



## FCC TEST REPORT (15.407)

**REPORT NO.:** RF940321L05A

**MODEL NO.:** WL-760A

**OEM MODEL NO.:** TEW-503PI

**RECEIVED:** NA

**TESTED:** Mar. 10 ~ Mar. 23, 2005

**ISSUED:** May 28, 2005

**APPLICANT:** SparkLAN Communications, Inc.

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**ISSUED BY:** Advance Data Technology Corporation

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**TEST LOCATION:** No. 19, Hwa Ya 2<sup>nd</sup> Rd., Wen Hwa Tsuen, Kwei  
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R.O.C.

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0528  
ILAC MRA



No. 2177-01



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## 1. CERTIFICATION

**PRODUCT:** WLAN 802.11a/b/g PCI Adapter  
**OEM PRODUCT NAME:** 108Mbps Wireless PCI Adapter  
**BRAND NAME:** SparkLAN  
**OEM BRAND NAME:** TRENDnet  
**MODEL NO:** WL-760A  
**OEM MODEL NO.:** TEW-503PI  
**APPLICANT:** SPARKLAN COMMUNICATIONS, INC.  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARDS:** FCC Part 15, Subpart E (Section 15.407)  
ANSI C63.4-2003

The above equipment (model no.: WL-760A) is identical to model no. WMP55AG ver. 1.3, which has been tested by **Advance Data Technology Corporation** from Mar. 10 ~ Mar. 23, 2005, 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 :** Andrea Hsia , **DATE:** May 28, 2005  
(Andrea Hsia)

**TECHNICAL**  
**ACCEPTANCE :** Gary Chang , **DATE:** May 28, 2005  
Responsible for RF (Gary Chang)

**APPROVED BY :** Cody Chang , **DATE:** May 28, 2005  
(Cody Chang, Deputy Manager)

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: FCC Part 15, Subpart E (Section 15.407)</b>			
<b>Standard Section</b>	<b>Test Type</b>	<b>Result</b>	<b>Remark</b>
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -16.21dB at 0.637MHz
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -1.72dB at 5350.00MHz
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

<b>Measurement</b>	<b>Frequency</b>	<b>Uncertainty</b>
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.73 dB
	200MHz ~1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	WLAN 802.11a/b/g PCI Adapter
<b>OEM PRODUCT</b>	108Mbps Wireless PCI Adapter
<b>MODEL NO.</b>	WL-760A
<b>OEM MODEL NO.</b>	TEW-503PI
<b>POWER SUPPLY</b>	3.3Vdc from host equipment
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 2) 802.11a: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 2)
<b>FREQUENCY RANGE</b>	802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.15 ~ 5.35GHz and 5.725 ~ 5.850GHz
<b>NUMBER OF CHANNEL</b>	802.11b & 802.11g: 11 for Normal mode / 1 for Turbo mode 802.11a: 13 for Normal mode / 5 for Turbo mode
<b>CHANNEL SPACING</b>	802.11b & 802.11g: 5MHz 802.11a: 20MHz for Normal mode / 40MHz for Turbo mode
<b>OUTPUT POWER</b>	802.11b: 63.826mW 802.11g: 51.050mW 802.11a: 50.933mW
<b>DATA CABLE</b>	NA
<b>ANTENNA TYPE</b>	Dipole antenna with 2.0dBi gain (for 2.4GHz) Dipole antenna with 2.0dBi gain (for 5.0GHz)
<b>I/O PORTS</b>	NA
<b>ASSOCIATED DEVICES</b>	NA

#### NOTE:

1. This is a duplicate report of RF940321L05, the difference is changing the Model name, Brand name, Product Name and Applicant.
2. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.
3. This EUT is capable of providing data rates of up to 108Mbps in Turbo Mode depending upon reception quality.
4. 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

Operated in 5150 ~ 5250MHz, 5250MHz ~ 5350MHz bands:

Eight channels are provided to this EUT for normal mode.

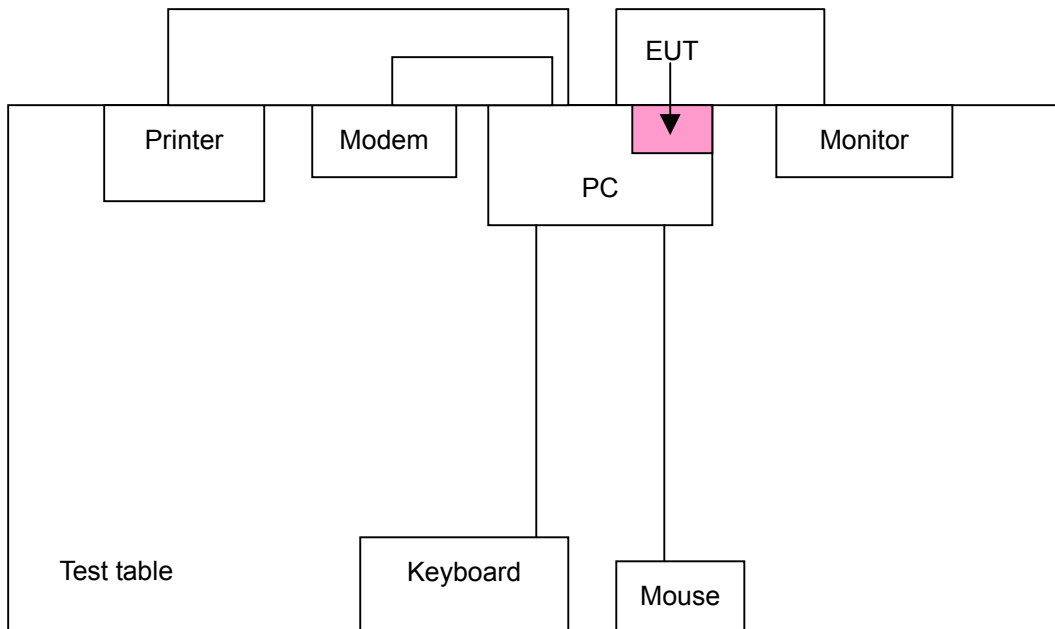
Channel	Frequency
1	5180 MHz
2	5200 MHz
3	5220 MHz
4	5240 MHz
5	5260 MHz
6	5280 MHz
7	5300 MHz
8	5320 MHz

Three channels are provided to this EUT for turbo mode.

Channel	Frequency
1	5210 MHz
2	5250 MHz
3	5290 MHz

### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

(Power from host equipment)







3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	X	X	X	X	NA

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz  
 RE≥1G: Radiated Emission above 1GHz APCM: Antenna Port Conducted Measurement

**Power Line Conducted Emission Test:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 8	5	OFDM	BPSK	6

**Radiated Emission Test (Below 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 8	5	OFDM	BPSK	6

**Radiated Emission Test (Above 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 8	1, 4, 5, 8	OFDM	BPSK	6
802.11a Turbo	1 to 3	1, 2, 3	OFDM	BPSK	12



**Bandedge Measurement:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 8	1, 8	OFDM	BPSK	6
802.11a Turbo	1 to 3	1, 3	OFDM	BPSK	12

**Antenna Port Conducted Measurement:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 8	1, 4, 5, 8	OFDM	BPSK	6
802.11a Turbo	1 to 3	1, 2, 3	OFDM	BPSK	12



### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a WLAN 802.11a/b/g PCI Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

#### FCC Part 15, Subpart E (15.407)

#### ANSI C63.4-2003

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	PC	MSI	Hetis 865G Giga	3AS0119581	FCC DoC Approved
2	LCD MONITOR	ACER	AL1721	ET.L0408.01040 4001E6PK00	FCC DoC Approved
3	PRINTER	EPSON	LQ-300+	DCGY047265	FCC DoC Approved
4	MOUSE	HP	M-S69	M4-010565	INZ211443
5	KEYBOARD	HP	SK-1688	C0306114659	GYUR84SK
6	MODEM	ACEEX	1414V/3	0401008248	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m shielded cable with one core
3	1.8 m shielded cable without core
4	1.2 m shielded cable without core
5	1.3 m shielded cable without core
6	1.2 m shielded cable without core

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

## 4. TEST TYPES AND RESULTS (5150 ~ 5350MHz Band)

### 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
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 16, 2005
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 09, 2006
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Feb. 15, 2006
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Feb. 15, 2006
Software ADT	ADT_Cond_V3	NA	NA

- 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. The test was performed in HwaYa Shielded Room 1.
  3. The VCCI Site Registration No. is C-2040.



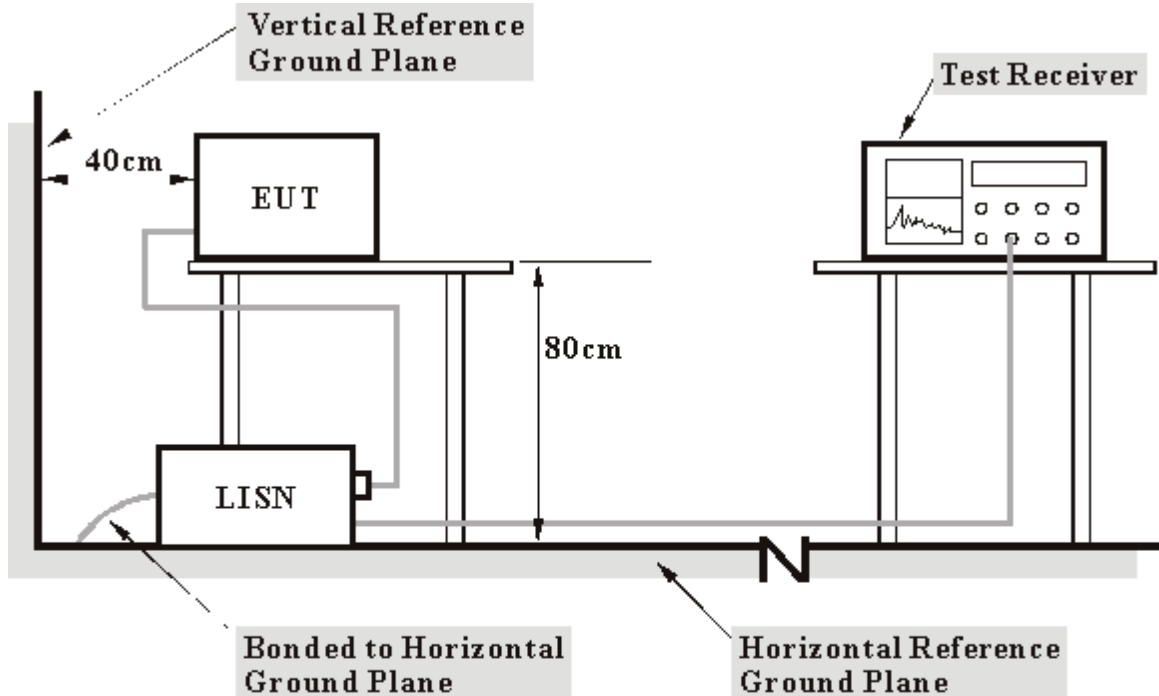
#### 4.1.3 TEST PROCEDURES

- 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 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

#### 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 into a notebook system placed on a testing table.
- b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook system sent "H" messages to its screen.
- d. The notebook system sent "H" messages to modem.
- e. The notebook system sent "H" messages to printer, and the printer printed them on paper.
- f. Steps c ~ e were repeated.



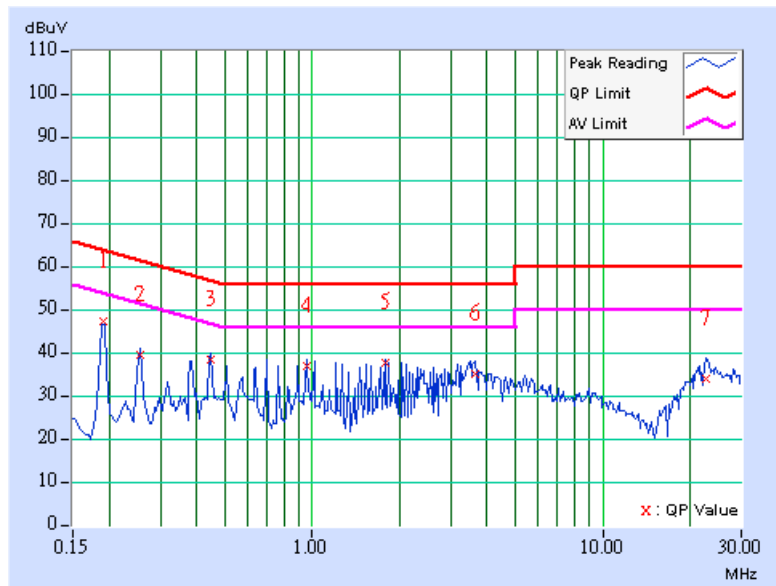
**4.1.7 TEST RESULTS**  
**Conducted Worst-Case Data**

<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 5	<b>6dB BANDWIDTH</b>	9 kHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 70%RH, 991hPa	<b>TESTED BY</b>	Scott Yang

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.192	0.11	46.20	-	46.31	-	63.96
2	0.255	0.11	38.47	-	38.58	-	61.58	51.58	-23.00	-
3	0.446	0.12	37.45	-	37.57	-	56.96	46.96	-19.39	-
4	0.956	0.17	36.10	-	36.27	-	56.00	46.00	-19.73	-
5	1.783	0.20	36.90	-	37.10	-	56.00	46.00	-18.90	-
6	3.629	0.27	34.12	-	34.39	-	56.00	46.00	-21.61	-
7	22.726	1.03	33.20	-	34.23	-	60.00	50.00	-25.77	-

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- 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.



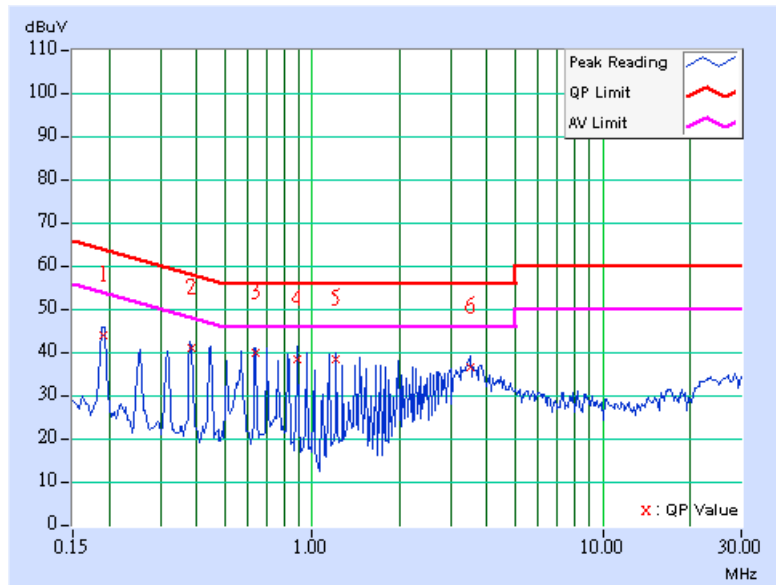


<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 5	<b>6dB BANDWIDTH</b>	9 kHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 70%RH, 991hPa	<b>TESTED BY</b>	Scott Yang

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.190	0.10	43.93	-	44.03	-	64.02
2	0.382	0.11	40.77	-	40.88	-	58.24	48.24	-17.37	-
<b>3</b>	<b>0.637</b>	<b>0.13</b>	<b>39.66</b>	-	<b>39.79</b>	-	<b>56.00</b>	<b>46.00</b>	<b>-16.21</b>	-
4	0.892	0.16	38.24	-	38.40	-	56.00	46.00	-17.60	-
5	1.210	0.19	38.32	-	38.51	-	56.00	46.00	-17.49	-
6	3.500	0.26	36.34	-	36.60	-	56.00	46.00	-19.40	-

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- 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 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dB $\mu$ V/m) *note 3
5150~5250	-27	68.3
5250~5350	-27	68.3
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

**NOTE:**

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E = \frac{1000000\sqrt{30P}}{3} \quad \mu\text{V/m, where P is the eirp (Watts)}$$



## 4.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 19, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 21, 2005
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 22, 2006
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 16, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170241	Feb. 23, 2006
Preamplifier Agilent	8449B	3008A01961	Nov. 09, 2005
Preamplifier Agilent	8447D	2944A10629	Nov. 09, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218182/4	Feb. 17, 2006
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218194/4	Feb. 17, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA

- 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. The test was performed in HwaYa Chamber 1.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.



#### 4.2.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

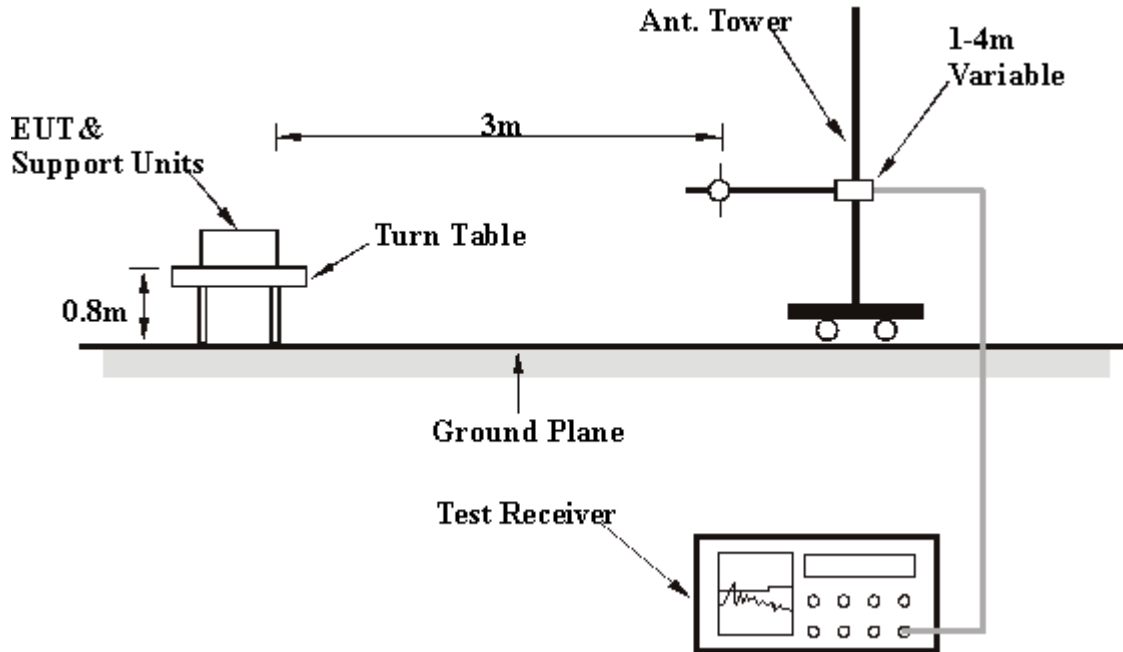
**NOTE:**

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.

#### 4.2.5 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.6 TEST SETUP



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

#### 4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

## 4.2.8 TEST RESULTS

**Below 1GHz Worst-Case Data**

<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 5	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 61%RH, 991hPa	<b>TESTED BY</b>	Brad Wu

**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	168.02	28.84 QP	43.50	-14.66	1.25 H	67	14.72	14.12
2	238.50	36.15 QP	46.00	-9.85	1.25 H	51	23.28	12.87
3	370.18	30.87 QP	46.00	-15.13	1.00 H	169	14.87	16.01
4	400.01	37.51 QP	46.00	-8.49	1.00 H	300	20.78	16.73
5	479.58	43.28 QP	46.00	-2.72	1.00 H	300	24.94	18.34
6	504.31	39.92 QP	46.00	-6.08	1.25 H	127	21.28	18.65
7	537.35	37.30 QP	46.00	-8.70	1.25 H	166	18.07	19.23
8	745.10	40.40 QP	46.00	-5.60	1.00 H	260	17.28	23.12

**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	31.50	34.21 QP	40.00	-5.79	1.25 V	310	20.61	13.60
2	168.18	29.55 QP	43.50	-13.95	1.50 V	250	15.69	13.86
3	238.67	40.26 QP	46.00	-5.74	1.75 V	250	27.43	12.83
4	400.28	36.42 QP	46.00	-9.58	1.00 V	143	19.78	16.64
5	492.37	43.18 QP	46.00	-2.82	1.00 V	300	24.70	18.48
6	664.58	43.15 QP	46.00	-2.85	1.50 V	236	21.37	21.78
7	731.00	43.52 QP	46.00	-2.48	1.00 V	310	20.55	22.97
8	950.00	38.08 QP	46.00	-7.92	1.25 V	130	12.47	25.61

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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

**802.11a OFDM modulation**

<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 1	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

**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	3453.00	44.00 PK	68.30	-24.30	1.31 H	133	11.12	32.88
2	#5150.00	47.08 PK	74.00	-26.92	1.18 H	358	10.02	37.05
2	#5150.00	36.94 AV	54.00	-17.06	1.18 H	358	-0.12	37.05
3	*5180.00	102.25 PK			1.18 H	358	65.16	37.09
3	*5180.00	92.11 AV			1.18 H	358	55.02	37.09
4	#15540.00	58.15 PK	74.00	-15.85	1.01 H	360	9.69	48.46
4	#15540.00	45.75 AV	54.00	-8.25	1.01 H	360	-2.71	48.46

**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	3453.00	46.53 PK	68.30	-21.77	1.34 V	154	13.65	32.88
2	#5150.00	57.06 PK	74.00	-16.94	1.15 V	337	20.01	37.05
2	#5150.00	46.54 AV	54.00	-7.46	1.15 V	337	9.48	37.05
3	*5180.00	112.23 PK			1.15 V	337	75.14	37.09
3	*5180.00	101.71 AV			1.15 V	337	64.62	37.09
4	10360.00	55.05 PK	68.30	-13.25	1.01 V	103	8.99	46.06
5	#15540.00	60.82 PK	74.00	-13.18	1.01 V	176	12.36	48.46
5	#15540.00	47.69 AV	54.00	-6.31	1.01 V	176	-0.77	48.46

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#" The radiated frequency falling in the restricted band.



<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 4	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

#### 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	3493.00	42.55 PK	68.30	-25.75	1.01 H	61	9.65	32.91
2	*5240.00	104.41 PK			1.02 H	78	67.21	37.20
2	*5240.00	94.74 AV			1.02 H	78	57.54	37.20

#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3493.00	44.87 PK	68.30	-23.43	1.22 V	287	11.97	32.91
2	*5240.00	113.17 PK			1.22 V	40	75.97	37.20
2	*5240.00	103.24 AV			1.22 V	40	66.04	37.20

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#" The radiated frequency falling in the restricted band.





<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 5	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

#### 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	3506.00	42.47 PK	68.30	-25.83	1.05 H	100	9.54	32.93
2	*5260.00	104.18 PK			1.03 H	101	66.93	37.25
2	*5260.00	94.58 AV			1.03 H	101	57.33	37.25

#### 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	3506.00	44.89 PK	68.30	-23.41	1.05 V	293	11.96	32.93
2	*5260.00	112.34 PK			1.35 V	188	75.09	37.25
2	*5260.00	102.58 AV			1.35 V	188	65.33	37.25

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#" The radiated frequency falling in the restricted band.



<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 8	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

#### 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	3546.00	43.07 PK	68.30	-25.23	1.47 H	87	10.03	33.04
2	*5320.00	103.66 PK			1.25 H	305	66.30	37.36
2	*5320.00	93.11 AV			1.25 H	305	55.75	37.36
3	#5350.00	54.26 PK	74.00	-19.74	1.25 H	305	16.87	37.39
3	#5350.00	43.71 AV	54.00	-10.29	1.25 H	305	6.32	37.39

#### 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	3546.00	47.67 PK	68.30	-20.63	1.21 V	192	14.63	33.04
2	*5320.00	112.36 PK			1.30 V	317	75.00	37.36
2	*5320.00	100.68 AV			1.30 V	317	63.32	37.36
3	#5350.00	63.96 PK	74.00	-10.04	1.30 V	317	26.57	37.39
<b>3</b>	<b>#5350.00</b>	<b>52.28 AV</b>	<b>54.00</b>	<b>-1.72</b>	<b>1.30 V</b>	<b>317</b>	<b>14.89</b>	<b>37.39</b>
4	#10640.00	56.50 PK	74.00	-17.50	1.14 V	192	9.78	46.72
4	#10640.00	43.36 AV	54.00	-10.64	1.14 V	192	-3.36	46.72

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#"The radiated frequency falling in the restricted band.

**802.11a Turbo OFDM modulation**

<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 1	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

**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	3473.00	44.51 PK	68.30	-23.79	1.06 H	332	11.61	32.89
2	#5150.00	49.59 PK	74.00	-24.41	1.01 H	22	12.54	37.05
2	#5150.00	39.94 AV	54.00	-14.06	1.01 H	22	2.88	37.05
3	*5210.00	100.73 PK			1.01 H	22	63.60	37.13
3	*5210.00	91.08 AV			1.01 H	22	53.95	37.13

**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	3473.00	48.19 PK	68.30	-20.11	1.05 V	297	15.29	32.89
2	#5150.00	59.13 PK	74.00	-14.87	1.22 V	37	22.08	37.05
2	#5150.00	49.43 AV	54.00	-4.57	1.22 V	37	12.37	37.05
3	*5210.00	110.27 PK			1.22 V	37	73.14	37.13
3	*5210.00	100.57 AV			1.22 V	37	63.44	37.13

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#" The radiated frequency falling in the restricted band.



<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 2	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

#### 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	3500.00	43.85 PK	68.30	-24.45	1.19 H	19	10.94	32.91
2	*5250.00	99.81 PK			1.14 H	150	62.59	37.23
2	*5250.00	90.18 AV			1.14 H	150	52.96	37.23

#### 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	3500.00	49.30 PK	68.30	-19.00	1.22 V	295	16.39	32.91
2	*5250.00	109.19 PK			1.21 V	41	71.97	37.23
2	*5250.00	99.61 AV			1.21 V	41	62.38	37.23

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#": The radiated frequency falling in the restricted band.



<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>CHANNEL</b>	Channel 3	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	18deg. C, 50%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

#### 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	3526.00	43.83 PK	68.30	-24.47	1.12 H	139	10.85	32.98
2	*5290.00	100.77 PK			1.40 H	66	63.45	37.32
2	*5290.00	91.40 AV			1.40 H	66	54.08	37.32
3	#5350.00	50.63 PK	74.00	-23.37	1.40 H	66	13.24	37.39
3	#5350.00	41.26 AV	54.00	-12.74	1.40 H	66	3.87	37.39

#### 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	3526.00	48.73 PK	68.30	-19.57	1.21 V	296	15.75	32.98
2	*5290.00	109.50 PK			1.21 V	316	72.18	37.32
2	*5290.00	99.60 AV			1.21 V	316	62.28	37.32
3	#5350.00	59.85 PK	74.00	-14.15	1.21 V	316	22.46	37.39
3	#5350.00	50.09 AV	54.00	-3.91	1.21 V	316	12.70	37.39

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

- NOTE:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  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
  6. "#"The radiated frequency falling in the restricted band.



### 4.3 PEAK TRANSMIT POWER MEASUREMENT

#### 4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

**NOTE:** Where B is the 26dB emission bandwidth in MHz.

#### 4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

**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

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 300kHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

**NOTE:**

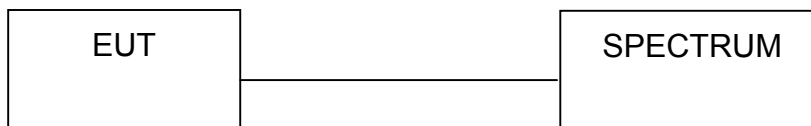
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



4.3.7 TEST RESULTS

**802.11a OFDM modulation**

<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	22deg.C, 55%RH, 991hPa
<b>TESTED BY</b>	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	29.376	14.68	17.00	25.68	PASS
4	5240	30.974	14.91	17.00	27.92	PASS
5	5260	36.475	15.62	24.00	29.12	PASS
8	5320	37.931	15.79	24.00	32.56	PASS

**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

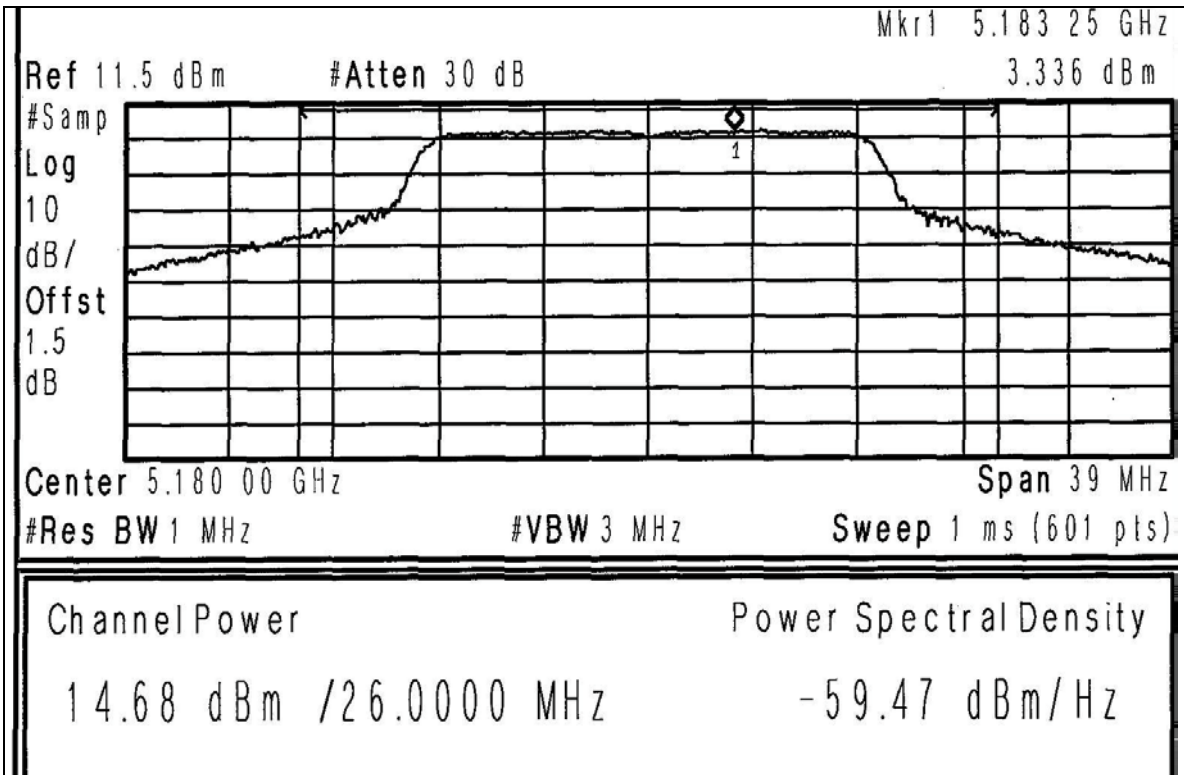
\*(The test data is in accordance with ADT Report No.: RF940321L05.)



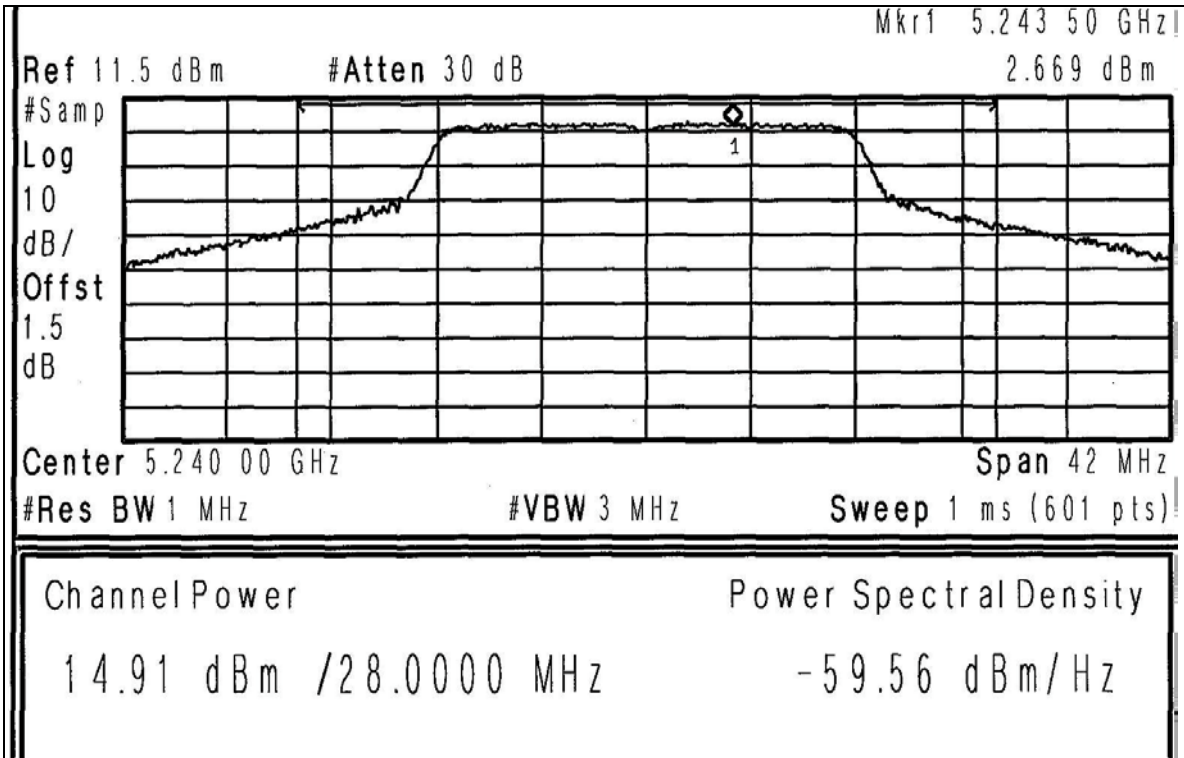


Peak Power Output:

CH1

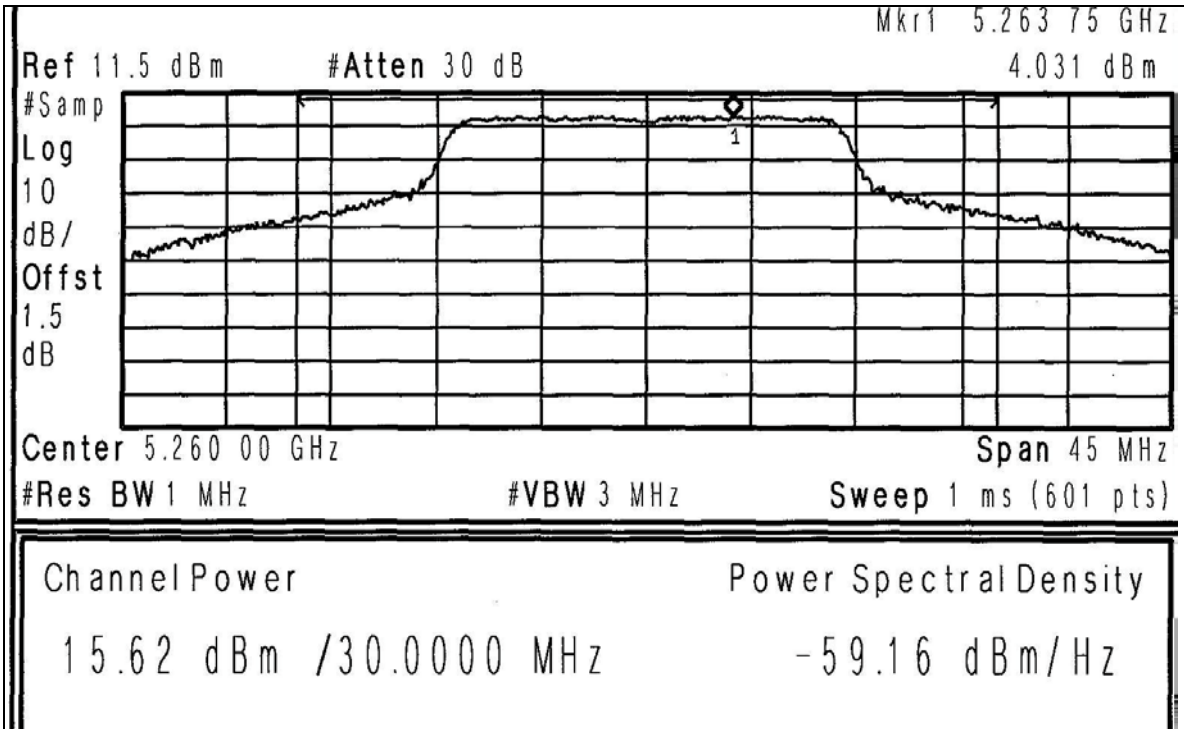


CH4

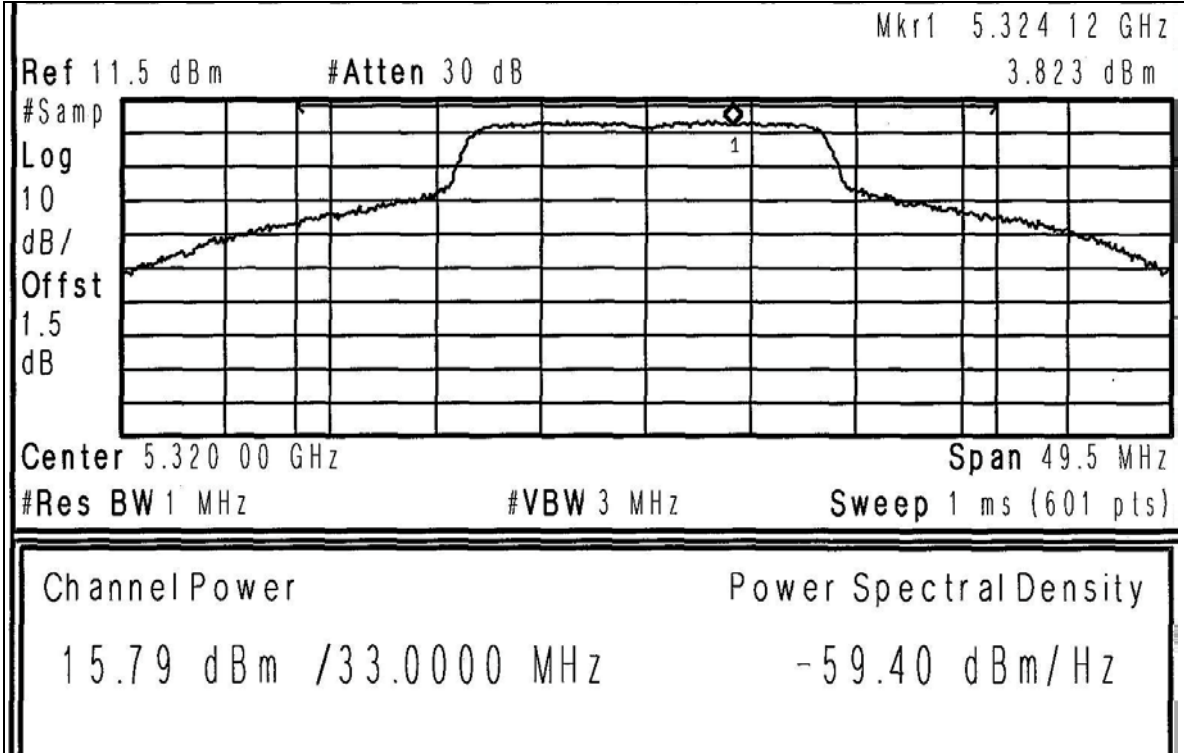




CH5

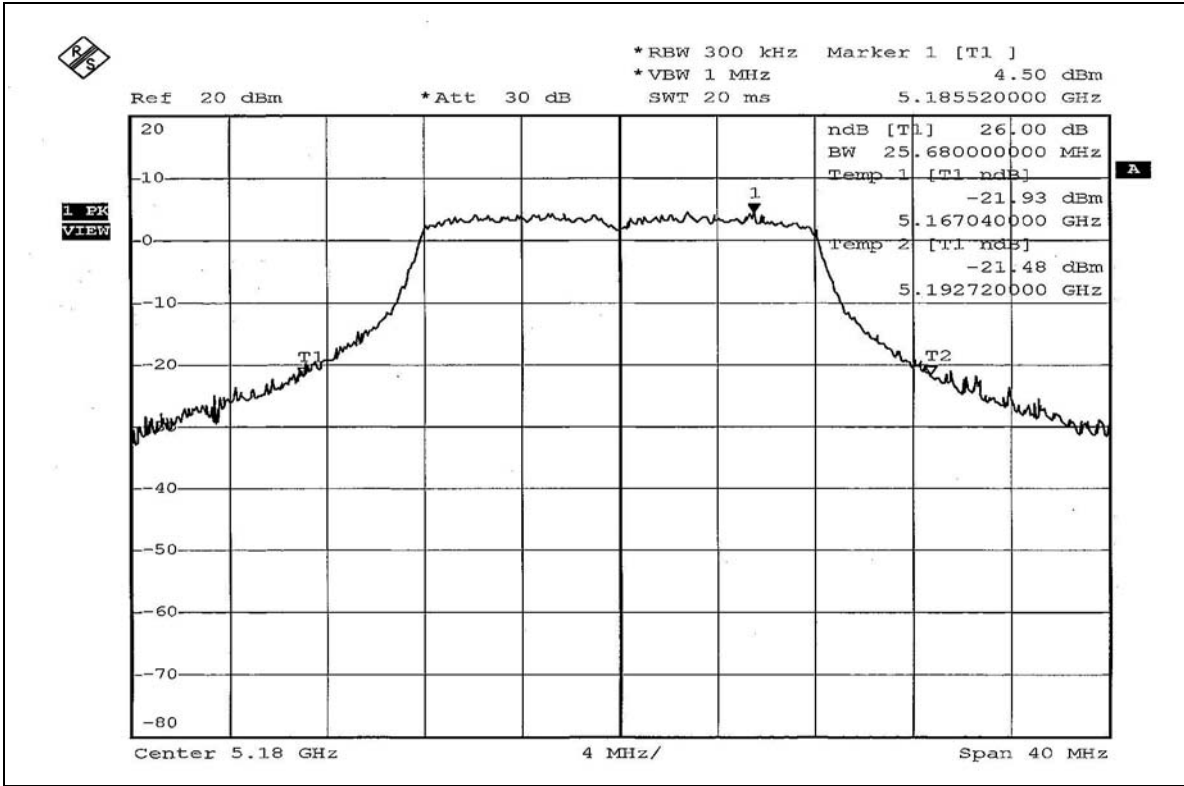


CH8

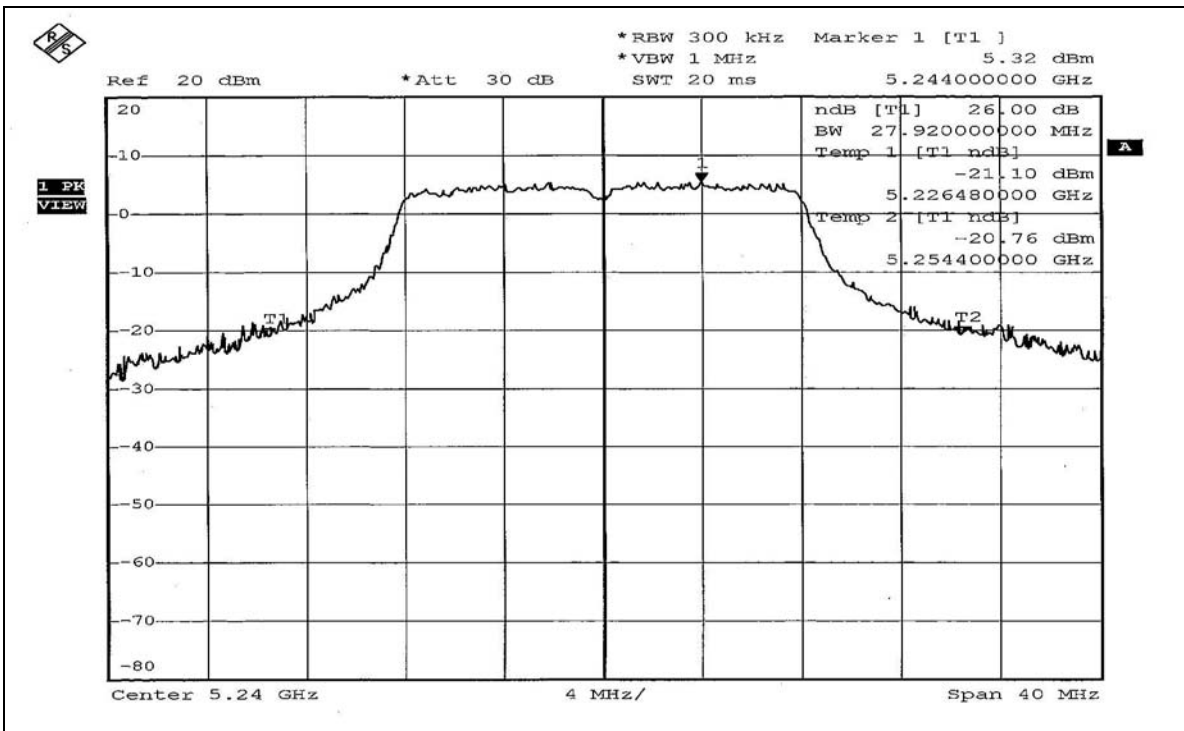




26dB Occupied Bandwidth:  
CH1

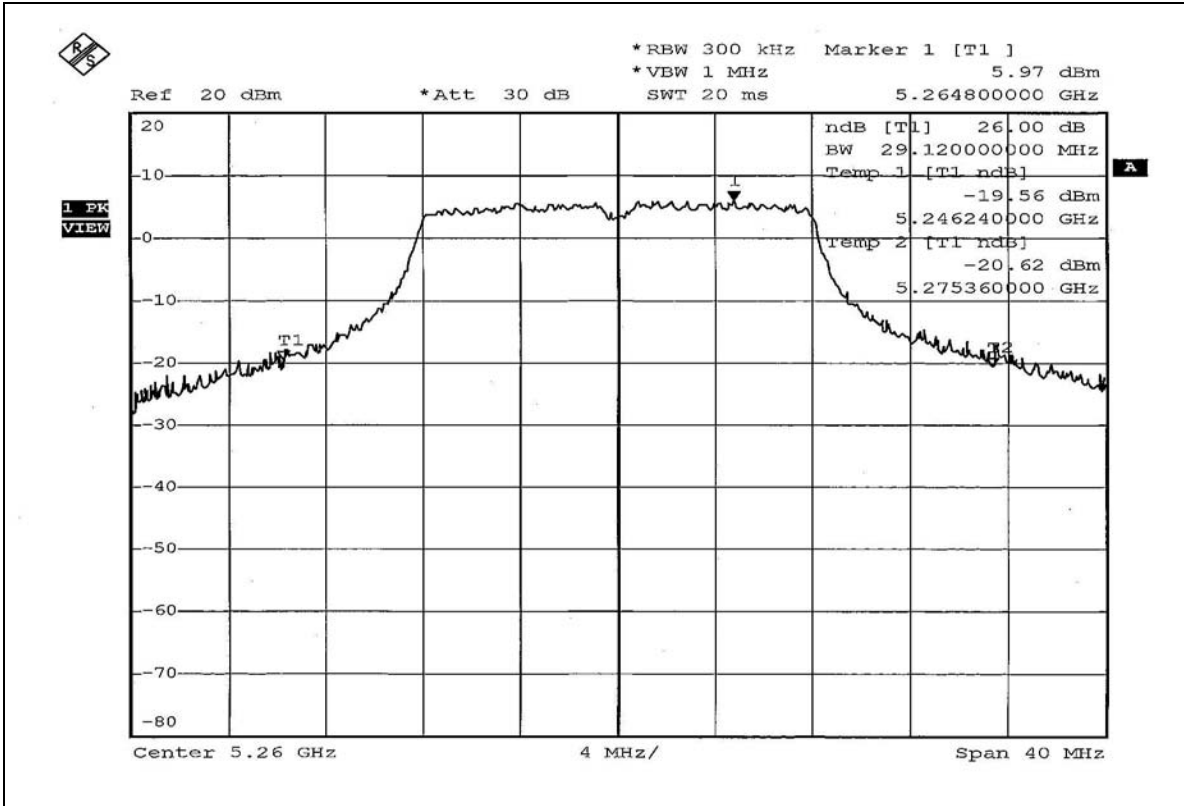


CH4

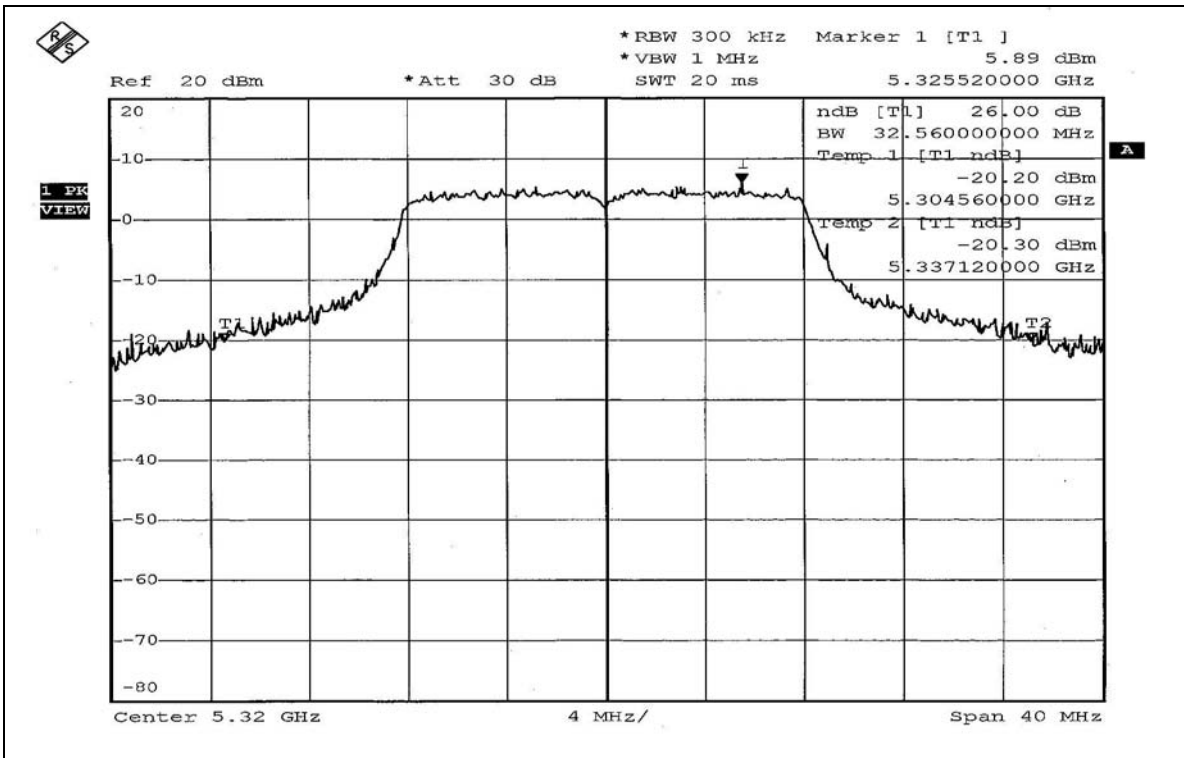




CH5



CH8



**802.11a Turbo OFDM modulation**

<b>EUT</b>	WLAN 802.11a/b/g PCI Adapter	<b>MODEL</b>	WL-760A
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	22deg.C, 55%RH, 991hPa
<b>TESTED BY</b>	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5210	34.514	15.38	17.00	47.04	PASS
2	5250	33.497	15.25	17.00	46.72	PASS
3	5290	34.995	15.44	24.00	53.44	PASS

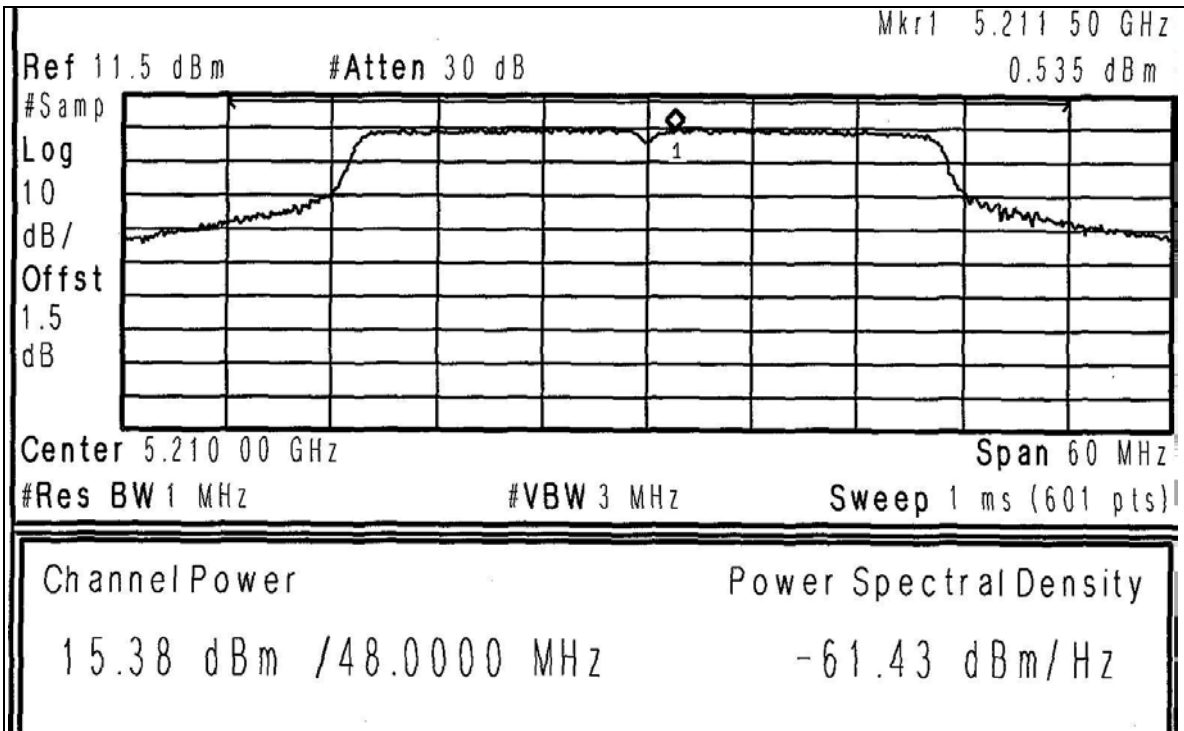
**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

\*(The test data is in accordance with ADT Report No.: RF940321L05.)

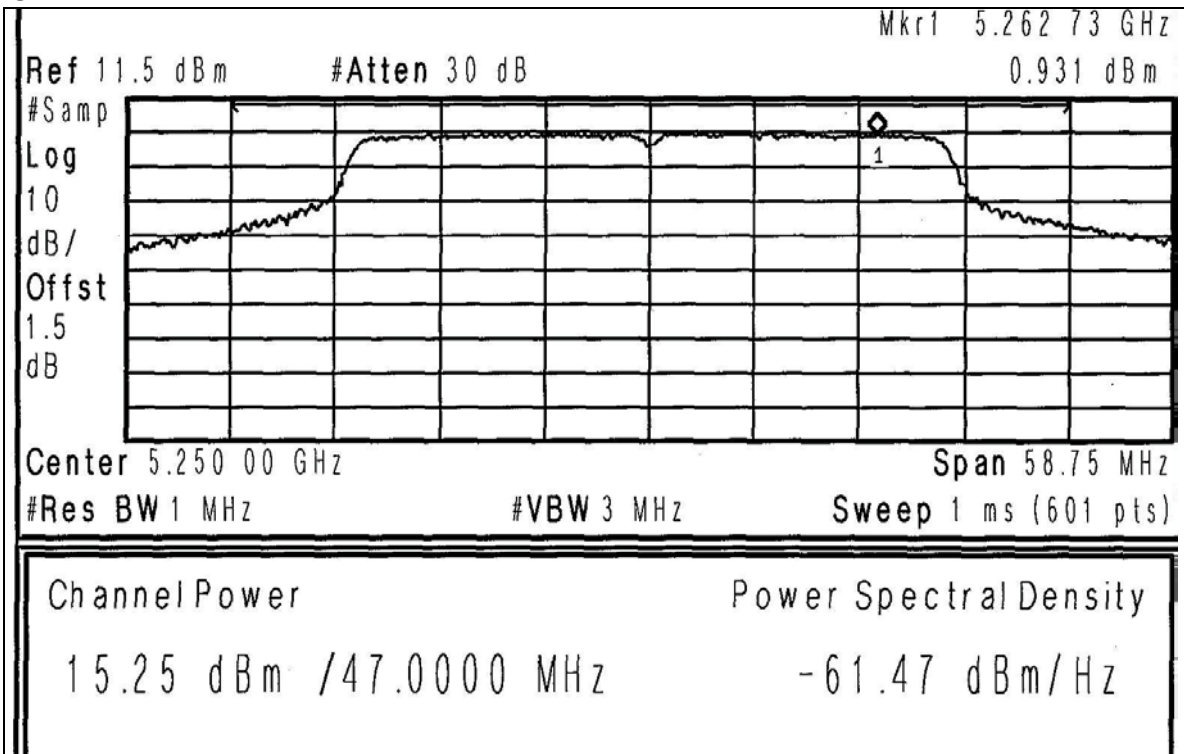


Peak Power Output:

CH1

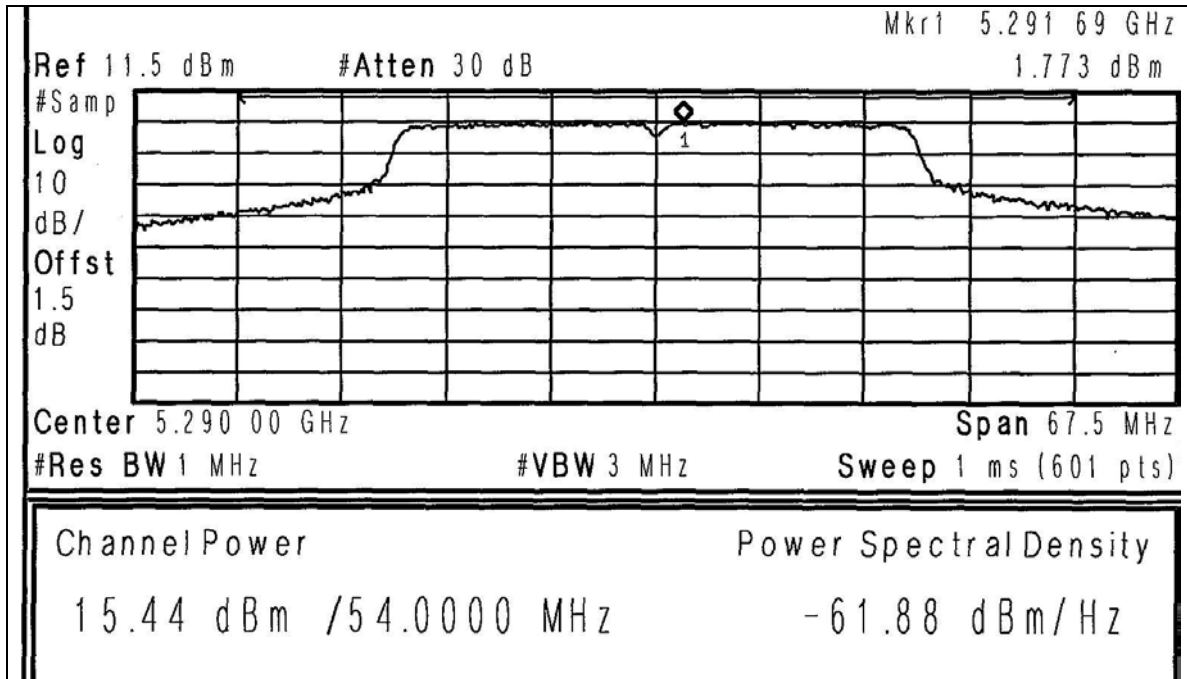


CH2



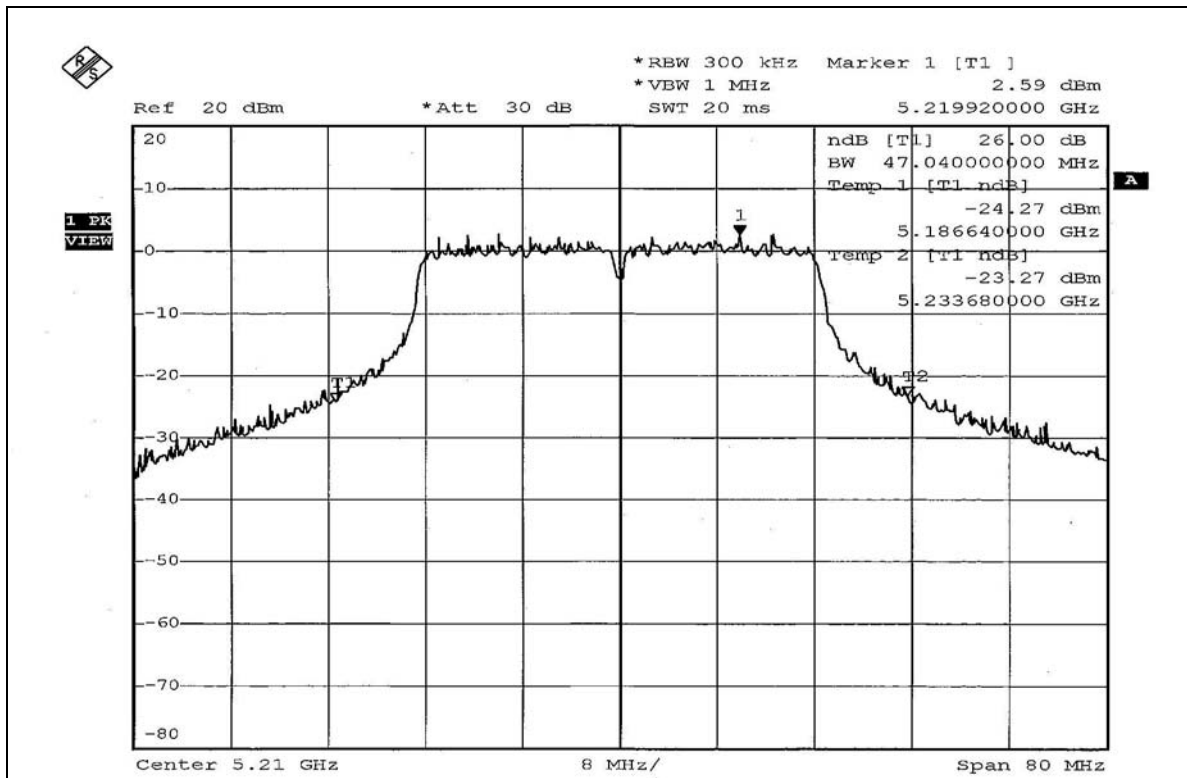


CH3



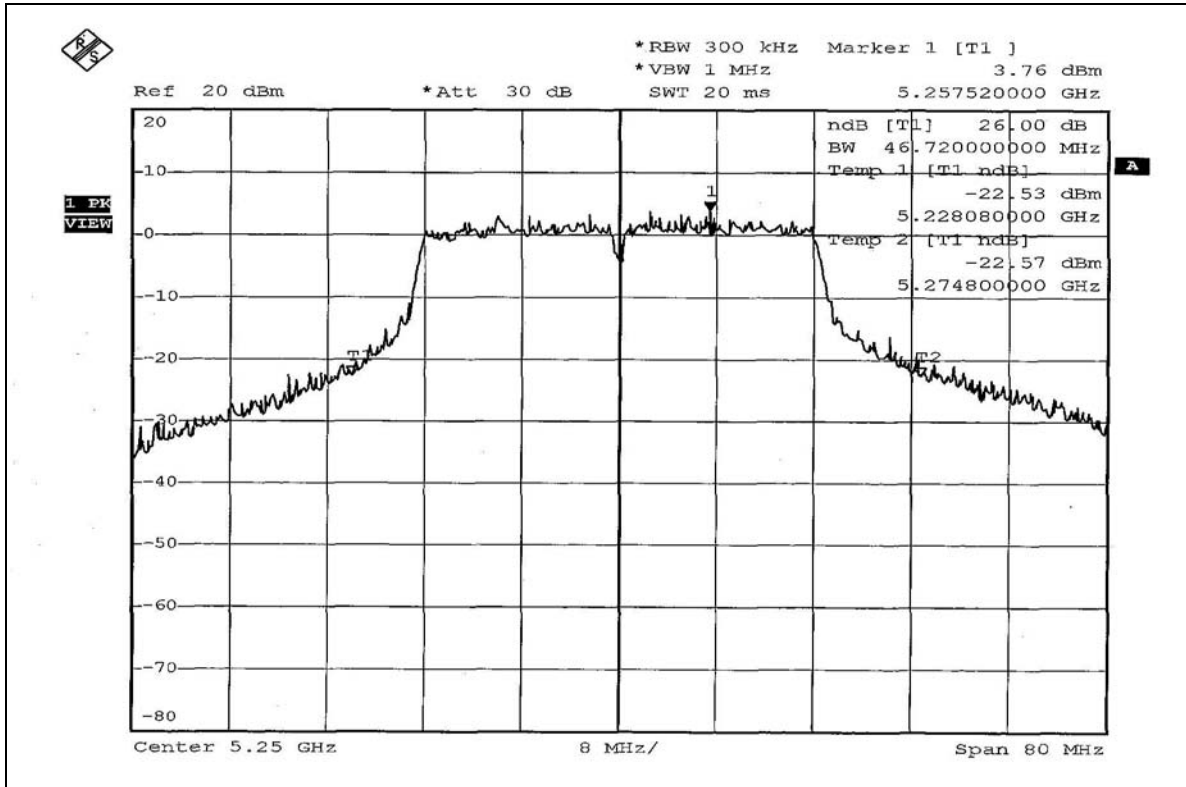
26dB Occupied Bandwidth:

CH1





CH2



CH3

