

## FCC TEST REPORT (15.407)

**REPORT NO.:** RF940906H06

**MODEL NO.:** AP-80MB, AP-80SB, AP-80M, AP-80S

**RECEIVED:** Sep. 06, 2005

**TESTED:** Sep. 23 to Oct. 06, 2005

**ISSUED:** Oct. 22, 2005

**APPLICANT:** ARUBA WIRELESS NETWORKS INC.

**ADDRESS:** 1322 Crossman Ave. Sunnyvale , CA94089-1113, U.S.A.

**ISSUED BY:** Advance Data Technology Corporation

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

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ILAC MRA



No. 2177-01

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## 1. CERTIFICATION

**PRODUCT:** Aruba 80 a+b/g Outdoor Stand-alone Access Point /  
WDS Bridge Master  
Aruba 80 a+b/g Outdoor Stand-alone Access Point /  
WDS Bridge Slave

**BRAND NAME:** ARUBA WIRELESS NETWORKS

**MODEL NO.:** AP-80MB, AP-80SB, AP-80M, AP-80S

**TEST SAMPLE:** R&D SAMPLE

**TESTED:** Sep. 23 to Oct. 06, 2005

**APPLICANT:** ARUBA WIRELESS NETWORKS INC.

**STANDARDS:** FCC Part 15, Subpart E (Section 15.407)  
ANSI C63.4-2003

The above equipment (Model: AP-80MB) 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:** Oct. 22, 2005  
( Carol Liao )

**TECHNICAL**  
**ACCEPTANCE :** Hank Chung , **DATE:** Oct. 22, 2005  
Responsible for RF ( Hank Chung )

**APPROVED BY :** May Chen , **DATE:** Oct. 22, 2005  
(May Chen, Deputy Manager)

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart E (Section 15.407)			
Standard Section	Test Type	Result	Remark
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.19dB at 0.344MHz
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 -0.50dB 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.

**NOTE:**

1. The EUT was operating in 2.412 ~ 2.462GHz, 5.250 ~ 5.350GHz and 5.725 ~ 5.850GHz frequencies band. This report was recorded the RF parameters including 5.250 ~ 5.350GHz. For the 2.412 ~ 2.462GHz and 5.725 ~ 5.850GHz RF parameters was recorded in another test report.

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master
<b>MODEL NO.</b>	AP-80MB
<b>POWER SUPPLY</b>	DC 48 V from POE
<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 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: 5.25 ~ 5.35GHz and 5.725 ~ 5.850GHz
<b>NUMBER OF CHANNEL</b>	802.11b & 802.11g: 11 (1 for 802.11g Turbo mode) 802.11a: 9 (3 for 802.11a 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>	Please see note 7 (on next page)
<b>DATA CABLE</b>	POE Cable x 1 (Shielded, 30m)
<b>ANTENNA TYPE</b>	Please see note 5 (on next page)
<b>I/O PORTS</b>	RJ 45 Port x 1
<b>ASSOCIATED DEVICES</b>	NA

#### NOTE:

1. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.
2. This EUT is capable of providing data rates of up to 108 Mbps in 802.11a/g Turbo mode depending upon reception quality.
3. The EUT was operated with the following power adapter:

<b>BRAND:</b>	MICROELECTRONICS TECH. INC.
<b>MODEL:</b>	TR60A-POE-L(0640-0086)
<b>INPUT:</b>	INPUT: 100-240Vac 1.5A 47-63Hz
<b>OUTPUT:</b>	OUTPUT: 48V, 1.2A

4. The EUT has four model names which are identical to each other in all aspects except for the followings:

Brand Name	Model Name	Product Name	Difference
Aruba	AP-80SB	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Slave	Int5G.+Ext2.4G (Accton software)
Aruba	AP-80MB	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master	Ext2.4G+Ext5G (Accton software)
Aruba	AP-80S	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Slave	Int5G.+Ext2.4G (Aruba software)
Aruba	AP-80M	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master	Ext2.4G+Ext5G (Aruba software)

From the above models, model: **AP-80MB** was selected as representative model for the test and its data were recorded in this report.

5. There are eleven antennas provided to this EUT, please refer to the following table:

For 2.4GHz					
No.	Model No.	Gain (dBi)	Cable Loss (dB)	Antenna Type	Antenna Connector
1	AP-ANT-80	8.0 dBi	0.79dB	Dipole	N-type
2	AP-ANT-82	12.0 dBi		Wide-Angle (H-Plane)90°Sector	
3	AP-ANT-84	5.0 dBi		Wide-Angle 135° Directional	
4	AP-ANT-85	15.0 dBi		High Gain, Directional Panel	
5	AP-ANT-87	7.0 dBi		Wide-Angle (H-Plane)60°Patch	
6	AP-ANT-81	8.0 dBi		Wide-Angle (H-Plane)60°Sector	
7	AP-ANT-83	7.0 dBi		Wide-Angle 90° Directional Sector	
For 5GHz					
No.	Model No.	Gain (dBi)	Cable Loss (dB)	Antenna Type	Antenna Connector
1	AP-ANT-86	9.0dBi	1.36dB	Omnidirectional (Dipole)	N-type
2	AP-ANT-87	7.0dBi		Wide-Angle (H-Plane)60°Patch	
3	AP-ANT-88	10.0dBi		120° Sector, typical with 36” cable	
4	AP-ANT-89	14.0dBi		Wide-Angle, High Gain, Directional Panel,	
5	ANT05535	17.0dBi	NA	Directional, Patch Panel (Internal Antenna)	Probe Pin

**Note:**

- All of the above antennas are outdoor Antenna except the antenna model No.: ANT05535.
- Antenna Model No. AP-ANT-85, AP-ANT-89 and ANT05535 can be used in point-to-point applications.
- From above antennas, the different type of antennas were chosen for final test and its data were recorded in this report.
- For 2.4GHz antennas, antenna 2, 6 and 7 are the same type of antenna ( wide Angle(H-Plane)Sector and ), we choose the highest gain antenna for final test. Antenna 2, the highest antenna gain one, was selected as representative antenna for the test.



## 6. Frequency Range of each Antennas are as followings:

For 2.4GHz	
Antenna No.	Frequency Range
No. 1 ~ 7	2400MHz ~ 2483.5MHz
For 5GHz	
Antenna No.	Frequency Range
No. 1 ~ 4	5.25GHz~5.35GHz and 5.725GHz ~ 5.850GHz
No. 5	5.725GHz ~ 5.850GHz (ISM Band)

## 7. Maximum peak output power (Unit : dBm) :

No.	Model No. (Antenna)	Operating Frequency (MHz)		
		2412~2462	5250~5350	5725~5850
1	AP-ANT-80	24.06	NA	NA
2	AP-ANT-82	18.46	NA	NA
3	AP-ANT-84	24.06	NA	NA
4	AP-ANT-85	18.46	NA	NA
5	AP-ANT-87	24.06	22.53	24.98
6	AP-ANT-86	NA	20.44	24.98
7	AP-ANT-88	NA	19.39	24.98
8	AP-ANT-89	NA	16.56	24.98
9	ANT05535	NA	NA	13.50

## 8. 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 5250MHz ~ 5350MHz bands:

Four channels are provided to this EUT for normal mode.

Channel	Frequency
1	5260 MHz
2	5280 MHz
3	5300 MHz
4	5320 MHz

one channel is provided to this EUT for turbo mode.

Channel	Frequency
1	5290 MHz

## 3.2.1 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&lt;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 4	4	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 4	4	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 4	1, 4	OFDM	BPSK	6
802.11a Turbo	1	1	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 4	1, 4	OFDM	BPSK	6
802.11a Turbo	1	1	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 4	1, 4	OFDM	BPSK	6
802.11a Turbo	1	1	OFDM	BPSK	12

### **3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is an Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master. 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

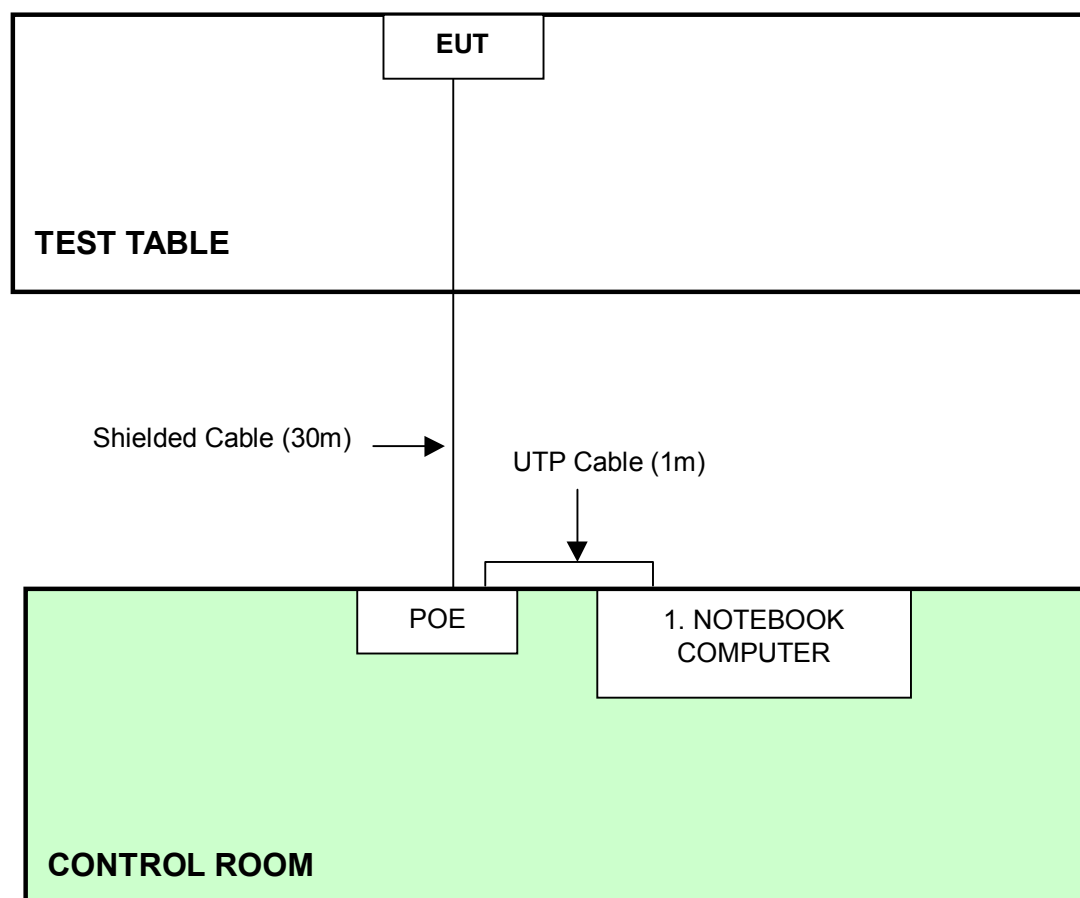
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP01L	TW-09c748- 12800-165-3171	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

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

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST



**NOTE:** 1. Support unit 1 was kept in the control room during the test.  
2. Please refer to the photos of test configuration in Item 6 also.

## 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	847124/029	Dec. 07, 2005
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 08, 2005
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 19, 2006
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 19, 2006
Terminator(for KYORITSU)	50	3	Oct. 12, 2005
Software	Cond-V2e	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 ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.
4. The measurement uncertainty is 2.53 dB, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.





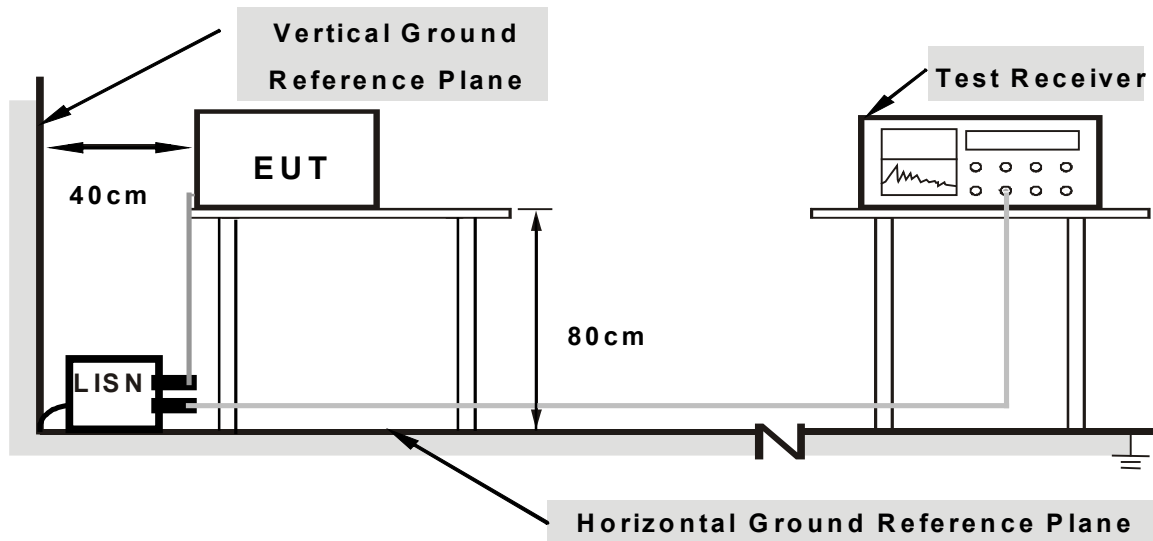
#### 4.1.3 TEST PROCEDURES

- 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 level 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) are 80 cm from EUT and at least 80 from other units and other metal planes**

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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer system to act as a communication partner and placed it outside of testing area.
- c. The communication partner run test program “ART V48 build5” to enable EUT under transmission/receiving condition continuously at specific channel frequency via UTP cable and wireless.

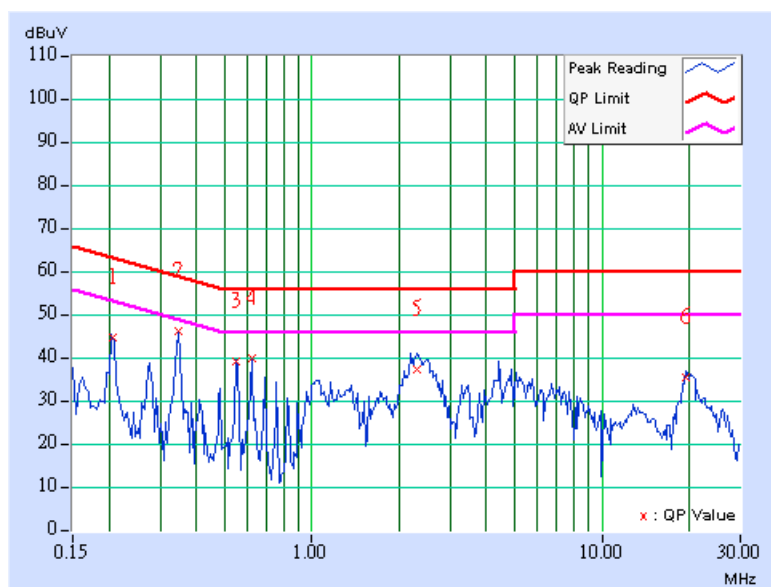
## 4.1.7 TEST RESULTS

**Conducted Worst-Case Data**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<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>	27deg. C, 65%RH, 961hPa	<b>TESTED BY</b>	Phoenix Huang

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	0.206	0.15	43.61	-	43.76	-	63.37	53.37	-19.61	-
2	0.345	0.16	45.05	-	45.21	-	59.07	49.07	-13.86	-
3	0.548	0.18	37.96	-	38.14	-	56.00	46.00	-17.86	-
4	0.619	0.18	38.81	-	38.99	-	56.00	46.00	-17.01	-
5	2.310	0.28	36.00	-	36.28	-	56.00	46.00	-19.72	-
6	19.526	1.30	34.42	-	35.72	-	60.00	50.00	-24.28	-

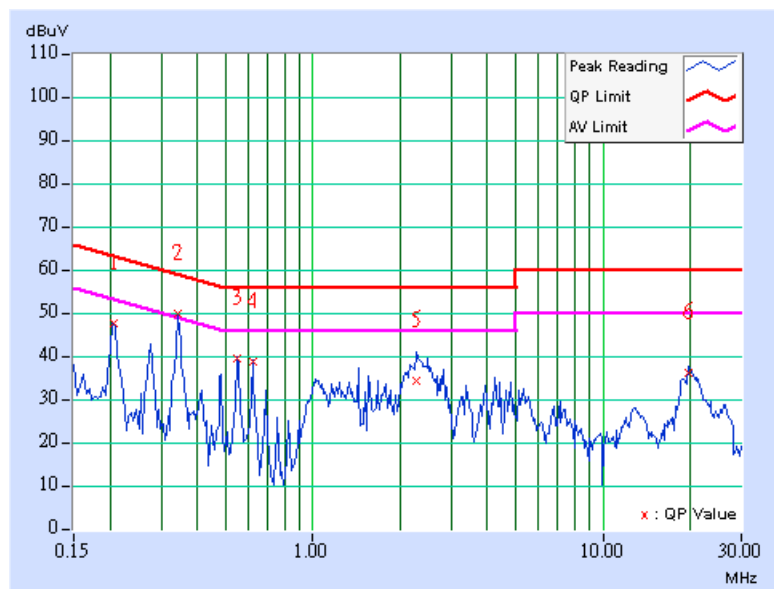
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<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>	27deg. C, 65%RH, 961hPa	<b>TESTED BY</b>	Phoenix Huang

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.206	0.15	46.53	-	46.68	-	63.37	53.37	-16.69	-
2	0.344	0.16	48.75	-	48.91	-	59.11	49.11	-10.19	-
3	0.550	0.18	38.64	-	38.82	-	56.00	46.00	-17.18	-
4	0.619	0.18	37.88	-	38.06	-	56.00	46.00	-17.94	-
5	2.267	0.28	33.27	-	33.55	-	56.00	46.00	-22.45	-
6	19.793	1.12	35.11	-	36.23	-	60.00	50.00	-23.77	-

- 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 (dBμV/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

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

## 4.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 07, 2006
HP Pre_Amplifier	8449B	3008A01922	Oct. 13, 2005
ROHDE & SCHWARZ Test Receiver	ESCS30	100287	Dec. 08, 2005
CHASE Broadband Antenna	VULB9168	138	Dec. 21, 2005
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 11, 2005
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 30, 2006
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 26, 2006
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 26, 2006
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek) 1GHz-20GHz	SF102	22054-2	Nov. 15, 2005
RF Cable(RICHTEC)	9913-30M	STCCAB-30M- 1GHz-021	Jul. 16, 2006
Software	ADT_Radiated_V 5.14	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 Periodic 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. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

#### 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 10dB 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 10dB 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:**

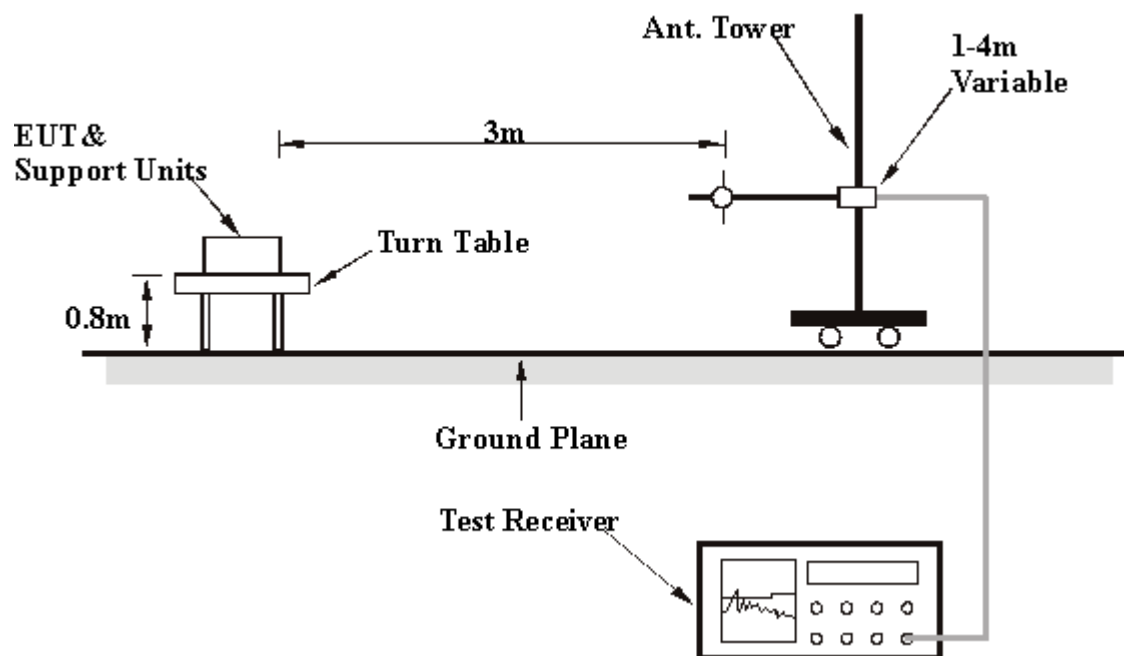
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above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

#### 4.2.5 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 (ANTENNA 1)

**Below 1GHz Worst-Case Data**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<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>	28deg. C, 55%RH, 966hPa	<b>TESTED BY</b>	Wen Yu

**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	200.01	26.40 QP	43.50	-17.10	1.25 H	210	15.90	10.50
2	250.02	32.10 QP	46.00	-13.90	1.84 H	113	18.50	13.60
3	320.01	30.90 QP	46.00	-15.10	1.24 H	53	14.70	16.20
4	375.02	27.00 QP	46.00	-19.00	1.25 H	357	9.50	17.50
5	400.01	24.90 QP	46.00	-21.10	1.43 H	2	6.40	18.40
6	500.01	27.30 QP	46.00	-18.70	1.10 H	2	7.10	20.20
7	550.01	29.90 QP	46.00	-16.10	1.00 H	37	7.80	22.10
8	600.01	28.60 QP	46.00	-17.40	1.45 H	34	6.80	21.90

**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	120.00	30.80 QP	43.50	-12.70	1.34 V	353	19.40	11.50
2	200.00	31.40 QP	43.50	-12.10	1.36 V	9	20.20	11.20
3	240.01	32.50 QP	46.00	-13.50	1.74 V	300	19.60	12.90
4	250.02	29.90 QP	46.00	-16.10	1.60 V	326	16.60	13.30
5	320.00	31.90 QP	46.00	-14.10	1.39 V	55	15.40	16.50
6	399.98	31.50 QP	46.00	-14.50	1.24 V	36	13.10	18.40
7	550.00	32.40 QP	46.00	-13.60	1.22 V	25	10.10	22.30
8	600.00	32.60 QP	46.00	-13.40	1.24 V	143	9.10	23.50

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5260.00	99.70 PK			1.34 H	79	63.90	35.80
1	*5260.00	91.10 AV			1.34 H	79	55.30	35.80
2	10520.00	49.10 PK	68.30	-19.20	1.20 H	3	4.40	44.70

**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	*5260.00	115.10 PK			1.15 V	3	79.30	35.80
1	*5260.00	107.00 AV			1.15 V	3	71.20	35.80
2	10520.00	50.20 PK	68.30	-18.10	1.14 V	2	5.50	44.70

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 4
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5320.00	97.60 PK			1.30 H	65	61.80	35.80
1	*5320.00	88.90 AV			1.30 H	65	53.10	35.80
2	#5350.00	48.50 PK	74.00	-25.50	1.25 H	65	12.70	35.80
2	#5350.00	37.00 AV	54.00	-17.00	1.25 H	65	1.20	35.80
3	#10640.00	50.40 PK	74.00	-23.60	1.11 H	7	4.50	45.90
3	#10640.00	40.30 AV	54.00	-13.70	1.11 H	7	-5.60	45.90

**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	*5320.00	113.20 PK			1.16 V	4	77.40	35.80
1	*5320.00	104.90 AV			1.16 V	4	69.10	35.80
2	#5350.00	64.10 PK	74.00	-9.90	1.19 V	0	28.30	35.80
2	#5350.00	53.00 AV	54.00	-1.00	1.19 V	0	17.20	35.80
3	#10640.00	52.60 PK	74.00	-21.40	1.21 V	1	6.70	45.90
3	#10640.00	41.30 AV	54.00	-12.70	1.21 V	1	-4.60	45.90

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	12Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5290.00	94.40 PK			1.11 H	315	58.60	35.80
1	*5290.00	86.20 AV			1.11 H	315	50.40	35.80
2	#5350.00	46.50 PK	74.00	-27.50	1.12 H	343	10.70	35.80
2	#5350.00	35.40 AV	54.00	-18.60	1.12 H	343	-0.40	35.80
3	10580.00	48.90 PK	68.30	-19.40	1.20 H	6	3.70	45.30

**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	*5290.00	111.60 PK			1.14 V	5	75.80	35.80
1	*5290.00	104.00 AV			1.14 V	5	68.20	35.80
2	#5350.00	63.70 PK	74.00	-10.30	1.16 V	3	27.90	35.80
2	#5350.00	53.20 AV	54.00	-0.80	1.16 V	3	17.40	35.80
3	10580.00	52.20 PK	68.30	-16.10	1.19 V	3	7.00	45.30

- 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.

## 4.2.9 TEST RESULTS (ANTENNA 2)

## Below 1GHz Worst-Case Data

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<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>	28deg. C, 55%RH, 966hPa	<b>TESTED BY</b>	Wen Yu

## ANTENNA POLARITY &amp; 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	200.01	27.00 QP	43.50	-16.50	1.32 H	320	16.50	10.50
2	250.03	32.40 QP	46.00	-13.60	1.08 H	53	18.80	13.60
3	320.00	30.40 QP	46.00	-15.60	1.52 H	123	14.20	16.20
4	375.01	27.00 QP	46.00	-19.00	1.75 H	346	9.50	17.50
5	400.01	22.00 QP	46.00	-24.00	1.50 H	237	3.60	18.40
6	500.01	25.90 QP	46.00	-20.10	1.04 H	239	5.70	20.20
7	550.00	28.90 QP	46.00	-17.10	1.11 H	43	6.80	22.10
8	600.02	29.50 QP	46.00	-16.50	1.54 H	320	7.60	21.90

## ANTENNA POLARITY &amp; 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	120.03	31.20 QP	43.50	-12.30	1.53 V	62	19.70	11.50
2	199.99	30.40 QP	43.50	-13.10	1.24 V	153	19.30	11.20
3	240.03	31.00 QP	46.00	-15.00	1.80 V	300	18.10	12.90
4	250.01	30.70 QP	46.00	-15.30	1.60 V	326	17.40	13.30
5	320.01	32.40 QP	46.00	-13.60	1.07 V	100	15.90	16.50
6	399.98	31.90 QP	46.00	-14.10	1.24 V	36	13.50	18.40
7	550.00	33.40 QP	46.00	-12.60	1.75 V	0	11.10	22.30
8	600.00	33.30 QP	46.00	-12.70	1.79 V	243	9.80	23.50

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5260.00	100.90 PK			1.00 H	315	65.10	35.80
1	*5260.00	92.70 AV			1.00 H	315	56.90	35.80
2	10520.00	50.10 PK	68.30	-18.20	1.02 H	320	5.40	44.70

**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	*5260.00	116.00 PK			1.00 V	1	80.20	35.80
1	*5260.00	107.70 AV			1.00 V	1	71.90	35.80
2	10520.00	52.30 PK	68.30	-16.00	1.01 V	3	7.60	44.70

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 4
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

#### 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	*5320.00	98.60 PK			1.02 H	329	62.80	35.80
1	*5320.00	89.80 AV			1.02 H	329	54.00	35.80
2	#5350.00	49.60 PK	74.00	-24.40	1.02 H	329	13.80	35.80
2	#5350.00	38.10 AV	54.00	-15.90	1.02 H	329	2.30	35.80
3	#10640.00	51.30 PK	74.00	-22.70	1.11 H	6	5.40	45.90
3	#10640.00	40.60 AV	54.00	-13.40	1.11 H	6	-5.30	45.90

#### 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	*5320.00	113.90 PK			1.00 V	359	78.10	35.80
1	*5320.00	104.80 AV			1.00 V	359	69.00	35.80
2	#5350.00	64.90 PK	74.00	-9.10	1.10 V	3	29.10	35.80
2	#5350.00	53.20 AV	54.00	-0.80	1.10 V	3	17.40	35.80
3	#10640.00	53.20 PK	74.00	-20.80	1.01 V	358	7.30	45.90
3	#10640.00	42.00 AV	54.00	-12.00	1.01 V	358	-3.90	45.90

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	12Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5290.00	97.90 PK			1.01 H	318	62.10	35.80
1	*5290.00	89.40 AV			1.01 H	318	53.60	35.80
2	#5350.00	53.10 PK	74.00	-20.90	1.09 H	320	17.30	35.80
2	#5350.00	38.60 AV	54.00	-15.40	1.09 H	320	2.80	35.80
3	10580.00	49.80 PK	68.30	-18.50	1.10 H	350	4.60	45.30

**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	*5290.00	112.10 PK			1.01 V	2	76.30	35.80
1	*5290.00	104.30 AV			1.01 V	2	68.50	35.80
2	#5350.00	67.30 PK	74.00	-6.70	1.01 V	358	31.50	35.80
2	#5350.00	<b>53.50 AV</b>	<b>54.00</b>	<b>-0.50</b>	<b>1.01 V</b>	<b>358</b>	<b>17.70</b>	<b>35.80</b>
3	10580.00	52.70 PK	68.30	-15.60	1.00 V	3	7.50	45.30

- 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.

## 4.2.10 TEST RESULTS (ANTENNA 3)

## Below 1GHz Worst-Case Data

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<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>	28deg. C, 55%RH, 966hPa	<b>TESTED BY</b>	Wen Yu

## ANTENNA POLARITY &amp; 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	199.98	26.40 QP	43.50	-17.10	1.20 H	20	15.90	10.50
2	250.00	33.60 QP	46.00	-12.40	1.02 H	36	20.00	13.60
3	320.02	29.90 QP	46.00	-16.10	1.10 H	270	13.70	16.20
4	375.01	26.70 QP	46.00	-19.30	1.34 H	56	9.20	17.50
5	400.02	25.30 QP	46.00	-20.70	1.30 H	207	6.90	18.40
6	500.01	28.00 QP	46.00	-18.00	1.09 H	9	7.80	20.20
7	550.01	30.10 QP	46.00	-15.90	1.53 H	43	8.00	22.10
8	600.02	29.30 QP	46.00	-16.70	1.31 H	43	7.40	21.90

## ANTENNA POLARITY &amp; 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	120.01	30.80 QP	43.50	-12.70	1.34 V	353	19.40	11.50
2	200.00	32.60 QP	43.50	-10.90	1.36 V	9	21.40	11.20
3	240.01	33.00 QP	46.00	-13.00	1.36 V	3	20.10	12.90
4	250.02	31.80 QP	46.00	-14.20	1.60 V	326	18.50	13.30
5	320.01	31.90 QP	46.00	-14.10	1.39 V	55	15.40	16.50
6	400.00	32.00 QP	46.00	-14.00	1.24 V	36	13.60	18.40
7	550.00	31.40 QP	46.00	-14.60	1.62 V	250	9.20	22.30
8	600.00	33.00 QP	46.00	-13.00	1.24 V	143	9.50	23.50

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5260.00	99.40 PK			1.20 H	29	63.60	35.80
1	*5260.00	91.60 AV			1.20 H	29	55.80	35.80
2	10520.00	50.50 PK	68.30	-17.80	1.11 H	6	5.80	44.70

**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	*5260.00	115.00 PK			1.19 V	5	79.20	35.80
1	*5260.00	106.10 AV			1.19 V	5	70.30	35.80
2	10520.00	51.20 PK	68.30	-17.10	1.20 V	6	6.50	44.70

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 4
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

#### 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	*5320.00	98.20 PK			1.19 H	39	62.40	35.80
1	*5320.00	90.20 AV			1.19 H	39	54.40	35.80
2	#5350.00	49.10 PK	74.00	-24.90	1.08 H	3	13.30	35.80
2	#5350.00	38.50 AV	54.00	-15.50	1.08 H	3	2.70	35.80
3	#10640.00	52.30 PK	74.00	-21.70	1.08 H	12	6.40	45.90
3	#10640.00	40.90 AV	54.00	-13.10	1.08 H	12	-5.00	45.90

#### 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	*5320.00	113.80 PK			1.20 V	4	78.00	35.80
1	*5320.00	105.20 AV			1.20 V	4	69.40	35.80
2	#5350.00	64.70 PK	74.00	-9.30	1.10 V	2	28.90	35.80
<b>2</b>	<b>#5350.00</b>	<b>53.50 AV</b>	<b>54.00</b>	<b>-0.50</b>	<b>1.10 V</b>	<b>2</b>	<b>17.70</b>	<b>35.80</b>
3	#10640.00	52.60 PK	74.00	-21.40	1.11 V	358	6.70	45.90
3	#10640.00	41.20 AV	54.00	-12.80	1.11 V	358	-4.70	45.90

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	12Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5290.00	97.20 PK			1.19 H	28	61.40	35.80
1	*5290.00	89.70 AV			1.19 H	28	53.90	35.80
2	#5350.00	49.30 PK	74.00	-24.70	1.22 H	4	13.50	35.80
2	#5350.00	38.90 AV	54.00	-15.10	1.22 H	4	3.10	35.80
3	10580.00	50.80 PK	68.30	-17.50	1.11 H	6	5.60	45.30

**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	*5290.00	111.60 PK			1.11 V	1	75.80	35.80
1	*5290.00	103.90 AV			1.11 V	1	68.10	35.80
2	#5350.00	63.70 PK	74.00	-10.30	1.11 V	1	27.90	35.80
2	#5350.00	53.10 AV	54.00	-0.90	1.11 V	1	17.30	35.80
3	10580.00	51.90 PK	68.30	-16.40	1.02 V	4	6.70	45.30

- 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.

## 4.2.11 TEST RESULTS (ANTENNA 4)

## Below 1GHz Worst-Case Data

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<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>	28deg. C, 55%RH, 966hPa	<b>TESTED BY</b>	Wen Yu

## ANTENNA POLARITY &amp; 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	200.00	25.60 QP	43.50	-17.90	1.25 H	210	15.10	10.50
2	250.01	33.00 QP	46.00	-13.00	1.43 H	63	19.40	13.60
3	320.03	30.90 QP	46.00	-15.10	1.50 H	148	14.70	16.20
4	375.01	27.00 QP	46.00	-19.00	1.25 H	357	9.50	17.50
5	400.00	23.90 QP	46.00	-22.10	1.50 H	237	5.50	18.40
6	500.03	25.90 QP	46.00	-20.10	1.04 H	239	5.70	20.20
7	550.00	28.90 QP	46.00	-17.10	1.11 H	43	6.80	22.10
8	600.01	28.60 QP	46.00	-17.40	1.63 H	326	6.80	21.90

## ANTENNA POLARITY &amp; 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	120.00	31.20 QP	43.50	-12.30	1.53 V	62	19.70	11.50
2	200.01	30.40 QP	43.50	-13.10	1.24 V	153	19.30	11.20
3	240.03	32.50 QP	46.00	-13.50	1.74 V	300	19.60	12.90
4	250.01	30.70 QP	46.00	-15.30	1.60 V	326	17.40	13.30
5	320.00	33.50 QP	46.00	-12.50	1.04 V	234	17.00	16.50
6	399.98	32.50 QP	46.00	-13.50	1.24 V	36	14.20	18.40
7	550.03	33.40 QP	46.00	-12.60	1.75 V	0	11.10	22.30
8	600.00	33.30 QP	46.00	-12.70	1.79 V	5	9.80	23.50

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5260.00	99.10 PK			1.02 H	2	63.30	35.80
1	*5260.00	89.90 AV			1.02 H	2	54.10	35.80
2	10520.00	49.30 PK	68.30	-19.00	1.09 H	18	4.60	44.70

**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	*5260.00	113.30 PK			4.00 V	2	77.50	35.80
1	*5260.00	104.40 AV			4.00 V	2	68.60	35.80
2	10520.00	50.90 PK	68.30	-17.40	1.10 V	9	6.20	44.70

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 4
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

#### 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	*5320.00	98.70 PK			1.00 H	350	62.90	35.80
1	*5320.00	89.60 AV			1.00 H	350	53.80	35.80
2	#5350.00	48.40 PK	74.00	-25.60	1.01 H	358	12.60	35.80
2	#5350.00	38.10 AV	54.00	-15.90	1.01 H	358	2.30	35.80
3	#10640.00	50.60 PK	74.00	-23.40	1.03 H	4	4.70	45.90
3	#10640.00	39.50 AV	54.00	-14.50	1.03 H	4	-6.40	45.90

#### 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	*5320.00	112.80 PK			1.14 V	0	77.00	35.80
1	*5320.00	103.90 AV			1.14 V	0	68.10	35.80
2	#5350.00	62.50 PK	74.00	-11.50	1.30 V	359	26.70	35.80
2	#5350.00	52.40 AV	54.00	-1.60	1.30 V	359	16.60	35.80
3	#10640.00	51.40 PK	74.00	-22.60	1.00 V	350	5.50	45.90
3	#10640.00	40.30 AV	54.00	-13.70	1.00 V	350	-5.60	45.90

- 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>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>CHANNEL</b>	Channel 1
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	12Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 70%RH, 966hPa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TESTED BY</b>	Wen Yu		

**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	*5290.00	96.20 PK			1.03 H	1	60.40	35.80
1	*5290.00	87.10 AV			1.03 H	1	51.30	35.80
2	#5350.00	46.60 PK	74.00	-27.40	1.10 H	20	10.80	35.80
2	#5350.00	35.70 AV	54.00	-18.30	1.10 H	20	-0.10	35.80
3	10580.00	48.90 PK	68.30	-19.40	1.20 H	3	3.70	45.30

**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	*5290.00	109.90 PK			1.16 V	2	74.10	35.80
1	*5290.00	101.50 AV			1.16 V	2	65.70	35.80
2	#5350.00	60.30 PK	74.00	-13.70	1.18 V	358	24.50	35.80
2	#5350.00	50.10 AV	54.00	-3.90	1.18 V	358	14.30	35.80
3	10580.00	50.10 PK	68.30	-18.20	1.10 V	1	4.90	45.30

- 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	FSP40	100036	Nov. 23, 2005

**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 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

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:**

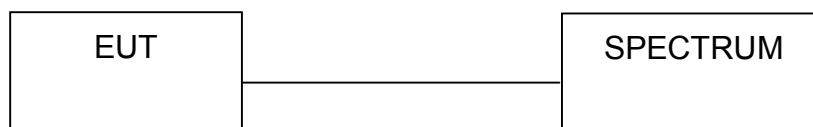
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

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 (ANTENNA 1)

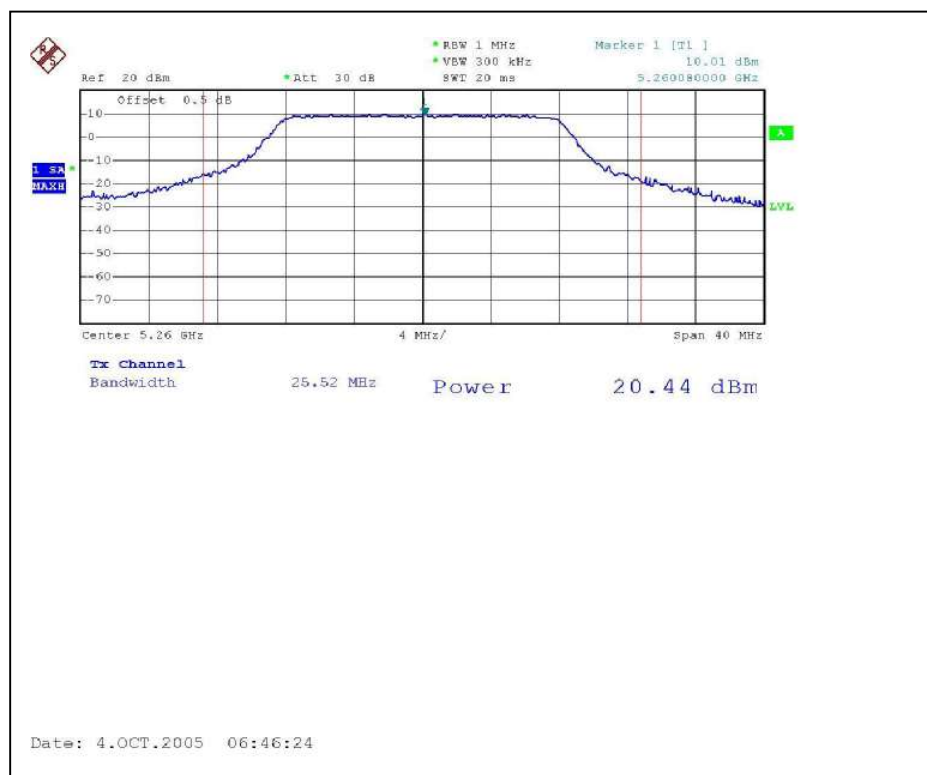
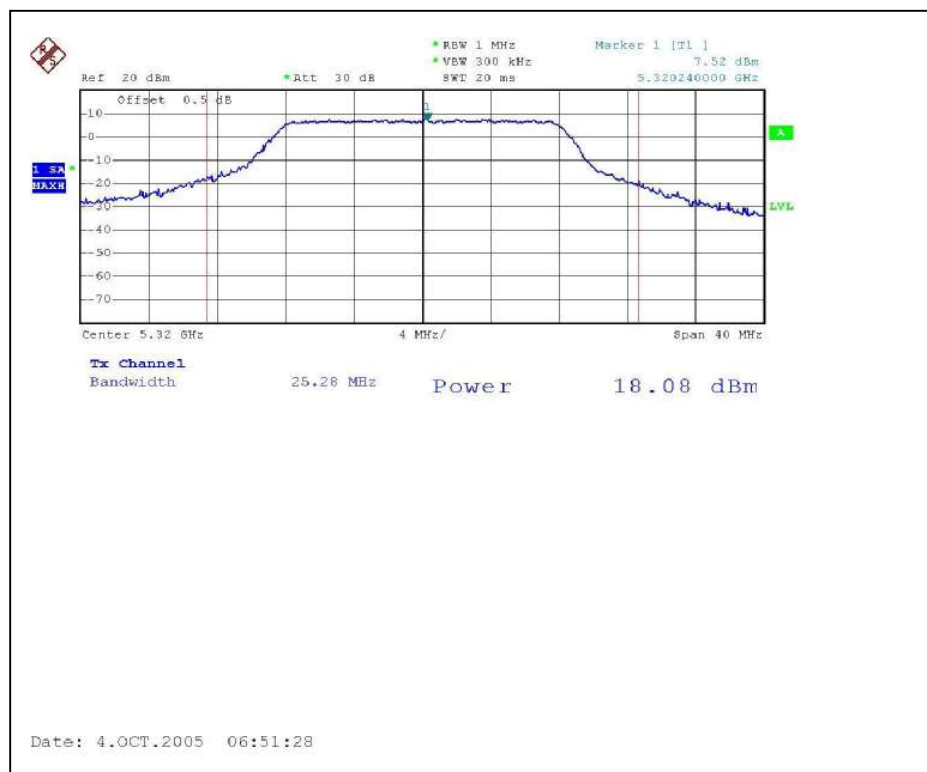
**802.11a OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	6Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

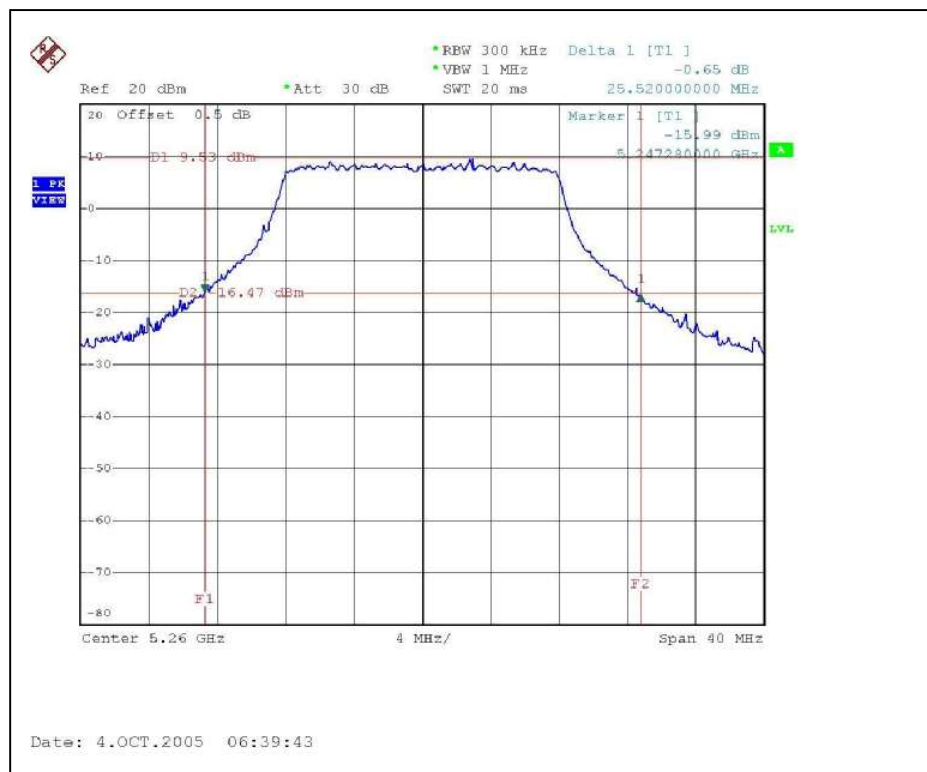
Antenna 1 (Gain : 9.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5260	20.44	22.36	25.52	PASS
4	5320	18.08	22.36	25.28	PASS

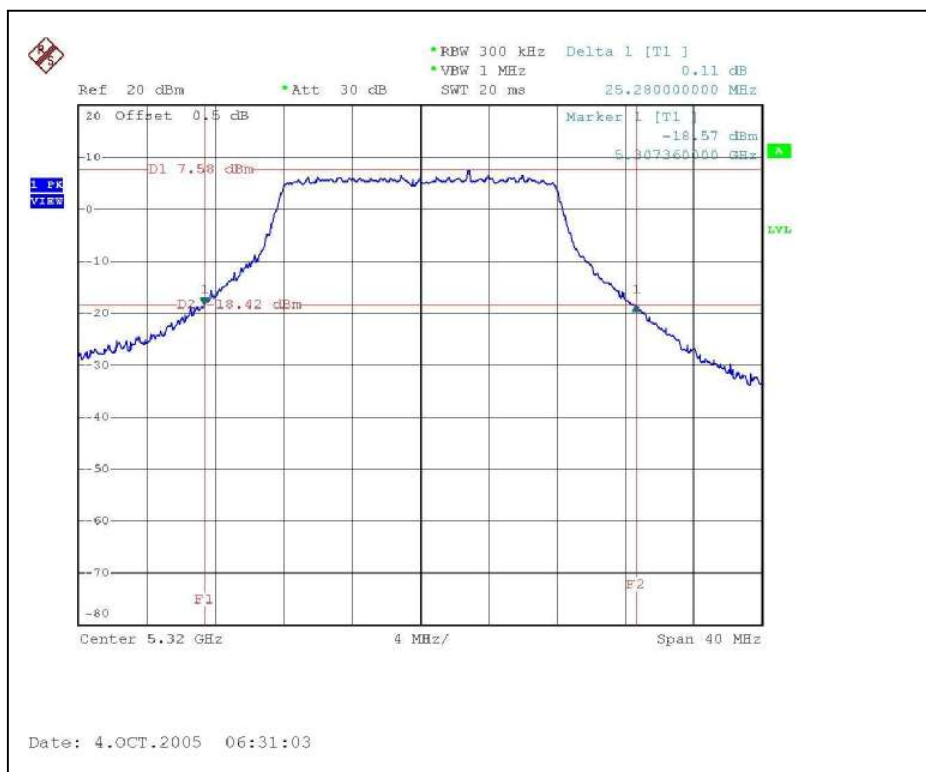
**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

**Peak Power Output:  
CH1****CH4**

## 26dB Occupied Bandwidth: CH1



## CH4



**802.11a Turbo OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	12Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

Antenna 1 (Gain : 9.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5290	19.39	22.36	49.01	PASS

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

Ref 20 dBm Att 30 dB RBW 1 MHz VBW 300 kHz SMT 20 ms

Marker 1 [T1] 5.89 dBm 5.280770000 GHz

Offset 0.5 dB

1 SA MAXH

LVL

Center 5.29 GHz 6.5 MHz/ Span 65 MHz

**Tx Channel**

Bandwidth 49.01 MHz Power 19.39 dBm

The image shows a spectrum plot with a blue trace. The y-axis represents power in dBm, ranging from -80 to 20. The x-axis represents frequency in GHz, with a center frequency of 5.29 GHz and a span of 65 MHz. A prominent peak is visible at 5.29 GHz, marked with a red '1' and labeled 'D1 4.89 dBm'. Another marker is present at 5.26455000 GHz, labeled 'Marker 1 [T1] -21.08 dBm'. The plot includes various settings: RBW 300 kHz, Delta 1 [T1], VBW 1 MHz, Att 30 dB, Ref 20 dBm, and SWT 20 ms. The plot is titled 'Date: 4.OCT.2005 06:21:18'.



## 4.3.8 TEST RESULTS (ANTENNA 2)

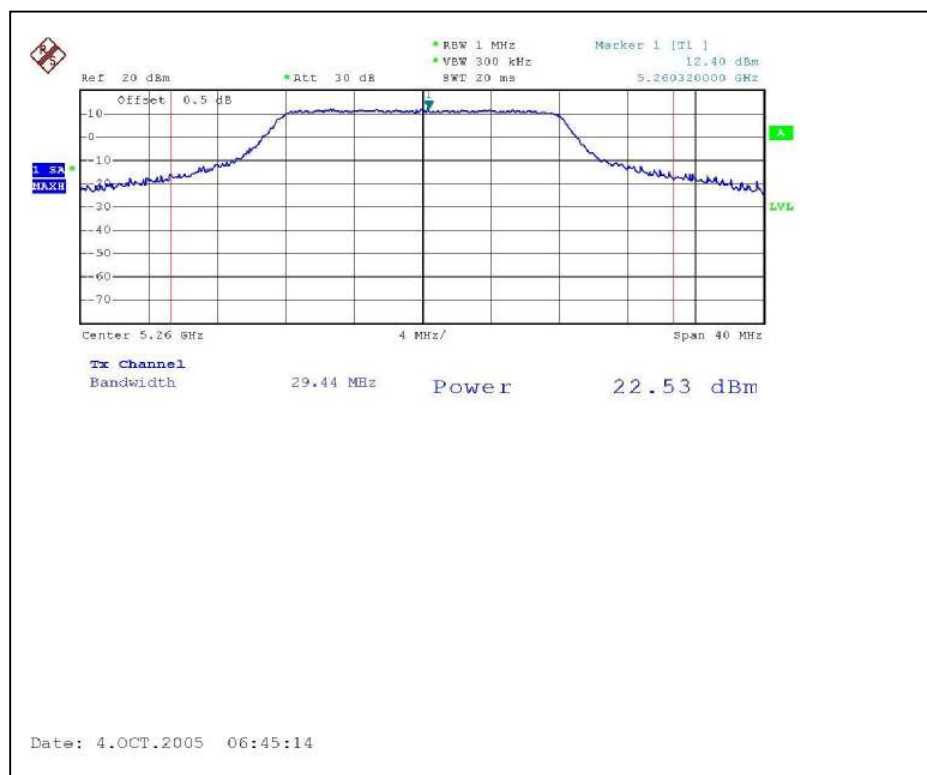
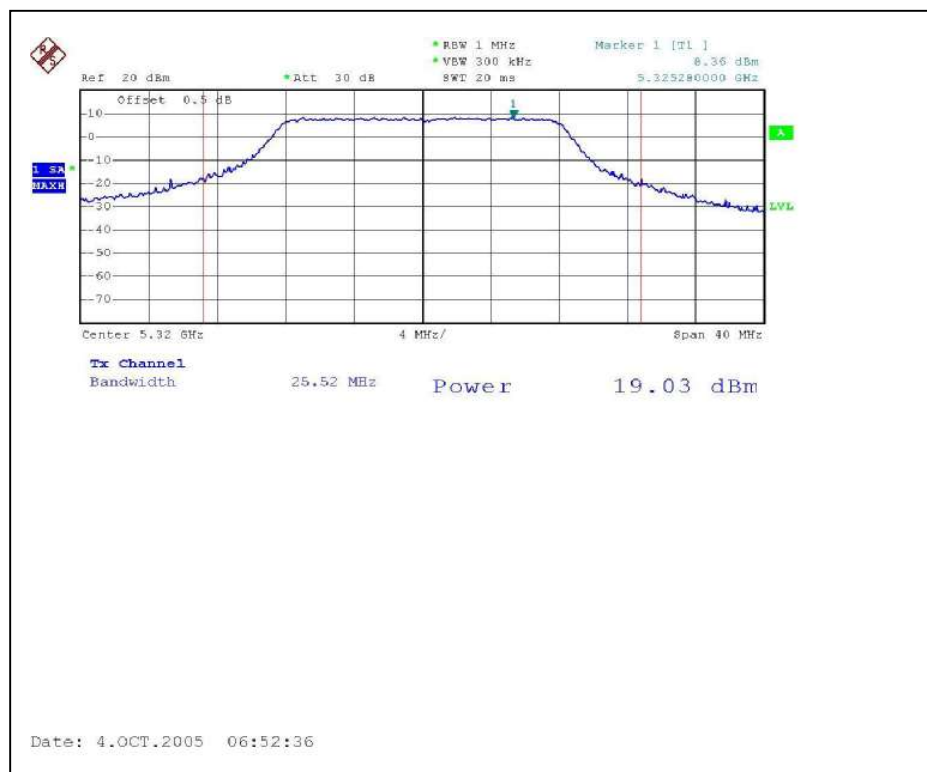
**802.11a OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	6Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

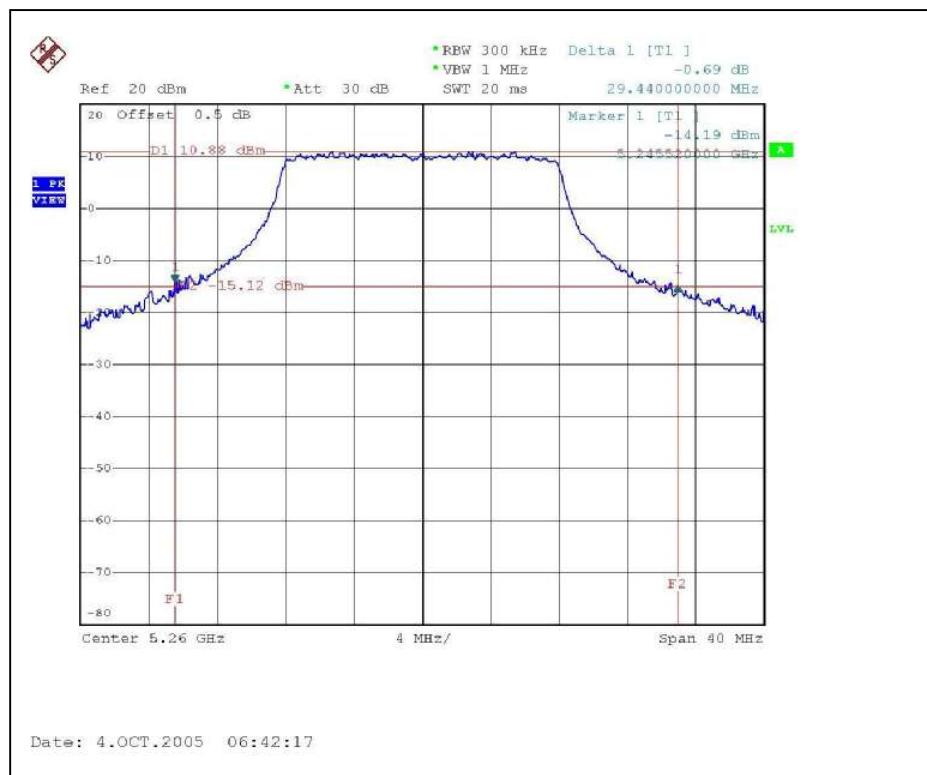
Antenna 2 (Gain : 7.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5260	22.53	24	29.44	PASS
4	5320	19.03	24	25.52	PASS

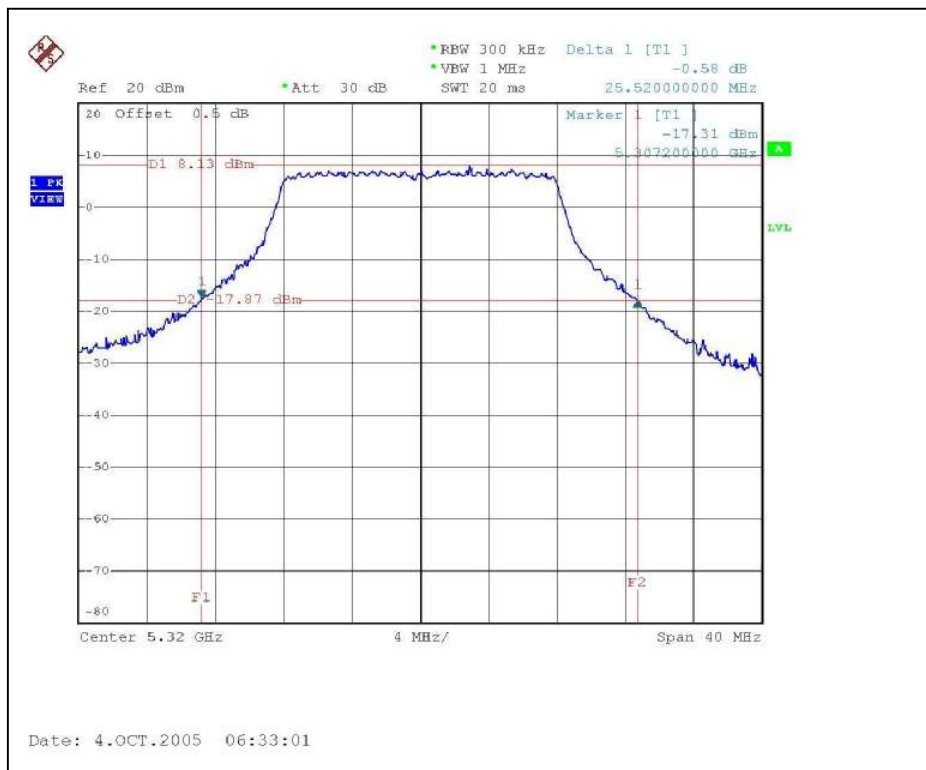
**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

**Peak Power Output:  
CH1****CH4**

## 26dB Occupied Bandwidth: CH1



## CH4



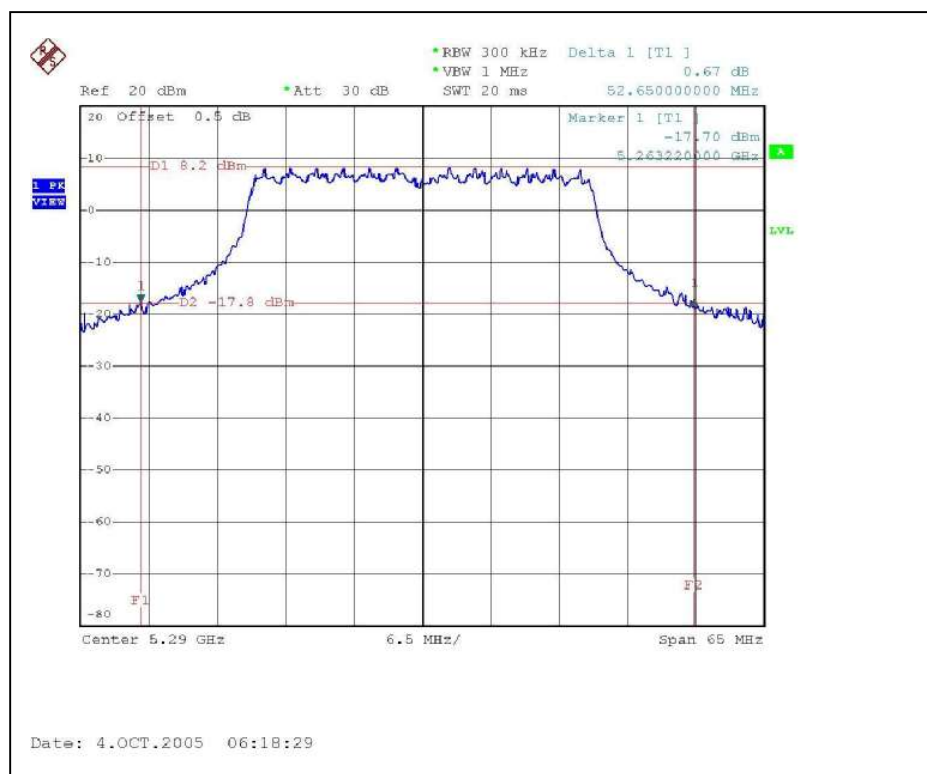
**802.11a Turbo OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	12Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

Antenna 2 (Gain : 7.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5290	22.08	24	52.65	PASS

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

**Peak Power Output:  
CH1****26dB Occupied Bandwidth:  
CH1**

## 4.3.9 TEST RESULTS (ANTENNA 3)

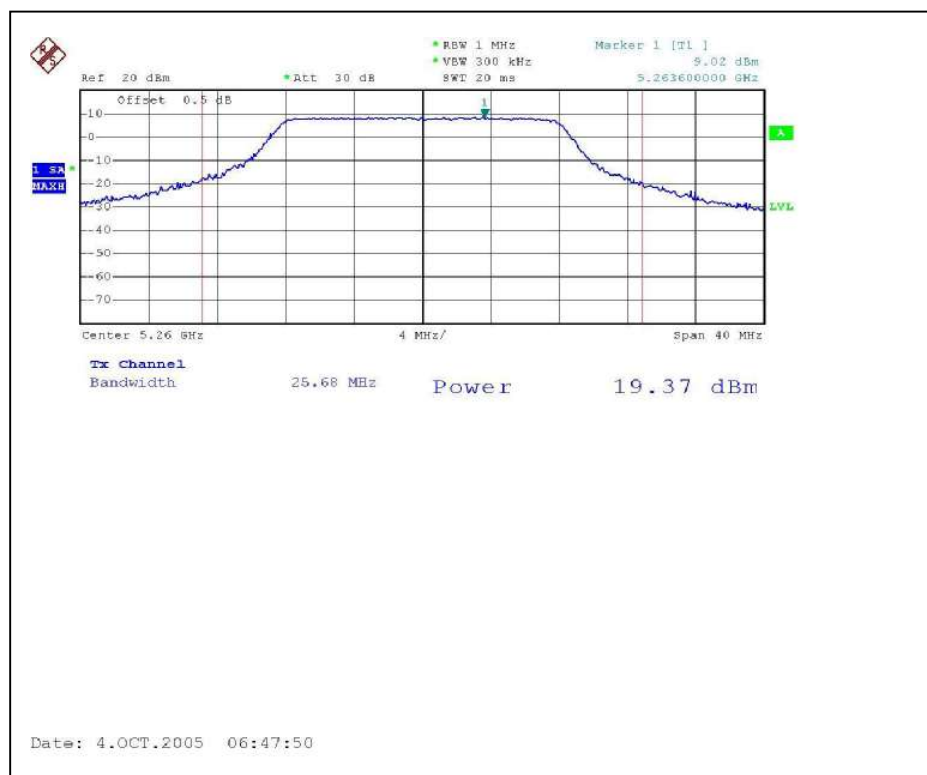
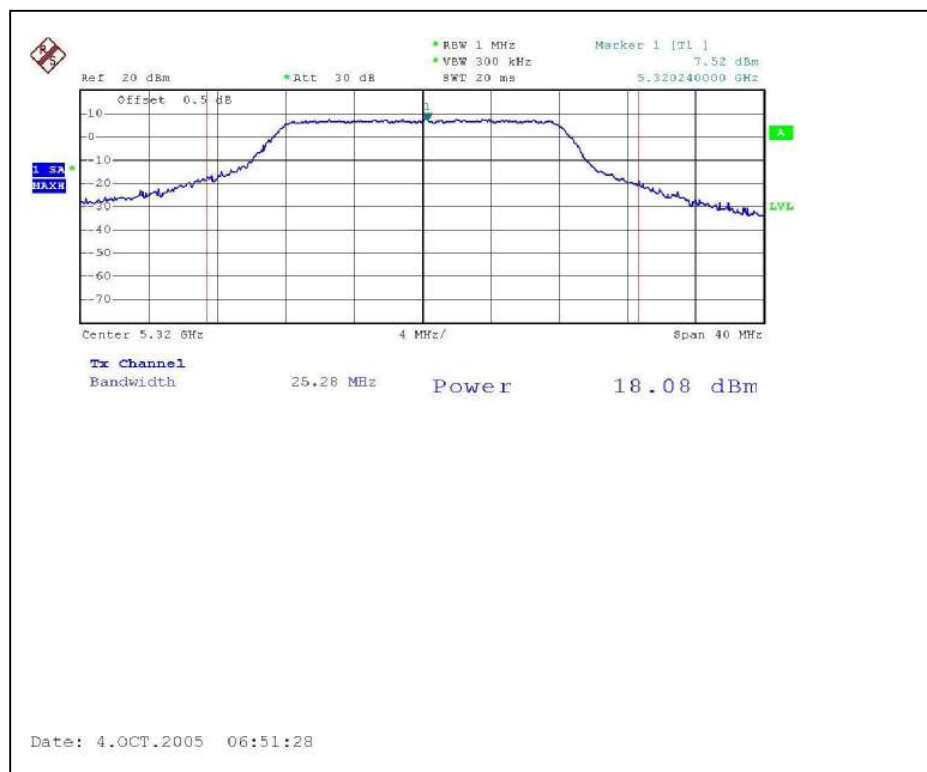
**802.11a OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	6Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

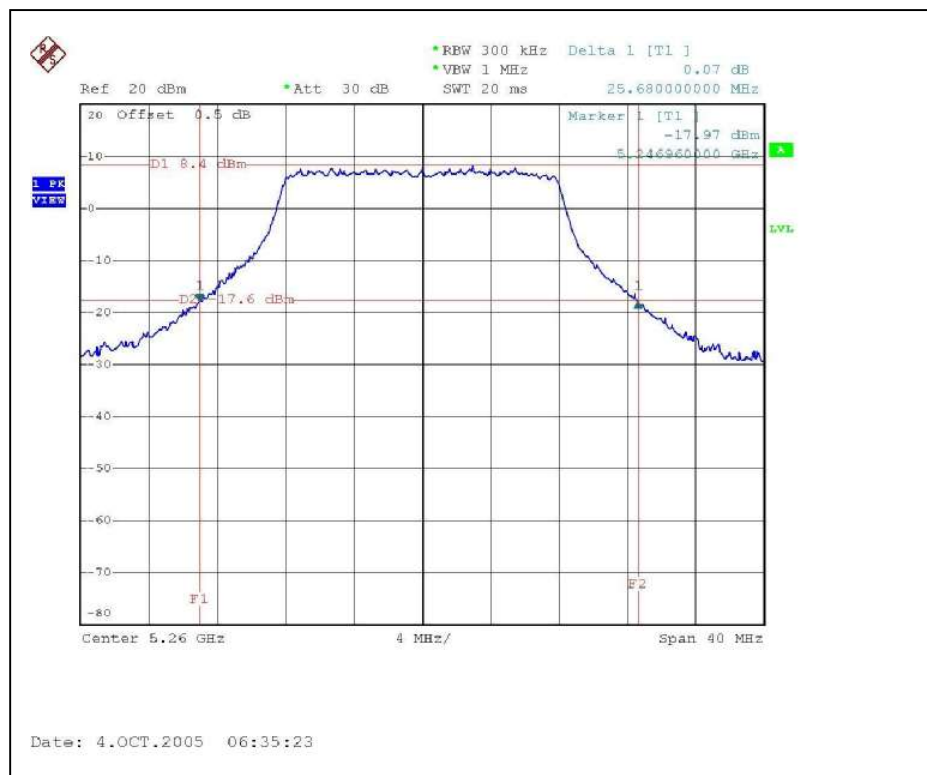
Antenna 3 (Gain : 10.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5260	19.37	21.36	25.68	PASS
4	5320	18.08	21.36	25.28	PASS

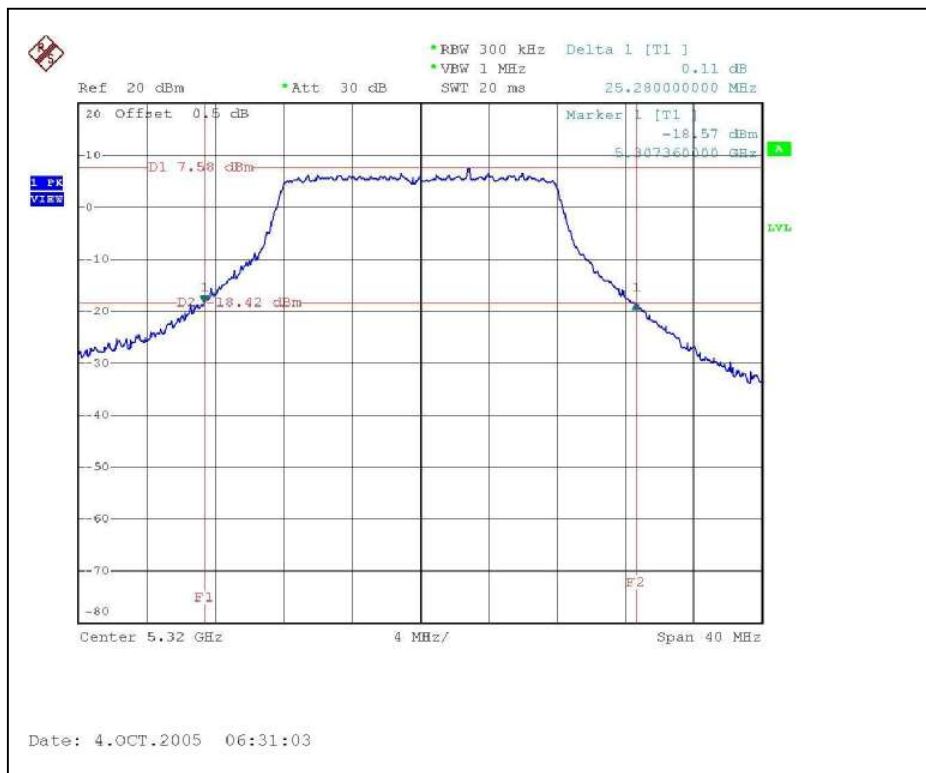
**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

**Peak Power Output:  
CH1****CH4**

## 26dB Occupied Bandwidth: CH1



## CH4





**802.11a Turbo OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	12Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

Antenna 3 (Gain : 10.0 dBi) +Cable loss (1.36dB)

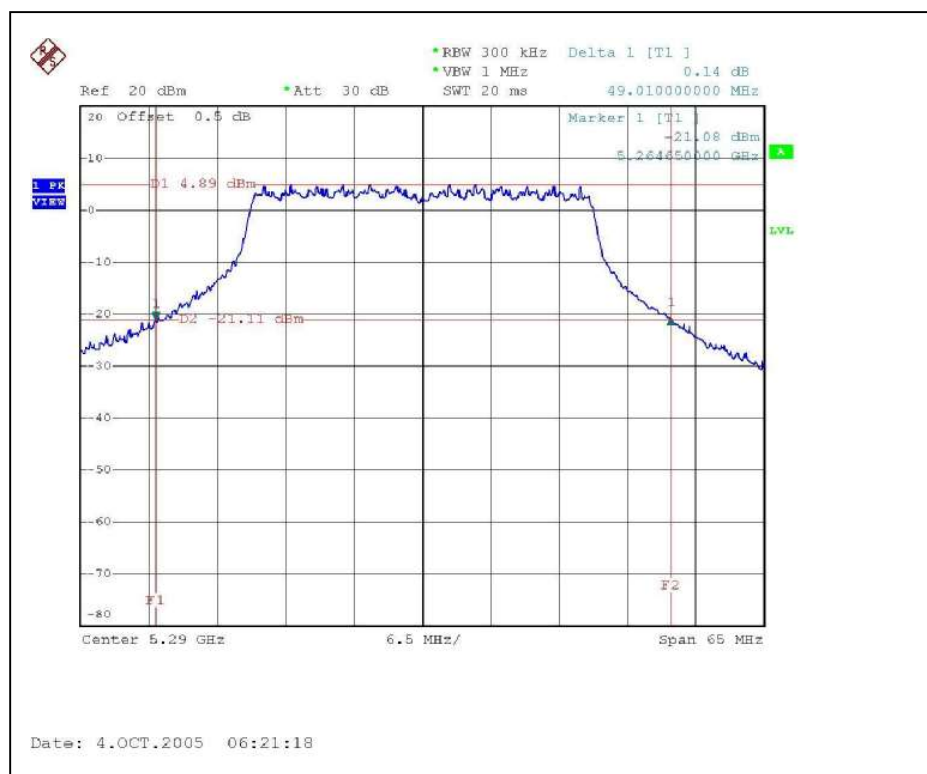
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5290	19.39	21.36	49.01	PASS

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

# Peak Power Output: CH1



# 26dB Occupied Bandwidth: CH1



## 4.3.10 TEST RESULTS (ANTENNA 4)

**802.11a OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	6Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

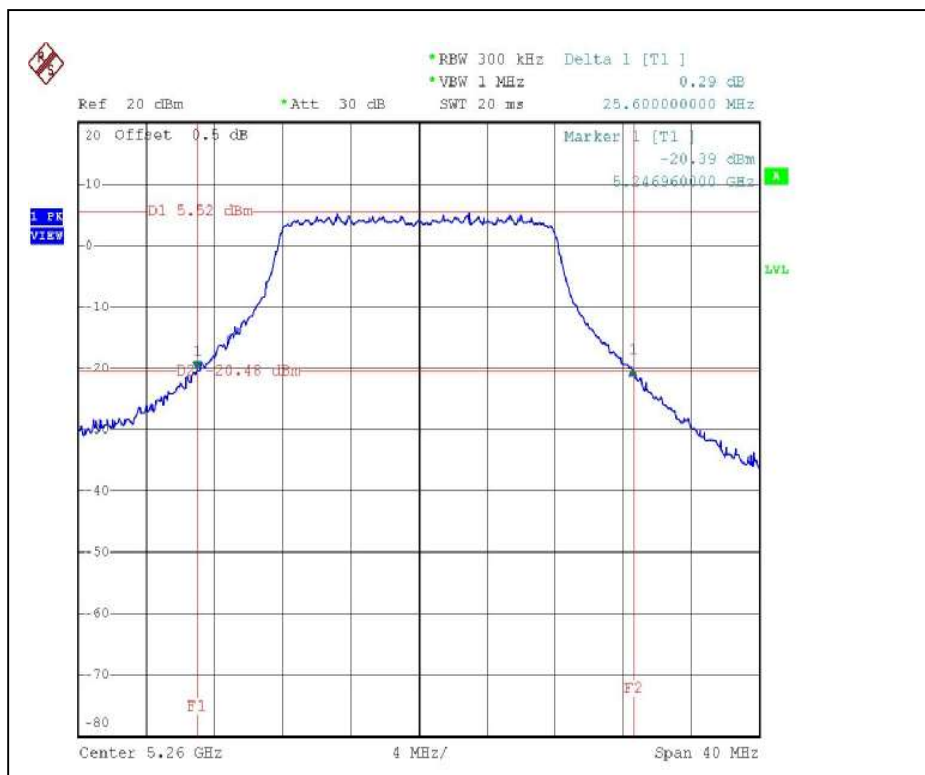
Antenna 4 (Gain : 14.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5260	16.56	17.36	25.6	PASS
4	5320	16.42	17.36	25.76	PASS

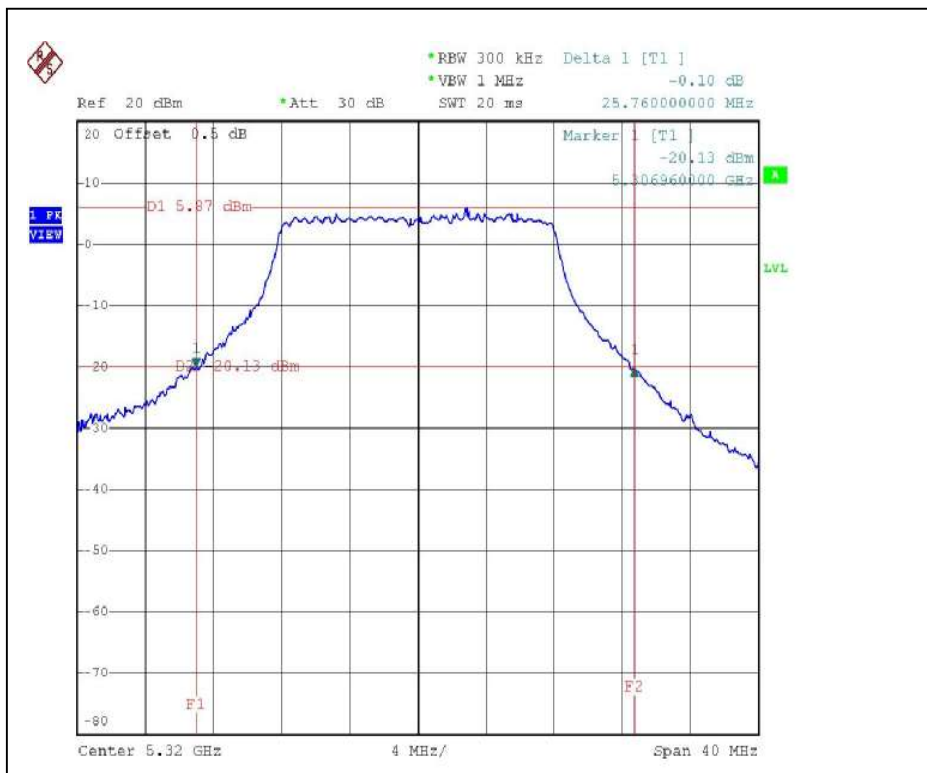
**NOTE:** The 26dBc Occupied Bandwidth plot, please refer to the following pages.

**Peak Power Output:  
CH1****CH4**

## 26dB Occupied Bandwidth: CH1



## CH4



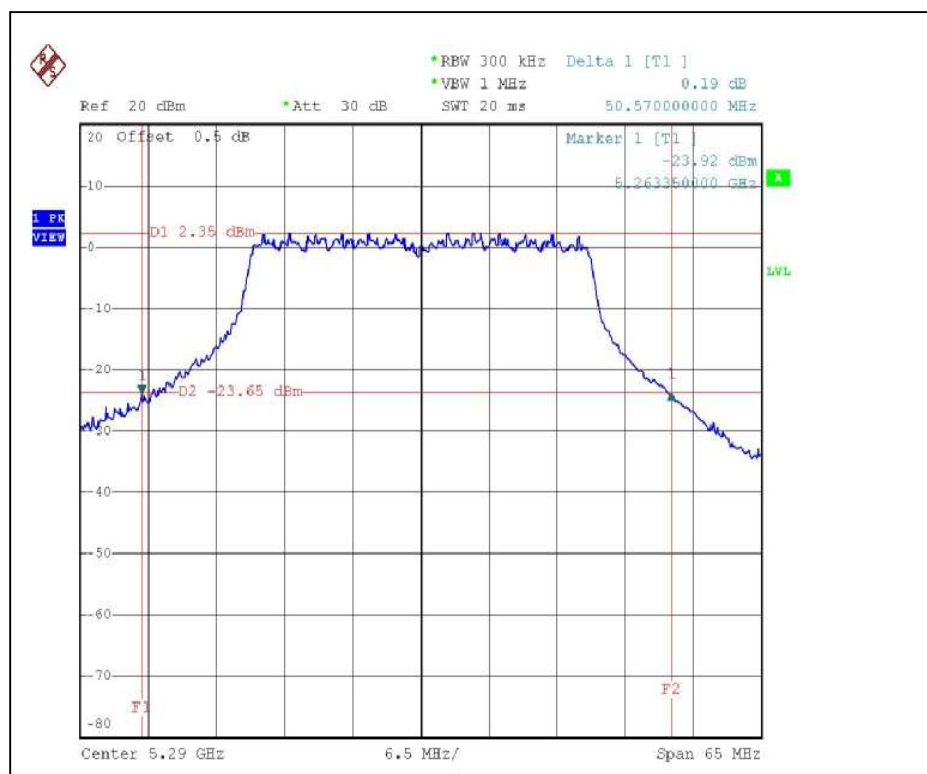
**802.11a Turbo OFDM modulation**

<b>EUT</b>	Aruba 80 a+b/g Outdoor Stand-alone Access Point / WDS Bridge Master		
<b>MODEL</b>	AP-80MB	<b>TRANSFER RATE</b>	12Mbps
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 966hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TESTED BY</b>	Rex Huang

Antenna 4 (Gain : 14.0 dBi) +Cable loss (1.36dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5290	16.43	17.36	50.57	PASS

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

**Peak Power Output:  
CH1****26dB Occupied Bandwidth:  
CH1**

#### 4.4 PEAK POWER EXCURSION MEASUREMENT

##### 4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	13dB
5.25 – 5.35 GHz	13dB
5.725 – 5.825 GHz	13dB

##### 4.4.2 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. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.



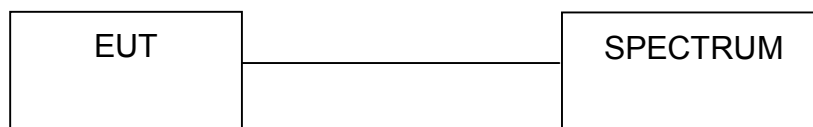
#### 4.4.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum bandwidth span to view the entire spectrum.
3. Using peak detector and Max-hold function for Trace 1 (RB=1MHz, VB=3MHz) and 2 (RB=1MHz, VB=300KHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

#### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

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