# FCC TEST REPORT

**REPORT NO.:** RF900628R02
**MODEL NO.:** XI-325, XI-325B
**RECEIVED:** June 28, 2001
**TESTED:** July 2 ~ August 9, 2001

**APPLICANT:** Z-COM, INC.

**ADDRESS:** 7F-2, No.9, Prosperity RD. I, Science-Based Industrial Park Hsinchu, 300 Taiwan, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.



0528

Lab Code: 200102-0

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# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT :** | 2.4GHz Wireless LAN Card |
| **BRAND NAME :** | Z-Com |
| **MODEL NO. :** | XI-325, XI-325B |
| **APPLICANT :** | Z-COM, INC. |
| **STANDARDS :** | 47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992 |

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from July 2, 2001 to August 9, 2001, The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY : Gary Chang (Gary Chang), DATE: Aug. 13, 2001

CHECKED BY : Demi Chen (Demi Chen), DATE: Aug. 13, 2001

APPROVED BY : Alan Lane (Dr. Alan Lane, Manager), DATE: Aug 13, 2001

# 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: 47 CFR Part 15, Subpart C | | | |
|---|---|---|---|
| **Standard Section** | **Test Type and Limit** | **Result** | **REMARK** |
| 15.107 | AC Power Conducted Emission<br>Limit: 48dBuV | PASS | Meet the requirement of limit<br>Minimum passing margin is –7.5dBuV at 2.74757MHz |
| 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(c) | Transmitter Radiated Emissions<br>Limit: Table 15.209 | PASS | Meet the requirement of limit<br>Minimum passing margin is –2.5dBuV at 2486.50 MHz |
| 15.247(d) | Power Spectral Density<br>Limit: max. 8dBm | PASS | Meet the requirement of limit |
| 15.247(c) | Band Edge Measurement<br>Limit: 20 dB less than the peak value of fundamental frequency | PASS | Meet the requirement of limit |

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | 2.4GHz Wireless LAN Card |
| **MODEL NO.** | XI-325, XI-325B |
| **POWER SUPPLY** | 5 VDC from notebook |
| **MODULATION TYPE** | CCK, BPSK, QPSK |
| **RADIO TECHNOLOGY** | DSSS |
| **TRANSFER RATE** | 1/2/5.5/11Mbps |
| **FREQUENCY RANGE** | 2412MHz ~ 2462MHz |
| **NUMBER OF CHANNEL** | 11 |
| **OUTPUT POWER** | 18.15dBm |
| **ANTENNA TYPE** | Printed antenna(fixed and detachable) |
| **DATA CABLE** | NA |
| **I/O PORTS** | NA |
| **ASSOCIATED DEVICES** | NA |

**NOTE:**

1. Model: XI-325 and XI-325B are identical including the antenna type. The only difference is the antenna installation, XI-325 is fixed, and XI-325B is detachable.
2. For a more detailed features description, please refer to the manufacturer's specifications or User's Manual.

## 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

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

**NOTE:**

1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.
3. The test results (A) is for model XI-325, and (B) for XI-325B.

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a 2.4GHz Wireless LAN Card. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC CFR 47 Part 15, Subpart C. (15.247)**
**ANSI C63.4 : 1992**

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

**NOTE**: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

## 3.4 DESCRIPTION OF SUPPORT UNITS

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

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | NOTEBOOK | IBM | ThinkPad 380XD | 97-84L54 | FCCDoC APPROVED |
| 2 | PRINTER | HP | 2225C+ | 3123S97230 | DSI6XU2225 |
| 3 | MODEM | ACEEX | 1414 | 980020510 | IFAXDM1414 |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | NA |
| 2 | 1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core. |
| 3 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |

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

# 4 TEST TYPES AND RESULTS

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY (MHz) | Class B (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.45 – 30 | 48 | - |

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| *ROHDE & SCHWARZ Test Receiver | ESHS30 | 828109/007 | July 4, 2002 |
| *ROHDE & SCHWARZ Artificial Mains Network (for EUT) | ESH3-Z5 | 839135/006 | July 3, 2002 |
| ROHDE & SCHWARZ 4-wire ISN | ENY41 | 837032/016 | Nov. 28, 2001 |
| ROHDE & SCHWARZ 2-wire ISN | ENY22 | 837497/016 | Dec. 3, 2001 |
| *EMCO-L.I.S.N. (for peripheral) | 3825/2 | 9204-1964 | July 3, 2002 |
| *Software | Cond-V2J | NA | NA |
| *RF cable (JYEBAO) | RG-58A/U | Cable-C02.01 | July 9, 2002 |
| HP Terminator (For EMCO LISN) | 11593A | E1-01-298 | Feb. 20, 2002 |
| HP Terminator (For EMCO LISN) | 11593A | E1-01-299 | Feb. 20, 2002 |
| Shielded Room | Site 2 | ADT-C02 | NA |
| VCCI Site Registration No. | Site 2 | C-240 | NA |

**NOTE**:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. " *" = These equipments are used for the final measurement.

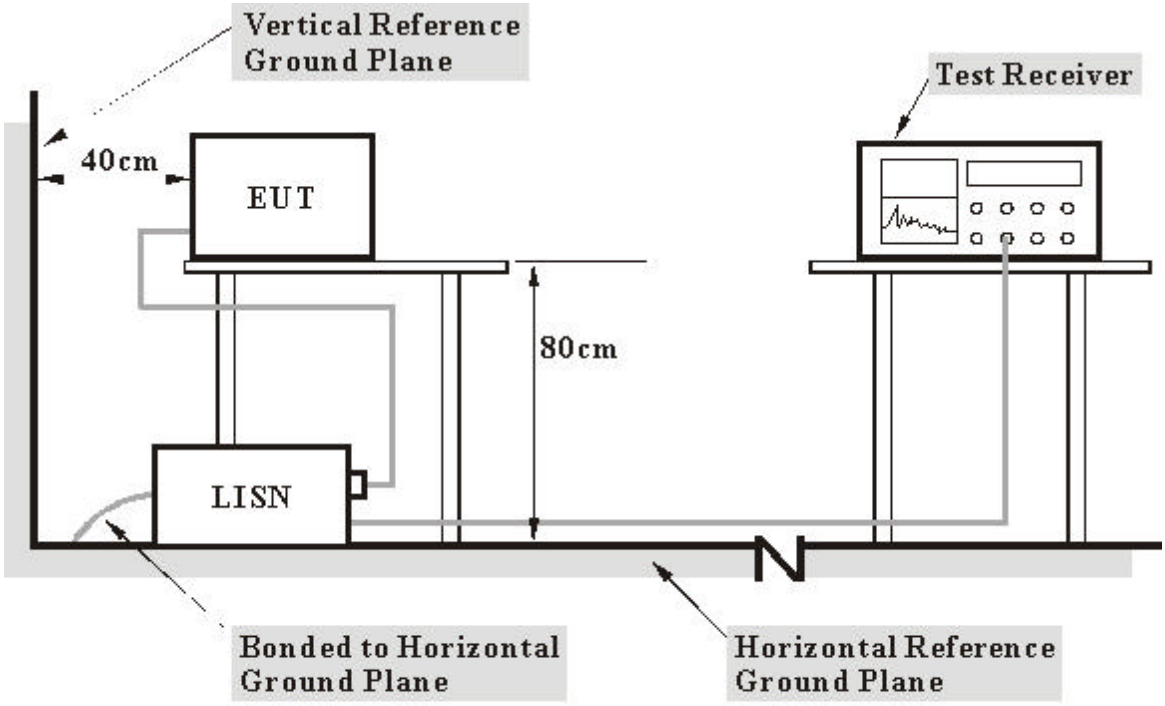
### 4.1.3 TEST PROCEDURES

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 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

### 4.1.4 TEST SETUP




Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

### 4.1.5 EUT OPERATING CONDITIONS

a. Connected the EUT to a computer system placed on a testing table.
b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The computer system sent "H" messages to its screen.
d. The computer system sent "H" messages to modem.
e. The computer system sent "H" messages to printer, and the printer prints them on paper.

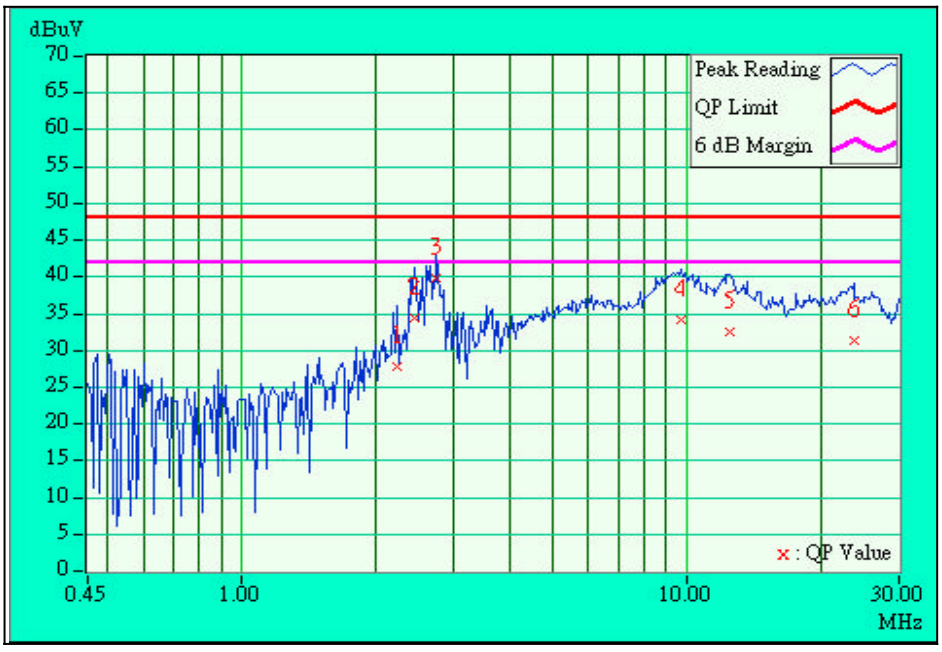
## 4.1.6 TEST RESULTS(A)

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325 |
| **MODE** | Channel 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Line (L) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 2.23438 | 0.22 | 27.85 | - | 28.07 | - | 48.00 | - | -19.93 | - |
| 2 | 2.43840 | 0.24 | 34.33 | - | 34.57 | - | 48.00 | - | -13.43 | - |
| 3 | 2.74296 | 0.27 | 39.89 | - | 40.16 | - | 48.00 | - | -7.84 | - |
| 4 | 9.68623 | 0.68 | 34.17 | - | 34.85 | - | 48.00 | - | -13.15 | - |
| 5 | 12.53659 | 0.85 | 32.57 | - | 33.42 | - | 48.00 | - | -14.58 | - |
| 6 | 23.68487 | 1.32 | 31.32 | - | 32.64 | - | 48.00 | - | -15.36 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

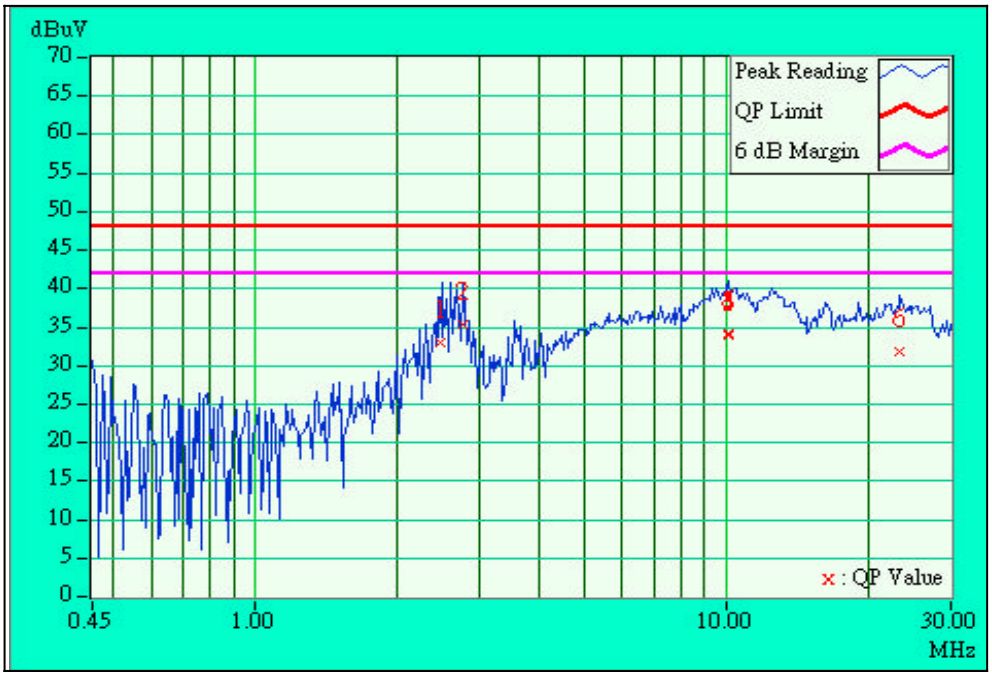


| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325 |
| **MODE** | Channel 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 2.47910 | 0.25 | 33.07 | - | 33.32 | - | 48.00 | - | -14.68 | - |
| 2 | 2.74609 | 0.27 | 35.33 | - | 35.60 | - | 48.00 | - | -12.40 | - |
| 3 | 10.07307 | 0.60 | 34.00 | - | 34.60 | - | 48.00 | - | -13.40 | - |
| 4 | 10.07307 | 0.60 | 33.94 | - | 34.54 | - | 48.00 | - | -13.46 | - |
| 5 | 10.07312 | 0.60 | 34.06 | - | 34.66 | - | 48.00 | - | -13.34 | - |
| 6 | 23.39190 | 1.20 | 31.78 | - | 32.98 | - | 48.00 | - | -15.02 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

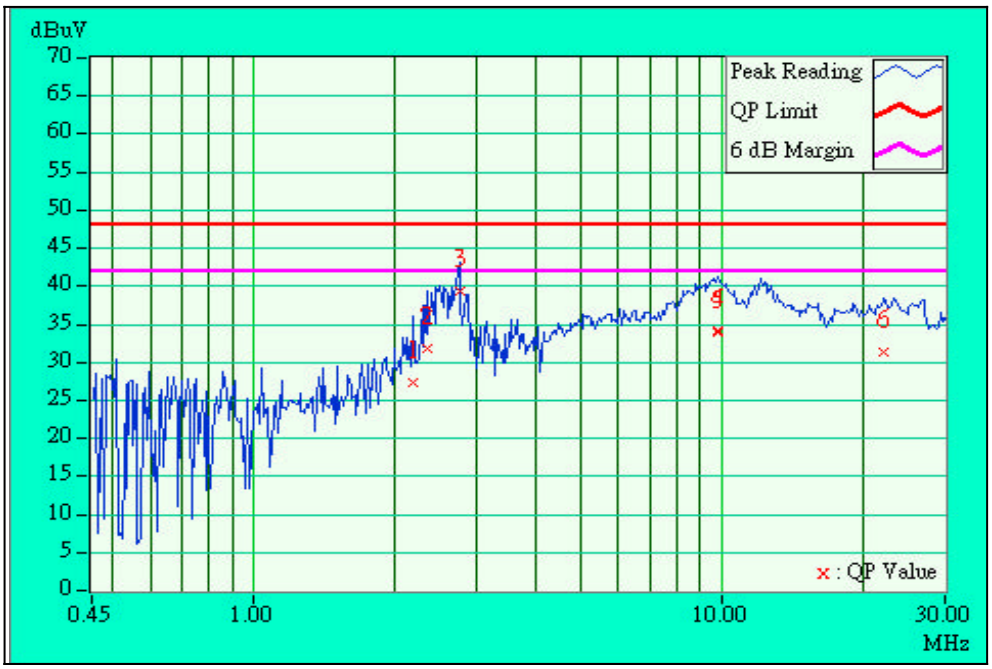


| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325 |
| **MODE** | Channel 6 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Line (L) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 2.18750 | 0.22 | 27.33 | - | 27.55 | - | 48.00 | - | -20.45 | - |
| 2 | 2.34292 | 0.23 | 31.80 | - | 32.03 | - | 48.00 | - | -15.97 | - |
| 3 | 2.74457 | 0.27 | 39.32 | - | 39.59 | - | 48.00 | - | -8.41 | - |
| 4 | 9.78379 | 0.69 | 34.24 | - | 34.93 | - | 48.00 | - | -13.07 | - |
| 5 | 9.78379 | 0.69 | 33.91 | - | 34.60 | - | 48.00 | - | -13.40 | - |
| 6 | 22.21561 | 1.23 | 31.24 | - | 32.47 | - | 48.00 | - | -15.53 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

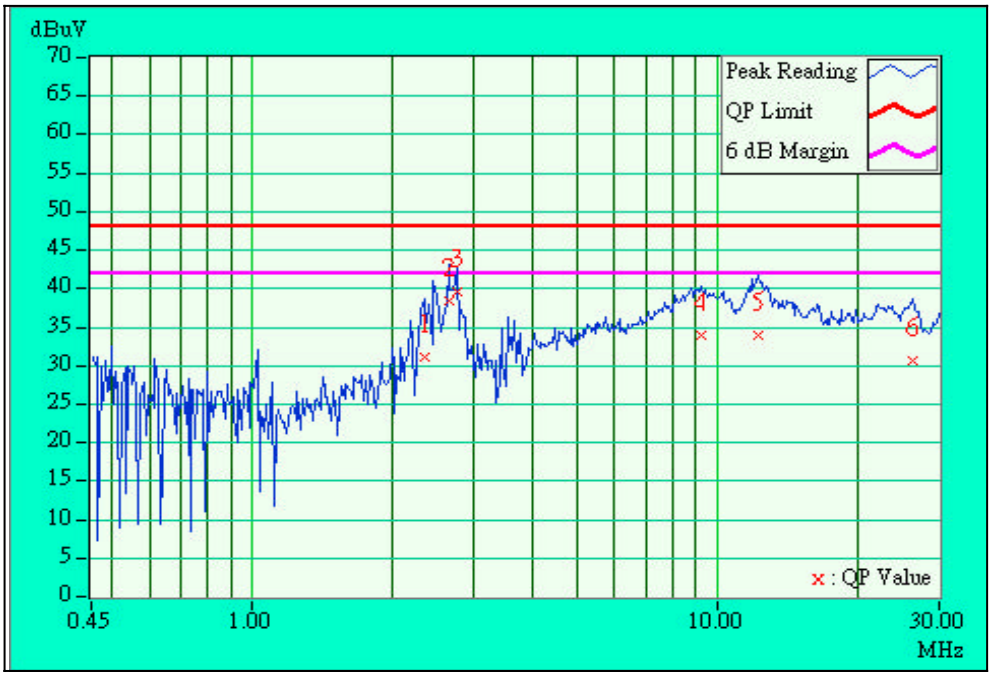


| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325 |
|---|---|---|---|
| MODE | Channel 6 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Neutral (N) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60%RH, 1005 hPa | TESTED BY: Gary Chang | |

| 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 | 2.34357 | 0.23 | 31.19 | - | 31.42 | - | 48.00 | - | -16.58 | - |
| 2 | 2.64580 | 0.26 | 38.36 | - | 38.62 | - | 48.00 | - | -9.38 | - |
| 3 | 2.74747 | 0.27 | 39.65 | - | 39.92 | - | 48.00 | - | -8.08 | - |
| 4 | 9.21094 | 0.57 | 33.98 | - | 34.55 | - | 48.00 | - | -13.45 | - |
| 5 | 12.25245 | 0.74 | 34.05 | - | 34.79 | - | 48.00 | - | -13.21 | - |
| 6 | 26.38358 | 1.33 | 30.65 | - | 31.98 | - | 48.00 | - | -16.02 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

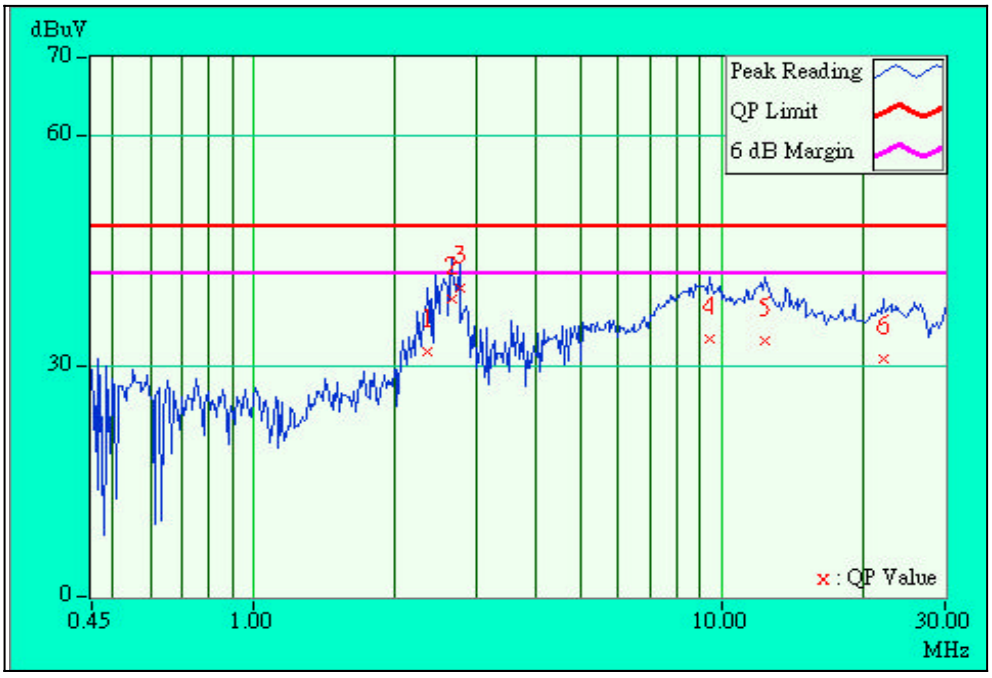


| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325 |
|---|---|---|---|
| MODE | Channel 11 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60%RH, 1005 hPa | TESTED BY: Gary Chang | |

| 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 | 2.33984 | 0.23 | 31.72 | - | 31.95 | - | 48.00 | - | -16.05 | - |
| 2 | 2.64339 | 0.26 | 38.62 | - | 38.88 | - | 48.00 | - | -9.12 | - |
| 3 | 2.74392 | 0.27 | 39.95 | - | 40.22 | - | 48.00 | - | -7.78 | - |
| 4 | 9.41398 | 0.67 | 33.48 | - | 34.15 | - | 48.00 | - | -13.85 | - |
| 5 | 12.35803 | 0.84 | 33.33 | - | 34.17 | - | 48.00 | - | -13.83 | - |
| 6 | 22.09766 | 1.23 | 30.86 | - | 32.09 | - | 48.00 | - | -15.91 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

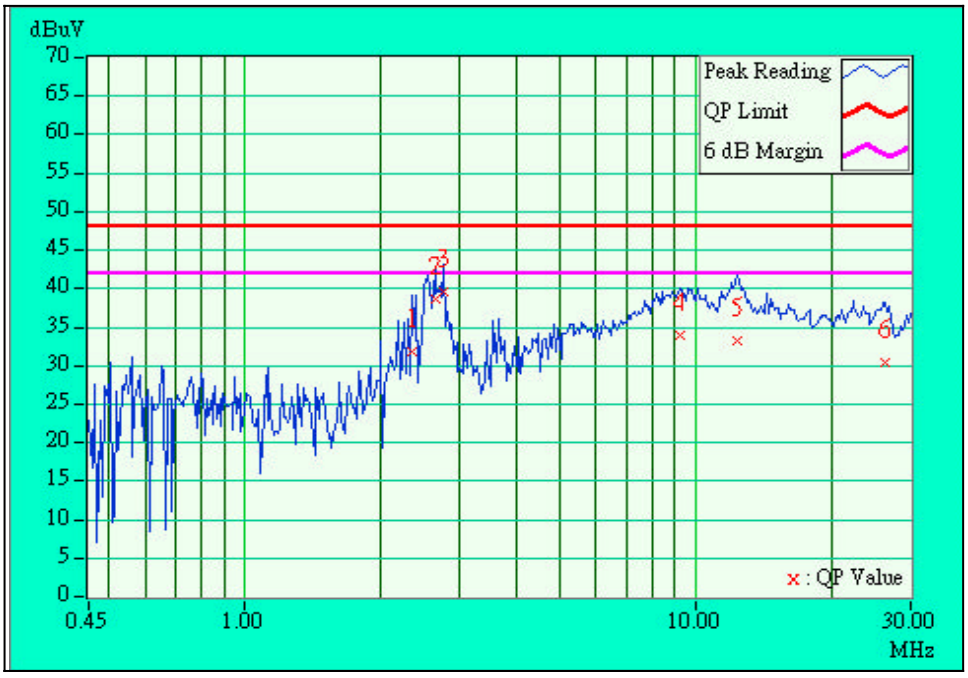


| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325 |
| **MODE** | Channel 11 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Netural (N) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 2.34212 | 0.23 | 31.80 | - | 32.03 | - | 48.00 | - | -15.97 | - |
| 2 | 2.64574 | 0.26 | 38.75 | - | 39.01 | - | 48.00 | - | -8.99 | - |
| 3 | 2.74974 | 0.27 | 39.69 | - | 39.96 | - | 48.00 | - | -8.04 | - |
| 4 | 9.20703 | 0.57 | 34.02 | - | 34.59 | - | 48.00 | - | -13.41 | - |
| 5 | 12.38126 | 0.74 | 33.21 | - | 33.95 | - | 48.00 | - | -14.05 | - |
| 6 | 26.34766 | 1.33 | 30.52 | - | 31.85 | - | 48.00 | - | -16.15 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



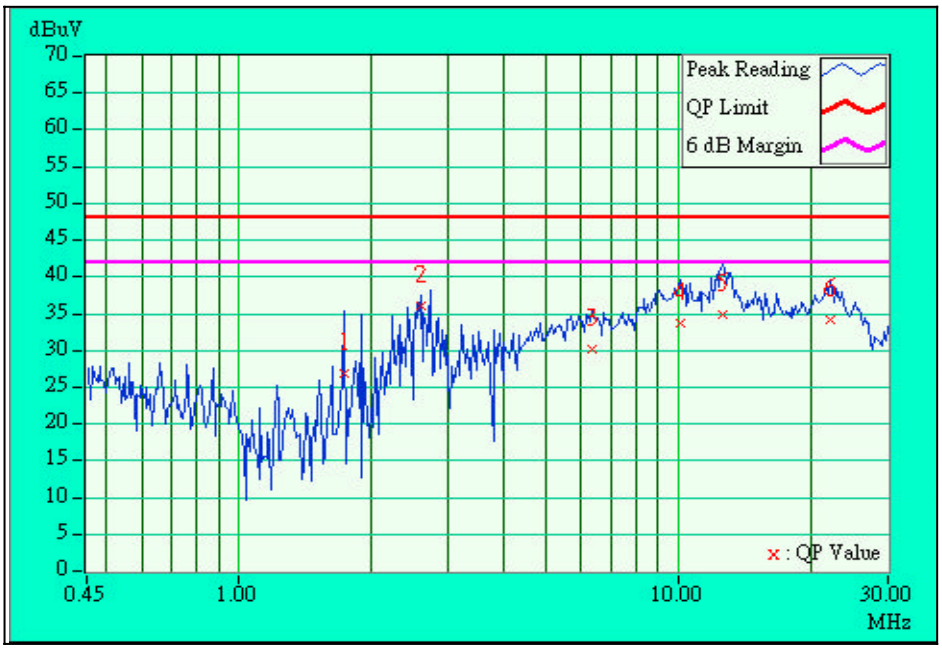
## 4.1.7 TEST RESULTS(B)

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Line (L) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 1.74219 | 0.20 | 26.81 | - | 27.01 | - | 48.00 | - | -20.99 | - |
| 2 | 2.58594 | 0.23 | 36.13 | - | 36.36 | - | 48.00 | - | -11.64 | - |
| 3 | 6.34766 | 0.34 | 30.18 | - | 30.52 | - | 48.00 | - | -17.48 | - |
| 4 | 10.07422 | 0.40 | 33.77 | - | 34.17 | - | 48.00 | - | -13.83 | - |
| 5 | 12.64443 | 0.45 | 34.81 | - | 35.26 | - | 48.00 | - | -12.74 | - |
| 6 | 22.18359 | 0.56 | 34.08 | - | 34.64 | - | 48.00 | - | -13.36 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

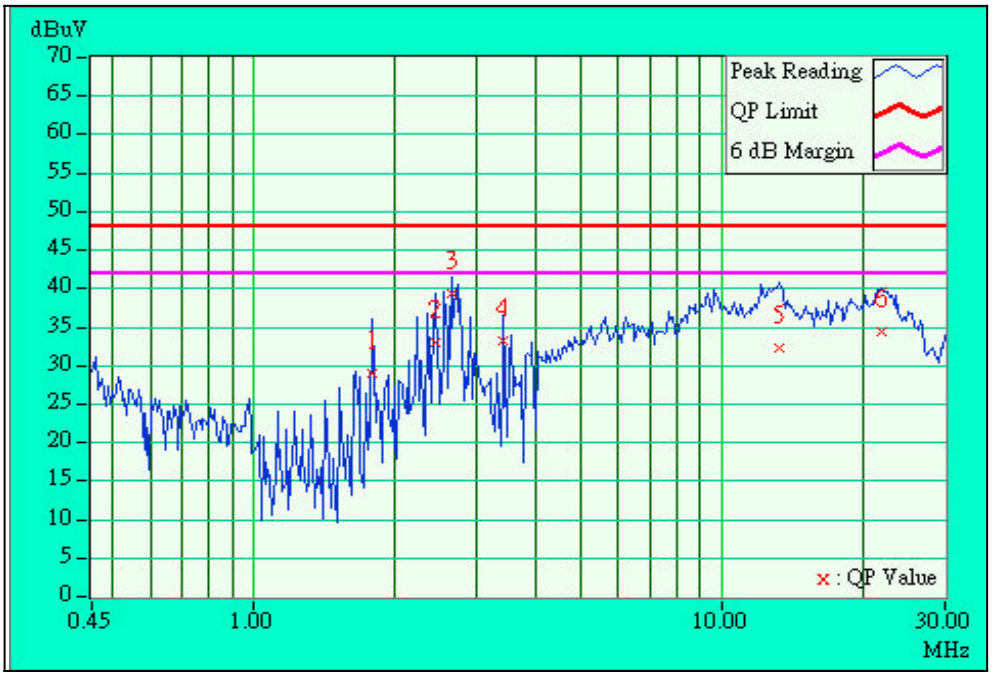


| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 1.79279 | 0.20 | 28.96 | - | 29.16 | - | 48.00 | - | -18.84 | - |
| 2 | 2.43750 | 0.22 | 32.95 | - | 33.17 | - | 48.00 | - | -14.83 | - |
| 3 | 2.63930 | 0.23 | 39.44 | - | 39.67 | - | 48.00 | - | -8.33 | - |
| 4 | 3.42188 | 0.27 | 33.33 | - | 33.60 | - | 48.00 | - | -14.40 | - |
| 5 | 13.28906 | 0.53 | 32.24 | - | 32.77 | - | 48.00 | - | -15.23 | - |
| 6 | 21.96484 | 0.94 | 34.45 | - | 35.39 | - | 48.00 | - | -12.61 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

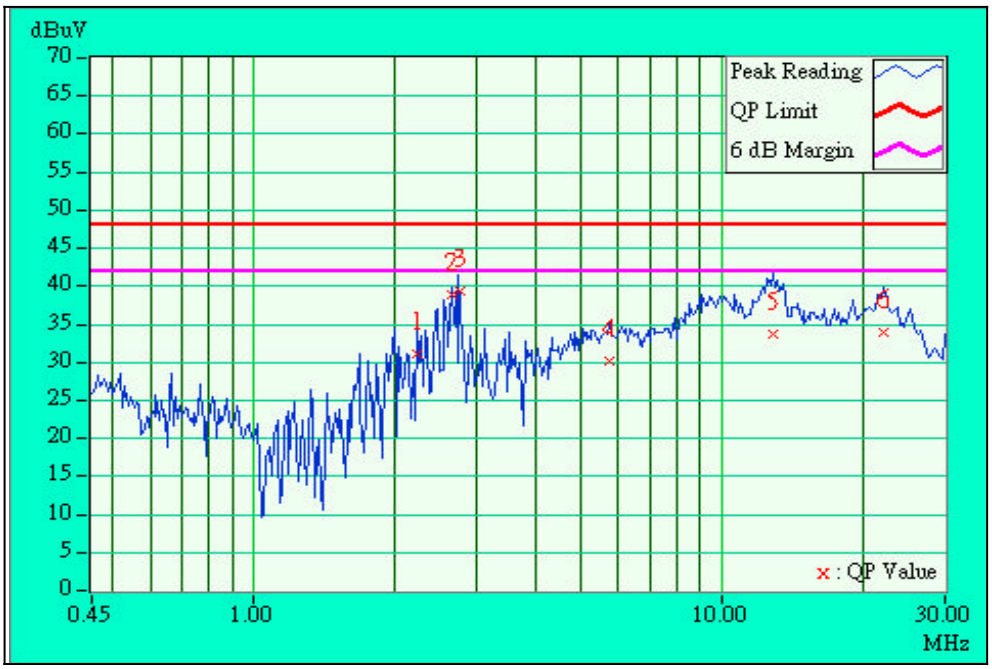


| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 6 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Line (L) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 2.23802 | 0.21 | 31.05 | - | 31.26 | - | 48.00 | - | -16.74 | - |
| 2 | 2.64707 | 0.23 | 38.87 | - | 39.10 | - | 48.00 | - | -8.90 | - |
| 3 | 2.74736 | 0.24 | 39.43 | - | 39.67 | - | 48.00 | - | -8.33 | - |
| 4 | 5.76030 | 0.33 | 30.07 | - | 30.40 | - | 48.00 | - | -17.60 | - |
| 5 | 12.89181 | 0.46 | 33.75 | - | 34.21 | - | 48.00 | - | -13.79 | - |
| 6 | 22.27734 | 0.55 | 34.01 | - | 34.56 | - | 48.00 | - | -13.44 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

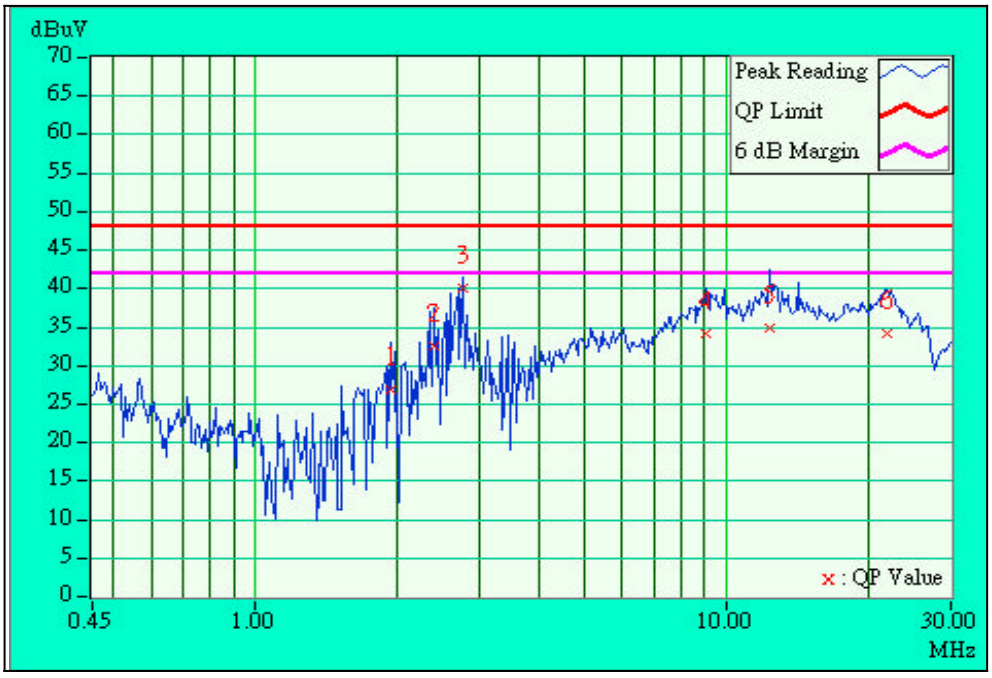


| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325B |
|---|---|---|---|
| MODE | Channel 6 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Neutral (N) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60%RH, 1005 hPa | TESTED BY: Gary Chang | |

| 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 | 1.92969 | 0.20 | 26.78 | - | 26.98 | - | 48.00 | - | -21.02 | - |
| 2 | 2.38820 | 0.22 | 32.43 | - | 32.65 | - | 48.00 | - | -15.35 | - |
| 3 | 2.75247 | 0.24 | 39.96 | - | 40.20 | - | 48.00 | - | -7.80 | - |
| 4 | 9.07031 | 0.38 | 34.11 | - | 34.49 | - | 48.00 | - | -13.51 | - |
| 5 | 12.35537 | 0.49 | 34.77 | - | 35.26 | - | 48.00 | - | -12.74 | - |
| 6 | 22.03125 | 0.94 | 34.16 | - | 35.10 | - | 48.00 | - | -12.90 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

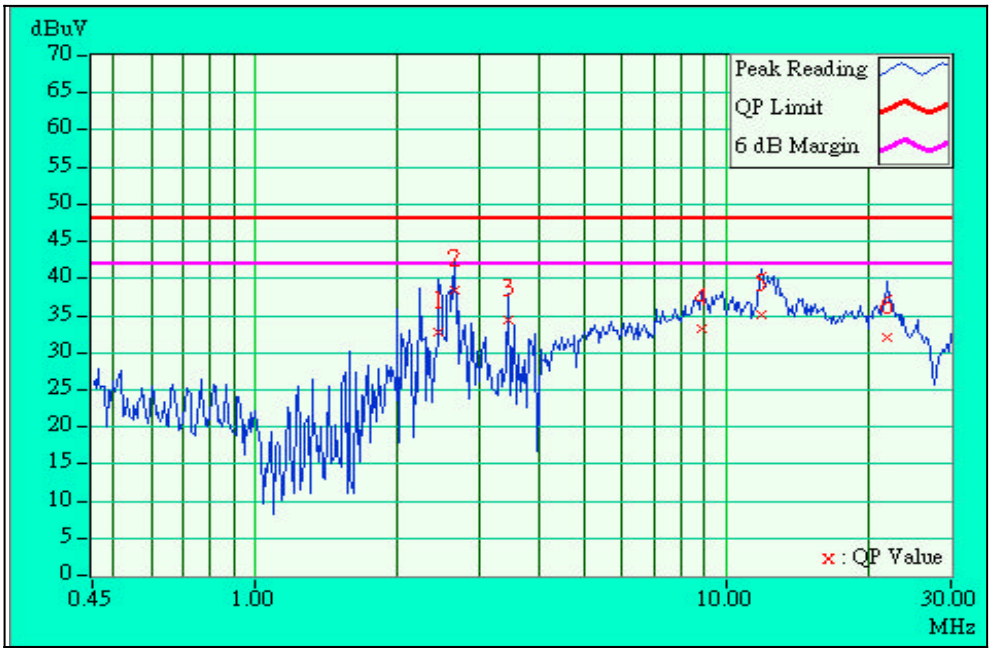


| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325B |
|---|---|---|---|
| MODE | Channel 11 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60%RH, 1005 hPa | TESTED BY: Gary Chang | |

| 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 | 2.44531 | 0.22 | 32.79 | - | 33.01 | - | 48.00 | - | -14.99 | - |
| 2 | 2.64539 | 0.23 | 38.51 | - | 38.74 | - | 48.00 | - | -9.26 | - |
| 3 | 3.42969 | 0.27 | 34.39 | - | 34.66 | - | 48.00 | - | -13.34 | - |
| 4 | 8.85938 | 0.38 | 33.20 | - | 33.58 | - | 48.00 | - | -14.42 | - |
| 5 | 11.90302 | 0.44 | 35.22 | - | 35.66 | - | 48.00 | - | -12.34 | - |
| 6 | 21.89971 | 0.56 | 32.08 | - | 32.64 | - | 48.00 | - | -15.36 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

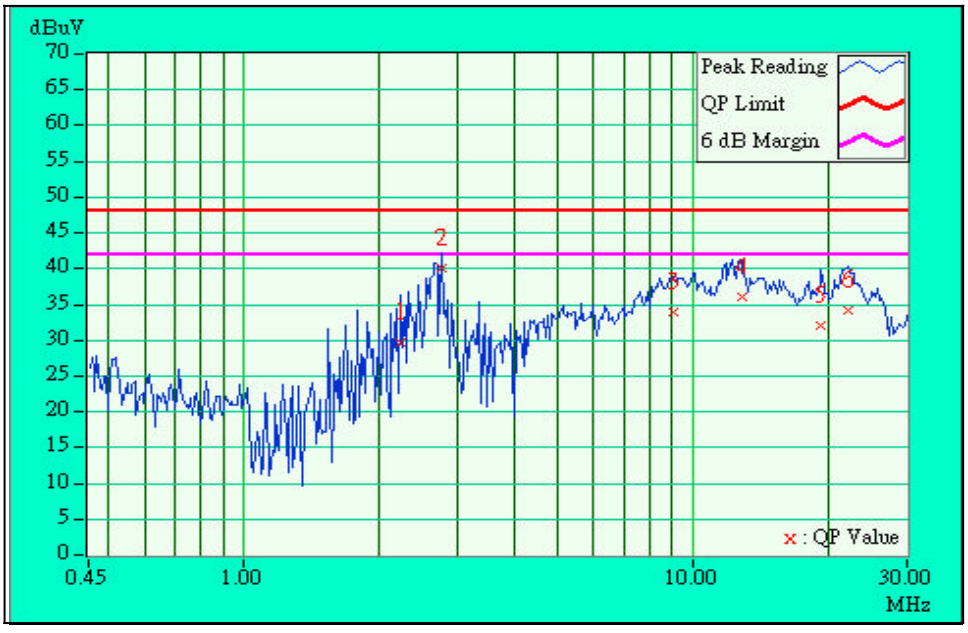


| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 11 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **PHASE** | Netural (N) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60%RH, 1005 hPa | **TESTED BY**: Gary Chang | |

| 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 | 2.24219 | 0.21 | 29.68 | - | 29.89 | - | 48.00 | - | -18.11 | - |
| 2 | 2.74757 | 0.24 | 40.18 | - | 40.42 | - | 48.00 | - | -7.58 | - |
| 3 | 9.04688 | 0.38 | 33.83 | - | 34.21 | - | 48.00 | - | -13.79 | - |
| 4 | 12.81640 | 0.51 | 36.16 | - | 36.67 | - | 48.00 | - | -11.33 | - |
| 5 | 19.32676 | 0.86 | 32.08 | - | 32.94 | - | 48.00 | - | -15.06 | - |
| 6 | 22.09111 | 0.94 | 34.21 | - | 35.15 | - | 48.00 | - | -12.85 | - |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 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 of Fundamental | |
|---|---|---|
| | uV/m | dBuV/m |
| 30-88 | 100 | 40.0 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46.0 |
| Above 960 | 500 | 54.0 |

**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 |
|---|---|---|---|
| * HP Spectrum Analyzer | 8590L | 3544A01176 | May 7, 2002 |
| * HP Preamplifier | 8447D | 2944A08485 | Nov. 3, 2001 |
| * HP Preamplifier | 8449B | 3008A01201 | Dec. 13, 2001 |
| * HP Preamplifier | 8449B | 3008A01292 | Aug. 21, 2001 |
| * ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839013/007<br>839379/002 | Jan. 25, 2002 |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055 | Nov. 23, 2001 |
| * CHASE BILOG Antenna | CBL6112A | 2221 | Aug. 2, 2002 |
| * SCHWARZBECK Horn Antenna | BBHA9120-D1 | D130 | July 6, 2002 |
| * EMCO Horn Antenna | 3115 | 9312-4192 | April 15, 2002 |
| * EMCO Turn Table | 1060 | 1115 | NA |
| * SHOSHIN Tower | AP-4701 | A6Y005 | NA |
| * Software | AS61D4 | NA | NA |
| * ANRITSU RF Switches | MP59B | M35046 | Aug. 2, 2002 |
| * TIMES RF cable | LMR-600 | CABLE-ST5-01 | Aug. 2, 2002 |
| * Antenna (Horn) | BBHA9120-D | D130 | July 10, 2002 |
| Open Field Test Site | Site 5 | ADT-R05 | July 28, 2002 |
| VCCI Site Registration No. | Site 5 | R-1039 | NA |
| Site Registration No. | FCC: 90422<br>Canada IC: IC 3789<br>VCCI : R-1039 | | |

**NOTE:**

1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. "*" = These equipments are used for the final measurement.

## 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 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

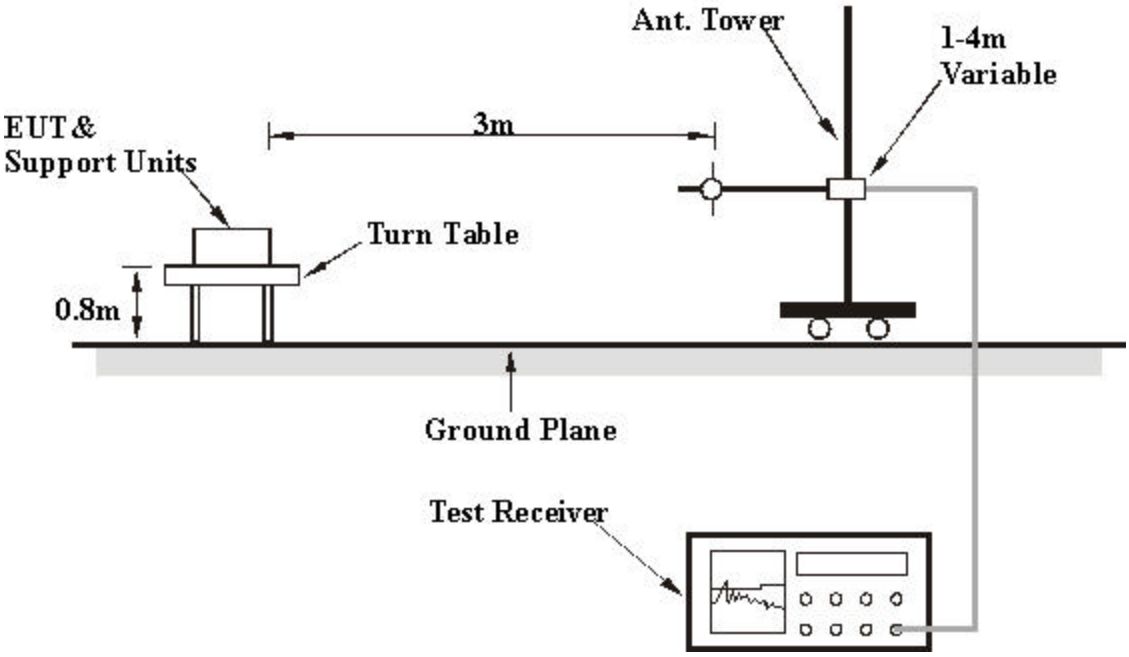
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

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

### 4.2.4 TEST SETUP




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

### 4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

## 4.2.6 TEST RESULTS(A)

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325 |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **DETECTOR FUNCTION** | Quasi-Peak |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60 % RH, 1050 hPa | **TESTED BY**: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 88.50 | 35.3 QP | 43.50 | -8.20 | 2.02H | 11 | 25.30 | 7.93 | 2.08 | 0.00 | -10.01 |
| 2 | 132.44 | 35.9 QP | 43.50 | -7.60 | 1.07H | 107 | 22.40 | 10.97 | 2.52 | 0.00 | -13.49 |
| 3 | 220.15 | 30.8 QP | 46.00 | -15.20 | 1.00H | 271 | 18.40 | 9.58 | 2.82 | 0.00 | -12.41 |
| 4 | 264.33 | 33.4 QP | 46.00 | -12.60 | 1.33H | 287 | 18.40 | 12.00 | 2.96 | 0.00 | -14.96 |
| 5 | 572.40 | 38.4 QP | 46.00 | -7.60 | 1.39H | 331 | 17.40 | 17.38 | 3.61 | 0.00 | -21.00 |
| 6 | 748.49 | 38.2 QP | 46.00 | -7.80 | 1.51H | 298 | 15.20 | 18.80 | 4.21 | 0.00 | -23.03 |
| 7 | 792.40 | 38.6 QP | 46.00 | -7.40 | 1.54H | 320 | 15.40 | 19.10 | 4.10 | 0.00 | -23.22 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325 |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **DETECTOR FUNCTION** | Quasi-Peak |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60 % RH, 1050 hPa | **TESTED BY**: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 132.45 | 33.6 QP | 43.50 | -9.90 | 1.00V | 221 | 20.10 | 10.97 | 2.52 | 0.00 | -13.49 |
| 2 | 176.24 | 29.8 QP | 43.50 | -13.70 | 1.00V | 344 | 18.40 | 8.73 | 2.65 | 0.00 | -11.38 |
| 3 | 220.45 | 30.2 QP | 46.00 | -15.80 | 1.19V | 330 | 17.60 | 9.73 | 2.83 | 0.00 | -12.56 |
| 4 | 308.45 | 34.3 QP | 46.00 | -11.70 | 1.00V | 70 | 18.40 | 12.77 | 3.15 | 0.00 | -15.92 |
| 5 | 528.40 | 34.1 QP | 46.00 | -11.90 | 1.68V | 234 | 13.40 | 17.04 | 3.67 | 0.00 | -20.71 |
| 6 | 748.24 | 35.7 QP | 46.00 | -10.30 | 1.59V | 207 | 12.70 | 18.80 | 4.21 | 0.00 | -23.02 |
| 7 | 792.10 | 34.6 QP | 46.00 | -11.40 | 1.45V | 277 | 11.40 | 19.10 | 4.10 | 0.00 | -23.21 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325 |
|---|---|---|---|
| MODE | Channel 1 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60 % RH,<br>1050 hPa | TESTED BY: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2038.20 | 51.0 PK | 74.00 | -23.00 | 1.20H | 298 | 20.10 | 27.57 | 3.29 | 0.00 | -30.86 |
| 2 | *2411.60 | 102.2 PK | - | - | 1.72H | 8 | 70.24 | 28.33 | 3.62 | 0.00 | -31.95 |
| 3 | *2411.60 | 94.4 AV | - | - | 1.72H | 8 | 62.40 | 28.33 | 3.62 | 0.00 | -31.95 |
| 4 | 4824.00 | 52.4 PK | 74.00 | -21.60 | 1.22H | 189 | 14.20 | 32.99 | 5.21 | 0.00 | -38.20 |
| 5 | 4824.00 | 52.9 PK | 74.00 | -21.10 | 1.36H | 34 | 14.70 | 32.99 | 5.21 | 0.00 | -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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2038.50 | 50.6 PK | 74.00 | -23.40 | 1.41V | 285 | 19.70 | 27.57 | 3.29 | 0.00 | -30.86 |
| 2 | *2412.50 | 100.4 PK | - | - | 1.13V | 290 | 68.40 | 28.33 | 3.62 | 0.00 | -31.96 |
| 3 | *2412.50 | 96.1 AV | - | - | 1.13V | 290 | 64.10 | 28.33 | 3.62 | 0.00 | -31.96 |
| 4 | 4074.20 | 52.9 PK | 74.00 | -21.10 | 1.49V | 324 | 15.70 | 32.40 | 4.77 | 0.00 | -37.17 |
| 5 | 4824.30 | 52.5 PK | 74.00 | -21.50 | 1.29V | 174 | 14.30 | 32.99 | 5.21 | 0.00 | -38.20 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " *" : Fundamental frequency
5. The other emission levels were very low against the limit.

| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325 |
|---|---|---|---|
| MODE | Channel 6 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60 % RH,<br>1050 hPa | TESTED BY: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2063.40 | 50.2 PK | 74.00 | -23.80 | 1.00H | 307 | 19.24 | 27.61 | 3.31 | 0.00 | -30.92 |
| 2 | *2438.40 | 106.3 PK | - | - | 1.26H | 144 | 74.24 | 28.38 | 3.64 | 0.00 | -32.03 |
| 3 | *2438.40 | 100.1 AV | - | - | 1.26H | 144 | 68.10 | 28.38 | 3.64 | 0.00 | -32.03 |
| 4 | 4126.10 | 53.0 PK | 74.00 | -21.00 | 1.65H | 335 | 15.80 | 32.40 | 4.79 | 0.00 | -37.19 |
| 5 | 4874.30 | 52.5 PK | 74.00 | -21.50 | 1.79H | 304 | 14.20 | 33.07 | 5.25 | 0.00 | -38.31 |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2062.40 | 51.3 PK | 74.00 | -22.70 | 1.40V | 9 | 20.40 | 27.61 | 3.31 | 0.00 | -30.92 |
| 2 | *2437.20 | 100.2 PK | - | - | 1.77V | 354 | 68.20 | 28.38 | 3.64 | 0.00 | -32.02 |
| 3 | *2437.20 | 93.4 AV | - | - | 1.77V | 354 | 61.40 | 28.38 | 3.64 | 0.00 | -32.02 |
| 4 | 4126.10 | 52.6 PK | 74.00 | -21.40 | 1.37V | 181 | 15.40 | 32.40 | 4.79 | 0.00 | -37.19 |
| 5 | 4874.40 | 53.0 PK | 74.00 | -21.00 | 1.52V | 297 | 14.70 | 33.07 | 5.25 | 0.00 | -38.31 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " *" : Fundamental frequency
5. The other emission levels were very low against the limit.

| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325 |
|---|---|---|---|
| MODE | Channel 11 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60 % RH,<br>1050 hPa | **TESTED BY**: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2088.40 | 47.8 PK | 74.00 | -26.20 | 1.26H | 54 | 16.80 | 27.66 | 3.33 | 0.00 | -30.99 |
| 2 | *2464.30 | 104.6 PK | - | - | 1.58H | 3 | 72.50 | 28.42 | 3.66 | 0.00 | -32.08. |
| 3 | *2464.30 | 97.3 AV | - | - | 1.58H | 3 | 65.20 | 28.42 | 3.66 | 0.00 | -32.08. |
| 4 | 2486.50 | 55.5 PK | 74.00 | -18.50 | 1.09H | 54 | 23.40 | 28.47 | 3.68 | 0.00 | -32.15. |
| 5 | 2486.50 | 51.5 AV | 54.00 | -2.50 | 1.09H | 54 | 19.40 | 28.47 | 3.68 | 0.00 | -32.15 |
| 6 | 4176.20 | 52.6 PK | 74.00 | -21.40 | 2.01H | 287 | 15.40 | 32.40 | 4.81 | 0.00 | -37.21 |
| 7 | 4924.20 | 52.9 PK | 74.00 | -21.10 | 1.10H | 172 | 14.50 | 33.15 | 5.28 | 0.00 | -38.43 |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2088.00 | 49.9 PK | 74.00 | -24.10 | 1.08V | 162 | 18.90 | 27.66 | 3.33 | 0.00 | -30.99 |
| 2 | *2464.20 | 102.2 PK | - | - | 1.02V | 101 | 70.16 | 28.42 | 3.66 | 0.00 | -32.09 |
| 3 | *2464.20 | 96.4 AV | - | - | 1.02V | 101 | 64.30 | 28.42 | 3.66 | 0.00 | -32.09 |
| 4 | 2495.60 | 57.4 PK | 74.00 | -16.60 | 1.05V | 43 | 25.30 | 28.47 | 3.68 | 0.00 | -32.15 |
| 5 | 2495.60 | 51.5 AV | 54.00 | -2.50 | 1.05V | 43 | 19.33 | 28.47 | 3.68 | 0.00 | -32.16 |
| 6 | 4176.40 | 51.7 PK | 54.00 | -22.30 | 1.03V | 12 | 14.50 | 32.40 | 4.81 | 0.00 | -37.22 |
| 7 | 4924.10 | 52.9 PK | 54.00 | -21.10 | 1.07V | 122 | 14.50 | 33.15 | 5.28 | 0.00 | -38.43 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " *" : Fundamental frequency
5. The other emission levels were very low against the limit.

## 4.2.7 TEST RESULTS(B)

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **DETECTOR FUNCTION** | Quasi-Peak |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60 % RH, 1050 hPa | **TESTED BY**: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 132.41 | 30.7 QP | 43.50 | -12.80 | 1.06H | 190 | 18.40 | 11.16 | 1.13 | 0.00 | -12.29 |
| 2 | 264.74 | 32.8 QP | 46.00 | -13.20 | 1.34H | 120 | 18.40 | 12.75 | 1.70 | 0.00 | -14.45 |
| 3 | 352.48 | 34.2 QP | 46.00 | -11.80 | 1.25H | 250 | 17.80 | 14.31 | 2.05 | 0.00 | -16.36 |
| 4 | 396.47 | 33.9 QP | 46.00 | -12.10 | 1.02H | 346 | 15.70 | 15.96 | 2.22 | 0.00 | -18.18 |
| 5 | 440.27 | 34.9 QP | 46.00 | -11.10 | 1.16H | 313 | 16.20 | 16.32 | 2.38 | 0.00 | -18.69 |
| 6 | 528.70 | 34.5 QP | 46.00 | -11.50 | 1.73H | 283 | 14.20 | 17.66 | 2.61 | 0.00 | -20.26 |
| 7 | 748.17 | 37.2 QP | 46.00 | -8.80 | 1.51H | 280 | 13.80 | 20.14 | 3.26 | 0.00 | -23.41 |
| 8 | 924.01 | 33.1 QP | 46.00 | -12.90 | 1.26H | 211 | 8.40 | 21.00 | 3.68 | 0.00 | -24.70 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 11 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **DETECTOR FUNCTION** | Quasi-Peak |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60 % RH, 1050 hPa | **TESTED BY**: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 132.47 | 30.7 QP | 43.50 | -12.80 | 1.40V | 309 | 18.40 | 11.16 | 1.13 | 0.00 | -12.29 |
| 2 | 220.47 | 29.4 QP | 46.00 | -16.60 | 2.13V | 27 | 17.60 | 10.26 | 1.52 | 0.00 | -11.80 |
| 3 | 264.02 | 32.8 QP | 46.00 | -13.20 | 1.81V | 226 | 18.40 | 12.75 | 1.70 | 0.00 | -14.45 |
| 4 | 396.04 | 35.8 QP | 46.00 | -10.20 | 1.48V | 168 | 17.60 | 15.96 | 2.22 | 0.00 | -18.18 |
| 5 | 528.04 | 37.1 QP | 46.00 | -8.90 | 2.12V | 20 | 16.90 | 17.62 | 2.60 | 0.00 | -20.22 |
| 6 | 748.14 | 39.2 QP | 46.00 | -6.80 | 1.11V | 257 | 15.80 | 20.14 | 3.26 | 0.00 | -23.41 |
| 7 | 880.63 | 35.9 QP | 46.00 | -10.10 | 1.72V | 32 | 11.70 | 20.68 | 3.55 | 0.00 | -24.24 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325B |
| **MODE** | Channel 1 | **FREQUENCY RANGE** | Above 1000 MHz |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **DETECTOR FUNCTION** | Peak(PK)<br>Average (AV) |
| **ENVIRONMENTAL CONDITIONS** | 30 deg. C, 60 % RH,<br>1050 hPa | **TESTED BY**: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2037.80 | 48.0 PK | 74.00 | -26.00 | 2.23H | 12 | 19.47 | 25.27 | 3.29 | 0.00 | -28.57 |
| 2 | *2413.50 | 93.2 PK | - | - | 1.55H | 176 | 62.40 | 27.19 | 3.62 | 0.00 | -30.82 |
| 3 | *2413.50 | 87.9 AV | - | - | 1.55H | 176 | 57.10 | 27.19 | 3.62 | 0.00 | -30.82 |
| 4 | 4075.50 | 50.3 PK | 74.00 | -23.70 | 1.69H | 57 | 15.40 | 30.18 | 4.77 | 0.00 | -34.95 |
| 5 | 4826.00 | 54.7 PK | 74.00 | -19.30 | 1.75H | 214 | 18.07 | 31.43 | 5.21 | 0.00 | -36.65 |
| 6 | 4826.00 | 42.5 AV | 54.00 | -11.50 | 1.75H | 214 | 5.89 | 31.43 | 5.21 | 0.00 | -36.64 |
| 7 | 6113.10 | 52.0 PK | 74.00 | -22.00 | 1.62H | 346 | 13.15 | 32.83 | 5.98 | 0.00 | -38.81 |
| 8 | 9647.90 | 49.8 AV | 54.00 | -4.20 | 1.08H | 189 | 4.50 | 38.08 | 7.21 | 0.00 | -45.29 |
| 9 | 9647.90 | 61.5 PK | 74.00 | -12.50 | 1.08H | 189 | 16.19 | 38.08 | 7.21 | 0.00 | -45.29 |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2037.00 | 50.0 PK | 74.00 | -24.00 | 1.21V | 38 | 21.40 | 25.27 | 3.29 | 0.00 | -28.57 |
| 2 | *2412.50 | 93.2 PK | - | - | 1.36V | 13 | 62.40 | 27.19 | 3.62 | 0.00 | -30.82 |
| 3 | *2412.50 | 87.0 AV | - | - | 1.36V | 13 | 56.20 | 27.19 | 3.62 | 0.00 | -30.82 |
| 4 | 4075.50 | 51.1 PK | 74.00 | -22.90 | 1.31V | 293 | 16.20 | 30.18 | 4.77 | 0.00 | -34.95 |
| 5 | 4824.20 | 52.0 PK | 74.00 | -22.00 | 1.19V | 273 | 15.40 | 31.43 | 5.21 | 0.00 | -36.64 |
| 6 | 9467.80 | 58.6 PK | 74.00 | -15.40 | 1.10V | 235 | 13.60 | 37.96 | 7.08 | 0.00 | -45.04. |
| 7 | 9467.80 | 46.4 AV | 54.00 | -7.60 | 1.10V | 235 | 1.40 | 37.96 | 7.08 | 0.00 | -45.04 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " *" : Fundamental frequency
5. The other emission levels were very low against the limit.

| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325B |
|---|---|---|---|
| MODE | Channel 6 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60 % RH,<br>1050 hPa | TESTED BY: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2063.50 | 48.1 PK | 74.00 | -25.90 | 1.10H | 22 | 19.40 | 25.39 | 3.31 | 0.00 | -28.70 |
| 2 | *2437.50 | 93.3 PK | - | - | 1.04H | 6 | 62.40 | 27.30 | 3.64 | 0.00 | -30.94. |
| 3 | *2437.50 | 88.1 AV | - | - | 1.04H | 6 | 57.20 | 27.30 | 3.64 | 0.00 | -30.94. |
| 4 | 4125.20 | 50.3 PK | 74.00 | -23.70 | 1.43H | 157 | 15.20 | 30.28 | 4.79 | 0.00 | -35.07 |
| 5 | 4873.20 | 42.2 AV | 54.00 | -11.80 | 1.45H | 207 | 5.48 | 31.47 | 5.25 | 0.00 | -36.72 |
| 6 | 4873.20 | 58.2 PK | 74.00 | -15.80 | 1.45H | 207 | 21.48 | 31.47 | 5.25 | 0.00 | -36.72. |
| 7 | 9747.50 | 57.9 PK | 74.00 | -16.10 | 1.11H | 118 | 12.40 | 38.15 | 7.32 | 0.00 | -45.47. |
| 8 | 9747.50 | 49.0 AV | 54.00 | -5.00 | 1.11H | 118 | 3.50 | 38.15 | 7.32 | 0.00 | -45.47 |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2062.80 | 50.5 PK | 74.00 | -23.50 | 1.13V | 59 | 21.80 | 25.39 | 3.31 | 0.00 | -28.70 |
| 2 | *2438.40 | 88.1 AV | - | - | 1.22V | 123 | 57.20 | 27.30 | 3.64 | 0.00 | -30.94 |
| 3 | *2438.40 | 94.3 PK | - | - | 1.22V | 123 | 63.40 | 27.30 | 3.64 | 0.00 | -30.94 |
| 4 | 4125.10 | 51.8 PK | 74.00 | -22.20 | 1.97V | 313 | 16.70 | 30.28 | 4.79 | 0.00 | -35.07 |
| 5 | 4874.10 | 51.5 PK | 74.00 | -22.50 | 1.63V | 129 | 14.80 | 31.47 | 5.25 | 0.00 | -36.72 |
| 6 | 6188.20 | 54.5 PK | 74.00 | -19.50 | 1.78V | 304 | 15.28 | 33.19 | 6.01 | 0.00 | -39.20. |
| 7 | 6188.20 | 45.7 AV | 54.00 | -8.30 | 1.78V | 304 | 6.47 | 33.19 | 6.01 | 0.00 | -39.20 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " *" : Fundamental frequency
5. The other emission levels were very low against the limit.

| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325B |
|---|---|---|---|
| MODE | Channel 11 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 30 deg. C, 60 % RH,<br>1050 hPa | TESTED BY: Gary Chang | |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2087.80 | 49.5 PK | 74.00 | -24.50 | 1.27H | 95 | 20.70 | 25.50 | 3.33 | 0.00 | -28.83 |
| 2 | 2483.50 | 48.3 PK | 74.00 | -25.70 | 1.18H | 308 | 17.11 | 27.52 | 3.68 | 0.00 | -31.20 |
| 3 | *2462.00 | 98.5 PK | - | - | 1.03H | 24 | 67.32 | 27.52 | 3.68 | 0.00 | -31.20. |
| 4 | *2462.00 | 91.3 AV | - | - | 1.03H | 24 | 60.10 | 27.52 | 3.68 | 0.00 | -31.20. |
| 5 | 4175.50 | 51.6 PK | 74.00 | -22.40 | 2.02H | 305 | 16.40 | 30.38 | 4.81 | 0.00 | -35.19 |
| 6 | 4924.10 | 51.6 PK | 74.00 | -22.40 | 1.84H | 320 | 14.80 | 31.51 | 5.28 | 0.00 | -36.80 |
| 7 | 6226.30 | 52.7 PK | 74.00 | -21.30 | 1.50H | 340 | 13.38 | 33.28 | 6.01 | 0.00 | -39.29 |
| 8 | 9874.90 | 61.8 PK | 74.00 | -12.20 | 2.09H | 219 | 16.20 | 38.22 | 7.43 | 0.00 | -45.66 |
| 9 | 9874.90 | 49.3 AV | 54.00 | -4.70 | 2.09H | 219 | 3.70 | 38.22 | 7.43 | 0.00 | -45.66 |

**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) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2087.50 | 49.5 PK | 74.00 | -24.50 | 1.16V | 313 | 20.70 | 25.50 | 3.33 | 0.00 | -28.83 |
| 2 | *2461.50 | 91.5 PK | - | - | 1.11V | 66 | 60.40 | 27.41 | 3.66 | 0.00 | -31.07. |
| 3 | *2461.50 | 86.3 AV | - | - | 1.11V | 65 | 55.20 | 27.41 | 3.66 | 0.00 | -31.07. |
| 4 | 2483.50 | 47.0 PK | 74.00 | -27.00 | 1.33V | 320 | 15.80 | 27.52 | 3.68 | 0.00 | -31.20 |
| 5 | 4175.50 | 51.0 PK | 74.00 | -23.00 | 1.55V | 158 | 15.80 | 30.38 | 4.81 | 0.00 | -35.19 |
| 6 | 4924.50 | 52.0 PK | 74.00 | -22.00 | 1.41V | 204 | 15.20 | 31.51 | 5.28 | 0.00 | -36.80 |
| 7 | 6263.50 | 53.9 PK | 74.00 | -20.10 | 1.01V | 276 | 14.44 | 33.46 | 6.03 | 0.00 | -39.49 |
| 8 | 6263.50 | 44.9 AV | 54.00 | -9.10 | 1.01V | 276 | 5.40 | 33.46 | 6.03 | 0.00 | -39.50 |
| 9 | 9848.00 | 62.0 PK | 74.00 | -12.00 | 1.61V | 320 | 16.40 | 38.21 | 7.41 | 0.00 | -45.61 |
| 10 | 9848.00 | 46.8 AV | 54.00 | -7.20 | 1.61V | 320 | 1.20 | 38.21 | 7.41 | 0.00 | -45.62 |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " *" : Fundamental frequency
5. The other emission levels were very low against the limit.

## 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 |
|---|---|---|---|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839379/002 | Dec. 28, 2001 |
| HP ATTENUATOR | 8496B | 3247A18505 | Cal. on use |
| HP PLOTTER | 7475A | 2641V27755 | N/A |

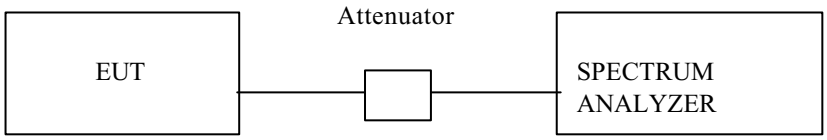
**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.3.3 TEST PROCEDURE

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

### 4.3.4 TEST SETUP




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

### 4.3.5 EUT OPERATING CONDITIONS

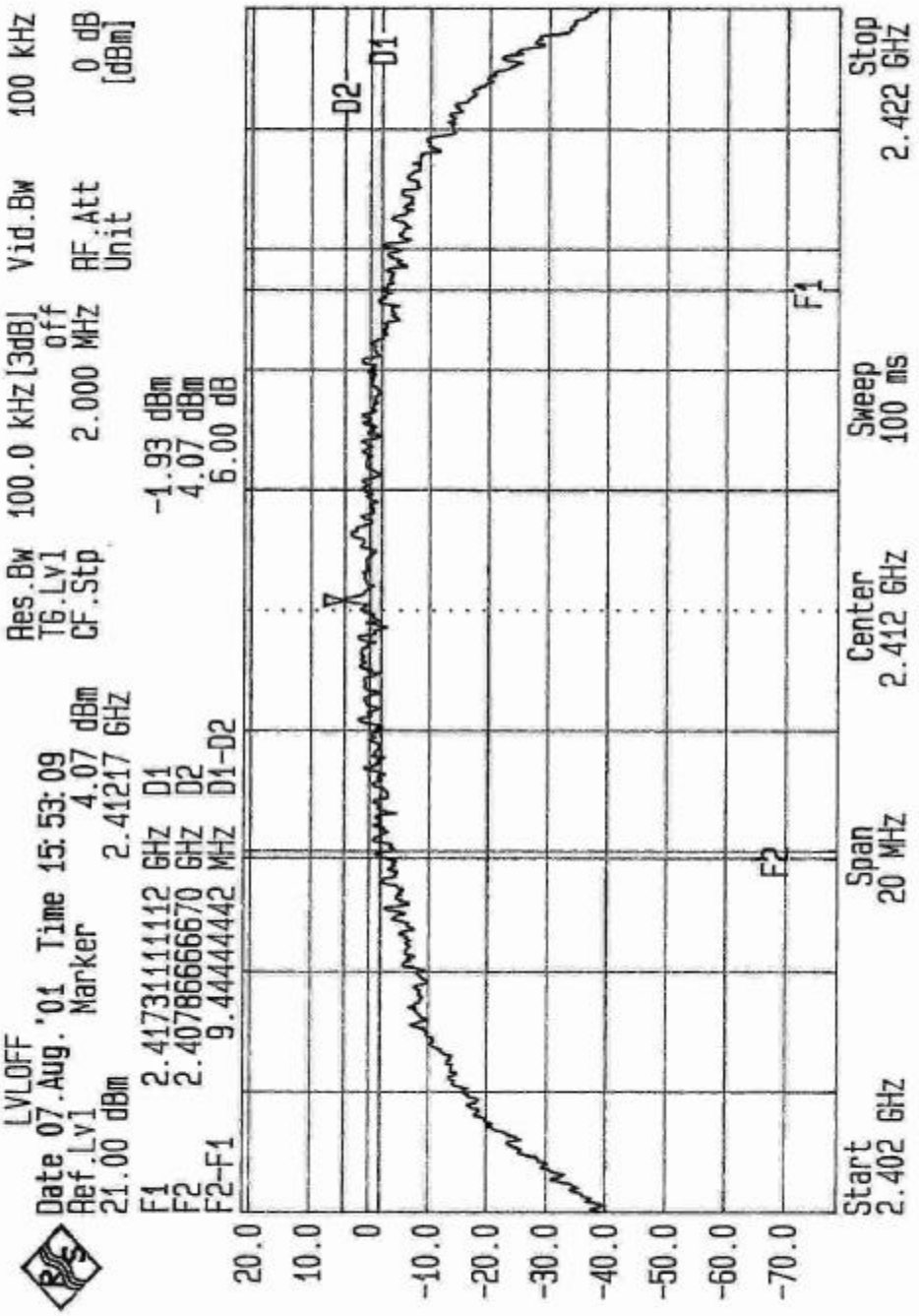
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 4.3.6 TEST RESULTS

| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325, XI-325B |
|---|---|---|---|
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 27 deg. C, 75%RH, 1005 hPa |
| TESTED BY: Gary Chang | | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6 dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 9.44 | 0.5 | PASS |
| 6 | 2437 | 9.98 | 0.5 | PASS |
| 11 | 2462 | 9.60 | 0.5 | PASS |

CH1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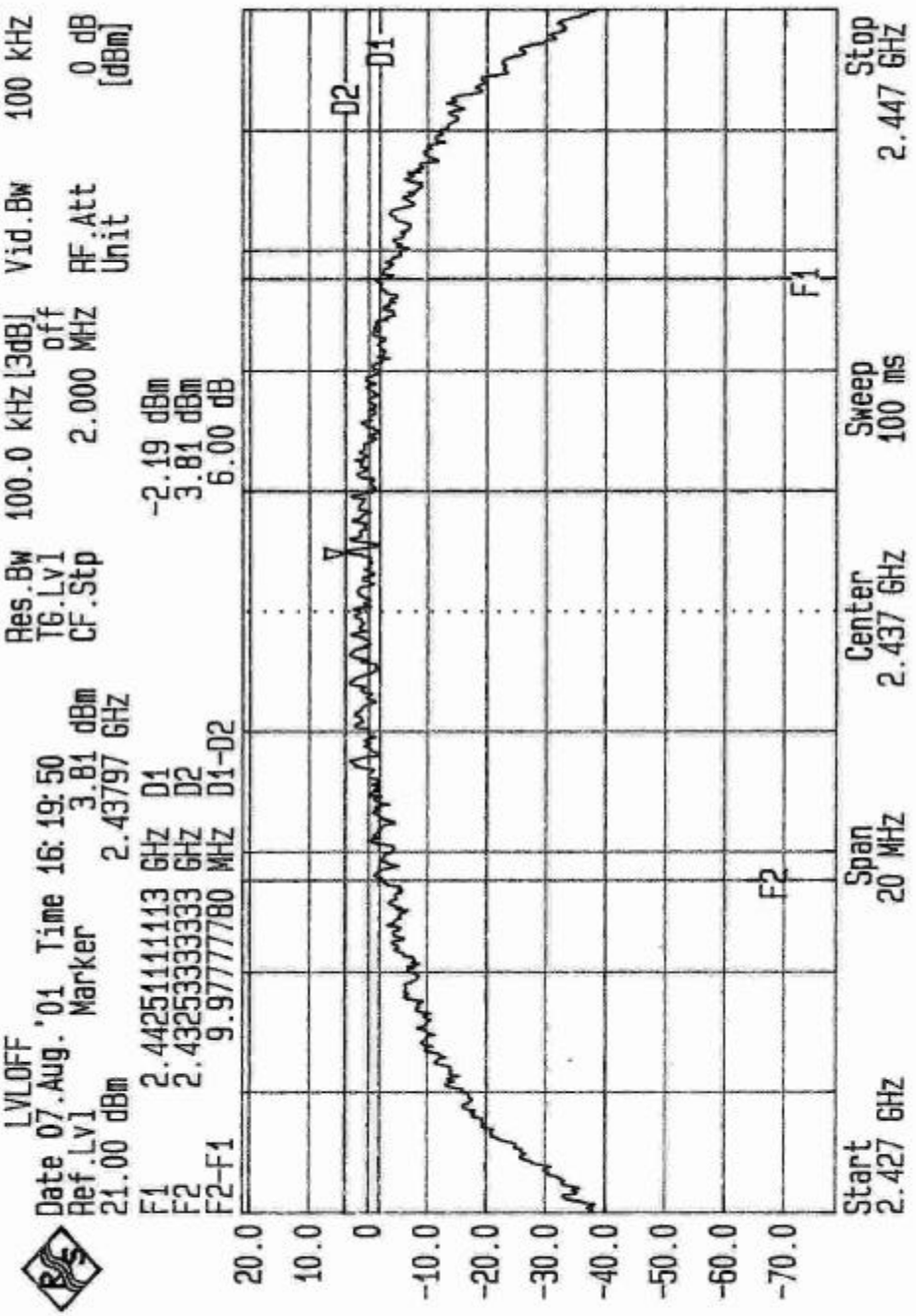
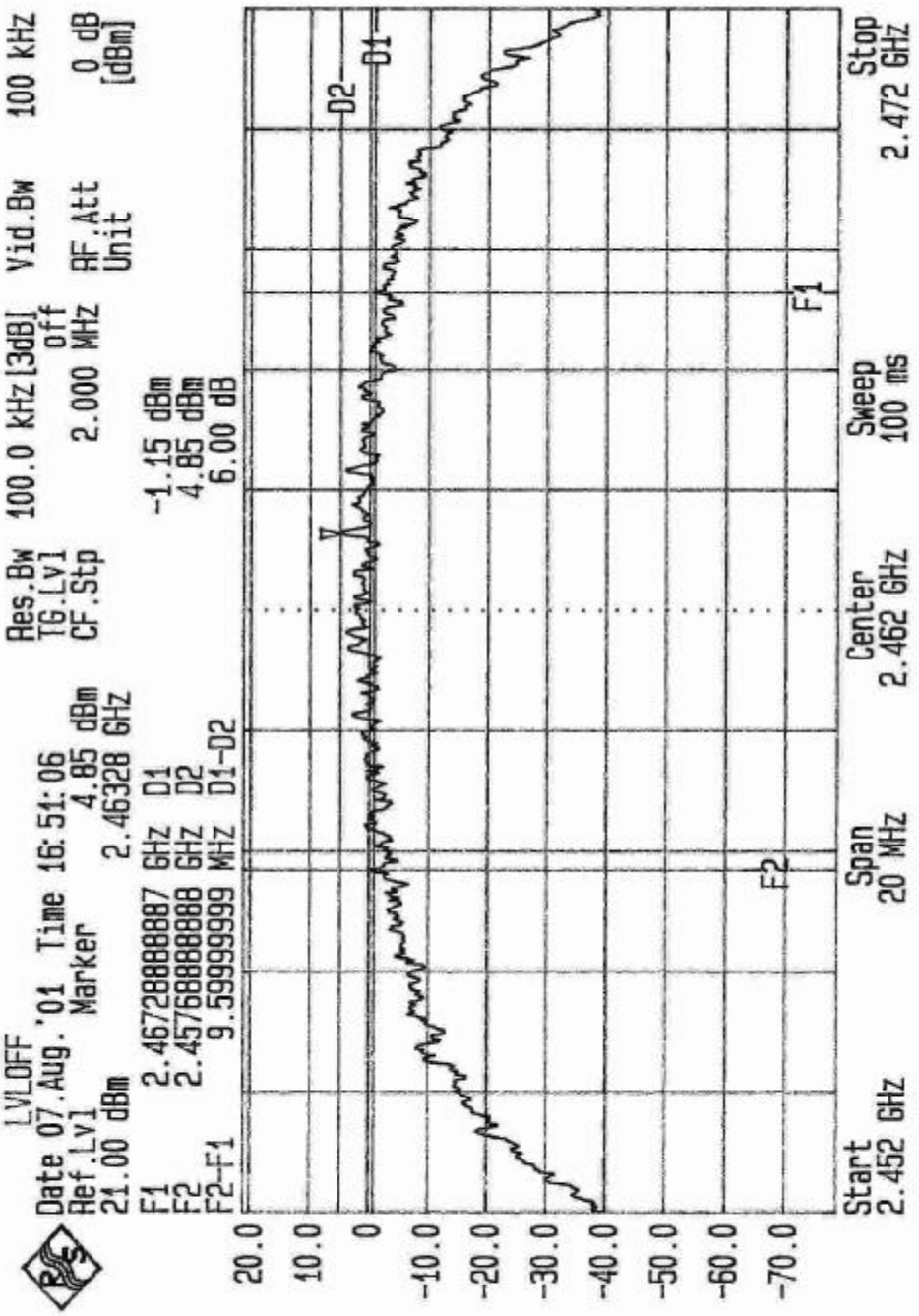
Date 07.Aug.'01 Time 15:53:09
Ref.Lvl 4.07 dBm
21.00 dBm Marker 2.41217 GHz
F1 2.417311111112 GHz D1 -1.93 dBm
F2 2.407866666670 GHz D2 4.07 dBm
F2-F1 9.44444442 MHz D1-D2 6.00 dB
Res.Bw 100.0 kHz[3dB] Vid.Bw 100 kHz
T6.Lvl off RF.Att 0 dB
CF.Stp 2.000 MHz Unit [dBm]
Start 2.402 GHz
Span 20 MHz
Center 2.412 GHz
Sweep 100 ms
Stop 2.422 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D1
D2
F1
F2

CH6


LVLOFF
Date 07.Aug.'01 Time 16:19:50
Ref.Lvl 3.81 dBm
21.00 dBm Marker 2.43797 GHz
F1 2.44251111113 GHz D1 -2.19 dBm
F2 2.43253333333 GHz D2 3.81 dBm
F2-F1 9.97777780 MHz D1-D2 6.00 dB
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.000 MHz RF.Att 0 dB
Unit [dBm]
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 100 ms
Stop 2.447 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D1
D2
F1
F2

CH11


LVLOFF
Date 07.Aug.'01 Time 16:51:06
Ref.Lvl 4.85 dBm
21.00 dBm 2.46328 GHz
F1 2.467288888887 GHz D1
F2 2.457688888888 GHz D2
F2-F1 9.59999999 MHz D1-D2
Res.Bw 100.0 kHz[3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.000 MHz RF.Att 0 dB
Unit [dBm]
-1.15 dBm
4.85 dBm
6.00 dB
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 100 ms
Stop 2.472 GHz
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0

## 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 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839379/002 | Dec. 28, 2001 |
| HP ATTENUATOR | 8496B | 3247A18505 | Cal. on use |
| HP PLOTTER | 7475A | 2641V27755 | N/A |

**NOTE:**

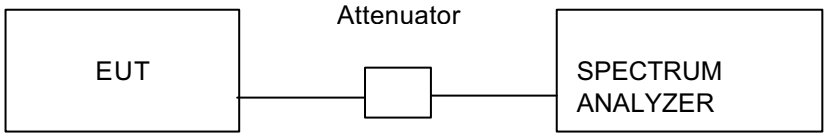
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.4.3 TEST PROCEDURES

a. The transmitter output was connected to the spectrum analyzer through an attenuator.
b. The center frequency of the spectrum analyzer was set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
c. The span of the spectrum analyzer should be larger than 6dB BandWidth plus 10MHz.
d. Used Peak Search to read the peak power after Maximum Hold function was activated.
e. Shifted the marker to +/- 3MHz and +/-6MHz, and recorded the reading.
f. The Maximum Peak Output Power was the linear summation of the 5 readings in (4) and (5).

**NOTE:** This measurement is the total power of 15MHz bandwidth which is far more wider than 6dB bandwidth.

### 4.4.4 TEST SETUP




### 4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

## 4.4.6 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless LAN Card | **MODEL** | XI-325, XI-325B |
| **INPUT POWER (SYSTEM)** | 120Vac, 60 Hz | **ENVIRONMENTAL CONDITIONS** | 27 deg. C, 75%RH, 1005 hPa |
| **TESTED BY**: Gary Chang | | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 18.10 | 30 | PASS |
| 6 | 2437 | 18.15 | 30 | PASS |
| 11 | 2462 | 18.12 | 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 |
|---|---|---|---|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839379/002 | Dec. 28, 2001 |
| HP ATTENUATOR | 8496B | 3247A18505 | Cal. on use |
| HP PLOTTER | 7475A | 2641V27755 | N/A |

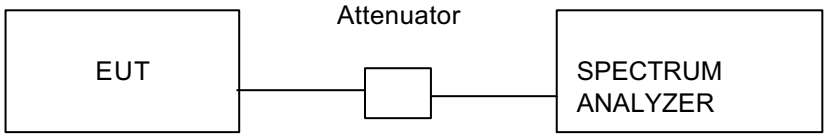
**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.5.3 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 3 kHz RBW and 30 kHz 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 TEST SETUP




### 4.5.5 EUT OPERATING CONDITIONS

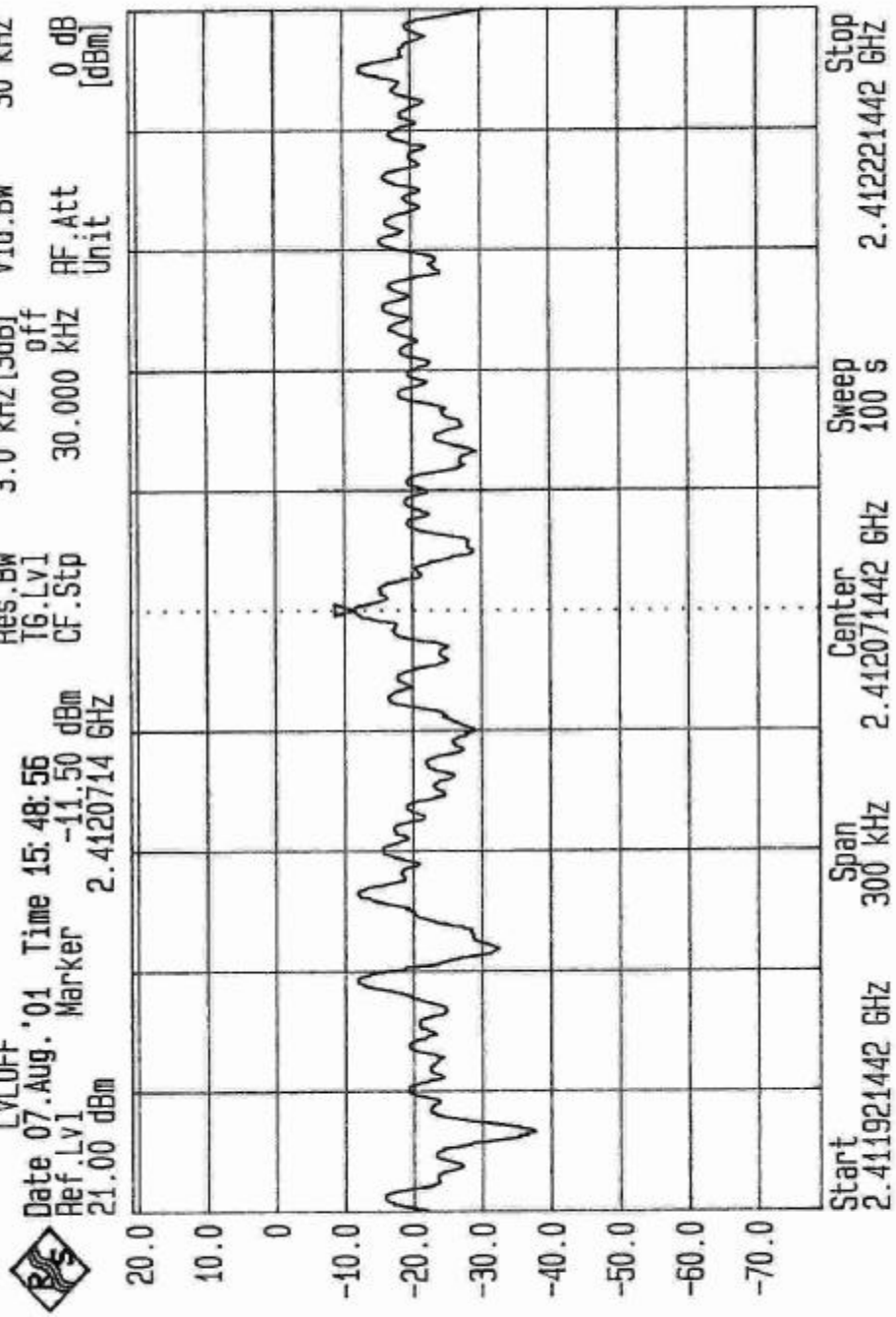
Same as 4.3.5

## 4.5.6 TEST RESULTS

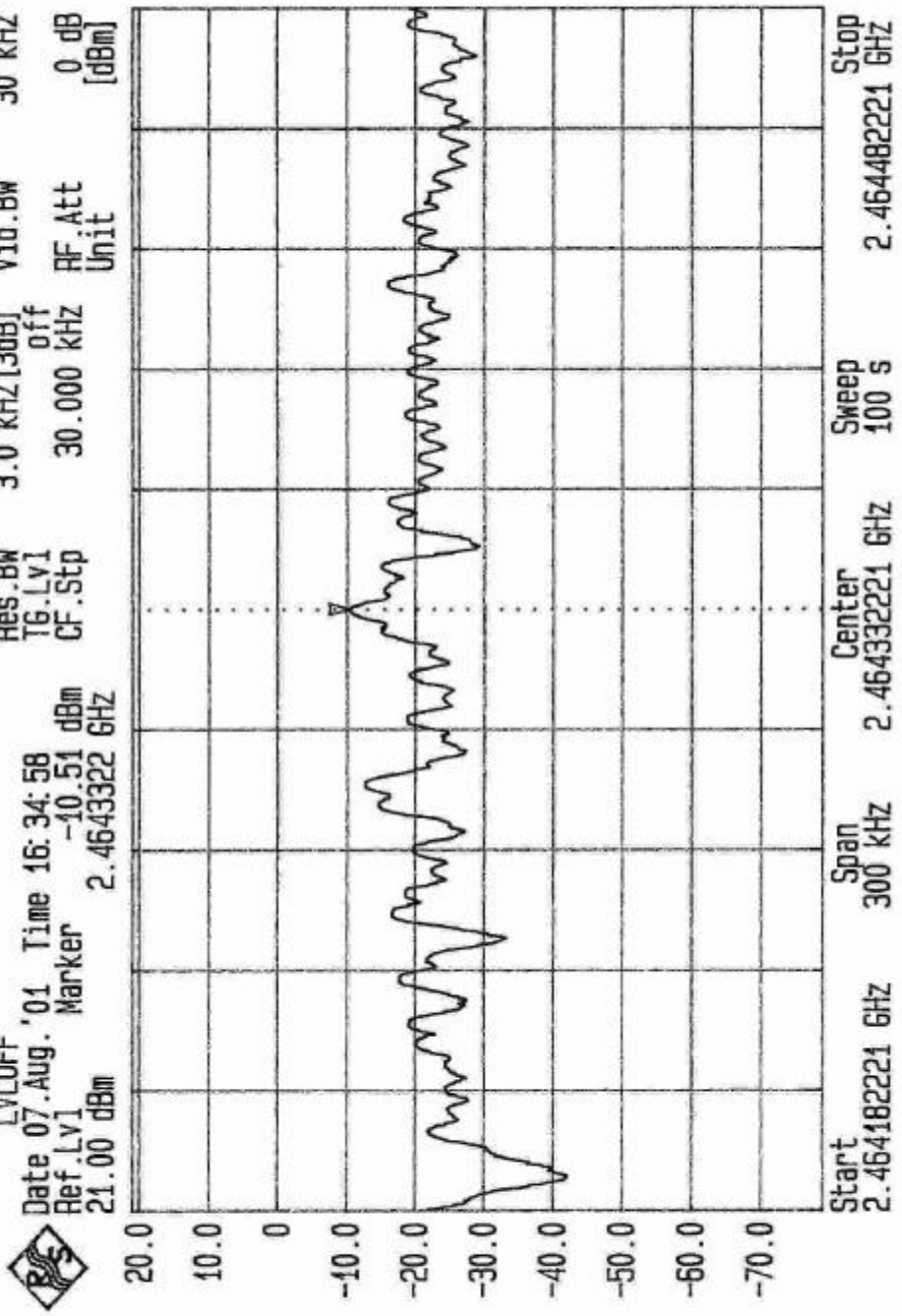
| EUT | 2.4GHz Wireless LAN Card | MODEL | XI-325, XI-325B |
|---|---|---|---|
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 27 deg. C, 75%RH, 1005 hPa |
| TESTED BY: Gary Chang | | | |

| CHANNEL NUMBER | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3 KHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | -11.50 | 8 | PASS |
| 6 | 2437 | -11.37 | 8 | PASS |
| 11 | 2462 | -10.51 | 8 | PASS |

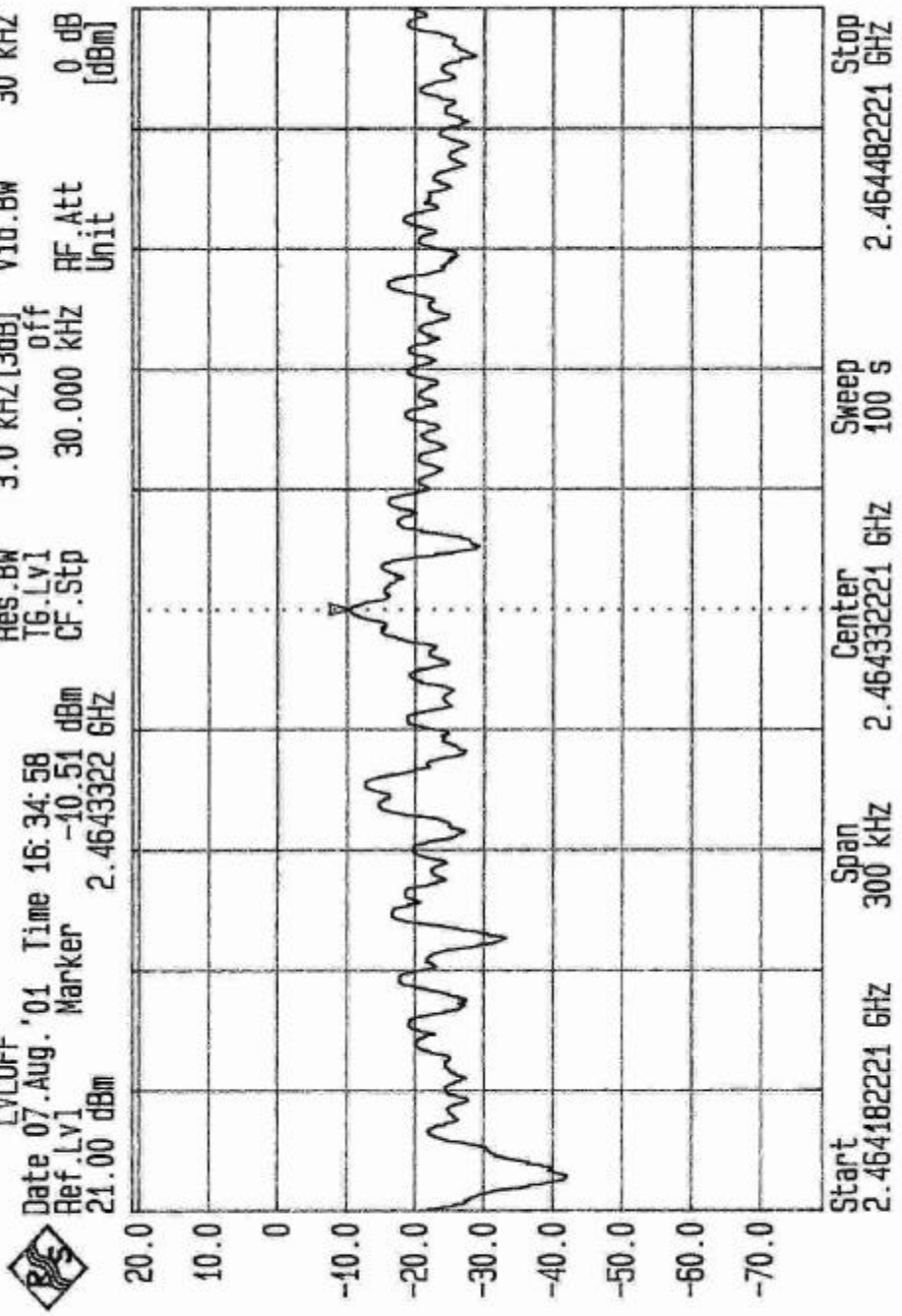
CH1


LVLOFF
Date 07.Aug.'01 Time 15:48:56
Ref.Lvl -11.50 dBm
21.00 dBm Marker 2.4120714 GHz
Res.Bw 3.0 kHz [3dB] Vid.Bw 30 kHz
T6.Lvl off
CF.Stp 30.000 kHz RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.411921442 GHz
Span 300 kHz
Center 2.412071442 GHz
Sweep 100 s
Stop 2.412221442 GHz

CH6


LVLOFF
Date 07.Aug.'01 Time 16:34:58
Ref.Lvl
21.00 dBm
Marker
-10.51 dBm
2.4643322 GHz
Res.Bw
TG.Lvl
CF.Stp
3.0 kHz [3dB]
off
30.000 kHz
Vid.Bw
RF.Att
Unit
30 kHz
0 dB
[dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.4641822221 GHz
Span
300 kHz
Center
2.4643322221 GHz
Sweep
100 s
Stop
2.4644822221 GHz

CH11


LVLOFF
Date 07.Aug.'01 Time 16:34:58
Ref.Lvl
21.00 dBm
Marker
-10.51 dBm
2.4643322 GHz
Res.Bw
TG.Lvl
CF.Stp
3.0 kHz [3dB]
off
30.000 kHz
Vid.Bw
RF.Att
Unit
30 kHz
0 dB
[dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.4641B2221 GHz
Span
300 kHz
Center
2.4643322 21 GHz
Sweep
100 s
Stop
2.4644B2221 GHz

## 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 |
|---|---|---|---|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI | 848926/005<br>846839/018 | Dec 28, 2001 |
| HP ATTENUATOR | 8496B | 3247A18505 | Cal. on use |
| HP PLOTTER | 7475A | 2641V27755 | N/A |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 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 with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

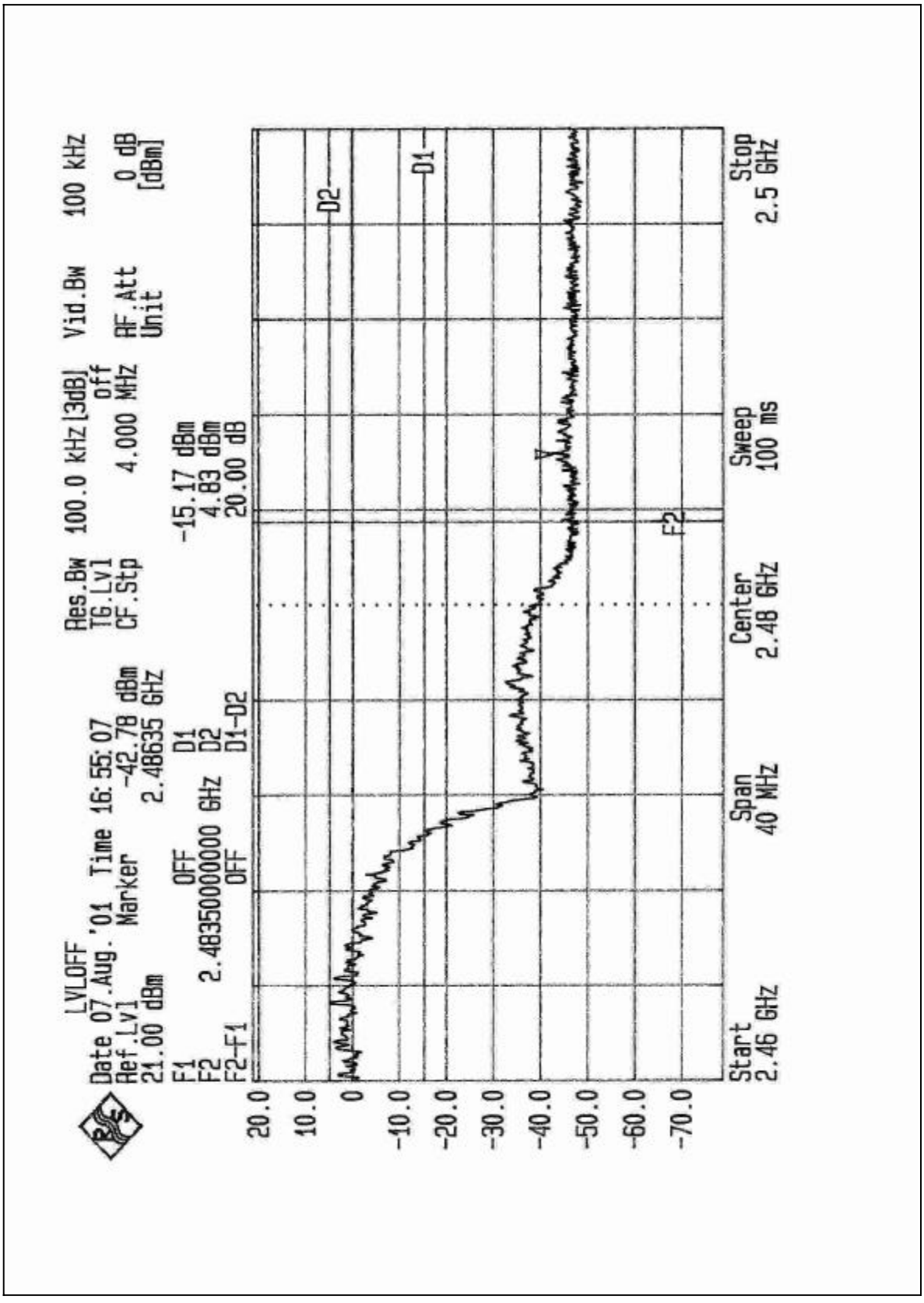
### 4.6.4 EUT OPERATING CONDITION

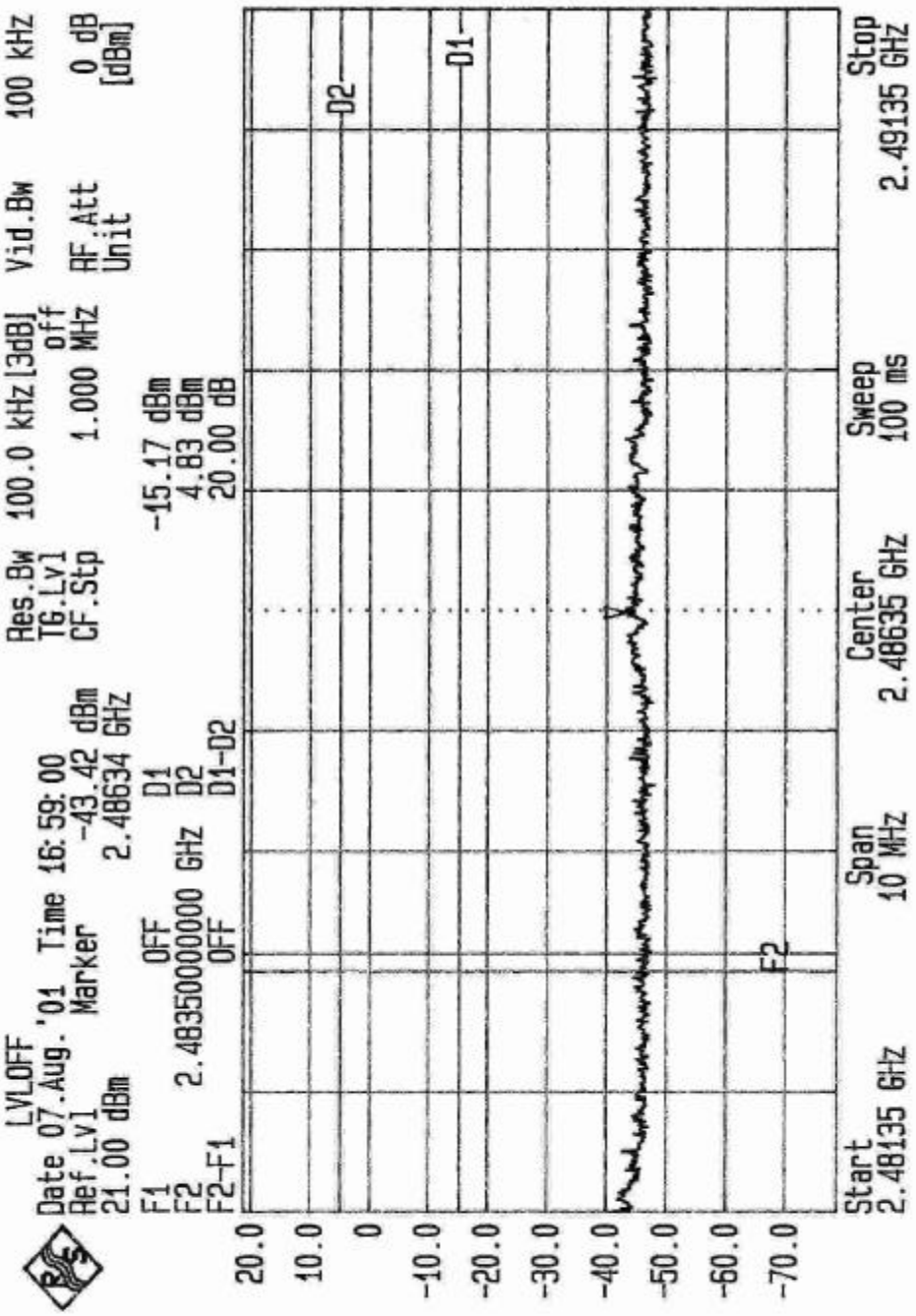
Same as Item 4.3.5

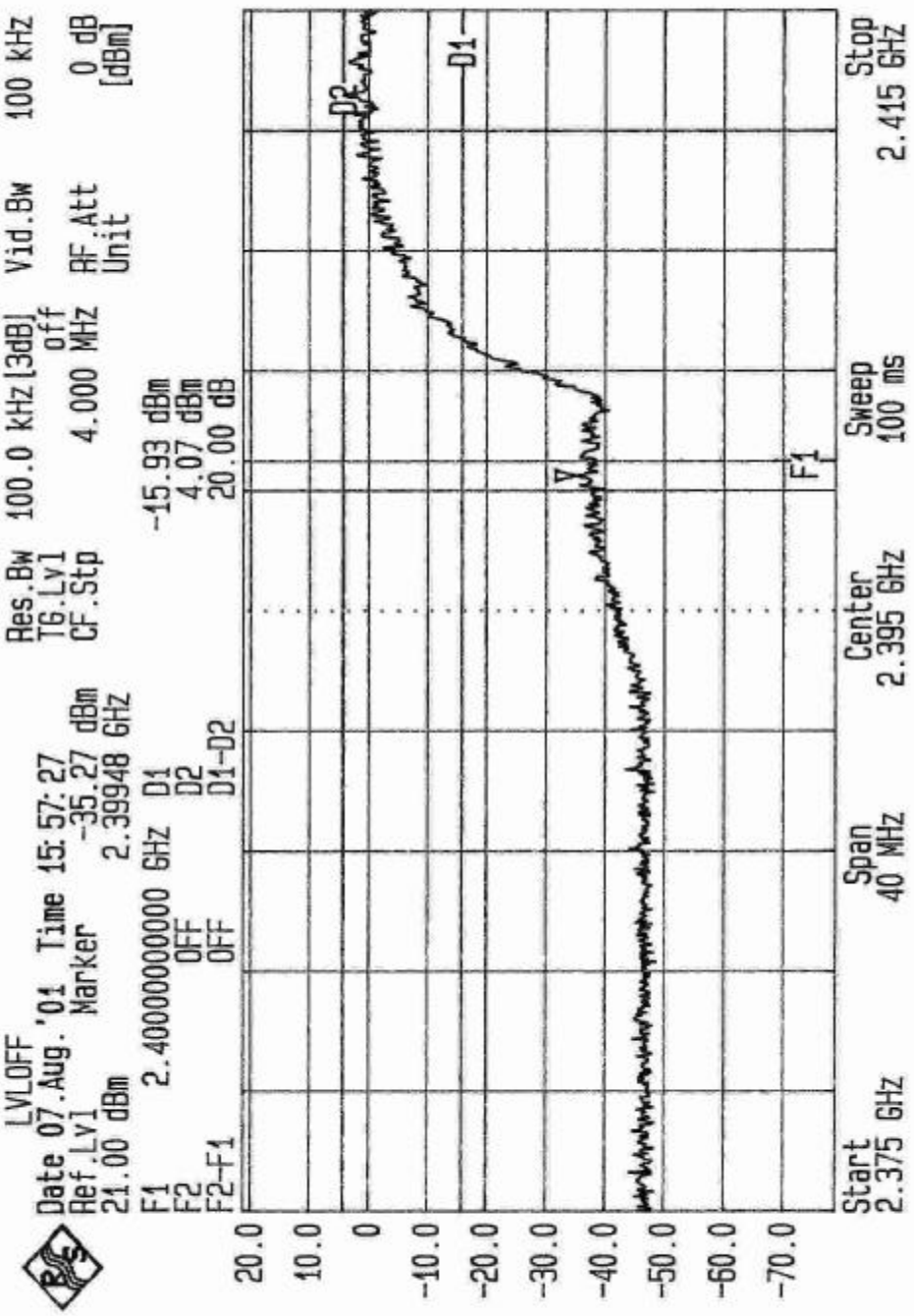
### 4.6.5 TEST RESULTS

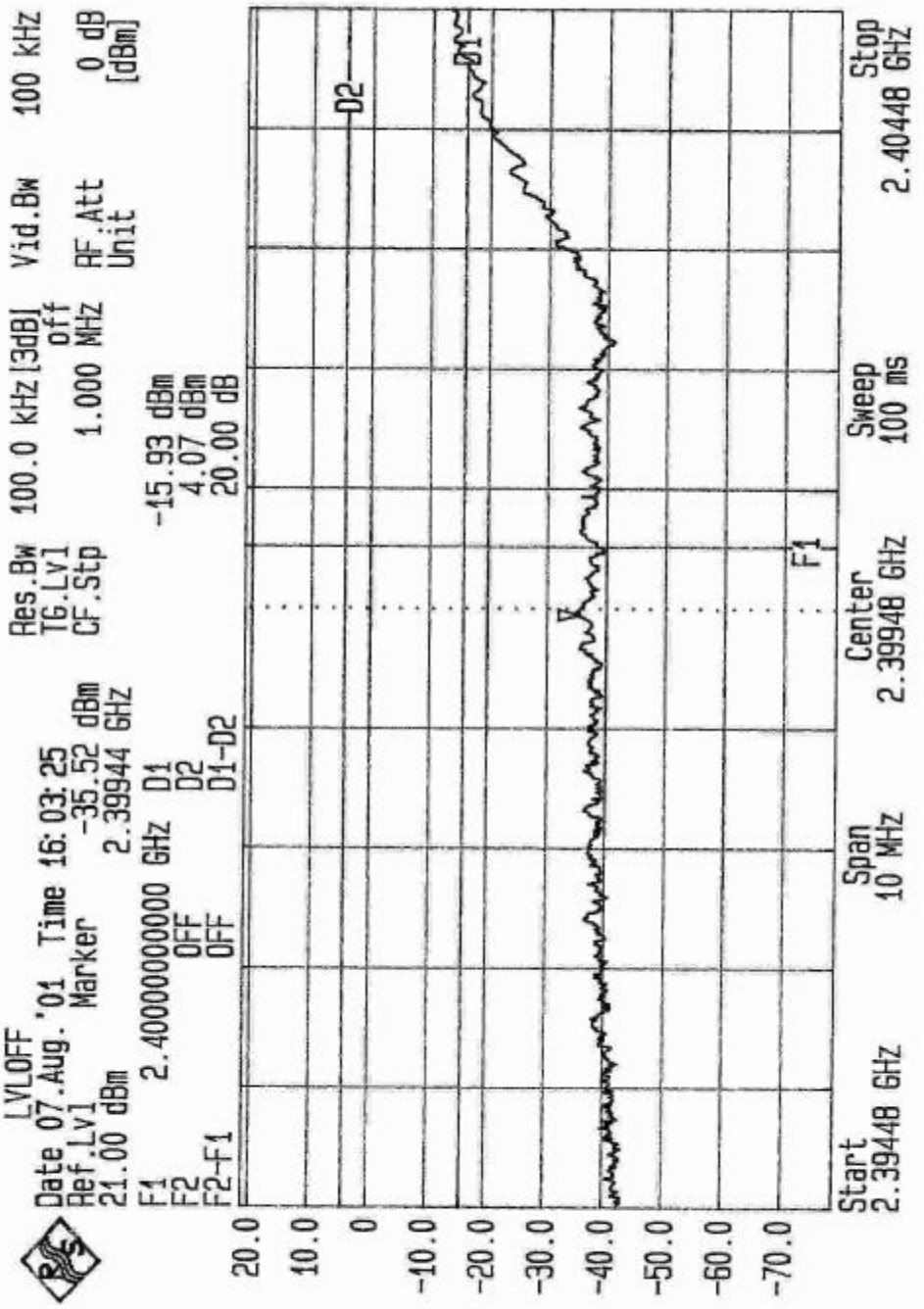
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

**NOTE:** The band edge emission plot on the following 4 pages shows 20.0dB delta between carrier maximum power and local maximum emission in restrict band (2.48635GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 (Page 28) is 97.3dBuV/m, so the maximum field strength in restrict band is 97.3-47.61=49.69 dBuV/m which is under 54 dBuV/m limit.


LVLOFF
Date 07.Aug.'01 Time 16:55:07
Ref.Lvl
21.00 dBm
Marker
-42.78 dBm
2.48635 GHz
F1
F2
F2-F1
2.48350000000 GHz
OFF
OFF
D1
D2
D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl
CF.Stp
4.000 MHz
-15.17 dBm
4.83 dBm
20.00 dB
Vid.Bw
RF.Att
Unit
100 kHz
0 dB
[dBm]
D1
D2
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.46 GHz
Span
40 MHz
Center
2.48 GHz
Sweep
100 ms
Stop
2.5 GHz


LVLOFF
Date 07.Aug.'01 Time 16:59:00
Ref.Lvl
21.00 dBm
Marker
-43.42 dBm
2.48634 GHz
F1
F2
F2-F1
OFF
2.48350000000 GHz
OFF
D1
D2
D1-D2
Res.Bw 100.0 kHz [3dB]
T6.Lvl off
CF.Stp 1.000 MHz
-15.17 dBm
4.83 dBm
20.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D1
D2
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.48135 GHz
Span 10 MHz
Center 2.48635 GHz
Sweep 100 ms
Stop 2.49135 GHz


LVLOFF
Date 07.Aug.'01 Time 15:57:27
Ref.Lvl -35.27 dBm
21.00 dBm 2.39948 GHz
F1 2.40000000000 GHz D1
F2 OFF D2
F2-F1 OFF D1-D2
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
T6.Lvl off
CF.Stp 4.000 MHz RF.Att 0 dB
Unit [dBm]
-15.93 dBm
4.07 dBm
20.00 dB
D1
D2
F1
Start 2.375 GHz
Span 40 MHz
Center 2.395 GHz
Sweep 100 ms
Stop 2.415 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0


LVLOFF
Date 07.Aug.'01 Time 16:03:25
Ref.Lvl -35.52 dBm
21.00 dBm 2.39944 GHz
F1 2.40000000000 GHz D1
F2 OFF D2
F2-F1 OFF D1-D2
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
T6.Lvl off
CF.Stp 1.000 MHz RF.Att 0 dB
Unit [dBm]
-15.93 dBm
4.07 dBm
20.00 dB
D1
D2
F1
Start 2.39448 GHz
Span 10 MHz
Center 2.39948 GHz
Sweep 100 ms
Stop 2.40448 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0

## 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.

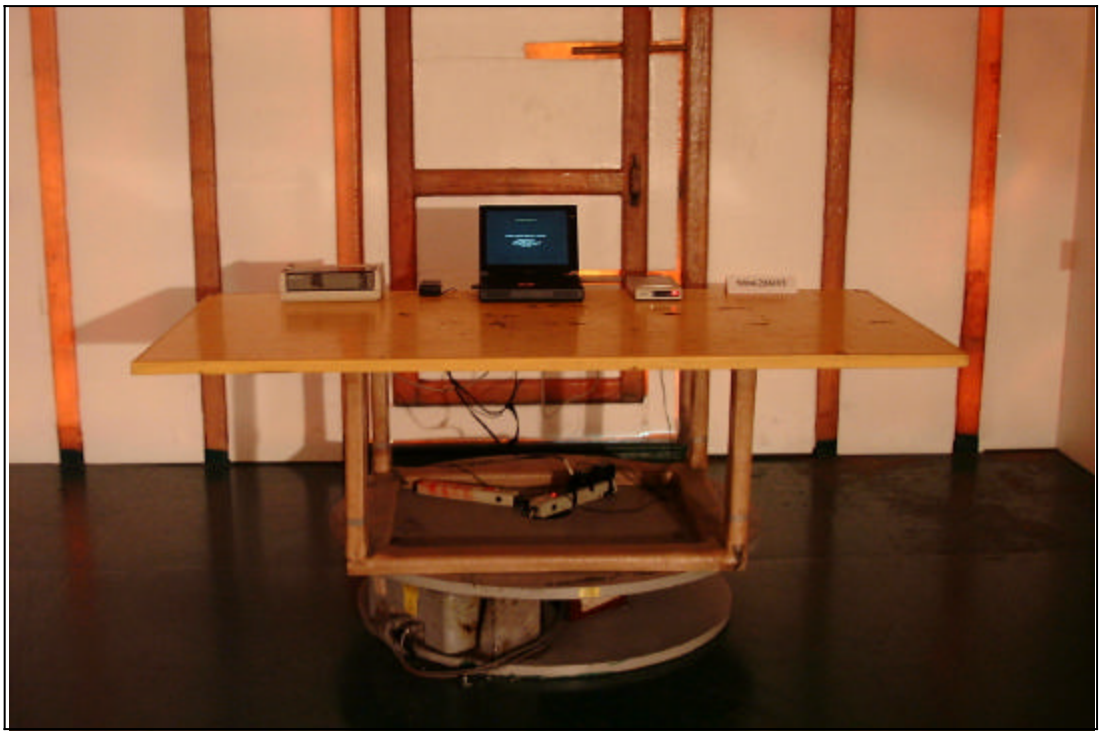
### 4.7.2 ANTENNA CONNECTED CONSTRUCTION

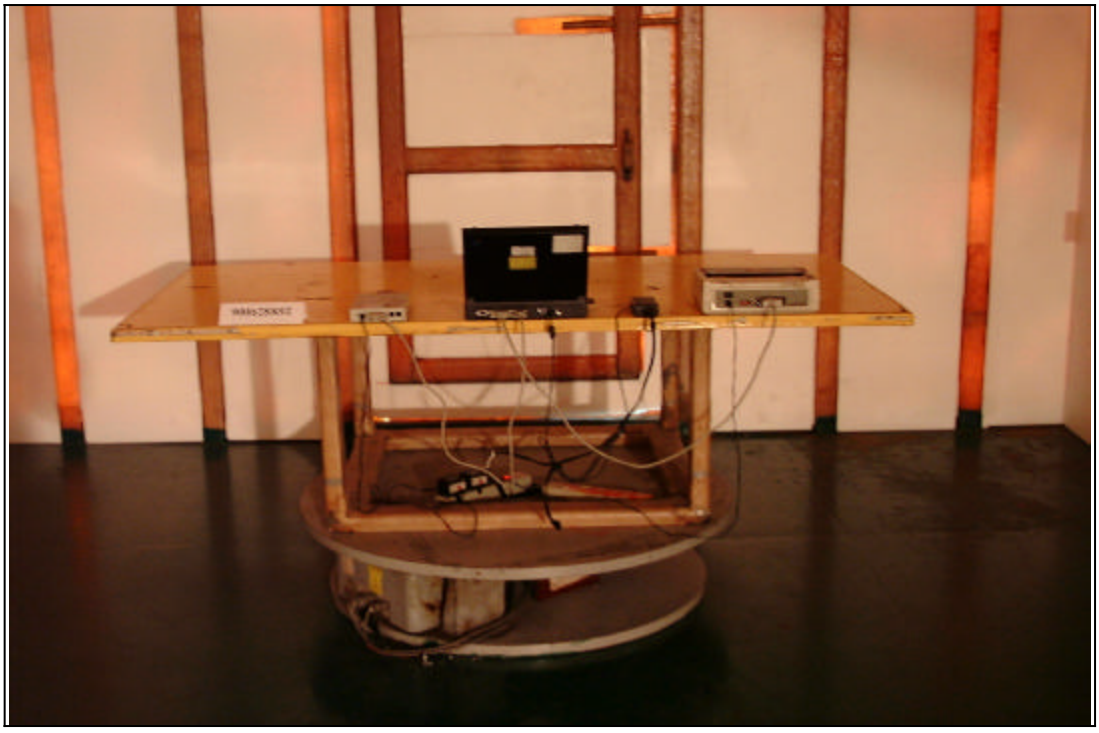
The antenna used in this product is printed antenna. There is no antenna connector for model XI-325, and MMCX antenna connector is used for model XI-325B. The maximum Gain of this antenna is only -1dBi.

# 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 and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

| | |
|---|---|
| **USA** | FCC, NVLAP |
| **Germany** | TUV Rheinland |
| **Japan** | VCCI |
| **New Zealand** | MoC |
| **Norway** | NEMKO |
| **R.O.C.** | BSMI, DGT, CNLA |

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:

**Lin Kou EMC Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

**Hsin Chu EMC Lab**:
Tel: 886-35-935343
Fax: 886-35-935342

**Lin Kou Safety Lab**:
Tel: 886-2-26093195
Fax: 886-2-26093184

**Lin Kou RF&Telecom Lab**
Tel: 886-3-3270910
Fax: 886-3-3270892

**Email**: service@mail.adt.com.tw
**Web Site**: www.adt.com.tw

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