



## Supplemental “Dual Xmit” Test Report

**REPORT NO.:** RF941122H03D-2

**MODEL NO.:** HiveAP 20 ag

**RECEIVED:** April 07, 2008

**TESTED:** Aug. 19 to 21, 2008

**ISSUED:** Aug. 21, 2008

**APPLICANT:** Accton Technology Corporation

**ADDRESS:** No.1, Creation Rd. III, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

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

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## 1. CERTIFICATION

**PRODUCT :** HiveAP 20 ag  
**BRAND NAME :** AEROHIVE  
**MODEL NO. :** HiveAP 20 ag  
**TESTED:** Aug. 21, 2008  
**APPLICANT :** Accton Technology Corporation  
**TEST ITEM:** ENGINEERING SAMPLE  
**STANDARDS :** 47 CFR FCC Part 15, Subpart C  
ANSI C63.4-2003

**PREPARED BY :** Midoli Peng , **DATE:** Aug. 21, 2008  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE :** Hank Chung , **DATE:** Aug. 21, 2008  
Responsible for RF ( Hank Chung, Deputy Manager )

**APPROVED BY :** May Chen , **DATE:** Aug. 21, 2008  
( May Chen, Deputy Manager )

### Note:

Per a request of the FCC, the access point radio was tested for radiated emissions in restricted bands while transmitting on both 2.4 GHz and 5 GHz at simultaneously.



## 2. DUAL XMIT, CONDUCTED EMISSION MEASUREMENT

### 2.1 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.



## 2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER                              | MODEL NO.       | SERIAL NO. | CALIBRATED UNTIL |
|---|-----------------|------------|------------------|
| ROHDE & SCHWARZ<br>Test Receiver                        | ESCS 30         | 100287     | Mar. 10, 2009    |
| Line-Impedance Stabilization<br>Network(for EUT)        | KNW-407         | 8-1395-12  | May. 06, 2009    |
| Line-Impedance Stabilization<br>Network(for Peripheral) | ENV-216         | 100072     | Jun. 12, 2009    |
| RF Cable (JYEBAO)                                       | 5DFB            | COACAB-001 | Jul. 23, 2009    |
| 50 ohms Terminator                                      | 50              | 3          | Nov. 15, 2008    |
| Software  | ADT_Cond_V7.3.2 | 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.

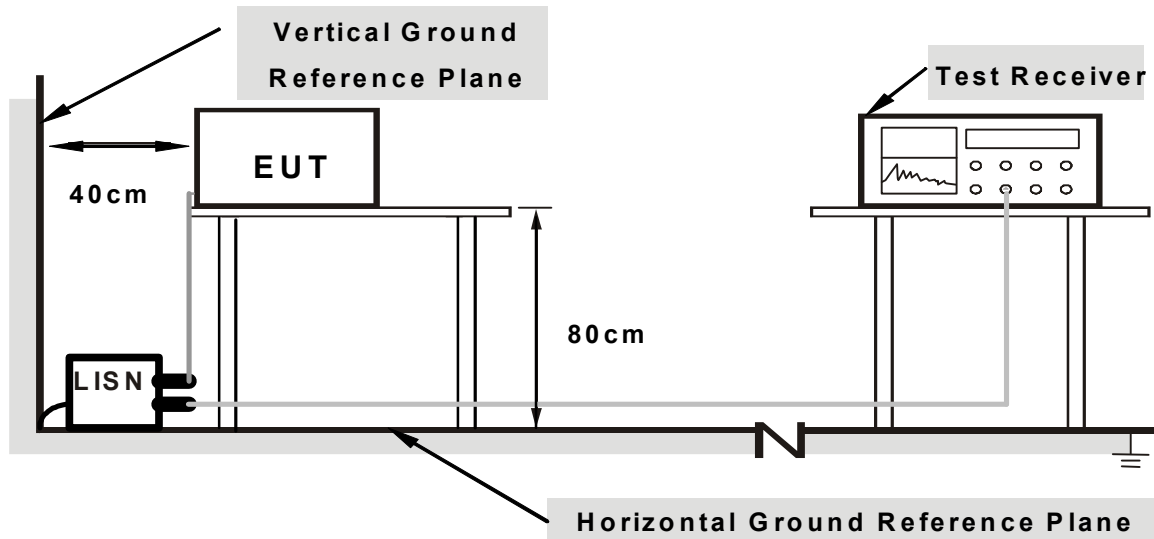
## 2.3 TEST PROCEDURES

- 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) were not recorded.

## 2.4 DEVIATION FROM TEST STANDARD

No deviation

## 2.5 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.

## 2.5 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer systems to act as a communication partner and placed them outside of testing area.
- c. The communication partner run test program “ART48 Build 10” to enable EUT under transmission/receiving condition continuously at specific channel frequency via UTP cable.

### Note:

- 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.

#### FCC 15.247

| Mode                    | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|-------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 2.4 GHz<br>802.11g<br>+ | 1 to 11           | 6              | DSSS                  | DBPSK           | 1                |
| 5 GHz<br>802.11a        | 1 to 5            | 5              | OFDM                  | BPSK            | 6                |

#### FCC 15.407

| Mode                           | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|--------------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| 2.4 GHz<br>802.11g<br>+        | 1 to 11           | 6              | DSSS                  | DBPSK           | 1                |
| 5 GHz<br>Draft 802.11n (20MHz) | 1 to 4            | 4              | OFDM                  | BPSK            | 6                |

- The EUT was Pre-tested as the following test modes:

| Test Mode | Description  |
|-----------|--------------|
| Mode 1    | With Adapter |
| Mode 2    | With POE     |

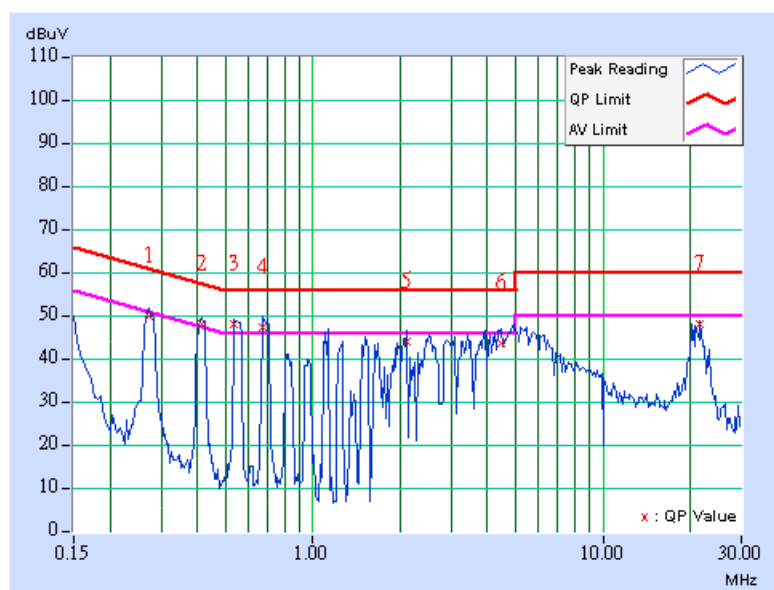
**Mode 1**, the worse case one, was chosen for final test.

## 2.6 TEST RESULTS (For 15.247)

|                                 |   |                      |           |
|---------------------------------|---|----------------------|-----------|
| <b>TEST MODE</b>                | Dual transmission<br>11b, 2437MHz<br>11a, 5825MHz | <b>6dB BANDWIDTH</b> | 9 kHz     |
| <b>INPUT POWER</b>              | 120Vac, 60 Hz                                     | <b>PHASE</b>         | Line (L)  |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>961hPa                        | <b>TESTED BY</b>     | Max Tseng |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(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  | 0.271          | 0.25                    | 49.28         | -     | 49.53          | -     | 61.08     | 51.08 | -11.55 | -      |
| 2  | 0.416          | 0.11                    | 47.38         | -     | 47.49          | -     | 57.54     | 47.54 | -10.05 | -      |
| 3  | 0.537          | 0.15                    | 47.43         | 35.78 | 47.58          | 35.93 | 56.00     | 46.00 | -8.42  | -10.07 |
| 4  | 0.673          | 0.20                    | 46.41         | 35.67 | 46.61          | 35.87 | 56.00     | 46.00 | -9.39  | -10.13 |
| 5  | 2.098          | 0.29                    | 43.15         | -     | 43.44          | -     | 56.00     | 46.00 | -12.56 | -      |
| 6  | 4.484          | 0.42                    | 42.75         | -     | 43.17          | -     | 56.00     | 46.00 | -12.83 | -      |
| 7  | 21.664         | 0.90                    | 47.25         | -     | 48.15          | -     | 60.00     | 50.00 | -11.85 | -      |

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

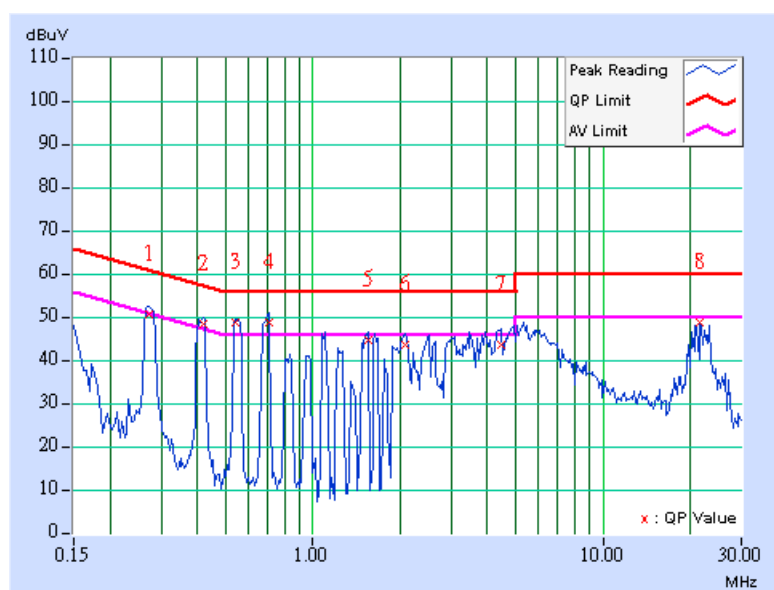




|                                 |                              |                      |             |
|---------------------------------|------------------------------|----------------------|-------------|
| <b>TEST MODE</b>                | Dual transmission            | <b>6dB BANDWIDTH</b> | 9 kHz       |
|                                 | 11b, 2437MHz<br>11a, 5825MHz |                      |             |
| <b>INPUT POWER</b>              | 120Vac, 60 Hz                | <b>PHASE</b>         | Neutral (N) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>961hPa   | <b>TESTED BY</b>     | Max Tseng   |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |       | Emission Level<br>[dB (uV)] |       | Limit<br>[dB (uV)] |       | Margin<br>(dB) |        |
|----|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|----------------|--------|
|    |                |                         | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.           | AV.    |
|    |                |                         | 1                          | 0.271 | 0.26                        | 49.92 | -                  | 50.18 | -              | 61.08  |
| 2  | 0.420          | 0.10                    | 47.80                      | 39.67 | 47.90                       | 39.77 | 57.46              | 47.46 | -9.56          | -7.69  |
| 3  | 0.541          | 0.14                    | 48.06                      | 39.61 | 48.20                       | 39.75 | 56.00              | 46.00 | -7.80          | -6.25  |
| 4  | 0.705          | 0.21                    | 48.14                      | 32.80 | 48.35                       | 33.01 | 56.00              | 46.00 | -7.65          | -12.99 |
| 5  | 1.547          | 0.30                    | 44.09                      | -     | 44.39                       | -     | 56.00              | 46.00 | -11.61         | -      |
| 6  | 2.074          | 0.28                    | 42.89                      | -     | 43.17                       | -     | 56.00              | 46.00 | -12.83         | -      |
| 7  | 4.457          | 0.42                    | 42.94                      | -     | 43.36                       | -     | 56.00              | 46.00 | -12.64         | -      |
| 8  | 21.664         | 0.90                    | 48.08                      | -     | 48.98                       | -     | 60.00              | 50.00 | -11.02         | -      |

- 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.

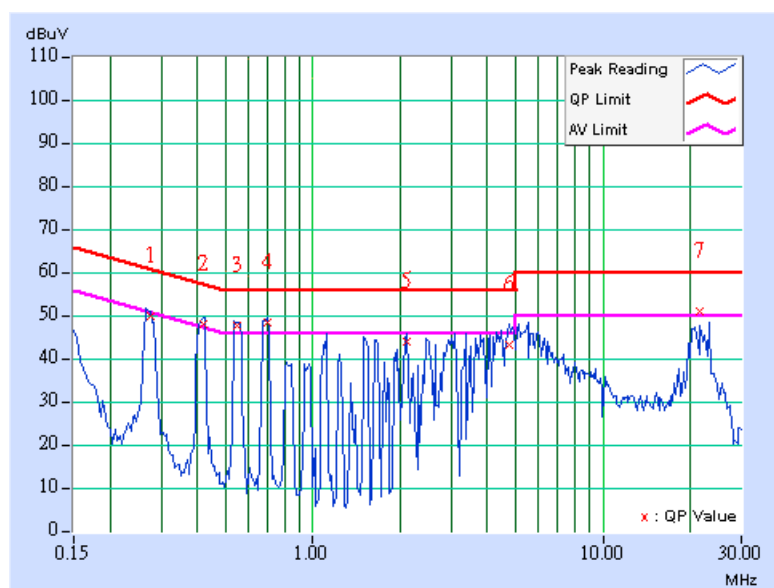


## 2.7 TEST RESULTS (For 15.407)

|                                 |   |                      |           |
|---------------------------------|---|----------------------|-----------|
| <b>TEST MODE</b>                | Dual transmission<br>11g, 2437MHz<br>11a, 5240MHz | <b>6dB BANDWIDTH</b> | 9 kHz     |
| <b>INPUT POWER</b>              | 120Vac, 60 Hz                                     | <b>PHASE</b>         | Line (L)  |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>961hPa                        | <b>TESTED BY</b>     | Max Tseng |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |       | Emission Level<br>[dB (uV)] |       | Limit<br>[dB (uV)] |       | Margin<br>(dB) |       |
|----|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|----------------|-------|
|    |                |                         | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.           | AV.   |
|    |                |                         | 1                          | 0.275 | 0.25                        | 49.00 | -                  | 49.25 | -              | 60.97 |
| 2  | 0.420          | 0.11                    | 47.34                      | -     | 47.45                       | -     | 57.46              | 47.46 | -10.01         | -     |
| 3  | 0.551          | 0.16                    | 46.97                      | 38.41 | 47.13                       | 38.57 | 56.00              | 46.00 | -8.87          | -7.43 |
| 4  | 0.701          | 0.21                    | 47.63                      | 36.52 | 47.84                       | 36.73 | 56.00              | 46.00 | -8.16          | -9.27 |
| 5  | 2.098          | 0.29                    | 43.05                      | -     | 43.34                       | -     | 56.00              | 46.00 | -12.66         | -     |
| 6  | 4.746          | 0.43                    | 42.39                      | -     | 42.82                       | -     | 56.00              | 46.00 | -13.18         | -     |
| 7  | 21.663         | 0.90                    | 50.17                      | 48.20 | 51.07                       | 49.10 | 60.00              | 50.00 | -8.93          | -0.90 |

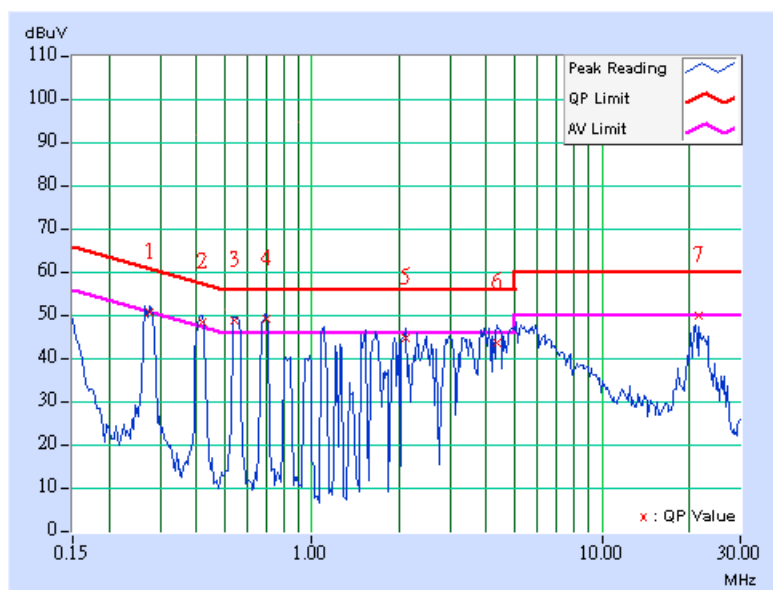
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



|                                 |   |                      |             |
|---------------------------------|---|----------------------|-------------|
| <b>TEST MODE</b>                | Dual transmission<br>11g, 2437MHz<br>11a, 5240MHz | <b>6dB BANDWIDTH</b> | 9 kHz       |
| <b>INPUT POWER</b>              | 120Vac, 60 Hz                                     | <b>PHASE</b>         | Neutral (N) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>961hPa                        | <b>TESTED BY</b>     | Max Tseng   |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(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  | 0.275          | 0.26                    | 49.66         | -     | 49.92          | -     | 60.97     | 50.97 | -11.05 | -     |
| 2  | 0.420          | 0.10                    | 47.80         | 39.86 | 47.90          | 39.96 | 57.46     | 47.46 | -9.56  | -7.50 |
| 3  | 0.545          | 0.15                    | 47.93         | 39.61 | 48.08          | 39.76 | 56.00     | 46.00 | -7.92  | -6.24 |
| 4  | 0.701          | 0.21                    | 48.30         | 37.11 | 48.51          | 37.32 | 56.00     | 46.00 | -7.49  | -8.68 |
| 5  | 2.113          | 0.29                    | 43.80         | -     | 44.09          | -     | 56.00     | 46.00 | -11.91 | -     |
| 6  | 4.340          | 0.42                    | 42.88         | -     | 43.30          | -     | 56.00     | 46.00 | -12.70 | -     |
| 7  | 21.663         | 0.90                    | 49.08         | -     | 49.98          | -     | 60.00     | 50.00 | -10.02 | -     |

- 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.





### 3. DUAL XMIT, RADIATED EMISSION MEASUREMENT

#### 3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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

**NOTE:**

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



### 3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER              | MODEL NO.                  | SERIAL NO.          | CALIBRATED UNTIL |
|---|----------------------------|---------------------|------------------|
| ADVANTEST Spectrum Analyzer             | R3271A                     | 85060311            | July 15, 2009    |
| HP Pre_Amplifier                        | 8449B                      | 3008A01922          | Oct. 04, 2008    |
| ROHDE & SCHWARZ<br>Test Receiver        | ESCS30                     | 100375              | Mar. 31, 2009    |
| SCHWARZBECK TRILOG<br>Broadband Antenna | VULB 9168                  | 138                 | April 29, 2009   |
| Schwarzbeck Horn_Antenna                | BBHA9120                   | D124                | Dec. 16, 2008    |
| Schwarzbeck Horn_Antenna                | BBHA 9170                  | BBHA9170153         | Jan. 27, 2009    |
| RF Switches (ARNITSU)                   | CS-201                     | 1565157             | Aug. 13, 2009    |
| RF CABLE (Chaintek)                     | SF102                      | 22054-2             | Dec. 06. 2008    |
| RF Cable                                | 8DFB                       | STCCAB-30M-1<br>GHz | Oct. 09, 2008    |
| Software                                | ADT_Radiated_V<br>7.6.15.8 | NA                  | NA               |
| CHANCE MOST<br>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 and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) 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 3789C-3.



### 3.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.
- g. The emissions up to 40 GHz were examined. Those emission falling within a restricted band were evaluated against the "restricted band emission limit" ( 54 dB $\mu$ V / 74 dB $\mu$ V).

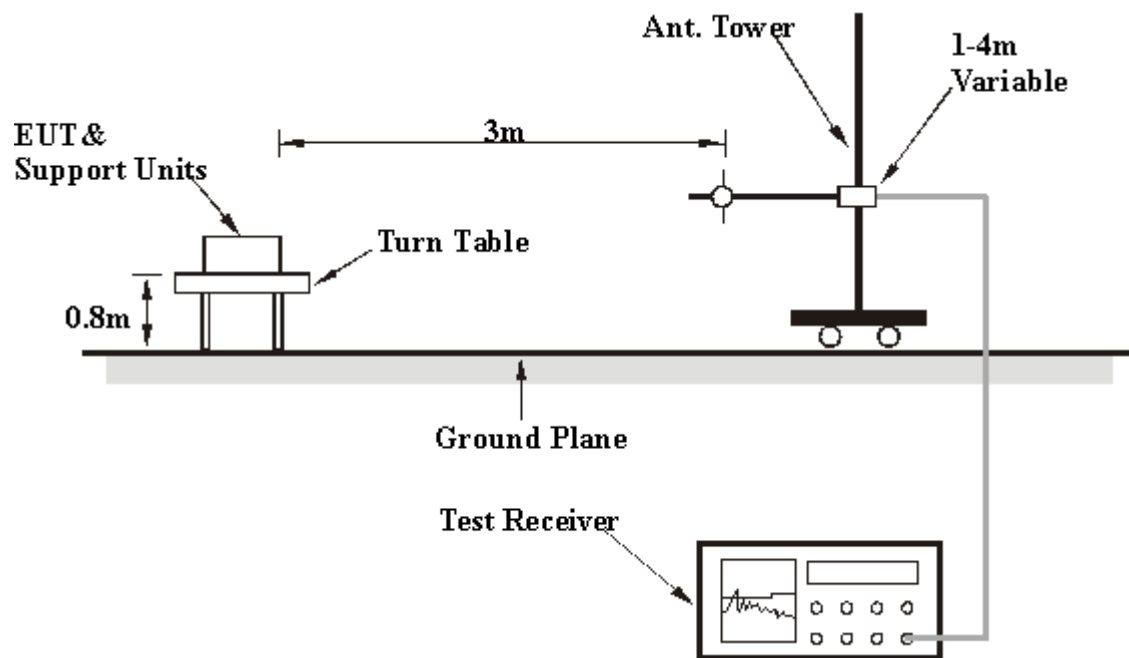
#### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

### 3.4 DEVIATION FROM TEST STANDARD

No deviation

### 3.5 TEST SETUP



### 3.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer systems to act as a communication partner and placed them outside of testing area.
- c. The communication partner run test program “ART48 Build 10” to enable EUT under transmission/receiving condition continuously at specific channel frequency via UTP cable.

Note:

**For 15.247:**

The EUT was tested for out of band radiated emissions with the unit transmitting on 802.11b, 2437 MHz and 802.11a, 5825 MHz. These frequencies and power levels were chosen because these frequencies produced the worst case radiated emissions during the radiated emissions in restricted bands test performed previously. The unit was set to transmit at the same power level as was used in the initial radiated emissions tests and was transmitting at the same data rate. (Please refer to RF941122H03D test report)

The harmonic of the fundamental signals were recorded in this report.

There are four antennas provided to this EUT, please refer to the following table:

| Model          | Antenna Type              | Gain (dBi)         | Antenna Connector | Note              |
|----------------|---------------------------|--------------------|-------------------|-------------------|
| FDS_2FED01+I3G | Dual Band Antenna, Dipole | For 2.4GHz : 3 dBi | MMCX              | Integral antenna  |
|                |                           | For 5GHz : 5 dBi   |                   |                   |
| NA             | Dipole                    | For 2.4GHz : 2 dBi | Reverse SMA       | dedicated antenna |
| W1028          | Dipole                    | For 5GHz : 2 dBi   | Reverse SMA       |                   |

The model: FDS\_2FED01+I3G, the worse case one was chosen for final test.

The EUT was Pre-tested as the following test modes:

| Test Mode | Description  |
|-----------|--------------|
| Mode 1    | With Adapter |
| Mode 2    | With POE     |

**Mode 1**, the worse case one, was chosen for final test.



**For 15.407:**

The EUT was tested for out of band radiated emissions with the unit transmitting on 802.11b, 2437 MHz and 802.11a, 5240 MHz. These frequencies and power levels were chosen because these frequencies produced the worst case radiated emissions during the radiated emissions in restricted bands test performed previously. The unit was set to transmit at the same power level as was used in the initial radiated emissions tests and was transmitting at the same data rate.

(Please refer to RF941122H03D-1 test report)

The harmonic of the fundamental signals were recorded in this report.

There are four antennas provided to this EUT, please refer to the following table:

| Model          | Antenna Type                 | Gain (dBi)         | Antenna Connector | Note              |
|----------------|------------------------------|--------------------|-------------------|-------------------|
| FDS_2FED01+I3G | Dual Band Antenna,<br>Dipole | For 2.4GHz : 3 dBi | MMCX              | Integral antenna  |
|                |                              | For 5GHz : 5 dBi   |                   |                   |
| NA             | Dipole                       | For 2.4GHz : 2 dBi | Reverse SMA       | dedicated antenna |
| W1028          | Dipole                       | For 5GHz : 2 dBi   | Reverse SMA       |                   |

The model: FDS\_2FED01+I3G, the worse case one was chosen for final test.

The EUT was Pre-tested as the following test modes:

| Test Mode | Description  |
|-----------|--------------|
| Mode 1    | With Adapter |
| Mode 2    | With POE     |

**Mode 1**, the worse case one, was chosen for final test.



### 3.7 TEST RESULTS (For 15.247)

|                                 |   |  |                                    |
|---------------------------------|---|--|------------------------------------|
| <b>TEST MODE</b>                | Dual transmission<br>11b, 2437MHz<br>11a, 5825MHz | <b>FREQUENCY RANGE</b>                   | 30MHz~1000MHz                      |
| <b>INPUT POWER</b>              | 120Vac, 60Hz                                      | <b>DETECTOR FUNCTION &amp; BANDWIDTH</b> | Peak (PK)<br>Average (AV)<br>1 MHz |
| <b>ENVIRONMENTAL CONDITIONS</b> | 28deg. C, 83%RH,<br>973 hPa                       | <b>TESTED BY</b>                         | Frank Liu                          |

#### 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   | 250.00      | 25.41 QP                | 46.00          | -20.59      | 1.20 H             | 66                   | 10.91            | 14.50                    |
| 2   | 300.00      | 24.44 QP                | 46.00          | -21.56      | 1.00 H             | 284                  | 8.26             | 16.18                    |
| 3   | 375.00      | 31.38 QP                | 46.00          | -14.62      | 1.00 H             | 78                   | 12.22            | 19.16                    |
| 4   | 500.00      | 31.43 QP                | 46.00          | -14.57      | 1.00 H             | 249                  | 10.12            | 21.31                    |
| 5   | 792.00      | 35.32 QP                | 46.00          | -10.68      | 2.14 H             | 283                  | 7.10             | 28.22                    |
| 6   | 800.00      | 32.88 QP                | 46.00          | -13.12      | 1.00 H             | 8                    | 4.43             | 28.45                    |
| 7   | 891.00      | 39.27 QP                | 46.00          | -6.73       | 1.00 H             | 56                   | 9.81             | 29.46                    |
| 8   | 900.00      | 35.68 QP                | 46.00          | -10.32      | 1.00 H             | 91                   | 6.12             | 29.56                    |
| 9   | 924.00      | 34.95 QP                | 46.00          | -11.05      | 1.00 H             | 137                  | 5.01             | 29.94                    |
| 10  | 990.00      | 32.21 QP                | 54.00          | -21.79      | 2.15 H             | 113                  | 1.11             | 31.10                    |

#### 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   | 42.90       | 30.40 QP                | 40.00          | -9.60       | 1.00 V             | 78                   | 17.57            | 12.83                    |
| 2   | 500.00      | 34.74 QP                | 46.00          | -11.26      | 1.16 V             | 276                  | 13.43            | 21.31                    |
| 3   | 792.00      | 33.20 QP                | 46.00          | -12.80      | 1.39 V             | 7                    | 4.98             | 28.22                    |
| 4   | 858.00      | 34.79 QP                | 46.00          | -11.21      | 1.39 V             | 124                  | 5.71             | 29.08                    |
| 5   | 891.00      | 39.53 QP                | 46.00          | -6.47       | 1.16 V             | 245                  | 10.07            | 29.46                    |
| 6   | 924.00      | 37.93 QP                | 46.00          | -8.07       | 1.05 V             | 118                  | 7.99             | 29.94                    |
| 7   | 957.84      | 35.38 QP                | 46.00          | -10.62      | 1.05 V             | 191                  | 4.87             | 30.51                    |
| 8   | 990.00      | 33.17 QP                | 54.00          | -20.83      | 1.84 V             | 269                  | 2.07             | 31.10                    |

**NOTE:**

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



|                                 |   |  |                                    |
|---------------------------------|---|--|------------------------------------|
| <b>TEST MODE</b>                | Dual transmission<br>11b, 2437MHz<br>11a, 5825MHz | <b>FREQUENCY RANGE</b>                   | 1000MHz~40000MHz                   |
| <b>INPUT POWER</b>              | 120Vac, 60Hz                                      | <b>DETECTOR FUNCTION &amp; BANDWIDTH</b> | Peak (PK)<br>Average (AV)<br>1 MHz |
| <b>ENVIRONMENTAL CONDITIONS</b> | 28deg. C, 83%RH,<br>973 hPa                       | <b>TESTED BY</b>                         | Frank Liu                          |

#### 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   | 4874.00     | 40.40 PK                | 74.00          | -33.60      | 1.19 H             | 38                   | 4.85             | 35.55                    |
| 2   | 4874.00     | 30.50 AV                | 54.00          | -23.50      | 1.19 H             | 38                   | -5.05            | 35.55                    |
| 3   | 7311.00     | 45.40 PK                | 74.00          | -28.60      | 1.47 H             | 21                   | 3.36             | 42.04                    |
| 4   | 7311.00     | 34.10 AV                | 54.00          | -19.90      | 1.47 H             | 21                   | -7.94            | 42.04                    |
| 5   | 10480.00    | 56.60 PK                | 74.00          | -17.40      | 1.47 H             | 0                    | 10.48            | 46.12                    |
| 6   | 10480.00    | 42.60 AV                | 54.00          | -11.40      | 1.47 H             | 0                    | -3.52            | 46.12                    |

#### 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   | 4874.00     | 46.30 PK                | 74.00          | -27.70      | 1.33 V             | 146                  | 10.75            | 35.55                    |
| 2   | 4874.00     | 33.50 AV                | 54.00          | -20.50      | 1.33 V             | 146                  | -2.05            | 35.55                    |
| 3   | 7311.00     | 46.70 PK                | 74.00          | -27.30      | 1.39 V             | 271                  | 4.66             | 42.04                    |
| 4   | 7311.00     | 35.30 AV                | 54.00          | -18.70      | 1.39 V             | 271                  | -6.74            | 42.04                    |
| 5   | 10480.00    | 56.60 PK                | 74.00          | -17.40      | 1.47 V             | 0                    | 10.48            | 46.12                    |
| 6   | 10480.00    | 42.60 AV                | 54.00          | -11.40      | 1.47 V             | 0                    | -3.52            | 46.12                    |

**NOTE:**

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



### 3.8 TEST RESULTS (For 15.407)

|                                 |   |  |                                    |
|---------------------------------|---|--|------------------------------------|
| <b>TEST MODE</b>                | Dual transmission<br>11b, 2437MHz<br>11a, 5240MHz | <b>FREQUENCY RANGE</b>                   | 30MHz~1000MHz                      |
| <b>INPUT POWER</b>              | 120Vac, 60Hz                                      | <b>DETECTOR FUNCTION &amp; BANDWIDTH</b> | Peak (PK)<br>Average (AV)<br>1 MHz |
| <b>ENVIRONMENTAL CONDITIONS</b> | 28deg. C, 83%RH,<br>973 hPa                       | <b>TESTED BY</b>                         | Frank Liu                          |

#### 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   | 250.00      | 25.53 QP                | 46.00          | -20.47      | 1.23 H             | 69                   | 11.03            | 14.50                    |
| 2   | 300.00      | 24.89 QP                | 46.00          | -21.11      | 1.02 H             | 297                  | 8.71             | 16.18                    |
| 3   | 375.00      | 33.64 QP                | 46.00          | -12.36      | 1.02 H             | 92                   | 14.48            | 19.16                    |
| 4   | 500.00      | 31.59 QP                | 46.00          | -14.41      | 1.11 H             | 241                  | 10.28            | 21.31                    |
| 5   | 792.00      | 34.33 QP                | 46.00          | -11.67      | 2.19 H             | 244                  | 6.11             | 28.22                    |
| 6   | 800.00      | 33.54 QP                | 46.00          | -12.46      | 1.04 H             | 16                   | 5.09             | 28.45                    |
| 7   | 891.00      | 38.34 QP                | 46.00          | -7.66       | 1.03 H             | 72                   | 8.88             | 29.46                    |
| 8   | 900.00      | 35.92 QP                | 46.00          | -10.08      | 1.07 H             | 99                   | 6.36             | 29.56                    |
| 9   | 924.00      | 35.23 QP                | 46.00          | -10.77      | 1.04 H             | 111                  | 5.29             | 29.94                    |
| 10  | 990.00      | 33.54 QP                | 54.00          | -20.46      | 2.00 H             | 109                  | 2.44             | 31.10                    |

#### 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   | 42.90       | 31.24 QP                | 40.00          | -8.76       | 1.07 V             | 99                   | 18.41            | 12.83                    |
| 2   | 500.00      | 33.89 QP                | 46.00          | -12.11      | 1.22 V             | 275                  | 12.58            | 21.31                    |
| 3   | 792.00      | 33.70 QP                | 46.00          | -12.30      | 1.44 V             | 23                   | 5.48             | 28.22                    |
| 4   | 858.00      | 35.12 QP                | 46.00          | -10.88      | 1.12 V             | 169                  | 6.04             | 29.08                    |
| 5   | 891.00      | 40.00 QP                | 46.00          | -6.00       | 1.26 V             | 192                  | 10.54            | 29.46                    |
| 6   | 924.00      | 36.83 QP                | 46.00          | -9.17       | 1.09 V             | 124                  | 6.89             | 29.94                    |
| 7   | 957.84      | 36.83 QP                | 46.00          | -9.17       | 1.14 V             | 129                  | 6.32             | 30.51                    |
| 8   | 990.00      | 32.18 QP                | 54.00          | -21.82      | 1.92 V             | 225                  | 1.08             | 31.10                    |

**NOTE:**

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



|                                 |   |  |                                    |
|---------------------------------|---|--|------------------------------------|
| <b>TEST MODE</b>                | Dual transmission<br>11b, 2437MHz<br>11a, 5240MHz | <b>FREQUENCY RANGE</b>                   | 1000MHz~40000MHz                   |
| <b>INPUT POWER</b>              | 120Vac, 60Hz                                      | <b>DETECTOR FUNCTION &amp; BANDWIDTH</b> | Peak (PK)<br>Average (AV)<br>1 MHz |
| <b>ENVIRONMENTAL CONDITIONS</b> | 28deg. C, 83%RH,<br>973 hPa                       | <b>TESTED BY</b>                         | Frank Liu                          |

#### 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   | 4874.00     | 41.60 PK                | 74.00          | -32.40      | 1.23 H             | 69                   | 6.05             | 35.55                    |
| 2   | 4874.00     | 31.70 AV                | 54.00          | -22.30      | 1.23 H             | 69                   | -3.85            | 35.55                    |
| 3   | 7311.00     | 46.30 PK                | 74.00          | -27.70      | 1.59 H             | 28                   | 4.26             | 42.04                    |
| 4   | 7311.00     | 35.20 AV                | 54.00          | -18.80      | 1.59 H             | 28                   | -6.84            | 42.04                    |
| 5   | 10480.00    | 55.20 PK                | 74.00          | -18.80      | 1.29 H             | 23                   | 9.08             | 46.12                    |
| 6   | 10480.00    | 41.30 AV                | 54.00          | -12.70      | 1.29 H             | 23                   | -4.82            | 46.12                    |

#### 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   | 4874.00     | 45.83 PK                | 74.00          | -28.17      | 1.27 V             | 169                  | 10.28            | 35.55                    |
| 2   | 4874.00     | 33.40 AV                | 54.00          | -20.60      | 1.27 V             | 169                  | -2.15            | 35.55                    |
| 3   | 7311.00     | 45.83 PK                | 74.00          | -28.17      | 1.44 V             | 246                  | 3.79             | 42.04                    |
| 4   | 7311.00     | 34.60 AV                | 54.00          | -19.40      | 1.44 V             | 246                  | -7.44            | 42.04                    |
| 5   | 10480.00    | 58.30 PK                | 74.00          | -15.70      | 1.49 V             | 19                   | 12.18            | 46.12                    |
| 6   | 10480.00    | 41.50 AV                | 54.00          | -12.50      | 1.49 V             | 19                   | -4.62            | 46.12                    |

**NOTE:**

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



#### 4. INFORMATION ON THE TESTING LABORATORIES

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

|                    |                      |
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