

FCC TEST REPORT

REPORT NO.: RF930831H01A

MODEL NO.: WMP-G06

RECEIVED: Aug. 31, 2004

TESTED: Dec. 26 to 28, 2004

ISSUED: Dec. 30, 2004

APPLICANT: Alpha Networks Inc.

ADDRESS: No. 8, Li-shing Road VII, Science-based Industrial Park, Hsinchu Taiwan.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

This test report consists of 32 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, A2LA or any government agencies. The test results in the report only apply to the tested sample. The test results in this report are traceable to the national or international standards.



0536
ILAC MRA



No. 2177-01

Table of Contents

1	CERTIFICATION	4
2	SUMMARY OF TEST RESULTS	5
3	GENERAL INFORMATION	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	7
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	7
3.4	DESCRIPTION OF SUPPORT UNITS	8
3.5	CONFIGURATION OF SYSTEM UNDER TEST	8
4	TEST TYPES AND RESULTS	9
4.1	RADIATED EMISSION MEASUREMENT	9
4.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT	9
4.1.2	TEST INSTRUMENTS	10
4.1.3	TEST PROCEDURES	11
4.1.4	TEST SETUP	12
4.1.5	EUT OPERATING CONDITIONS	12
4.1.6	TEST RESULTS	13
4.1.7	TEST RESULTS – DSSS	14
4.1.8	TEST RESULTS - OFDM	17
4.2	MAXIMUM PEAK OUTPUT POWER	20
4.2.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	20
4.2.2	TEST INSTRUMENTS	20
4.2.3	TEST PROCEDURES	21
4.2.4	TEST SETUP	21
4.2.5	EUT OPERATING CONDITIONS	21
4.2.6	TEST RESULTS- DSSS	22
4.2.7	TEST RESULTS- OFDM	23
4.3	BAND EDGES MEASUREMENT	24
4.3.1	LIMITS OF BAND EDGES MEASUREMENT	24
4.3.2	TEST INSTRUMENTS	24
4.3.3	TEST PROCEDURE	24
4.3.4	EUT OPERATING CONDITION	24
4.3.5	TEST RESULTS – DSSS	25
4.3.6	TEST RESULTS- OFDM	27
4.4	ANTENNA REQUIREMENT	29
4.4.1	STANDARD APPLICABLE	29



4.4.2	ANTENNA CONNECTED CONSTRUCTION.....	29
5	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	30
6	INFORMATION ON THE TESTING LABORATORIES	32



1 CERTIFICATION

PRODUCT : 802.11g/2.4GHz Wireless Mini-PCI Adapter
BRAND NAME : ALPHA
MODEL NO. : WMP-G06
TESTED: Dec. 26 to 28, 2004
APPLICANT : Alpha Networks Inc.
TEST ITEM: ENGINEERING SAMPLE
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment (Model: WMP-G06) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Carol Liao , **DATE:** Dec. 30, 2004
(Carol Liao)

TECHNICAL
ACCEPTANCE : Hank Chung , **DATE:** Dec. 30, 2004
Responsible for RF (Hank Chung)

APPROVED BY : Eric Lin , **DATE:** Dec. 30, 2004
(Eric Lin, 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
15.247(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 -1.8dB at 132.60MHz
15.247(c)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

NOTE: This report is prepared for FCC class II permissive change. Only radiated emission, Maximum Peak Output Power and Band Edge Measurement conducted emission were presented in this test report.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11g/2.4GHz Wireless Mini-PCI Adapter
MODEL NO.	WMP-G06
POWER SUPPLY	3.3Vdc from host equipment
MODULATION TYPE	CCK, OFDM, DBPSK, DQPSK
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	1/2/5.5/6/9/11/12/18/24/36/48/54Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	15.46 dBm
ANTENNA TYPE	PIFA Antenna and $1/4 \lambda$ Monopole Antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. There are two antenna types provided to this EUT. One is PIFA antenna with 1dBi gain, and another is $1/4 \lambda$ Monopole Antenna with 2.0dBi gain.
2. This report is prepared for FCC class II permissive change. The difference compared with the original design is as the following:

◆ Add one new antenna:

No.	Gain (dBi)	Antenna Type	Antenna Connector
1	1.0 dBi	PIFA Antenna	MHF connector

3. The above EUT information was declared by the manufacturer and 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 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. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst case, were chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 802.11g/2.4GHz Wireless Mini-PCI Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C. (15.247)
ANSI C63.4 : 2003

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

3.4 DESCRIPTION OF SUPPORT UNITS

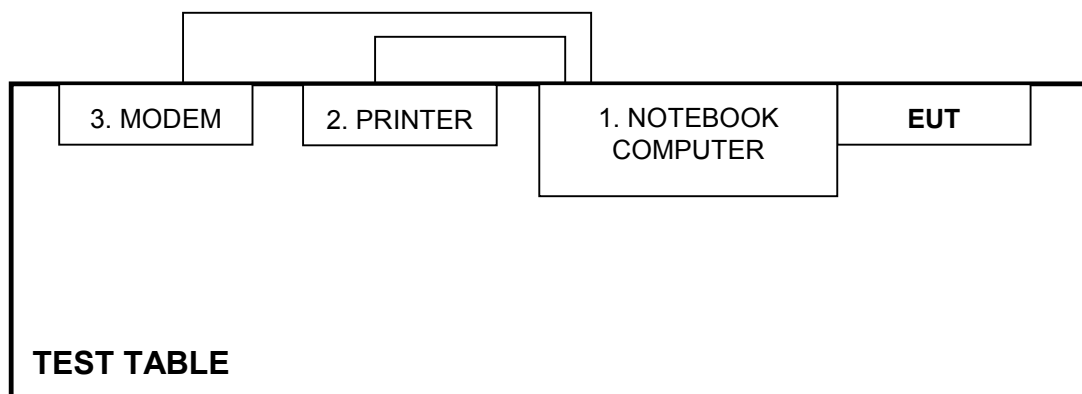
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook Computer	DELL	PP01L	TW-09c748-12800-165-3171	FCC DoC
2	PRINTER	HP	C2642A	MY79F1C3MZ	B94C2642X
3	MODEM	ACEEX	1414	0206026776	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
3	1.0 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



NOTE: 1. Please refer to the photos of test configuration in Item 5 also.

4 TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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 (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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8594E	3710A04861	Sep. 23, 2005
ADVANTEST Spectrum Analyzer	R3271A	85060311	Jun. 29, 2005
CHASE RF Pre_Amplifier	CPA9232	1057	Aug 06, 2005
HP Pre_Amplifier	8449B	3008A01922	Oct. 13, 2005
ROHDE & SCHWARZ Test Receiver	ESCS30	100287	Dec. 08, 2005
CHASE Broadband Antenna	VULB9168	138	May 22, 2005
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jun. 16, 2005
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170192	Feb. 16, 2005
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
RF Switches (ARNITSU)	CS-201	1565157	Jul. 15, 2005
RF CABLE (Chaintek) 1GHz-20GHz	SF102	22054-2	Feb. 10, 2005
RF Cable(RICHTEC)	9913-30M	STCCAB-30M-1GHz-021	Jul. 15, 2005
Software	AS60P8	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

- Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824-3.
7. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4.

Measurement	Value
Radiated emissions (30MHz-1GHz)	2.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~20GHz)	1.88 dB



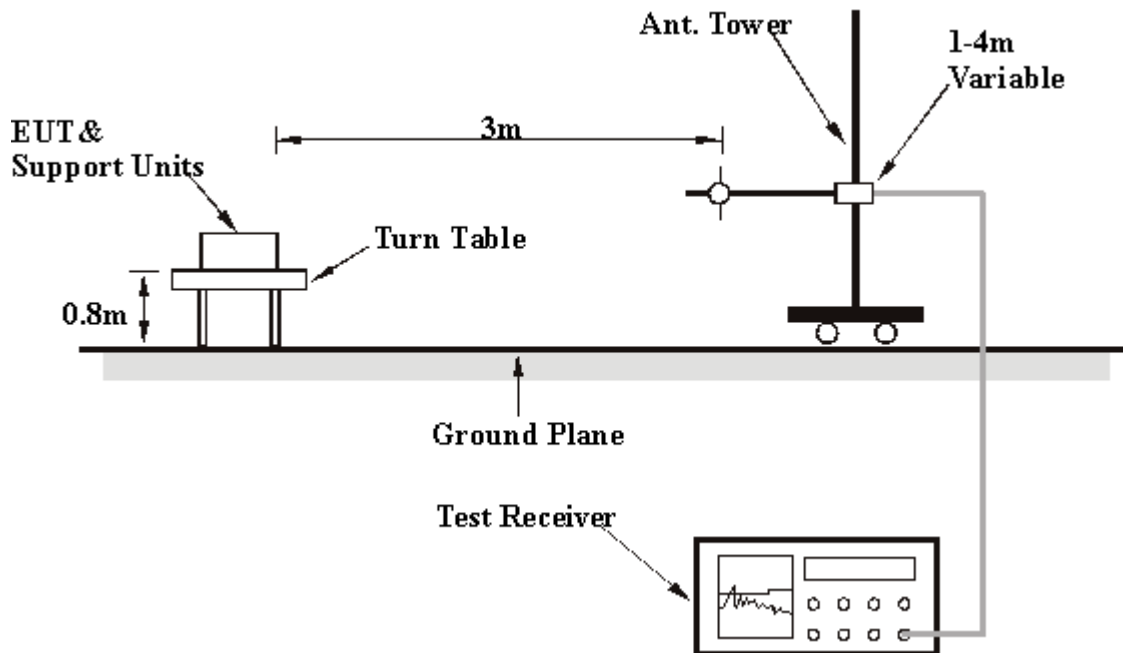
4.1.3 TEST PROCEDURES

- 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 300 Hz for Average detection (AV) at frequency above 1GHz.

4.1.4 TEST SETUP



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

4.1.5 EUT OPERATING CONDITIONS

- Plug the EUT into support unit 1 (Notebook computer) which placed on a testing table.
- The support unit 1 (Notebook computer) ran a test program "RT2500. exe" to enable EUT under transmission condition continuously at specific channel frequency.
- Notebook computer sends "H" messages to modem.
- Notebook computer sends "H" messages to printer, and the printer prints them on paper.

4.1.6 TEST RESULTS

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
TEST MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	132.60	41.70 QP	43.50	-1.80	2.24 H	9	-59.80	101.50
2	166.54	41.50 QP	43.50	-2.00	1.67 H	12	-60.00	101.50
3	199.90	31.60 QP	43.50	-11.90	1.54 H	26	-69.90	101.50
4	233.22	32.20 QP	46.00	-13.80	1.59 H	178	-69.30	101.50
5	266.62	29.40 QP	46.00	-16.60	1.42 H	217	-72.10	101.50
6	299.77	34.10 QP	46.00	-11.90	1.08 H	204	-67.40	101.50
7	600.00	33.80 QP	46.00	-12.20	1.41 H	325	-67.70	101.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	133.49	35.20 QP	43.50	-8.30	1.93 V	48	-66.30	101.50
2	166.12	39.40 QP	43.50	-4.10	1.96 V	78	-62.10	101.50
3	200.00	28.10 QP	43.50	-15.40	1.37 V	111	-73.40	101.50
4	233.49	27.90 QP	46.00	-18.10	1.34 V	231	-73.60	101.50
5	267.27	31.20 QP	46.00	-14.80	2.08 V	26	-70.30	101.50
6	299.81	28.90 QP	46.00	-17.10	2.34 V	162	-72.60	101.50
7	600.00	32.80 QP	46.00	-13.20	1.00 V	268	-68.70	101.50

- 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.

4.1.7 TEST RESULTS – DSSS

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
MODE	Channel 1	FREQUENCY RANGE	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	2038.00	45.50 PK	74.00	-28.50	1.37 H	176	16.60	28.90
1	2038.00	42.90 AV	54.00	-11.10	1.37 H	176	14.00	28.90
2	2390.00	47.00 PK	74.00	-27.00	1.08 H	27	13.20	33.80
2	2390.00	39.80 AV	54.00	-14.20	1.08 H	27	6.00	33.80
3	*2412.00	100.40 PK			1.08 H	27	70.50	29.90
3	*2412.00	93.80 AV			1.08 H	27	63.90	29.90
4	2786.00	47.10 PK	74.00	-26.90	1.36 H	2	16.00	31.10
4	2786.00	35.30 AV	54.00	-18.70	1.36 H	2	4.20	31.10
5	4824.00	52.60 PK	74.00	-21.40	1.12 H	317	16.40	36.20
5	4824.00	40.40 AV	54.00	-13.60	1.12 H	317	4.20	36.20
6	7236.00	57.90 PK	74.00	-16.10	1.00 H	333	16.30	41.70
6	7236.00	46.10 AV	54.00	-7.90	1.00 H	333	4.50	41.70
7	9648.00	52.30 PK	74.00	-21.70	1.59 H	3	7.40	44.90
7	9648.00	42.90 AV	54.00	-11.10	1.59 H	3	-2.00	44.90

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	2038.00	48.70 PK	74.00	-25.30	1.03 V	24	19.80	28.90
1	2038.00	47.00 AV	54.00	-7.00	1.03 V	24	18.10	28.90
2	2390.00	49.10 PK	74.00	-24.90	1.00 V	177	15.30	33.80
2	2390.00	42.30 AV	54.00	-11.70	1.00 V	177	8.50	33.80
3	*2412.00	106.00 PK			1.00 V	177	76.10	29.90
3	*2412.00	99.60 AV			1.00 V	177	69.80	29.90
4	2786.00	54.30 PK	74.00	-19.70	1.00 V	229	23.20	31.10
4	2786.00	42.80 AV	54.00	-11.20	1.00 V	229	11.70	31.10
5	4824.00	49.90 PK	74.00	-24.10	1.00 V	19	13.60	36.20
5	4824.00	38.70 AV	54.00	-15.30	1.00 V	19	2.50	36.20
6	7236.00	54.50 PK	74.00	-19.50	1.00 V	21	12.90	41.70
6	7236.00	43.50 AV	54.00	-10.50	1.00 V	21	1.80	41.70
7	9648.00	53.10 PK	74.00	-20.90	1.67 V	29	8.20	44.90
7	9648.00	42.90 AV	54.00	-11.10	1.67 V	29	-2.00	44.90

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
MODE	Channel 6	FREQUENCY RANGE	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	2063.00	45.90 PK	74.00	-28.10	1.01 H	324	16.80	29.10
1	2063.00	43.60 AV	54.00	-10.40	1.01 H	324	14.60	29.10
2	*2437.00	100.20 PK			1.05 H	24	70.20	30.00
2	*2437.00	93.80 AV			1.05 H	24	63.80	30.00
3	2811.00	47.30 PK	74.00	-26.70	1.00 H	317	16.20	31.10
3	2811.00	35.70 AV	54.00	-18.30	1.00 H	317	4.60	31.10
4	4874.00	54.20 PK	74.00	-19.80	1.23 H	321	17.80	36.50
4	4874.00	42.40 AV	54.00	-11.60	1.23 H	321	6.00	36.50
5	7311.00	58.30 PK	74.00	-15.70	1.01 H	317	16.50	41.80
5	7311.00	46.70 AV	54.00	-7.30	1.01 H	317	4.90	41.80
6	9748.00	52.80 PK	74.00	-21.20	1.67 H	17	8.20	44.60
6	9748.00	43.10 AV	54.00	-10.90	1.67 H	17	-1.50	44.60

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	2063.00	50.20 PK	74.00	-23.80	1.04 V	10	21.20	29.10
1	2063.00	49.00 AV	54.00	-5.00	1.04 V	10	20.00	29.10
2	*2437.00	107.40 PK			1.00 V	176	77.40	30.00
2	*2437.00	100.80 AV			1.00 V	176	70.80	30.00
3	2811.00	53.50 PK	74.00	-20.50	1.01 V	231	22.40	31.10
3	2811.00	41.50 AV	54.00	-12.50	1.01 V	231	10.30	31.10
4	4874.00	52.50 PK	74.00	-21.50	1.14 V	20	16.10	36.50
4	4874.00	41.00 AV	54.00	-13.00	1.14 V	20	4.60	36.50
5	7311.00	54.30 PK	74.00	-19.70	1.25 V	31	12.60	41.80
5	7311.00	43.70 AV	54.00	-10.30	1.25 V	31	2.00	41.80
6	9748.00	52.50 PK	74.00	-21.50	1.72 V	49	7.90	44.60
6	9748.00	43.50 AV	54.00	-10.50	1.72 V	49	-1.10	44.60

- 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. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
MODE	Channel 11	FREQUENCY RANGE	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	2088.00	40.00 PK	74.00	-34.00	1.00 H	323	10.80	29.20
1	2088.00	44.70 AV	54.00	-9.30	1.00 H	323	15.50	29.20
2	*2462.00	103.50 PK			1.04 H	24	73.40	30.10
2	*2462.00	97.00 AV			1.04 H	24	66.90	30.10
3	2483.50	47.00 PK	74.00	-27.00	1.04 H	24	16.90	30.10
3	2483.50	40.50 AV	54.00	-13.50	1.04 H	24	10.40	30.10
4	2836.00	49.00 PK	74.00	-25.00	1.07 H	331	17.80	31.20
4	2836.00	38.40 AV	54.00	-15.60	1.07 H	331	7.20	31.20
5	4924.00	59.00 PK	74.00	-15.00	1.21 H	319	22.30	36.70
5	4924.00	47.40 AV	54.00	-6.60	1.21 H	319	10.80	36.70
6	7386.00	59.40 PK	74.00	-14.60	1.00 H	323	17.50	41.80
6	7386.00	48.70 AV	54.00	-5.30	1.00 H	323	6.80	41.80
7	9848.00	54.10 PK	74.00	-19.90	1.64 H	354	9.70	44.40
7	9848.00	45.90 AV	54.00	-8.10	1.64 H	354	1.50	44.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2088.00	50.40 PK	74.00	-23.60	1.03 V	9	21.20	29.20
1	2088.00	49.20 AV	54.00	-4.80	1.03 V	9	20.00	29.20
2	*2462.00	109.40 PK			1.00 V	175	79.30	30.10
2	*2462.00	102.70 AV			1.00 V	175	72.70	30.10
3	2483.50	52.90 PK	74.00	-21.10	1.00 V	175	22.80	30.10
3	2483.50	46.30 AV	54.00	-7.70	1.00 V	175	16.10	30.10
4	2836.00	50.60 PK	74.00	-23.40	1.00 V	230	19.40	31.20
4	2836.00	40.10 AV	54.00	-13.90	1.00 V	230	8.90	31.20
5	4924.00	54.70 PK	74.00	-19.30	1.16 V	22	18.00	36.70
5	4924.00	43.20 AV	54.00	-10.80	1.16 V	22	6.50	36.70
6	7386.00	57.30 PK	74.00	-16.70	1.26 V	30	15.40	41.80
6	7386.00	45.60 AV	54.00	-8.40	1.26 V	30	3.70	41.80
7	9848.00	55.50 PK	74.00	-18.50	1.68 V	117	11.10	44.40
7	9848.00	48.90 AV	54.00	-5.10	1.68 V	117	4.50	44.40

- 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. The limit value is defined as per 15.247
 6. “ * ” : Fundamental frequency

4.1.8 TEST RESULTS - OFDM

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
MODE	Channel 1	FREQUENCY RANGE	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	2038.00	45.60 PK	74.00	-28.40	1.31 H	143	16.60	28.90
1	2038.00	43.30 AV	54.00	-10.70	1.31 H	143	14.30	28.90
2	2390.00	45.90 PK	74.00	-28.10	1.06 H	27	12.10	33.80
2	2390.00	38.10 AV	54.00	-15.90	1.06 H	27	4.30	33.80
3	*2412.00	93.70 PK			1.06 H	27	63.80	29.90
3	*2412.00	85.90 AV			1.06 H	27	56.00	29.90
4	2786.00	48.00 PK	74.00	-26.00	1.27 H	12	16.90	31.10
4	2786.00	36.80 AV	54.00	-17.20	1.27 H	12	5.70	31.10
5	4824.00	49.20 PK	74.00	-24.80	1.13 H	321	12.90	36.20
5	4824.00	36.80 AV	54.00	-17.20	1.13 H	321	0.60	36.20
6	7236.00	48.60 PK	74.00	-25.40	1.01 H	319	7.00	41.70
6	7236.00	37.20 AV	54.00	-16.80	1.01 H	319	-4.40	41.70
7	9648.00	51.20 PK	74.00	-22.80	1.29 H	294	6.30	44.90
7	9648.00	40.30 AV	54.00	-13.70	1.29 H	294	-4.60	44.90

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	2038.00	49.30 PK	74.00	-24.70	1.04 V	26	20.40	28.90
1	2038.00	47.00 AV	54.00	-7.00	1.04 V	26	18.10	28.90
2	2390.00	53.10 PK	74.00	-20.90	1.00 V	177	19.30	33.80
2	2390.00	45.60 AV	54.00	-8.40	1.00 V	177	11.80	33.80
3	*2412.00	100.90 PK			1.00 V	177	71.00	29.90
3	*2412.00	93.40 AV			1.00 V	177	63.50	29.90
4	2786.00	48.40 PK	74.00	-25.60	1.00 V	231	17.30	31.10
4	2786.00	37.30 AV	54.00	-16.70	1.00 V	231	6.20	31.10
5	4824.00	55.70 PK	74.00	-18.30	1.00 V	19	19.50	36.20
5	4824.00	43.70 AV	54.00	-10.30	1.00 V	19	7.50	36.20
6	7236.00	50.70 PK	74.00	-23.30	1.00 V	30	9.00	41.70
6	7236.00	38.40 AV	54.00	-15.60	1.00 V	30	-3.20	41.70
7	9648.00	50.50 PK	74.00	-23.50	1.68 V	252	5.60	44.90
7	9648.00	40.20 AV	54.00	-13.80	1.68 V	252	-4.70	44.90

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. The limit value is defined as per 15.247
6. “ * ” : Fundamental frequency

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
MODE	Channel 6	FREQUENCY RANGE	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	2063.00	47.40 PK	74.00	-26.60	1.06 H	327	18.30	29.10
1	2063.00	46.50 AV	54.00	-7.50	1.06 H	327	17.50	29.10
2	*2437.00	96.00 PK			1.06 H	23	66.10	30.00
2	*2437.00	88.30 AV			1.06 H	23	58.30	30.00
3	2811.00	47.40 PK	74.00	-26.60	1.03 H	314	16.30	31.10
3	2811.00	37.00 AV	54.00	-17.00	1.03 H	314	5.90	31.10
4	4874.00	53.50 PK	74.00	-20.50	1.21 H	332	17.10	36.50
4	4874.00	41.20 AV	54.00	-12.80	1.21 H	332	4.80	36.50
5	7311.00	49.10 PK	74.00	-24.90	1.03 H	327	7.40	41.80
5	7311.00	37.60 AV	54.00	-16.40	1.03 H	327	-4.10	41.80
6	9748.00	51.00 PK	74.00	-23.00	1.27 H	318	6.40	44.60
6	9748.00	40.80 AV	54.00	-13.20	1.27 H	318	-3.80	44.60

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	2063.00	51.40 PK	74.00	-22.60	1.04 V	10	22.30	29.10
1	2063.00	50.00 AV	54.00	-4.00	1.04 V	10	20.90	29.10
2	*2437.00	103.30 PK			1.00 V	176	73.30	30.00
2	*2437.00	95.50 AV			1.00 V	176	65.50	30.00
3	2811.00	49.50 PK	74.00	-24.50	1.00 V	230	18.40	31.10
3	2811.00	38.50 AV	54.00	-15.50	1.00 V	230	7.30	31.10
4	4874.00	53.50 PK	74.00	-20.50	1.18 V	17	17.10	36.50
4	4874.00	42.10 AV	54.00	-11.90	1.18 V	17	5.70	36.50
5	7311.00	50.90 PK	74.00	-23.10	1.27 V	27	9.20	41.80
5	7311.00	38.20 AV	54.00	-15.80	1.27 V	27	-3.50	41.80
6	9748.00	50.90 PK	74.00	-23.10	1.22 V	21	6.30	44.60
6	9748.00	40.50 AV	54.00	-13.50	1.22 V	21	-4.10	44.60

- 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. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter	MODEL	WMP-G06
MODE	Channel 11	FREQUENCY RANGE	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa	TESTED BY	Rex Huang

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	2088.00	46.50 PK	74.00	-27.50	1.12 H	309	17.30	29.20
1	2088.00	45.20 AV	54.00	-8.80	1.12 H	309	16.00	29.20
2	*2462.00	98.00 PK			1.05 H	24	67.90	30.10
2	*2462.00	90.50 AV			1.05 H	24	60.40	30.10
3	2483.50	47.60 PK	74.00	-26.40	1.05 H	24	17.50	30.10
3	2483.50	40.10 AV	54.00	-13.90	1.05 H	24	10.00	30.10
4	2836.00	49.20 PK	74.00	-24.80	1.01 H	325	18.00	31.20
4	2836.00	38.70 AV	54.00	-15.30	1.01 H	325	7.50	31.20
5	4924.00	53.00 PK	74.00	-21.00	1.09 H	326	16.30	36.70
5	4924.00	41.30 AV	54.00	-12.70	1.09 H	326	4.60	36.70
6	7386.00	51.80 PK	74.00	-22.20	1.07 H	309	9.90	41.80
6	7386.00	40.20 AV	54.00	-13.80	1.07 H	309	-1.70	41.80
7	9848.00	51.70 PK	74.00	-22.30	1.09 H	348	7.30	44.40
7	9848.00	41.20 AV	54.00	-12.80	1.09 H	348	-3.20	44.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2088.00	51.00 PK	74.00	-23.00	1.04 V	8	21.80	29.20
1	2088.00	49.60 AV	54.00	-4.40	1.04 V	8	20.40	29.20
2	*2462.00	103.90 PK			1.00 V	176	73.90	30.10
2	*2462.00	96.40 AV			1.00 V	176	66.30	30.10
3	2483.50	53.60 PK	74.00	-20.40	1.00 V	176	23.40	30.10
3	2483.50	46.00 AV	54.00	-8.00	1.00 V	176	15.90	30.10
4	2836.00	51.60 PK	74.00	-22.40	1.00 V	231	20.40	31.20
4	2836.00	40.90 AV	54.00	-13.10	1.00 V	231	9.70	31.20
5	4924.00	54.10 PK	74.00	-19.90	1.27 V	13	17.40	36.70
5	4924.00	42.40 AV	54.00	-11.60	1.27 V	13	5.70	36.70
6	7386.00	55.10 PK	74.00	-18.90	1.25 V	29	13.20	41.80
6	7386.00	42.70 AV	54.00	-11.30	1.25 V	29	0.90	41.80
7	9848.00	51.40 PK	74.00	-22.60	1.29 V	28	7.00	44.40
7	9848.00	41.60 AV	54.00	-12.40	1.29 V	28	-2.80	44.40

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. The limit value is defined as per 15.247
6. “ * ” : Fundamental frequency

4.2 MAXIMUM PEAK OUTPUT POWER

4.2.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.2.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005
Agilent SIGNAL GENERATOR	E8257C	MY43320668	Jan. 1, 2005
TEKTRONIX OSCILLOSCOPE	TDS 220	B027241	Jun. 30, 2005
NARDA DETECTOR	4503A	FSCM99899	NA

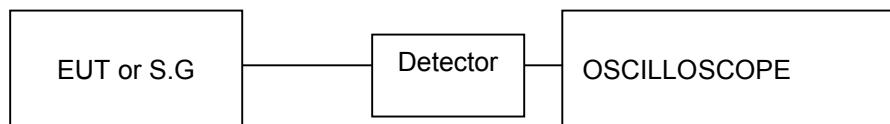
NOTE:

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

4.2.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the peak 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 peak reading on oscilloscope. Record the power level.

4.2.4 TEST SETUP



4.2.5 EUT OPERATING CONDITIONS

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

4.2.6 TEST RESULTS- DSSS

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter		
MODEL	WMP-G06	ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Sky Liao

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.32	30	PASS
6	2437	15.46	30	PASS
11	2462	15.17	30	PASS

4.2.7 TEST RESULTS- OFDM

EUT	802.11g/2.4GHz Wireless Mini-PCI Adapter		
MODEL	WMP-G06	ENVIRONMENTAL CONDITIONS	20 deg. C, 66%RH, 987 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Sky Liao

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	14.90	30	PASS
6	2437	15.17	30	PASS
11	2462	15.10	30	PASS

4.3 BAND EDGES MEASUREMENT

4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 1 MHz Resolution Bandwidth).

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005

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.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set RBW spectrum analyzer to 1 MHz and set VBW spectrum analyzer to 10 Hz with suitable frequency span including 1 MHz bandwidth from band edge. The band edges was measured and recorded.

4.3.4 EUT OPERATING CONDITION

Same as Item 4.2.5



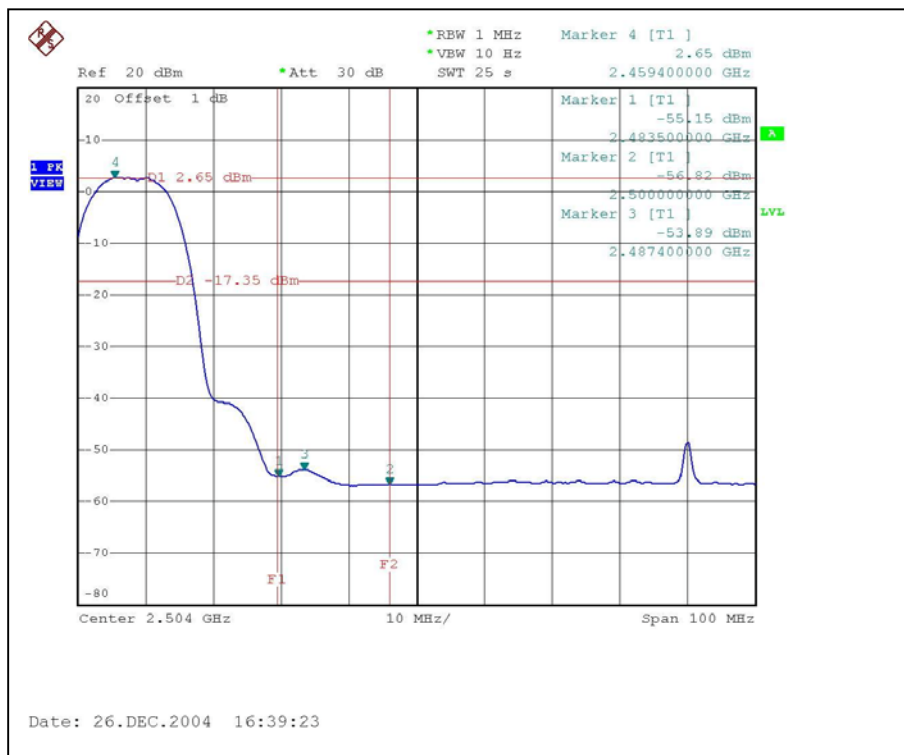
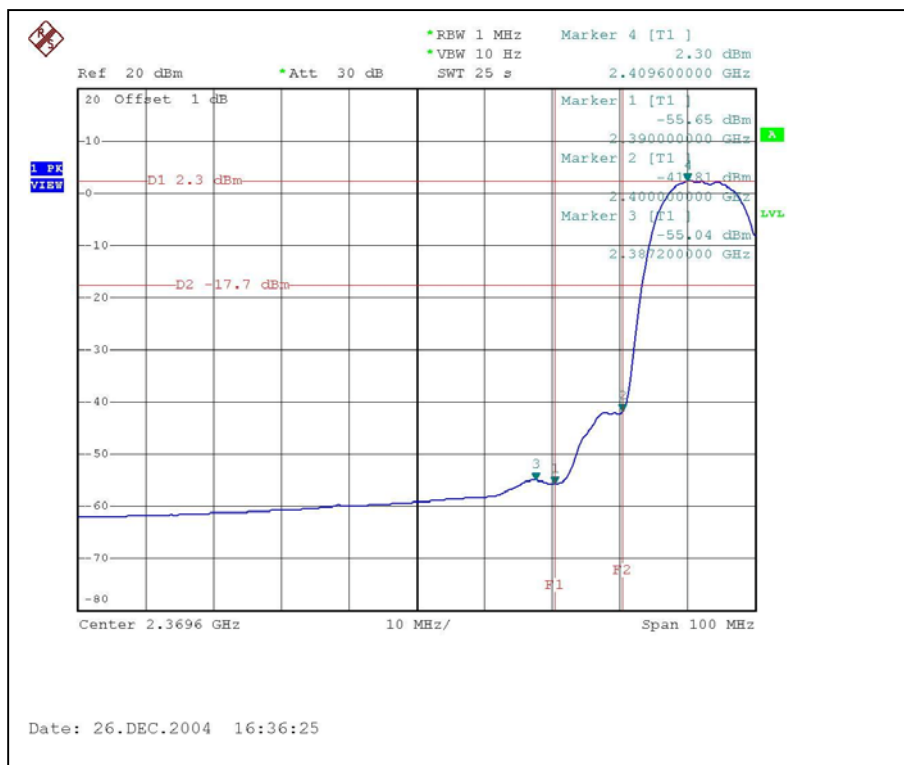
4.3.5 TEST RESULTS – DSSS

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

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

NOTE (1): The band edge emission plot on the following first page shows 57.95dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 99.60dBuV/m, so the maximum field strength in restrict band is $99.60 - 57.95 = 41.65$ dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 57.80dB 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 11 at the item 4.2. is 102.70dBuV/m, so the maximum field strength in restrict band is $102.70 - 57.80 = 44.90$ dBuV/m which is under 54 dBuV/m limit.



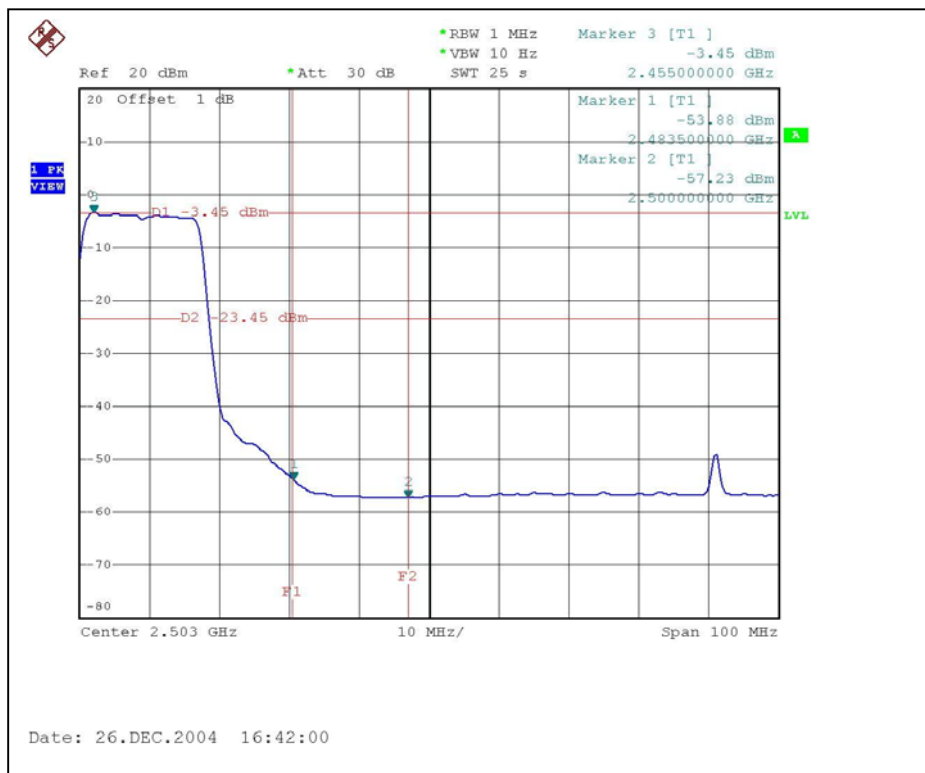
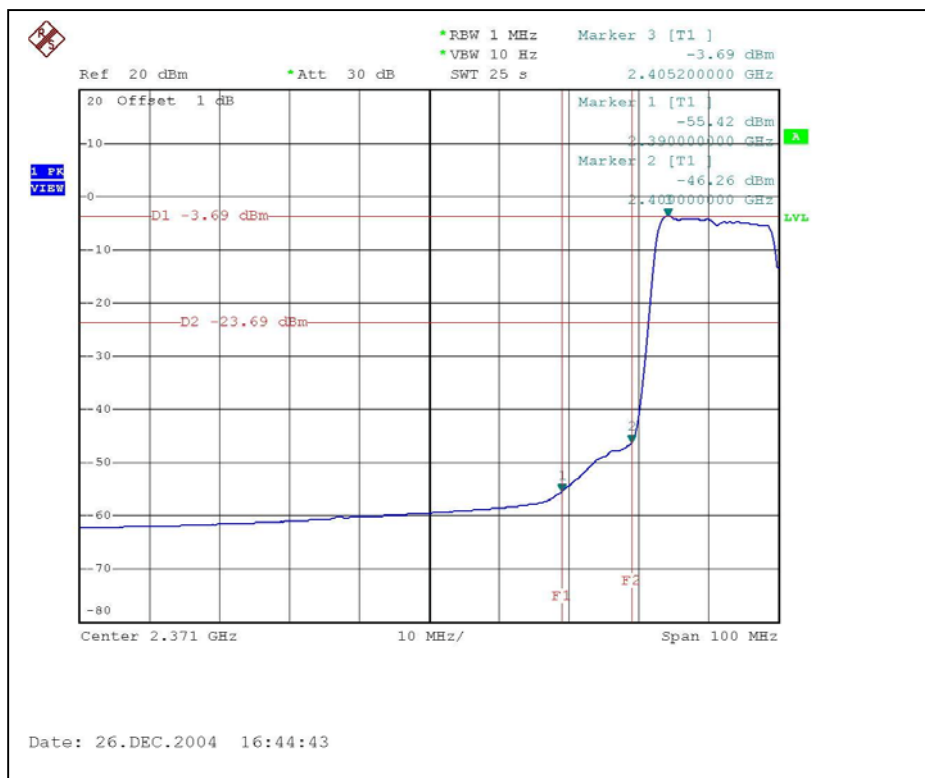
4.3.6 TEST RESULTS- OFDM

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

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

NOTE (1): The band edge emission plot on the following first page shows 51.73dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2. is 93.40dBuV/m, so the maximum field strength in restrict band is $93.40 - 51.73 = 41.67$ dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 50.43dB 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 11 at the item 4.2. is 96.40dBuV/m, so the maximum field strength in restrict band is $96.40 - 50.43 = 45.97$ dBuV/m which is under 54 dBuV/m limit.





4.4 ANTENNA REQUIREMENT

4.4.1 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.

4.4.2 ANTENNA CONNECTED CONSTRUCTION

The antennas used in this product are $1/4 \lambda$ Monopole Antenna with MHF connector and PIFA Antenna with MHF connector. The maximum Gain of the antenna is 2.0dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST





6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

USA	FCC, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB, GOST-ASIA (MOU)
Russia	CERTIS (MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service@adt.com.tw

Web Site: www.adt.com.tw

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