FCC TEST REPORT

REPORT NO.: RF900828R09
MODEL NO.: SL-2211UB
RECEIVED: August 28, 2001
TESTED: August 27 ~ September 5, 2001

APPLICANT: SENAO INTERNATIONAL CO., LTD.

ADDRESS: 2F, No.531, Chung Cheng Rd., Hsin-Tien, Taipei, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

0528

Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT :	Wireless LAN USB ADAPTER
BRAND NAME :	SENAO
MODEL NO. :	SL-2211UB
APPLICANT :	SENAO INTERNATIONAL CO., LTD.
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from August 27, 2001 to September 5, 2001. The test record, data evaluation and Equipment UnderTest (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: Sep. 7, 2001
Steven Lu

CHECKED BY : Emily Lu , DATE: Sep 7, 2001
Emily Lu

APPROVED BY : , DATE: Sept. 7, 2001
Harris W. Lai
Senior V.P.

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**
15.107	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –6.60dBuV at 2.571MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –2.30dBuV at 6189.00 MHz
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 LAN USB ADAPTER
MODEL NO.	SL-2211UB
POWER SUPPLY	5VDC from notebook
MODULATION TYPE	BPSK, QPSK, CCK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	17dBm
ANTENNA TYPE	Dipole Antenna
DATA CABLE	1.5m (Shielded)
I/O PORTS	USB Port
ASSOCIATED DEVICES	NA

For a more detailed features description, please refer to the manufacturer's specifications or the 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.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

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

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	IBM	TYPE 2635-9AH	97-84L54	FCC DoC Approved
2	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
3	MODEM	ACEEX	1414	980020510	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

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

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

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	ESHS30	828109/007	July 4, 2002
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 3, 2002
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 3, 2002
Software	Cond-V2J	NA	NA
RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 5, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

NOTE:

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

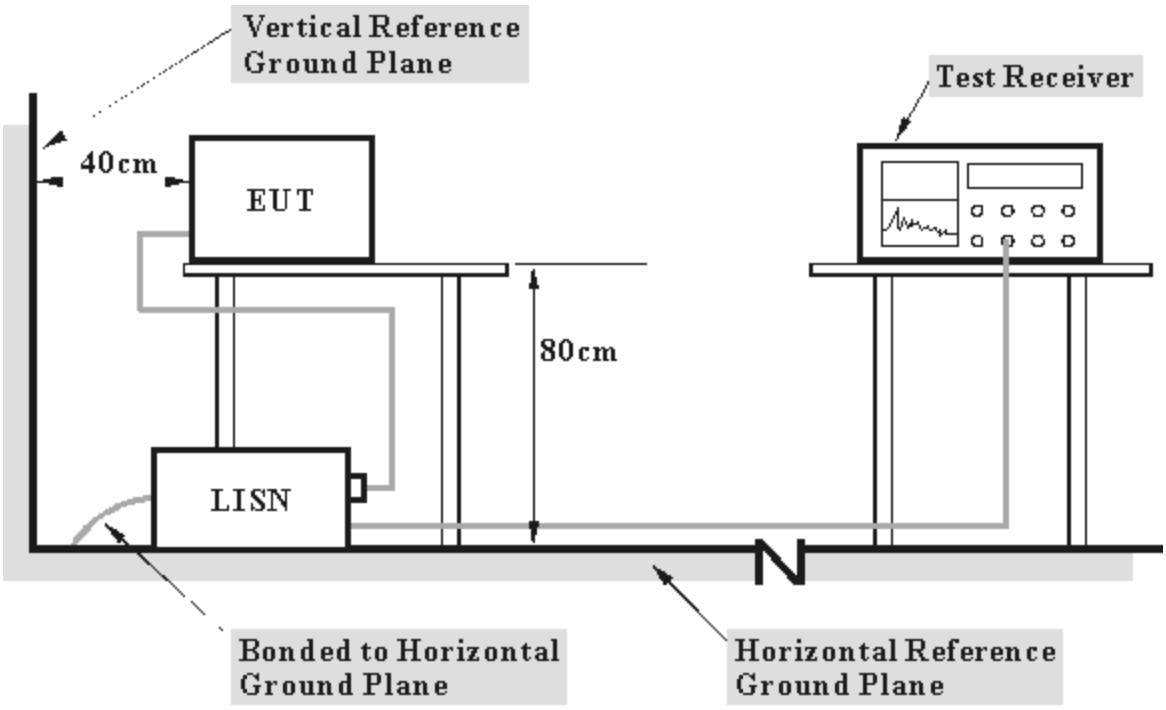
4.1.3 TEST PROCEDURES

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 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not 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 – Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITIONS

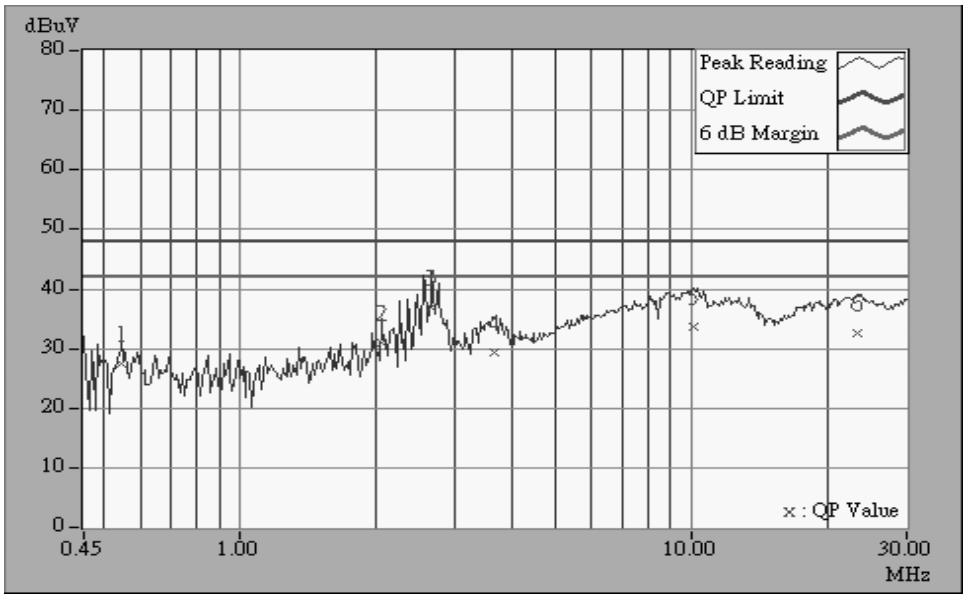
a. Connected the EUT to a computer system placed on a testing table.
b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The computer system sent "H" messages to its screen.
d. The computer system sent “H” messages to modem.
e. The computer system sent "H" messages to printer, and the printer prints them on paper.

4.1.6 TEST RESULTS

EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.546	0.10	27.52	-	27.62	-	48.00	-	-20.38	-
2	2.063	0.11	30.87	-	30.98	-	48.00	-	-17.02	-
3	2.655	0.17	36.88	-	37.05	-	48.00	-	-10.95	-
4	3.664	0.27	29.46	-	29.73	-	48.00	-	-18.27	-
5	10.139	0.51	33.64	-	34.15	-	48.00	-	-13.85	-
6	23.438	1.07	32.71	-	33.78	-	48.00	-	-14.22	-

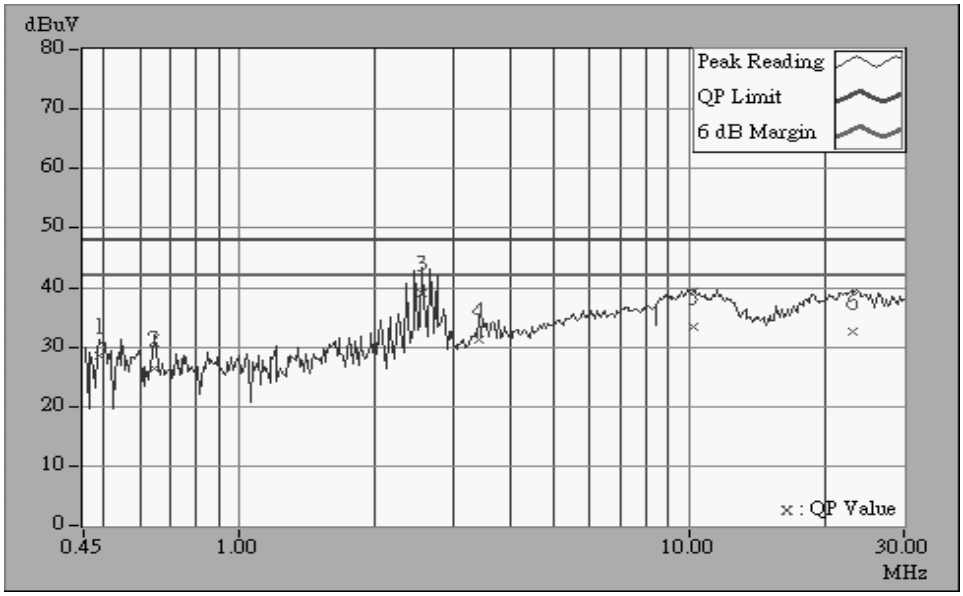
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.489	0.10	28.67	-	28.77	-	48.00	-	-19.23	-
2	0.645	0.10	26.29	-	26.39	-	48.00	-	-21.61	-
3	2.550	0.16	39.13	-	39.29	-	48.00	-	-8.71	-
4	3.390	0.24	31.22	-	31.46	-	48.00	-	-16.54	-
5	10.229	0.41	33.46	-	33.87	-	48.00	-	-14.13	-
6	22.988	0.86	32.56	-	33.42	-	48.00	-	-14.58	-

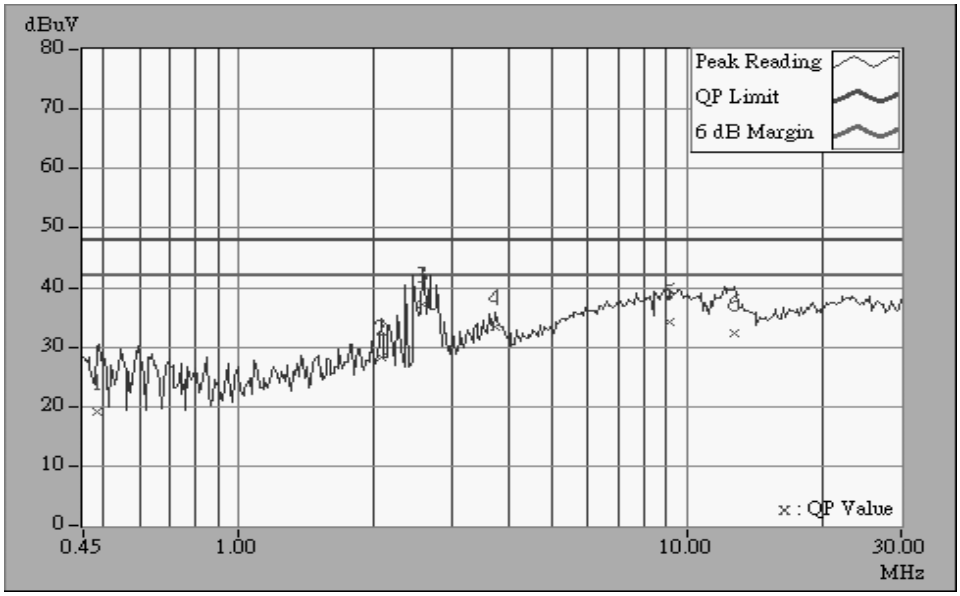
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.483	0.10	19.25	-	19.35	-	48.00	-	-28.65	-
2	2.082	0.11	28.19	-	28.30	-	48.00	-	-19.70	-
3	2.571	0.16	37.05	-	37.21	-	48.00	-	-10.79	-
4	3.744	0.27	33.32	-	33.59	-	48.00	-	-14.41	-
5	9.170	0.47	34.27	-	34.74	-	48.00	-	-13.26	-
6	12.779	0.67	32.34	-	33.01	-	48.00	-	-14.99	-

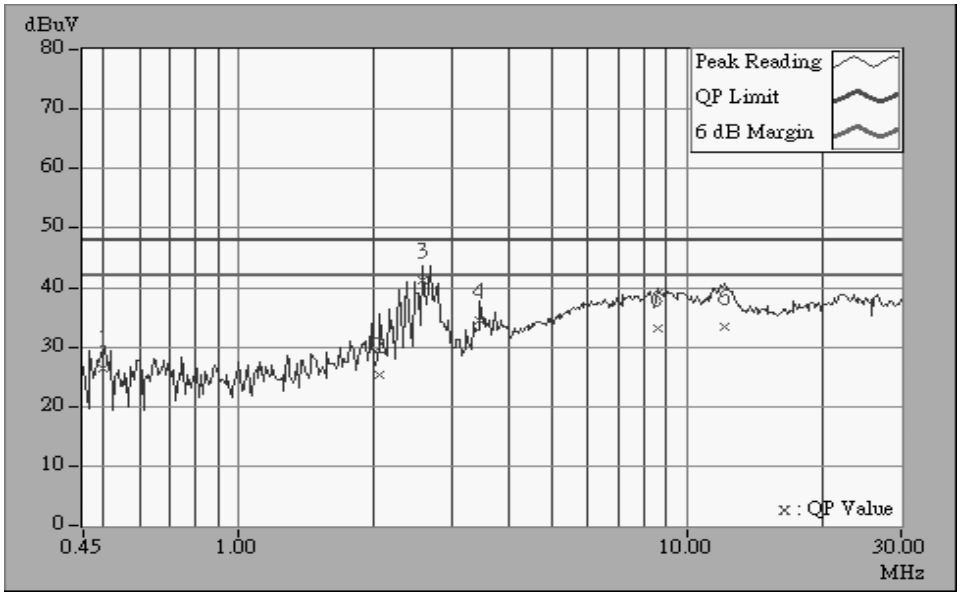
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.498	0.10	26.39	-	26.49	-	48.00	-	-21.51	-
2	2.067	0.11	25.21	-	25.32	-	48.00	-	-22.68	-
3	2.571	0.16	41.24	-	41.40	-	48.00	-	-6.60	-
4	3.453	0.25	34.52	-	34.77	-	48.00	-	-13.23	-
5	8.594	0.38	33.21	-	33.59	-	48.00	-	-14.41	-
6	12.101	0.48	33.42	-	33.90	-	48.00	-	-14.10	-

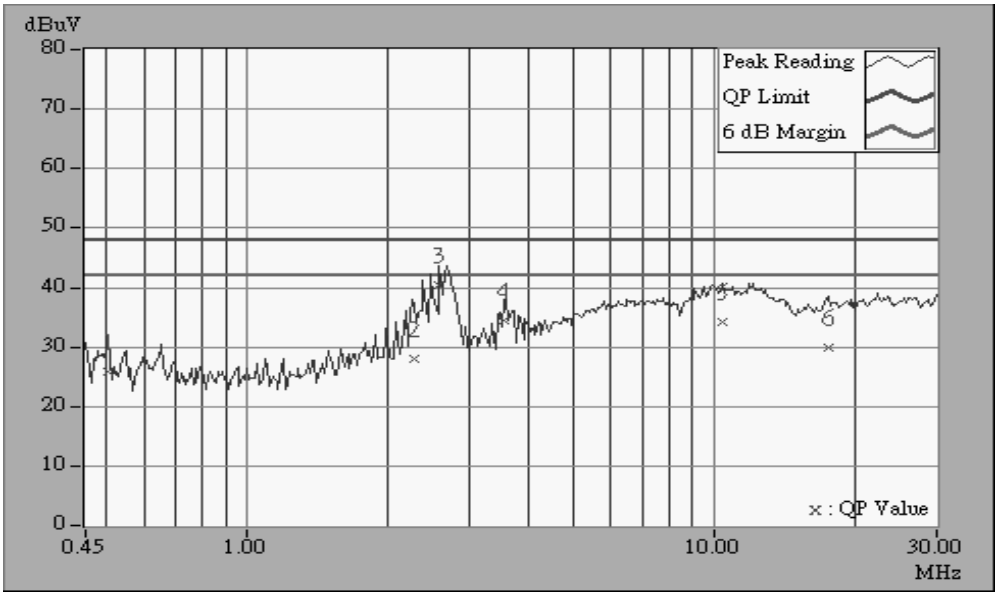
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.501	0.10	25.87	-	25.97	-	48.00	-	-22.03	-
2	2.272	0.13	28.13	-	28.26	-	48.00	-	-19.74	-
3	2.577	0.16	40.52	-	40.68	-	48.00	-	-7.32	-
4	3.562	0.26	34.41	-	34.67	-	48.00	-	-13.33	-
5	10.442	0.53	34.13	-	34.66	-	48.00	-	-13.34	-
6	17.552	0.90	29.98	-	30.88	-	48.00	-	-17.12	-

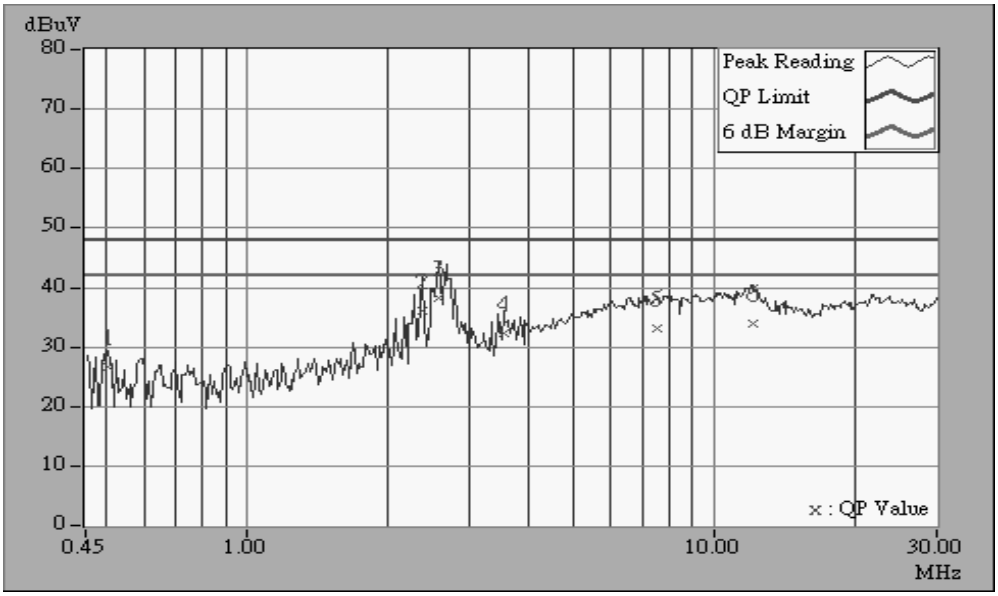
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.501	0.10	26.72	-	26.82	-	48.00	-	-21.18	-
2	2.373	0.14	36.07	-	36.21	-	48.00	-	-11.79	-
3	2.578	0.16	38.22	-	38.38	-	48.00	-	-9.62	-
4	3.546	0.25	32.41	-	32.66	-	48.00	-	-15.34	-
5	7.583	0.36	33.01	-	33.37	-	48.00	-	-14.63	-
6	12.137	0.49	34.04	-	34.53	-	48.00	-	-13.47	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies	Field Strength of Fundamental	
(MHz)	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
* HP Preamplifier	8447D	2944A08485	Nov. 3, 2001
* HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
* EMCO Horn Antenna	3115	9312-4192	April 15, 2002
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
* Antenna (Horn)	BBHA9120-D	D130	July 10, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI : R-1039		

NOTE: 1.The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.

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

3."*" = These equipments are used for the final measurement.

4.2.3 TEST PROCEDURES

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

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

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

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

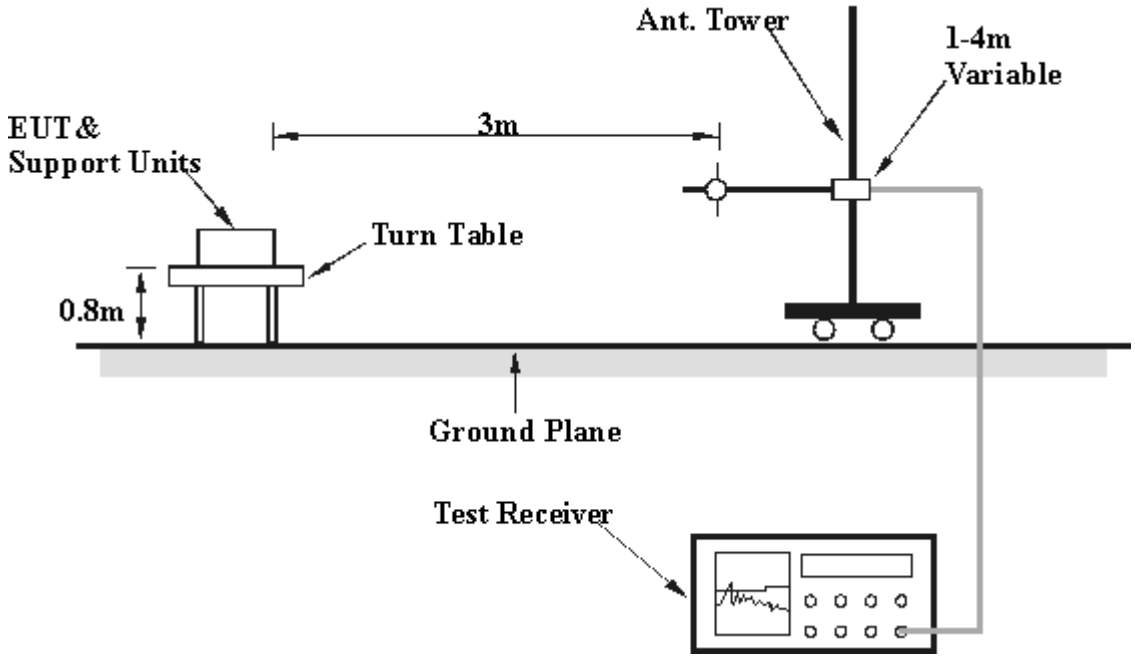
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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

NOTE:

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

4.2.4 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

EUT	Wireless LAN USB ADAPTER	MODEL	SL-2211UB
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	TESTED BY: Gary 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)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	264.00	33.8 QP	46.00	-12.20	1.53H	90	19.20	12.89	1.70	0.00	-14.58
2	323.90	33.6 QP	46.00	-12.40	1.05H	6	18.00	13.67	1.95	0.00	-15.64
3	395.98	31.7 QP	46.00	-14.30	1.38H	320	13.50	15.96	2.22	0.00	-18.18
4	440.02	31.1 QP	46.00	-14.90	1.18H	209	12.40	16.32	2.38	0.00	-18.69
5	528.40	32.1 QP	46.00	-13.90	1.17H	120	11.80	17.66	2.61	0.00	-20.26
6	616.20	34.0 QP	46.00	-12.00	1.65H	65	12.30	18.82	2.89	0.00	-21.72
7	748.00	33.6 QP	46.00	-12.40	1.31H	275	10.20	20.14	3.26	0.00	-23.40

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)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	132.40	32.7 QP	43.50	-10.80	1.46V	59	20.40	11.16	1.13	0.00	-12.29
2	264.14	31.7 QP	46.00	-14.30	1.12V	327	17.30	12.75	1.70	0.00	-14.45
3	395.96	30.6 QP	46.00	-15.40	1.26V	208	12.40	15.96	2.22	0.00	-18.18
4	480.17	33.2 QP	46.00	-12.80	1.55V	32	13.80	16.92	2.47	0.00	-19.39
5	528.40	30.7 QP	46.00	-15.30	1.50V	156	10.40	17.66	2.61	0.00	-20.26
6	748.10	29.8 QP	46.00	-16.20	1.20V	114	6.40	20.14	3.26	0.00	-23.41
7	880.40	32.6 QP	46.00	-13.40	1.29V	246	8.40	20.68	3.55	0.00	-24.24

NOTE: 1 Emission level = Raw Value - Correction Factor

2 Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)

3 The other emission levels were very low against the limit.

4 Margin value = Emission level - Limit value

EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Gary 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)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2038.10	45.9 PK	74.00	-28.10	1.00H	149	17.30	25.27	3.29	0.00	-28.57
2	*2413.10	94.6 PK	-	-	1.49H	326	63.84	27.19	3.62	0.00	-30.82
3	*2413.10	86.1 AV	-	-	1.49H	326	55.33	27.19	3.62	0.00	-30.82
4	4074.20	48.3 PK	74.00	-25.70	1.46H	236	13.40	30.18	4.77	0.00	-34.95
5	4824.00	50.8 PK	74.00	-23.20	1.17H	82	14.20	31.43	5.21	0.00	-36.65
6	6114.00	50.2 PK	74.00	-23.80	1.95H	49	11.40	32.83	5.98	0.00	-38.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2038.00	47.0 PK	74.00	-27.00	1.30V	76	18.40	25.27	3.29	0.00	-28.57
2	*2412.40	99.8 PK	-	-	1.19V	344	68.95	27.19	3.62	0.00	-30.82
3	*2412.40	89.8 AV	-	-	1.19V	344	59.00	27.19	3.62	0.00	-30.82
4	4076.00	49.2 PK	74.00	-24.80	1.11V	61	14.30	30.18	4.77	0.00	-34.95
5	4824.40	50.4 PK	74.00	-23.60	1.05V	187	13.80	31.43	5.21	0.00	-36.64
6	6114.10	53.8 PK	74.00	-20.20	1.67V	358	14.95	32.83	5.98	0.00	-38.81
7	6114.10	44.5 AV	54.00	-9.50	1.67V	358	5.66	32.83	5.98	0.00	-38.81

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

EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Gary 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)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2063.50	45.4 PK	74.00	-28.60	1.51H	331	16.70	25.39	3.31	0.00	-28.70
2	*2438.20	93.0 PK	-	-	1.43H	66	62.10	27.30	3.64	0.00	-30.94.
3	*2438.20	84.3 AV	-	-	1.43H	66	53.40	27.30	3.64	0.00	-30.94.
4	4126.00	49.3 PK	74.00	-24.70	1.37H	29	14.20	30.28	4.79	0.00	-35.07
5	4874.10	50.9 PK	74.00	-23.10	1.60H	336	14.20	31.47	5.25	0.00	-36.72
6	6189.00	50.4 PK	74.00	-23.60	1.45H	315	11.20	33.19	6.01	0.00	-39.20

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2063.10	46.1 PK	74.00	-27.90	1.24V	83	17.40	25.39	3.31	0.00	-28.70
2	*2438.20	102.5 PK	-	-	1.00V	324	71.59	27.30	3.64	0.00	-30.94
3	*2438.20	93.0 AV	-	-	1.00V	324	62.10	27.30	3.64	0.00	-30.94
4	4126.40	49.2 PK	74.00	-24.80	1.77V	151	14.10	30.28	4.79	0.00	-35.07
5	4876.20	57.9 PK	74.00	-16.10	1.00V	215	21.20	31.47	5.25	0.00	-36.73
6	4876.20	44.2 AV	54.00	-9.80	1.00V	215	7.51	31.47	5.25	0.00	-36.73
7	6189.00	55.9 PK	74.00	-18.10	1.07V	201	16.75	33.19	6.01	0.00	-39.21
8	6189.00	51.7 AV	54.00	-2.30	1.07V	201	12.46	33.19	6.01	0.00	-39.20

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

EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH 1005 hPa	**TESTED BY**: Gary 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)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2087.10	45.2 PK	74.00	-28.80	1.00H	3	16.40	25.50	3.33	0.00	-28.83
2	*2463.10	95.3 PK	-	-	1.31H	354	64.20	27.41	3.66	0.00	-31.07
3	*2463.10	88.2 AV	-	-	1.31H	354	57.10	27.41	3.66	0.00	-31.07
4	2483.50	48.4 PK	74.00	-25.60	1.41H	129	17.20	27.52	3.68	0.00	-31.20
5	4176.10	50.4 PK	74.00	-23.60	2.20H	330	15.20	30.38	4.81	0.00	-35.19
6	4924.10	50.7 PK	74.00	-23.30	1.39H	89	13.90	31.51	5.28	0.00	-36.81
7	6264.00	50.2 PK	74.00	-23.80	1.28H	25	10.70	33.46	6.03	0.00	-39.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2088.10	47.2 PK	74.00	-26.80	1.58V	265	18.40	25.50	3.33	0.00	-28.83
2	*2463.00	100.1 PK	-	-	1.24V	83	69.00	27.41	3.66	0.00	-31.07.
3	*2463.00	91.2 AV	-	-	1.24V	83	60.10	27.41	3.66	0.00	-31.07.
4	2483.40	47.4 PK	74.00	-26.60	1.12V	15	16.20	27.52	3.68	0.00	-31.20
5	4176.00	49.7 PK	74.00	-24.30	1.04V	87	14.50	30.38	4.81	0.00	-35.19
6	4924.10	50.2 PK	74.00	-23.80	1.15V	173	13.40	31.51	5.28	0.00	-36.80
7	6264.10	55.4 PK	74.00	-18.60	1.00V	176	15.86	33.46	6.03	0.00	-39.49.
8	6264.10	50.9 AV	54.00	-3.10	1.00V	176	11.45	33.46	6.03	0.00	-39.49

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

4.3 6DB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

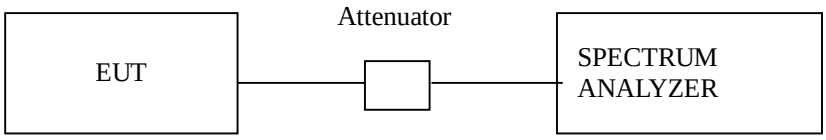
Notes:

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



4.3.5 EUT OPERATING CONDITIONS

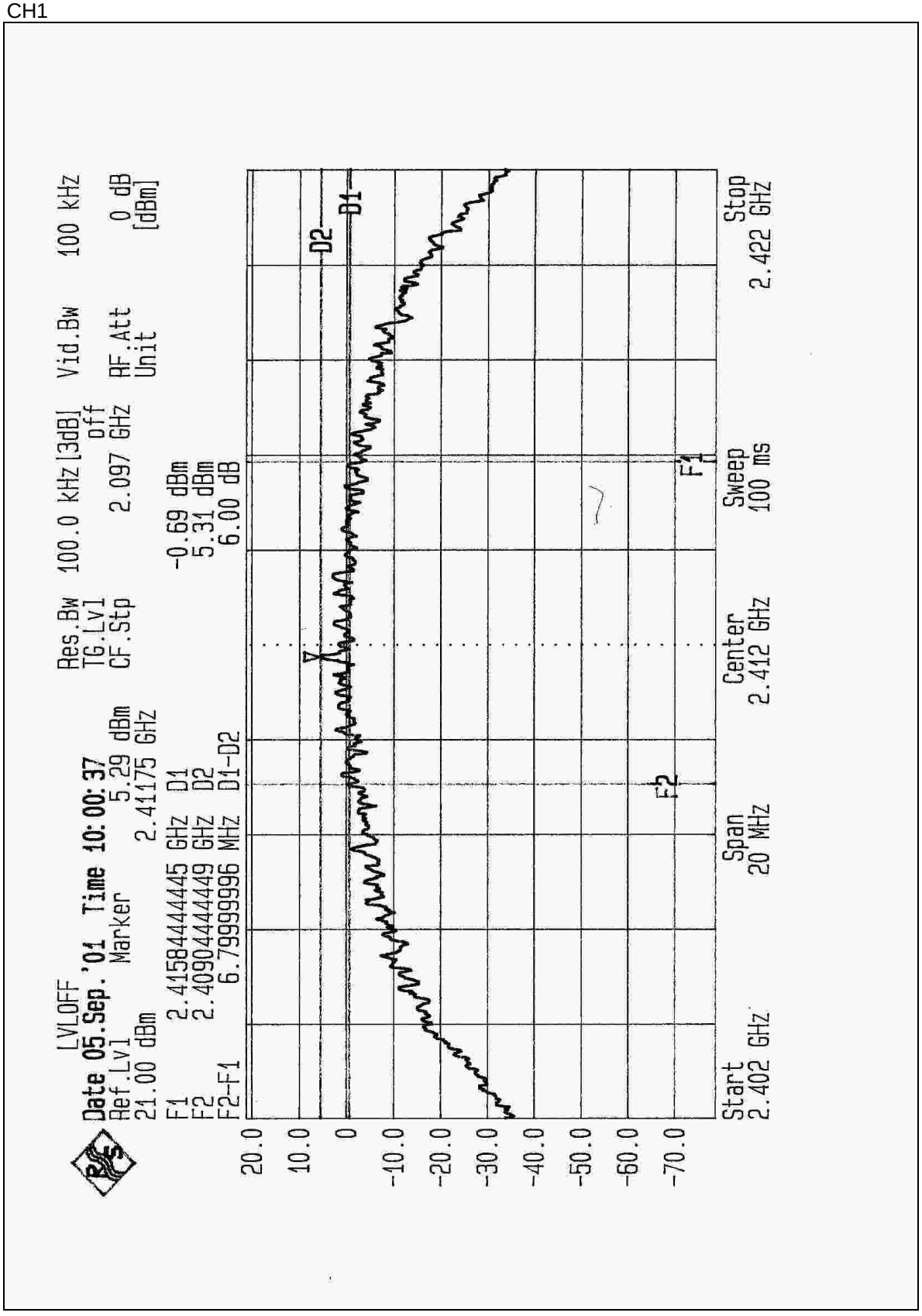
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

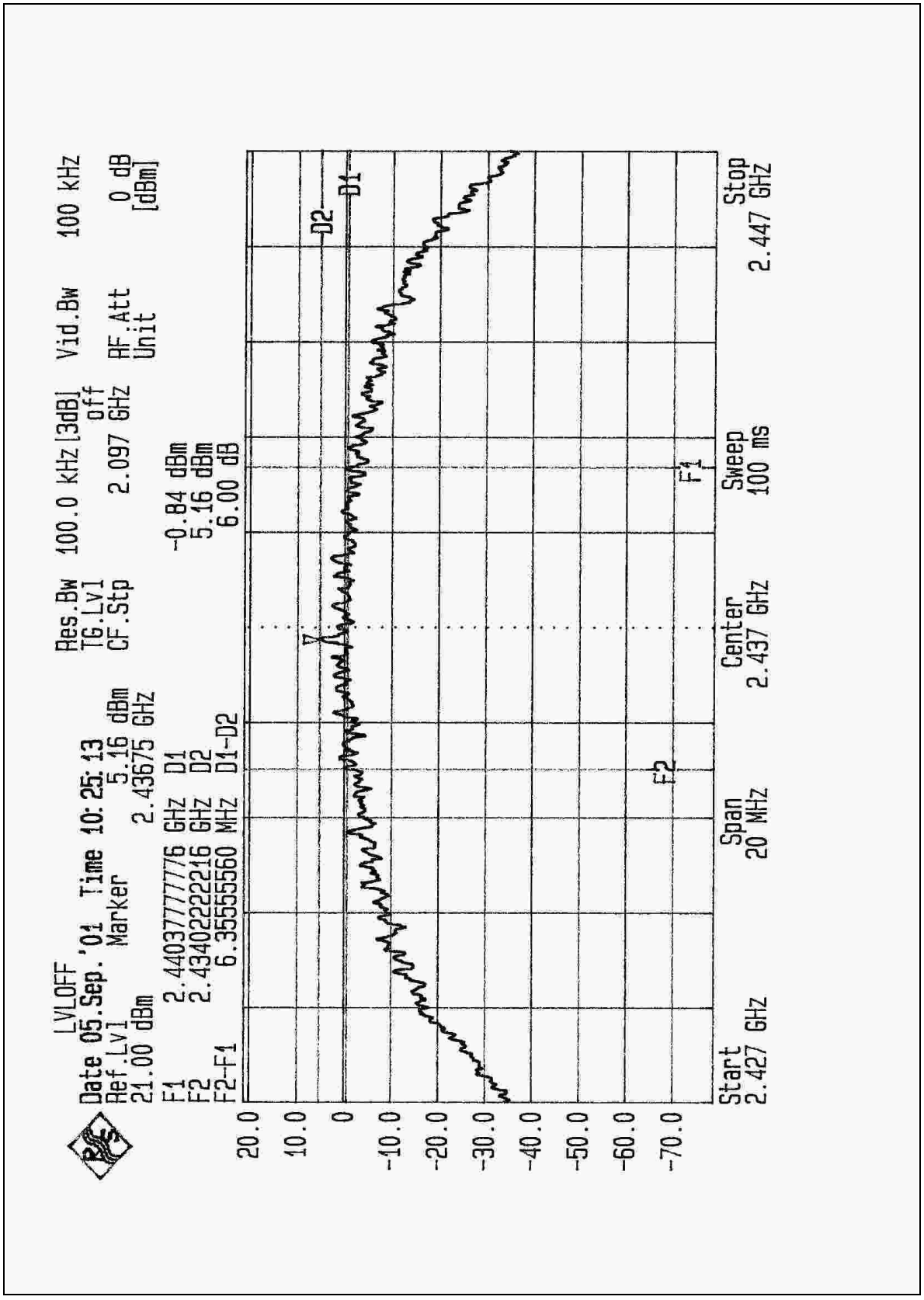
EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 75%RH, 1005 hPa
TESTED BY: James Lee			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	6.80	0.5	PASS
6	2437	6.36	0.5	PASS
11	2462	6.78	0.5	PASS

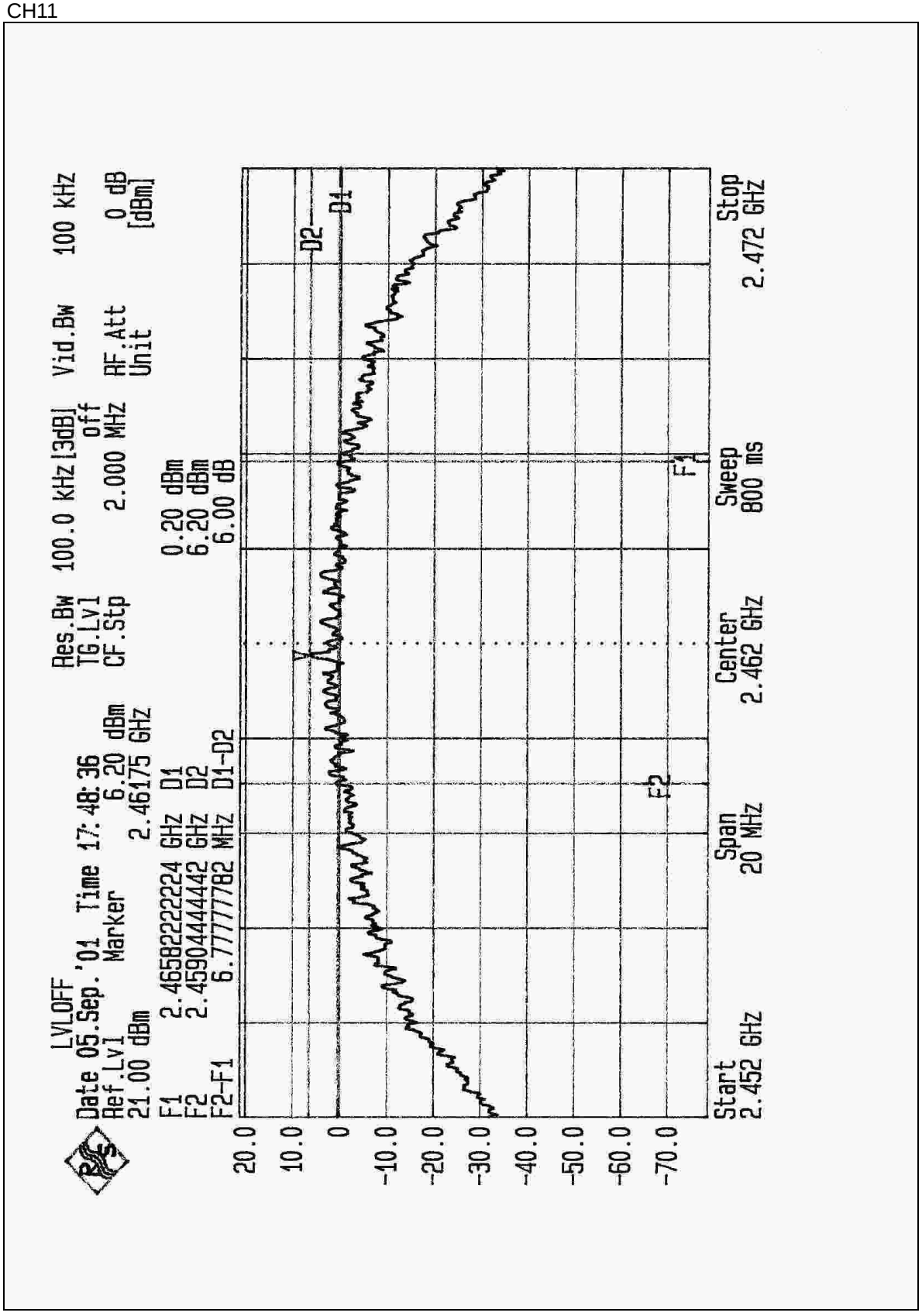
CH1


LVLOFF
Date 05.Sep.'01 Time 10:00:37
Ref.Lvl
21.00 dBm
Marker
5.29 dBm
2.41175 GHz
F1 2.415844444445 GHz D1
F2 2.409044444449 GHz D2
F2-F1 6.79999996 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.097 GHz
-0.69 dBm
5.31 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.402 GHz
Span 20 MHz
Center 2.412 GHz
Sweep 100 ms
Stop 2.422 GHz

CH6


LVLOFF
Date 05.Sep. '01 Time 10:25:13
Ref.Lvl 21.00 dBm
Marker 5.16 dBm 2.43675 GHz
F1 2.44037777776 GHz D1 -0.84 dBm
F2 2.43402222216 GHz D2 5.16 dBm
F2-F1 6.35555560 MHz D1-D2 6.00 dB
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.097 GHz RF.Att 0 dB
Unit [dBm]
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 100 ms
Stop 2.447 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D1
D2
F1
F2

CH11


LVLOFF
Date 05.Sep.'01 Time 17:48:36
Ref.Lvl 6.20 dBm
21.00 dBm Marker 2.46175 GHz
F1 2.4658222224 GHz D1
F2 2.4590444442 GHz D2
F2-F1 6.7777782 MHz D1-D2
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.000 MHz RF.Att 0 dB
Unit [dBm]
0.20 dBm
6.20 dBm
6.00 dB
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 800 ms
Stop 2.472 GHz
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

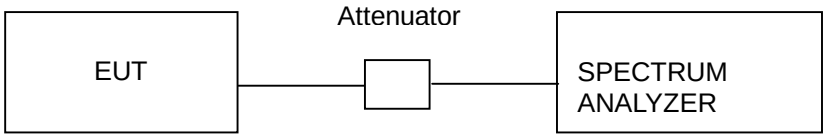
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

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

NOTE: This measurement is the total power of 12MHz bandwidth which is far more wider than 6dB bandwidth.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 3.4.5

4.4.6 TEST RESULTS

EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
INPUT POWER (SYSTEM)	120ac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 75%RH, 1005 hPa
TESTED BY: James Lee			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.18	30	PASS
6	2437	17.11	30	PASS
11	2462	17.06	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
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

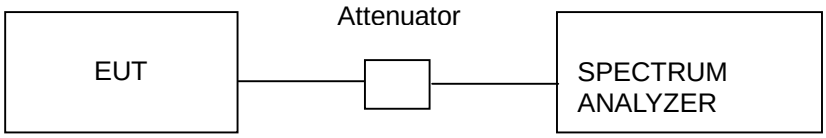
NOTE:1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

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

4.5.3 TEST PROCEDURE

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

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITION

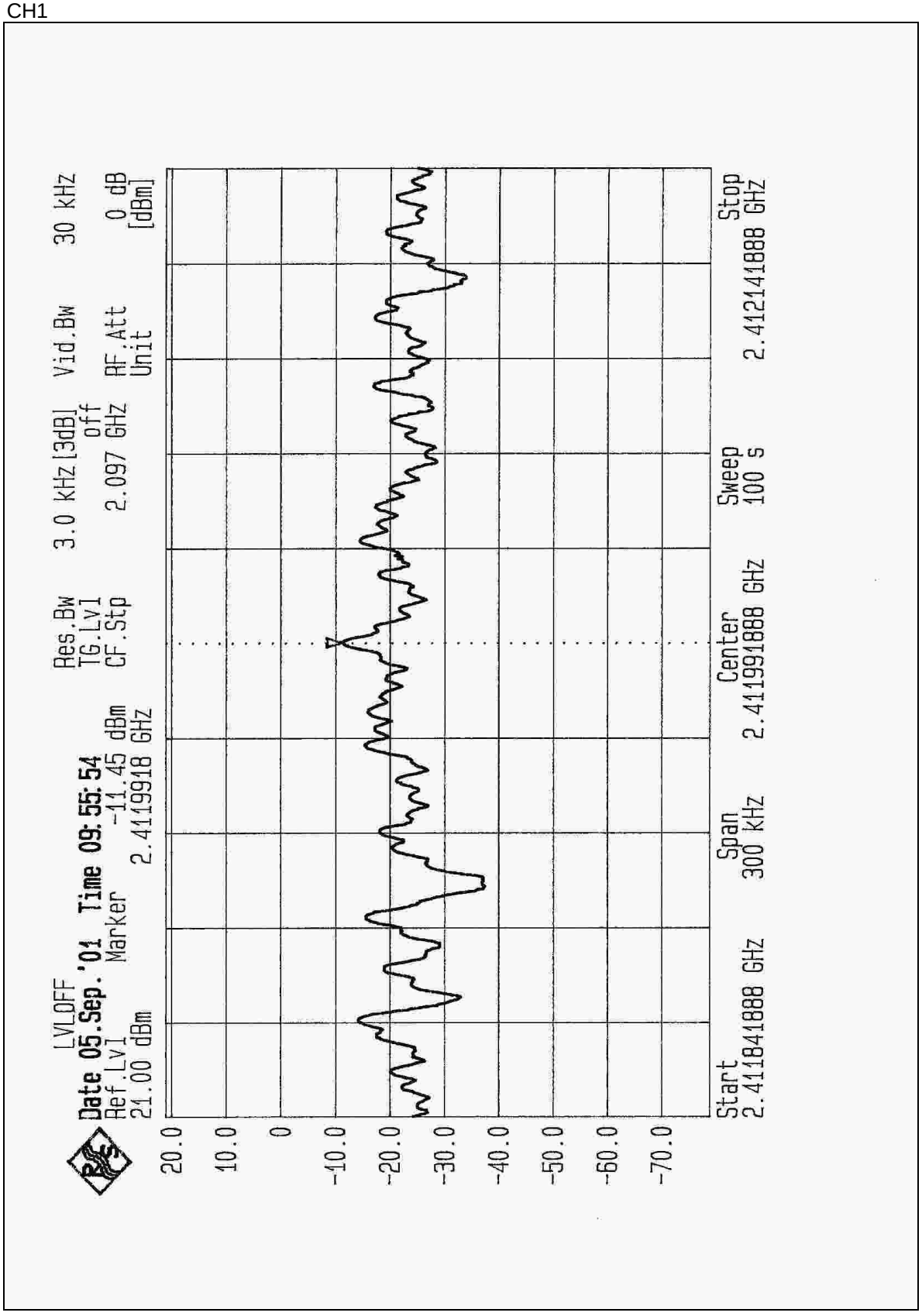
Same as Item 3.4.5

4.5.6 TEST RESULTS

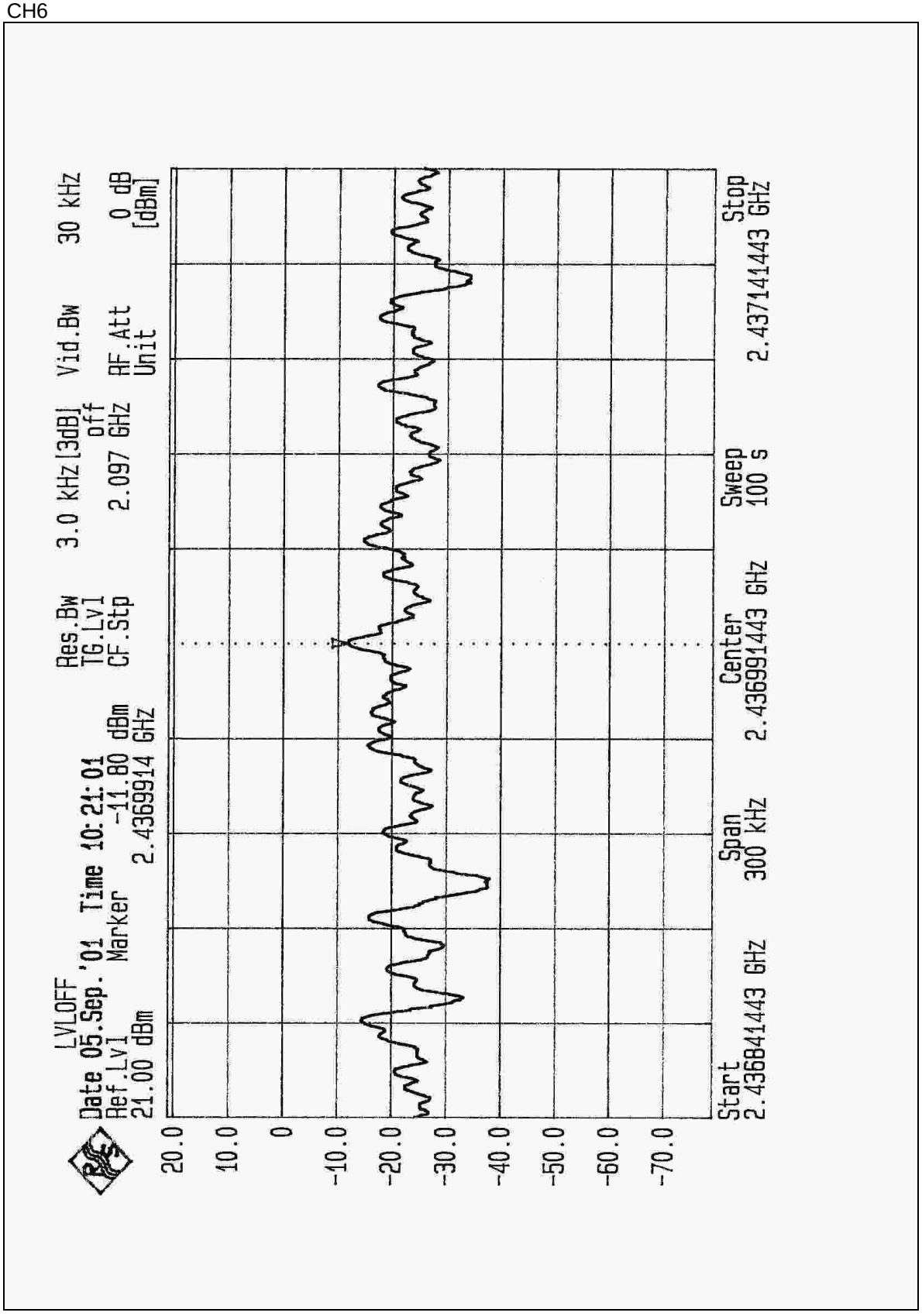
EUT	Wireless LAN USB ADAPTER	**MODEL**	SL-2211UB
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 75%RH, 1005 hPa
TESTED BY: James Lee			

CHANNEL NUMBER	**CHANNEL FREQUENCY (MHz)**	**RF POWER LEVEL IN 3 kHz BW (dBm)**	**MAXIMUM LIMIT (dBm)**	**PASS/FAIL**
1	2412	-11.45	8	PASS
6	2437	-11.80	8	PASS
11	2462	-11.55	8	PASS

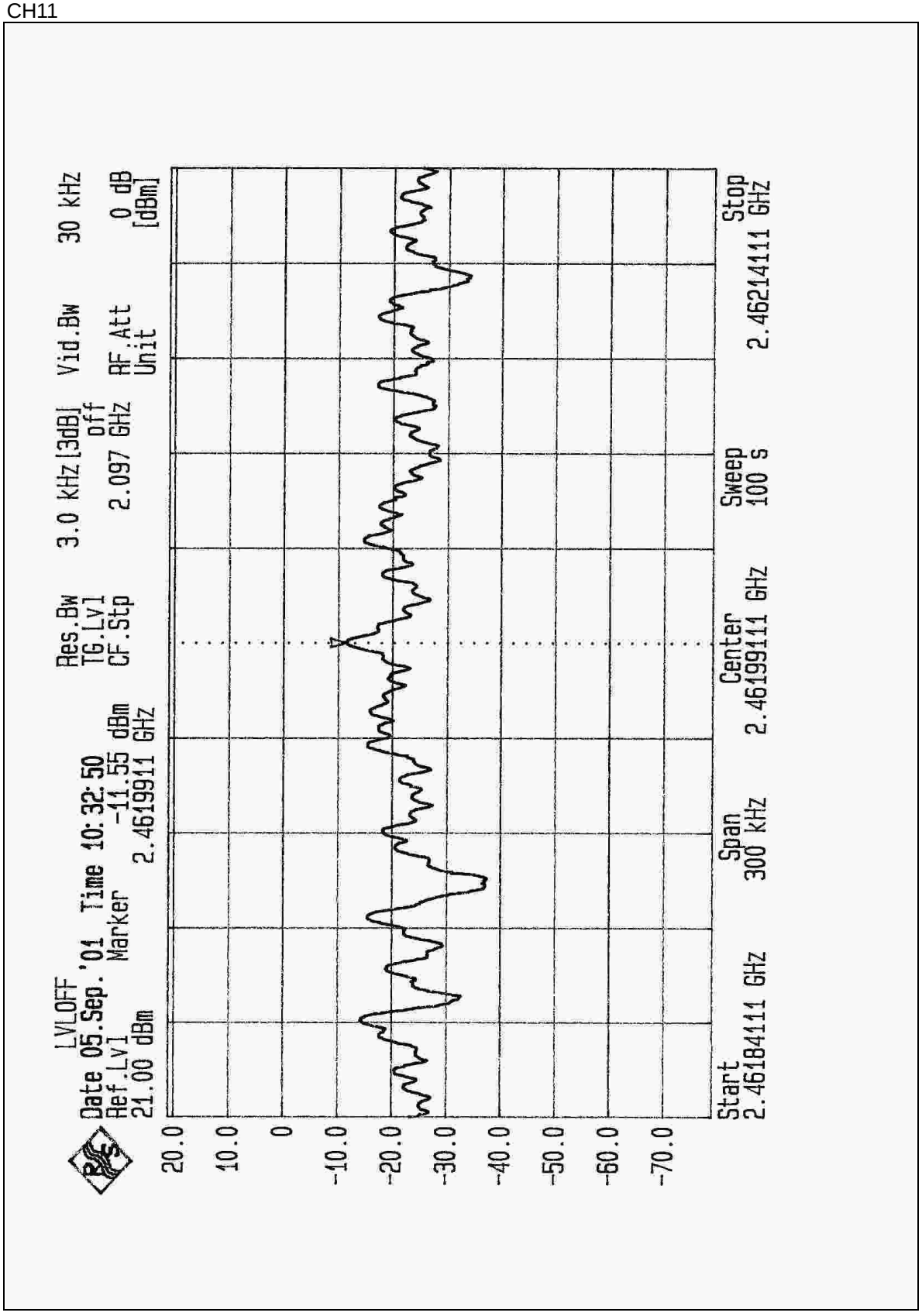
CH1


LVLOFF
Date 05.Sep.'01 Time 09:55:54
Ref.Lvl
21.00 dBm
Marker
-11.45 dBm
2.4119918 GHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
2.097 GHz
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
2.411841888 GHz
Span
300 kHz
Center
2.411991888 GHz
Sweep
100 s
Stop
2.412141888 GHz

CH6


LVLOFF
Date 05.Sep.'01 Time 10:21:01
Ref.Lvl
21.00 dBm
Marker
-11.80 dBm
2.4369914 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.097 GHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
Sweep
100 s
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.436841443 GHz
Span
300 kHz
Center
2.436991443 GHz
Stop
2.437141443 GHz

CH11


LVLOFF
Date 05.Sep.'01 Time 10:32:50
Ref.Lvl
21.00 dBm
Marker
-11.55 dBm
2.4619911 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.097 GHz
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
2.46184111 GHz
Span
300 kHz
Center
2.46199111 GHz
Sweep
100 s
Stop
2.46214111 GHz