FCC TEST REPORT

REPORT NO.: RF90011510
MODEL NO.: BEFW11S4
RECEIVED: January 15, 2001
TESTED: January 16, 2001

APPLICANT: Global Sun Technology Inc.

ADDRESS: No.13, Tung Yuan Rd., Jung Li Industrial Park, Jung Li City, Tao Yuan Hsien, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 13-1, Lane 19, Wen Shan 3rd St., Kweishan, Taoyuan Hsien, Taiwan, R.O.C.

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Accredited Laboratory

Table of Contents

1 CERTIFICATION 4
2 SUMMARY OF TEST RESULTS 5
3 GENERAL INFORMATION 6
3.1 GENERAL DESCRIPTION OF EUT 6
3.2 DESCRIPTION OF TEST MODES 6
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS 7
3.4 DESCRIPTION OF SUPPORT UNITS 7
4 TEST PROCEDURES AND RESULTS 8
4.1 CONDUCTED EMISSION MEASUREMENT 8
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 8
4.1.2 TEST INSTRUMENTS 8
4.1.3 TEST PROCEDURES 9
4.1.4 TEST SETUP 10
4.1.5 TEST RESULTS 11
4.2 Radiated Emission Measurement 17
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 17
4.2.2 TEST INSTRUMENTS 18
4.2.3 TEST PROCEDURES 19
4.2.4 TEST SETUP 20
4.2.5 TEST RESULTS 21
4.3 6dB BANDWIDTH MEASUREMENT 25
4.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT 25
4.3.2 TEST INSTRUMENTS 25
4.3.3 TEST PROCEDURE 26
4.3.4 TEST SETUP 26
4.3.5 EUT OPERATING CONDITION 26
4.3.6 TEST RESULTS 27
4.4 MAXIMUM PEAK OUTPUT POWER 31
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 31
4.4.2 INSTRUMENTS 31
4.4.3 TEST PROCEDURES 32
4.4.4 TEST SETUP 32
4.4.5 EUT OPERATING CONDITION 32
4.4.6 TEST RESULTS 33
4.5 POWER SPECTRAL DENSITY MEASUREMENT 34
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 34

4.5.2 TEST INSTRUMENTS 34
4.5.3 TEST PROCEDURE....35
4.5.4 TEST SETUP 35
4.5.5 EUT OPERATING CONDITION....35
4.5.6 TEST RESULTS 36
4.6 BAND EDGES MEASUREMENT 40
4.6.1 LIMITS OF BAND EDGES MEASUREMENT 40
4.6.2 TEST INSTRUMENTS 40
4.6.3 TEST PROCEDURE....40
4.6.4 EUT OPERATING CONDITION....41
4.6.5 TEST RESULTS 41
4.6.6 NOTE ON BAND EDGE EMISSION....42
4.7 PROCESSING GAIN OF A DIRECT SEQUENCE SPREAD SPECTRUM MEASUREMENT(WORSE CASE) 45
4.7.1 LIMITS OF PROCESSING GAIN OF A DIRECT SEQUENCE SPREAD SPECTRUM MEASUREMENT 45
4.7.2 TEST INSTRUMENTS & SUPPORT UNIT....45
4.7.3 METHOD OF MEASUREMENT 46
4.7.4 TEST SETUP....47
4.7.5 TEST PROCEDURES 48
4.7.6 EUT OPERATING CONDITION....48
4.7.7 TEST RESULTS 49
4.8 ANTENNA REQUIREMENT.... 65
4.8.1 STANDARD APPLICABLE 65
4.8.2 ANTENNA CONNECTED CONSTRUCTION....65
5 PHOTOGRAPHS OF THE TEST CONFIGURATION.... 66
6 INFORMATION ON THE TESTING LABORATORIES 68
ANNEX PHOTOGRAPHS OF EUT

1 CERTIFICATION

PRODUCT :	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch
BRAND NAME :	Linksys
MODEL NO :	BEFW11S4
APPLICANT :	Global Sun Technology Inc.
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992
SITE REGISTERATION NO :	90422 (FCC) IC 3789-5 (Canada IC)

We, **Advance Data Technology Corporation**, hereby certify that one sample BEFW11S4 of the designation has been tested in our facility on January 16, 2001.

The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

Tested by : Steven Lu , Date: Jan. 17. 2001
Steven Lu

Prepared by : Demi Chen , Date: Jan. 17, 2001
Demi Chen

Approved by : Alan Lane , Date: Jan. 17, 2001
Dr. Alan Lane, Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
STANDARD PARAGRAPH	**TEST REQUIREMENTS**	**RESULT**	**REMARK**
15.107	AC Power Conducted Emissions Spec.: 48 dBuV	Yes	Minimum passing margin is –8.10 dBuV At 0.72344 MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Spec.: min. 500 Khz	Yes	9.96 MHz > 500 kHz
15.247(b)	Maximum Peak Output Power Spec.: max. 30 dBm	Yes	17.39 dBm < 30 dBm
15.247(c)	Transmitter Radiated Emissions Spec.: Table 15.209	Yes	Minimum passing margin is –2.1 dBuV At 650.0 MHz
15.247(d)	Power Spectral Density Spec.: max. 8dBm	Yes	-12.11 dBm < 8 dBm
15.247(c)	Band Edge Measurement	Yes	N/A
15.247(e)	Processing Gain of Direct Sequence Spread Spectrum System Spec.: min. 10 dB	Yes	11.4dB ≧ 10dB

NOTE:

The receiver portion of the EUT has been tested in ADT. The test result has been verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch
MODEL NO.	BEFW11S4
POWER SUPPLY	9VDC (from AC Adapter)
DATA CABLE	RJ45 Cable
I/O PORTS	NA
MODULATION TYPE	DSSS BPSK/QPSK/CCK
TRANSFER RATE	11/5.5/2/1Mbps
FREQUENCY RANGE	2400 ~ 2483.5MHz
NUMBER OF CHANNEL	11
ANTENNA TYPE	Pual monopole
ASSOCIATED DEVICES	NA
DESCRIPTION BETWEEN MODELS	NA

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		

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch, according to the specifications of the manufacturers, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)

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

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.	I/O Cable
1	PC	IBM	2187-12W	1S218714ABNA001N	Nonshielded Power (1.8m)
2	MONITOR	HP	D2842A	KR93473116	Nonshielded Power (1.5m) Shielded Signal(1.8m)
3	PRINTER	HP	2225C+	3123S97230	Nonshielded Power (1.8m) Shielded Signal(1.2m)
5	MODEM	ACEEX	1414	980020509	Nonshielded Power (1.9m) Shielded Signal(1.2m)
6	KEYBOARD	ACER	6311	K6357051087	Shielded Signal (1.8m)
7	MOUSE	LOGITECH	M-S43	LZE00703207	Nonshielded Signal(1.5m)
8	NOTEBOOK	DELL	PPX	99125	Nonshielded Signal (1.8m)
9	NOTEBOOK	TWINHEAD	P90	10613504	Nonshielded Power (1.8m)

4 TEST PROCEDURES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

4.1.2 TEST INSTRUMENTS

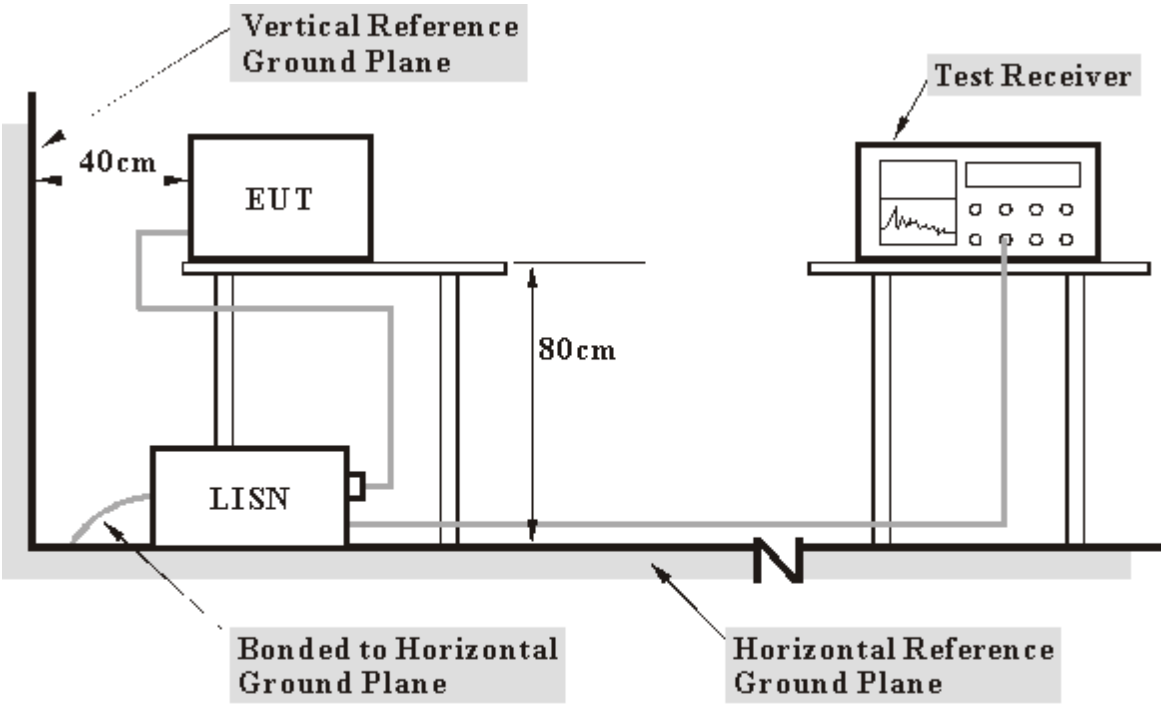
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS30	828765/002	July 19, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 19, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO-L.I.S.N.	3825/2	90031627	July 19, 2001
Shielded Room	Site 5	ADT-C05	NA

Notes: 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.

4.1.3 TEST PROCEDURES

1. Place the EUT at 0.4 meter away from the conduction wall of the shielded room.
2. Connect the EUT to the power mains through a Line Impedance Stabilization Network (LISN).
3. Connect the other support units to the other LISN too.
4. Make sure the 50Ω/ 50μH coupling impedance is provided to the measurement instrument by the LISNs.
5. Measure the maximum conducted interference on both lines of the power mains connects to the EUT, within frequency range 450KHz ~ 30MHz.
6. The emission level under limit by 10dB is not needed to be reported.

4.1.4 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.

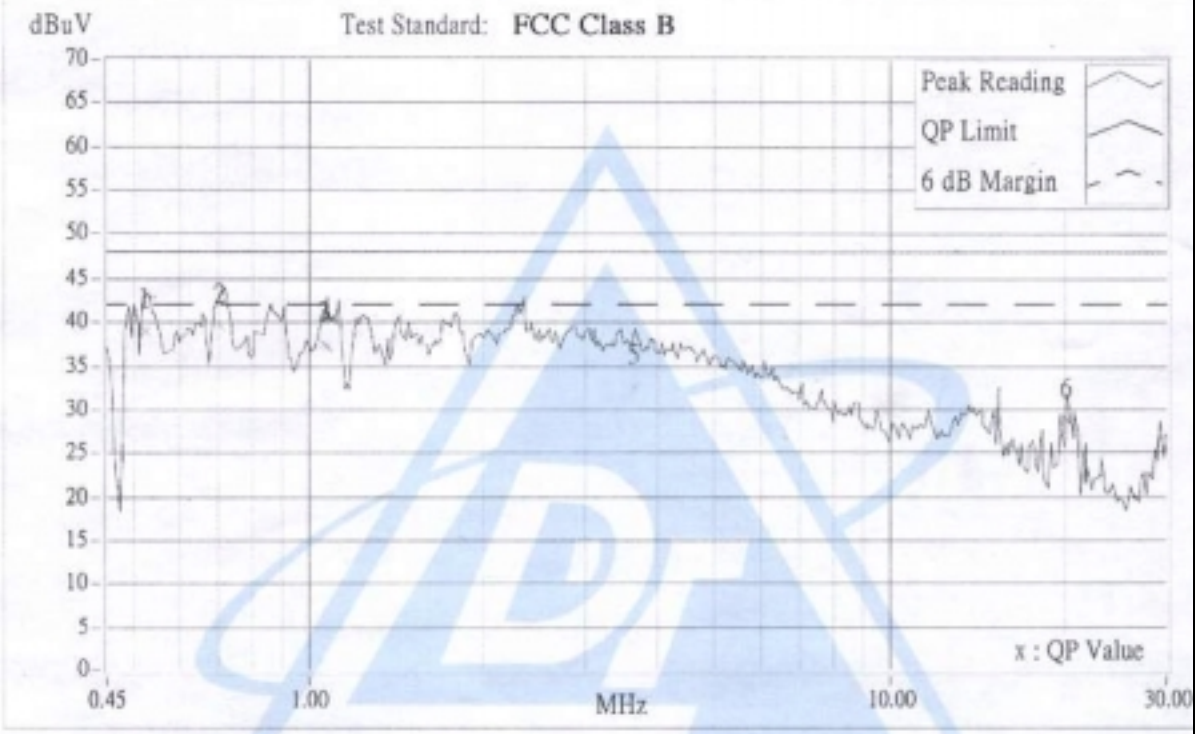
For the actual test configuration, please refer to the related Item in this test report (**Photographs of the Test Configuration**).

4.1.5 TEST RESULTS

Brand / Model : BERW11S4
Test Mode : CH1
Power Source : 110V
Remark :
Tested by : STEVEN

Location: Conduction 5 Date: 2001/1/15 Time: PM 05:16:15 Phase: L1

Temperatuer (C): 20 Humidity (%): 60 Approved by:

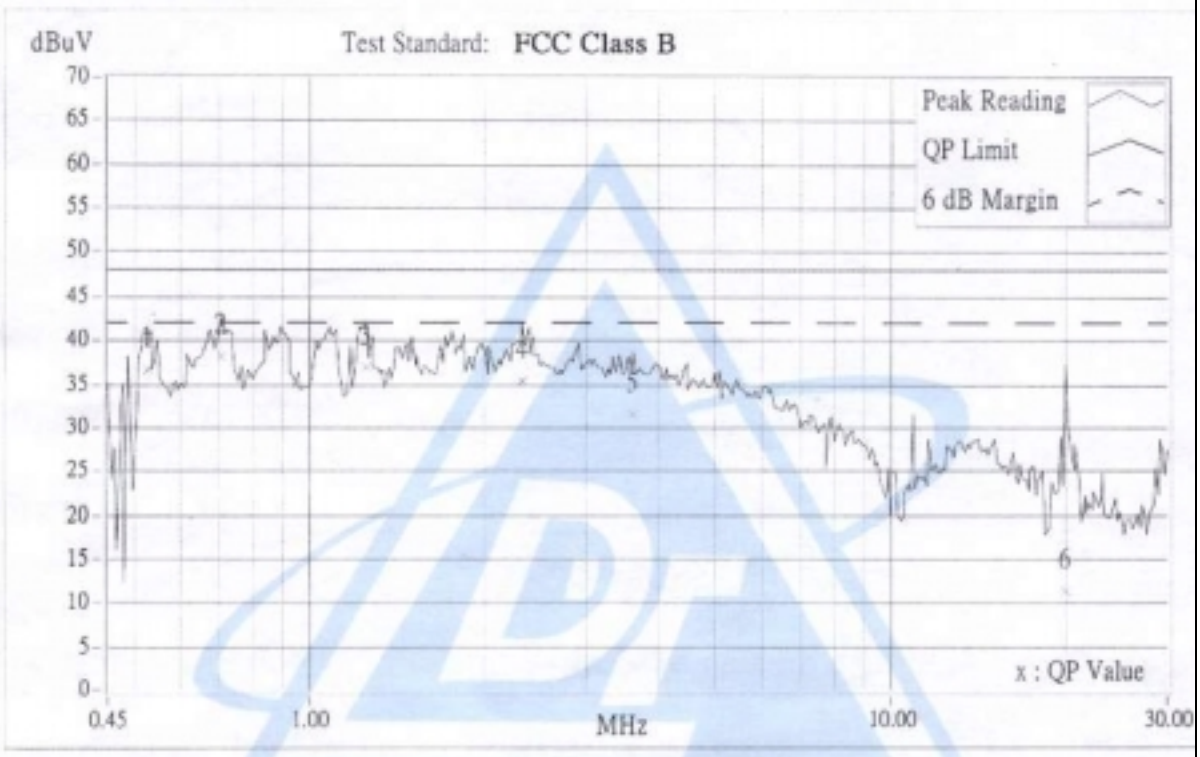


	Frequency	Corr. Factor	Reading dBuV	Emission dBuV	Limit dBuV	Margins dB
No.	MHz	dB	QP	QP	QP	QP
1	0.52195	0.20	39.06	39.26	48.00	-8.74
+2	0.70702	0.20	39.49	39.69	48.00	-8.31
3	1.06934	0.21	37.33	37.54	48.00	-10.46
4	1.07168	0.21	37.29	37.50	48.00	-10.50
5	3.64336	0.46	32.62	33.08	48.00	-14.92
6	20.25908	1.22	28.68	29.90	48.00	-18.10

Brand / Model : BERW11S4
Test Mode : CH1
Power Source : 110V
Remark :
Tested by : STEVEN

Location: Conduction 5 Date: 2001/1/15 Time: PM 05:20:03 Phase: N

Temperatuer (C): 20 Humidity (%): 60 Approved by:

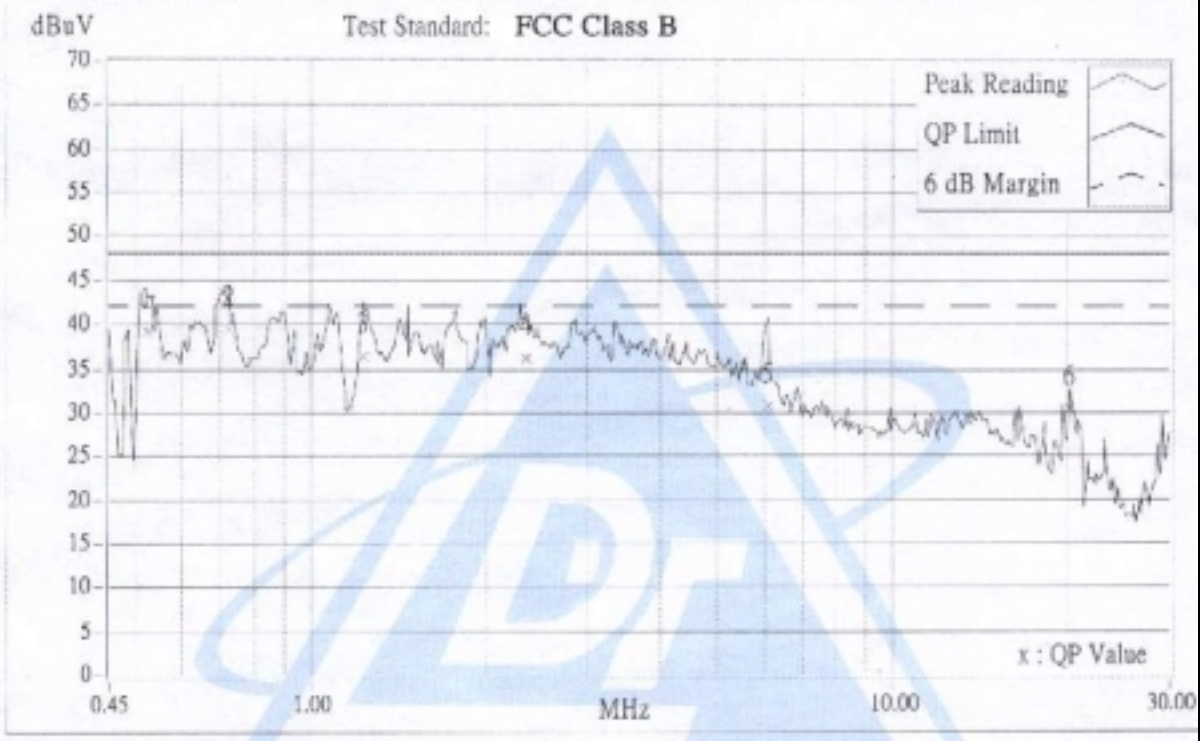


	Frequency	Corr. Factor	Reading dBuV	Emission dBuV	Limit dBuV	Margins dB
No.	MHz	dB	QP	QP	QP	QP
1	0.52933	0.20	36.57	36.77	48.00	-11.23
+2	0.70779	0.20	38.17	38.37	48.00	-9.63
3	1.25000	0.23	36.88	37.11	48.00	-10.89
4	2.32958	0.33	35.40	35.73	48.00	-12.27
5	3.60547	0.46	31.42	31.88	48.00	-16.12
6	20.00000	0.90	11.40	12.30	48.00	-35.70

Brand / Model : BERW11S4
Test Mode : CH6
Power Source : 110V
Remark :
Tested by : STEVEN

Location: Conduction 5 Date: 2001/1/15 Time: PM 05:49:20 Phase: L1

Temperatuer (C): 20 Humidity (%): 60 Approved by:

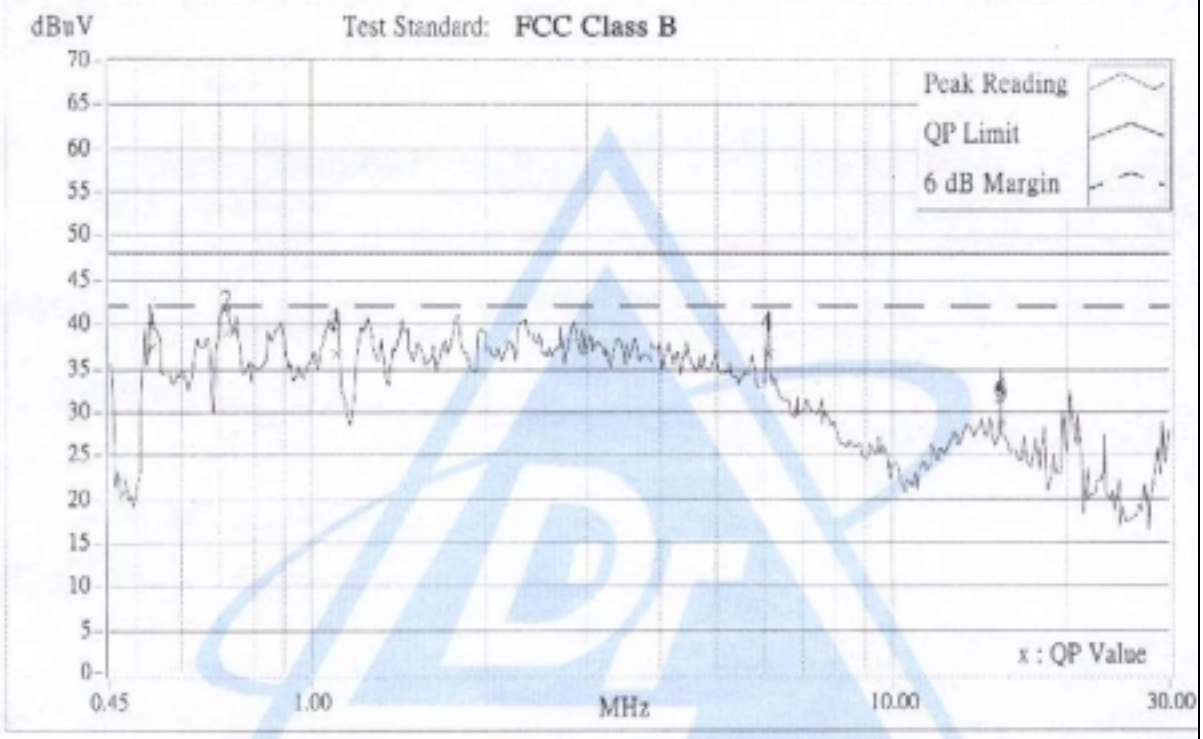


	Frequency	Corr. Factor	Reading dBuV	Emission dBuV	Limit dBuV	Margins dB
No.	MHz	dB	QP	QP	QP	QP
1	0.52219	0.20	39.18	39.38	48.00	-8.62
+2	0.72344	0.20	39.53	39.73	48.00	-8.27
3	1.22656	0.22	36.40	36.62	48.00	-11.38
4	2.33984	0.33	36.19	36.52	48.00	-11.48
5	6.11328	0.54	30.68	31.22	48.00	-16.78
6	20.25781	1.22	30.54	31.76	48.00	-16.24

Brand / Model : BERW11S4
Test Mode : CH6
Power Source : 110V
Remark :
Tested by : STEVEN

Location: Conduction 5 Date: 2001/1/15 Time: PM 05:45:58 Phase: N

Temperatuer (C): 20 Humidity (%): 60 Approved by:

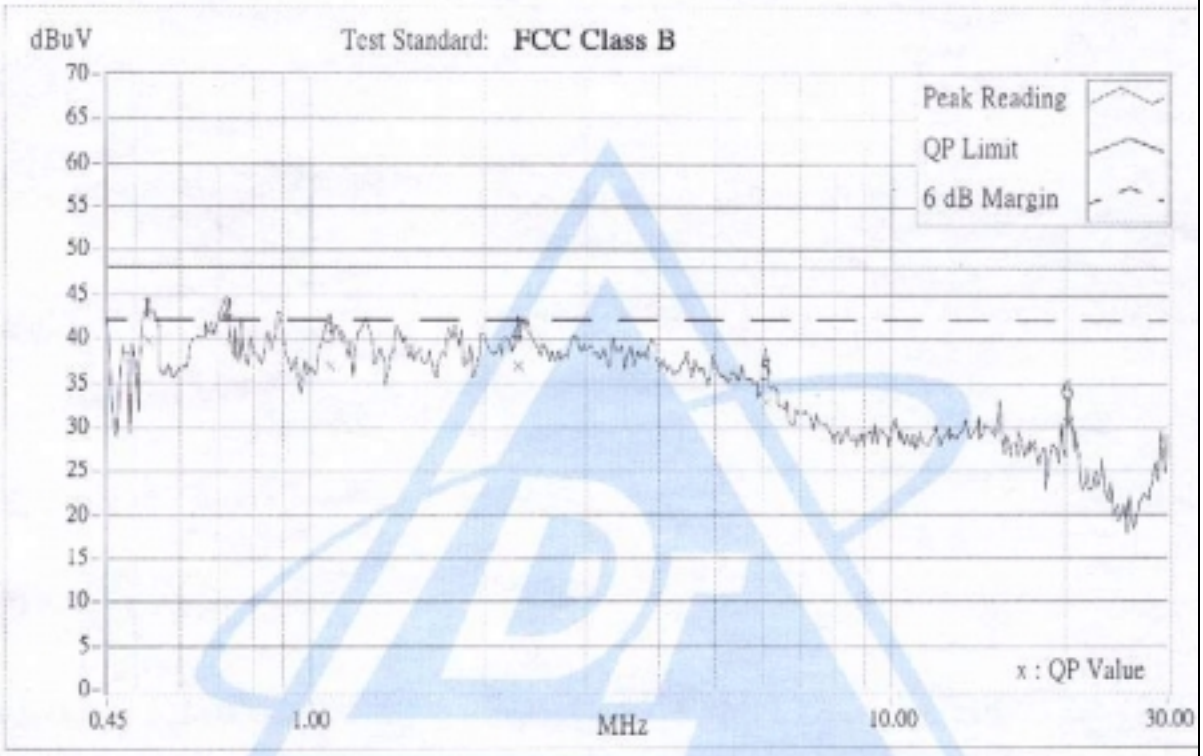


	Frequency	Corr. Factor	Reading dBuV	Emission dBuV	Limit dBuV	Margins dB
No.	MHz	dB	QP	QP	QP	QP
1	0.53350	0.20	37.49	37.69	48.00	-10.31
+2	0.71953	0.20	38.95	39.15	48.00	-8.85
3	1.10156	0.21	36.55	36.76	48.00	-11.24
4	6.11378	0.50	36.63	37.13	48.00	-10.87
5	15.47378	0.63	28.32	28.95	48.00	-19.05
6	15.47455	0.63	28.99	29.62	48.00	-18.38

Brand / Model : BERW11S4
Test Mode : CH 11
Power Source : 110V
Remark :
Tested by : STEVEN

Location: Conduction 5 Date: 2001/1/15 Time: PM 05:54:07 Phase: L1

Temperatuer (C): 20 Humidity (%): 60 Approved by:

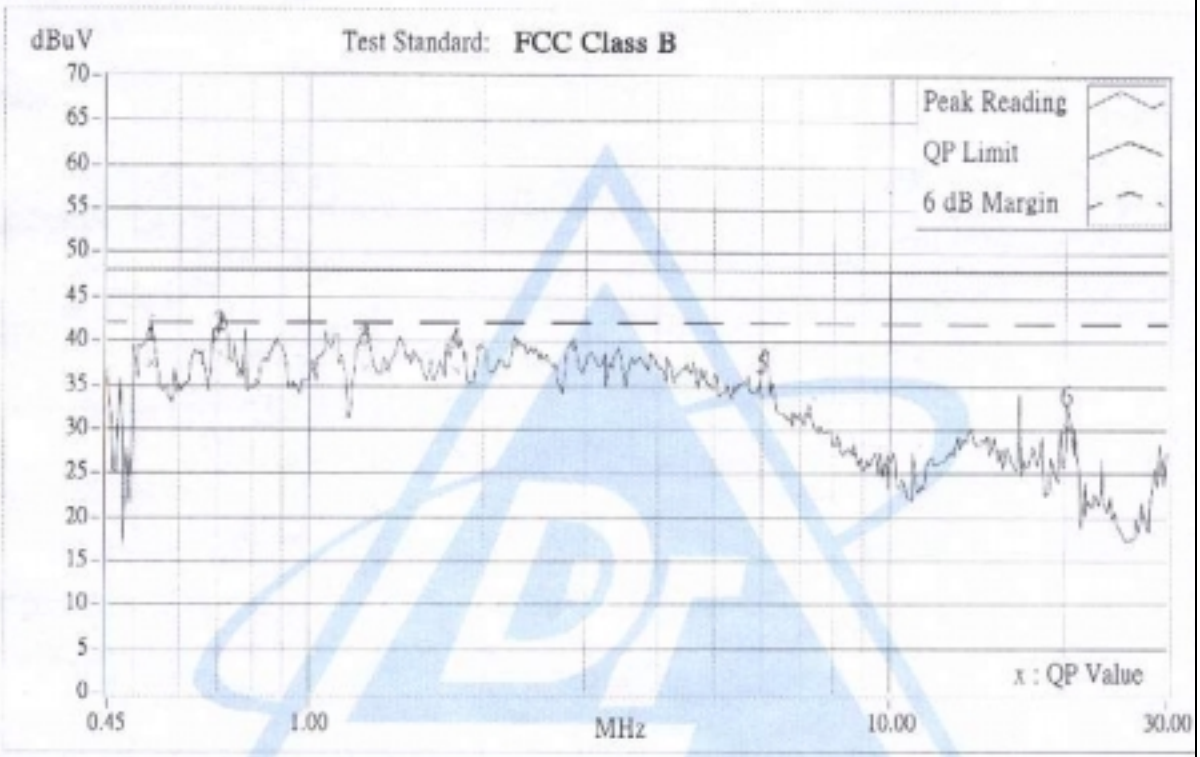


	Frequency	Corr. Factor	Reading dBuV	Emission dBuV	Limit dBuV	Margins dB
No.	MHz	dB	QP	QP	QP	QP
+1	0.52812	0.20	39.81	40.01	48.00	-7.99
2	0.72344	0.20	39.70	39.90	48.00	-8.10
3	1.08203	0.21	37.01	37.22	48.00	-10.78
4	2.28906	0.33	36.94	37.27	48.00	-10.73
5	6.11328	0.54	32.71	33.25	48.00	-14.75
6	20.25781	1.22	30.44	31.66	48.00	-16.34

Brand / Model : BERW11S4
Test Mode : CH 11
Power Source : 110V
Remark :
Tested by : STEVEN

Location: Conduction 5 Date: 2001/1/15 Time: PM 05:56:32 Phase: N

Temperatuer (C): 20 Humidity (%): 60 Approved by:



	Frequency	Corr. Factor	Reading dBuV	Emission dBuV	Limit dBuV	Margins dB
No.	MHz	dB	QP	QP	QP	QP
1	0.53984	0.20	37.55	37.75	48.00	-10.25
+2	0.70781	0.20	38.61	38.81	48.00	-9.19
3	1.24609	0.22	36.98	37.20	48.00	-10.80
4	1.78516	0.28	36.70	36.98	48.00	-11.02
5	6.08594	0.50	33.95	34.45	48.00	-13.55
6	20.25781	0.90	30.22	31.12	48.00	-16.88

4.2 Radiated Emission Measurement

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 - 1000	47	37

Notes: 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.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8590L	3544A01176	Apr. 18, 2001
HP Preamplifier	8447D	2944A08485	Apr. 27, 2001
HP Preamplifier	8347A	3307A01088	Sep. 04, 2001
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	N/A
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
SCHWARZBECK Horn Antenna	BBHA9120-D	D130	Jul. 9, 2001
SCHWARZBECK Horn Antenna	BBHA9170	123	Jan. 30, 2001
EMCO Turn Table	1060	1115	N/A
SHOSHIN Tower	AP-4701	A6Y005	N/A
Open Field Test Site	Site 5	ADT-R05	Aug. 08, 2001

Notes:

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.

4.2.3 TEST PROCEDURES

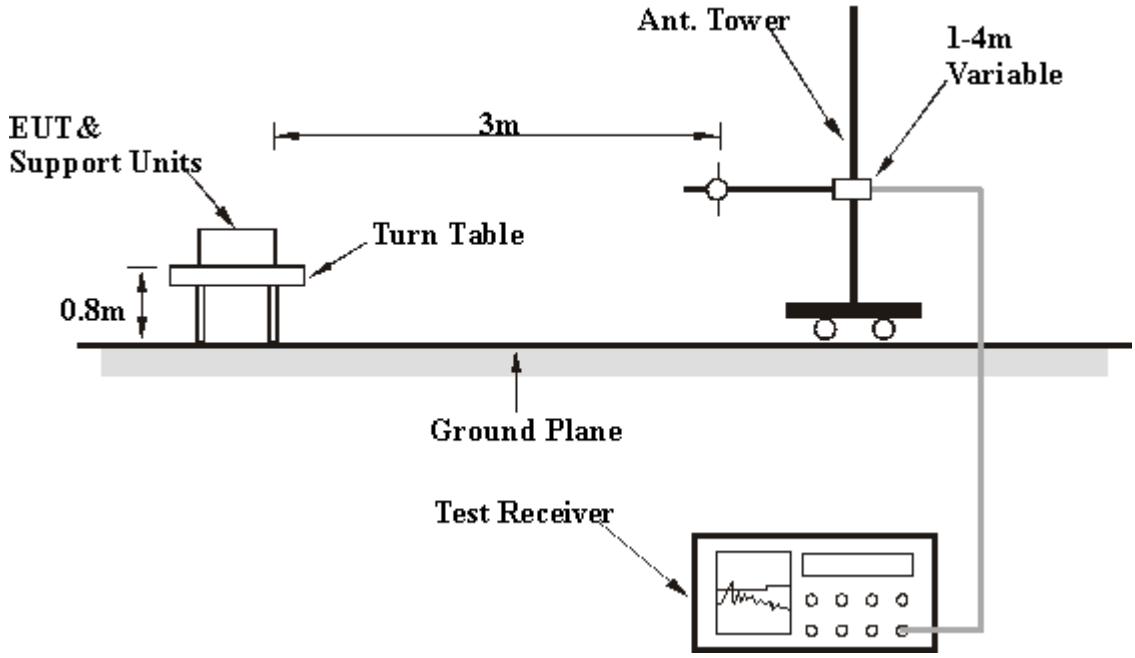
1. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
8. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.
9. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

Note:1. The frequency range of verification is either from 30 MHz to 1GHz or from 30 MHz up to 10 times carrier frequency of EUT (whichever is the highest frequency range).

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for frequency below 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for frequency above 1GHz.

4.2.4 TEST SETUP



For the actual test configuration, please refer to the related Item in this test report (**Photographs of the Test Configuration**).

4.2.5 TEST RESULTS

Digital Portion

EUT	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Mode	Channel 1	**Detector Function**	Quasi-Peak
Frequency Range	30-1000 MHz	**Test Distance**	3M
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

ANTENNA POLARITY: VERTICAL							
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
150.01	14.38	19.32	33.7	43.5	-9.8	99	77
450.01	7.70	27.70	35.4	46.0	-10.6	158	35
500.01	6.36	31.94	38.3	46.0	-7.7	128	334
550.00	6.24	35.26	41.5	46.0	-4.5	130	283
599.99	5.75	33.95	39.7	46.0	-6.3	115	291
650.00	5.60	38.30	43.9	46.0	-2.1	107	305
700.01	4.54	38.86	43.4	46.0	-2.6	106	354
800.01	3.75	37.05	40.8	46.0	-5.2	212	82
850.01	3.15	32.95	36.1	46.0	-9.9	100	78
900.01	2.62	35.48	38.1	46.0	-7.9	99	74
949.99	1.43	36.77	38.2	46.0	-7.8	157	73

ANTENNA POLARITY: HORIZONTAL							
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
250.00	12.61	26.69	39.3	46.0	-6.7	115	127
300.00	11.37	28.43	39.8	46.0	-6.2	119	215
450.00	7.70	31.4	39.1	46.0	-6.9	99	232
500.01	6.36	34.94	41.3	46.0	-4.7	108	334
550.01	5.24	38.06	43.3	46.0	-2.7	110	4
649.99	5.60	34.40	40.0	46.0	-6.0	102	243
700.01	4.54	35.16	39.7	46.0	-6.3	101	65
750.01	3.96	36.24	40.2	46.0	-5.8	109	239
800.00	3.75	34.95	38.7	46.0	-7.3	120	180

Notes:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

RF Portion

EUT	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Mode	Channel 1	**Detector Function**	PK Average
Frequency Range	Above 1000 MHz	**Test Distance**	3M
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

ANTENNA POLARITY: Vertical		**Detector Function :**				**6dB Bandwidth: 1MHz**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
2038.0	34.57	10.2	-	44.8	-	74.0	54.0	-29.2	-	104	86
*2413.5	36.09	72.6	64.5	108.7	100.6	-	-	-	-	104	238
4076.0	43.10	8.1	-	51.2	-	74.0	54.0	-22.8	-	123	159
4824.1	43.73	7.6	-	51.3	-	74.0	54.0	-22.7	-	115	164

ANTENNA POLARITY: Horizontal		**Detector Function :**				**6dB Bandwidth: 1MHz**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
2038.0	35.57	9.7	-	45.3	-	74.0	54.0	-28.7	-	108	119
*2413.5	36.09	66.8	58.2	102.9	94.3	-	-	-	-	107	290
4076.5	43.10	8.3	-	51.4	-	74.0	54.0	-22.6	-	108	244
4824.5	43.73	-3.13	-	40.6	-	74.0	54.0	-33.4	-	125	126

Notes:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (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	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Mode	Channel 6	**Detector Function**	PK Average
Frequency Range	Above 1000 MHz	**Test Distance**	3M
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

ANTENNA POLARITY: Vertical		**Detector Function :**				**6dB Bandwidth: 1MHz**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
2063.2	34.78	10.9	-	45.7	-	74.0	54.0	-28.3	-	134	44
*2438.5	36.37	72.9	64.3	109.3	100.7	-	-	-	-	109	192
4126.6	42.71	8.7	-	51.4	-	74.0	54.0	-22.6	-	116	334
4874.2	43.75	8.5	-	52.2	-	74.0	54.0	-21.8	-	103	9

ANTENNA POLARITY: Horizontal		**Detector Function :**				**6dB Bandwidth: 1MHz**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
2062.9	34.78	13.6	-	48.4	-	74.0	54.0	-25.6	-	128	282
*2438.5	36.37	62.1	54.2	98.5	90.6	-	-	-	-	99	285
4126.0	42.71	8.7	-	51.4	-	74.0	54.0	-22.6	-	111	46
4874.0	43.75	8.0	-	51.7	-	74.0	54.0	-22.3	-	108	339

Notes:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (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	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Mode	Channel 11	**Detector Function**	PK Average
Frequency Range	Above 1000 MHz	**Test Distance**	3M
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

ANTENNA POLARITY: Vertical		**Detector Function :**				**6dB Bandwidth: 1MHz**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
2088.0	35.07	11.2	-	46.3	-	74.0	54.0	-27.7	-	99	57
*2463.5	36.44	73.3	65.3	109.7	101.7	-	-	-	-	99	196
4176.1	42.76	9.5	-	52.3	-	74.0	54.0	-21.7	-	150	162
4923.4	43.27	8.5	-	51.8	-	74.0	54.0	-22.2	-	109	326

ANTENNA POLARITY: Horizontal		**Detector Function :**				**6dB Bandwidth: 1MHz**				**Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K	A.V.		
2087.6	35.07	12.2	-	47.3	-	74.0	54.0	-26.7	-	133	282
*2463.5	36.44	64.1	55.6	100.6	92.0	-	-	-	-	142	143
4174.0	42.69	10.0	-	52.7	-	74.0	54.0	-21.3	-	99	241
4924.9	43.27	7.5	-	50.8	-	74.0	54.0	-23.2	-	107	288

Notes: 1.Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (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 Limit of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	846839/018 848926/005	Mar. 03, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

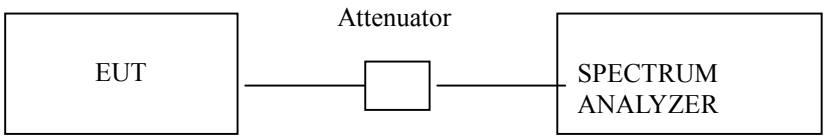
Notes:

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 CONDITION

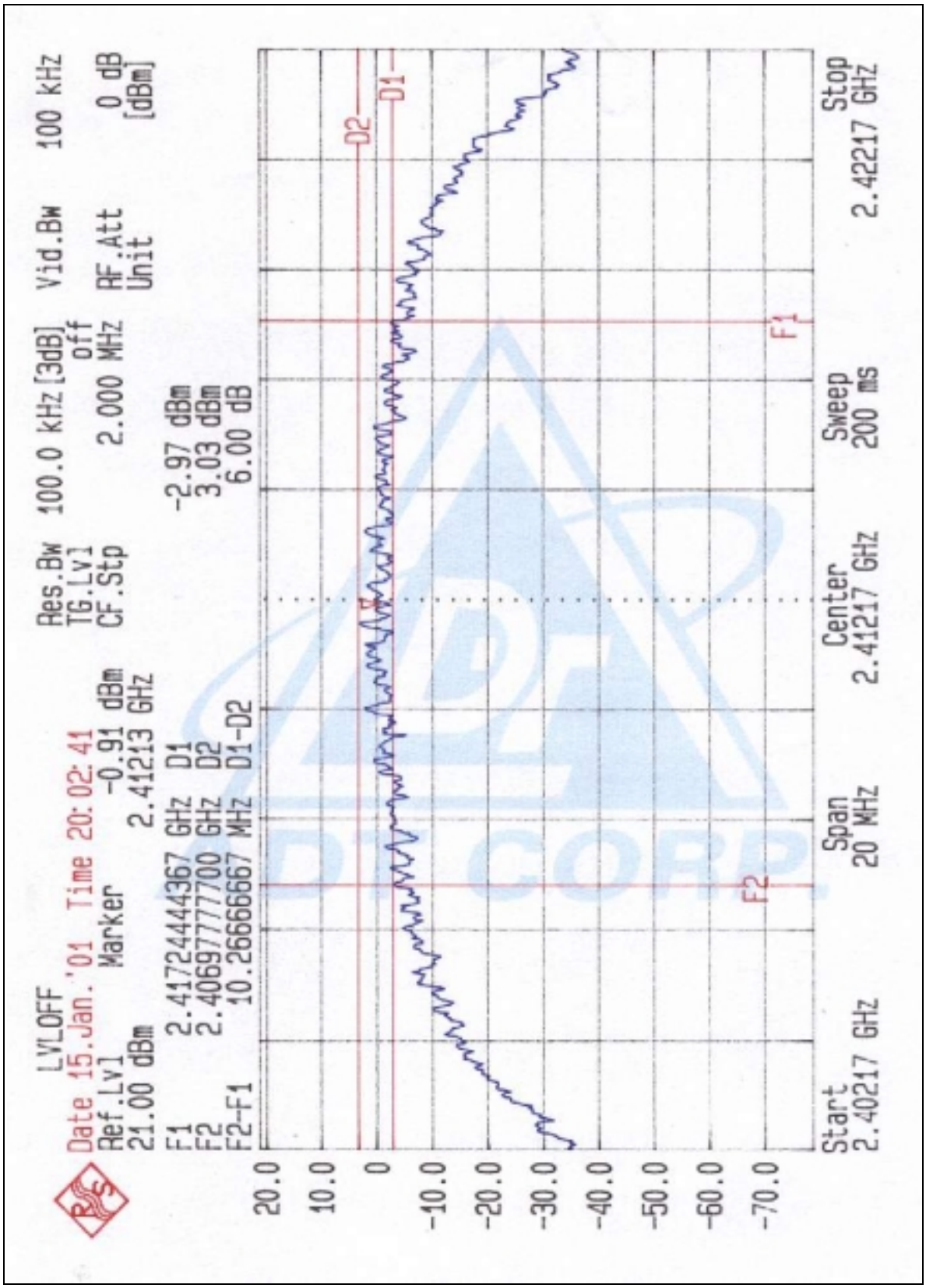
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

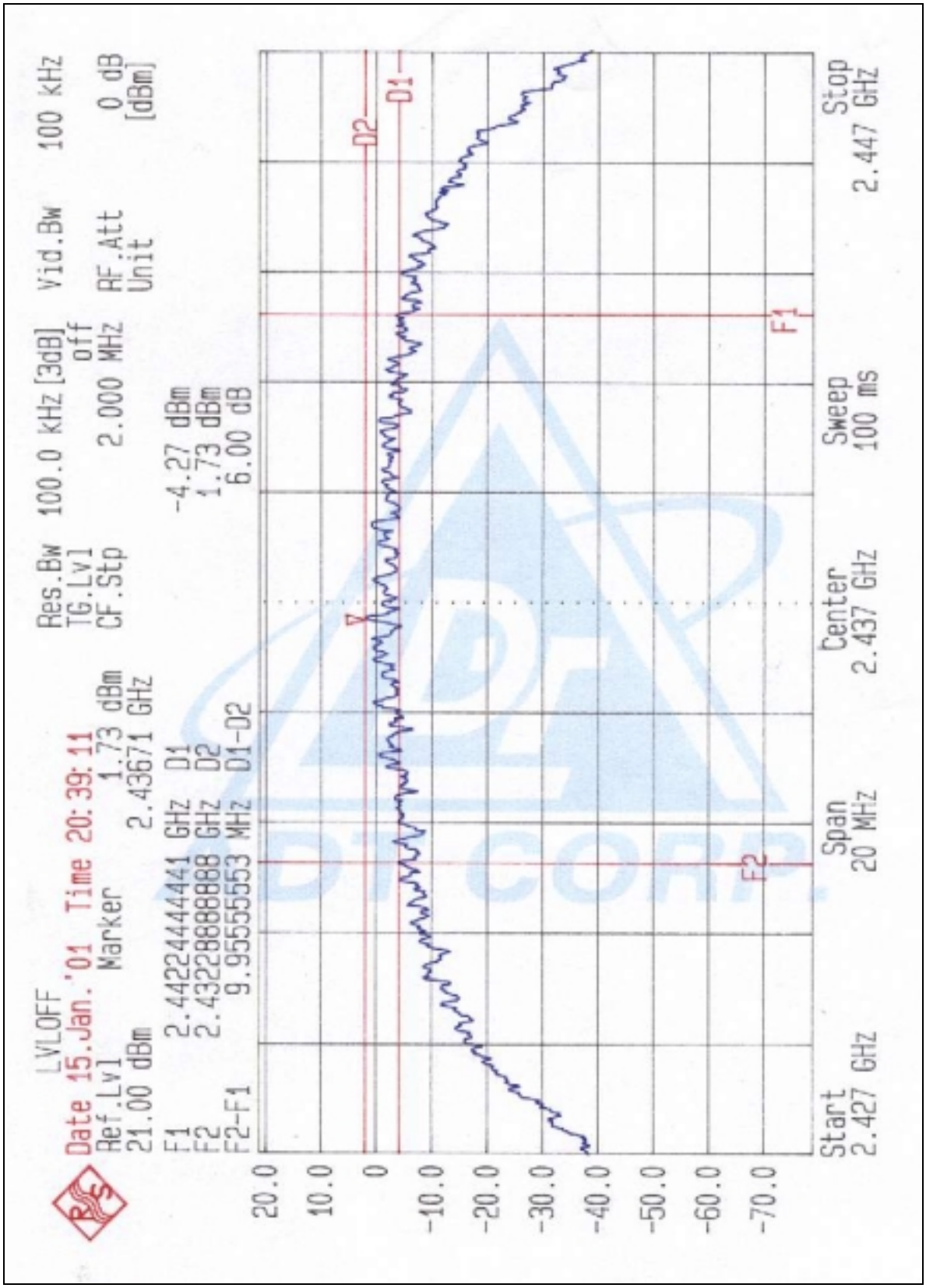
EUT	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.27	0.5	PASS
6	2437	9.96	0.5	PASS
11	2462	9.96	0.5	PASS

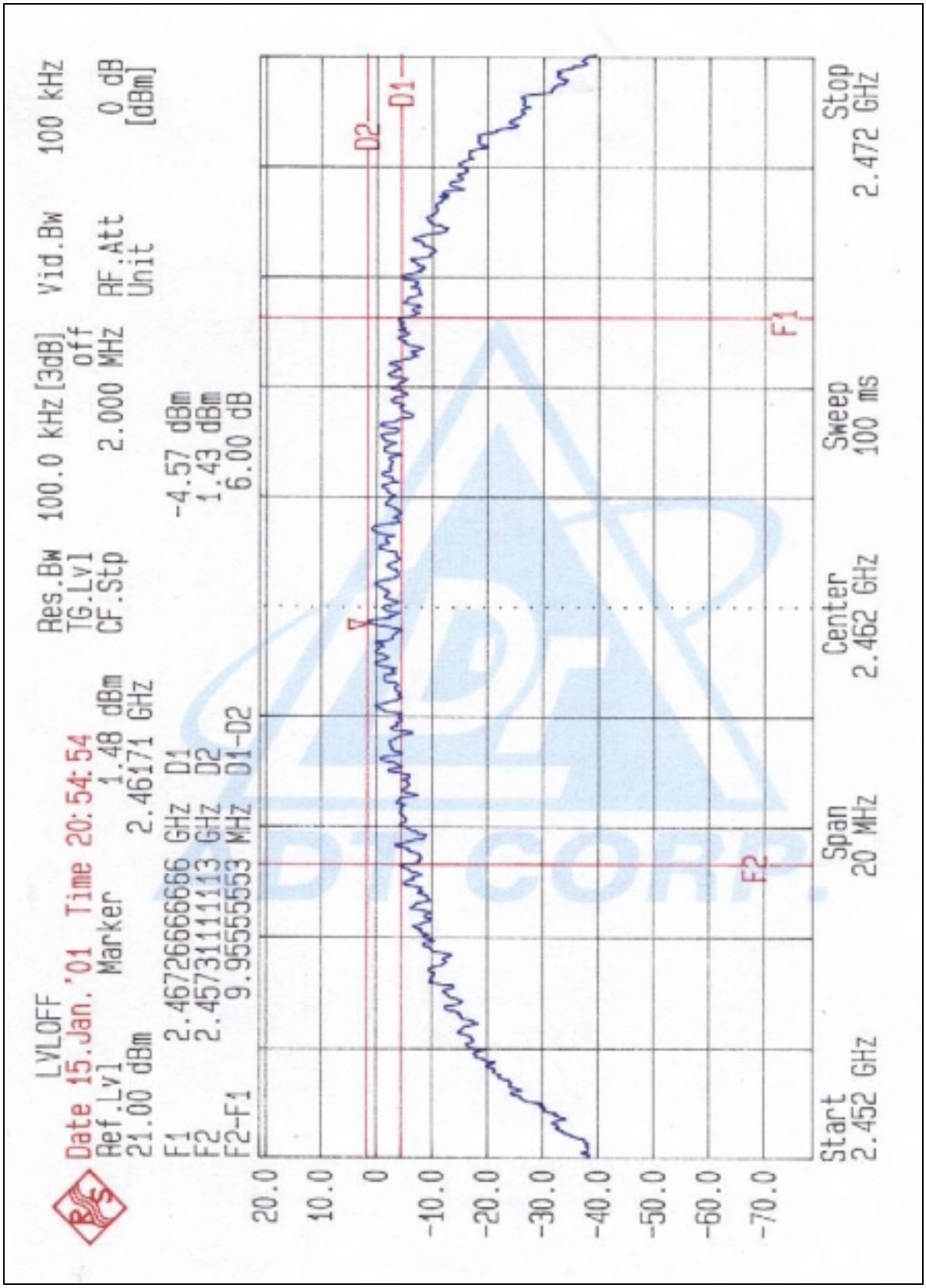
CH1


LVLOFF
Date 15.Jan.'01 Time 20:02:41
Ref.Lvl
21.00 dBm
Marker
-0.91 dBm
2.41213 GHz
F1 2.417244367 GHz D1
F2 2.406977700 GHz D2
F2-F1 10.26666667 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-2.97 dBm
3.03 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D2
D1
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.40217 GHz
Span 20 MHz
Center 2.41217 GHz
Sweep 200 ms
Stop 2.42217 GHz

CH6


LVLOFF
Date 15.Jan.'01 Time 20:39:11
Ref.Lvl
21.00 dBm
Marker 1.73 dBm
2.43671 GHz
F1 2.442444441 GHz D1
F2 2.432288888 GHz D2
F2-F1 9.95555553 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-4.27 dBm
1.73 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D2
D1
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 100 ms
Stop 2.447 GHz

CH11


LVLOFF
Date 15.Jan.'01 Time 20:54:54
Ref.Lvl
21.00 dBm
Marker
1.48 dBm
2.46171 GHz
F1 2.467266666 GHz D1
F2 2.457311111 GHz D2
F2-F1 9.955555553 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-4.57 dBm
1.43 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D2
D1
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 100 ms
Stop 2.472 GHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Limit of Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP SPECTRUM ANALYZER	8593E	3926A04191	Mar. 03, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

Notes:

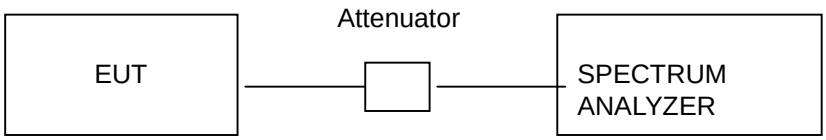
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
3. The span of the spectrum analyzer should be larger than 6dB BandWidth plus 10MHz.
4. Use Peak Search to read the peak power after Maximum Hold function is activated.
5. Shift the marker to +/- 3MHz and +/-6MHz, and record the reading.
6. The Maximum Peak Output Power is the linear summation of the 5 readings in (4) and (5).

Note: This measurement is the total power of 15MHz bandwidth which is far more wider than 6dB bandwidth.

4.4.4 TEST SETUP



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

4.4.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.4.6 TEST RESULTS

Output Power Into Antenna:

EUT	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.39	30	PASS
6	2437	16.57	30	PASS
11	2462	16.27	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Limit of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	846839/018 848926/005	Mar. 03, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

Notes:

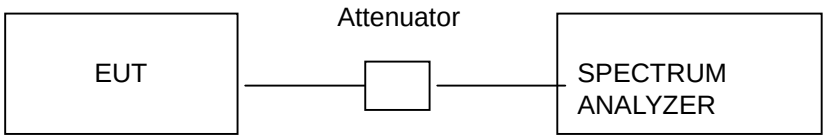
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

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



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

4.5.5 EUT OPERATING CONDITION

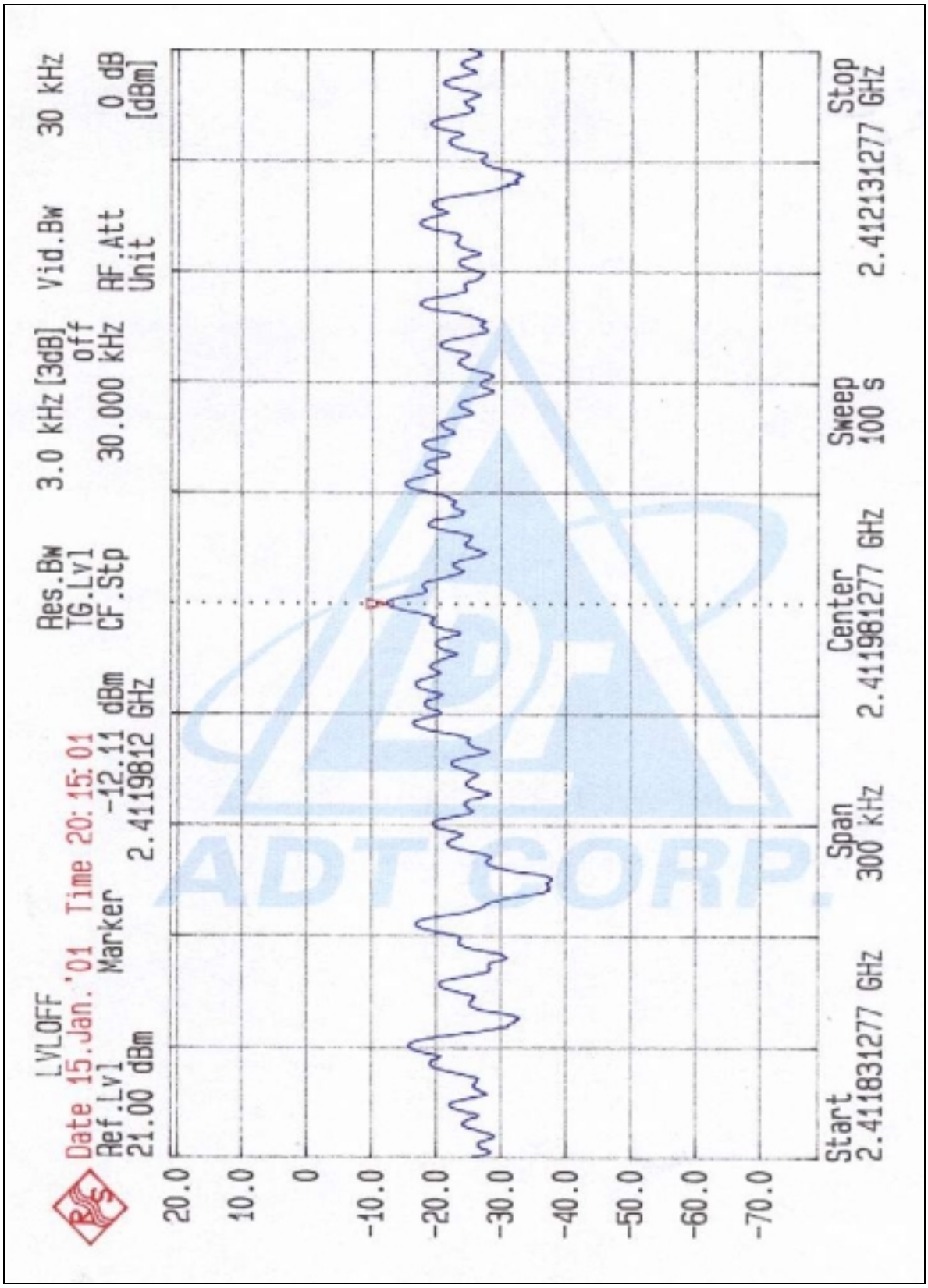
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.6 TEST RESULTS

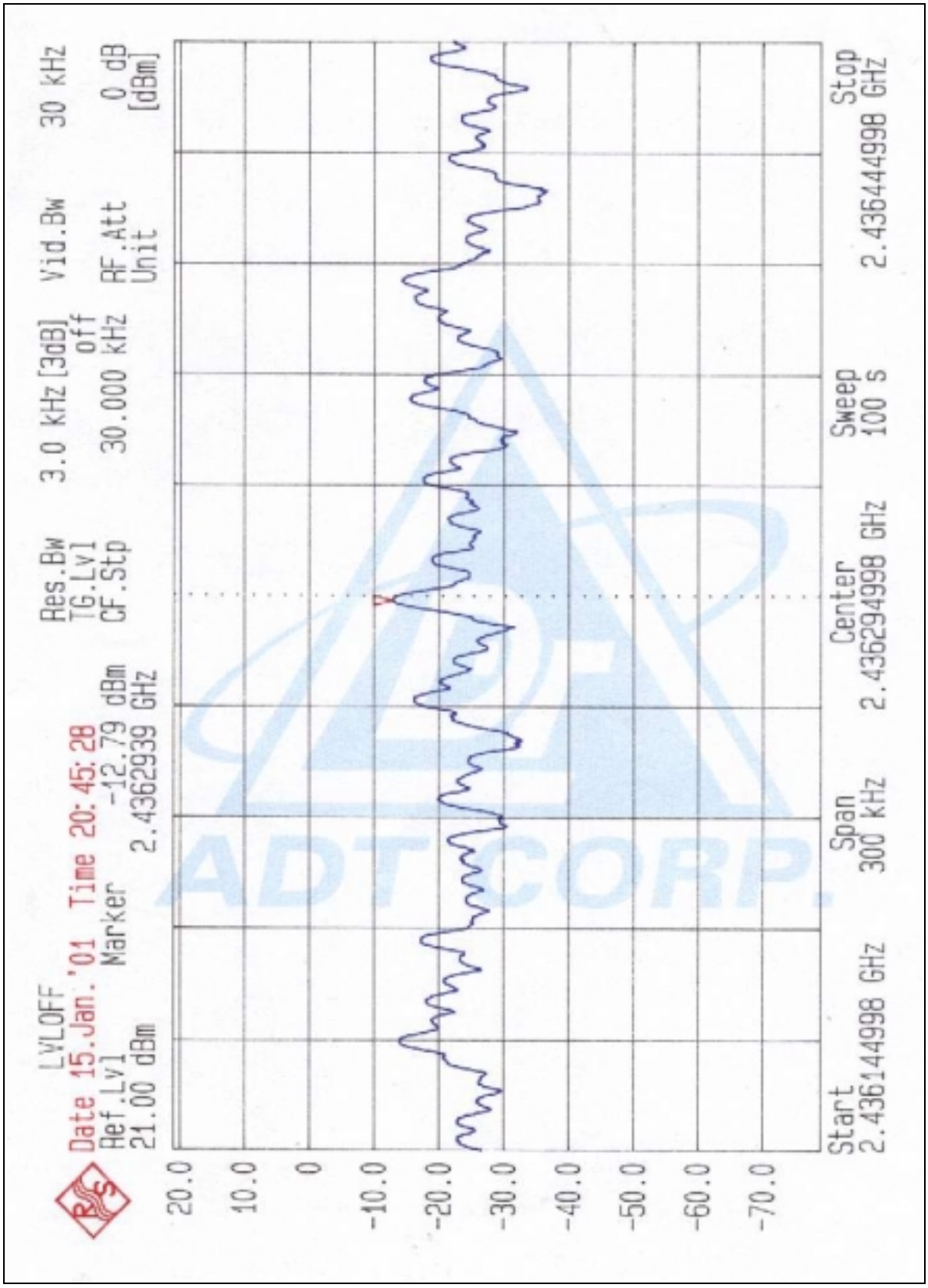
EUT	EtherFast Wireless AP + Cable/DSL Router with 4-Port Switch	**Model**	BEFW11S4
Environmental Conditions	20℃, 60%RH	**Tested By**	Steven Lu

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-12.11	8	PASS
6	2437	-12.79	8	PASS
11	2462	-13.15	8	PASS

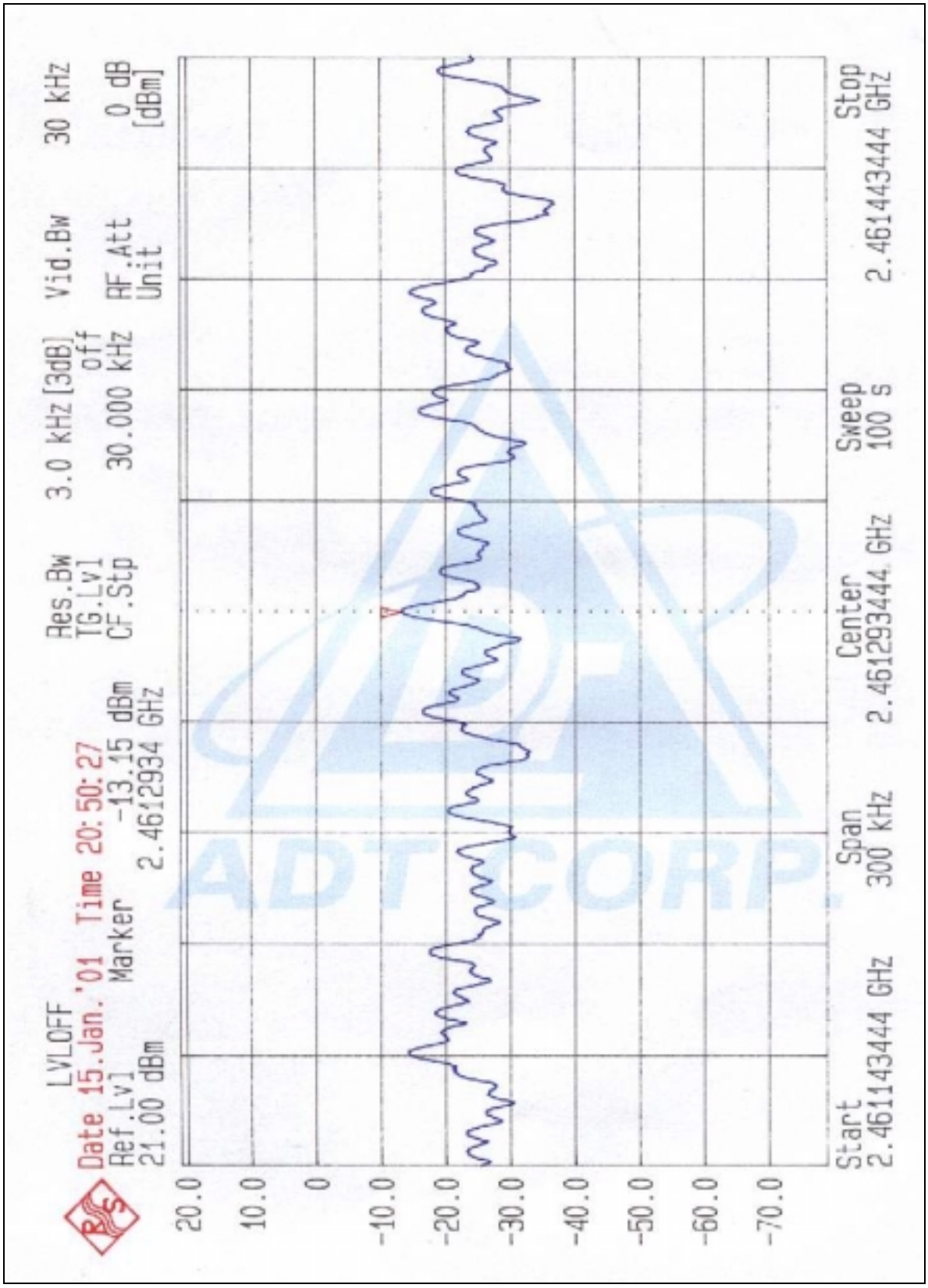
CH1


LVLOFF
Date 15.Jan.'01 Time 20:15:01
Ref.Lvl
21.00 dBm
Marker
2.4119812 GHz
-12.11 dBm
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.411831277 GHz
Span
300 kHz
Center
2.411981277 GHz
Sweep
100 s
Stop
2.412131277 GHz

CH6


LVLOFF
Date 15.Jan.'01 Time 20:45:28
Ref.Lvl
21.00 dBm
Marker
-12.79 dBm
2.4362939 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.436144998 GHz
Span 300 kHz
Center 2.436294998 GHz
Sweep 100 s
Stop 2.436444998 GHz

CH11


LVLOFF
Date 15.Jan.'01 Time 20:50:27
Ref.Lvl
21.00 dBm
Marker
-13.15 dBm
2.4612934 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.46143444 GHz
Span
300 kHz
Center
2.46293444 GHz
Sweep
100 s
Stop
2.46144344 GHz