



# FCC TEST REPORT

**REPORT NO.:** RF900809R02

**MODEL NO.:** NCP140, NWH640

**RECEIVED:** August 9, 2001

**TESTED:** August 13 ~ August 22, 2001

**APPLICANT:** NATIONAL DATACOMM CORPORATION

**ADDRESS:** 4F, No.24-2, Industry East 4<sup>th</sup> Road,  
Science Park, 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

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# 1 CERTIFICATION

**PRODUCT :** Wireless USB Adapter  
**BRAND NAME :** NDC  
**MODEL NO. :** NCP140, NWH640  
**APPLICANT :** NATIONAL DATACOMM CORPORATION  
**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 13, 2001 to August 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 : Gary Chang , DATE: Aug 27, 2001  
Gary Chang

CHECKED BY : Demi Chen , DATE: Aug 27, 2001  
Demi Chen

APPROVED BY : Alan Lane , DATE: Aug 27, 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 -11.33dBuV at 17.26700MHz
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 -2.2dBuV at 748.50 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

<b>PRODUCT</b>	Wireless USB Adapter
<b>MODEL NO.</b>	NCP140, NWH640
<b>POWER SUPPLY</b>	5VDC from host equipment
<b>MODULATION TYPE</b>	BPSK, QPSK, CCK
<b>RADIO TECHNOLOGY</b>	DSSS
<b>TRANSFER RATE</b>	1/2/5.5/11Mbps
<b>FREQUENCY RANGE</b>	2412MHz ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11
<b>OUTPUT POWER</b>	15dBm
<b>ANTENNA TYPE</b>	Dipole Antenna
<b>DATA CABLE</b>	1.5m (shielded)
<b>I/O PORTS</b>	USB Port
<b>ASSOCIATED DEVICES</b>	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 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	ThinkPad F Series	AA-G5434	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	ESCS30	838251/021	Jan. 17, 2002
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	835239/001	May 20, 2002
ROHDE & SCHWARZ 4-wire ISN	ENY41	935154/007	May 13, 2002
ROHDE & SCHWARZ 2-wire ISN	ENY22	833823/026	May 9, 2002
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	835239/002	May 20, 2002
Software	Cond-V2J	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C09.01	June 10, 2002
JYEBAO Terminator (For ROHDE & SCHWARZ LISN)	BNC 3950-0000	E1-01-379	June 13, 2002
Shielded Room	Site 9	ADT-C09	NA
VCCI Site Registration No.	Site 9	C-1312	NA

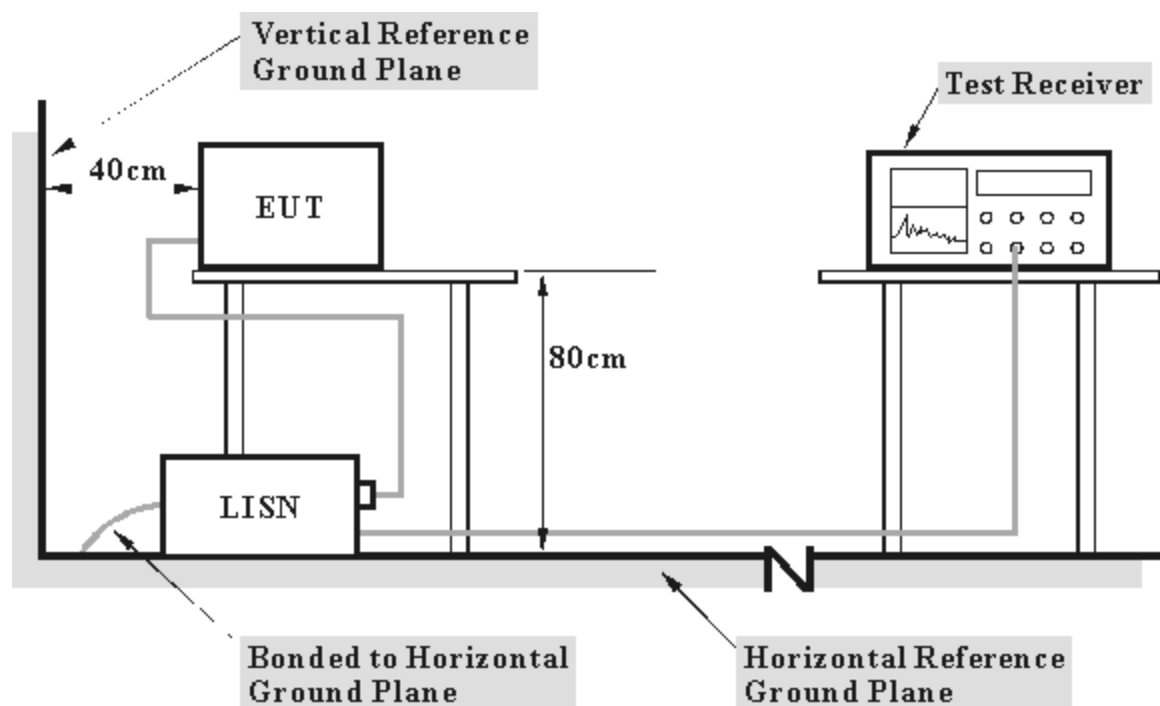
**NOTE:**

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

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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

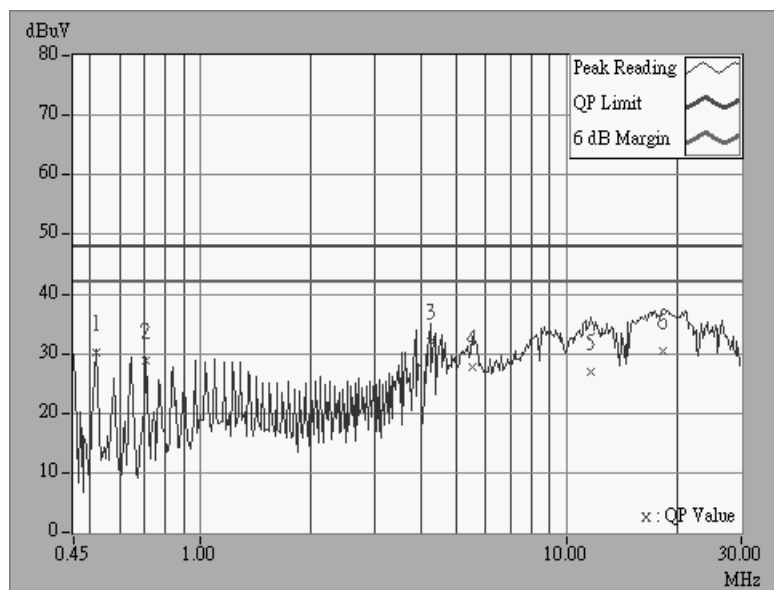
- a. Connected the EUT to a computer system placed on a testing table.
- b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The computer system sent "H" messages to its screen.
- d. The computer system sent "H"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

## 4.1.6 TEST RESULTS

<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 1	<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	0.51600	0.12	30.10	-	30.22	-	48.00	-	-17.78	-
2	0.70800	0.15	28.94	-	29.09	-	48.00	-	-18.91	-
3	4.25400	0.31	32.08	-	32.39	-	48.00	-	-15.61	-
4	5.53700	0.38	27.81	-	28.19	-	48.00	-	-19.81	-
5	11.59100	0.70	26.90	-	27.60	-	48.00	-	-20.40	-
6	18.34129	0.90	30.57	-	31.47	-	48.00	-	-16.53	-

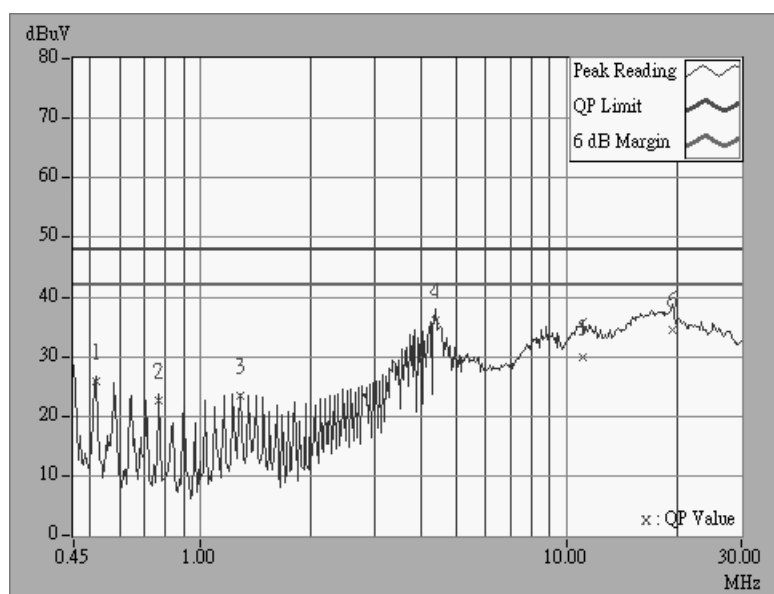
- Remarks:
1. "\*": Undetectable
  2. QP. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.



<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 1	<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	0.51600	0.12	25.93	-	26.05	-	48.00	-	-21.95	-
2	0.77100	0.16	22.71	-	22.87	-	48.00	-	-25.13	-
3	1.28400	0.23	23.44	-	23.67	-	48.00	-	-24.33	-
4	4.37100	0.31	36.02	-	36.33	-	48.00	-	-11.67	-
5	11.06300	0.54	29.98	-	30.52	-	48.00	-	-17.48	-
6	19.40300	0.70	34.37	-	35.07	-	48.00	-	-12.93	-

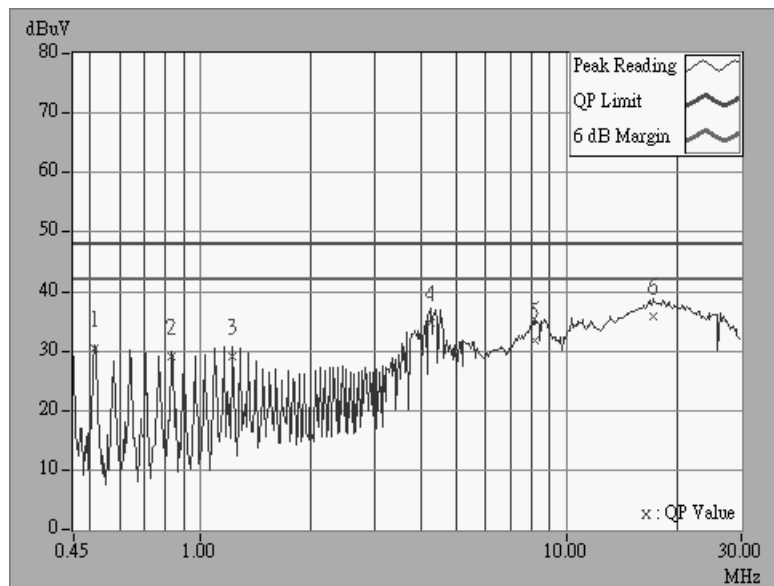
- Remarks:
1. "\*\*": Undetectable
  2. QP. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading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



<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 6	<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	0.51300	0.12	30.54	-	30.66	-	48.00	-	-17.34	-
2	0.83400	0.17	29.19	-	29.36	-	48.00	-	-18.64	-
3	1.22100	0.20	29.12	-	29.32	-	48.00	-	-18.68	-
4	4.23900	0.31	34.79	-	35.10	-	48.00	-	-12.90	-
5	8.15600	0.51	31.73	-	32.24	-	48.00	-	-15.76	-
6	17.26700	0.90	35.77	-	36.67	-	48.00	-	-11.33	-

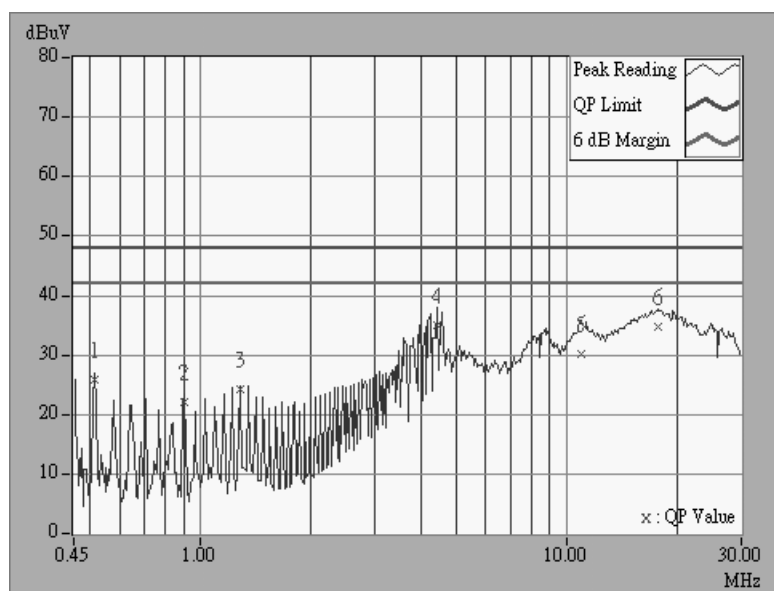
- Remarks:
1. "\*": Undetectable
  2. QP. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.



<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 6	<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	0.51300	0.12	25.89	-	26.01	-	48.00	-	-21.99	-
2	0.90000	0.18	22.07	-	22.25	-	48.00	-	-25.75	-
3	1.28400	0.23	24.12	-	24.35	-	48.00	-	-23.65	-
4	4.43400	0.31	35.14	-	35.45	-	48.00	-	-12.55	-
5	10.92500	0.54	30.25	-	30.79	-	48.00	-	-17.21	-
6	17.79200	0.70	34.65	-	35.35	-	48.00	-	-12.65	-

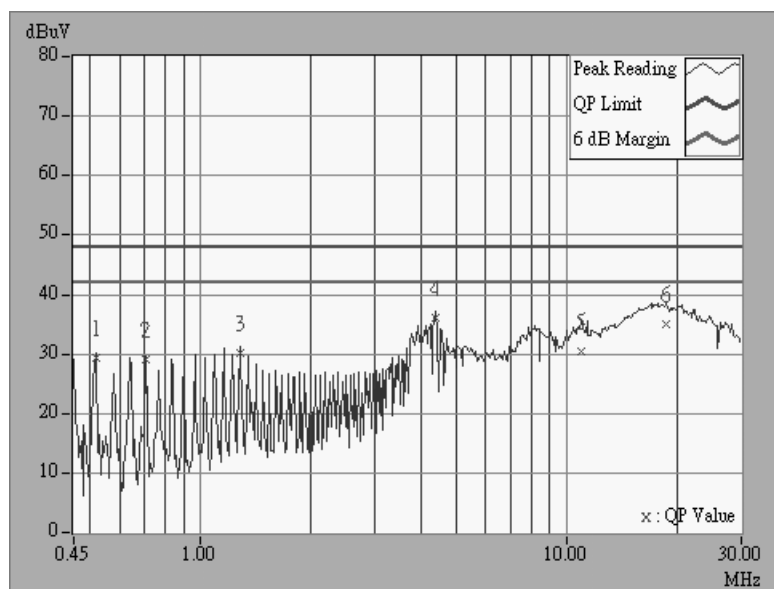
- Remarks:
1. "\*": Undetectable
  2. QP. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.



<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 11	<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	0.51625	0.12	29.48	-	29.60	-	48.00	-	-18.40	-
2	0.70500	0.15	29.18	-	29.33	-	48.00	-	-18.67	-
3	1.28400	0.20	30.04	-	30.24	-	48.00	-	-17.76	-
4	4.36500	0.32	36.10	-	36.42	-	48.00	-	-11.58	-
5	10.97600	0.66	30.45	-	31.11	-	48.00	-	-16.89	-
6	18.61400	0.90	35.03	-	35.93	-	48.00	-	-12.07	-

- 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.

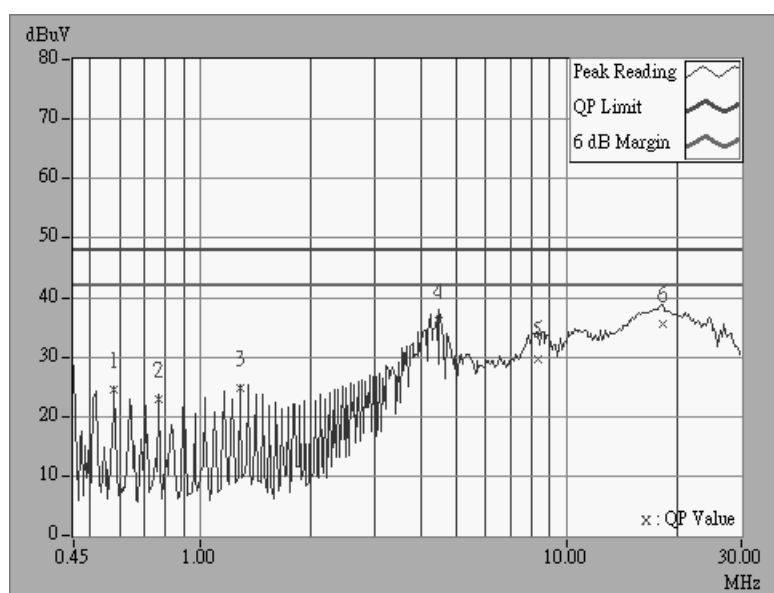




<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 11	<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> Steven Lu	

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	0.57900	0.13	24.62	-	24.75	-	48.00	-	-23.25	-
2	0.77100	0.16	22.99	-	23.15	-	48.00	-	-24.85	-
3	1.28400	0.23	24.73	-	24.96	-	48.00	-	-23.04	-
4	4.49400	0.32	35.97	-	36.29	-	48.00	-	-11.71	-
5	8.34800	0.44	29.63	-	30.07	-	48.00	-	-17.93	-
6	18.28700	0.70	35.45	-	36.15	-	48.00	-	-11.85	-

- 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.



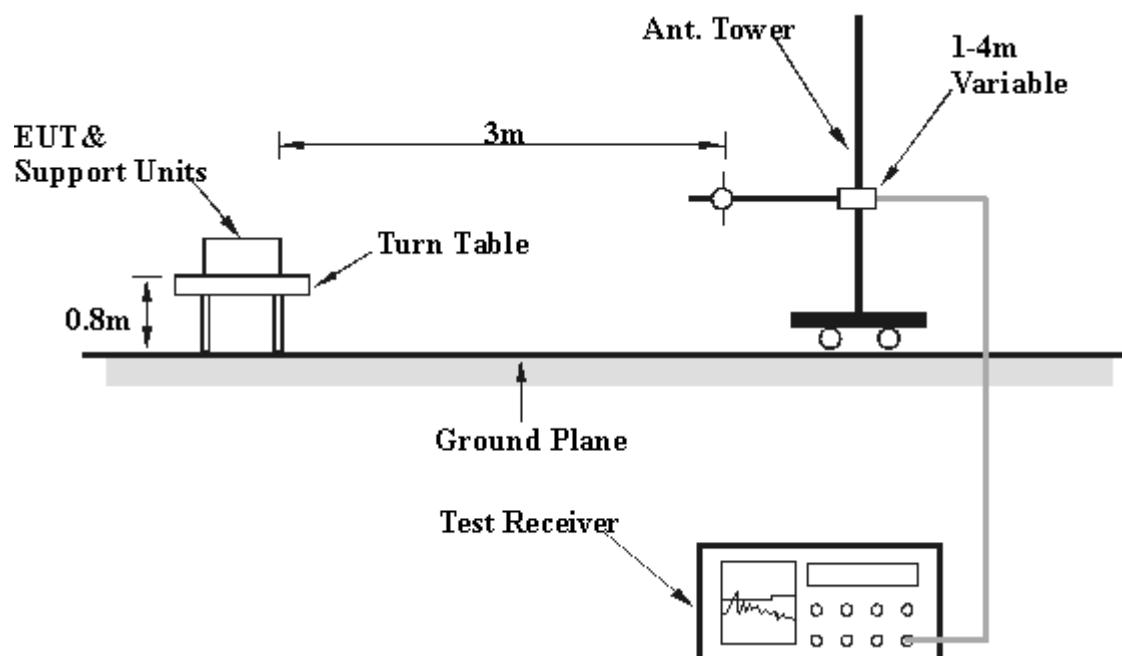
#### 4.2.3 TEST PROCEDURES

- 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

<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	36.4 QP	43.50	-7.10	1.67H	36	24.10	11.16	1.13	0.00	-12.29
2	144.05	33.1 QP	43.50	-10.40	1.43H	349	21.30	10.58	1.18	0.00	-11.76
3	240.00	43.2 QP	46.00	-2.80	1.68H	265	30.20	11.41	1.62	0.00	-13.04
4	258.10	39.3 QP	46.00	-6.70	1.70H	292	24.80	12.82	1.68	0.00	-14.52
5	264.14	37.8 QP	46.00	-8.20	1.00H	344	23.40	12.75	1.70	0.00	-14.46
6	288.04	37.8 QP	46.00	-8.20	1.69H	172	23.10	12.88	1.81	0.00	-14.70
7	359.47	39.5 QP	46.00	-6.50	1.02H	150	22.80	14.58	2.08	0.00	-16.67
8	395.75	35.7 QP	46.00	-10.30	1.32H	343	17.50	15.96	2.22	0.00	-18.18
9	408.21	34.1 QP	46.00	-11.90	1.21H	46	15.70	16.14	2.27	0.00	-18.42
10	480.14	40.1 QP	46.00	-5.90	1.05H	72	20.70	16.92	2.47	0.00	-19.38
11	483.96	36.6 QP	46.00	-9.40	2.00H	238	17.20	16.96	2.47	0.00	-19.44
12	528.04	37.0 QP	46.00	-9.00	2.21H	85	16.80	17.62	2.60	0.00	-20.22
13	572.10	35.8 QP	46.00	-10.20	1.00H	311	14.80	18.25	2.75	0.00	-21.00
14	660.21	37.7 QP	46.00	-8.30	1.65H	223	15.40	19.25	3.05	0.00	-22.29
15	748.50	43.8 QP	46.00	-2.20	1.24H	268	20.40	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



### 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	132.06	35.8 QP	43.50	-7.70	1.00V	346	23.50	11.16	1.13	0.00	-12.29
2	144.00	41.2 QP	43.50	-2.30	1.03V	199	29.44	10.58	1.18	0.00	-11.76
3	192.04	29.2 QP	43.50	-14.30	1.09V	330	18.90	8.95	1.39	0.00	-10.35
4	264.01	37.0 QP	46.00	-9.00	1.05V	129	22.60	12.75	1.70	0.00	-14.45
5	395.82	33.6 QP	46.00	-12.40	1.05V	318	15.40	15.96	2.22	0.00	-18.18
6	480.41	38.8 QP	46.00	-7.20	1.44V	129	19.40	16.92	2.47	0.00	-19.39
7	483.87	35.2 QP	46.00	-10.80	1.50V	51	15.80	16.96	2.47	0.00	-19.44
8	528.00	34.0 QP	46.00	-12.00	1.19V	359	13.80	17.62	2.60	0.00	-20.22
9	572.47	38.2 QP	46.00	-7.80	1.27V	26	17.20	18.25	2.75	0.00	-21.00
10	660.04	36.5 QP	46.00	-9.50	2.15V	68	14.20	19.25	3.05	0.00	-22.29
11	748.50	40.9 QP	46.00	-5.10	1.00V	7	17.50	20.14	3.26	0.00	-23.41
12	792.47	40.1 QP	46.00	-5.90	1.83V	64	16.20	20.60	3.31	0.00	-23.91
13	600.00	35.8 QP	46.00	-10.20	1.30V	3	14.60	17.72	3.53	0.00	-21.25
14	616.01	34.9 QP	46.00	-11.10	1.54V	356	13.58	17.68	3.61	0.00	-21.29
15	748.78	35.4 QP	46.00	-10.60	1.26V	165	12.35	18.80	4.21	0.00	-23.02

- 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



<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 1	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> Steven Lu	

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>											
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	2038.4	47.0 PK	74.00	-27.00	1.16H	147	18.40	25.27	3.29	0.00	-28.57
2	*2413.5	92.1 PK	-	-	1.30H	111	61.30	27.19	3.62	0.00	-30.82
3	*2413.5	85.0 AV	-	-	1.30H	111	54.20	27.19	3.62	0.00	-30.82
4	4075.2	51.1 PK	74.00	-22.90	1.20H	220	16.20	30.18	4.77	0.00	-34.95
5	4823.4	52.2 PK	74.00	-21.80	1.13H	177	15.60	31.43	5.21	0.00	-36.64
6	8150.4	53.0 PK	74.00	-21.00	1.17H	136	9.40	36.66	6.97	0.00	-43.63

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>											
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	2038.4	47.1 PK	74.00	-26.90	1.12V	131	18.52	25.27	3.29	0.00	-28.57
2	*2413.5	94.9 PK	-	-	1.26V	98	64.12	27.19	3.62	0.00	-30.81.
3	*2413.5	87.9 AV	-	-	1.26V	98	57.10	27.19	3.62	0.00	-30.81.
4	4075.5	50.5 PK	74.00	-23.50	1.17V	140	15.59	30.18	4.77	0.00	-34.95
5	4824.6	50.9 PK	74.00	-23.10	1.36V	192	14.30	31.43	5.21	0.00	-36.64
6	8151.2	53.8 PK	74.00	-20.20	1.29V	162	10.20	36.66	6.97	0.00	-43.63
7	8151.2	44.8 AV	54.00	-9.20	1.29V	162	1.20	36.66	6.97	0.00	-43.63

- 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





<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 6	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	2063.5	45.7 PK	74.00	-28.30	1.10H	62	17.03	25.39	3.31	0.00	-28.70
2	*2438.4	92.7 PK	-	-	1.14H	141	61.80	27.30	3.64	0.00	-30.94
3	*2438.4	84.8 AV	-	-	1.14H	141	53.90	27.30	3.64	0.00	-30.94
4	4125.7	49.6 PK	74.00	-24.40	1.21H	121	14.58	30.28	4.79	0.00	-35.07
5	4874.2	51.9 PK	74.00	-22.10	1.15H	182	15.20	31.47	5.25	0.00	-36.72
6	8250.4	56.1 PK	74.00	-17.90	1.23H	209	12.40	36.70	7.01	0.00	-43.71.
7	8250.4	46.1 AV	54.00	-7.90	1.23H	209	2.40	36.70	7.01	0.00	-43.71

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	2062.4	46.3 PK	74.00	-27.70	1.16V	194	17.64	25.39	3.31	0.00	-28.70
2	*2438.4	97.5 PK	-	-	1.08V	242	66.56	27.30	3.64	0.00	-30.95
3	*2438.4	89.0 AV	-	-	1.08V	242	58.04	27.30	3.64	0.00	-30.95
4	4125.4	49.2 PK	74.00	-24.80	1.15V	227	14.14	30.28	4.79	0.00	-35.07
5	4874.1	52.1 PK	74.00	-21.90	1.24V	279	15.40	31.47	5.25	0.00	-36.72
6	8250.1	54.1 PK	74.00	-19.90	1.48V	320	10.40	36.70	7.01	0.00	-43.72
7	8250.1	45.1 AV	54.00	-8.90	1.48V	320	1.40	36.70	7.01	0.00	-43.71

- 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



<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60%RH, 1005 hPa	<b>TESTED BY:</b> 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	2087.8	46.1 PK	74.00	-27.90	1.37H	269	17.24	25.50	3.33	0.00	-28.83
2	*2463.3	93.6 PK	-	-	1.43H	308	62.50	27.41	3.66	0.00	-31.08
3	*2463.3	83.2 AV	-	-	1.43H	308	52.10	27.41	3.66	0.00	-31.08
4	2483.5	47.9 PK	74.00	-26.10	1.26H	232	16.70	27.52	3.68	0.00	-31.20
5	4175.1	51.8 PK	74.00	-22.20	1.20H	270	16.60	30.38	4.81	0.00	-35.19
6	4924.1	50.4 PK	74.00	-23.60	1.29H	235	13.58	31.51	5.28	0.00	-36.80
7	8350.1	44.9 AV	54.00	-9.10	1.23H	171	1.10	36.74	7.07	0.00	-43.81
8	8350.1	56.4 PK	74.00	-17.60	1.23H	171	12.54	36.74	7.07	0.00	-43.82

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	2087.4	46.9 PK	74.00	-27.10	1.12V	202	18.12	25.50	3.33	0.00	-28.83
2	*2463.2	91.9 PK	-	-	1.04V	165	60.87	27.41	3.66	0.00	-31.08
3	*2463.2	83.8 AV	-	-	1.04V	165	52.70	27.41	3.66	0.00	-31.08
4	2491.6	47.1 PK	74.00	-26.90	1.17V	230	15.86	27.52	3.68	0.00	-31.20
5	4175.3	51.8 PK	74.00	-22.20	1.12V	188	16.60	30.38	4.81	0.00	-35.19
6	4923.8	50.0 PK	74.00	-24.00	1.37V	129	13.25	31.51	5.28	0.00	-36.80
7	8350.0	55.9 PK	74.00	-18.10	1.43V	95	12.04	36.74	7.07	0.00	-43.82
8	8350.1	45.3 AV	54.00	-8.70	1.18V	151	1.50	36.74	7.07	0.00	-43.81

- 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

### 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

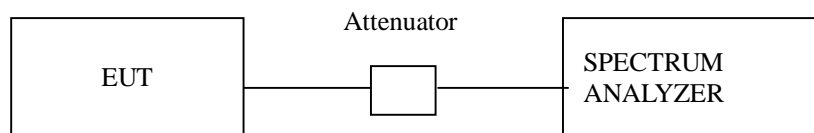
#### Notes:

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.

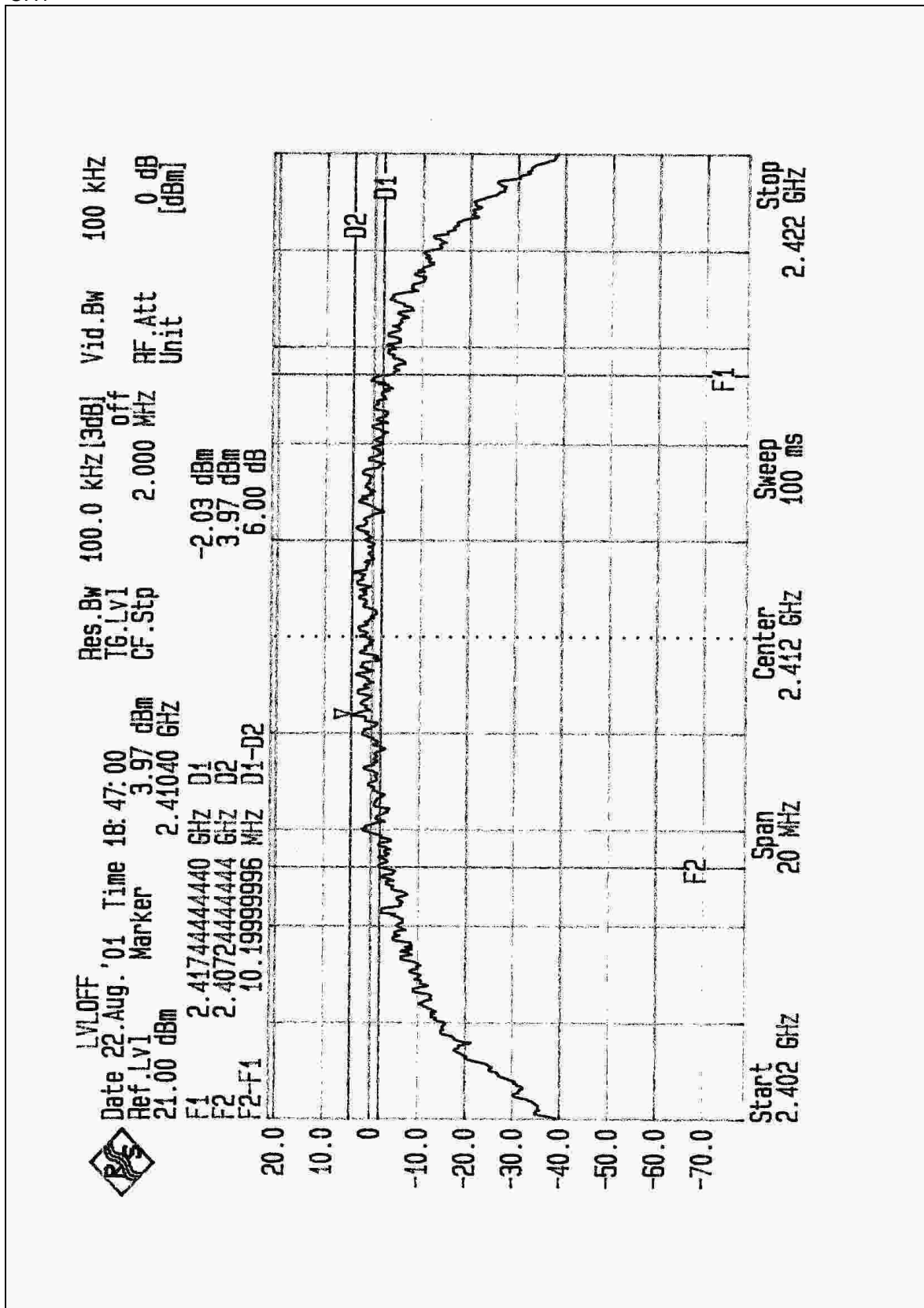


## 4.3.6 TEST RESULTS

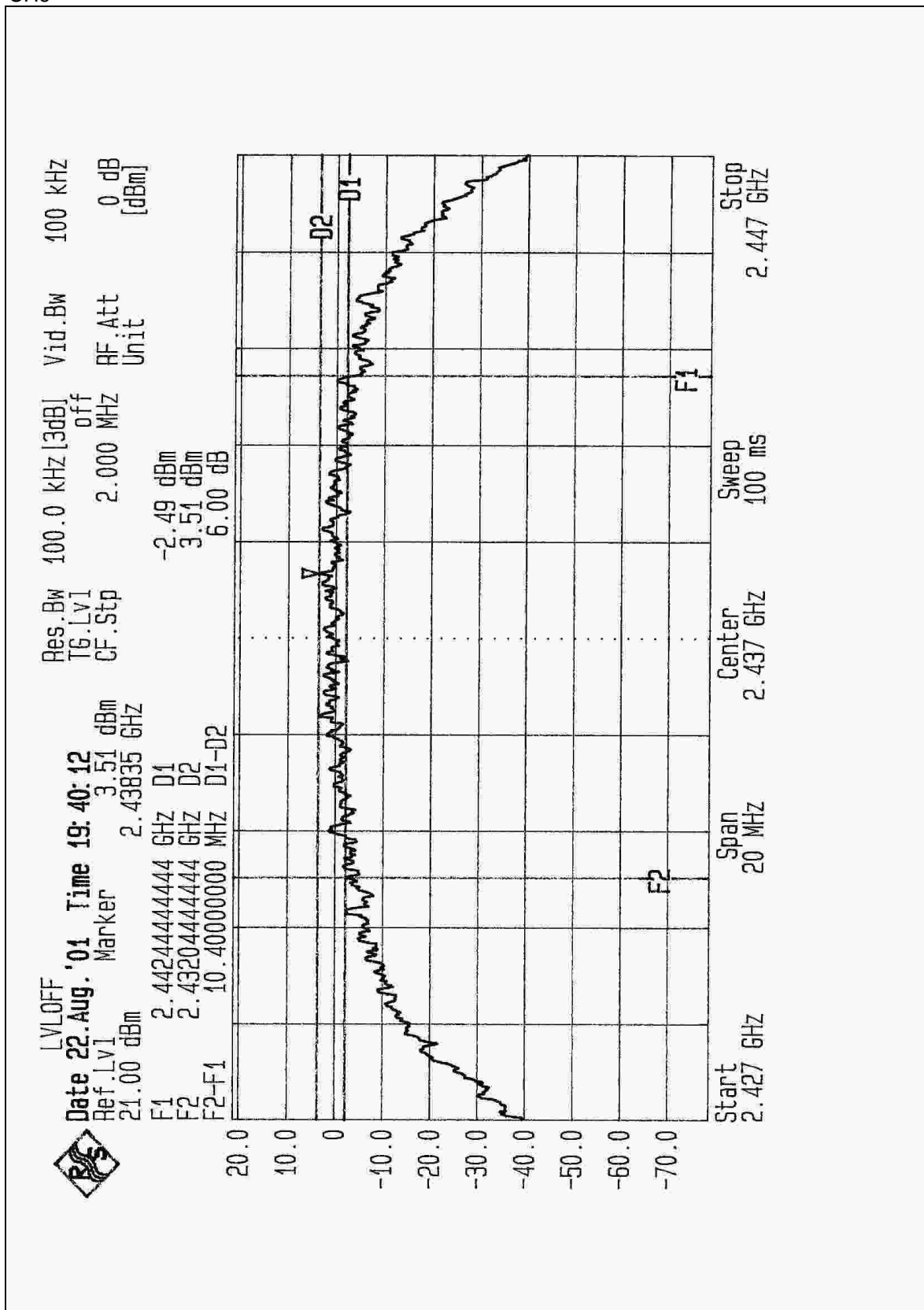
<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	27 deg. C, 65%RH, 1005 hPa
<b>TESTED BY:</b> Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.20	0.5	PASS
6	2437	10.40	0.5	PASS
11	2462	10.22	0.5	PASS

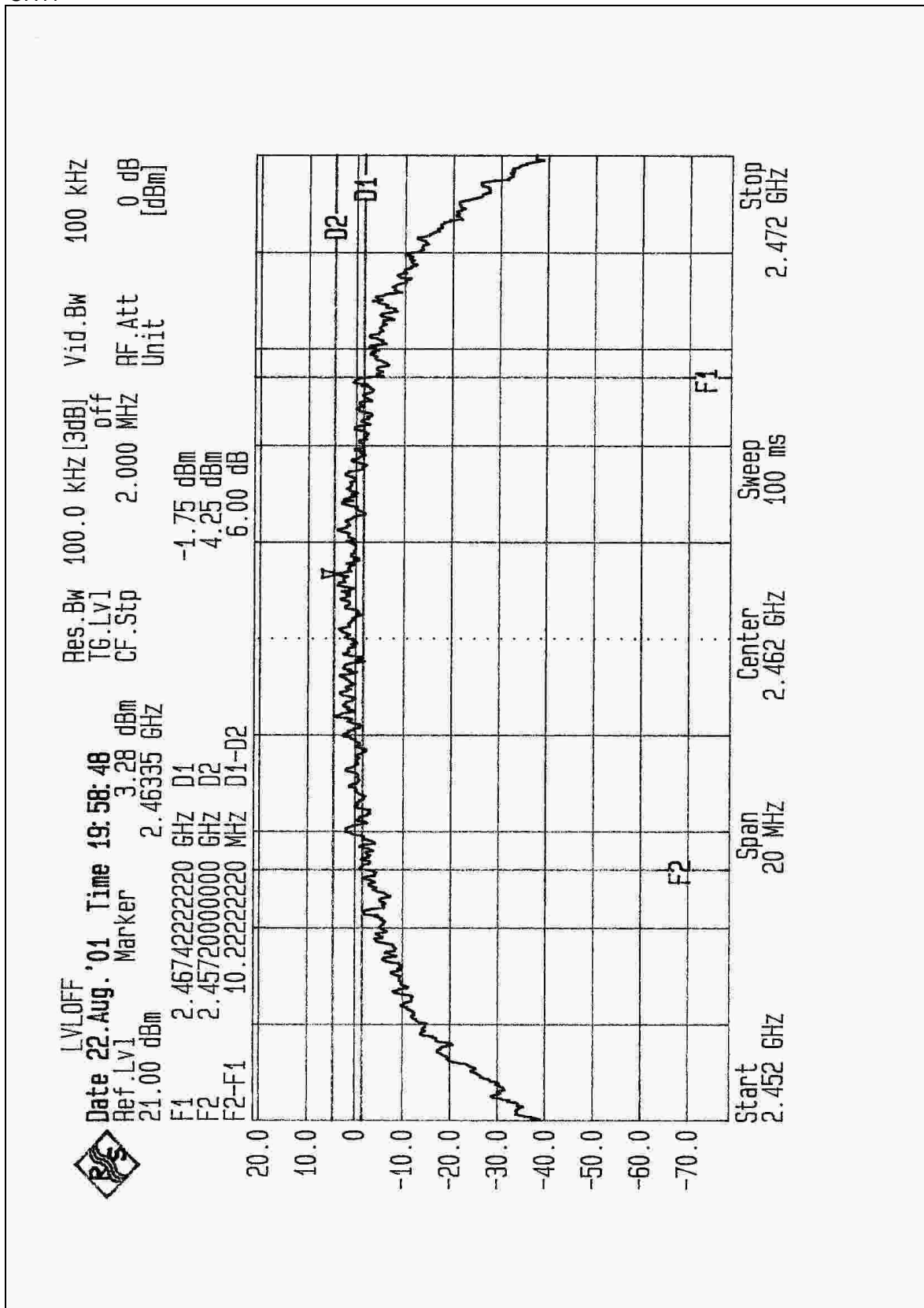
CH1



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

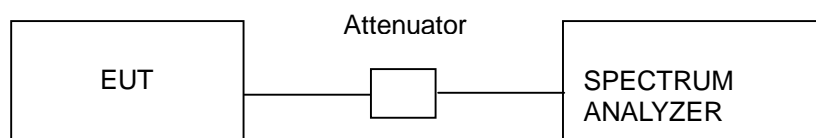
- NOTE:** 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 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

<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	27 deg. C, 60%RH, 1005 hPa
<b>TESTED BY:</b> Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	18.20	30	PASS
6	2437	18.10	30	PASS
11	2462	18.38	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.

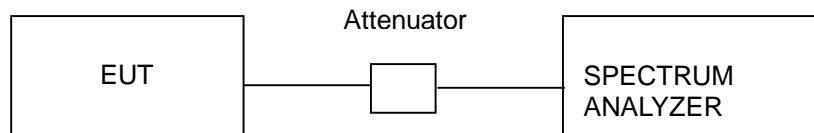
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 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

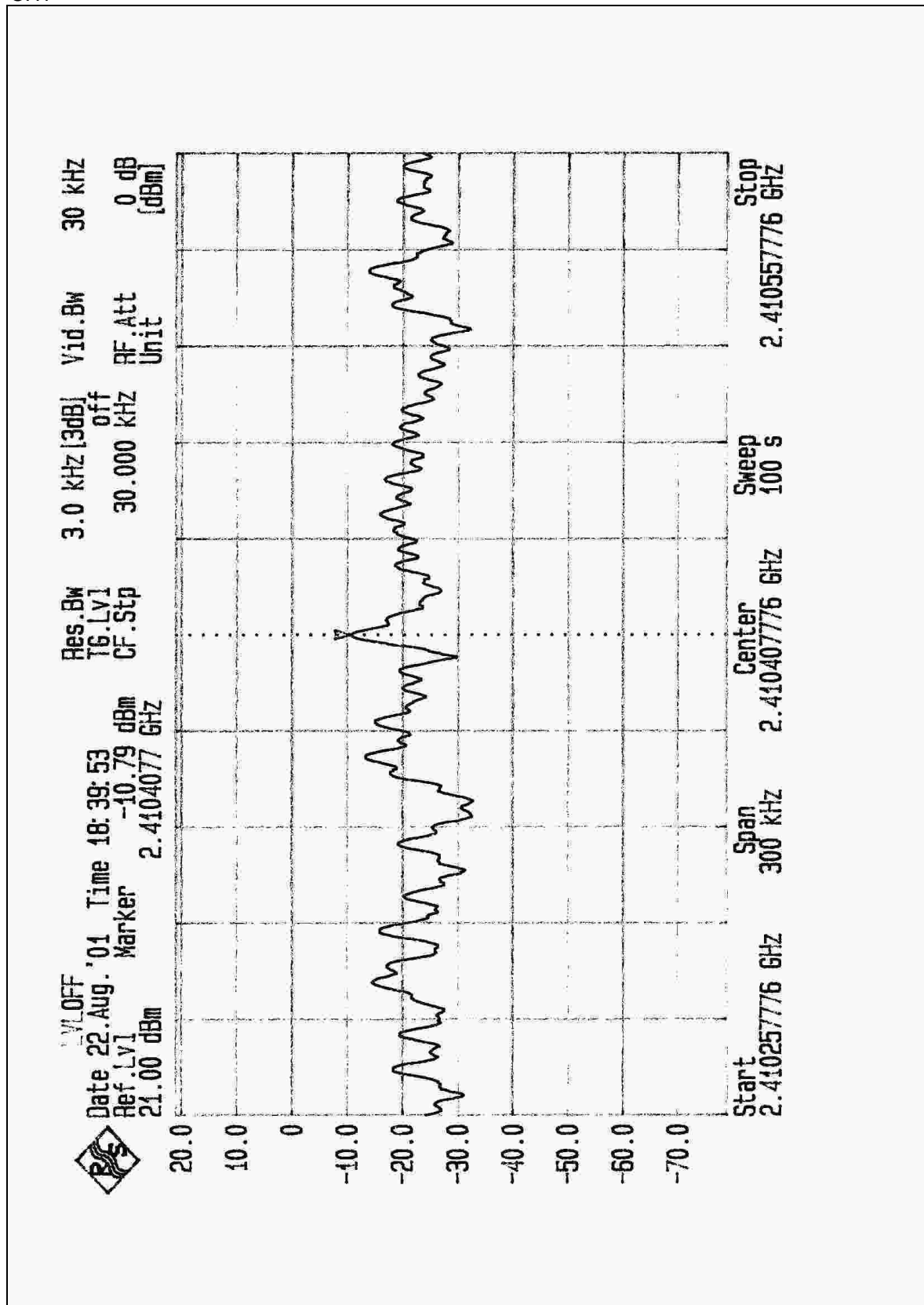
## 4.5.6 TEST RESULTS

<b>EUT</b>	Wireless USB Adapter	<b>MODEL</b>	NCP140, NWH640
<b>INPUT POWER (SYSTEM)</b>	230Vac, 50 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	27 deg. C, 65%RH, 1005 hPa
<b>TESTED BY:</b> Steven Lu			

<b>CHANNEL NUMBER</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 kHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	2412	-10.79	8	PASS
6	2437	-11.19	8	PASS
11	2462	-10.53	8	PASS

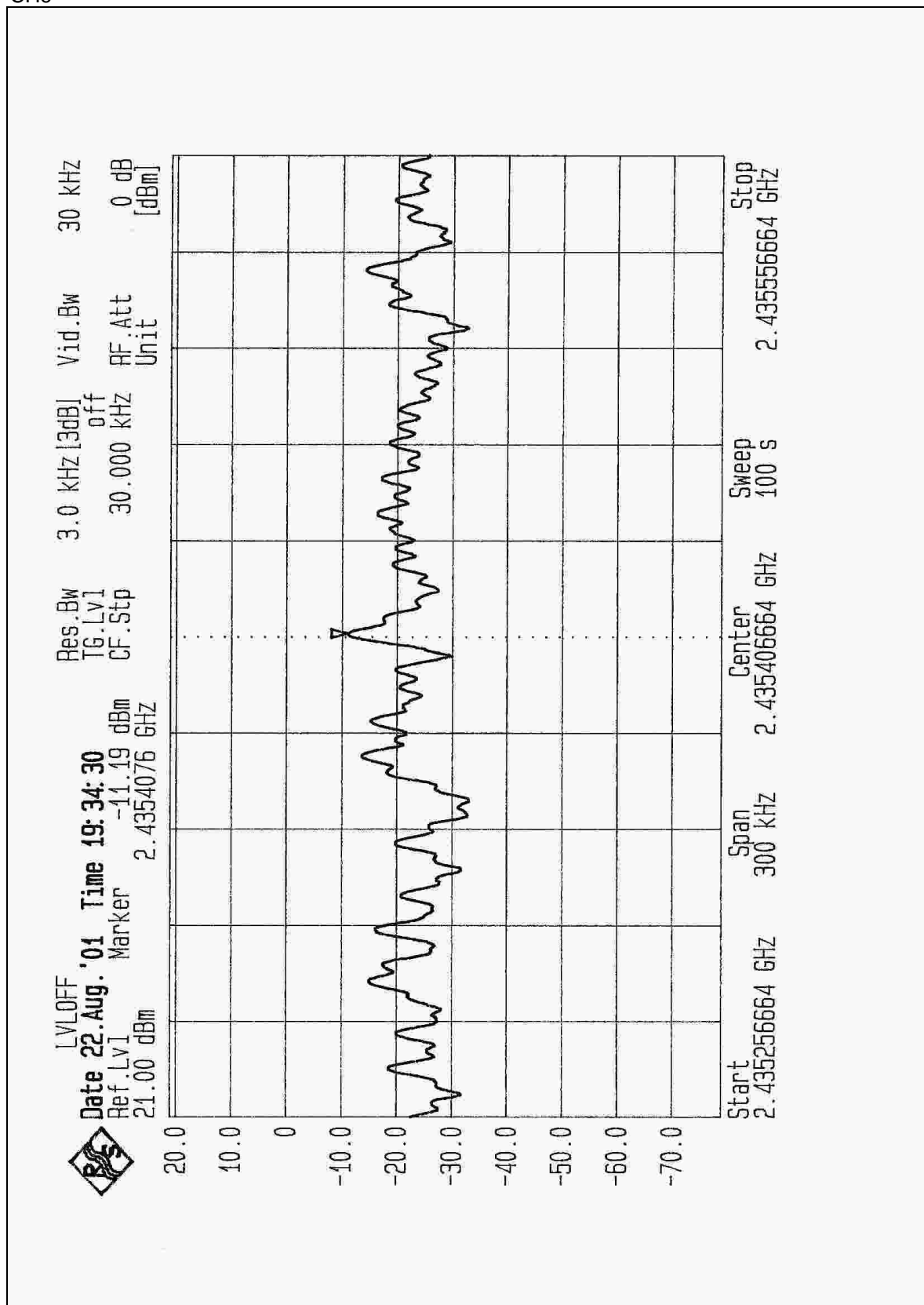


CH1





CH6







CH11

