# FCC TEST REPORT

**REPORT NO.:** RF940818L07
**MODEL NO.:** VF0180
**RECEIVED:** Aug. 22, 2005
**TESTED:** Aug. 22 ~ Aug. 30, 2005
**ISSUED:** Sep. 02, 2005

**APPLICANT:** Broadxent Pte Ltd

**ADDRESS:** 31 International Business Park, Creative Resource, Singapore 609921

**ISSUED BY:** Advance Data Technology Corporation

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.



0528
ILAC MRA

No. 2177-01

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# 1. CERTIFICATION

| | |
|---|---|
| **PRODUCT:** | Wireless AP |
| **MODEL:** | VF0180 |
| **BRAND:** | Creative |
| **APPLICANT:** | Broadxent Pte Ltd |
| **TESTED:** | Aug. 22 ~ Aug. 30, 2005 |
| **TEST SAMPLE:** | ENGINEERING SAMPLE |
| **STANDARDS:** | FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003 |

The above equipment have 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** : Wendy Liao , **DATE:** Sep. 02, 2005

**TECHNICAL ACCEPTANCE** Responsible for RF : Gary Chang , **DATE:** Sep. 02, 2005

**APPROVED BY** : Cody Chang / Deputy Manager , **DATE:** Sep. 02, 2005

# 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 15, Subpart C | | | |
|---|---|---|---|
| **STANDARD SECTION** | **TEST TYPE AND LIMIT** | **RESULT** | **REMARK** |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit.<br>Minimum passing margin is –15.37dB at 1.512MHz |
| 15.247(a)(2) | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Limit: min. 500kHz | PASS | Meet the requirement of limit. |
| 15.247(b) | Maximum Peak Output Power<br>Limit: max. 30dBm | PASS | Meet the requirement of limit. |
| 15.247(d) | Radiated Emissions<br>Limit: Table 15.209 | PASS | Meet the requirement of limit.<br>Minimum passing margin is –2.36dB at 101.92MHz |
| 15.247(e) | Power Spectral Density<br>Limit: max. 8dBm | PASS | Meet the requirement of limit. |
| 15.247(d) | Band Edge Measurement<br>Limit: 20dB less than the peak value of fundamental frequency | PASS | Meet the requirement of limit. |

## 2.1 MEASUREMENT UNCERTAINTY

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

| MEASUREMENT | FREQUENCY | UNCERTAINTY |
|---|---|---|
| Conducted emissions | 9kHz ~ 30MHz | 2.44 dB |
| Radiated emissions | 30MHz ~ 200MHz | 3.73 dB |
| | 200MHz ~1000MHz | 3.74 dB |
| | 1GHz ~ 18GHz | 2.20 dB |
| | 18GHz ~ 40GHz | 1.88 dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **EUT** | Wireless AP |
| **MODEL NO.** | VF0180 |
| **POWER SUPPLY** | 5Vdc from AC adapter |
| **MODULATION TYPE** | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM |
| **RADIO TECHNOLOGY** | DSSS, OFDM |
| **TRANSFER RATE** | 802.11b: 11/5.5/2/1Mbps<br>802.11g: 54/48/36/24/18/12/9/6Mbps |
| **FREQUENCY RANGE** | 2412MHz ~ 2462MHz |
| **NUMBER OF CHANNEL** | 11 |
| **OUTPUT POWER** | 16.032mW |
| **ANTENNA TYPE** | Dipole antenna with 3dBi gain |
| **DATA CABLE** | NA |
| **I/O PORTS** | RJ45 |
| **ASSOCIATED DEVICES** | NA |

**NOTE:**

1. The EUT was tested with the following adapter:

| | |
|---|---|
| **BRAND:** | CREATIVE |
| **MODEL:** | TESA1-050240 |
| **INPUT:** | 100-240Vac, 50-60Hz, 0.32A |
| **OUTPUT:** | 5Vdc, 2.4A |
| **POWER LINE:** | DC: 1.88 m non-shielded cable without core |

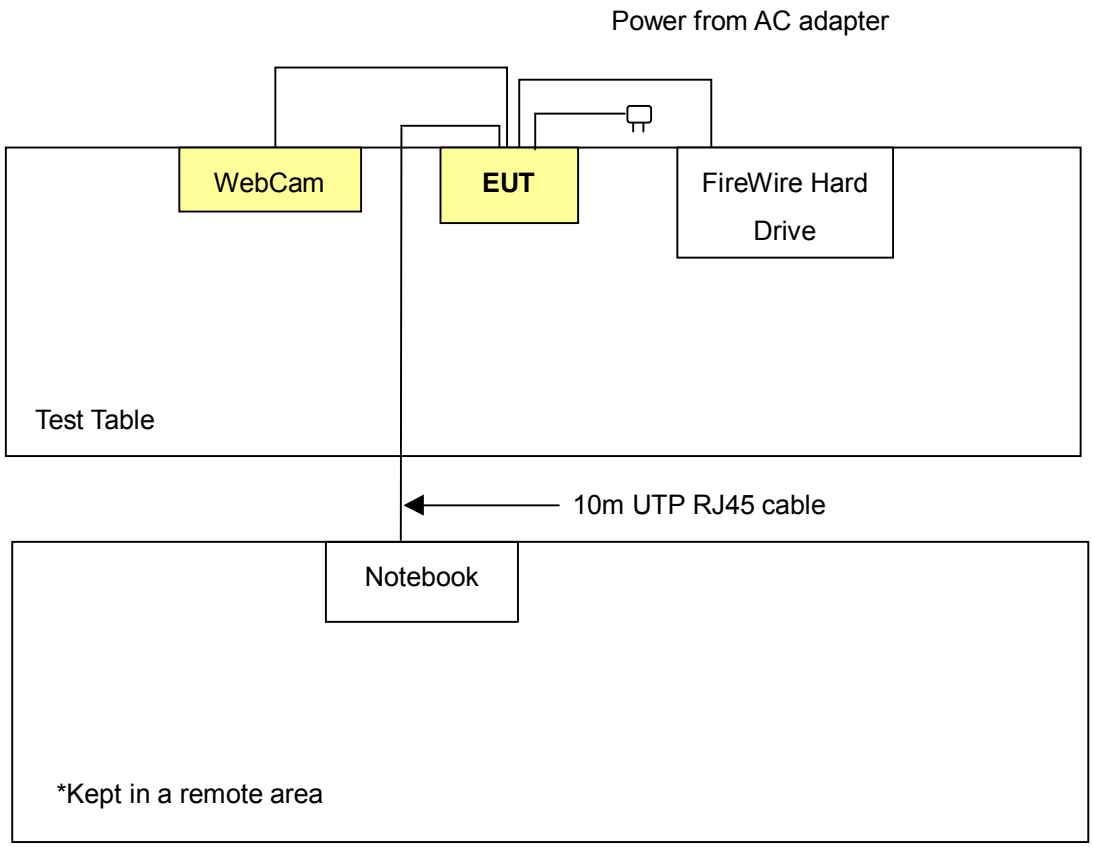
2. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.
3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

## 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---|---|---|---|
| 1 | 2412 MHz | 7 | 2442 MHz |
| 2 | 2417 MHz | 8 | 2447 MHz |
| 3 | 2422 MHz | 9 | 2452 MHz |
| 4 | 2427 MHz | 10 | 2457 MHz |
| 5 | 2432 MHz | 11 | 2462 MHz |
| 6 | 2437 MHz | | |

### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



## 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT CONFIGURE MODE | APPLICABLE TO | | | | DESCRIPTION |
|---|---|---|---|---|---|
| | PLC | RE<1G | RE≥1G | APCM | |
| - | √ | √ | √ | √ | NA |

Where **PLC:** Power Line Conducted Emission **RE<1G:** 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) |
|---|---|---|---|---|---|
| 802.11g | 1 to 11 | 1, 6, 11 | 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) |
|---|---|---|---|---|---|
| 802.11g | 1 to 11 | 11 | 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) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | CCK | 11 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6 |

**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) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 11 | DSSS | CCK | 11 |
| 802.11g | 1 to 11 | 1, 11 | OFDM | BPSK | 6 |

**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) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | CCK | 11 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6 |

## 3.2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless AP. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

**ANSI C63.4- 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.

## 3.2.4 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 | FireWire Hard Drive | Terasys | F12-UF | A0100222-5390009 | FCC DoC Approved |
| 2 | NOTEBOOK COMPUTER | DELL | PP05L | 12130898320 | E2K24CLNS |
| 3 | WebCam | CREATIVE | SF2 | NA | NA |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | 1.8 m shielded cable, terminated with USB connector, w/o core. |
| 2 | NA |
| 3 | NA |
| 4 | 1.8m shielded cable |

**NOTE:** 1. All power cords of the above support units are non shielded (1.8m).
2. Item 2 act as a communication partner to transfer data.

# 4. TEST TYPES AND RESULTS

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

**NOTE**: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| Test Receiver<br>ROHDE & SCHWARZ | ESCS30 | 100291 | Nov. 16, 2005 |
| RF signal cable<br>Woken | 5D-FB | Cable-HYC01-01 | Jan. 09, 2006 |
| LISN<br>SCHWARZBECK | NNBL 8226-2 | 8226-142 | May. 02, 2006 |
| LISN<br>ROHDE & SCHWARZ | ESH2-Z5 | 100104 | Feb. 15, 2006 |
| Software<br>ADT | ADT_Cond_V3 | NA | NA |

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

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

### 4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

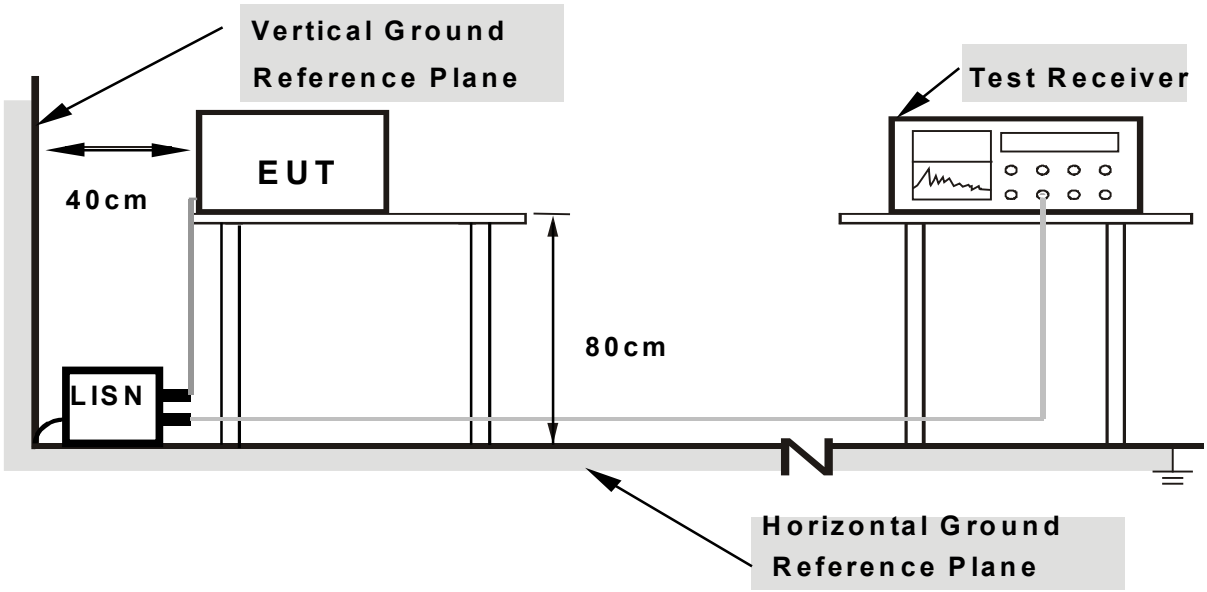
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP




**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) 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 another notebook system to act as a communication partner and placed it outside of testing area.
c. The communication partner run a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency via an RJ45 cable.
d. The communication partner sent data to EUT by command "PING".

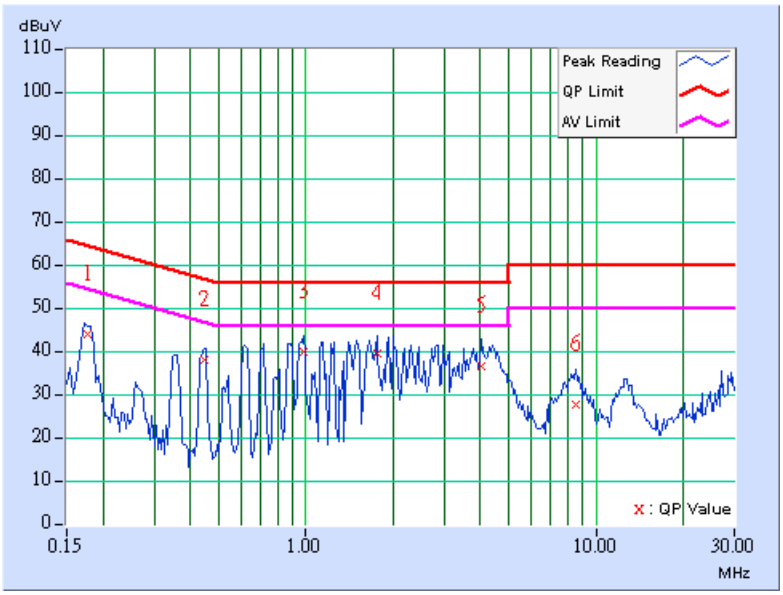
## 4.1.7 TEST RESULTS

### CONDUCTED WORST-CASE DATA

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | PHASE | Line 1 |
| CHANNEL | Channel 1 | 6dB BANDWIDTH | 9 kHz |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.177 | 0.11 | 43.44 | - | 43.55 | - | 64.63 | 54.63 | -21.08 | - |
| 2 | 0.447 | 0.12 | 37.57 | - | 37.69 | - | 56.93 | 46.93 | -19.24 | - |
| 3 | 0.982 | 0.24 | 39.65 | - | 39.89 | - | 56.00 | 46.00 | -16.11 | - |
| 4 | 1.762 | 0.26 | 39.07 | - | 39.33 | - | 56.00 | 46.00 | -16.67 | - |
| 5 | 4.027 | 0.39 | 36.20 | - | 36.59 | - | 56.00 | 46.00 | -19.41 | - |
| 6 | 8.504 | 0.50 | 27.33 | - | 27.83 | - | 60.00 | 50.00 | -32.17 | - |

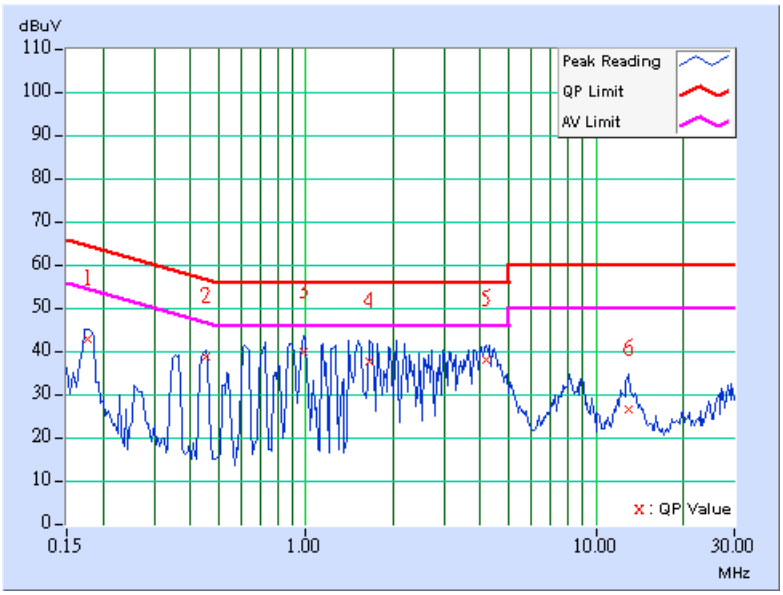
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | PHASE | Line 2 |
| CHANNEL | Channel 1 | 6dB BANDWIDTH | 9 kHz |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.177 | 0.11 | 42.53 | - | 42.64 | - | 64.61 | 54.61 | -21.97 | - |
| 2 | 0.455 | 0.12 | 38.35 | - | 38.47 | - | 56.79 | 46.79 | -18.32 | - |
| 3 | 0.982 | 0.24 | 39.51 | - | 39.75 | - | 56.00 | 46.00 | -16.25 | - |
| 4 | 1.660 | 0.25 | 37.23 | - | 37.48 | - | 56.00 | 46.00 | -18.52 | - |
| 5 | 4.180 | 0.39 | 37.66 | - | 38.05 | - | 56.00 | 46.00 | -17.95 | - |
| 6 | 12.945 | 0.45 | 26.04 | - | 26.49 | - | 60.00 | 50.00 | -33.51 | - |

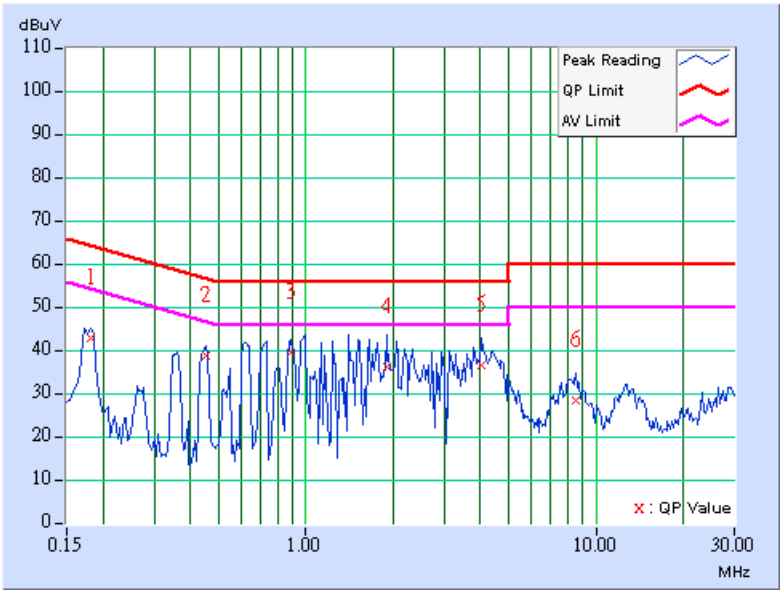
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | PHASE | Line 1 |
| CHANNEL | Channel 6 | 6dB BANDWIDTH | 9 kHz |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.181 | 0.11 | 42.45 | - | 42.56 | - | 64.43 | 54.43 | -21.87 | - |
| 2 | 0.455 | 0.12 | 38.56 | - | 38.68 | - | 56.79 | 46.79 | -18.11 | - |
| 3 | 0.884 | 0.21 | 39.21 | - | 39.42 | - | 56.00 | 46.00 | -16.58 | - |
| 4 | 1.906 | 0.26 | 35.96 | - | 36.22 | - | 56.00 | 46.00 | -19.78 | - |
| 5 | 4.027 | 0.39 | 36.14 | - | 36.53 | - | 56.00 | 46.00 | -19.47 | - |
| 6 | 8.563 | 0.50 | 27.91 | - | 28.41 | - | 60.00 | 50.00 | -31.59 | - |

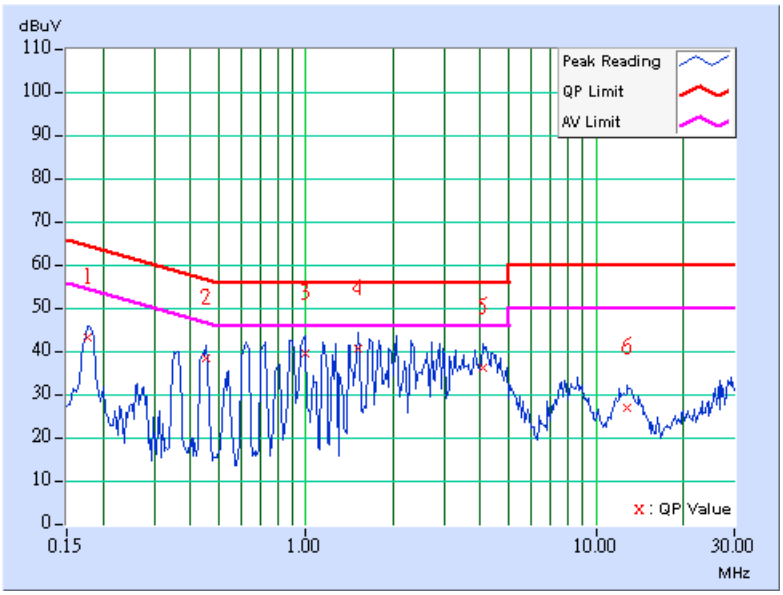
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | PHASE | Line 2 |
| CHANNEL | Channel 6 | 6dB BANDWIDTH | 9 kHz |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.177 | 0.11 | 42.87 | - | 42.98 | - | 64.61 | 54.61 | -21.63 | - |
| 2 | 0.455 | 0.12 | 38.21 | - | 38.33 | - | 56.79 | 46.79 | -18.46 | - |
| 3 | 0.994 | 0.24 | 39.17 | - | 39.41 | - | 56.00 | 46.00 | -16.59 | - |
| **4** | **1.512** | **0.25** | **40.38** | **-** | **40.63** | **-** | **56.00** | **46.00** | **-15.37** | **-** |
| 5 | 4.094 | 0.39 | 36.00 | - | 36.39 | - | 56.00 | 46.00 | -19.61 | - |
| 6 | 12.883 | 0.45 | 26.47 | - | 26.92 | - | 60.00 | 50.00 | -33.08 | - |

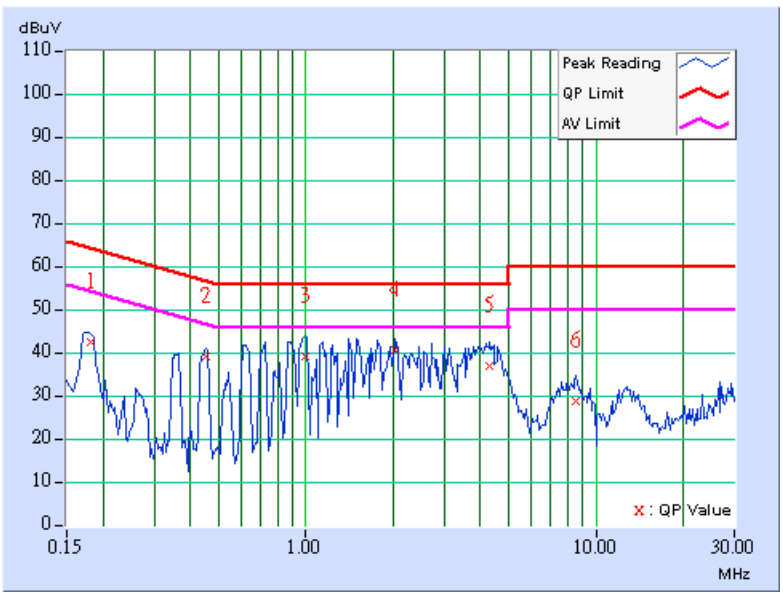
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | PHASE | Line 1 |
| CHANNEL | Channel 11 | 6dB BANDWIDTH | 9 kHz |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.181 | 0.11 | 42.22 | - | 42.33 | - | 64.43 | 54.43 | -22.10 | - |
| 2 | 0.455 | 0.12 | 38.76 | - | 38.88 | - | 56.79 | 46.79 | -17.91 | - |
| 3 | 0.994 | 0.24 | 38.88 | - | 39.12 | - | 56.00 | 46.00 | -16.88 | - |
| 4 | 2.035 | 0.26 | 40.21 | - | 40.47 | - | 56.00 | 46.00 | -15.53 | - |
| 5 | 4.289 | 0.40 | 36.37 | - | 36.77 | - | 56.00 | 46.00 | -19.23 | - |
| 6 | 8.531 | 0.50 | 28.28 | - | 28.78 | - | 60.00 | 50.00 | -31.22 | - |

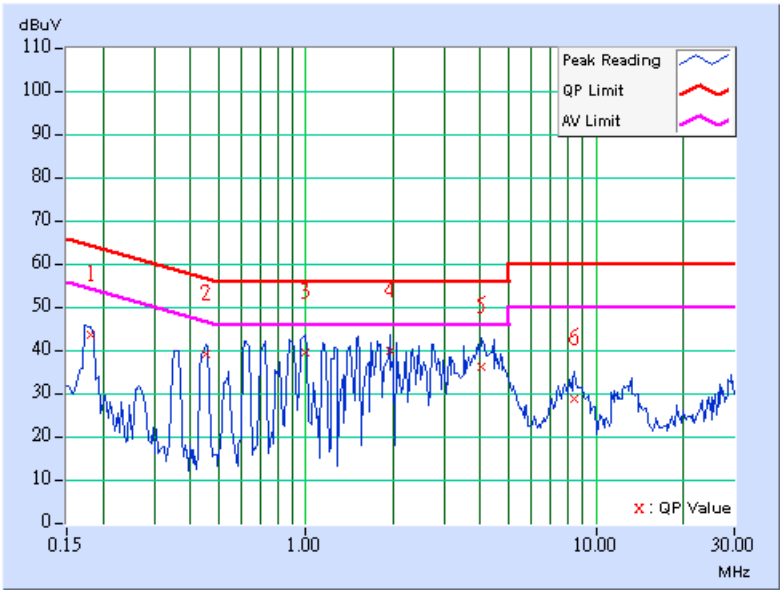
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | PHASE | Line 2 |
| CHANNEL | Channel 11 | 6dB BANDWIDTH | 9 kHz |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.181 | 0.11 | 43.12 | - | 43.23 | - | 64.43 | 54.43 | -21.20 | - |
| 2 | 0.455 | 0.12 | 38.78 | - | 38.90 | - | 56.79 | 46.79 | -17.89 | - |
| 3 | 0.994 | 0.24 | 39.08 | - | 39.32 | - | 56.00 | 46.00 | -16.68 | - |
| 4 | 1.945 | 0.26 | 39.50 | - | 39.76 | - | 56.00 | 46.00 | -16.24 | - |
| 5 | 4.043 | 0.39 | 35.95 | - | 36.34 | - | 56.00 | 46.00 | -19.66 | - |
| 6 | 8.422 | 0.43 | 28.57 | - | 29.00 | - | 60.00 | 50.00 | -31.00 | - |

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



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

| FREQUENCIES (MHz) | FIELD STRENGTH (microvolts/meter) | MEASUREMENT DISTANCE (meters) |
|---|---|---|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE:**

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

## 4.2.2 TEST INSTRUMENTS

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

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

2. The test was performed in HwaYa Chamber 1.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The IC Site Registration No. is IC4924-2.

### 4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

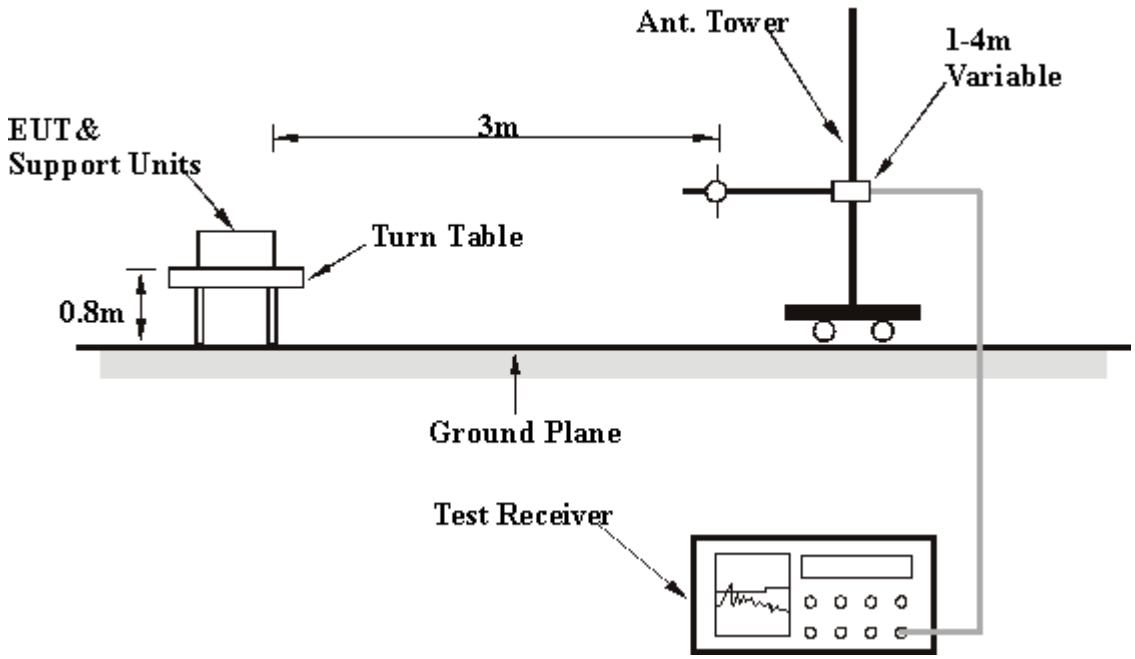
**NOTE:**

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 1kHz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP




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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

**RADIATED WORST-CASE DATA: BELOW 1GHz**

| | | | |
|---|---|---|---|
| **EUT** | Wireless AP | **MEASUREMENT DETAIL** | |
| **MODEL** | VF0180 | **FREQUENCY RANGE** | Below 1000MHz |
| **CHANNEL** | Channel 11 | **DETECTOR FUNCTION** | Quasi-Peak |
| **MODULATION TYPE** | BPSK | **ENVIRONMENTAL CONDITIONS** | 27deg. C, 67%RH, 991hPa |
| **TRANSFER RATE** | 6Mbps | **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz |
| **TESTED BY** | Match Tsui | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 47.49 | 29.07 QP | 40.00 | -10.93 | 1.75 H | 130 | 14.31 | 14.76 |
| **2** | **101.92** | **41.14 QP** | **43.50** | **-2.36** | **1.75 H** | **295** | **30.20** | **10.94** |
| 3 | 138.86 | 30.62 QP | 43.50 | -12.88 | 1.75 H | 253 | 16.48 | 14.13 |
| 4 | 171.90 | 35.39 QP | 43.50 | -8.11 | 1.75 H | 298 | 21.89 | 13.50 |
| 5 | 249.66 | 34.84 QP | 46.00 | -11.16 | 1.00 H | 322 | 21.76 | 13.08 |
| 6 | 300.20 | 32.78 QP | 46.00 | -13.22 | 1.00 H | 262 | 18.45 | 14.33 |
| 7 | 374.07 | 35.92 QP | 46.00 | -10.08 | 1.00 H | 295 | 19.89 | 16.03 |
| 8 | 432.38 | 32.08 QP | 46.00 | -13.92 | 1.75 H | 25 | 14.62 | 17.46 |
| 9 | 465.43 | 31.97 QP | 46.00 | -14.03 | 1.50 H | 232 | 13.85 | 18.12 |
| 10 | 500.42 | 36.84 QP | 46.00 | -9.16 | 1.75 H | 307 | 18.24 | 18.59 |
| 11 | 624.83 | 32.66 QP | 46.00 | -13.34 | 1.25 H | 286 | 11.42 | 21.24 |
| 12 | 700.64 | 40.80 QP | 46.00 | -5.20 | 1.25 H | 154 | 18.53 | 22.26 |
| 13 | 803.67 | 35.30 QP | 46.00 | -10.70 | 1.75 H | 208 | 11.56 | 23.73 |
| 14 | 900.86 | 35.47 QP | 46.00 | -10.53 | 1.50 H | 253 | 10.35 | 25.11 |

**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.

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | Below 1000MHz |
| CHANNEL | Channel 11 | DETECTOR FUNCTION | Quasi-Peak |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 27deg. C, 67%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| 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 | 47.49 | 35.85 QP | 40.00 | -4.15 | 1.00 V | 70 | 21.08 | 14.76 |
| 2 | 96.09 | 37.83 QP | 43.50 | -5.67 | 1.00 V | 145 | 27.40 | 10.43 |
| 3 | 129.14 | 30.95 QP | 43.50 | -12.55 | 1.00 V | 286 | 17.50 | 13.45 |
| 4 | 169.96 | 32.04 QP | 43.50 | -11.46 | 1.00 V | 82 | 18.35 | 13.69 |
| 5 | 249.66 | 28.99 QP | 46.00 | -17.01 | 1.50 V | 229 | 15.91 | 13.08 |
| 6 | 374.07 | 31.92 QP | 46.00 | -14.08 | 2.00 V | 229 | 15.89 | 16.03 |
| 7 | 399.34 | 33.72 QP | 46.00 | -12.28 | 1.25 V | 352 | 17.10 | 16.62 |
| 8 | 500.42 | 37.43 QP | 46.00 | -8.57 | 1.25 V | 307 | 18.84 | 18.59 |
| 9 | 700.64 | 37.97 QP | 46.00 | -8.03 | 1.50 V | 127 | 15.71 | 22.26 |
| 10 | 803.67 | 36.16 QP | 46.00 | -9.84 | 1.25 V | 118 | 12.43 | 23.73 |
| 11 | 900.86 | 37.21 QP | 46.00 | -8.79 | 1.25 V | 16 | 12.09 | 25.11 |
| 12 | 931.96 | 32.66 QP | 46.00 | -13.34 | 1.25 V | 163 | 7.23 | 25.43 |

**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.

## 802.11b DSSS MODULATION

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | 1 ~ 25GHz |
| CHANNEL | Channel 1 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| MODULATION TYPE | CCK | ENVIRONMENTAL CONDITIONS | 27deg. C, 67%RH, 991hPa |
| TRANSFER RATE | 11Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1608.00 | 43.82 PK | 74.00 | -30.18 | 1.21 H | 187 | 15.05 | 28.78 |
| 1 | 1608.00 | 39.29 AV | 54.00 | -14.71 | 1.21 H | 187 | 10.52 | 28.78 |
| 2 | 2320.00 | 50.11 PK | 74.00 | -23.89 | 1.00 H | 258 | 18.38 | 31.73 |
| 2 | 2320.00 | 39.98 AV | 54.00 | -14.02 | 1.00 H | 258 | 8.25 | 31.73 |
| 3 | 2390.00 | 54.91 PK | 74.00 | -19.09 | 1.32 H | 250 | 22.87 | 32.04 |
| 3 | 2390.00 | 45.69 AV | 54.00 | -8.31 | 1.32 H | 250 | 13.65 | 32.04 |
| 4 | *2412.00 | 102.09 PK | | | 1.32 H | 250 | 69.96 | 32.13 |
| 4 | *2412.00 | 94.63 AV | | | 1.32 H | 250 | 62.50 | 32.13 |
| 5 | 3216.00 | 48.59 PK | 82.09 | -33.50 | 1.09 H | 270 | 14.66 | 33.93 |
| 5 | 3216.00 | 41.09 AV | 74.63 | -33.54 | 1.09 H | 270 | 7.16 | 33.93 |
| 6 | 4824.00 | 47.38 PK | 74.00 | -26.62 | 1.05 H | 332 | 9.18 | 38.20 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1608.00 | 46.25 PK | 74.00 | -27.75 | 1.01 V | 5 | 17.48 | 28.78 |
| 1 | 1608.00 | 43.15 AV | 54.00 | -10.85 | 1.01 V | 5 | 14.38 | 28.78 |
| 2 | 2320.00 | 57.93 PK | 74.00 | -16.07 | 1.15 V | 250 | 26.20 | 31.73 |
| 2 | 2320.00 | 46.91 AV | 54.00 | -7.09 | 1.15 V | 250 | 15.18 | 31.73 |
| 3 | 2360.00 | 56.66 PK | 74.00 | -17.34 | 1.10 V | 249 | 24.76 | 31.90 |
| 3 | 2360.00 | 46.76 AV | 54.00 | -7.24 | 1.10 V | 249 | 14.86 | 31.90 |
| 4 | *2412.00 | 107.99 PK | | | 1.10 V | 249 | 75.86 | 32.13 |
| 4 | *2412.00 | 100.70 AV | | | 1.10 V | 249 | 68.57 | 32.13 |
| 5 | 3216.00 | 50.60 PK | 87.99 | -37.39 | 1.02 V | 8 | 16.67 | 33.93 |
| 5 | 3216.00 | 45.62 AV | 80.70 | -35.08 | 1.02 V | 8 | 11.69 | 33.93 |
| 6 | 4824.00 | 47.47 PK | 74.00 | -26.53 | 1.35 V | 18 | 9.27 | 38.20 |

**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.
5. " * ": Fundamental frequency.

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | 1 ~ 25GHz |
| CHANNEL | Channel 6 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| MODULATION TYPE | CCK | ENVIRONMENTAL CONDITIONS | 27deg. C, 67%RH, 991hPa |
| TRANSFER RATE | 11Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 1624.00 | 43.96 PK | 74.00 | -30.04 | 1.14 H | 259 | 15.15 | 28.81 |
| 1 | 1624.00 | 39.41 AV | 54.00 | -14.59 | 1.14 H | 259 | 10.60 | 28.81 |
| 2 | 2320.00 | 50.16 PK | 74.00 | -23.84 | 1.00 H | 25 | 18.43 | 31.73 |
| 2 | 2320.00 | 39.91 AV | 54.00 | -14.09 | 1.00 H | 25 | 8.18 | 31.73 |
| 3 | *2437.00 | 102.01 PK | | | 1.21 H | 226 | 69.76 | 32.25 |
| 3 | *2437.00 | 94.58 AV | | | 1.21 H | 226 | 62.33 | 32.25 |
| 4 | 3249.00 | 47.05 PK | 82.01 | -34.96 | 1.07 H | 273 | 13.07 | 33.98 |
| 4 | 3249.00 | 39.12 AV | 74.58 | -35.46 | 1.07 H | 273 | 5.14 | 33.98 |
| 5 | 4874.00 | 47.85 PK | 74.00 | -26.15 | 1.00 H | 158 | 9.53 | 38.32 |

| 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 | 1624.00 | 45.28 PK | 74.00 | -28.72 | 1.36 V | 37 | 16.47 | 28.81 |
| 1 | 1624.00 | 41.91 AV | 54.00 | -12.09 | 1.36 V | 37 | 13.10 | 28.81 |
| 2 | 2320.00 | 57.13 PK | 74.00 | -16.87 | 1.13 V | 276 | 25.40 | 31.73 |
| 2 | 2320.00 | 47.74 AV | 54.00 | -6.26 | 1.13 V | 276 | 16.01 | 31.73 |
| 3 | *2437.00 | 107.71 PK | | | 1.06 V | 278 | 75.46 | 32.25 |
| 3 | *2437.00 | 100.42 AV | | | 1.06 V | 278 | 68.17 | 32.25 |
| 4 | 3249.00 | 49.62 PK | 87.71 | -38.09 | 1.00 V | 294 | 15.64 | 33.98 |
| 4 | 3249.00 | 44.76 AV | 80.42 | -35.66 | 1.00 V | 294 | 10.78 | 33.98 |
| 5 | 4874.00 | 47.92 PK | 74.00 | -26.08 | 1.25 V | 335 | 9.60 | 38.32 |

**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.

5. " * ": Fundamental frequency.

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | 1 ~ 25GHz |
| CHANNEL | Channel 11 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| MODULATION TYPE | CCK | ENVIRONMENTAL CONDITIONS | 27deg. C, 67%RH, 991hPa |
| TRANSFER RATE | 11Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Match Tsui | | |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1641.00 | 45.75 PK | 74.00 | -28.25 | 1.16 H | 276 | 16.90 | 28.85 |
| 1 | 1641.00 | 42.82 AV | 54.00 | -11.18 | 1.16 H | 276 | 13.97 | 28.85 |
| 2 | 2320.00 | 50.02 PK | 74.00 | -23.98 | 1.02 H | 315 | 18.29 | 31.73 |
| 2 | 2320.00 | 39.88 AV | 54.00 | -14.12 | 1.02 H | 315 | 8.15 | 31.73 |
| 3 | *2462.00 | 101.85 PK | | | 1.20 H | 250 | 69.49 | 32.36 |
| 3 | *2462.00 | 94.11 AV | | | 1.20 H | 250 | 61.75 | 32.36 |
| 4 | 2483.50 | 54.48 PK | 74.00 | -19.52 | 1.30 H | 250 | 22.02 | 32.46 |
| 4 | 2483.50 | 45.67 AV | 54.00 | -8.33 | 1.30 H | 250 | 13.21 | 32.46 |
| 5 | 3282.00 | 44.60 PK | 81.85 | -37.25 | 1.06 H | 271 | 10.57 | 34.03 |
| 5 | 3282.00 | 35.91 AV | 74.11 | -38.20 | 1.06 H | 271 | 1.88 | 34.03 |
| 6 | 4924.00 | 47.75 PK | 74.00 | -26.25 | 1.15 H | 159 | 9.29 | 38.46 |

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

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1641.00 | 45.86 PK | 74.00 | -28.14 | 1.32 V | 210 | 17.01 | 28.85 |
| 1 | 1641.00 | 42.64 AV | 54.00 | -11.36 | 1.32 V | 210 | 13.79 | 28.85 |
| 2 | 2320.00 | 55.41 PK | 74.00 | -18.59 | 1.22 V | 39 | 23.68 | 31.73 |
| 2 | 2320.00 | 45.27 AV | 54.00 | -8.73 | 1.22 V | 39 | 13.54 | 31.73 |
| 3 | *2462.00 | 107.12 PK | | | 1.33 V | 254 | 74.76 | 32.36 |
| 3 | *2462.00 | 99.89 AV | | | 1.33 V | 254 | 67.53 | 32.36 |
| 4 | 2483.50 | 55.48 PK | 74.00 | -18.52 | 1.33 V | 254 | 23.02 | 32.46 |
| 4 | 2483.50 | 46.28 AV | 54.00 | -7.72 | 1.33 V | 254 | 13.82 | 32.46 |
| 5 | 3282.00 | 46.52 PK | 87.12 | -40.60 | 1.15 V | 39 | 12.49 | 34.03 |
| 5 | 3282.00 | 39.21 AV | 79.89 | -40.68 | 1.15 V | 39 | 5.18 | 34.03 |
| 6 | 4924.00 | 47.91 PK | 74.00 | -26.09 | 1.26 V | 315 | 9.45 | 38.46 |

**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.
5. " * ": Fundamental frequency.

## 802.11g OFDM MODULATION_NORMAL MODE

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | 1 ~ 25GHz |
| CHANNEL | Channel 1 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Morgan Chen | | |

**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 | 1608.00 | 43.12 PK | 74.00 | -30.88 | 1.05 H | 54 | 14.36 | 28.76 |
| 2 | 2320.00 | 49.11 PK | 74.00 | -24.89 | 1.00 H | 21 | 18.11 | 31.00 |
| 3 | 2390.00 | 50.12 PK | 74.00 | -23.88 | 1.03 H | 248 | 18.72 | 31.40 |
| 3 | 2390.00 | 40.75 AV | 54.00 | -13.25 | 1.03 H | 248 | 9.35 | 31.40 |
| 4 | 2392.10 | 64.12 PK | 74.00 | -9.88 | 1.03 H | 248 | 32.71 | 31.41 |
| 5 | *2412.00 | 100.08 PK | | | 1.03 H | 248 | 68.54 | 31.54 |
| 5 | *2412.00 | 90.11 AV | | | 1.03 H | 248 | 58.57 | 31.54 |
| 6 | 3216.00 | 46.58 PK | 80.08 | -33.50 | 1.02 H | 122 | 13.60 | 32.98 |
| 7 | 4824.00 | 46.65 PK | 74.00 | -27.35 | 1.08 H | 158 | 9.88 | 36.77 |

**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 | 1641.00 | 46.22 PK | 74.00 | -27.78 | 1.32 V | 31 | 17.43 | 28.79 |
| 2 | 2320.00 | 56.90 PK | 74.00 | -17.10 | 1.14 V | 18 | 25.90 | 31.00 |
| 2 | 2320.00 | 46.60 AV | 54.00 | -7.40 | 1.14 V | 18 | 15.60 | 31.00 |
| 3 | *2462.00 | 105.67 PK | | | 1.15 V | 310 | 73.82 | 31.85 |
| 3 | *2462.00 | 95.52 AV | | | 1.15 V | 310 | 63.67 | 31.85 |
| 4 | 2483.50 | 56.67 PK | 74.00 | -17.33 | 1.15 V | 310 | 24.68 | 31.99 |
| 4 | 2483.50 | 46.52 AV | 54.00 | -7.48 | 1.15 V | 310 | 14.53 | 31.99 |
| 5 | 3282.00 | 50.22 PK | 85.67 | -35.47 | 1.45 V | 12 | 17.11 | 33.11 |
| 5 | 3282.00 | 45.31 AV | 75.52 | -30.21 | 1.45 V | 12 | 12.20 | 33.11 |
| 6 | 4924.00 | 47.25 PK | 74.00 | -26.75 | 1.28 V | 319 | 10.45 | 36.80 |

**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.
5. " * ": Fundamental frequency.

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | 1 ~ 25GHz |
| CHANNEL | Channel 6 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Morgan Chen | | |

| 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 | 1624.00 | 43.25 PK | 74.00 | -30.75 | 1.15 H | 315 | 14.48 | 28.77 |
| 2 | 2320.00 | 49.25 PK | 74.00 | -24.75 | 1.04 H | 65 | 18.25 | 31.00 |
| 3 | *2437.00 | 99.97 PK | | | 1.04 H | 65 | 68.28 | 31.69 |
| 3 | *2437.00 | 90.02 AV | | | 1.04 H | 65 | 58.33 | 31.69 |
| 4 | 3248.00 | 46.38 PK | 79.97 | -33.59 | 1.08 H | 146 | 13.33 | 33.05 |
| 5 | 4874.00 | 46.55 PK | 74.00 | -27.45 | 1.02 H | 256 | 9.77 | 36.78 |

| 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 | 1624.00 | 46.32 PK | 74.00 | -27.68 | 1.08 V | 315 | 17.55 | 28.77 |
| 2 | 2320.00 | 56.80 PK | 74.00 | -17.20 | 1.25 V | 315 | 25.80 | 31.00 |
| 2 | 2320.00 | 46.71 AV | 54.00 | -7.29 | 1.25 V | 315 | 15.71 | 31.00 |
| 3 | *2437.00 | 104.55 PK | | | 1.25 V | 315 | 72.86 | 31.69 |
| 3 | *2437.00 | 94.48 AV | | | 1.25 V | 315 | 62.79 | 31.69 |
| 4 | 3248.00 | 50.25 PK | 84.55 | -34.30 | 1.25 V | 34 | 17.20 | 33.05 |
| 4 | 3248.00 | 45.02 AV | 74.48 | -29.46 | 1.25 V | 34 | 11.97 | 33.05 |
| 5 | 4874.00 | 46.95 PK | 74.00 | -27.05 | 1.28 V | 254 | 10.17 | 36.78 |

**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.
5. " * ": Fundamental frequency.

| EUT | Wireless AP | MEASUREMENT DETAIL | |
|---|---|---|---|
| MODEL | VF0180 | FREQUENCY RANGE | 1 ~ 25GHz |
| CHANNEL | Channel 11 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| MODULATION TYPE | BPSK | ENVIRONMENTAL CONDITIONS | 25deg. C, 70%RH, 991hPa |
| TRANSFER RATE | 6Mbps | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Morgan Chen | | |

| 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 | 1641.00 | 43.52 PK | 74.00 | -30.48 | 1.18 H | 315 | 14.73 | 28.79 |
| 2 | 2320.00 | 49.25 PK | 74.00 | -24.75 | 1.00 H | 258 | 18.25 | 31.00 |
| 3 | *2462.00 | 100.12 PK | | | 1.03 H | 215 | 68.27 | 31.85 |
| 3 | *2462.00 | 90.21 AV | | | 1.03 H | 215 | 58.36 | 31.85 |
| 4 | 2483.50 | 51.21 PK | 74.00 | -22.79 | 1.03 H | 215 | 19.22 | 31.99 |
| 4 | 2483.50 | 41.33 AV | 54.00 | -12.67 | 1.03 H | 215 | 9.34 | 31.99 |
| 5 | 3282.00 | 46.25 PK | 80.12 | -33.87 | 1.20 H | 318 | 13.14 | 33.11 |
| 6 | 4924.00 | 46.72 PK | 74.00 | -27.28 | 1.22 H | 318 | 9.92 | 36.80 |
| 6 | 4924.00 | 46.72 PK | 74.00 | -27.28 | 1.22 H | 318 | 9.92 | 36.80 |

| 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 | 1641.00 | 46.22 PK | 74.00 | -27.78 | 1.32 V | 31 | 17.43 | 28.79 |
| 2 | 2320.00 | 56.90 PK | 74.00 | -17.10 | 1.14 V | 18 | 25.90 | 31.00 |
| 2 | 2320.00 | 46.60 AV | 54.00 | -7.40 | 1.14 V | 18 | 15.60 | 31.00 |
| 3 | *2462.00 | 105.67 PK | | | 1.15 V | 310 | 73.82 | 31.85 |
| 3 | *2462.00 | 95.52 AV | | | 1.15 V | 310 | 63.67 | 31.85 |
| 4 | 2483.50 | 56.67 PK | 74.00 | -17.33 | 1.15 V | 310 | 24.68 | 31.99 |
| 4 | 2483.50 | 46.52 AV | 54.00 | -7.48 | 1.15 V | 310 | 14.53 | 31.99 |
| 5 | 3282.00 | 50.22 PK | 85.67 | -35.45 | 1.45 V | 12 | 17.11 | 33.11 |
| 5 | 3282.00 | 45.31 AV | 75.52 | -30.21 | 1.45 V | 12 | 12.20 | 33.11 |
| 6 | 4924.00 | 83.75 PK | 85.67 | -1.92 | 1.28 V | 319 | 46.95 | 36.80 |
| 6 | 4924.00 | 73.60 AV | 75.52 | -1.92 | 1.28 V | 319 | 36.80 | 36.80 |

**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.
5. " * ": Fundamental frequency.

## 4.3 6dB BANDWIDTH MEASUREMENT

### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| SPECTRUM ANALYZER | FSEK 30 | 100049 | Aug. 14, 2006 |

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

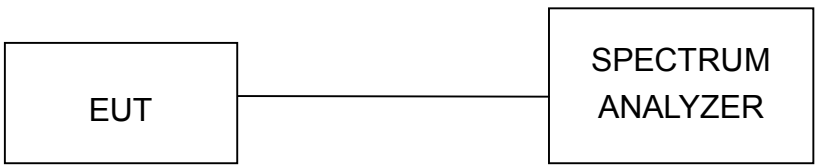
### 4.3.3 TEST PROCEDURE

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

### 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 lowest, middle and highest channel frequencies individually.

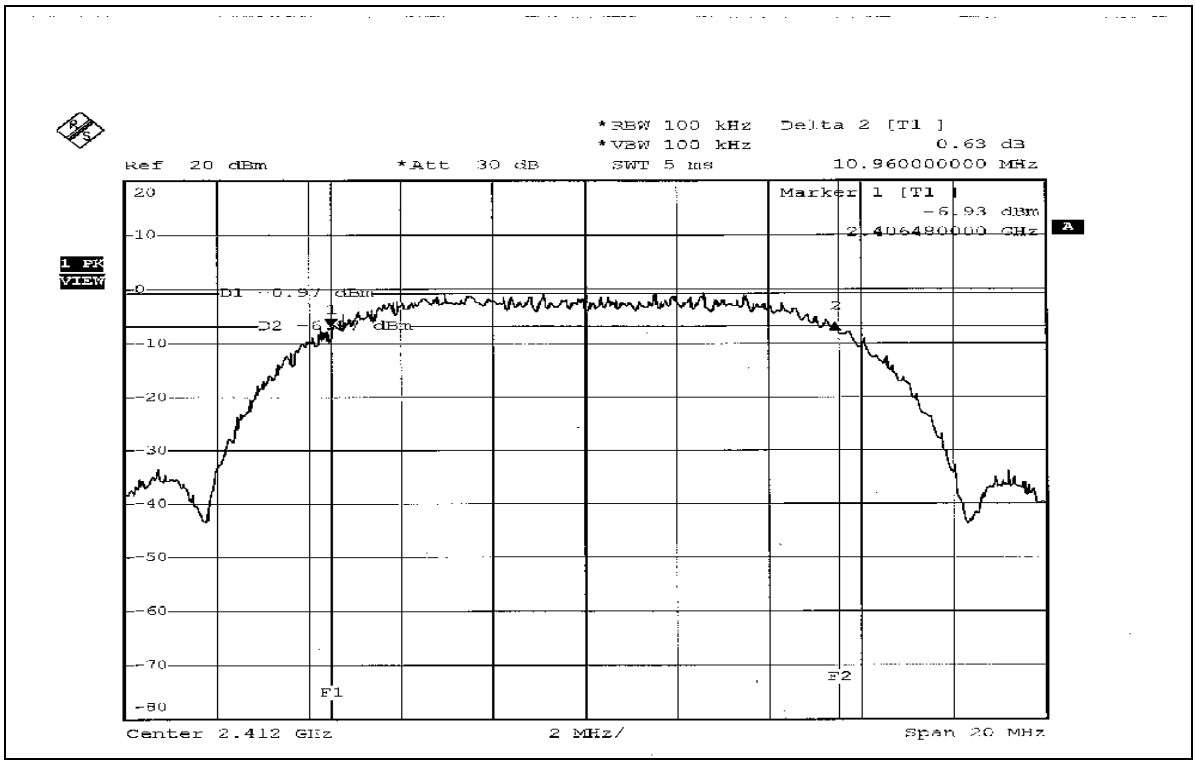
## 4.3.7 TEST RESULTS

### 802.11b DSSS MODULATION

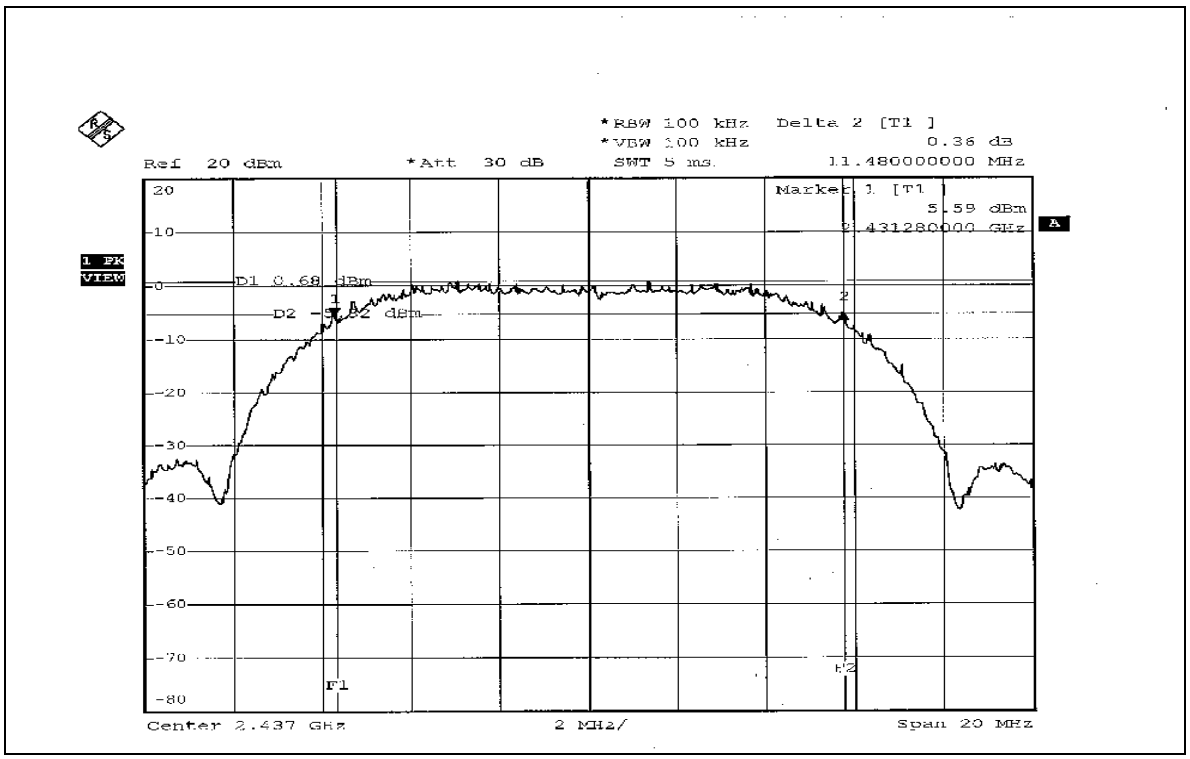
| | | | |
|---|---|---|---|
| **EUT** | Wireless AP | **MODEL** | VF0180 |
| **MODULATION TYPE** | CCK | **TRANSFER RATE** | 11Mbps |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **ENVIRONMENTAL CONDITIONS** | 26deg. C, 66%RH, 991hPa |
| **TESTED BY** | Gary Chang | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 10.96 | 0.5 | PASS |
| 6 | 2437 | 11.48 | 0.5 | PASS |
| 11 | 2462 | 11.00 | 0.5 | PASS |

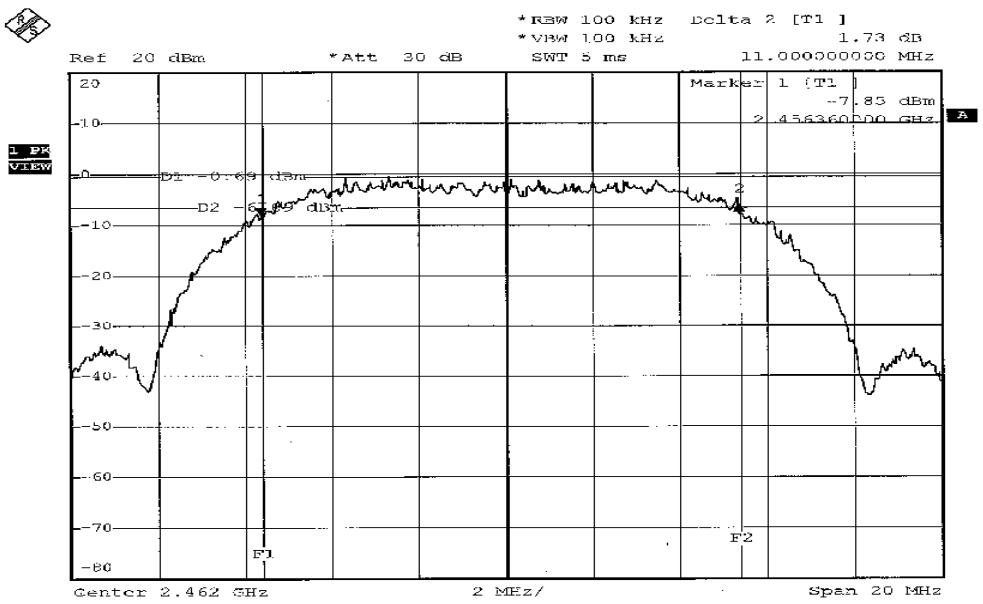
## CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1 ]
0.63 dB
10.960000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1 ]
-6.93 dBm
2.406480000 GHz
1 PK VIEW
D1 -0.97 dBm
D2 -6.30 dBm
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

## CH6


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1 ]
0.36 dB
11.480000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1 ]
5.59 dBm
2.431280000 GHz
1 PK VIEW
D1 0.68 dBm
D2 -5.82 dBm
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

## CH11

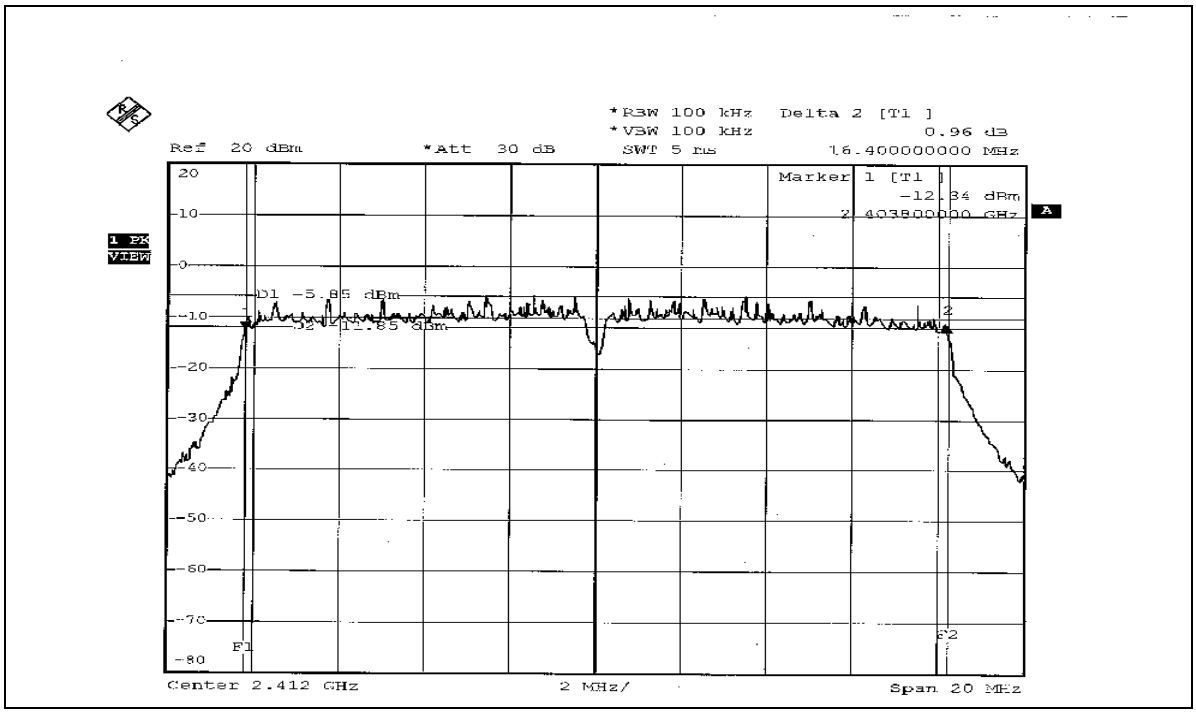

*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1 ]
1.73 dB
11.000000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1 ]
-7.85 dBm
2.456360000 GHz
1 PK
VIEW
D1 -0.69 dBm
D2 -6.69 dBm
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

## 802.11g OFDM MODULATION_NORMAL MODE

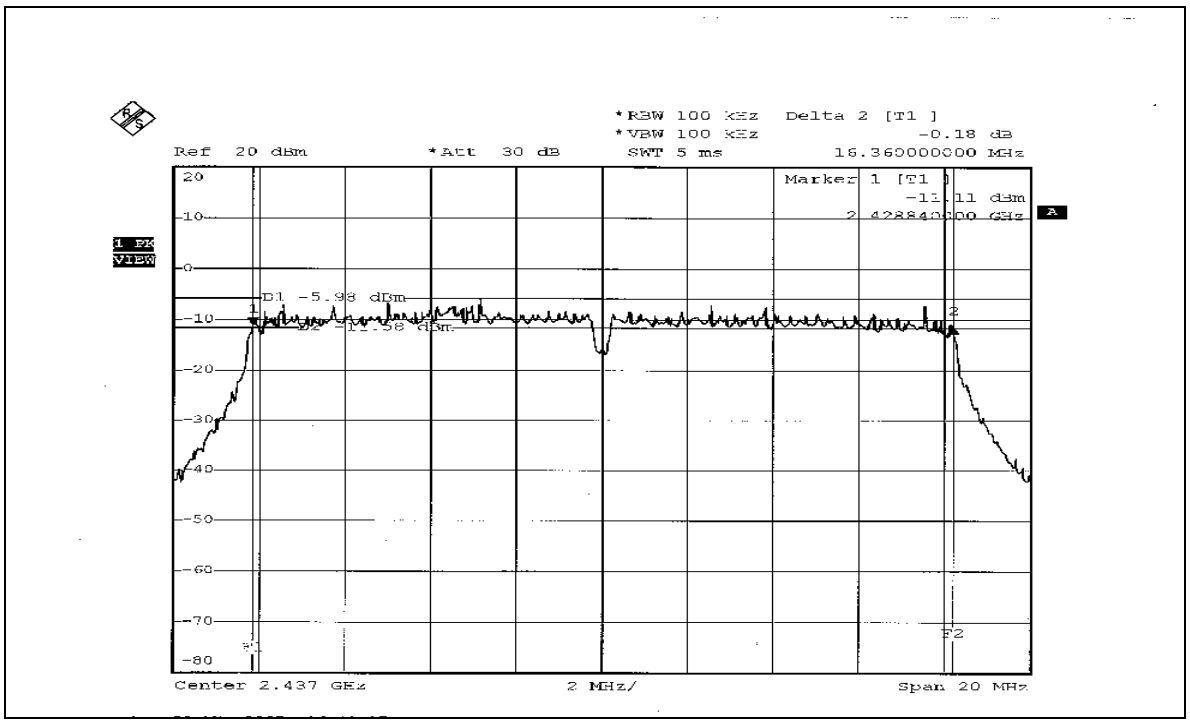
| | | | |
|---|---|---|---|
| **EUT** | Wireless AP | **MODEL** | VF0180 |
| **MODULATION TYPE** | BPSK | **TRANSFER RATE** | 6Mbps |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **ENVIRONMENTAL CONDITIONS** | 26deg. C, 66%RH, 991hPa |
| **TESTED BY** | Gary Chang | | |

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

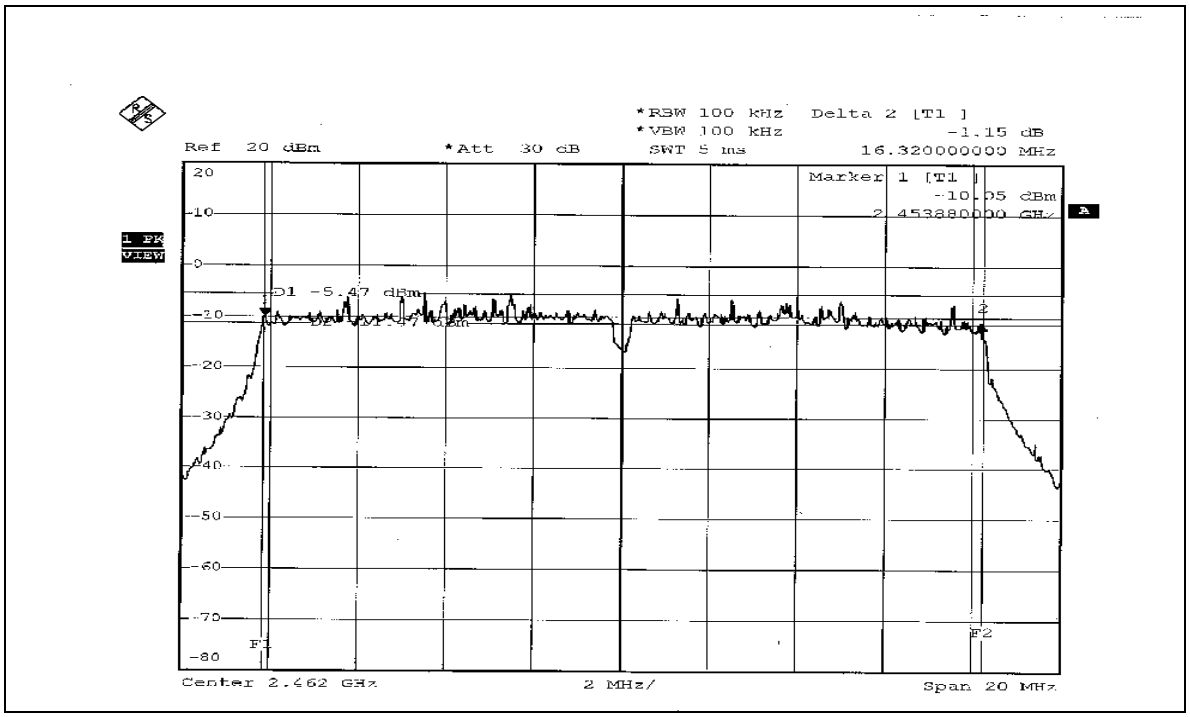
## CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1 ]
0.96 dB
16.400000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1 ]
-12.34 dBm
2.403800000 GHz
1 PK VIEW
D1 -5.85 dBm
D2 -11.85 dBm
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

## CH6


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1 ]
-0.18 dB
16.360000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1 ]
-11.11 dBm
2.428400000 GHz
1 PK VIEW
D1 -5.98 dBm
D2 -11.58 dBm
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

**CH11**


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1 ]
-1.15 dB
16.320000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1 ]
-10.05 dBm
2.453880000 GHz
1 PK VIEW
D1 -5.47 dBm
Center 2.462 GHz
2 MHz/
Span 20 MHz

## 4.4 MAXIMUM PEAK OUTPUT POWER

### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 4.4.2 INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSEK30 | 100049 | Aug. 14, 2006 |
| AGILENT SIGNAL GENERATOR | E8257C | MY43320668 | Dec. 06, 2005 |
| DIGITAL RT OSCILLOSCOPE | TDS1012 | C037299 | Dec. 07, 2005 |
| NARDA DETECTOR | 4503A | FSCM99899 | NA |

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

4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.

2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.

3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP


4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

## 4.4.7 TEST RESULTS

### 802.11b DSSS MODULATION

| EUT | Wireless AP | MODEL | VF0180 |
|---|---|---|---|
| MODULATION TYPE | CCK | TRANSFER RATE | 11Mbps |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 26deg. C, 66%RH, 991hPa |
| TESTED BY | Gary Chang | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (mW) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|---|
| 1 | 2412 | 15.922 | 12.02 | 30 | PASS |
| 6 | 2437 | 16.032 | 12.05 | 30 | PASS |
| 11 | 2462 | 15.959 | 12.03 | 30 | PASS |

### 802.11g OFDM MODULATION_NORMAL MODE

| EUT | Wireless AP | MODEL | VF0180 |
|---|---|---|---|
| MODULATION TYPE | BPSK | TRANSFER RATE | 6Mbps |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 26deg. C, 66%RH, 991hPa |
| TESTED BY | Gary Chang | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (mW) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|---|
| 1 | 2412 | 14.191 | 11.52 | 30 | PASS |
| 6 | 2437 | 14.355 | 11.57 | 30 | PASS |
| 11 | 2462 | 14.256 | 11.54 | 30 | PASS |

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSEK30 | 100049 | Aug. 14, 2006 |

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

4.5.3 TEST PROCEDURE

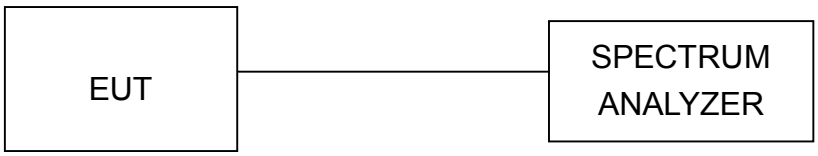
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP




4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

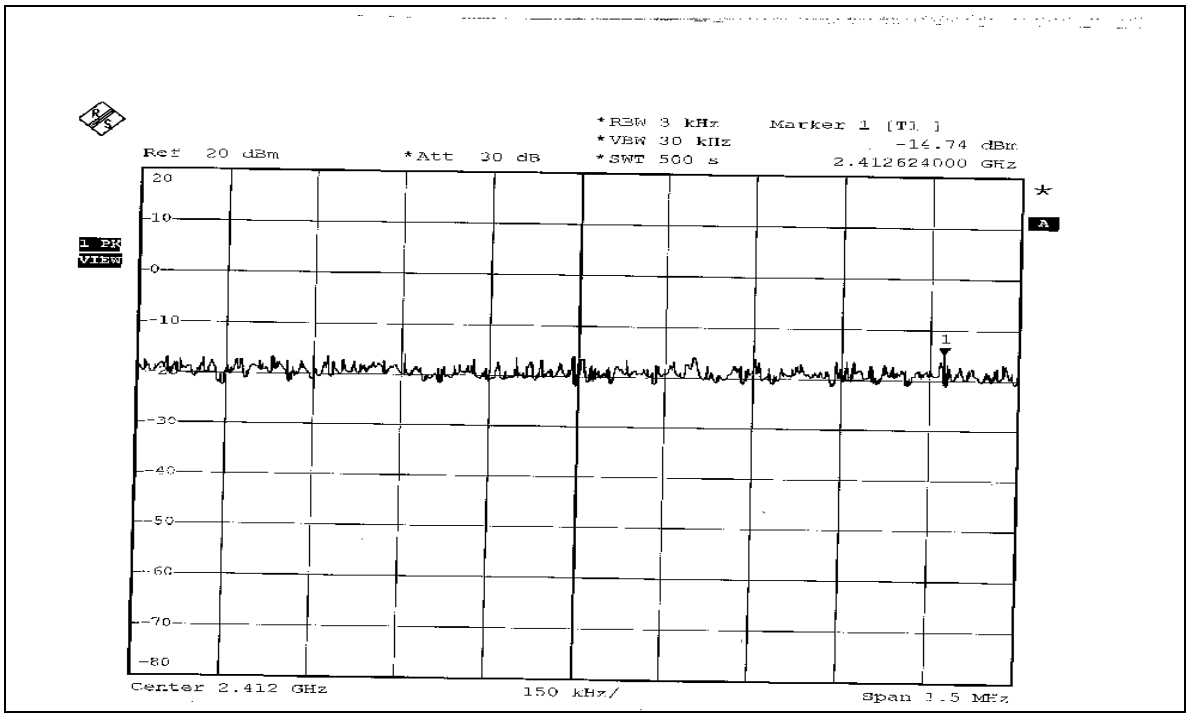
## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION

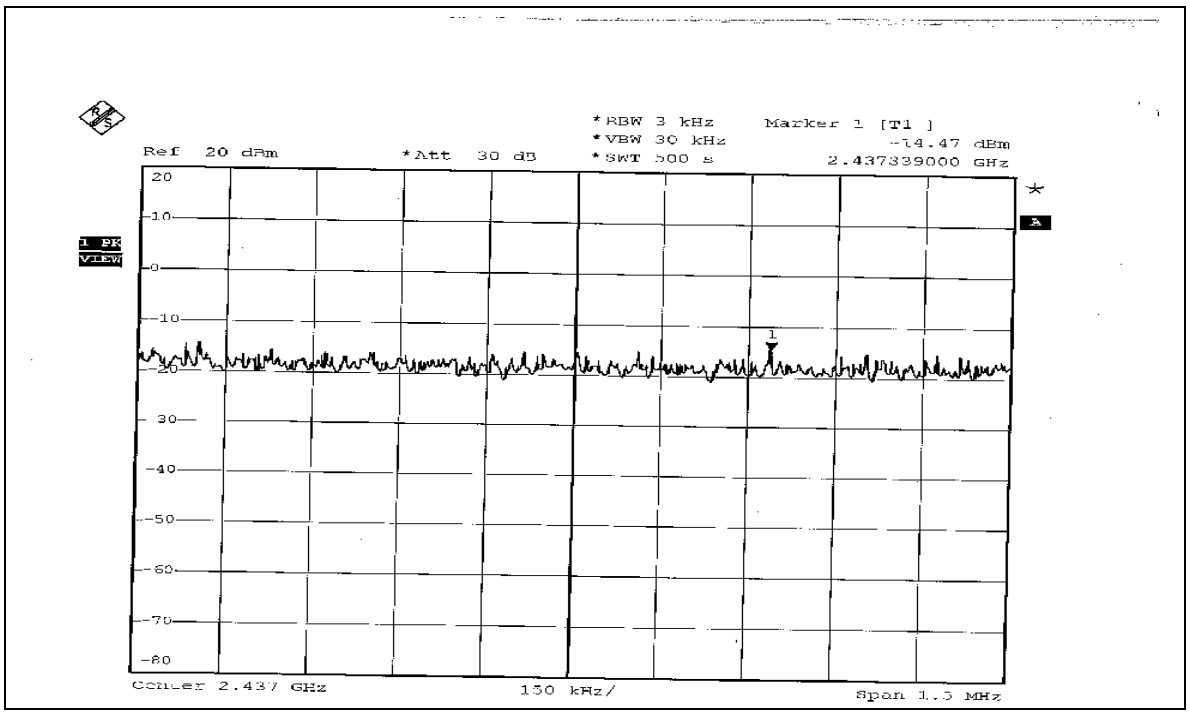
| | | | |
|---|---|---|---|
| **EUT** | Wireless AP | **MODEL** | VF0180 |
| **MODULATION TYPE** | CCK | **TRANSFER RATE** | 11Mbps |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **ENVIRONMENTAL CONDITIONS** | 26deg. C, 66%RH, 991hPa |
| **TESTED BY** | Gary Chang | | |

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | -14.74 | 8 | PASS |
| 6 | 2437 | -14.47 | 8 | PASS |
| 11 | 2462 | -14.41 | 8 | PASS |

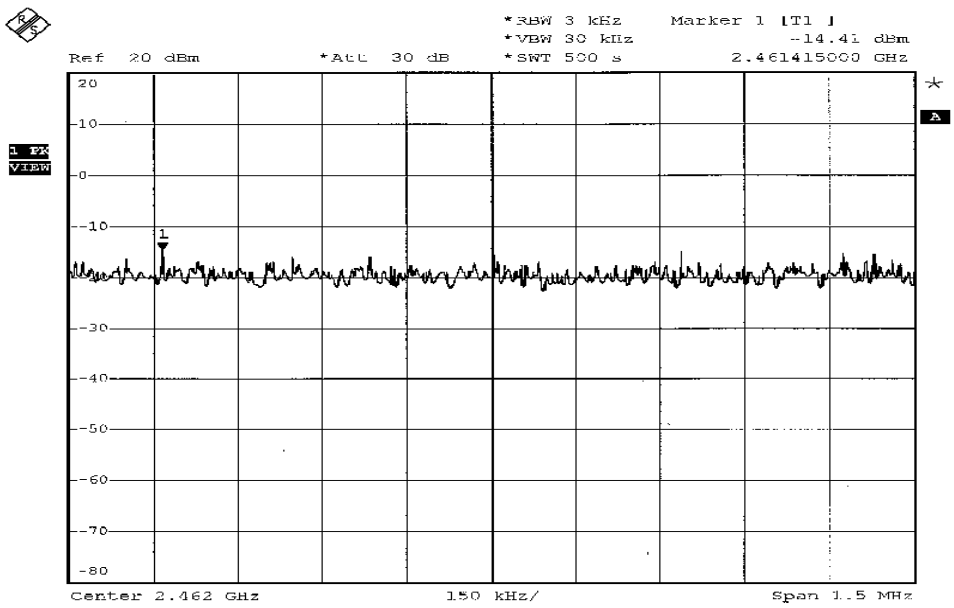
## CH1


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-14.74 dBm
2.412624000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
A
Center 2.412 GHz
150 kHz/
Span 1.5 MHz

## CH6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-14.47 dBm
2.437339000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
A
Center 2.437 GHz
150 kHz/
Span 1.5 MHz

## CH11

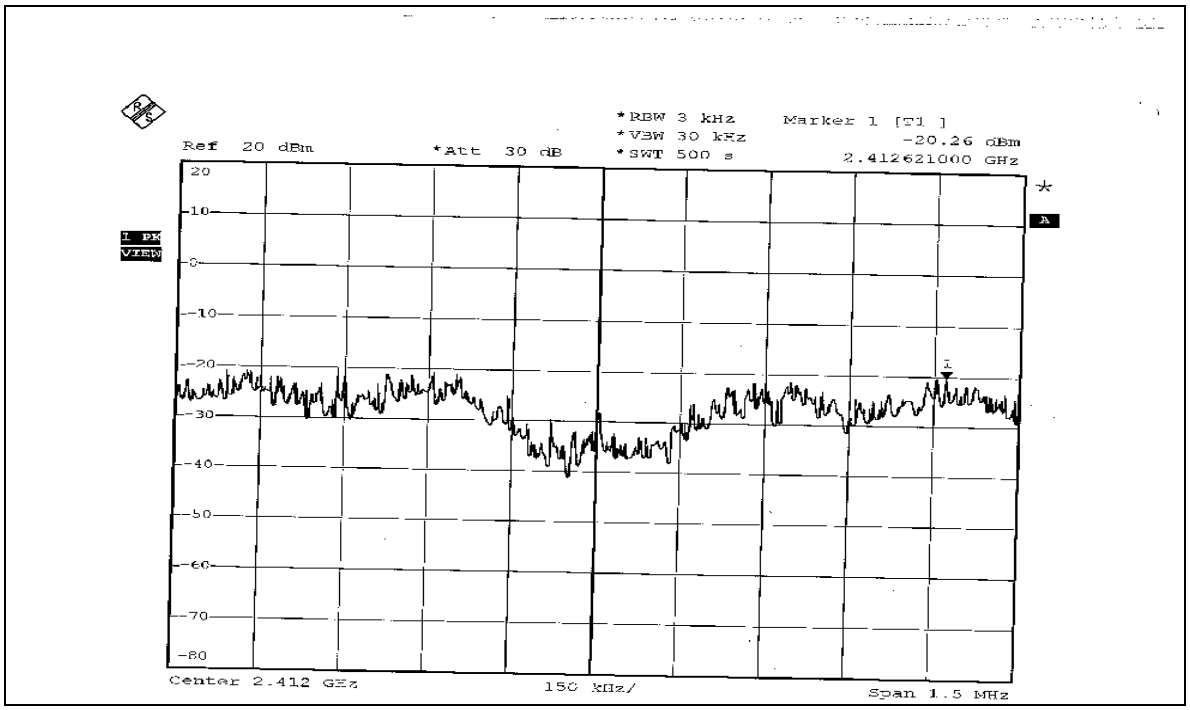

*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-14.41 dBm
2.461415000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
20
10
0
-10
-30
-40
-50
-60
-70
-80
A
Center 2.462 GHz
150 kHz/
Span 1.5 MHz

## 802.11g OFDM MODULATION_NORMAL MODE

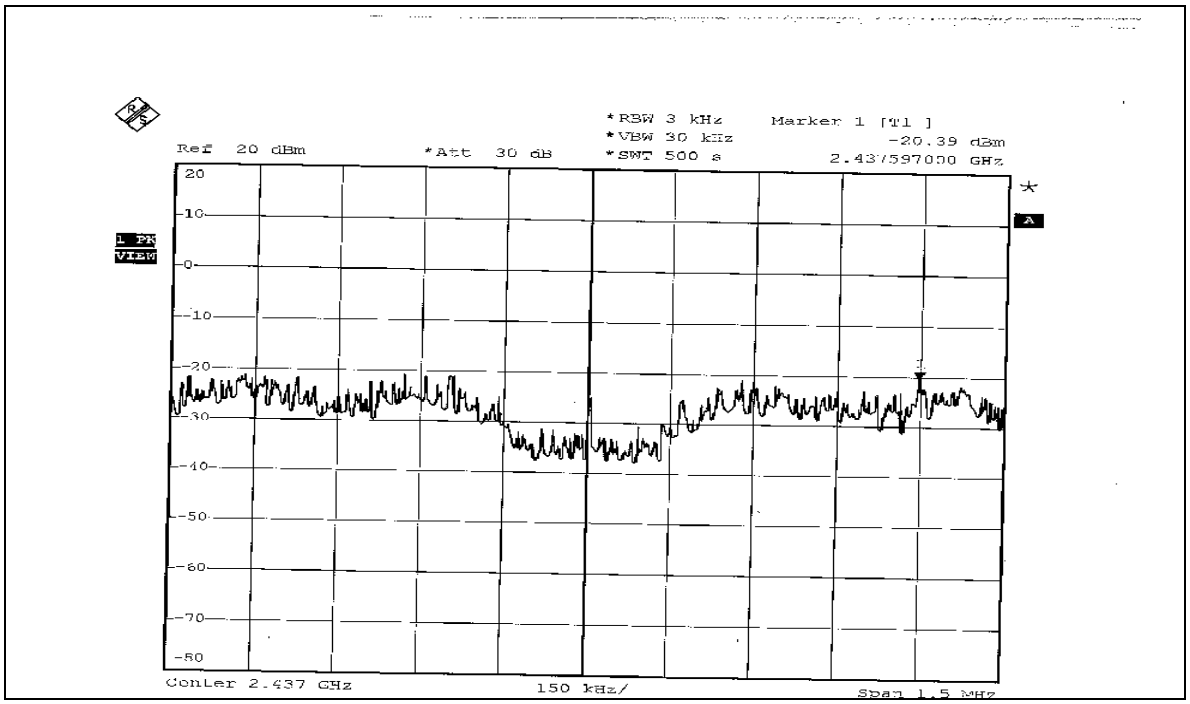
| | | | |
|---|---|---|---|
| **EUT** | Wireless AP | **MODEL** | VF0180 |
| **MODULATION TYPE** | BPSK | **TRANSFER RATE** | 6Mbps |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **ENVIRONMENTAL CONDITIONS** | 26deg. C, 66%RH, 991hPa |
| **TESTED BY** | Gary Chang | | |

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | -20.26 | 8 | PASS |
| 6 | 2437 | -20.39 | 8 | PASS |
| 11 | 2462 | -20.08 | 8 | PASS |

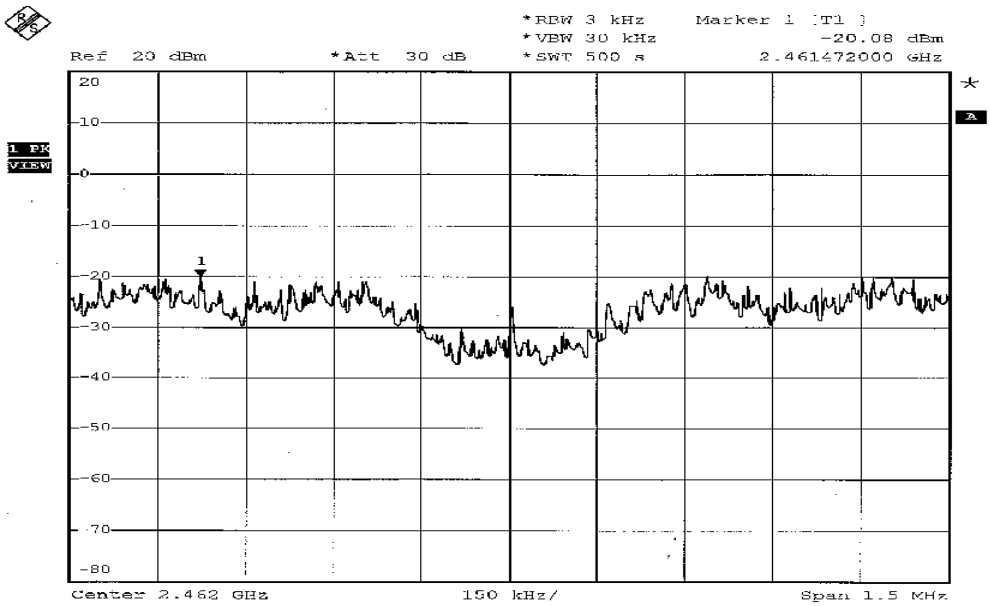
## CH1


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-20.26 dBm
2.412621000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.412 GHz
150 kHz/
Span 1.5 MHz

## CH6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-20.39 dBm
2.437597000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.437 GHz
150 kHz/
Span 1.5 MHz

## CH11


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1 ]
-20.08 dBm
2.461472000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.462 GHz
150 kHz/
Span 1.5 MHz

## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

### 4.6.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSEK30 | 100049 | Aug. 14, 2006 |

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

### 4.6.3 TEST PROCEDURE

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

The spectrum plots (Peak RBW=VBW=100kHz; Average RBW=1MHz, VBW=1kHz) are attached on the following pages.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 TEST RESULTS

The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

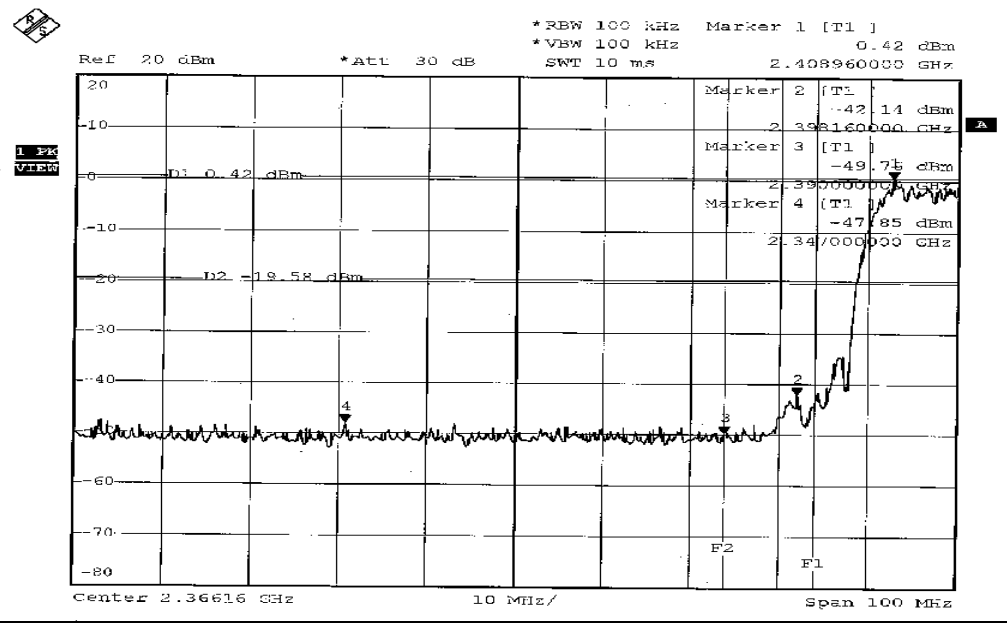
**802.11b DSSS MODULATION**

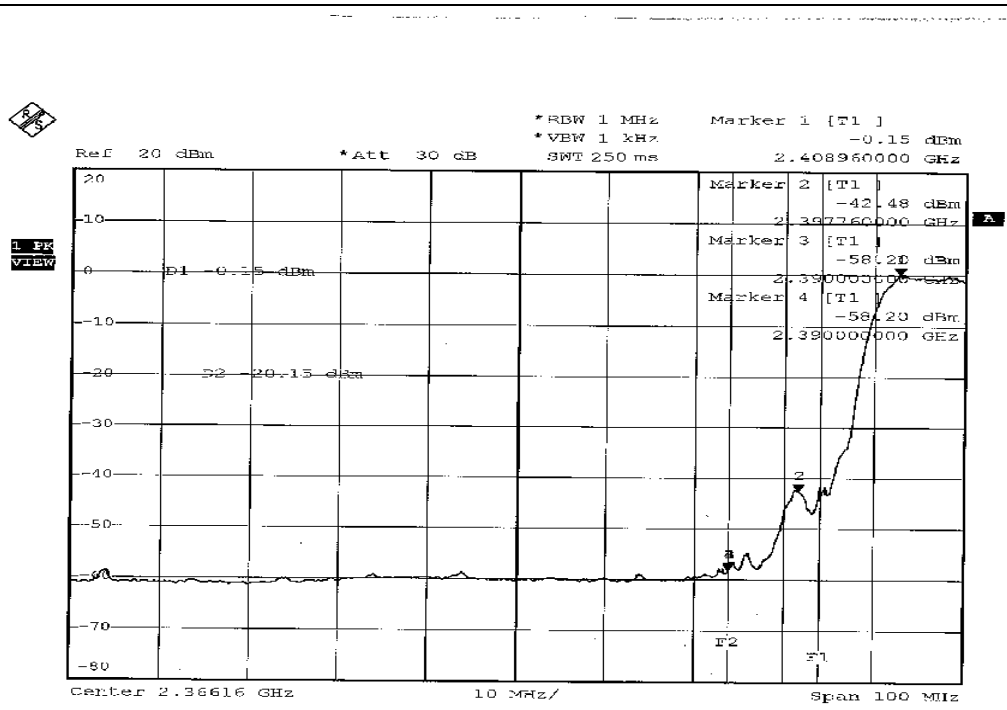
**NOTE 1:** The band edge emission plot on page 53 show 48.27dBc delta between carrier maximum power and local maximum emission in restrict band (2.3470GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 107.99dBuV/m (Peak), so the maximum field strength in restrict band is 107.99 – 48.27 = 59.72dBuV/m, which is under 74dBuV/m limit.

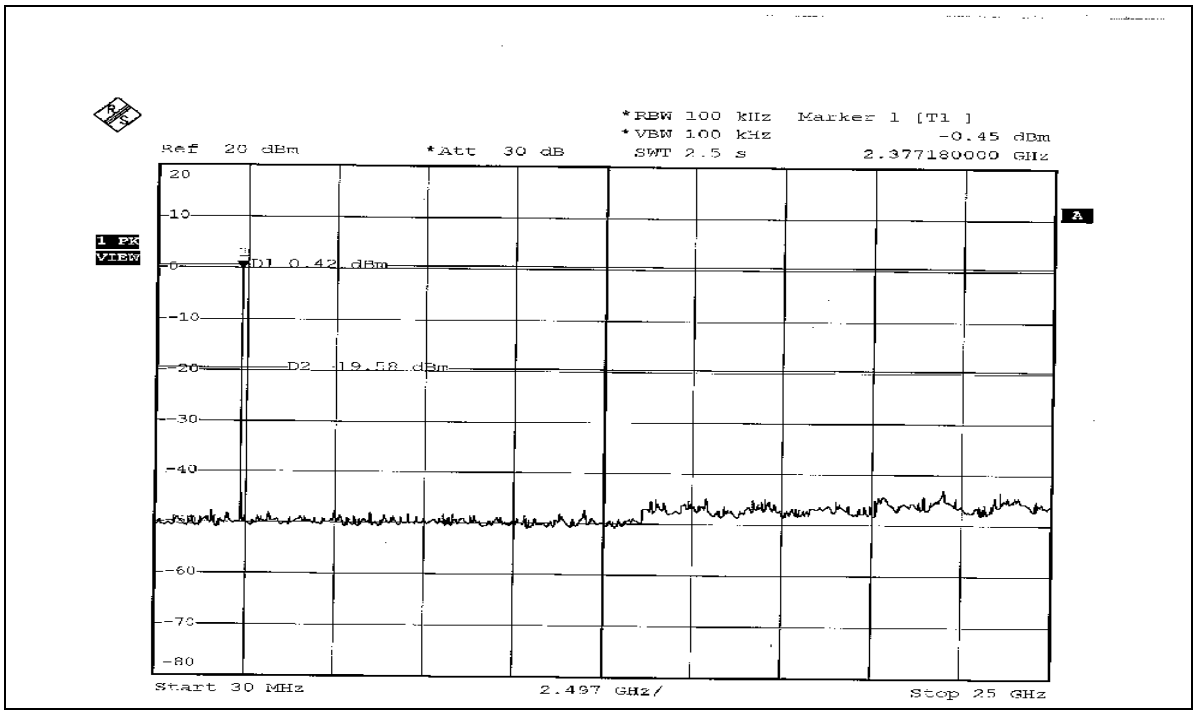
The band edge emission plot on page 53 show 58.05dBc delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 100.70dBuV/m (Average), so the maximum field strength in restrict band is 100.70 – 58.05 = 42.65dBuV/m, which is under 54dBuV/m limit.

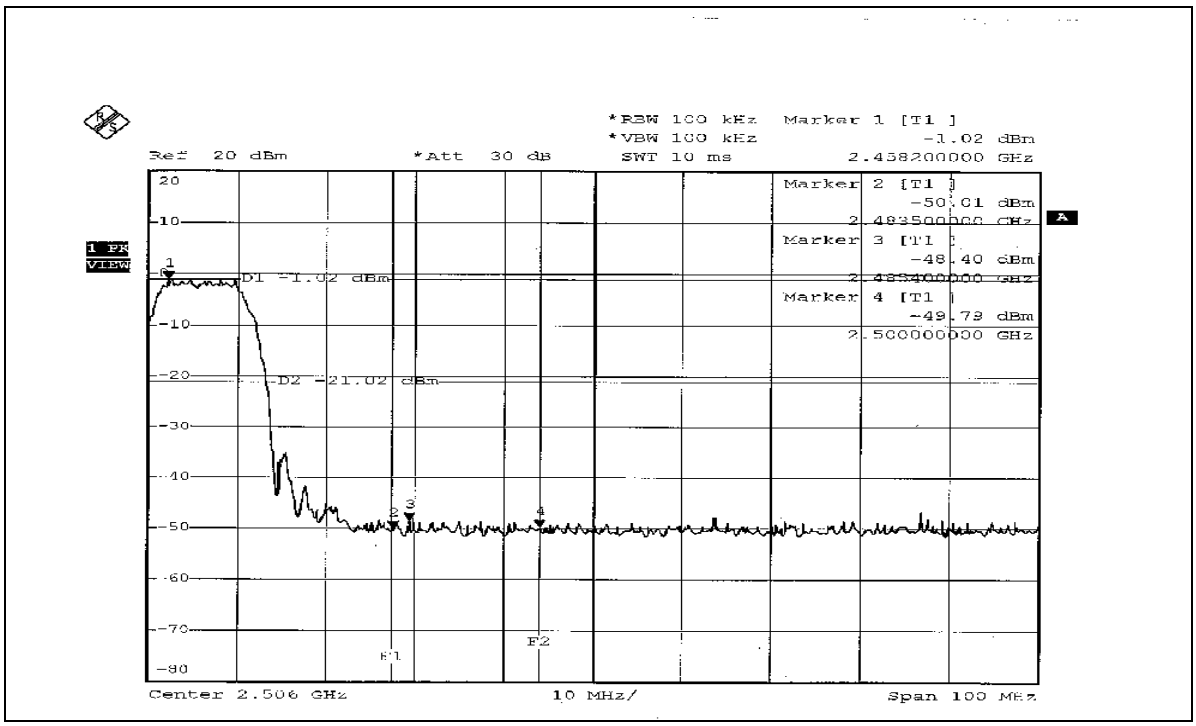
**NOTE 2:** The band edge emission plot on the page 54 show 47.38dBc delta between carrier maximum power and local maximum emission in restrict band (2.4854GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 107.12dBuV/m (Peak), so the maximum field strength in restrict band is 107.12 –47.38 = 59.74dBuV/m, which is under 74dBuV/m limit.

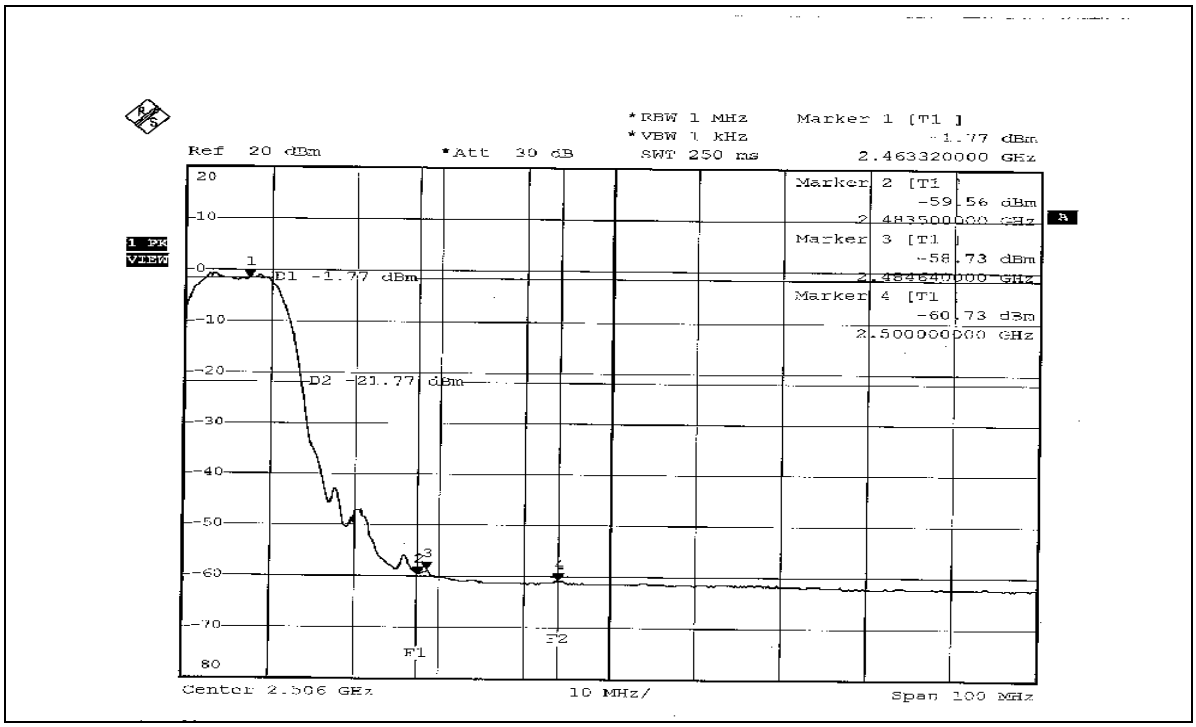
The band edge emission plot on the page 55 show 56.96dBc delta between carrier maximum power and local maximum emission in restrict band (2.4846GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 99.89dBuV/m (Average), so the maximum field strength in restrict band is 99.89 – 56.96 = 42.93dBuV/m, which is under 54dBuV/m limit.

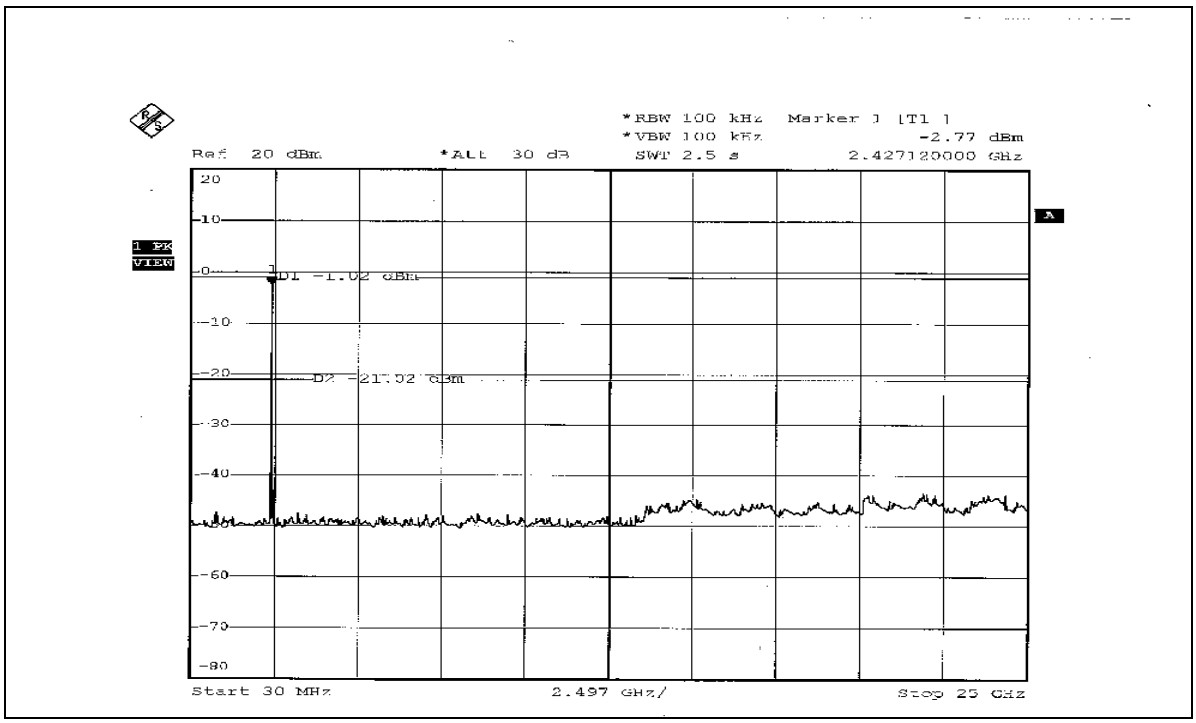

*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1 ]
0.42 dBm
2.408960000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-42.14 dBm
Marker 3 [T1 ]
-49.75 dBm
Marker 4 [T1 ]
-47.85 dBm
1 PK VIEW
D1 0.42 dBm
D2 -19.58 dBm
F2
F1
Center 2.36616 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1 ]
-0.15 dBm
2.408960000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-42.48 dBm
Marker 3 [T1 ]
Marker 4 [T1 ]
1 PK VIEW
D1 -0.15 dBm
D2 -20.15 dBm
F2
F1
Center 2.36616 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1 ]
-0.45 dBm
2.377180000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
D1 0.42 dBm
D2 -19.58 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1 ]
-1.02 dBm
2.458200000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
D1 -1.02 dBm
D2 -21.02 dBm
Marker 2 [T1 ]
-50.01 dBm
Marker 3 [T1 ]
-48.40 dBm
Marker 4 [T1 ]
-49.73 dBm
2.500000000 GHz
F1
F2
Center 2.506 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1 ]
-1.77 dBm
2.463320000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-59.56 dBm
2.483500000 GHz
Marker 3 [T1 ]
-58.73 dBm
2.484640000 GHz
Marker 4 [T1 ]
-60.73 dBm
2.500000000 GHz
1 PK VIEW
D1 -1.77 dBm
D2 -21.77 dBm
Center 2.506 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1 ]
-2.77 dBm
2.427120000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
D1 -1.02 dBm
D2 -21.02 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

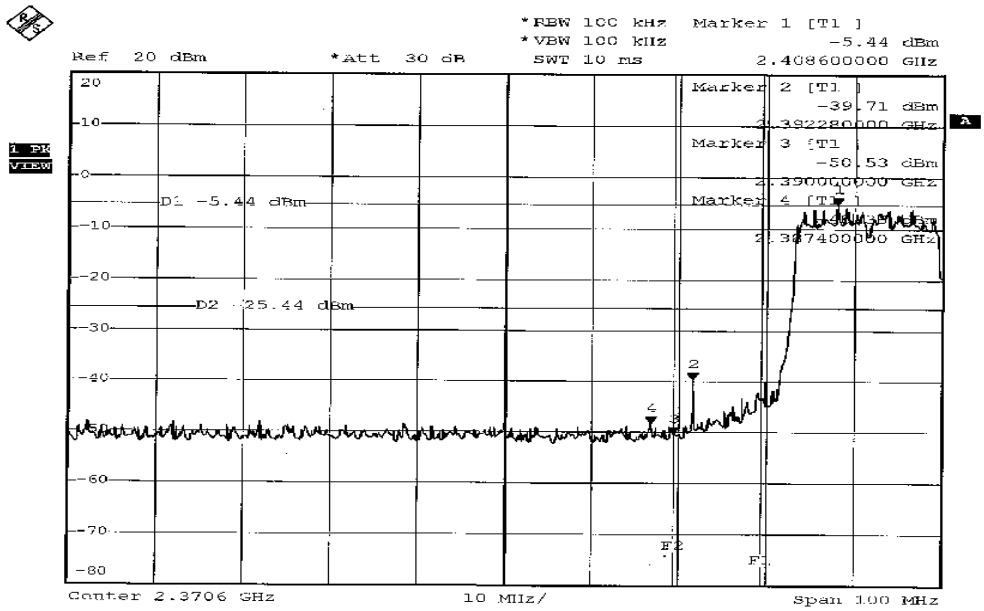
## 802.11g OFDM MODULATION_NORMAL MODE

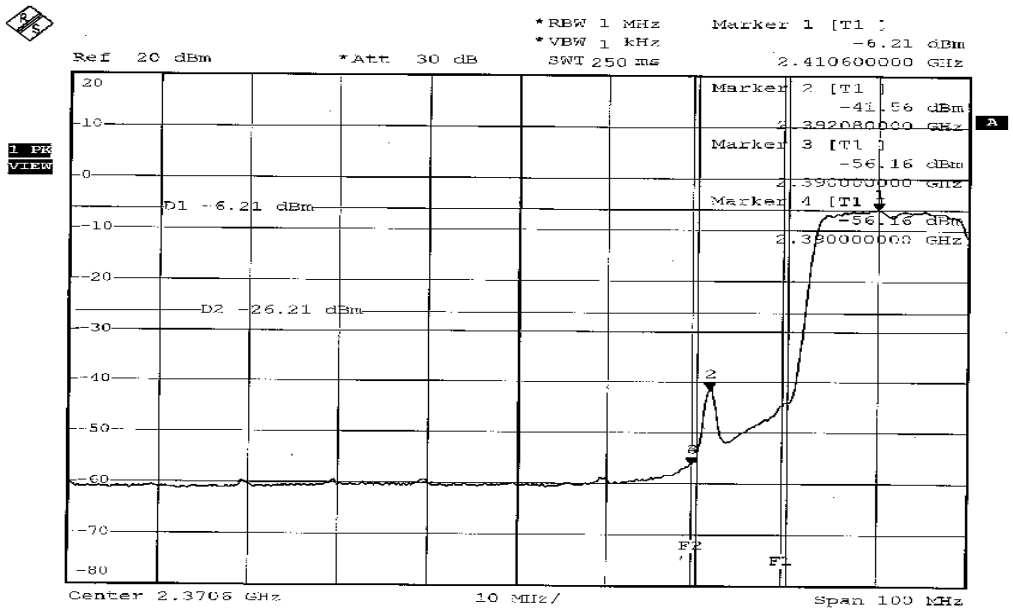
**NOTE 1:** The band edge emission plot on page 57 show 42.94dBc delta between carrier maximum power and local maximum emission in restrict band (2.3874GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 105.67dBuV/m (Peak), so the maximum field strength in restrict band is 105.67 – 42.94 = 62.73 dBuV/m, which is under 74dBuV/m limit.

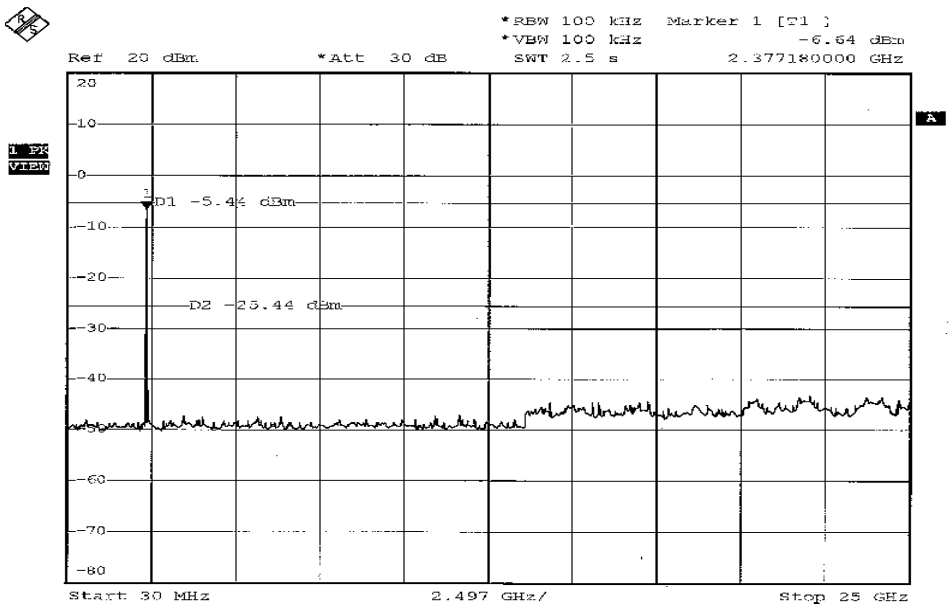
The band edge emission plot on page 57 show 49.95dBc delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 95.52dBuV/m (Average), so the maximum field strength in restrict band is 95.52 – 49.95 = 45.57dBuV/m, which is under 54dBuV/m limit.

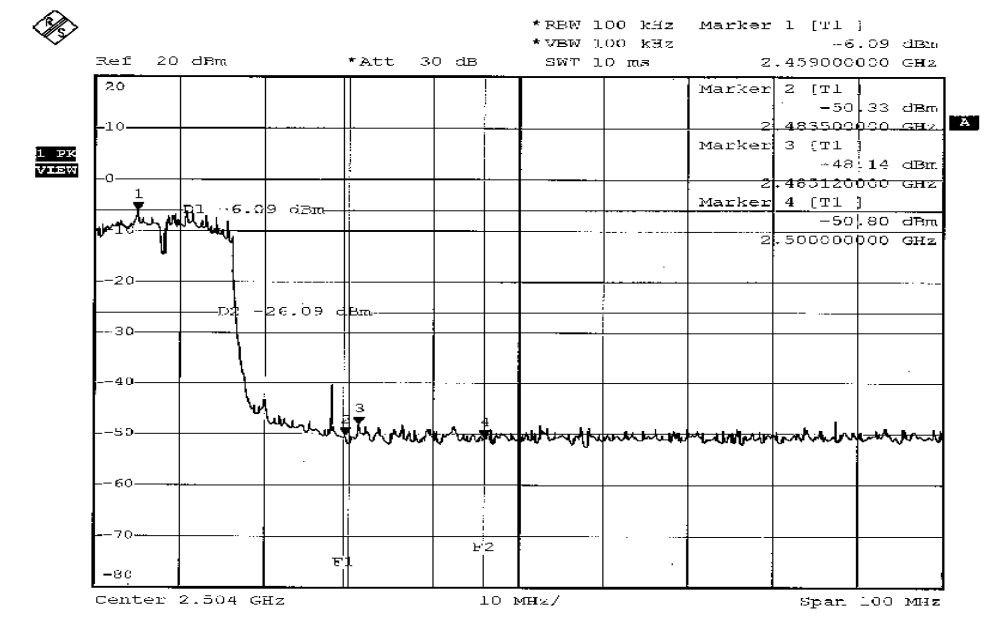
**NOTE 2:** The band edge emission plot on the page 58 show 42.05dBc delta between carrier maximum power and local maximum emission in restrict band (2.4851GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 105.67dBuV/m (Peak), so the maximum field strength in restrict band is 105.67 –42.05 = 63.62dBuV/m, which is under 74dBuV/m limit.

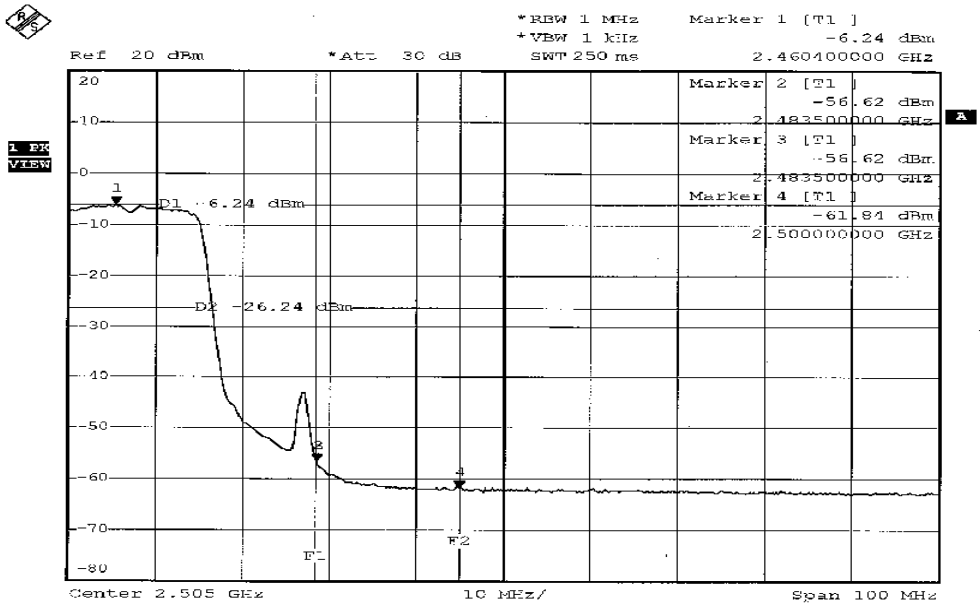
The band edge emission plot on the page 59 show 50.38dBc delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 95.52dBuV/m (Average), so the maximum field strength in restrict band is 95.52 – 50.38 = 45.14dBuV/m, which is under 54dBuV/m limit.

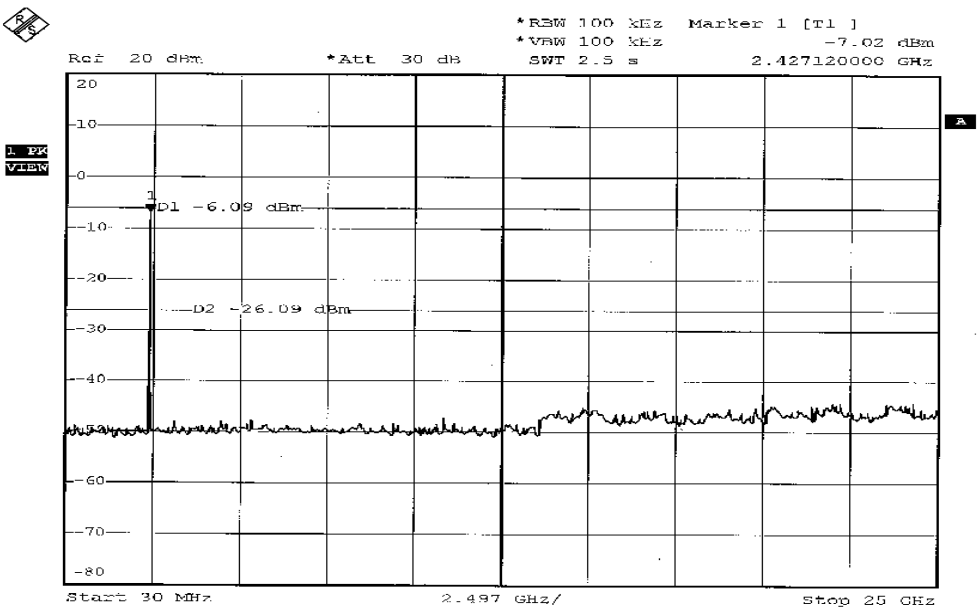

*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1 ]
-5.44 dBm
2.408600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-39.71 dBm
2.392280000 GHz
Marker 3 [T1 ]
-50.53 dBm
2.390000000 GHz
Marker 4 [T1 ]
2.387400000 GHz
D1 -5.44 dBm
D2 -25.44 dBm
1 PK VIEW
A
Center 2.3706 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1 ]
-6.21 dBm
2.410600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-41.56 dBm
2.392080000 GHz
Marker 3 [T1 ]
-56.16 dBm
2.390000000 GHz
Marker 4 [T1 ]
-56.16 dBm
2.390000000 GHz
D1 -6.21 dBm
D2 -26.21 dBm
1 PK VIEW
A
Center 2.3706 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1 ]
-6.64 dBm
2.377180000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
D1 -5.44 dBm
D2 -25.44 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1 ]
-6.09 dBm
2.459000000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-50.33 dBm
2.483500000 GHz
Marker 3 [T1 ]
-48.14 dBm
2.485120000 GHz
Marker 4 [T1 ]
-50.80 dBm
2.500000000 GHz
1 PK
VIEW
D1 -6.09 dBm
D2 -26.09 dBm
F1
F2
Center 2.504 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1 ]
-6.24 dBm
2.460400000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1 ]
-56.62 dBm
2.483500000 GHz
Marker 3 [T1 ]
-56.62 dBm
2.483500000 GHz
Marker 4 [T1 ]
-61.84 dBm
2.500000000 GHz
1 PK VIEW
D1 -6.24 dBm
D2 -26.24 dBm
Center 2.505 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1 ]
-7.02 dBm
2.427120000 GHz
Ref 20 dBm
*Att 30 dB
1 PK VIEW
D1 -6.09 dBm
D2 -26.09 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

## 4.7 ANTENNA REQUIREMENT

### 4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

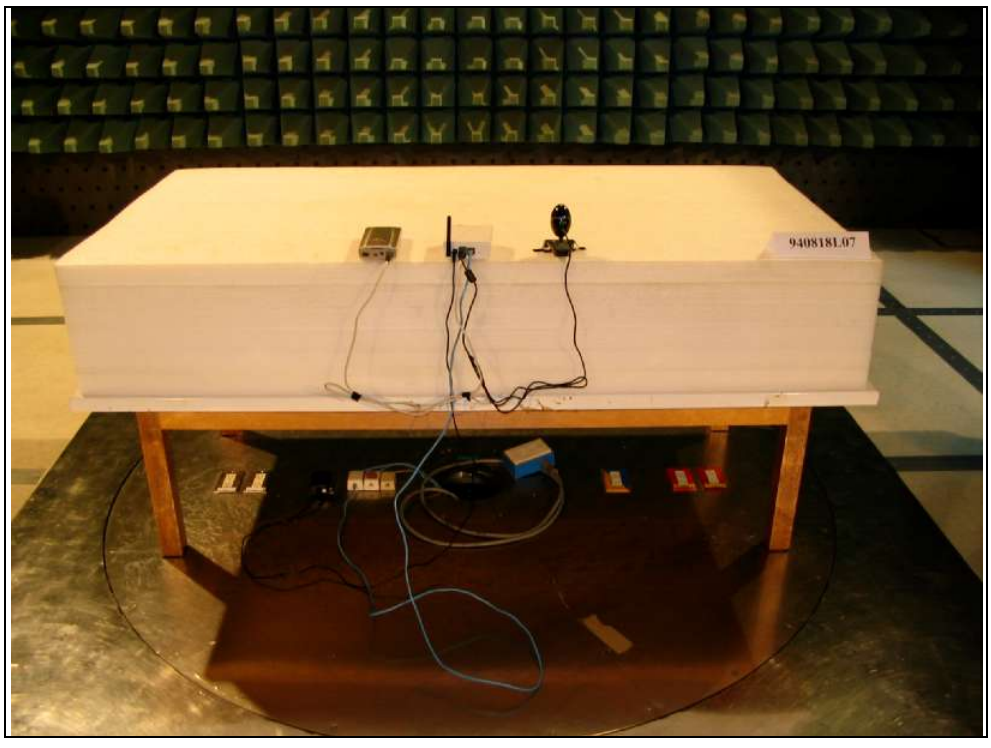
### 4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole antenna with UFL antenna connector. The maximum Gain of the antenna is 3dBi.

# 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

# RADIATED EMISSION TEST

# 6. INFORMATION ON THE TESTING LABORATORIES

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

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab**:
Tel: 886-3-5935343
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab**:
Tel: 886-3-3183232
Fax: 886-3-3185050

**Linko RF Lab.**
Tel: 886-3-3270910
Fax: 886-3-3270892

**Web Site**: www.adt.com.tw

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