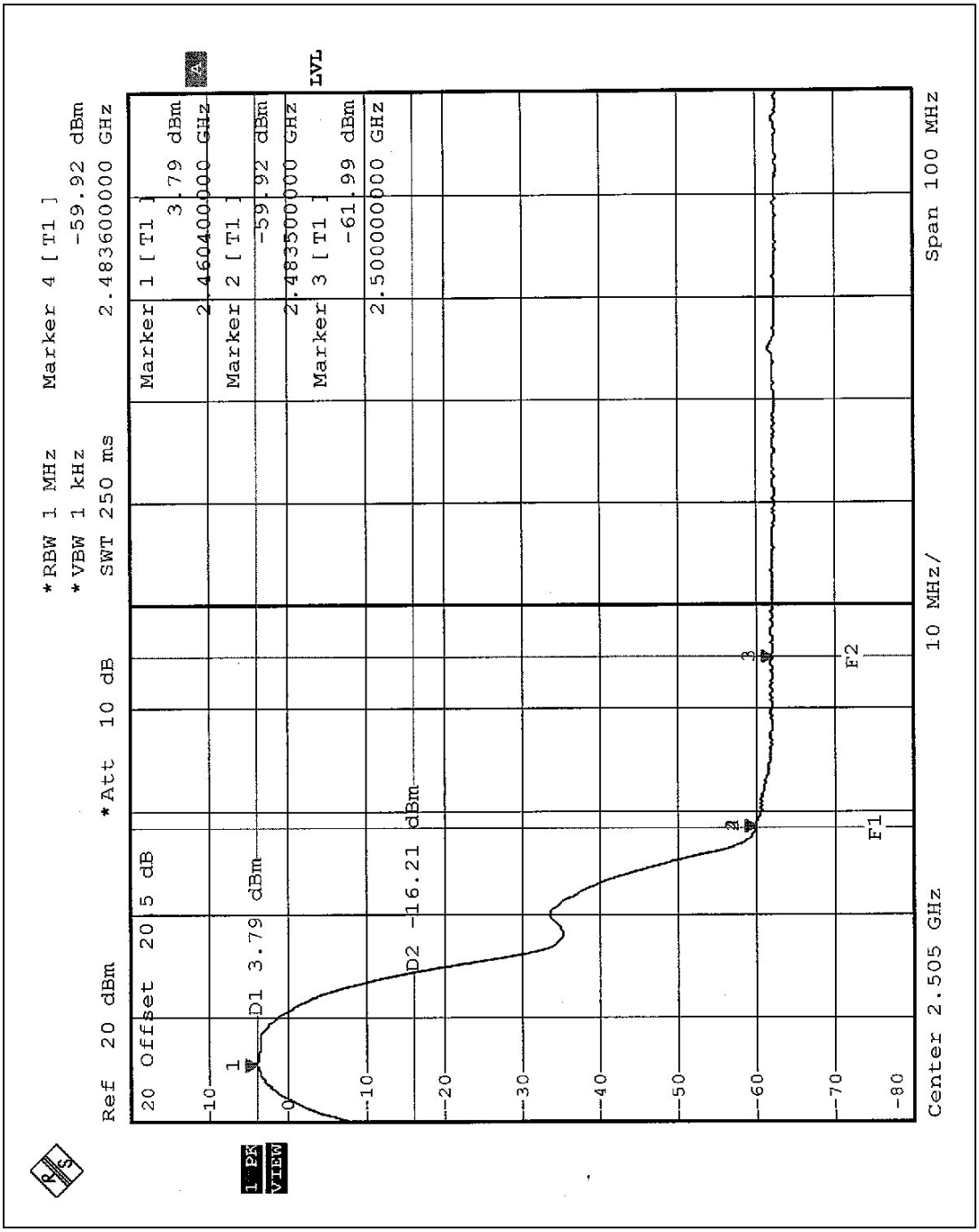
The spectrum plots are attached on the following 2 pages. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

NOTE (1): The band edge emission plot on the following first page shows 54.68dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 105.8dBuV/m, so the maximum field strength in restrict band is 105.8-54.68=51.12dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 63.71dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 104.5dBuV/m, so the maximum field strength in restrict band is 104.5-63.71=40.79dBuV/m which is under 54 dBuV/m limit.


Ref 20 dBm
Offset 20.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 4 [T1]
-57.48 dBm
2.376000000 GHz
Marker 1 [T1]
2.16 dBm
2.410600000 GHz
Marker 2 [T1]
-33.31 dBm
2.400000000 GHz
Marker 3 [T1]
-52.52 dBm
2.390000000 GHz
D1 2.16 dBm
D2 -17.84 dBm
LVL
1 PK VIEW
Center 2.371 GHz
10 MHz/
Span 100 MHz
F1
F2


Ref 20 dBm
20 Offset 20 5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 4 [T1]
-59.92 dBm
2.483600000 GHz
Marker 1 [T1]
3.79 dBm
2.460400000 GHz
Marker 2 [T1]
-59.92 dBm
2.483500000 GHz
Marker 3 [T1]
-61.99 dBm
2.500000000 GHz
D1 3.79 dBm
D2 -16.21 dBm
LVL
1 PK
VIEW
Center 2.505 GHz
10 MHz/
Span 100 MHz
F1
F2

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

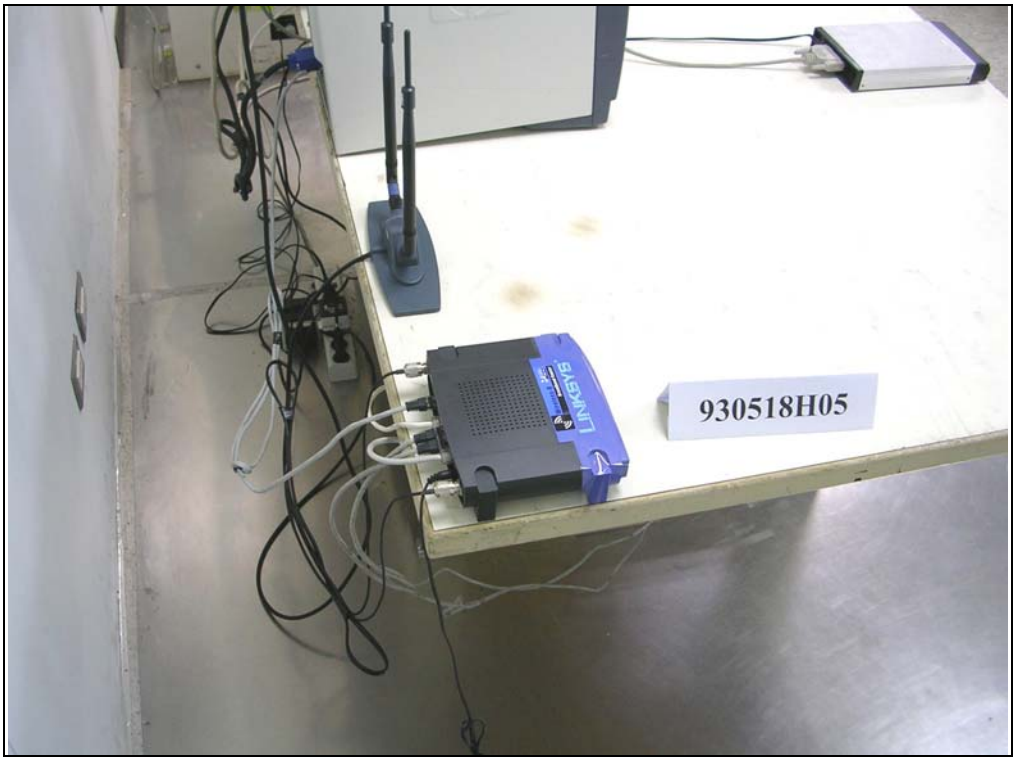
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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 High-Gain Omni Antenna with Reverse TNC connector. The maximum Gain of the antenna is 7.0dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST (antenna with the remote antenna-stand)



CONDUCTED EMISSION TEST (antenna without the remote antenna-stand)

RADIATED EMISSION TEST (antenna with the remote antenna-stand)

RADIATED EMISSION TEST (antenna without the remote antenna-stand)

6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP, UL
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

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

Report Format Version 1.0