

FCC DoC TEST REPORT

REPORT NO.: D921208R02

MODEL NO.: MN-710

RECEIVED: December 05, 2003

TESTED: December 05 ~ December 10, 2003

APPLICANT: Microsoft Corporation

ADDRESS: One Microsoft Way, Redmond WA 98052-6399,
U.S.A

ISSUED BY: Advance Data Technology Corporation

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

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0528
ILAC MRA



Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT : Microsoft[®] Broadband Networking Wireless USB
2.0 Adapter (Receiver Part)
BRAND NAME : Microsoft[®]
MODEL NO. : MN-710
TEST ITEM: ENGINEERING SAMPLE
APPLICANT : MICROSOFT CORPORATION
STANDARDS : FCC Part 15, Subpart B, class B,
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from December 05 ~ December 10, 2003. 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.

PREPARED BY: _____, **DATE:** December 12, 2003
Wendy Liao

APPROVED BY: _____, **DATE:** December 12, 2003
Ellis Wu / Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| Standard Section | Test Type | Result | Remarks |
|------------------------------------|--------------------|--------|---|
| FCC Part 15, Subpart B, class B | Conducted Emission | PASS | Meet the requirement of limit Minimum passing margin is -7.10dB at 0.168 MHz |
| | Radiated Emissions | PASS | Meet the requirement of limit Minimum passing margin is -4.42dB at 195.23 MHz |

NOTE: The information of measurement uncertainty is available upon the customer's request.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------------|--|
| PRODUCT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) |
| MODEL NO. | MN-710 |
| POWER SUPPLY | 5.0Vdc from host equipment |
| MODULATION TYPE | BPSK, QPSK, CCK, 16QAM, 64QAM |
| MODULATION TECHNOLOGY | DSSS, OFDM |
| TRANSFER RATE | 54/48/36/24/18/12/11/9/6/5.5/2/1Mbps |
| FREQUENCY RANGE | 2412MHz ~ 2462MHz |
| NUMBER OF CHANNEL | 11 |
| MAXIMUM OUTPUT POWER | 18.30dBm |
| ANTENNA TYPE | Dipole antenna with 2.5dBi gain |
| DATA CABLE | USB cable (1.8m Shielded) |
| I/O PORTS | USB |
| ASSOCIATED DEVICES | NA |

NOTE:

1. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
2. The EUT complies with IEEE 802.11g draft standards, and backwards compatible with IEEE 802.11b products.
3. 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 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 | | |

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. Transfer rate 6Mbps with OFDM technique, the worst case, was chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part). According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart B, class B
ANSI C63.4 : 1992

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

3.4 DESCRIPTION OF SUPPORT UNITS

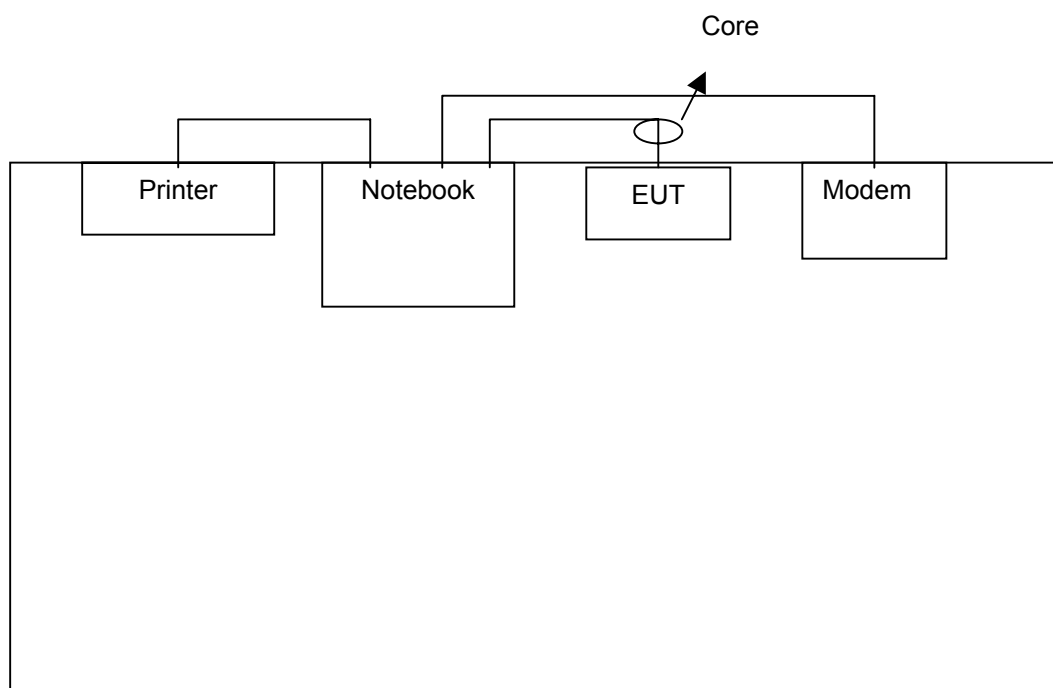
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|----------|-------|-----------|--------------------------|------------------|
| 1 | NOTEBOOK | DELL | PP01L | TW-0791UH-12800-123-5423 | FCC DoC Approved |
| 2 | PRINTER | EPSON | LQ-300+ | DCGY017058 | FCC DoC Approved |
| 3 | MODEM | ACEEX | 1414 | 980020516 | 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).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|--|------------|--------------|------------------|
| ROHDE & SCHWARZ Test Receiver | ESHS 30 | 828765/002 | July 15, 2004 |
| ROHDE & SCHWARZ Artificial Mains Network (for EUT) | ESH3-Z5 | 835239/001 | Apr. 28, 2004 |
| ROHDE & SCHWARZ Artificial Mains Network (for peripherals) | ESH3-Z5 | 835239/002 | Apr. 28, 2004 |
| *ROHDE & SCHWARZ 4-wire ISN | ENY41 | 935154/007 | Apr. 30, 2004 |
| *ROHDE & SCHWARZ 2-wire ISN | ENY22 | 833823/026 | Apr. 30, 2004 |
| Software | Cond-V2M3 | NA | NA |
| RF cable (JYBEO) | 5D-FB | Cable-C09.01 | May 23, 2004 |
| SUHNER Terminator (For ROHDE & SCHWARZ LISN) | 65BNC-5001 | E1-010789 | Jun. 04, 2004 |

- 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. “*”: These equipment are used for conducted telecom port test only (if tested).
 3. The test was performed in ADT Shielded Room No. 9.
 4. The VCCI Site Registration No. is C-1312.

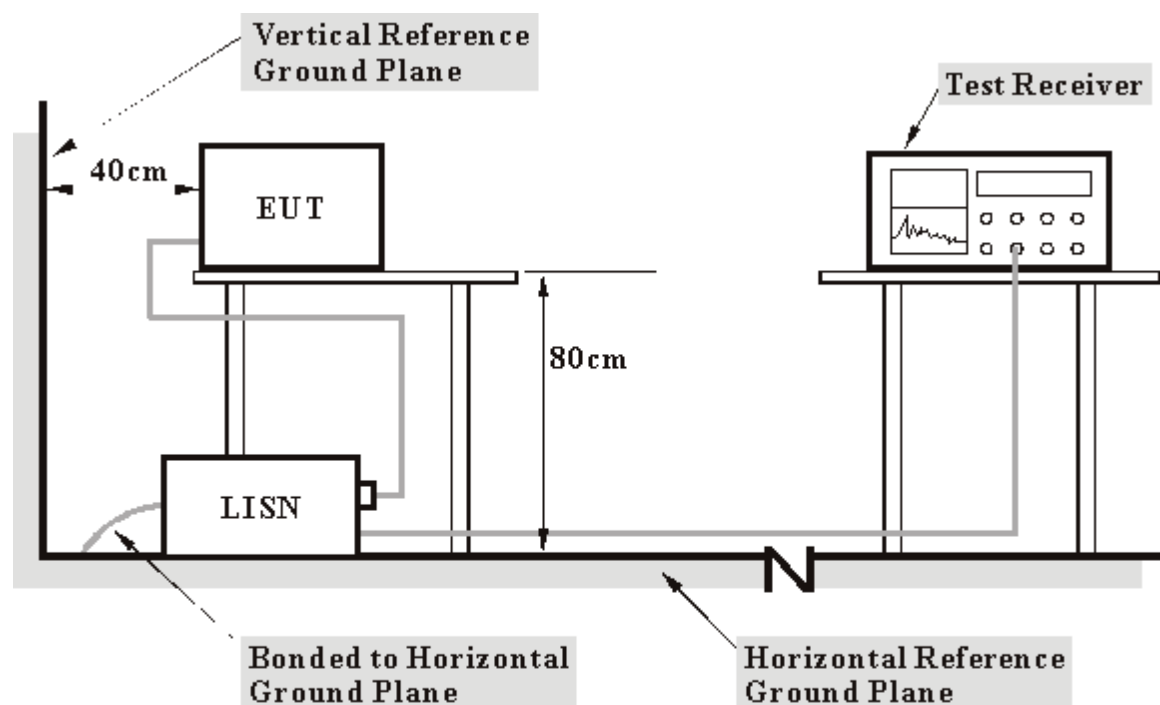
4.1.3 TEST PROCEDURES

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

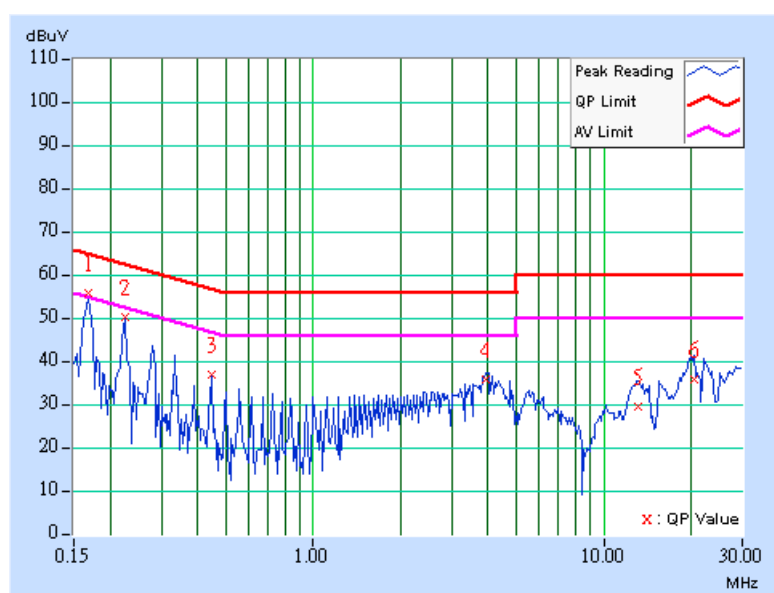
- a. Plug the EUT a notebook computer system placed on a testing table.
- b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The computer system sent "H" messages to its screen.
- d. The computer system sent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

4.1.7 TEST RESULTS

| | | | |
|---------------------------------|--|------------------------------|----------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 1 | 6dB BANDWIDTH | 9kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | TESTED BY: Martin Lee | |

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.168 | 0.10 | 54.73 | - | 54.83 | - | 65.06 | 55.06 | -10.23 | - |
| 2 | 0.225 | 0.11 | 49.28 | - | 49.39 | - | 62.63 | 52.63 | -13.24 | - |
| 3 | 0.447 | 0.20 | 35.83 | - | 36.03 | - | 56.93 | 46.93 | -20.90 | - |
| 4 | 3.952 | 0.30 | 34.85 | - | 35.15 | - | 56.00 | 46.00 | -20.85 | - |
| 5 | 13.190 | 0.79 | 28.40 | - | 29.19 | - | 60.00 | 50.00 | -30.81 | - |
| 6 | 20.468 | 1.12 | 34.73 | - | 35.85 | - | 60.00 | 50.00 | -24.15 | - |

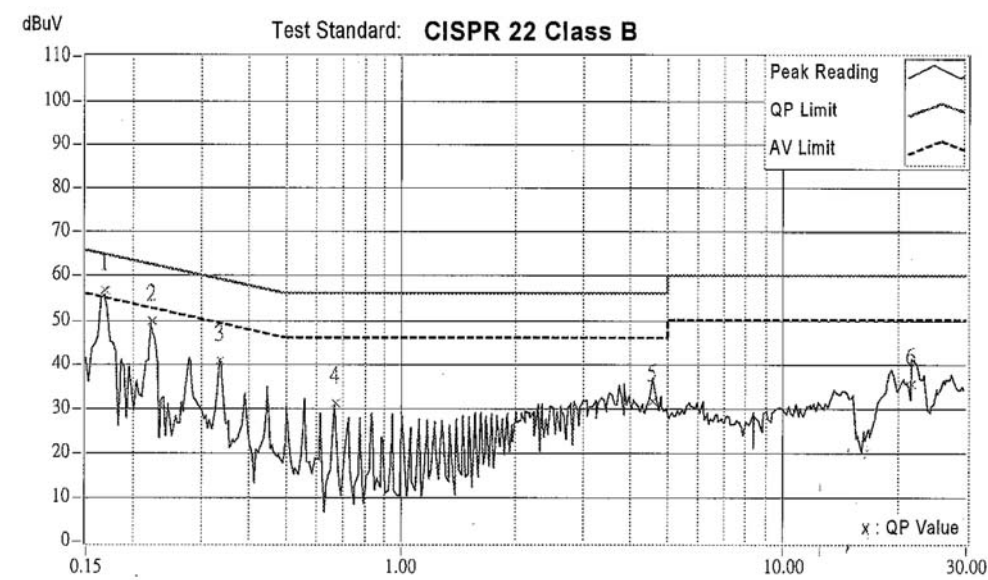
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



| | | | |
|---------------------------------|--|------------------------------|-------------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 1 | 6dB BANDWIDTH | 9kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Neutral (N) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | TESTED BY: Martin Lee | |

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.165 | 0.10 | 57.42 | - | 57.52 | - | 65.21 | 55.21 | -7.69 | - |
| 2 | 0.222 | 0.11 | 50.96 | - | 51.07 | - | 62.74 | 52.74 | -11.67 | - |
| 3 | 0.666 | 0.20 | 29.72 | - | 29.92 | - | 56.00 | 46.00 | -26.08 | - |
| 4 | 3.718 | 0.20 | 26.78 | - | 26.98 | - | 56.00 | 46.00 | -29.02 | - |
| 5 | 13.082 | 0.68 | 29.33 | - | 30.01 | - | 60.00 | 50.00 | -29.99 | - |
| 6 | 21.236 | 0.92 | 34.68 | - | 35.60 | - | 60.00 | 50.00 | -24.40 | - |

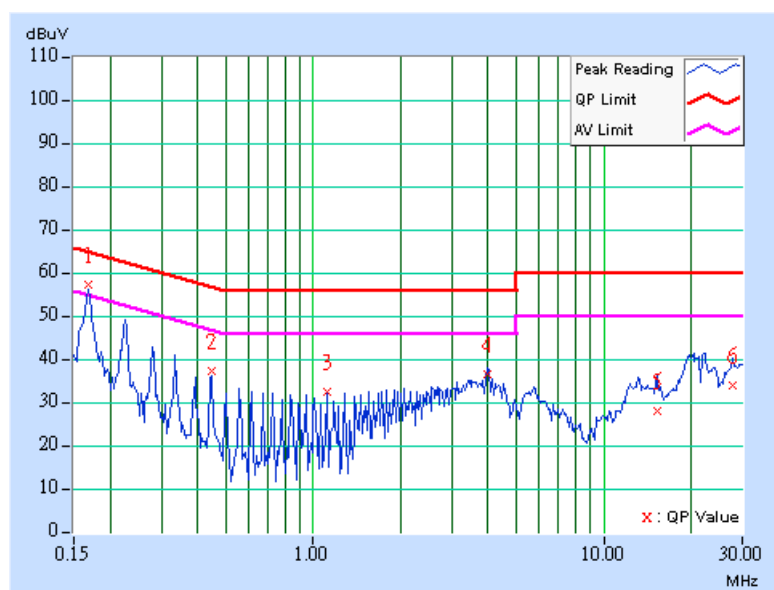
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



| | | | |
|---------------------------------|--|------------------------------|----------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 6 | 6dB BANDWIDTH | 9kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | TESTED BY: Martin Lee | |

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|----------------|-------|-----------|-------|--------|-------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.168 | 0.10 | 55.94 | 47.86 | 56.04 | 47.96 | 65.06 | 55.06 | -9.02 | -7.10 |
| 2 | 0.447 | 0.20 | 36.01 | - | 36.21 | - | 56.93 | 46.93 | -20.72 | - |
| 3 | 1.114 | 0.20 | 31.06 | - | 31.26 | - | 56.00 | 46.00 | -24.74 | - |
| 4 | 3.961 | 0.30 | 35.37 | - | 35.67 | - | 56.00 | 46.00 | -20.33 | - |
| 5 | 15.224 | 0.91 | 26.90 | - | 27.81 | - | 60.00 | 50.00 | -32.19 | - |
| 6 | 27.722 | 1.35 | 32.69 | - | 34.04 | - | 60.00 | 50.00 | -25.96 | - |

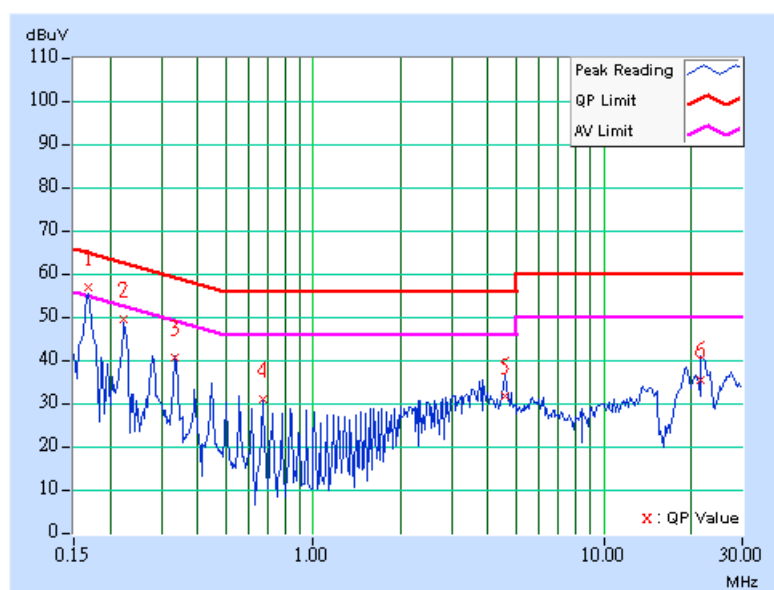
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



| | | | |
|---------------------------------|--|------------------------------|-------------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 6 | 6dB BANDWIDTH | 9kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Neutral (N) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | TESTED BY: Martin Lee | |

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|----------------|-------|-----------|-------|--------|-------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.168 | 0.10 | 55.96 | 45.91 | 56.06 | 46.01 | 65.06 | 55.06 | -9.00 | -9.05 |
| 2 | 0.222 | 0.11 | 48.74 | - | 48.85 | - | 62.74 | 52.74 | -13.89 | - |
| 3 | 0.336 | 0.17 | 39.92 | - | 40.09 | - | 59.30 | 49.30 | -19.21 | - |
| 4 | 0.669 | 0.20 | 30.21 | - | 30.41 | - | 56.00 | 46.00 | -25.59 | - |
| 5 | 4.582 | 0.23 | 30.88 | - | 31.11 | - | 56.00 | 46.00 | -24.89 | - |
| 6 | 21.677 | 0.93 | 34.59 | - | 35.52 | - | 60.00 | 50.00 | -24.48 | - |

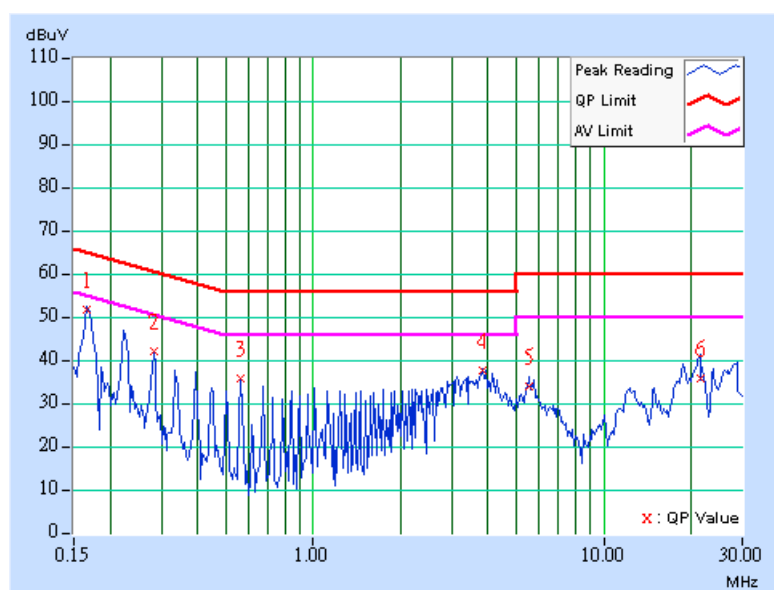
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



| | | | |
|---------------------------------|--|------------------------------|----------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 11 | 6dB BANDWIDTH | 9kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | TESTED BY: Martin Lee | |

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.165 | 0.10 | 50.72 | - | 50.82 | - | 65.21 | 55.21 | -14.39 | - |
| 2 | 0.282 | 0.14 | 41.00 | - | 41.14 | - | 60.76 | 50.76 | -19.62 | - |
| 3 | 0.561 | 0.20 | 34.80 | - | 35.00 | - | 56.00 | 46.00 | -21.00 | - |
| 4 | 3.814 | 0.29 | 36.61 | - | 36.90 | - | 56.00 | 46.00 | -19.10 | - |
| 5 | 5.552 | 0.38 | 32.82 | - | 33.20 | - | 60.00 | 50.00 | -26.80 | - |
| 6 | 21.425 | 1.16 | 34.90 | - | 36.06 | - | 60.00 | 50.00 | -23.94 | - |

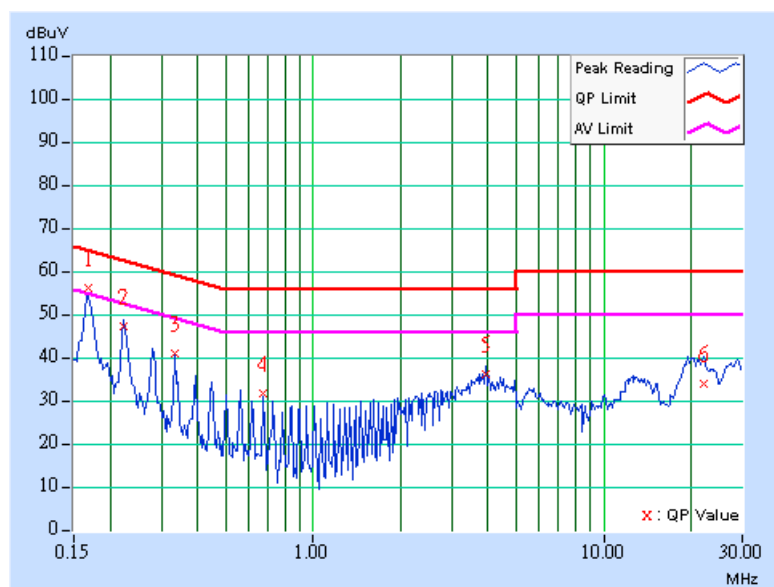
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



| | | | |
|---------------------------------|--|------------------------------|-------------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 11 | 6dB BANDWIDTH | 9kHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | PHASE | Neutral (N) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 60%RH, 991hPa | TESTED BY: Martin Lee | |

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|----------------|-------|-----------|-------|--------|-------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.168 | 0.10 | 55.19 | 45.34 | 55.29 | 45.44 | 65.06 | 55.06 | -9.77 | -9.62 |
| 2 | 0.222 | 0.11 | 46.60 | - | 46.71 | - | 62.74 | 52.74 | -16.03 | - |
| 3 | 0.336 | 0.17 | 40.10 | - | 40.27 | - | 59.30 | 49.30 | -19.03 | - |
| 4 | 0.672 | 0.20 | 31.09 | - | 31.29 | - | 56.00 | 46.00 | -24.71 | - |
| 5 | 3.919 | 0.20 | 35.49 | - | 35.69 | - | 56.00 | 46.00 | -20.31 | - |
| 6 | 22.064 | 0.94 | 33.07 | - | 34.01 | - | 60.00 | 50.00 | -25.99 | - |

- 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 15.109 as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|----------------------|--------------------------------------|----------------------------------|
| 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 |
|------------------------------------|---------------------|--------------------------|------------------|
| * HP Spectrum Analyzer | 8593E | 3911A07465 | July 07, 2004 |
| * HP Preamplifier | 8447D | 2432A03504 | June 10, 2004 |
| * HP Preamplifier | 8449B | 3008A01292 | Aug. 11, 2004 |
| SCHAFFNER Tunable Dipole Antenna | VHBA 9123 | 459 | Jun. 26, 2004 |
| SCHWARZBECK Tunable Dipole Antenna | UHA 9105 | 977 | |
| * ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839013/007 839379/002 | Feb. 13, 2004 |
| * Schwarzbeck Antenna | VULB9168 | 137 | Apr. 03, 2004 |
| * SCHWARZBECK Horn Antenna | BBHA9120-D1 | D130 | June 30, 2004 |
| *ADT. Turn Table | TT100 | 0306 | NA |
| *ADT. Tower | AT100 | 0306 | NA |
| *Software | ADT_Radiated_V 5.14 | NA | NA |
| *TIMES RF cable | LL142 | CABLE-CH6-01 | Apr. 30, 2004 |

- 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. "*" = These equipment are used for the final measurement.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The test was performed in ADT Chamber No. 6.

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.

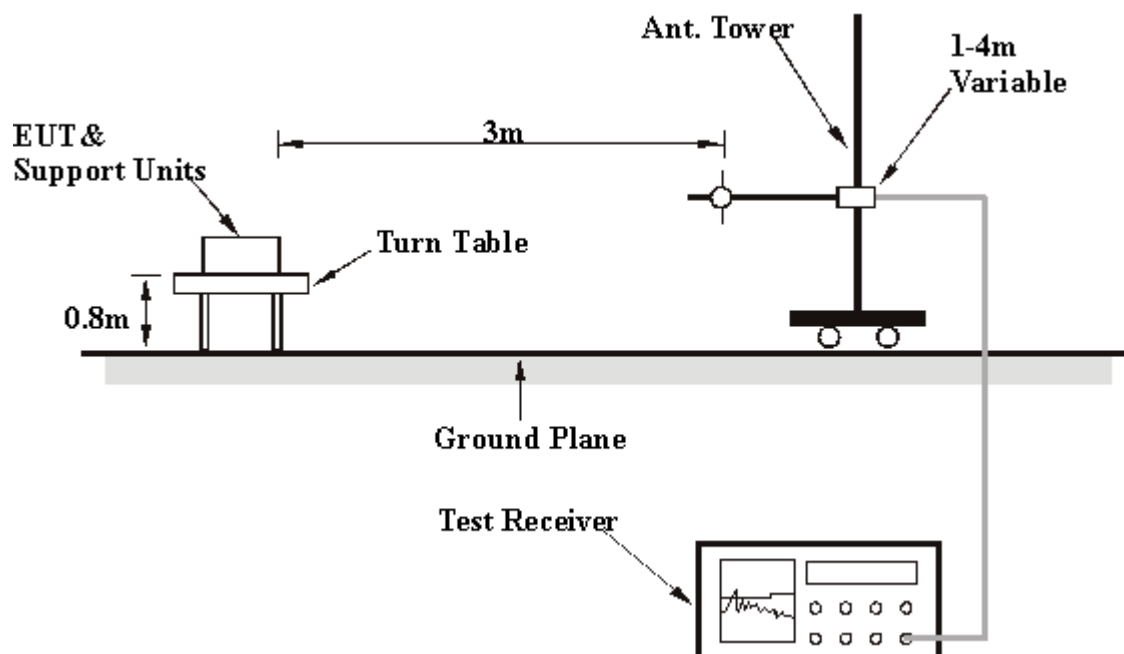
NOTE:

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 10 Hz 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

| | | | |
|---------------------------------|--|------------------------------|----------------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 11 | FREQUENCY RANGE | Below 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25 deg. C, 60 % RH, 991 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) | Correction Factor (dB/m) |
| 1 | 150.52 | 33.13 QP | 43.50 | -10.37 | 2.50 H | 289 | 19.09 | 14.04 |
| 2 | 195.23 | 39.08 QP | 43.50 | -4.42 | 1.75 H | 253 | 27.58 | 11.50 |
| 3 | 259.38 | 37.37 QP | 46.00 | -8.63 | 1.00 H | 67 | 23.76 | 13.61 |
| 4 | 325.47 | 32.95 QP | 46.00 | -13.05 | 1.00 H | 76 | 17.18 | 15.77 |
| 5 | 455.71 | 35.56 QP | 46.00 | -10.44 | 1.75 H | 94 | 16.18 | 19.38 |
| 6 | 599.56 | 35.32 QP | 46.00 | -10.68 | 1.50 H | 256 | 12.73 | 22.59 |

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 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 | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 11 | FREQUENCY RANGE | Below 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25 deg. C, 60 % RH, 991 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) | Correction Factor (dB/m) |
| 1 | 37.78 | 31.23 QP | 40.00 | -8.77 | 1.00 V | 193 | 17.23 | 14.00 |
| 2 | 160.24 | 36.35 QP | 43.50 | -7.15 | 1.00 V | 64 | 22.09 | 14.26 |
| 3 | 195.23 | 34.03 QP | 43.50 | -9.47 | 2.50 V | 358 | 22.53 | 11.50 |
| 4 | 261.32 | 36.07 QP | 46.00 | -9.93 | 1.75 V | 25 | 22.39 | 13.69 |
| 5 | 457.10 | 40.80 QP | 46.00 | -5.20 | 1.24 V | 52 | 21.40 | 19.40 |
| 6 | 599.56 | 37.21 QP | 46.00 | -8.79 | 1.00 V | 346 | 14.62 | 22.59 |
| 7 | 914.47 | 37.46 QP | 46.00 | -8.54 | 1.00 V | 166 | 10.15 | 27.30 |

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.

4.2.8 TEST RESULTS

| | | | |
|---------------------------------|--|------------------------------|--------------------------|
| EUT | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 1 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25 deg. C, 60 % RH, 991hPa | 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) | Correction Factor (dB/m) |
| 1 | 4824.00 | 49.34 PK | 74.00 | -24.66 | 1.07 H | 34 | 11.48 | 37.86 |
| 2 | 9648.00 | 53.33 PK | 74.00 | -20.67 | 1.27 H | 34 | 8.86 | 44.47 |
| 2 | 9648.00 | 43.93 AV | 54.00 | -10.07 | 1.27 H | 34 | -0.54 | 44.47 |

| 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) | Correction Factor (dB/m) |
| 1 | 4824.00 | 50.72 PK | 74.00 | -23.28 | 1.22 V | 349 | 12.86 | 37.86 |
| 2 | 9648.00 | 53.30 PK | 74.00 | -20.70 | 1.22 V | 34 | 8.83 | 44.47 |
| 2 | 9648.00 | 44.53 AV | 54.00 | -9.47 | 1.22 V | 34 | 0.06 | 44.47 |

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 | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 6 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25 deg. C, 60 % RH, 991 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) | Correction Factor (dB/m) |
| 1 | 4874.00 | 52.60 PK | 74.00 | -21.40 | 1.10 H | 197 | 14.66 | 37.94 |
| 1 | 4874.00 | 45.18 AV | 54.00 | -8.82 | 1.10 H | 197 | 7.24 | 37.94 |
| 2 | 9748.00 | 56.26 PK | 74.00 | -17.74 | 1.06 H | 271 | 11.44 | 44.82 |
| 2 | 9748.00 | 46.42 AV | 54.00 | -7.58 | 1.06 H | 271 | 1.60 | 44.82 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|--|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 4874.00 | 51.13 PK | 74.00 | -22.87 | 1.47 V | 282 | 13.19 | 37.94 |
| 1 | 4874.00 | 42.84 AV | 54.00 | -11.16 | 1.47 V | 282 | 4.90 | 37.94 |
| 2 | 9748.00 | 55.92 PK | 74.00 | -18.08 | 1.42 V | 34 | 11.10 | 44.82 |
| 2 | 9748.00 | 45.62 AV | 54.00 | -8.38 | 1.42 V | 34 | 0.80 | 44.82 |

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 | Microsoft® Broadband Networking Wireless USB 2.0 Adapter (Receiver Part) | MODEL | MN-710 |
| MODE | Channel 11 | FREQUENCY RANGE | Above 1000 MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak(PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25 deg. C, 60 % RH, 991 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) | Correction Factor (dB/m) |
| 1 | 4924.00 | 54.22 PK | 74.00 | -19.78 | 1.14 H | 274 | 16.20 | 38.02 |
| 1 | 4924.00 | 46.32 AV | 54.00 | -7.68 | 1.14 H | 274 | 8.30 | 38.02 |
| 2 | 9848.00 | 54.27 PK | 74.00 | -19.73 | 1.42 H | 41 | 9.24 | 45.03 |
| 2 | 9848.00 | 44.87 AV | 54.00 | -9.13 | 1.42 H | 41 | -0.16 | 45.03 |

| 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 | 4924.00 | 51.63 PK | 74.00 | -22.37 | 1.47 V | 282 | 13.61 | 38.02 |
| 1 | 4924.00 | 44.36 AV | 54.00 | -9.64 | 1.47 V | 282 | 6.34 | 38.02 |
| 2 | 9848.00 | 55.17 PK | 74.00 | -18.83 | 1.33 V | 311 | 10.14 | 45.03 |
| 2 | 9848.00 | 44.87 AV | 54.00 | -9.13 | 1.33 V | 311 | -0.16 | 45.03 |

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 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 |
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www.adt.com.tw/index.5/phtml.

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