



FCC TEST REPORT

REPORT NO.: RF900919R01

MODEL NO.: WL-381F, WL-382F (for GemTek)

OEM MODEL NO.: DWL-120 (for D-Link)

RECEIVED: September 5, 2001

TESTED: Sep. 7 ~ Sep. 22, 2001

APPLICANT: GEMTEK TECHNOLOGY CO., LTD.

ADDRESS: No.1, Jen Ai Road, Hsinchu Industrial Park
Hukou, Hsinchu, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

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0528



Lab Code: 200102-0



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.....	7
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	7
3.4	DESCRIPTION OF SUPPORT UNITS.....	8
4	TEST TYPES AND RESULTS.....	9
4.1	CONDUCTED EMISSION MEASUREMENT	9
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	9
4.1.2	TEST INSTRUMENTS	9
4.1.3	TEST PROCEDURES.....	10
4.1.4	TEST SETUP	10
4.1.5	EUT OPERATING CONDITIONS.....	11
4.1.6	TEST RESULTS.....	12
4.2	RADIATED EMISSION MEASUREMENT	18
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	18
4.2.2	TEST INSTRUMENTS	19
4.2.3	TEST PROCEDURES.....	20
4.2.4	TEST SETUP	21
4.2.5	EUT OPERATING CONDITIONS.....	21
4.2.6	TEST RESULTS.....	22
4.3	6DB BANDWIDTH MEASUREMENT	26
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	26
4.3.2	TEST INSTRUMENTS	26
4.3.3	TEST PROCEDURE	27
4.3.4	TEST SETUP	27
4.3.5	EUT OPERATING CONDITIONS.....	27
4.3.6	TEST RESULTS.....	28
4.4	MAXIMUM PEAK OUTPUT POWER	32
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	32
4.4.2	INSTRUMENTS	32
4.4.3	TEST PROCEDURES.....	33
4.4.4	TEST SETUP	33
4.4.5	EUT OPERATING CONDITIONS.....	33
4.4.6	TEST RESULTS.....	34
4.5	POWER SPECTRAL DENSITY MEASUREMENT.....	35
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	35
4.5.2	TEST INSTRUMENTS	35
4.5.3	TEST PROCEDURE	36



4.5.4	TEST SETUP	36
4.5.5	EUT OPERATING CONDITION	36
4.5.6	TEST RESULTS.....	37
4.6	BAND EDGES MEASUREMENT	41
4.6.1	LIMITS OF BAND EDGES MEASUREMENT.....	41
4.6.2	TEST INSTRUMENTS	41
4.6.3	TEST PROCEDURE	41
4.6.4	EUT OPERATING CONDITION	42
4.6.5	TEST RESULTS.....	42
4.7	ANTENNA REQUIREMENT.....	45
4.7.1	STANDARD APPLICABLE.....	45
4.7.2	ANTENNA CONNECTED CONSTRUCTION.....	45
5	PHOTOGRAPHS OF THE TEST CONFIGURATION	46
6	INFORMATION ON THE TESTING LABORATORIES	48



1 CERTIFICATION

PRODUCT : USB Adapter
BRAND NAME : GemTek
MODEL NO. : WL-381F, WL-382F
OEM BRAND NAME : D-Link
OEM MODEL NO. : DWL-120
APPLICANT : GEMTEK TECHNOLOGY 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 Sep. 7, 2001 to Sep. 22, 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: Sept. 26, 2001
Steven Lu

CHECKED BY : Emily Lu · DATE: Sep. 26, 2001
Emily Lu

APPROVED BY : Alan Lane · DATE: Sept. 26, 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 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 -9.16dBuV at 23.699 MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -3.40dBuV at 4175.5 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	USB Adapter
MODEL NO.	WL-381F, WL-382F, DWL-120
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	18.3dBm
ANTENNA TYPE	Monopole Antenna
DATA CABLE	1.2m (shielded)
I/O PORTS	USB Port
ASSOCIATED DEVICES	NA

NOTE:

- 1.The model WL-381F and DWL-120 are identical except for brand name and model no..
- 2.The model WL-381F and WL-382F are identical except for outer appearance and model no..

Model No.	Description
WL-381F	With wave shape on the top cover
WL-382F	With round dots inscribed on the top cover

- 3.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 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	DELL	INSPIRON 5000e	TW-012JXN-12961-0B9-2192	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

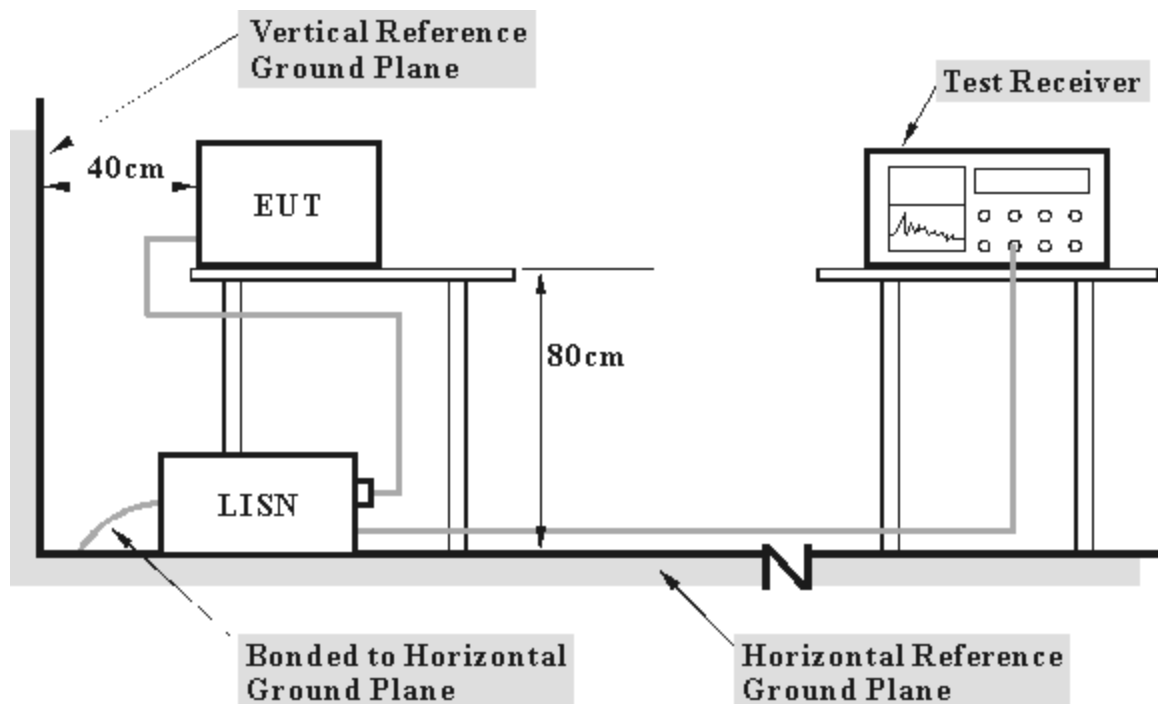
NOTE:

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.

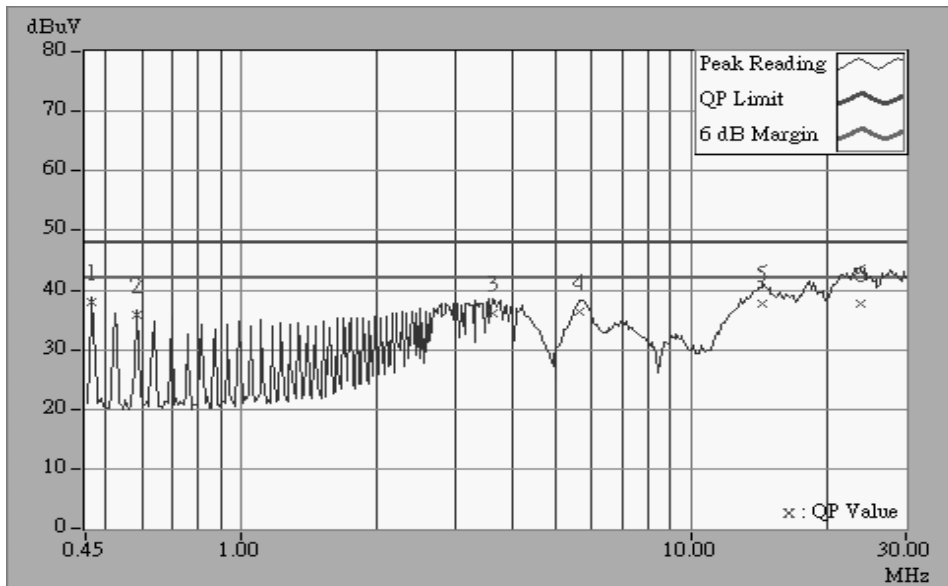


4.1.6 TEST RESULTS

EUT	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%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	0.466	0.10	37.88	-	37.98	-	48.00	-	-10.02	-
2	0.582	0.10	35.88	-	35.98	-	48.00	-	-12.02	-
3	3.616	0.26	36.06	-	36.32	-	48.00	-	-11.68	-
4	5.661	0.36	36.33	-	36.69	-	48.00	-	-11.31	-
5	14.415	0.76	37.78	-	38.54	-	48.00	-	-9.46	-
6	23.699	1.07	37.77	-	38.84	-	48.00	-	-9.16	-

- 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.

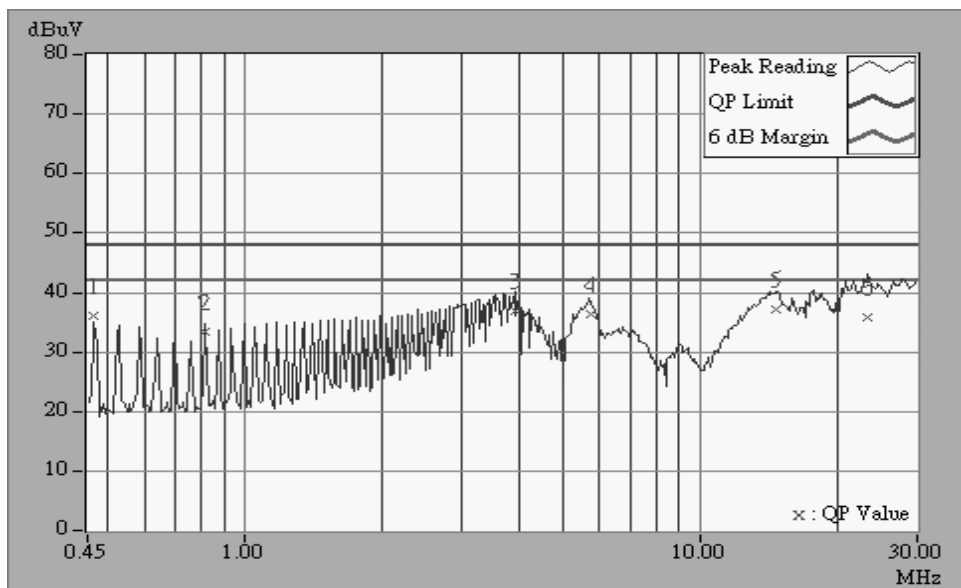




EUT	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.465	0.10	36.00	-	36.10	-	48.00	-	-11.90	-
2	0.816	0.10	33.46	-	33.56	-	48.00	-	-14.44	-
3	3.914	0.29	37.03	-	37.32	-	48.00	-	-10.68	-
4	5.724	0.33	36.49	-	36.82	-	48.00	-	-11.18	-
5	14.724	0.59	37.06	-	37.65	-	48.00	-	-10.35	-
6	23.360	0.87	35.71	-	36.58	-	48.00	-	-11.42	-

- 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.

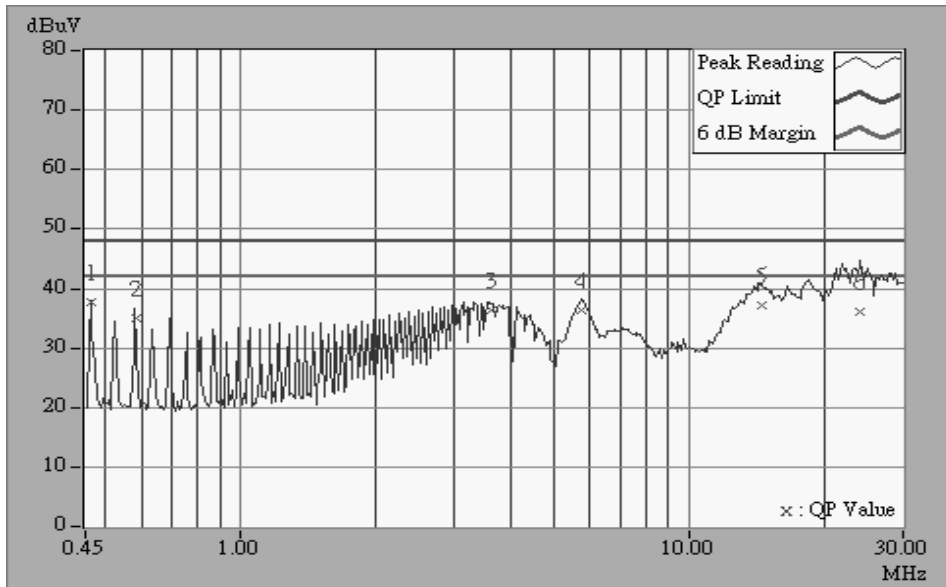




EUT	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.464	0.10	37.59	-	37.69	-	48.00	-	-10.31	-
2	0.582	0.10	35.07	-	35.17	-	48.00	-	-12.83	-
3	3.605	0.26	36.26	-	36.52	-	48.00	-	-11.48	-
4	5.756	0.36	36.44	-	36.80	-	48.00	-	-11.20	-
5	14.480	0.77	37.07	-	37.84	-	48.00	-	-10.16	-
6	24.104	1.08	36.14	-	37.22	-	48.00	-	-10.78	-

- 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.

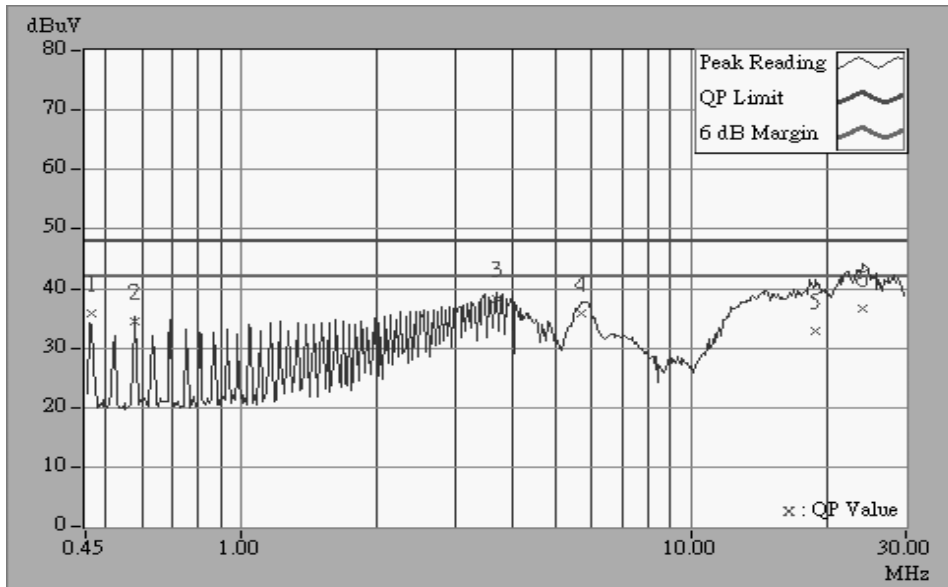




EUT	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.462	0.10	35.73	-	35.83	-	48.00	-	-12.17	-
2	0.579	0.10	34.54	-	34.64	-	48.00	-	-13.36	-
3	3.711	0.27	38.17	-	38.44	-	48.00	-	-9.56	-
4	5.684	0.33	35.90	-	36.23	-	48.00	-	-11.77	-
5	18.944	0.76	32.89	-	33.65	-	48.00	-	-14.35	-
6	23.990	0.88	36.73	-	37.61	-	48.00	-	-10.39	-

- Remarks:
1. "**": Undetectable
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 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.

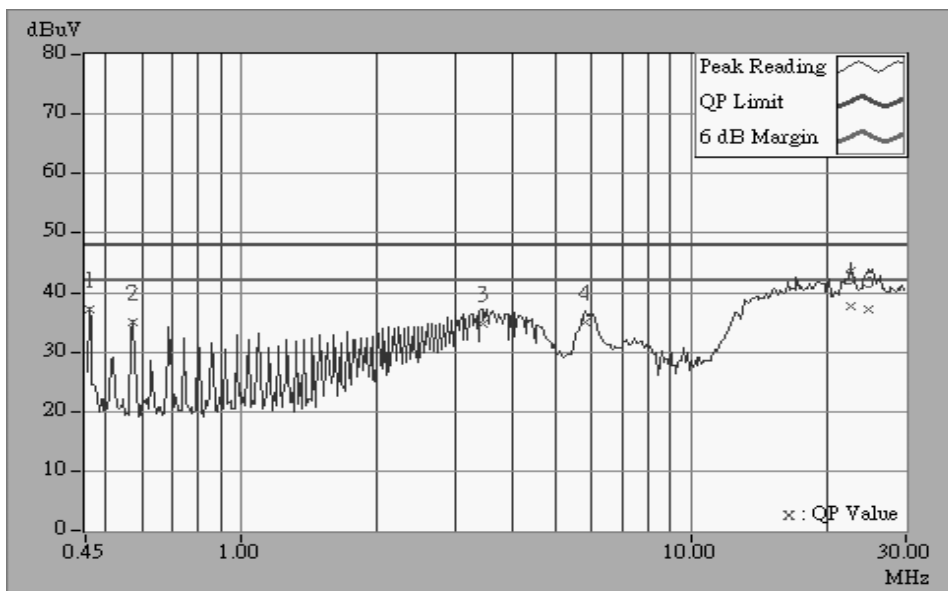




EUT	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.459	0.10	37.23	-	37.33	-	48.00	-	-10.67	-
2	0.574	0.10	34.95	-	35.05	-	48.00	-	-12.95	-
3	3.453	0.25	34.88	-	35.13	-	48.00	-	-12.87	-
4	5.812	0.36	35.03	-	35.39	-	48.00	-	-12.61	-
5	22.568	1.05	37.72	-	38.77	-	48.00	-	-9.23	-
6	24.662	1.09	37.26	-	38.35	-	48.00	-	-9.65	-

- 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.

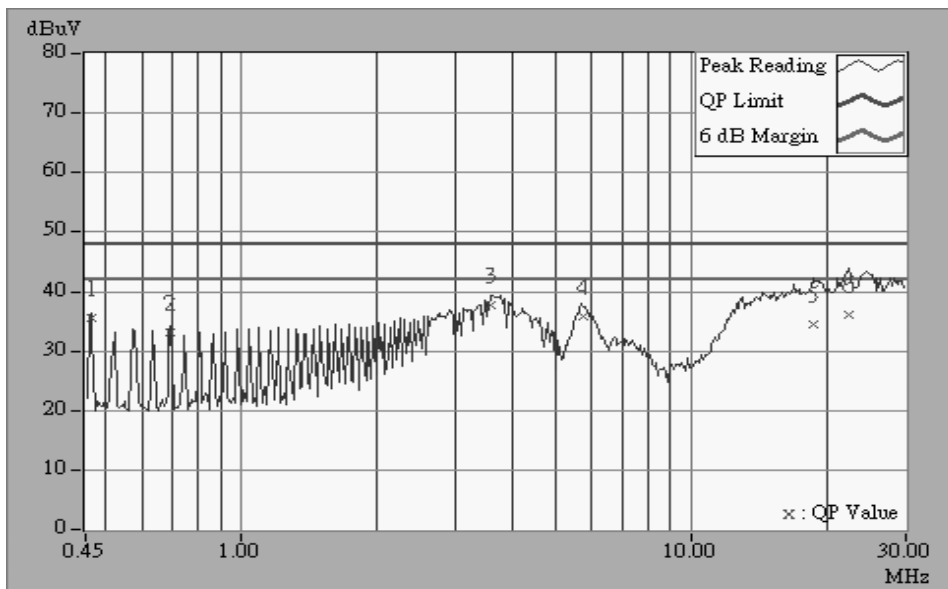




EUT	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.462	0.10	35.67	-	35.77	-	48.00	-	-12.23	-
2	0.693	0.10	33.25	-	33.35	-	48.00	-	-14.65	-
3	3.583	0.26	37.61	-	37.87	-	48.00	-	-10.13	-
4	5.725	0.33	35.90	-	36.23	-	48.00	-	-11.77	-
5	18.620	0.74	34.39	-	35.13	-	48.00	-	-12.87	-
6	22.406	0.85	36.20	-	37.05	-	48.00	-	-10.95	-

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





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 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.



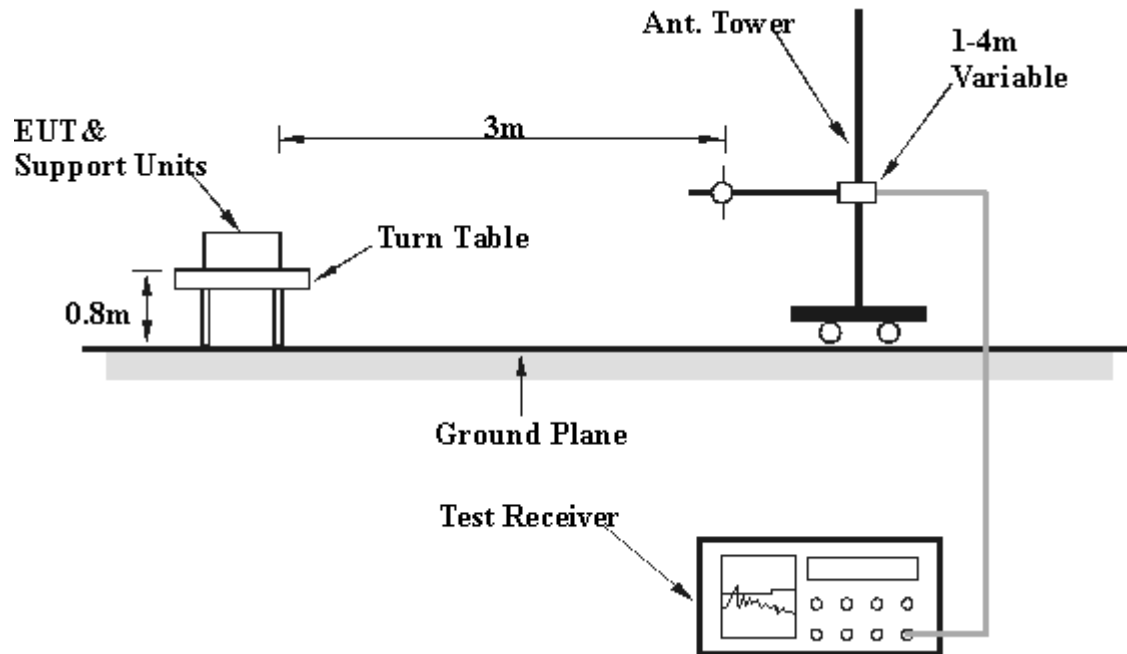
4.2.3 TEST PROCEDURES

- 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	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	132.00	27.5QP	43.5	-16.0	1.15H	104	15.21	11.16	1.13	0.00	-12.29
2	176.00	30.1QP	43.5	-13.4	1.15H	268	16.69	9.08	1.33	0.00	-10.41
3	396.00	25.0QP	46.0	-21.0	1.91H	98	6.82	15.96	2.22	0.00	-18.18
4	440.00	28.4QP	46.0	-17.6	2.25H	279	9.69	16.32	2.38	0.00	-18.69
5	528.00	29.8QP	46.0	-16.2	2.05H	179	9.58	17.62	2.60	0.00	-20.00
6	572.00	27.4QP	46.0	-18.6	1.52H	141	6.40	18.25	2.75	0.00	-21.00
7	748.00	32.1QP	46.0	-13.9	1.13H	226	8.70	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	132.01	29.4QP	43.5	-14.1	1.21V	248	17.06	11.16	1.13	0.00	-12.29
2	176.01	29.0QP	43.5	-14.5	1.04V	202	18.59	9.08	1.33	0.00	-10.41
3	308.00	25.7QP	46.0	-20.3	1.93V	108	10.39	13.38	1.91	0.00	-15.29
4	440.00	31.6QP	46.0	-14.4	1.66V	292	12.92	16.32	2.38	0.00	-18.69
5	528.01	32.4QP	46.0	-13.6	1.28V	89	12.18	17.62	2.60	0.00	-20.22
6	572.00	26.5QP	46.0	-19.5	1.66V	51	5.47	18.25	2.75	0.00	-21.00
7	748.50	32.1QP	46.0	-13.9	1.82V	199	8.70	20.14	3.26	0.00	-23.40

- 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	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 1	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	2037.8	49.0PK	74.00	-25.0	1.76H	86	53.80	25.20	4.86	34.90	4.84
2	*2412.4	100.6PK	-	-	1.53H	215	68.40	27.11	5.10	0.00	-32.21
3	*2412.4	93.4AV	-	-	1.53H	215	61.20	27.11	5.10	0.00	-32.21
4	4075.5	51.3PK	74.00	-22.7	1.61H	179	48.90	30.13	6.78	34.52	-2.39
5	4824.0	50.0PK	74.00	-24.0	1.37H	354	46.00	31.43	7.23	34.63	-4.02

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	2037.8	48.8PK	74.00	-25.2	1.27V	71	53.60	25.20	4.86	34.90	4.84
2	*2412.9	105.9PK	-	-	1.67V	244	73.68	27.11	5.10	0.00	-32.21
3	*2412.9	99.0AV	-	-	1.67V	244	66.80	27.11	5.10	0.00	-32.21
4	4075.6	49.5PK	74.00	-24.5	1.69V	93	47.10	30.13	6.78	64.52	-2.39
5	4824.0	48.6PK	74.00	-25.4	1.40V	127	44.60	31.43	7.23	34.63	-4.02

- 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	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 6	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	2062.8	51.2PK	74.00	-22.8	1.00H	273	55.70	25.41	4.96	34.90	4.53
2	2062.8	48.3AV	54.00	-5.7	1.00H	273	52.87	25.41	4.96	34.90	4.53
3	*2438.0	100.8PK	-	-	1.25H	211	68.40	27.33	5.08	0.00	-32.40
4	*2438.0	94.8AV	-	-	1.25H	211	62.35	27.33	5.08	0.00	-32.40
5	4125.6	50.7PK	74.00	-23.3	1.65H	181	48.20	30.32	6.70	34.56	-2.46
6	4874.0	49.8PK	74.00	-24.2	1.13H	134	45.70	31.47	7.21	34.63	-4.05

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	2062.7	47.0PK	74.00	-27.0	1.45H	64	51.52	25.41	4.96	34.90	4.53
2	*2438.4	107.6PK	-	-	1.00H	335	75.20	27.33	5.08	0.00	-32.40
3	*2438.4	100.6AV	-	-	1.00H	335	68.20	27.33	5.08	0.00	-32.40
4	4125.5	52.6PK	74.00	-21.4	1.20H	231	50.10	30.32	6.70	34.56	-2.46
5	4125.5	48.4AV	54.00	-5.6	1.20H	231	45.90	30.32	6.70	34.56	-2.46
6	4874.2	50.9PK	74.00	-23.1	1.20H	147	46.80	31.47	7.21	34.63	-4.05

- 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	USB Adapter	MODEL	WL-381F, WL-382F
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23 deg. C, 50%RH, 1005 hPa	TESTED BY: Steven Lu	

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	2087.7	50.3 PK	74.00	-23.70	1.48H	127	54.60	25.62	5.02	34.90	4.26
2	2087.7	47.8 AV	54.00	-6.20	1.48H	127	52.10	25.62	5.02	34.90	4.26
3	*2463.6	101.3 PK	-	-	1.65H	168	68.90	27.33	5.08	0.00	-32.40
4	*2463.6	93.6 AV	-	-	1.65H	168	61.20	27.33	5.08	0.00	-32.40
5	2491.7	42.5 PK	74.00	-31.50	1.59H	167	44.79	27.54	5.06	34.90	2.31
6	4175.5	54.5 PK	74.00	-20.50	1.01H	182	52.00	30.41	6.68	34.58	-2.51
7	4175.5	50.6 AV	54.00	-3.40	1.01H	182	48.10	30.41	6.68	34.58	-2.51
8	4925.2	48.3 PK	74.00	-25.70	1.09H	240	44.20	31.51	7.21	34.62	-4.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2087.8	51.5PK	74.00	-22.5	1.00V	73	55.80	25.62	5.02	34.90	4.26
2	2087.8	49.9AV	54.00	-4.10	1.00V	73	54.20	25.62	5.02	34.90	4.26
3	*2464.1	106.6PK	-	-	1.05V	336	74.20	27.33	5.08	0.00	-32.40
4	*2464.1	100.2AV	-	-	1.05V	336	67.80	27.33	5.08	0.00	-32.40
5	2484.0	44.4PK	74.00	-29.60	1.98V	164	46.73	27.54	5.06	34.90	2.31
6	4175.4	52.3PK	74.00	-21.70	2.13V	249	49.80	30.41	6.68	34.58	-2.51
7	4175.4	48.2AV	54.00	-5.80	2.13V	249	45.68	30.41	6.68	34.58	-2.51
8	4926.1	47.9PK	74.00	-26.10	0.99V	203	43.80	31.51	7.21	34.62	-4.10

- 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

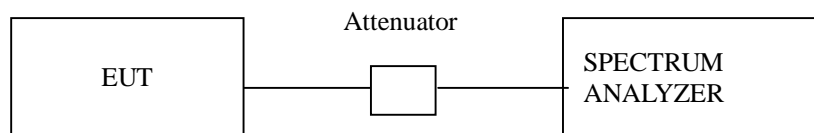
Notes:

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.



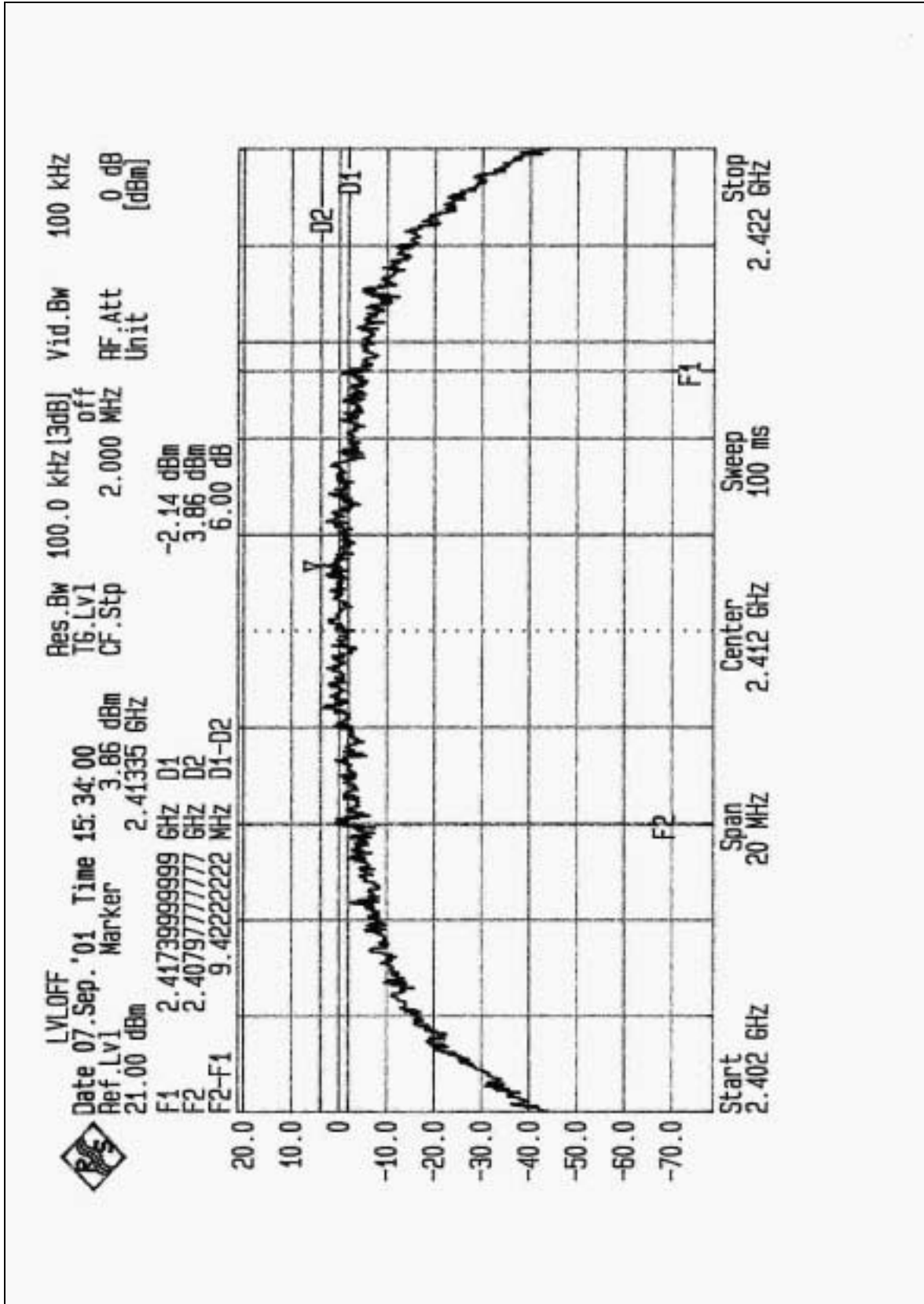
4.3.6 TEST RESULTS

EUT	USB Adapter	MODEL	WL-381F, WL-382F
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	9.42	0.5	PASS
6	2437	11.09	0.5	PASS
11	2462	11.11	0.5	PASS

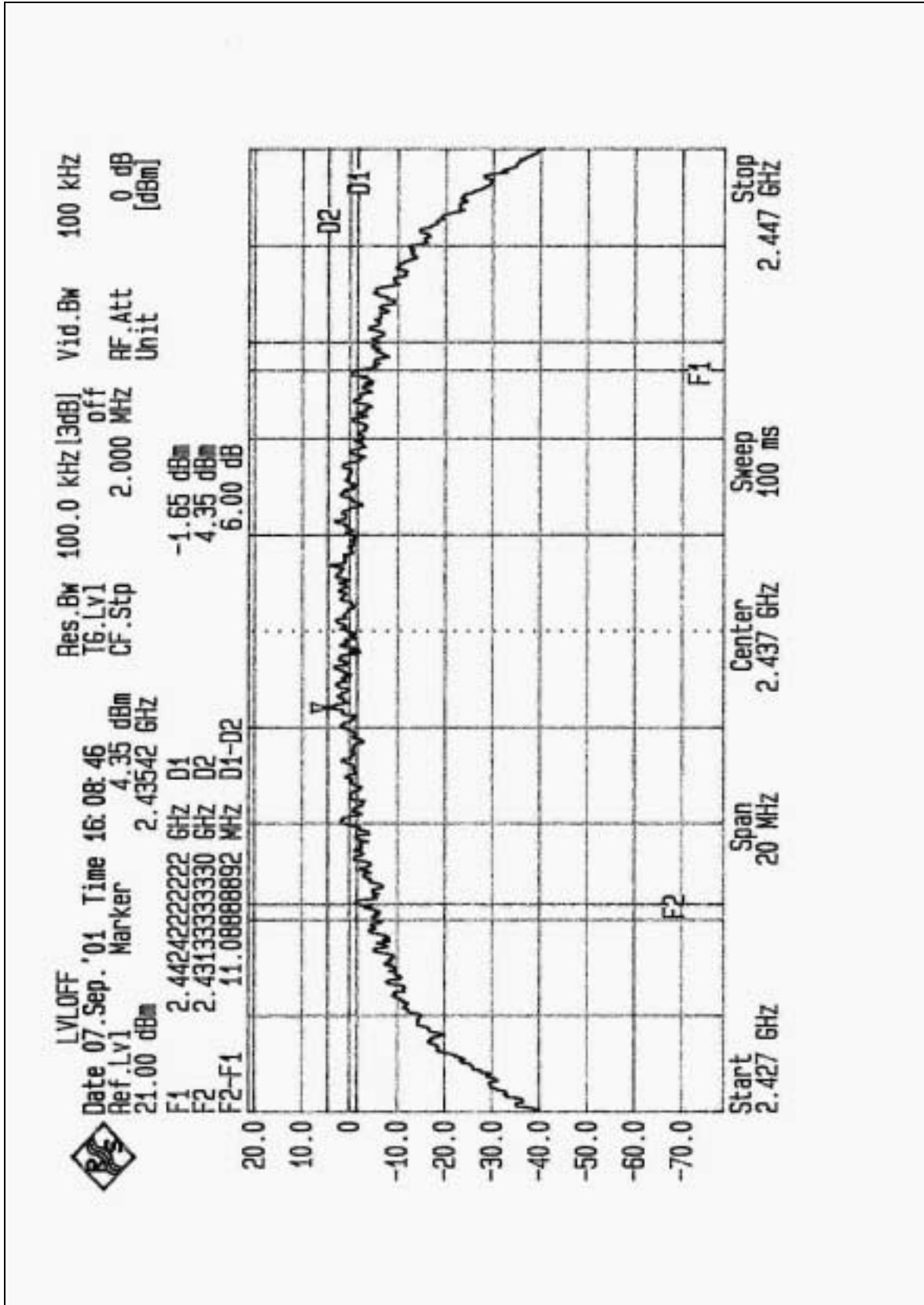


CH1



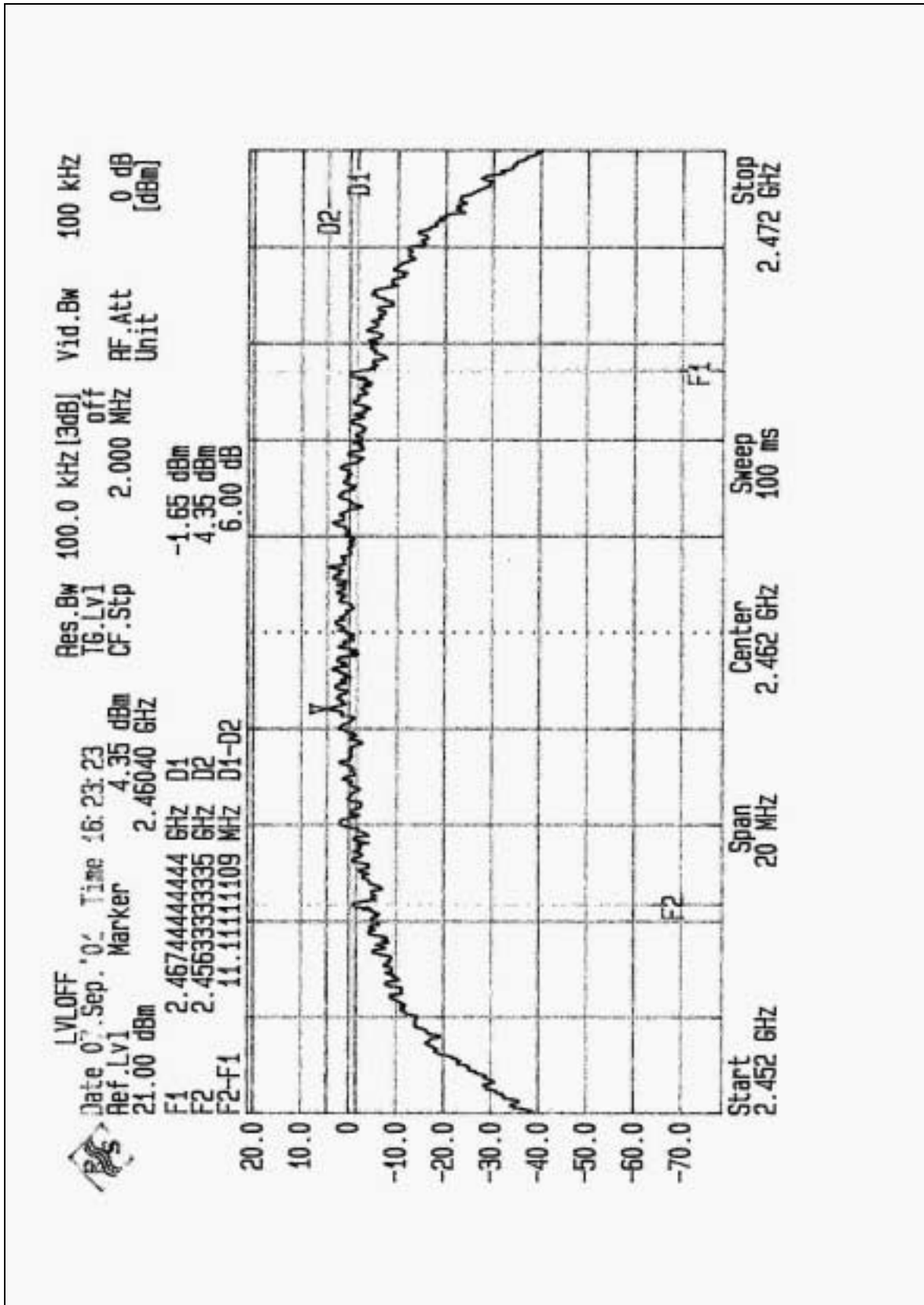


CH6





CH11





4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

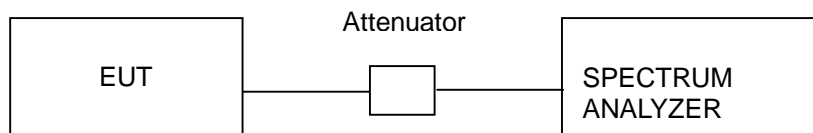


4.4.3 TEST PROCEDURES

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	USB Adapter	MODEL	WL-381F, WL-382F
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	18.15	30	PASS
6	2437	18.05	30	PASS
11	2462	18.33	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.

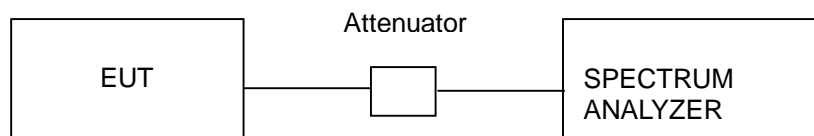
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

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



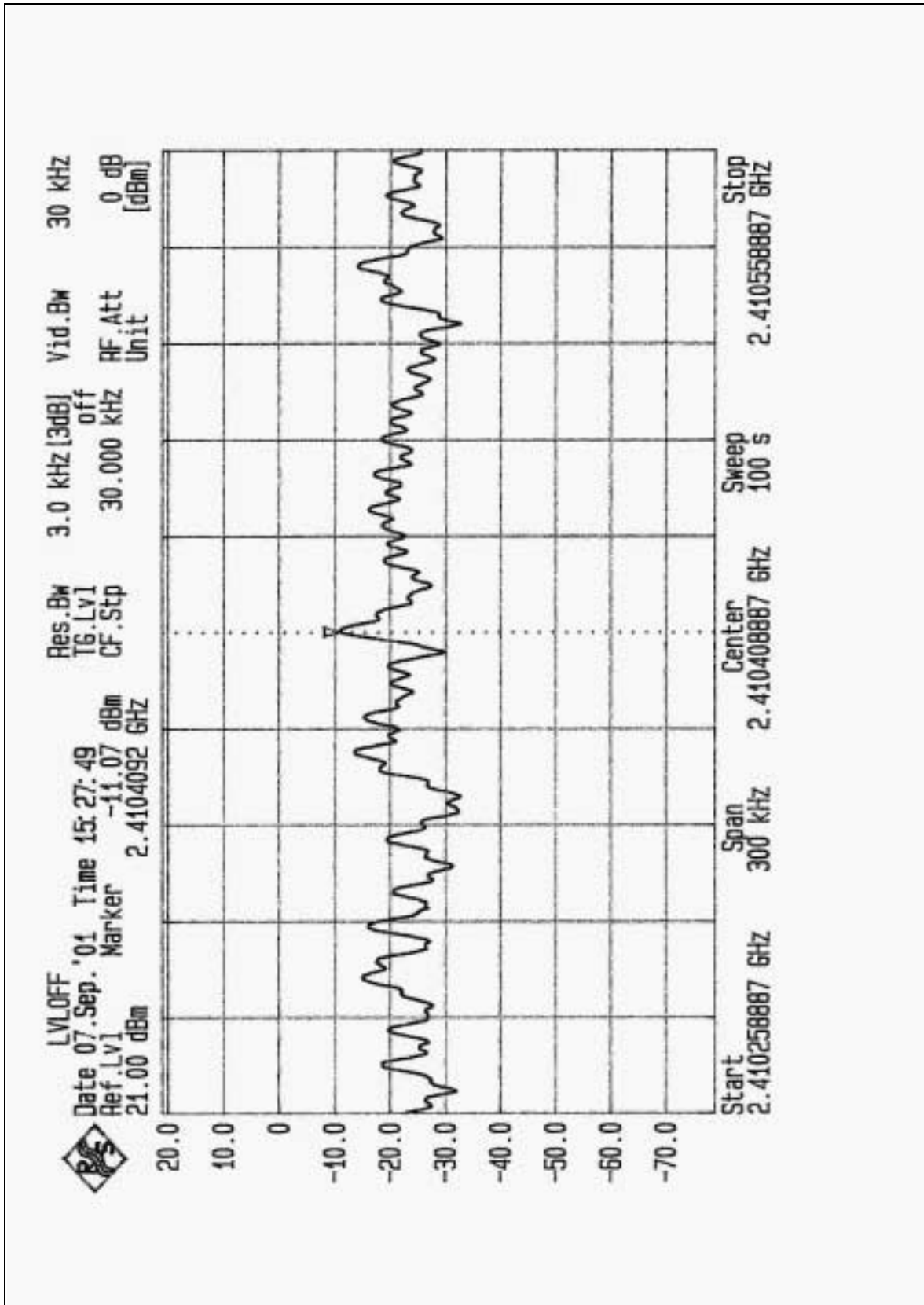
4.5.6 TEST RESULTS

EUT	USB Adapter	MODEL	WL-381F, WL-382F
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 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	-11.07	8	PASS
6	2437	-10.61	8	PASS
11	2462	-10.58	8	PASS

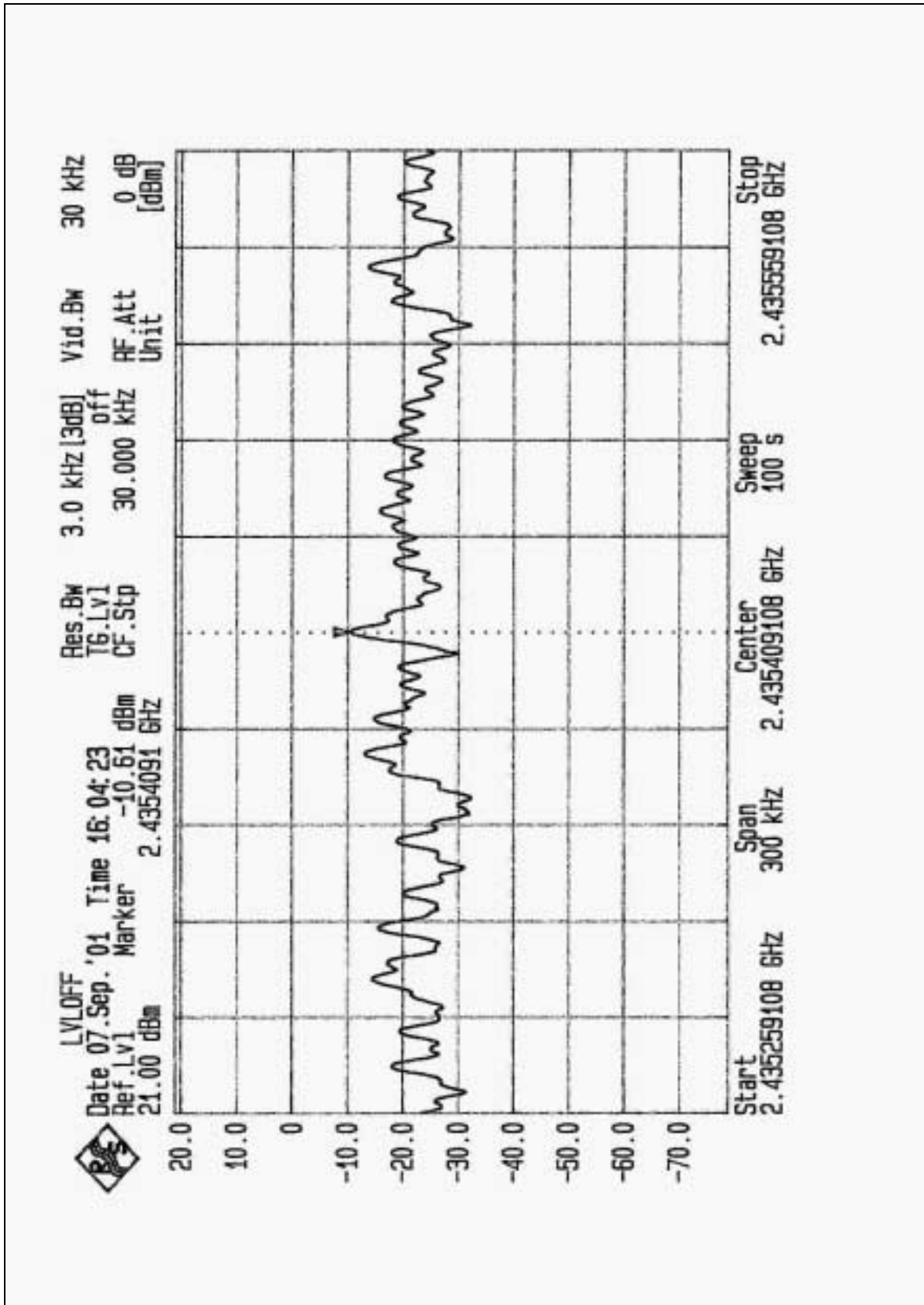


CH1



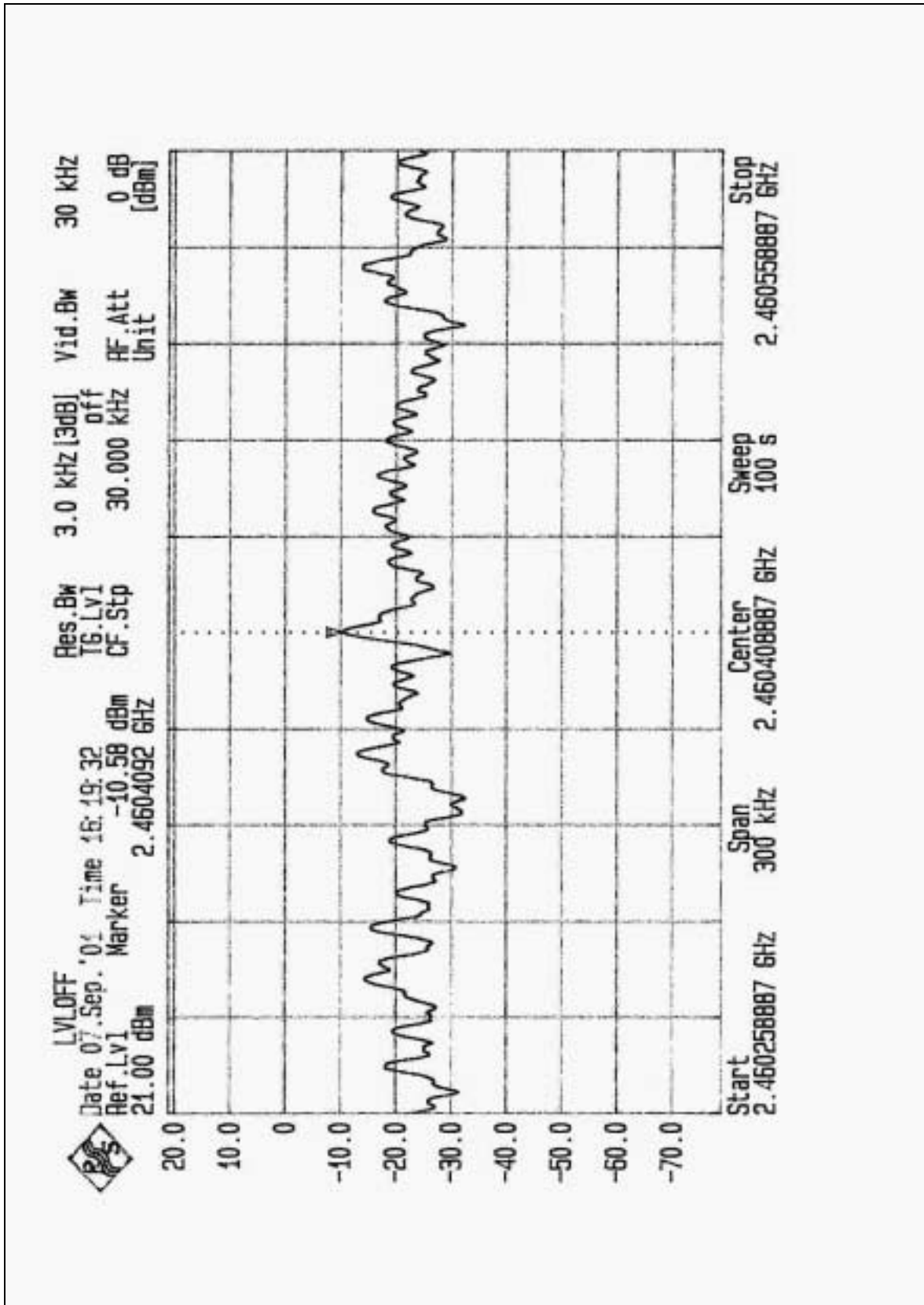


CH6





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
ROHDE & SCHWARZ TEST RECEIVER	ESMI	848926/005 846839/018	Dec 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE:

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

4.6.3 TEST PROCEDURE

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



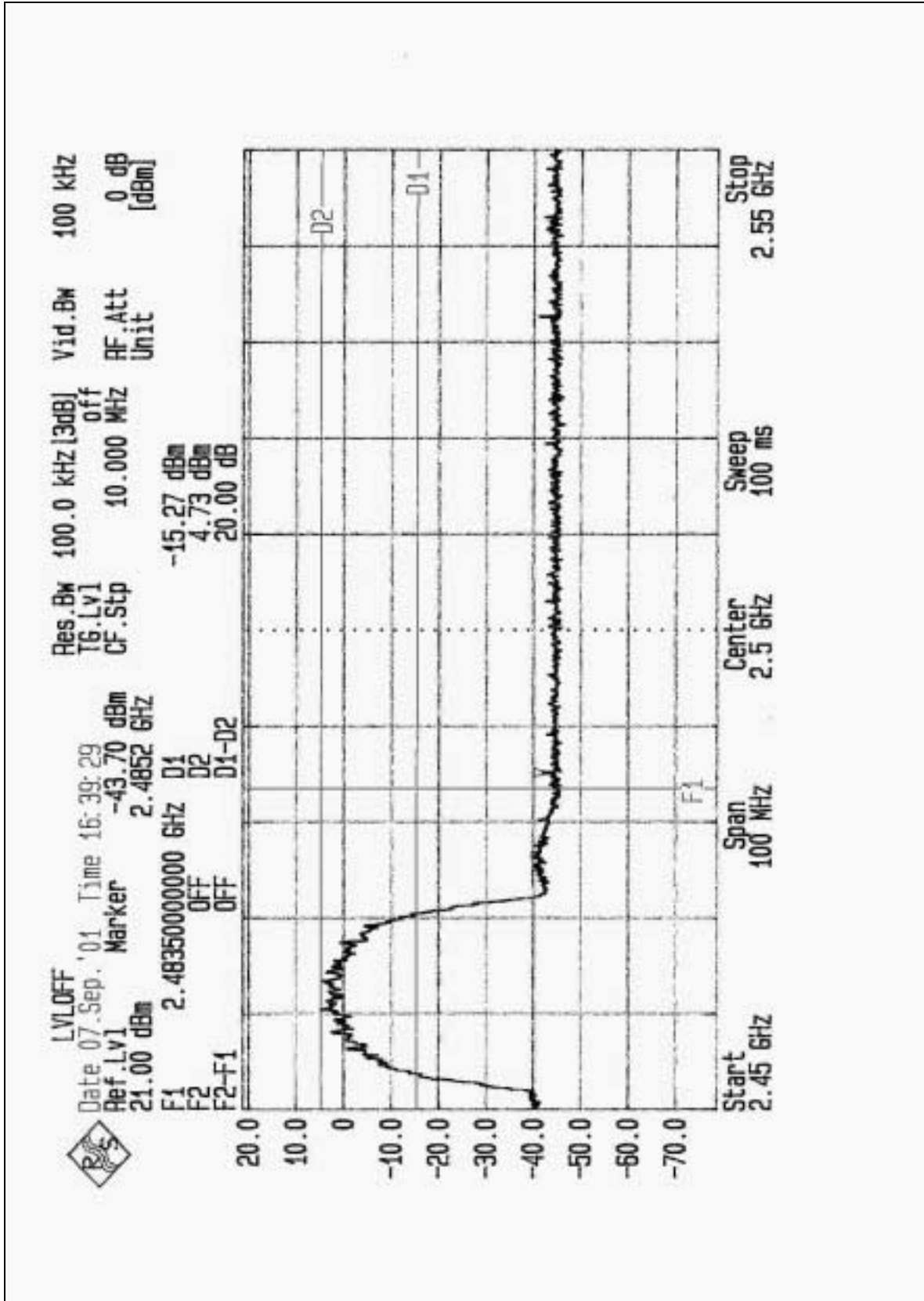
4.6.4 EUT OPERATING CONDITION

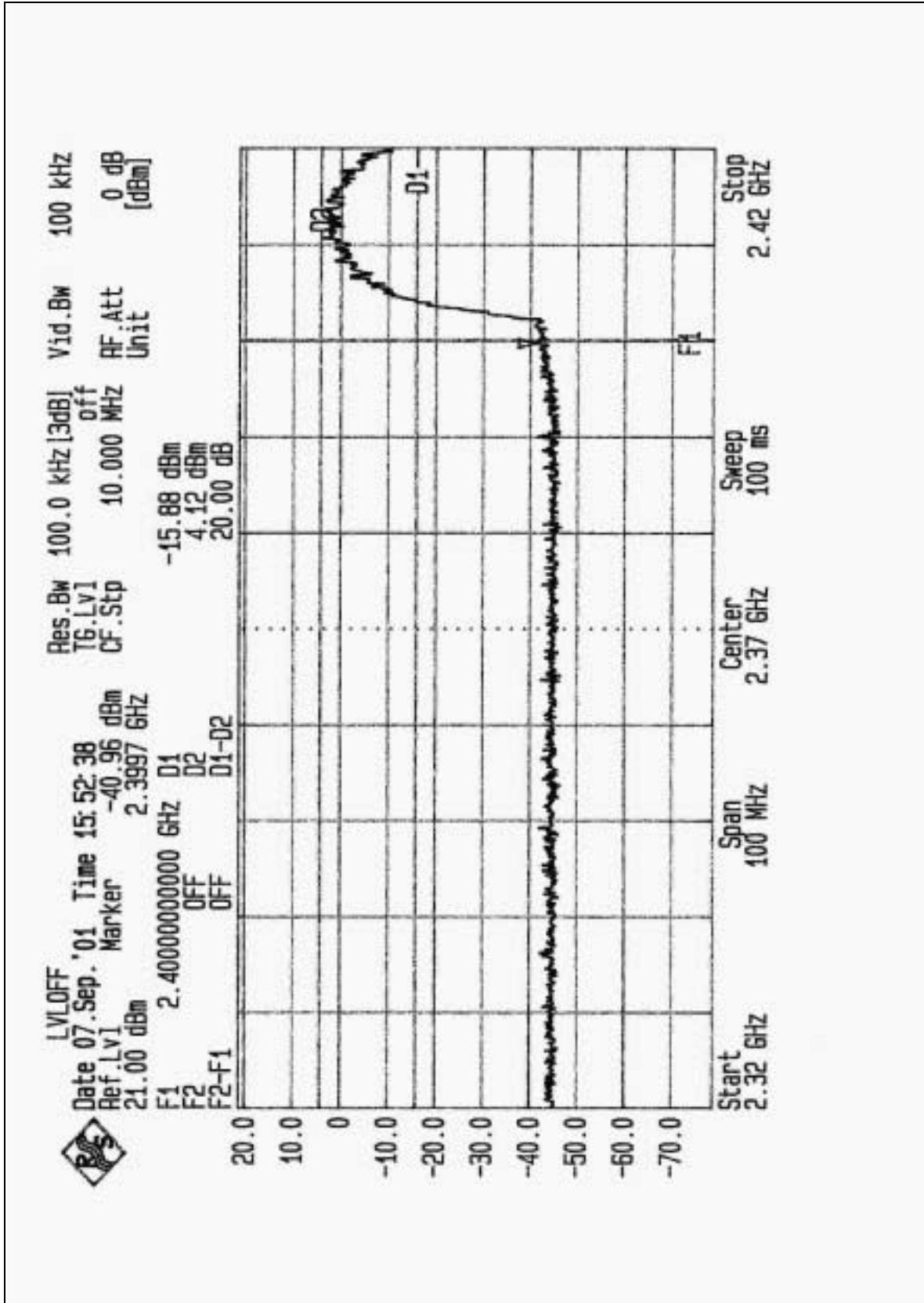
Same as Item 3.4.5

4.6.5 TEST RESULTS

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

NOTE: The band edge emission plot on the following 2 pages shows 48.43dB delta between carrier maximum power and local maximum emission in restrict band (2.4852GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 (Page 25) is 100.2dBuV/m, so the maximum field strength in restrict band is $100.2 - 48.43 = 51.77$ 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.

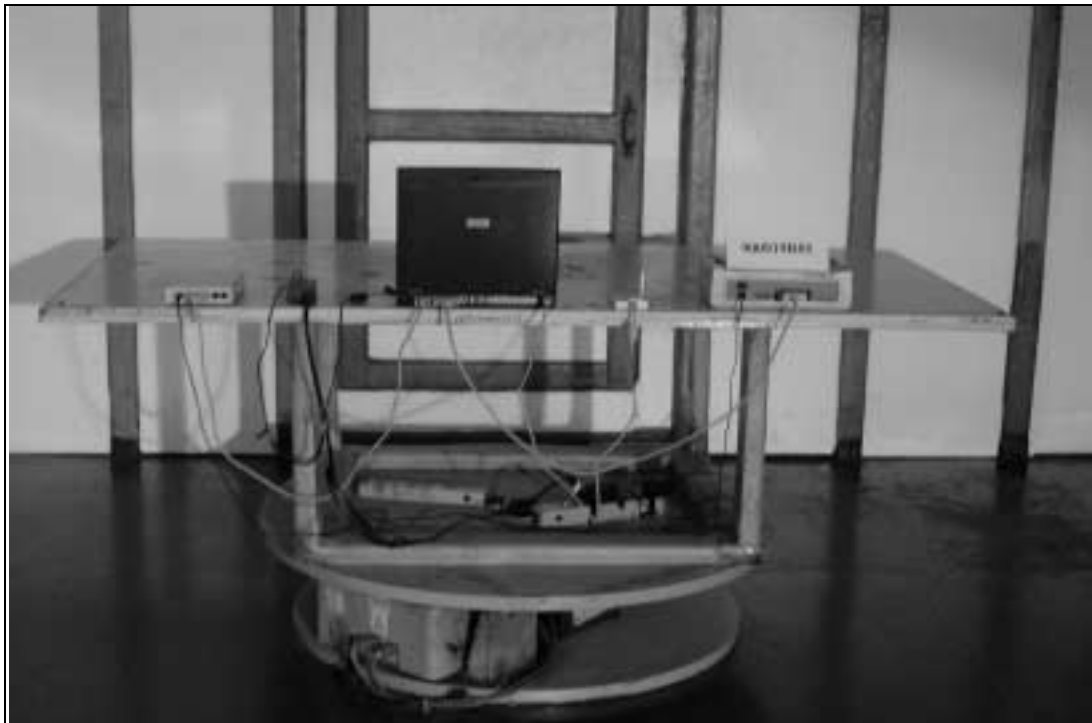
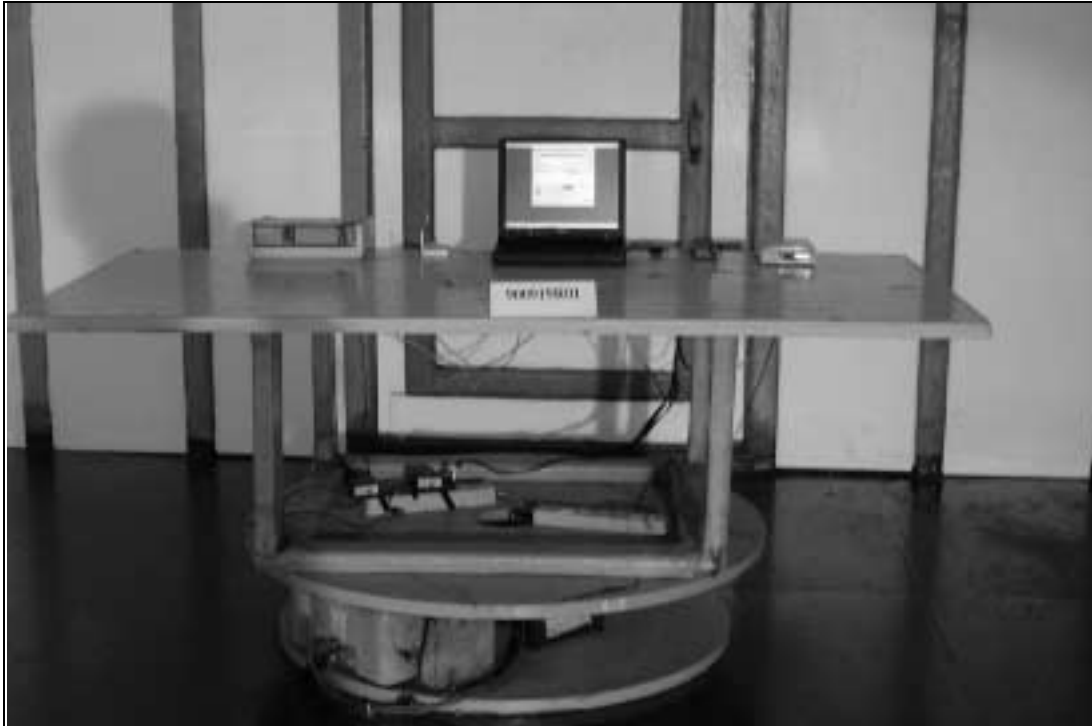
4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Monopole antenna. There is no antenna connector. The maximum Gain of the antenna is 1dBi only.

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 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
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:

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