



FCC TEST REPORT

REPORT NO.: RF930607L14

MODEL NO.: RB-8110 PLUS

RECEIVED: June 7, 2004

TESTED: June 10 ~ June 23, 2004

APPLICANT: SENDFAR TECHNOLOGY CO.,LTD..

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ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei
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R.O.C.

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1 CERTIFICATION

PRODUCT : Wireless Router Bridge
MODEL NO. : RB-8110 PLUS
BRAND NAME: SendFar
APPLICANT: SENDFAR TECHNOLOGY CO.,LTD..
TESTED: June 10 ~ June 23, 2004
TEST ITEM : ENGINEERING SAMPLE
STANDARDS : FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2001

The above equipment 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: Wendy Liao, **DATE:** June 24, 2004
Wendy Liao

APPROVED BY: Cody Chang, **DATE:** June 24, 2004
Cody Chang / Supervisor



2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -9.65dB at 0.588MHz
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 -1.02dB at 131.52MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

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



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Router Bridge
MODEL NO.	RB-8110 PLUS
POWER SUPPLY	48Vdc from POE adapter
MODULATION TYPE	BPSK, QPSK, CCK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/6/9/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	23.00dBm
ANTENNA TYPE	Dipole antenna with 5dBi antenna gain
DATA CABLE	30m RJ45 shielded cable. 1.8m RS232 shielded cable.
I/O PORTS	MIL-C-50 style RS232 console port. MIL-C-5015 style Ethernet port.
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT were powered by the following POE (power over Ethernet) :

MODEL :	F919I-4808
INPUT :	100-240Vac 2A 50-60Hz
OUTPUT :	48Vdc, 0.8A

2. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 11Mbps.
3. The above EUT information was declared by 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 to this EUT.

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

NOTE:

1. Below 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.
3. From our experience transfer rate, 11Mbps with CCK technique the worst cases, were chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)
ANSI C63.4 : 2001

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

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



3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP01L	TW-09C748-12800-193-C800	FCC DoC Approved
2	NOTEBOOK	DELL	PP05L	20838027664	FCC DoC Approved
3	PRINTER	EPSON	LQ-300+	DCGY046007	FCC DoC Approved

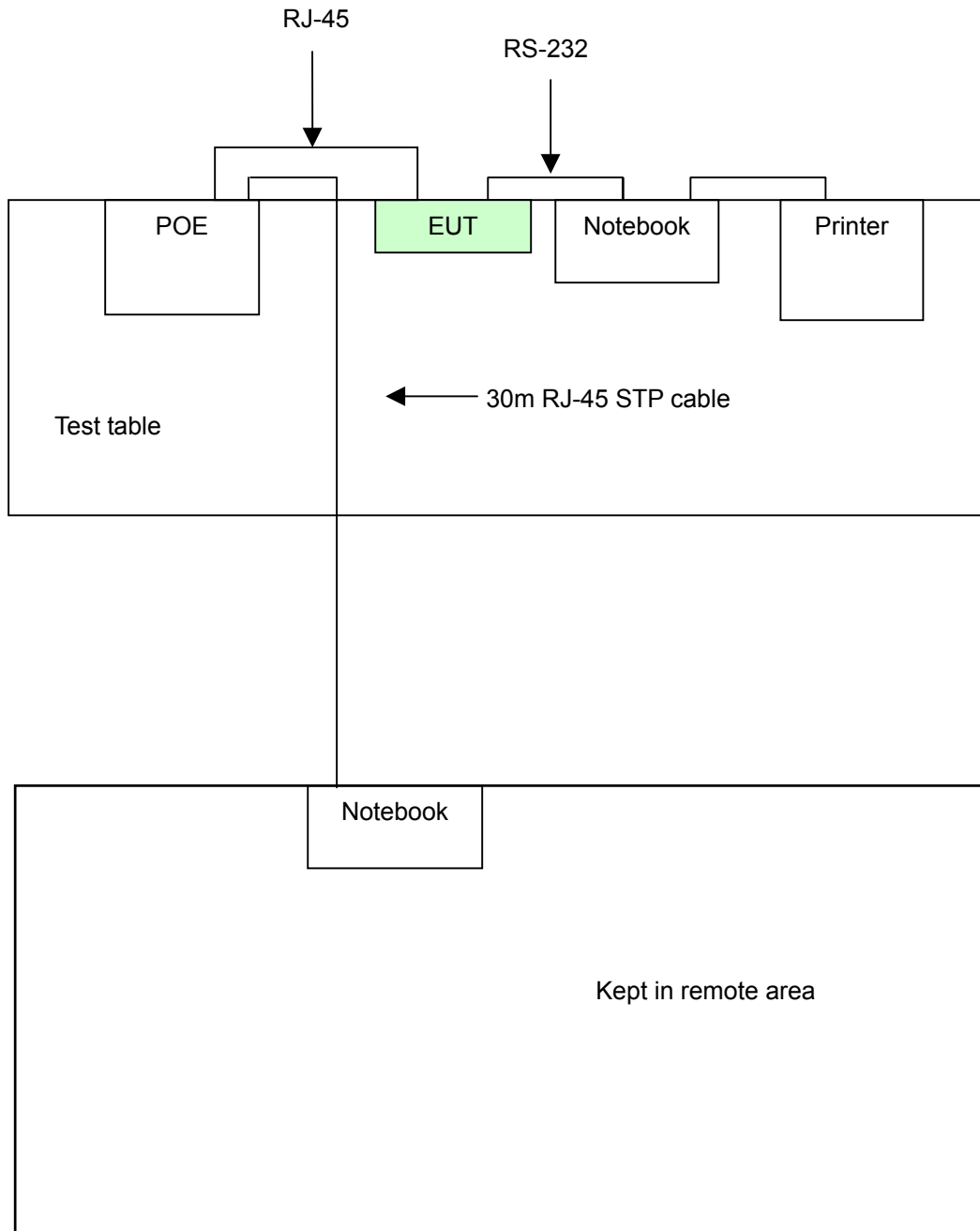
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	1.2m shielded cable without core

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 2 act as a communication partner to transfer data.



3.5 CONFIGURATION OF SYSTEM UNDER TEST





4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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



4.1.2 TEST INSTRUMENTS

DESCRIPTION	MODEL NO.	MANUFACTURER	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Dec. 11, 2004	Dec. 12, 2004
RF signal cable Woken	5D-FB	Cable-HyC02-01	Mar. 07, 2005	Mar. 02, 2005
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Mar. 10, 2005	Oct. 22, 2004
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Mar. 04, 2005	Dec. 10, 2004
Software ADT	ADT_Cond_V3	NA	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 HwaYa Shielded Room 2.



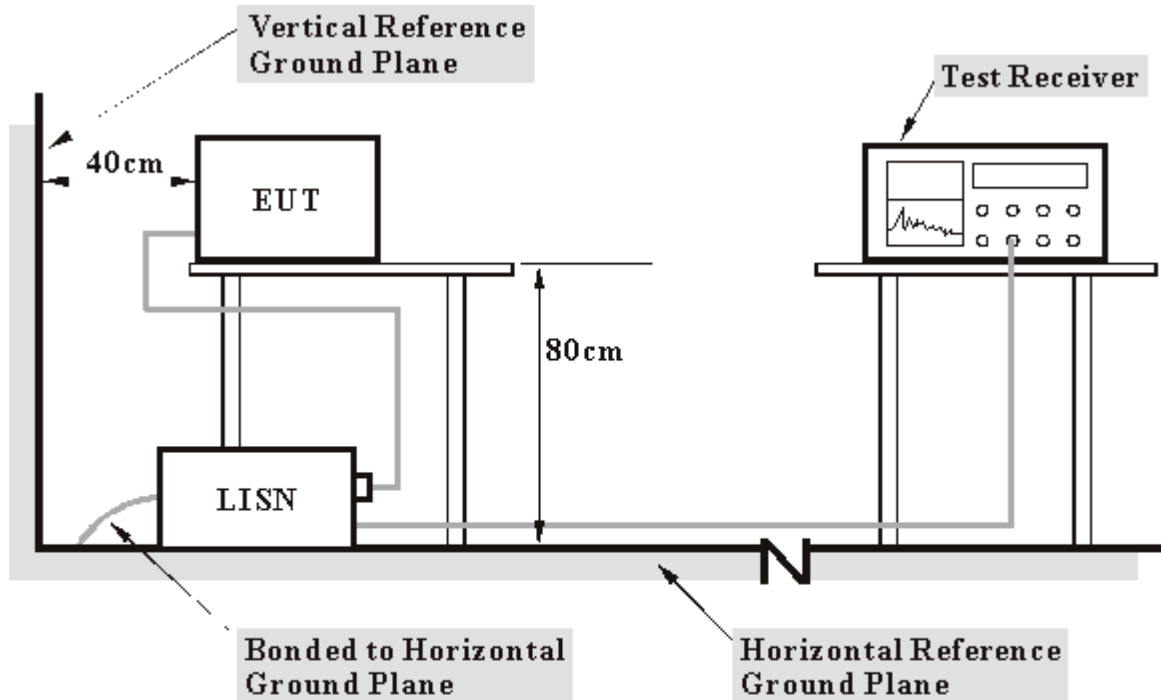
4.1.3 TEST PROCEDURES

- 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 under Limit - 20dB was not recorded.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

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

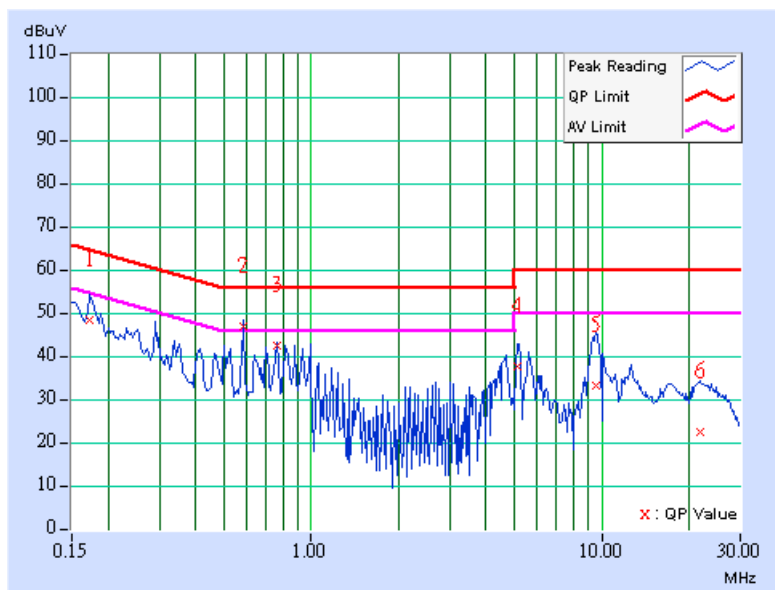


4.1.7 TEST RESULTS

EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 991 hPa	TESTED BY: Hardaway Lee	

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	0.173	0.10	47.45	-	47.55	-	64.79
2	0.588	0.16	46.19	43.78	46.35	43.94	56.00	46.00	-9.65	-2.06
3	0.759	0.19	41.62	-	41.81	-	56.00	46.00	-14.19	-
4	5.113	0.36	36.78	-	37.14	-	60.00	50.00	-22.86	-
5	9.559	0.52	32.45	-	32.97	-	60.00	50.00	-27.03	-
6	21.719	1.00	21.51	-	22.51	-	60.00	50.00	-37.49	-

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

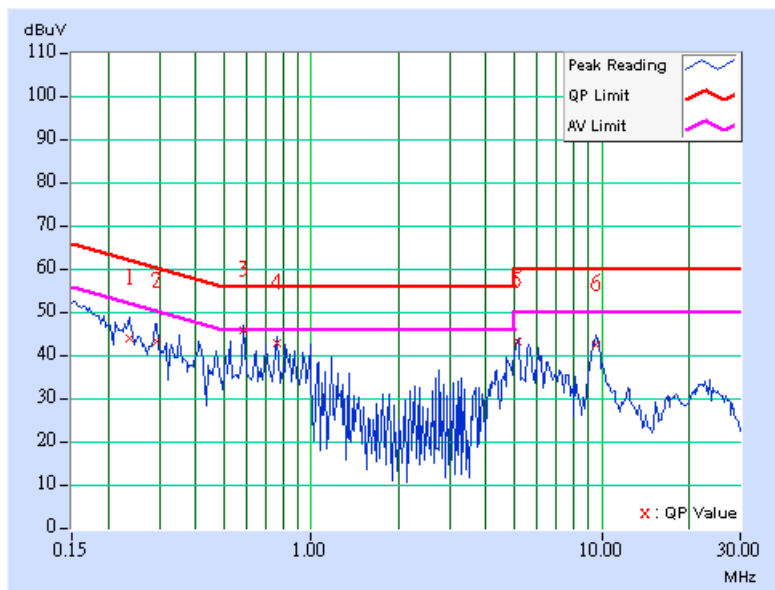




EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 991 hPa	TESTED BY: Hardaway Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.236	0.10	43.64	-	43.74	-	62.24	52.24	-18.50	-
2	0.295	0.11	42.70	-	42.81	-	60.40	50.40	-17.59	-
3	0.588	0.15	45.30	-	45.45	-	56.00	46.00	-10.55	-
4	0.759	0.18	42.66	-	42.84	-	56.00	46.00	-13.16	-
5	5.121	0.35	42.82	-	43.17	-	60.00	50.00	-16.83	-
6	9.570	0.48	42.22	-	42.70	-	60.00	50.00	-17.30	-

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

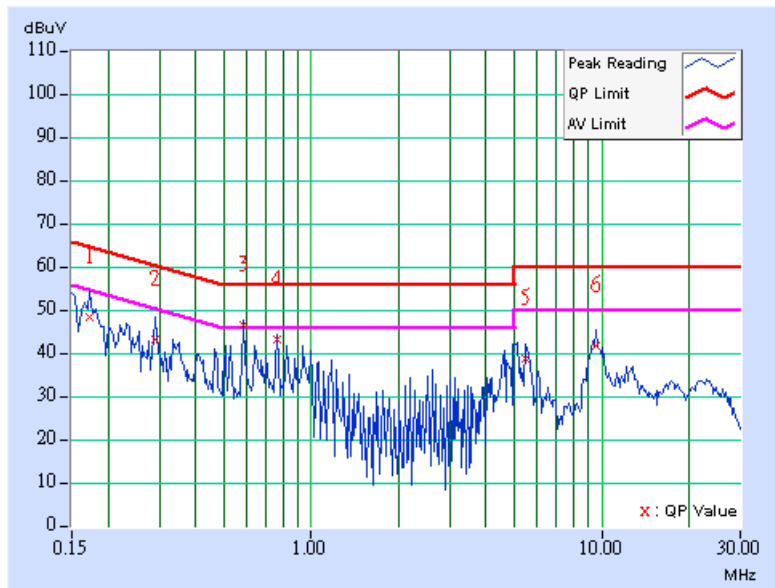




EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 991 hPa	TESTED BY: Hardaway Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	47.86	-	47.96	-	64.79	54.79	-16.83	-
2	0.291	0.11	42.75	-	42.86	-	60.51	50.51	-17.65	-
3	0.588	0.16	46.05	43.78	46.21	43.94	56.00	46.00	-9.79	-2.06
4	0.759	0.19	42.73	-	42.92	-	56.00	46.00	-13.08	-
5	5.461	0.38	38.55	-	38.93	-	60.00	50.00	-21.07	-
6	9.578	0.52	41.17	-	41.69	-	60.00	50.00	-18.31	-

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

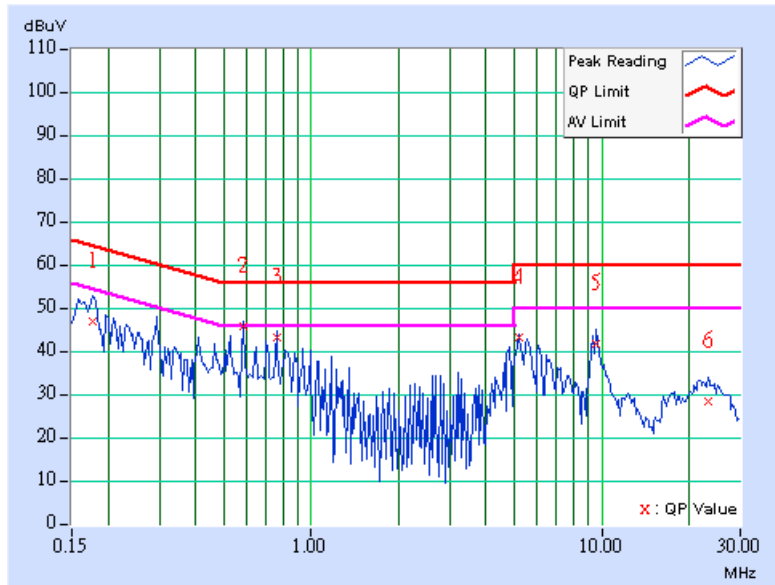




EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 991 hPa	TESTED BY: Hardaway Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	46.53	-	46.63	-	64.61	54.61	-17.98	-
2	0.588	0.15	45.08	-	45.23	-	56.00	46.00	-10.77	-
3	0.759	0.18	42.61	-	42.79	-	56.00	46.00	-13.21	-
4	5.207	0.35	42.72	-	43.07	-	60.00	50.00	-16.93	-
5	9.574	0.48	41.25	-	41.73	-	60.00	50.00	-18.27	-
6	23.184	0.68	27.91	-	28.59	-	60.00	50.00	-31.41	-

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

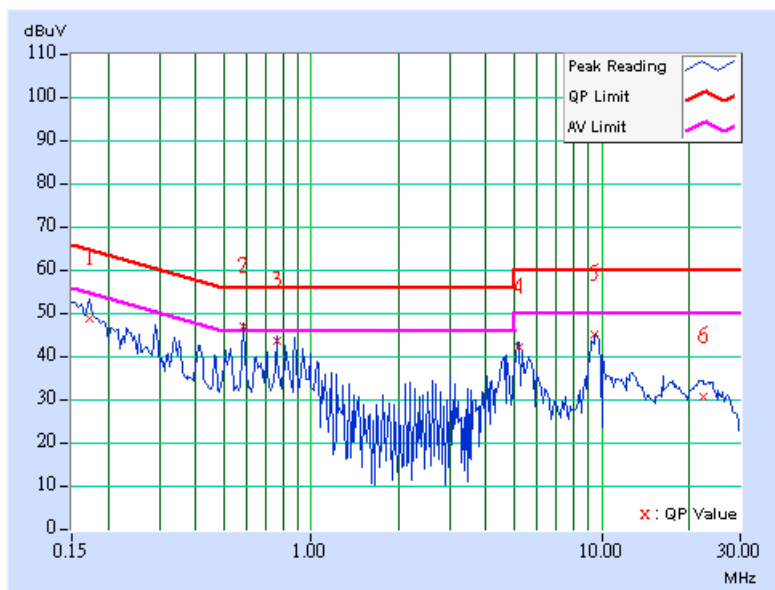




EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 991 hPa	TESTED BY: Hardaway Lee	

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	0.173	0.10	47.90	-	48.00	-	64.79
2	0.588	0.16	45.89	43.61	46.05	43.77	56.00	46.00	-9.95	-2.23
3	0.759	0.19	42.85	-	43.04	-	56.00	46.00	-12.96	-
4	5.211	0.37	41.19	-	41.56	-	60.00	50.00	-18.44	-
5	9.500	0.52	43.99	-	44.51	-	60.00	50.00	-15.49	-
6	22.363	1.03	29.63	-	30.66	-	60.00	50.00	-29.34	-

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

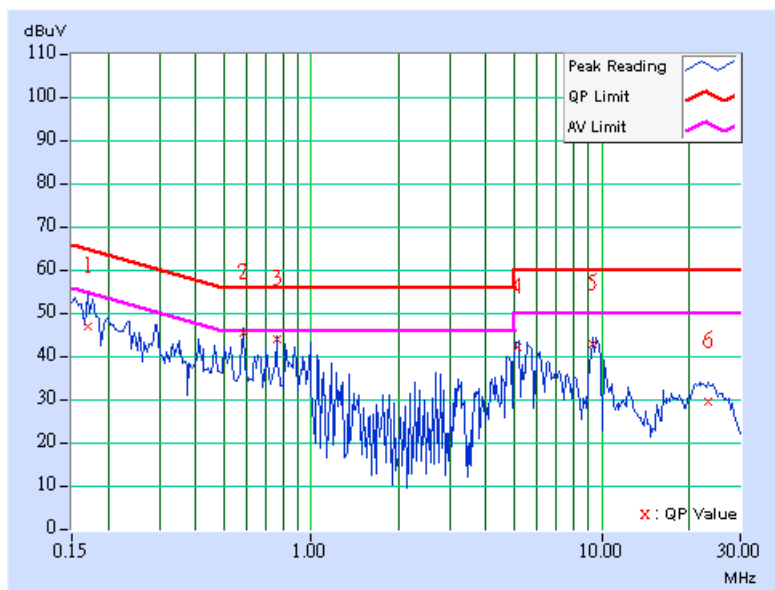




EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Netural (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 991 hPa	TESTED BY: Hardaway Lee	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.10	46.45	-	46.55	-	64.98	54.98	-18.44	-
2	0.588	0.15	44.94	-	45.09	-	56.00	46.00	-10.91	-
3	0.759	0.18	43.21	-	43.39	-	56.00	46.00	-12.61	-
4	5.129	0.35	41.72	-	42.07	-	60.00	50.00	-17.93	-
5	9.336	0.47	42.26	-	42.73	-	60.00	50.00	-17.27	-
6	23.297	0.68	29.11	-	29.79	-	60.00	50.00	-30.21	-

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





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



4.2.2 TEST INSTRUMENTS

DESCRIPTION	MODEL NO.	MANUFACTURER	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ES17	838496/016	Feb. 09, 2005	May 27, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 15, 2004	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 03, 2005	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Feb. 03, 2005	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170242	Feb. 23, 2005	Feb. 23, 2005
Preamplifier Agilent	8447D	2944A10631	Jan. 15, 2005	Jan. 15, 2005
Preamplifier Agilent	8449B	3008A01960	Jan. 22, 2005	Jan. 27, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Mar. 04, 2005	Mar. 05, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219275/4	Mar. 04, 2005	Mar. 05, 2005
Software ADT.	ADT_Radiated_V5. 14	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT.	TT100.	TT93021704	NA	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC4924-4.



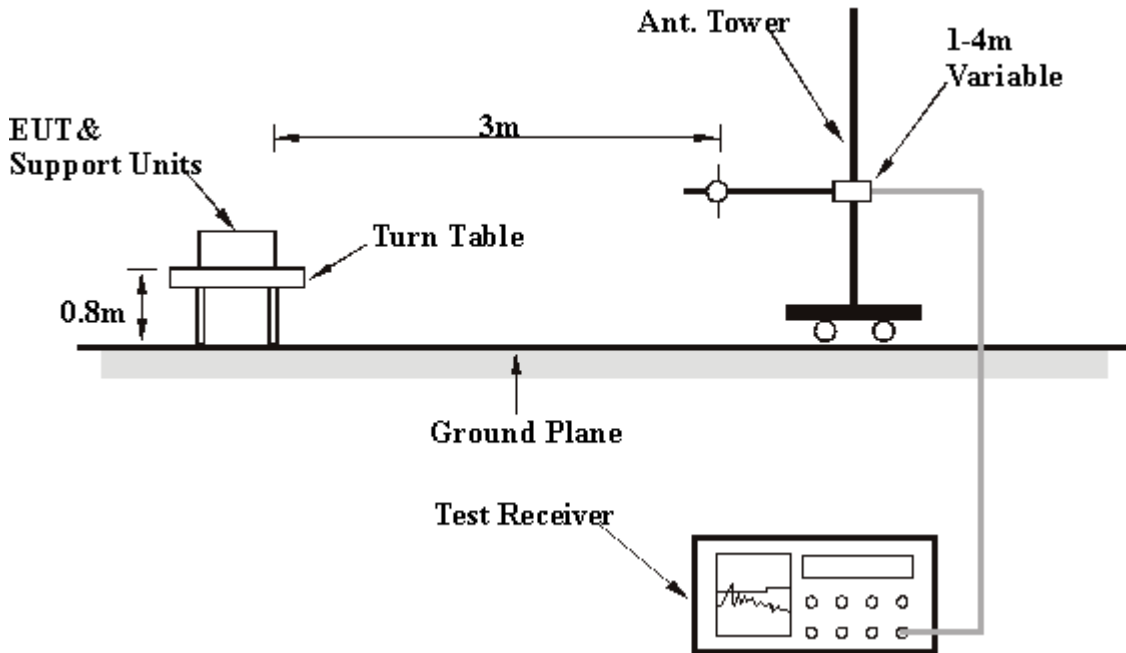
4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 10Hz 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 4.1.6



4.2.6 TEST RESULTS

EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28 deg. C, 75 % RH, 991hPa	TEST BY	Allen Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	131.52	42.48 QP	43.50	-1.02	1.00 H	178	28.71	13.77
2	162.18	33.74 QP	43.50	-9.76	1.75 H	277	19.02	14.72
3	199.98	42.34 QP	43.50	-1.16	1.00 H	274	31.07	11.27
4	239.94	37.59 QP	46.00	-8.41	1.00 H	217	24.63	12.96
5	265.21	44.77 QP	46.00	-1.23	1.00 H	232	31.30	13.47
6	405.17	35.47 QP	46.00	-10.53	1.50 H	247	18.61	16.86
7	463.49	36.97 QP	46.00	-9.03	1.50 H	265	18.82	18.15
8	531.52	35.98 QP	46.00	-10.02	1.25 H	232	16.85	19.13
9	601.50	31.44 QP	46.00	-14.56	1.25 H	211	10.59	20.85
10	749.99	44.88 QP	46.00	-1.12	1.50 H	247	21.64	23.24

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	64.99	32.62 QP	40.00	-7.38	1.00 V	49	19.58	13.05
2	131.08	41.64 QP	43.50	-1.86	1.00 V	286	27.91	13.74
3	199.12	31.16 QP	43.50	-12.34	1.00 V	49	19.81	11.34
4	265.21	37.10 QP	46.00	-8.90	1.25 V	265	23.63	13.47
5	331.30	32.06 QP	46.00	-13.94	1.00 V	298	16.95	15.10
6	397.39	31.82 QP	46.00	-14.18	1.75 V	283	15.15	16.67
7	463.49	34.66 QP	46.00	-11.34	1.00 V	196	16.50	18.15
8	531.52	34.42 QP	46.00	-11.58	1.75 V	169	15.29	19.13
9	729.80	30.61 QP	46.00	-15.39	1.25 V	211	7.87	22.74
10	749.98	44.85 QP	46.00	-1.15	1.00 V	178	21.61	23.24

- 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 Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 68 % RH, 991 hPa	TESTED BY: Allen Chung	

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	47.08 PK	74.00	-26.92	1.45 H	23	15.13	31.95
1	2038.00	41.92 AV	54.00	-12.08	1.45 H	23	9.97	31.95
2	2390.00	44.33 PK	74.00	-29.67	1.00 H	40	10.97	33.36
2	2390.00	33.93 AV	54.00	-20.07	1.00 H	40	0.57	33.36
3	*2412.00	106.40 PK			1.00 H	40	72.96	33.44
3	*2412.00	96.00 AV			1.00 H	40	62.56	33.44
4	4076.00	50.12 PK	74.00	-23.88	1.05 H	52	11.73	38.39
4	4076.00	37.41 AV	54.00	-16.59	1.05 H	52	-0.98	38.39

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	47.70 PK	74.00	-26.30	1.42 V	57	15.75	31.95
2	2038.00	42.44 AV	54.00	-11.56	1.42 V	57	10.49	31.95
2	2390.00	55.48 PK	74.00	-18.52	1.44 V	231	22.12	33.36
2	2390.00	47.81 AV	54.00	-6.19	1.44 V	231	14.45	33.36
3	*2412.00	117.55 PK			1.44 V	231	84.11	33.44
3	*2412.00	109.88 AV			1.44 V	231	76.44	33.44
4	4076.00	50.06 PK	74.00	-23.94	1.15 V	254	11.67	38.39
4	4076.00	36.47 AV	54.00	-17.53	1.15 V	254	-1.92	38.39

REMARKS:

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



EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 68 % RH, 991 hPa	TESTED BY: Allen Chung	

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	44.28 PK	74.00	-29.72	1.31 H	246	12.24	32.04
1	2063.00	35.62 AV	54.00	-18.38	1.31 H	246	3.58	32.04
2	*2437.00	104.85 PK			1.00 H	39	71.32	33.53
2	*2437.00	96.84 AV			1.00 H	39	63.31	33.53
3	4126.00	48.98 PK	74.00	-25.02	1.26 H	286	10.43	38.55
3	4126.00	36.20 AV	54.00	-17.80	1.26 H	286	-2.35	38.55

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	45.75 PK	74.00	-28.25	1.32 V	275	13.71	32.04
1	2063.00	39.30 AV	54.00	-14.70	1.32 V	275	7.26	32.04
2	*2437.00	117.78 PK			1.00 V	58	84.25	33.53
2	*2437.00	110.03 AV			1.00 V	58	76.50	33.53
3	4126.00	49.63 PK	74.00	-24.37	1.25 V	6	11.08	38.55
3	4126.00	36.50 AV	54.00	-17.50	1.25 V	6	-2.05	38.55

REMARKS:

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



EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
MODE	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 68 % RH, 991 hPa	TESTED BY: Allen Chung	

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	47.50 PK	74.00	-26.50	1.03 H	301	15.37	32.13
1	2088.00	41.22 AV	54.00	-12.78	1.03 H	301	9.09	32.13
2	*2462.00	102.61 PK			1.01 H	128	68.99	33.62
2	*2462.00	94.69 AV			1.01 H	128	61.07	33.62
3	2483.50	39.50 PK	74.00	-34.50	1.01 H	128	5.80	33.70
3	2483.50	31.58 AV	54.00	-22.42	1.01 H	128	-2.12	33.70
4	4176.00	49.51 PK	74.00	-24.49	1.00 H	265	10.75	38.76
4	4176.00	37.87 AV	54.00	-16.13	1.00 H	265	-0.89	38.76

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	49.71 PK	74.00	-24.29	1.00 V	342	17.58	32.13
1	2088.00	45.74 AV	54.00	-8.26	1.00 V	342	13.61	32.13
2	*2462.00	116.42 PK			1.23 V	225	82.80	33.62
2	*2462.00	108.70 AV			1.23 V	225	75.08	33.62
3	2483.50	53.31 PK	74.00	-20.69	1.23 V	225	19.61	33.70
3	2483.50	45.59 AV	54.00	-8.41	1.23 V	225	11.89	33.70
4	4176.00	49.91 PK	74.00	-24.09	1.12 V	96	11.15	38.76
4	4176.00	37.81 AV	54.00	-16.19	1.12 V	96	-0.95	38.76

REMARKS:

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



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

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

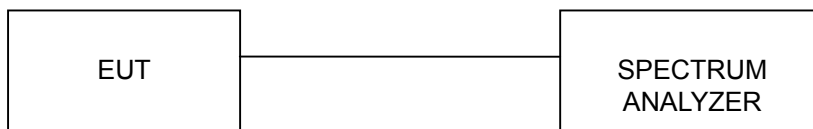
NOTE:

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

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 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.

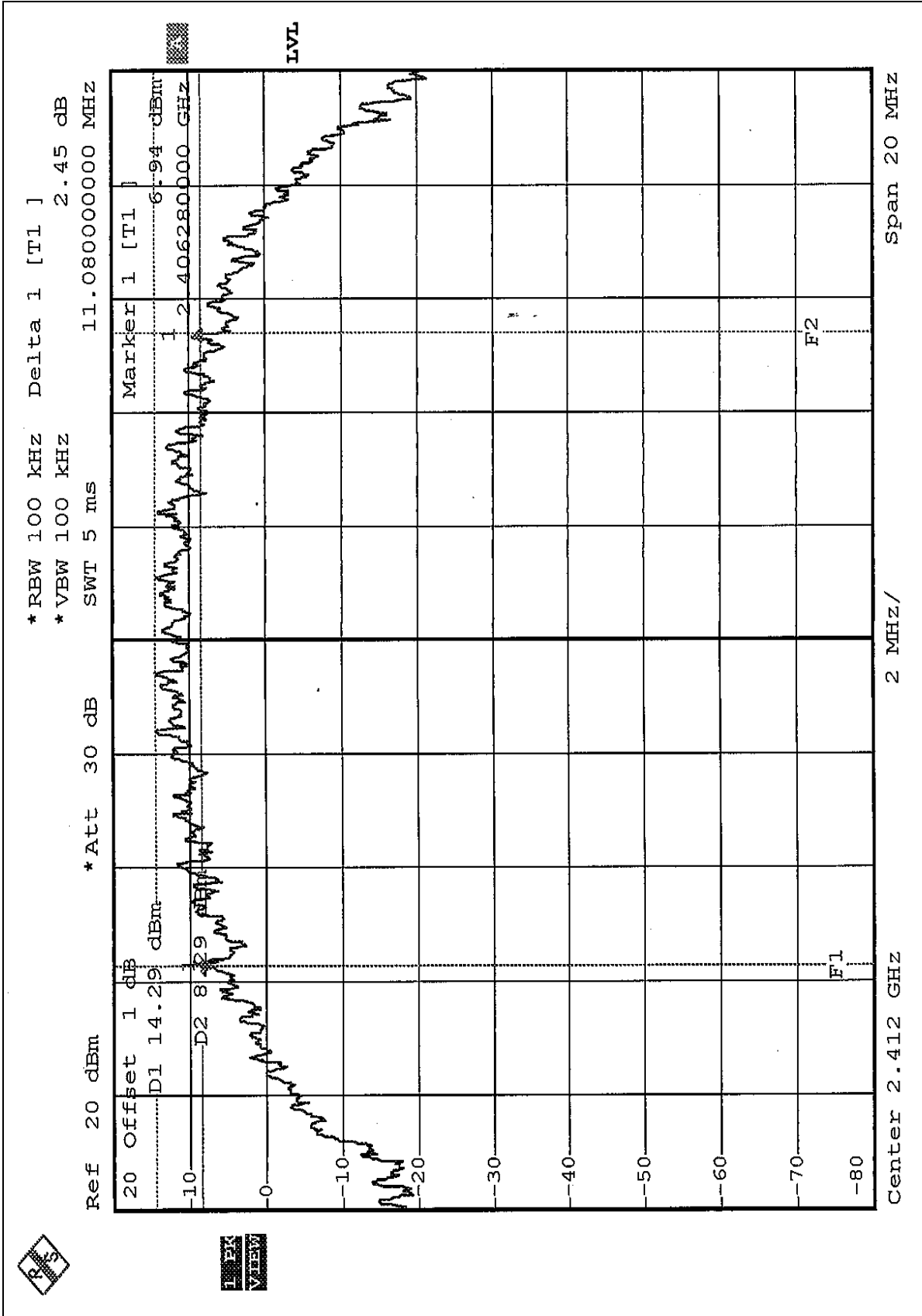


EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa
TESTED BY: Allen Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.08	0.5	PASS
6	2437	11.08	0.5	PASS
11	2462	9.72	0.5	PASS

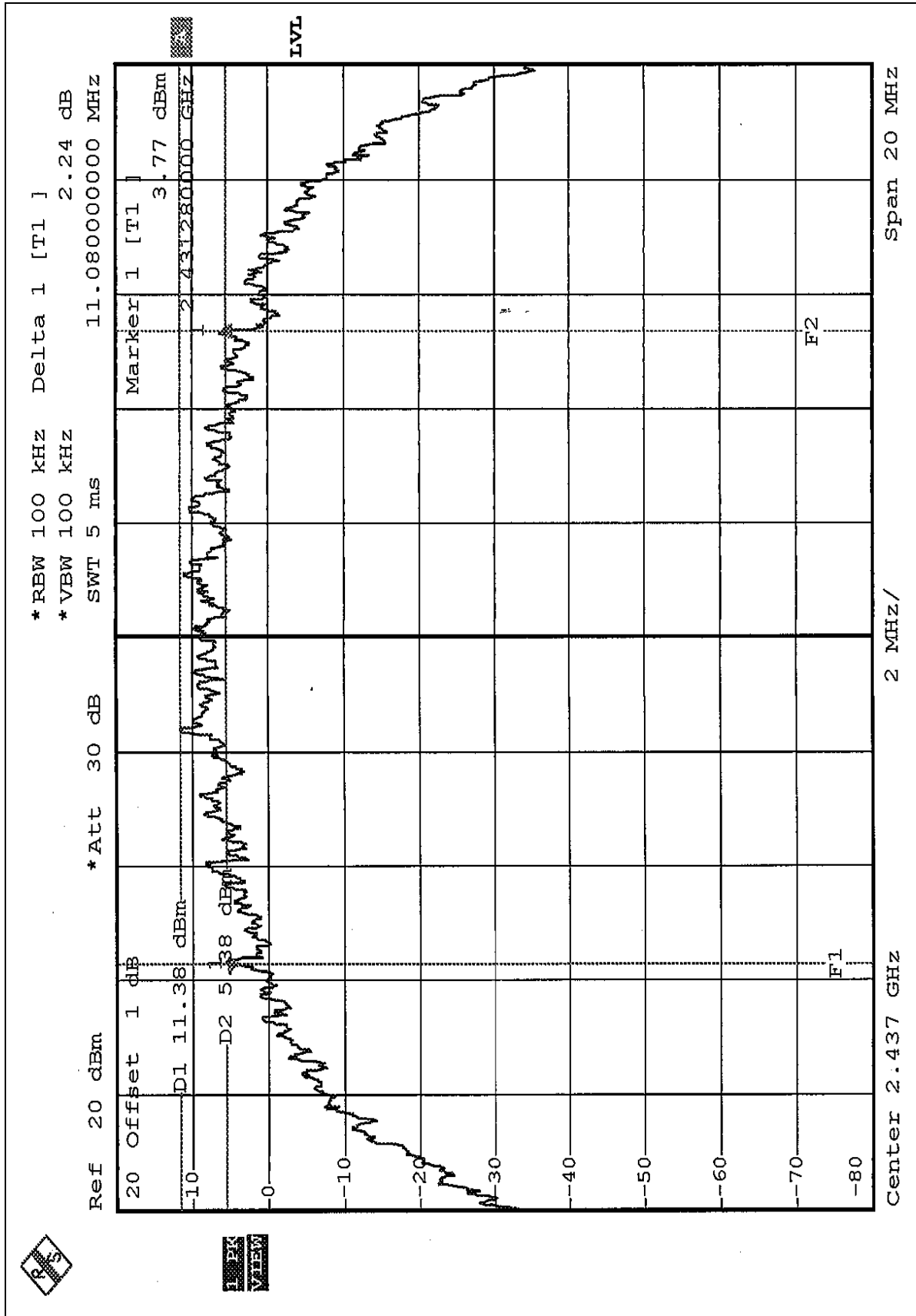


CH1



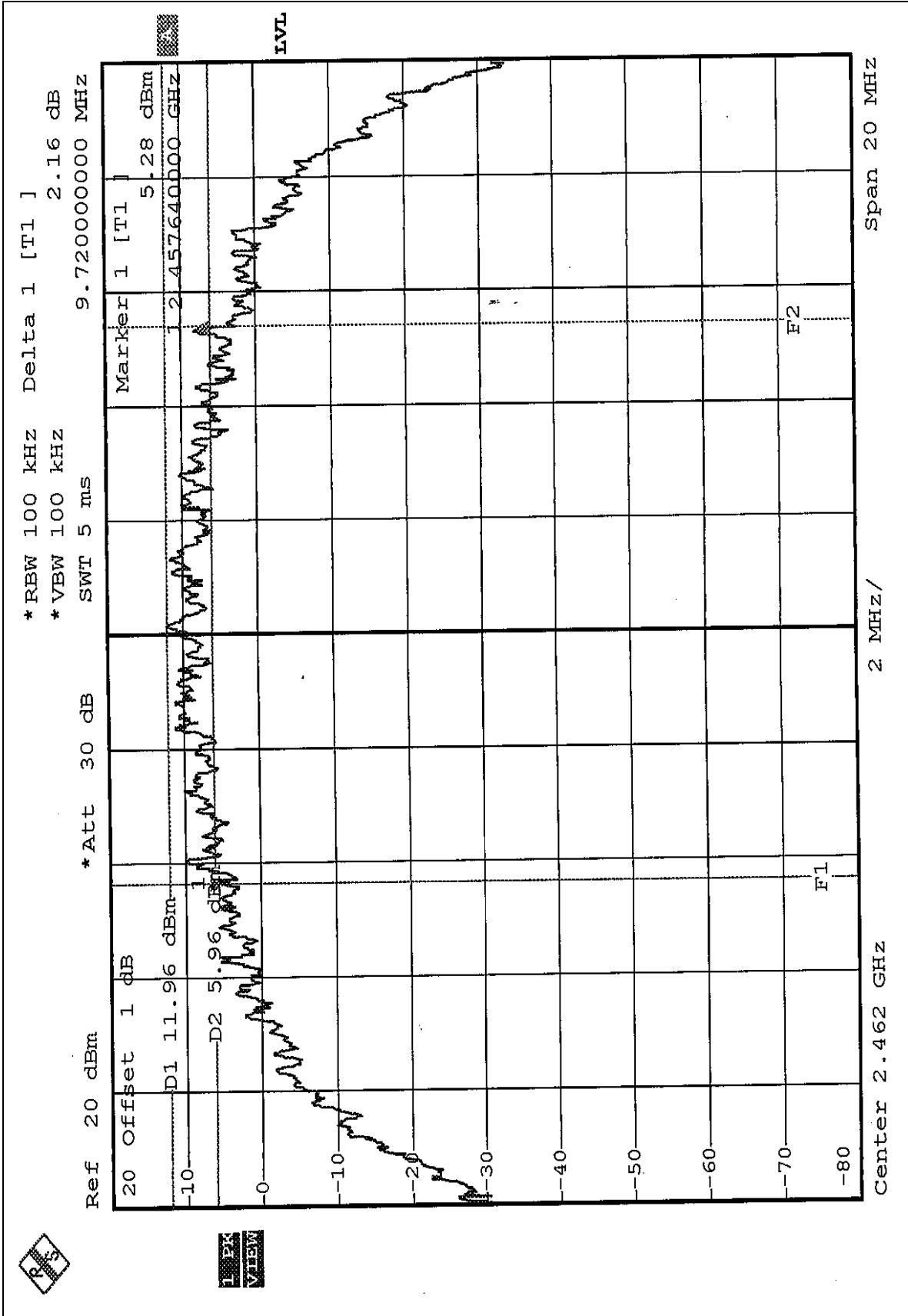


CH6





CH11





4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	C019167	Feb. 01, 2005
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

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



4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



4.4.7 TEST RESULTS

EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa
TESTED BY: Allen Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	21.00	30	PASS
6	2437	23.00	30	PASS
11	2462	21.00	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	August 12, 2004

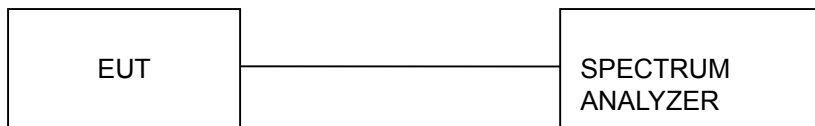
NOTE:

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

4.5.3 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= $\text{span}/3\text{kHz}$. The power spectral density was measured and recorded. The sweep time is allowed to be longer than $\text{span}/3\text{kHz}$ 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



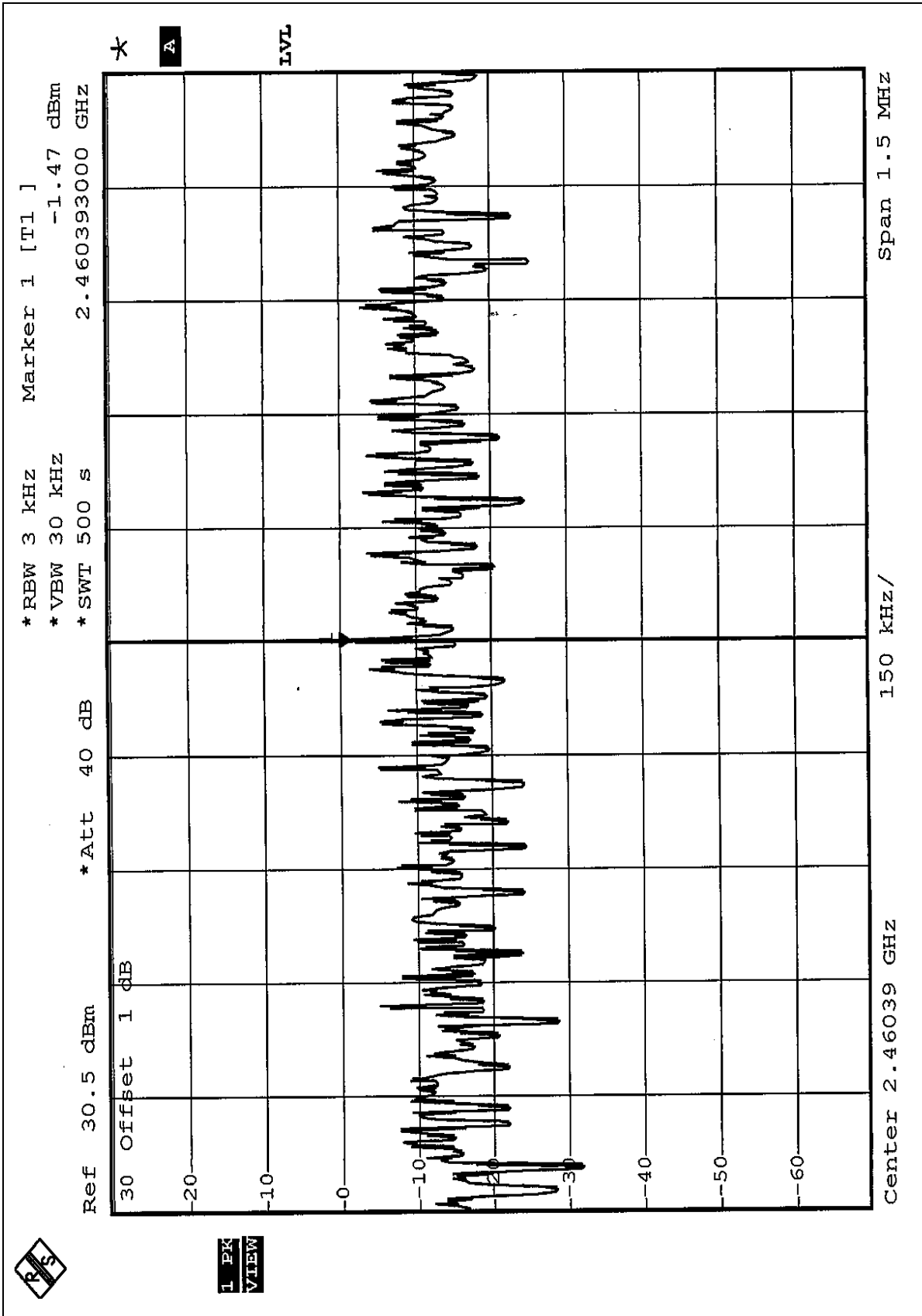
4.5.6 TEST RESULTS

EUT	Wireless Router Bridge	MODEL	RB-8110 PLUS
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa
TESTED BY: Allen Chang			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-1.47	8	PASS
6	2437	-0.86	8	PASS
11	2462	-0.81	8	PASS

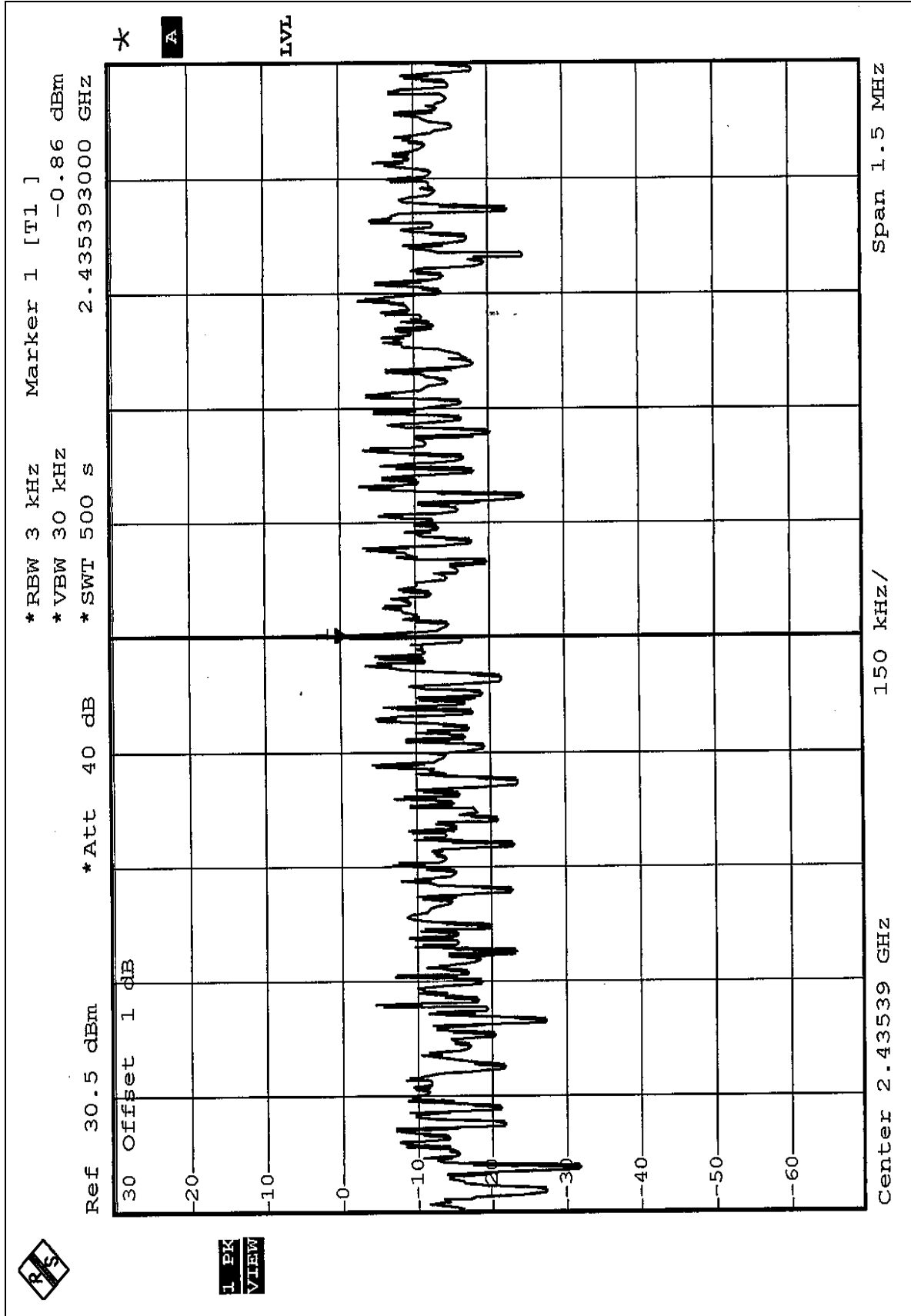


CH1



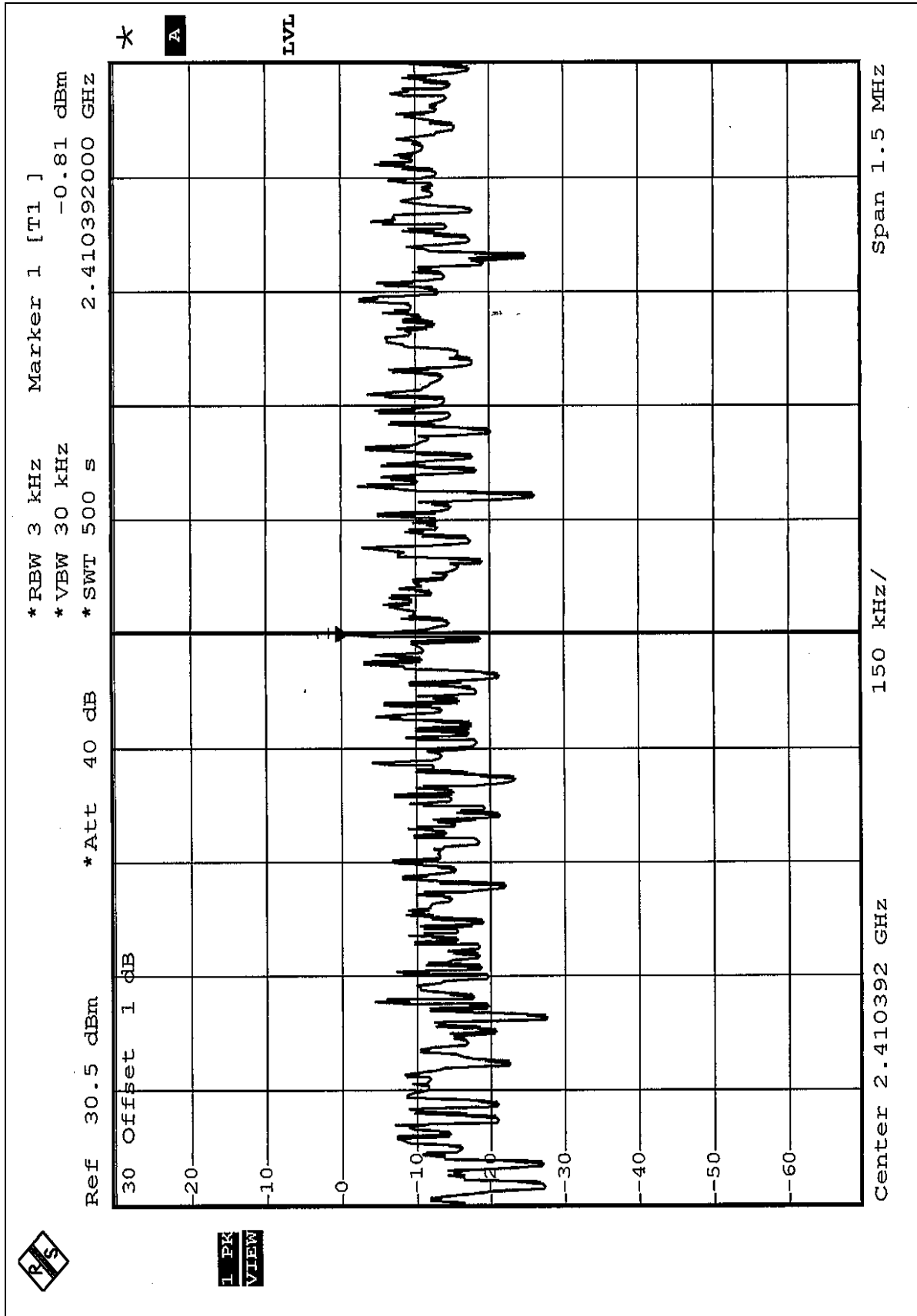


CH6





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	August 12, 2004

NOTE:

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

4.6.3 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 1MHz and 10Hz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.6.4 EUT OPERATING CONDITION

Same as Item 4.3.5

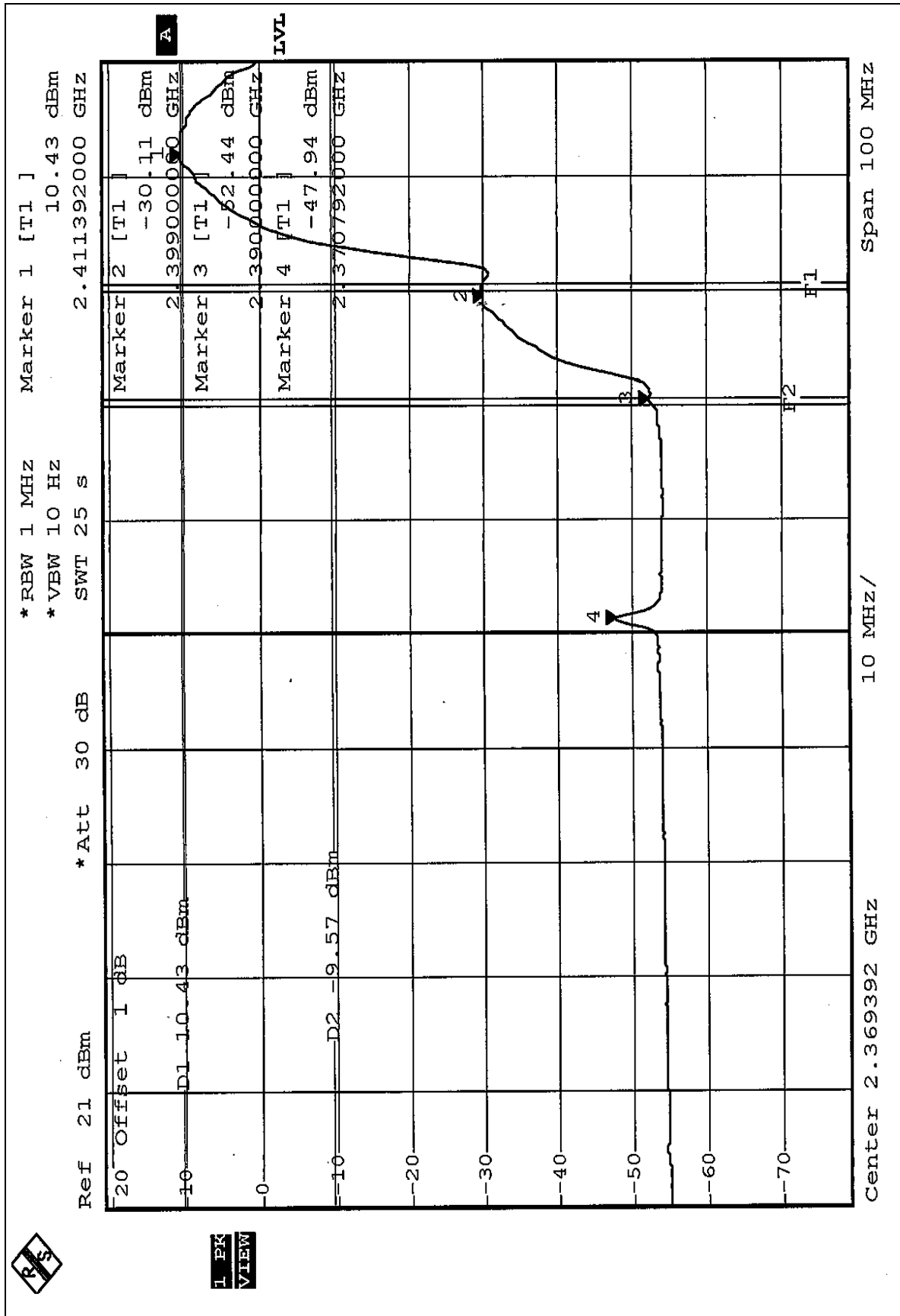


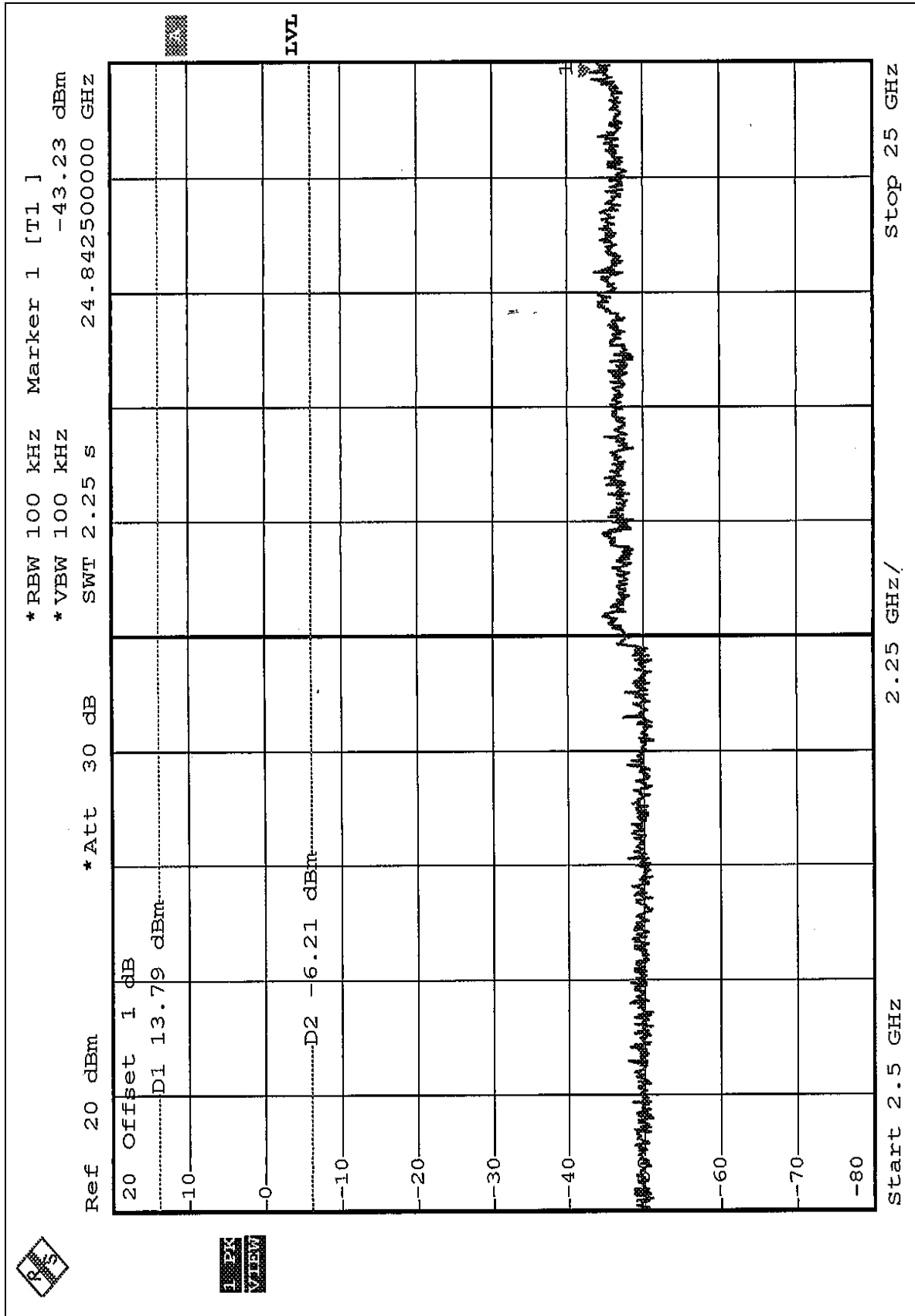
4.6.5 TEST RESULTS

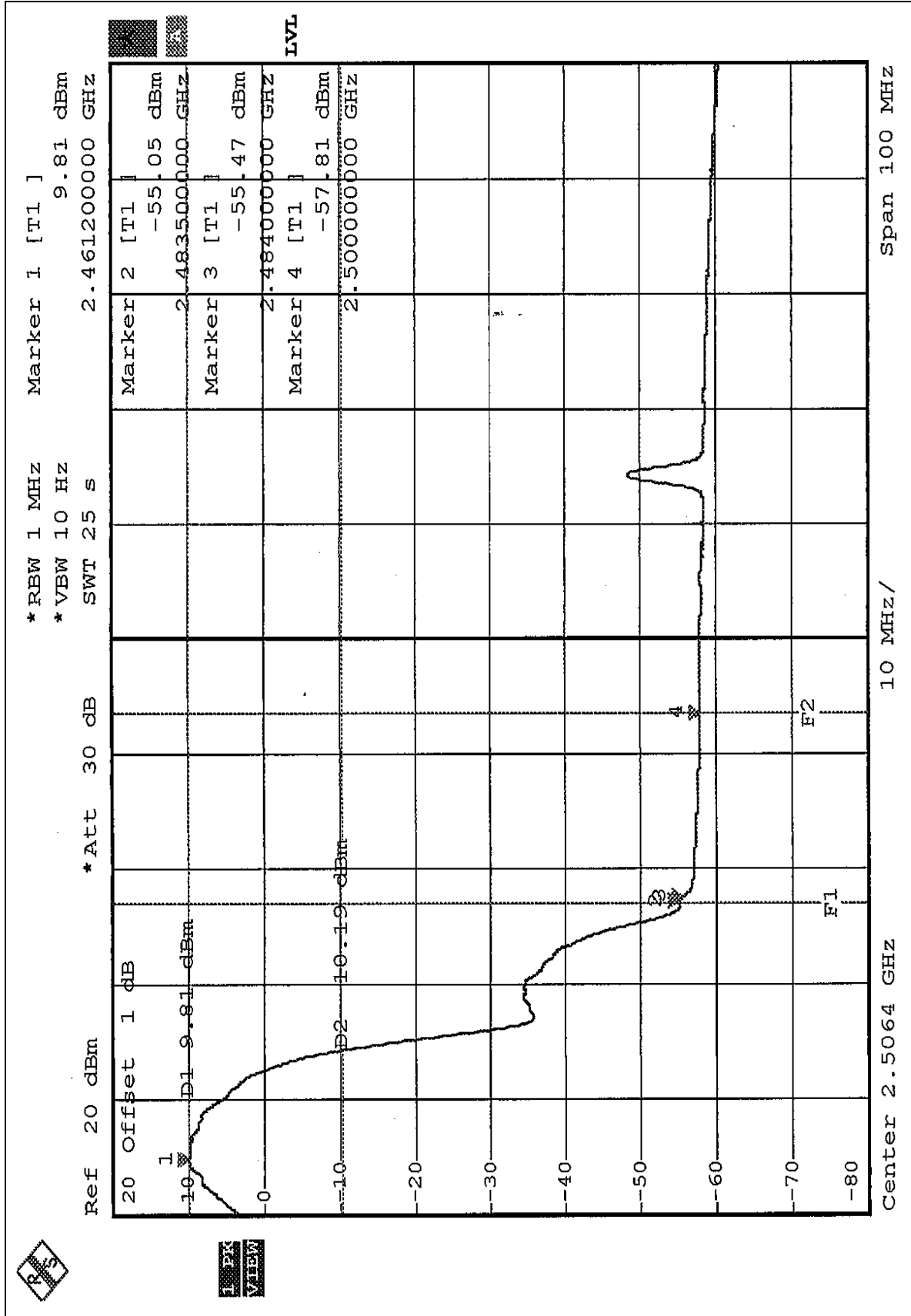
The spectrum plots are attached on the following 4 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

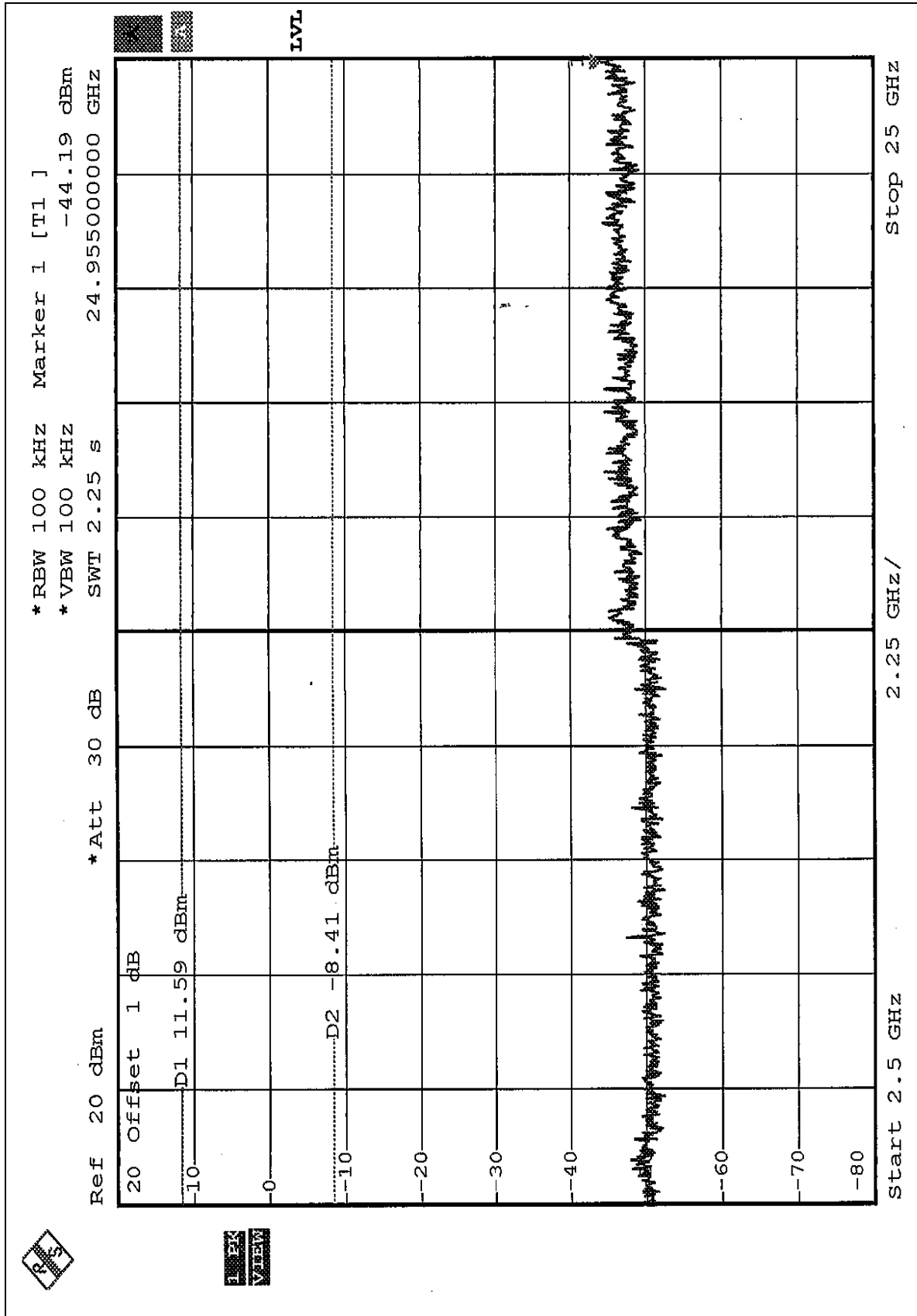
NOTE: The band edge emission plot on the following 1 ~ 2 pages shows 58.37dB delta between carrier maximum power and local maximum emission in restrict band (2.3707GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.6 is 109.88dBuV/m, so the maximum field strength in restrict band is $109.88-58.37=51.51$ dBuV/m which is under 54 dBuV/m limit.

NOTE: The band edge emission plot on the following 3 ~ 4 pages shows 64.86dB delta between carrier maximum power and local maximum emission in restrict band (2.4840GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 is 108.70dBuV/m, so the maximum field strength in restrict band is $108.70-64.86=43.84$ dBuV/m which is under 54 dBuV/m limit.











4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

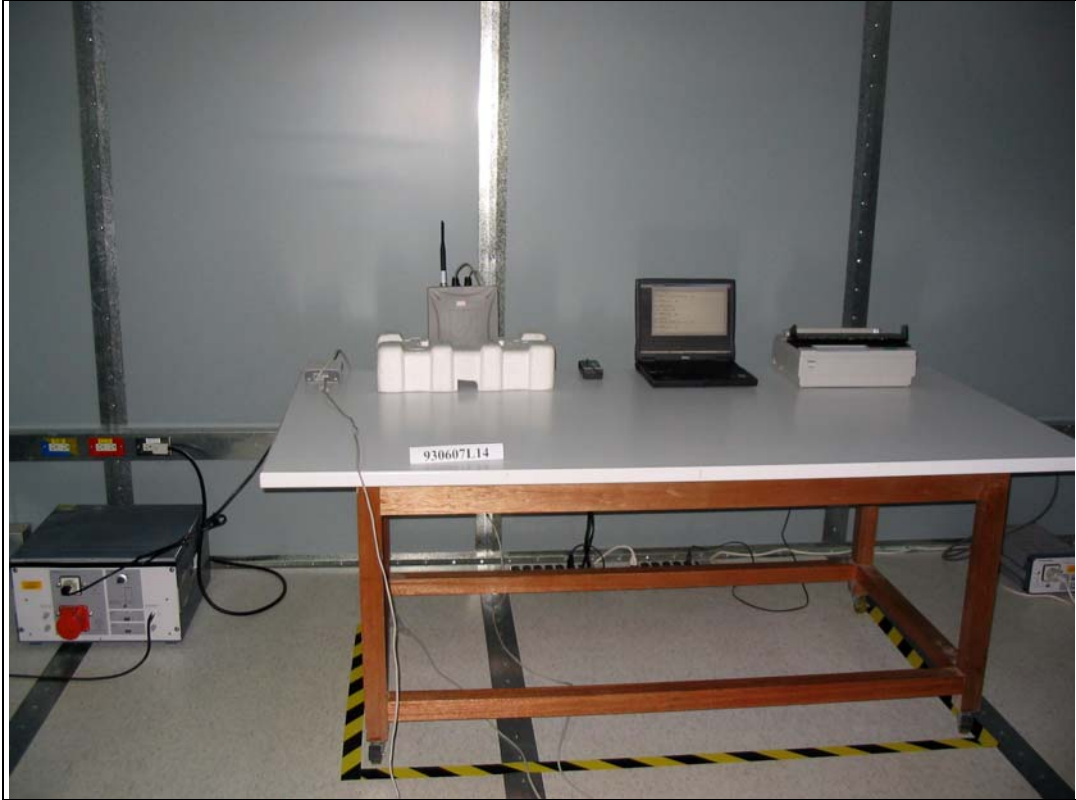
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

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.

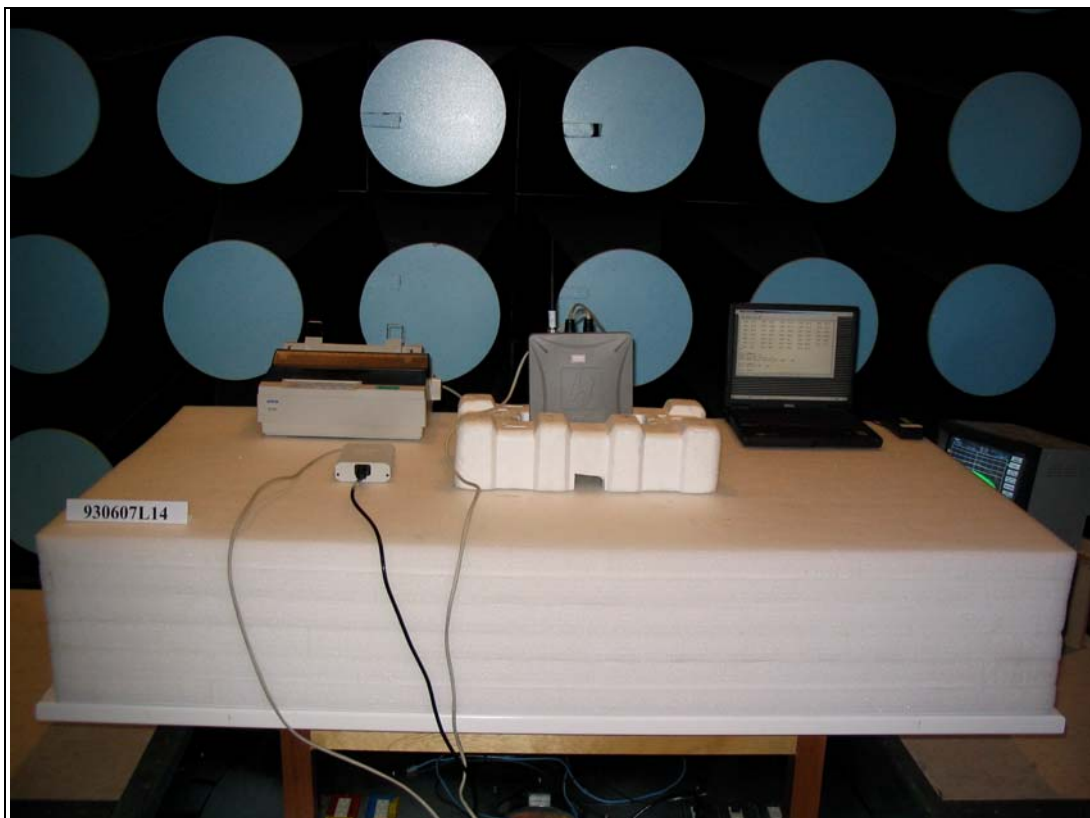
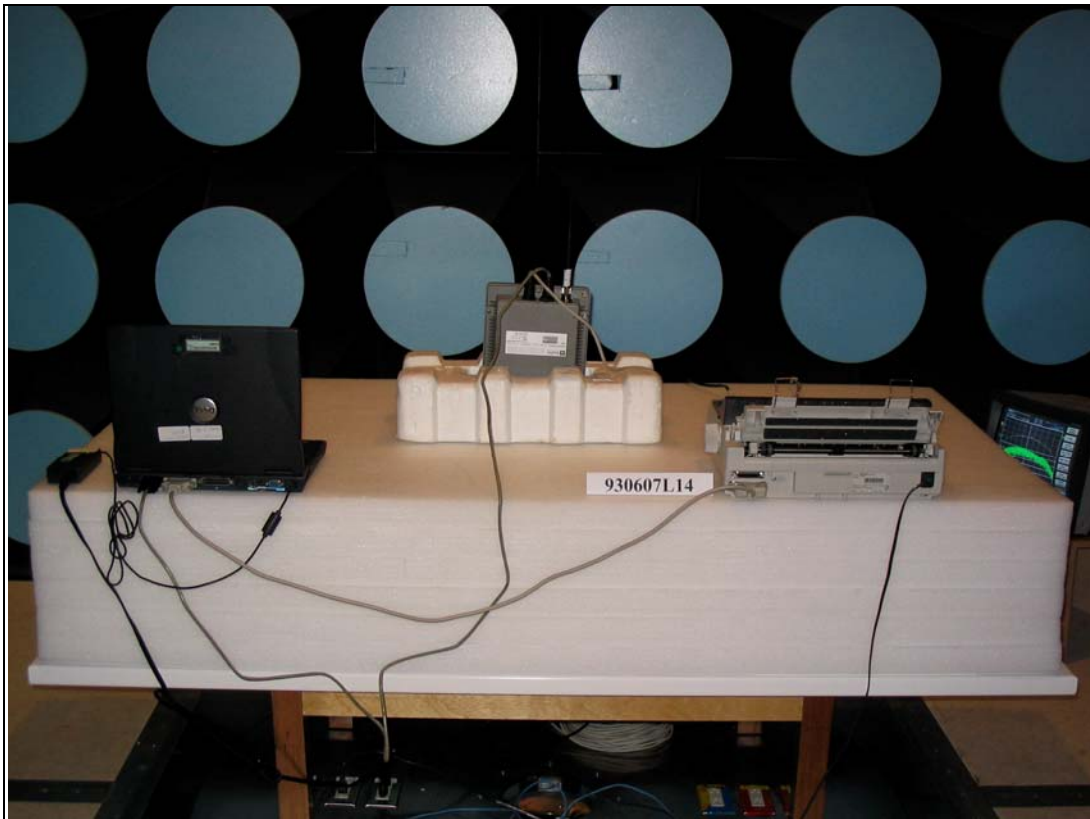
4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole Antenna with Revers N Type connector. And the maximum Gain of this antenna is only 5dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





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:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Linko RF Lab.

Tel: 886-3-3270910

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

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