



# FCC TEST REPORT

**REPORT NO.:** RF921203R04

**MODEL NO.:** NL-3054CB Plus Aries2

**RECEIVED:** October 28, 2003

**TESTED:** October 28 ~ December 11, 2003

**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.

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0528  
ILAC MRA



Lab Code: 200102-0

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## 1 CERTIFICATION

**PRODUCT :** Atheros 11g Card Bus Adapter  
**BRAND NAME :** SENAO  
**MODEL NO. :** NL-3054CB Plus Aries2  
**TEST ITEM:** Engineering Sample  
**APPLICANT :** SENAO INTERNATIONAL CO., LTD.  
**STANDARDS :** FCC 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 October 28 to December 11, 2003. 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.

**PREPARED BY:** Wendy Liao, **DATE:** December 15, 2003  
Wendy Liao

**APPROVED BY:** Ellis Wu, **DATE:** December 15, 2003  
Ellis Wu / 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
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -11.21dB at 0.166MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -2.01dB at 2390.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

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

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Atheros 11g Card Bus Adapter
<b>MODEL NO.</b>	NL-3054CB Plus Aries2
<b>BRAND NAME</b>	SENAO
<b>POWER SUPPLY</b>	3.3Vdc from host equipment
<b>MODULATION TYPE</b>	BPSK, QPSK, CCK, 16QAM, 64QAM
<b>RADIO TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	54/48/36/24/18/12/11/9/6/5.5/2/1/Mbps Turbo mode: up to 108Mbps
<b>FREQUENCY RANGE</b>	2412MHz ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11
<b>MAXIMUN OUTPUT POWER</b>	22.00dBm
<b>ANTENNA TYPE</b>	Printed antenna with 0dBi antenna gain
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	PCMCIA
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

1. Fully compatible with the 802.11g standard to provide a wireless data rate of up to 54Mbps.
2. The EUT complies with IEEE 802.11g draft standards, and backward compatible with IEEE 802.11b products.
3. A turbo mode at channel 6 was provided to this EUT.
4. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

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

**NOTE:**

1. Below 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, the worst case, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.
3. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst cases, were chosen for final test.
4. Three test results were presented in the following sections, the test result A was for CCK technique, the test result B was for OFDM technique and the test result C was for turbo mode at channel 6.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an Atheros 11g Card Bus Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C. (15.247)**

**ANSI C63.4 : 1992**

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

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

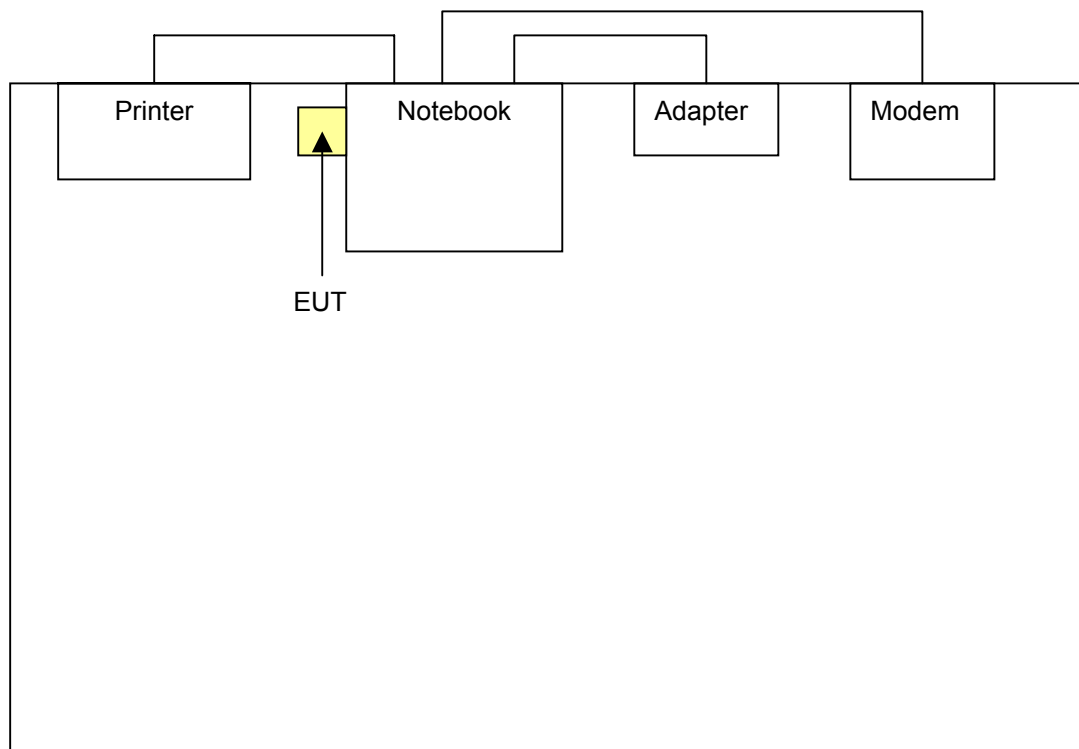
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	Dell	PP01L	TW-09C748-12800-190-B220	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC Approved
3	MODEM	ACEEX	1414	980020503	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).

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST





## 4 TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Jan. 20, 2004
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Dec. 09, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Dec. 09, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100220	Dec. 09, 2004
*ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 19, 2004
*ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Nov. 19, 2004
Software	Cond-V2M3	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	May 01, 2004
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010770	Mar. 24, 2004
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Apr. 06, 2004

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. “\*”: These equipment are used for conducted telecom port test only (if tested).
  3. The test was performed in ADT Shielded Room No. 10.
  4. The VCCI Site Registration No. is C-1312.



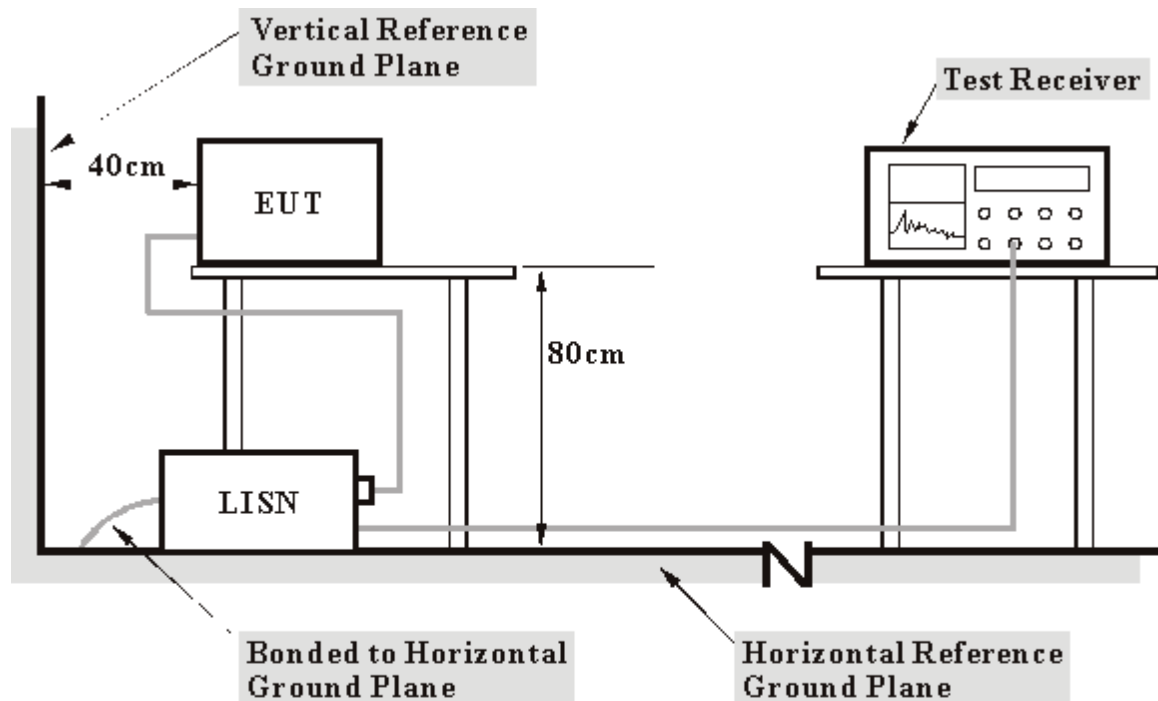
#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



- Note:** 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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



#### 4.1.6 EUT OPERATING CONDITIONS

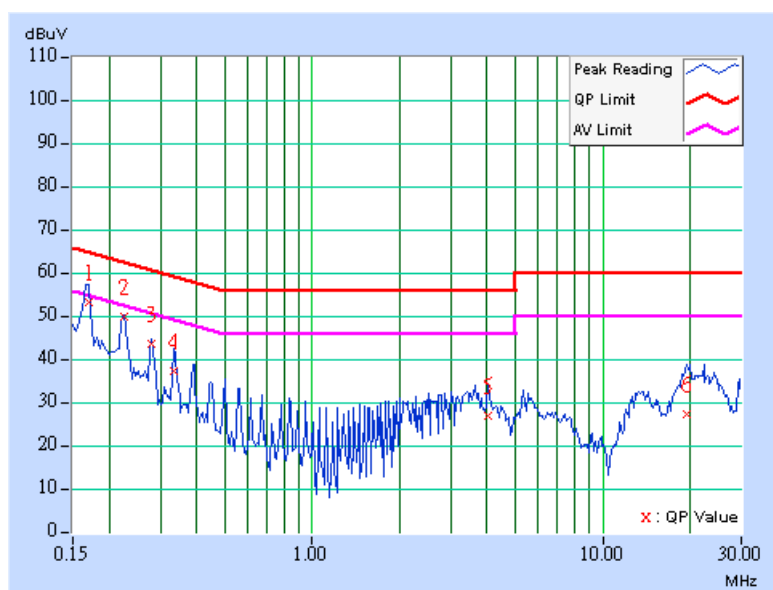
- a. Connected the EUT to a computer system placed on a testing table.
- b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The computer system sent "H" messages to its screen.
- d. The computer system sent "H"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

## 4.1.7 TEST RESULTS

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 1	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 65%RH, 991 hPa	<b>TESTED BY:</b> Jamison Chan	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.06	52.71	-	52.77	-	64.98	54.98	-12.22	-
2	0.224	0.06	49.33	-	49.39	-	62.66	52.66	-13.27	-
3	0.279	0.06	43.04	-	43.10	-	60.85	50.85	-17.75	-
4	0.334	0.06	36.61	-	36.67	-	59.36	49.36	-22.69	-
5	4.020	0.22	26.33	-	26.55	-	56.00	46.00	-29.45	-
6	19.426	0.63	26.68	-	27.31	-	60.00	50.00	-32.69	-

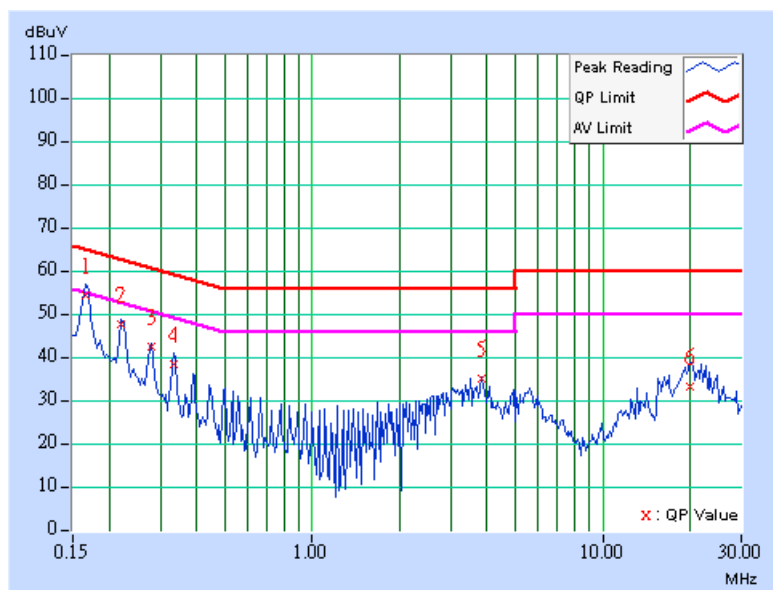
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value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



<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 1	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 60%RH, 991 hPa	<b>TESTED BY:</b> Jamison Chan	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.05	53.92	-	53.97	-	65.18	55.18	-11.21	-
2	0.220	0.05	47.25	-	47.30	-	62.81	52.81	-15.51	-
3	0.279	0.05	42.05	-	42.10	-	60.85	50.85	-18.75	-
4	0.334	0.05	37.93	-	37.98	-	59.36	49.36	-21.38	-
5	3.846	0.20	34.53	-	34.73	-	56.00	46.00	-21.27	-
6	19.875	0.51	32.64	-	33.15	-	60.00	50.00	-26.85	-

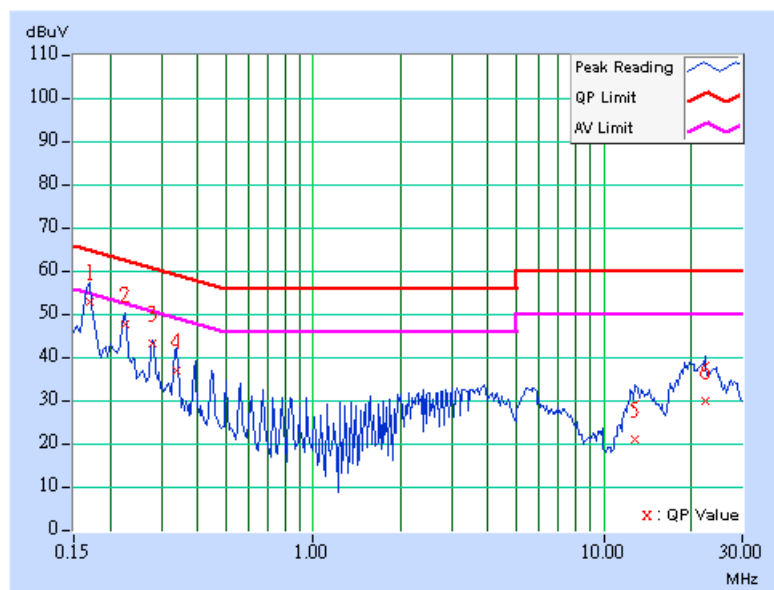
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 6	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 60%RH, 991 hPa	<b>TESTED BY:</b> Jamison Chan	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.06	52.31	-	52.37	-	64.98	54.98	-12.62	-
2	0.224	0.06	46.96	-	47.02	-	62.66	52.66	-15.64	-
3	0.279	0.06	42.51	-	42.57	-	60.85	50.85	-18.28	-
4	0.338	0.06	36.24	-	36.30	-	59.26	49.26	-22.96	-
5	12.867	0.50	20.35	-	20.85	-	60.00	50.00	-39.15	-
6	22.324	0.76	29.20	-	29.96	-	60.00	50.00	-30.04	-

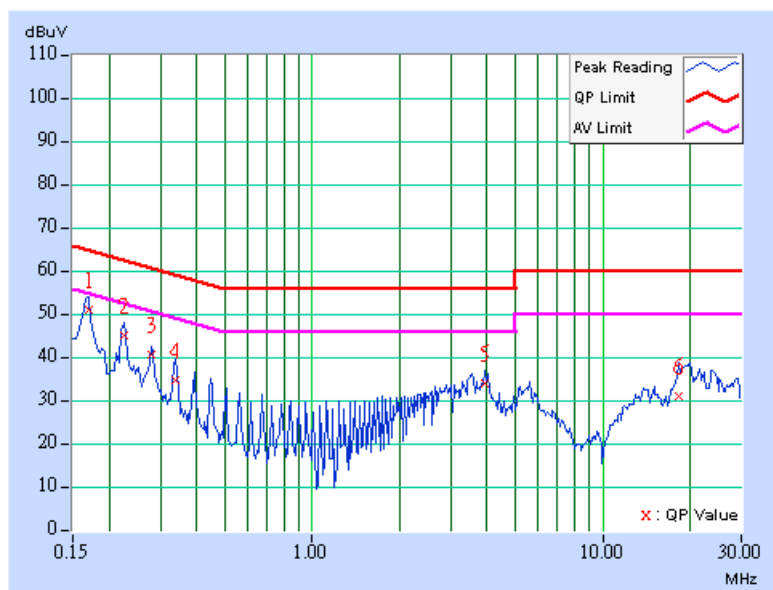
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value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



<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 6	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 60%RH, 991 hPa	<b>TESTED BY:</b> Jamison Chan	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.05	50.57	-	50.62	-	64.98	54.98	-14.36	-
2	0.224	0.05	44.85	-	44.90	-	62.66	52.66	-17.76	-
3	0.279	0.05	40.11	-	40.16	-	60.85	50.85	-20.69	-
4	0.338	0.05	34.47	-	34.52	-	59.26	49.26	-24.74	-
5	3.922	0.21	33.72	-	33.93	-	56.00	46.00	-22.07	-
6	18.340	0.50	30.69	-	31.19	-	60.00	50.00	-28.81	-

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

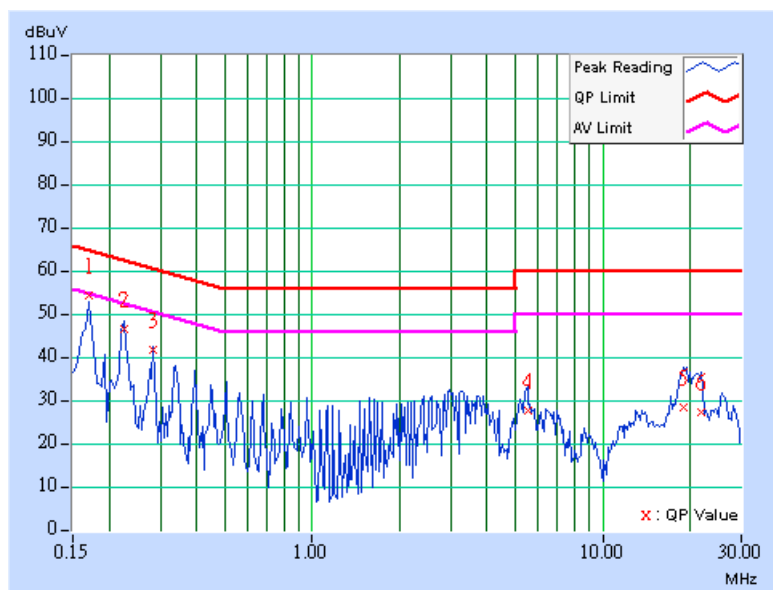




<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 11	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 60%RH, 991 hPa	<b>TESTED BY:</b> Jamison Chan	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.06	53.62	-	53.68	-	64.98	54.98	-11.31	-
2	0.224	0.06	45.97	-	46.03	-	62.66	52.66	-16.63	-
3	0.283	0.06	41.27	-	41.33	-	60.73	50.73	-19.40	-
4	5.504	0.27	27.08	-	27.35	-	60.00	50.00	-32.65	-
5	18.914	0.62	27.61	-	28.23	-	60.00	50.00	-31.77	-
6	21.848	0.73	26.75	-	27.48	-	60.00	50.00	-32.52	-

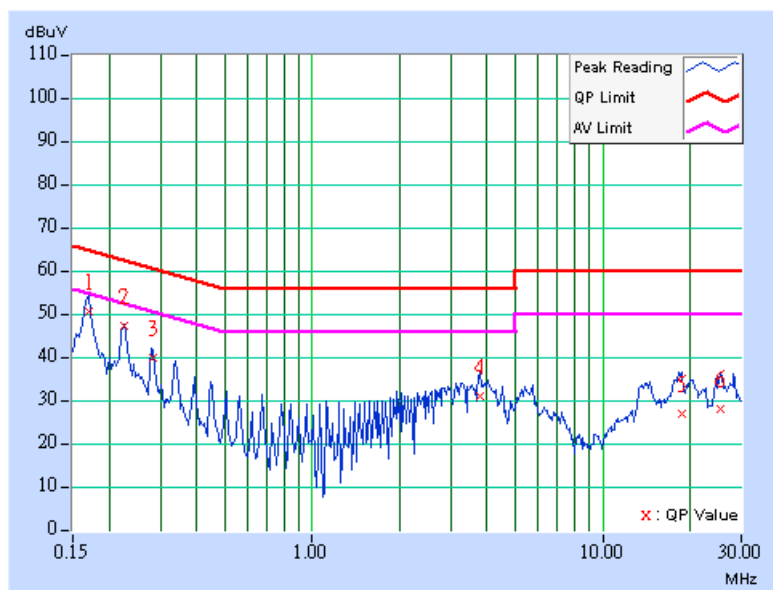
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
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<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 11	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Netural (N)
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 60%RH, 991 hPa	<b>TESTED BY:</b> Jamison Chan	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.05	50.19	-	50.24	-	64.98	54.98	-14.74	-
2	0.224	0.05	46.54	-	46.59	-	62.66	52.66	-16.07	-
3	0.283	0.05	39.27	-	39.32	-	60.73	50.73	-21.41	-
4	3.758	0.20	30.25	-	30.45	-	56.00	46.00	-25.55	-
5	18.691	0.50	26.30	-	26.80	-	60.00	50.00	-33.20	-
6	25.430	0.73	27.59	-	28.32	-	60.00	50.00	-31.68	-

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





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

**NOTE:**

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

#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	Jun. 10, 2004
* HP Preamplifier	8447D	2944A08485	May 01, 2004
* HP Spectrum Analyzer	8593E	3926A04191	
* HP Preamplifier	8449B	3008A01292	Aug. 13, 2004
ROHDE & SCHWARZ TEST RECEIVER	ESI7	838496/016	Feb. 23, 2004
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Feb. 13, 2004
SCHAFFNER Tunable Dipole Antenna	VHBA 9123	459	Jun. 26, 2004
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* CHASE BILOG Antenna	CBL6112A	2221	July 26, 2004
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jun. 30, 2004
* EMCO Turn Table	1060	1115	NA
* CHANCE Tower	CM-AT40	CM-A010	NA
* Software	ADT_Radiate d_V5.14	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 05, 2004
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jan. 05, 2004

**NOTE:** 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

2. "\*" = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. 5.
5. The VCCI Site Registration No. is R-1039.



#### 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

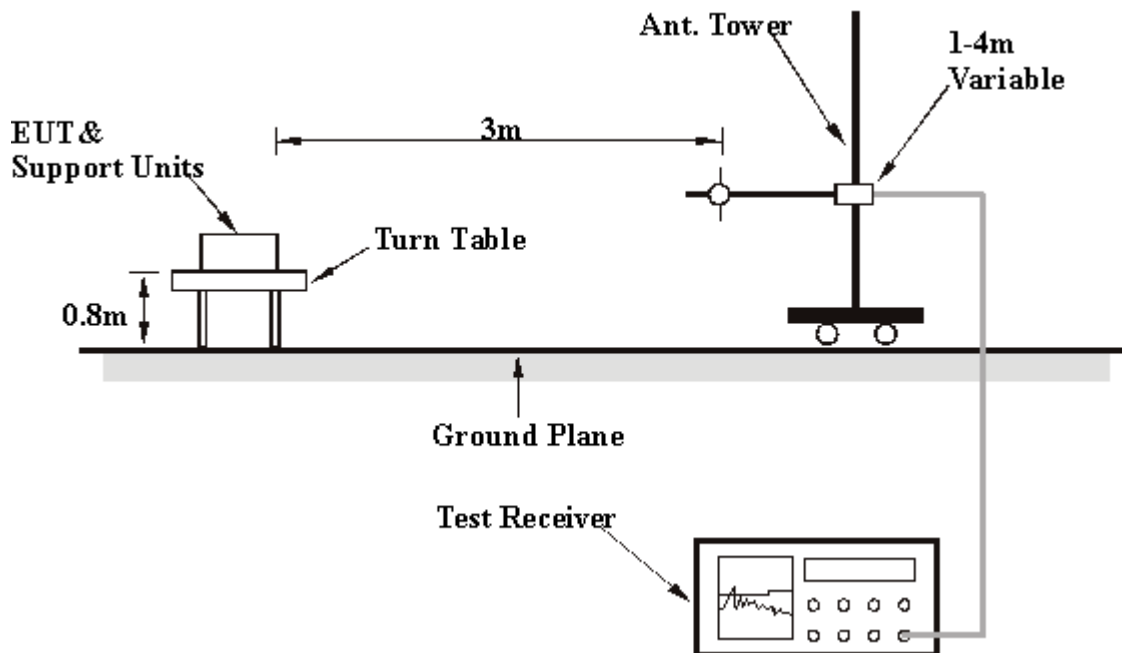
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 74 % RH, 991 hPa	<b>TESTED BY:</b> Martin Lee	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	57.21	24.23 QP	40.00	-15.77	3.00 H	157	10.85	13.38
2	133.03	31.90 QP	43.50	-11.60	2.50 H	217	18.63	13.26
3	175.79	32.73 QP	43.50	-10.77	1.50 H	229	19.86	12.87
4	265.21	29.03 QP	46.00	-16.97	1.00 H	1	15.15	13.88
5	298.26	30.28 QP	46.00	-15.72	1.00 H	229	15.23	15.05
6	360.46	26.88 QP	46.00	-19.12	1.00 H	40	10.19	16.69
7	399.34	30.72 QP	46.00	-15.28	1.00 H	61	13.03	17.69
8	432.38	26.79 QP	46.00	-19.21	2.00 H	91	8.05	18.74
9	500.42	27.85 QP	46.00	-18.15	1.75 H	124	7.83	20.02
10	533.47	35.08 QP	46.00	-10.92	1.50 H	211	14.32	20.75
11	564.57	27.96 QP	46.00	-18.04	1.50 H	229	6.41	21.55
12	599.56	30.59 QP	46.00	-15.41	1.50 H	247	8.00	22.59
13	653.99	26.27 QP	46.00	-19.73	1.50 H	223	2.96	23.31
14	702.59	33.97 QP	46.00	-12.03	1.25 H	307	9.92	24.05
15	749.24	30.03 QP	46.00	-15.97	2.00 H	169	4.70	25.33
16	811.44	27.66 QP	46.00	-18.34	1.00 H	133	1.92	25.74
17	858.10	35.10 QP	46.00	-10.90	1.00 H	133	8.80	26.30
18	916.41	28.15 QP	46.00	-17.85	1.00 H	274	0.83	27.33
19	947.52	30.88 QP	46.00	-15.12	1.50 H	118	3.20	27.68

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

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 74 % RH, 991 hPa	<b>TESTED BY:</b> Martin Lee	

<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)	Correction Factor (dB/m)
1	57.21	28.37 QP	40.00	-11.63	1.25 V	250	14.99	13.38
2	133.03	33.06 QP	43.50	-10.44	1.25 V	85	19.80	13.26
3	175.79	32.81 QP	43.50	-10.69	1.00 V	49	19.94	12.87
4	300.20	30.32 QP	46.00	-15.68	1.25 V	55	15.22	15.10
5	350.74	32.54 QP	46.00	-13.46	2.50 V	88	16.10	16.44
6	399.34	32.58 QP	46.00	-13.42	1.00 V	130	14.88	17.69
7	467.37	29.22 QP	46.00	-16.78	1.00 V	169	9.67	19.55
8	498.48	31.42 QP	46.00	-14.58	1.00 V	97	11.43	19.99
9	531.52	37.38 QP	46.00	-8.62	1.00 V	94	16.67	20.71
10	564.57	29.13 QP	46.00	-16.87	1.25 V	4	7.58	21.55
11	599.56	30.90 QP	46.00	-15.10	1.00 V	163	8.32	22.59
12	630.66	29.90 QP	46.00	-16.10	1.00 V	172	6.90	23.00
13	702.59	40.18 QP	46.00	-5.82	1.50 V	169	16.13	24.05
14	733.69	27.77 QP	46.00	-18.23	1.50 V	169	2.87	24.90
15	766.73	27.49 QP	46.00	-18.51	1.75 V	61	2.05	25.44
16	799.78	29.05 QP	46.00	-16.95	1.50 V	136	3.43	25.62
17	858.10	37.29 QP	46.00	-8.71	1.25 V	166	10.99	26.30
18	912.53	29.96 QP	46.00	-16.04	1.25 V	163	2.68	27.28
19	947.52	33.02 QP	46.00	-12.98	1.25 V	340	5.34	27.68

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



## 4.2.8 TEST RESULTS ( A )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 1	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.13 PK	74.00	-13.87	1.00 H	275	30.48	29.65
1	2390.00	51.07 AV	54.00	-2.93	1.00 H	275	21.42	29.65
2	*2412.00	114.30 PK			1.00 H	275	84.58	29.72
2	*2412.00	105.24 AV			1.00 H	275	75.52	29.72
3	4824.00	54.74 PK	74.00	-19.26	1.85 H	3	19.29	35.45
3	4824.00	38.39 AV	54.00	-15.61	1.85 H	3	2.94	35.45
4	7236.00	60.45 PK	74.00	-13.55	2.00 H	283	19.82	40.63
4	7236.00	46.50 AV	54.00	-7.50	2.00 H	283	5.87	40.63
5	9648.00	57.54 PK	74.00	-16.46	1.79 H	307	13.08	44.46
5	9648.00	46.25 AV	54.00	-7.75	1.79 H	307	1.79	44.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.54 PK	74.00	-16.46	1.00 V	64	27.89	29.65
1	2390.00	48.58 AV	54.00	-5.42	1.00 V	64	18.93	29.65
2	*2412.00	111.71 PK			1.00 V	64	81.99	29.72
2	*2412.00	102.75 AV			1.00 V	64	73.03	29.72
3	4824.00	57.74 PK	74.00	-16.26	1.03 V	274	22.29	35.45
3	4824.00	41.84 AV	54.00	-12.16	1.03 V	274	6.39	35.45
4	7236.00	60.03 PK	74.00	-13.97	2.35 V	316	19.40	40.63
4	7236.00	46.01 AV	54.00	-7.99	2.35 V	316	5.38	40.63
5	9648.00	58.23 PK	74.00	-15.77	2.61 V	312	13.77	44.46
5	9648.00	49.81 AV	54.00	-4.19	2.61 V	312	5.35	44.46

**REMARKS:**

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

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 6	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

<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)	Correction Factor (dB/m)
1	2390.00	55.0 PK	74.00	-19.00	1.09 H	239	25.40	29.60
1	*2437.00	116.46 PK			1.04 H	274	86.67	29.79
1	*2437.00	107.58 AV			1.04 H	274	77.79	29.79
2	4874.00	55.52 PK	74.00	-18.48	1.66 H	276	19.73	35.79
2	4874.00	37.84 AV	54.00	-16.16	1.66 H	276	2.05	35.79
3	7311.00	62.23 PK	74.00	-11.77	2.10 H	273	21.57	40.67
3	7311.00	46.62 AV	54.00	-7.38	2.10 H	273	5.96	40.67
4	9748.00	56.23 PK	74.00	-17.77	2.12 H	14	12.03	44.20
4	9748.00	42.05 AV	54.00	-11.95	2.12 H	14	-2.15	44.20

<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)	Correction Factor (dB/m)
1	*2437.00	113.20 PK			1.24 V	33	83.41	29.79
1	*2437.00	103.50 AV			1.24 V	33	73.71	29.79
2	4874.00	59.38 PK	74.00	-14.62	1.24 V	33	23.59	35.79
2	4874.00	42.52 AV	54.00	-11.48	1.24 V	33	6.73	35.79
3	7310.00	65.06 PK	74.00	-8.94	2.00 V	266	24.40	40.66
3	7310.00	44.08 AV	54.00	-9.92	2.00 V	266	3.42	40.66

**REMARKS:**

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

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	112.94 PK			1.00 H	275	83.09	29.85
1	*2462.00	104.80 AV			1.00 H	275	74.95	29.85
2	2483.50	55.85 PK	74.00	-18.15	1.00 H	275	25.94	29.91
2	2483.50	47.71 AV	54.00	-6.29	1.00 H	275	17.80	29.91
3	4924.00	54.18 PK	74.00	-19.82	2.07 H	308	18.09	36.09
3	4924.00	37.99 AV	54.00	-16.01	2.07 H	308	1.90	36.09
4	7386.00	60.21 PK	74.00	-13.79	1.96 H	273	19.18	41.02
4	7386.00	45.64 AV	54.00	-8.36	1.96 H	273	4.61	41.02
5	9848.00	48.96 PK	74.00	-25.04	2.25 H	294	4.86	44.10
6	12310.00	57.92 PK	74.00	-16.08	1.34 H	248	11.98	45.94
6	12310.00	44.51 AV	54.00	-9.49	1.34 H	248	-1.43	45.94

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	110.67 PK			1.00 V	75	80.82	29.85
1	*2462.00	101.68 AV			1.00 V	75	71.83	29.85
2	2462.00	53.58 PK	74.00	-20.42	1.00 V	75	23.73	29.85
2	2462.00	44.59 AV	54.00	-9.41	1.00 V	75	14.74	29.85
3	4924.00	57.20 PK	74.00	-16.80	1.52 V	91	21.11	36.09
3	4924.00	40.10 AV	54.00	-13.90	1.52 V	91	4.01	36.09
4	7386.00	60.32 PK	74.00	-13.68	2.54 V	322	19.29	41.02
4	7386.00	46.33 AV	54.00	-7.67	2.54 V	322	5.30	41.02
5	9848.00	57.03 PK	74.00	-16.97	1.00 V	230	12.93	44.10
5	9848.00	47.73 AV	54.00	-6.27	1.00 V	230	3.63	44.10

**REMARKS:**

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

## 4.2.9 TEST RESULTS ( B )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 1	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.13 PK	74.00	-11.87	1.00 H	0	32.48	29.65
<b>1</b>	<b>2390.00</b>	<b>51.99 AV</b>	<b>54.00</b>	<b>-2.01</b>	<b>1.00 H</b>	<b>0</b>	<b>22.34</b>	<b>29.65</b>
2	*2412.00	109.53 PK			1.00 H	0	79.81	29.72
2	*2412.00	99.39 AV			1.00 H	0	69.67	29.72
3	4824.00	51.50 PK	74.00	-22.50	1.85 H	215	16.05	35.45
3	4824.00	32.98 AV	54.00	-21.02	1.85 H	215	-2.47	35.45
4	7236.00	52.04 PK	74.00	-21.96	1.71H	230	11.41	40.63
4	7236.00	38.34 AV	54.00	-15.66	1.71H	230	-2.29	40.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.75 PK	74.00	-17.25	2.24 H	238	27.10	29.65
1	2390.00	47.03 AV	54.00	-6.97	2.24 H	238	17.38	29.65
2	*2412.00	104.15 PK			2.24 H	238	74.43	29.72
2	*2412.00	94.43 AV			2.24 H	238	64.71	29.72
3	4824.00	46.04 PK	74.00	-27.96	1.26 H	231	10.59	35.45
3	4824.00	32.50 AV	54.00	-21.50	1.26 H	231	-2.95	35.45

**REMARKS:**

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



<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 6	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

<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)	Correction Factor (dB/m)
1	*2437.00	109.91 PK			1.22 H	99	80.12	29.79
1	*2437.00	99.52 AV			1.22 H	99	69.73	29.79
2	4874.00	45.52 PK	74.00	-28.48	1.61 H	170	9.73	35.79

<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)	Correction Factor (dB/m)
1	*2437.00	103.70 PK			1.53 V	168	73.91	29.79
1	*2437.00	93.44 AV			1.53 V	168	63.65	29.79
2	4874.00	46.13 PK	74.00	-27.87	1.14 V	273	10.34	35.79

**REMARKS:**

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

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

<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)	Correction Factor (dB/m)
1	*2462.00	109.51 PK			1.26 H	96	79.66	29.85
1	*2462.00	100.72 AV			1.26 H	96	70.87	29.85
2	2483.60	59.51 PK	74.00	-14.49	1.26 H	96	29.60	29.91
2	2483.60	50.72 AV	54.00	-3.28	1.26 H	96	20.81	29.91
3	4924.00	49.05 PK	74.00	-24.95	1.00 H	24	12.96	36.09
3	4924.00	40.26 AV	54.00	-13.74	1.00 H	24	4.17	36.09

<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)	Correction Factor (dB/m)
1	*2462.00	104.65 PK			1.03 V	65	74.80	29.85
1	*2462.00	94.27 AV			1.03 V	65	64.42	29.85
2	2483.60	54.65 PK	74.00	-19.35	1.03 V	65	24.74	29.91
2	2483.60	44.27 AV	54.00	-9.73	1.03 V	65	14.36	29.91
3	4924.00	47.70 PK	74.00	-26.30	1.35 V	147	11.61	36.09
3	4924.00	37.32 AV	54.00	-16.68	1.35 V	147	1.23	36.09

**REMARKS:**

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

## 4.2.10 TEST RESULTS ( C )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>MODE</b>	Channel 6	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	30 deg. C, 60 % RH, 991 hPa	<b>TESTED BY:</b> Hardaway Lee	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	104.83 PK			2.11 H	199	75.04	29.79
1	*2437.00	95.47 AV			2.11 H	199	65.68	29.79
2	2483.50	52.57 PK	74.00	-21.43	2.11 H	199	22.66	29.91
2	2483.50	43.24 AV	54.00	-10.76	2.11 H	199	13.33	29.91
3	2483.50	58.61 PK	74.00	-15.39	2.11 H	199	28.70	29.91
3	2483.50	49.25 AV	54.00	-4.75	2.11 H	199	19.34	29.91
4	4874.00	45.59 PK	74.00	-28.41	1.21 H	230	9.80	35.79

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.63 PK	74.00	-18.37	1.42 V	71	25.98	29.65
1	2390.00	46.31 AV	54.00	-7.69	1.42 V	71	16.66	29.65
2	*2437.00	101.85 PK			1.42 V	71	72.06	29.79
2	*2437.00	92.53 AV			1.42 V	71	62.74	29.79
3	2483.50	49.59 PK	74.00	-24.41	1.42 V	71	19.68	29.91
4	4874.00	44.98 PK	74.00	-29.02	1.25 V	275	9.19	35.79

**REMARKS:**

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

### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST INSTRUMENTS

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

**NOTE:**

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



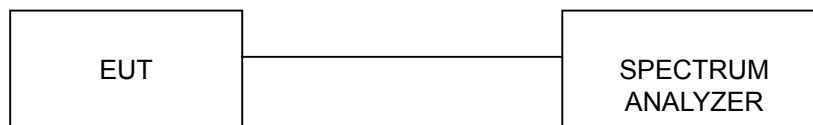
#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



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

#### 4.3.6 EUT OPERATING CONDITIONS

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

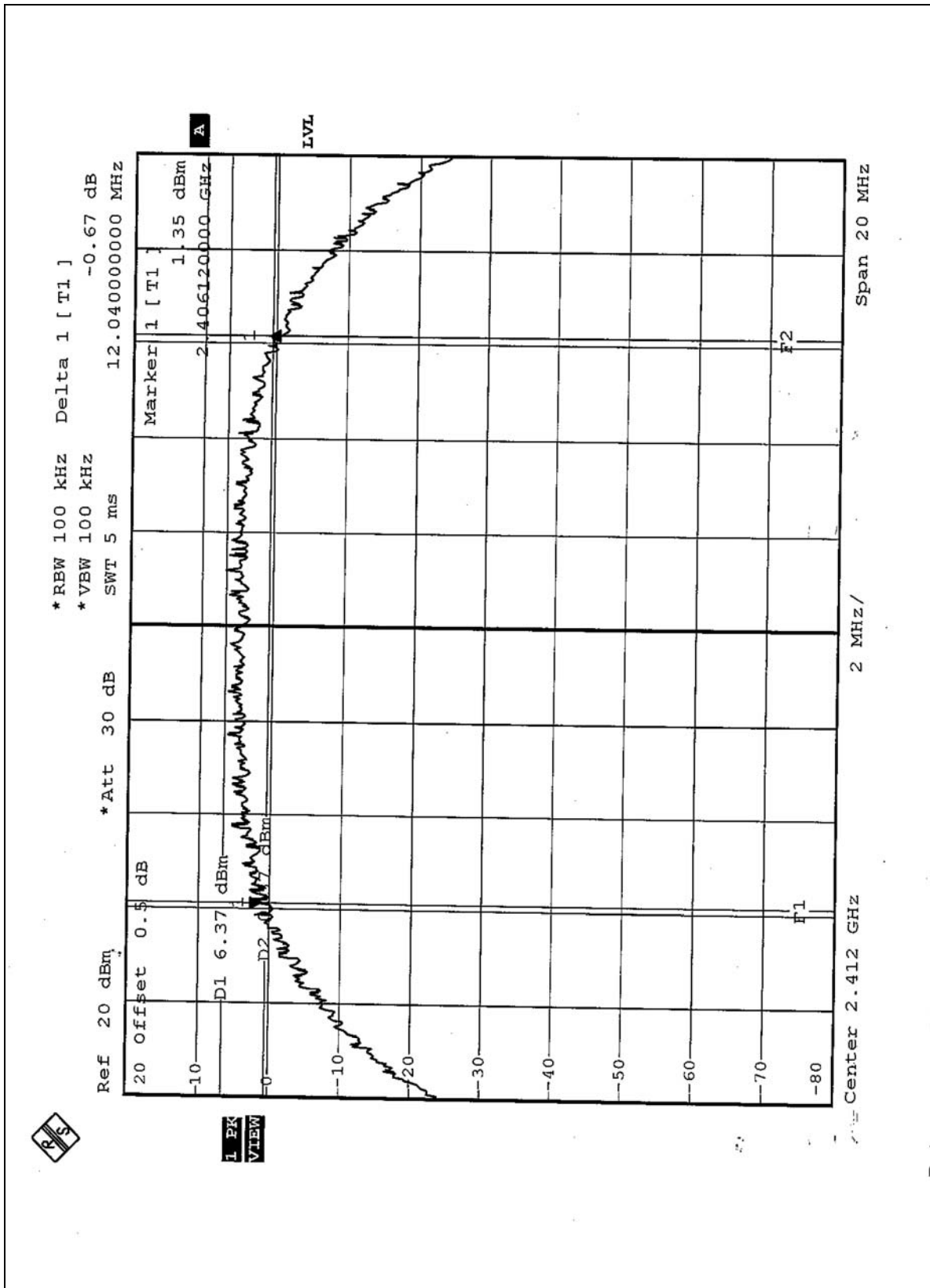


## 4.3.7 TEST RESULTS ( A )

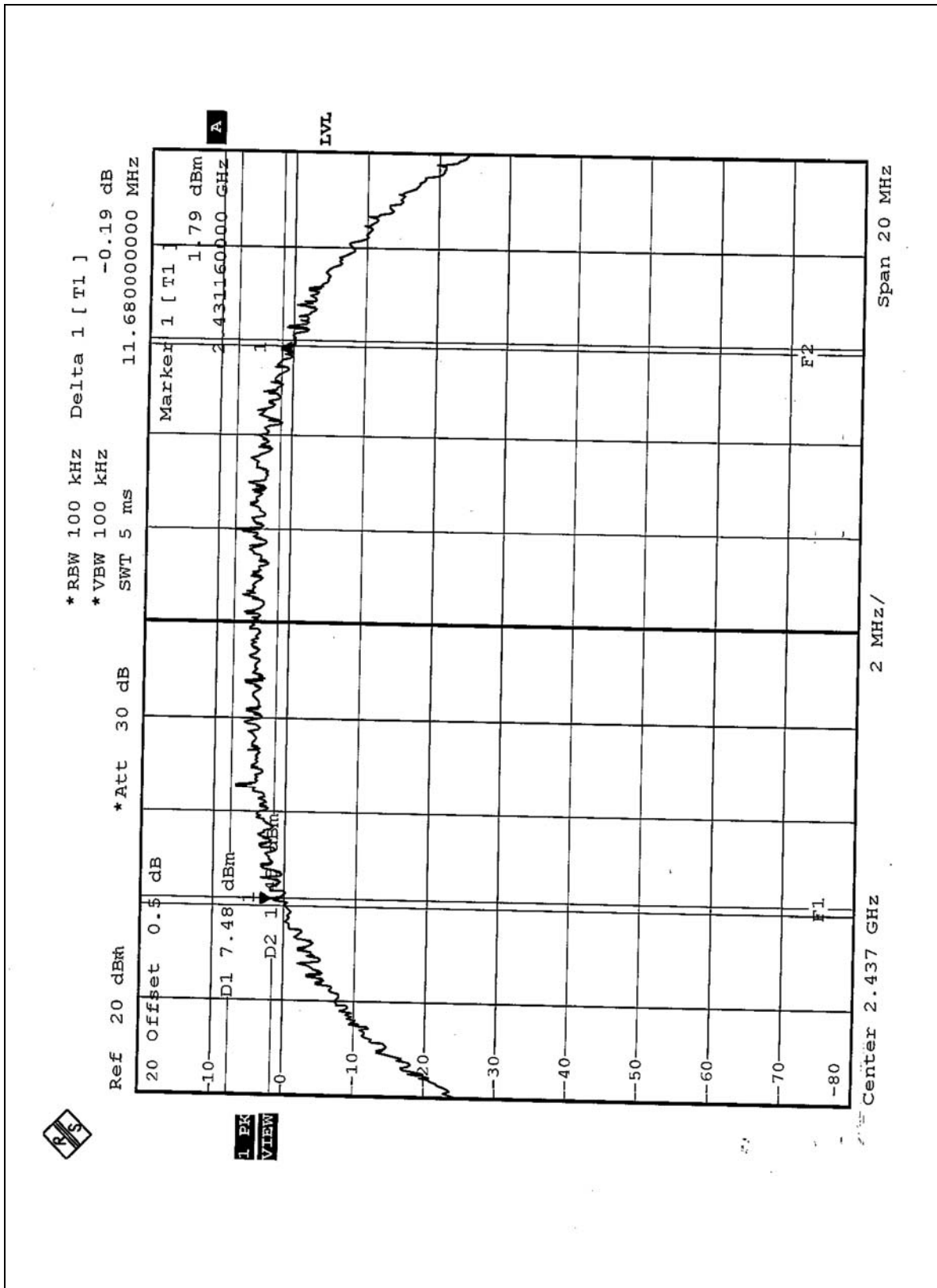
<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	12.04	0.5	PASS
6	2437	11.68	0.5	PASS
11	2462	11.60	0.5	PASS

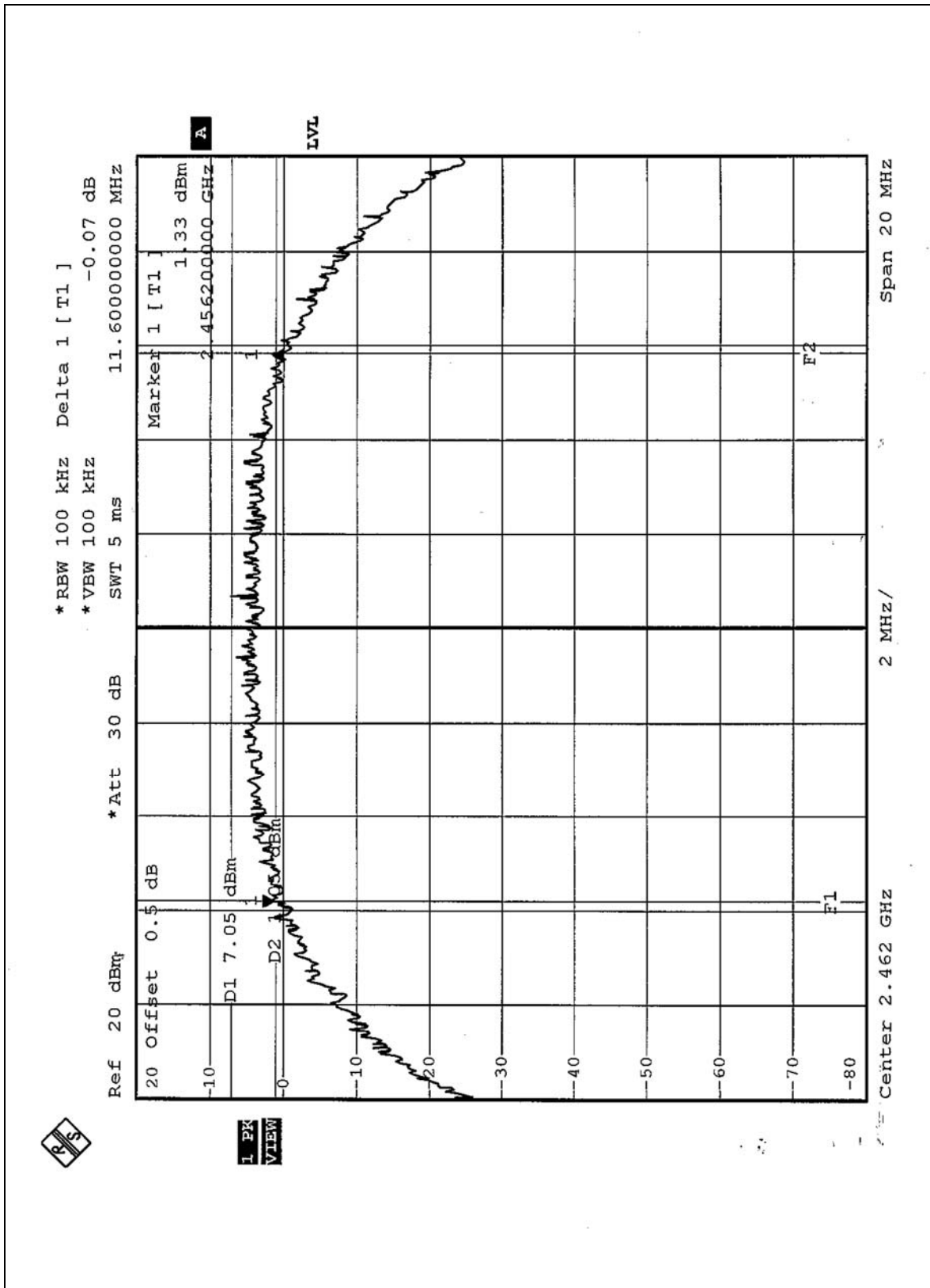
## CH1



## CH6



## CH11



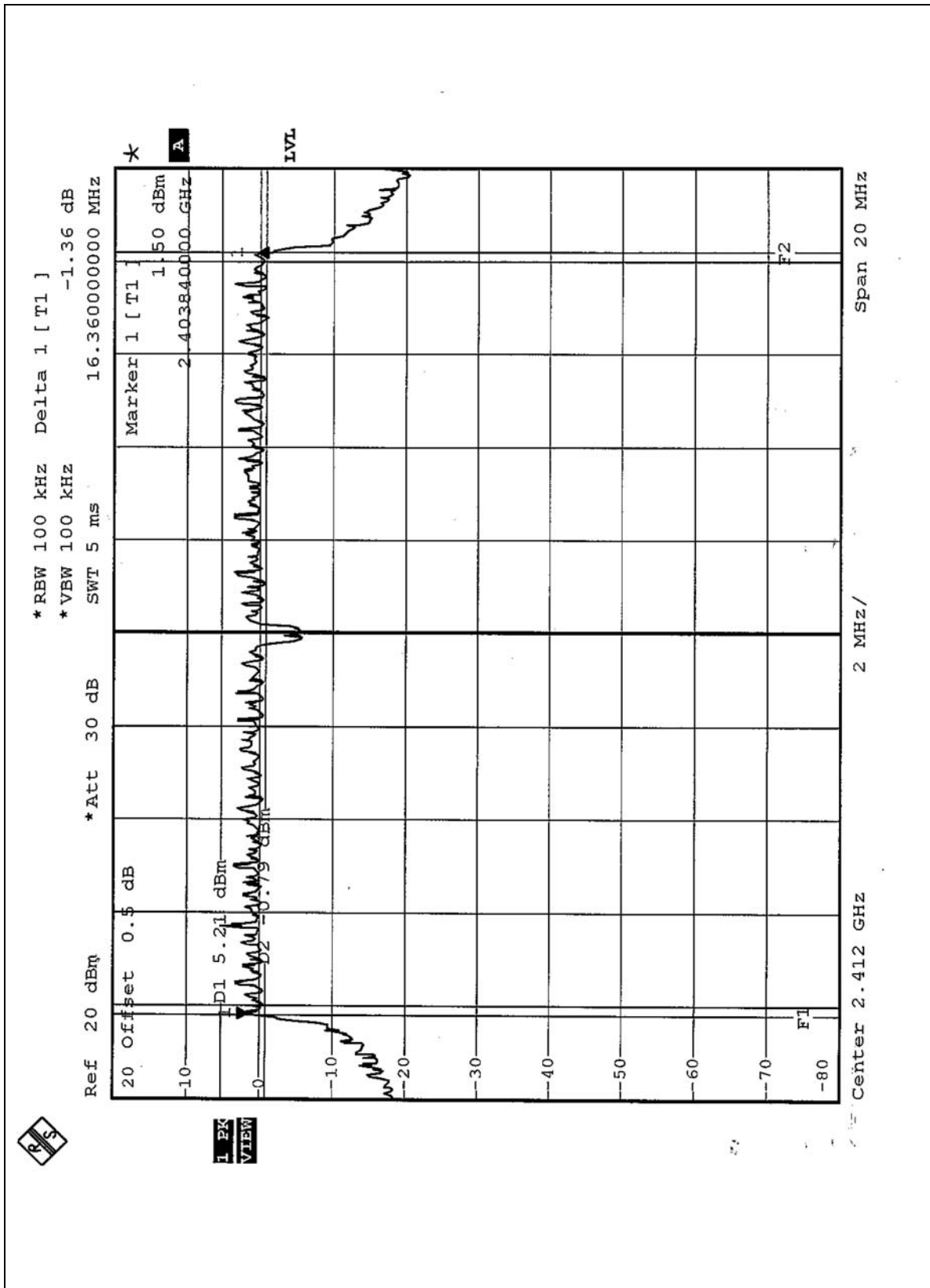


## 4.3.8 TEST RESULTS ( B )

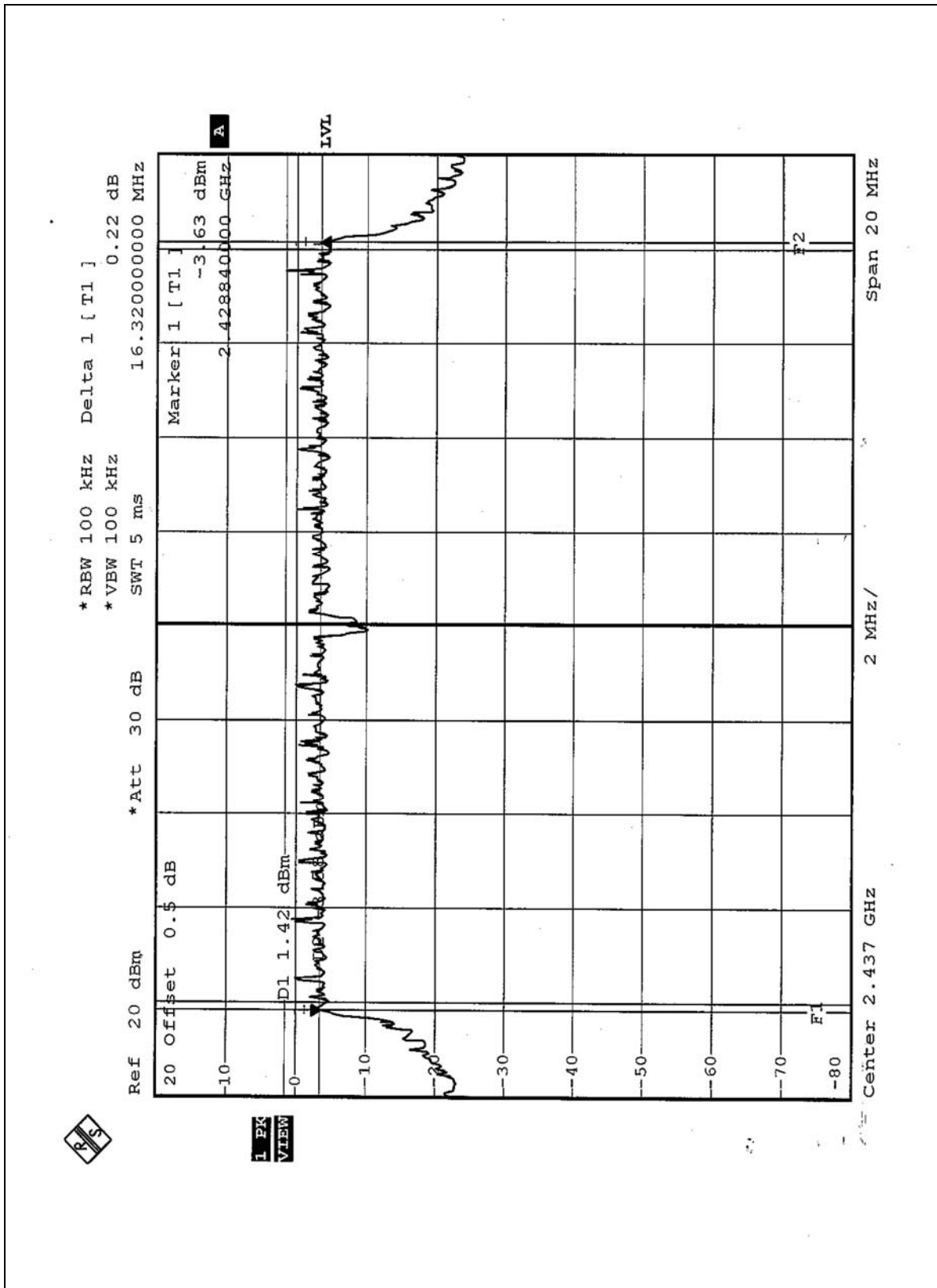
<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	16.36	0.5	PASS
6	2437	16.32	0.5	PASS
11	2462	16.40	0.5	PASS

## CH1

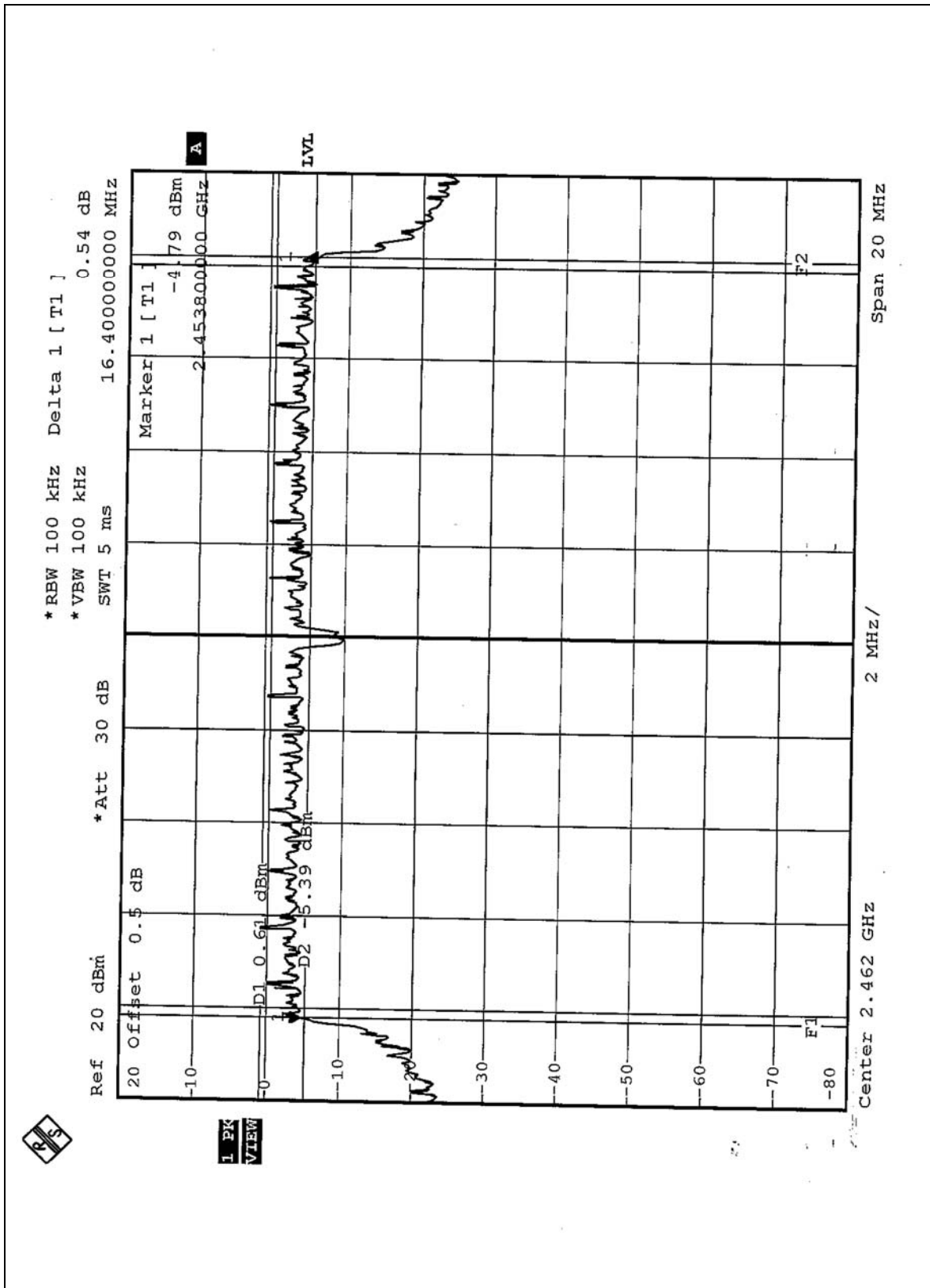


## CH6





## CH11



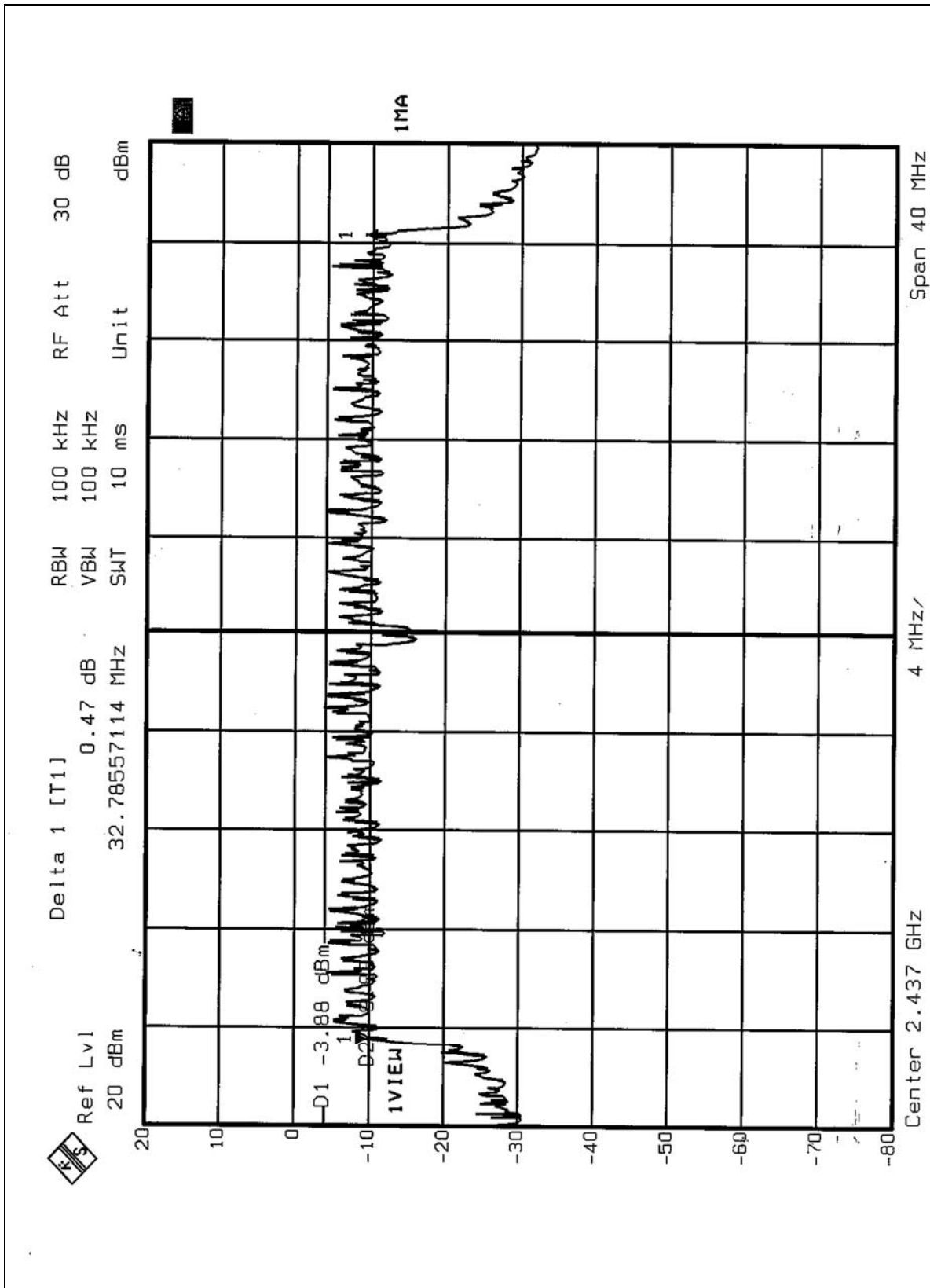


## 4.3.9 TEST RESULTS ( C )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
6	2437	32.79	0.5	PASS

## CH1



#### 4.4 MAXIMUM PEAK OUTPUT POWER

##### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004
R&S SIGNAL GENERATOR	SMP04	100011	May 28, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	B048470	Mar. 05, 2004
NARDA DETECTOR	4503A	FSCM99899	NA

**NOTE:**

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

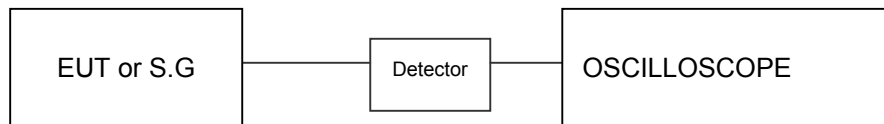
#### 4.4.3 TEST PROCEDURES

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

#### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

## 4.4.7 TEST RESULTS ( A )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	20.03	30	PASS
6	2437	21.38	30	PASS
11	2462	18.92	30	PASS

## 4.4.8 TEST RESULTS ( B )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	21.62	30	PASS
6	2437	22.00	30	PASS
11	2462	21.12	30	PASS

## 4.4.9 TEST RESULTS ( C )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
6	2437	20.35	30	PASS

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

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

**NOTE:**

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



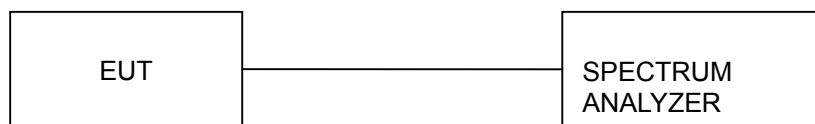
#### 4.5.3 TEST PROCEDURE

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

#### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.5.5 TEST SETUP



#### 4.5.6 EUT OPERATING CONDITIONS

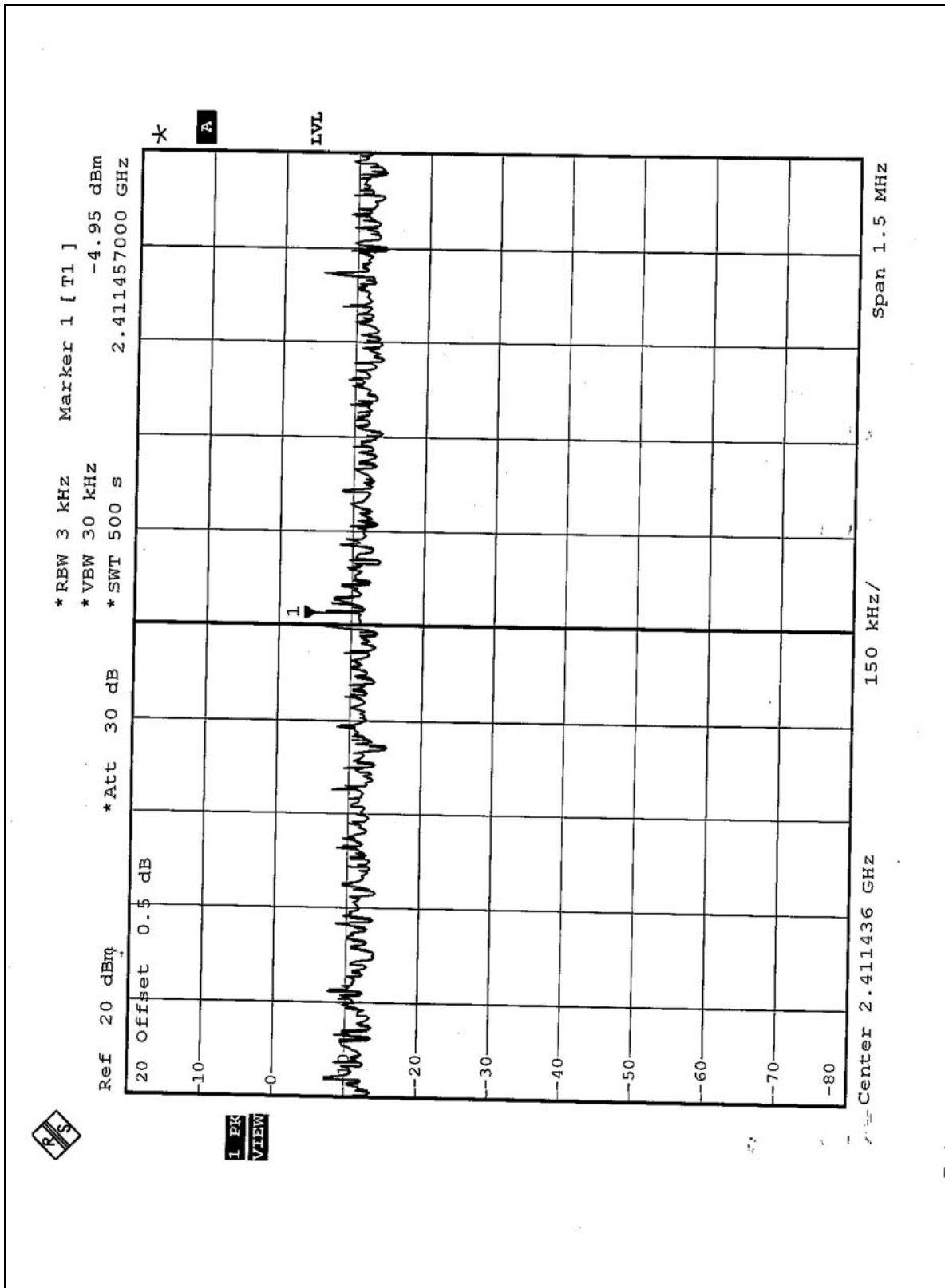
Same as 4.3.6

## 4.5.7 TEST RESULTS ( A )

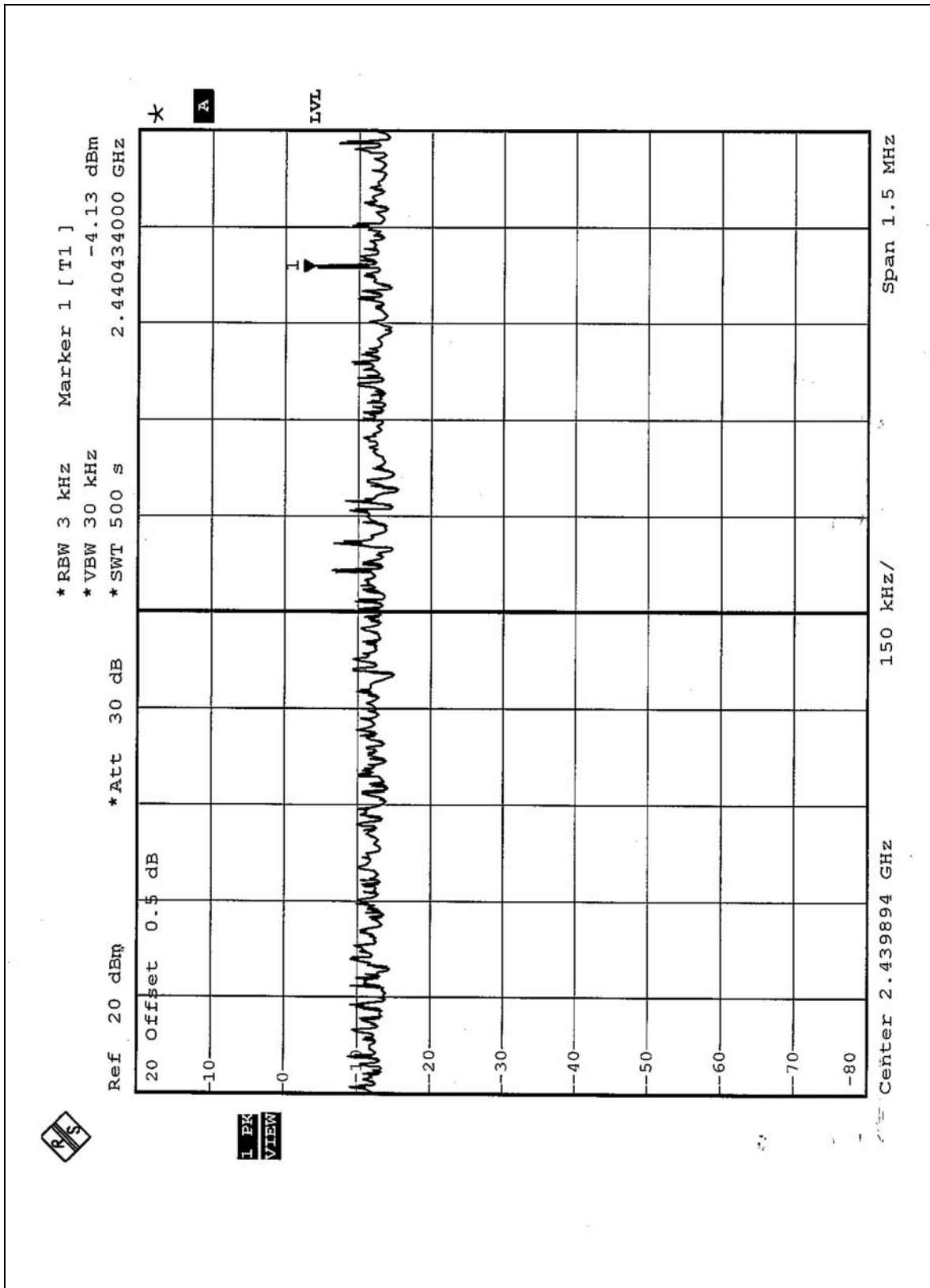
<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

<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	-4.95	8	PASS
6	2437	-4.13	8	PASS
11	2462	-4.37	8	PASS

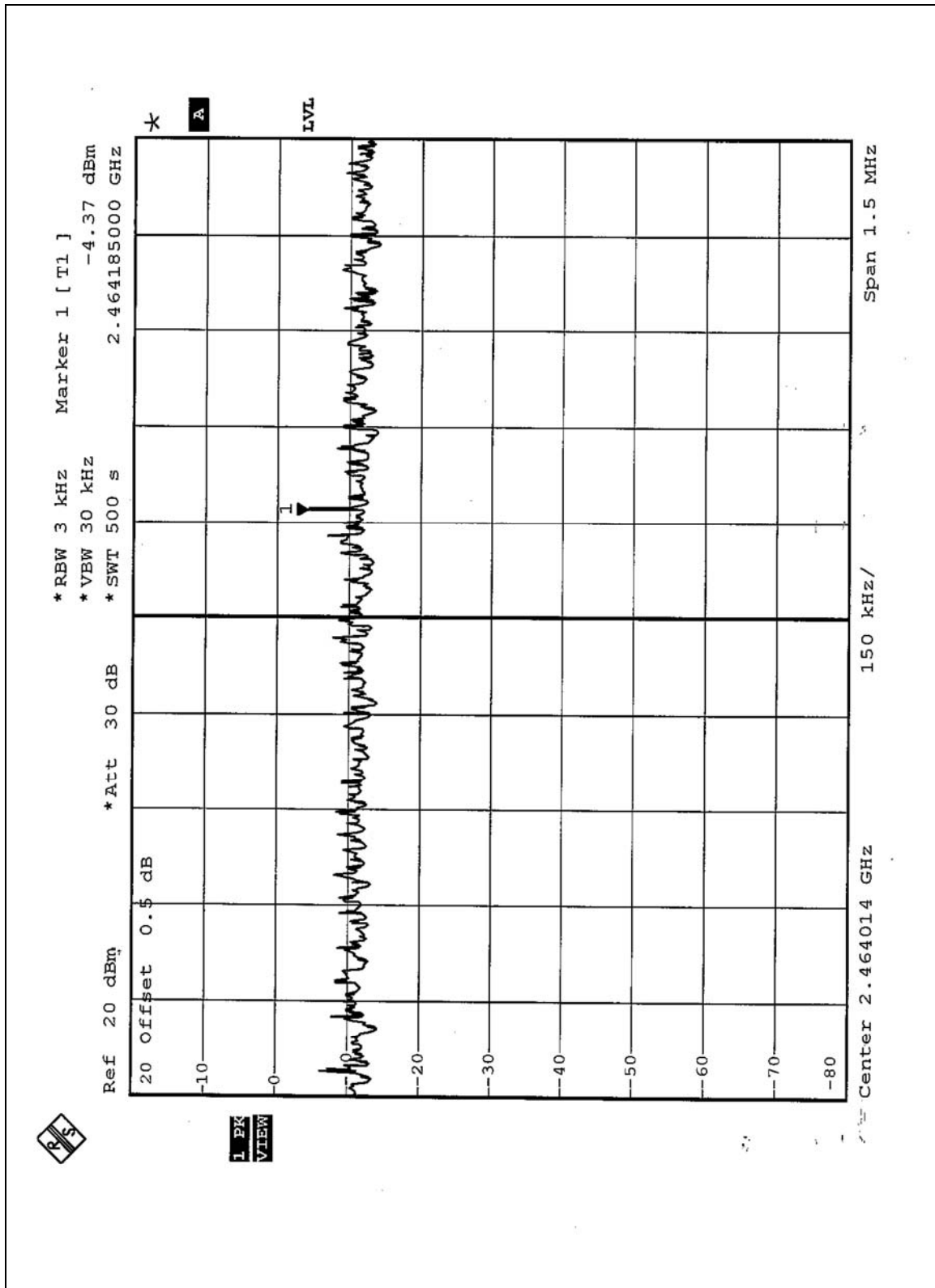
## CH1



## CH6



## CH11



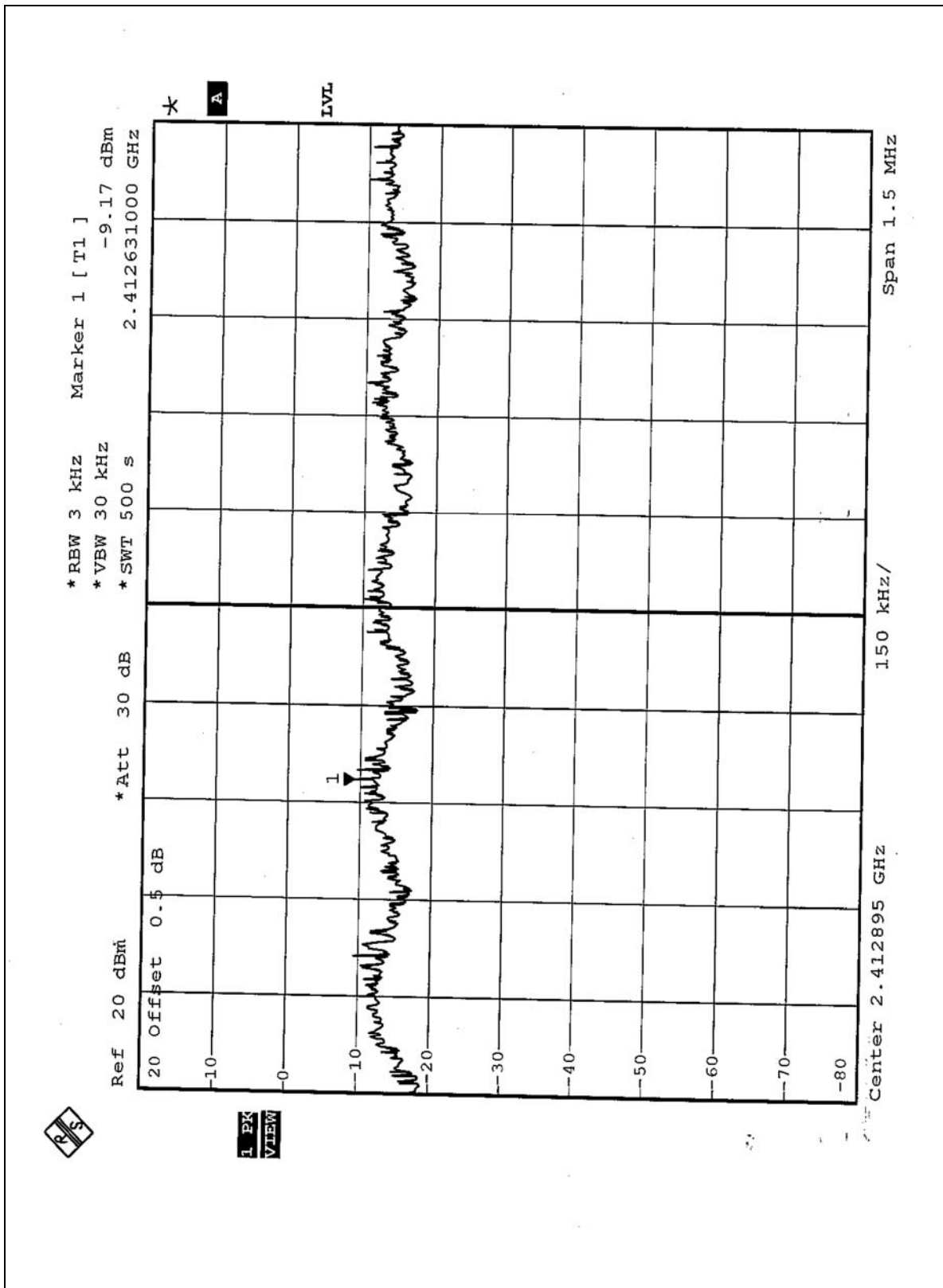
## 4.5.8 TEST RESULTS ( B )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

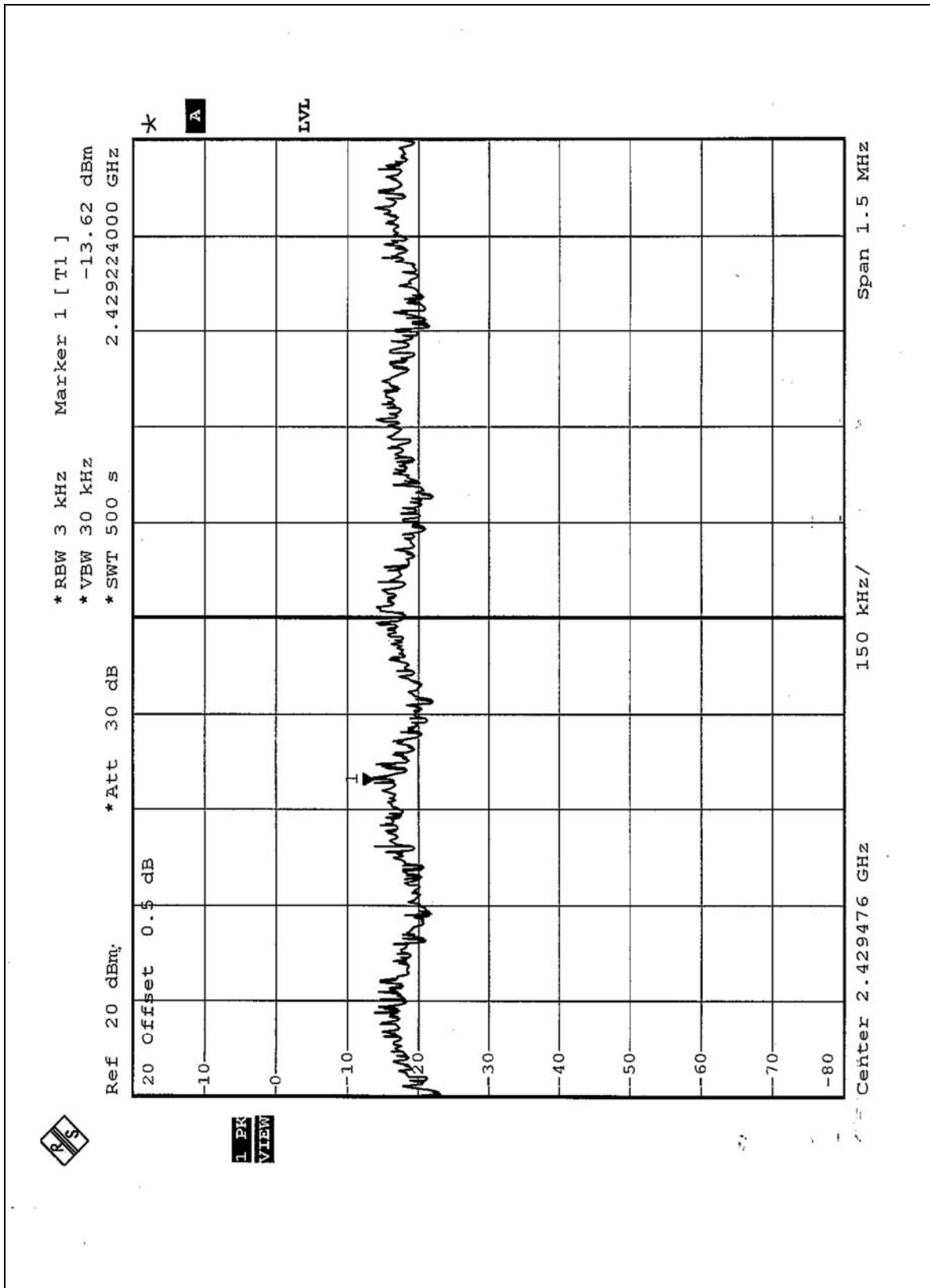
<b>CHANNEL NUMBER</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 KHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	2412	-9.17	8	PASS
6	2437	-13.62	8	PASS
11	2462	-12.72	8	PASS



## CH1

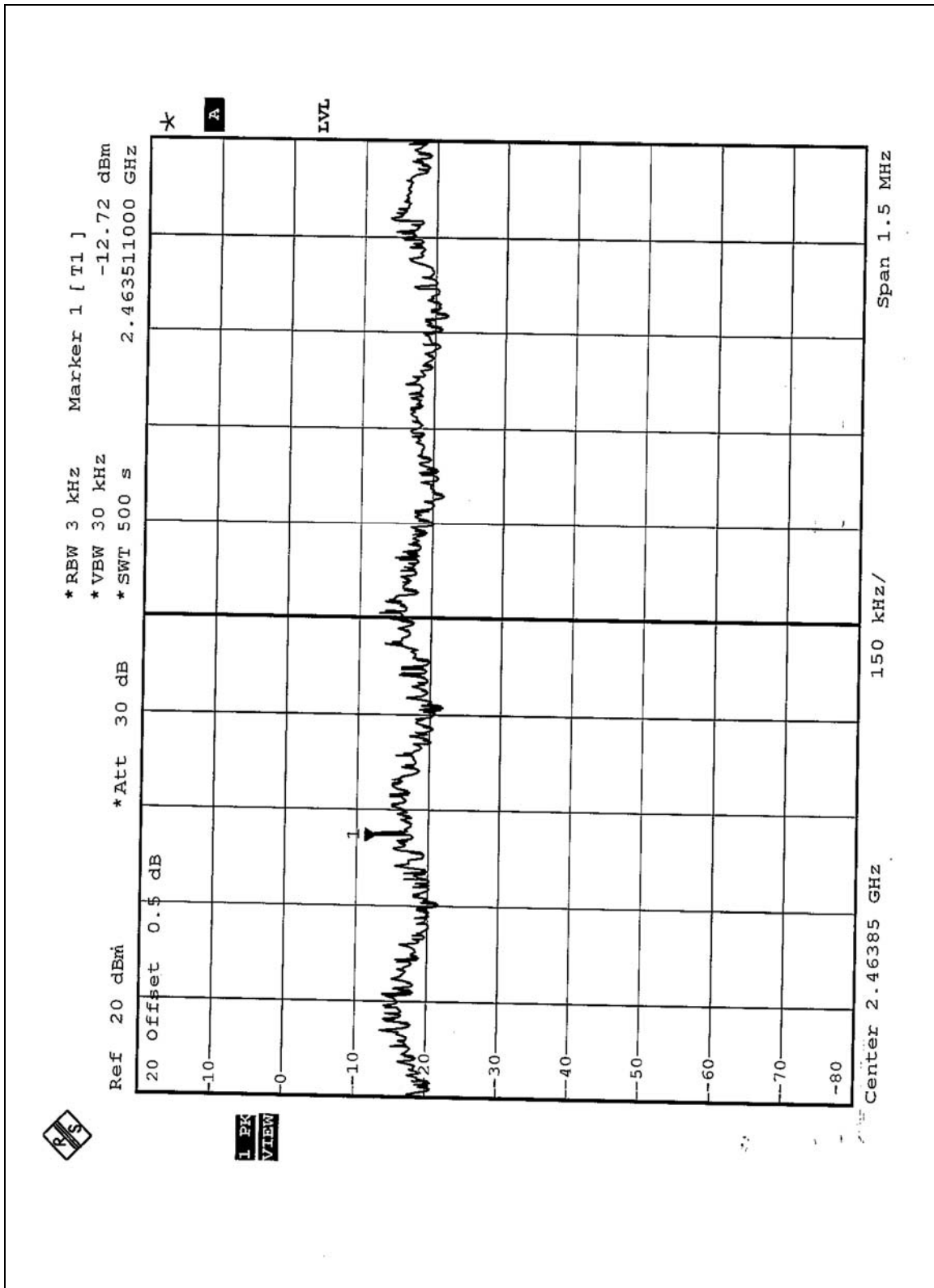


## CH6





## CH11

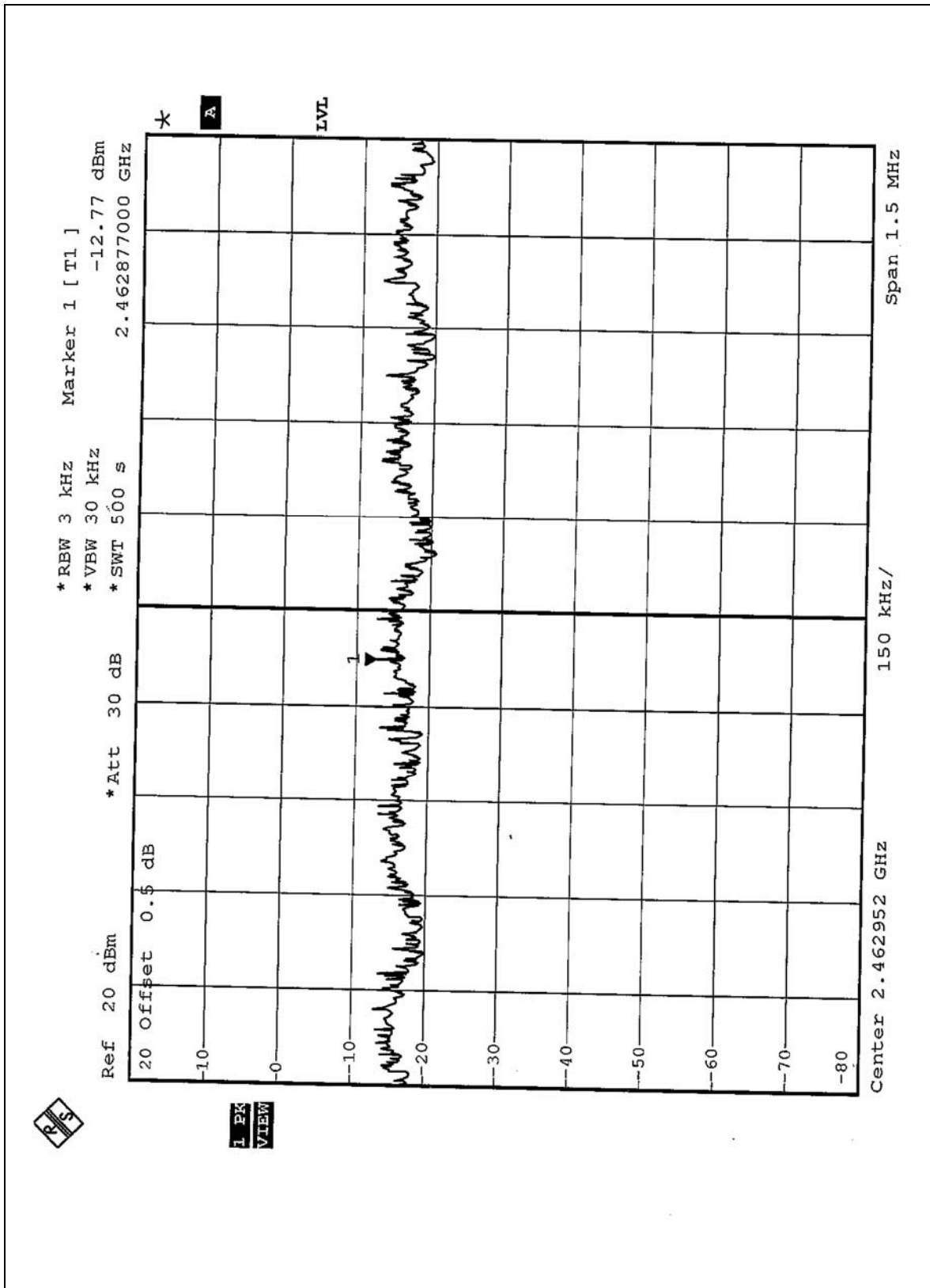


## 4.5.9 TEST RESULTS ( C )

<b>EUT</b>	Atheros 11g Card Bus Adapter	<b>MODEL</b>	NL-3054CB Plus Aries2
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65%RH, 991 hPa
<b>TESTED BY:</b> Jamison Chan			

<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>
6	2437	-7.46	8	PASS

## CH6



## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

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

**NOTE:**

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

### 4.6.3 TEST PROCEDURE

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

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6



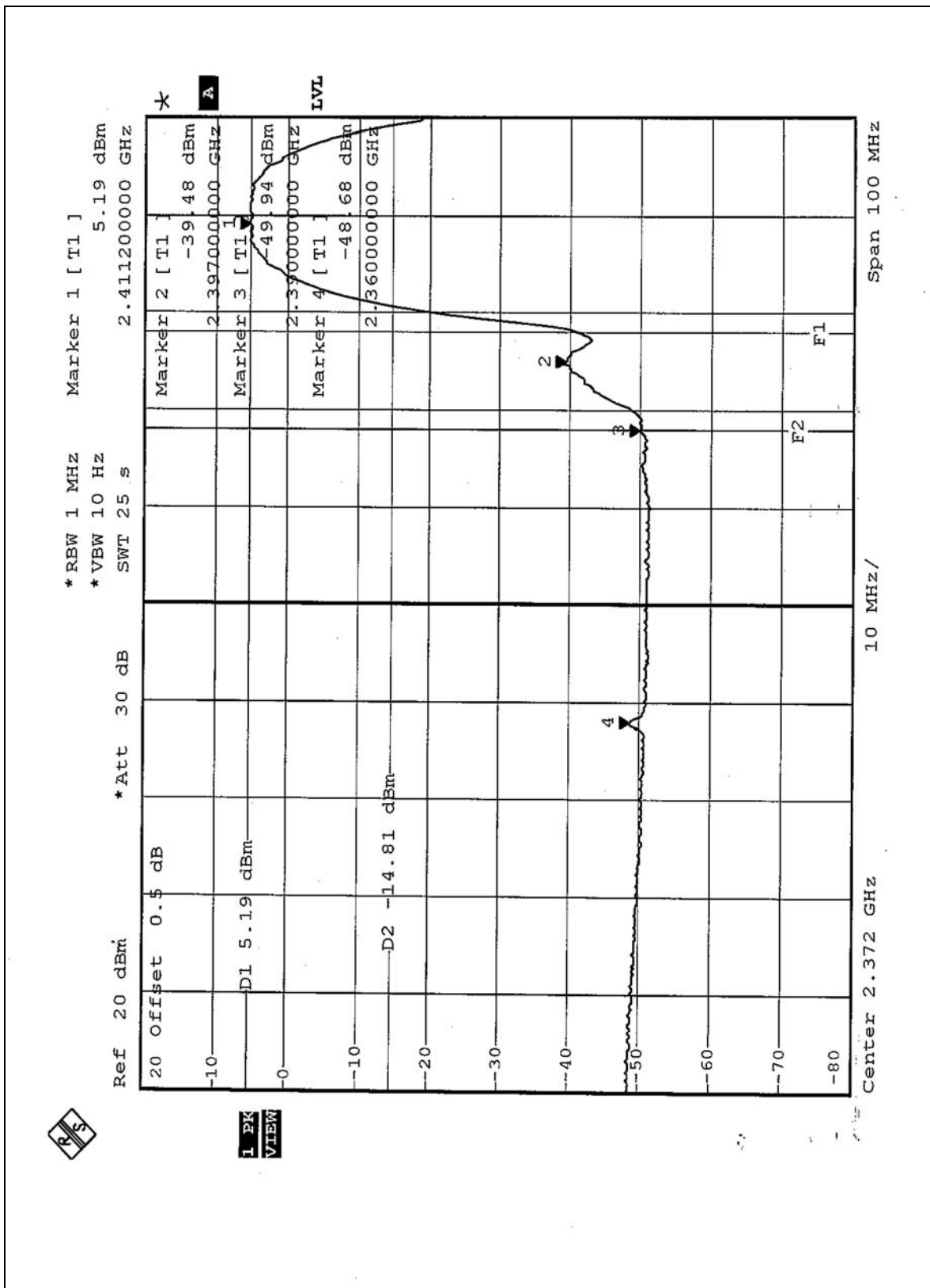
#### 4.6.6 TEST RESULTS ( A )

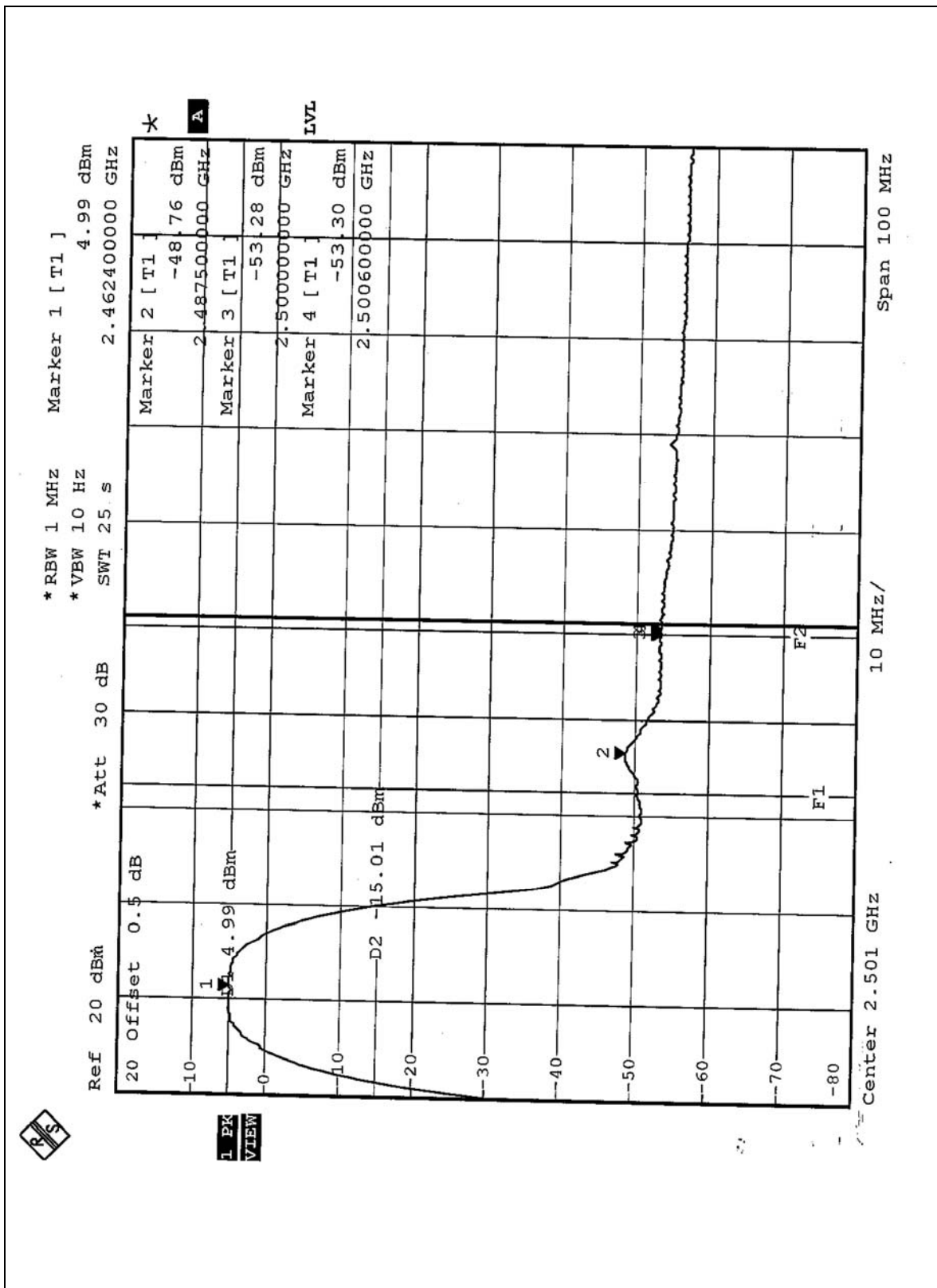
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

**NOTE:**

The band edge emission plot on the following first pages shows 53.87dB delta between carrier maximum power and local maximum emission in restrict band (2.3600GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.8 is 105.24dBuV/m, so the maximum field strength in restrict band is  $105.24 - 53.87 = 51.37$ dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following second pages shows 53.75dB delta between carrier maximum power and local maximum emission in restrict band (2.4875GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.8 is 104.80dBuV/m, so the maximum field strength in restrict band is  $104.80 - 53.75 = 51.05$ dBuV/m which is under 54 dBuV/m limit.







#### 4.6.7 TEST RESULTS ( B )

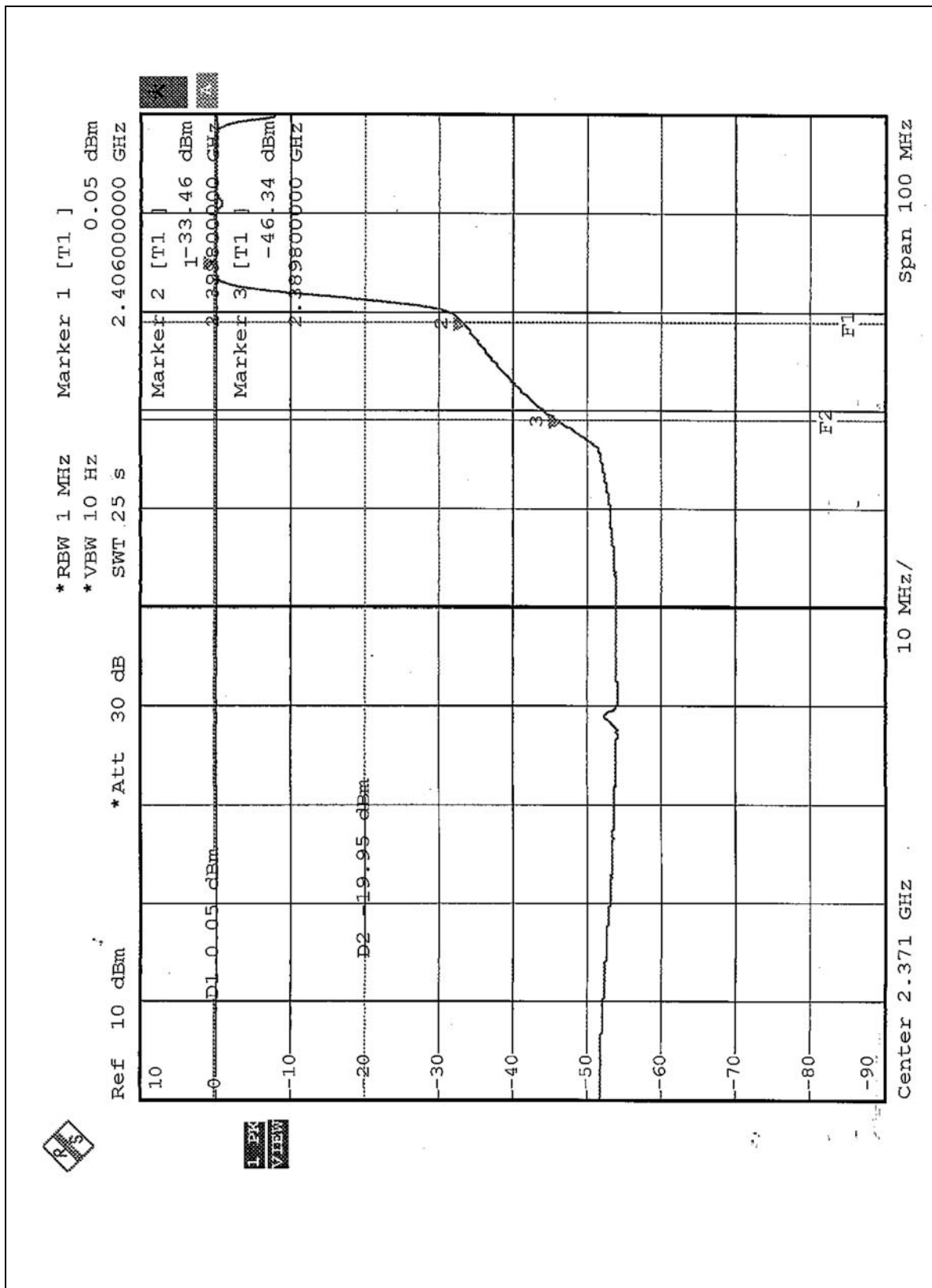
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

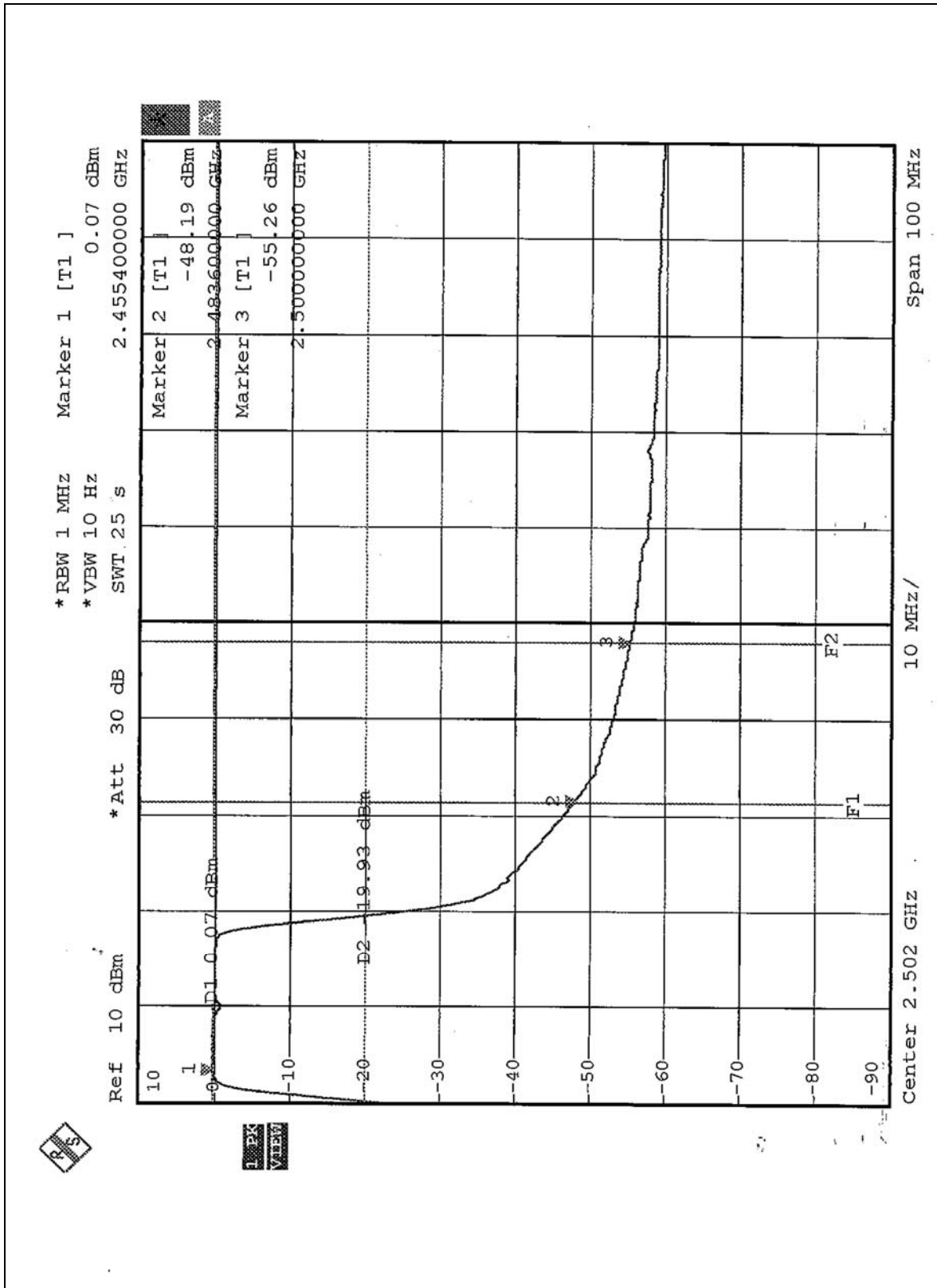
**NOTE:**

The band edge emission plot on the following first pages shows 46.39dB delta between carrier maximum power and local maximum emission in restrict band (2.3898GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.9 is 99.39dBuV/m, so the maximum field strength in restrict band is  $99.39 - 46.39 = 53.00$  dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following second pages shows 48.26dB delta between carrier maximum power and local maximum emission in restrict band (2.4836GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.9 is 100.72dBuV/m, so the maximum field strength in restrict band is  $100.72 - 48.26 = 52.46$  dBuV/m which is under 54 dBuV/m limit.









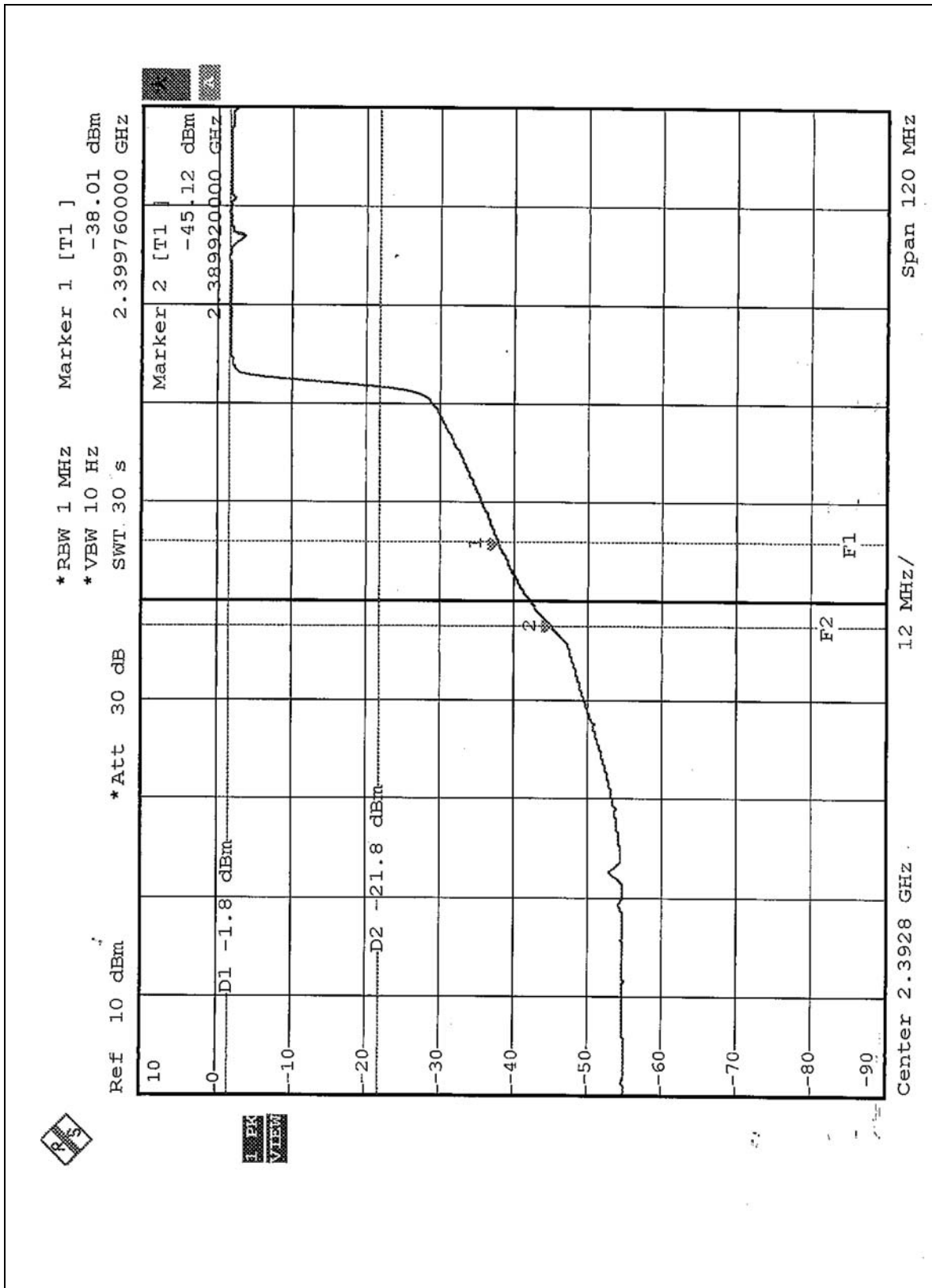
#### 4.6.8 TEST RESULTS ( C )

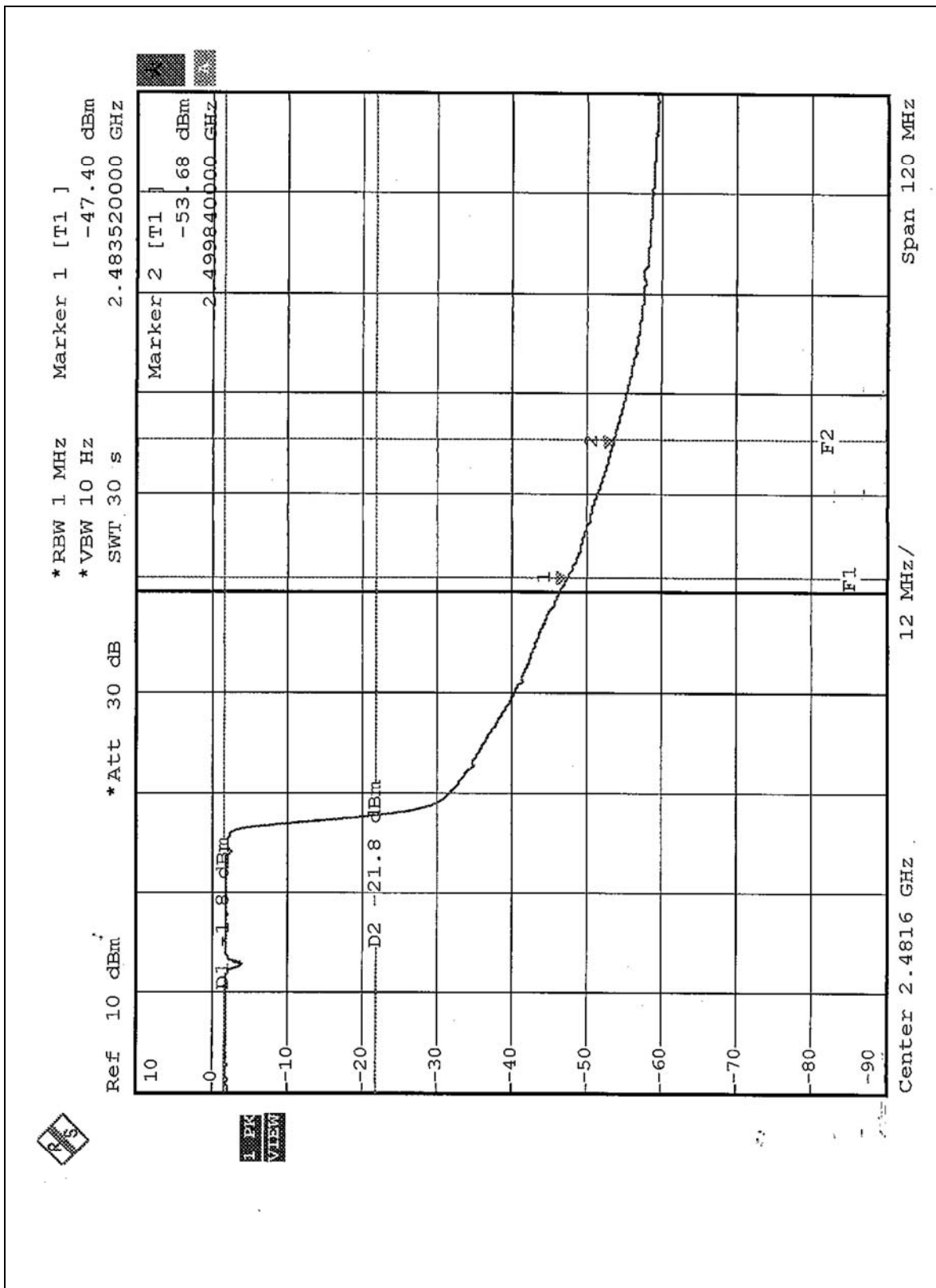
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

**NOTE:**

The band edge emission plot on the following first pages shows 43.32dB delta between carrier maximum power and local maximum emission in restrict band (2.3899GHz). The emission of carrier strength list in the test result of channel 6 at the item 4.2.10 is 95.47dBuV/m, so the maximum field strength in restrict band is  $95.47 - 43.32 = 52.15$  dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following second pages shows 45.60dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 6 at the item 4.2.10 is 95.47dBuV/m, so the maximum field strength in restrict band is  $95.47 - 45.60 = 49.87$  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 Printed antenna without any antenna connector. And the maximum Gain of this antenna is 0dBi.

## 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:

<b>USA</b>	FCC, NVLAP
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>New Zealand</b>	MoC
<b>Norway</b>	NEMKO
<b>R.O.C.</b>	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](http://www.adt.com.tw/index.5/phtml).

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